SPRAWOZDANIA ARCHEOLOGICZNE VOL 75/2 (2023), PP. 65-113

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PL ISSN 0081-3834, e-ISSN: 2719-647X

DOI: https://doi.org/10.23858/SA/75.2023.2.3409

https://rcin.org.pl/dlibra/publication/277423

Jak cytować:

Szeliga, M., & Gawryjołek-Szeliga, K. (2023). Early Neolithic settlers on the border of the loess of Eastern Poland: new data from the Nałęczów Plateau. Sprawozdania Archeologiczne, 75(2), 65–113. https://doi.org/10.23858/SA/75.2023.2.3409

SPRAWOZDANIA ARCHEOLOGICZNE 75/2, 2023
PL ISSN 0081-3834
DOI: 10.23858/SA75.2023.2.3409

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EARLY NEOLITHIC SETTLERS ON THE BORDER OF THE LOESS OF EASTERN POLAND: NEW DATA FROM THE NAŁĘCZÓW PLATEAU

ABSTRACT

Szeliga M. and Gawryjołek-Szeliga K. 2023. Early Neolithic settlers on the border of the loess of Eastern Poland: new data from the Nałęczów Plateau. *Sprawozdania Archeologiczne* 75/2, 65-113.

This article is an interim presentation of the colonisation of the loess upland border of the western Lublin Region by LBK societies. The main point of reference are materials discovered in Bogucin (Nałęczów Plateau) in 2011, which are currently the only homogenous Early Neolithic collection from this region. The results of the research indicate that the LBK settlement on the loess borderland started at least at the end of the 6th millennium BC, in the classical stage of the Music-Note phase (NII). It clearly intensified during its latest part (NIII), which was linked with the adaptation of the early-Želiezovce ornamentation style. The obtained data confirms the existence of at least two settlement micro-regions in the discussed period. They dynamically developed through intense and far-reaching interregional contacts and exchange of goods (especially flints and flint artefacts). The initial territories of the LBK societies inhabiting the analysed loess borderland were most probably the areas of the northern foreland of the Sandomierz Upland.

Keywords: Neolithic settlement, LBK, loess border, Nałęczów Plateau, Želiezovce style
Received: 05.03.2023; Revised: 26.06.2023; Accepted: 21.12.2023

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INTRODUCTION

The early phase of the Neolithic associated with the development of the Linear Pottery culture (LBK) remains one of the most enigmatic periods of the Neolithic settlement on the upland territories of the interfluve between the Vistula and Bug Rivers despite a great number of known sites (*cf.,* Brzozowski 1988; Szeliga 2021, tab. 1). On the one hand, this state of affairs results from the very slow pace of obtaining new evidence – together with the fact that surface-collected materials are predominant. On the other, it is a consequence of the fact that previous discoveries have not been sufficiently researched and published – this observation especially refers to the most abundant inventories found during excavations. These limitations mainly affect not only comprehensive considerations on the development of the LBK within the entire loess interfluvial zone of the Vistula and Bug Rivers, but also micro-regional studies. In this context, especially important are clearly geographical disproportions in the distribution and representativeness of diagnostic finds. The vast majority of sites associated with the culture in question are clustered within the south-eastern part of the discussed zone – more precisely in territories located between the Huczwa and Bug Rivers, which are part of the Western Volhynian Upland (Szeliga 2021, fig. 1: 2). The great majority of the excavated inventories which were found in feature context – representing nearly the entire scope of the stylistic development of the LBK – also come from this territory (*cf.*, Kempisty 1962; Kącki 1982; Zakościelna 1988a; 1988b; Niedźwiedź and Panasiewicz 1994; Gawryjołek-Szeliga 2009; Szeliga and Gawryjołek-Szeliga 2021, fig. 11). This material admittedly provides us with the basis to very generally reconstruct the development of the culture in question across the discussed territory, but the fact that individual inventories – especially from the earliest and particularly the latest stages of the LBK – have not been completely researched still remains the main limitation (Szeliga 2021, 64-69). The state of research of the remaining loess territories located in the interfluve of the Vistula and Bug Rivers is much poorer. In the light of the current state of knowledge, LBK sites distributed across the central, western and northern parts of this area are much more scattered. Most of them are grouped in clusters of different sizes – counting from several to even more than ten settlement points – arranged along the local watercourses. With a few exceptions, they are solely surface discoveries or were excavated without feature context (Szeliga 2021, fig. 1; tab. 1). This fact considerably reduces their cognitive value, both for local analyses and supra-regional research, which include all the loess uplands located between the Vistula and Bug Rivers.

In the context of the indicated problems and interpretative limitations, discoveries made during recent years at Site 6 in Bogucin, Nałęczów Plateau, appear to be especially pertinent. At this moment, it is the largest excavated LBK settlement located in the interfluvial zone of the Vistula and Bug Rivers. At the same time, the material discovered at this site is one of the most sizeable Early Neolithic inventories found in this territory and the only inventory from its entire western zone found in feature context (*cf.*, Szeliga 2021, tab. 1).

This gives us previously unknown interpretation possibilities by presenting new and important data on the history and intensity of settling the edge zone of the loess uplands located in eastern Poland by the LBK society as well as information concerning the range of the chronological and stylistic development of the discussed culture in this territory. The

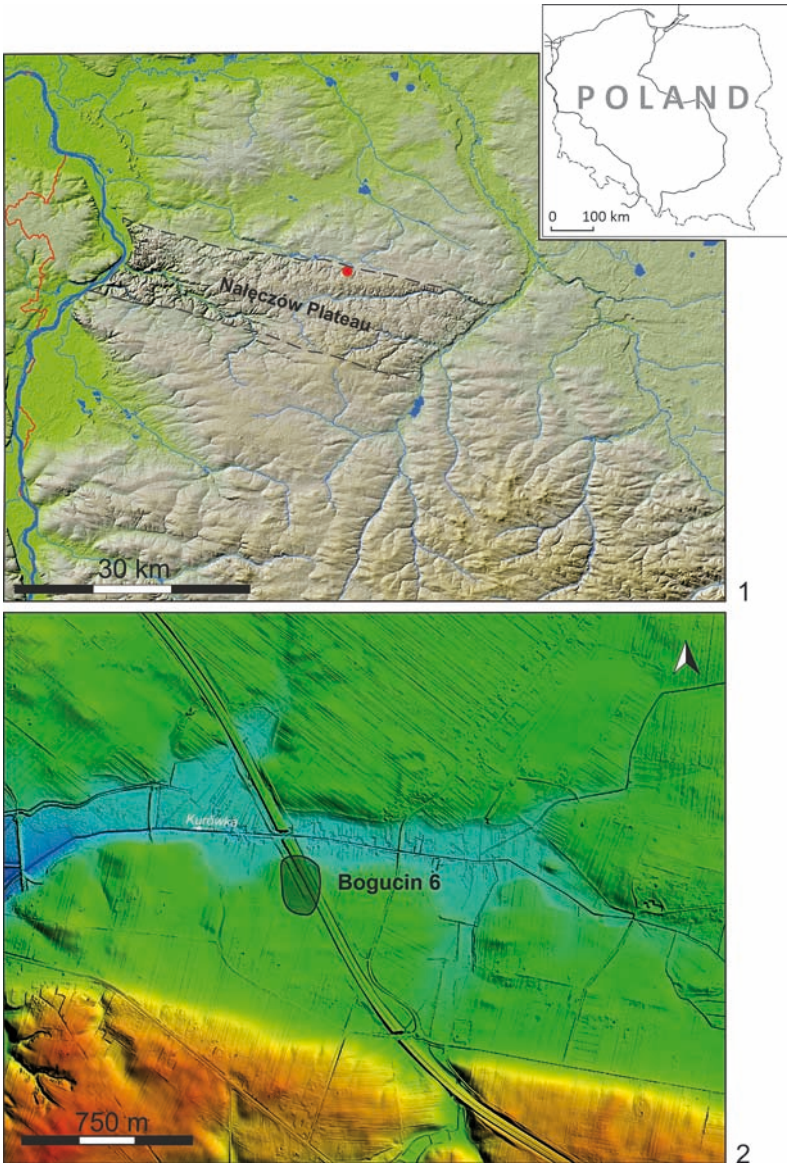


Fig. 1. Location of the analysed area and Site 6 in Bogucin
(1 – map based on Gawrysiak 2004, modified by M. Szeliga)

indicated issues, together with the complex presentation and multi-faceted analysis of the extremely important collection of finds from Bogucin are the main subject of considerations presented in this paper.

LBK SITE IN BOGUCIN

Site Bogucin 6 (AZP 75-79/14) is located on the north-eastern edge of the Nałęczów Plateau, which is at the same time the north-western extremity of the loess upland occupying the interfluve of the Vistula and Bug Rivers (Fig. 1: 1) and the northernmost part of the Polish loess cover (*cf.*, Maruszczak 1991; Marks *et al.* 2006). It covers part of the top and a slightly convex slope of a vast flattening descending to the north, to the valley of the Kurówka River (Fig. 1: 2). Its modern soil cover is composed of Luvisols formed on the loess and loess-like dusty deposits, which are the latest lithofacies component of the local quaternary sediments (Reder and Stępniewski 2012, 14). The site was discovered in 2007 during verification surface research conducted along the rute of the planned S17 express road. It was estimated that the site covered *c.* 2.5 ha. The discovery was immediately followed by a preliminary survey research, which made it possible to classify the site as a multicultural settlement, intensely occupied at least from the Neolithic to the Early Middle Ages (Sadowski 2006). The excavation proper – which was a rescue intervention – was carried out in 2011 and led by Mariusz Matyaszewski from the Archaeological Research and Supervision in Workshop of Lublin (Pracownia Badań i Nadzorów Archeologicznych w Lublinie) The research covered jointly 230 ares and resulted in discovering abundant relics of the multicultural settlement from the Neolithic, Bronze Age, Iron Age, Early Middle Ages and Modern Period (Matyaszewski 2011). The earliest phase of the site was linked with the early stage of the Neolithic and the LBK settlement that existed within its limits (Gawryjołek-Szeliga and Szeliga 2012).

FEATURES

The Early Neolithic phase of settling the discussed site is represented by a total number of 51 features. They were recorded only in the central part of the researched area, forming several minor, more or less distinct clusters (Fig. 2). The analysis of the dimensions and morphological properties of particular features made it possible to classify them in two basic formal categories – postholes and pits. The former is represented by only four features (Nos. 4, 30, 123, 310, Fig. 3: 1-4) that were small in size, with a regular, oval outline in plan view (maximum diameter of 60 cm), trough-shaped or irregular in the cross-section and a rather shallow depth (up to 22 cm). The fills of each of them were of homogeneous character and consistency, and their colour was light grey-brown. Postholes Nos. 4 and 310 were

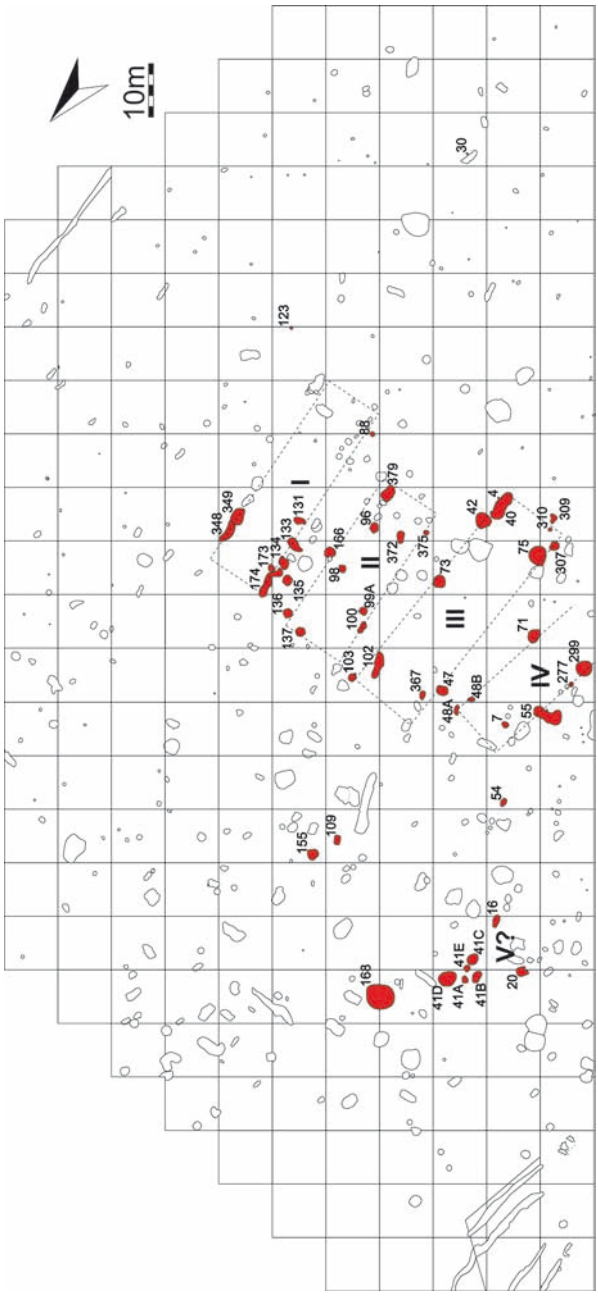


Fig. 2. Bogucin, Site 6: Arrangement of the LBK features in the researched area with supposed locations of longhouses (according to Gawryjołek-Szeliga and Szeliga 2012, modified by M. Szeliga)

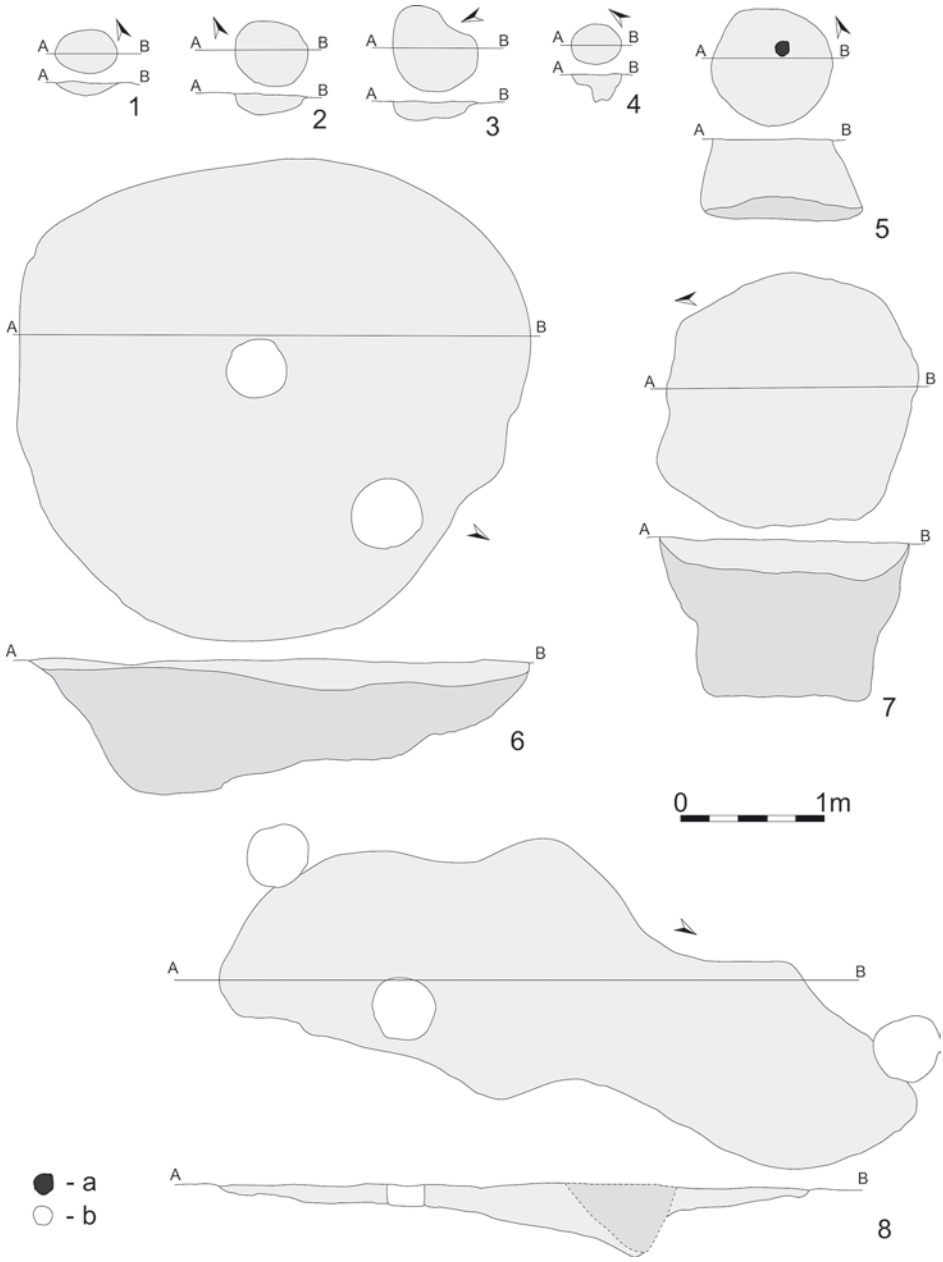


Fig. 3. Bogucin, Site 6: Plan views and cross-sections of selected LBK features:
1 – Feature 30; 2 – Feature 123; 3 – Feature 310; 4 – Feature 4; 5 – Feature 88; 6 – Feature 75;
7 –Feature 135; 8 – Feature 102; a – modern hop pits; b – stone
(according to Gawryjołek-Szeliga and Szeliga 2012, modified by M. Szeliga)

located in the zone of the greatest concentration of the LBK relics, in the direct vicinity of the pits (Fig. 2). This may indicate that they were functionally and structurally related, which might have been linked with creating and using above-ground structures of farm and/or residential buildings. On the other hand, postholes Nos. 30 and 123 were discovered at a clear distance (several dozens of metres) to the south-east from the cluster of the LBK features (Fig. 2). This fact allows us to rule out their functional relation to other features dated to the same time. This means that their association with the LBK is not certain, although single characteristic pottery sherds were discovered in their fills.

