

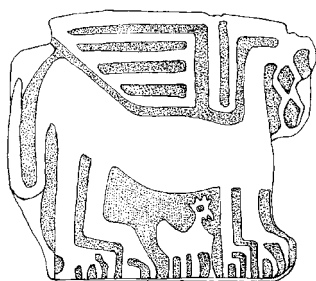
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EARLY IRON AGE IN CENTRAL EUROPE

Editorial

Dear Readers,

You are now holding the current, thematic issue of Študijné zvesti AÚ SAV journal, dedicated to the Early Iron Age in Central Europe. This issue emerged from the discussions and outcomes of the 4th International Conference on the Early Iron Age in Central Europe, held in Nitra from July 6–9, 2022.

The articles featured here were either presented directly at the conference or are inspired by the themes debated during both the official sessions and informal discussions within the conference forums.

The contributions by leading scholars in Early Iron Age studies span a broad spectrum of research questions. The papers cover results from typo-chronological analyses of individual artefacts or artefact groups, including the cauldron with cross-shaped attachments from Castaneda (CH), nail-shaped head ornaments from the Western Carpathians, eastern-type artefacts from Transdanubia, *Kegelhalsgefäße* from Northeastern Transdanubia, and a *Schnabelkanne* from an unidentified site in Germany. These studies not only help define exchange and trade networks across Europe but also shed light on the social dynamics of Hallstatt period societies. Similarly, the examination of material culture and burial practices at necropolises offers insights into the social stratification of the period, allowing also for the identification of non-standard burial practices (e.g., those associated with elite or deviant burials). The cemeteries sites discussed in this issue come from a diverse array of regions in Europe, including Domasław (PL), Frög (AT), Hurbanovo (SK), Muskervastlwald at Burgstallkogel (AT), and Sâncrai-Darvaş (RO). Notably, the Pilismarót-Basaharc burial ground (HU) is examined through both anthropological and archaeological analyses. Cemeteries, along with their associated artefact groups, contribute significantly to refining the chronological framework of the Hallstatt period. For example, a chronology of the Hallstatt period in Moravia based on an analysis of the graves containing wagon and horse harness items, correlated with other European chronological systems, is presented. Settlement studies, whether focused on hilltop fortified sites or unfortified lowland settlements, address questions of function and socio-economic organization. Several contributions explore the role of settlement sites as elite residences (e.g., the manor house at Holedeč/CZ) or as sites with specific functions within investigated microregions (e.g., Tribeč Mountains/SK, Central Orava region/SK, the Poštela hilltop site region/SI, and the Nagyberki-Szalacska region/HU). These microregional studies are not only concerned with the role of (hilltop) settlements in local settlement structures, but also with the diverse past uses of the landscape – from being used as funerary landscapes (burying in barrows and flat graves) through habitation to the economic activities – often employing an interdisciplinary approach that incorporates archaeobotany, geophysics or LIDAR analysis.

The range of topics addressed in this issue underscores the value of bringing together scholars from various European regions, providing an important synthesis of current research, as well as differing methodologies in the study of the Early Iron Age in Central Europe. The use of diverse methodological frameworks – such as typo-chronological analysis, burial ritual studies, archaeobotanical and anthropological research, geophysical methods, LIDAR, and microregional spatial analysis – offers a multifaceted approach to understanding critical aspects of the period, including social organization, long-distance interactions, the role of hilltop sites, and the structured management of landscapes. Together, these perspectives form a rich mosaic that enhances our understanding of this pivotal historical era.

I hope you find this ‘Early Iron Age’ issue both intellectually stimulating and rewarding in its scholarly contributions.

Lucia Benediková
Managing Editor of the Issue

A NEW POINT ON THE BUCKET LIST

A Cauldron with Cross-Shaped Attachments from an Iron Age Grave at Castaneda, Canton Grisons, Switzerland

Christoph Baur – Christoph Walser – Thomas Reitmaier

DOI: <https://doi.org/10.31577/szausav.2024.71.12>

Keywords: Val Mesolcina, Hallstatt period, Golasecca culture, cauldron with cross-shaped attachments, spatial analysis

So far, the Iron Age graveyard of Castaneda in the Val Mesolcina, located in the southern part of the Swiss Canton Grisons, has yielded some 200 graves, dating from between 500 and 150 BC, as well as parts of the associated settlement. Castaneda lies on the north-eastern border of the Alpine region occupied by the Golasecca culture during the Late Bronze and Early Iron Ages, on an important communication route through the Val Mesolcina. This very old interaction zone connected Northern Italy with the Swiss Plateau (Mittelland) and the Alpine Rhine Valley, as far as Lake Constance.

In summer 2021, four new graves were uncovered. Grave 1/2021, dating from the end of the Hallstatt period, contained a bronze cauldron with cross-shaped attachments. The entirely preserved vessel belongs to Type C, as defined by Gero v. Merhart. These cauldrons have been discovered in a wide area, stretching from the Balaton region in Hungary to the source of the Seine in France, almost exclusively as part of high-ranking male grave inventories. The *Caput Adriae* region is suspected to have been the production centre.

The discovery of the Castaneda cauldron is an opportunity to reanalyse the distribution of Type C cauldrons. This may shed some new light on Early Iron Age trade routes and trade networks, while also offering new insights into social hierarchies in the Alpine region of the Golasecca culture during the Early Iron Age.

INTRODUCTION

The village of Castaneda is located on a south-facing terrace, 780 m above sea level and 450 m above the valley floor, at the junction of the Val Calanca and the Val Mesolcina in the Swiss Canton Grisons (Fig. 1). Since the Mesolithic (*Della Casa* 2000), the valley of the Moesa River has been a dynamic interaction zone. Furthermore, it has been a key section of an important north-south route over the San Bernardino Pass, connecting Northern Italy with Southern Central Europe, i.e. the Swiss Plateau (Mittelland) and the Alpine Rhine Valley as far as Lake Constance (*Nebelsick/Balzer/Metzner-Nebelsick et al.* 2022, 621). Traces of early settlements, established during the Neolithic, have been found not only at Castaneda, but also at Mesocco, the Val Mesolcina's northernmost municipality (*Rageth* 1992; *Rageth/Defuns* 1992).

Throughout the Iron Age, the Val Mesolcina marked the north-eastern border of the Golasecca culture of Northern Italy. The dense network of settlements known from the Hallstatt (Ha) and La Tène (Lt) periods and the associated, extraordinarily furnished burial grounds suggest that the communication and trading route across the San Bernardino became particularly important at this time (*Nagy* 2012, 20–26; *Schmid-Sikimić/Seifert/Ebnöther* 2023). The cemeteries, in particular, have been known and excavated since the late 1800s. Many grave inventories were dispersed across various European museums (*Stech* 2013). Over the last 20 years, several projects have focused on the publication of grave inventories from the cemeteries of Castaneda (*Nagy* 2012) and Mesocco (*Schmid-Sikimić* 2002) in Canton Grisons, and the necropolis of Giubiasco (*Tori et al.* 2010) in Canton Ticino.

The Iron Age burial ground of Castaneda is located to the south of the church of St. Stefano, while the remains of the Late Bronze Age and Iron Age settlement are just northeast of it. Patrick Nagy, when



Fig. 1. The Val Mesolcina in the south-west of the Swiss Canton Grisons. The known Iron Age settlements are marked in red (map: www.map.gis.gr.ch; aerial image: ETH-Bibliothek Zürich, Bildarchiv/Stiftung Luftbild Schweiz; photograph: Swissair Photo AG/LBS_R1-911505/CC BY-SA 4.0; graphic: ADG).

he published the known grave and settlement features in 2012, estimated that at least 200 graves, almost exclusively inhumation burials, had been uncovered by then (*Nagy 2012*, 84).¹ These belonged to the local phases Tessin C to Lt C, corresponding to phases Ha D3 to Lt C in the Central European chronology (Fig. 2; *Nagy 2012*, 365–377, fig. 8: 1). The associated settlement started much earlier, during Tessin A, which can be correlated with Ha D1 (*Nagy 2012*, 361–364). The chronological discrepancy may suggest that the full extent of the burial ground has not yet been recorded.

¹ Owing to the early excavation of the graveyard, the exact number of burials is unknown.

	Lombardy De Marinis 1981	Tessin/Misox Nagy 2012	Central Europe Nagy 2012
1000 BCE	Ascona II	Protogolasecca II	Ha B1
	Protogolasecca Tipo Ca Morta – Malpensæ	Protogolasecca III	Ha B2
900 BCE	G I A1	G I A1	Ha B3
800 BCE	G I A2	G I A2	Ha C
700 BCE	G I B	G I B	
	G I C	G I C	
600 BCE	G II A	Tessin A	Ha D1
	G II A/B	Tessin B	Ha D2
500 BCE	G II B	Tessin C	Ha D3
	G III A1	Tessin D1	Lt A
	G III A2	Tessin D2	
400 BCE	G III A3	Lt B1	Lt B1
	G III B	Lt B2	Lt B2
300 BCE		Lt C1	Lt C1
200 BCE		Lt C2	Lt C2
		Lt D1	Lt D1a
100 BCE		Lt D2	Lt D1b
			Lt D2a
10 BCE			Lt D2b

Fig. 2. Relative chronology of the Golasecca culture in Lombardy, Ticino/Mesolcina and Central Europe (cf. Nagy 2012, fig. 8: 1).

THE DISCOVERY OF THE CAULDRON GRAVE AT CASTANEDA

In June 2021, the Archaeological Services of Canton Grisons (ADG) carried out archaeological investigations in the Via a la Mota, just south of the church and right at the heart of the known Iron Age cemetery. The excavations yielded four Iron Age graves: two cist graves belonging to phases Tessin D2 and Lt C1 respectively, a third, severely damaged, probably dating from phase Lt B2, and grave 1/2021, which will be discussed in more detail here.

Only about 0.5 m below the surface (Fig. 3) an almost square pit emerged, surrounded by stone slabs and containing a rare cremation burial. Evidence of the incineration burial rite is highly unusual in the Castaneda cemetery; grave 1/2021 is only the second cremation burial to have been found so far.² The grave goods had been deposited in the north-western half of the small tomb, while the cremated bones had been scattered in its south-eastern half (Fig. 4). The most outstanding of the various grave goods was an entirely preserved cauldron with cross-shaped attachments. Associated with a bronze cup and a ceramic beaker, it was part of a set of vessels often observed in funeral contexts of the Golasecca culture, consisting of a large container, a scoop, and a drinking vessel (Nagy 2012, 338).



Fig. 3. Uncovering of grave 1/2021 and the cauldron with cross-shaped attachments from Castaneda (photo: ADG).



Fig. 4. Grave 1/2021. Grave plan and distribution of the grave goods (photo & graphics: ADG).

² In the Val Mesolcina and Sopraceneri regions, inhumation burials were the norm from phase Tessin C (Ha D3) onwards, while in the Sottoceneri region and Lombardy, cremation burials were most common (Della Casa *et al.* 2010, 352). Of the over 200 graves published by P. Nagy, only the female grave 68, dating from Tessin D2 (Lt A), has so far been identified as a cremation burial.

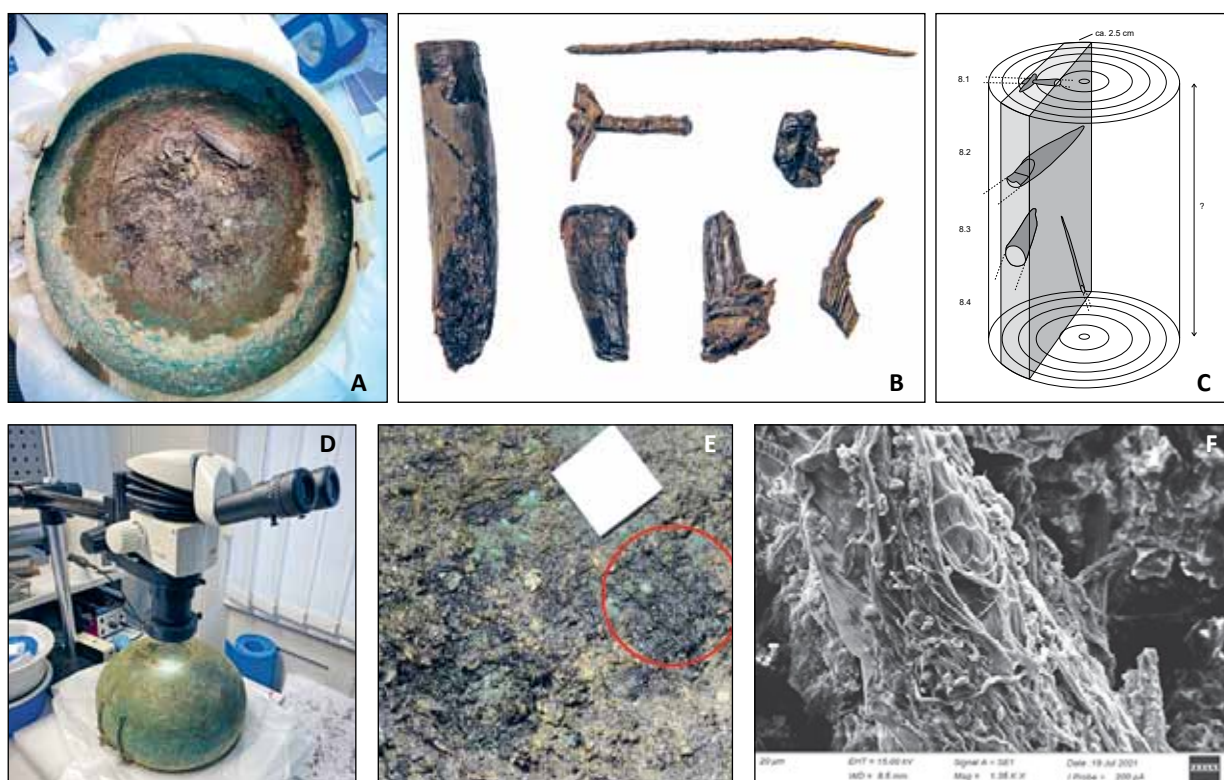


Fig. 5. Scientific analysis of the Castaneda cauldron. A – wood and organic residues at the bottom of the cauldron; B – detail of the preserved wood with tool marks; C – reconstruction of the wooden board (lid); D – analysis of textile/leather residues; E – macroscopic evidence of sheep wool on the cauldron; F – microscopic evidence of sheep wool on the cauldron (photos A–D: ADG; E–F: A. Rast-Eicher).

Grave goods and their positions in the grave

The ceramic beaker, of Nagy's Type 1c (Tessin B–C; Nagy 2012, 260, fig. 4: 73), was placed upside down to the west of the bronze cauldron, while the scoop, a single-handled bronze cup known as a *capeduncola*, was placed to the south of it. Remains of wood both above and below the *capeduncola* suggested that it had once stood on a wooden board and had a wooden cover. The cauldron had also originally stood on a wooden board. Five identical serpentine fibulae completed the ensemble. One lay under the cauldron, three lay between the cauldron and the *capeduncola*, and a fifth was deposited with an iron knife to the east of the cauldron.

Dating of the grave

The fibulae belong to Type 3 of the serpentine fibulae defined by P. Nagy for Castaneda and date the grave to local phase Tessin C, i.e. Ha D3 (Nagy 2012, 106).³ The poorly preserved *capeduncola*, made of thin bronze sheet,⁴ belongs to a well-known type from Northern Italy (De Marinis 1981, 24–205; Nagy 2012, 221, fig. 4: 52) dating to G III A 1, i.e. Ha D3 (Fig. 2). It has an everted rim, a high, almost vertical neck and a dome shaped body. On the neck, an incised decoration is preserved: at least four horizontal lines, between which patterned bands composed of bundles of strokes, hanging triangles and slash hatches are recognisable. A good parallel was found in grave 81 at Castaneda itself, which dates the same period as grave 1/2021 (Nagy 2012, 745, pl. 71: 511). Interestingly, the handle of our *capeduncola* does not have

³ According to Nagy's seriation of the Castaneda graves, types 2 and 3 of the serpentine fibulae represent an early stage (C1) of the phase Ticino C (Nagy 2012, 346, fig. 6: 3).

⁴ Because of its fragile state of preservation, a thorough analysis and documentation of the bronze scoop has not yet been possible. At the time of writing, it is in the process of conservation at the HE-Arc in Neuchâtel, Switzerland.



Fig. 6. The Castaneda cauldron (photo: ADG).

a cruciform attachment like other specimens of the type but tapers to a point like a willow leaf. A cup from Este, Benvenuti grave 116, dating from Lt A, has a similar attachment (*Capius/Chieco Bianchi* 2006, 251, pl. 130: 16).

Scientific analyses

During conservation, a thin layer of organic residue and fragments of wood (Fig. 5: A, B) were found in the bottom of the cauldron. The wood was identified as branches of spruce. Processing marks were detected on some of the fragments (Fig. 5: B), which had originally been part of a 3 cm-thick board, presumably used as a lid (Fig. 5: C). Radiocarbon dating of one of the fragments confirmed that the wood was contemporary with the burial and not secondary material introduced later on.⁵

Furthermore, remains of sheep wool were detected, not only in the bottom and on the outside of the cauldron (Fig. 5: D–F), but also on the scoop, the three fibulae deposited between the scoop and the cauldron, and the fibula under the cauldron. By contrast, no remains of wool were found on the knife and the fibula next to it. This suggests that the drinking service had been wrapped in a sheepskin and fastened with four fibulae before being deposited, while the personal accoutrements of the deceased were placed directly in the grave.

THE CAULDRON FROM GRAVE 1/2021 AT CASTANEDA

The completely preserved cauldron, with cross-shaped attachments (Fig. 6), has semi-circular twisted handles. The handle ends are bent into hooks with S-shaped extensions and hemispherical knobs on the tips (Fig. 7: C). The four single handle attachments, mounted pairwise (Fig. 7: B), are undecorated. Each is fixed to the body of the cauldron by three rivets with conical heads. In cross-section, their eyelets are diamond-shaped, their central branches trapezoidal, and their flat arms and lower ends triangular. The arm of one of the crosses has a semi-circular recess (Fig. 7: E) – either a false hole or a casting defect.

The rounded body of the vessel is 15.8 cm high and measures 27.6 cm in diameter at the narrowest point (where the handles are mounted) and 29.6 cm at the widest. The retracting rim is slightly thicker than the rest of the body. A recessed, flat bottom, with a diameter of 8.6 cm, provides stability (Fig. 7: A). Several dents on the body and stress marks on the handles (Fig. 7: D) are proof of intensive use. In addition, the vessel had been patched with a 1 × 2.5 cm metal plate attached to the outside (Fig. 7: A).

An elaborate geometric frieze is incised below the rim of the vessel, composed of 13 horizontal lines and groups of oblique and vertical strokes (Fig. 8). At the top of the frieze, an initial blank band is followed by a band filled with simple, oblique hatching lines. The hatching lines are set at more-or-less regular intervals, running from upper right to lower left. The bottom of the frieze is marked by a band of hanging triangles, each filled with three inscribed lines converging at the point. These outer bands frame the central, seven-band-wide ornamentation consisting of three ingeniously interlaced, continuous, crenelated meanders (*Zinnenmäander*). Rectangular areas filled with a zig-zag pattern form the horizontal lines of the meanders, while the verticals consist of bundles of three vertical strokes, each running across three bands. The upper meander consists of broad merlons and narrow crenels, the middle meander of uniform merlons and crenels, and the lower meander of narrow merlons and broad crenels. The filler spaces above the crenels of the uppermost row and below the merlons of the lowermost row are filled by four centrally inscribed slashes. These filler spaces combined with the prominent vertical lines of the interlaced meander bands form a second pattern, namely a stepped wavy band that appears superimposed over the meanders.

The decoration is best preserved near the cross-shaped attachments (Fig. 7: E); towards the centre of the cauldron, the decoration had been heavily abraded. Constant maintenance and cleaning probably caused the fine, incised decoration at the easily reachable centre of the container to disappear over time, while the area around the handle attachments was less carefully and intensively cleaned. This, and the overall condition of the vessel, show that it had been in use, carefully treated and maintained, for a long period, possibly several generations.

⁵ Sample BE-17211.1.1 2464 ±26 BP, 758–420 BC, cal. 2 sigma.

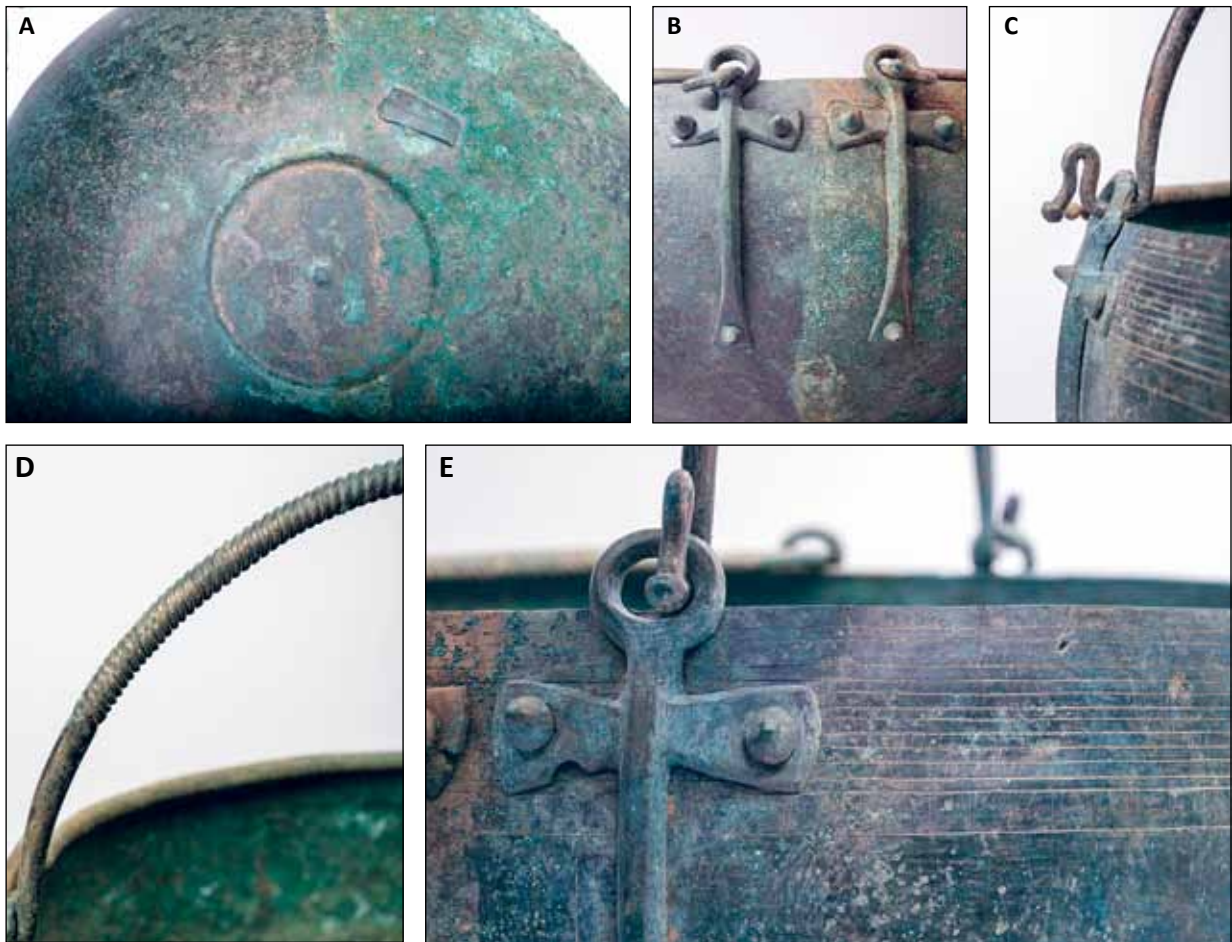


Fig. 7. Details of the Castaneda cauldron. A – bottom of the cauldron with patch; B – cross-shaped attachments, only the left one has been restored; C – handle hook with S-shaped extension and hemispherical knob on the tip; D – twisted handle and stress marks; E – the ornamentation on the rim was best preserved next to the handle attachments (photo: ADG).

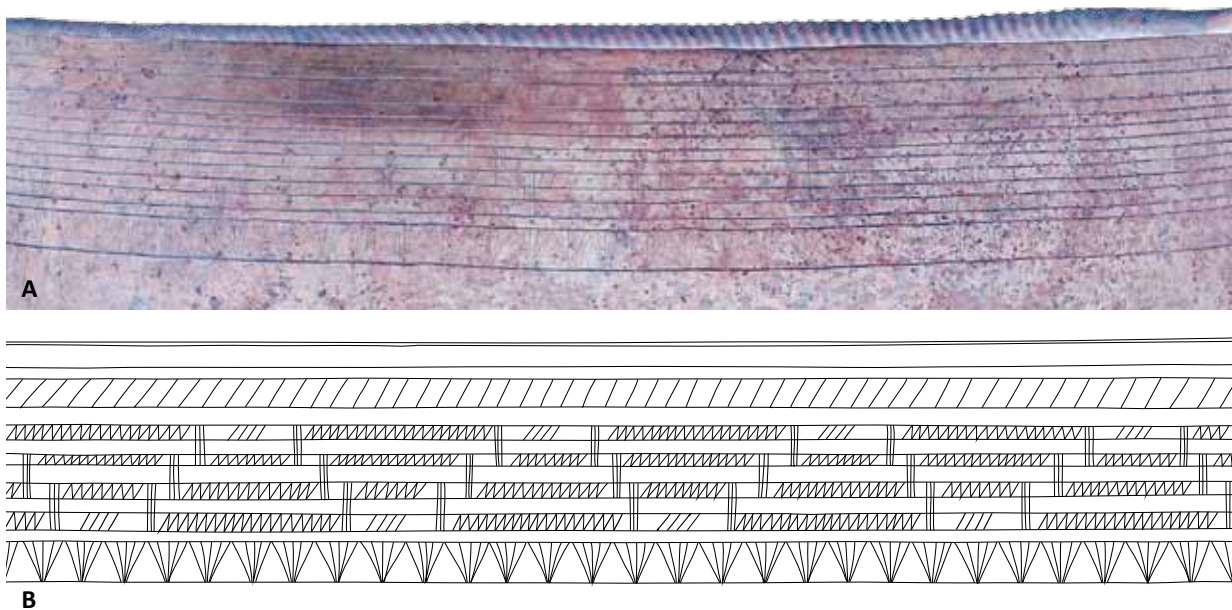


Fig. 8. A – false-colour picture of the ornamentation on the cauldron's rim; B – reconstruction of the decorative pattern (photo & graphics: ADG).

SPATIAL ANALYSIS OF VON MERHART'S TYPE C CAULDRONS

Research history

The cauldron belongs to Type C of cauldrons with cross-shaped attachments, as defined by Gero von Merhart in 1952 (*Merhart 1969*, 286, 298–300, map 1). At the time, von Merhart listed 63 specimens and recognised the southern groups of the Eastern Hallstatt culture as the main producing agents. Cauldrons of Type C arrived in Central Europe from the Eastern Alps during periods Ha C and Ha D. Von Merhart's distribution map shows them loosely dispersed from the Balaton region to the source of the Seine. Markus Egg added some 30 specimens to von Merhart's list and pointed out that, besides the main distribution centre in modern Slovenia, another minor one existed in Northern Venetia (*Egg 1985*, 373–377, fig. 40; 1996, 100–102, fig. 58). B. Teržan (1998, 525, 526, fig. 9) postulated a shift of the production area from the Styrian-South Pannonian Group in Ha C–Ha D1 to the Dolenjsko Group in Ha D2–Ha D3.

The typological development of the cauldrons with cross-shaped attachments is still not clear. They are found almost exclusively in grave contexts, whose dates span the whole of the Hallstatt period, i.e. approximately 300 years. In 1991, in his unfortunately unpublished dissertation on ancient Venetic bronze production, Ralf Schwarz tried to classify the cauldrons by their handle attachments (*Schwarz 1991*, 234–253).⁶ Based on antiquarian and archaeological observations, he was able to identify different possible workshops and formulate some theories about their chronological development. In his view (*Schwarz 1991*, 253), cauldrons with single handle attachments (mounted in pairs) were older than those with twin attachments, the latter not appearing before Ha D1, while the cauldrons' decoration, based mainly on meanders, evolved from complex patterns, requiring considerable time to execute, to simpler forms, eventually consisting of no more than single bands of hatching and triangles; the very last cauldrons simply had horizontal lines around the rims or remained undecorated.

Method and data

The aim of our study was to verify Schwarz's conclusions by conducting spatio-temporal and statistical analyses. For this purpose, we compiled a database, from the available literature, of 134 specimens of Type C cauldrons, originating from 72 sites, spread over 12 countries (Table 1).⁷ We grouped the specimens into ten feature combinations, based on combinations of the type of the cross-shaped attachment and the type of ornamentation on the rim: cauldrons with single attachments combined with (1) checkerboard patterns,⁸ (2) meanders, (3) lines, (4) triangles and (5) no decoration; cauldrons with twin attachments combined with (6) meanders, (7) lines, (8) triangles and (9) no decoration; and finally, cauldrons with an indeterminate form of attachment and/or decoration (10). On the timeline, the cauldrons were separated into three groups: early (Ha C), middle (Ha D1–Ha D2)⁹ and late (Ha D3–Lt A).

Major problems and data biases hampering the study were related to the dating of the objects. More than half of the cauldrons, namely 73 specimens, could not be dated directly, either because they were found without other dating material, or because of missing documentation; after all, a huge proportion of the cauldrons originates from old excavations.¹⁰ Moreover, a fairly large discrepancy between the time of production and the time of deposition of the cauldrons, especially those found outside the supposed production areas in Italy and Slovenia, was to be expected. Found almost exclusively in high-ranking grave inventories,

⁶ As he himself admitted, this was a stopgap solution, since in the case of a vast number of finds from Venetic territory only the cauldron attachments were preserved.

⁷ M. Egg listed 82 cauldrons (*Egg 1985*, 373–376) and added a further seven in 1996 (*Egg 1996*, 101). B. Teržan contributed another seven specimens (*Teržan 1998*, 525). Since then, in addition to the cauldron from Castaneda/CH, four specimens have been discovered at Verucchio/IT, two at Aigen im Ennstal/AT and one each at Niederrasen/IT, Stari Kostolac/RS and Szurdokpüspöki/HU, cf. literature in Table 1. The remainder were added based on Schwarz's typology of the attachments from Venetic cauldrons (*Schwarz 1991*, 234–253) and represent a minimum count of these vessels.

⁸ This ornament is also found on the older Urnfield cauldrons of von Merhart's Type B. On the Type C cauldrons, it is only found in combination with single attachments.

⁹ Specimens dating from Ha D in general were included in this phase.

¹⁰ For example, most of the Venetic specimens and the cauldrons from Magdalenska gora and Stična originated from mixed up grave inventories from the excavations by the Duchess of Mecklenburg in the early 1900s. The latter contributed to a vivid and ongoing discussion on the chronology of the Early Iron Age in Slovenia (*Božič 2010; 2016; Gabrovec et al. 2006; 2010; Tecco Hvala 2012; Tecco Hvala/Dular/Kocuvan 2004*).

Table 1. List of Type C cauldrons with cross-shaped attachments.

N°	Country	Location	Lat. wgs84	Lon. wgs84	Context	Attachments	Ornaments	Feature combination	Group_phase	Phase	Reference
1	Austria	Bernhardthal	48.693	16.869	unknown	single attachments	indet	10	indet	indet	<i>Prüssing 1991</i> , 73, No. 259, pl. 68
2	Austria	Hallstatt	47.554	13.646	grave	single attachments	meander	2	early (Ha C)	Ha C1	<i>Kroner 1959</i> , 132, 133, pl. 113: 1
3	Austria	Hallstatt	47.554	13.646	grave	double attachments	lines	7	middle (Ha D/Ha D1–D2)	Ha D	<i>Kroner 1959</i> , 146, pl. 126: 2
4	Austria	Helpfau-Uttendorf	48.154	13.117	grave	double attachments	lines	7	middle (Ha D/Ha D1–D2)	Ha D2	<i>Egg 1985</i> , 373–377, fig. 27: 40
5	Austria	Helpfau-Uttendorf	48.154	13.117	grave	double attachments	lines	7	middle (Ha D/Ha D1–D2)	Ha D2	<i>Egg 1985</i> , 373–377, fig. 27: 40
6	Austria	Hof i. Leithageb	47.944	16.576	grave?	single attachments	meander	2	indet	indet	<i>Kubitschek 1911</i> , 243, fig. 24
7	Austria	Kleinklein	46.740	15.430	grave	single attachments	meander	2	early (Ha C)	Ha C2	<i>Dobiat 1980</i> , 203, pl. 2: 7
8	Austria	Kleinklein	46.740	15.430	grave	double attachments	meander	6	middle (Ha D/Ha D1–D2)	Ha D1	<i>Hack 2002</i> , 115, 116, fig. 23; pl. 1; <i>Hebert 1991</i> , 41, 42, fig. 9
9	Austria	Kleinklein	46.740	15.430	grave	double attachments	lines	7	middle (Ha D/Ha D1–D2)	Ha D2	<i>Egg/Kramer 2005</i> , 33, fig. 28
10	Austria	Kulm bei Aigen	47.523	14.141	grave	single attachments	meander	2	middle (Ha D/Ha D1–D2)	Ha D1	<i>Artner 2012</i> , 69, 70, fig. 19; pl. 4; 5: 15–18
11	Austria	Kulm bei Aigen	47.523	14.141	grave	single attachments	meander	2	middle (Ha D/Ha D1–D2)	Ha D1	<i>Artner 2012</i> , 69, 70, fig. 19; pl. 4; 5: 15–18
12	Austria	Pfaffstetten	48.015	16.261	grave?	double attachments	meander	6	indet	indet	<i>Kyrle 1924</i> , XXVI, fig. 16
13	Austria	Ramingstein	47.075	13.836	unknown	unknown	indet	10	indet	indet	<i>Merhart 1969</i> , 372
14	Austria	Strettweg	47.176	14.659	grave	unknown	indet	10	middle (Ha D/Ha D1–D2)	Ha D1	<i>Egg 1996</i> , 100–102, fig. 54: 5–9; pl. 26: 5–9
15	Austria	Waisenberg	46.705	14.563	grave	unknown	indet	10	late (Ha D3–Lt A)	Ha D3	<i>Glückscher 1994</i> , 47
16	Croatia	Beram	45.256	13.898	grave	double attachments	triangles (various)	8	indet	indet	<i>Merhart 1969</i> , 372; <i>Mladin 1974</i> , 125, 126, pl. 30: 7
17	Croatia	Beram	45.256	13.898	grave	double attachments	triangles (various)	8	indet	indet	<i>Merhart 1969</i> , 372; <i>Mladin 1974</i> , 125, 126, pl. 30: 7
18	Croatia	Goričan	46.386	16.680	grave	unknown	indet	10	indet	indet	<i>Vidović 1984</i> , 97
19	Croatia	Nesactium	44.917	13.969	grave	single and double attachments	no ornaments	10	indet	indet	<i>Mladin 1974</i> , 99, 100, grave 12, No. 48, pl. 11: 1; 45: 3, 3a
20	Croatia	Nesactium	44.917	13.969	grave	single attachments	triangles (various)	4	indet	indet	<i>Mladin 1974</i> , 100, grave 12, No. 49, pl. 11: 2; 46: 1, 1a
21	Croatia	Nesactium	44.917	13.969	grave	double attachments	no ornaments	9	indet	indet	<i>Mladin 1974</i> , 100, grave 12, No. 50, pl. 11: 3; 46: 2
22	Croatia	Nesactium	44.917	13.969	grave	double attachments	lines	7	indet	indet	<i>Mladin 1974</i> , 100, 101, grave 12, No. 51, pl. 12: 1; 46: 3
23	Croatia	Nesactium	44.917	13.969	grave	unknown	meander	10	indet	indet	<i>Mladin 1974</i> , 101, grave 12, No. 52, pl. 45: 6, 6a
24	Croatia	Nesactium	44.917	13.969	grave	unknown	meander	10	indet	indet	<i>Mladin 1974</i> , 101, grave 12, No. 53, pl. 12: 3
25	Croatia	Nesactium	44.917	13.969	grave	double attachments	indet	10	indet	indet	<i>Mladin 1974</i> , 109, 110, grave unknown, Nos. 10, 11, pl. 17: 4, 5; 64: 5, 8
26	Croatia	Picuge	45.197	13.648	grave	single attachments	triangles (various)	4	indet	indet	<i>Mladin 1974</i> , 121, pl. 64: 4, 6, 7; <i>Starč 1955</i> , 157, pl. 37: 1
27	Croatia	Picuge	45.197	13.648	grave	single attachments	triangles (various)	4	indet	indet	<i>Mladin 1974</i> , 121, pl. 64: 4, 6, 7; <i>Starč 1955</i> , 157, pl. 37: 1
28	Croatia	Picuge	45.197	13.648	grave	double attachments	no ornaments	9	early (Ha C)	Ha C	<i>Mladin 1974</i> , 113, grave 19, No. 5, pl. 12: 2; 44: 4

Table 1. Continuation.

