

Lech Czerniak*, Joanna Pyzel**, Marcin Wąs**

**THE BEGINNINGS OF THE NEOLITHIC
IN EASTERN POMERANIA:
A LINEAR POTTERY CULTURE SETTLEMENT
AT SITE 13, KOŚCIELNA JANIA,
SMĘTOWO GRANICZNE COMMUNE**

ABSTRACT

Czerniak L., Pyzel J. and Wąs M. 2016. The beginnings of the Neolithic in Eastern Pomerania: a Linear Pottery culture settlement at site 13, Kościelna Jania, Smętowo Graniczne Commune. *Sprawozdania Archeologiczne* 68, 193-222.

The aim of this article is to report on the remains of the first permanent Linear Pottery culture (LBK) settlement to be recorded in Eastern Pomerania, at a site in Kościelna Jania. Exceptional aspects of this discovery include the presence of what had very probably been longhouses, the large number of artefacts, the site's far-northern location in relation to large LBK enclaves and the relatively early date to which it has been attributed – namely, the onset of the *Notenkopf* phase. The authors discuss the implications of this discovery on interpretations of the Neolithisation process in the southern Baltic coastal region. One of the key issues to resolve is where contact between farming societies and hunter-gatherer communities occurred and whether these encounters were sporadic or reasonably regular resulting, for example, from these groups living in close proximity to one another.

Keywords: Neolithisation, LBK, Pomerania, southern Baltic

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*Institute of Archaeology and Ethnology, Gdańsk University, Bielańska st. 5, 80-851 Gdańsk, Poland; lechczerniak@gmail.com

** Institute of Archaeology and Ethnology, Gdańsk University, Bielańska st. 5, 80-851 Gdańsk, Poland

INTRODUCTORY REMARKS

This article aims to detail archaeological evidence of the first ever permanent Linear Pottery culture (LBK) settlement recorded in Eastern Pomerania (Pomerelia), at Kościelna Jania – site 13 (preliminary reports: Paner *et al.* 2003; Jarzęcka and Kochanowski 2005; Kochanowski 2005; Paner *et al.* 2006; Felczak 2006; Felczak 2009; Czerniak and Pyzel 2011). Exceptional aspects of this discovery include the presence of what had very probably been longhouses, the large number of artefacts, the site's far-northern location in relation to large LBK enclaves and the relatively early date to which it has been attributed – namely, the onset of the *Notenkopf* phase.

The discovery at Kościelna Jania – and potentially at neighbouring sites (Fig. 1) – of a permanent LBK settlement, located 15-50 km away from the Baltic coast and from the nearest Ertebølle culture site in Rzucewo (Król and Schild 2009; Kabaciński *et al.* 2011), necessitates a major revision of existing ideas about 'the landscape of interaction' between local hunter-gatherers and farming communities arriving in the Polish Lowlands. The evidence presented herein gives rise to the hypothesis that LBK communities reaching Pomerania and entering into relationships with the local population came not only from the distant regions of Kuyavia and the Chełmno Land, but first and foremost from the nearby Starogard Lakeland – an area characterised by the presence of small pockets of very fertile soils.

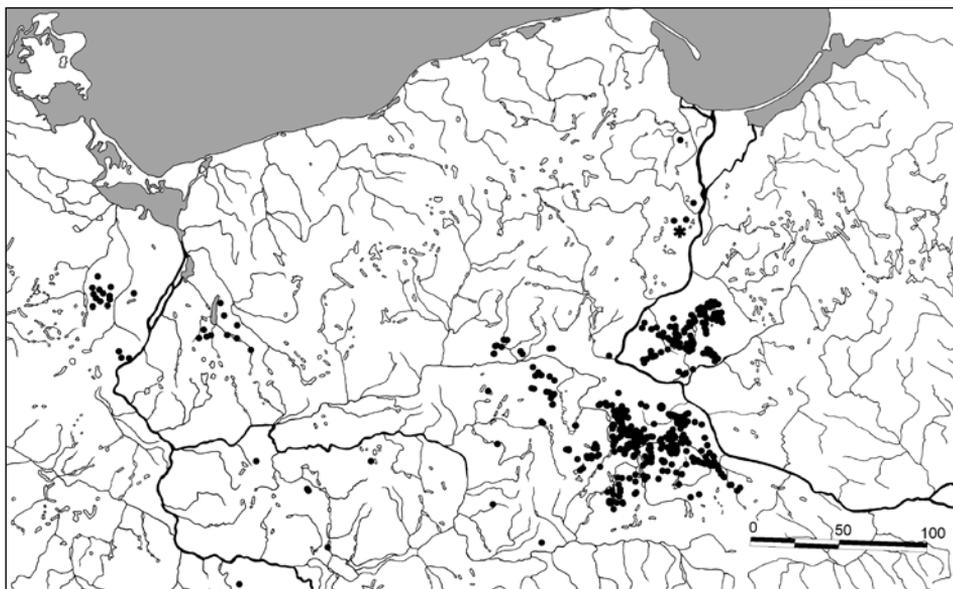


Fig. 1. LBK sites in Pomerania (after Pyzel 2009 with modifications by the authors). The Kościelna Jania site is marked with a star: 1 – Juszkowo – Rusocin, site 28; 2 – Brody Pomorskie, site 20; 3 – Barłožno, site 15; 4 – Bobrowiec-Kornatka, site 5.

It had long been known that an LBK site had existed in the Starogard Lakeland at Brody Pomorskie – site 20 (Felczak 1987). However, only a handful of pottery sherds discovered at this location provided the basis for tentatively interpreting it as an area of occasional forays rather than as a settlement site.

Site 13 in Kościelna Jania (recorded on Poland's national archaeological grid as AZP 24-44/4) was discovered in the early spring of 1998 as part of an archaeological survey preceding rescue excavations along the planned route of the A1 motorway (Fig. 2). However, at the time only seven sherds of medieval pottery were discovered. Rescue excavations were carried out by Gdańsk Archaeological Museum from early September to mid-December 2002 (directed by Marian Kochanowski) and then – after a year's break – from September to the end of December 2004. The second season of excavation work was directed by Bogdan Kościński, the archaeological team comprising Marian Kochanowski, Paweł M. Pogodziński, Aleksander Piasecki and Piotr Kalka.

A total surface area of 34,800 m² was examined, with nearly 500 features and strata being recorded. Settlement evidence attributed to the LBK, early Funnel Beaker culture, early Iron Age as well as the medieval and post-medieval periods was noted.

This article is a revised and extended version of a report on the LBK material recovered from this site, which the authors were commissioned to write by Gdańsk Archaeological Museum, and copies of which are filed in the museum archive and at Poland's highways agency – GDDKiA in Warsaw. The authors would like to thank the Gdańsk Archaeological Museum authorities and Marian Kochanowski for the opportunity of studying the material presented herein.

1. SETTLEMENT STRUCTURE. INTERPRETATION OF BUILDINGS AND ACTIVITY AREAS

The site occupies the north and northwest slopes of an extensive elevation which sweeps down towards marshland at the edge of a stream named the Janka. However, the fact that it lies around 900 m away from this stream suggests that the settlement's inhabitants probably used one of the many small nearby pools as a water supply (Fig. 2). The site is set in a landscape characterised by a diverse range of postglacial hills and marshy hollows. The contemporary topsoil was made up of podsolic clays. The fill within features consisted predominantly of grey-black or grey-brown humus-rich, slightly clayey sand. The natural subsoil at this site was heterogeneous, consisting of clay in some areas and fine sand and gravel in others. These soil conditions prevented the survival of organic material (Kochanowski 2005).

Features indicative of a permanent LBK settlement were recorded across an area of around 1 ha, where the underlying natural subsoil was clay (Fig. 3). These features had been badly damaged by later structures dating from the early Iron Age and by intensive

land development during the post-medieval period. This (coupled with difficult excavation conditions and a lack of experience in examining features of this type) was probably why no postholes that would have clearly evidenced LBK longhouses were recorded at this site.

It would seem that the aforementioned area of around 1 ha roughly equated to the full extent of LBK activity at this site. The maximum distribution of features could only be securely established at the site's northern end (where an approximately 170-metre-wide tract devoid of any features was recorded) and at its southern edge (where there was a strip of 70 m in width leading down to a large marshy depression). However, the site's topographical constraints (bounded to the east and southwest by marshy hollows) suggests that LBK features probably did not extend much further west and east beyond the roughly 90-metre-wide strip of motorway examined (Fig. 3).

LBK pottery was recorded in 40 different contexts; however, only 15 features can be deemed to represent a settlement attributable to this culture. They occurred in three relatively closely spaced clusters (Fig. 3). The most significant was a cluster comprising features 64, 242, 401, 409, 410, 411, 446 and 448, five of which can be interpreted as borrow pits associated with three longhouses. Borrow pits is the term used herein for features which were elliptical in horizontal section (in this instance measuring 4.5-8.5 m long and 1.5-2.2 m wide). Features of this type occur almost exclusively on either side of LBK longhouses, running parallel to their side walls (e.g. Coudart 1998, 33). In view of their very specific function, characteristic shape and the fact that they occur as parallel sequences of pits spaced 7-10 m apart, they are considered to be good indicators of LBK longhouses in the absence of any posthole evidence. Another characteristic aspect of borrow pits is that the last pit at the southeast end of a longhouse was positioned in line with the building's end wall, thus making it possible to identify that part of the house fairly securely. Analysing the distribution of borrow pits at Kościelna Jania enabled the location and approximate dimensions of three longhouses to be determined (Fig. 3).

Borrow pits probably initially served as quarries for clay, later being reused for a variety of purposes, most often ending up as places where rubbish generated by the occupants of the nearest house was deposited, which is why they are usually rich in artefacts.