The second category of features – more numerous and considerably more diverse – were pits, a total number of 47 features. Over half of them (30 features) had regular (circular or slightly oval) outlines in plan view and, usually, a trough-shaped profile (Fig. 3: 6), whereas flat-bottomed features with trapezoidal or nearly rectangular profiles were much less numerous (Fig. 3: 5, 7). The sizes of the pits were considerably diverse, usually with diameters ranging from one to three metres at the level of their discovery (sporadically even 5 metres: feature 168). Their depths varied from 12 to even 122 centimetres. Their fills were usually homogeneous in character and consistency, although their dark grey-brown colour had different hues. Only several of the fills were visibly stratified (Fig. 3: 5-6), which indicates that the features were gradually filled in stages and over a prolonged period of time after being used. The precise identification and functional classification of the discussed features is made impossible by the limited number of the archaeological data and, in many cases, by the poor state of their preservation. Still, it is highly probable that some of them (Fig. 3: 5, 7) were used as storage pits. We cannot rule out the possibility that other such features – especially the largest, trough-shaped hollows – were construction pits, left after building and using habitation structures of the longhouse type. Most probably, the same role was played by 17 other pits having decidedly greater dimensions at the level of their discovery, ranging from 80 × 200 cm (Feature 48A) to even 170 × 640 cm (Feature 174) and diverse maximum depths (19-82 cm), with considerable variations within particular structures. The outlines of these pits were elongated, less frequently oval or irregular and usually had trough-shaped or irregular profiles, whereas their fills were homogenous in structure and colour (Fig. 3: 8). The individual morphological properties of the discussed features, as well as their distribution and orientation within the researched area (Fig. 2), justify the interpretation that they are the remains of construction pits linked with building and the use of residential constructions of the longhouse type, as they find numerous and close analogies across the entire range of the LBK.

The location of the LBK features within the excavated area of the site allows us to suspect that they determine the northern limit of the settlement, which occupied an unspecified total area on the gentle slope and top of the local terrain flattening. The poor state of preservation of the features – especially lack of row arrangements of the preserved postholes – makes it impossible to precisely determine the number and arrangement of the residential buildings within the researched area. The analysis of the dispersion of the LBK

features, supported by data obtained from other, better examined settlements attributed to the discussed culture from the drainage basin of the Upper Vistula (*e.g.*, Milisauskas 1986; Czekaj-Zastawny 2008; 2014; Kulczycka-Leciejewiczowa 2008; Dębiec 2014), allows us to suspect that what was discovered in the excavated area were the remains of at least four LBK longhouses having a width of *c.* 10 m and length of several dozens of metres, oriented roughly N-S (Fig. 2). It appears that this assumption can be partially verified by expanding the excavation to the south-western part of the site.

ARTEFACTS

All the excavated LBK features yielded 634 artefacts, the great majority of which are vessel fragments (501) and flint artefacts (117). Daub fragments (12) and stone items (4) were decidedly less numerous (Table 1). Particular features contained very small quantities of artefacts. In most of them, only single or a few artefacts were discovered. Greater amounts of such materials – including the total number of a dozen or so artefacts representing different categories – were yielded much less frequently. Only 10 features contained more numerous inventories, ranging from 21 to 59 artefacts (Table 1). The numbers of the discovered artefacts did not directly correspond to the forms or dimensions of the features in which they were found.

The analysis of the quantitative distribution of flint artefacts and pottery within the features that were the most abundant in archaeological material indicated that most of them contained artefacts that were especially concentrated at the top level and, sporadically, in the middle part, whereas in the deeper strata and near the bottom they were much more sparse or even absent (Fig. 4: 1-4). This fact closely corresponds to data obtained from, for example, the uppermost strata of damaged LBK features from Site 6 in Tominy, Opatów District (Szeliga and Zakościelna 2007, figs 13 and 14) as well as the middle and bottom levels of pits from Site 16 in Rzeszów (Kadrow 1990, figs 5b; 6b; 7b; 8b; 9b; 12b; 13b), indirectly indicating a somewhat considerable degree of destruction of certain features linked with this culture and recorded in the excavated part of the site.

Considering the general range of the relics of the LBK settlement within the researched area of the site – as well as the sizes and depths of particular features – their overall abundance in material should be considered modest and untypical in regard to other, previously researched settlements of this culture. The most notable disproportions mainly concern the number of pottery remains, which usually are a category of mass artefacts (*cf.*, for example, Kadrow 1990, 22; 1997, 8, fig. 3; Gruszczyńska 1992, 123; Michalak-Ścibior and Taras 1995, tab. II; Dębiec 2006, 47; Szeliga 2008, tab. 1). The main reasons of this fact – besides the original functional diversity of farm buildings built within the limits of the settlement and factors linked with the creation of their fills – should be attributed to the incomplete state of preservation of the great majority of these features (as a result of slope

Table 1. Bogucin, Site 6: qualitative and quantitative comparison of artefacts originating from the LBK features

Feature No.	Pottery	Flint	Stone	Daub	Total
4	30	5	-	-	**35**
7	3	4	-	-	**7**
16	5	-	-	-	**5**
20	11	1	1	-	**13**
30	1	-	-	-	**1**
40	12	9	-	-	**21**
41A	12	-	-	-	**12**
41B	43	5	-	-	**48**
41C	2	-	-	-	**2**
41D	1	-	-	-	**1**
41E	2	-	-	-	**2**
42	9	5	-	-	**14**
47	31	7	-	3	**41**
48A	5	1	-	-	**6**
48B	11	2	-	-	**13**
54	2	-	-	-	**2**
55	43	14	1	-	**58**
71	5	-	-	-	**5**
73	1	2	-	-	**3**
75	1	4	-	-	**5**
88	2	2	-	-	**4**
96	1	1	-	-	**2**
98	5	4	-	-	**9**
99A	12	-	-	-	**12**
100	3	-	-	-	**3**
102	9	4	-	-	**13**
103	4	1	-	-	**5**
109	2	-	-	-	**2**
123	1	-	-	-	**1**
131	26	7	1	2	**36**
133	33	-	-	2	**35**
134	3	-	-	1	**4**
135	2	-	-	-	**2**
136	9	4	-	-	**13**
137	1	2	-	-	**3**
155	1	-	-	-	**1**
166	5	1	-	-	**6**

Feature No.	Pottery	Flint	Stone	Daub	Total
168	14	1	-	-	**15**
173	4	-	-	-	**4**
174	9	3	-	-	**12**
277	16	2	-	-	**18**
299	26	-	-	-	**26**
307	34	6	1	-	**41**
309	3	-	-	-	**3**
310	3	-	-	-	**3**
348	4	-	-	4	**8**
349	14	-	-	-	**14**
367	7	1	-	-	**8**
372	1	-	-	-	**1**
375	2	1	-	-	**3**
379	15	18	-	-	**33**
TOTAL	**501**	**117**	**4**	**12**	**634**

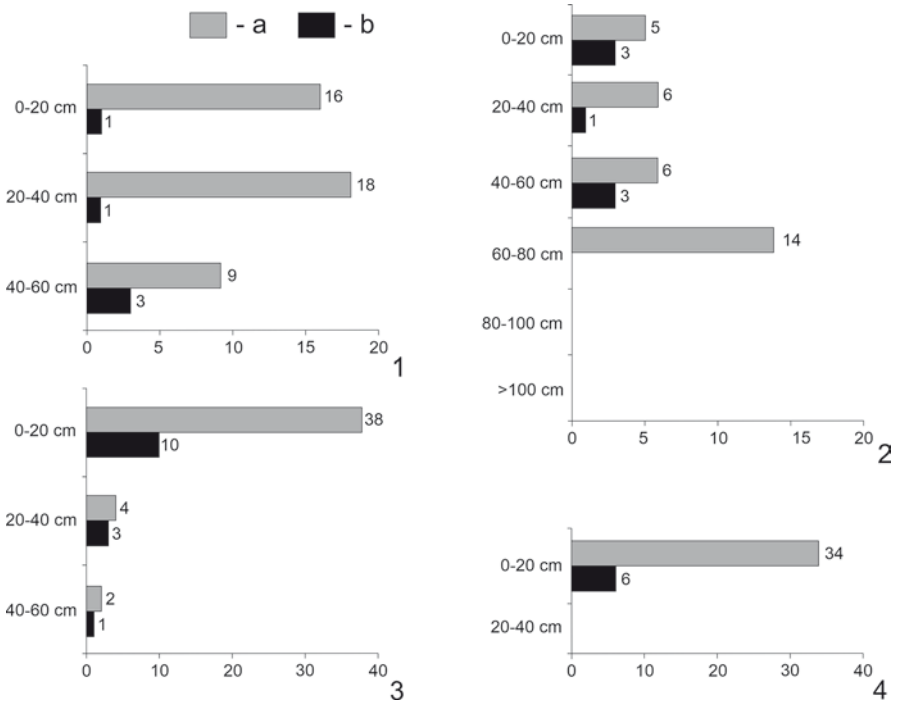


Fig. 4. Bogucin, Site 6: Quantitative distribution of pottery (a) and flint materials (b) in regard of the depths of the most abundant LBK features: 1 – feature 41B; 2 – feature 47; 3 – feature 55; 4 – feature 307. Prepared by M. Szeliga

Table 2. Bogucin, Site 6: condition of the ceramics in the LBK features:
O – ornamented fragments; NO – non-ornamented fragments

Rims		Bodies		Bases		Unspecified shards	Total	
O	NO	O	NO	O	NO	NO	O	NO
55	24	111	265	10	27	9	176	325
79		**376**		**37**		**9**	**501**	

erosion and intense, multi-phase settlement process in the later phase of using the site) as well as the methodical procedures used during their exploration.

POTTERY

The pottery inventory discovered in the LBK features encompasses 501 specimens (Table 1) represented entirely by vessel sherds. This collection is composed of very fragmented material, which makes it difficult to reconstruct the vessels. None of the vessels was entirely preserved, and only several were reconstructed to a degree that allows us to learn about their whole forms and ornamentation sequences. The attempts to reconstruct the vessels were also considerably hindered by fresh breaks, which indicated that sometimes pottery inventories found in particular features were considerably incomplete. In the entire collection, the most numerous type of sherds are fragments of bodies (75.05%), as opposed to very small numbers of parts of rims and bases (15.77% and 7.39%). About 1.80% of the sherds could not be identified due to their small size and poor state of preservation. They were generally classified as unidentified sherds (Table 2). The present state of preservation of the collection makes it difficult to determine the original number of vessels. However, the obtained refits of sherds (*c.* 25% of the whole collection) and the number of diagnostic fragments (*e.g.*, rims, bases and ornamented sherds) allow us to estimate that the whole collection represents the remains of at least 40 vessels.

Morphometric and technological properties

The examination of the production features of the pottery included 437 sherds (87.22% of the entire collection). Based on the analysis of the wall thickness, properties of the clay fabric, ornamentation techniques as well as the methods of vessel surface finishing, it was observed that there is a distinct division between delicate (so-called tableware) and coarse (so-called kitchenware) vessels, which is typical of the LBK pottery (*e.g.*, Kulczycka-Leciejewiczowa 1979, 82-83; Kadrow 1990, 33; 1997, 8-12; Gruszczyńska 1992, 123; Michalak-Ścibior and Taras 1995, 86-93).

The forms included in the former category have thin walls – whose thickness ranges from 2.5 mm to 8 mm, but fragments with 5-8 mm-thick walls are predominant. They were made of greasy clay, thinned mainly with fine and very fine sand, grog (chamotte) of various degrees of granulation and organic addition, which have various composition and volumes in particular specimens, although it appears that sand was added on a usual basis. Sporadically, the clay fabric did not contain intentionally added temper. In some cases, it contained very finely crushed stone and ochre. The characteristic feature of the pottery included in this category is the presence of incised ornaments and the small size of the vessels, which are mainly represented by spherical bowls, both hemispherical, and in the shape of three-fourths of a sphere (Figs 5: 1, 2; 7: 1-6; 8: 1-4, 7), and – considerably less often – by open bowls (Fig. 9: 1, 3) and more complex forms (Fig. 9: 4, 10). The surfaces of these vessels – especially those of specimens decorated with incised ornaments – are much more carefully formed in comparison with the rest of the collection. Their walls are usually even, smoothened (in several cases they are even slightly polished). In most cases, they are lustreless and – depending on the amount of temper and state of preservation – smooth or coarse. Both their external and internal surfaces usually have solid colours, ranging from grey through brown to black, which indicates that they were evenly fired in a reductive atmosphere. Some of the vessels were slipped, as evidenced by exfoliated external surfaces of several sherds. The thin-walled pottery of somewhat inferior production quality is usually unornamented or has plastic ornament, and the clay fabric used in its production contains greater amounts of crushed grog and organic temper. The wall surfaces of such vessels are often uneven, wavy, both smooth and grainy, and their colours are often diverse, blotched, mainly of grey, yellow-grey or – less frequently – orange colour.

