



REMAINS OF A LATE NEOLITHIC SETTLEMENT FROM SITE 7 IN KRZYŻ WIELKOPOLSKI

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A b s t r a c t. The research conducted at site 7 in Krzyż Wielkopolski has provided evidence of long-term occupation of this area from the Late Palaeolithic (Sviderian) to the modern era. Undoubtedly the most intensive occupation is related to the Early Mesolithic communities of the Preboreal and Boreal Periods. However, pottery fragments, flint tools, and perhaps also belemnite artefacts, all associated with societies of the Corded Ware culture, prove Late Neolithic settlement at the site. That is the focus of this article. Based on the macroscopic analysis of pottery fragments, two technological groups were distinguished, suggesting heterogeneity of the collection. This may indicate at least two stages of settlement related to Corded Ware culture communities.

K e y w o r d s : Corded Ware culture, Late Neolithic, Greater Poland

INTRODUCTION

Site 7 at Krzyż Wielkopolski is best known for its Early Mesolithic occupation of the Preboreal and Boreal Periods (KABACIŃSKI 2017; KABACIŃSKI, WINIARSKA-KABACIŃSKA 2017). Remains unearthed during excavations in 2014 and 2015 extended the period of the site's occupation to the Late Neolithic. The discovered traces were associated with the Corded Ware culture (hereinafter CWC; KABACIŃSKI 2017, further literature there; KABACIŃSKI, WINIARSKA-KABACIŃSKA 2017).

Traces left by Corded Ware populations are known throughout most of Europe and from different environmental conditions. This is also evident in Poland, where CWC sites are recorded from the Baltic coast to the Carpathian Mountains. The communities in question appeared in this area around 2800 BC and developed until the beginning of the Bronze Age (WŁODARCZAK 2017: 277).

In Central Europe, CWC materials are most frequently recorded in Central Germany and Bohemia. In Poland, the finds from Małopolska, included in the eastern part



of the CWC complex, clearly stand out in the archaeological record (WŁODARCZAK 2017: 278), while the finds from Greater Poland, Kuyavia, and Pomerania indicate connections of these areas “with Central Germany and, above all, with Single Grave culture from the northern province of Corded Ware culture. Within this zone there are two concentrations of finds that display a certain local specificity: the Lower Odra group (also called the Wkra group) located in Western Pomorze and Vorpommern in Germany, as well as a cluster in Kujawy” (WŁODARCZAK 2017: 278). In the remaining parts of Poland CWC finds are not numerous, which makes describing their local features problematic (CZEBRESZUK 2000; CZEBRESZUK, SZMYT 2008a, b; WŁODARCZAK 2017: 278).

Until the second half of the twentieth century, some researchers were convinced that the areas of the Polish Lowlands were inhabited by the CWC communities sporadically and peripherally (e.g. MACHNIK 1979: 408). However, studies carried out in the 21st century, mainly excavations preceding large development projects, provided new data to change these interpretations. These studies proved that “currently, the number of settlement sites from this zone is higher than in the case of the upland zone of southern Poland and it is steadily increasing” (WŁODARCZAK 2017: 289). Archaeological research conducted in recent years has provided new evidence from the areas of eastern and western Greater Poland (CZEBRESZUK 2000; CZEBRESZUK, SZMYT 2008a, b). This shows that further discoveries are to be expected soon (WŁODARCZAK 2017: 289).

The remains of short-lived settlements of CWC communities are sparse and usually limited to artefacts such as pottery, which is the most often published set of sources (WITKOWSKA 2006: 72).

This is also reflected in the discussed assemblage. This state of research probably results from settlement model and economy, as small CWC groups most probably preferred short-term stays in their chosen areas. The sites were usually located on slightly elevated locations within low landscapes: in river valleys and on the shores of lakes, usually on sandy soils (WŁODARCZAK 2017: 289 after CZEBRESZUK, SZMYT 2008a: 239). CWC sites are quite common and usually contain relatively few cultural remains (KURZAWA 2001: 289; WŁODARCZAK 2017: 289).

KRZYŻ WIELKOPOLSKI SITE 7 – RESEARCH HISTORY

Site 7 at Krzyż Wielkopolski is located at the northern edge of the ice-marginal valley of the Noteć River, near the place where the Drawa River flows into the Noteć (Fig. 1). Since 2005, Jacek Kabaciński has been conducting archaeological research that has proved the unique nature of this place, providing rich and diverse remains of settlements of various chronology. Noteworthy is the large assemblage collection of Mesolithic bone and antler artefacts. The conducted research provided important data concerning the style of life and subsistence of the Mesolithic communities in the Polish Lowlands during the Preboreal and Boreal Period. Yet, the remains of Late Neolithic settlement linked with the CWC, discovered in 2014 and 2015, turned



Fig. 1. Krzyż Wielkopolski, site 7. Location of the site within the Polish Plain (by A. Głód)

out to be equally interesting (KABACIŃSKI 2017, further literature there; KABACIŃSKI, WINIARSKA-KABACIŃSKA 2017).

