

Gawron-Szymczyk, Aleksanda

Gaming pieces, pads or ... anything else? : Late Bronze Age ceramic discs in the light of experimental research

Studia archaeologica Brunensia. 2022, vol. 27, iss. 1, pp. 5-18

ISSN 1805-918X (print); ISSN 2336-4505 (online)

Stable URL (DOI): <https://doi.org/10.5817/SAB2022-1-1>

Stable URL (handle): <https://hdl.handle.net/11222.digilib/145214>

License: [CC BY-SA 4.0 International](https://creativecommons.org/licenses/by-sa/4.0/)

Access Date: 17. 02. 2024

Version: 20220831

Terms of use: Digital Library of the Faculty of Arts, Masaryk University provides access to digitized documents strictly for personal use, unless otherwise specified.

Gaming pieces, pads or ... anything else? Late Bronze Age ceramic discs in the light of experimental research

Hrací kameny, podložky nebo... něco jiného? Keramické kotouče z pozdní doby bronzové z pohledu experimentální archeologie

Aleksandra Gawron-Szymczyk

Abstract

Small-sized (usually 2–9 cm) ceramic discs are usually found in settlement contexts of various chronology. Many of them are likely classified as mass artefacts and they are not included in the use-wear analyses. From the settlement in Wrocław, Niemczańska str. (south-western Poland) we know a collection of nine such items, dated to the late stages of the Bronze Age. The work aim is to find out about the function of ceramic discs. They were subjected to microscopic observations. Then, a series of experiments were performed to compare the traces documented on the archaeological material. The results of comparative analyses indicate the use of ceramic discs as potter's ribs to shape and to uniform the thickness of the vessels' walls.

Key words

Bronze Age, ceramics, experiment, ceramic discs, experimental archaeology

Abstrakt

V sídlištních kontextech z různých období se často objevují keramické kotouče malých rozměrů (obvykle 2–9 cm). Mnohé z nich jsou klasifikovány jako běžné nálezy s hromadným výskytem a nebývají tedy podrobeny žádné další traseologické analýze. Ze sídlištní lokality v Niemczańskiej ulici ve Vratislavi (jihozápadní Polsko) pochází soubor devíti předmětů zmíněného typu, datovaný do pozdních fází doby bronzové. Cílem výzkumu je identifikovat funkci těchto keramických kotoučů. Předměty byly nejprve prozkoumány pod mikroskopem. Poté byla provedena série experimentů, které měly za úkol porovnat stopy opotřebení na povrchu archeologického materiálu. Výsledky srovnávacích analýz naznačují, že keramické kotouče byly používány jako hrnčířská pomůcka – hladítko na úpravu tloušťky stěn nádob.

Klíčová slova

doba bronzová, keramika, experiment, keramické kotouče, experimentální archeologie

Introduction

Ceramic discs are artefacts rarely captured in archaeological contexts, usually being reused pieces of vessels. They are found in extensive areas and come from various archaeological periods (*Żychlińska 2015*, 547). They usually have a round or oval shape, 2–9 cm in diameter and smoothed edges (*Mierzwiński 2003*, 158). These specific artefacts are rather found in settlement contexts (*Żychlińska 2015*, 547 – further literature there). They also occur in the areas where the population of the so-called Lusatian culture (part of Urnfield culture) has lived – it spread from the Baltic Sea to the north-eastern Czech Republic and northern Slovakia; in the west, the Lusatian culture almost reached the middle Elbe, and in the east – the Vistula river zone (*Podborský 1993*, 301). According to the literature, the enormous majority of the discs are dated from the end of the Bronze Age to the Early Iron Age (ca. 950–550 B.C.; *Żychlińska 2015*, 547–548 – further literature there). The most numerous collection of ceramic discs, as many as 120 specimens, comes from the stronghold in Biskupin, from the streets and houses (*Kołosówna 1950*, 231–232).

However, it is important to ask the question of the function of these items. Several possible interpretations were presented: they are considered to be pads for crucibles or stone moulds used in metallurgy (*Cofita-Broniewska – Hensel 1996*, 14; *Mierzwiński 2003*, 146–164), toys for children (*Kołosówna 1950*, 233), or fishing net weights (*Vuković 2015*, 116–120). Nevertheless, relatively few use-wear analyses have been carried out to confirm these opinions (*van Gijn – Hofman 2008*, 21–35; *Vieugué 2015*, 89–102). Moreover, no such analyses have yet been carried out on the Bronze Age discs from Central and Eastern Europe.

The purpose of this study is to identify the possible function of ceramic discs from the set-

tlement Wrocław, Niemczańska str. based on experimental research.

1. The site and material

The settlement Wrocław, Niemczańska str. (Fig. 1), from which nine ceramic discs originate, is dated to the late stages of the Bronze Age (ca. 1100–750 B.C.; *Kądziołka 2012*, 6). During excavations in 2003 and 2005, a total of 47 areas were examined, revealing 203 pits (*Kądziołka 2012*, 3). This collection includes 10 buildings, probably of residential functions, 48 postholes, 134 pits of various functions (including storage, production and waste pits, *Kądziołka 2012*, 24–31).

One ceramic disc comes from feature no. 150, eight from feature no. 151. Feature no. 150 measured 2.98 m² and it was a remain of a presumed post-supported building, probably not used for housing. The circular structure no. 151 had a diameter of about 1.3 m. Its section was of trapezoid shape, which is a typical form of storage pits (*Baron – Stolarczyk 2012*, 108).