Nr	Country	Location	Lat_wgs84	Lon_wgs84	Context	Attachments	Ornaments	Feature combination	Group_phase	Phase	Reference
29	Croatia	Piçuge	45.197	13.648	grave	single attachments	lines	3	early (Ha C)	Ha C	<i>Mladin 1974</i> , 113, grave 19, No. 6, pl. 22: 2; 60: 1, 1a, 121, grave 19, Nos. 29–31, pl. 29: 4; 64: 4, 6, 7
30	Croatia	Piçuge	45.197	13.648	grave	single attachments	checkerboard	1	indet	indet	<i>Mladin 1974</i> , 110, grave 4, pl. 22: 1; 54; <i>Staré 1955</i> , 157, pl. 37: 2
31	Croatia	Sv. Petar Ludbreški	46.255	16.694	grave	single attachments	indet	10	middle (Ha D/Ha D1–D2)	Ha D	<i>Balen-Letunić 1984</i> , 69–71, pl. 1: 1
32	Czech Republic	Býčí skála cave	49.307	16.694	deposition	double attachments	lines	7	middle (Ha D/Ha D1–D2)	Ha D2	<i>Hallstatt a Býčí skála 1969</i> , 84, pl. 4
33	Czech Republic	Červené Poříčí-Svíhov	49.501	13.295	grave?	single attachments	meander	2	middle (Ha D/Ha D1–D2)	Ha D2	<i>Smolík 1886</i> , 194–196, pl. 9: 11
34	Czech Republic	Nymburk	50.186	15.044	unknown	double attachments	no ornaments	9	indet	indet	<i>Kytlicová 1991</i> , 111, 112, No. 76, pl. 15
35	France	Bouranton	48.311	4.180	grave	single attachments	triangles (various)	4	late (Ha D3–Lt A)	Ha D3–Lt A	<i>Verbrughe/Villes 1995</i> , 46, 47
36	France	Buchères	48.238	4.114	unknown	double attachments	no ornaments	9	indet	indet	<i>Gaudron 1956</i> , 192–194, fig. 2
37	France	Cravant	47.685	3.689	unknown	double attachments	meander	6	indet	indet	<i>Gaudron 1956</i> , 192–194, fig. 1
38	France	Estissac	48.271	3.803	grave	double attachments	triangles (various)	8	late (Ha D3–Lt A)	Ha D3–Lt A	<i>Deffressigne/Villes 1995</i> , 60, fig. A 3: 09
39	France	Poiseul-La-Ville-La Perrière	47.577	4.682	grave	single attachments	meander	2	early (Ha C)	Ha C1	<i>Chaume/Feugère 1990</i> , fig. 5: 5; <i>Joffroy/Paris 1973</i> , 221–223, fig. 5: 6: 2
40	Germany	Aislingen	48.505	10.455	grave	single attachments	checkerboard	1	middle (Ha D/Ha D1–D2)	Ha D1–2	<i>Jacob 1995</i> , 85, No. 230; <i>Kossack 1959</i> , 141, pl. 38: 5; <i>Schwarz 1991</i> , 243
41	Germany	Asperg	48.904	9.144	grave	double attachments	indet	10	middle (Ha D/Ha D1–D2)	Ha D	<i>Jacob 1995</i> , 85, No. 234; <i>Zürn 1970</i> , 21, pl. 12
42	Germany	Bargen, Engen (Konstanz)	47.883	8.764	grave	double attachments	meander	6	early (Ha C)	Ha C2	<i>Jacob 1995</i> , 85, No. 231
43	Germany	Friedrichsfeld	49.440	8.575	grave	single attachments	meander	2	early (Ha C)	Ha C2	<i>Jacob 1995</i> , 85, No. 232; <i>Neilissen 1975</i> , 190, pl. 5
44	Germany	Herbertingen-Hundersingen	48.077	9.399	grave	double attachments	meander	6	early (Ha C)	Ha C?	<i>Jacob 1995</i> , 84, No. 227; <i>Schiek 1957</i> , 141 pl. 24: 1
45	Germany	Mendingen-Ihringen	48.043	7.647	grave	double attachments	lines	7	middle (Ha D/Ha D1–D2)	Ha D2	<i>Jacob 1995</i> , 84, No. 228; <i>Thomas 1982</i> , 69–71, fig. 2
46	Germany	Mössingen-Beisen	48.394	9.037	grave	unknown	meander	10	early (Ha C)	Ha C2	<i>Jacob 1995</i> , 85, No. 233; <i>Merhart 1969</i> , 372, pl. 49: 2
47	Germany	Rehling	48.486	10.923	grave	single attachments	meander	2	middle (Ha D/Ha D1–D2)	Ha D	<i>Jacob 1995</i> , 84, 85, No. 229; <i>Kossack 1959</i> , 188, pl. 49: 2
48	Hungary	Ártánd	47.126	21.758	grave	double attachments	no ornaments	9	late (Ha D3–Lt A)	Ha D3	<i>Párducz 1965</i> , 149, pl. 4: 5; <i>Patay 1990</i> , 30, No. 32, pl. 24
49	Hungary	Regőly	46.578	18.389	unknown	double attachments	no ornaments	9	indet	indet	<i>Párducz 1965</i> , 219, pl. 24: 1; <i>Patay 1990</i> , 30, No. 33, pl. 24
50	Hungary	Somlószőlös	47.175	17.352	grave?	single attachments	triangles (various)	4	middle (Ha D/Ha D1–D2)	Ha D2	<i>Bakay/Kalicz/Sági 1970</i> , 197, fig. 57: 9; <i>Patay 1990</i> , 30, 31, No. 34, pl. 25
51	Hungary	Szurdokpüspöki	47.976	19.698	grave	single attachments	indet	10	late (Ha D3–Lt A)	Ha D3–Lt A	<i>Tankó 2015</i> , 438, 439, fig. 2: 1
52	Hungary	Vaskeresztes	47.196	16.450	grave	unknown	triangles (various)	10	early (Ha C)	Ha C2	<i>Fekete 1985</i> , 33–35

Table 1. Continuation.

N°	Country	Location	Lat_wgs84	Lon_wgs84	Context	Attachments	Ornaments	Feature combination	Group_phase	Phase	Reference
53	Italy	Asolo	45.796	11.913	unknown	single attachments	meander	2	indet	indet	<i>Notizie degli Scavi</i> 1883, 118–120; <i>Schwarz</i> 1991, 236, 237, No. 264
54	Italy	Asolo	45.796	11.913	unknown	single attachments	meander	2	indet	indet	<i>De Fogolari</i> 1980, 95, pl. 4; c; <i>Notizie degli Scavi</i> 1883, 118–120; <i>Schwarz</i> 1991, 236, 237, No. 264
55	Italy	Belluno province	46.140	12.216	unknown	single attachments	meander	2	indet	indet	<i>Schwarz</i> 1991, Nos. 290, 291, 293, 299, 300, 304, 305
56	Italy	Belluno province	46.140	12.216	unknown	single attachments	meander	2	indet	indet	<i>Schwarz</i> 1991, Nos. 290, 291, 293, 299, 300, 304, 305
57	Italy	Belluno province	46.140	12.216	unknown	single attachments	meander	2	indet	indet	<i>Schwarz</i> 1991, Nos. 290, 291, 293, 299, 300, 304, 305
58	Italy	Belluno province	46.140	12.216	unknown	single attachments	meander	2	indet	indet	<i>Schwarz</i> 1991, Nos. 290, 291, 293, 299, 300, 304, 305
59	Italy	Castel Novo	45.616	11.463	unknown	double attachments	triangles (various)	8	indet	indet	<i>Laviosa Zambotti</i> 1938, 384, 385, fig. 152; <i>Merhart</i> 1969, 372, pl. 29; 9
60	Italy	Cavarzano	46.147	12.216	grave?	single attachments	triangles (various)	4	indet	indet	<i>Notizie degli Scavi</i> 1883, 37, 38; <i>Schwarz</i> 1991, Nos. 266, 270, 271
61	Italy	Cavarzano	46.147	12.216	grave?	single attachments	meander	2	indet	indet	<i>Notizie degli Scavi</i> 1883, 37, 38; <i>Schwarz</i> 1991, No. 265
62	Italy	Cavarzano	46.147	12.216	grave?	single attachments	meander	2	indet	indet	<i>Notizie degli Scavi</i> 1883, 37, 38; <i>Schwarz</i> 1991, No. 303
63	Italy	Cavarzano	46.147	12.216	grave?	single attachments	no ornaments	5	indet	indet	<i>Notizie degli Scavi</i> 1883, 37, 38; <i>Schwarz</i> 1991, Nos. 283–285
64	Italy	Cavarzano	46.147	12.216	grave?	single attachments	no ornaments	5	indet	indet	<i>Notizie degli Scavi</i> 1883, 37, 38; <i>Schwarz</i> 1991, No. 289
65	Italy	Cavarzano	46.147	12.216	grave?	single attachments	no ornaments	5	indet	indet	<i>Notizie degli Scavi</i> 1883, 37, 38; <i>Schwarz</i> 1991, Nos. 292, 294–298
66	Italy	Cavarzano	46.147	12.216	grave?	single attachments	no ornaments	5	indet	indet	<i>Notizie degli Scavi</i> 1883, 37, 38; <i>Schwarz</i> 1991, Nos. 271, 273, 275
67	Italy	Cavarzano	46.147	12.216	grave?	single attachments	no ornaments	5	indet	indet	<i>Notizie degli Scavi</i> 1883, 37, 38; <i>Schwarz</i> 1991, Nos. 277–281, 308–310.
68	Italy	Ellen	46.779	11.839	unknown	double attachments	indet	10	indet	indet	<i>Lunz</i> 1974, 160, pl. 45; 3
69	Italy	Lozzo di Cadore	46.486	12.446	grave	single attachments	indet	10	indet	indet	<i>Notizie degli Scavi</i> 1883, 67
70	Italy	Lozzo di Cadore	46.486	12.446	grave	single attachments	indet	10	indet	indet	<i>Notizie degli Scavi</i> 1883, 67
71	Italy	Lozzo di Cadore	46.486	12.446	grave	single attachments	indet	10	indet	indet	<i>Notizie degli Scavi</i> 1883, 67
72	Italy	Lozzo di Cadore	46.486	12.446	grave	single attachments	indet	10	indet	indet	<i>Notizie degli Scavi</i> 1883, 67
73	Italy	Mel	46.065	12.098	grave	double attachments	lines	7	late (Ha D3–Lt A)	Lt A	<i>De Fogolari</i> 1980, 95, pl. 5; a; <i>Schwarz</i> 1991, 250, No. 316
74	Italy	Mel	46.065	12.098	grave?	single attachments	meander	2	indet	indet	<i>Schwarz</i> 1991, 244, 245, No. 288
75	Italy	Mel	46.065	12.098	grave?	single attachments	meander	2	indet	indet	<i>Schwarz</i> 1991, 248, No. 301
76	Italy	Mel	46.065	12.098	grave?	single attachments	meander	2	indet	indet	<i>Schwarz</i> 1991, 249, No. 311
77	Italy	Montebelluna	45.778	12.042	grave	single attachments	meander	2	early (Ha C)	Ha C2	<i>De Fogolari</i> 1980, 95; <i>Schwarz</i> 1991, 241, 242, No. 282
78	Italy	Montebelluna	45.778	12.042	grave	unknown	triangles (various)	10	indet	indet	<i>De Fogolari</i> 1980, 95; <i>Schwarz</i> 1991, 249, Nos. 306, 312–315
79	Italy	Montebelluna	45.778	12.042	grave	unknown	triangles (various)	10	indet	indet	<i>De Fogolari</i> 1980, 95; <i>Schwarz</i> 1991, 249, Nos. 306, 312–315
80	Italy	Niederrassen	46.773	12.038	grave	single attachments	lines	3	middle (Ha D/Ha D1–D2)	Ha D1–2	<i>Demetz/Lunz/Brunner Renzler</i> 1997, 51, fig. p. 9; 21.
81	Italy	Padua	45.413	11.875	grave	single attachments	checkerboard	1	early (Ha C)	Ha C1	<i>Chieco Bianchi/Garbsch</i> 1978, 87, pl. 20; 22; 25; <i>Schwarz</i> 1991, 236, 237, No. 263, 242, 243, No. 286

Table 1. Continuation.

Nr	Country	Location	Lat_wgs84	Lon_wgs84	Context	Attachments	Ornaments	Feature combination	Group_phase	Phase	Reference
82	Italy	Padua	45.413	11.875	grave	single attachments	checkerboard	1	early (Ha C)	Ha C1	<i>Chieco Bianchi/Garbsch 1978, 87, pl. 20; 22; 25; Schwarz 1991, 236, 237, Nos. 263; 242, 243, No. 286</i>
83	Italy	Trentino province	46.055	11.125	unknown	double attachments	lines	7	indet	indet	<i>Merhart 1969, 372, pl. 29: 7</i>
84	Italy	Verucchio	43.983	12.423	grave	single attachments	indet	10	early (Ha C)	Ha C2	<i>Eles 2015, Seriation, Type 173, grave 48/1972</i>
85	Italy	Verucchio	43.983	12.423	grave	single attachments	indet	10	early (Ha C)	Ha C2	<i>Eles 2015, Seriation, Type 173, grave 12/2005.</i>
86	Italy	Verucchio	43.983	12.423	grave	single attachments	indet	10	early (Ha C)	Ha C2	<i>Eles 2015, Seriation, Type 173, grave 25/2005</i>
87	Italy	Verucchio	43.983	12.423	grave	single attachments	indet	10	early (Ha C)	Ha C2	<i>Eles 2015, Seriation, Type 173, grave 35/2005</i>
88	Netherlands	Venlo	51.370	6.149	unknown	single attachments	lines	3	indet	indet	<i>Roymans 1991, 42, 43, fig. 15: a</i>
89	Serbia	Stari Kostolac	44.716	21.172	single find	double attachments	meander	6	indet	indet	<i>Jacanović 1995, 101, 102, Cat. No. 2, fig. 3</i>
90	Slovakia	Bratislava (Pozsony)	48.217	17.407	unknown	unknown	indet	10	indet	indet	<i>Merhart 1969, 372</i>
91	Slovenia	Dolenjske Toplice	45.754	15.062	grave	double attachments	no ornaments	9	late (Ha D3–Lt A)	Ha D3–Lt A	<i>Teržan 1976, 401, pl. 30: 10</i>
92	Slovenia	Dolenjske Toplice	45.754	15.062	grave	double attachments	triangles (various)	8	late (Ha D3–Lt A)	Ha D3–Lt A	<i>Starč 1955, 143, pl. 28: 5; Teržan 1976, 402, pl. 38: 1</i>
93	Slovenia	Gornja Radgona	46.677	15.991	grave	unknown	indet	10	indet	indet	<i>Teržan 1990, 87, 88, 342, 343</i>
94	Slovenia	Legen	46.502	15.109	grave	unknown	triangles (various)	10	early (Ha C)	Ha C	<i>Strmčnik-Gulič 1979, pl. 5: 10</i>
95	Slovenia	Libna	45.954	15.522	grave	double attachments	lines	7	indet	indet	<i>Guštin 1976, 46, pl. 77: 1; Starč 1955, 144, pl. 28: 4</i>
96	Slovenia	Magdalenska gora	45.980	14.634	grave	single attachments	triangles (various)	4	middle (Ha D/Ha D1–D2)	Ha D1–2	<i>Prelboge, grave 2/13; Gabrovec 1963, pl. 15: 2; Gabrovec et al. 2010, 215, 216; Kromer/Gabrovec 1962, 2; Tecco Hvala/Dulari Kocuvan 2004, 129, pl. 24: 11</i>
97	Slovenia	Magdalenska gora	45.980	14.634	grave	double attachments	no ornaments	9	late (Ha D3–Lt A)	Ha D3	<i>Barrow 4, grave 32; Hencken 1978, 23 pl. 72: n</i>
98	Slovenia	Magdalenska gora	45.980	14.634	grave	single and double attachments	no ornaments	10	late (Ha D3–Lt A)	Ha D3–Lt A	<i>Laščik, grave 5/6-7-7a; Gabrovec et al. 2010, 216–218; Hencken 1978, 30, 31, pl. 110: d</i>
99	Slovenia	Magdalenska gora	45.980	14.634	grave	single attachments	triangles (various)	4	late (Ha D3–Lt A)	Ha D3–Lt A	<i>Laščik, grave 5/29; Gabrovec et al. 2010, 216–218; Hencken 1978, 36–38, pl. 136: c</i>
100	Slovenia	Magdalenska gora	45.980	14.634	grave	single attachments	no ornaments	5	late (Ha D3–Lt A)	Ha D3–Lt A	<i>Laščik, grave 5/29; Gabrovec et al. 2010, 216–218; Hencken 1978, 36–38, pl. 136: c, d</i>
101	Slovenia	Magdalenska gora	45.980	14.634	grave	single attachments	lines	3	indet	indet	<i>Starč 1955, 143, pl. 28: 1</i>
102	Slovenia	Magdalenska gora	45.980	14.634	grave	single attachments	meander	2	early (Ha C)	Ha C2	<i>Starč 1955, 143, pl. 25: 1</i>
103	Slovenia	Medvedjek	45.930	14.919	grave	double attachments	no ornaments	9	indet	indet	<i>Barrow 1, grave 36; Egg 1985, 374, No. 7</i>
104	Slovenia	Razvanje	46.518	15.636	grave	single attachments	triangles (various)	4	middle (Ha D/Ha D1–D2)	Ha D	<i>Pahič 1968, 62 pl. 4: 24; Teržan 1990, 329, pl. 63: 1</i>
105	Slovenia	Rifnik	46.200	15.404	unknown	unknown	indet	10	indet	indet	<i>Merhart 1969, 372</i>
106	Slovenia	Rifnik	46.200	15.404	deposition	single attachments	meander	2	middle (Ha D/Ha D1–D2)	Ha D	<i>Vrenčur 2018, 87–91, pl. 38: 2</i>
107	Slovenia	Rifnik-Crnolica	46.200	15.404	grave	double attachments	no ornaments	9	early (Ha C)	Ha C2	<i>Vrenčur 2011, 90, 91, pl. 13: 1</i>

Table 1. Continuation.

N°	Country	Location	Lat_wgs84	Lon_wgs84	Context	Attachments	Ornaments	Feature combination	Group_phase	Phase	Reference
108	Slovenia	Šmarjeta	45.888	15.250	grave	single attachments	triangles (various)	4	indet	indet	<i>Druzinka vas: Stare 1973</i> , 81, pl. 62: 1
109	Slovenia	Šmarjeta	45.888	15.250	grave	double attachments	no ornaments	9	indet	indet	<i>Maše vine: Hoernes 1915</i> , 112
110	Slovenia	Šmarjeta	45.888	15.250	grave	single attachments	meander	2	indet	indet	<i>Vini vrh: Staré 1955</i> , 144, pl. 31: 1
111	Slovenia	Šmarjeta	45.888	15.250	grave	double attachments	lines	7	indet	indet	<i>Staré 1955</i> , 143, pl. 26: 1; <i>Staré 1973</i> , 74, pl. 36: 1
112	Slovenia	Šmarjeta	45.888	15.250	grave	double attachments	no ornaments	9	indet	indet	<i>Staré 1955</i> , 143, pl. 27: 2; <i>Staré 1973</i> , 75, pl. 36: 2
113	Slovenia	Stična	45.957	14.805	grave	single attachments	meander	2	indet	indet	<i>Barrow 2</i> , grave 3: <i>Gabrovec et al. 2006</i> , 27 od. 36; <i>Wells 1981</i> , 50, fig. 37: a
114	Slovenia	Stična	45.957	14.805	grave	unknown	lines	10	indet	indet	<i>Barrow 4: Gabrovec et al. 2006</i> , 27 od. 36; <i>Wells 1981</i> , 50, 51, fig. 38: a
115	Slovenia	Stična	45.957	14.805	grave	double attachments	no ornaments	9	middle (Ha D/Ha D1–D2)	Ha D1	<i>Barrow 2</i> , grave 6: <i>Gabrovec et al. 2006</i> , 27 od. 36; <i>Wells 1981</i> , 51, fig. 40: a
116	Slovenia	Stična	45.957	14.805	grave	single attachments	lines	3	indet	indet	<i>Barrow 5</i> , grave 14: <i>Gabrovec et al. 2006</i> , Barrow 50; <i>Wells 1981</i> , 70, fig. 124: b
117	Slovenia	Stična	45.957	14.805	grave	single attachments	meander	2	middle (Ha D/Ha D1–D2)	Ha D1	<i>Barrow 5</i> , grave 18: <i>Gabrovec et al. 2006</i> , Barrow 50, fig. 42; <i>Wells 1981</i> , 71, fig. 128: b
118	Slovenia	Stična	45.957	14.805	grave	double attachments	no ornaments	9	indet	indet	<i>Barrow 6</i> , grave 8: <i>Gabrovec et al. 2006</i> , Barrow 55; <i>Wells 1981</i> , 73, 74, fig. 139: a
119	Slovenia	Stična	45.957	14.805	grave	double attachments	lines	7	indet	indet	<i>Barrow 7</i> , grave 2: <i>Gabrovec et al. 2006</i> , Barrow 27; <i>Wells 1981</i> , 80, 81, fig. 169: a
120	Slovenia	Stična	45.957	14.805	unknown	single attachments	checkerboard	1	indet	indet	<i>Staré 1955</i> , 143, pl. 27: 1
121	Slovenia	Stična	45.957	14.805	grave	double attachments	no ornaments	9	middle (Ha D/Ha D1–D2)	Ha D1	<i>Gabrovec et al. 2010</i> , 30, Barrow 48, Find 23, fig. 9, pl. 14
122	Slovenia	Stična	45.957	14.805	unknown	double attachments	lines	7	indet	indet	<i>Staré 1955</i> , 143, pl. 26: 2
123	Slovenia	Stična-Grize	45.947	14.824	grave	unknown	triangles (various)	10	early (Ha C)	Ha C	"Grize" Barrow Vessel: <i>Gabrovec et al. 2006</i> , 173, pl. 146, Barrow 28 od. 29; <i>Gabrovec et al. 2010</i> , 279; <i>Merhart 1969</i> , 372
124	Slovenia	Sv. Lovrenc	46.244	15.110	grave	double attachments	no ornaments	9	early (Ha C)	Ha C2	<i>Staré 1955</i> , 143, pl. 25: 2; <i>Teržan 1990</i> , 110, 357, pl. 78: 1
125	Slovenia	Svelo	45.825	13.731	unknown	single attachments	no ornaments	5	indet	indet	<i>Merhart 1969</i> , 372, pl. 17: 6
126	Slovenia	Unec	45.823	14.284	grave	unknown	meander	10	early (Ha C)	Ha C	<i>Urleb 1956</i> , 294, pl. 1: 4
127	Slovenia	Vače	46.119	14.838	grave	unknown	indet	10	indet	indet	<i>Barrow 3</i> , grave 7: <i>Mahr 1934</i> , 122
128	Slovenia	Vače	46.119	14.838	grave	unknown	indet	10	indet	indet	<i>Flat grave 13: Mahr 1934</i> , 121
129	Slovenia	Vače	46.119	14.838	unknown	single attachments	indet	10	indet	indet	<i>Staré 1955</i> , 144, pl. 28: 3
130	Slovenia	Vintarjevec	46.015	14.823	grave	single attachments	checkerboard	1	indet	indet	<i>Staré 1955</i> , 144, pl. 28: 2
131	Slovenia	Zamarkova	46.574	15.792	unknown	unknown	indet	10	indet	indet	<i>Merhart 1969</i> , 372
132	Switzerland	Arbedo	46.213	9.044	deposition	unknown	meander	10	middle (Ha D/Ha D1–D2)	Ha D	<i>Schindler 1998</i> , 130, 131, Cat. No. 1183, pl. 50
133	Switzerland	Castaneda	46.257	9.141	grave	single attachments	meander	2	late (Ha D3–Lt A)	Ha D3	–
134	Switzerland	Claro	46.255	9.017	unknown	double attachments	meander	6	late (Ha D3–Lt A)	Ha D3–Lt A	<i>De Marinis 2000</i> , 396–398, fig. 33

like the princely mounds of Strettweg (Egg 1996) and Kleinklein (Dobiat 1980; Egg/Kramer 2005; Hack 2002) in Austria or the Early Iron Age centres of Stična and Magdalenska gora in Slovenia, where they were often found together with prestigious horse-burials (Dular 2007, fig. 1), the cauldrons could have been handed down as heirlooms over several generations before being deposited in a grave inventory, as demonstrated by the newly discovered cauldron from Castaneda.

Another major issue was related to preservation status. Roughly 25% (38 specimens) of the known cauldrons fell into feature combination 10, as the form of the handle attachment and/or the ornamentation was unknown. Often, this was because the ornamentation had become abraded as a result of poor preservation, or in some cases, prolonged use, but there were also instances where descriptions in the literature were incomplete or where no conservation had been carried out.

Spatio-temporal analysis

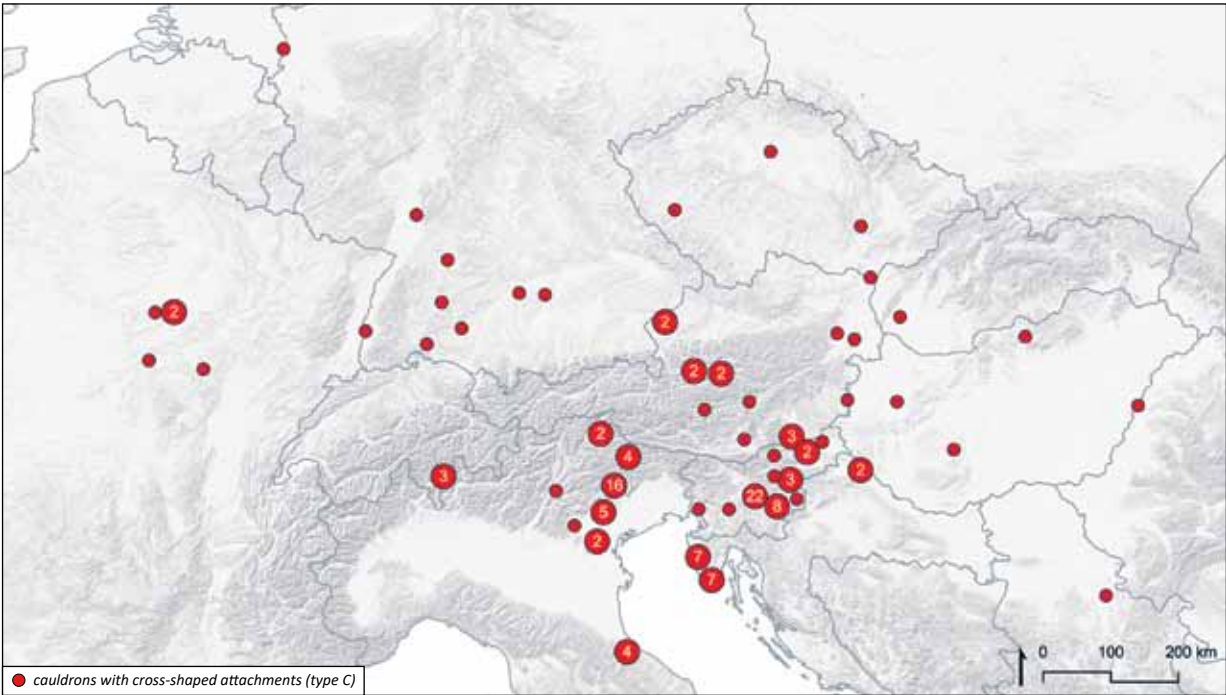
Figure 9 shows the geographical distribution of von Merhart's Type C cauldrons. It highlights two concentrations, one in Central Slovenia, with 41 specimens, and the other in Northeastern Italy, with at least 35. Since von Merhart's study, it has been widely recognised that the workshops producing the cauldrons were located in those two regions (Egg 1985, 377; Merhart 1969, 299). The Istrian peninsula, where 14 specimens were found at Nescatium and Picuge, may also have harboured a workshop; this will be discussed later. The specimens from Hungary have been interpreted as resulting from contacts between the Dolenjska Group of Slovenia and the Scythian world of the Carpathian Basin (Teržan 1998, 525, 526; Tankó 2015, 440).

Most of the 15 Austrian specimens were found on an old salt-trading route connecting the salt mines of Hallstatt in Upper Austria with Styria and Central Slovenia (Artner 2012, 75, with references; Egg 1985, 384). Two specimens were found at Uttendorf, a key point on the salt route connecting Hallstatt and Hallein with the Inn and Danube valleys (Egg 1985, 383–385). Similarly, the pieces from Eastern Austria, Slovakia and the Czech Republic may have been related to a communication route known as the 'Amber Road', connecting the *Caput Adriae* via the Morava River Valley and the Bohemian Basin to the valleys of the Weichsel and the Oder and thus to Poland and the Baltic region, known for their amber reserves (most recently Chytráček *et al.* 2017, 248–252). Most likely of all to have been connected to communication routes is the accumulation in Southwestern Germany, in the triangle between the rivers Rhine,¹¹ Main and Danube. The French specimens should be seen in a similar context. They were found in Burgundy, in the hills of the Côte-d'Or separating the upper Saône and Seine valleys, in Champagne, around Troyes, and in the upper valley of the Yonne. The find sites are all fairly close to the Hallstatt period princely site at Mont Lassois, where an artificial harbour was recently discovered (Chaume 2020). Strikingly similar is the concentration of Swiss cauldrons: all of them were found within a radius of some 10 km at the north-eastern end of Lake Maggiore, where the transalpine routes over the San Bernardino and Gotthard passes meet and the rivers Ticino and Moesa are no longer navigable. In summary, it can be stated that the distribution of the cauldrons correlates strongly with overland trade and communication routes.

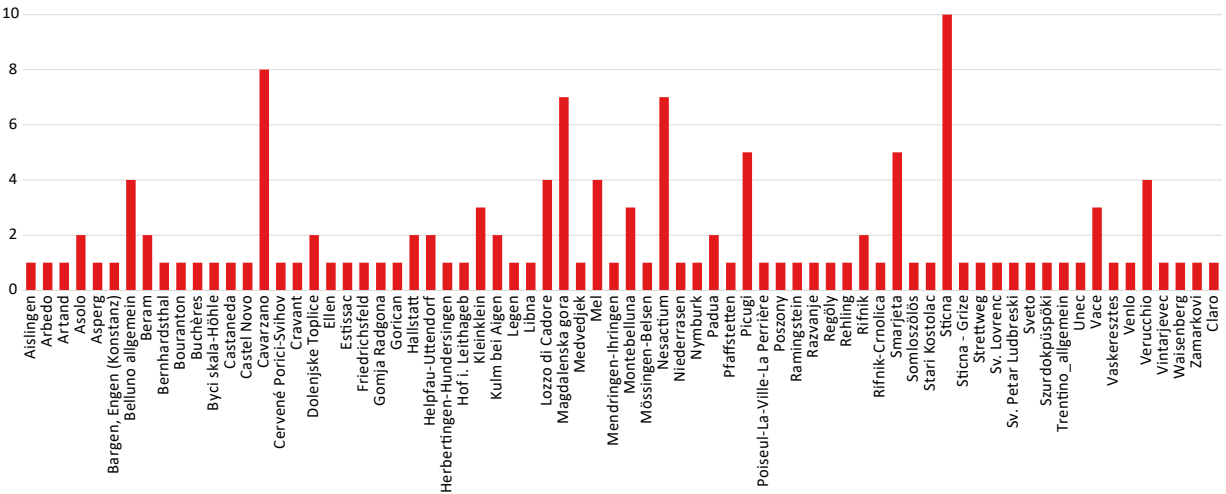
Figure 10 shows the distribution of handle-attachment types (single/twin) relative to their dating. It clearly highlights the major problems caused by the lack of dated specimens. Nevertheless, some tendencies can be observed. In the early phase (Ha C), single handle attachments outnumber twin attachments by far. During the middle phase (Ha D1–Ha D2), the numbers are almost equal, with single attachments still slightly more prevalent. In the late phase (Ha D3–Lt A), this situation is reversed, with twin attachments now slightly more common. Another indication for a chronological sequence are two cauldrons from Slovenia and Croatia, respectively, on which both single and twin attachments were mounted. Possibly these two pieces were repaired. The cauldron from Magdalenska gora (No. 98) dates from the late phase, while the specimen from Nesactium (No. 19) is undated.

A look at the distribution by country is also informative. In Slovenia, the first assumed production centre, and in adjacent Austria and Croatia, single and twin attachments are equally prevalent. The same applies to Hungary, Germany and France, on the periphery. In Northern Italy, however, the second large production area, single attachments clearly predominate. Unfortunately, Italy has the highest rate of undated specimens, at about 63%; the dated pieces, however, belong mostly to the early phase. In Slovenia, the dated cauldrons are spread evenly throughout all the phases. Except for early

¹¹ The isolated piece from Venlo in the Netherlands (No. 88) may also be related to contacts via the Rhine Valley.



Distribution: cauldrons with cross-shaped attachments per site



Distribution: cauldrons with cross-shaped attachments per country

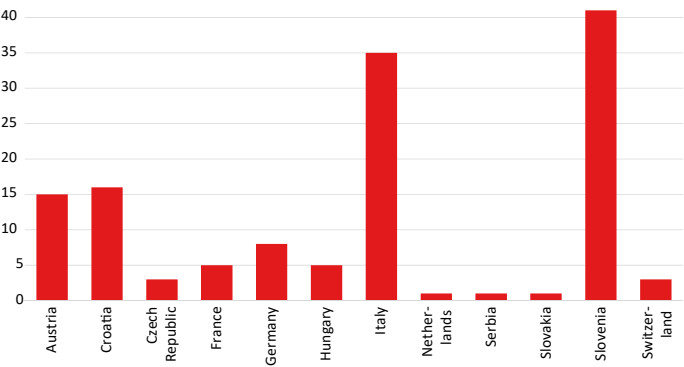
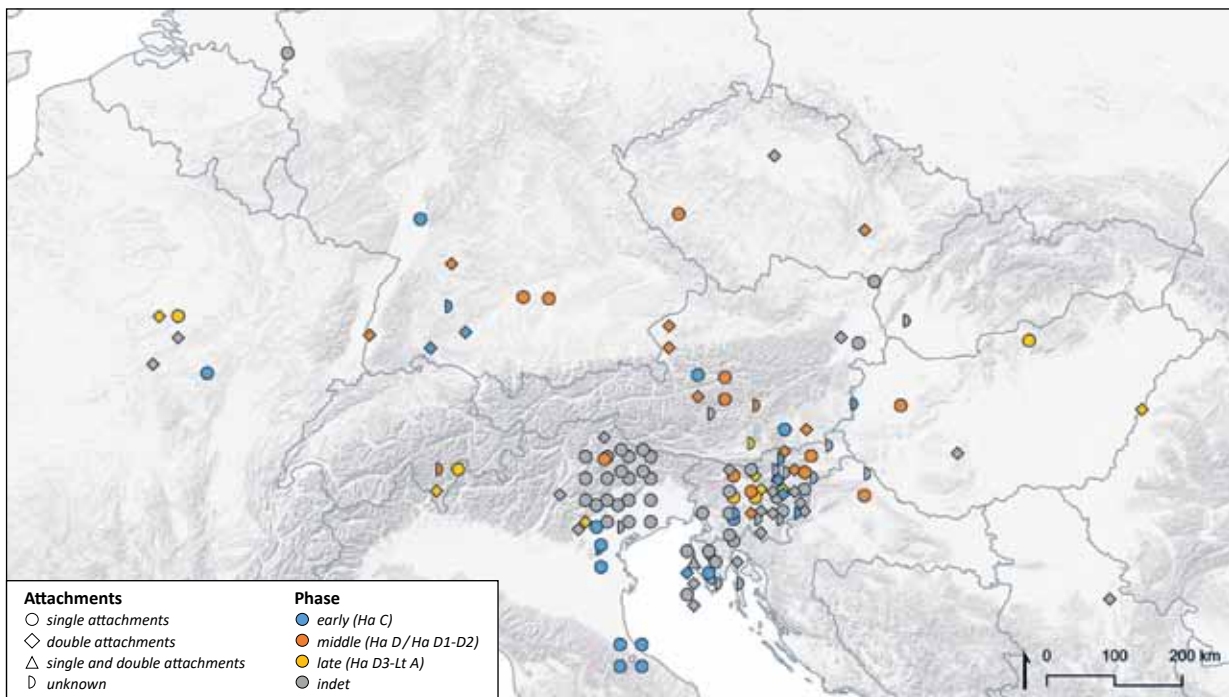
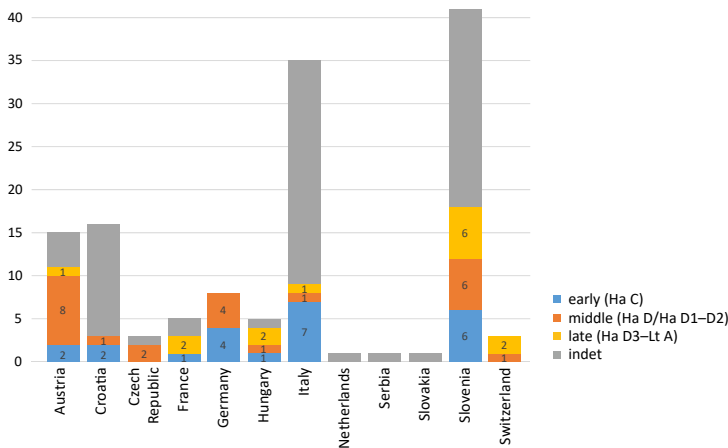


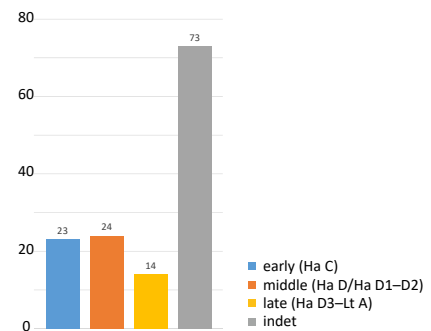
Fig. 9. Distribution map of Type C cauldrons with cross-shaped attachments and related statistics. Points on the map are represented as point clusters. Numbers on the points represent the number of finds in the specific area (map: background map: SRTM30 Hillshade; SRTM 30m [NASA Shuttle Radar Topography Mission Global 1 arc second] by NASA EOSDIS Land Processes Distributed Active Archive Center [LP DAAC, <https://lpdaac.usgs.gov/>] provided via WMS by terrestris GmbH & Co. KG Bonn; graphics: ADG).



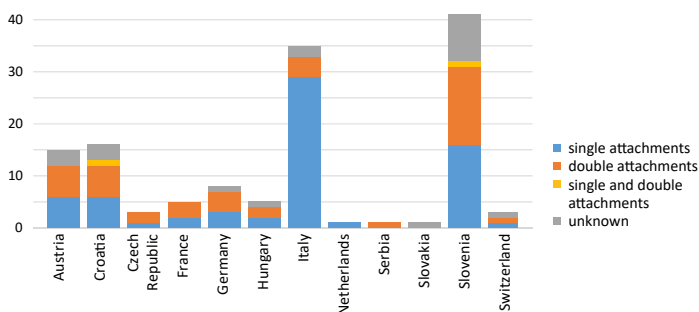
Distribution: phase per country



Distribution: cauldrons with cross-shaped attachments (type C) per phase



Distribution: attachments per country



Distribution: attachments per phase

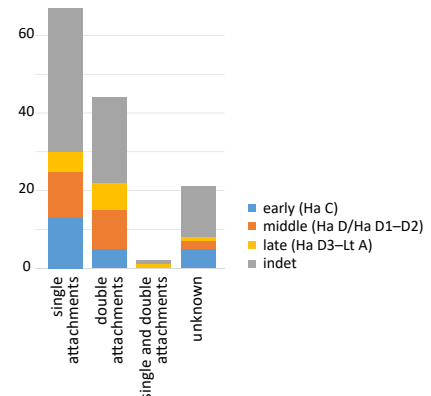
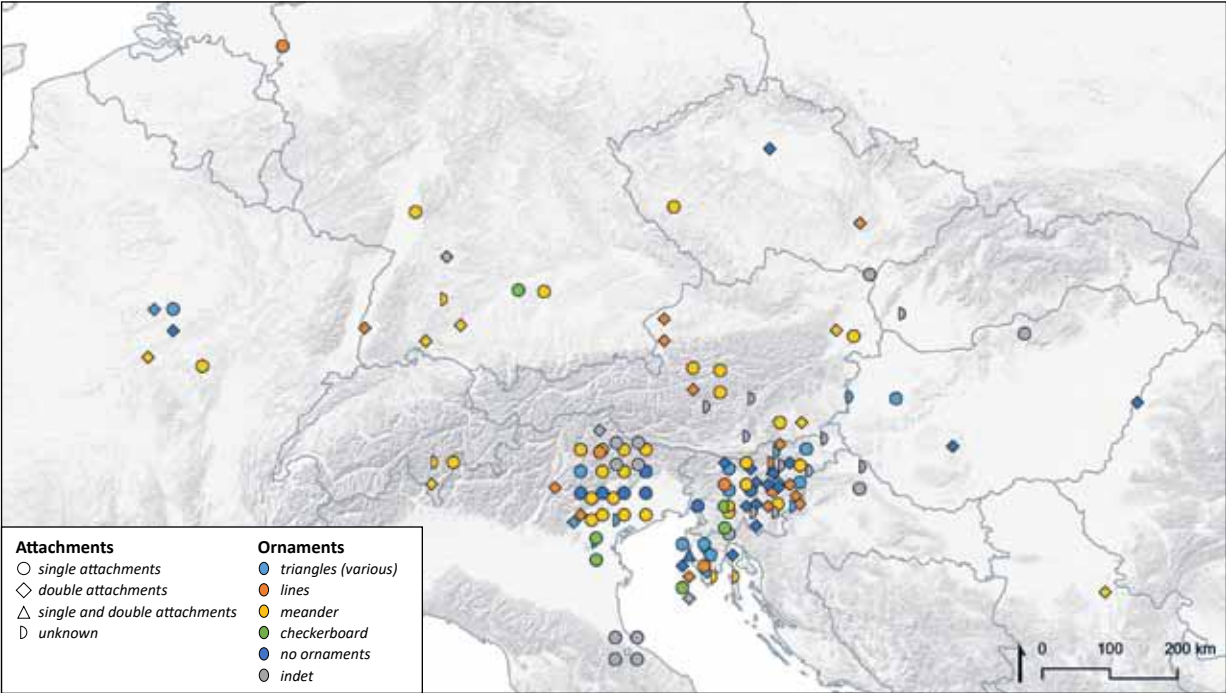
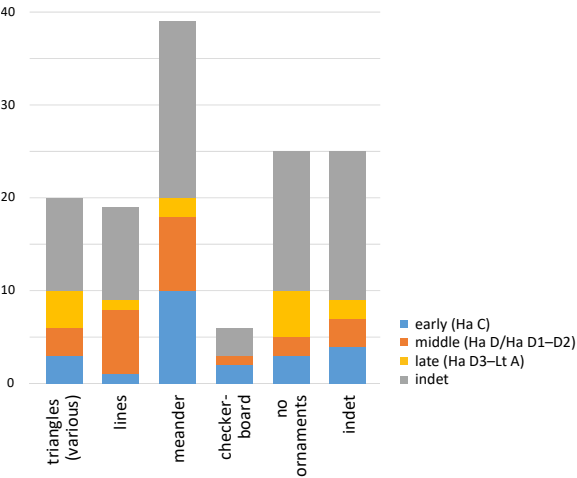


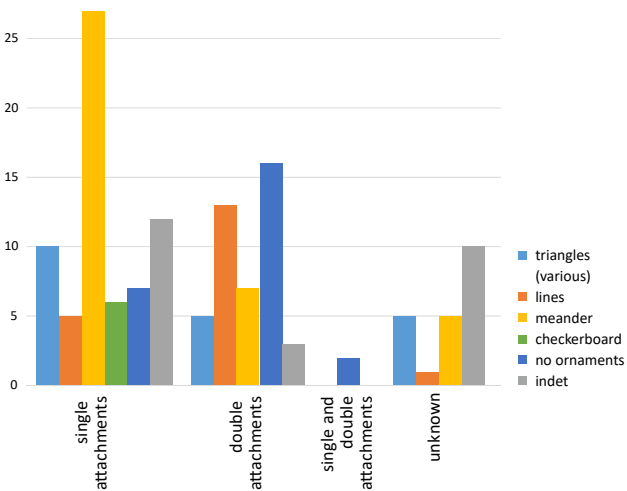
Fig. 10. Distribution map of Type C cauldrons with single and twin cross-shaped attachments over time and related statistics. Points on the map are represented in the form of point cluster displacements (map: background map: SRTM30 Hillshade; SRTM 30m [NASA Shuttle Radar Topography Mission Global 1 arc second] by NASA EOSDIS Land Processes Distributed Active Archive Center [LP DAAC, <https://lpdaac.usgs.gov/>] provided via WMS by terrestris GmbH & Co. KG Bonn; graphics: ADG).