The kitchenware pottery comprised decidedly larger vessels with thicker walls – ranging from 9 to 18 mm. The clay fabric contains considerable amounts of crushed grog, organic temper, gravel and sand. Sporadically, it also includes crushed stone, limestone and ochre. The granulation of the temper is widely diverse: from fine (0.5-1 mm – mainly sand), through medium (1.1-3 mm – grog and organic temper, sand), coarse-grained (3-5 mm – grog and organic temper, gravel, sporadically crushed stone) to very coarse-grained (5-11 mm – mainly grog temper and gravel). The prevailing decorative patterns are plastic ornament represented by nodules, finger and fingernail imprints (Figs 10: 1-4; 11: 2-9; 12: 1, 2, 5-9), and – only in several cases – applied strips (Fig. 12: 3). Incised ornament was rather exceptional (Fig. 6: 1). Just like in the case of thin-walled forms, the most numerous group are spherical bowl fragments (Figs 10: 1-3; 11: 9). The materials also included fragments of a squat wide-open vessel with a massive, everted rim (Fig. 8: 16). Because the clay fabric used in the production of the vessels contains considerable amounts of coarse-grained temper, the preserved surfaces are usually rough, porous or even coarse. Both the external and internal surfaces of the vessel walls were finished in a much less careful way than the walls of the tableware vessels. In most cases, they were only initially smoothed or rubbed. The upper and middle parts of the vessels are usually particolored, and the predominant

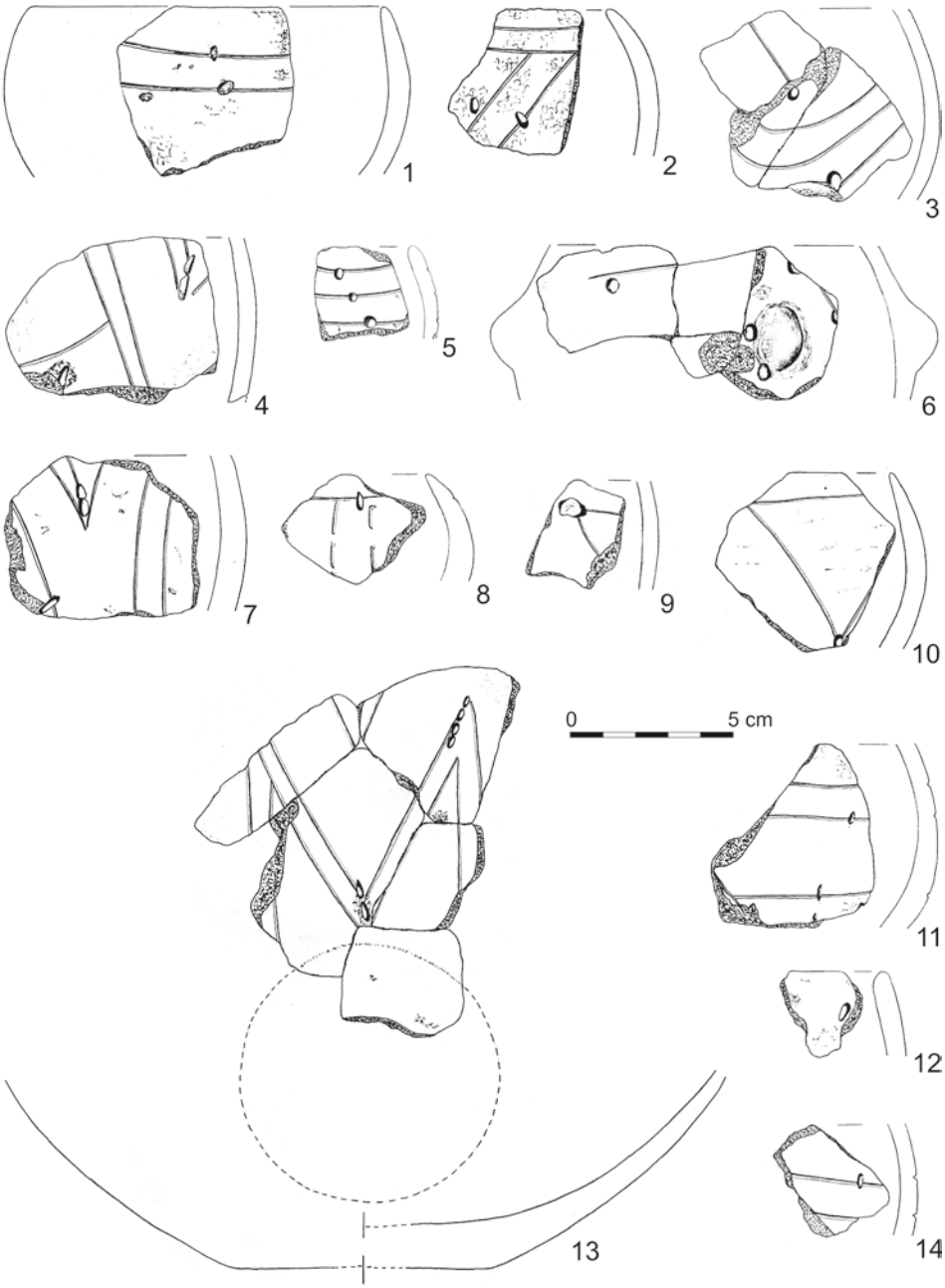


Fig. 5. Bogucin, Site 6: Selection of vessel pottery from the LBK features: 1 – Feature 173; 2 – Feature 16; 3, 6 – Feature 349; 4, 7, 13 – Feature 307; 5 – Feature 137; 8, 11 – Feature 47; 9 – Feature 135; 10 – Feature 133; 12 – Feature 42; 14 – Feature 41. Drawn by K. Gawryjołek-Szeliga

colours are bright hues of yellow/orange/grey. They are darker near the base. Most of the vessels included in this group were poorly fired in an oxidising atmosphere, which was caused by their size and method of production, but also probably by functional reasons and the intended use of such pottery.

The above-presented technological categorisation of the pottery material was not strictly followed by the potters who produced it. For example, some of the thick-walled vessels – probably bigger and having walls whose thickness exceeds 9 mm – were made of clay fabric generally used in the production of thin-walled pottery. The collection also includes delicate forms, made of clay thinned with the use of mineral temper, often having considerable granulation.

Vessel forms

As mentioned before, the morphologies of the analysed pottery collection are generally not very diverse. Based on partial reconstructions (including drawings) that allow us detect the basic features and parameters of the vessels, we can state that a relatively large proportion were spherical bowls. It seems that this category includes all the basic variants known from LBK inventories discovered across the drainage basin of the Upper Vistula. Among them, the least numerous are forms with completely everted rims and those whose rims are slightly inclined inwards (Figs 5: 1; 8: 10, 13, 17; 12: 1, 3), which correspond to types I and II according to the classification by M. Godłowska (1991, fig. 3), but the most numerous are forms in the shape of the segment of a sphere (both ½ and ¾), with rims strongly bent inwards (Fig. 5: 2, 8). Their sizes and macro-morphological features are very diverse. They have different wall thicknesses and gradients, and their edges are profiled in various ways. The bases of the vessels are most often flat (Figs 5: 13; 6: 13; 7: 1-2), and only sometimes do they have a slightly concave shape (Fig. 7: 11), with the diameters ranging from 30 to 120 mm. Forms with a distinguished base are extremely rare (Fig. 11: 9). The rim diameters of the spherical bowls range from 6 to 22 cm, but in most cases they do not exceed 10 cm. Determining their heights was made impossible by the virtual lack of completely reconstructed forms and the considerable fragmentation and incompleteness of the assemblage.

Other forms are definitely less numerous. They are mainly open bowl-shaped vessels – including unornamented forms with rim diameters of 18 and 19 cm and unspecified heights (Figs 8: 11, 17; 9: 1, 3) and somewhat untypical, very small forms having only nodules under the rims (Figs 9: 4; 12: 4). Another group of extremely rare forms are small amphora-shaped vessels (Fig. 9: 10) and large, thick-walled, squat vessels with strongly everted rims and large diameters (Fig. 8: 16). Such forms sometimes have horizontally pierced, semi-circular handles. One vessel is decorated with an incised ornament inlaid with dark/black substance resembling wood tar (Fig. 6: 1).

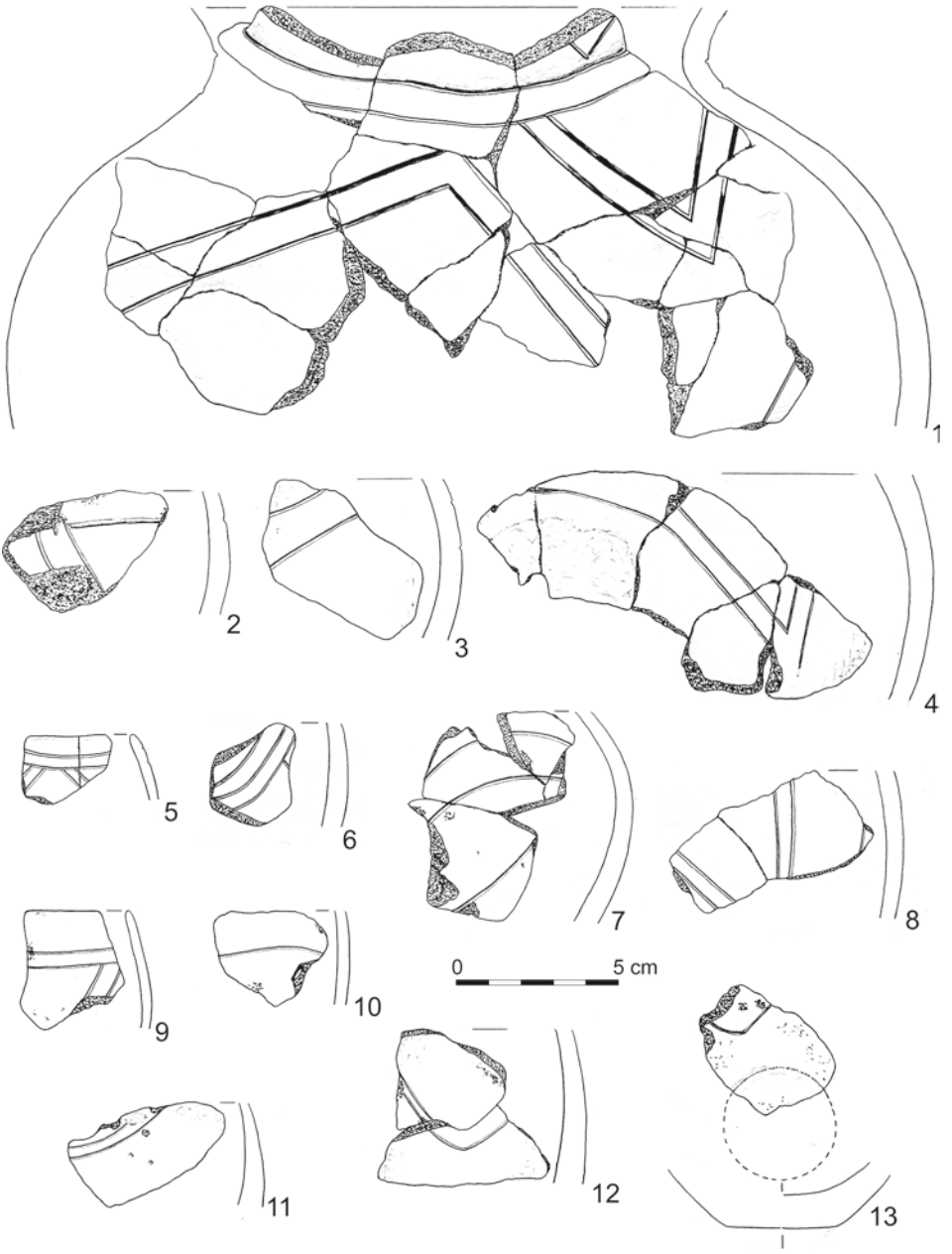


Fig. 6. Bogucin, Site 6: Selection of vessel pottery from the LBK features: 1 – Feature 4; 2 – Feature 47; 3 – Feature 41; 4, 6 – Feature 48B; 5 – Feature 100; 7 – Feature 349; 8 – Feature 307; 9, 12 – Feature 133; 10-11 – Feature 367; 13 – Feature 16. Drawn by K. Gawryjołek-Szeliga

Ornamentation

The overall share of ornamented sherds in the collection was determined to be *c.* 35.13% (176 specimens). The most numerous group are body fragments of different sizes. They outnumber ornamented rims and, especially, base parts (Table 2). Among the ornamented sherds, the most frequent are pottery fragments decorated with incised patterns, which occur almost exclusively on thin-walled vessels and represents the most common decorative element recorded below the rim as well as in the middle parts of certain vessels. In the former case, the incised ornament nearly always takes the form of rectilinear patterns composed of single (Figs 5: 8; 7: 8; 8: 3), double (Figs 5: 1, 2; 6: 5, 9; 7: 1, 2, 4; 8: 1, 2, 8, 9), or even triple (Figs 5: 5; 7: 3, 5, 6) horizontal lines – that go around the perimeter of a vessel, but not always form a full circle (Fig. 7: 3, 5) – usually located directly below the rim. Much more diverse decorative compositions can be found on the middle parts of the vessels, forming rectilinear or curvilinear patterns (*cf.*, Pyzel 2010, 20, 21) – oriented horizontally or diagonally to the vertical symmetry axis of vessels – most often composed of evenly distributed double (Figs 5: 3, 7, 13; 6: 1, 4, 7, 9, 11, 12; 7: 1, 2, 4, 6-8, 10, 11) or, less frequently, triple (Figs 6: 6; 7: 5) incised lines. Their widths are diverse, varying from *c.* 0.5 mm (Fig. 7: 3, 5) to 2 mm (Figs 6: 2; 8: 12), but lines whose width is more or less 1 mm are clearly the most numerous. Most of them were made with pointed tools and have V-shaped profiles in cross section.

The incised ornaments are most often accompanied by music-note holes or Želiezovce-type notches of diverse sizes and shapes. The music-note holes are usually more or less elongated and tear-shaped (Figs 5: 8, 11, 12, 14; 7: 7). Only sporadically are their outlines regular, round or oval (Fig. 5: 2, 3, 5, 6). They are usually arranged separately within incised lines (Fig. 5: 1, 2, 5), next to them (Fig. 5: 2, 6), at their ends (Fig. 5: 3) as well as in the places where they meet or bend (Fig. 5: 9, 10). Only in few cases, do the music-note holes form various small groups usually arranged in rows (Fig. 5: 4, 7, 13), or they even overlap, creating single elongated grooves joining parallel incised lines (Fig. 8: 1). This decorative element refers to the Želiezovce ornamentation style (Pavúk 1969, Abb. 5: 9; Kadrow 1990, fig. 8: g, q, z; Dębiec 2015, 41, 47), represented in the analysed collection by numerous diagnostic notches. Each time, they are accompanied by incised ornaments within the main decorative compositions and in patterns located below the rim. Most often, the notches cross single incised lines (Figs 7: 7, 9; 8: 3, 12, 18) or join two parallel incised lines (Figs 7: 1, 2, 4, 8, 10-11; 8: 2, 5, 6, 15). In one case, a small, tear-shaped music-note hole was impressed next to regularly arranged notches (Fig. 7: 2).

Plastic elements are slightly more scarce in the analysed assemblage. They occur most frequently (or, in some case, exclusively) – and in their greatest diversity – on the surfaces of the thick-walled vessels. This group is most often represented by nodules of different shapes and sizes – although the most numerous are circular (Figs 9: 8; 10: 3; 11: 1, 6, 9; 12: 10) and oval elements (Figs 10: 4; 11: 4), which often have hollows on the tops of their usually

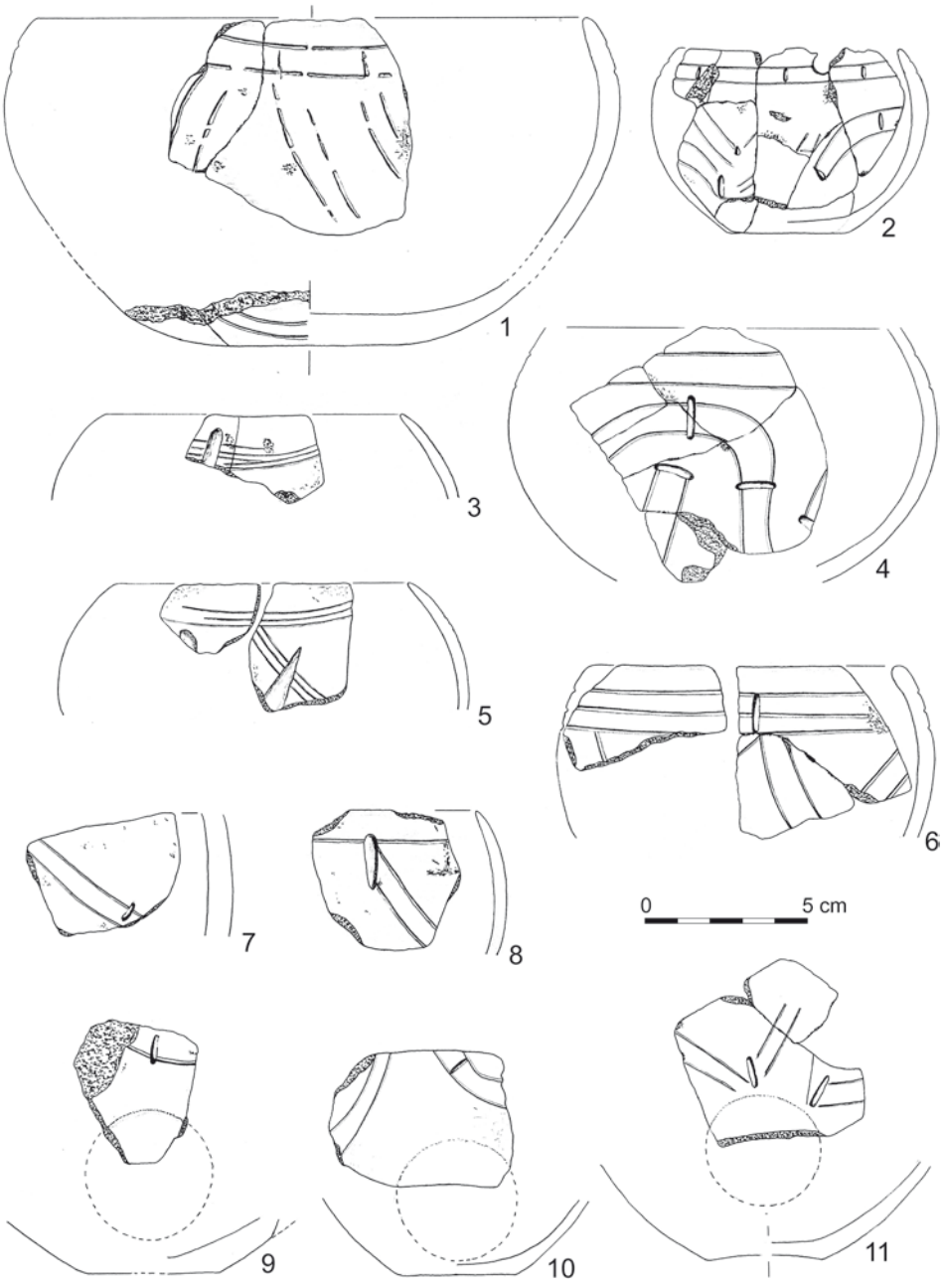


Fig. 7. Bogucin, Site 6: Selection of vessel pottery from the LBK features: 1 – Feature 131; 2, 10 – Feature 379; 3, 5 – Feature 103; 4 – Feature 136; 6 – Feature 133; 7 – Feature 7; 8 – Feature 48A; 9 – Feature 100; 11 – Feature 98. Drawn by K. Gawryjołek-Szeliga

