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Treasures of Time

Research of the Faculty of Archaeology
of Adam Mickiewicz University in Poznań

Location of the main research areas.
Numbering, compare the table of Contents.

Adam Mickiewicz University
Poznań

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Research of the Faculty of Archaeology
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Contents

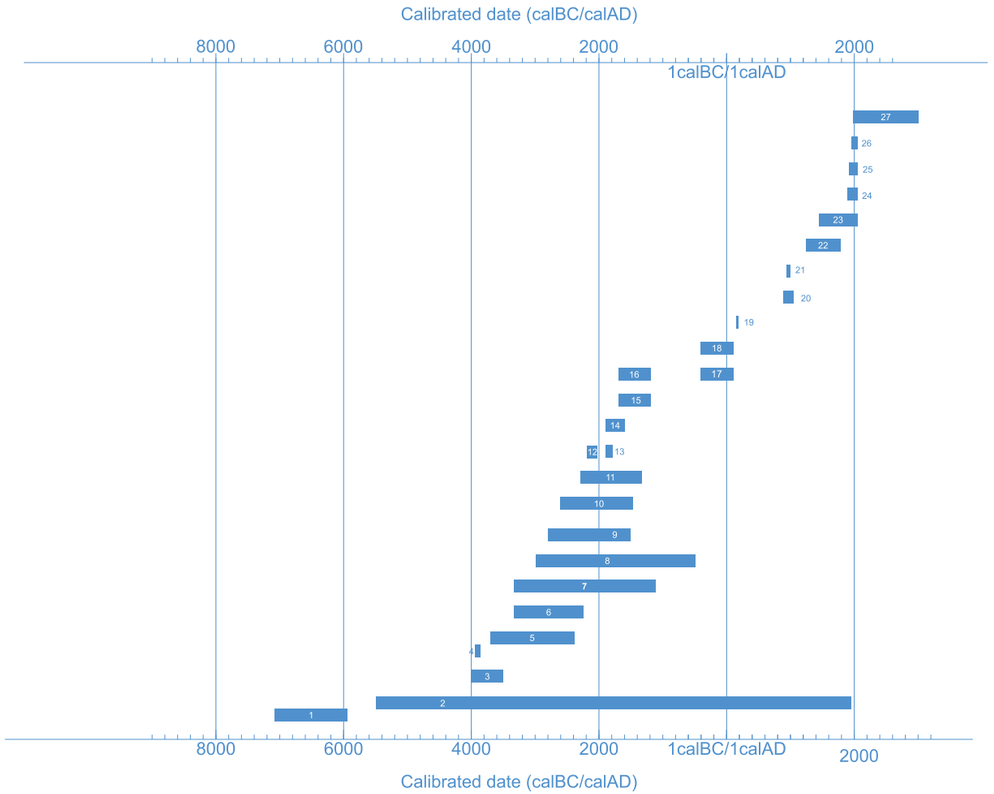
FACULTY OF ARCHAEOLOGY AMU

Treasures of Time: Research of the Faculty of Archaeology of Adam Mickiewicz University in Poznań

Introduction

In 2019, archaeology at the Adam Mickiewicz University in Poznan celebrated its honourable 100th anniversary! The establishment of archaeology at this university was associated with the strong influence of the authority of Prof. Józef Kostrzewski and a succession of eminent scholars, many of whom we today call Masters.

The year 2019 was a real breakthrough. We started the second century of existence within the Alma Mater Posnaniensis with a new structural independence and quality that the academic archaeology of Poznań had not yet known for its one hundred years of existence. This change, the formation of the first Polish Faculty of Archaeology, has opened new chances and possibilities of which we are now taking advantage.



Calibrated date
(calBC/calAD)

Prof. Józef Kostrzewski
(1885-1969)

Currently, the Faculty of Archaeology of Adam Mickiewicz University is formed by a number of teams, each with their own leaders. In the majority of cases, these teams are united by interdisciplinarity, which integrates within selected projects the experience of many so-called 'auxiliary' sciences of archaeology. This trend is paralleled by the development of specialised laboratories armed with the latest equipment in the Faculty of Archaeology.

This publication presents the current scientific interests creatively developed by such teams at the Faculty of Archaeology of Adam Mickiewicz University. The research of these teams covers vast areas in time and space, summing up at least the last 9,000 years of prehistory. The following articles, arranged in chronological order, allow us to explore the prehistory of various areas.

The adventure begins around 7100 BC, in the Neolithic settlement of Çatalhöyük located in Turkey. Then, we move on to the loess uplands near Krakow, where the first farmers from the south of Europe had just arrived (5500 BC). A little later (4000-3500 BC), and a little farther north, in the area of Greater Poland, some of the first megalithic constructions in this part of the world were built. Around the same time, about 800 km to the southeast, a settlement

of the Trypillia culture remains in the phase of development (3950 BC). The end of the Stone Age in Poland was described in the history of Late Neolithic communities on a hill in the center of Kujawy region (3700-2400 BC). Farther east, in the forest-steppe area of Ukraine, significant cultural and social changes resulted in the formation of the Yamnaya culture (3350-2250 BC), beginning the Bronze Age.