The first traces of the presence of Neolithic communities were recorded in the western part of the site during archaeological excavations in 2014 (Figs 2, 3). The excavations were set up (trench 1/2014 and test pits) on an oxbow lake terrace. Among the recorded archaeological finds, those associated with the Palaeolithic period (flint material) prevailed. A vessel fragment, probably from a beaker, decorated with a cord ornament, and flint tools including a heart-shaped arrowhead were also found (Figs 4, 5). This material was assigned to the CWC (KABACIŃSKI, WINIARSKA-KABACIŃSKA 2014).

During the excavations in 2015, exploration of the western part of the site continued to determine the extent of the Palaeolithic occupation found in 2014. Two trenches (trench 1/2015 and trench 2/2015; Figs 2, 3) were set up on a more or less meridian-oriented axis over the floodplain terrace of the Noteć River, adjacent to the oxbow lake from the south-east (KABACIŃSKI, WINIARSKA-KABACIŃSKA 2015). Trench 1/2015 (Fig. 6), measuring 1×15m, was located on the edge of the terrace slope and the adjacent part of the oxbow lake. The exploration focused on the eight-meter-long section covering the edge of the terrace.

The stratigraphy was poorly discernible. Artefacts possibly attributable to the Neolithic period (belemnite) were found in redeposited layers of sand and alluvial gravel (evidence of a flood). These layers were separated by thin peat layers indicating that the area was periodically a wetland. Then, in order to clarify and document the stratigraphic situation, research was continued on an area of approximately 1.5 m², covering square No. 1 and half of square No. 2. This allowed for the recording of an extensive

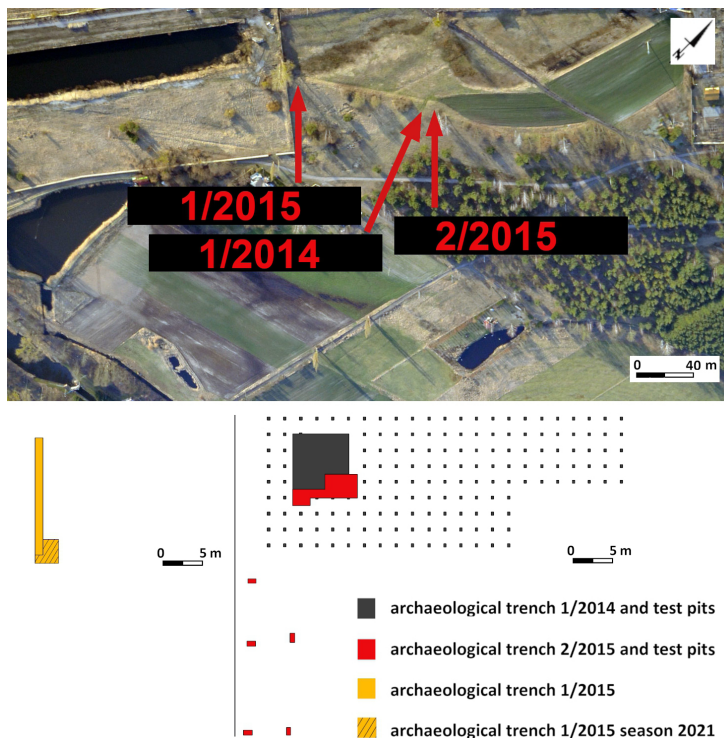


Fig. 2. Krzyż Wielkopolski, site 7. Trenches 1/2014, 1/2015, 1/2015-season 2020, and 2/2015 – location and plan (photo by W. Rączkowski, J. Kabaciński, design by A. Głód)

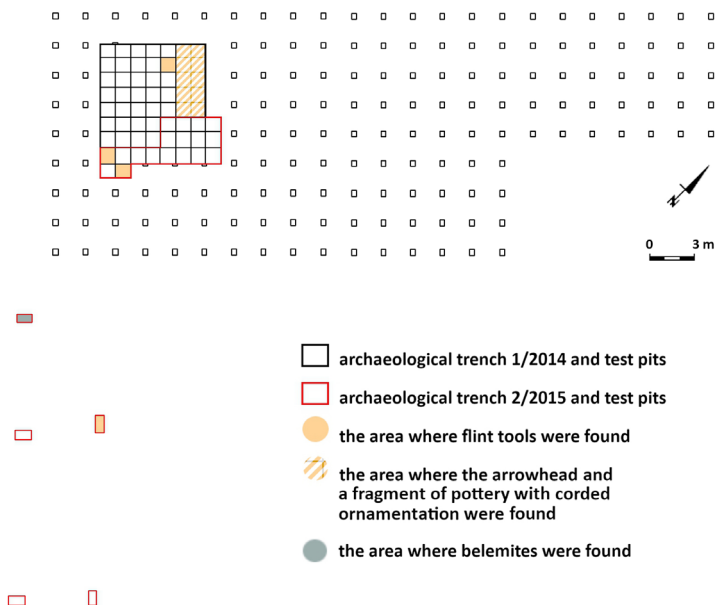


Fig. 3. Krzyż Wielkopolski, site 7. Trenches 1/2014 and 2/2015 – plan (by A. Głód)



Fig. 4. Krzyż Wielkopolski, site 7. Trench 1/2014 (photo of corded ornamentation taken in Laboratory of Microscopic Analyses in Archaeology at the University of Adam Mickiewicz in Poznań). (Photo by A. Kurzawska, design by A. Głód)

sequence of mineral and biogenic sediments, which reached about 2.5 meters down from the surface (Fig. 7). The recorded stratigraphy indicates the existence of an oxbow lake of the Noteć River in the area at the end of the Pleistocene and in the early and middle Holocene. After then, it was completely buried. The modern edge of the oxbow lake is an artificial structure created by peat exploitation (this activity is visible on the southern profile of the trench) (KABACIŃSKI, WINIARSKA-KABACIŃSKA 2015). At a depth of about 150 cm, within the transition zone between layers 3 (lowest peat) and 4 (alluvial sands), numerous fragments of Neolithic (CWC) pottery were recorded.