Distribution: ornaments per phase



Distribution: attachments – ornaments



Distribution: ornaments per country

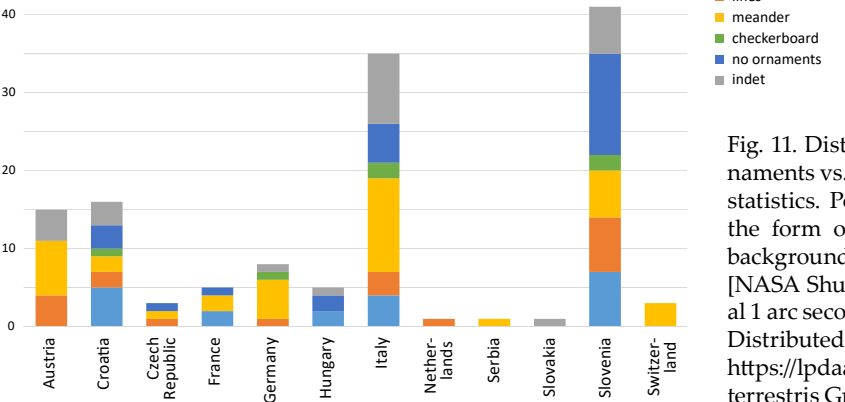


Fig. 11. Distribution map of Type C cauldron ornaments vs. handle-attachment types and related statistics. Points on the map are represented in the form of point cluster displacements (map: background map: SRTM30 Hillshade; SRTM 30m [NASA Shuttle Radar Topography Mission Global 1 arc second] by NASA EOSDIS Land Processes Distributed Active Archive Center [LP DAAC, <https://lpdaac.usgs.gov/>] provided via WMS by terrestris GmbH & Co. KG Bonn; graphics: ADG).

examples from Hallstatt (No. 2) and Kleinklein (No. 7), the Austrian cauldrons were all deposited in the middle phase, while the German cauldrons were deposited evenly throughout the early and middle phases. In France, we have evidence for two late depositions and one early one; since another two are undated, however, the data are inconclusive.

We can therefore state that the two production centres differ in terms of attachment type and dating. The differences in dating can be largely explained by the numerous undated pieces from Italy. The two cauldrons from Slovenia and Croatia bearing both types of attachment are of no help in correlating type with date, since it is not clear, if one type replaced the other, which was the earlier. However, the dominance of single attachments in Italy could be an indication that the different attachment types represent different workshop circles, rather than different time periods.

Let us now turn our attention to the ornamentation on the rims of the cauldrons (Fig. 11). Cauldrons with meanders and undecorated cauldrons clearly dominate the overall picture. The latter seem to have been most popular in Southeastern Europe, while those with meanders predominate in Central Europe. In Italy, meanders are the most common ornamentation. Undecorated cauldrons predominate in Slovenia, though a greater variability can be observed here, with cauldrons featuring meanders, lines and triangles also appearing in good numbers, all equally represented. In Croatia, triangles seem to have been the most popular ornamentation, while only meander- and line ornaments appear in Austria and Germany, with one exception.

The German cauldron from Aislingen (No. 40) bears a checkerboard pattern. This kind of decoration is also known from an older form of cauldron with cross-shaped attachments, namely von Merhart's Type B 2b (Merhart 1969, 288), but has so far only been found on six specimens of Type C. Two of them (Nos. 81 and 82) were found in the same grave, known as the 'Tomba dei vasi broccati', in Padua, Italy; two were found in Slovenia, at Stična (No. 120) and Vintarjevec (No. 130); and one was found on the Istrian peninsula, at Picuge, Croatia (No. 30). Since bronze cups with checkerboard ornaments have also been discovered on the Istrian peninsula, Schwarz tends to believe that cauldrons with this particular decoration may have originated here (Schwarz 1991, 243, 301–306, 326). Given Istria's long tradition in the production of bronze-sheet vessels (Stjernquist 1967, 83–85), it is at least a reasonable hypothesis.

If we look at the combinations of ornamentation types with the two different attachment types, it is noticeable that the checkerboard pattern is only present on cauldrons with single attachments. Meanders are by far the most common type of decoration on cauldrons of this type. By contrast, cauldrons with twin attachments are most commonly found with simple line decor or with no decoration at all.

As for chronology, it can be observed that all the types of decoration are already present in the early phase. Meanders and checkerboard ornaments are concentrated mainly in the early and middle phases. Triangles occur evenly across all the phases, while simple line decoration occurs most frequently in the middle phase and undecorated pieces are most strongly represented in the late phase.

Although the data for feature combinations are considerably distorted by the large number of undated and undetermined specimens, they are nevertheless worth including in our considerations (Fig. 12). In Italy, combination 2 is predominant, followed by combination 5. In Slovenia, as already observed, the situation is more dynamic: combination 9 is most frequent, but combinations 2, 4 and 7 are also well represented. Austria occupies an intermediate position, with combinations 2 and 7 accounting for most of the specimens. On the timeline, combinations 1, 2 and 6 occur during the early and middle phases; combinations 4, 5 and 7 are concentrated in the middle and late phases; the poorly represented combination 8 is present only in the late phase, while combination 9 is well documented in all phases.

We can sum up as follows. Meanders are the predominant ornament on cauldrons with single attachments and are mainly present in the early and middle phases in Italy, while most cauldrons with twin attachments have simple line decor or no decoration at all and are mainly found in Slovenia. Checkerboard decoration, found only on cauldrons with single attachments and concentrated in the early and middle phases, may be associated with a minor production centre in Istria. However, caution should be exercised when making generalised statements, as the example of the triangle decor, which is well documented in all phases, clearly shows. The feature combinations which include triangles (combinations 4 and 8) are only represented in the middle and late phases, since specimens with triangles dating from the early phase were found without attachments and therefore fall into combination 10.

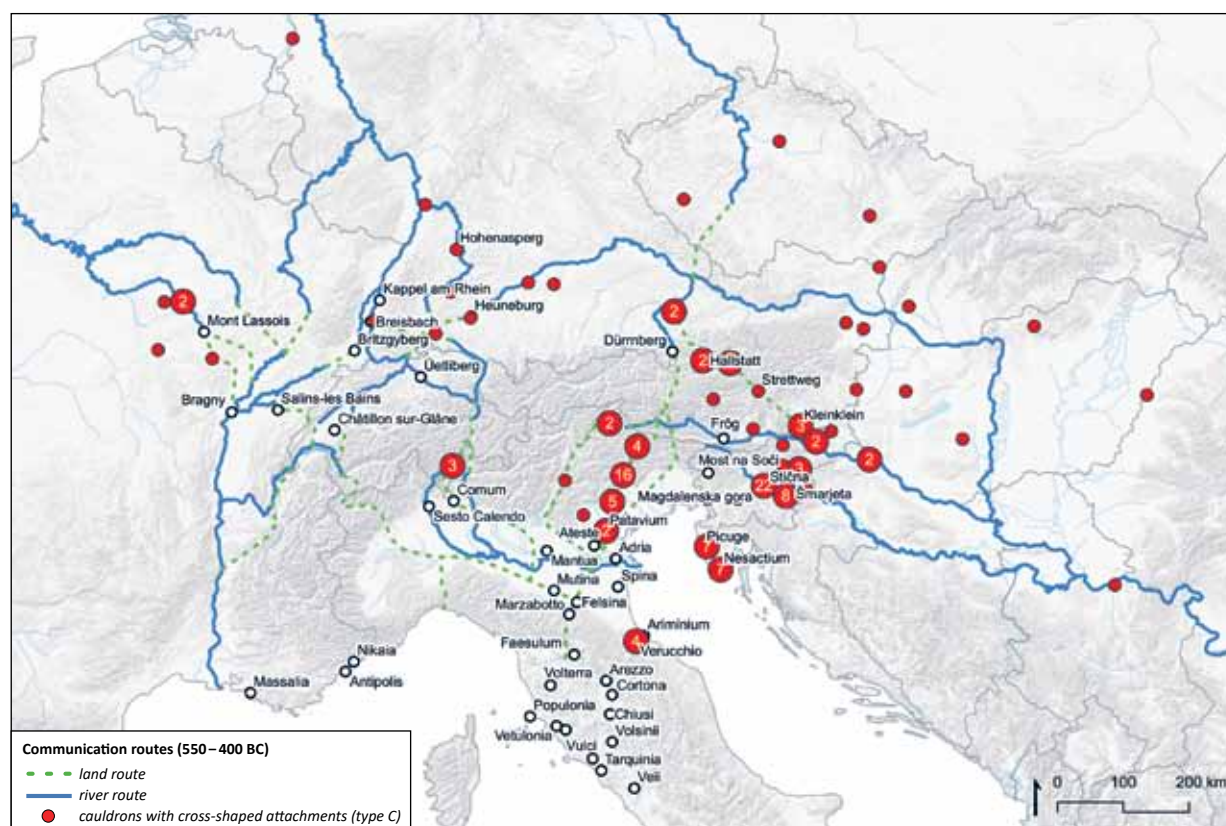


Fig. 13. Trade and communication routes between the Northern Mediterranean (Northern Adriatic, Po Plain and Southern France) and Central Europe (after *Della Casa* 2018, fig. 1.1; *Pauli* 1993, 162–170, fig. 40–43; map: background map: SRTM30 Hillshade; SRTM 30m [NASA Shuttle Radar Topography Mission Global 1 arc second] by NASA EOSDIS Land Processes Distributed Active Archive Center [LP DAAC, <https://lpdaac.usgs.gov/>] provided via WMS by terrestris GmbH & Co. KG Bonn; hydrological data: EU-Hydro – River Network Database, Version 1.3 (WMS-Service), © European Union, Copernicus Land Monitoring Service 2023, European Environment Agency (EEA); graphics: ADG).

CONCLUSIONS

Even though the data for conducting spatial analysis of the distribution of von Merhart's Type C cauldrons with cross-shaped attachments are heavily biased (more than 50% of specimens are undated and the feature combinations of 25% are unknown), some trends in the occurrence of single and twin attachments and their relationships with the different categories of ornamentation can be recognised.

Firstly, there is no evidence that the occurrence of different types of attachment is time-related. Single and twin attachments both occur from the beginning of production in Ha C, while twin attachments are also present on some specimens of von Merhart's earlier Type B1, mainly dating from Ha B2/B3 (*Merhart* 1969, 286, 287, pl. 25; 26). The ornament patterns do show some chronological development, however, evolving from complex meander decorations to simple line ornaments and eventually a complete absence of decoration, as Schwarz stated (*Schwarz* 1991, 253). Both attachment and ornament type, however, seem more strongly related to the evolution and interaction of different workshop centres than to chronology alone.

The spatial analysis supports the idea that at least two different production centres were active during the early Hallstatt period: one in Northeastern Italy, producing mainly cauldrons with single attachments and meander decor, and a second one in Central Slovenia, producing mainly cauldrons with twin attachments and simple line ornaments or no decoration at all. A third centre, probably closely related to the Italian workshops, can be postulated for the Istrian peninsula, producing cauldrons with single attachments and checkerboard decoration. The workshops must certainly have been in lively exchange and competition with one another, simply because of their geographical proximity. The Italian workshops seem to have stopped production, or changed their production style, early on. One can only speculate as to the reasons. In the middle of the sixth century BC, the Etruscans massively expanded

their influence in Northern Italy and the Po Valley (Becker 2017, 1024–1026) and more and more Etruscan bronze products found their way to Central Europe (Baitinger 2017). The Venetic workshops, caught between the Etruscan production centres in the west and the Eastern Hallstatt centres of Slovenia, may simply have lost access to the sales markets over time.

Many of the cauldrons with cross-shaped attachments were in use for a long time before they found their way into graves or, less often, hoards. Apparently, these vessels circulated amongst an elite network of high-ranking individuals.¹² In the East Hallstatt district, they were exclusively male and of princely rank and were buried with opulent grave furnishings, including weapons, wagons and extensive bronze drinking services. If we compare the spatial distribution of their graves with the transport routes known for the Iron Age (Fig. 13; cf. Della Casa 2018, fig. 1.1; Pauli 1993, 162–170, fig. 40–43) it is evident that this group of people controlled interregional trade and communication networks connecting the Northern Mediterranean region, i.e. the Northern Adriatic, Po Plain and Southern France, with Central Europe.

The cauldron from Castaneda was most probably an import from Northeastern Italy. Contacts with the *Caput Adriae* region are well evidenced by finds from Castaneda and the Val Mesolcina (Nagy 2012, 393). The button ends of the cauldron's handles are striking, since they have not been observed on any other cauldron of Type C. They do occur, however, on ribbed buckets (*Rippenzisten*) of the Adriatic type (Stjernquist 1967, 75–78) and on *situlae*, probably produced at Bologna, of which one example was found in the well-known warrior grave B of Sesto Calende (De Marinis 2009, 179, fig. 17, 4). It is possible that the handles of the cauldron were replaced over time.

For Castaneda, however, the discovery of such a prestigious bronze vessel is also important from a social point of view. It sheds light on the social rank of its last owner.¹³ In the Alpine region of the Golasecca culture, the burial rite did not involve the status symbols customary elsewhere as part of the grave furnishings, such as weapons and chariots (Stech 2013, 309). In grave 1/2021, both the bronze cauldron, a unique imported piece from the Eastern Alps, and the incineration rite distinguish the deceased from his peers. He is the earliest individual so far known from Castaneda to have been buried with an extensive set of bronze vessels. It was not until phase Tessin D2 (Lt A) that bronze vessels became a regular feature in burials here (Nagy 2012, 334–338, fig. 5.7b; 5.9). The above-average presence of bronze vessels makes the Castaneda burials exceptional in the Alpine region of the Golasecca culture (Nagy 2012, 382).

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¹² Since they were often found together with horse equipment or even horse burials a connection to horse and chariot races seems to be evident (Teržan 2011).

¹³ Because of a lack of documentation and publication of Early Iron Age graves for the Sopraceneri region, as well as minor differences in grave-furnishing patterns, identifying the social status of the deceased and the dates of burials is not straightforward (Nagy 2012, 338). Imported goods seem to be a signifier of social rank (Stech 2013, 118). On this behalf the authors would like to thank Biljana Schmid-Sikimic for her valuable input for this article. Further investigations on the social status of the deceased in grave 1/2021 are on the way.

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Nový zápis v zozname kotlov

Kotol s krížovými atašami z hrobu z doby železnej z lokality Castaneda, kantón Grisons, Švajčiarsko

Christoph Baur – Christoph Walser – Thomas Reitmaier

Súhrn

Na pohrebisku z doby železnej v Castanede v údolí Val Mesolcina, ktoré sa nachádza v južnej časti švajčiarskeho kantónu Grisons (obr. 1), sa doteraz našlo približne 200 hrobov z obdobia 500 až 150 rokov pred n. l., ako aj časti súvisiaceho sídliska. Castaneda leží na severovýchodnej hranici alpského regiónu obývaného v neskej dobe bronzovej a staršej dobe železnej kultúrou Golasecca, na dôležitej komunikačnej trase prechádzajúcej údolím Val Mesolcina. Táto veľmi stará kontaktná zóna spájala severnú Itáliu so Švajčiarskou plošinou (*Mittelland*) a s alpským údolím Rýna až po Bódamské jazero.

V lete 2021 bol objavený ojedinelý žiarový hrob (č. 1/2021; obr. 3; 4), datovaný do záveru doby halštatskej (Tessin C, porov. obr. 2). Obsahoval kompletne zachovaný bronzový kotol typu C s krížovými atašami, ako ho definoval Gero v. Merhart (obr. 6–8). Tieto kotlíky, ktoré sa vyskytujú v širokom priestore od Balatonu v Maďarsku až po prameň Seiny vo Francúzsku, sú takmer výlučne súčasťou inventára hrobov vysoko postavených mužských jedincov. Predpokladá sa, že centrom výroby bola oblasť *Caput Adriae*.

Objav z Castanedy ponúka možnosť opätovne analyzovať distribúciu kotlov typu C (obr. 9–12). Hoci údaje pre priestorovú analýzu distribúcie sú značne skreslené (50 % exemplárov je nedatovaných; 25 % má neurčitú kombináciu prvkov), možno rozpoznať niektoré trendy vo vzťahu kotlov s jednoduchými a dvojíťmi atašami a rôznymi druhmi výzdoby.

V prvom rade neexistuje dôkaz, že výskyt rôznych typov ataší je chronologicky podmienený. Jednoduché aj dvojité ataše sa vyskytujú od začiatku výroby v HC, pričom tie druhé sú prítomné aj na niektorých exemplároch von Merhartovho skoršieho typu B1, datovaného najmä do HB2/HB3. Výzdoba vykazuje určitú chronologickú postupnosť, vyvíja sa od zložitého meandrového vzoru smerom k jednoduchým líniovým ornamentom. Tento vývoj vrcholí úplnou absenciou výzdoby. Zdá sa však, že tak forma ataší, ako aj typ výzdoby súvisia skôr s vývojom a interakciou rôznych dielenských centier než s chronológiou.

Priestorová analýza podporuje myšlienku dvoch výrobných centier: jedného v severovýchodnom Taliansku, ktoré vyrábalo najmä kotlíky s jednoduchými atašami a meandrovou výzdobou, a druhého v strednom Slovinsku, ktoré vyrábalo predovšetkým kotle s dvojíťmi atašami a jednoduchými líniovými ornamentmi alebo nezdobené kusy. Tretie centrum, ktoré pravdepodobne úzko súvisí s italskými dielňami, možno predpokladať na Istrijskom polostrove. Vyrábalo kotle s jednoduchými atašami a šachovnicovým vzorom. Zdá sa, že italské dielne zastavili výrobu alebo zmenili vyrábaný typ kotlov veľmi skoro. O dôvodoch možno len špekulovať. S etruskou expanziou v polovici 6. storočia pred n. l. mohli dielne v okolí dnešných Benátok jednoducho stratiť prístup na odbytové trhy.

Mnohé z kotlov s krížovými atašami sa používali dlho. Tieto nádoby zrejme kolovali v rámci elitnej siete vysoko postavených osôb. Vo východoalštatskom okruhu sa viažu výlučne na mužských jedincov alebo na vysokopostavených jedincov a nachádzali sa v sprievode ďalšej honosnej hrobovej výbavy. Ak porovnáme priestorové rozloženie takýchto hrobov s dopravnými trasami známymi pre dobu železnú (obr. 13), je zjavné, že táto skupina ľudí kontrolovala medziregionálne obchodné a komunikačné siete spájajúce severné Stredomorie so strednou Európou.

Kotol z Castanedy bol pravdepodobne importom zo severovýchodnej Itálie. Kontakty s regiónom *Caput Adriae* dokazujú nálezy z údolia Val Mesolcina. Nález prestížnej bronzovej nádoby vrhá svetlo na spoločenské postavenie jej posledného majiteľa. Pohrebný rítus v alpskej oblasti kultúry Golasecca neobsahoval inde obvyklé statusové symboly, ako sú zbrane a voz. Pri tomto pohrebe sa na odlíšenie pochovaného jedinca od jeho súputníkov použil jednak importovaný bronzový kotol, jednak kremácia ostatkov zosnulého. V Castanede je to zároveň najstarší doklad o pochovaní mŕtveho s rozsiahlym súborom bronzových nádob. Až vo fáze Tessin D2 (LTA) sa tu bronzové nádoby stali pravidelným prídavkom v hroboch. Nadpriemerne vysokým výskytom bronzových nádob sú hroby z Castanedy výnimočné v alpskom regióne kultúry Golasecca.

- Obr. 1. Val Mesolcina na juhozápade švajčiarskeho kantónu Grisons. Známe osídlenie z doby železnej je vyznačené červenou (mapa: map.gis.gr.ch; letecké foto: ETH-Bibliothek Zürich, Bildarchiv/Stiftung Luftbild Schweiz; foto: Swissair Photo AG/LBS_R1-911505/CC BY-SA 4.0; grafika: ADG).
- Obr. 2. Relatívna chronológia kultúry Golasecca v Lombardsku, v regióne Ticino/Mesolcina a v strednej Európe (porov. Nagy 2012, obr. 8.1).
- Obr. 3. Odkrývanie hrobu 1/2021 a kotla s krížovými atášami v Castanede (foto: ADG).
- Obr. 4. Hrob 1/2021. Plán hrobu a uloženie hrobových prídavkov (foto a grafika: ADG).
- Obr. 5. Analýzy kotla z Castanedy. A – zvyšky dreva a organického materiálu na dne kotla; B – detail zachovaného dreva so stopami nástroja; C – rekonštrukcia drevenej dosky (veko); D – analýza zvyškov textilu/kože; E – makroskopický doklad ovčej vlny v kotle; F – mikroskopický dôkaz ovčej vlny v kotle (foto A–D: ADG; E–F: A. Rast-Eicher).
- Obr. 6. Kotel z Castanedy (foto: ADG).
- Obr. 7. Detaily kotla z Castanedy. A – spodná časť kotla s reparačným zásahom; B – krížové atáše, reštaurovaná bola len ľavá; C – hák rukoväti s esovitým predĺžením a polguľovitým ukončením; D – tordovaná rukoväť so známami opotrebovania; E – výzdoba okraja sa najlepšie zachovala v blízkosti atáší (foto: ADG).
- Obr. 8. A – farebne filtrovaný obrázok výzdoby na okraji kotla; B – rekonštrukcia výzdobného motívu (foto a grafika: ADG).
- Obr. 9. Mapa rozšírenia kotlov typu C s krížovými atášami a súvisiaca štatistika. Body na mape sú prezentované vo forme zhlukov. Číslo v krúžkoch označuje počet nálezov v jednotlivých oblastiach (mapa: podkladová mapa: SRTM30 Hillshade; SRTM 30m [NASA Shuttle Radar Topography Mission Global 1 arc second] od NASA EOSDIS Land Processes Distributed Active Archive Center [LP DAAC, <https://lpdaac.usgs.gov/>] poskytovaná prostredníctvom WMS by terrestris GmbH & Co. KG Bonn; grafika: ADG).
- Obr. 10. Mapa rozšírenia kotlov typu C s jednoduchými a dvojíťmi krížovými atášami v čase a súvisiaca štatistika. Body na mape sú prezentované vo forme zhlukov (mapa: podkladová mapa: SRTM30 Hillshade; SRTM 30m [NASA Shuttle Radar Topography Mission Global 1 arc second] od NASA EOSDIS Land Processes Distributed Active Archive Center [LP DAAC, <https://lpdaac.usgs.gov/>] poskytovaná prostredníctvom WMS by terrestris GmbH & Co. KG Bonn; grafika: ADG).
- Obr. 11. Mapa rozšírenia výzdoby a typov rukovätí kotlov typu C a súvisiaca štatistika. Body na mape sú prezentované vo forme zhlukov (mapa: podkladová mapa: SRTM30 Hillshade; SRTM 30m [NASA Shuttle Radar Topography Mission Global 1 arc second] od NASA EOSDIS Land Processes Distributed Active Archive Center [LP DAAC, <https://lpdaac.usgs.gov/>] poskytovaná prostredníctvom WMS by terrestris GmbH & Co. KG Bonn; grafika: ADG).
- Obr. 12. Mapa rozšírenia kombinácií atribútov kotlov typu C v čase a súvisiaca štatistika. Body na mape sú prezentované vo forme zhlukov (mapa: podkladová mapa: SRTM30 Hillshade; SRTM 30m [NASA Shuttle Radar Topography Mission Global 1 arc second] od NASA EOSDIS Land Processes Distributed Active Archive Center [LP DAAC, <https://lpdaac.usgs.gov/>] poskytovaná prostredníctvom WMS by terrestris GmbH & Co. KG Bonn; grafika: ADG).
- Obr. 13. Obchodné a komunikačné trasy medzi severným Stredomorím (severná adriatická oblasť, Pádska nížina a južné Francúzsko) a strednou Európou (podľa Della Casa 2018, obr. 1.1; Pauli 1993, 162–170, obr. 40–43; mapa: podkladová mapa: SRTM30 Hillshade; SRTM 30m [NASA Shuttle Radar Topography Mission Global 1 arc second] od NASA EOSDIS Land Processes Distributed Active Archive Center [LP DAAC, <https://lpdaac.usgs.gov/>] poskytovaná prostredníctvom WMS by terrestris GmbH & Co. KG Bonn; hydrologické dáta: EU-Hydro – River Network Database, Version 1.3 (WMS-Service), © European Union, Copernicus Land Monitoring Service 2023, European Environment Agency (EEA); grafika: ADG).

Tabela 1. Zoznam kotlov typu C s krížovými atášami.

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NEW FINDINGS OF BRONZE NAIL-SHAPED HEAD ORNAMENTS FROM WESTERN CARPATHIANS ¹

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The paper deals with eight (six?) new findings of the nail-shaped head ornaments (ear rings, temple rings, head or head cover ornaments) from the Slovakian part of the Western Carpathians – namely from the site Demänovská hora in cadastre of Liptovský Mikuláš-Ploštín and Demänovská Dolina (both Dist. Liptovský Mikuláš). This kind of jewellery has parallels among the head ornaments distributed in the cultural environment north-east and east to the Carpathian Mountains Arc. They are broadly dated from the end of Ha C1 till the beginning of Lt A. Only two of new exemplars from Slovakia, defined as type DH_II, have direct parallels among the head rings of Sokolniki type. Three almost complete and one fragmented exemplar of type DH_I have two direct analogies in the local North Slovakian cultural environment, and in one up-to-date unpublished exemplar in Dunajec Valley (Maszkowice) in Southern Poland, otherwise they can't find any direct parallels in the territories of distribution of this type of ornament. The DH_I exemplars from Slovakia are larger and more massive, moreover they are decorated in local manner. Two other fragmented artefacts cannot be satisfactory defined as nail-shaped head ornaments especially because of the shape of the hoop necks (without completely preserved hoop endings), however, according to their head shape their belonging to the nail-shaped head ornaments is likely. It can be hypothesised about the local production of type DH_I – the theory that is supported by the occurrence of other local types of jewellery from the Hallstatt and Early La Tène periods in the Slovakian parts of the Western Carpathians. Regarding the function of these ornaments, judging from the weight and size, at least type DH_I was most likely used as head/hair ornament rather than the ear ring.

INTRODUCTION

Nail-shaped head ornaments represent the specific type of personal jewellery. They are usually interpreted as ear or temple rings (*Ohrringe/Schläfenringe*), but they could have been used also as hair or head (head cover) decorations. Therefore, in our paper we prefer more neutral variant of their functional determination – head ornaments or head rings. They are produced from bronze, silver, gold or electron. In general, they have heads with conical, semi-globular or semi-circular shape. The heads can be shaped of thinner metal sheet or they can be casted as more massive. The hoop of this jewellery is bent and can be made of thinner or thicker metal stick, it usually has oval or round cross-section, sometimes transformed to rectangular on the hoop neck just below the head. Both heads and hoops can be decorated or undecorated. Some types have thickened ends of the hoops in the form of a small cone, disc or a bulge. Furthermore, some exemplars only have differently thickened ends without larger disc or cone head (for general morphological characteristics see e.g. Kozubová/Fojtík 2021, 58, 60, with references).

This ornament is linked with the cultural environment north-east and east to the Carpathian Mountains Arc (cf. e.g. Czopek 2007, 118, fig. 3; Gawlik 2007, 219–240; Kozubová/Fojtík 2021, 60; Polit 2010, 155–162, fig. 1). To the Western Carpathians nearest area of their dense distribution is the territory of the Tarnobrzeg group of the Lusatian culture where they come mostly from the graves, but they can occur also on the settlements, and the workshop of their local production was discovered at site Zawada near Połaniec, too (Czopek 2007, 118, fig. 3; Gawlik 2007, 219–240; Kozubová/Fojtík 2021, 60). Sparsely, they occur, however, also on the northern (Polish) side of the Western Carpathians in the graves (Chełmiec [Abłamowicz R./

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Ablamowicz D. 1989, 199–212]; Modlnica, site 5, inhumation grave 927 [*Dzięgielewski* 2015, 84, fig. 62: b)], hoards (Świdnik, Dist. Limanowa [*Kostrzewski* 1962, pl. XXVIII; *Żurowski* 1927]), and settlements (hilltop site Góra Zyndarma in Maszkowice [unpublished; Marcin S. Przybyła pers. comm.]). Further to the east appear the nail-shaped head ornaments in the assemblages of Juchnow, Dnepr-Dvina, Miłogrady, and Wysocko culture as well as of the ‘Scythian’ culture, especially in the environment of its so-called forest-steppe variant (*Gawlik* 2007, 220; *Kozubová/Fojtík* 2021, 60). The origin of this jewellery is questioned, and besides the opinion that the idea of its usage comes from the east to the west, also the views occur that count with the possibility of the influence of forest-steppe rings by the prototypes from the Lusatian or Wysocko culture environment or with the independent development of this type of jewellery in different cultural environments (*Gawlik* 2007, 231, 232; *Kozubová/Fojtík* 2021, 60).

The heads of some nail-shaped types remind the heads of snake shaped temple rings that are shaped as slim cones – similarly to nail-shaped head rings also the heads of the snake-shaped temple rings can be made of thinner metal sheet or fully casted with flat head bottoms (cf. e.g. *Kozubová* 2013, 27; to functional terminology of snake-shaped types see *Kozubová* 2018, 13–63). Unlike the nail-shaped head rings, the snake-shaped types are typical products of the Vekerzug culture (*Kozubová* 2013, 27). Nevertheless, the nail-shaped ornaments occur sparsely also in culturally foreign environment of the Vekerzug culture in the cremation and inhumation graves in the Carpathian Basin where they represent the southernmost exemplars of their territory of distribution (*Kozubová* 2018, 31, fig. 17: 31; 18: 3, 4; 19: 10, 11; 2019, fig. 31; *Kozubová/Fojtík* 2021, 60–63, fig. 6; *Miroššayová* 2012, 258, fig. 5; 6;² 2015, 29). Among them two silver exemplars come from Slovakia from the cremation grave No. 40/08 with stone construction in Ždaňa, dated to the first half of the 6th century BC, i.e. to Ha D1 stage (*Kozubová/Fojtík* 2021, 63; *Miroššayová* 2015, 29, 82, 83, pl. XXX).

Despite nail-shaped and snake-shaped types of the head ornaments are typologically and culturally different, it cannot be excluded that the nail-shaped rings played the role in the development of the Vekerzug snake-shaped ear/temple rings (*Gawlik* 2007, 220; *Kozubová* 2018, 32; 2019, 109).

The westernmost objects of this type are known from Moravia and West Poland (Smržice-Trávníky u ostrova, Polanowice, Strzegom; *Kozubová/Fojtík* 2021, 60, fig. 6).

In the Western Carpathians the only up-to-date exemplars were recorded from the cemetery of the Lusatian culture in Dolný Kubín II and from the hilltop site (hillfort) Tupá skala in Vyšný Kubín (*Bukowski* 1977, 208, map 2; pl. 4; *Čaplovič* 1961, fig. 153: 13; 1987, pl. LXVII: 7). Both rings were ascribed to the ‘Type I (disc-like), variation Ia’, e.g. to the rings ‘manufactured by casting technique’, with ‘conical head and thin bail’ by Z. Bukowski who dated the ‘variation Ia’ to 6th–4th cent. BC (*Bukowski* 1977, 208). The ring from Dolný Kubín II was analysed also in later works and was dated to the phase Dolný Kubín IIb–III, i.e. from the end of Ha C1 till the end of Ha D stage and was related to the nail-shaped rings from Southeast Poland (*Benediková* 2006, 59, 60, 136, fig. 48; 77; 78; 80; 88). Judging from the published drawing and photography (*Čaplovič* 1961, fig. 153: 13; 1987, pl. LXVII: 7), the Vyšný Kubín exemplar’s classification as a nail-shaped head ornament might be questionable because of the untypical shape of the head – flat rounded head with high conical protuberance. From Maszkowice, Góra Zyndarma site, in Poland one or two exemplars of this type are known, even though up-to-date they are unpublished (Marcin S. Przybyła pers. comm.).

Regarding the chronology of the nail-shaped head rings, the Ukrainian exemplars are dated to the 7th–5th cent. BC, and the Polish ones to the end of Ha C–beginning of Lt A stages, or coarsely to Ha D stage (*Kozubová/Fojtík* 2021, 60, with references).

Recently discovered exemplars dealt with in our paper come from one hilltop site in the Slovakian part of the Western Carpathians, namely from Demänovská hora (known also as Demänovská Poludnica) in the cadastres of Liptovský Mikuláš-Ploštín and Demänovská Dolina (both Dist. Liptovský Mikuláš).

DEMÄNOVSKÁ HORA SITE

Demänovská hora is interpreted as a refuge place, with possible ritual function, having its role in the Final Bronze Age, Hallstatt and La Tène periods settlement structure. Site is known since 1970s and besides the survey activities conducted in 2018–2022, the place was surveyed and/or excavated also in 1974, 1979, 1998, 2001, 2004 and 2015. During the field research were discovered the traces of fortification (dry

² Among the finds listed on cited figure, the exemplars from Algyő, Csanytelek and Tápiószéle cemeteries belong to the snake-shaped types (cf. also *Kozubová* 2013, 30; 2018, fig. 10).

masonry made of sand stone slabs), and rather thin (thickness up to 20–35 cm; only on some spots, like the cracks in the bedrock, up to 50 cm) cultural layer, nevertheless containing abundant finds of pottery, metal finds, granite pebbles (which must have been brought from the river valley below), scattered clay daub with imprints of wooden constructions, human and animal bones and a quantity of charred plant remains (see more in e.g. Barta *et al.* 2023, 1–20; Benediková 2006, 182–191; Benediková/Švihurová/Šimková 2020, 38, 39; Benediková *et al.*, *in print*; Furman 2020; Furman/Benediková/Šimková 2018; 2019, 76–83; 2020; Furman/Benediková/Felcan 2021; Furman/Zachar/Felcan 2022; Pieta 1981, 53–66; 1983, 39–49; Pieta/Barta/Benediková 2021, 117–145).

During the intensive metal detector systematic survey of the site in 2018–2021 that was carried out also as a prevention from illegal treasure hunter activities, over 700 metal artefacts were retrieved, including the collection of 450 bronze arrowheads of eastern type (Furman/Benediková/Šimková 2019, 76–83). The assemblage of finds in the broader context is published elsewhere (Benediková *et al.*, *in print*); here we present only eight bronze nail-shaped head ornaments considering also their distribution in the Carpathian Basin and beyond.

Circumstances of discovery

Five of up-to-now eight known exemplars of Demänovská hora nail-shaped head ornaments were discovered on the northern slope of the site below the top plateau – e.g. on the spots of the highest distribution of metal finds discovered during detector surveys. One exemplar comes from the top plateau, one from the southern slope below the top plateau and the most recently discovered was the head ring above the north-western foothill of the hilltop site (Fig. 1: 1, 2).

DESCRIPTION OF ARTEFACTS

1. Bronze nail-shaped head ornament; almost complete, only the very end of the hoop is broken off; round head of flat semi-circular frontal shape; short hoop made of wire with oval to round cross-section bent towards the top of the head, attached to the bottom of the head almost in the centre; undecorated; measurements: length: 35 mm, head diameter: 24 mm, hoop diameter: 2 mm, weight: 7 g; Reg. No. 2018_8_1; Fig. 2: 5.
2. Bronze nail-shaped head ornament fragment; only part of the hoop is preserved; round head of conical frontal shape; hoop with round cross-section broken off, attached to the bottom of the head slightly asymmetrically off the centre; hoop neck of rectangular cross-section; preserved parts undecorated; measurements: length: 20 mm, head diameter: 26 mm, hoop diameter: 2 mm, weight: 19 g; Reg. No. 2018_19_1; Fig. 2: 1.
3. Bronze nail-shaped head ornament fragment; almost complete, only the very end of the hoop is broken off; round head of conical frontal shape with rounded peak; hoop with round cross-section attached to the bottom of the head asymmetrically off the centre, hoop bent towards the bottom of the head with its end bent off the head; hoop neck of rectangular cross-section; terminal end of the hoop decorated by multiple short parallel incisions; measurements: length: 53 mm, head size: 19 × 20 mm, hoop diameter: 2 mm, weight: 8 g; Reg. No. 2018_19_4; Fig. 2: 6.
4. Bronze (nail-shaped head ornament?) fragment; only neck of the hoop (?) is preserved; deformed round head of slightly lower conical frontal shape; hoop (?) attached to the bottom of the head in the centre; rather massive hoop (?) neck of rectangular cross-section; preserved parts undecorated; measurements: length: 17 mm, head size: 21 × 25 mm, hoop (?) neck size: 5 × 5 mm, weight: 11 g; Reg. No. 2018_19_9; Fig. 2: 2.
5. Bronze (nail-shaped head ornament?) fragment; only neck of the hoop (?) is preserved; oval to round head of conical frontal shape; hoop (?) attached to the bottom of the head asymmetrically off the centre; rather massive hoop (?) neck of rectangular cross-section; preserved parts undecorated; measurements: length: 15 mm, head diameter: 18 × 19 mm, hoop (?) diameter: 2.5 mm, weight: 6.44 g; Reg. No. 2019_35_1; Fig. 2: 3.
6. Bronze nail-shaped head ornament fragment; complete; round head of conical frontal shape; surface of the head slightly shaped; hoop with oval to round cross-section attached to the bottom of the head asymmetrically off the centre, hoop bent towards the top of the head with its end bent off the head; hoop neck of pentagonal cross-section decorated by three short oblique incisions; terminal end of the hoop decorated by multiple short and oblique parallel incisions; measurements: length: 48 mm, head size: 16 × 17 mm, pin diameter: 2.5 mm, weight: 7.09 g; Reg. No. 2021_2_1; Fig. 2: 8.
7. Bronze nail-shaped head ornament; almost complete, only the very end of the hoop is broken off; round head of flat semi-circular frontal shape; short hoop made of wire with oval to round cross-section bent towards the edge of the head, attached to the bottom of the head almost in the centre; undecorated; measurements: length: 29 mm; head diameter: 17 mm, hoop diameter: 2 mm, weight: 4.52 g; Reg. No. 2021_2_5; Fig. 2: 4.
8. Bronze nail-shaped head ornament; complete; round head of flat semi-circular frontal shape; short hoop made of wire with round cross-section bent towards the edge of the head, attached to the bottom of the head almost in the centre; at the end decorated by 20 parallel incisions, just on one side; measurements: length: 63 mm; head size: 24.5 × 25.5 mm, hoop diameter: 2.5 mm, weight: 16.75 g; Reg. No. 2022_1 (Fig. 2: 7).