The discs are similar in shape and size and were made of ceramic vessels representing different technology of manufacturing. The differences cover temper, clay quality and surface treatment (Table 1).

2. Methods

Firstly, macroscopic documentation of the ceramic discs was done with the use of a Canon camera (EOS550D, lens EFS 18–55 mm). The micro traces were analysed at the Laboratory of Archaeometry and Artefact Conservation at the Institute of Archaeology, Wrocław University with the use of a digital microscope Nikon ShuttlePix P-MFSC (magnification from 20× to 400×).

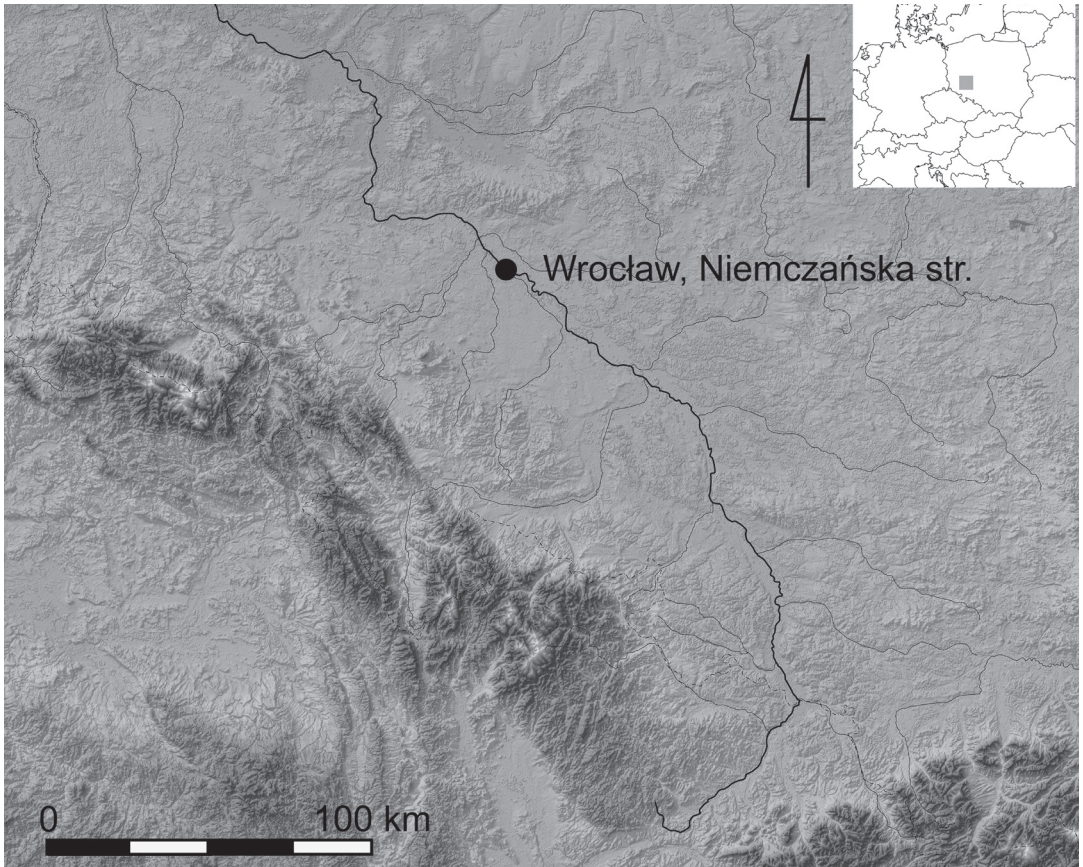


Fig. 1. Wrocław, Niemczańska site in SW Poland. Source: Google Maps with modifications

Obr 1. Lokalita Vratislav, Niemczańska ul. v JZ Polsku. Zdroj: Google Maps, upraveno

Sample ID	pit no.	diameter	technology				Figure
			temper	quality of clay	thickness	surface treatment	
N-01	151	45 mm	g	heterogeneous	9 mm	pol/sm	Fig. 3: 1
N-02	151	44 mm	s	heterogeneous	10 mm	ro/sm	Fig. 3: 2
N-03	151	33-38 mm	s, g	heterogeneous	9 mm	ro/sm	Fig. 3: 3
N-04	151	40 mm	s	homogeneous	6 mm	pol/pol	Fig. 4: 4
N-05	151	44 mm	cs	heterogeneous	9 mm	sm/ro	Fig. 4:5
N-06	151	60 mm	cs	heterogeneous	12 mm	sm/sm	Fig. 4: 6
N-07	151	42 mm	g	homogeneous	7 mm	sm/sm	Fig 5: 7
N-08	151	50 mm	s	homogeneous	9 mm	sm/pol	Fig. 5: 8
N-09	150	33 mm	s	homogeneous	3 mm	pol/pol	Fig. 5: 9

Table 1. Results of macroscopic observation of the ceramic discs. Key: temper: g – grog, s – sand, cs – crushed stone; surface treatment (external/internal): sm – smoothed; pol – polished; ro – rough

Tab. 1. Výsledky makroskopického pozorování keramických kotoučů. Legenda: ostřivo: g – šamot, s – písek, cs – kamenná drť; povrchová úprava (vnější/vnitřní): sm – hlazení; pol – leštění; ro – drsný povrch.