Trench 2/2015 and test pits were excavated next to trench 1/2014 on the oxbow lake terrace (Figs 2, 3). Among the archaeological finds, numerous flint and ceramic materials were recorded. However, only a few flint items can be related to the Neolithic period (KABACIŃSKI, WINIARSKA-KABACIŃSKA 2015).



Fig. 5. Krzyż Wielkopolski, site 7. Arrowhead, trench 1/2014 (by A. Głód)

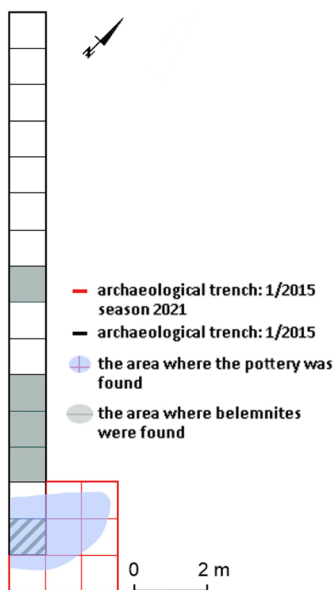


Fig. 6. Krzyż Wielkopolski, site 7. Trenches 1/2015 and 1/2015-season 2021 – plan (by A. Głód)

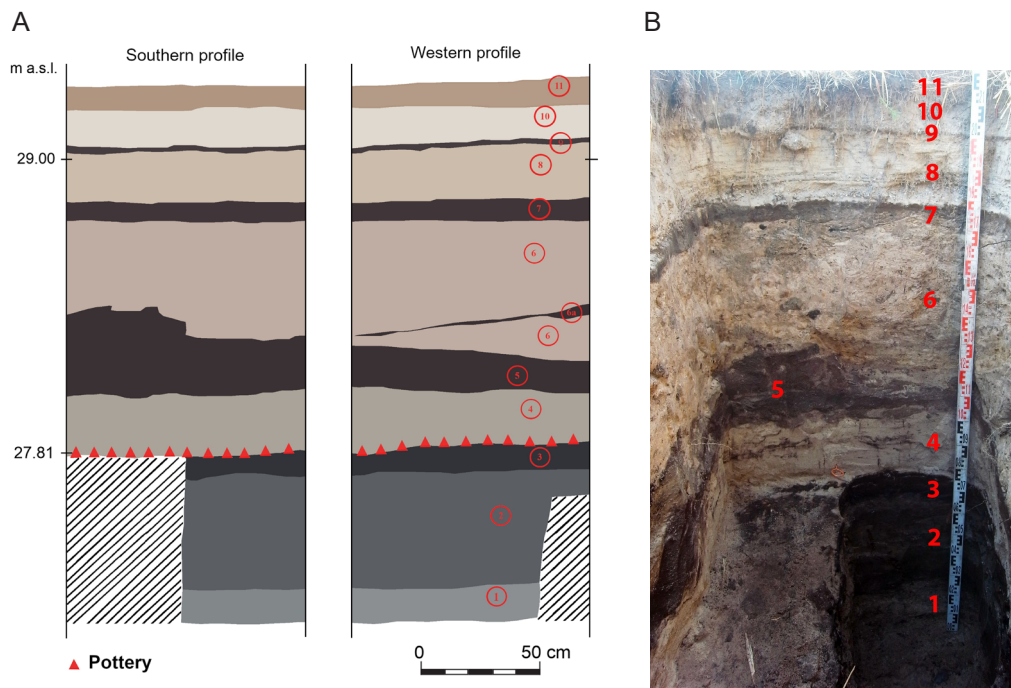


Fig. 7. Krzyż Wielkopolski, site 7. Trench 1/2015. A – southern and western profiles (prepared by A. Głód), B – southern profile (by J. Kabaciński)

Archaeological materials recorded in 2015 are linked with several episodes of occupation. The oldest one is associated with the Sviderian culture of the Late Palaeolithic period. Flint tools dated back to the Mesolithic and Neolithic period were also identified. The pottery associated with the Late Neolithic occupation at the site is the main focus of the studies. The youngest prehistoric traces found at the site are associated with the Lusatian culture. Remains of medieval and early modern settlements were also recorded (KABACIŃSKI, WINIARSKA-KABACIŃSKA 2015).