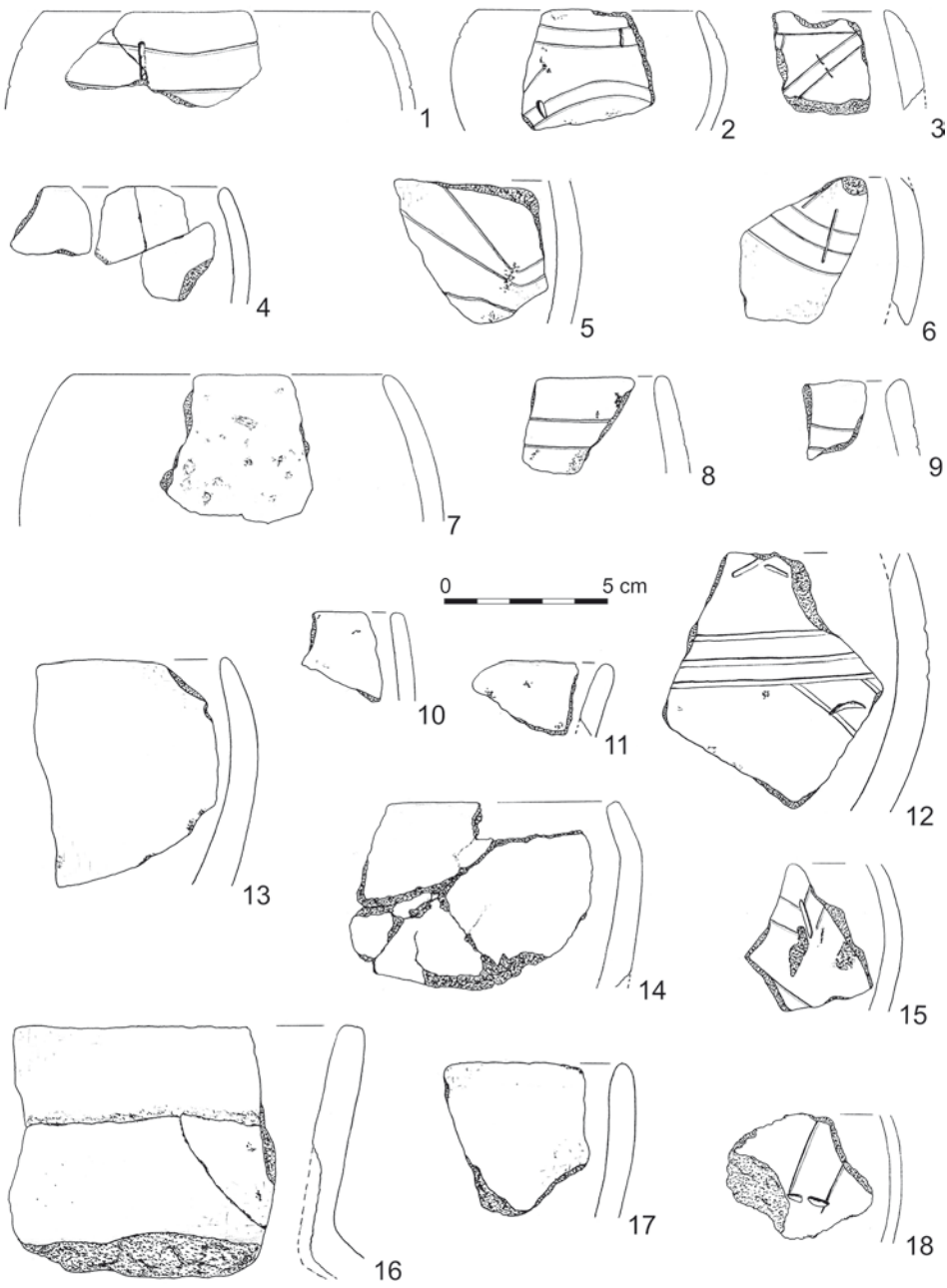


Fig. 8. Bogucin, Site 6: Selection of vessel pottery from the LBK features: 1 – Feature 136; 2, 5 – Feature 379; 3 – Feature 47; 4, 12-13, 15 – Feature 133; 6 – Feature 134; 7-9 – Feature 307; 10-11 – Feature 229; 14 – Feature 99; 16 – Feature 40; 17-18 – Feature 55. Drawn by K. Gawryjołek-Szeliga

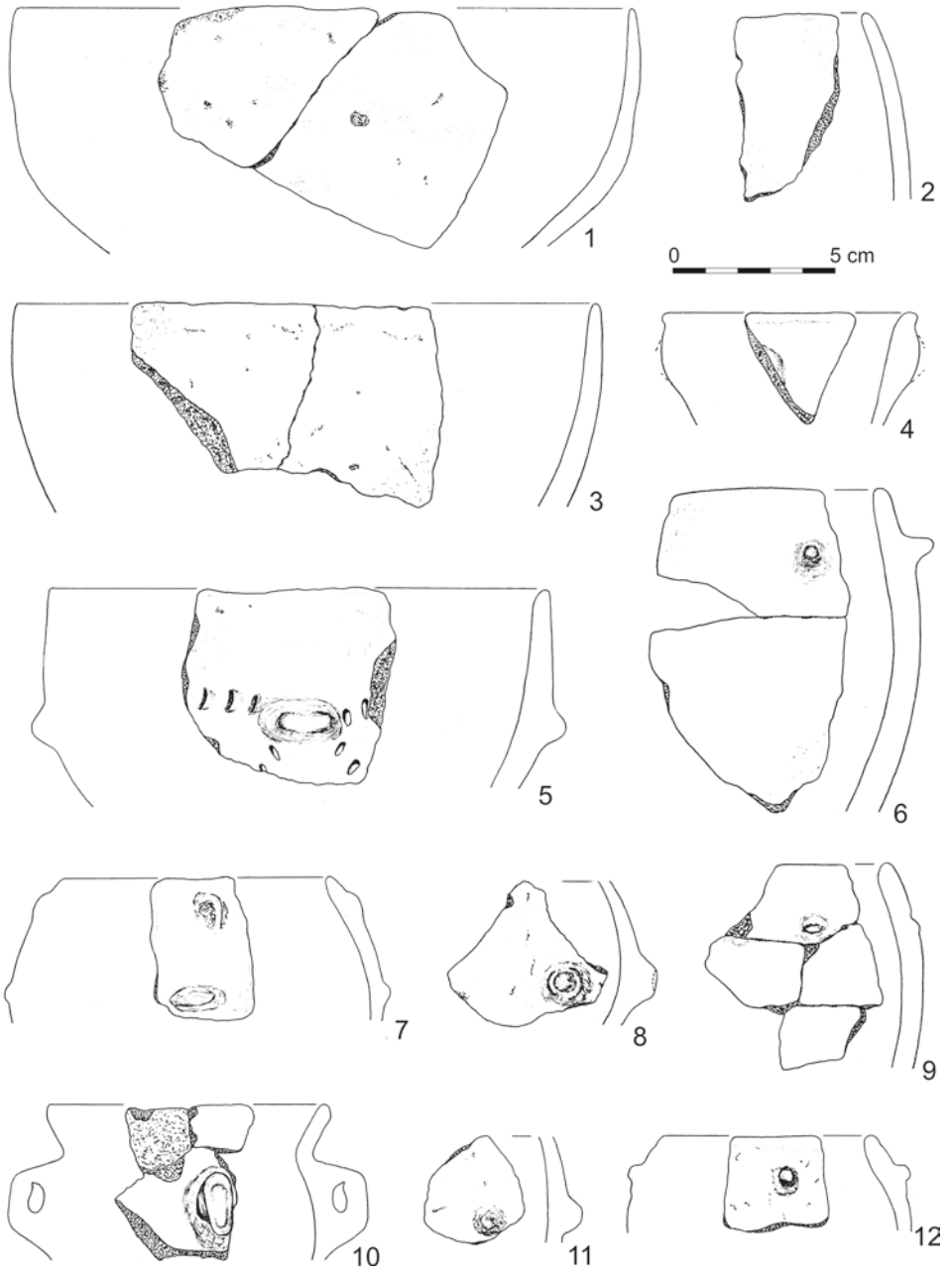


Fig. 9. Bogucin, Site 6: Selection of vessel pottery from the LBK features: 1 – Feature 131; 2 – Feature 41; 3 – Feature 55; 4, 6, 9 – Feature 133; 5, 12 – Feature 307; 7 – Feature 310; 8, 11 – Feature 4; 10 – Feature 102. Drawn by K. Gawryjołek-Szeliga

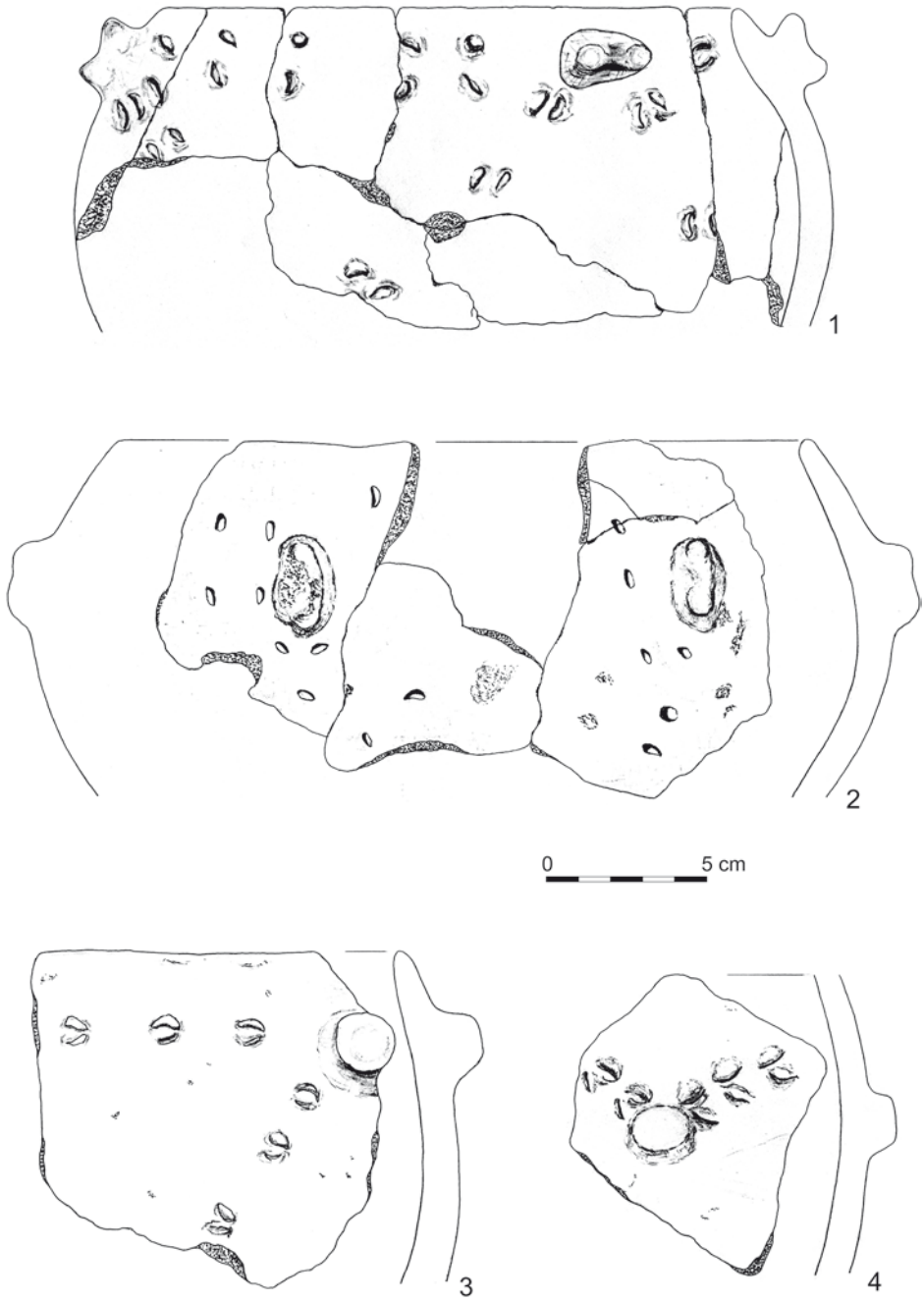


Fig. 10. Bogucin, Site 6: Selection of vessel pottery from the LBK features:
1 – Feature 277; 2 – Feature 41; 3 – Feature 55; 4 – Feature 307. Drawn by K. Gawryjołek-Szeliga

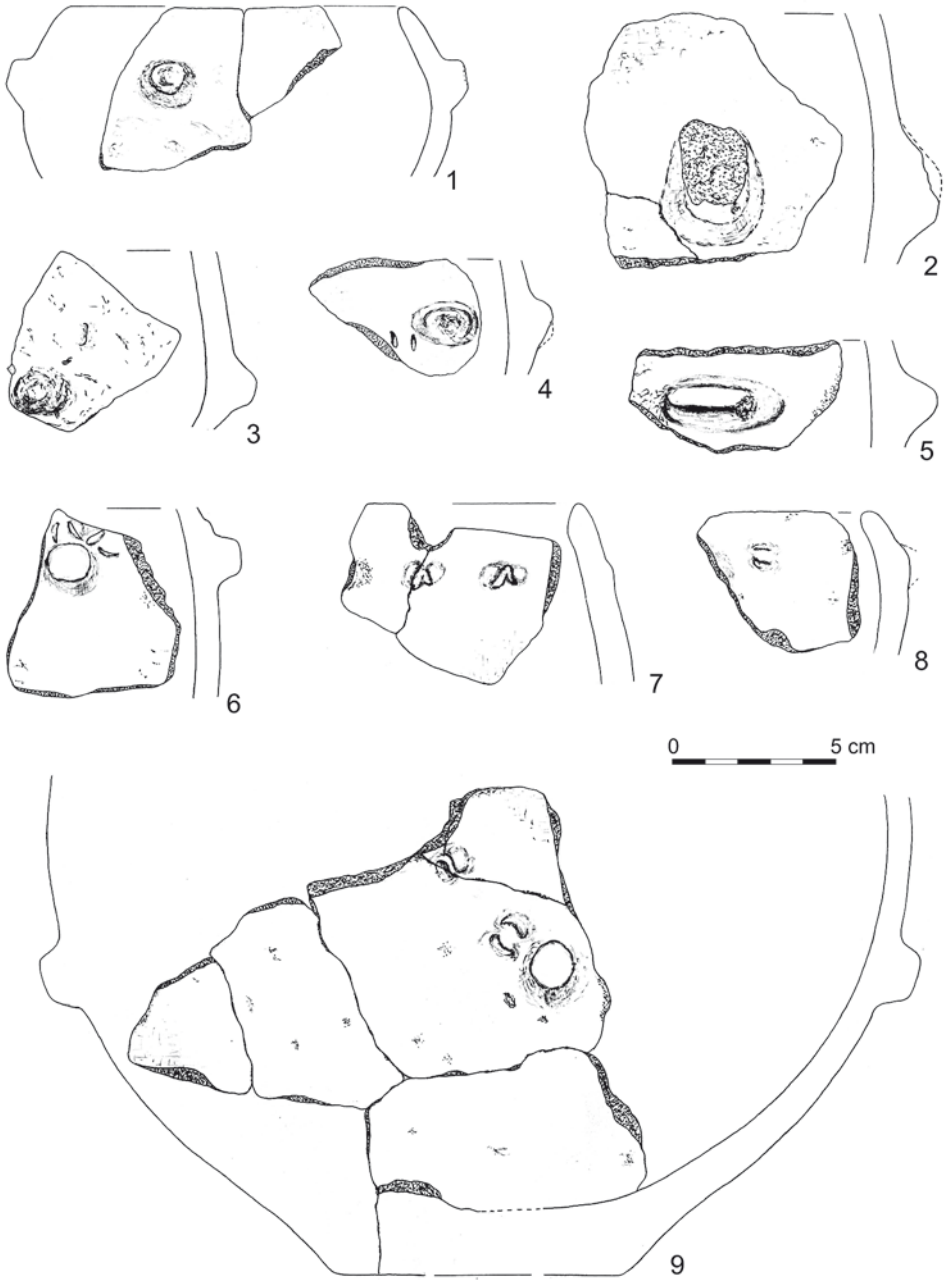


Fig. 11. Bogucin, Site 6: Selection of vessel pottery from the LBK features:
1 – Feature 131; 2 – Feature 4; 3 – Feature 47; 4, 6-7, 9 – Feature 307; 5 – Feature 55; 8 – Feature 133.
Drawn by K. Gawryjołek–Szeliga