Fig. 2. A Bronze Age stray shard before preparation for work (a) and after processing with the leather-hard pottery (b). A. Gawron-Szymczyk

Obr. 2. Střep z doby bronzové před pracovním použitím (a) a po použití k úpravě keramiky v kožovitém stavu (b). A. Gawron-Szymczyk

An experiment was then designed to compare and interpret the observed traces. I used the experimental protocol introduced by P. Richter (1991). Selected fragments of stray pottery vessels dating to the Bronze Age were used during the experiment. They came from vessels with a temper from crushed stone and grog, the thickness of the wall ranged from 0.5 to 0.9 cm. The surfaces of the shards were smoothed, but not burnished. After an initial documentation (Fig. 2: a), the shards were formed into round or oval disks by striking a flint nodule. The diameter of the obtained disks was in the range of 5–6 cm. Then each disc was used to work with various materials, differentiated in terms of hardness and homogeneity. In this part, I used granite, sandstone, hide, animal bone (pig rib), leather-hard experimental pottery (the moment when the pottery paste is partially dried, it can be held without the possibility of deformation and has a consistency similar to leather) until traces were obtained (Fig. 2: b). During work, the tool was

placed at an acute angle to the experimental material surface. The abrasion was carried out with a uniform, rectilinear movement, with the same strength in each experiment. In the case of hide, bone and ceramics, the process of producing the traces lasted 30 minutes, while granite and sandstone – 15 minutes (until the traces were macroscopically observable). During work with hide and bone, there was a strong clash of their surface, while when working with granite and sandstone, the edges of discs were very strongly rubbed-off. The discs were soiled with hide, bone and dust from sandstone and the finest fraction of pottery paste, so they were washed. Also archaeological discs were washed before microscopic observations.

The discs were subjected to microscopic observations. Particular attention was paid to the condition of the grains of the mineral temper and the abrasion of the loam fraction. Some of the traces were poorly visible (hide, bone). Others, on the other hand, were deep scratches (sandstone, granite).

3. Results

3.1. Archaeological discs

The group of artefacts is heterogeneous in terms of wear with three clear groups. The discs numbered 1–3 (Fig. 3) have a preliminary round shape, while their edges are partly slightly smoothed. The temper grains remain sharp, but the clay fraction is visibly smoothed. There are no dents or scratches on the working surface. Artefacts numbered 4–6 (Fig. 4) have a more regular shape and smoother working edges. The temper grains are slightly worn. The discs marked with numbers 7–9 (Fig. 5) have very smooth edges. Moreover, artefacts nos. 7 and 8 have a partially worn surface. Intensively worn edges can be seen microscopically and it is not possible to observe whether the wear was created as a result of parallel, perpendicular or circumferential movements. The temper grains are heavily grated, imperceptible to the touch.

It can be defined that all items were used, although to a different extent. Each disc has a partially smoothed external surface which resulted from the work angle reaching not only the edge but the surface as well. This may suggest that the tool was at an acute angle to the working surface. Probably, the shards were initially formed round or oval by flaking them with stone. After this stage, the tool was used and rubbed off during working with pottery paste. I suppose the discs' edges were not intentionally honed before working ceramic vessels.

3.2. Experimental discs

The disc processing the granite was rubbed off after 10 minutes of work. Moreover, deep, regular scratches with parallel bands appeared on the working edge (Fig. 6: a). The traces on the working edge after processing the sandstone

look similar, although the scratches are slightly shallower and appear in a greater number (Fig. 6: b). In both cases, the mineral temper present in the pottery paste was wiped off.

Working the hide did not rub off the mineral temper, but only the finest fraction of the pottery paste (Fig. 6: c). Similar traces were observed on the disc used for working a bone (Fig. 6: d), while during the work there was a very strong abrasion of the bone surface.

Working leather-hard pottery resulted in a strong abrasion of the disc with no deep scratches. The working surface is uniformly smoothed, while the grains of the mineral temper are partially abraded (Fig. 7: a).

Traces observed on the archaeological discs correspond to those documented on an experimental tool used in working the pottery (Fig. 7). No traces from other experiments have been identified. This conclusion is similar to the experiments carried out with the Neolithic pottery from Bulgaria (*Vieugué 2015*, 89–102).

4. Discussion

Recycling, also in prehistoric communities, was likely used on a large scale, as confirmed by much evidence (e.g. *Shimelmütz 2015*, 34–45; *Vuković 2015*, 111–126). Equally frequent was re-use of vessels manufactured by former communities (*Buko 1990*, 165–168). The Late Bronze Age ceramic discs are noted in excavated material, but their function has remained unclear. After a series of experiments, it was found out that the majority of the experimental traces did not correspond to the traces documented on the archaeological objects. They can only be equated with working on leather-hard pottery. It was not possible to connect the experimental traces with the work on granite, sandstone, hide, and animal bone. Due to the quick abrasion of the finest fraction in ceramic tools, it