In 2021, to verify and better understand the context of the discovery of numerous fragments of CWC ceramics from trench 1/2015, a decision was made to resume work at site 7, and trench 1/2015-season 2021 was set up. This trench was located next to trench 1/2015 (square No. 1, Fig. 6). As expected, at the bottom of layer 4 (alluvial sands) adjacent to layer 3 (peat), numerous fragments of CWC pottery were recorded. However, no features were discovered in the course of the excavations.

METHODS

To describe the technological features of the ceramics, the system proposed by Jacek Kurzawa (KURZAWA 2001: 113–142) was used, which in turn is based on the model applied for analysis of the Funnel Beaker culture ceramics from Kuyavia and Greater Poland (KOŚKO, PRINKE 1977). In this system, the type of admixture, its amount and granulation are described in detail. The method also takes into account traits that relate to the manner in which vessels are formed – the thickness of the walls and the final treatment of the outer and inner surfaces – and fired – the colour of the cross-section.

MATERIALS

Trench 1/2014

Pottery

Only one fragment of pottery was found in this trench: a rim part of a vessel decorated with parallel impressions of a double cord on the neck. The preserved fragment shows three rows of cord impressions (Fig. 4). A horizontal cord impression is the most frequently recorded decorative motif on CWC vessels. This motif is considered part of the CWC's Pan-European Horizon tradition, and it remained in use in later phases. Ceramics decorated in this way are known from both grave and settlement contexts. Cord impressions were usually placed on beakers and amphoras, sometimes as a part of a multi-element decorative system (WITKOWSKA 2006: 77, 78).

A mineral admixture of multi-coloured crushed stone (predominantly medium-grained, with a coarse-grained fraction present) was added to the clay. It is characteristic of the younger phases of the described culture (phases 3–4: cycle IIc according to CZEBRESZUK 1996: 100–112).

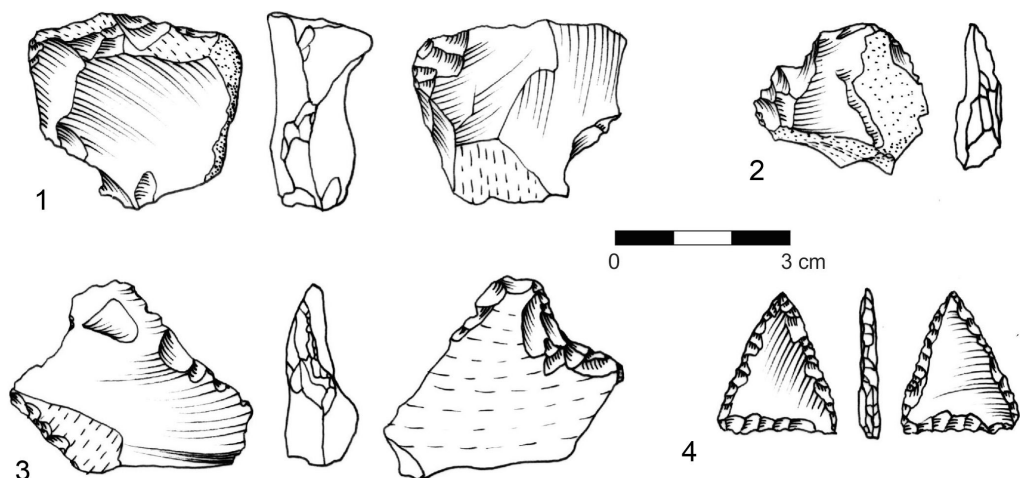


Fig. 9. Krzyż Wielkopolski, site 7. Flint artefacts: 1, 2, 4 – trench 1/2014, 3 – trench 2/2015 (by J. Mugaj)

The wall thickness of the fragment is 8.9 mm, which classifies it as medium-walled. The outer and inner surfaces are undulating and rough due to the protruding admixture of crushed stone. The cross-section is dark cream-grey. The ceramics crumble very easily.

Flint tools

The processing of flint material into weapons and tools for everyday use played an important role in the economy of the Late Neolithic communities, just as in the previous millennia. Core tools (e.g. axes) and tools made from splintered pieces were commonly produced (WŁODARCZAK 2017: 314). The flint collection consists of five specimens made of Baltic erratic cretaceous flint. One specimen is a large, bifacially retouched heart-shaped arrowhead (2.1 × 2.5 cm, Figs 5 and 9: 4) found during the cleaning of the 3rd mechanical layer (squares from No. 1 to 10). Arrowheads are among the most common elements of armament and are usually found in graves of the CWC population. Weaponry items were common grave goods in male burials (WŁODARCZAK 2017: 305). Similar artefacts are known from the CWC (T17) grave at the Siniarzewo 1 site, district Aleksandrów Kujawski (DOMAŃSKA, KABACIŃSKI 2000: 555, 556), and from Dąbrowa Biskupia, site 21, district of Inowrocław in Kuyavia (BUDZISZEWSKI et al. 2008: 41–57). Unfortunately, these arrowheads have no significant chronological value. Larger arrowheads, resembling the specimen from Krzyż, were also found in the grave in Dąbrowa Biskupia. An assemblage of flint tools from that grave is typical of phase 4 of CWC flint-making in Kuyavia (BUDZISZEWSKI et al. 2008: 56).