At the Kościelna Jania site the above criteria are met by features 448 and 409, 410 and 242, as well as 401. Feature 448 lies parallel to feature 409, with which it forms a pair, thus providing the basis for identifying house 1, which measures approximately 6.5 m wide, hence allowing its length to be estimated as an average one of around 15-20 m. Directly east of this house were two other features that were undoubtedly borrow pits (410 and 242), lying parallel to one another, though the distance between them equated to the dimensions of two closely spaced longhouses. Given this situation, pit 401, located midway between the two earlier mentioned borrow pits and in line with their southern edge, may also have served as a small borrow pit separating the two houses designated longhouses 2 and 3 (Fig. 3). Thus, we have a cluster of three longhouses built in close proximity to one another, house 1 differing slightly from the other two in its alignment, possibly suggesting

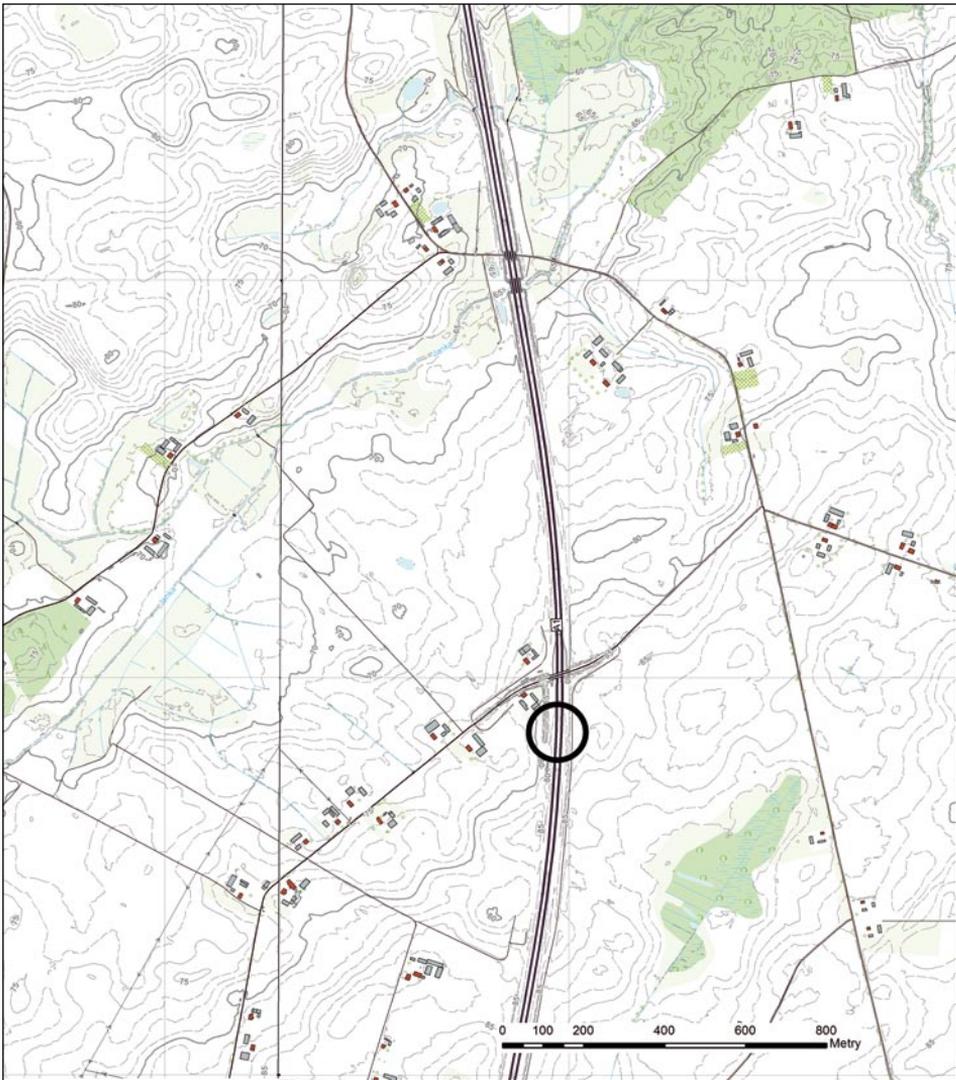


Fig. 2. Kościelna Jania, Smętowo Graniczne Commune, site 13. Site location (circle).

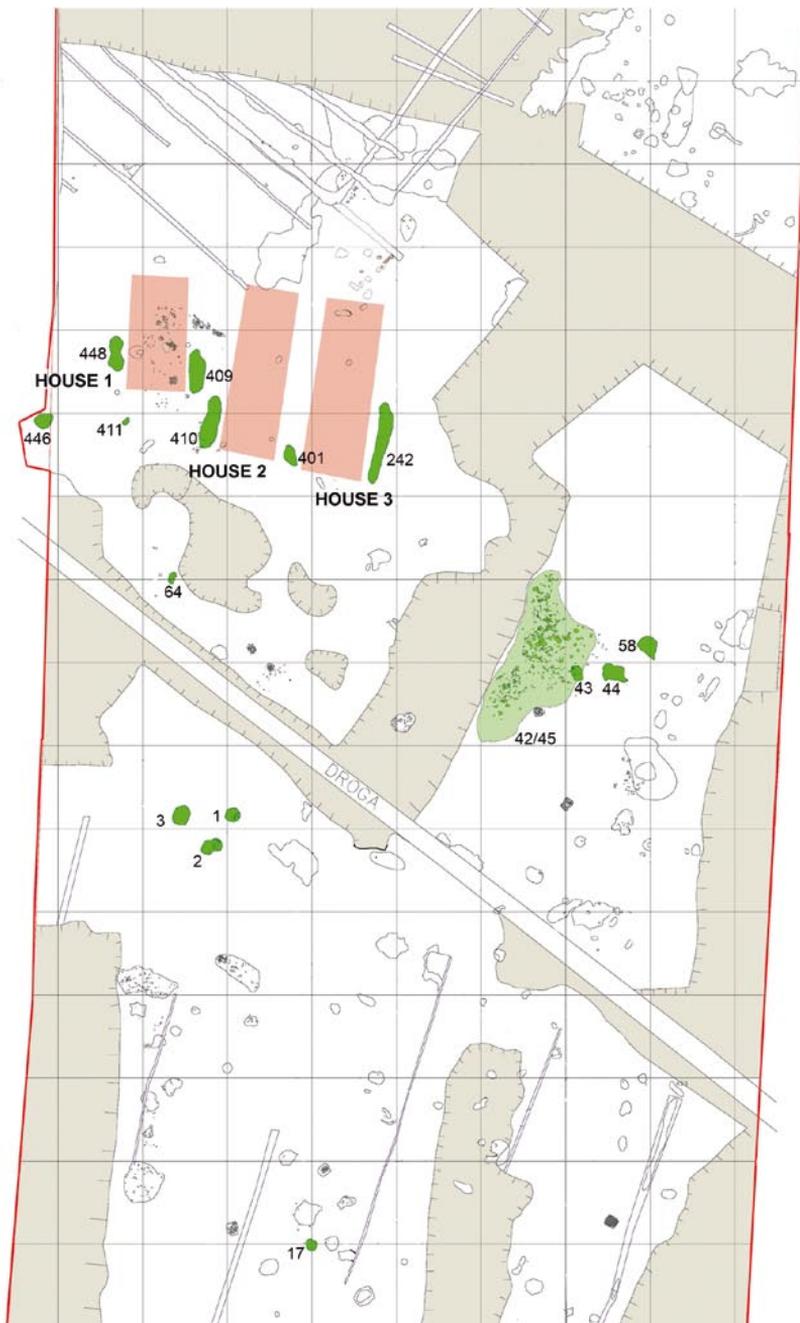


Fig. 3. Kościelna Jania, Sępólno Graniczne Commune, site 13.
 Distribution of LBK features (green – pits; brown – reconstructed houses). Grey – modern destructions

that it was not built at the same time. The two other longhouses evidently represent a contemporary pair, as can be surmised from how closely spaced they were, their shared alignment and the fact that their southeast end walls were positioned in line with one another. Taking all of these points into consideration it appears most likely that house 1 was built slightly earlier than the pair of houses 2 and 3. Analysis of pottery recovered from the borrow pits suggests that all of the houses had been in use at roughly the same time, notwithstanding the fact that feature 448 (associated with house 1) did indeed slightly pre-date the others.

The presence of longhouses in clusters of two to five, seldom more, typifies the layout of buildings at LBK villages, particularly in the eastern regions of this culture's distribution range, which include Little Poland (Czerniak 2013) as well as Kuyavia (Ludwinowo, site 7; Pyzel 2012 – Fig. 2), and probably represent a single though fairly numerous group forming a joint household.

Borrow pits

Feature **242**, measuring 910 × 140 cm in horizontal section, and 30 cm deep, was associated with house 3. It was positioned east of this building and contained 171 sherds of LBK pottery and two flints.

Feature 401, measuring 210 × 152 cm and 25 cm deep, located between houses 2 and 3, contained 74 potsherds.

Feature 409, measuring 530 × 180 cm and 30 cm deep, was associated with house 1 (next to its east wall) and contained 42 potsherds and 1 flint.

Feature 410, measuring 640 × 200 cm and 60 cm deep, was associated with house 2 (next to its west wall) and contained 142 potsherds and 9 flints.

Feature 448, measuring 430 × 180 cm and 40 cm deep, was associated with house 1 (next to its west wall) and contained 253 potsherds and 6 flints.

Three further features linked to unspecified everyday household activities were associated with the above houses.

Feature 64, a relatively small pit measuring 150 × 110 cm and 20 cm deep, was located c. 15 m south of the houses. It contained 18 potsherds and 1 sandstone polishing slab, suggesting that stone tools may have been made or repaired nearby.

Feature 411, a small pit measuring 100 × 80 cm and 20 cm deep, was positioned 2 m south of house 1. It contained 1 potsherd.

Feature 446, a pit measuring 220 × 180 cm and 30 cm deep, was located around 8 m southwest of house 1. It contained 1 potsherd.

Other features

A cluster consisting of features 1-3 was situated approximately 35 m south of the longhouses discussed above. This is quite a significant distance for pits functionally associated with LBK longhouses, although it is an observation made at larger and relatively densely built-up settlements. In this instance it can be assumed that the features in question would

have served a purpose connected with carrying out particularly onerous household tasks. Unfortunately, the material recovered and observations made during the course of excavation do not provide any clues, other than the fact that in its ultimate phase feature 3 may have been used for the disposal of rubbish.

Feature 1 was circular in section with a diameter of 180 cm and a depth of 30 cm. It contained 28 potsherds.

Feature 2, an irregular oval (possibly widened at some stage), measured 210 × 70 cm and 50 cm deep. It contained 118 potsherds (mostly at the top of the feature) and 1 flint.