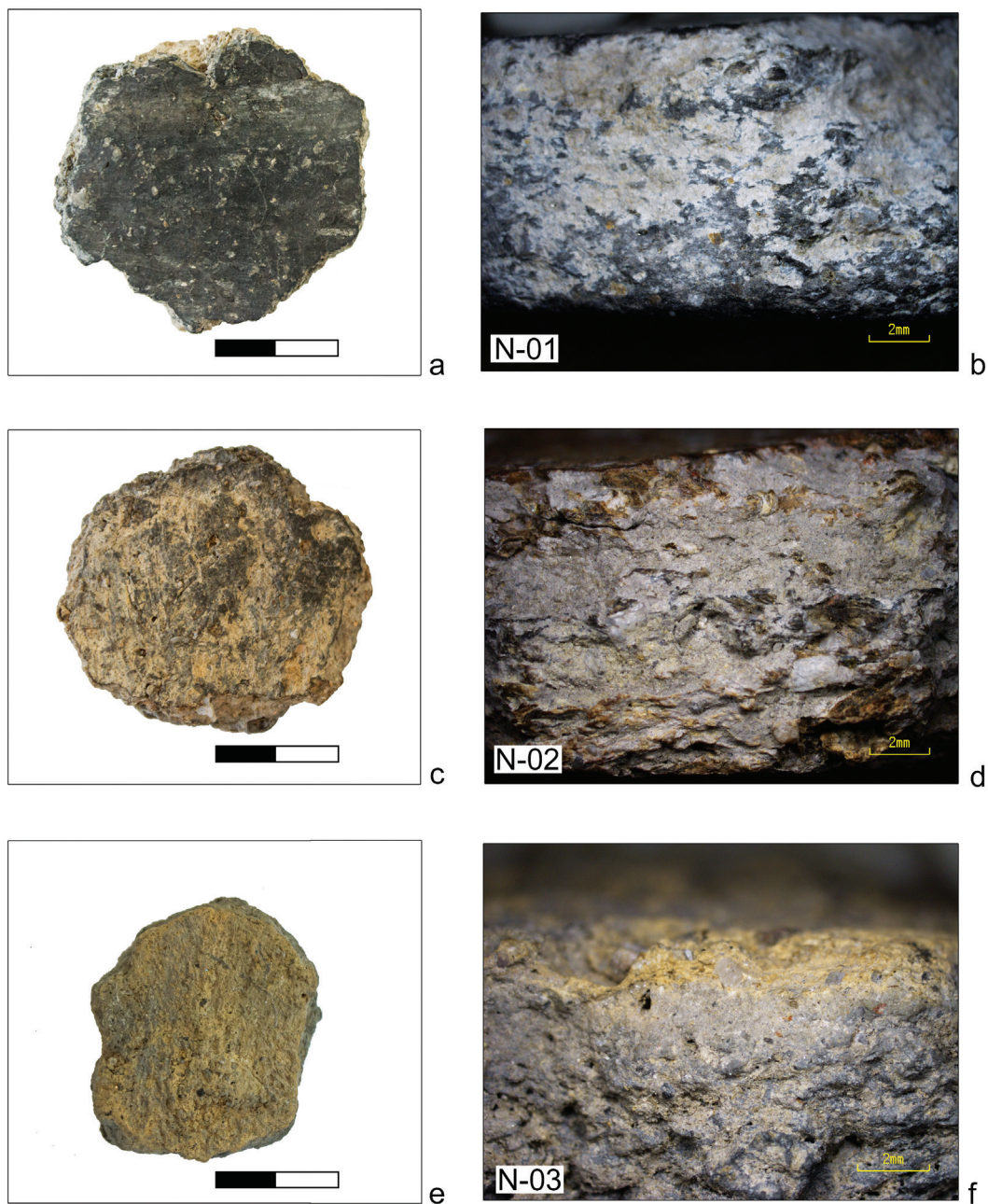


Fig. 3. Discs nos. 1-3 with slightly smoothed edges. A. Gawron-Szymczyk

Obr. 3. Kotouče č. 1-3 s lehce ohlazenými okraji. A. Gawron-Szymczyk

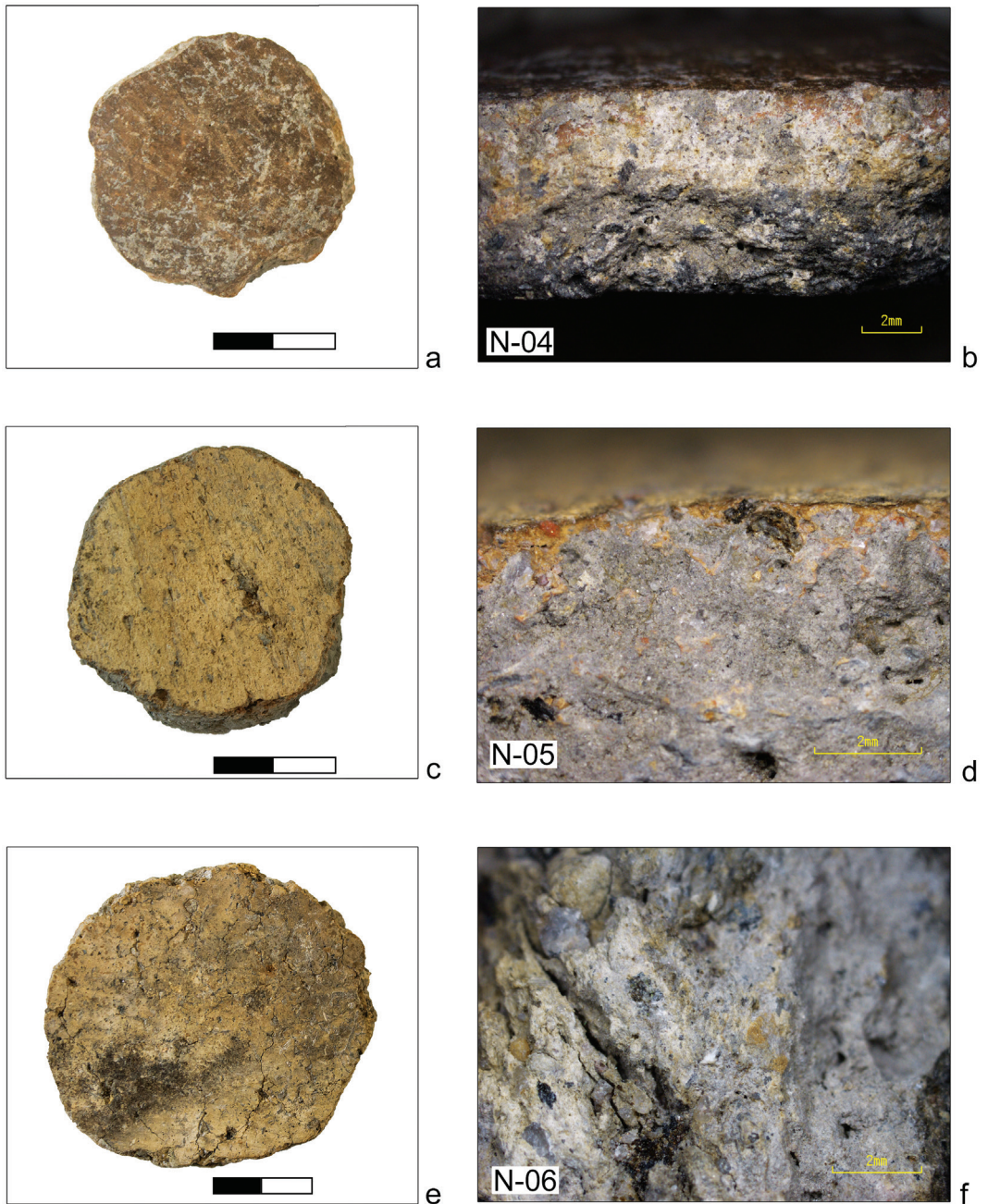