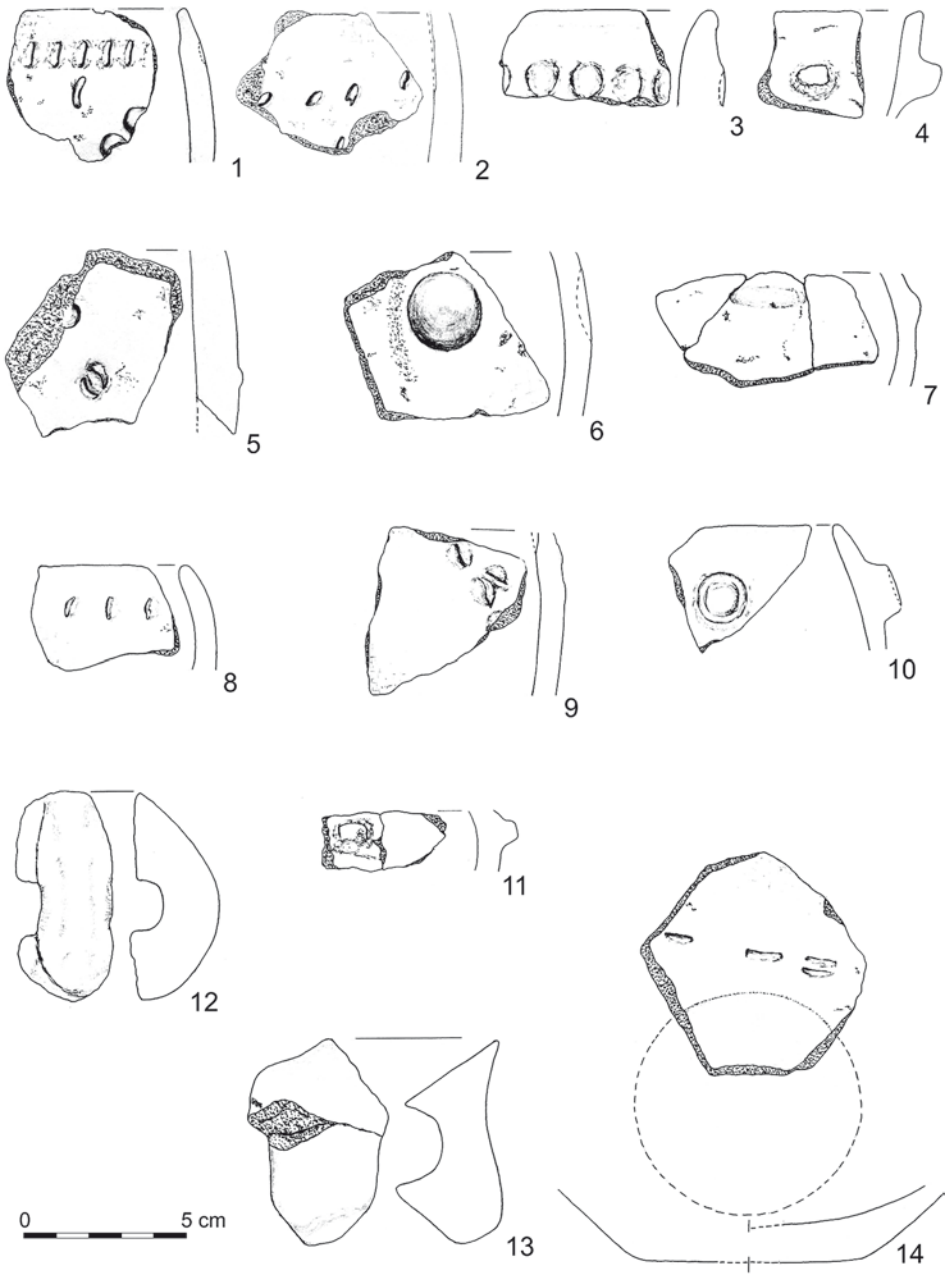


Fig. 12. Bogucin, Site 6: Selection of vessel pottery from the LBK features:
1 – Feature 173; 2 – Feature 131; 3 – Feature 55; 4 – Feature 40; 5 – Feature 75; 6 – Feature 136; 7 – Feature 41; 8 – Feature 102; 9-10 – Feature 307; 11 – Feature 4; 12 – Feature 229; 13 – Feature 168; 14 – Feature 367. Drawn by K. Gawryjołek-Szeliga

flattened surfaces. Oval – horizontal or vertical – nodules with a conical cross-section are somewhat less numerous (Figs 9: 5-7; 11: 5). In at least two cases, forms having rectangular outlines were recorded (Fig. 12: 4, 11). A considerable majority of the nodules are single forms. Double nodules – alleged or confirmed – occur only sporadically (Fig. 10: 2). Among them, the most noteworthy are four small double nodules – having a conical shape and asymmetrically arranged in alternating horizontal and vertical patterns directly below the rim of a spherical bowl discovered in Feature 277 (Fig. 10: 1).

Handles – which, besides their functional meaning, have an undisputed decorative value – are definitely less numerous in the analysed materials. Altogether, the collection yielded five handles – the great majority of which are massive, horizontally pierced forms having a semi-circular cross-section (Fig. 12: 12), but sometimes their shape is difficult to reproduce (Fig. 12: 13). These were part of large, thick-walled vessels (probably storage containers). An exceptional case was the discovery of a somewhat untypical, horizontally pierced handle having an angular shape, situated in the upper part of the body of a thin-walled amphora-shaped vessel, whose rim was slightly bent outwards (Fig. 9: 10).

Another example of plastic ornament is a strip decorated with a row of somewhat regular, oval and shallow finger imprints found on a single rim fragment (Fig. 12: 3). Finger and fingernail imprints alone were recorded on a relatively small number of sherds, mainly of thick-walled vessels. Most often, they formed simple linear compositions in the upper parts of vessel bodies, which were adorned with nodules or equipped with handles, as well as directly below the rims of vessels (Figs 10: 1, 3; 11: 6, 7; 12: 5, 9). Based on a completely reconstructed rim part of a spherical bowl discovered in Feature 277 (Fig. 10: 1), we can suspect that this type of ornament might have covered larger parts or even entire surfaces of the vessels, taking the shape of single rows encircling their rims and spreading radially from particular nodules and handles located at different heights of bodies.

Fingernail or finger imprints – most often arranged in horizontal rows below the rims – are definitely less common (Fig. 12: 1, 2, 8). In one case, the discussed type of decorative elements occurred together with music-note ornaments (Fig. 9: 5). One sherd had a large, circular hollow with a very regular outline and the diameter of c. 24 mm (Fig. 12: 6).

FLINT ARTEFACTS

The collection of flint items encompasses altogether 117 artefacts. They were discovered in 28 features – that is in slightly more than half of them – usually as single specimens or rather small assemblages counting up to 18 items (Table 1). Despite this small number, the analysed material is diverse in respect of the raw materials used in their production (Table 3; Fig. 13: 1). The predominant group are flints genetically linked with Mesozoic sediments located on the north-eastern edge of the Holy Cross Mountains (Świętokrzyskie Mountains), specifically with Turonian deposits situated by the right bank

Table 3. Bogucin, Site 6: quantitative comparison of flint artefacts originating from the LBK features: 1 – Świeciechów flint; 2 – chocolate flint; 3 – Volhynian flint; 4 – erratic flint; 5 – Jurassic-Cracow flint; 6 – burned flint; 7 – unspecified flint

Feature No.	1	2	3	4	5	6	7	Total
4	5	-	-	-	-	-	-	**5**
7	2	1	-	-	1	-	-	**4**
20	-	1	-	-	-	-	-	**1**
40	6	1	1	1	-	-	-	**9**
41B	-	2	2	1	-	-	-	**5**
42	3	2	-	-	-	-	-	**5**
47	3	3	-	-	-	-	1	**7**
48A	1	-	-	-	-	-	-	**1**
48B	1	1	-	-	-	-	-	**2**
55	10	2	-	1	-	1	-	**14**
73	1	1	-	-	-	-	-	**2**
75	1	3	-	-	-	-	-	**4**
88	1	-	-	1	-	-	-	**2**
96	1	-	-	-	-	-	-	**1**
98	3	1	-	-	-	-	-	**4**
102	2	1	-	-	1	-	-	**4**
103	1	-	-	-	-	-	-	**1**
131	5	-	-	-	-	2	-	**7**
136	2	2	-	-	-	-	-	**4**
137	1	1	-	-	-	-	-	**2**
166	-	-	-	-	-	-	1	**1**
168	-	1	-	-	-	-	-	**1**
174	3	-	-	-	-	-	-	**3**
277	2	-	-	-	-	-	-	**2**
307	5	-	1	-	-	-	-	**6**
367	1	-	-	-	-	-	-	**1**
375	-	-	-	-	1	-	-	**1**
379	17	1	-	-	-	-	-	**18**
Razem	**77**	**24**	**4**	**4**	**3**	**3**	**2**	**117**

of the Middle Vistula (Świeciechów flint) and – to a lesser degree – Upper Jurassic sediments located on the opposite bank of the river (chocolate flint). The linear distance between the outcrops of both raw materials and the researched settlement is *c.* 60-80 kilometres. Undoubtedly, Świeciechów flint was of the greatest importance. Artefacts made of this raw material were the most numerous in the majority of the features containing flint artefacts. It is definitely predominant in the entire raw material structure (*c.* 65.82%; Table

3; Fig. 13: 1). Artefacts made of chocolate flint are the second most numerous – although a definitely smaller – group, constituting collectively *c.* 20.51% of the entire assemblage. This clear disproportion between the numbers of products made of both materials is confirmed by the materials found at other LBK sites from central-eastern Poland, especially those located in the direct vicinities of their outcrops (*e.g.*, Sandomierz-Kruków, Site 20, Tominy, Site 6; *cf.*, Michalak-Ścibior and Taras 1995, tab. V; Szeliga and Zakościelna 2007, 14; Szeliga 2008, fig. 12).

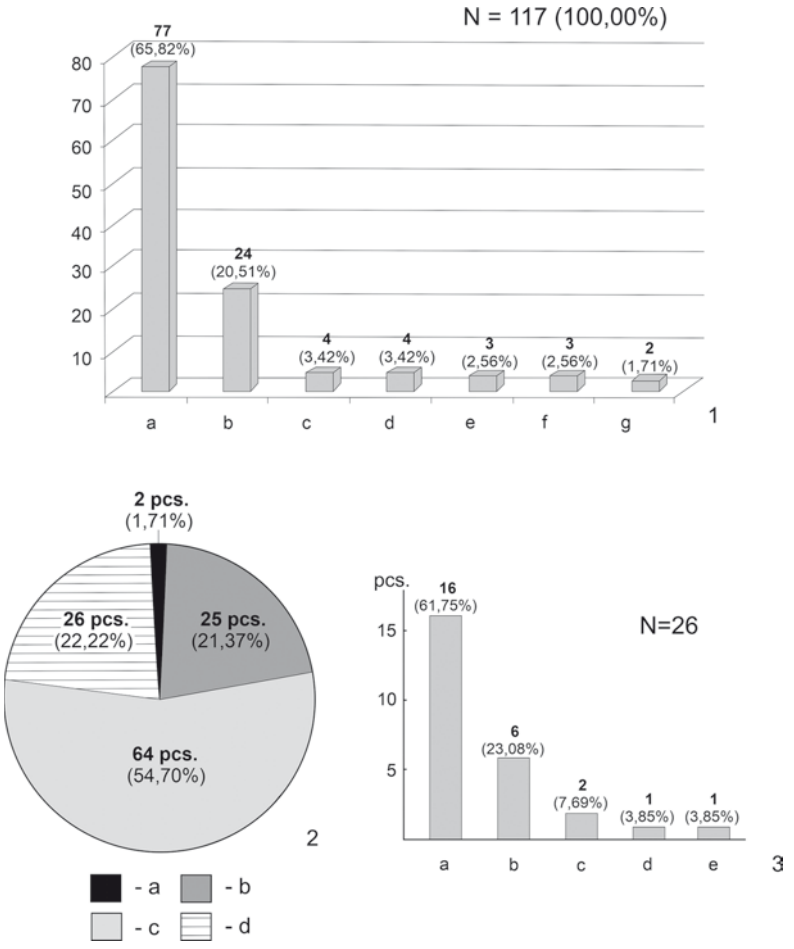


Fig. 13. Bogucin, Site 6: Flint inventory from the LBK features:
1 – raw material structure (a – Świeciechów flint; b – chocolate flint; c – Volhynian flint; d – erratic flint; e – Jurassic-Cracow flint; f – burnt flint; g – unspecified flint); 2 – morphological structure (a – core forms; b – blades and their fragments; c – flakes; d – retouched tools); 3 – typological structure of the retouched tools (a – end-scrapers; b – retouched blades; c – retouched flakes; d – truncation; e – end-scraper+truncation).
Prepared by M. Szeliga

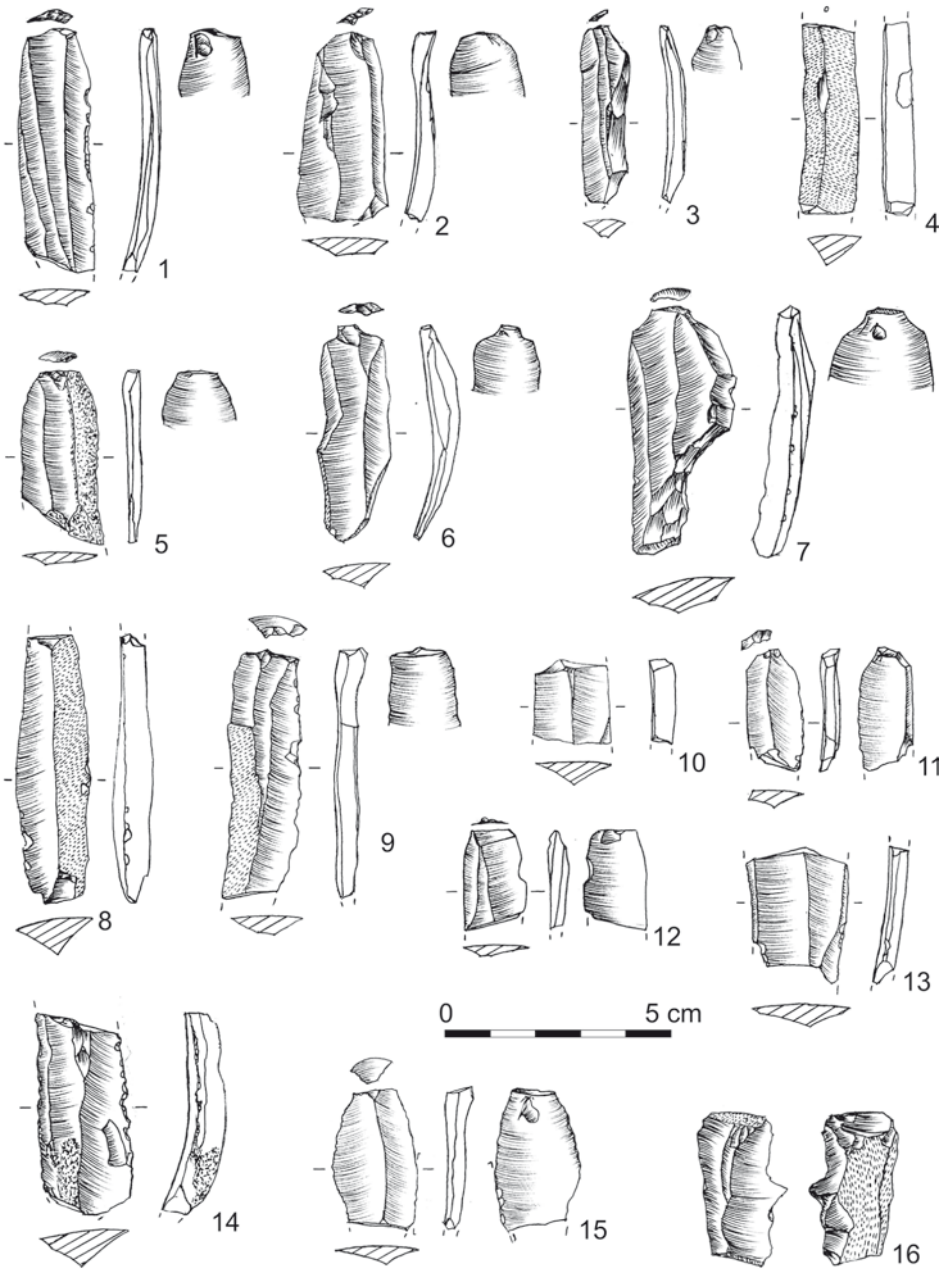


Fig. 14. Bogucin, Site 6: Selection of flint materials from the LBK features: 1, 12 – Feature 379; 2 – Feature 136; 3 – Feature 98; 4 – Feature 307; 5, 10 – Feature 131; 6 – Feature 42; 7-9, 14 – Feature 55; 11 – Feature 20; 13 – Feature 168; 15 – Feature 47; 16 – Feature 88. Raw materials: 1-3, 7, 11, 13-14 – chocolate flint; 4, 6, 8-10, 12, 15 – Świeciechów flint; 5 – burnt flint; 16 – erratic flint. Drawn by M. Szeliga

The remaining identified flint varieties are represented only by small groups (Fig. 13: 1), composed of artefacts that were usually found individually in particular features. Four specimens (3.42%) were made of Cretaceous flints, whose outcrops are located across the vast areas of the central-eastern part of the Volhynian-Podolian Upland. The same number applies to erratic flints from glacigenic sediments – which were probably located at a short distance from the settlement. Three artefacts (2.56%) were made of Jurassic-Cracow flint (Table 3; Fig. 13: 1). They were all made of brown flint that macroscopically corresponds to variant A according to M. Kaczanowska and J. K. Kozłowski (1976, 206). It was impossible to definitely determine the raw material used in the production of five specimens (*c.* 4.27%), which was caused, among other factors, by the fact that they were heavily burnt.