Intense elements of this era can be traced in the area of southern Europe in the Greek Anthemous Valley (3350-1150 BC), in Attica (3000-500 BC) on the plains of the Hungarian Lowlands (2600-1450 BC) and to the Upper Dniester Valley, where numerous burial mounds were formed (2800-1500 BC). A similar chronological range is presented in the articles devoted to a unique site in Bruszczewo, Greater Poland (2300-1350 BC), which not only accumulates valuable metal artefacts, but is also the subject of interest of an interdisciplinary team focused on reconstructing its environmental context.

The next text take us far to the east, to the area of Iraqi Kurdistan, where we can appreciate the importance of Mesopotamian influences in shaping the picture of the Early Bronze Age (2200-2150 BC).

Subsequent texts describe the discoveries of Poznań scientists in Syria (1906-1787 BC) and in Greater Poland (1900-1600 BC). These two distant points describe various aspects of life in contemporary communities in the Middle and Early Bronze Age.

The characteristic archaeological materials of the later centuries of the Bronze Age (1800-1200 BC) reveal an intensification of military conflicts and migration processes (1700-1200 BC). The turn of the eras is illustrated in this volume by texts on the interpretation of representations on ancient Greek and Roman sculpture (400 BC-100 AD), as well as the cultural situation in the Polish lands (400 BC-100 AD).

We are introduced to the new era by an article on the funerary customs of communities from the Polish lowlands describing discoveries at the site of Mirosław (160-175 AD). Moments of the formation of elements of Polish statehood are referred to in texts describing towns at Grzybowo (919-1050 AD) and Poznań in the early Middle Ages (950-1000 AD).

Later parts of the Middle Ages are described by sacral monuments located also in the area of the contemporary city of Poznań: the Collegiate Church of St Mary Magdalene (1263-1802 AD) and the still extant Church of the Blessed Virgin Mary on Ostrów Tumski, founded around 1431 AD in the immediate vicinity of the previously described early medieval site of the ‘origin’ of the city of Poznań.

The final texts of the volume do not refer directly to a particular period of prehistory, but present the history of Polish archaeological research on the Iberian Peninsula, the contemporary perception of prehistoric art by the inhabitants of present-day Canada and Siberia, and the development of methodological thought among Poznań archaeologists.

The volume closes with a text describing one of the many perspectives currently faced by the staff of the Faculty of Archaeology of Adam Mickiewicz University in Poznań: the new ArchaeoMicroLab.

We look to the future with great hope that the Staff of the Faculty will provide ideas for many more volumes of Treasures of Time. We trust that this set of articles will present archaeology at the Adam Mickiewicz University in Poznań in its new structure as a Faculty and show its potential. We would thus like to encourage you to get acquainted with our Poznań perspective on archaeological studies, and to reflect on ways of exploring the past.

Andrzej Michałowski

Danuta Żurkiewicz

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Metallurgy in the Early Bronze defensive settlement in Bruszczewo, site 5, Śmigiel commune, Kościan district: One more step on the way to the synthesis

Janusz Czebreszuk

Abstract

Long-term excavations carried out in the defensive settlement of the Únětice Culture in Bruszczewo (Śmigiel commune, Kościan district) have resulted in an abundant assemblage of artefacts related to metallurgy. These represent various ready-made products (i.e., ornaments, tools, and weapons), as well as some scrap prepared for smelting. Other finds included smelting by-products (metal prills/droplets) and unfinished and never used artefacts with preserved casting seams. Also, the artefact assemblage recorded at this site connected with metallurgy but made of other materials is unique in Europe. In this context, it is worth mentioning: tuyeres, melting pots, and clay footings, as well as a stone casting mould used for making open bracelets. This article presents an analysis and a description of these finds. The metal artefacts were analysed on the basis of the results of a metallurgical study, to which almost all metals recorded in Bruszczewo were subjected. Also, the applied chronological frame was based on the types of metal typical of the Únětice culture. The significant number of artefacts and their multi-aspect, archaeological and metallurgical analyses, place Bruszczewo among the key points on the map of knowledge of Early Bronze metallurgy on our continent. Moreover, this article indicates that the presented site offers great research potential that can be used in further studies into prehistoric metallurgical knowledge, including technological innovations.

Keywords: metallurgy, Bruszczewo, Early Bronze Age, Únětice Culture, metallurgical knowledge

Introduction

Both in the 1960s and during the latest archaeological campaign carried out from the turn of the last century, the settlement in Bruszczewo has provided an amazing abundance of metallurgy artefacts. What is more, they are very spectacular artefacts. Hence, to this day, the defensive settlement in Bruszczewo represents an exclusive case in terms of the variety and quantity metallurgy artifacts in the entire Únětice culture.