Fig. 4. Discs nos. 4–6 with moderately smoothed edges. A. Gawron-Szymczyk

Obr. 4. Kotouče č. 4–6 s mírně ohlazenými okraji. A. Gawron-Szymczyk

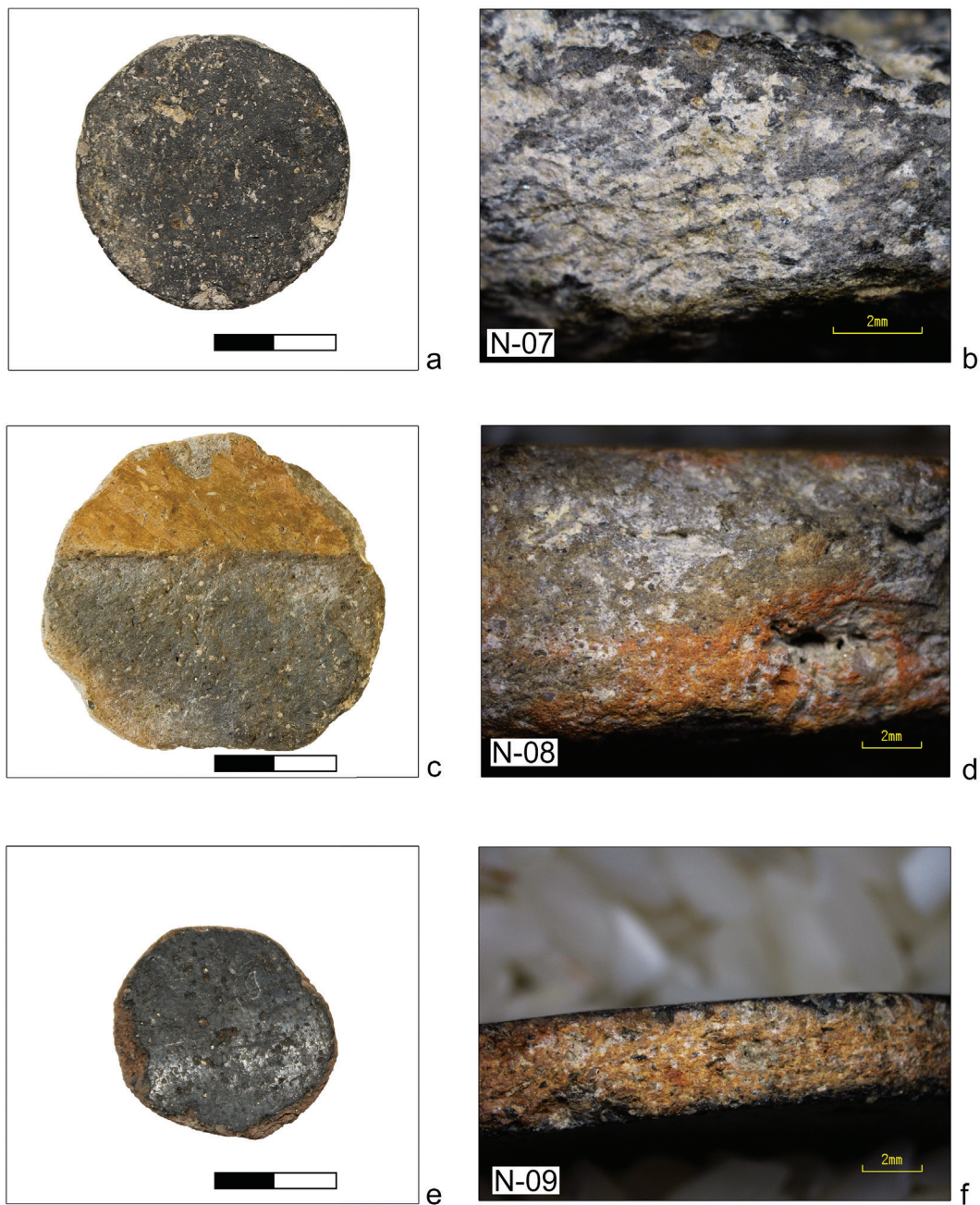


Fig. 5. Heavily used discs nos. 7-9 with intensively smoothed edges. A. Gawron-Szymczyk