Feature 3, oval in section, measured 240 × 150 cm and 80 cm deep. It contained 92 potsherds and part of a stone mattock.

The third cluster, comprising **features 42/45, 43, 44** and possibly also **58**, lay approximately 20 m southeast of house 3. Within this group feature **42/45** was particularly distinctive. Irregular in shape, it measured 2230 × 860 cm with a depth of 50 cm, and contained 119 potsherds. It was described as a concentration of stones. Unfortunately, these stones were not adequately analysed (no record was made either of their dimensions or raw materials) and it can only be conjectured that this feature must have represented an extensive but shallow pit dug by inhabitants of the LBK settlement in order to quarry stones occurring at this site in the form of typical moraine debris. Abundant pottery, exclusively LBK sherds (despite the nearby presence of features attributable to the Funnel Beaker culture and later periods), recorded among the stones indicates that this pit had only remained open during the period when the LBK settlement had been in use. The relatively large number of sherds found among the stones represented a typical range of vessel types (storage vessels, cooking pots and tableware) characteristic of the pottery found across the whole site. They may have been deposited in this pit by chance rather than as the result of a particular form of activity. The remaining features in this cluster also offer no indication of the type of activities carried out in this part of the settlement.

Feature 43 was an oval pit measuring 190 × 140 cm and 12 cm deep. It contained 17 potsherds and 1 flint.

Feature 44 was an irregular oval pit measuring 280 × 200 cm and 77 cm deep. It contained 39 potsherds and 8 flints.

Feature 58 was a pit of irregular oval section measuring 180 × 170 cm and 40 cm deep. It contained 3 potsherds.

Feature 17, located around 90 m south of house 3, was the furthest feature from the longhouses to contain LBK pottery; however, it most likely dated from the Iron Age.

Examining the settlement evidence it can be concluded that the excavated LBK contexts, which constitute a complex configuration of functionally diverse features most probably associated with longhouses, represent the remains of a hamlet (almost all of which was uncovered) inhabited by a group of at least a dozen individuals forming a joint household. Based on the layout of the conjectured houses, this hamlet may have been in use over two phases: initially, as a single farmstead which was subsequently enlarged by the addition

of two further houses. Neither of the scenarios which this expansion may have followed can be ruled out, namely that two new houses were built after the abandonment of the earlier one, or that a pair of houses was raised next to one that remained in use. This is due to the fact that there are virtually no differences in the pottery associated with each of the houses. Thus, bearing in mind that the hamlet was occupied during a period attributable to a single phase of ceramic chronology, whilst its layout was also evidently changed during this time, it can be estimated that it remained in use for 3-4 generations, hence around 70-100 years (Czerniak 2016). Both the presence of longhouses and the adjacent pits attest to the complex settlement structure characteristic of permanent LBK settlement zones, which in this part of the Polish Lowlands have hitherto only been noted in Kuyavia and the Chełmno Land.

2. POTTERY

The site at Kościelna Jania yielded a total of 1896 ceramic sherds, some of which could be refitted, reducing this number to 1214. However, analysis was carried out on the full number of sherds prior to reassembly into larger sections.

A total of 1106 sherds were recovered from the three clusters of LBK features described above. The majority were directly linked to suggested houses 1 (295 sherds) and 2-3 (385 sherds). The cluster made up of features 1-3 produced 230 sherds, whilst the cluster comprising features 42/45, 43, 44 and 58 yielded 196 sherds. Relatively few ceramic fragments were found within individual features, hence comparisons have been carried out on assemblages recovered from the defined clusters.

2.1. Technology

Pottery technology analysis was carried out in keeping with the approach advocated by Joanna Pyzel (Pyzel 2010, 74ff.; therein a summary of this analytical technique and its methodological principles), identifying technological attributes and categorising them into technological groups (gt), subgroups (pgt) and technological group elements (egt). Details of these categories are presented in Table 1.

Analysis of Kuyavian assemblages has shown that the use of sand and grog tempers (gt II) increased over time in relation to that of the organic tempers (gt I) primarily typical of early LBK pottery (see Pyzel 2010: 85). Whilst recognising that the detailed picture of variability in technological practices is more complex (Pyzel 2010: 86), it can nonetheless be concluded that the assemblage from Kościelna Jania largely conforms to the Kuyavian model. There is a clear distinction between fine and coarse wares, which is a typical aspect of pottery of the middle and later LBK phases (phases II-III, see Pyzel 2010, 107). Within the assemblage there is a slight predominance (62%) of thick-walled vessels (gt I and II, see Table 2).

Table 1. Description of technological system of LBK pottery
(after Pyzel 2010, appendix 31)

unit of technological system		gt	I							II		III			
		pgt	A			B	C		D	A	B	A			B
		egt	1	2	3	B	1	2	D	A	B	1	2	3	B
aa-temper type	organic	■	■	■	●	○	○		●				○		+
	sand	+	●	+		■	■		■	■	■	■	■	■	■
	grit								+	+					
	grog			○	■	●		■						○	
	mica											+			+
	limestone			+						+	+				+
ab-temper size	small		■		○	■	■	■				■	■	■	
	medium		●	○	■	●	○	○	●	○					■
	big	■		■	○				■	■					
ac-temper density	small		●	○	●	■	■					■	■	■	
	medium		■		■	●	○	■	●	○					■
	big	■		■					■	■					

Among the coarse, thick-walled pottery there is a clear predominance of gt I, and in particular of gt IA – typical cooking ware with coarse plant inclusions. It represents c. 63% of gt I and gt II sherds, whilst in Kuyavia it accounts on average for 58% of phase IIA sherds and only 48% of those ascribed to phase IIB (see Pyzel 2010, 85, tab. 14). This pottery is truly ‘thick-walled’ – sherds which are over 9 mm thick account for 42.51% of this material.

Other than typical pgt IIIA sherds, the fine, thin-walled pottery also includes a significant percentage of pgt IIIA3 fragments – featuring a greater proportion of fine plant inclusions. This suggests that these sherds can be attributed to LBK phase IIA, further confirmation being provided by analysis of their stylistic traits, which are detailed later in this article.

Comparative analysis of individual clusters (Table 2) shows that they are similar and conform to the same relatively early model, which may point to the fact that there is very little chronological difference between them. However, it is striking that, for example, there is a relatively large percentage of gt II sherds in features 1-3, though the incidence of grog-tempered pottery is lower (IA3, IC1, IB). Nevertheless – taking into consideration analysis of stylistic attributes – it seems that this is a case of different ceramic traditions rather than significant chronological differences.

Table 2. Frequency of individual technological group elements, in per cent (calculated separately for fine ware and coarse ware)

	IA1	IA2	IA3	IB	IC1	IC2	ID	IIA	IIB	sum	%gt I i II	IIIA1	IIIA2	IIIA3	IIB	sum	%gt III
features 1-3	34,19	5,98	12,82	5,98	5,98	5,98	0,85	23,08	5,13	100	50,87	74,34	20,35	0	2,61	100	49,13
house 1	25,82	0	11,74	13,15	10,8	23,94	2,82	7,04	4,69	100	72,2	95,12	1,22	0	3,66	100	27,8
houses 2-3	34,4	2,29	19,72	6,42	12,84	13,3	0,46	2,29	8,26	100	56,62	92,22	0,6	0	7,19	100	43,38
cluster 3	41,18	0,98	30,39	1,96	10,78	10,78	1,96	0,98	0,98	100	52,04	94,68	4,26	0	1,06	100	47,96
total	45,72	2,71	14,84	5,85	7,8	12,89	1,27	5,68	3,22	100	62,18	82,15	8,79	0,28	8,79	100	37,82

2.2. Decoration

2.2.1. General remarks

The pottery recovered from Kościelna Jania includes 669 decorated sherds, accounting for 35.3% of the entire assemblage. Barely 26% of gt I and gt II sherds are decorated, the number rising to 51% for gt III sherds. Examination of 435 refitted fragments of decorated pottery resulted in the recording of 500 decoration units (the terminology in this report is taken from the classification used for ornamentation in Pyzel 2010, 25 ff.), 5.1% of which were rim decoration motifs 5.6% – secondary decoration motifs, 71.8% – main decoration motifs and 13.1% – plastic decoration (knobs).

2.2.2. Decorative elements

Decorative elements are the most widely recorded, irrespective of their classification into types of motif composition, hence they were used to analyse chronological variation within each of the identified feature clusters. The following traits were significant chronological indicators: the frequency of broad incised lines (an early trait) and the frequency of music note motifs (a later trait) on fine ware, and the frequency of pinched motifs and decoration in the form of plain large, vertical cuts – referred to as a rain motif (both of which are early designs) on coarse ware (though there is never full correlation between decoration and technological groups). All of the pottery decorated in this manner (563 fragments in total) was analysed, dividing this material according to the aforementioned clusters from which it had been recovered. The results are presented in Table 3.

A striking aspect of the entire assemblage is the significant frequency of broad incised lines (which appear on 41% of pottery featuring incised and music-note motifs). These lines are mostly U-shaped in cross-section. Music-note motifs account for only 21% of this category, most of the notes being of the ‘classic’ variety with far fewer examples of the large, archaic type. It is also worth mentioning a small group of sherds (1.4%) decorated with filled bands (Figs. 6:14; 9:11). These occur both with broad and regular incised lines, and they account for a similar percentage to that noted among Kuyavian assemblages (1.8% for phase IIA – see Pyzel 2010: 25, Table 1).

Coarse ware is decorated principally with pinched motifs (29.21%) as well as large, vertical cuts (rain pattern – 7.43%). These are also early traits which suggest that the Kościelna Jania settlement dates to phase IIA.