During the research conducted by Z. Pieczyński (1964-1968), three axes and two dagger blades were found. Their in-depth analyses are available in the archaeological literature (cf. in particular: Pieczyński, 1985, Fig. 1; Blajer, 1990, pp. 104-105; Czebreszuk, Müller & Silska, 2004, pp. 18-19; Rassmann, 2004, 2010; Silska, 2012, pp. 115-121; Jaeger, Czebreszuk, Müller & Kneisel 2015).

In the 1965 season, one axe (unprovenanced find, Silska, 2012, Fig. 76: 1) and one dagger blade (Ft. 19, Silska, 2012, Fig. 76: 5) were found. In the 1967 season, a hoard which was 'shallowly sunken into the undisturbed subsoil' was discovered in Trench Y, designated as Feature 82 (Silska 2012, p. 55, 115, Fig. 35, Fig. 76). It consisted of 3 artefacts: two axes (Silska, 2012, Fig. 76: 2, 4) and one dagger blade (Silska, 2012, Fig. 76: 3). Presumably, the hoard had been wrapped in cloth (Silska, 2012: 116, Fig. 35).

In addition to the aforementioned artefacts, some metal products were recorded – but those artefacts are far less frequently noted in the literature. One of them was a tiny fragment of a 'bronze awl' (from Feature 81) which was subjected to the metallurgical analysis despite its meagre size (No. 2758, cf. Silska, 2012, p. 115, Fig. 77; 78 and Table 9). Moreover, a 'nugget of raw bronze' (Silska, 2012, p. 115) was reported as having been found (this artefact is currently registered as lost). Also, a 'metal prill (droplet)' was subjected to metallurgical analysis (No. 2769B, cf. Silska, 2012, Table 9 and Figs. 77 and 78). There are no data on this origin of the find or the circumstances of its discovery at the site, though.

The objects related to metallurgy, discovered in the 1967 season in the Bruszczewo settlement were truly spectacular. These were four tuyeres, the first of which was preserved in its entirety (Pieczyński, 1985, Fig. 1: 2; Czebreszuk et al., 2004, Fig. 4: 2; Jaeger et al., 2015, Fig. 6.4, second from the left in the rear row), the second tuyere was preserved in two fragments (Pieczyński, 1985, Fig. 1: 1; Czebreszuk et al., 2004, Fig. 4: 1; Jaeger et al., 2015, Fig. 6.4, first and last from the left in the rear row), the third was preserved as one fragment (Pieczyński, 1985, Fig. 1: 3; Jaeger et al., 2015, Fig. 6.4, first from the left in the front row), and the fourth was represented by only one fragment (Pieczyński, 1985, Fig. 1: 4). The artefact published in Jaeger et al. (2015, Fig. 6.4, front row, second left) might represent another type of tuyere (asymmetric in longitudinal section). Other finds included one crucible (Pieczyński, 1985, Fig. 1: 6; Czebreszuk et al., 2004, Fig. 4:11), and one casting spoon (Pieczyński, 1985, Fig. 1: 4; Czebreszuk, et al., 2004, Fig. 12; Jaeger et al., 2015, Fig. 6.4, last from the left in the front row). The most spectacular, however, were three clay footings (Pieczyński, 1985, Fig. 1: 8-10; Czebreszuk et al., 2004, Fig. 4: 6-8) and one fragment of a sandstone shell mould used for the production of armlets/bracelets with stamp-shaped ends (Pieczyński, 1985, Fig. 1: 7; Czebreszuk et al., 2004, Fig. 4: 9; Silska, 2012, Fig. 119; Jaeger et al., 2015, Fig. 6.4, back row, third left). These artefacts were found close to each other at the top of the hill in Trench W near Feature 75B, which was classified as a hearth (Silska, 2012, p. 116). Hence, the literature on the subject uses the terms 'founder's workshop' (Pieczyński, 1985, p. 167) or 'metallurgical workshop' to describe this feature (Czebreszuk et al., 2004, p. 18).

By the turn of the century, the collection of finds was more numerous but consisted of less spectacular artefacts. Some are not very characteristic in terms of typology. This situation is the result of the use of a metal detector during this research stage. Thanks to this method, it was possible to discover a greater number of small objects, including fragmented scrap prepared for smelting, as well as waste and debris associated with the metallurgical process, such as prills (solidified droplets formed when liquid metal is poured into the moulds). Another effect of the methodology used was the acquisition of items unrelated to the Bronze Age (including the modern ones). Due to the poor degree of preservation of particular artefacts, it was not possible to select a subset from the Bronze Age for metallurgical analysis, and so those representing subsequent periods may also have been included.