The morphologies of the discussed flint inventory are not very diverse. Flakes are definitively the most numerous, jointly constituting 54.70% of the whole collection (Fig. 13: 2). Intentionally retouched tools are the second most abundant group, only slightly outnumbering the total number of blades. The remaining specimens of the inventory can be included – although tentatively – in the group of core-forms. They constitute only 1.71% of all the finds discovered within the discussed LBK features (Fig. 13: 2) and are represented by a single unipolar splinter made of erratic flint (Fig. 14: 16) and a fragment of a hammerstone formed on a Świeciechów flint core.

The most abundant collection of flakes and their fragments encompasses specimens having different metric values as well as morphological profiles and representing different stages of the production process. Flakes of unspecified technological origin – specimens having their dorsal surfaces entirely covered with negative scars or flakes with only partially natural dorsal surfaces – are definitely the most numerous group of this category. The material also included several massive, completely cortical specimens formed during the initial exploitation phase – specifically at the stage of forming the main exploitation surfaces of the core (especially striking platforms). The analysed collection does not contain diagnostic remains left by such technological procedures as repairing striking platforms (rejuvenation flakes, core tablets) or changing the orientation of blade cores, which were known and used by the societies of the LBK, as indicated by materials from many other settlement sites (*e.g.*, Kozłowski 1970; Lech 1979; 1997; 2008, Kaczanowska 1985; Kaczanowska *et al.* 1987; Kabaciński 2010; Pelisiak 2014; Wilczyński 2014a; 2014b). The complete absence of such remains in the collection may indicate that the community inhabiting the discussed settlement processed raw materials to a somewhat limited degree. However, this is contradicted by the presence of few refits of flint products (Figs 17: 4; 18). They indirectly indicate that the original quantity and quality structures of inventories discovered in particular features are relatively incomplete.

The great majority of the blades are represented by different fragments (Fig. 14: 1-5, 8-15), whereas complete specimens are extremely rare (Fig. 14: 6, 7). All of them were obtained from single-platform cores. The predominant group are blades with completely scarred dorsal faces formed during advanced stages of core exploitation (Fig. 14: 1, 2, 6, 7,

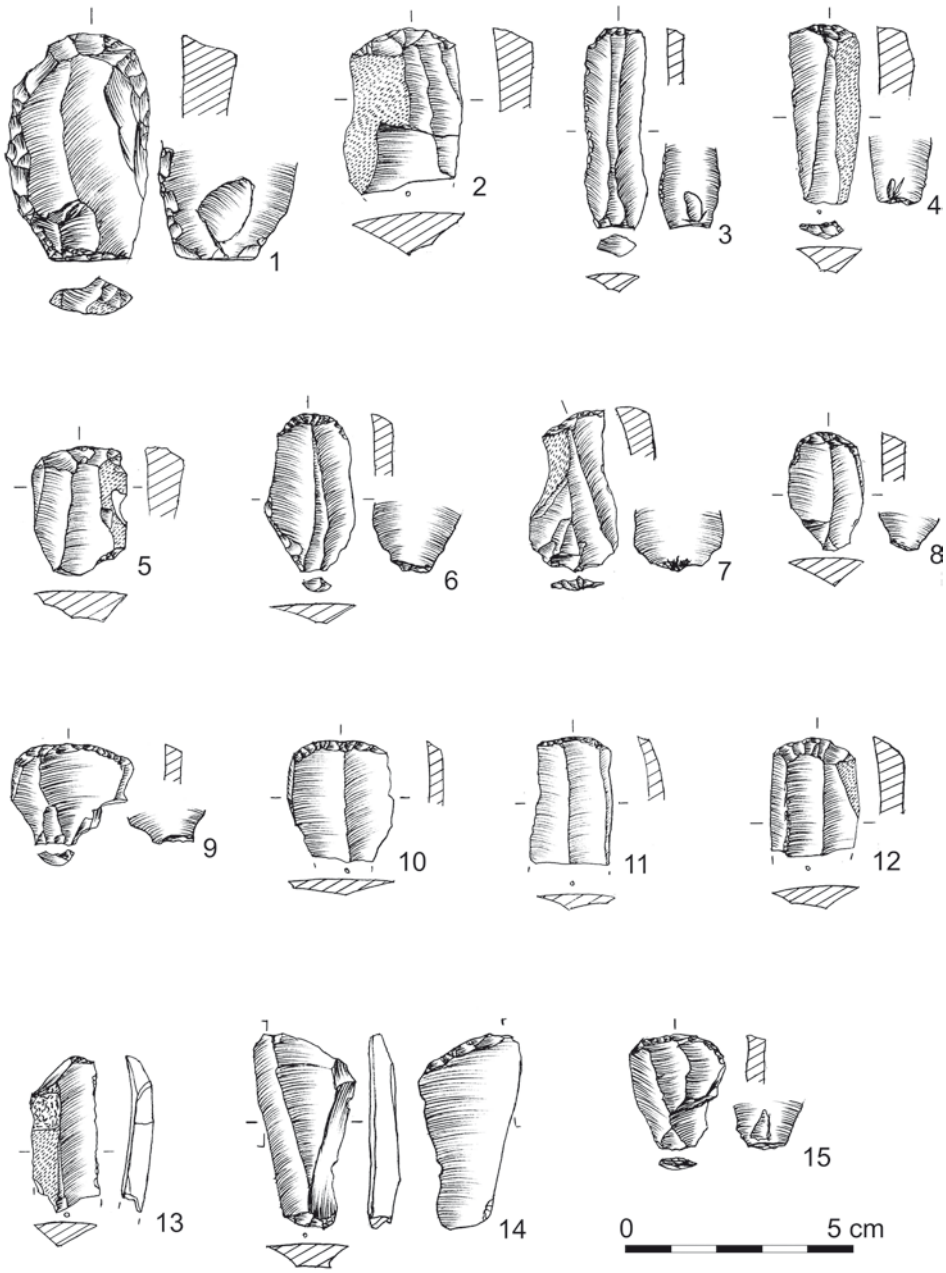


Fig. 15. Bogucin, Site 6: Selection of flint materials from the LBK features: 1, 9, 15 – Feature 55; 2 – Feature 88; 3, 10 – Feature 379; 4 – Feature 47; 5 – Feature 4; 6-7 – Feature 40; 8 – Feature 7; 11 – Feature 375; 12 – Feature 42; 13 – Feature 131; 14 – Feature 73. Raw materials: 1-10, 12-15 – Świeciechów flint; 11 – Jurassic-Cracow flint. Drawn by M. Szeliga

10-15), as well as longitudinally cortical blades formed during the expansion of the flaking faces into the natural sides of the cores (Fig. 14: 5, 8, 9). They are usually somewhat regular specimens having parallel or converging lateral edges and triangular or trapezoidal cross-sections. A high share of faceted butts and frequent marks of platform edge trimming indicate that the core angle was carefully adjusted directly before removing the blades. The lateral edges of one specimen were polished on both sides, obliquely to its long axis, which suggests that it was originally used as one of insets forming a segmented blade of a harvesting tool (Fig. 14: 15).

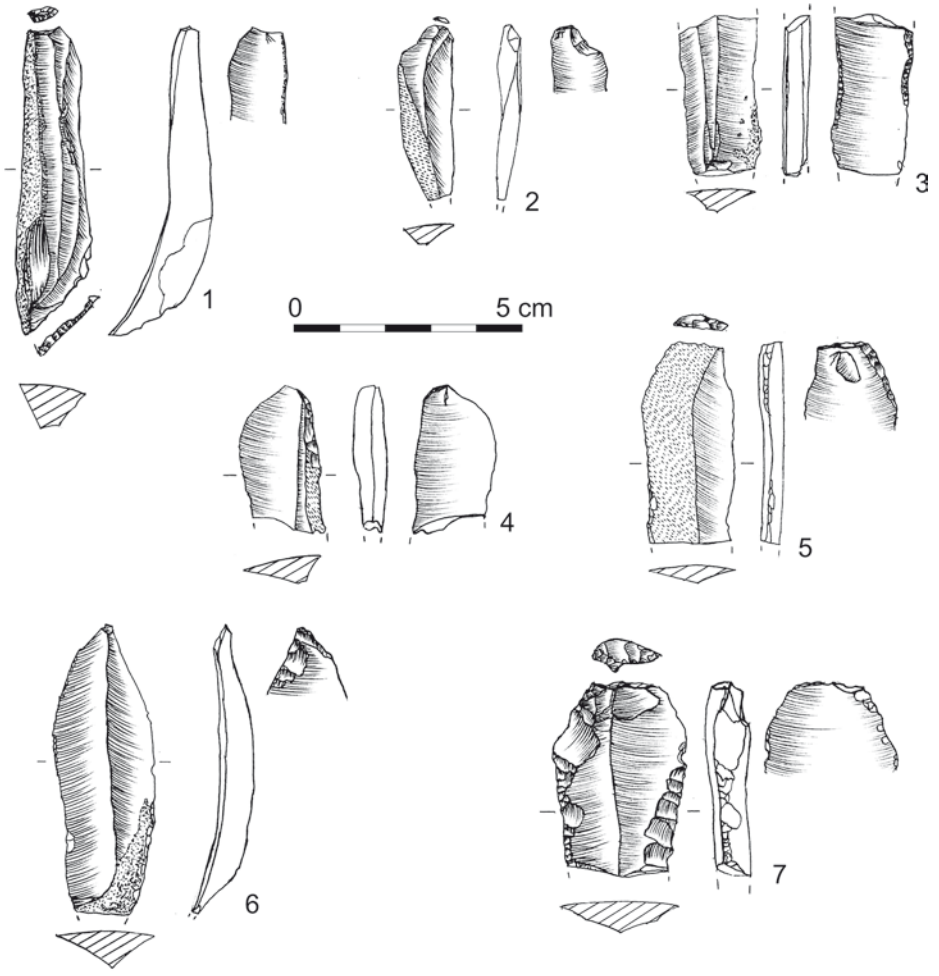


Fig. 16. Bogucin, Site 6: Selection of flint materials from the LBK features: 1, 4 – Feature 136; 2-3 – Feature 40; 5 – Feature 307; 6 – Feature 55; 7 – Feature 41B. Raw materials: 1, 3 – chocolate flint; 2, 4-5 –Świeciechów flint; 6 – erratic or Volhynian flint; 7 – Volhynian flint. Drawn by M. Szeliga

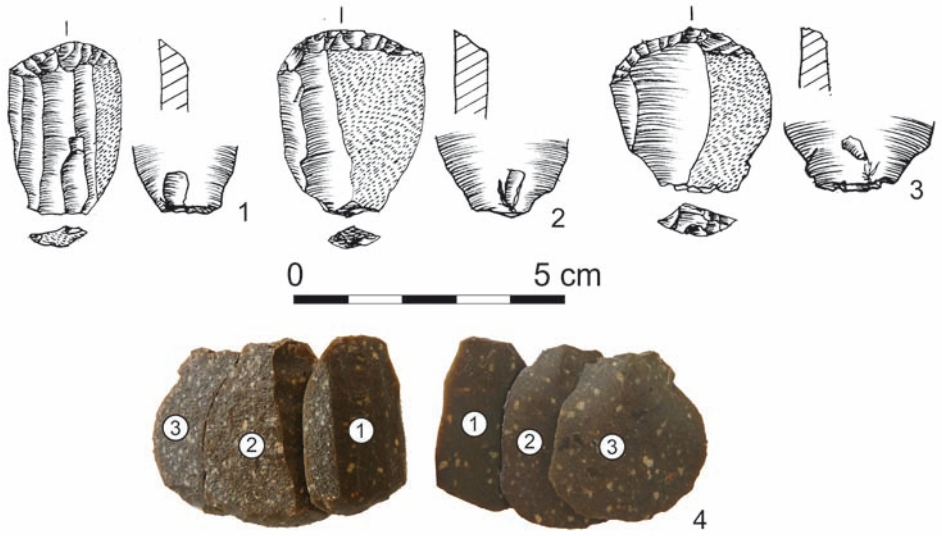
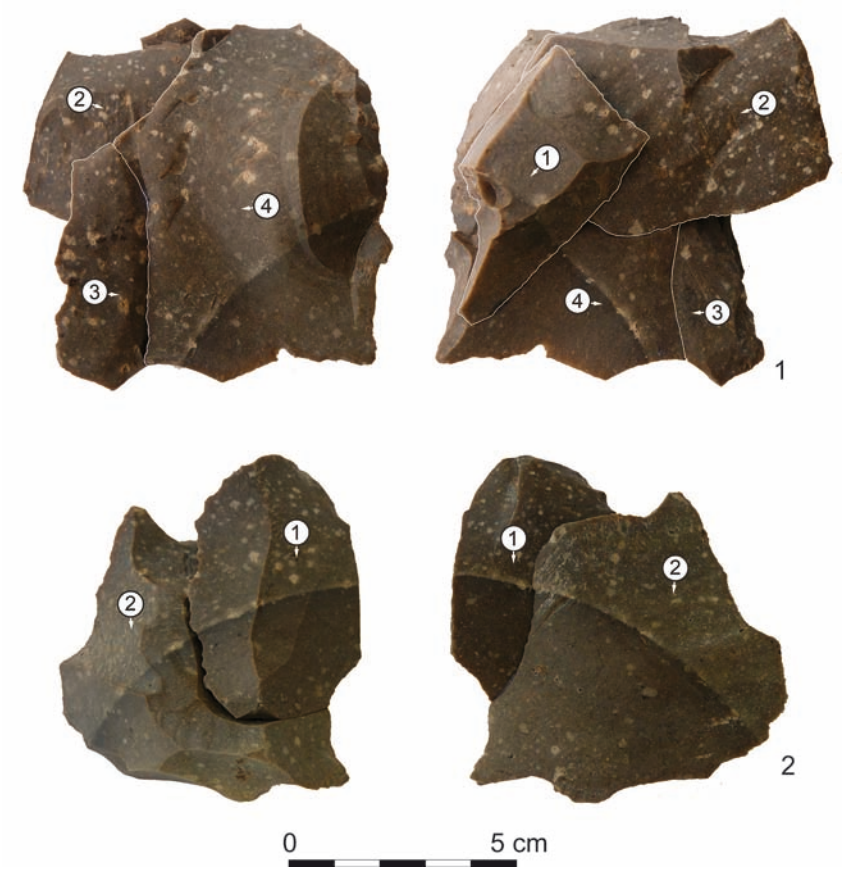