Among these assemblages, the most archaic traits are noted on pottery recovered from features associated with house 1: incised lines appear on 60% of sherds, whilst music-note motifs – on only 7.5%. The impressed decoration is marked by a high frequency of pinched motifs (32%) and cuts (rain pattern – 16%), hence archaic traits, though it is worth highlighting that there is also a small percentage (4%) of fingernail impressions, which are

Table 3. Frequency of individual decorative elements, in per cent

	Broad incised line	Broad line with a music note	Incised line	Incised line with a music note	Total incised lines	Pinched mitfs	Finger impressions	Fingernail impressions	Vertical cuts „rain“	Total mpressions
features 1-3	34,25	13,7	46,58	5,48	100	60	40	0	0	100
house 1	60	0	32,5	7,5	100	32	48	4	16	100
houses 2-3	26,04	13,54	33,33	27,08	100	20,31	59,38	9,38	10,94	100
cluster 3	20,45	4,55	59,09	15,91	100	55	40	0	5	100
total	34,28	6,8	45,61	13,31	100	29,21	56,44	6,93	7,43	100
total 100%	21,8	4,32	29,01	8,47	63,6	10,63	20,34	2,52	2,7	36,4

generally regarded as later stylistic traits (see Pyzel 2010: 107). Interestingly, this design was also noted on pottery from houses 2 and 3, which may point to a connection of some kind between their inhabitants. Based on the frequency of particular chronologically diagnostic decorative elements, these houses appear to be later than house 1, though the difference between them seems minimal. All of the pottery from Kościelna Jania is attributable to phase IIA. In view of its modest size, further stages of stylistic analysis have been carried out on the whole assemblage.

2.2.3. Ornament composition – decoration motifs

2.2.3.1. RIM DECORATION MOTIFS

The entire Kościelna Jania assemblage includes only 33 sherds with rim decoration motifs. They constitute barely 5.1% of decoration elements, whilst in Kuyavia the average figure is c. 13%, and even in Grabie, dated to LBK I, it stands at c. 10% (calculations based on Pyzel 2010, Table 9, 67-70). This confirms the previously mooted early dating of material from Kościelna Jania to phase II. Only 22% of all rims are decorated. There are no decorated rim lips. Single incised lines predominate (e.g. Fig. 4: 5, 11); 45% of rim decoration motifs are single lines composed of different impressions – mostly finger-impressed (e.g. Fig. 8:12), but also pinched (e.g. Fig. 9:2).

2.2.3.2. SECONDARY DECORATION MOTIFS

Secondary decoration motifs were recorded on 37 sherds. Both their frequency and their stylistic traits are consistent with the middle phase of the LBK. There is a relatively large incidence of triangular designs, usually not accompanied by an incised line under the rim, instead featuring a curvilinear main design (e.g. Figs. 4: 9; 5: 12; 6:3). Of particular note is an arched design reminiscent of the principal decorative motifs of LBK I (Fig. 4:11). The whole vessel is, however, definitely typical of LBK II.

2.2.3.3. MAIN DECORATION MOTIFS

Although they account for the greatest number of recorded decoration units, the condition of the sherds is generally too poor to allow for accurate reconstruction. Fine ware features a distinct predominance of curvilinear designs (c. 70%) – usually indeterminate – over straight linear motifs. Spiral motifs are sparsely represented (e.g. Fig. 4: 9, 13); they are more characteristic of the early LBK (including LBK IIA – e.g. Fig. 6: 12). There are, however, more classic, interlocking S-shaped scrolls (e.g. Figs. 5: 4, 13; 6:10). They usually end in a music note (in nearly 64% of cases, e.g. Fig. 5: 13), and occasionally in just an incised line (16%, Fig. 10:1). Transverse incised 'bars' punctuated with notes account for 13%

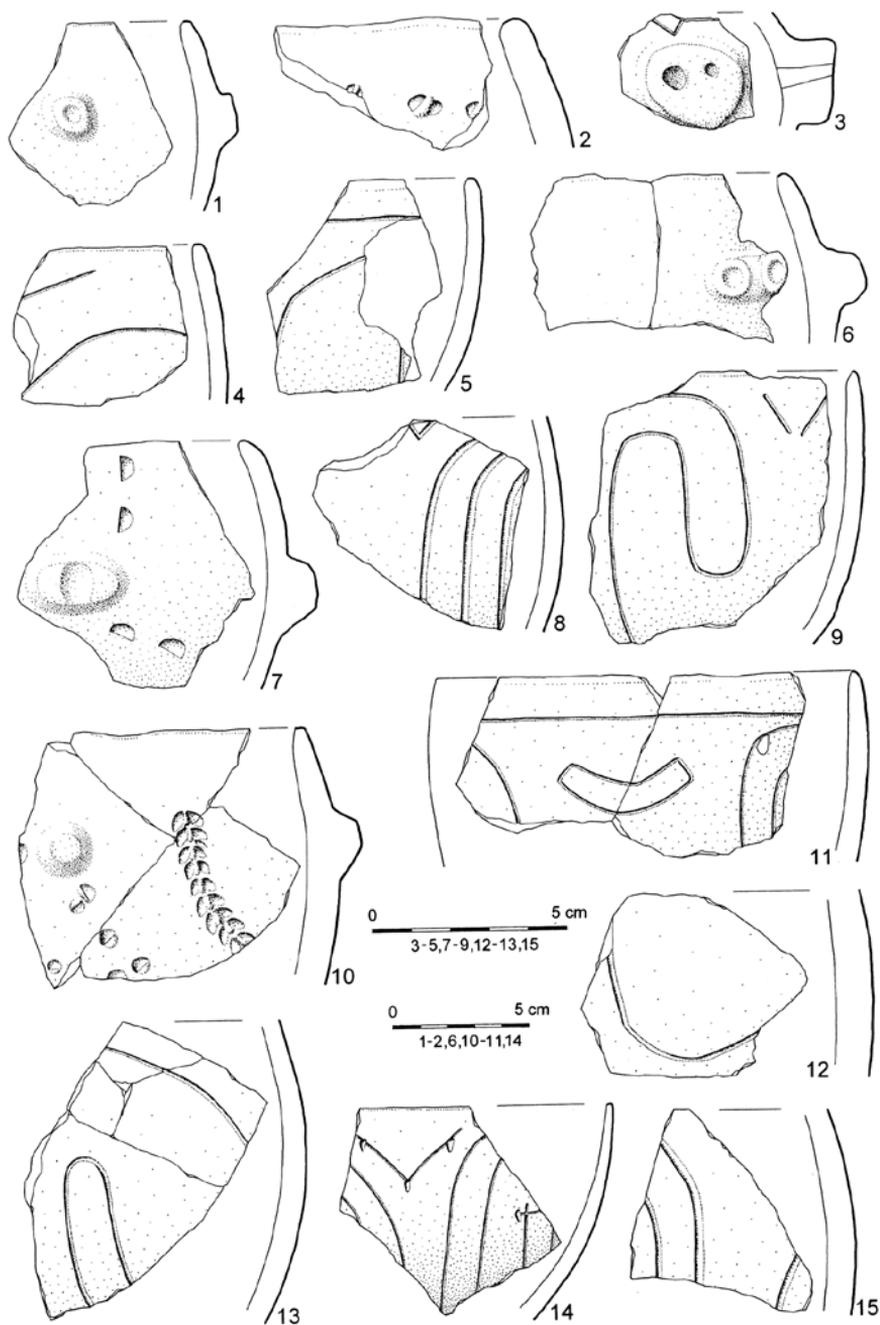


Fig. 4. Kościelna Jania, Śmętowo Graniczne Commune, site 13. Selected pottery. 1 – pit 44; 2-5- pit 401; 6-8 – pit 409; 9-15 – pit 448 (drawing: J. Pyzel and M. Gościmiński)

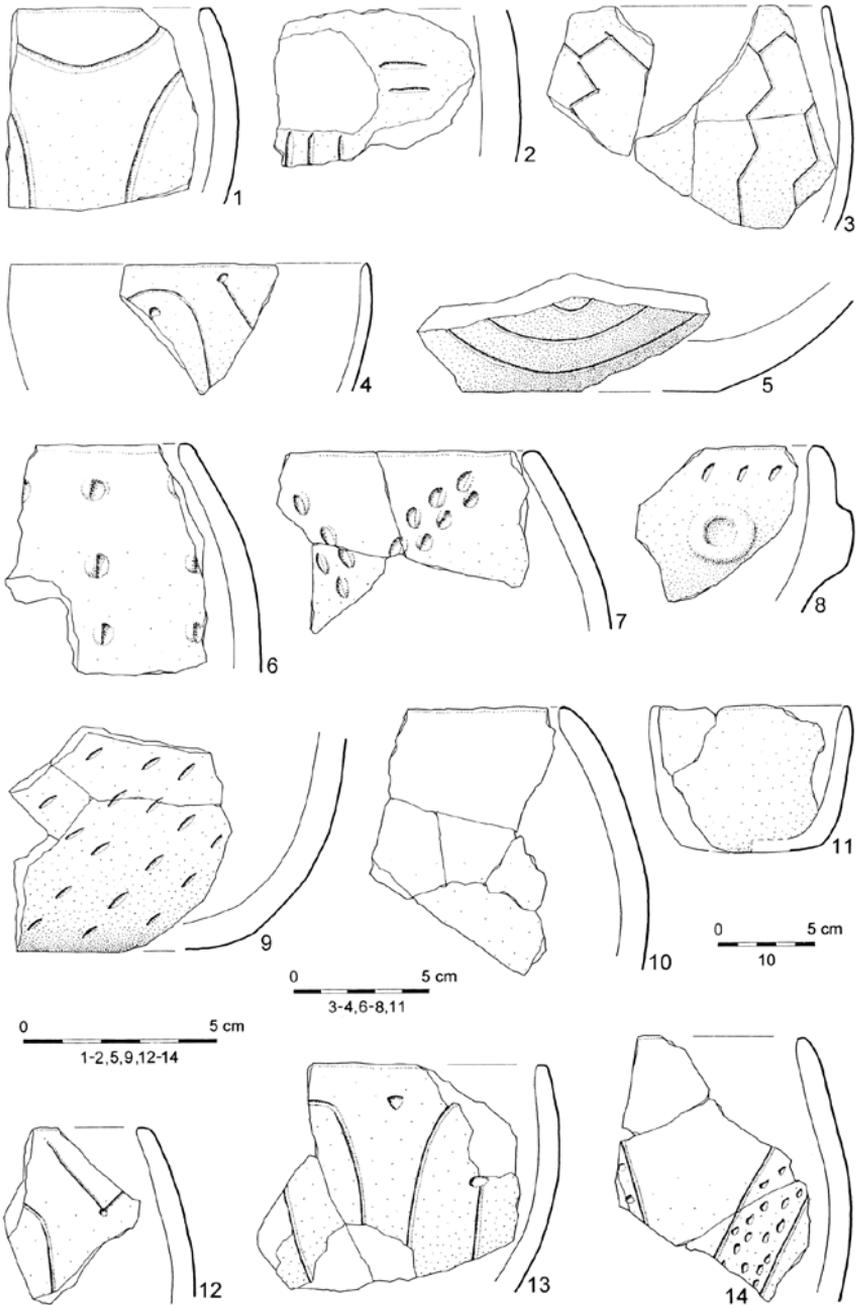


Fig. 5. Kościelna Jania, Smętowo Graniczne Commune, site 13. Selected pottery. 1-3, 6-9 – pit 242B; 4, 10 – layer 470; 11-14 – pit 410 (drawing: J. Pyzel and M. Gościmiński)