In total, 55 analyses were conducted (repeated in the case of some artefacts), including at least 14 analyses of slag (Rassmann, 2010, Table 2). Table 1 presents only metals and the objects related to metallurgy produced (probably) in the Early Bronze Age (Table 1). The analyses involved three stages. The first, conducted in the 1960s, included 6 artefacts analysed at the Central Laboratory of the Institute of Archaeology and Ethnology of the Polish Academy of Sciences (then IHKM PAN); the artefacts had laboratory numbers: 2754B, 2755 to 2758, and 2769B (Silska, 2012, Table 9). At the beginning of the 21st century, four of the enumerated artefacts were re-analysed in Germany: 2754B = FMZM2823, 2755 = FMZM2824, 2756 = FMZM2825, and 2757 = FMZM2826 (Rassmann, 2004; Silska, 2012, Table 10). The most numerous series, containing 45 samples, was re-tested at the Central Laboratory. Those were samples with numbers 14739 to 14755, 14758 to 14782, and 14827 to 14829, and included artefacts obtained during the second stage of research at the site.

Some of these artefacts could be assigned to the defined types of copper from the Early Bronze Age (Rassmann, 2004, 2010). In particular, these were (see Table 1, Figure 1): copper of the Kläden type (14742 and 14751), copper of the Bresienchen type (14761, FMZM2824, and FMZM2826), copper of the Bennewitz type (FMZM2825), and 'pure' copper (14739, 14743, 14745, 14746, 14750, 14753, and 14827) (Figure 1). In addition, the next 7 analyses indicated the presence of both copper (14754, 14755, and 14758) and tin bronze (14741, 14748, 14749, and 14768), as seen in Table 1. It should also be noted that, yet another group of products could be associated with the smelting process, for example those with a high tin content and a clear percentage of another element – lead (Nos. 14747, 14752, 14762 and 14776). Artefact No. 14747 – a bead (Rassmann, 2010, Table 2: 5) – and a fragment of a 'doubleheader' (No. 14752, cf. Rassmann, 2010, Table 2: 6) still have casting seams.

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Ordinal No.	Metal type	Inv. No.	Trench	Object	Typology	Lab. No.	Literature	Remarks	Figures
1	Bresinchen	47Z029	47		metal fr.	14761	Rassmann 2010, Tabl. 1:6		1:2
2	Bresinchen	34Z001	34		metal fr.	14762	Rassmann 2010		
3	Bresinchen		Y	P82	axe	FMZM2824 and 2755	Rassmann 2004, Ryc. 124, first from left; Silska 2012, Tab. 9:2		1:3
4	Bresinchen		Y	P82	dagger blate	FMZM2826 and 2757	Rassmann 2004, Ryc. 124, second from right; Silska 2012, Tab. 9:4		1:1
5	Bennewitz		Y	P82	axe	FMZM2825 and 2756	Rassmann 2004, Ryc. 124, second from left; Silska 2012. Tab. 9:3		1:4
6	CM	34Z002	5		metal fr.	14741	Rassmann 2010		
7	CM	39Z013	39		pin, fr.	14743	Rassmann 2010, Tabl. 1:5		2:7
8	CM	403	22	119	disk	14745	Rassmann 2010, Tabl. 2:2		2:3
9	CM	395	3		dagger	14746	Rassmann 2010, Tabl. 2:1		2:2
10	CM	703	22		metal fr.	14748	Rassmann 2010, Tabl. 2:10		2:4
11	CM	2203	23		metal fr. dagger blate	14749	Rassmann 2010, Tabl. 2:4		2:6
12	CM	1803	23		doublehaeder' (dwugłówkowiec)	14750	Rassmann 2010, Tabl. 2:9		2:1
13	CM	2403	22	117	awl, fr.	14753	Rassmann 2010, Tabl. 2:7		2:8
14	CM	3603	27		wire coil, square section	14754	Rassmann 2010, Tabl. 2:3		2:5
15	CM	3103	from the surface		awl	14755	Rassmann 2010, Tabl. 2:11		2:9
16	CM	35Z006	35		metal fr.	14768	Rassmann 2010		
17	CM	11321	52		pin (Rollenkopf-nadel)	14827	Rassmann 2010, Tabl. 1:1	plot (Flache) 11, natural layer 11014	2:10
18	Kläden	47Z030	47		axe, fr.	14742	Rassmann 2010, Tabl. 1:7		3:3
19	Kläden	4703	29	146	knife / razor	14751	Rassmann 2010, Tabl. 2:8		3:2
20	Kläden		trench E,F,G,H		axe	FMZM2823 and 2754B	Rassmann 2004, Ryc. 124, first from right; Silska 2012, Tab. 9:1		3:1
21	Kläden?		trench Y	P81	awl	2758	Silska 2012, Tab. 9:5	missing (fully used for analysis?)	
22	BR+Pb	47Z031	47		metal fr.	14739	Rassmann 2010, Tabl. 1:3		3:6
23	BR+Pb	2503	22	125	doublehaeder' (dwugłówkowiec) with a casting seam	14747	Rassmann 2010, Tabl. 2:6		3:5
24	BR+Pb	3003	from the surface		bead with a casting seam	14752	Rassmann 2010, Tabl. 2:5		3:4
25	BR+Pb?	39R009	from the surface		metal fr.	14776	Rassmann 2010		
26	BR+Pb				metal drop	2769B	Silska 2012, Tab. 9:6		
27		44Z034	44		metal fr., round "punch"	14740	Rassmann 2010, Tabl. 1:4	doubtful, a lot of silver, Rassmann 2010:712	3:8
28		44Z032	44		"hoop", fr.	14744	Rassmann 2010, Tabl. 1:2	doubtful a lot of antimony, Rassmann 2010:712	3:7
29		12441	plot (Flache) 12		round-round "punch"			Bef. 12034, Abtrag 12006, -91/-92	
30		F12495	plot (Flache) 12	house 4	pin (Ösenkopf-nadel)		Kneisel, Müller 2011:312		
31			51		round-chisel "punch"				
32			F	P19	dagger blate		Silska 2012, Ryc. 76:5		
33			W	P75B	"founder's workshop"		Silska 2012:116	at least 11 artifacts, description in the text	
34		41119	41	174	crucible		Czebreszuk 2015, Fig.4.84, ID8051		
35		41152	41	174	crucible		Czebreszuk 2015, Fig.4.84, ID8068		
36		45173	45	190	nozzle, fr.		Czebreszuk 2015, ID8377		
37		36046	36	159	crucible, fr.		Czebreszuk 2015, ID8382		
38		49305	49	191	crucible, fr.		Czebreszuk 2015, Fig.4.99, ID8423		
39		49307	49	191	crucible, fr.		Czebreszuk 2015, Fig.4.96, ID8467		
40		49240	49	204	crucible		Czebreszuk 2015, Fig.4.109, ID8518		
41		49239	49	200	crucible		Czebreszuk 2015, Fig.4.105, ID8591		
42		56/97	7	from the EBA moat	crucible		Czebreszuk 2015, ID8820		
43		38048	38	humus	nozzle, fr.		Czebreszuk 2015, ID9020		