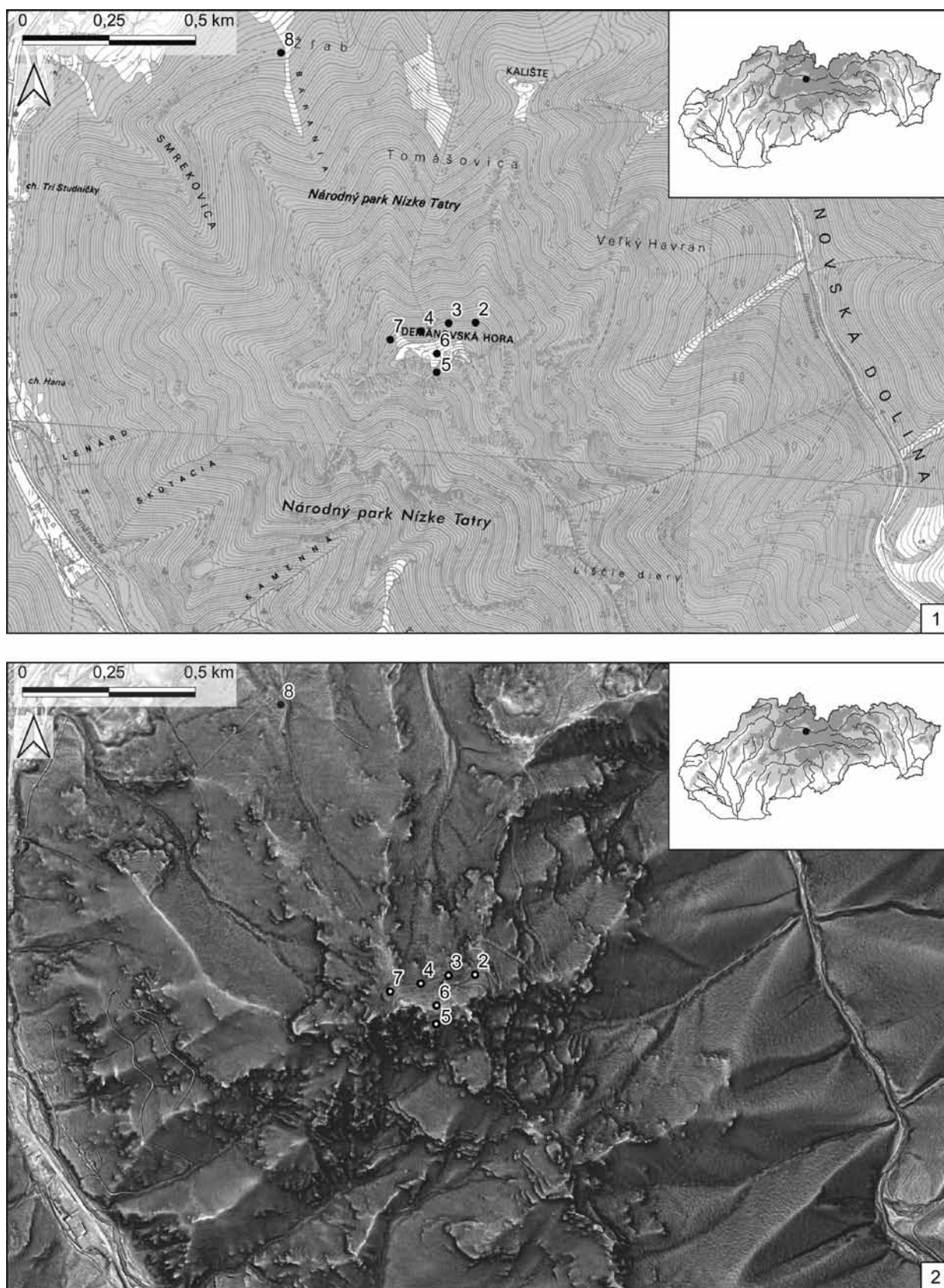


Fig. 1. Distribution of nail-shaped head ornaments on Demänovská hora site. The numbers correspond with the numbers in the chapter *Description of artefacts* (the location of artefact No. 1 is unknown). Map M. Furman. Map source: 1 – GCCA SR (ÚGKK SR); 2 – GCCA SR (ÚGKK SR); visualisation T. Lieskovský.

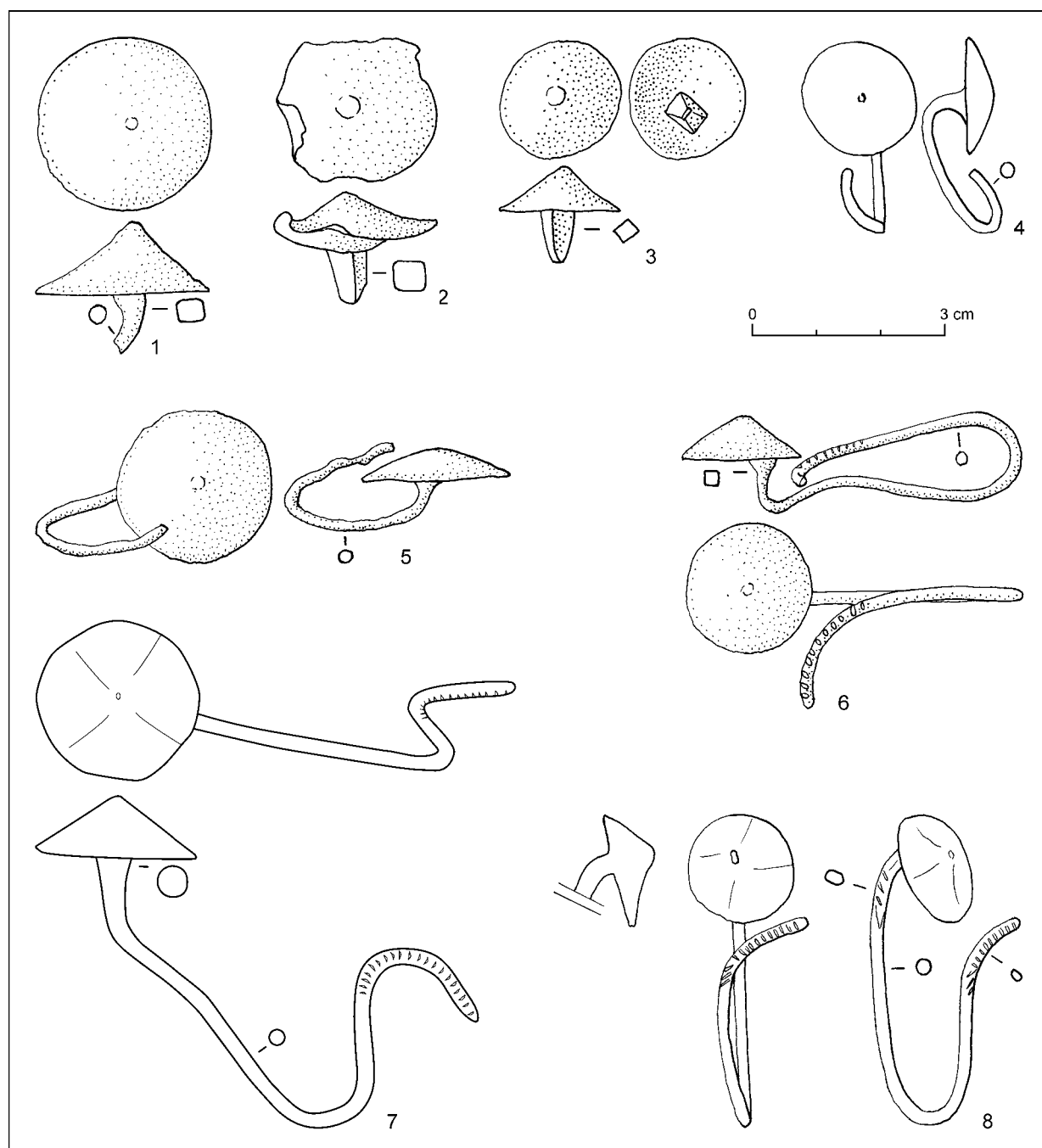


Fig. 2. Demänovská Dolina – Liptovský Mikuláš-Ploštín, Demänovská hora. Bronze nail-shaped head ornaments. 1 – 2018_19_1; 2 – 2018_19_9; 3 – 2019_35_1; 4 – 2021_2_5; 5 – 2018_8_1; 6 – 2018_19_4; 7 – 2022_1; 8 – 2021_2_1. Drawings B. Arvayová, M. Furman (No. 7).

ARTEFACT ANALYSES

Within our eight exemplars, two types of nail-shaped head ornaments can be recognized. By two artefacts it cannot be sufficiently reasoned whether they belong to functional group of head ring jewellery.

Type DH_I (Demänovská hora I) is represented by three (almost) complete exemplars of the head ornaments with round head of conical frontal shape with rounded or pointed peak, two of them decorated at the end of the hoop and one of them on the end of the hoop as well as on the hoop neck by short incisions (Fig. 2: 6–8). The largest one is the exemplar with Reg. No. 2022_1 (Fig. 2: 7). It is possible that the

exemplar with Reg. No. 2018_19_1 (Fig. 2: 1) belongs to this type as well, as it has the head and the hoop neck shaped in the same manner, so as the hoop attached to the bottom of the head off its centre reminds the type DH_I rings. This fragment is also the heaviest one of all studied head rings – actually only its head and small fragment of the hoop weights 19 g (!). The complete largest exemplar with Reg. No. 2022_1 (Fig. 2: 7) has 16.75 g, even though the heads of the two heaviest specimens are almost the same size (24.5 × 25.5 for No. 2022_1 and 26 mm for No. 2018_19_1). Judging from the weight and size of these two largest ornaments it is more likely that they served as head/hair not as an ear ornament.

Type DH_II is represented by two (almost) complete undecorated exemplars of the head rings with round head of flat semi-circular frontal shape and with gracile hoop (Fig. 2: 4, 5).

The function of head ring jewellery can be assumed for two another fragments (Fig. 2: 2, 3). Hypotheses about these artefacts being the head rings is made according to the shape of their head, however, their hoop is broken off just below the hoop neck and the hoop neck of rectangular cross-section is really massive when compared to up-to-date known nail-shaped head rings and also to the artefacts studied in this paper.

The detailed typology of the nail-shaped head rings east of the Carpathians was elaborated by V. G. Petrenko (1978). Typological overview of the nail-shaped head rings from the Lusatian culture environment was offered by K. Moskwa (1976) and Z. Bukowski (1977). In the last 20 years these ornaments in the territories of the Lusatian, Wysocko, Miłograd cultures, and further to the east were dealt with e.g. by A. Gawlik (2005; 2007; 2009; for further references cf. Kozubová/Fojtík 2021, 58, 60).

Despite rather abundant literature to this topic it is relatively difficult to find the analogies to our artefacts from Demänovská hora site. Only type DH_II has parallels among the rings of Sokolniki type, variant B, as defined by A. Gawlik (2009, 184, 185; fig. 6; 7). These rings are distributed on the territory of Miłograd culture; in Scythian culture, they are, however, not limited to the territory of forest-steppe Ukraine, but occur also in lower Don and Upper Crimea regions (Gawlik 2009, 185). On the basis of the occurrence of this (and other) type of the bronze industry of eastern origin in the Lusatian territory (influences from the territory of Miłograd culture) these objects appearing in Southeast Poland are dated to 6th and 5th cent. BC (Gawlik 2009, 185).

Type DH_I has – apart from two analogies from the local cultural environment from neighbouring North Slovakian Orava region, namely the nail-shaped ring from grave No. 112 on the necropolis Dolný Kubín II, perhaps also from the hilltop site Tupá skala in Vyšný Kubín (see above), and unpublished exemplar (or perhaps two exemplars?) from the hillfort Góra Zyndarma in Maszkowice in Dunajec Valley (Marcin S. Przybyła pers. comm.) – no known analogies among the head rings from the Lusatian culture, other cultures east of the Carpathian Arc or Scythian culture of forest-steppe or steppe regions. They cannot be compared with other rings of this kind because of the shape of their head and because of the decoration on the hoop. The head of our rings is conical, full, casted and flat at the bottom. Known analogies, however, can have full, casted heads with flat bottom, but such types have the heads of semi-circular or semi-globular shape, not of the conical one. Other issue is that even the full, casted heads with semi-globular shape occur only sparsely – mostly they are only thin semi-circular in cross-section, and so resembling opened umbrella (cf. e.g. Bukowski 1977, fig. 11–13; Gawlik 2005, fig. 2: h, i, n, o, s, t, w, x; 3: a–e; 2009, fig. 4: 6, 7, 17, 18; 5; Moskwa 1976, fig. 23: n; 33: f–m; 41: g; 53: g, h; 61: i–l; 68: z; 71: l, t; Petrenko 1978, pl. 16; 17).

We encounter the same problem if we try to compare the heads and preserved parts of the hoop necks of the type DH_III. The heads of our type are again massive, conical, casted, with flat bottoms. Compared to type DH_I (and other known rings of this kind from other regions) they even differ in the shape of their hoop necks which are very massive and sharply rectangular in cross-section. The only ear/temple ring that can be picked here for the comparison would be actually the ‘phantom’ piece – namely only the impression of the ear/temple ring on the sherd known from Smržice-Trávníky u ostrova site (Moravia, Czech Republic; Kozubová/Fojtík 2021, fig. 2: 1, 1a; 5). This exemplar would have a similarly shaped, very massive hoop and hoop neck with rectangular cross-section, conical, full, casted head with flat bottom, although its head was very small in comparison with our type DH_I or DH_III.

The nail-shaped head rings from Demänovská hora site can be dated only according to the chronological position of known analogies from the regions north-east and east to the Carpathian Mountains – to the 7th–beginning of the 5th cent. BC, i.e. from the end of Ha C1 till the end of Ha D stage of the Hallstatt period (cf. *Introduction*). Other artefacts from the Demänovská hora site (regarding the current state of the art; cf. Barta et al. 2023, 1–20; Benediková et al., *in print*; Furman/Benediková/Šimková 2019, 76–83) do not contradict such dating.

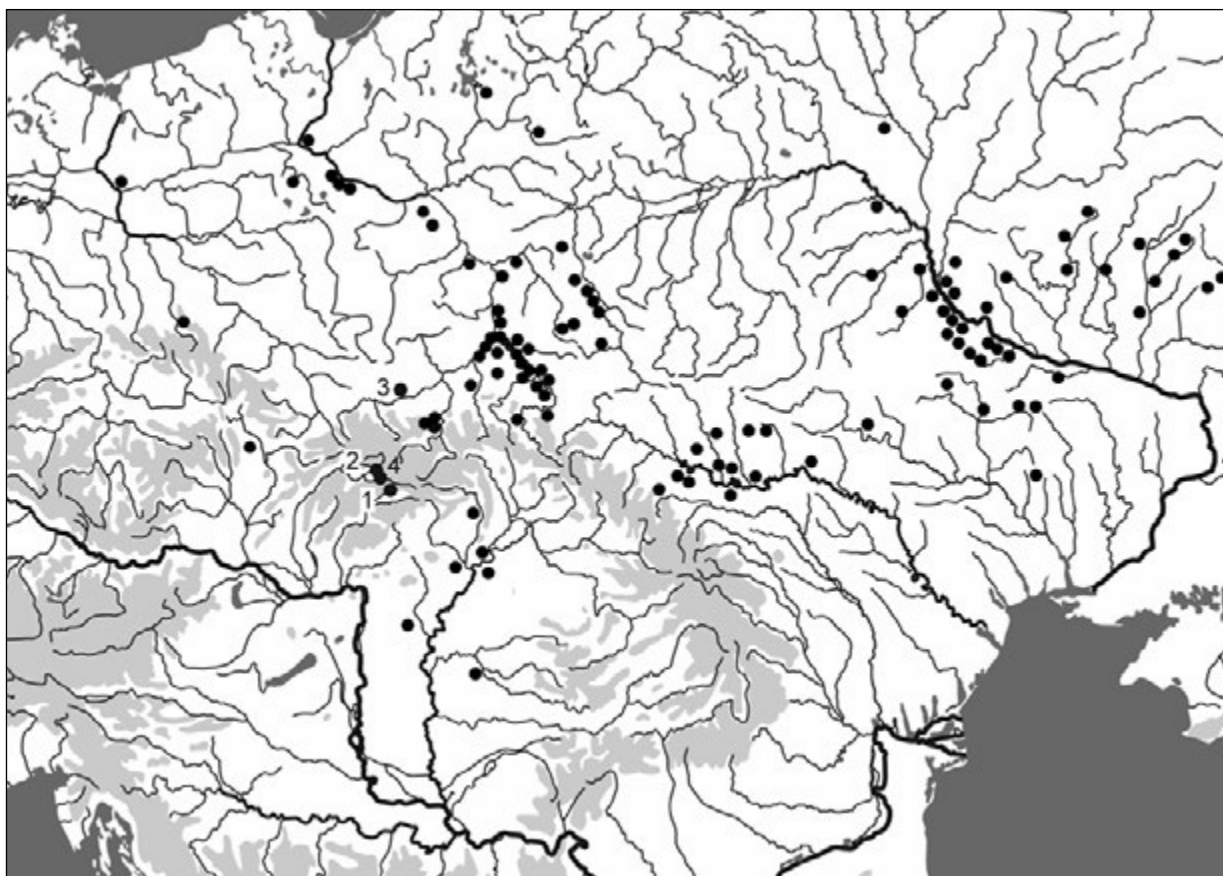


Fig. 3. Distribution of the bronze nail-shaped head ornaments in Europe. After Kozubová/Fojtík 2021, fig. 6, with references. Completed by 1–4. 1 – Demänovská Dolina – Liptovský Mikuláš-Ploštín, Demänovská hora site; 2 – Dolný Kubín II; 3 – Modlnica, site 5; 4 – Vyšný Kubín, Tupá skala site (for references see chapter *Introduction*).

CONCLUSIONS

Eight (six?) new findings of the nail-shaped head rings from the Demänovská hora site in Northern Slovakia represent the highest concentration of this type of jewellery on one site when considering the territory of the Carpathian Basin and of the Tarnobrzeg group of the Lusatian culture (Fig. 3). Even if we omit two disputable artefacts, we still have six pieces from our site (and that doesn't need to be the final number as by each of four intensive survey campaigns between 2018 and 2021 at least one exemplar of this type of jewellery was discovered).

The geographically nearest largest concentration of these head rings within one site is known from the area of Wysocko culture where 15 pieces were discovered at the cemetery in Rakiv Kut (Raków Kał) and 6 or 7 pieces at the cemetery in Lugove (Czechy-Ługowe; Gawlik 2005, 209, 210, fig. 2: n, o, s, t, w, x; 3: a–e).

Regarding the spatial distribution of this jewellery our exemplars can be most likely related to one of the centres of the production and distribution in the Southeast Poland. Nevertheless, as far as we do not have direct comparative parallels between North Slovakian and Southeast Polish territory, we can hypothesise that at least our type DH_I (to which belong also two analogical pieces from Orava region, exemplar [two exemplars?] from Maszkowice in Dunajec Valley on the Polish side of the Western Carpathians, and perhaps also two functionally disputable artefacts discussed in our paper) were produced somewhere in the Slovakian part of the Western Carpathians. Type DH_II, as it has the parallels among the Sokolniki type nail-shaped head ornaments, could have been imported from the area of the Lusatian culture north of the Carpathian Arc. Thus, the idea (including a few 'prototypes') of use of this head ornament could have come from outside, preferred fashion taste was local, however, and the nail-shaped head rings started to be produced locally. This idea can be supported by other known local jewellery types from Slovakian part of the Western Carpathians, namely from the regions of Liptov and Orava. During the

Hallstatt and Early La Tène periods we encounter in these regions (with sparse occurrence in other regions of Slovakian Western Carpathians – Middle Váh River Valley, Turiec, Spiš, sometimes also in lowland regions of the country³) e.g. pins of Orava type, pearl rings, disc shaped openwork ornaments, diadems of Istebné type, as well as Early La Tène fibula of Liptov type (Benediková 2017, 350, 351, 358, fig. 7: 3; 9: 22, 23; 11a; 11b: 9–11; 12; 14; Furman/Brezňanová 2020, 141–147; Novotná 1980, 164, 165, pl. 47: 1005–1111). Regarding their only North Slovakian distribution they were most likely produced in up-to-date unknown local jewellery workshop(s). One of them could have been situated within the settlement below Demänovská hora site – on the settlement Pod Rohačkou in the cadastre of Liptovský Mikuláš-Ploštín that is known as the important archaeological site since the 18th century and the archaeological activities have been being conducted here till present (Benediková et al. 2019, 53–58, with references; Felcanová/Felcan/Lieskovský 2021, 92–99). The site is situated on the foothill of a hillfort Rohačka (Sliacka 2016, 45–50, with references) and is known by abundant find assemblages as well as by structures dated from the Late Bronze Age till the Modern era, majority of them, however, dated to the La Tène and Roman periods (Benediková et al. 2019, 51–88, with references; Felcanová/Felcan/Lieskovský 2021, 92–99; Furman/Zachar/Felcan 2022).

Regarding the function of studied head ornaments, judging from the weight and size, at least type DH_I was most likely used as head/hair ornament rather than the ear ring.

Together with other artefacts from the Demänovská hora site (cf. Benediková et al., in print) the nail-shaped head rings can be related to the impulses and contacts of the Slovakian Western Carpathian region with the cultural territories (north)east of the Carpathian Mountains. They are not the only objects that come (or whose idea of production, decoration, usage comes) from this part of the world. The mountain regions of Slovakia yielded several types of artefacts that evidence the contacts with Tarnobrzeg group, Wysocko culture or Vekerzug culture and they contribute to the knowledge about the eastern type artefacts occurrence beyond their original distribution territory north-east and east of the Carpathian Mountains (see more in Benediková 2017, 335–381, with references). Nevertheless, taking into account broader dating of Demänovská hora site based on the artefactual as well as ecofactual evidence (Ha C–Lt A; also later stages of the La Tène period, as well as the Final Bronze Age use of the site is recorded; Barta et al. 2023, 1–20; Benediková et al., in print; Furman/Benediková/Šimková 2019, 76–83), as well as broad dating of the nail-shaped head rings in whole territory of their distribution (between Ha C and beginning of Lt A) it is not possible to decide to which wave of influences (migrations?; cf. e.g. Czopek 2007, 109–125; Gawlik 2010, 153–172; Klápa 2017, 65–82; Kozubová/Fojtík 2021, 80–96) belong our head ring collection. Moreover, if we consider their local production following the foreign models, we must also consider that contacts with eastern cultures/ethnics must have been (at least in some periods) peaceful. Although some of the artefacts from this period, both at our site and in the wider territory of Central Europe, are represented by militaria (arrowheads of the eastern type), of which some types (outer shaft arrowheads of eastern type) have traditionally (and with the argumentative support of the so-called catastrophic horizons at some sites) been interpreted as evidence of conflict with an external enemy, other reasons for the general occurrence of militaria of ‘eastern type’ (e.g. weapons used by local populations, technological innovation in case of inner shaft arrowheads of eastern type, etc.) are also sought (cf. e.g. Kozubová 2019, 64; Kozubová/Fojtík 2021, 96, 97; Novák 2022, 286, 287). In addition, the artefacts of eastern type cannot be ascribed to one place of origin nor to one time horizon (cf. e.g. Klápa 2017, 65–82; Kozubová/Fojtík 2021, 80–96) what makes the idea about ‘peaceful ways’ of spreading of at least some types of these artefacts to Central Europe more presumable.

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Nové nálezy bronzových klincovitých ozdób hlavy v Západných Karpatoch

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Súhrn

Klincovité ozdoby hlavy predstavujú špecifický typ osobných šperkov. Mohli slúžiť ako náušnice alebo záušnice (*Ohr-
ringe/Schläfenringe*), ale aj ako ozdoby vlasov alebo hlavy (pokrývok hlavy).

Tento ornament je kultúrne spätý s prostredím severovýchodne a východne od karpatského oblúka (porov. napr. *Czopek 2010*, 118, obr. 3; *Gawlik 2007*, 219–240; *Kozubová/Fojtík 2021*, 60; *Polit 2010*, 155–162, obr. 1). K Západným Karpatom geograficky najbližšou oblasťou ich koncentrovaného rozšírenia je územie tarnobrzeskej skupiny lužickej kultúry (obr. 3; *Czopek 2007*, 118, obr. 3; *Gawlik 2007*, 219–240; *Kozubová/Fojtík 2021*, 60; *Polit 2010*, 155–162, obr. 1).

V Západných Karpatoch vystupujú na slovenskej i poľskej strane karpatského oblúka (obr. 3; *Ablamowicz R./Ablamowicz D. 1989*, 199–212; *Benediková 2006*, 59, 60, 136, obr. 48; 77; 78; 80; 88; *Bukowski 1977*, 208, mapa 2; tab. 4; *Čaplovič 1961*, obr. 153; 13; 1987, tab. LXVII: 7; *Dziegielewska 2015*, obr. 62: b; *Kostrzewski 1962*, tab. XXVIII; *Żurowski 1927*).

Klincovité ozdoby sa sporadicky vyskytujú aj v kultúrne cudzom prostredí vekeerzugskej kultúry (*Kozubová 2018*, 31, obr. 17: 31; 18: 3, 4; 19: 10, 11; 2019, obr. 31; *Kozubová/Fojtík 2021*, 60–63, obr. 6; *Miroššayová 2012*, 258, obr. 5; 6; 2015, 29).

Najzápadnejšie predmety tohto typu sú známe z Moravy a zo západného Poľska (Smržice-Trávníky u ostrova, Polanowice, Strzegom; *Kozubová/Fojtík 2021*, 60, obr. 6).

Ukrajinské exempláre klincovitých šperkov hlavy sú datované do 7.–5. stor. pred n. l. a poľské do konca stupňa HC až začiatku stupňa LTA, resp. veľmi hrubo do stupňa HD (*Kozubová/Fojtík 2021*, 60, s literatúrou).

V našom príspevku sa zaoberáme nedávno objavenými ôsmimi (šiestimi?) exemplármi pochádzajúcimi z vyšinnej lokality v slovenskej časti Západných Karpát, a to z Demänovskej hory (známej aj ako Demänovská Poludnica) v katastroch Liptovský Mikuláš-Ploštín a Demänovská Dolina (obe okr. Liptovský Mikuláš; obr. 1; pozri napr. *Barta et al. 2023*, 1–20; *Benediková 2006*, 182–191; *Benediková/Švihurová/Šimková 2020*, 38–39; *Benediková et al., v tlači*; *Furman 2020*; *Furman/Benediková/Šimková 2018*; 2019, 76–83; 2020; *Furman/Benediková/Felcan 2021*; *Furman/Zachar/Felcan 2022*; *Pieta 1981*, 53–66; 1983, 39–49; *Pieta/Barta/Benediková 2021*, 117–145). Počas intenzívneho systematického výskumu lokality detektorom kovov v rokoch 2018–2022 bolo získaných viac ako 700 kovových artefaktov, vrátane kolekcie 450 bronzových hrotov šípov východného typu (*Benediková et al., v tlači*; *Furman/Benediková/Šimková 2019*, 76–83).

Medzi našimi ôsmimi artefaktmi sa dajú definovať dva typy klincovitých ozdób hlavy, pri dvoch exemplároch (prír. č. 2018_19_9, 2019_35_1; obr. 2: 2, 3) nie je možné spoľahlivo rozhodnúť, či ide o tento typ predmetu.

Typ DH_I (Demänovská hora I) je zastúpený tromi (takmer) kompletnými zdobenými exemplármi (prír. č. 2018_19_4, 2021_2_1, 2022_1; obr. 2: 6–8) a azda i jedným ďalším fragmentom (prír. č. 2018_19_1; obr. 2: 1). Typ DH_II reprezentujú dva (takmer) kompletne nezdobené exempláre (prír. č. 2018_8_1, 2021_2_5; obr. 2: 4, 5).

Napriek pomerne bohatej literatúre k tejto téme vrátane typologických prác (*Bukowski 1977*; *Gawlik 2005*; 2007; 2009; *Moskwa 1976*; *Petrenko 1978*) sa k našim artefaktom z lokality Demänovská hora ťažko hľadajú analógie. Jediné typ DH_II má paralely medzi ozdobami typu Sokolniki, variant B, ako ho definovala A. Gawlik s analógiami v miľogradskej kultúre a v „skýtskej“ kultúre východne od Karpát (*Gawlik 2009*, 184, 185; obr. 6; 7).

Typ DH_I nemá – s výnimkou dvoch analógií z miestneho kultúrneho prostredia susedného severoslovenského regiónu Oravy, konkrétne exemplárov z hrobu 112 v Dolnom Kubíne II a azda i z hradiska Tupá skala vo Vyšnom Kubíne (pozri vyššie), a jedného (dvoch?) nepublikovaného exemplára z hradiska Góra Zyndarma v Maszkowiciach v doline Dunajca (Marcin S. Przybyła pers. comm.) – známe analógie medzi náušnicami/záušnicami z prostredia lužickej kultúry, iných kultúr na východ od karpatského oblúka ani skýtskej kultúry lesostepných či stepných oblastí. S inými ozdobami tohto druhu ich nemožno porovnávať pre tvar masívnej liatej hlavice s plochou (nie konkávnou) spodnou stranou a pre výzdobu na závesnom krúžku/slučke (porov. napr. *Bukowski 1977*, obr. 11–13; *Gawlik 2005*, obr. 2: h, i, n, o, s, t, w, x; 3: a–e; 2009, obr. 4: 6, 7, 17, 18; 5; *Moskwa 1976*, obr. 23: n; 33: f–m; 41: g; 53: g, h; 61: i–t; 68: z; 71: l, t; *Petrenko 1978*, tab. 16; 17).

Na rovnaký problém narazíme, ak sa pokúsime porovnať ďalšie dva fragmenty z našej kolekcie, o ktorých nie je možné s istotou povedať, že ide o klincovité ozdoby hlavy. Jediný artefakt, ktorý sa dá vybrať na porovnanie, je vlastne len odtlačok klincovitého šperku na črepe z lokality Smržice-Trávníky u ostrova (Morava, Česká republika; *Kozubová/Fojtík 2021*, obr. 2: 1, 1a; 5). Tento exemplár má podobne tvarovaný veľmi masívny kľúčik závesnej slučky so štvorhraným prierezom, a kónickú, plnú, liatu hlavicu s rovnou spodnou stranou, hoci jeho hlavica je v porovnaní s naším typom DH_I alebo dvomi neistými diskutovanými artefaktmi veľmi malá.

Klincovité šperky z lokality Demänovská hora možno datovať len podľa chronologického zaradenia známych analógií z oblastí severovýchodne a východne od Karpát, t. j. do 7. až 5. stor. pred n. l. (od konca stupňa HC1 začiatku LTA). Ďalšie artefakty z lokality Demänovská hora nie sú v rozpore s takýmto datovaním (porov. *Barta et al. 2023*, 1–20; *Benediková et al., v tlači*; *Furman/Benediková/Šimková 2019*, 76–83).

Osem (ak vynecháme dva problematické artefakty, stále zostáva šesť kusov) nových nálezov klincovitých ozdôb hlavy z lokality Demänovská hora na severnom Slovensku predstavuje najvyššiu koncentráciu tohto typu šperku na jednej lokalite v rámci územia Karpatskej kotliny a tarnobrzskej skupiny lužickej kultúry (obr. 3). Geograficky najbližšia výrazná koncentrácia týchto šperkov v rámci jednej lokality je známa z oblasti vysokej kultúry (Gawlik 2005, 209, 210, obr. 2: n, o, s, t, w, x; 3: a–e).

Vzhľadom na to, že neexistujú presné tvarové paralely pre všetky severoslovenské exempláre, môžeme vysloviť hypotézu, že minimálne náš typ DH_I (ku ktorému možno zaradiť aj dva analogické kusy z regiónu Oravy, jeden z doliny Dunajca na poľskej strane Západných Karpát, a možno aj dva problematické artefakty diskutované v našom článku) bol vyrobený niekde v slovenskej časti Západných Karpát. Myšlienka (vrátane niekoľkých „prototypov“ – typ Sokolniki/DH_II) používania tejto ozdoby hlavy mohla prísť zvonka, preferovaný módný vkus však bol miestny a klincovité krúžky sa začali vyrábať lokálne. Túto myšlienku možno podporiť aj ďalšími známymi lokálnymi typmi šperkov z halštatského až starolaténskeho obdobia zo slovenskej časti Západných Karpát, predovšetkým z regiónov Liptova a Oravy, ku ktorým patria z doby halštatskej napr. ihlice typu Orava, kruhy s vývalkami, terčovité prelamované ozdoby, diademy typu Istebné, ako aj starolaténske spony typu Liptov (Benediková 2017, 350, 351, 358, obr. 7: 3; 9: 22, 23; 11a; 11b: 9–11; 12; 14; Furman/Brezňanová 2020, 141–147; Novotná 1980, 164, 165, tab. 47: 1005–1111). Miestnu šperkársku dielňu by sme mohli hľadať azda aj v osade Pod Rohačkou v katastri Liptovského Mikuláša-Ploštína pod Demänovskou horou, ktorá je rozsiahlou lokalitou s bohatými nálezmi z rôznych období od doby bronzovej do novoveku, najmä však z doby laténskej a rímskej (Benediková et al. 2019, 53–58, s literatúrou; Felcanová/Felcan/Lieskovský 2021, 92–99; Furman/Zachar/Felcan 2022; Sliacka 2016, 45–50, s literatúrou).

Klincovité ozdoby hlavy (spolu s niektorými ďalšími artefaktmi z lokality Demänovská hora [porov. Benediková et al., v tlačí], ako aj s ďalšími artefaktmi známymi zo severného a stredného Slovenska, kde sa dá predpokladať východný pôvod [pozri napr. Benediková 2017, 335–381, s literatúrou]) možno spájať s impulzmi a s kontaktmi slovenskej oblasti Západných Karpát s areálmi kultúr (severo)východne od Karpát. Berúc do úvahy širšie datovanie lokality Demänovská hora na základe artefaktov i ekofaktov (HC–LTA, aj neskoršie stupne doby laténskej; Barta et al. 2023, 1–20; Benediková et al., v tlačí; Furman/Benediková/Šimková 2019, 76–83), ako aj široké datovanie klincovitých šperkov na celom území ich rozšírenia (HC–LTA) však nie je možné rozhodnúť, ku ktorej vlne vplyvov (migrácií?; porov. napr. Czopek 2007, 109–125; Gawlik 2010, 153–172; Klápa 2017, 65–82; Kozubová 2019, 64; Kozubová/Fojtík 2021, 80–97) patrí naša kolekcia klincovitých ozdôb hlavy.

Obr. 1. Distribúcia klincovitých ozdôb hlavy na lokalite Demänovská hora. Číslo zodpovedajú číslam v kapitole *Opis artefaktov* (poloha artefaktu č. 1 nie je známa). Mapa M. Furman. Zdroj mapy: 1 – ÚGKK SR; 2 – ÚGKK SR, vizualizácia T. Lieskovský.

Obr. 2. Demänovská Dolina – Liptovský Mikuláš-Ploštín, Demänovská hora. Bronzové klincovité ozdoby hlavy. 1 – 2018_19_1; 2 – 2018_19_9; 3 – 2019_35_1; 4 – 2021_2_5; 5 – 2018_8_1; 6 – 2018_19_4; 7 – 2022_1; 8 – 2021_2_1. Kresby B. Arvayová, M. Furman (č. 7).

Obr. 3. Rozšírenie bronzových klincovitých ozdôb hlavy v Európe. Podľa Kozubová/Fojtík 2021, obr. 6, s literatúrou. Doplnené o 1–4. 1 – Demänovská Dolina – Liptovský Mikuláš-Ploštín, Demänovská hora; 2 – Dolný Kubín II; 3 – Modlnica, stan. 5; 4 – Vyšný Kubín, Tupá skala (literatúru pozri v kapitole Úvod).

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HIGH HOPES: ON SETTLEMENT STRATEGIES IN THE TRIBEČ MOUNTAINS (WEST SLOVAKIA)

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Michal Felcan – Peter Romsauer**

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In the paper, preliminary results of archaeological research in the Tribeč Mountains are introduced, based on new data acquired by airborne laser scanning and their verification in the field. Thanks to this research, the view on the number and distribution of relics of anthropogenic activities in this area in the Late Bronze and Early Iron Ages has changed substantially. In addition to previously known hillforts, other structures were also newly identified, such as fortifications and new fortification elements, areas formed by numerous artificial terraces, as well as mounds and roads.

INTRODUCTION

In the Tribeč Mountains, Western Slovakia, there is a large concentration of hillforts dated to the Urnfield and/or Hallstatt periods, however, the present knowledge does not allow to resolve their relationships and to precise their dating. Most of the known settlements and cemeteries were located at the lower altitudes on more fertile soils of Žitava and Nitra hills and the Nitra River plain (Fig. 1–4). In the presented paper, preliminary results of the current archaeological research of habitation in the higher altitudes of the landscape will be presented, stimulated mainly by the data acquired by airborne laser scanning.

The Tribeč Mountains are located between the towns of Nitra, Partizánske, and Zlaté Moravce. They are part of Inner Western Carpathians and are surrounded by Danubian Lowland from the south and valleys of the river Nitra from the west and north, and the river Žitava from the east. The Tribeč Mountains consist of four units (from the south to the north): Zobor, Jelenec, Veľký Tribeč, and Rázdiel unit.

The geomorphological terrain of the Tribeč Mountains is from upland to highland (400–800 m above mean sea level) divided by deep stream valleys. The highest peaks are mountain tops of the main ridge, namely the Veľký Tribeč (829.6 m), Malý Tribeč (769.4 m), and Javorový vrch (730.6 m), all formed of granitoid rocks. In the SW part of the mountains, Žibrica (616.6 m) and Zobor (587 m) are the highest and most significant. They are formed of Mesozoic complexes (Jahn 2009, 10, 11). The peripheral parts of the Tribeč Mountains consist of resistant quartzites that form rocky hillocks, such as Hrdovická, Veľký Lysec, and Svinec (Košťál 2007, 23, 24).

Large parts of the Tribeč Mountains belong to the Ponitrie Protected Landscape Area.

HISTORY OF RESEARCH – TRIBEČ MOUNTAINS IN THE LATE BRONZE¹ AND EARLY IRON AGES

Information on finds and sites dated to the Urnfield and Hallstatt periods has been coming to light gradually from the early twentieth century. The finds were usually collected in the areas of hillforts. The hillfort on the top of Veľký Tribeč Mountain, along with adjacent roads and water sources in its

¹ In this paper, the term Late Bronze Age or the Urnfield period is used for a time span from the Br D to Ha B stage (including).