of ends (Figs. 6: 8; 7:13). A design of this type ('T-shaped') has also been noted at other sites in the Polish Lowlands: Olsza 9, Ludwinowo 7, Siniarzewo 1, Chabsko 40, Łojewo 1, Żegotki 3, Parchanie, Bodzanowo, Wola Kożuszkowa 1, Brześć Kujawski 4, Miechowice 4, and Zagajewice 1 in Kuyavia (Pyzel 2010, 61, fig. 35, therein further references), as well as at Żuławki Małej 1 (Szkudlarek 1996, fig. 16:3) and Szczecin-Płonia 2 (Kozłowska 2004, 112, figs. 6:1, 9:4). R. Grygiel (1978, 98) believes that this is an element typical of the eastern LBK, whilst Ryszard Kirkowski (1994, 66) contends that it is characteristic of the so-called 'Chełmża style' (a western element, mainly attributable to LBK phase III). In our opinion it has no chronological or genetic relevance, and can best be described as an element of the northern lowlands. In Kościelna Jania it is both the earliest and most northerly recorded example.

Straight linear motifs feature one evident import – Fig. 5: 3. Its foreign provenance is suggested by technological differences – it is the only vessel in the whole assemblage to be generously tempered with sand. The closest analogy for the ornament comes from the Tiszadob group in eastern Slovakia (e.g. Prešov-Šarišské Lúky – Šiška 1989, 76, fig. 23: 1-4, 7; 78, fig. 24: 2, 10; 79, fig. 25: 8 – all Tiszadob, early phase). This vessel is interesting in the context of eastern Slovakian finds discovered in the Chełmno Land, for example at Ryńsk (Kirkowski 1993a) or Annów (Kirkowski 1993; 1994), which prompted R. Kirkowski to suggest that some of the migrants to the Chełmno Land may have come directly from southeast Slovakia (Kirkowski 1994, 64).

Notably, the Kościelna Jania assemblage also includes bounded designs of the LBK Ib type (Zofipole, Kulczycka-Leciejewiczowa 1983: 91) – e.g. fig. 7:7; 11 :8. However, there is an absence of elements with Gniechowice attributes, the majority being entirely consistent with pottery ascribed to LBK phase IIA.

Coarse ware is marked by a relatively high percentage of ornamentation covering the entire vessel surface. These designs include ones composed of long, vertical cuts making up a rain pattern (e.g. Fig. 6: 1; 9: 13), as well as finger impressions (e.g. Fig. 10: 8) and pinched motifs (e.g. Fig. 7: 6) of the 'pseudo-barbotine' variety (Kulczycka-Leciejewiczowa 1983, 73, 92). In contrast to these, all-over designs made up of fingernail impressions (e.g. Fig. 8: 3) are arranged in horizontal rows. There are also numerous designs made up of various lines – vertical/horizontal (Fig. 7: 7) and oblique (Fig. 7: 5). The vessel shown in Fig. 4: 10 is notable for being decorated with very closely spaced pinched lines accompanied by finger impressions possibly covering the whole vessel surface. The fine ware features a great wealth of motifs observed both in LBK I and II.

2.2.4. Number of lines in a design

There are lots of single lines (e.g. Figs. 4: 5; 5: 4), though because the pottery is highly fragmented this is often difficult to determine with complete certainty. The incidence of triple lines is, however, undoubtedly low (just under 2%, e.g. Fig. 4: 8).

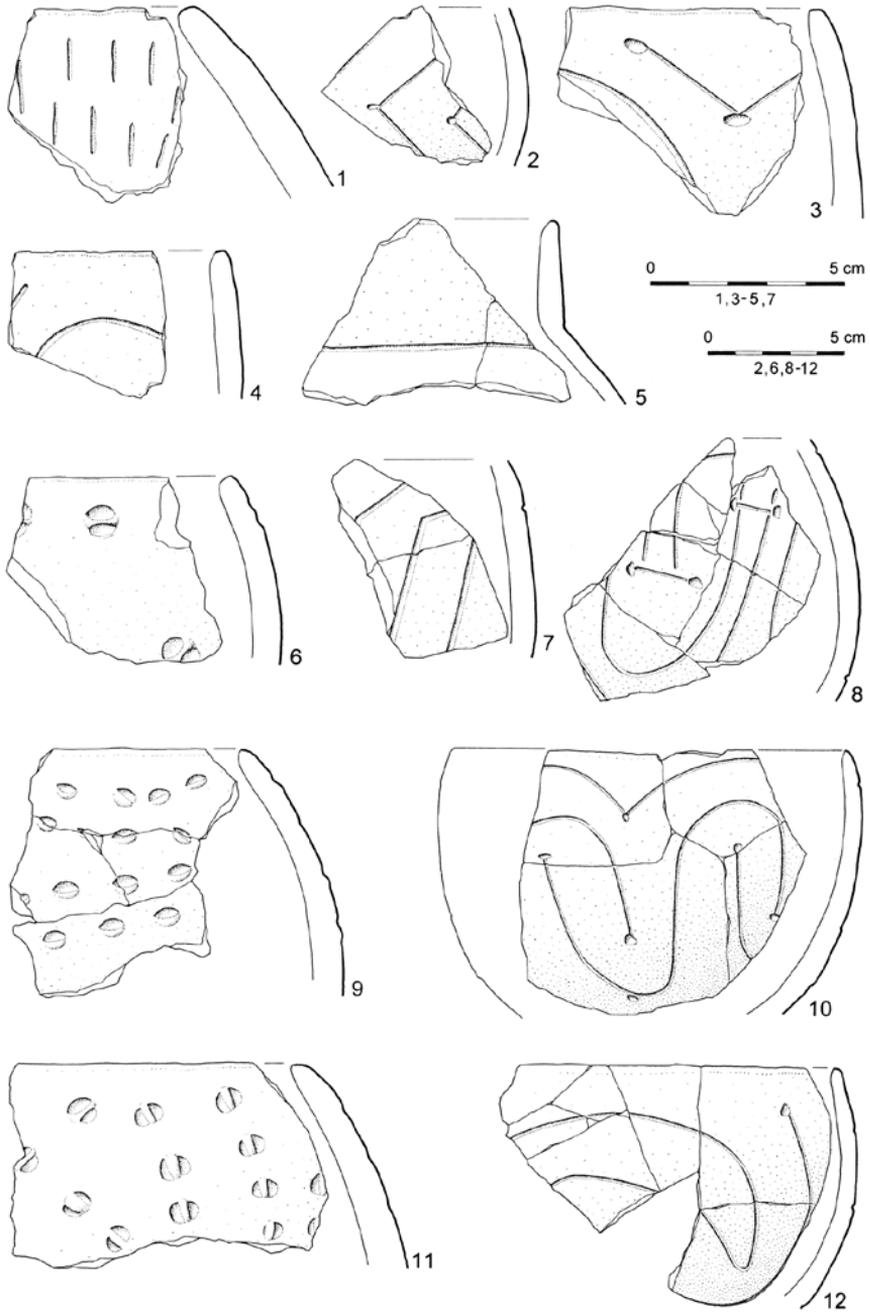


Fig. 6. Kościelna Jania, Smętowo Graniczne Commune, site 13. Selected pottery. 1-2 – pit 42/45, 3-5- pit 43; 6-12. pit 242A (drawing: J. Pyzel and M. Gościński)