Table 1: Bruszczewo, site 5, Śmigiel commune, Kościan district. Metal and metallurgical artefacts.

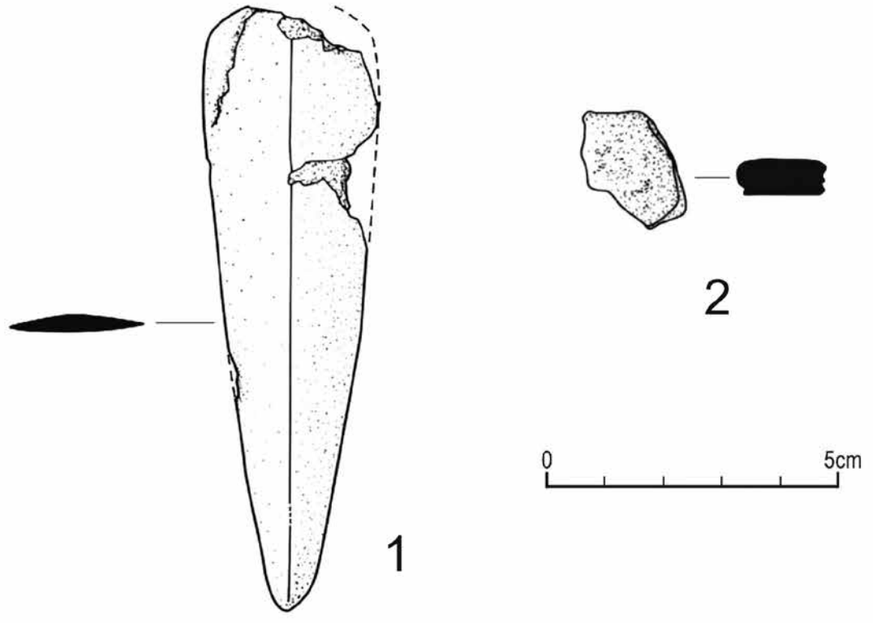

Figure 1. Bruszczewo, site 5, Śmigiel commune, Kościan district. Metal artefacts made of metal types Bresinchen (1-3) and Bennewitz (4). For more complete data on the artefacts, see Table 1.

The results of the typological and chronological analysis of the artefacts found in the 1960s have been previously reported in the literature (Blajer, 1990, pp. 104-105; Silska, 2012, p. 117) and therefore this work does not delve into that topic but instead focuses on the Early-Bronze artefacts obtained during excavations since the turn of the 21st century. Unfortunately, their typological analysis was stymied by the fact that very few artefacts were preserved in their entirety; only 5 such artefacts were recorded and thus analysed here.