A splintered piece was found in the same layer (37 × 35 × 16 mm, Fig. 9: 1). It is a bipolar specimen. Moreover, 3 splintered flakes were found in the test pits located south of trench 1/2014 (Fig 9: 2).

Splintered pieces and splintered flakes were often produced during Neolithic and Early Bronze times. However, due to the lack of traces of other Neolithic/Early Bronze cultures on the Krzyż 7 site these items are most probably associated with the CWC.

*Trench 1/2015 and 1/2015-season 2021***Pottery**

The assemblage of pottery fragments from trenches 1/2015 and 1/2015-season 2021 totals 99 fragments. Unfortunately, most of them (51 fragments) are too small to be analysed in detail and their technical parameters could not be determined. They were thus excluded from subsequent analyses.

Morphology. The described assemblage consists mostly (if not exclusively) of fragments of a single vessel. Its considerable fragmentation, as well as the lack of diagnostic parts like rim or base sherds, makes it impossible to reconstruct the complete form. Some matching fragments allowed only its partial reconstruction (Fig. 10). The vessel, most likely a pot, has an s-shaped profile, with a gentle transition between the neck and the body. Such vessels were most probably common products for everyday use, as indicated by their presence on CWC settlements/encampments (WITKOWSKA 2006: 28; WŁODARCZAK 2017: 288, 317).

Ornamentation. Among the studied pottery fragments, only six were decorated with a row of finger impressions on a decorative band located at the neck/body transition (Figs 10, 11). Amphoras known from the area between the Elbe and Saale Rivers (KURZAWA 2001: 190, further literature there) bear fingerprints on this part

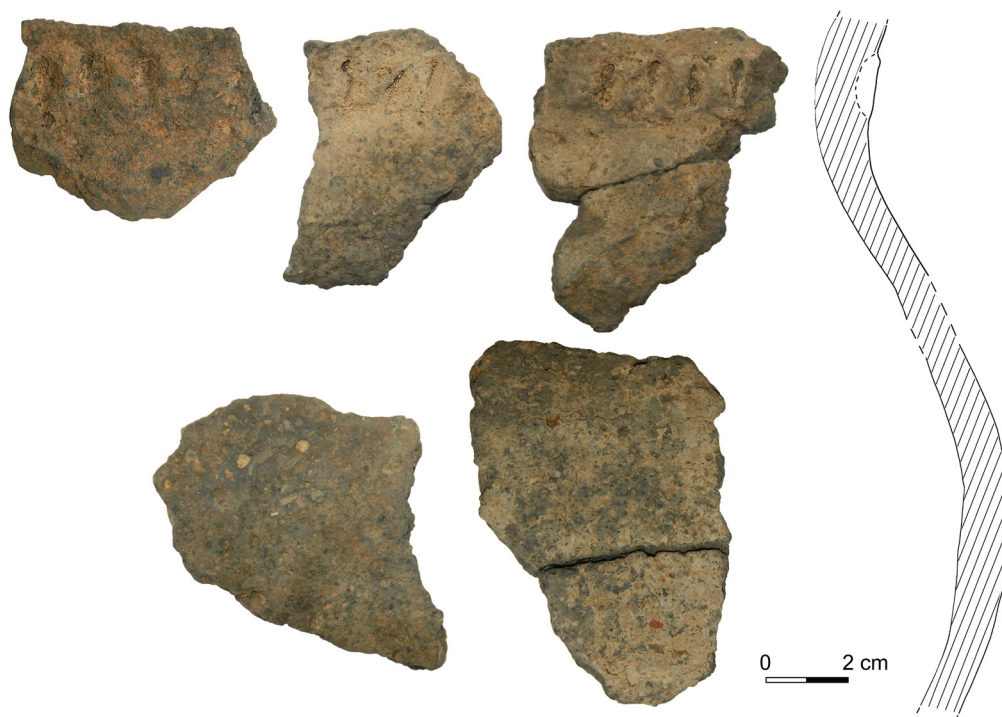


Fig. 10. Krzyż Wielkopolski, site 7. Partial reconstruction of the vessel from trench 1/2015 and 1/2015-season 2021 (by A. Głód)