Obr. 5. Značně opotřebené kotouče č. 7-9 se silně ohlazenými okraji. A. Gawron-Szymczyk

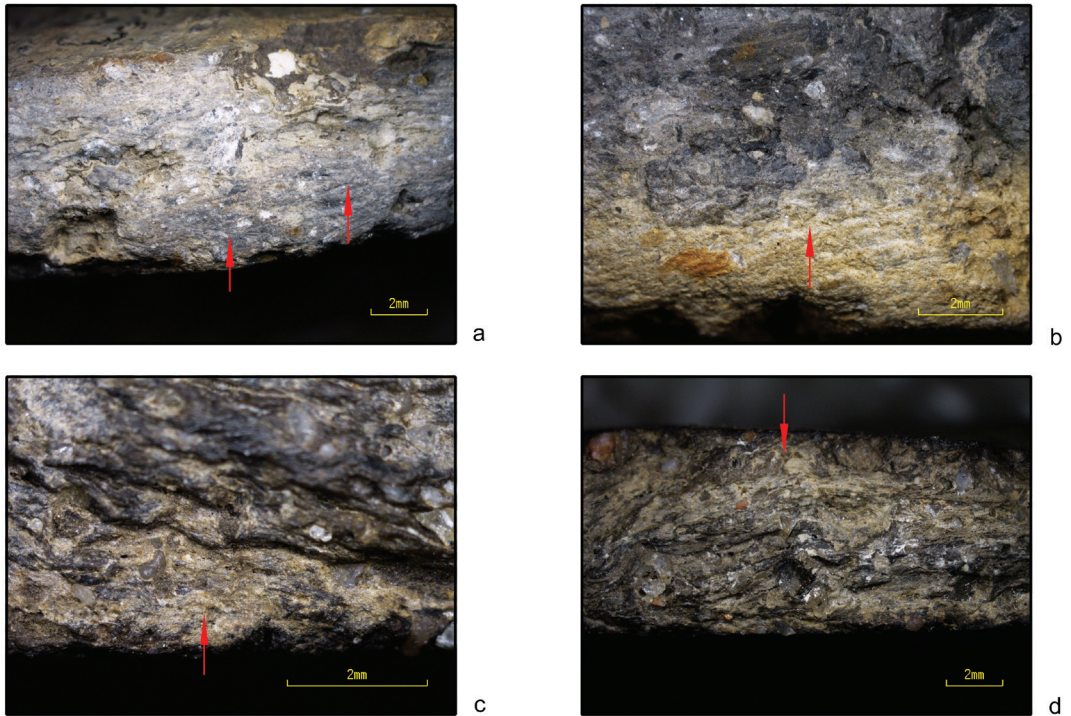


Fig. 6. Traces on the experimental discs: a – granite (deep regular scratches, smoothed paste including temper), b – sandstone (shallow scratches, smoothed paste including temper), c – hide (no scratches, intact temper, smoothed finest fraction of the paste), d – animal bone (no scratches, intact temper, smoothed finest fraction of the paste). A. Gawron-Szymczyk

Obř. 6. Stopy opotřebení na pokusných kotoučích: a – žula (hluboké pravidelné rýhy, ohlazení keramické hmoty včetně ostřiva), b – pískovec (mělké rýhy, ohlazení keramické hmoty včetně ostřiva), c – kůže (bez škrábanců, neporušené ostřivo, ohlazení nejjemnější frakce keramické hmoty), d – zvířecí kost (bez škrábanců, neporušené ostřivo, ohlazení nejjemnější frakce keramické hmoty). A. Gawron-Szymczyk

seems that using them to work with harder materials would be ineffective and would require frequent tool changes to new ones. Consequently – it is possible that there would be more of them in the archaeological material. In my opinion, discs were not smoothed before use, but only prepared. Perhaps, a series of experiments should be performed on the pretreatment of discs on sandstones of various fractions. This could confirm or contradict the no-prior-treatment theory.

In the literature, it is possible to meet the opinion that the discs were used as smoothers

in the production of ceramic vessels (*Vuković 2015*, 116; *Žychlińska 2015*, 548 – further literature there). According to my previous experimental studies, ceramic smoothers are not useful when working with pottery. Based on microscopic studies of Bronze Age ceramics, it can be concluded that it does not show any traces of ceramic tools (*Gawron-Szymczyk et al. 2020*, 137–156). However, it is possible that the discs were used as potter's ribs to shape and to uniform the thickness of the vessels' walls. Potter's ribs are also used in contemporary pottery. It is worth noting that recycled shards