A pin with a hammer-shaped head and rolled into a coil (no. 14827, cf. Rassmann, 2010, Table 1: 1) was made of 'pure' copper, but typo-chronologically it is characterized by a very long period of use (the entire Bronze Age) and an extensive area of distribution (Central Europe). Nevertheless, the stratigraphic position of this artefact from Bruszczewo is unambiguous (Trench 52, plot 11, natural layer 11014, Kneisel, 2010, p. 138) – falling at the end of the Early Bronze Age.

A dagger, or rather the blade of a dagger with one rivet preserved (No. 14746), seems heavily worn (shortened due to repeated sharpening?). It is only about 4 cm long (Rassmann, 2010, Table 2: 1) and originally it had 3 rivets. Its style is that of Únětice daggers.

Archaeological literature has hitherto interpreted the almost completely preserved artefact No. 14751 as a knife (Rassmann, 2010, Table 2: 8; see also finds from Radłowice in Lower Silesia – Furmanek, Dreczko, Mozgała-Swacha & Kopec, 2019, p. 131, Fig. 81). However, there exists an alternative functional interpretation of this artefact indicating that it could be a toiletry device – a razor. The best analogies that might support such a hypothesis are known from outside the Únětice oecumene, for example in the developed Wessex culture (Jarosław Sobieraj PhD, personal communication – for which the present author is very grateful). All in all, it is the oldest well-dated artefact from the Únětice culture within the Central European Bronze Age. Most importantly, though, it is a device used for personal hygiene that was obtained from a sedimentary context. Such care for sanitation seems one of the hallmarks of the then emerging elite. The occurrence of this type of find in Bruszczewo indicates that representatives of that social stratum lived there, a fact which requires all the more emphasis as the artefact in question comes from an unambiguous stratigraphic context (i.e., Pit 146) dated to the Early Bronze Age. The oldest hitherto personal hygiene devices (tweezers) were recorded in Central and Northern Europe in the Jutland zone; they represented the Early Bronze Age II (after Vandkilde, 1996) and were dated to 1500-1300 BC (Vandlikde, 1996, pp. 174-175).

The 'doubleheader' (No. 14750) is a piece that connects two chains with pins attached at the other ends. A complete example was found in the hoard from Wrocław – Gądów Małe (Sarnowska, 1969, p. 220, Fig. 76: c). This artefact is characteristic only of the Únětice tradition (Jaeger et al., 2015, p. 229) and is known from its classical phase.

A large-ear pin is another metal artefact found in Bruszczewo (Müller & Kneisel, 2010, Fig. 14). This type was very popular in the Únětice culture during its classical stage of development. Nevertheless, a careful metallurgical analysis revealed that the Bruszczewo specimen was made using advanced technologies (Müller & Kneisel, 2010, pp. 772-773), which, as a matter of fact, became widespread in the Middle Bronze Age (Kneisel, 2012). The stratigraphic context is very precise in this case as the artefact was found inside House 4, dating to the end of the Early Bronze Age (Müller & Kneisel, 2010, p. 773).

In addition to the typology, the aforementioned metallurgical analysis was a critical method for dating artefacts since it allowed the types of copper to be assigned to individual horizons within the Early Bronze Age (Rassmann, 2010, Fig. 1). One of the artefacts (No. 14761) belongs to Horizon II with copper of the Bresinchen type from the Early Bronze Age dated to the years 2100-2000 BC. Two other items from the hoard wrapped in cloth, an axe (FMZM2824) and a dagger blade (FMZM2826), were classified in the same way. Another artefact recorded at the site (FMZM 2823), an axe (unprovenanced find), may also be dated to the end of this horizon (Rassmann, 2004, p. 262) or the transition interval between Horizons II and III (Rassmann, 2010, p. 714). The other axe from the cloth-wrapped hoard (FMZM2825) was classified as Bennewitz type copper, associated with Horizon III of Early Bronze metals, dating to 2000-1850 BC. Another 9 artefacts were associated with Horizon IV (1850-1650 BC). Of these, 7 artefacts belonging to the metal group known as 'pure copper' (Figure 2). These are artefacts Nos: 14739 ('prill'), 14743 (fragment of a pin), 14745 (disc), 14746 (dagger), 14750 ('double-header'), 14753 (awl), and 14827 (pin) (Rassmann, 2010, Fig. 2B). In addition, the analyses of artifacts numbered 14751 (razor) and 14742 (fragment of an axe) revealed that their metal composition was that of the Kläden group (Figure 3), which places them at the end of the time period related to Horizon IV (i.e., around 1650 BC).