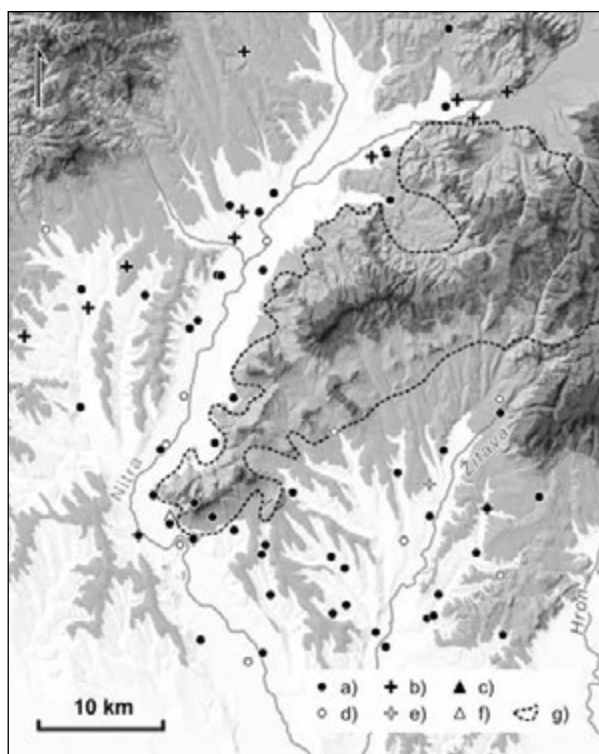


Fig. 1. Previously known sites dated to the Urnfield period (Br D–early Ha A2) in the wider surroundings of the Tribeč Mountains on a topographic terrain model. Legend: a – settlements; b – settlements of uncertain dating (e.g. 'Br D?'); c – cemeteries/burial mounds; d – questionable cemeteries/barrows; e – hillforts; f – hillforts of uncertain dating; g – the area of interest. The sites were mapped according to the available publications. Authors P. Kmeťová and P. Bisták; graphics T. Lieskovský.

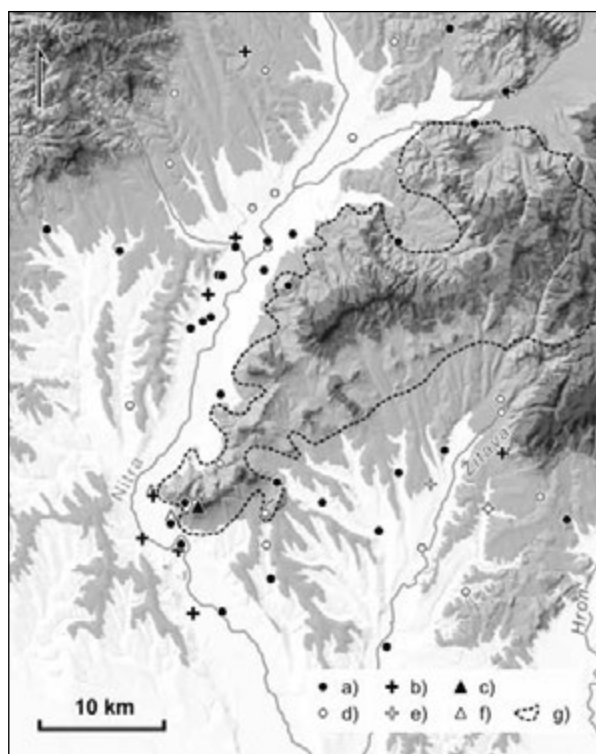


Fig. 2. Previously known sites dated to the Urnfield period (Ha A2–Ha B1) in the wider surroundings of the Tribeč Mountains on a topographic terrain model. Legend: a – settlements; b – settlements of uncertain dating (e.g. 'Ha A2–Ha B1?'); c – cemeteries/burial mounds; d – questionable cemeteries/barrows; e – hillforts; f – hillforts of uncertain dating; g – the area of interest. The sites were mapped according to the available publications. Authors P. Kmeťová and P. Bisták; graphics T. Lieskovský.

surroundings, was described and drawn by L. Odescalchi (*Odescalchi* 1922, 13–18). Hillforts on the tops of the Zobor and Žibrica Mountains were first mentioned by J. Eisner (1923, 125). Systematic surveys and geodetic documentation of fortified settlements in the 1920s and 1930s were realized by Š. Janšák who published ground plans, descriptions, and dating based on collected finds of hillforts in Nitra-Dražovce near Church of St. Michal, Nitra-Lupka, Nitra-Zobor, Žibrica and Veľký Tribeč (*Janšák* 1929). In the second half of the twentieth century several hillforts were discovered: Veľký Lysec near Kostolany pod Tribečom, Šiance near Klátova Nová Ves, Hradište near Malé Uherce, and Michalov vrch near Kolačno.

Only a few hillforts have been excavated up to now, most of all by a small-scale trenching: Tábor near Krnáč (Ha C1 + ?), excavations in 1965–1966, 2017 (*Benadik* 1967, 612–618, 622; *Felcan/Gróf* 2019), and yet unpublished rescue excavations in recent years; Zobor near Nitra (Ha B1–esp. Ha B3–Ha C1), excavations in the late 1960s, 1973, and 1986–1987 (*Danielová* 2017; *Veliačik/Romsauer* 1994, 122); Šiance near Klátova Nová Ves (Ha B3–Ha C1), excavations in 1972 (*Wiedermann* 1985, 51); Žibrica near Štitáre (Ha B3–esp. Ha C and Ha D1), magnetic survey in 2000 and 2005, and excavations in 2002–2003 (*Felcan* 2019; *Felcan/Stegmann-Rajtár* 2018; *Stegmann-Rajtár* 2004); and Veľký Lysec and Malý Lysec hillfort² near Kostolany pod Tribečom (Ha C–Ha D1), excavations in 2013–2014 (*Borzová/Borza/Bisták* 2014; *Romsauer/Borzová/Bisták* 2013).

In a few other hillforts, only insignificant finds roughly dated to the Urnfield and Hallstatt periods were obtained during excavations aimed at habitation in the later eras: Michalov vrch near Kolačno (Hallstatt period?), Nitra-Dražovce (Ha A2–Ha B1 [?]), and Lupka in Nitra (Late Bronze Age; *Veliačik/Romsauer* 1994, 81, 121, 123, with additional references). Only field surveys with find collecting were carried out in the areas of hillforts Veľký Tribeč (Ha B3–Ha C1) and Hradište near Malé Uherce (Ha B3–Ha C1 [?];

² The fortified area of the hillfort stretches on two close hilltops, Veľký Lysec and Malý Lysec.

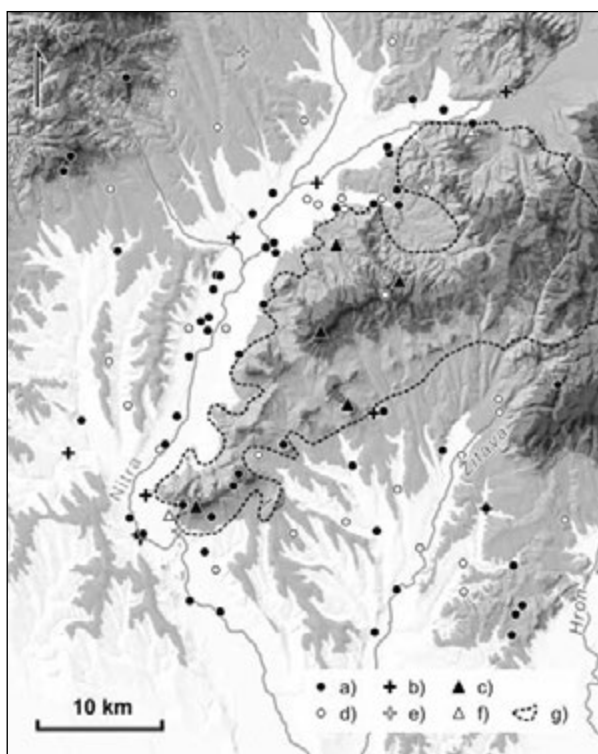


Fig. 3. Previously known sites dated to the turn of the Urnfield and Hallstatt periods (Ha B3–Ha C1 according to dating by *Veliačik/Romsauer 1992*) in the wider surroundings of the Tribeč Mountains on a topographic terrain model. a – settlements; b – settlements of uncertain dating (e.g. 'Ha B'); c – cemeteries/burial mounds; d – questionable cemeteries/barrows; e – hillforts; f – hillforts of uncertain dating; g – the area of interest. The sites were mapped according to the available publications. Authors P. Kmetová and P. Bisták; graphics T. Lieskovský.

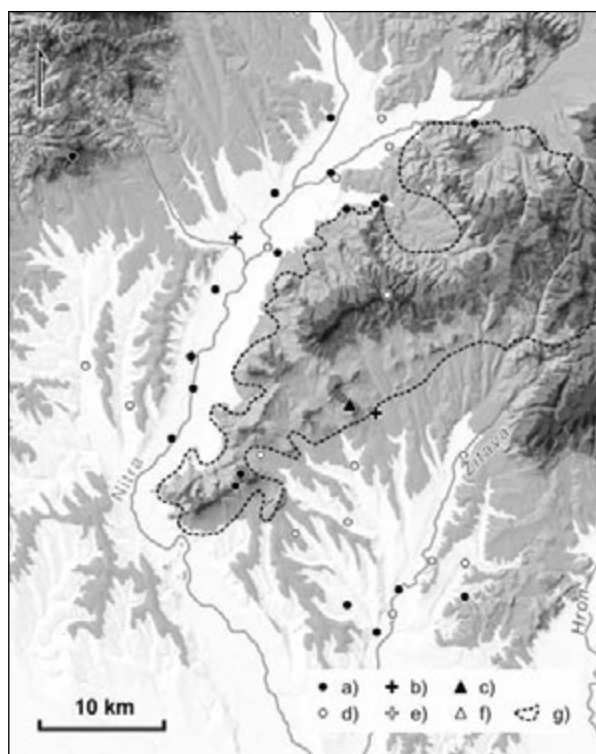


Fig. 4. Previously known sites dated to the Hallstatt period (Ha C2–Ha D1) in the wider surroundings of the Tribeč Mountains on a topographic terrain model. Legend: a – settlements; b – settlements of uncertain dating (e.g. 'Hallstatt period'); c – cemeteries/burial mounds; d – questionable cemeteries/barrows; e – hillforts; f – hillforts of uncertain dating; g – the area of interest. The sites were mapped according to the available publications. Authors P. Kmetová and P. Bisták; graphics T. Lieskovský.

Veliačik/Romsauer 1994, 87, 142). In the case of Šípok hillfort near Malé Uherce, the published information is unclear (*Horňák/Stegmann-Rajtár 2008*, fig. 1).

Open settlements in the vicinity of hillforts were identified only sporadically in the woody highland terrain. They are known mainly from fieldwork and collecting finds in the areas as follows: some of the artificial terraces near hillfort Zobor (Late Bronze Age, Ha B3; *Pieta 2011*), near the hillfort Žibrica (*Felcan 2019*, 96, 100, fig. 42), and outside the fortified area of the hillfort Veľký Lysec and Malý Lysec (*Bisták/Borzoová/Borza 2017*); and settlement on the hillock Hrdovická near Nitrianska Streda (Ha A2; *Vavák 2007*). A settlement was researched by trenching only in a single case: Panská hora/Panský les site near the Žibrica hillfort near Štitáre village: P. Romsauer, 1984, and the earlier fieldworks of Š. Janšák (Hallstatt period; *Felcan 2019*; *Janšák 1929*; *Romsauer 1985*).

METHODS

Recently, a large amount of new information was recovered from the evaluation of visualisations of data acquired by the airborne laser scanning, carried out from 2019 on. The anthropogenic relics were subsequently verified by field research.

Airborne laser scanning

For the area of interest, there are four sets of airborne laser scanning (ALS) data, but only one covers the entire territory of the Tribeč Mountains.

The first two ALS data sets were aimed only at selected areas and were of low density (Bisták/Borzová 2018; Borzová/Bisták 2020, 39, 40; Borzová et al. 2017; Ruttkay 2017, 302, 315–326). From 2019, a digital terrain model at a resolution of 1 m/px created based on ALS data by the National Forest Centre is also available; however, since ALS was performed during the vegetation period, it is not very suitable for archaeological remote sensing.

From 2017 on, the whole territory of Slovakia is gradually scanned under the auspices of the Geodesy, Cartography and Cadastre Authority of the Slovak Republic (GCCA SR). The area of the Tribeč Mountains has been scanned in winter and early spring 2017/2018 (region 08 Nitra) and 2018/2019 (region 13 Partizánske). The acquired ALS data are with a very high density of 20–40 points per m² and with an exceptionally high vertical accuracy of 3 cm and a positional accuracy of 12–15 cm. The data are available via open access in a form of digital elevation model at a resolution of 1 m/px (Leitmannová et al. 2022). For the purposes of archaeological remote sensing and field research purposes in the Tribeč Mountains, a digital elevation model was derived with a very high resolution of 25 cm/px and a special ‘integrated’ visualisation was developed that has been used for detailed archaeological remote sensing. Due to this, in the territory of approximately 261 km² (SW and central parts of the Tribeč Mountains), more than 11,500 assumed anthropogenic relics of various ages were identified, such as ramparts, ditches, artificial terraces, remnants of lime and charcoal kilns, field systems, vineyards, and roads, which substantially change the view on habitation and human use of the region in the past (Bisták 2022). For this study, the remaining NW part of Tribeč Mountains (Rázdiel unit) was investigated mainly using the above visualisations.

Archaeological field research

The use of ALS has caused a substantial improvement in the efficiency of planning and conducting field research. Visualisations based on high-resolution ALS data were used to create the *MB Tiles* file format imported into the *Locus Map Pro* application suitable for collecting fieldwork data (Leitmannová et al. 2022). Data acquired by archaeological remote sensing of visualisations of ALS data and by fieldwork were processed in the open-source *Quantum GIS* environment (version 3.16).

Archaeological field surveys in forested terrain from 2019 on comprised surveys focused on anthropogenic relics, and of surface artefact collection, supplemented by sample collection. Although the artefact collection is not optimal in the forested environment, it was carried out regularly during the mapping of anthropogenic relics in order to date and interpret the original function of identified areas (see Kuna 2004, 305). Since field surveys in the surroundings of the Veľký Tribeč hillfort have yielded only chronologically insignificant finds, and illegal pits dug by site looters with metal detectors were discovered in a few areas with anthropogenic relics, metal detector surveys were also carried out in a few areas in 2022 and 2023.³

In 2021, a survey was also carried out to find suitable wetlands to sample for pollen analysis in cooperation with the palynologist M. Čierniková on the eastern and western slopes of the central Tribeč Mountains, in the larger surroundings of the Veľký Tribeč Mountain. All presumed sites turned out to be unsuitable. Ultimately, a peat bog was sampled in Partizánske-Veľké Bielice outside the area of Tribeč Mountains; however, the results of the analysis are not yet available. The results of the pollen analysis are planned to be compared with archaeological dating of sites in the Tribeč Mountains from the Late Bronze Age onwards.

Geophysical survey

Non-invasive archaeological research was supplemented in selected areas by magnetic survey (Pašteka/Mikuška 2021). Data were gathered with a Bartington Grad 601-2 fluxgate gradiometer. The survey area was divided into grids and their corner points were measured using a GNSS set for precise localisation. The data were extracted in the standard way and the results were visualised after processing and filtration.

³ The Monuments Board of the Slovak Republic has carried out the metal detector surveys in cooperation with the associations OZ Hradiská and Archeo Moravia z.s.

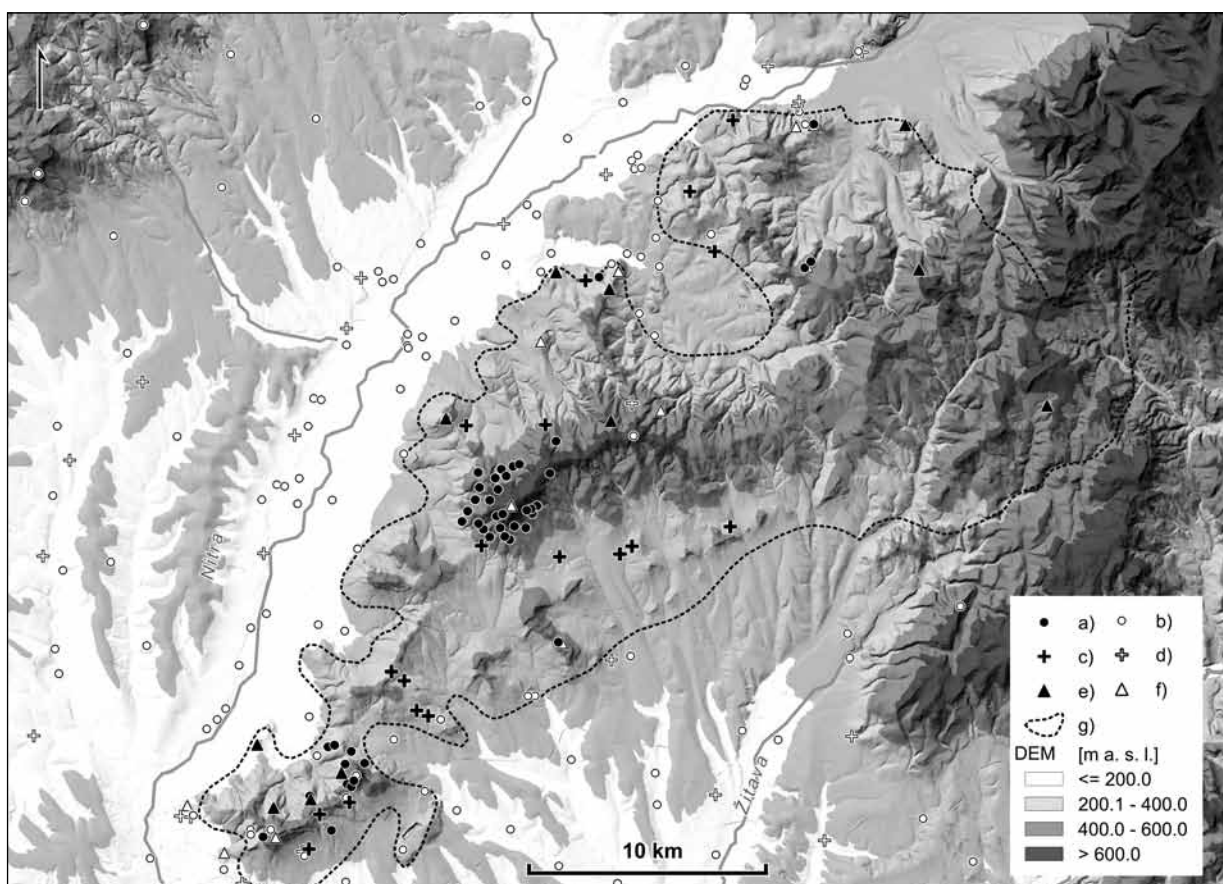


Fig. 5. Newly identified sites in the Tribeč Mountains possibly dated to the Urnfield and Hallstatt periods and previously known sites on a topographic terrain model. Legend: a – newly identified areas with artificial terraces – settlements (?); b – previously known settlements; c – newly identified burial (?) mounds/areas with burial (?) mounds; d – previously known cemeteries/burial mounds; e – newly identified hillforts; f – previously known hillforts; g – the area of interest. Previously known sites were mapped according to available publications. Authors P. Bisták and P. Kmeťová; graphics T. Lieskovský.

The distance between the measured lines was 1 m and the data acquisition used a sampling interval of 0.125 m. The internal precision of the measured induction field vector magnitude was ± 0.1 nT, the acquisition error (outer resolution) was approximately ± 1 nT. The positioning of acquisition points was performed in a local coordinate system (local northing and easting directions were used), and later the data were transformed into the global system JTSK-03. After the field data acquisition was completed, the data were transferred to a PC, where basic quality control was performed. Data have been corrected for diurnal variations of the Earth's magnetic field by means of a median filter applied to each data line. Subsequently, the data were interpolated by means of a kriging method into a regular grid with cell dimensions 0.25×0.25 m. The median filter was applied, and the Earth's normal magnetic field removed to derive the anomalous magnetic field.

Acquired magnetic field anomalies were displayed as a black-and-white map, which was later interpreted for archaeological use.

NEW KNOWLEDGE ACQUIRED BY CURRENT ARCHAEOLOGICAL RESEARCH

A significant amount of previously unknown anthropogenic structures of assumed Late Bronze and Early Iron Age dating have been identified in the Tribeč Mountains based on ALS data. Most of these structures were verified by field survey. These structures include previously unknown fortification structures of long-known hillforts, newly recognised fortified sites and ramparts, areas of artificial terraces, roads systems between these areas, and burial (?) mounds (Fig. 5).

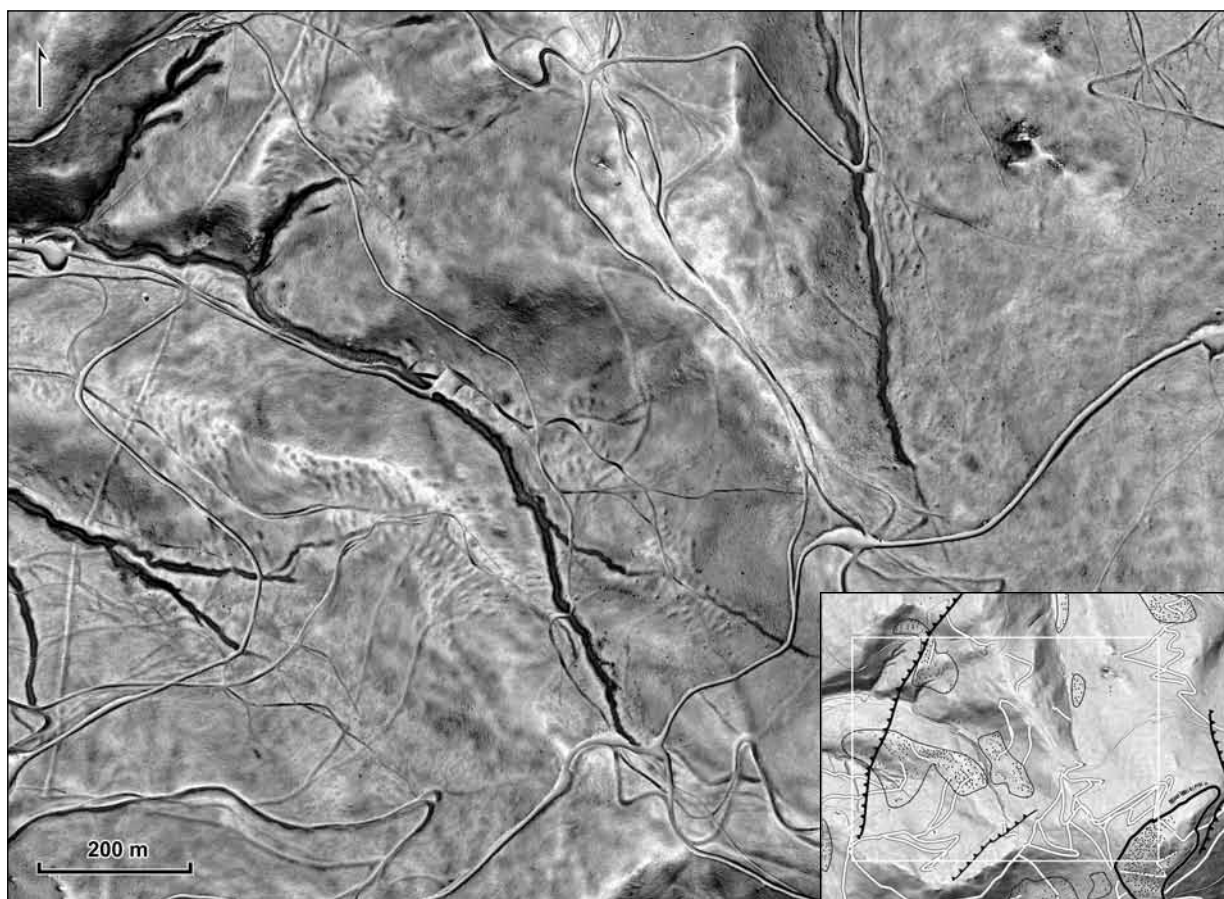


Fig. 6. Terrace concentrations on the north-western slopes of the Veľký Tribeč Mountain. Source GCCA SR; visualisation T. Lieskovský.

Fortified sites

Several previously unknown fortifications and smaller fortified areas were recognised (Fig. 5: e). These small hillforts thicken the network of fortified areas in the Tribeč Mountains. The existence of the rampart was newly recognised in some of previously known sites (Nitrianska Streda, site Hrdovická; Klátova Nová Ves-Sádok, site 'vicinity of the church'). Current research has also identified the site of unknown location ('hillfort near Javorový vrch hill') from where the Hallstatt period pottery finds were reported (Ruttkayová/Ruttkay 1991, 58) with a small hillfort Brloh near Krnča. As for newly recognised enclosed sites, field surveys in some of them have not yet bring any finds (Podhorany-Mechenice, sites Korytnice, Horanča, and Pod Žibricou; Staré háje near Klátova Nová Ves; Chlmok near Pažiť), and some have not yet been surveyed (Oselný vrch near Veľké Uherce, and Noviny near Malá Lehota).

Archaeological remote sensing of visualisations based on ALS data combined with field surveys has also brought a variety of new information on known hillforts, such as hillforts Zobor, Žibrica, Veľký Lysec and Malý Lysec, Veľký Tribeč, Tábor near Krnča, and Šiance near Klátova Nová Ves (Fig. 5: f; Bisták 2022).

Artificially formed terraces

Previous research has recognised artificially formed terraces in the Tribeč Mountains only sporadically. Some of them were detected in the areas of hillforts and their surroundings (Veľký Lysec and Malý Lysec [Bisták/Borzová/Borza 2017, 52–56]; Zobor [Pieta 2011, 202]; Žibrica [Felcan 2019, fig. 39; Janšák 1929, 12, 13, fig. 19; 20; Stegmann-Rajtár 2004]).



Fig. 7. Large terraces in the area north of the Žibrica hillfort. Photo P. Kmeťová.

Nevertheless, recent archaeological research based on visualisations of ALS data revealed that slopes with artificially formed terraces are much more frequent in the territory of the Tribeč Mountains, within the enclosures of hillforts,⁴ but mainly in their immediate vicinity, usually within a distance of 500 m. Exceptions to the rule are two largest zones with concentrations of terraces in the broader surroundings of the Žibrica and Veľký Tribeč hillforts, with the most distant terrace concentrations about 1.5 km (Žibrica), and 3 km (Veľký Tribeč) from the hillfort. Together, 2,665 terraces have been counted, of which 2,127 were outside the hillforts located mainly in 50 concentrations (Fig. 5: a).⁵ Up to now, 29 areas with terraces outside the hillforts and seven within the hillforts have been verified by the field survey. In the Zobor unit of the Tribeč Mountains, 509 terraces have been recorded (the Zobor and Žibrica hillforts and their surroundings), in the Veľký Tribeč unit 2,012 terraces (Veľký Tribeč, Veľký Lysec and Malý Lysec, Tábor, and Šiance hillforts, with their surroundings), and in the Rázdiel unit 144 terraces (Michalov vrch near Kolačno, Hradište near Malé Uherce, Šípok near Malé Uherce, and Chlmok near Pažiť hillforts, with their surroundings). The terrace concentrations form spatially limited areas that might be considered as individual components (Fig. 6). The largest area with terraces (approximately 25 ha) is located on the northern slopes of Žibrica. The area of other concentrations reaches 0.5 to 12 hectares. The areas with terraces are located at an altitude of 276.6 m to 827.9 m with an average altitude of 522.7 m.

Most of the terraces appear to have been created by cutting them into a slope forming flat platforms of roughly oblong to oval ground plan. The areas of these platforms range from 25 to 80 m². Occasionally, exceptionally large terraces occur, especially north of the surroundings of the Žibrica hillfort, where their areas reach up to 500 m² (Fig. 7). At least some terraces have been constructed with the dry-stone

⁴ Artificial terraces have been identified within the enclosures of most of the larger hillforts: Zobor, Žibrica, Veľký Lysec and Malý Lysec, Veľký Tribeč, Šiance, Tábor near Krná, Hradište and Šípok near Malé Uherce, Chlmok near Pažiť.

⁵ A terrace concentration, as used in this paper, is an area with at least three terraces close to each other. However, a low number of terraces (three to nine) have been recorded only in eight cases, while in most cases the concentrations consist of several dozens of terraces.



Fig. 8. A terrace with a dry-stone wall that stabilises its front located in the area west of the Veľký Lysec and Malý Lysec hillfort. Photo P. Bisták.

wall stabilising its front, as documented in three terraces in the surroundings of the Veľký Lysec and Malý Lysec hillfort (Fig. 8; *Bisták 2022*, 74).

Artificial terraces that were field surveyed in the Tribeč Mountains have similar appearance and character; therefore, it is assumed that they had the same or similar function, including terraces that have not yet been surveyed. They differ considerably from other terrace-like structures, such as remains of charcoal kilns.⁶ The field surveys in most of the areas provided only insignificant pottery sherds and clay daub fragments. The function of terraces as settlement units or at least as production sites is indicated by the discovery of 15 loom weights in a wind-throw on a terrace west of the Veľký Tribeč hillfort (see below).

Burial (?) mounds

There is only a very limited amount of information on the Late Bronze or Early Iron Age burial places in the region of the Tribeč Mountains. Geographically closest earlier known cemeteries are located in the lowland or at the foothills (Fig. 1–4; *Veliačik/Romsauer 1994*, 95, 101, 111, 119, 121–125, 141, 142, 123, 139–141, 154, 155, 211, 212, with references). Nevertheless, archaeological remote sensing of visualisations of ALS data has identified 36 mounds in the Tribeč Mountains (Fig. 5: c). Subsequent field survey has examined 11 of them in cadastral communities of Nitrianske Hrnčiarovce, Dolné Štitáre, Žirany, Solčany, and Práznovce, and nine of them appear as burial mounds. These mounds have smaller dimensions and are hardly visible in the woods. They form groups of two to four or five mounds. The earlier survey in the area around the mounds in Nitrianske Hrnčiarovce yielded some Hallstatt period pottery sherds (*Ruttkay 2017*, 320; *Veliačik/Romsauer 1994*, 126). However, without further research, the function and dating of the mounds are assumed only.

⁶ In the Tribeč Mountains, remains of approximately 2,000 charcoal kilns have been recorded, and many of them were also verified by the field research. Platforms with remnants of charcoal kilns located on the slopes are round to oval with sharper and less eroded rims (*Bisták 2022*, 129–137) than the artificial terraces presented in this article.



Fig. 9. Prehistoric (?) road leading to/from the western gate of the Zobor hillfort. Source GCCA SR; visualisation T. Lieskovský.

Roads

Visualisations of the ALS data have also revealed hundreds of old road lines. The first reports on the ancient roads in the Tribeč Mountains were published in the early twentieth century. The roads leading to the Veľký Tribeč hillfort were described and sketched by count L. Odescalchi from the nearby village of Solčany. He also mentioned the so-called Curved road, which was considered very ancient by locals and was already not in use at that time (*Odescalchi 1922*, 15–18, fig. 4; 5). A part of the road leading to the Žibrica hillfort was documented by Š. Janšák (*1929*, 12, 13, fig. 19).

The roads identified by the current research vary and often form stratigraphy with other roads. Based on these facts, the earlier (prehistoric?) level of communications was divided from the later levels of communications. In contrast to the hollow ways of the Middle Ages and Modern Era of 2.5–4 m width and usually grouped in bunches of numerous lines, the roads of the earlier (prehistoric?) level were wider (4–7 m) and were usually represented by a single rather shallow hollow way, only occasionally by two or more lines. The wide and shallow roads also lead from the entrances of the hillforts and decline moderately, usually in a serpentine style (Fig. 9). This type of communication was also documented in areas with terraces, and their solitary segments also in the lower parts of the Tribeč Mountains, however, only as very shallow lines. These roads connect hillforts with each other, and hillforts and terraced areas in their surroundings, in several cases. Furthermore, roads of this type are disturbed by later bunches of hollow ways (of the mediaeval and Modern Era type) or other mediaeval to modern or recent era structures. Together, 311 segments of these earlier (prehistoric?) roads have been documented. Their length is 114.44 km in total. Although these communications have not been dated by finds so far, it can be assumed that at least some of them were of the same age as the hillforts and areas with artificial terraces in their surroundings.

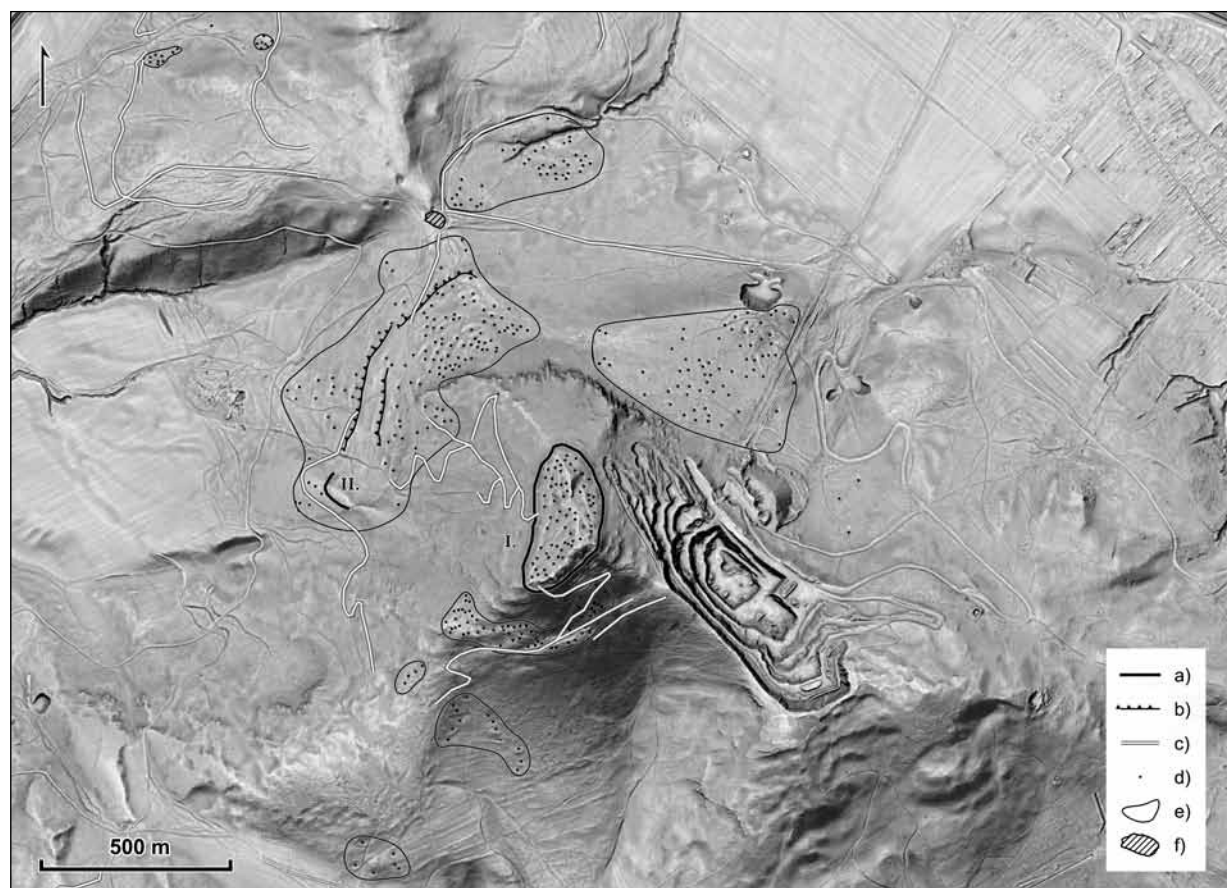


Fig. 10. Žibrica hillfort and its surroundings. Legend: a – ramparts of the Žibrica hillfort (I) and newly identified hillfort (II); b – lines of assumed ramparts; c – prehistoric (?) roads; d – settlement terrace; e – areas with artificial terraces; f – water reservoir. Source GCCA SR; interpretation P. Bisták; visualisation T. Lieskovský.

CASE STUDIES

Žibrica hillfort and its surroundings

The Žibrica hillfort was built around the summit of the Žibrica mountain, the natural dominant of the northeast part of the south Tribeč Mountains (Zobor Mountains/Zoborské vrchy), situated on the border of three cadastral communities (Žirany, Podhorany-Mechenice, and Štitáre-Dolné Štitáre). The hillfort in height 565 to 617 m covers an area of approximately 5.6 ha. It was in use from the end of the Bronze Age (Ha B3) to the early Ha D1, and the most numerous finds are dated to Ha C and Ha D1 stages. Sporadic finds indicate the habitation also in the Middle La Tène period, High Middle Ages, and Modern Era (Felcan 2019; Felcan/Bisták/Lieskovský 2020; Felcan/Stegmann-Rajtár 2018; Stegmann-Rajtár 2004).

Artificial terraces inside the enclosed area, as well as southwards and eastwards from there, were already recorded by earlier research (Felcan 2019, fig. 39; Janšák 1929, fig. 19). Recent research based on ALS data has also identified terrace concentrations to the north and northwest from the hillfort, up to a distance of 1.5 km (Fig. 10). In total, 65 terraces have been recorded in the enclosed area of the hillfort and 337 terraces outside. Field surveys were carried out in the southern, western, and northern areas with terraces and yielded mainly pottery sherds (also some specimens with Hallstatt period decoration), a pyramid-shaped loom weight and also a few small metal finds dated to the Hallstatt and La Tène periods.⁷ Terrace concentrations to the north and northwest of the hillfort are exceptional for their very large terraces. The area of some of them is up to 500 m² and they are visible especially on steep slopes (Fig. 7).

⁷ Metal detector survey in the area of western and northern terraces was performed in spring 2023 and is not yet evaluated.

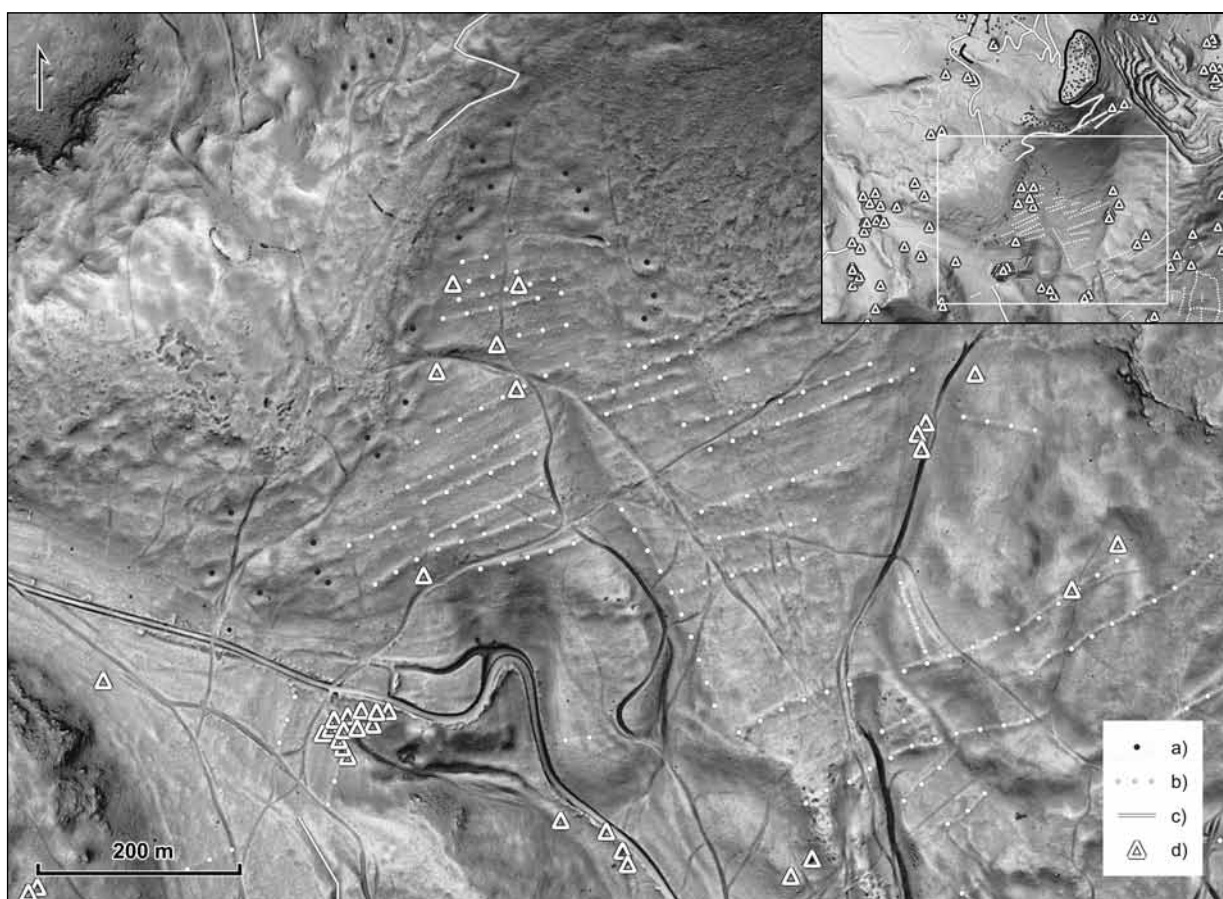


Fig. 11. Štitáre, site Panský les. Legend: a – settlement terrace; b – ‘lynchets’ of abandoned field area; c – prehistoric (?) roads; d – remains of lime kilns. Source GCCA SR; interpretation P. Bisták; visualisation T. Lieskovský.