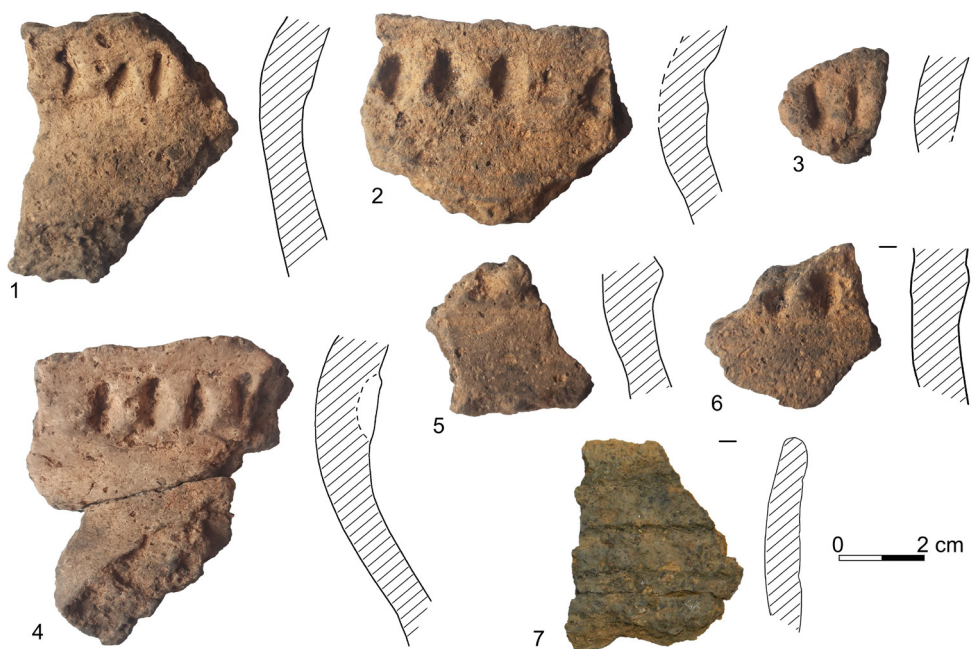


Fig. 11. Krzyż Wielkopolski, site 7. Fragments of decorated pottery. 1–6 – trenches 1/2015 and 1/2015-season 2021; 7 – trench 1/2014 (by A. Głód)

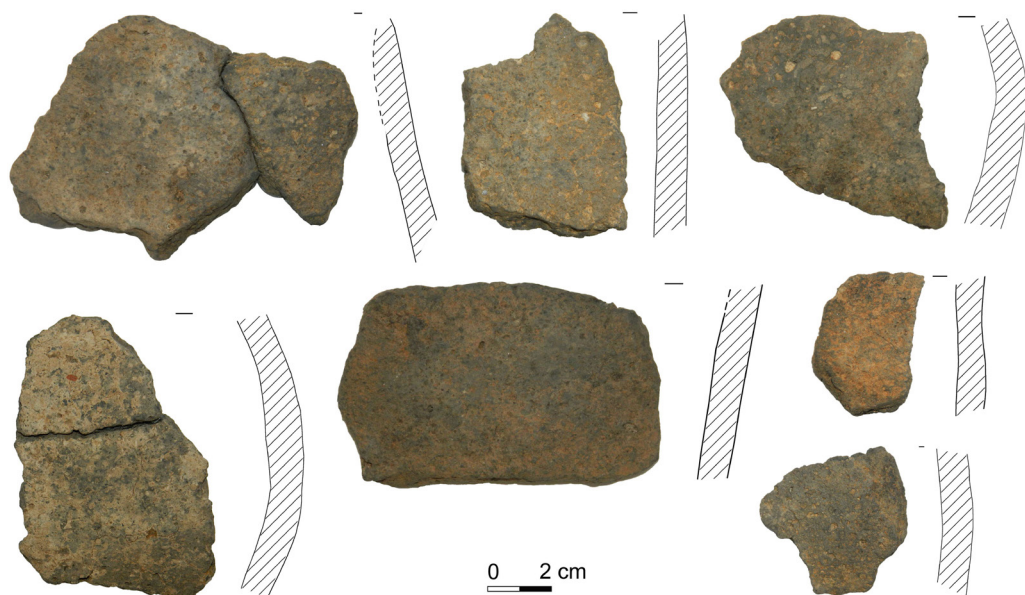


Fig. 12. Krzyż Wielkopolski, site 7. Fragments of pottery from trenches 1/2015 and 1/2015-season 2021 (by A. Głód)

of the vessel. This is a decoration typical of settlement assemblages. Pots with this decorative motif have been found on many sites in Greater Poland and Kuyavia, one example being Lutol Mokry, site 36 (CZEBRESZUK, SZMYT 2012: 88, fig. 12: 3, 8; 13:10, further literature there). Other examples of such decoration are known from a beaker discovered in Račice (Bohemia), an amphora from the site of Bottendorf in Germany (WITKOWSKA 2006: 44, 77, 78; fig. 2: 13, fig. 8: 15), and from Tarków, site 23, Inowrocław district (CZEBRESZUK 1996: fig. 24: 6; CZEBRESZUK 2000: 439, fig. 29). Such commonly used vessels also occur, albeit rarely, in graves, e.g. a pot from the burial mound in Kuczkowo, site 5 in Kuyavia (CZEBRESZUK 2000: 439, fig. 29).

Technology. In the fragments from trenches 1/2015 and 1/2015-season 2021, chamotte of various granulometry (fine, medium and coarse) and organic admixture were recorded. With wall thickness ranging from 0.9 to 1.2 cm, they can be classed as medium (up to 9 mm) or thick-walled (over 10 mm) vessels.

The outer and inner surfaces are matte and rough, with fine pores probably resulting from the admixture of chamotte that has fallen out or organic admixture which has burnt. The ceramics also crumble very easily. The cross-sections are monochromatic, in a dark blue-black.

The CWC pottery from site 7 in Krzyż Wielkopolski was made according to a recipe mainly characteristic of the older phase of this unit (group 1–2: cycle Ib according to CZEBRESZUK 1996: 81–100; KURZAWA 2001: 127–129), which was based on an admixture of chamotte with no mineral admixture.