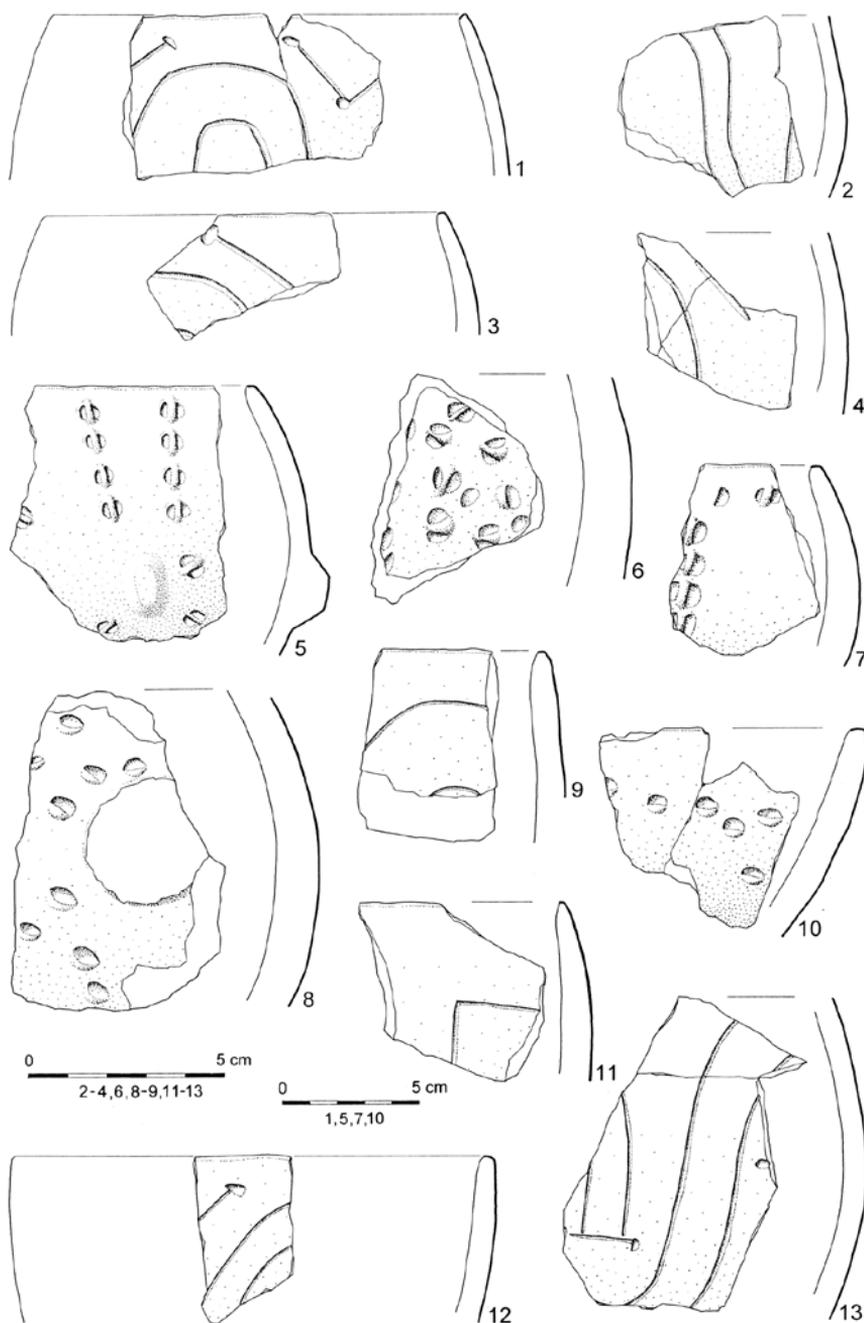


Fig. 7. Kościelna Jania, Smętowo Graniczne Commune, site 13. Selected pottery. 1, 2, 4, 5 - pit 3; 3 - pit 5, 6-13 - pit 42 (drawing: J. Pyzel and M. Gościński)

2.2.5. Plastic decoration

Decorative applied knobs were noted primarily on coarse ware, of which there was a relatively large quantity at Kościelna Jania. Most of the knobs are of classic round or oval form, many of them accompanying either main or under-rim motifs. There are also three examples of knobs modelled by pinching (e.g. Figs. 8: 5; 9: 9), which is characteristic of the early LBK (for Zofipole analogies see Kulczycka-Leciejewiczowa 1983: fig. 6e). Analogies for the form shown in Fig. 4: 3 were found at the Piecki 8 site in Kuyavia, dated to LBK IIA (Czerniak 2004, fig. 117:1).

There was one instance of a series of knobs covering the entire surface of a vessel (Fig. 9: 6). This type of whole-surface decoration has been noted on LBK I pottery, though in the form of small hemispherical knobs evocative of barbotine decoration (Kulczycka-Leciejewiczowa 1983: fig. 3e – Zofipole, Gniechowice pottery), whereas in this case the knobs are much larger.

2.3. Vessel forms

The analysed assemblage features a relatively large quantity of globular bowls with a fairly wide mouth (e.g. Fig. 4: 5, 9, 11), which is an early trait corroborating the LBK IIA attribution of this site. Large forms (e.g. Fig. 10:3) also appear to be of early date. Small, open bowls, including coarse ware specimens, were also recorded (Figs. 9: 3, 8; 10: 6).

One fragment of a modelled figural motif was also found (Fig. 9: 12).

2.4. Summary

Technological and stylistic analysis of the pottery from Kościelna Jania indicates that it should be attributed to phase IIA (for distinguishing features see Czerniak 1994; further details – Pyzel 2010, 107, 262). It is worth highlighting that although the analysed assemblages were not entirely contemporaneous, they are relatively homogeneous, evidencing their similarity in terms of chronology and ceramic tradition. It is interesting that the decorative elements on these sherds are more archaic, in particular the high incidence of broad incised lines, which are more characteristic of phase I of the LBK. Broad incised lines were, however, used to produce more advanced decorative motifs typical of LBK II. They also appear together with music note components: ‘classic’ notes and ‘classic’ filled bands.

Analysis of the Kościelna Jania ceramic assemblage suggests that it is typologically later than Boguszewo and Grabie (Czerniak 1994), both dated to phase I. Its greatest similarity is to early LBK II pottery from the Chełmno Land, from Annowo 7 and Gruta 52 (R. Kirkowski (1993; 1994) dated Gruta 52 to phase III of the LBK. We believe this dating to be erroneous, as all other finds recovered from this site are significantly earlier and do

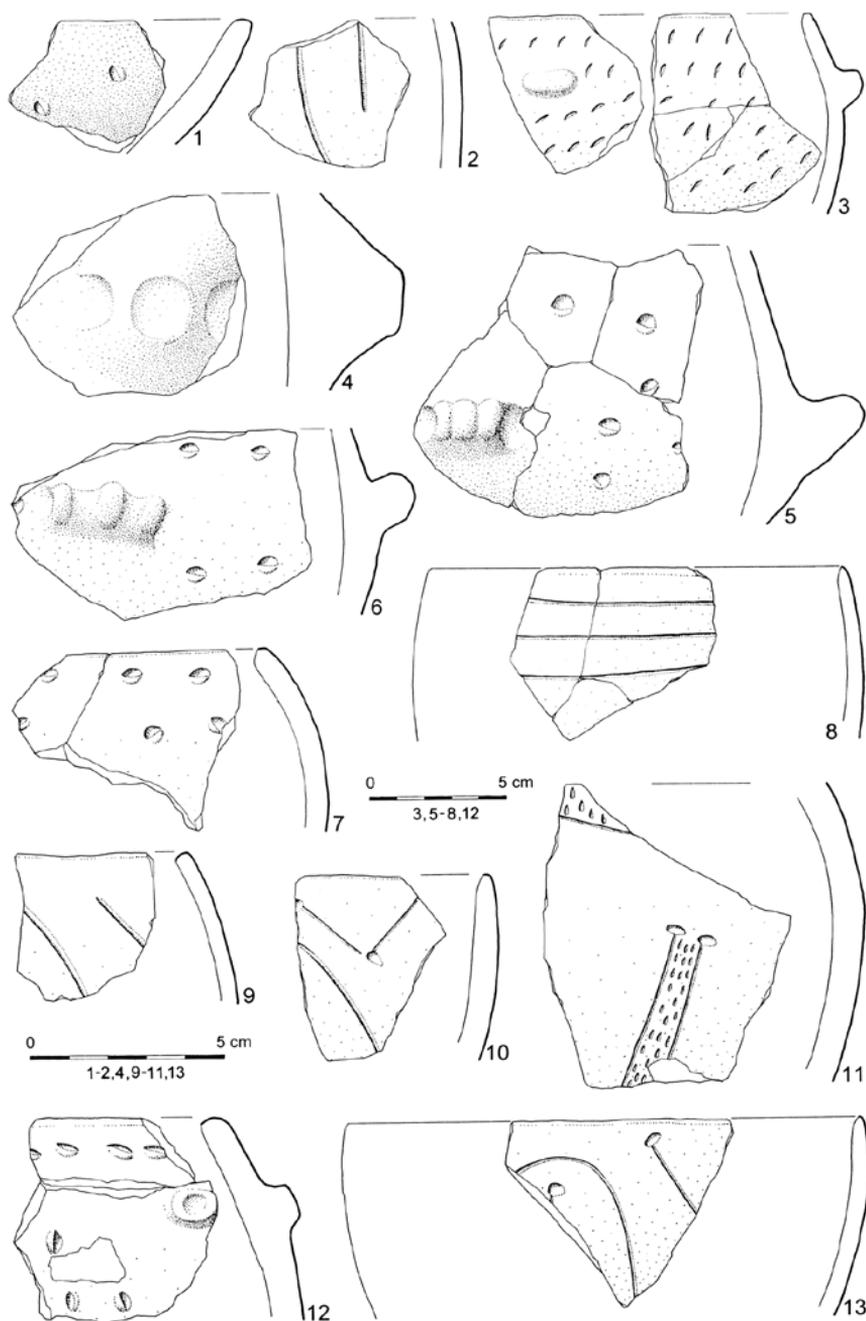


Fig. 8. Kościelna Jania, Smętowo Graniczne Commune, site 13. Selected pottery. 1-11 – layer 210; 12 – layer 270; 13 – layer 470 (drawing: J. Pyzel and M. Gościński)