Fig. 17. Bogucin, Site 6: Three end-scrapers from the Feature 379 (1-3) and their refit (4). The numeration in the photographs corresponds to the numbers in the figure and it reflects the order of the strikes. Raw material: Świeciechów flint. Prepared by M. Szeliga

The materials include 26 intentionally retouched forms, which comprise 22.22% of the total number of the discovered flint artefacts of the LBK (Fig. 13: 2). Their typological structure demonstrates a clear predominance of end-scrapers, whose overall share in the group of tools was as much as 61.53% (Fig. 13: 3). With a single exception of a specimen made of Jurassic-Cracow flint (Fig. 15: 11), Świeciechów flint was used in the production of all the end-scrapers. It is worth mentioning that three of them, discovered in Feature 379, could be refitted together (Fig. 17: 1-4). The discussed category of tools is a somewhat morphologically uniform group of artefacts. They were formed both on blades (Fig. 15: 2-4, 6, 8, 11-14) and flakes (Figs 15: 1, 5, 7, 9, 15; 17: 1-3). Their working edges are usually arched, slightly or moderately curved, mostly symmetrically to the longer axes of the half-products on which they are formed (Figs 15: 1, 2, 5, 6, 8-10, 12, 15; 17: 1-3). Specimens with straight working edges – perpendicular (Fig. 15: 11) or oblique to the longer axis (Fig. 15: 13) – are decidedly less numerous. A single combined tool (end scraper + truncation) was also discovered. The fact that its surface was polished on both sides indicates that it was used as an inset of a harvesting tool (Fig. 15: 14). The second most numerous group of typological tools are entire or fragmentarily preserved retouched blades and flakes. Eight such tools were found, comprising 30.77% of the total number of the discovered tools. Each of them was intentionally retouched only on a fragment of one or two edges, on one side (Fig. 16: 2-7). It appears that the locations of the retouch – in respect of their parts and surfaces – were not the result of following any rules. The last, least numerous category of tools are truncations, represented – besides the above-mentioned combined form – by only one



Ryc. 18. Bogucin, Site 6: Refitted flakes made of Świeciechów flint found in Feature 379 (1) and features Nos. 103 and 174 (2). The order and directions of the strikes were marked in the photographs. Prepared by M. Szeliga

specimen made of chocolate flint with the truncated edge perpendicular to the longer axis of the blade (Fig. 16: 1). It was formed on a longitudinally cortical plunging blade removing the apex of a core.

The flint inventory – despite the fact that it seems that it is incomplete as regards its original quantity and quality structure – demonstrates very close similarities with other LBK assemblages discovered across the drainage basin of the Upper Vistula. Clear analogies concern not only the general morphological diversity of the collection and the shares of particular inventory groups within it, but also general production tendencies manifested by the structure of tool types, which is similar to patterns known from many other sites – especially by the clear predominance of end-scrapers (*e.g.*, Lech 1979, 128; Balcer 1983, tab. 8; Kaczanowska *et al.* 1987, 95, 98, 103; Kadrow 1990, fig. 25: a-f; Wilczyński 2014a,

fig. 2; 2014b, 504, 505). The general diversity of the inventory demonstrates proportions characteristic of so-called 'user settlements' and is decidedly different from structures typical of settlements where flint materials were extensively processed (*e.g.*, Olszanica, Vedrovice, Tominy; *cf.*, Lech 2008, fig. 26: B, H; Szeliga 2014, fig. 3: F-H). The closest analogies to the character of the discussed collection can be found in the structures of inventories discovered at the sites of Tarnoszyn and Strachów, which demonstrate – besides the predominance of flake half-products and a small number of specimens included in morphological group I – fairly similar, high quantities of blades and prepared tools (respectively: 19.1% and 29.8% in Tarnoszyn, 22.6% and 25.2% in Strachów; *cf.*, Lech 1997, tab. 2; 2008, fig. 26: C, E).

The high percentage of blades and retouched tools may suggest that at least some of them were brought to the settlement in the final form. Still, we must remember that this suggestion may regard only some specimens included in the whole category, especially those made of materials other than Świeciechów flint. Processing Świeciechów flint within the limits of the settlement is indirectly confirmed by a single fragment of a hammer-stone discovered in Feature 307 and a small number of Świeciechów flint artefacts that can be refitted. They are remains left after initial procedures conducted during the preparation of the main exploitation surfaces of cores (Fig. 18: 1, 2) and actions aiming at tool production (Fig. 17: 4).

STONE ARTEFACTS

The least numerous and diverse group of the mobile finds are stone artefacts, of which only four specimens were found (Table 1). There were one entire and fragments of two other abrasive plates – made of fine-grained and medium-grained sandstone – and a small (72,7 × 54.8 × 21 mm) axe – asymmetric in the longitudinal and cross section, made of light rock (of bright beige colour), whose macroscopic properties resemble those of marl (Fig. 19). It is the first LBK axe made of this type of material discovered in the Lublin Region that has macroscopic features analogous to the properties of similar Early Neolithic finds from south-eastern Poland (Pelisiak 2018, fig. 1: G).

RELATIVE CHRONOLOGY OF MATERIALS AND SETTLEMENT IN BOGUCIN

The analyses of ornamentation techniques and decorative patterns indicate that the stylistically earliest group of pottery finds are materials ornamented in the music-note style. Among them, there is a distinctive but small group of thin-walled sherds decorated with double or triple incised lines, which are straight or S-shaped. A small number of tiny

Fig. 19. Bogucin, Site 6: Stone axe found in Feature 55. Photo by M. Szeliga

music-note imprints, having round, somewhat regular shapes, are arranged on them (or along them) (Fig. 5: 3, 5, 6, 9). These specimens clearly correspond to pottery decorated in the early music-note style, but their small number makes it impossible to rule out the possibility that they are also linked with the later phase of the LBK stylistic development, that is with phase NIII. The early music-note ornamentation is represented much more often by the analysed materials, showing a decidedly greater stylistic variety. Its main indicator are small music-note holes having oblong or tear-shaped outlines and individually arranged on or next to incised lines (Fig. 5: 1, 2, 8, 11, 12, 14), but sometimes they are closely spaced or overlapping pits forming vertical rows within rectilinear or angular motifs of double incised lines (Figs 5: 4, 7, 13; 8: 1).

The most numerous group of pottery finds – representing the latest ornamentation type – are sherds decorated in the early-Želiezovce style (phase ŽI; *cf*., Pavúk 1969, 321-325). Its diagnostic indicator is the presence of impressed notches – having different sizes and intersecting one or more incised lines (Figs 7: 3, 7, 9; 8: 12, 18) or joining two adjacent parallel lines that form varied rectilinear and curvilinear compositions near the rim, in the middle part and – less frequently – near the base (Fig. 7: 1, 2, 4, 6, 8, 10, 11; 8: 2, 5, 15). Sometimes, impressed ornaments are represented by tiny dashes individually arranged within particular incised lines (Fig. 8: 3, 6). An occurrence of small, tear-shaped music-note holes was recorded on a partially reconstructed small spherical bowl found in Feature 379, next to regularly arranged notches joining double incised, straight and arched lines (Fig. 7: 2). The presence of both ornamentation motifs on the same vessel is also a very characteristic element of the early-Želiezovce style (Pavúk 1969, Abb. 13-16; Kadrow 1990, 62, fig. 8).

To sum up, the relative chronology of the settlement in Bogucin – analysed in the context of the stylistic variation of the ornaments present on the examined vessels – is limited to a relatively short period, which probably lasted from the late stage of the Music-Note phase (NIII) to the beginning of the Želiezovce phase (ŽI) of the LBK. The somewhat small range of the stylistic variation of the sherds found in the excavated features may indicate their similar chronologies, which suggest a single-phase character of the local LBK settlement. This assumption is indirectly corroborated by lack of clear stratigraphic relations between thus classified features. Unfortunately, the fact that we have no absolute dates makes it impossible to verify this thesis. Certain, but rather general, hints concerning the chronology of the settlement in Bogucin were provided by a single radiocarbon date from charcoal (Gawryjołek-Szeliga and Szeliga 2012, 72; Szeliga 2021, 70). The sample probably constituted a secondary deposit in a feature of the Lublin-Volhynian culture. The date it produced was 6220 ± 40 BP, which gives a timeframe ranging from 5170 to 5075 BC (68.2%). Keeping in mind this date and radiocarbon determinations from other LBK sites located in the drainage basin of the Vistula (*cf.*, Dębiec and Dzbyński 2007, 56-58; Kulczycka-Leciejewiczowa 2008, fig. 55; Czekaj-Zastawny 2008, 116, tab. I; 2014, tab. XI; Valde-Nowak 2009, tab. 1; Szeliga 2017, tab. 1, fig. 6; Czekaj-Zastawny and Oberc 2021, tab. 45; Kadrow *et al.* 2021, tab. 1), it appears that the period of using the settlement in Bogucin may be most probably dated to the period between *c.* 5150/5100 and 5000/4900 BC. This range partly overlaps with the developed and late phase of the LBK in Central Europe, which corresponds to the chronological framework of its Music-note and Želiezovce phases in the drainage basin of the Upper Vistula (*e.g.*, Kulczycka-Leciejewiczowa 2008, 106-108; Czekaj-Zastawny 2008, 116; 2014, 94, 104).

THE FIRST FARMERS ON THE EDGE OF THE LOESS OF WESTERN LUBLIN REGION

For the time being, we know of over 60 LBK sites – represented mainly by surface finds – from the entire area of the western Lublin Region (identified with the territories comprised between the Wieprz and Vistula Rivers). They are quite widely dispersed, but the majority are grouped in several settlement clusters of different sizes (Szeliga 2021, fig. 1: 2). The greatest number of such sites were documented at the north-western edge of the discussed area, which encompasses the Nałęczów Plateau and the neighbouring territories located outside the compact range of the loess cover (Fig. 20: 1). There are two main settlement clusters within this zone: (1) a larger group covering its western part (lower and middle course of the Bystra River) with the adjacent section of the valley of the Middle Vistula; (2) a smaller cluster located in its eastern area, by the Middle Ciemięga and Upper Kurówka Rivers (Fig. 20: 2, 3). The two most abundant inventories come from these clusters. They are represented by the collection from Bogucin, Site 6, which is the main subject of this paper,

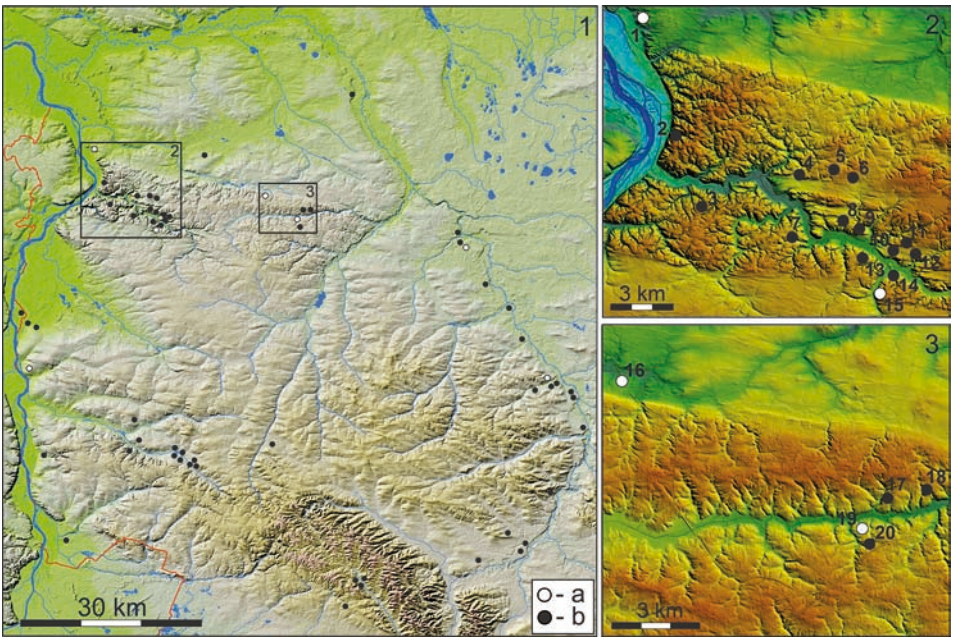


Fig. 20. LBK sites in the interfluve of the Vistula and Wieprz Rivers: 1 – general dispersion of the diagnostic surface finds (a) and excavated sites (b); 2-3 – locations of the sites in the analysed settlement microregions within the Nałęczów Plateau and the adjacent non-loess areas. Sites: 1 – Puławy-Włostowice, Site 3; 2 – Parchatka, Site 26; 3 – Góry Rzeczyckie, Site 1; 4 – Celejów, Site 10; 5 – Łopatki Kolonia, Site 1; 6 – Łopatki, Site 3; 7– Rąblów Kolonia, Site 10; 8 – Zgórzyńskie, Site 5; 9 - Zgórzyńskie, Site 8; 10– Zarzeka, Site 6; 11 – Zarzeka, Site 8; 12 – Zarzeka, Site 17; 13 – Mareczki, Site 12; 14 - Wąwolnica, Site 7; 15 – Wąwolnica, Site 1; 16 – Bogucin, Site 6; 17 – Snopków, Site 5; 18 – Snopków, Site 12; 19 – Panieńszczyzna, Site 1; 20 – Dąbrowica, Site 12 (according to Szeliga 2021, fig. 1: 2, modified)

and a group of finds (found outside features) discovered in Puławy-Włostowice, Site 3 (*cf.*, Szeliga 2018b, 179-182). Presently, they are the most important corpus of sources and practically the only point of reference in the discussion on settling both the edge zone of the local loess cover and the entire upland zone of the western Lublin Region by the LBK societies.

In light of the current state of research, the entire discussed area lacks finds that can be linked with the earliest stage of the LBK and stylistically homogenous collections from the Music-Note phase. This situation, mainly reflects the incomplete state of research and, to much a lesser degree, the actual intensity of the cultural and settlement processes, considerably limits the possibility of definitely determining the time of including the discussed territories in the essential ecumene of the LBK. Based on data from other settlement clusters of this culture – including other upland territories located in the interfluve of the Vistula and Bug Rivers – we can assume that the colonisation of the western and northwestern parts of the Lublin Region by the societies of the LBK commenced at least in the classical stage of the Music-Note phase (NII), and was clearly (and possibly most intensely)

continued in its latest part (NIII), which was linked with the adaptation of the early-Želiezovce decorative style in the local vessel ornamentation (Szeliga 2021, 66). This fact appears to be corroborated by the overall stylistic diversity of the pottery from Bogucin and Puławy-Włostowice. In both cases, the classical music-note ornamentation was represented by a small number of pottery materials, although the late music-note/early-Želiezovce style was quantitatively predominant (*cf.*, Szeliga 2018b, 186-189). This allows us to suspect a relatively close relation between the two inventories – in regard to their styles and chronologies – and, as a result, link the establishment and development of the two settlements (and micro-regions) with the same phase of settling the marginal part of the Nałęczów Plateau and the adjacent non-loess territories by the early agricultural societies. The still outstanding question is whether this was the first or a subsequent stage of the colonisation of these territories by the LBK societies. Independently from this issue, the accessible source data indicates a particular intensity and durability of the settlement processes in the discussed territories, mainly during the period linked with the adaptation of the early-Želiezovce ornamentation patterns by the local late music-note community. This process most probably occurred at the end of the 6th millennium BC.

The Želiezovce ornamentation motifs recorded in the assemblages from Bogucin and Puławy-Włostowice do not differ greatly from the decorative style characteristic of the early stage of the youngest phase of the LBK, finding numerous and very close analogies within all the greatest settlement clusters of this culture located in the drainage basin of the Upper and Middle Vistula. This observation concerns both the loess regions of western (*cf.*, *e.g.*, Godłowska 1991; Czekaj-Zastawny 2014) and northern Lesser Poland (*cf.*, Rauhut 1970; Michalak-Ścibior and Taras 1995; Szeliga 2008; Kulczycka-Leciejewiczowa 2008) as well as the Subcarpathian loess regions (*cf.*, Kadrow 1990; 1997; Dębiec 2014; 2015). A completely different situation can be observed in the interfluvial zone of the Vistula and Bug Rivers, where pottery decorated in the Želiezovce style was previously represented only by a small collection from Site 42 in Podhorce, Werbkowice Commune (Kącki 1982, 4, fig. 1). The lack of such motifs at other sites – especially in the most numerous and richest music-note inventories from the interfluve of the Bug and Huczwa Rivers indicates a territorially limited adaptation of early-Želiezovce ornamentation patterns and, at the same time, a different scope of the stylistic development of the LBK in the western and eastern Lublin Region. This fact also allows us to assume that different ornamentation traditions in these territories – the classical and late-music note style in its eastern part and the early-Želiezovce tradition in the western and north-western areas – stagnated until the end of the development of the discussed culture (Szeliga 2021, 68, 69). The mentioned processes are part of a much broader territorial context and well correspond to the dynamics and sequence of analogous cultural phenomena that are suspected to have occurred across the vast territories of the northern and north-eastern forefield of the Carpathian Mountains – starting with the Music-Note phase of the LBK (Kadrow and Zakościelna 2000, 193, 194, figs 2 and 3).