Accordingly, it can be concluded that the metal horizons discovered in Bruszczewo represent almost the entire period of development of the Early Bronze Age. In particular, it covers the time period from 2100 to 1650 BC. This unambiguously indicates that the metallurgical activity in the defensive settlement in Bruszczewo developed throughout its lifespan.

Also, special attention should be given to the characteristics of the typological and functional composition of the metal artefacts typical of particular horizons. For Horizon II, these include an axe (Bennewitz type, variant B) and a fragment of an unidentified object. For Horizon III, there are two axes and a dagger blade. In turn, for Horizon IV, artefact types include, among other things, a pin with a hammered out and rolled head, a dagger blade significantly shortened (probably) by repeated sharpening, and the 'doubleheader'. The remaining analyses were taken from fragments of unidentified items.

Such a distribution, wherein the oldest horizons yield only large objects and the youngest – usually scrap (i.e., destroyed or broken/prepared for re-smelting), may indicate that their deposition at the site was long-lasting. The oldest relics consist of fully preserved tools which were consciously left (as indicated by the hoard wrapped in cloth) or forgotten/lost. In Horizon IV, small fragments prepared for/created during smelting or those lost as a result of everyday activity prevailed.

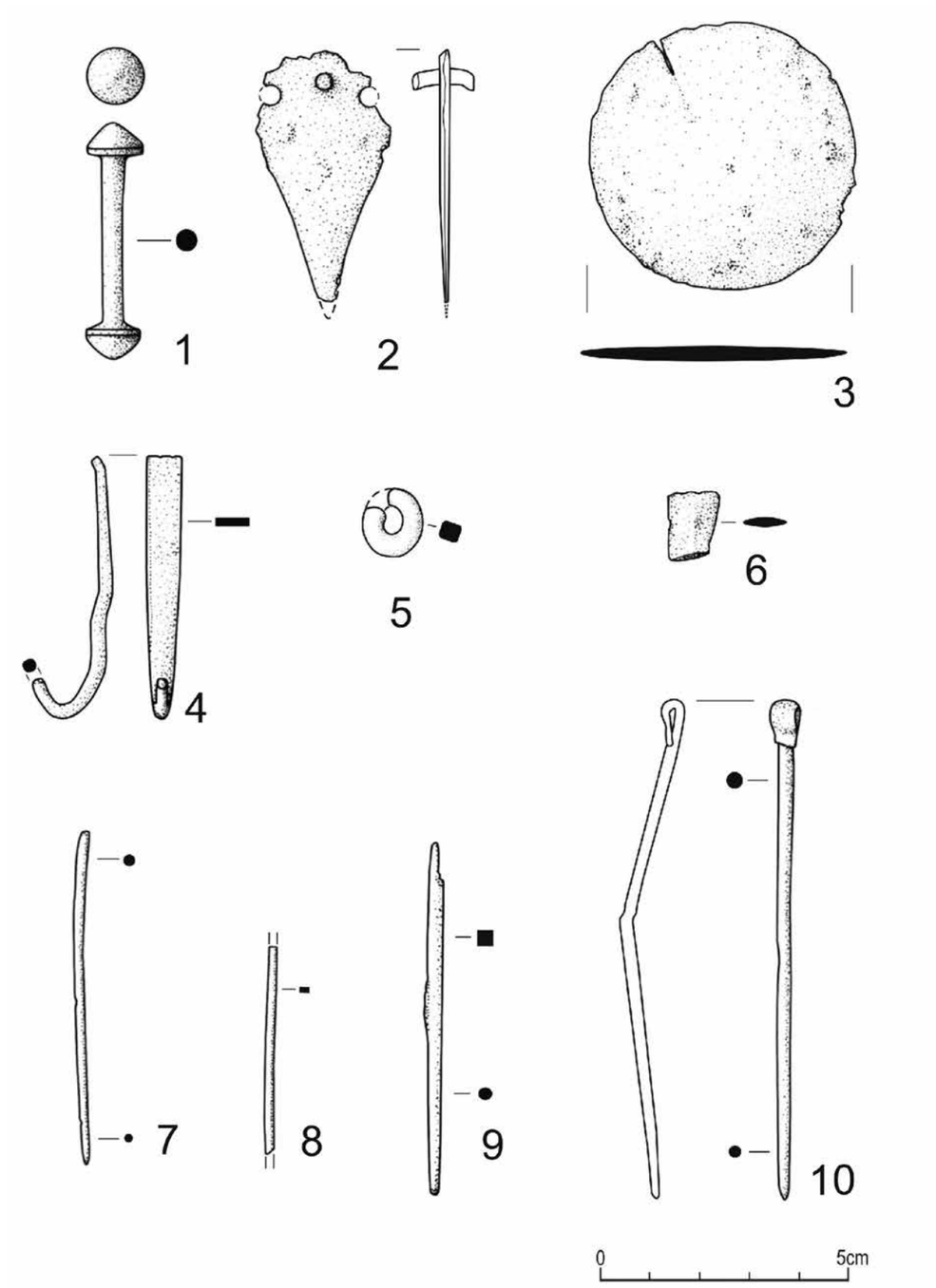

Figure 2. Bruszczewo, site. 5, Śmigiel commune, Kościan district. Metal artefacts made of metal referred to as ‘pure copper’. For more complete data on the artefacts, see Table 1.