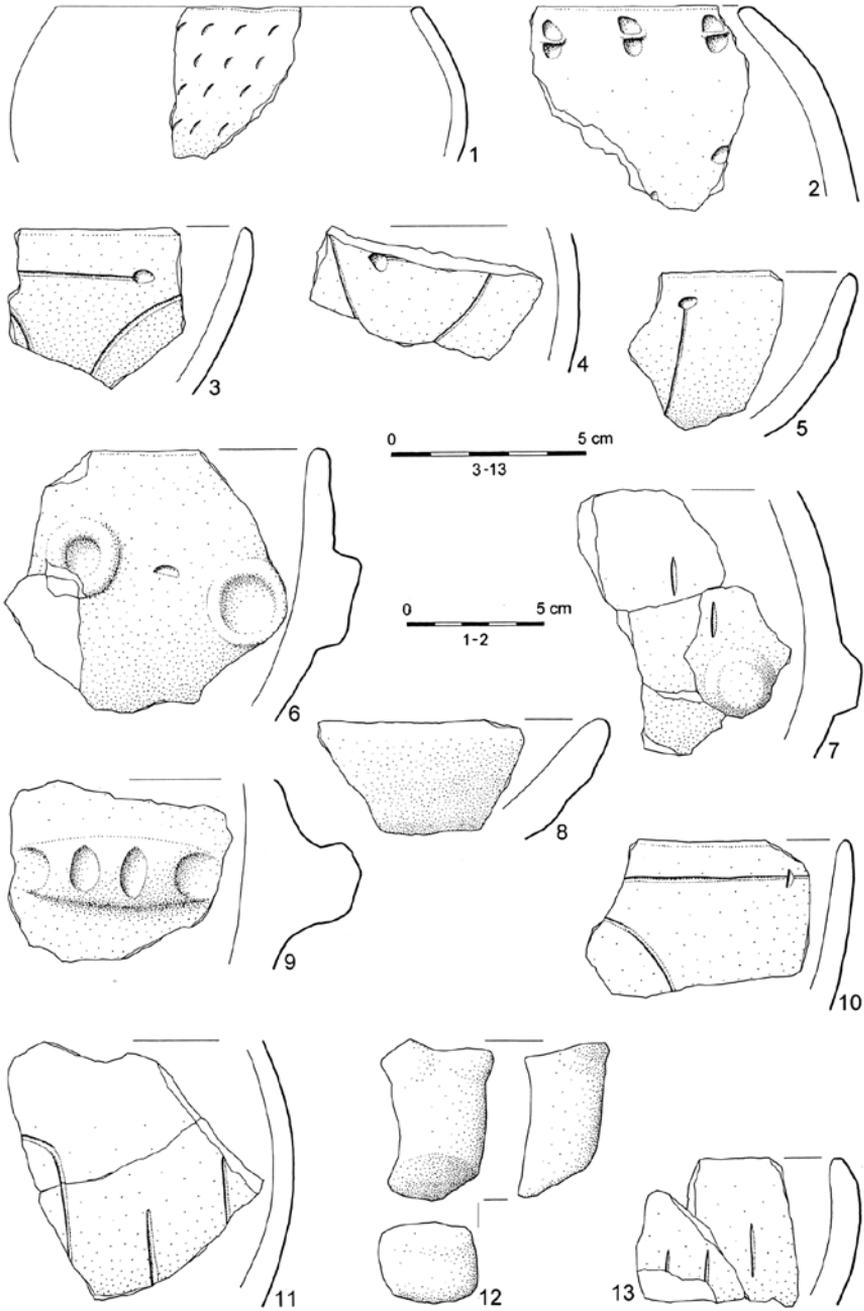


Fig. 9. Kościelna Jania, Smętowo Graniczne Commune, site 13. Selected pottery. Pit 410
(drawing: J. Pyzel and M. Gościmiński)

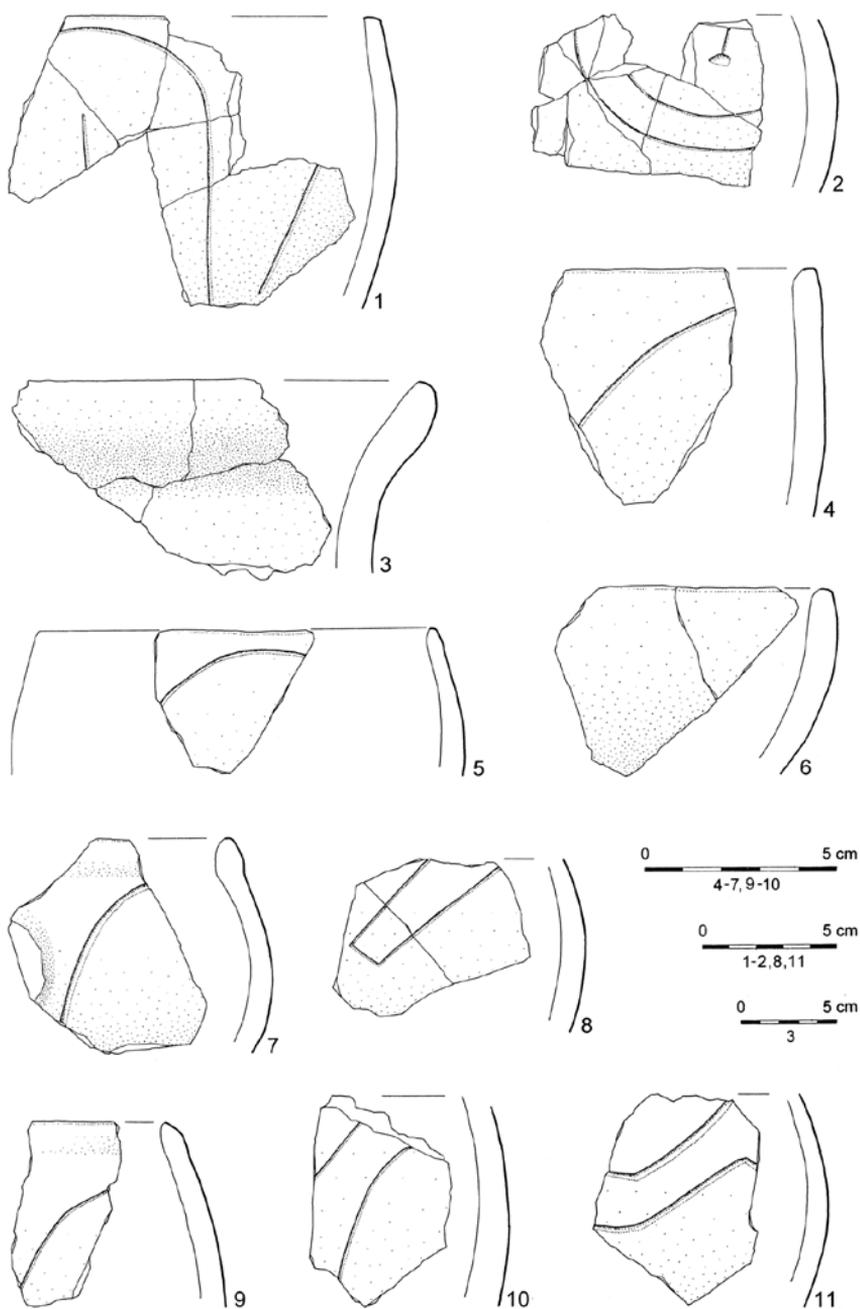


Fig. 10. Kościelna Jania, Smętowo Graniczne Commune, site 13. Selected pottery. 1, 2 – pit 1; 4, 5, 7 – pit 3; 3, 6, 8, 9-11 – pit 2 (drawing: J. Pyzel and M. Gościński)

not exhibit any traits attributable to phase III). For example, at Annowo music note motifs appear on 17% of sherds, broad incised lines on 30%, and curvilinear motifs on 80% (after Kirkowski 1993). At Kościelna Jania these percentages are as follows: 13%, 26% and 70%, whilst the statistics overall for phase II sites in Kuyavia amount to 31%, 18% and 73% (Pyzel 2010, 107), which seems to indicate that they can be ascribed to the early part of phase IIA. There is also a striking similarity in decorative motifs, with very simple curvilinear designs predominant at both sites (those recorded at Kościelna Jania are probably even simpler than those at Annowo). The Kościelna Jania assemblage differs in this respect from Western Kuyavian LBK IIA pottery – e.g. from Piecki 8 (Czerniak 2004), Miechowice 7 (Czerniak 1994) and Strzelce 2 (Wiślański 1959) – which features a greater wealth and variety of decoration. Thus, Kościelna Jania seems closer in stylistic terms to pottery from the Chełmno Land, though it is possibly a little earlier. The most typologically similar examples in Kuyavia come from Miechowice 4, and in particular Glinianka 7 (Grygiel 2004).

In this context the Kościelna Jania site is remarkably interesting. It dates to the very beginning of phase IIA, when Kuyavia (and the Chełmno Land, though here the data is not as detailed) became widely settled for the first time. This process of apparently sudden colonisation was relatively short-lived (Pyzel 2010, 221ff.). Thus it is striking that it encompassed enclaves this far north.

3. FLINTWORK

Excavations at Kościelna Jania yielded an assemblage of 122 flint artefacts evidencing prehistoric use of this raw material. However, only 36 of these artefacts, recovered from the fill of 11 features, could be linked to the remains of the LBK settlement. Because of the severe disturbance to the original stratigraphy across the entire site and the presence of features dated to the early phase of the Funnel Beaker culture, it cannot be ruled out that this is not a homogeneous assemblage. However, it does appear to be fairly cohesive both typologically and technologically, rendering all of the artefacts within it attributable to the LBK settlement.

Such a small number of lithic finds does not allow for an in-depth analysis of LBK flintworking at this site. Nevertheless, it is a valuable source of information, particularly in view of its regional location in relation to known centres of LBK settlement in Kuyavia and the Chełmno Land (Balcer 1983; Kabaciński 2010).

A breakdown of the assemblage is presented in Table 4. Local varieties of calcareous flint – Pomeranian and Baltic (Cashubian variant) – predominate among the raw materials; these flint varieties are each represented by 10 pieces (Wąs 2016). The remaining specimens are made from non-local raw materials: chocolate and Jurassic flint. There are 6 pieces made of chocolate flint: 2 flakes, 3 blades – 2 of them featuring sickle gloss – and 1 truncation with sickle gloss. Four items are made of Jurassic flint: 1 flake and 3 blades (Fig. 11: 2, 5, 8).

Table 4. Flintwork excavated from LBK features

Flint artefacts	Features								
	2	43	44	75	242	409	410	448	n
Splinters			1			1			4
Splintered flakes	1		5		2		3	4	19
Flakes								2	2
Blades		1	1				5		7
Scraps			1	1					2
Blades with retouch				1					1
Truncation							1		1
Total	1	1	8	2	2	1	9	6	30

Of all the features associated with the LBK settlement, the one that offers the greatest insight into flintworking at this site is feature 410 (a borrow pit next to house 2). The fill of this pit yielded 9 flints that in all probability constitute a toolkit (Fig. 11: 2-7). It comprises 5 blades, 1 truncation and 3 splintered flakes. This is a particularly valuable sample because of the raw materials represented. Other than one small blade made of Baltic flint, the remainder are fragments of blade tools in Jurassic flint (2 fragments) and chocolate flint (2 fragments). There is also one Jurassic flint truncation and one flake. The remaining flakes are made of local raw materials: Baltic and Pomeranian flint. Two blade fragments (proximal and mesial) and a truncation in chocolate flint feature very distinct sickle gloss, notched and rounded edges. They are undoubtedly remnants of worn and damaged cutting (possibly harvesting) tools. No use wear was noted on two fragments (proximal and apex) of Jurassic blades. Nonetheless, their residual form suggests that they too may have been tools.

The extant proximal blade fragments are stylistically consistent with LBK blade debitage. The butts have faceted, raised, unabraded edges at the proximal end. Where they survive, bulbs of percussion are prominent.

Splintered flakes recovered from this feature are small specimens measuring around 2 cm. Technologically and typologically this toolkit is analogous with finds from similar flintworking contexts at LBK settlements in the Polish Lowlands.