Fossils

In total, seven pieces of belemnite were collected from trench 1/2015. These finds are difficult to interpret because they are not formally artefacts but could be modified and used as ornaments. Their natural appearance, elongated and rounded, with a central canal-like groove along the longer axis, means they could be easily adapted as raw material for beads. Fossil finds have also been found at other Neolithic sites (GUMIŃSKI, KOWALSKI 2011: 481, 482). In Krzyż Wielkopolski none of the fossils bore clear traces of modification.

Trench 2/2015

Flint tools:

There are three flint artefacts from trench 2/2015 and test pits that can be connected with the CWC: two splintered flakes, including one retouched (Fig 9: 3), and a small flake from a damaged polished axe.

Fossils:

Two belemnite fragments were found in the first mechanical layer. No traces of processing were recorded.

CHRONOLOGICAL ANALYSIS

Direct cultural and chronological identification could be performed only for the pottery. As a result of the analysis of the CWC ceramics, two technological groups were distinguished in the material from Krzyż Wielkopolski. The vessel fragment from trench 1/2014 was made according to a recipe characteristic of the younger phase, with technology based on the admixture of crushed stone (groups 3–4: cycle IIc according to CZEBRESZUK 1996), while the assemblage from trench 1/2015 and 1/2015-season 2021 represents the technology of the older phase, based on admixture of chamotte (groups 1–2: cycle Ib according to CZEBRESZUK 1996). The partially reconstructed s-shaped pot from trench 1/2015 is a form characteristic of the early phase (CZEBRESZUK 1996: 94; CZEBRESZUK, SZMYT 2012: 98, 108, further literature there). The collection's lack of homogeneity may indicate at least two stages of the site's occupation by CWC communities. Only the assemblage from trench 1/2015 comes from a secure stratigraphic context. Unfortunately, the registered ornamentation – a double cord impression – does not constitute a good chronological marker as it is present in various Neolithic cultural groups (CZEBRESZUK 1996: 96–107; KURZAWA 2001: 189, 190, 204–209; WITKOWSKA 2006: 77, 78, 95, 96; POSPIESZNY 2009: 25, 26).

CONCLUSIONS

The traces of CWC occupation recorded at site 7 at Krzyż Wielkopolski are modest in comparison to the finds associated with earlier (Late Palaeolithic and Mesolithic) and later (Lusatian culture) periods. The discussed pottery fragments and flint tools (and perhaps the belemnite artefacts as well) are the only evidence of Late Neolithic occupation. That is not an exceptional phenomenon. At the end of the Neolithic and the beginning of the Bronze Age, distinct socio-economic changes are evident, probably caused by climatic changes. According to WŁODARCZAK (2013: 173): *“In the 3rd millennium BC changing climatic conditions stimulated a decrease in settlement sites in more elevated areas and a consequent increase in settlements in lower areas”*. The discovery in Krzyż Wielkopolski aligns with this hypothesis. The site on the Noteć ice-marginal valley was an attractive place for prehistoric communities (offering the opportunity to conduct various economic activities), and that is likely why the CWC communities settled here at least twice (CZEBRESZUK, SZMYT 201; WŁODARCZAK 2013).

The decoration, technology, and morphological features of the presented ceramic materials indicates their association with the CWC. Settlement features related to the CWC occupation at the site were not found. Nevertheless, it seems likely that the finds from trench 1/2015 were the remnants of a small camp. Given their ornamentation and morphology, the uncovered shards most probably represent settlement pottery. Despite the limited number of artefacts discovered, the finds from Krzyż enrich our knowledge of CWC settlement in Greater Poland.