As mentioned before, the main settlement activity of the first early agricultural societies in the north-western part of the Lublin Region – independently from the actual moment of their arrival to this area – can be now mainly linked with the period of the adaptation of the early-Želiezovce ornamentation traditions by the local environment of the late-music note LBK. At that time, the main settlement network – composed of at least two geographically isolated micro-regions that occupied the higher and middle parts of the river valleys and encompassed from several to even more than ten settlement points – developed within the marginal zone of the local loess cover and in territories located outside its compact range (Fig. 20: 2, 3). Similar preferences for clustering settlement points within micro-regional settlement structures were probably also prevalent across other territories of the western Lublin Region. This assumption is clearly corroborated by the dispersion of the previously recorded sites (Fig. 20: 1), which evidently corresponds to the structure of the LBK settlement network documented for the vast territories of the Vistula River drainage basin (*cf.,* Kruk 1973, 45-48; Czekaj-Zastawny 2008, 111, 112). At least some of the settlements operating in particular micro-regions had residential buildings in the form of longhouses. This fact is mainly confirmed by the results of the research conducted in Bogucin (Fig. 2), although we cannot rule out the possibility that analogous relics were found in Puławy-Włostowice. Unfortunately, the small number of the LBK features at this site and the fact that they were only partly researched make it impossible do conclusively determine their function (*cf.,* Szeliga 2018b, 179-182).

LOCAL COMMUNITIES AND THEIR NON-LOCAL RELATIONSHIPS

The complete lack of radiocarbon dates prevents us from deciding whether both mentioned settlements and micro-regions were settled for a long time or only episodically. Independently from this fact, the gathered data indicates their dynamic development within the entire settlement network, which was induced, for example, by intense interregional contacts and, as a result, exchange of goods – especially raw materials and flint products. The raw material structure of the inventory discovered in Bogucin reflects the character of the local economy, which was based on flint deposits from the north-eastern margin of the Holy Cross Mountains, especially on Świeciechów flint – imported from territories located 60 km from the site. This raw material was supplemented – to a considerable, but much lesser degree – by the supplies of somewhat more distant (70-80 km) chocolate flints. Other raw materials practically did not play any important role in the local processing and tool production, which is clearly confirmed by their smaller quantities (Fig. 13: 1). This statement evidently corresponds to the data obtained from Puławy-Włostowice (Zakościelna 1981, tab. 1; 2002, fig. 1; Balcer 1983, tab. 4), although the fact that the majority of the finds made at this site come from outside the features considerably limits the

possibility of determining their chronology and cultural attribution (*cf.*, Szeliga 2018b, 189). A hoard of pre-core forms made of Świeciechów flint found at this site – and certainly linked with the Early Neolithic horizon of the settlement – is especially important (Zakościelna 2002, 112-116; Szeliga 2018b, 179). Its presence – just as the raw material structure of the inventory from Bogucin – indicates the leading role of the local LBK communities in the redistribution of the flints from the Holy Cross Mountains across much more distant territories – undoubtedly to settlement clusters located east and south-east of the Nałęczów Plateau, occupying both the drainage basin of the Middle Wieprz River (Zakościelna and Gurba 1991, 13) and the much more remote interfluve of the Bug and Huczwa Rivers, which is indicated by single artefacts made of chocolate and Świeciechów flints included in the local inventories (*e.g.*, Uzarowiczowa 1964; Zakościelna 1981, tab. 1; Gawryjołek-Szeliga 2009, 64). The contacts with the LBK societies inhabiting the Western Volhynian Upland were mutual, which is indicated by a small number of artefacts made of Volhynian flint recorded both in Bogucin (Fig. 13: 1), and Puławy-Włostowice (Zakościelna 2002, fig. 1; Szeliga 2018b, 193). Most probably some of the Volhynian flint blades, flakes and tools imported to both settlements were subsequently redistributed – along with other artefacts, *e.g.*, items made of Świeciechów flint – to the north, *i.e.*, to LBK settlement clusters located across the lowland areas. This assumption is based on incidental finds of these raw materials in the inventories of the classical and late phases of the LBK in Kuyavia and Chełmno Land (*e.g.*, Domańska 1988, 83; 2002: 147, 148; Grygiel 2004, tab. 11; Kabaciński 2010, 106, 107, tab. 3, 12; Małecka-Kukawka 2008, tab. 1). The above-presented observation also concerns artefacts made of materials from more distant sources, *i.e.*, obsidian and Jurassic-Cracow flint, whose influx into the lowland areas during phases II and III of the LBK is documented by finds from several dozens of local settlement sites (*cf.*, Grygiel 2004; Małecka-Kukawka 2008; Szeliga 2009; Domańska and Kabaciński 2010; Kabaciński 2010; Pyzel and Wąs 2018; Budziszewski and Pyzel 2022, 127). Although obsidian artefacts have not been discovered in Bogucin and Puławy, the possibility that the local LBK societies redistributed them to the north is indirectly indicated by their sporadic finds at other sites of the western Lublin Region (*e.g.*, Rąblów Kolonia, Wąwolnica Commune; Góry Rzeczyckie, Kazimierz Dolny Commune; *cf.,* Brzozowski 1988; Szeliga 2021, tab. 1). It appears that the question of how the LBK societies from the lowland areas were supplied with chocolate flint – which represented the predominant raw material in the collective inventory structures of many local sites – is a completely separate issue (*e.g.*, Grygiel 2004; Małecka-Kukawka 2008; 2012; Kabaciński 2010; Budziszewski and Pyzel 2022, 127). The high frequencies of this raw material and the morphological structures of inventories that reflect the entire range of its processing at some settlement sites (Kabaciński 2018) allow us to suspect that it was imported to the settlement clusters located in this area as a result of expeditions to the outcrops of the flint organised by the inhabitants of such settlements, without the intermediation of the societies from the western Lublin Region.

The sporadic finds of obsidian artefacts in the interfluve of the Vistula and Wieprz Rivers and the presence of items made of Jurassic-Cracow flint in the inventories from Bogucin (Fig. 13: 1) and Puławy-Włostowice (Zakościelna 2002, fig. 1; Szeliga 2018b, 192) suggest that the local communities also maintained contacts with the LBK settlement clusters from the upland loess areas of the Vistula River drainage basin. Most probably, the initial territories of both mentioned raw materials were the settlement clusters from the Sandomierz Upland and its northern forefield. This assumption is corroborated by their relative proximity and location in the direct vicinity of the Vistula River valley as well as the nearly identical raw material preferences of the local LBK societies, oriented mainly at processing Świeciechów flint (Szeliga 2014, fig. 4; 2018a, 378-380). This interpretation also allows us to assume that the population of the western Lublin Region (including the inhabitants of the Nałęczów Plateau) participated in supplying the Sandomierz cluster with the Volhynian flint artefacts that were part of the inventories found in Tominy, Ożarów Commune (Szeliga 2018a, fig. 2) as well as – possibly – in Samborzec, Samborzec Commune (*cf.*, Lech 2008, 180, 181). On the other hand, contacts with the Rzeszów cluster are indicated by an axe from Bogucin - made of beige rock similar to marl – whose macroscopic features suggest its affinity to local finds of this type (Pelisiak and Dębiec 2022, fig. 2). Explaining this issue undoubtedly requires further, detailed research and specialist analyses. Another, relatively poorly represented category of finds, represented by pottery decorated in a style which refers to ornamentation used by the cultures of the Transcarpathian Eastern Linear circle, namely the Kapušany-Tiszadob group and the Bükk culture, should be associated with contacts and cultural exchange between the discussed sites and southern territories. Presently, only three vessel sherds of this type – discovered in Puławy-Włostowice and represented by base parts of thin-walled spherical bowls – are know from the entire area of the western Lublin Region (Szeliga 2018b, tabl. I: 8; IX: 4, 5). The fact that one of them is decorated with a music-note ornament allows us to state that it was locally produced and, at the same time, rule out the possibility that all of such finds were imports from Transcarpathian territories (Szeliga 2021, 75). This observation clearly corresponds to findings concerning analogous discoveries from other upland areas, including the northern forefield of the Sandomierz Upland (*cf.*, Szeliga and Zakościelna 2019, fig. 4: 2, 4; Szeliga and Gawryjołek-Szeliga 2022). Apart from the actual character of these finds (elements of interregional exchange or rather relics of more complex social and migration processes?; *cf.*, *e.g.*, Furmanek 2010, 192; Szeliga and Zakościelna 2019, 188, 189; Szeliga and Gawryjołek-Szeliga 2022, 105, 106), their presence in the western Lublin Region indicates clear links between the local societies and communities inhabiting the drainage basin of the Upper Vistula, especially the Sandomierz and – possibly – Rzeszów settlement clusters of the LBK.

The presented data expressly indicate that a dynamic settlement centre – maintaining intense and extensive contacts with all the neighbouring LBK settlements located both in the upland and lowland parts of this culture ecumene – functioned at the end of the 6th millennium BC in the marginal zone of the area of the loess cover of the western Lublin

Region. The remains of such contacts are visibly reflected by the raw material structures of both most abundant inventories from Bogucin and Puławy-Włostowice. They indicate the leading role of the local societies in the entire process of the raw material redistribution – through controlling and coordinating the directions and scale of the influx of locally processed items made of Świeciechów flint as well as half-products and tools whose production required imported raw materials, brought to the local settlements through indirect interregional exchange. At the same time, this fact indicates the crucial role of both settlement micro-regions in the entire system of the circulation and exchange of raw materials across vast territories on both sides of the Carpathians, which was especially dynamic since the Music-Note phase of the LBK (*e.g.*, Kaczanowska 1985, Karte 3; Lech 1979, fig. 1, 130, 131; 2003, fig. 1; Mateiciucová 2008, maps 7 and 8). The distribution of raw materials and items made of them allowed the local societies to initiate new and maintain existing interregional contacts. Most probably, it was accompanied by various social and cultural phenomena and events – having a ceremonial character and fundamentally shaping as well as strengthening permanent contacts with the inhabitants of other LBK settlement clusters. At the same time, it had a decidedly non-economic base, and met needs that were entirely non-utilitarian. This observation is clearly indicated by data from all the destination areas of the deliveries, from the Sandomierz Upland as well as the Western Volhynian Upland and lowland areas, especially Masovia and Kuyavia. The local river system was undoubtedly of pivotal importance for the effectiveness and durability of these processes. The most important role was played by the Wieprz – which connected the settlement clusters occupying the edge of the western Lublin Region loess with territories located east and south-east of them – and, especially, by the Vistula River – which was the fundamental communication artery with the southern (Sandomierz Upland) and northern (Masovia, Kuyavia) settlement clusters of the LBK. This fact corresponds to previous findings, according to which this river played an important role both in the process of the early agricultural colonisation of the lowland territories, and in the distribution of the flint raw materials, especially chocolate flint and Jurassic-Cracow flint (Kabaciński 2010, 107; Pyzel 2021, 213).

SUMMARY

The above-presented data indicates that the margin of the loess covering the western Lublin Region was most probably colonised by the LBK societies at the end of the 6th millennium BC. It also suggests a dynamic development of at least two settlement micro-regions in the loess area – maintaining extensive and multidirectional contacts of interregional character, which were based, *e.g.*, on the distribution and exchange of artefacts made of various flint types. The diversity of the ornamentation styles used in decorating the vessels from Bogucin and Puławy-Włostowice allows us to suspect that the colonisation

took place at least at the classical stage of the Music-Note phase, although the main intensity of the local settlement processes should be associated with the development of the late music-note style, strictly connected with the adaptation of the early-Želiezovce tradition. For the time being, the finds from both mentioned sites may be seen as representing the latest stage of the LBK stylistic development. At the same time, they designate the only 'compact' area where such a late ornamentation style was concentrated – not only in the western Lublin Region, but also across the entire upland zone of the Vistula-Bug interfluve (Kadrow 2020, fig. 8). It seems that the presence of pottery decorated in this style across the eastern part of this area (Podhorce; *cf.*, Kącki 1982, fig. 1), and even near Lutsk in Volhynia (Rovantsi; *cf.*, Bardeckiy 2012, fig. 5: 2, 3, 5, 6, 8, 9, 16) reflects only an ephemeral, much weaker and transient influence of the Želiezovce style on the local music-note complex. These issues undoubtedly require further specialist research, especially an intensification of excavations carried out at LBK settlements in the Volhynian Upland. Presently, the range of the accessible source data clearly indicates that the essential zone where the Želiezovce style was adapted are the territories of the western Lublin Region, especially settlement clusters occupying its northern edge, both on its loess cover (Bogucin) and outside its compact range (Puławy-Włostowice). The diversities of the ornamentation decorating pottery inventories from both sites indicate that their styles are very similar. This fact allows us to suspect that the chronologies of both settlements are most probably similar, thus they must have been established during simultaneous colonisation activities of the LBK societies in these territories. Unfortunately, the complete lack of radiocarbon dates makes it impossible to determine whether this activity was transient or long-term and spaced in time. The dynamic development and leading role of the local societies in the system of distribution and exchange of raw materials rather confirm the latter possibility. Nevertheless, the obtained data allow us to assume the permanent colonisation of both settlement clusters by the LBK communities, which is also corroborated by the remains of permanent residential buildings (longhouses) recorded in Bogucin (Fig. 2) and, possibly, Puławy-Włostowice (Szeliga 2018b, 182).

In the context of the discussed issues, one of the most important research questions is the origin of the societies initiating the settlement processes in the reviewed microregions. It appears that their original areas can be identified mainly with the Sandomierz settlement cluster of the LBK, and – perhaps – even with its northern enclave occupying the borderland between the loess Sandomierz Upland and the sandy-loam area of the Iłża Piedmont (Szeliga *et al.* 2019, fig. 1). This assumption appears to be corroborated by rather numerous and close analogies between these territories and both clusters from the western Lublin Region. They include identical raw material preferences of the local LBK societies – expressed by the crucial role of Świeciechów flint – and local imitations of pottery representing early linear ornamentation traditions, which refer to finds from the northern forefield of the Sandomierz Upland and possibly reflect analogous sociocultural phenomena and processes associated with those areas (Szeliga and Zakościelna 2019, 189; Szeliga and

Gawryjołek-Szeliga 2022, 105, 106). The relationships between both territories are also indicated by signs of mutual contacts, which include, on the one hand, the influx of artefacts – made mainly of Jurassic-Cracow flint and obsidian – to the north. On the other, they are represented by a highly probable redistribution of Volhynian flint items to the south. The similar locations of the discussed territories is also somewhat remarkable. In both cases, they include territories occupying borderlands between loess and non-loess areas. Having this in mind, we need to answer the following questions: Did the LBK societies reach the Nałęczów Plateau directly from the northern forefield of the Sandomierz Upland – and the colonisation of the local fringe of the loess uplands was a kind of repeating the original settlement pattern from their indigenous areas (Szeliga *et al*. 2020; 2023)? Was it the only target destination of the settlers, or maybe colonising it was an intermediate stage (and initial territory) for further, gradual migrations of the LBK societies, *e.g*., to the lowland areas? What – in this context – was the character of the actual links between the local clusters and the LBK societies from Masovia and Kuyavia? Certainly, they were not limited only to importing single artefacts made of various flint varieties and obsidian. This fact is directly indicated by scarce discoveries of pottery ornamented in the Šárka style from the eastern Lublin Region (Bronicki 2016, fig. 5: 8) and even Volhynia (Saile *et al.* 2018, abb. 5), which suggest a considerably greater range and scale, as well as a mutual character of these contacts. What actual role was played in this process by the communities inhabiting the analysed clusters from the western Lublin Region, by the Vistula River? The above-listed questions are undoubtedly ones of the most important issues in the context of further research on the origins, history and character of the neolithisation of the western Lublin Region and other territories located in the upland part of the Vistula and Bug interfluve.

Acknowledgements

The authors would like to thank Edmund Mitrus for allowing them to examine and present in this article the materials from Site 6 in Bogucin. Thanks also to Piotr Moskała for translating the text into English.

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