An interesting situation appears in the area south of the hillfort, on the Panský les (Panská hora) site near Štitáre village. Several types of archaeological relics are preserved there: the artificial terraces of oval to elongated oval ground plan right under the steep slopes, the ‘lynchet’ field system and the remnants of lime kilns of most likely Modern Era origin (Fig. 11). Between the oval terraces and the ‘lynchet’ field system, some less visible terrace-like structures are observable, as if the oval terraces were partially erased by later ‘lynchets’. The Panský les site was known from the earlier field surveys and a small rescue excavation in 1984, all focused on the areas outside the oval terraces – on the area of ‘lynchets’ and the present-day forest road (Felcan 2019, 90–93, fig. 39; Janšák 1929, 12, 13, pl. VI: 19; Romsauer 1985). The rescue excavation (Romsauer 1985) yielded finds of layers of destructed clay daub and numerous pottery sherds of settlement-like character dated to the Hallstatt period (Romsauer 1993, pl. V). The dating of the site to the Early Iron Age (Ha C–Ha D1) and estimation of its function as a settlement was corroborated by the current field survey which recorded the occurrence of pottery sherds and fragments of clay-daub scattered throughout the area, also collected find of a small boat-shaped fibula with a rhomboid-shaped bow of arch cross-section with two side knobs and a decoration on top of the bow (lines made by chasing), and originally with a long foot (Fig. 12: 1; *Eles Masi* 1986, 136–141, pl. 104–110, esp. Nos. 1257, 1296, and 1304; Novotná 2001, 82, 83; Říhový 1993, 93, 94; Trachsel 2004, 207, 220–242; Vavák 2015, 222) and several other Hallstatt period finds.⁸ Therefore, the settlement was contemporaneous with the habitation of the Žibrica hillfort. If we assume that the finds relate to the use of oval terraces similarly to the terraces at the Žibrica hillfort (see Felcan 2019, 98–103; Stegmann-Rajtár 2004), not to the later ‘lynchets’ (assumed field

⁸ The most recent metal detector surveys in 2023 and 2024 (realised after submission of the article) have brought collection of small finds dated to the Hallstatt period (including bronze fibulae of several types, pendants, small bronze and iron horse-harness fittings, knives with bent back and several bronze triangular arrowheads of the so-called early eastern or early Scythian type).

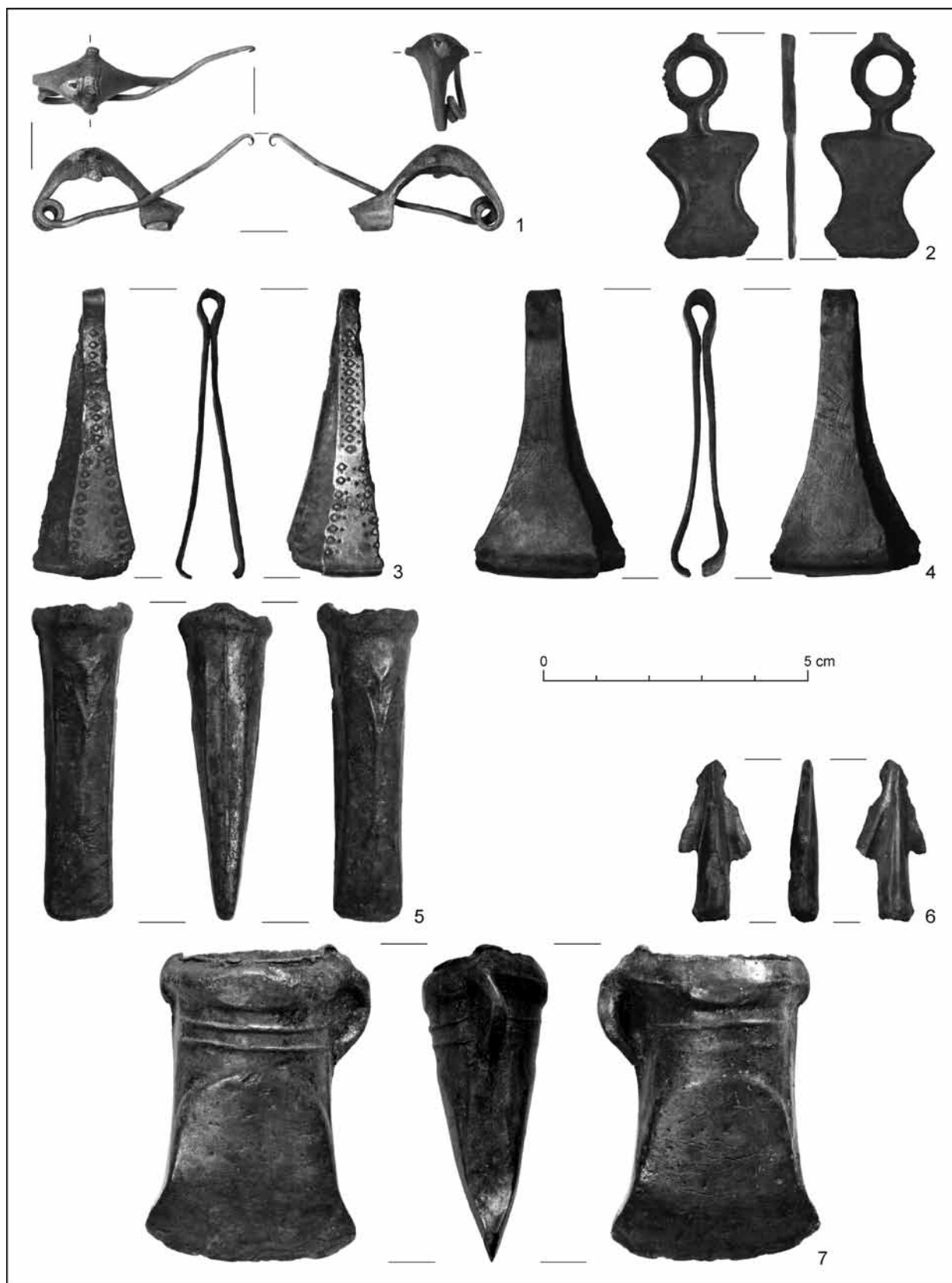


Fig. 12. Selected finds discovered during the surveys in the Tribeč Mountains in 2022. 1 – Štitáre, Panský les site in the vicinity of the Žibrica hillfort, bronze boat-shaped fibula collected; 2–7 – Kovarce and Nitrianska Streda, east and north slopes of the Veľký Tribeč, bronze artefacts found during the survey with metal detectors, 2 – sand-glass-shaped pendant, 3, 4 – tweezers, 5 – socketed chisel, 6 – arrowhead, 7 – socketed axe. Photo and graphics P. Kmeťová.

system), it can be hypothesised that the settlement originally consisted of much more oval terraces than is preserved and was once much larger than was considered by earlier research.

Other newly discovered anthropogenic relics in the surroundings of the Žibrica hillfort are as follows: a small fortified site Pod Žibricou; in its vicinity two parallel wall-like structures 350 m and 200 m long leading roughly along the contour lines; and to the north another parallel wall-like structure of 250 m in length, in the field all appearing as a sharp edge, and lines of prehistoric (?) roads including those connecting the hillfort with areas with terraces. The rim of the terrace concentration on the northern slope of the Žibrica is also lined by a low wall of about 60 m in length.

It is also worth mentioning that in the saddle north of the Žibrica hillfort there is a clearly visible dam of assumed water reservoir (wet environment up to the present) and several nearby situated water springs (Kamenný most site) from where the finds of insignificant pottery sherds were collected. A similar dam and a depression, interpreted as a water reservoir or iron ore mining remains (Baxa *et al.* 2016, 70), are in the saddle between the Veľký Lysec and Malý Lysec hills (parts of a single hillfort complex; Bisták/Lieskovský 2020a).

Thus, the area of the hillfort, together with presumably settlement areas with terraces, delimited by anthropogenic relics and verified by collected finds, is almost 2 km² (193 ha) in total.

Veľký Tribeč hillfort and its surroundings

The Veľký Tribeč hillfort (Fig. 13) is located on the main ridge of the Tribeč Mountains on the summit of the highest mountain Veľký Tribeč (829.6 m), in the border of two cadastral communities (Kovarce and Veľčice). The fort covers an area of 15.6 ha, with several entrances in the rampart. On the platform near the summit, remains of a stone enclosure were documented (Bisták/Lieskovský 2020b; Katkinová/Katkin 2002). However, no excavations were carried out at the hillfort, only field surveys that yielded sporadic finds of pottery sherds dated to the turn of the Bronze and Iron Ages (Ha B3–Ha C1; Veliačik/Romsauer 1994, 87). Based on these finds and the lack of information on other structures within the hillfort, it was hypothesised that the site might have served for seasonal transhumance and pasturing (Horňák/Stegmann-Rajtár 2008, 49).

The archaeological view of the hillfort and especially its surroundings has changed substantially based on ALS data, subsequent field surveys, and magnetic surveys. A variety of new data acquired from 2020 on either refined the knowledge on already known elements of the fortification, or brought completely new information on previously unknown structures.

The stone enclosure located *inside the fort* near the summit, known from the earlier surveys (Katkinová/Katkin 2002), has an area of 60 × 40 m and an opening in the south near the road crossing the hillfort (an entrance?). This road connects the northwest gate to the northeast gate and leads between two highest places on the hillfort (Bisták/Lieskovský 2020b). Archaeological remote sensing of the enclosed area did not yield any other structures in the higher northeast part, but in the steeper south-western part identified a clearly visible system of terraces ordered in rows. Altogether, 225 terraces have been counted there. Field surveys have also yielded a small number of pottery sherds dated to the Ha B and Ha C (?) stages.

A geophysical survey (Pašteka/Mikuška 2021) has been carried out in two areas in the northern parts of the Veľký Tribeč hillfort and partly beyond the enclosure and covered an area of about 1 ha in total (Fig. 14). Visualisations of the magnetometric data revealed anomalies representing various archaeological features and contexts, including a burnt feature, probably a furnace. It is worth noting that the detection of various settlement features is an important result within the hillfort, since settlement features are only rarely detectable within hillforts located in forested areas.

A massive *rampart of the hillfort* (Bisták/Lieskovský 2020b) was made of quarry stone. Its reported height of 0.5 to 1 m from the inside (Janšák 1929, 17) is correct but rather misleading, since the height from the outer side reaches up to 4 to 7 m and the width of the wall is 20 to 26 m. The northern rampart is widened on the outer side by a lower rampart or a 'step' of 6 to 10 m in width. Yet it is unclear whether it was part of the fortification system or an evidence of two phases of building the fortification. The rampart is open in several places. In the early 20th century, four old openings in the fortification were reported (Odescalchi 1922, 14, 15, fig. 1; 2). All of them are clearly visible on the visualisations of ALS data: on the north-western side there is a semi-pincer gate (a tangential entrance with a single wall inturned, creating a short passageway between two terminals), and simple entrances are on the north-eastern, south-western, and

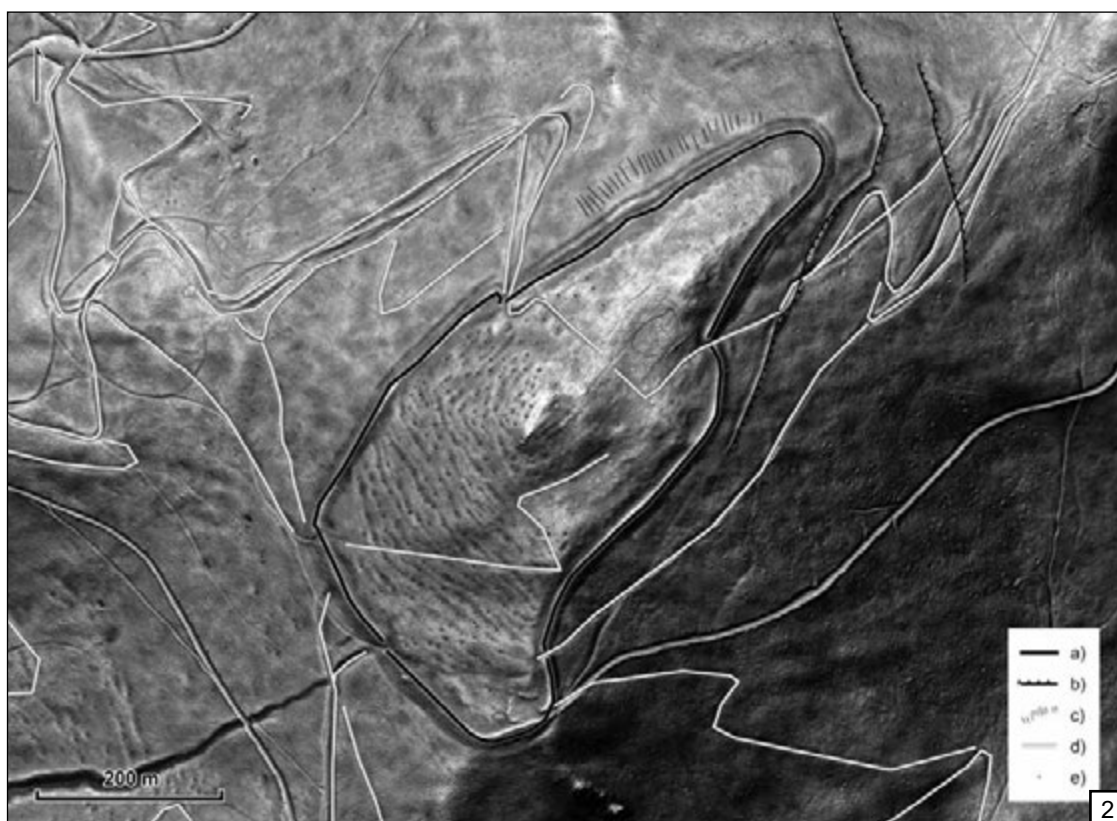
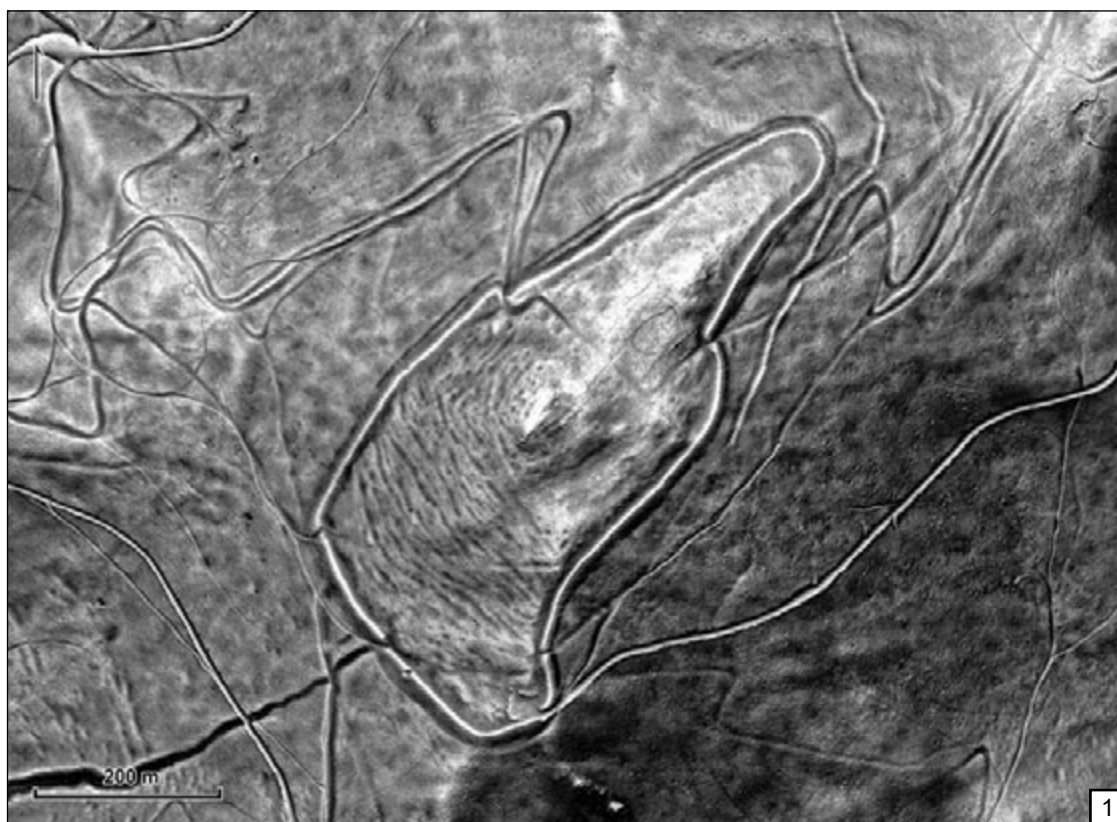


Fig. 13. DEM of Veľký Tribeč hillfort with clearly visible elements of fortification and inner structure. Legend: a – fortification of the hillfort; b – ramparts I–II; c – cross-ditches; d – prehistoric (?) roads; e – enclosed area; g – settlement terrace. Source GCCA SR; interpretation P. Bisták; visualisation T. Lieskovský.

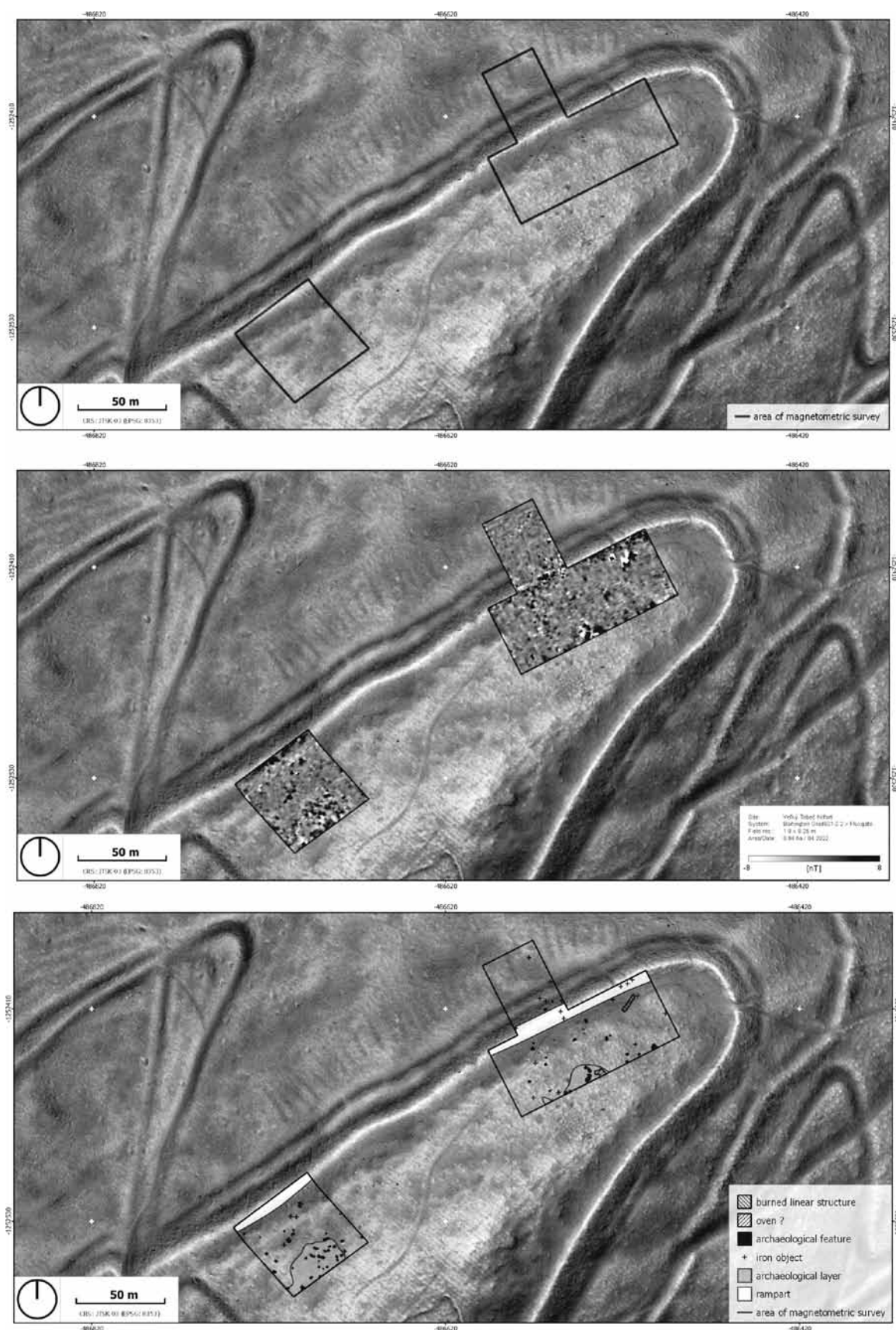


Fig. 14. Geomagnetic survey areas in the Veľký Tribeč hillfort, with results and interpretation. Author M. Felcan.

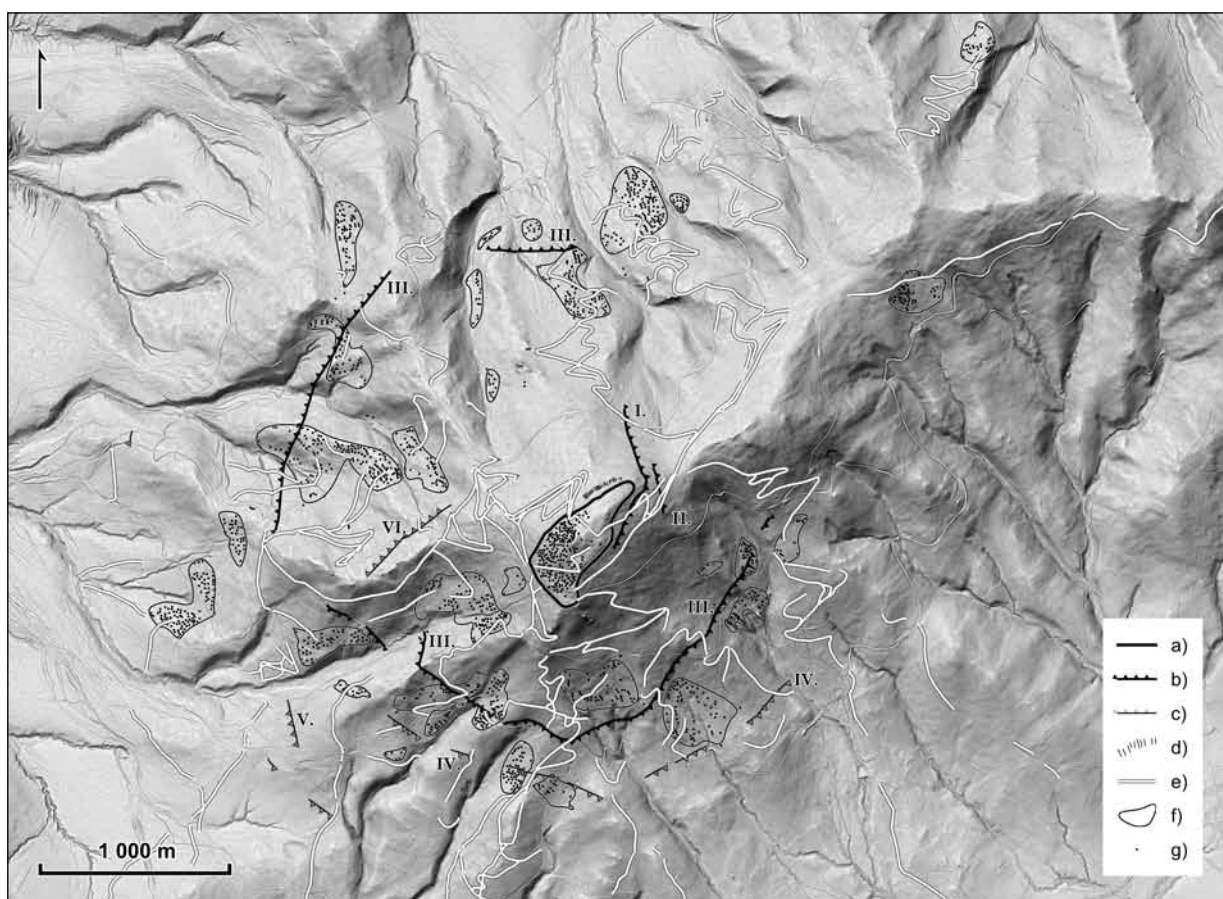


Fig. 15. Veľký Tribeč hillfort and its surroundings. Legend: a – hillfort rampart; b – ramparts I–III; c – less noticeable rampart-like structures IV–VI; d – cross-ditches; e – prehistoric (?) roads; f – areas with artificial terraces; g – settlement terrace. Source GCCA SR; interpretation P. Bisták; visualisation T. Lieskovský.

south-eastern side each (Bisták/Lieskovský 2020b).⁹ The geophysical survey carried out in two parts of the northern rampart indicated that the survey areas of the rampart were unburned (Fig. 14).

The exceptional and newly recognised structure was a *system of 27 short cross ditches* stretched along the outer side of the northern rampart in a length of approximately 218 m (Fig. 13: c; 15: d; Bisták/Lieskovský 2020b). The ditches are located on a gentle slope at a right angle to the rampart, about 9 to 15 m from the edge of the lower rampart. The lengths of individual ditches vary from 14 to 27 m, and their widths are from about 1 to 3 m. The distances between the ditches are approximately 3 to 7 m. In the terrain, they are hardly visible; only the westernmost four ditches can be recognised at present. Such structures along the walls of fortified sites are rare and are little known in the current state of research. Some examples were documented in Bohemia, such as at the Late Bronze Age hillfort Hradišťský vrch near Písek, the Late Bronze and Early Iron Age hillfort Luhov, or the La Tène oppidum Třísov. In the Hradišťský vrch hillfort, similar structures comprised of low walls, verified by excavation, situated also at a right angle to the rampart along its edge on a gentle slope, and are interpreted in association with a defence of the hillfort (Hlášek/Fröhlich 2019, 135, 136, fig. 4).

In addition to the massive rampart of the hillfort, *numerous lines of ramparts and ditches* (Fig. 15) were identified near and farther from the hillfort. First, the hillfort was protected from the east and southeast by two additional ramparts. The already known and more visible *rampart I* (Boržová/Borza 2019, 114) was located closer to the fort and is preserved at a length of about 768 m. The newly detected *rampart II* is preserved as a less conspicuous terrain undulation at a distance of 60 m east of rampart I.

Another conspicuous line, *rampart III* comprising several segments, leads to the southeast, south, west, and north of the hillfort at a distance of 620 to 1,590 m. The sections of the rampart are interrupted

⁹ In recent decades, another opening in the south rampart was gapped by a forest road.

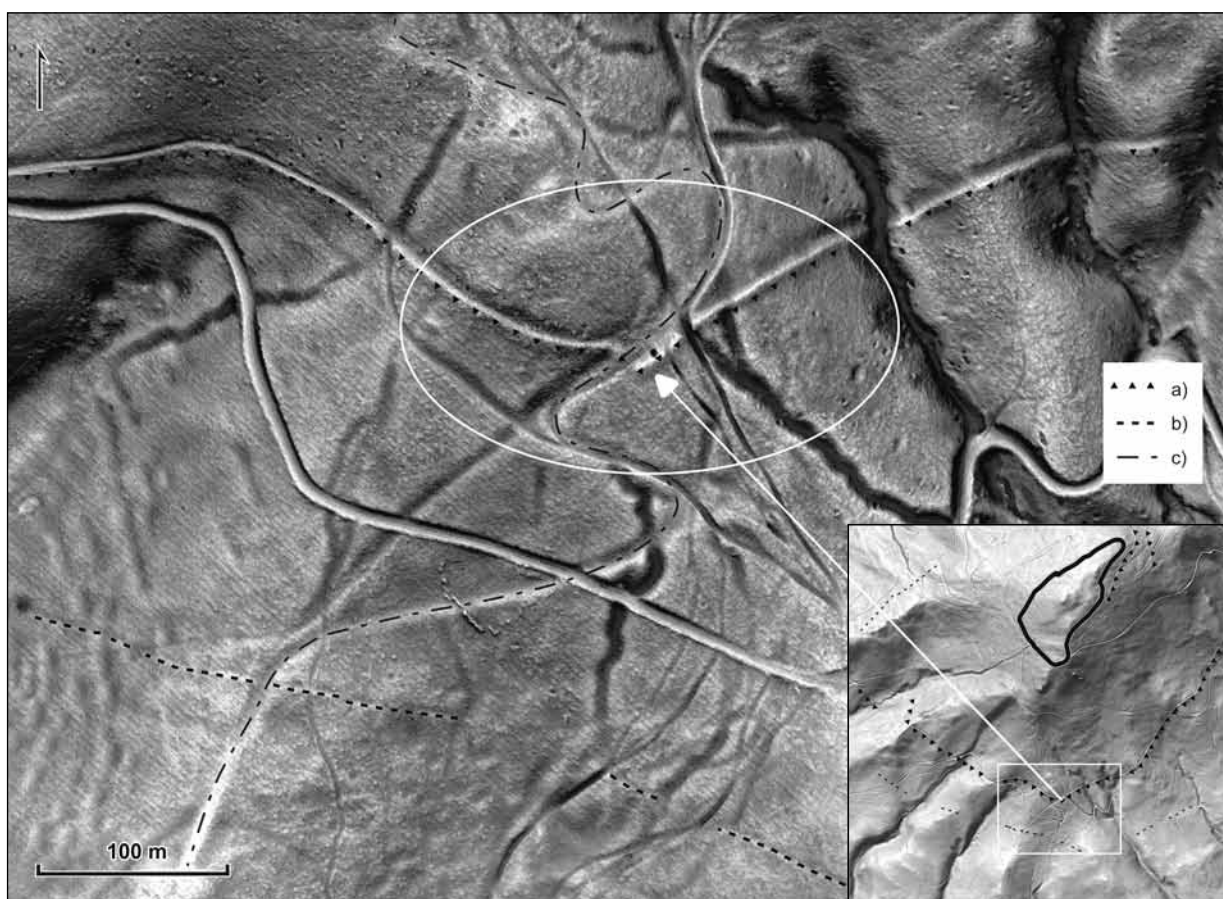


Fig. 16. Semi-pincer gate in the outer rampart III south of the Veľký Tribeč hillfort. Legend: a – rampart III; b – rampart IV; c – route of the prehistoric (?) road. Source GCCA SR; interpretation P. Bisták; visualisation and graphics T. Lieskovský.

by longer gaps without visible traces of the wall. The length of the visible segments is 4,620 m altogether and the total length, including gaps, is about 6,300 m. The rampart is located at a height of 460 to 622 m above sea level, it is enclosing an area of approximately 2,500 m in diameter, and its segments are within a distance of about 600 to 1,500 m from the Veľký Tribeč hillfort. The rampart in its south part opens in a semi-pincer gate creating a gap of 6 m (Fig. 16), the same type as in the hillfort rampart itself. The character of rampart III is varied. It is mainly made up of a stone embankment up to a height of 1 m and a width of 5 to 7 m at the base, while in the northwest part the wall is actually a strip of stones approximately 30 to 50 cm high, and in the northern part it is a stone and earth embankment up to 1 m high and 10 to 11 m wide at the base. The rampart is not dated at present. However, it was disturbed by later structures, especially recent roads, but also by some artificial terraces (Fig. 16).

Even at a longer distance from the hillfort, there is another segmented rampart, the less conspicuous *rampart IV* (at altitudes of 472–507 m and about 205–480 m south of rampart III). The length of the visible segments is 1,053 m and the total length including gaps is 2,370 m. A segment of this line is in one place opened for the road leading from the semi-pincer gate in rampart III and in another place, it is disturbed by a few artificial terraces. However, rampart IV has not been verified by field survey. Other more distant segmented ramparts – ramparts V and VI – have not been verified in the field as well. Their association with the hillfort must remain open.

In the wider surroundings of the Veľký Tribeč hillfort, 1,494 *artificial terraces* of oval to nearly oblong shape were identified in 29 concentrations. Some terraces also occur as single structures or in pairs outside the concentrations. Most of the terraces are located at a distance of up to 2.4 km from the summit of the hillfort, and only a single cluster of 35 terraces is located at a distance of 3.5 km. The areas of these concentrations range from 1 to 16.4 ha. Their total area is about 113 ha.

The areas with terraces are usually on gentle to moderate slopes around the springs of streams; the terraces are usually at a distance of up to about 220 m from the water source. Most of the terraces reach

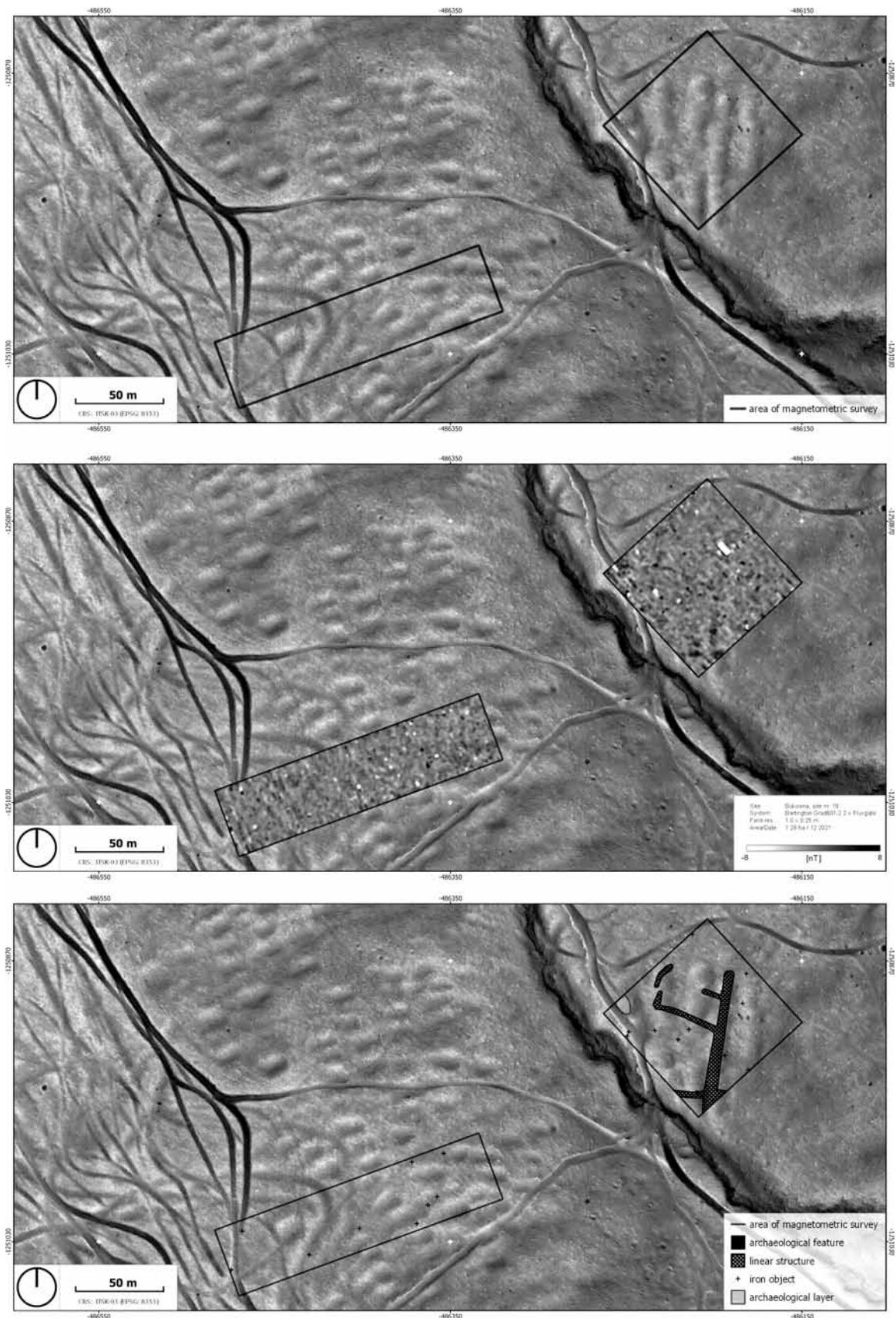


Fig. 17. Geomagnetic survey areas in the surroundings of the Veľký Tribeč hillfort, with results and interpretation. Author M. Felcan.

an area of 25 to 60 m² (Fig. 6). They are frequently ordered in long lines, roughly tracing contour lines or slightly diverging from them. Their layout indicates urbanistic planning and the construction of the assumed settlements. A similar layout of the terraces is visible in the southwest part of the Veľký Tribeč hillfort and also in and around several fortified hilltop settlements from the Late Bronze and Iron Ages, such as Molpír near Smolenice (*Felcan/Pašteka/Stegmann-Rajtár 2020*), Ostražica near Nižná or Tupá Skala near Vyšný Kubín (*Felcanová/Felcan/Lieskovský 2021*, 107–131).