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REFERENCES

- BUDZISZEWSKI J., CZEBRESZUK J., WINIARSKA-KABACIŃSKA M., CHACHLIKOWSKI P., 2008. Grób społeczności kultury ceramiki sznurowej z Dąbrowy Biskupiej, stan. 21, pow. Inowrocław, woj. kujawsko-pomorskie. In: Bednarczyk J., Czebreszuk J., Makarowicz P., Szymt M. (Eds), *Na pograniczu światów. Studia z pradziejów międzymorza bałtycko-pontyjskiego ofiarowane Profesorowi Aleksandrowi Koško w 60. rocznicę urodzin*. Poznań, Wydawnictwo Poznańskie: 31–69.
- CZEBRESZUK J., 1996. Społeczności Kujaw w początkach epoki brązu. Wydawnictwo UAM, Poznań.
- CZEBRESZUK J., 2000. Osadnictwo społeczności kultury ceramiki sznurowej. In: Koško A. (Ed.), *Archeologiczne badania ratownicze wzdłuż trasy gazociągu tranzytowego, t. III: Kujawy, part 4: Osadnictwo kultur późnoneolitycznych oraz interstadium epok neolitu i brązu: 3900–1400/1300 przed Chr.* Poznań, Wydawnictwo Poznańskie: 423–454.
- CZEBRESZUK J., SZMYT M., 2008a. Siedlungs formen des 3. Jahrtausends v. Chr. in der polnischen Tiefebene (Kulturen der Trichterbecher, Kugelamphoren und Schnurkeramik). Stand und Perspektiven der Untersuchungen. In: Dorfler W., Muller J. (Eds), *Umwelt – Wirtschaft – Siedlungen im dritten vorchristlichen Jahrtausend Mitteleuropas und Sudskandinaviens*, Offa-Bücher 84. Neumünster: 219–242.
- CZEBRESZUK J., SZMYT M., 2008b. Bell Beakers and their role in a settlement evolution during the Neolithic-Bronze interstage on the Polish lowland. In: Baioni M., Leonini V., lo Vetro D., Martini F., Poggiani-Keller R., Sarti L. (Eds), *Bell Beaker in everyday life*. Firenze, Museo fiorentino di preistoria “Paolo Graziosi”: 221–233.
- CZEBRESZUK J., SZMYT M., 2012. Osadnictwo społeczności z późnego paleolitu oraz z początków epoki brązu. In: Sobkowiak-Tabaka I. (Ed.), *Osadnictwo pradziejowe, średniowieczne i nowożytnie w Lutolu Mokrym*. Poznań, Instytut Archeologii i Etnologii PAN: 85–111.
- DOMAŃSKA L., KABACIŃSKI J., 2000. Krzemieniarstwo społeczności z interstadiału epoki neolitu i brązu. In: Koško A. (Ed.), *Archeologiczne badania ratownicze wzdłuż trasy gazociągu tranzytowego, t. III: Kujawy, cz. 4: Osadnictwo kultur późnoneolitycznych oraz interstadium epok neolitu i brązu: 3900–1400/1300 przed Chr.* Poznań, Wydawnictwo Poznańskie: 555–556.
- GUMIŃSKI W., KOWALSKI T., 2011. Aby na górze. Dwa późnoneolityczne groby z Dudki w Krainie Wielkich Jezior Mazurskich. In: Kowalewska-Marszałek H., Włodarczak P. (Eds), *Kurhany i obrządek pogrzebowy w IV–II tysiącleciu p.n.e.* Kraków, Warszawa, Instytut Archeologii i Etnologii PAN: 467–497.
- KABACIŃSKI J., 2017. Przejawy kontaktów międzykulturowych na stanowisku wczesnomezolitycznym w Krzyżu Wielkopolskim. In: Fudziński M., Świętosławski W., Chudziak W. (Eds), *Pradoliny pomorskich rzek. Kontakty kulturowe i handlowe społeczeństw w pradziejach i wczesnym średniowieczu*. Gdańsk, Muzeum Archeologiczne: 37–52.
- KABACIŃSKI J., WINIARSKA-KABACIŃSKA M., 2014. Sprawozdanie z badań archeologicznych na stanowisku Krzyż Wielkopolski 7. Sezon 2014. Maszynopis.
- KABACIŃSKI J., WINIARSKA-KABACIŃSKA M., 2015. Sprawozdanie z badań archeologicznych na stanowisku Krzyż Wielkopolski 7. Sezon 2015. Maszynopis.
- KABACIŃSKI J., WINIARSKA-KABACIŃSKA M., 2017. Flint tools for bone and antler adzes production at the Early Mesolithic site Krzyż Wielkopolski 7 (Western Poland). *Quaternary International* **427**: 128–137.

- KOŚKO A., PRINKE A., 1977. Sierakowo, woj. Bydgoszcz, stan. 8 – osada z fazy II (wczesnowióreckiej) kultury pucharów lejkowatych. *Fontes Archaeologici Posnanienses* 26: 1–42.
- KURZAWA J., 2001. Zagadnienie najwcześniejszych faz kultury ceramiki sznurowej na Nizinie Wielkopolsko-Kujawskiej. Problem tła genetycznego społeczności kultury pucharów lejkowatych. Poznań, Uniwersytet im. Adama Mickiewicza w Poznaniu.
- MACHNIK J., 1979. Krąg kultur ceramiki sznurowej. In: Hensel W., Wiślański T. (Eds), *Prahistoria ziem polskich, t. III: Neolit. Wrocław-Warszawa-Kraków-Gdańsk*: 337–411.
- POSPIESZNY Ł., 2009. Zwyczaje pogrzebowe społeczności kultury ceramiki sznurowej w Wielkopolsce i na Kujawach. Poznań: Wydawnictwo Poznańskie.
- WITKOWSKA B., 2006. Corded ware culture settlements on Central European Uplands. *Sprawozdania Archeologiczne* 58: 21–101.
- WŁODARCZAK P., 2006. *Kultura ceramiki sznurowej na Wyżynie Małopolskiej*. Kraków, Instytut Archeologii i Etnologii PAN.
- WŁODARCZAK P., 2013. The lost settlements – one of the visible problems in the Final Neolithic of south-easter Poland. In: Kadrow S., Włodarczak P. (Eds), *Environment and subsistence – forty years after Janusz Kruk’s “Settlement studiem”*. Bonn-Rzeszow: 173–184.
- WŁODARCZAK P., 2017. Battle axes and beakers. The Final Eneolithic societies. In: Włodarczak P. (Ed.), *The Past societies. 2. 5500–2000 BC. Polish lands from the first evidence of human presence to the early Middle Ages*. Warszawa, Instytut Archeologii i Etnologii PAN: 275–336.