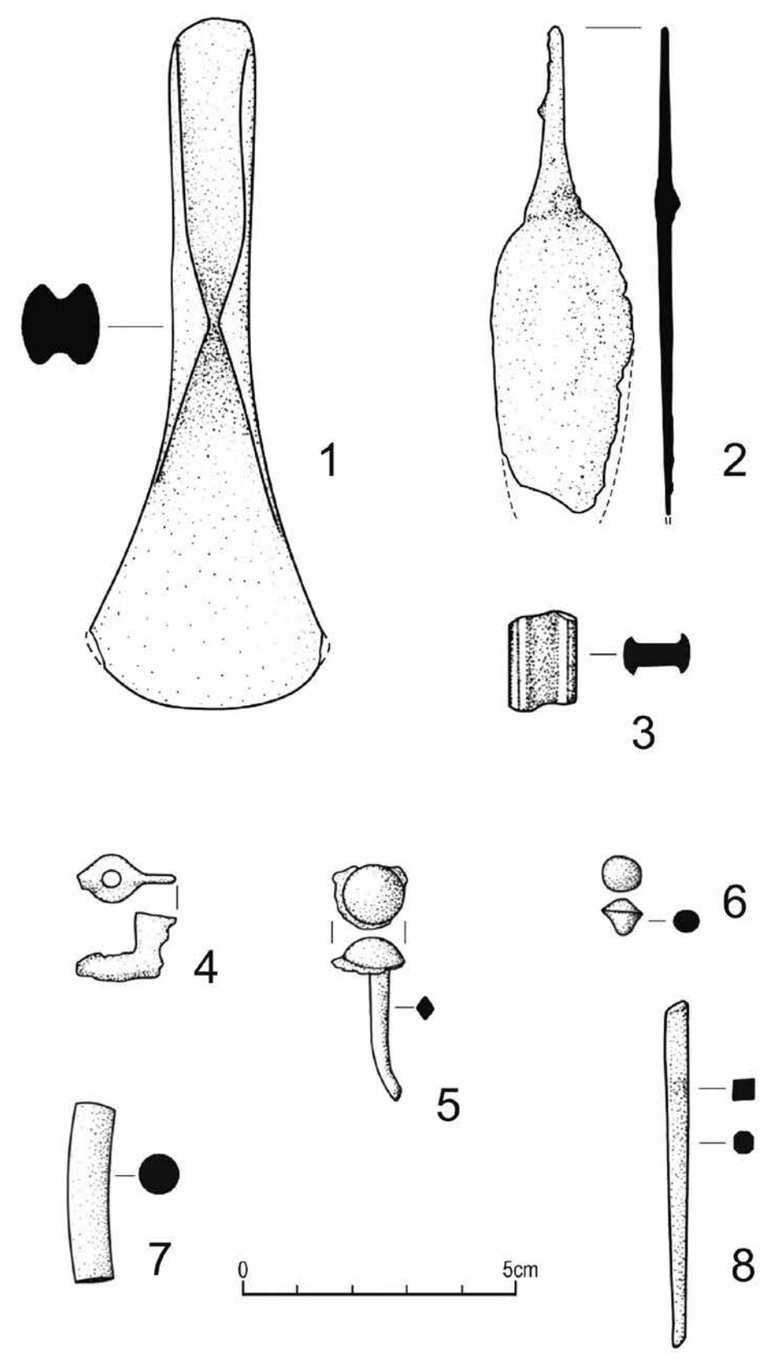

Figure 3. Bruszczewo, site. 5, Śmigiel commune, Kościan district. Metal artefacts made of metal type Kläden (1-3). Also, artefacts with high contents of: lead (4-6), antimony (7), and silver (8). For more complete data on the artefacts, see Table 1.

The foregoing analyses show the validity of the thesis prevalent in the literature that extensive metal smelting was present for an extended time in the Early Bronze defensive settlement in Bruszczewo and, in this way tools, ornaments, and weapons were manufactured, often with the use of advanced metallurgical technologies. These rich sources are therefore an appropriate basis for in-depth analyses. Consequently, they allow for more specific questions regarding the metallurgical knowledge of the Bruszczewo founders and their participation in the adaptation of the technological innovations that spread throughout Europe at the transition from the 3rd to 2nd millennium BC. It is also necessary to address the issue of the directions of the flow of metals and metallurgical knowledge, as well as to specify the timeline of the process of metal adaptation by the Bruszczewo community. These are the tasks that still pose a challenge to archaeologists.

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