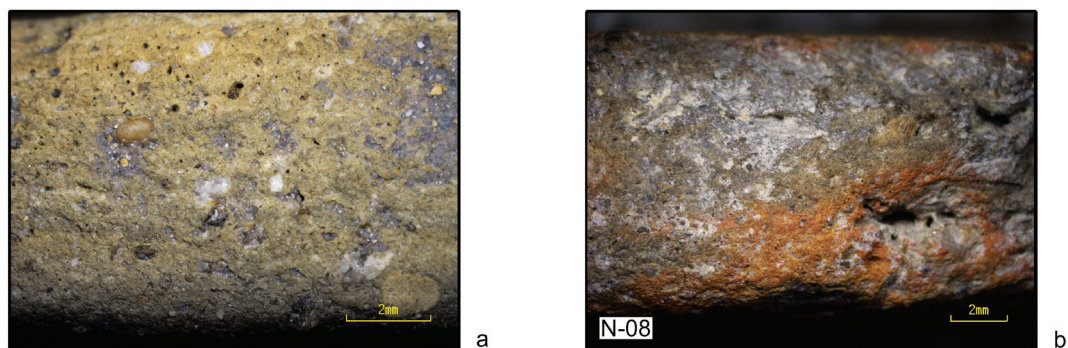


Fig. 7. Traces on the discs: a – experimental specimen used in working leather-hard pottery (abraded temper grains, no scratches, smoothed surface), b – disc N-08 from Wrocław, Niemczańska str. same as on the experimental object. A. Gawron-Szymczyk

Obr. 7. Stopy opotřebení na kotoučích: a – pokusný exemplář použitý k úpravě keramiky v kožovitém stavu (obroušená zrna ostřiva, bez škrábanců, ohlazený povrch), b – kotouč N-08 z Vratislavi, Niemczaňská ul., shodně s pokusným exemplářem. A. Gawron-Szymczyk

were used with different technological features (different temper, quality of the paste), but with very similar dimensions (Table 1).

The ceramic discs occur at sites of various chronology and distribution. In the Caribbean sites located on the islands of Guadeloupe, Saba and St. Lucia, smoothed fragments of vessels, dated between 400 B.C. and 1400 A.D., have been found (*van Gijn – Hofman, 2008, 21*). The results of research on objects from southwest Bulgaria, dated to the Early Neolithic period (6100–5600 cal. B.C.; *Vieugué 2015, 89*), are similar. Another result of this research was showing that the discs were used in processing the goat hide.

An interesting interpretation of similar items from the settlement of Pot Creek Pueblo (the beginning dates back to ca. 1260–1320 A.D.), New Mexico, USA, was proposed by Joseph T. M. Gray (*1997*). Pottery fragments with smoothed edges were designated as gaming pieces and pendants based on ethnographic and comparative research (*Gray 1997, 1–33*). Of course, we cannot rule out such use of the

discs from Wrocław, Niemczańska str. However, it seems that the traces were created as a result of work instead of shaping the discs.

One of the most important studies of ceramic discs from the Czech Republic is in “Osídlení z doby bronzové v Kněževsi u Prahy” (*Smejtek 2011, 208–210*). The way of using ceramic discs of the Urnfield culture from the Czech Republic is unconfirmed, however, the possibility of using them as game pieces is being considered (*Parma 2017, 241; Smejtek 2011, 210*). The disc from the Popovice site at Rajhrad (about 15 km south of Brno), dated to the Hallstatt period, was described as a “cult item” (*Podborský 1993, 375*).

Other discs, both perforated and non-perforated, are known from the Czech Early Bronze Age sites, but they are considered possible spindle-whorls in various stages of their manufacturing (*Podborský 1993, 271–375; Parma 2017, 241*). It is worth noting, however, that opinions on this matter vary and are presented elsewhere (*Žychliňská 2015, 548* – further literature there).

5. Conclusions

Experimental research allowed to identify the function of ceramic discs from the Late Bronze Age site at Wrocław, Niemczańska str., where the following was determined:

1. The traces of smoothing on the edges of archaeological discs are a result of work with leather-hard pottery;
2. It is possible that the ceramic discs were used as potter's ribs in the process of making vessels;

3. The edges of ceramic discs were not deliberately smoothed, the tool was probably prepared only by initial shaping;
4. Its use in processing granite, sandstone, hide or animal bones can be excluded on the basis of comparative studies.

The collection, although a small one, therefore provides promising data on the use of these interesting objects and it is important to make a use-wear analysis of ceramic discs from other sites of similar chronology.