By now, the terraces had been verified by a field survey in 17 concentrations, and 15 of them yielded rather sporadic finds of pottery sherds and small fragments of clay daub. Clay daub finds might indirectly suggest that buildings were once built in these areas. Due to the insignificant character of these artefacts, they cannot be dated more precisely than in the 'prehistory'. Therefore, two metal detector surveys were carried out to specify the dating of the use of sites with terraces. Together, five terrace concentrations and their close vicinities on the western and northern slopes of the Veľký Tribeč (cadastral communities of Kovarce and Nitrianska Streda) have been surveyed. Altogether, 116 metal artefacts were acquired that date to several eras: the Late Bronze Age, the La Tène and Roman periods, the Middle Ages, and the Modern Era. The Late Bronze Age metal finds were discovered in each of these areas, whereas finds from the other eras were recorded only in some of the sites (except for the Modern Era finds). In the current state of cleaning and conservation, 21 artefacts can be dated to the Late Bronze Age (Urnfield period) with certainty. All the artefacts were scattered in the sites with terraces, either found on the terrace platforms or apart from them. Some of the bronze artefacts are preserved intact (or almost intact): a socketed axe, two socketed chisels, two arrows, two decorated tweezers, and a sand-glass-shaped pendant (Fig. 12: 2–7). Moreover, every area has yielded scraps broken from bronze artefacts that represent a typical phenomenon of the Late Bronze Age settlements (e.g. *Parma et al. 2017*, 66–80) and hoards (e.g. *Salaš 2005*). In the survey areas, at least 11 of these scraps were found: several fragments of sickles, knife (?) blades, and single fragments of a chisel, a socketed axe, a bracelet, a chain, and a cone. The character of some finds allows only general dating to the Late Bronze Age (arrows: *Gedl 2014*, esp. 43; sickles: *Furmánek/Novotná 2006*; a tweezers with narrow, slightly widened arms: *Gedl 1988*, 28, 29, pl. 3; 4), but in some cases, a more precise dating is possible, namely the double Y-ribbed decoration on one of the chisels and the Y-ribbed combined with the double V-ribbed decoration on the other one,¹⁰ in the stages Ha A2 and Ha B1 (*Mozsolics 1985*, 36; 2000, 58, 59, 66, 78, 79, pl. 56: 2; 74: 6; 96: 16, 17; 97: 5; *Salaš 2005*, 41; *Tarbay 2015*, esp. 317), and of a few finds more likely rather to later than earlier stages of the Urnfield period (a socketed axe: e.g. *Říhovský 1992*, 198, 199; *Salaš 2005*, 40, 41; a tweezers with triangle-shaped arms: *Gedl 1988*, 22, 23, pl. 2; a pendant: *Ožd'áni/Žebrák 2017*, 254–256, pl. II: 8; *Puš 1978*, 46–49, fig. 1; 2).¹¹

Furthermore, at least two fragments of metal plano-convex ingots that frequently occur in the Late Bronze Age sites (see *Parma et al. 2017*, 92) were recovered in two areas. Additionally, in four out of five areas, lumps of metalworking by-products (18 to 20¹² pieces) were also found scattered throughout the areas. Although without metallographic analyses they cannot be dated to a certain period in multi-period sites, they could indicate local metal production activities or, in case they are dated to the Urnfield period, only storage of the metal material at the sites (e.g., *Parma et al. 2017*, 80–94; *Salaš 2005*, 126–129). However, the dating of the finds and sites will be evaluated in detail and refined after cleaning and conserving all the finds from the surveys.

It is interesting to note that the geophysical survey at one of these sites (Fig. 17) has revealed almost no anomalies that could be interpreted as archaeological features within the survey area. It can possibly be explained by the fact that the survey was carried out only in a small part of the terrace concentration that could have been without archaeological structures such as buildings or other features. On the other hand, there is also the possibility that some of the features were not detected by the survey, as they were shallow and already eroded. However, there is an interesting linear anomaly (Fig. 17: bottom) that can be interpreted as some kind of enclosure.

One of the metal detector surveys also yielded an important find in a site with terraces. The wind-throw located on a terrace platform revealed a line of 15 clay loom weights (either intact or fragmented) which were in a position reflecting their original functional arrangement on a vertical warp-weighted

¹⁰ The second chisel was cleaned after submission of the paper but still before finishing the editing process.

¹¹ Although some finds cannot be dated more precisely than to a time span of the Late Bronze and the Early Iron Ages, no find is dated solely to the Early Iron Age, and therefore such a dating is unlikely.

¹² Two pieces are either metal lumps or scraps.



Fig. 18. Find of clay loom weights in situ discovered in a wind-throw on one of the terraces west of the Veľký Tribeč hillfort, cadastral community of Kovarce. Photo P. Kmeťová.



Fig. 19. Collection of 14 out of 15 clay loom weights discovered in a wind-throw in the cadastral community of Kovarce, after cleaning (15th loom weight is too fragmentary). Photo P. Kmeťová.

loom (Fig. 18). The truncated pyramid-shaped loom weights were slim and of a low weight (81.1–219.5 g, an average weight 144.3 g; Fig. 19) indicating that they were used for the weaving of fine textiles (see Grömer 2016, 107–117). All of the loom weights were fired, mostly at low temperatures, but one was fired at a high temperature (based on different surface hardness). Since clay loom weights in general were usually used unfired and preserve only due to a secondary burning,¹³ it is likely that the building where the loom once stood was destroyed by the fire. Therefore, the situation presented is direct evidence that a terrace was once used as a platform for a building where textiles were produced. From the same wind-throw also pottery sherds and fragments of clay daub from the bottom of a fireplace or an earthen floor were collected. These sherds date the situation to the Urnfield period in general.

The surroundings of the Veľký Tribeč hillfort are also covered by a dense network of *roads and hollow ways* of the earlier (prehistoric?) level.¹⁴ Some of the roads lead through the entrances of the hillfort and entrances in other ramparts in its surroundings, along or through the areas with terraces. Similar wide roads seem to also interconnect the terrace concentrations. Moreover, it seems that these roads respected the layout of the terraces. Therefore, it can be presumed that if at least some sites with terraces were contemporaneous with each other or with the hillfort, at least some of these roads might have originated in the Late Bronze Age. Nevertheless, it cannot be excluded that some of them were in use for a longer time after the end of the Late Bronze Age (and the very Early Iron Age?) habitation, for example during the later periods when the terrace concentrations have been used, or that some roads originated in the later periods. Ultimately, the roads connecting the sites were most likely of local importance, while the road leading through the hillfort (connecting the north-western and north-eastern gates) was probably inter-regional communication connecting the Žitava region (Požítavie) and the middle Nitra region.

DISCUSSION

In the current state of research, the function of a considerable part of anthropogenic relics discovered on the basis of ALS data cannot be reliably stated without further field research. Nevertheless, after verification of dozens of structures of similar character in the field, their function can be determined with high probability even without verification of all of them. For this reason, the anthropogenic relics identified in the Tribeč Mountains were divided into several groups according to their character. Although their functions are in some cases obvious or probable, there are still many questions open:

1. *Ramparts.* Are all the wall-like structures identified as ramparts the elements of fortification? The function as a fortification is recognised, for example, in two ramparts north of the Zobor hillfort, as well as in rampart III with the semi-pincher gate in the surroundings of the Veľký Tribeč hillfort. However, rampart III is not intact, and is detectable in only several separate segments. Was the rampart left 'open' intentionally or could not have been finished for some reason? Was its role to protect only the selected areas from a certain direction? Or was it enclosed, but only its certain segments have been preserved to the present time? And were the segments associated with the hillfort itself? These questions arise regarding the inconspicuous rampart IV and other wall-like relics in the surroundings of the Veľký Tribeč hillfort. Similar extensive linear earthworks have recently been documented in the surroundings of the Gradišče above Knežak hillfort in Southeast Slovenia which dates to the Late Bronze and Early Iron Ages. These earthworks are interpreted as the boundary of the territory of the hillfort community (Laharnar/Lozić/Štular 2019, 269, Fig. 2; 4). Several segments of wall-like structures were also recognised near the Žibrica hillfort in the area with artificial terraces. Was their use intended for protection or for another reason, for example, to stabilise the slope with terraces or a road?

2. *Small enclosed areas with smaller ramparts.* It is not clear what purpose the enclosed areas of small dimensions have served. Were they part of fortification systems of larger hillforts or rather individual units? Were they serving for a long-term or temporary habitation, or as stations for a watch?

¹³ It should be noted that sometimes only a part of the originally present loom weights is preserved owing to a fire. The number of 15 loom weights, if they are the only preserved loom weights at the wind-throw/platform, is too low for the whole width of a loom, therefore most likely more loom weights were part of the loom originally (information and assumption by T. Štolcová, pers. comm. 2022).

¹⁴ The wider and shallow hollow way, mainly as a single line, often forms serpentine line – see chapter *New knowledge acquired by recent archaeological research/Roads*.

3. *Artificial terraces.* Artificially formed terraces within some of the hillforts in the Tribeč Mountains were already known earlier. An excavation of one of the terraces at Žibrica hillfort has yielded evidence of levelling the ground of the horizontal platform. It is worth noting that the present terrace shape was formed by transformation processes, particularly erosion or later ground modifications, resulting in increased terrace width. The finds of pottery of settlement-like character, clay daub with prints of wooden constructions and animal bones indicate its function as a settlement terrace (Felcan 2019, 98–103, fig. 45; Stegmann-Rajtár 2004, 510–512, fig. 4). Similar terraced platforms have been documented and excavated, for example, within the Early Iron Age hillforts in Southeast Slovenia. They have been made from earthen mounds or hewn into bedrock and have served mainly for individual buildings, which also correspond to their small size (Dular/Tecco Hvala 2007, 83, 104–106). Linear earth terraces on the slope of the famously known Early Iron Age hillfort Burgstallkogel near Großklein in Styria, located already outside the hilltop plateau, were also artificially formed, supported by wood and stone construction, and contained buildings and pits (Mele 2019). In the case of 50 terrace concentrations outside of hillforts in the Tribeč Mountains, there are only more or less strong indications that they are remnants of settlements. First, the most important evidence is the collection of 15 loom weights in a position that reflects their original arrangement on a warp-weighted loom, found on one of the terraces in the surroundings of the Veľký Tribeč, and thus an indication of the existence of a building. Such a hypothesis is underlined by finds of clay daub with prints of wooden constructions from several terraces outside the Veľký Lysec and Malý Lysec hillfort (Bisták/Borzová/Borza 2017, 56), and by small fragments of clay daub found in areas with terraces, as well as metal artefacts and raw material from five terrace concentrations in the surroundings of the Veľký Tribeč, all representing a standard collection of finds acquired in settlements. Nevertheless, even if some terraces have served as platforms for buildings, it is unclear whether some of the others could not have been used for other activities, e.g., for cultivation of crops.

A surface survey with collecting artefacts in the surroundings of the Žibrica hillfort, as well as metal detector surveys in the settlement agglomeration around the Veľký Tribeč hillfort, revealed the fact that the finds are found not only in the areas of terraces and their close vicinity where they were most likely transported by erosion, but even in a larger distance from them. Such a situation can refer either to the existence of structures not preserved in the terrain in the form of microrelief but preserved under the surface (see Borzová/Borza/Bisták 2014), or, more likely, that the living space for performing various activities was much larger and included an entire surrounding landscape (see Neustupný 1986).

4. *Mounds.* The function of the mounds can be identified with the help of a geophysical survey combined with trenching. In some cases, however, the function can remain unclear even after trenching (see Borzová/Gogová/Wiedermann 2007). It should also be stressed that even if all identified mounds in the Tribeč Mountains were burial mounds of the same age as the hillforts and settlements around them, their number would still be very low compared to the density of habitation.

Undoubtedly, a disadvantage of the data acquired by ALS as well as by geophysical survey is their disability to date the discovered structures. This is because they capture all human and natural interventions preserved in the irregularities of a land surface for the last several thousand years, resulting in a dense intertangle of various structures from different times. The earlier structures are often more or less covered or literally ‘erased’ by later structures. The resulting image can be best compared to a palimpsest, which is frequently used to characterise the archaeological landscape (Gojda 2000, 55). In most cases of horizontal superposition of the relics, it is possible to determine at least their relative dating. In this context, the situation in Panský les site (Štitáre cadastral community) near the Žibrica hillfort is a good example of multiple horizontal stratigraphies (Fig. 11). Based on the mutual spatial distribution of both areas, it is assumed that the later field system had erased the relics of most of the settlement terraces, of which some are preserved only in the marginal parts of the area. After the field system ceased to be used, the ‘lynchets’ were used for embedding the lime kilns and were also disturbed by later yet undated roads.

The surface finds collection can rarely yield some chronologically significant artefacts. More detailed information on site dating can be acquired mainly using intrusive archaeological research methods. The realised surveys with metal detectors have revealed that the terrace concentrations had been used for habitation already in the Urnfield and Hallstatt periods, but some of them had been used also in the later periods: in the La Tène and Roman periods, and also in the Middle Ages and Modern Era; however, in the latter two rather as a hunting area or for similar purposes. Therefore, it is not yet clear whether some of the terraces were built in some of these later periods. In this respect, it is worth noting the occurrence

of superpositions of some of the terraces with the ramparts in the surroundings of the Veľký Tribeč hillfort (Fig. 16). Moreover, the question of dating terrace settlements in association with each other, as well as with nearby hillforts, arises. It is not yet clear whether all the terraced areas/settlements were contemporary or moving in time and space.

Regarding the contemporaneity of the existence of terraced settlements with the near hillfort, only the same age of the Žibrica hillfort with Panský les settlement and most likely also with a terraced site to west to north of the hillfort was corroborated, and most likely also the Zobor hillfort with a terraced settlement north of it.

It must also be stressed that the small enclosed areas with smaller ramparts are undated yet; therefore, the possibility of their origin in different eras must also be considered.

Additionally, dating of communications is a complex and rather complicated subject, and without detailed analyses and further research remains only a hypothesis (see *Martínek et al. 2013; Vletter 2019*).

Another open question is related to prehistoric fields that are almost completely unknown at present in the territory of Slovakia (*Benediková et al. 2024; Hajnalová et al. 2023*). Although several hundred hectares of abandoned fields were identified in the area of interest either as fields separated by boundaries or as a ridge and furrow pattern, structures such as the so-called Celtic fields have not yet been recognised (see *Bisták 2022*, 150–153). A more detailed typology and evaluation of field boundaries and ridge and furrow fields will be an extremely time-consuming task for possible future research.

CONCLUSIONS

In conclusion, the use of ALS data in the research of relics of a fossil cultural landscape enables the identification and verification of even less conspicuous structures which are nearly imperceptible and are represented by only a slight difference in height (approximately 10 to 20 cm). Thanks to this method, a huge amount of previously unknown anthropogenic structures was discovered, part of which can be dated to the Urnfield and/or Hallstatt periods with different degrees of certainty.

The preliminary results of the research indicate that habitation at higher altitudes in the Tribeč Mountains in the Urnfield and Hallstatt periods, mainly within and close to hillforts, existed in a much larger extent than was previously assumed (cf. Fig. 1–5). Particularly surprising is the detection of extensive settlement agglomerations in the surroundings of the Veľký Tribeč and Žibrica hillforts, with hundreds of settlement terraces. Although the settlement terraces have also been recorded in the surroundings of other hillforts in the Tribeč Mountains, they are never of such a number and extent. Such a dense concentration of highland sites and terrace settlements in a mountainous region was not previously known; however, based on new, yet unpublished, ALS data from Slovakia, it seems that this situation probably only reflects the state of research and that the use of highland sites was, in fact, once more frequent. Yet, it is currently unclear whether the sites in the surroundings of a single hillfort were contemporary. It is also difficult to state whether people moved to mountainous sites after abandoning lowland settlements or whether mountainous sites existed at the same time as lowland ones.¹⁵ Ultimately, it seems too early to speculate whether habitation in the mountains was the result of long-term settlement strategies or only temporary activities and whether it was caused by the need for better protection or other reasons.

The finds from the terraced areas, which we interpret as remains of settlements on steep land, date the first phase of habitation in the surroundings of the hillforts to the Late Bronze Age/Urnfield period (surroundings of the Veľký Tribeč and Zobor hillforts). It is not yet clear whether this phase was restricted solely to the Ha B stage (as in the Zobor hillfort; *Danielová 2017*) or started in the earlier stages of the Urnfield period. The trend of habitation in and around hillforts also persisted in the Early Iron Age (Ha C–Ha D1). At that time, the Žibrica hillfort and most likely also the Veľký Lysec and Malý Lysec hillfort became the new centres of the region. The current results of archaeological researches in the Tribeč Mountains indicate the correctness of the hypothesis (*Horňák 2019*, 93) on the use of very large fortified areas up to 15 ha in the Ha B stage (the Veľký Tribeč and Zobor hillforts), while in the Hallstatt period smaller hillforts with an area up to 5 ha were used (e.g. the Veľký Lysec and Malý Lysec, and Žibrica

¹⁵ The present knowledge on sites known in lowlands in the surroundings of the Tribeč Mountains does not allow any clear indication for a rapid change of settlement strategies and abandonment of sites in a certain period due to movement to higher altitudes (see Fig. 1–4).

hillforts). However, this dimension criterion is valid only in the case of areas encircled by monumental ramparts around the hilltops, as is known from previous research. The latest researches revealed the existence of less noticeable fortifications near some of these smaller hillforts, and especially large settlement areas beyond the main fortified space (the Veľký Lysec and Malý Lysec, and Žibrica hillforts). To understand the settlement strategies in upland/mountainous sites, it will be necessary to take into consideration, along with further archaeological research, also the natural conditions and update the existing models of habitation (see *Blažová/Lieskovský 2011; Horňák 2019; Horňák/Stegmann-Rajtár 2008; Lofajová Danielová/Hajnalová/Šimunková 2024; Wiedermann 2003*).

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„High Hopes“: sídliskové stratégie v pohorí Tribeč (západné Slovensko)

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Súhrn

V pohorí Tribeč a v jeho bezprostrednom okolí sa nachádza pomerne veľká koncentrácia hradísk z obdobia popolnicových polí a z doby halštatskej, ale na základe doterajších poznatkov nie sú úplne vyjasnené ich vzájomné vzťahy a ani datovanie. Väčšina známych sídlisk a pohrebísk v zázemí hradísk sa nachádza v nižšie položenom území na úrodnejších pôdach Žitavskej a Nitrianskej pahorkatiny a Nitrianskej nivy (obr. 1–4). Vďaka najnovšiemu výskumu na základe vizualizácií dát leteckého laserového skenovania (LLS) však bolo získaných množstvo nových informácií, ktorých predbežné výsledky sú prezentované v tomto príspevku. V zalesnenom prostredí Tribeča sa od roku 2019 uplatňovala kombinácia cieleného prieskumu antropogénnych tvarov reliéfu a povrchového zberu, doplneného geofyzikálnym prieskumom. Len v centrálnej a juhozápadnej časti pohoria bolo na ploche 261 km² identifikovaných viac ako 11 500 antropogénnych relikto. Z nich približne štvrtina môže súvisieť s obdobím popolnicových polí a s dobou halštatskou. Ide o nové systémy opevnení, terasovité úpravy terénu, mohylovité útvary a úvozové cesty (obr. 5).

Sieť opevnených areálov v Tribeči zahusťujú novo zistené opevnené areály (Podhorany-Mechenice, polohy Korytnice, Horanča, Pod Žibricou; Klátova Nová Ves, poloha Staré háje; Pažiť, poloha Chlmok; Krnča, poloha Brloh; Veľké Uherce, poloha Oselný vrch; Malá Lehota, poloha Noviny). Na základe LLS je pravdepodobné, že opevnené boli aj ďalšie dávnejšie známe lokality (Nitrianska Streda, poloha Hrdovická; Klátova Nová Ves-Sádok, poloha Okolie kostola). O viacerých známych opevnených areáloch priniesol diaľkový prieskum zeme doplnený terénnym prieskumom množstvo nových informácií (Zobor, Žibrica, Veľký a Malý Lysec, Veľký Tribeč, Tábor v Krnči, Šiance v Klátovej Novej Vsi).

Informácie o umelo upravených terasách v pohorí Tribeč boli v malej miere známe z okolia hradísk Zobor, Žibrica a Veľký Lysec. Na základe LLS sa ukázalo, že terasovito upravené svahy v pohorí Tribeč sa nachádzajú v areáloch hradísk, ale najmä v ich blízkom a širšom okolí (spolu 2665 terás, z toho 2127 mimo hradísk v 50 koncentráciách), kde vytvárajú v priestore ohraničené areály, ktoré je možné považovať za samostatné sídliskové komponenty (obr. 6). Najväčší takýto sídliskový areál sa nachádza na severných svahoch Žibrice a dosahuje rozlohu cca 25 ha. Rozloha ostatných

areálov je v rozmedzí od 0,5 ha do 12 ha. Terasy mimo hradísk vznikli vo väčšine prípadov veľmi pravdepodobne zahľbením do svahu, čím boli vytvorené plochy o rozlohe 25–80 m², len v okolí Žibrice aj o rozlohe viac ako 500 m² (obr. 7). Zatiaľ ojedinele bolo zistené spevnenie čelnej steny terasy kamenným múrom (obr. 8). Ďalej bolo identifikovaných 36 mohylovitých útvarov, ktoré budú vyžadovať overenie v teréne. Rozlíšená bola tiež vrstva pravekých (?) ciest (311 úsekov v celkovej dĺžke 114,44 km), často spájajúcich hradiská s okolím (obr. 9).

Bližšie sme sa zaoberali situáciou v okolí hradísk Žibrica a Veľký Tribeč. V areáli hradiska Žibrica (HB3–HD1) je zaznamenaných 65 sídliskových terás a 337 v jeho okolí. Koncentrácie terás boli zistené až do vzdialenosti cca 1,5 km od hradiska (obr. 10; 11). Terénnym prieskumom boli overené skupiny terás južne, západne a severne od hradiska, pričom z areálov niektorých terás aj mimo nich bola získaná atypická a ojedinele aj typická halštatská keramika, hlinené tkáčske závažia, bronzová loďkovitá spona (obr. 12: 1) a ďalšie, zatiaľ nespracované nálezy z doby halštatskej (prieskum v r. 2023). Sídliskové areály hradiska spolu s osadami v jeho okolí, vymedzené terénnymi reliktnými a výskytom nálezov, majú spolu rozlohu takmer 2 km² (193 ha).

Hradisko Veľký Tribeč, ktoré je datované len na základe povrchových zberov do stupňov HB3–HC1, spolu s okolím bolo skúmané viacerými metódami. Výsledky geofyzikálneho prieskumu v areáli hradiska naznačujú existenciu viacerých archeologických objektov (obr. 14). Prekvapujúcim zistením o dávnejšie známom systéme opevnenia hradiska je výskyt 27 priečných priekop kolmých na vonkajšiu pätu valu hradiska v jeho severnej časti, identifikovaných na základe LLS (obr. 13). V okolí hradiska bola na základe LLS zistená výnimočne vysoká koncentrácia antropogénnych relikto (obr. 15). Unikátnym zistením je niekoľko línií doteraz neznámych valov v okolí hradiska (II–VI). Najvýraznejší je val III s priemerom cca 2,5 km, ktorý je tvorený viacerými úsekmi s celkovou dĺžkou cca 4,62 km. V južnej časti vytvárajú dve jeho línie polokružnú bránu širokú cca 6 m (obr. 16). Ďalšie línie menej výrazných valov IV–VI neboli zatiaľ v teréne overené. V širšom okolí hradiska bolo na LLS identifikovaných spolu 1494 sídliskových terás, ktoré sú sústredené do 29 areálov. Väčšina z nich leží v okruhu do 2,4 km od vrcholovej kóty Veľkého Tribeča, s výnimkou jednej koncentrácie 35 terás vzdialenej 3,5 km. Doteraz vykonaný geofyzikálny prieskum magnetometrom v dvoch z týchto areálov nepreukázal prítomnosť archeologických objektov, až na jednu líniovú štruktúru (obr. 17). V piatich areáloch bol uskutočnený prieskum s detektorom kovov, z ktorého pochádzajú nálezy datované rámcovo do mladšej až neskorej doby bronzovej (obr. 12: 2–7). Počas prieskumu areálu na západných svahoch Veľkého Tribeča bol vo vývrate na jednej z terás objavený súbor 15 tkáčskych závaží (obr. 18; 19). Táto situácia naznačuje, že na terase stála stavba, v ktorej sa tkali textilie. Existenciu stavieb na terasách indikujú aj nálezy konštrukčnej mazanice z iných polôh.

Predbežné výsledky výskumu naznačujú trend osídlenia vyšších polôh v pohorí Tribeč, najmä v blízkosti hradísk, v neskorej dobe bronzovej a dobe halštatskej v oveľa väčšej miere, ako bolo doteraz známe. Nálezy z terasovito upravených areálov, ktoré interpretujeme ako pozostatky sídlisk v svahovitom teréne, datujú prvú vlnu osídlenia v zázemí hradísk do mladšej až neskorej doby bronzovej (okolie hradísk Veľký Tribeč a Zobor). Tento trend pretrváva aj v dobe halštatskej, keď sa centrom regiónu stalo hradisko Žibrica (vrátane areálov terás mimo hradiska) a pravdepodobne aj hradisko Veľký a Malý Lysec. Doterajšie výsledky výskumov a prieskumov v Tribeči zatiaľ naznačujú správnosť hypotézy o využívaní obrovských opevnených areálov s rozlohou nad 15 ha v neskorej dobe bronzovej, kým v dobe halštatskej boli budované menšie hradiská s rozlohou do 5 ha. Toto veľkostné kritérium však platí len v prípade známych areálov s mohutnými valmi. Najnovšie výskumy preukázali pri niektorých z menších hradísk existenciu menej výrazných opevnení a najmä rozsiahlych sídelných areálov mimo opevnenia (Veľký a Malý Lysec, Žibrica). K pochopeniu stratégií osídľovania výšinných polôh bude nutné okrem ďalšieho archeologického výskumu zohľadniť aj environmentálne podmienky a aktualizovať existujúce modely osídlenia.

Obr. 1. Doteraz známe náleziská z obdobia popolnicových polí (BD až začiatok HA2) v širšom okolí pohoria Tribeč na výškopisnom modeli terénu. Legenda: a – sídliská; b – sídliská s neistým datovaním (napr. „BD?“); c – pohrebiská/mohyly; d – otázne pohrebiská/mohyly; e – hradiská; f – hradiská s neistým datovaním; g – skúmané územie. Lokality mapované podľa dostupnej literatúry. Autori P. Kmeťová a P. Bisták; grafické spracovanie T. Lieskovský.

Obr. 2. Doteraz známe náleziská z obdobia popolnicových polí (HA2–HB1) v širšom okolí pohoria Tribeč na výškopisnom modeli terénu. Legenda: a – sídliská; b – sídliská s neistým datovaním (napr. „HA2–HB1?“); c – pohrebiská/mohyly; d – otázne pohrebiská/mohyly; e – hradiská; f – hradiská s neistým datovaním; g – skúmané územie. Lokality mapované podľa dostupnej literatúry. Autori P. Kmeťová a P. Bisták; grafické spracovanie T. Lieskovský.

Obr. 3. Doteraz známe náleziská z obdobia prelomu popolnicových polí a doby halštatskej (HB3–HaC1, datovanie podľa Veliačik/Romsauer 1992) v širšom okolí pohoria Tribeč na výškopisnom modeli terénu. Legenda: a – sídliská; b – sídliská s neistým datovaním (napr. „neskorá doba bronzová“); c – pohrebiská/mohyly; d – otázne pohrebiská/mohyly; e – hradiská; f – hradiská s neistým datovaním; g – skúmané územie. Lokality mapované podľa dostupnej literatúry. Autori P. Kmeťová a P. Bisták; grafické spracovanie T. Lieskovský.

Obr. 4. Doteraz známe náleziská z doby halštatskej (HC2–HD1) v širšom okolí pohoria Tribeč na výškopisnom modeli terénu. Legenda: a – sídliská; b – sídliská s neistým datovaním (napr. „doba halštatská“); c – pohrebiská/mohyly; d – otázne pohrebiská/mohyly; e – hradiská; f – hradiská s neistým datovaním; g – skúmané územie. Lokality mapované podľa dostupnej literatúry. Autori P. Kmeťová a P. Bisták; grafické spracovanie T. Lieskovský.

Obr. 5. Nové náleziská v pohorí Tribeč a známe náleziská s datovaním do obdobia popolnicových polí a doby halštatskej na výškopisnom modeli terénu. Legenda: a – novozistené areály s terasami; b – známe sídliská; c – novozistené mohyly/mohylníky (?); d – známe pohrebiská/mohyly; e – novozistené hradiská; f – známe hradiská; g – skúmané územie. Známe lokality mapované podľa dostupnej literatúry. Autori P. Bisták a P. Kmeťová; grafické spracovanie T. Lieskovský.

Obr. 6. Koncentrácie terás na severozápadných svahoch Veľkého Tribeča. Zdroj ÚGKK SR; vizualizácia T. Lieskovský.

- Obr. 7. Výrazné terasy severne od hradiska Žibrica. Foto P. Kmeťová.
- Obr. 8. Terasa s kamennou čelnou stenou v areáli západne od hradiska na Veľkom Lysci a Malom Lysci. Foto P. Bisták.
- Obr. 9. Praveká (?) cesta k západnej bráne hradiska Zobor. Zdroj ÚGKK SR; vizualizácia T. Lieskovský.
- Obr. 10. Hradisko Žibrica a jeho okolie. Legenda: a – valové opevnenia hradiska Žibrica (I) a novozisteného hradiska (II); b – línie potenciálnych valov; c – praveké (?) cesty; d – sídlisková terasa; e – areály s umelými terasami; f – vodná nádrž. Zdroj ÚGKK SR; interpretácia P. Bisták; vizualizácia a grafické spracovanie T. Lieskovský.
- Obr. 11. Štitáre, poloha Panský les. Legenda: a – sídlisková terasa; b – línie medzí zaniknutých polí; c – praveké (?) cesty; d – pozostatky vápenných pecí. Zdroj ÚGKK SR; interpretácia P. Bisták; vizualizácia a grafické spracovanie T. Lieskovský.
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- Obr. 19. Súbor 14 z 15 hlinených tkáčskych závaží objavených vo vývrte stromu v k. ú. Kovarce po očistení (15. závažie je v príliš fragmentárnom stave). Foto P. Kmeťová.

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140 YEARS OF RESEARCH ON THE HALLSTATT PERIOD BURIAL SITE OF FRÖG IN CARINTHIA/AUSTRIA – AND NOW SOME NEW DATA¹

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In the 1960s, the Austrian *Bundesdenkmalamt* (Federal Historic Monuments Office; abbreviated BDA) carried out emergency excavations in the burial site of Frög in the southern part of Carinthia. Unfortunately, the documentation only became available for scientific processing some years ago.

The focus of my doctoral thesis, published in 2020, was to process this data, to review the excavation results of the 19th century and to integrate all data. An important point was the merging and entanglement of all existing grave field plans and the standardization of the grave mound designations. This Herculean task will facilitate future research and avoid confusion in nomenclature. Based on the excavation results of the 1960s, where barrows were to a large extent completely excavated and documented for the first time, and thanks to the linking of the obtained data with the known data on pottery of the 19th century, the local pottery could finally be better defined.

Since the metal finds were presented in detail by Gerhard Tomedi in 2002 they were only included in the analysis if necessary.

Since detailed plans and profile drawings of graves were produced in the 1960s for the first time, analyses on grave architecture and burial rituals are now possible. These were put into relation with those of the excavation of the 19th century. The presented results are based on comparatively few unrobbed graves.

INTRODUCTION

The burial site of Frög has been the subject of scientific research for 140 years and is one of the most important necropolises in the Eastern Alps, not least because of the relatively large number of burials. Lead figurines are one of the characteristics and the most famous findings of the burial site, which made the necropolis known far beyond the Austrian borders soon after the beginning of scientific research. It still constitutes a unique selling point today.

Frög is located in Carinthia, the southern province of Austria, within a sinuosity of the navigable Drava River (Tomedi 2001). The convenient location is reflected in the manifold cultural contacts, which become visible through the grave goods of different provenances. Frög was undoubtedly an important centre during the Hallstatt period and a hub for trade and communication between Italy, the eastern Alpine region, Central Europe and the Lower Danube region (Fig. 1).

RESEARCH HISTORY²

In 1883, Carl Baron Hauser reported in the *Mittheilungen der k. k. Central-Commission* of private persons opening legally leased burial mounds (Hauser 1883). Wilhelm Kokail, a local resident, found Frög's well known lead wagon (Egg 1987; Gleirscher 2004b; Kanitz 1884) during such a treasure hunt,

¹ This paper is a summary of my doctoral thesis submitted and approbated at the University of Innsbruck in 2019. The thesis was published in 2020 within the series *Universitätsforschungen zur Prähistorischen Archäologie* (Ebner-Baur 2020).

² For more detailed accounts of the research history see Ebner-Baur 2015, 162–164; 2020, 18–24; Fuchs 1988; Gleirscher 2002, 42–44; 2011, 9–26; Tomedi 2002, 21–28.



Fig. 1. The location of Frög and associated centres in the Hallstatt period.

therefore little is known about the circumstances of its discovery. It was 'restored and assembled' by Felix Philipp Kanitz,³ head of the k. k. anthropological and natural-historical collection which later was incorporated into the k. k. Naturhistorisches Hofmuseum (Natural History Court Museum) in 1876, who donated the find to the newly established Landesmuseum Kärnten (Carinthian State Museum).

The first director of the k. k. Naturhistorisches Hofmuseum Ferdinand von Hochstetter proposed systematic investigations in the burial ground. In its responsibility for coordinated archaeological interventions in Carinthia the Geschichtsverein für Kärnten (Carinthian Historical Institute) led archaeological excavations at Frög between 1883 and 1892 (Ebner 2009, 31–41). Caspar Kaiser, who carried out the excavations, opened 192 barrows under the scientific direction of Carl Baron Hauser.

In 1884 Josef Szombathy investigated another 32 burial mounds during an 18-day campaign on behalf of the Anthropologische Gesellschaft Wien (Viennese Anthropological Society).

Typically for this time, the excavators were focused on the recovery of the metal goods. Little attention was paid to everyday ceramic culture or grave architecture, burial rites and funeral acts.

Gerhard Tomedi published the results of those major excavations (Tomedi 2002).

After a few minor excavations during the first half of the 20th century (*Carinthia I* 1932, 2; *FÖ* 1, 1920–33 [1930–31, 100]; Müller-Karpe 1943), between 1962 and 1969 the *Bundesdenkmalamt* undertook rescue excavations in 58 barrows endangered by the construction of an artificial water channel of the Drava River (Fig. 2; Ebner-Baur 2020).

The excavators did not totally uncover the barrows from the beginning on. Rather, they first dug test trenches or opened small quadrants, which were successively expanded when necessary (Fig. 3). In addition, for the creation of a new burial site plan, the barrows were newly measured and labelled (BDA1–BDA433).

³ In 1884, Hauser mentioned cursorily the writer and Balkan explorer F. Kanitz as a supporter of the excavations at Frög. Later there was a confusion of his first name (Ebner-Baur 2020, 18; Gleirscher 2004b, 253; 2011, 13; Hauser 1884, LXIII; Tomedi 2002, 33).



Fig. 2. The burial site Frög based on maps from the 1960s and 1980s (Ebner-Baur 2020). Legend: a – mapped barrow 1986; b – mapped barrow 1965; c – excavated barrow BDA 1960s; d – potential flat grave.

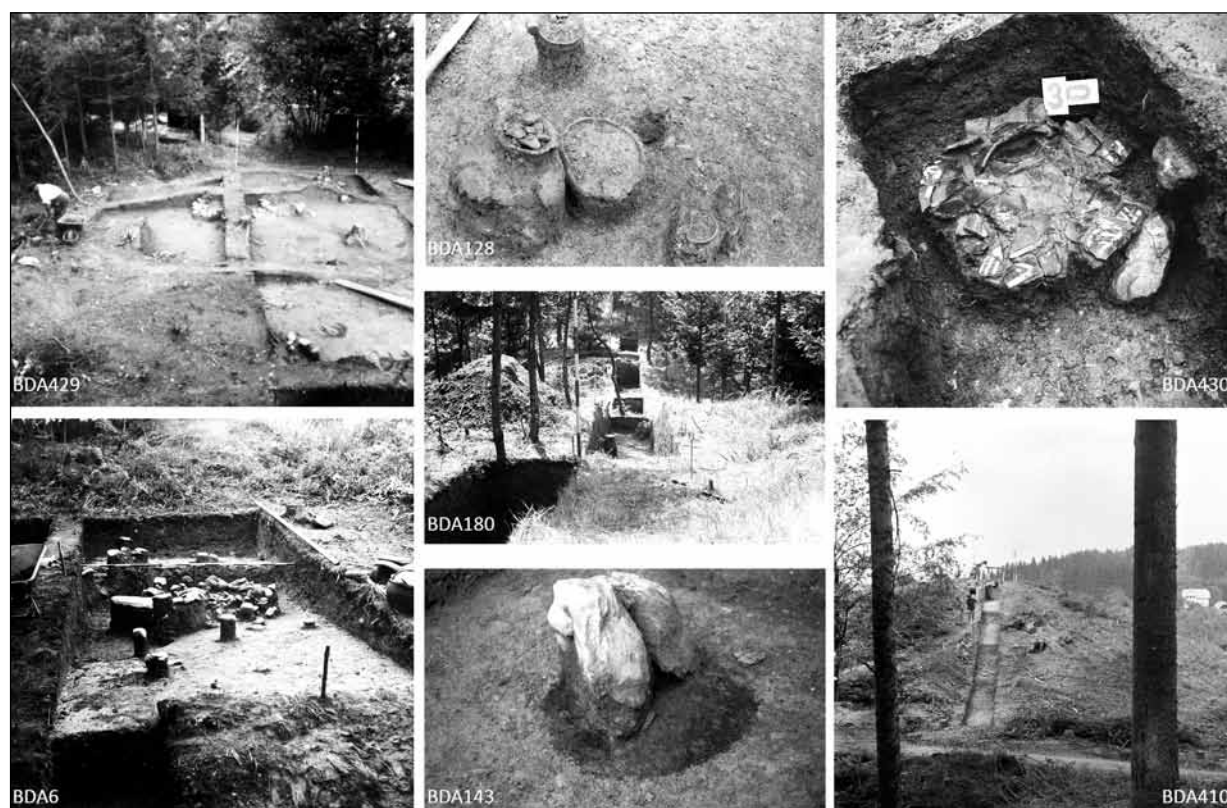


Fig. 3. Documentary photos of the BDA excavations (1962–1969) of the graves BDA6, BDA128, BDA143, BDA180, BDA410, BDA429 and BDA430 (Fotoarchiv Bundesdenkmalamt, Frög, Nos. 1271, 1357, 1530, 1576, 1594, 1633 and 1698; © BDA).

CHRONOLOGY

The metal objects of the traditional clothing have a supra-regional character and represent the basis for the local chronology and the synchronisation with other cultural groups. Fibulae and pins are the key finds of all phases.

Ceramics and their formal development at Frög are largely determined by local factors, even though supra-regional phenomena such as the emergence of Danubian decorative motifs as well as imported ceramics are also part of the pottery spectrum. Accordingly, ceramics may only support the existing chronological system.

So, even though the burial mounds of Frög were heavily robbed a relative chronological sequence can be established on the basis of individual costume objects and pottery sets. The chronological structure outlined by Gerhard Tomedi is still up to date (Tomedi 1992; 2002, 73–94). The inventory of graves dating to the relatively short-lasting initial phase Frög 1 remained in urnfield tradition, but the founding generation was the trailblazer for a new upcoming era. A similar trend can be observed within the burial site Ljubljana SAZU (Gabrovec 1973, 369). The majority of the graves date to Frög 2 and Frög 3. The occupancy became weaker after Frög 3 (around 720/700 BC). Only a few graves can be dated to Frög 5, which correspond to Ha D1, respectively Stična 2. The graves BDA201/1 and BDA143/1 held finds from Ha D2, respectively Sv. Lucija IIb, so it seems legitimate adding the short-lasting final phase Frög 6. In absolute chronological terms, the burial site was frequented between 820/810 and 550/530 BC. Findings of Lt A–Lt C indicate a not further definable frequentation during that time. The secondary burial BDA428/1 dates to Lt D1 (Fig. 4).