Greater numbers of flint artefacts were found at this site inside feature 44 (8 specimens) and feature 448 (6 specimens). The finds recovered from the fill of these features were almost exclusively splintered flakes and splinters made of Pomeranian and Baltic flint, as well as one Jurassic blade (Fig. 11:8). The remaining features produced single pieces also associated with splintering or flake removal. The exception was feature 75B, which yielded a proximal blade fragment with fine retouch, technologically and stylistically in keeping with the blades from feature 410 (Fig. 11: 1).

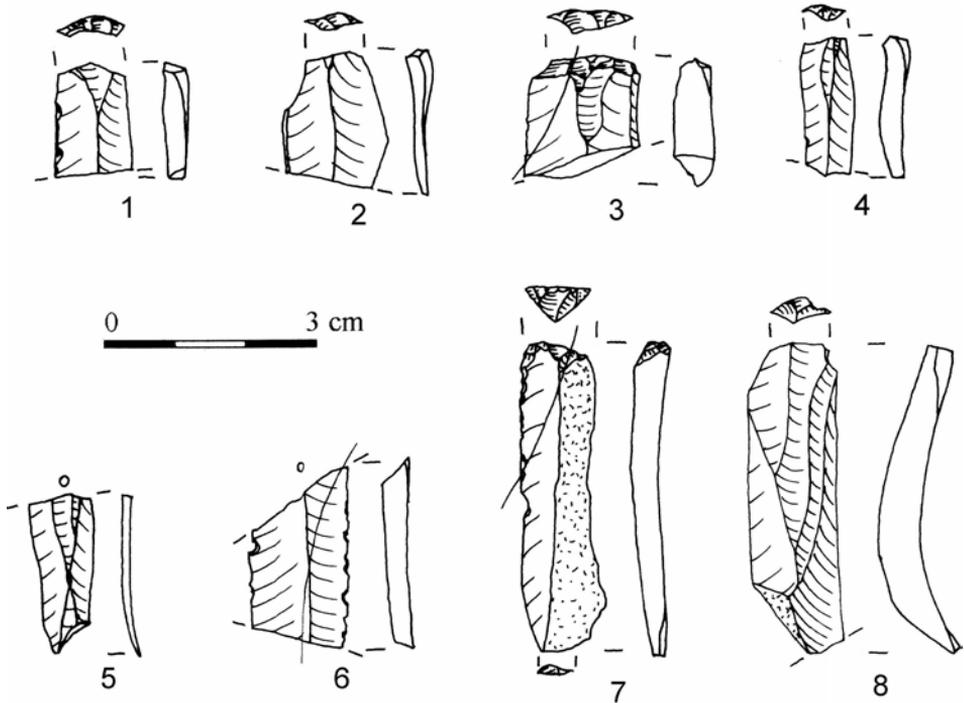


Fig. 11. Kościelna Jania, Smętowo Graniczne Commune, site 13. Selected flint artefacts. 1 – pit 75, 2-7 – pit 410, 8 – pit 44. Jurassic flint: 2, 5, 8; chocolate flint: 3, 6, 7; Baltic flint: 1, 4 (drawing: M. Wąs)

In summary, both in terms of raw material as well as technology and typology, this sample does not differ from other Polish Lowlands LBK flint inventories (cf. Małecką-Kukawka 1992; Kabaciński 2010). The least well-understood issue in this instance is the extent and quality of local flintworking. The available data indicates that splintering was the preferred reduction technique at this site. Local lithic materials (Baltic and Pomeranian flint) were most commonly used, though there is also one example of a splintered flake made of chocolate flint, which may point to the reuse of a larger primary form (e.g. a flake). The modification (secondary working) of finished products (tools, blades, flakes) made of 'exotic' raw materials is a typical phenomenon at settlements located in zones peripheral to distant outcrops. On the other hand, the processing of imported raw materials, like that of local flint, sheds some light on the range of production activities undertaken at the excavated settlement. Another circumstance relating to this issue is the survival of blade tools (inserts, knives etc.) in heavily exhausted form with very clear evidence of intensive use.

The overall picture of the analysed assemblage from Kościelna Jania can be said to result from several factors, the most significant of which are as follows:

- the availability and quality of local flint restricting the use of blade-based technology as practised in the LBK, resulting in splintering technology playing an important role in local lithic production;
- limited access to chocolate and Jurassic flint because of the significant distance to their outcrops and to the network of other settlements that could have facilitated their supply;
- the absence of an alternative to the use of tools featuring flint components (harvesting knives, sickles, etc.) and the consequent intensive use of available tools.

Although it is obvious that there were ties between lowland LBK settlement and the South, the lithic assemblage from Kościelna Jania provides a good illustration of the strength of these ties. Despite the excavated site being very far away from potential supply sources, there is no evidence of any attempt having been made to adapt local lithic resources to the production of tools made using blade-based technology. It is probable that local raw materials (in particular Pomeranian flint occurring in the form of several-centimetre-large pebbles) were not used because of their inadequate technical properties and characteristics. However, it cannot be ruled out that the underlying cause was a lack of knowledge and skills in processing local flint, and above all a conservative approach of sorts made manifest in the preferred use of specific ‘southern’ raw materials (Jurassic and chocolate flint – Pyzel and Wąs 2016).

4. DISCUSSION

The Neolithisation of the southern Baltic coast began around 5300/5200 cal BC when LBK farmers first arrived and came into contact with local hunter-gatherer communities. However, it was only after over a thousand years of mutual relations, principally between Ertebølle culture communities and LBK as well as later Danube culture groups, that a breakthrough took place with the emergence of the Funnel Beaker culture (TRB) and the rapid spread of agricultural subsistence (4100–3700 cal BC; Hartz *et al.* 2000; Hartz and Lübke 2006; Hartz 2011).

Without doubt, the interpretation of the TRB phenomenon is the main problem in assessing the Neolithisation of this area, as it was not until the arrival of these societies that there was a significant change in the picture of Pomerania’s settlement by farming communities. However, discussions of this issue can focus on either the short-term perspective, directly examining the origins of the TRB, or the long-term view, taking into account the period of impact exerted by Danubian societies. In the latter scenario, the discovery of the settlement at Kościelna Jania (and other LBK sites in the same region – Fig. 1) contributes several new considerations to existing debate (e.g. Bogucki 2001; 2008; Czerniak 2007; Terberger *et al.* 2009; Terberger and Kabaciński 2010, Czerniak and Pyzel 2011; Czekaj-Zastawny *et al.* 2013).

One of the key issues to address is how pottery, stone tools and certain agricultural goods produced by Danubian societies reached Ertebølle communities. This raises the

question of where contact between them was made and whether it was sporadic or relatively regular, arising, for example, from living at close quarters. The fact that the respective areas inhabited by these two societies were separated – according to earlier studies – by a considerable distance of some 100–200 km, and that interpretation was principally based on numerous ‘loose’ finds of Danubian stone tools in Pomerania (Wiślański 1975; Ilkiewicz 2005, Bigos 2014), substantiated hypotheses about the seasonal, ‘reconnaissance’ nature of forays into these lands made by Danubian communities and the occasional rather than systematic nature of contacts.

The discoveries presented herein leave no doubt that Danubian groups lived in small enclaves in close proximity to Ertebølle culture settlements, and that the role of ‘area of contact’ along this stretch of the Baltic coast was played (probably not exclusively) by the Starogard Lakeland region, which was characterised by the presence of small pockets of very fertile soils overlying a clay substrate. This area was also directly connected to the Vistula valley and to early farming territories further south (Chełmno Land and Kuyavia).

The discovery at Kościelna Jania of LBK features forming layouts typical of longhouse contexts provides evidence not only for the existence of a permanent settlement, but also for the potential existence of similar settlements at other sites where hitherto only LBK pottery has been recorded. Rescue excavations along the northern section of the A1 motorway revealed three other LBK sites similar in nature to the site at Brody Pomorskie, where isolated LBK potsherds were found. Proceeding from north to south these are as follows: Juskowo-Rusocin, site 28, Barłożno, site 15 and Bobrowiec-Kornatka, site 5 (Fig. 1). In view of the findings from Kościelna Jania, these discoveries can be regarded not only as evidence of short-lived forays, but as signs of the nearby presence of permanent settlements. The northernmost of these sites, at Juskowo-Rusocin, is of particular interest because it lies in the immediate vicinity of the Gulf of Gdańsk (Bednarczyk 2003; Przybył 2011).

The presence within this region of Late Band Pottery culture graves (featuring ‘Stroked Band’ pottery) at Brody Pomorskie and contemporaneous settlements at Barłożno and Bielawki, as well as Brześć Kujawski culture longhouse settlements at Barłożno and Bielawki (Felczak 2006; Ratajczyk 2007; 2009; Czerniak 2007), demonstrates that the settlement of this region initiated by the LBK was a long-term process, stretching back to the end of the fifth millennium BC.

Another issue is the relatively ‘early’ date ascribed to the Kościelna Jania site. This results from the fact that LBK communities appeared in the Lower Vistula region somewhat later than in the large and long-inhabited LBK enclaves further south in Kuyavia and the Chełmno Land, hence during the initial settlement (‘leap-frog’ colonisation) of those regions. Some significant observations in this context have been made regarding territories along the Lower Oder (summary of previous research – Jankowska 2009; most recent findings – M. Dziewanowski- personal communication) and to the west of it (Merstens and Schirren 2000; Cziesla 2008), which indicate that the first LBK settlements did not appear until the later phase of this culture, hence around 100–200 years later than in the

Gdańsk region. This indirectly highlights the particular importance of Kuyavia and the Chełmno Land as the principal areas exposed to the impact of Neolithisation in the southern Baltic region, directed both towards the northwest (Ertebølle culture) and (somewhat later?) the northeast (Narva culture).

The large ceramic assemblage from Kościelna Jania, which is both technologically and stylistically generally consistent with contemporary assemblages recorded in Kuyavia and Little Poland, includes a notable sherd which was most probably imported from an area attributable to the Tiszadob group in eastern Slovakia (Fig. 5: 3). Like the use of flint from Little Poland, this sherd may point both to the use of resources brought in during a period of rapid ('leap frog') colonisation and to the systematic maintenance of close ties with 'parent' communities in Kuyavia and the Chełmno Land.

Translated by Basia Gostyńska

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