References

- Baron, J. – Stolarczyk, T. 2012:* Wznowienie badań wykopaliskowych na osadzie epoki brązu i wczesnej epoki żelaza w Grzybianach w powiecie legnickim, Śląskie Sprawozdania Archeologiczne LIV, 101–127.
- Buko, A. 1990:* Ceramika wczesnopolska. Wprowadzenie do badań. Wrocław.
- Cofta-Broniewska, A. – Hensel, Z. 1996:* Metalurgia brązu pradziejowych społeczeństw Kujaw. Poznań.
- Gawron-Szymczyk, A. – Laciak, D. – Baron, J. 2020:* To smooth or not to smooth? A traceological and experimental approach to surface processing of Bronze and Iron Age ceramic, *Sprawozdania Archeologiczne* 72/2, 137–156.
- Gray, J. T. M. 1997:* Gaming in the Rio del Norte: Defining the Typology and Usage of Modified -Potsherds at Pot Creek Pueblo (LA 260, TA 1), *Honors Projects* 13, 1–33.
- Kądziółka, K. 2012:* Opracowanie wyników ratowniczych badań archeologicznych osady kultury łużyckiej przy ulicy Niemczańskiej we Wrocławiu w sezonach 2003 i 2005. Unpublished BS thesis, Institute of Archaeology, University of Wrocław.
- Kolosówna, Z. 1950:* Przedmioty kultu i zabawki z grodu kultury łużyckiej w Biskupinie. In: III Sprawozdanie z prac wykopaliskowych w grodzie kultury łużyckiej w Biskupinie w powiecie żnińskim za lata 1938–1939 i 1946–1948. Poznań, 193–238.
- Mierzwiński, A. 2003:* Znaki utrwalone w glinie. Społeczno-obrzędowe aspekty działań wytwórczych końca epoki brązu i wczesnej epoki żelaza. Model nadodrzański. Wrocław.
- Parma, D. – Barta, P. – Biško, R. – Bišková, J. – Hajnalová, M. – Holubová, Z. – Horáčková, L. – Jarošová, I. – Kala, J. – Kaupová, S. – Křivánek, R. – Nývtlová Fišáková, M. – Přichystal, A. – Roblíčková, M. – Tvrđý, Z. – Nohálová, H. – Vargová L. 2017:* Archeologie střední a mladší doby bronzové na Vyškovsku. Interpretacíni potenciál plošných záchranných výzkumů. Brno.
- Podborský, V. – Čížmář, M. – Dvořák, P. – Erhart A. – Janák, V. – Medunová-Benešová, A. – Nekvasil, J. – Ondráček, J. – Pavelčík, J. – Salaš M. – Stuchlík, S. – Stuchlíková, J. – Šebela, L. – Šmíd, M. – Štrof, A. – Tejral, J. – Valoch, K. 1993:* Právěké dějiny Moravy. Brno.
- Richter, P. B. 1991:* Experimentelle Archäologie: Ziele, Methoden und Aussage Möglichkeiten, *Experimentelle Archäologie in Deutschland, Bilanz* 6, 19–49.
- Shimelmütz, R. 2015:* The recycling of flint throughout the Lower and Middle Paleolithic sequence of Tabun Cave, Israel, *Quaternary International* 361, 34–45.
- Smejtek, L. 2011:* Osídlení z doby bronzové v Kněževsi u Prahy. Praha.
- Van Gijn, A. – Hofman, C. L. 2008:* Were they used as tools? An exploratory functional study of abraded

- potsherds from two pre-colonial sites on the island of Guadeloupe, northern Lesser Antilles, *Caribbean Journal of Science* 44/1, 21–35.
- Vieugué, J. 2015:* What were the recycled potsherds used for? Use-wear analysis of Early Neolithic ceramic tools from Bulgaria (6100–5600 cal. B.C.), *Journal of Archaeological Science* 58, 89–102.
- Vuković, J. 2015:* Secondary use, reuse and recycling of ceramic vessels: evidence from late neolithic Vinča, *Archaica* 3, 111–126.
- Żychlińska, J. 2015:* Funkcja krążków glinianych ludności kultury łużyckiej w świetle nowych znalezisk z Wielkopolski, *Folia Praehistorica Posnaniensia* 20, 545–556.

Hrací kameny, podložky nebo... něco jiného? Keramické kotouče z pozdní doby bronzové z pohledu experimentální archeologie

V sídlištních kontextech se často objevují keramické kotouče malých rozměrů (obvykle 2–9 cm; *Mierzwiński 2003*, 158). Zajímavé je, že pocházejí z různých období od neolitu až po středověk (*Żychlińska 2015*, 547). Mnohé z nich jsou klasifikovány jako běžné nálezy s hromadným výskytem a nebývají tedy podrobeny žádné další traseologické analýze. Během terénního výzkumu sídliště popelnicových polí v Niemczańskiej ulici ve Vratislavi (jihozápadní Polsko) se podařilo získat soubor devíti předmětů zmíněného typu, datovaný do pozdních fází doby bronzové (cca 1100–750 př. n. l.; *Kądziolka 2012*, 6). Hlavním cílem tohoto příspěvku je identifikovat funkci těchto keramických kotoučů. Až doposud ne-

byly provedeny žádné experimentální ani srovnávací studie týkající se keramických kotoučů z doby bronzové. Exempláře z Vratislavi, Niemczańskiej ulice byly nejdříve prozkoumány pod mikroskopem (Obr. 5, 6, 7). Poté byla provedena série experimentů, během nichž byly kotouče použity k práci se žulou (Obr. 3: a), pískovcem (Obr. 3: b), kůží (Obr. 3: c), zvířecí kostí (prasečí žebro; Obr. 3: d) a experimentální keramikou v kožovitém stavu (Obr. 4: a). Výsledky srovnávacích analýz naznačují, že keramické kotouče byly používány jako hrnčířská pomůcka – hladítko na tvarování a úpravu tloušťky stěn nádob. Jejich využití k opracování žuly, pískovce, kůže či zvířecích kostí můžeme vyloučit.

Mgr. Aleksandra Gawron-Szymczyk

- Institute of Archaeology
University of Wrocław
Szewska 48, 50-139 Wrocław, Poland
aleksandra.gawron-szymczyk@uwr.edu.pl
-



Toto dílo lze užít v souladu s licenčními podmínkami Creative Commons BY-SA 4.0 International (<https://creativecommons.org/licenses/by-sa/4.0/legalcode>). Uvedené se nevztahuje na díla či prvky (např. obrazovou či fotografickou dokumentaci), které jsou v díle užity na základě smluvní licence nebo výjimky či omezení příslušných práv.