	Tomedi 2002 Ebner-Baur	Gabrovac 1966 Teržan & Tranpič 1973	Teržan & Črešinar 2014	Peroni 1975	Pare 1996 & 1998	Hennig 2001	Egg 2013	David Elbali & Dunning 2005	absolute chronology
850									
800	Frög 1	Ljubljana Ila		Bologna IIA Este IIA	Ha B3 Bologna IIA Este IIA	Ha B2/3		Ha B3b (récent)	850/840–810/780
750	Frög 2	Ljubljana IIb Podzemelj 1 Sv. Lucija Ib	Horizont des eisernen Schmuckes	Bologna IIB Este IIB–C	Ha C1a Bologna IIB Este IIB–C	Ha C0	Ha C1a	Ha Ca (précoce)	810/780–730/720
700	Frög 3	Ljubljana IIIa Podzemelj 2	Halbmondfibel- horizont	Bologna IIIA Este IIIA	Ha C1b Bologna IIIA Este IIIA	Ha C1	Ha C1b	Ha Cb (tardif)	720/730–680/670
650	Frög 4	Ljubljana IIIb Stična 1 Sv. Lucija Ic1	Kahnfibel- horizont	Bologna IIIB Este IIIB		Ha C2	Ha C2	Ha D1a (ancien)	680/670–610/600
600	Frög 5	Stična 2 Sv. Lucija Ic2	Schlangenfibel- horizont	Bologna IIIC Este IIIC		Ha D1	Ha D1a	Ha D1b (moyen)	610/600–580/550
550	Frög 6	Sv. Lucija IIb	Certosafibelhorizont			Ha D2	Ha D1b	Ha D1c (final)	580/550–500
500									

Fig. 4. Chronological timetable of the Hallstatt period in Central Europe (Ebner-Baur 2020).

GRAVES AND BURIALS

Grave form

Barrows are the dominant grave form. Tomedi analysed the burial mounds (tumuli) according to size groups (Tomedi 2002, 104–106). Most of the hills had a diameter of between 5 and 6 m, but in the 19th century, the excavators rarely made reference to the height of the mounds.

Among the graves uncovered in 1960s a significant number were dug in natural ground formations.

They are especially noticeable on the north-eastern edge of the plots 1458/1 and 1489. However, the old excavations do not allow any clarification in this regard.

Flat graves, postulated by the excavators in the 1960s (FÖ 9, 1966–69 [1969, 188]; FÖ 10, 1971, 38) are likely but, because of the partly untraceable documentation, cannot be proven beyond doubt. However, barrows may flatten over time due to farming or land consolidation, e.g. the hills of the graves BDA429 and BDA129. The excavators declared the grave BDA428, with a secondary burial in the La Tène period, as a flat grave. The written documentation is unfortunately lost and the photos do not show any hill. However, for the reburial during the La Tène period, the grave must have been visible on the surface in some way.

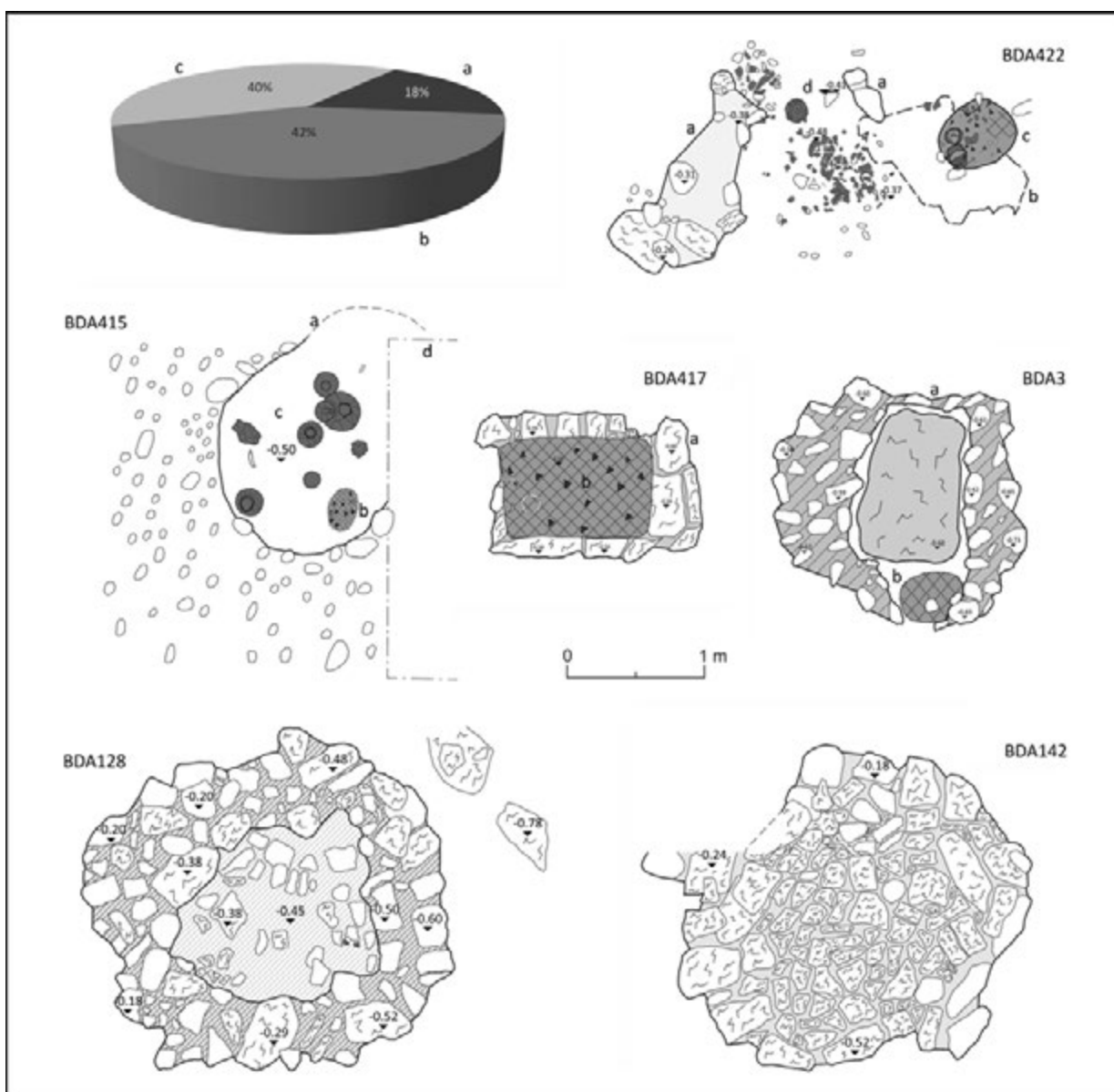


Fig. 5. Examples of the common grave architecture. BDA422: a – irregular stone setting, b – outline of the stone packing over the burial, c – unseparated cremation with personal outfit, d – grave goods; BDA415: a – grave pit, b – unseparated cremation with personal outfit, c – grave goods, d – trench limit; BDA417: a – stone cist, b – unseparated cremation with personal outfit; BDA3: a – stone enclosure with stone slab(s), b – charcoal concentration; BDA128: round and closed stone enclosure; BDA142: stone packing. No north orientation; for further descriptions see *Ebner-Baur 2020*. Diagram of the comparison: a – earthwork, b – stone construction, c – unknown.

Grave architecture

The term grave architecture subsumes all attributes of the grave construction. An analysis of the grave architecture was possible for 188 features of the 19th century and BDA excavations. Additionally, the grave construction of 125 barrows (i.e. 40%) remains unknown. Barrows made solely of soil and such with stone burial chambers are most common. Precisely, in 132 (i.e. 42%) graves from the 19th century and the BDA excavations stone constructions could be detected (Fig. 5). On the other side stand 56 (i.e. 18%) pure earthworks, which were built during the entire occupancy of the necropolis. It appears there is also no correlation between grave architecture and wealth or status represented by grave goods. The grave T7 (= BDA133),⁴

⁴ List of corresponding 'hill' names see *Ebner-Baur 2020*, 552–569.

containing the famous lead wagon, or grave BDA193/2 with the extraordinary amount of spindle whorls and a burnt splendour attire (*Prunktracht*) had no stone architectures.

The stone burial chambers, documented during the BDA excavations, consist of round, polygonal, rectangular or square stone enclosures. These structures were sometimes covered by a round or polygonal stone mantel or a stone slab of shale (*Schiefersteinplatte*). In addition, multilayer stone packings, stone pavements, irregular stone settings and stone cists were common⁵ (Fig. 5).

As with most old excavated burial grounds, there is no direct evidence of wooden installations in the graves, although some shapes of stone constructions suggest it, like grave T146 with an inner rectangular shape of the stone construction. Tomedi assumed a wooden coffin surrounded by stones (Tomedi 2002, 534, 535).

The horizontal stratigraphic distribution scheme (cf. Tomedi 2002, 313) of the grave construction in the burial site shows that the same grave-building types are often located close to one another. The reason might be their excavation at the same time or at least near-term and often by the same excavator. Since a bias cannot be excluded, conclusions on grave-building preferences of families or certain groups are not possible.

In the burial groups or burial grounds of the Southeastern Alps,⁶ site-dependent, individual burial traditions with common denominators such as burial mounds, earthworks and stone structures can be identified (Ebner-Baur 2020, 190–192).

Funeral form

The term funeral form describes if the deceased was buried on his own (single burial), at the same time together with another individual (double burial) or time-shifted with another deceased (collective burial).

Based on the analysis of all available records, collective burials are apparently the main funeral form. However undetected or undocumented grave manipulations in the excavations of the 19th century may have led to an overestimation in the number of collective graves. Analysing only the BDA excavations, 17 individual burials face only ten collective graves. Therefore, single burials seem to be the characteristic feature at Frög. According to archaeological findings, graves BDA18, BDA193, T50, T72, T75 and T181 are double burials.

Collective burials are common in the grave grounds in the Southeastern Alpine group.⁷ However, individual burials are present as well.⁸ The finding in grave BDA428 proves a secondary burial of the La Tène period for the first time at Frög.⁹

Funeral rite

All graves at Frög are cremation burials. Therefore, the term funeral rite describes how the cremated bones were treated and deposited in the grave. An analysis of the funeral rite was possible for 125¹⁰ features of the 19th century and BDA excavations (Fig. 6). The dominant burial rite, documented 26 (i.e. 21%) times, was the scattering of the unseparated cremation¹¹ over the grave sole. Such unseparated cremations were filled 13 (i.e. 10%) times into a pit and 22 (i.e. 18%) times into an urn. The urn of grave BDA430 was

⁵ Features of the excavations in the 19th century and the BDA excavation in numbers: stone enclosures 16 times, stone enclosure combined with stone mantels 17 times, stone packings 36 times, stone pavements 4 times, stone settings 13 times and stone cists 14 times (for details see Ebner-Baur 2020, 189, 190).

⁶ E.g. Fürholz (Wedenig 1999), Gratschach (Gleirscher 1998), Grabelsdorf (Gleirscher 1996; 1997b, 60–62), Gurina (Gleirscher 1997a; 2004a; Jablonka 2001, 41), Judendorf (Dolenz 1969, 18–28, pl. 6–10, insert 2), Tscherberg (Fera 1998, 14; Gleirscher 1999, 45–47) and Warmbad Villach (Gleirscher 1997c, 61–72; 2008; Kohla 1961, 406, 407, fig. 5: 3), Sulmtalnekropole (Dobiat 1980, 55–60) or Vila Prah in Kranj (Gorenjska region, Slovenia; Škvor Jernejčič 2017, 178), Habakuk and Pivola near Poštela (Maribor, Štajerska region, Slovenia; Teržan/Črešnar/Mušič 2015, 63, fig. 4).

⁷ Gurina (Gleirscher 1997a; 2004a), Gratschach (Gleirscher 1998), Tscherberg (Fera 1998).

⁸ E.g., Fürholz (Wedenig 1999, 6); Sulmtalnekropole (Dobiat 1980, 47); Tolmin (Goriška region, Slovenia; Škvor Jernejčič/Vinazza 2016, fig. 8); Ljubljana (Osrednjeslovenska region, Slovenia; Škvor Jernejčič/Vinazza 2016, fig. 3).

⁹ For stray finds of the La Tène period from Frög see Ebner-Baur 2020, 158–159, fig. 107.

¹⁰ In 49 (i.e. 39%) cases it was only possible to assert scattered cremations in general as a funeral rite.

¹¹ The term unseparated cremation (*Brandschüttung*) refers to unseparated cremated bones and pyre residues.

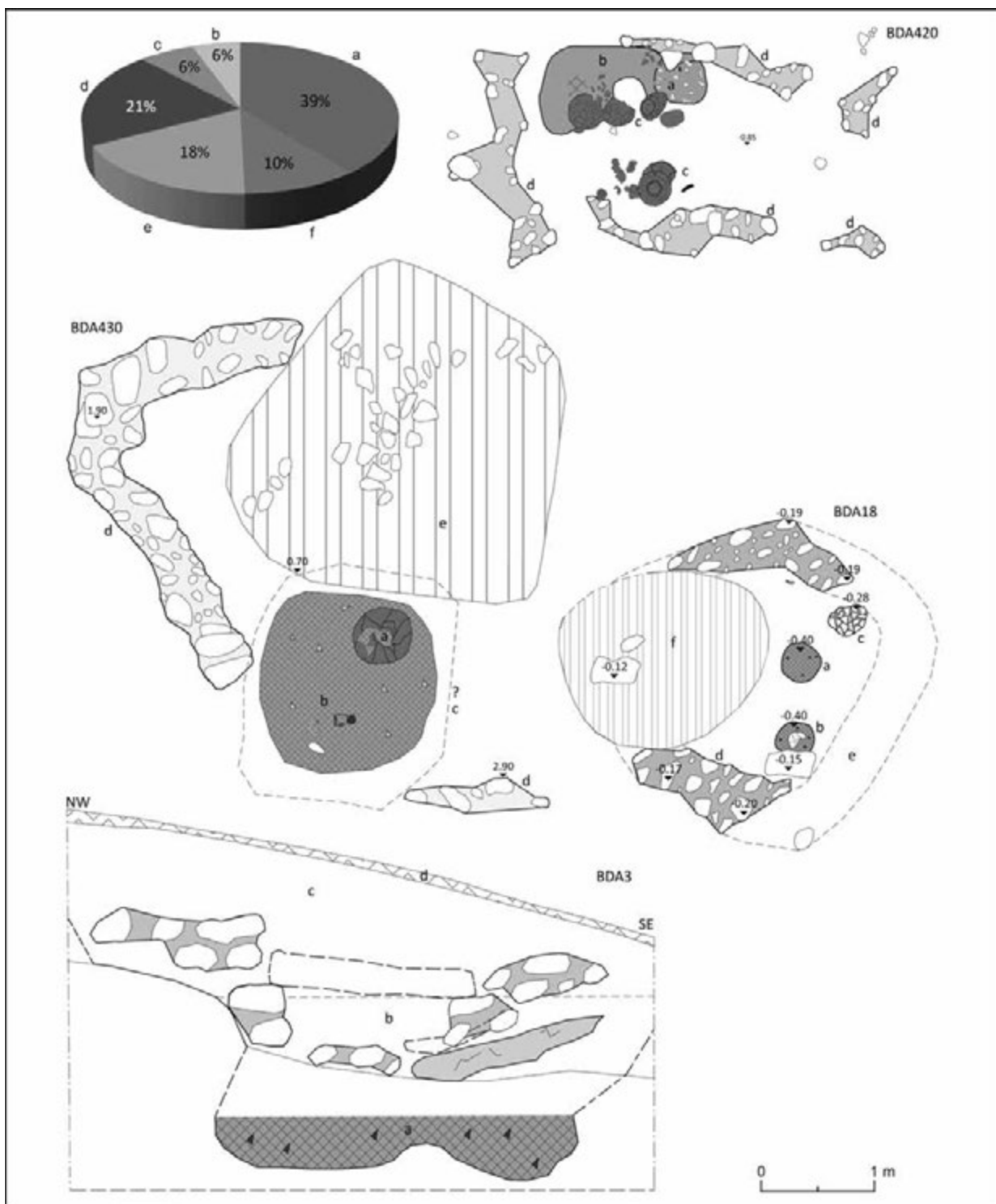


Fig. 6. Examples of the common funeral rites. BDA420: a – unseparated cremation with personal outfit scattered over the ground, b – pyre remains with pottery sherds, c – grave goods (set of ceramic vessels and an iron knife), d – stone setting; BDA430: a – urn with unseparated cremation and personal outfit, b – unseparated cremation with two unburnt fibulae, c – grave pit, d – remains of the stone setting (enclosure?), e – pottery-dated medieval robbery pit; BDA18: a – unseparated cremation filled into a pit, burial 1, b – unseparated cremation filled into a pit and pottery sherds on top, burial 2, c – pottery sherds in a charcoal concentration, d – remains of the stone enclosure, e – reconstructed outline of the stone enclosure, f – robbery pit; BDA3: a – *bustum* (unseparated cremation with personal outfit), b – stone enclosure with two stone slabs, c – earth filling, d – topsoil. No north orientation; for further descriptions see *Ebner-Baur 2020*. Diagram of the common funeral rites: a – unseparated cremation unclassified, b – *ossilegium*, c – *bustum*, d – unseparated cremation scattered over the ground, e – unseparated cremation filled into an urn, f – unseparated cremation filled into a pit (*Ebner-Baur 2020*, 183).

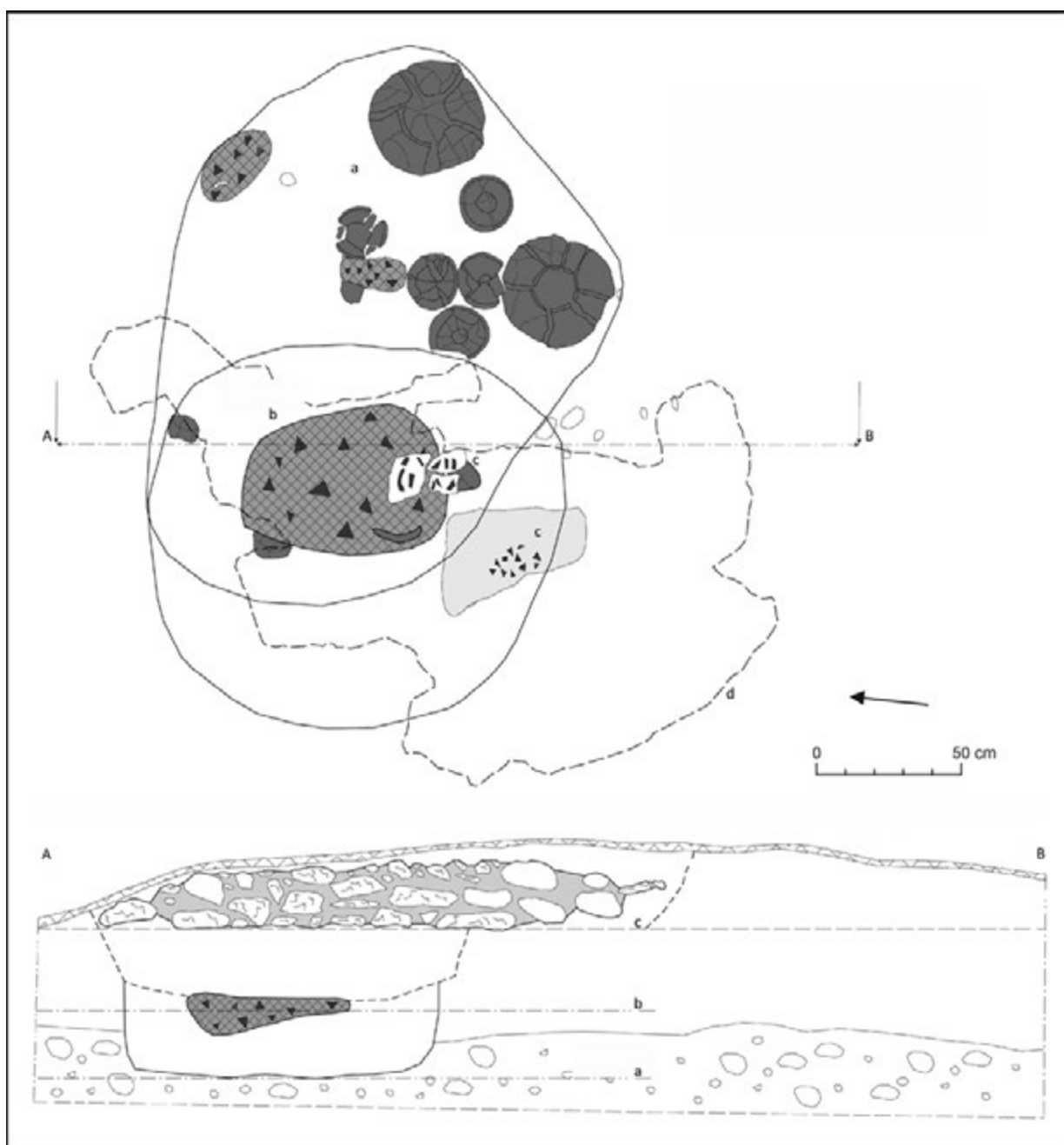


Fig. 7. Planum of grave BDA414: a – burial 1 (unseparated cremation with personal outfit and ceramic grave goods), b – burial 2 (unseparated cremation with pottery sherds), c – deposited pottery sherds and bones above burial 2, d – grave architecture, outline of the first stone layer; section A–B: a – level of burial 1, b – level of burial 2, c – level of deposited pottery sherds and bones (Ebner-Baur 2020).

possibly covered by a textile fixed with fibulae (e.g. Kohle 2019). The excavators found two unburned fibulae outside the urn lying on the grave sole whereas two burnt fibulae lay inside the urn between the cremated bones (Ebner-Baur 2019b; 2020, 187, 492–498).

Additionally, eight (i.e. 6%) bustum-graves and seven ossilegia (i.e. 6%) are evident. In the case of the bustum grave BDA3, the pyre was built over the burial pit. The bustum grave BDA193 is a possible double burial, since in addition to the female attire, objects with a male connotation were also found in the remains of the pyre (Ebner-Baur 2020, 184, 340–364). The term ossilegium refers to the case where the cremated human bones were sorted out and deposited separately from the pyre residues. Those bones

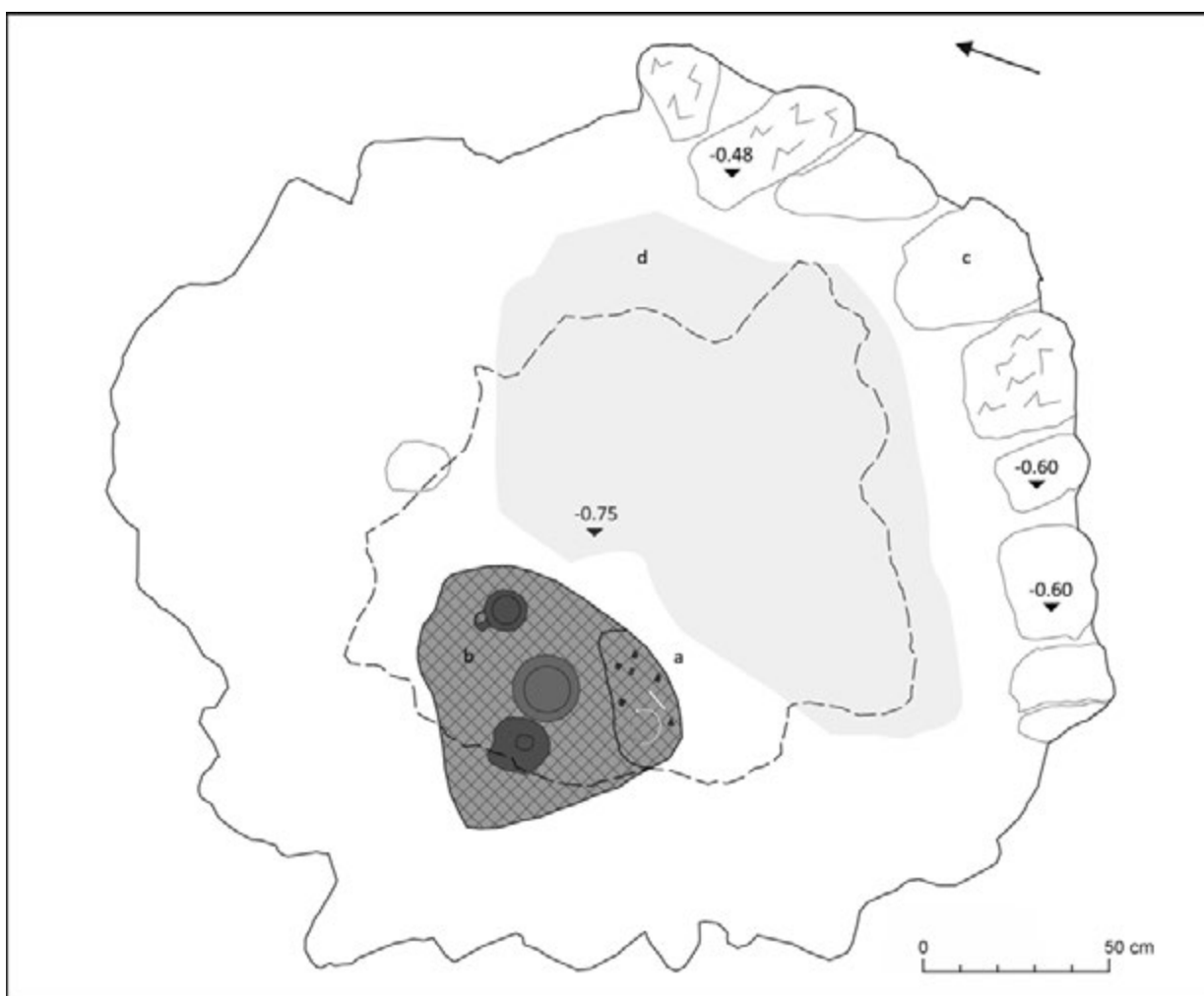


Fig. 8. Planum of grave BDA128: a – unseparated cremation with personal outfit, b – pyre remains with grave goods, c – grave architecture, lowest stone row of the stone enclosure, d – free area (Ebner-Baur 2020).

were usually found in small heaps on the grave sole. Hauser describes bones with bronze and iron objects within a cloth made of bast fiber in the burial T191/1 (Hauser 1891, 103). Another example is grave T168/1, where a small heap of human bones lay next to pieces of rich unburnt female jewellery. Here the latter was wrapped in a cloth (Tomedi 2002, 525, 527).

However, a chronological sequence of preferred burial rites cannot be determined.

Eating and drinking rituals

Eating and drinking ceremonies are an important part of the funeral ritual (Nebelsick 2000; 2017). Thanks to anthropological analysis and some documented features of the 1960s, eating and drinking rituals can be described for the first time at Frög. Funeral feast and meat offerings are evident through animal bones of the graves BDA68, BDA193/1 and BDA422. In the female grave BDA193/2 the anthropologist S. Renhart (Graz, Austria) was able to determine bones from a sheep or goat. L. D. Nebelsick noted gender-specific meat offerings for the Kalenderberg region: women got sheep or goat, whereas in male graves pig meat offerings were deposited (Nebelsick 2017, 173).

Numerous deposited drinking vessels as well as isolated pottery fragments, burnt and unburnt, indicate common drink offerings and libations in honour of the dead at the still open graves.

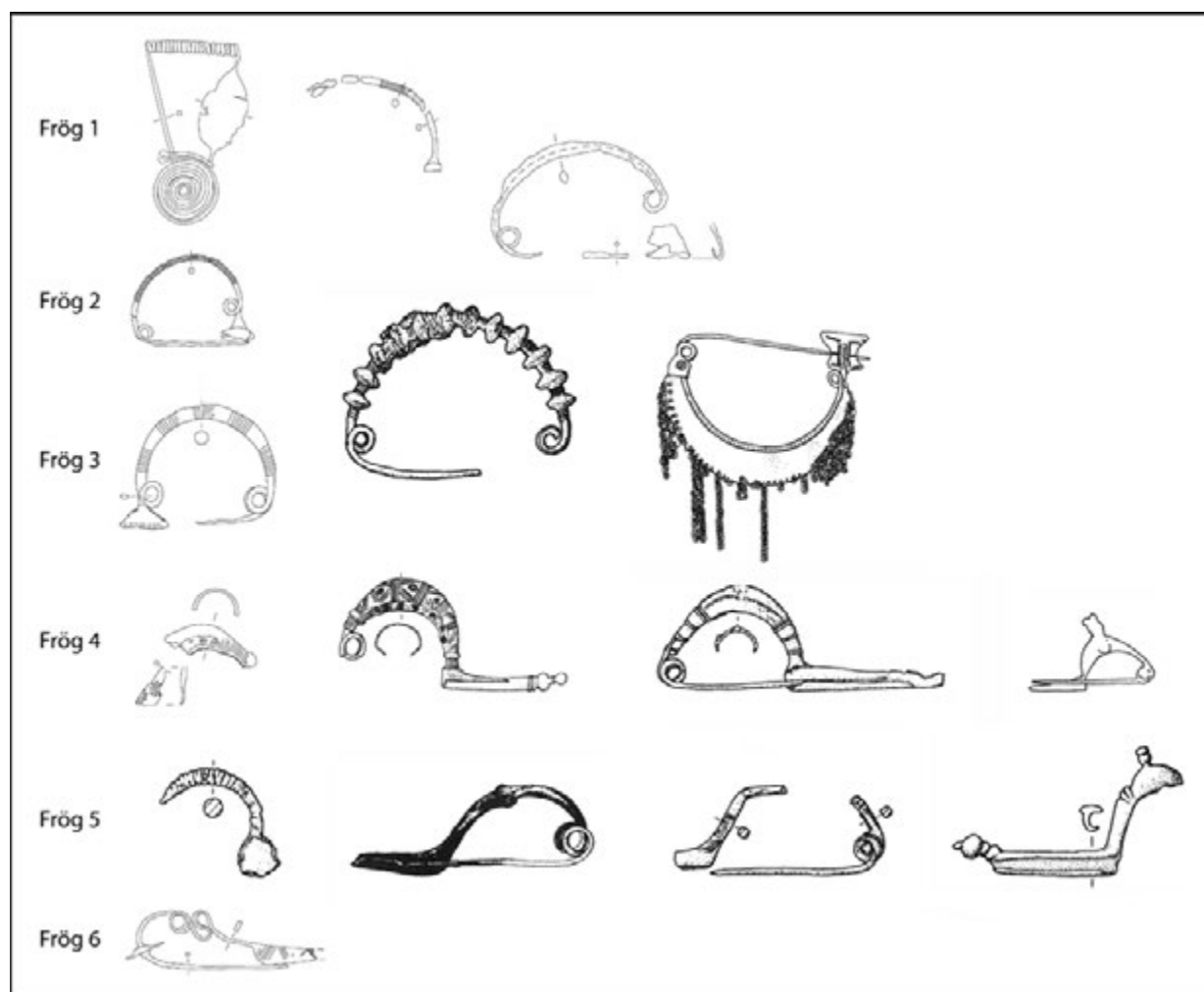


Fig. 9. Fibulae at Frög (after Gleirscher 2002; Tomedi 2002; newly arranged and supplemented by Ebner-Baur 2020).

Such traces are evident in grave BDA414/2 (Fig. 7). This collective grave contains two burials: the first burial on the bottom went with a rich pottery set and an arm ring made of bronze wire (*Drahtschmuckring*). The secondary burial lies 30 cm above the first one and consists of a pit filled with black loam, charcoal, cremated bones and pottery sherds. The burial pit was filled with soil up to the former level of the occupation layer. A multi-layer stone packing closed the burials. On the first stone layer, bones and pottery sherds were neatly arranged. Even if the bones were not kept for anthropological analysis, the remains of a funeral feast may be postulated (Ebner-Baur 2020, 212, 424–436).

The performance of rituals is elusive in the archaeological context. Certainly, the mourners did not dump the cremated bones of their relatives and friends into the grave without any ceremony. Analysis of the arrangement of the grave goods as well as the human remains and their relationship to the areas left free could reveal the movement of the actors during the burial ritual (Nebelsick 1995). Undisturbed burials in large number are a prerequisite for detailed studies. Therefore, the burial site of Frög can only rarely provide answers. Nevertheless, examining the plan of grave BDA128 (Fig. 8), the free place in the northwest of a stone row, which is the lowest level of the stone enclosure, is striking. It is conceivable that some mourners stayed in this approximately free area of about 3 m² during the funeral ceremony. A few people might have sat on the stones or placed some offerings on them (Ebner-Baur 2020, 211, 212, 312–318).

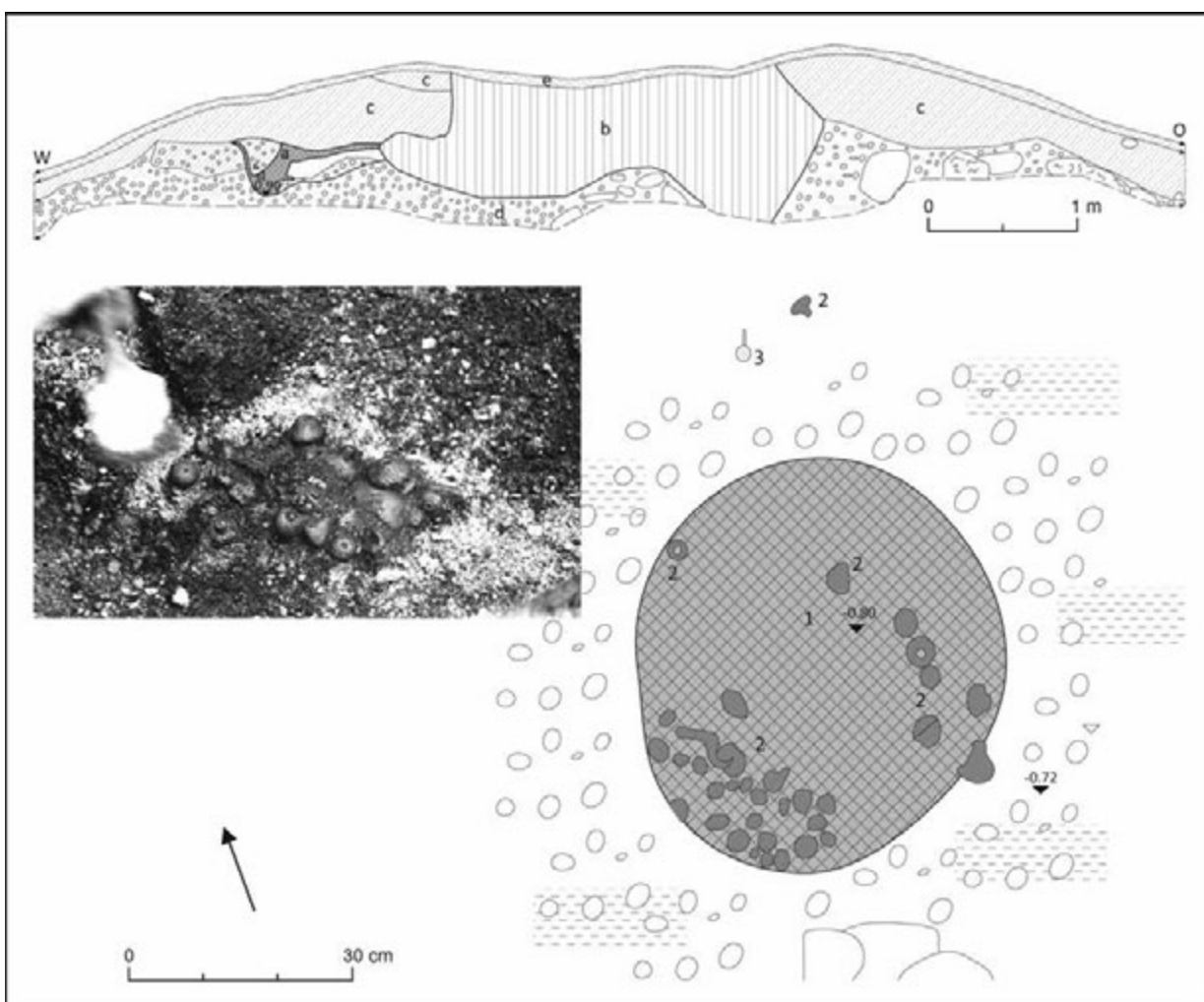


Fig. 10. Section of grave BDA193: a – burial 2 with spindle whorls, b – filled trench from the 19th century, c – barrow deposition, d – geological soil, e – topsoil (Ebner-Baur 2020); detailed planum of burial BDA193/2: 1 – burial pit filled with ash, cremated bones, pottery sherds, bronze objects, shells and the spindle whorls, 2 – 34 spindle whorls and two ceramic spacers, 3 – bronze object (Ebner-Baur 2020; photo of the feature, Fotoarchiv Bundesdenkmalamt, Frög No. 1387; © BDA).

GRAVE CONTENT

The grave contents consist of the cremated remains, the personal outfit and the grave goods. The burnt personal outfit and fitments of the deceased are most of the time mixed with the cremated remains. This includes all the items of clothing given to the deceased, such as brooches, pins, ring jewellery, belts, etc., and personal objects such as spindle whorls, knives and symposium crockery.

Grave goods are objects that were deposited around the buried person, such as vessels, spindle whorls or household appliances such as knives, which do not necessarily belong to the personal outfit of the deceased. Social groups or individuals might have laid such objects down. These mostly burnt items may have been placed already fragmentarily during burial rituals.

Social roles and identities of the buried person during his or her lifetime as well as the role he or she played for the community after death can be visible in the graves. The attire can indicate age and gender, and the goods can indicate the person's activities. Through the treatment of the body during the funeral ritual, the beliefs of the burying society can be explored (Gramsch 2010, 142; Rebay-Salisbury 2013, 83).

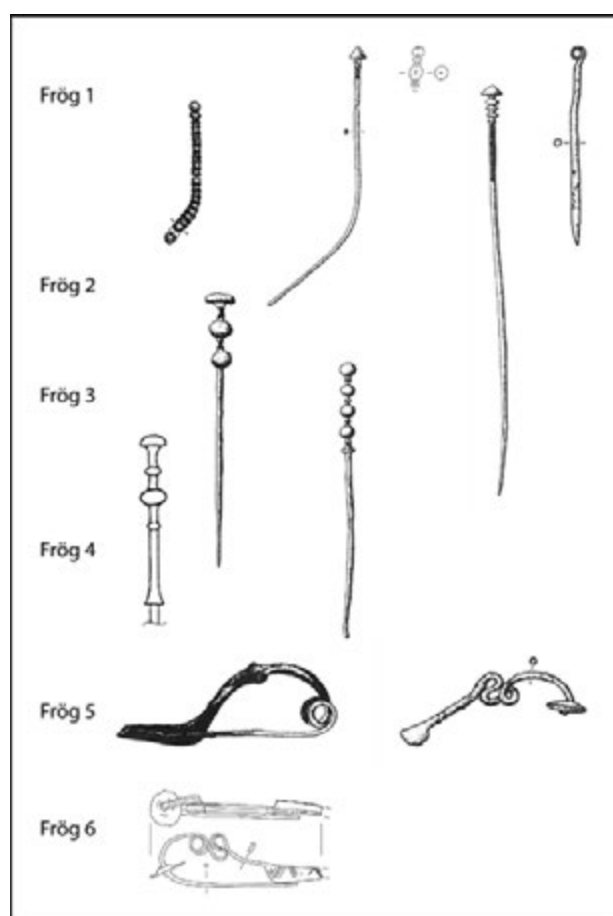


Fig. 11. Dress pins at Frög (after Gleirscher 2002; Tomedi 2002; newly arranged and supplemented by Ebner-Baur 2020).

burial site at Frög (cf. Tomedi 2002, 320). Individual female graves are documented only from phase Frög 2 onwards (e.g. BDA412), while female graves with rich jewellery do not appear before the transitional phase Frög 2–3 (e.g. BDA193/2 and BDA202).

Apart from male burials with weaponry graves with special and outstanding attires and grave goods seem to have been reserved for women.

For male burials, only two fitment-patterns, namely with one or more dress pins, are evident.

During phase Frög 5 and 6 fibulae became popular, and the dress pins disappeared (Fig. 11).

Iron balls or 'iron whorls' like in the Kalenderberg culture appear in male graves (Nebelsick 1997, 102; Rebay 2006, 179, 180). Weapons, harnesses and craft tools such as files or grindstones found their way into the grave inventories less often.

Disregarding possible grave robbing, six weapon combinations are detectable. Axes and spears are the dominant offensive weapons at Frög. The first group of graves with weapons subsumes graves with one or two axes. The second combination refers to burials with one or two spearheads, the third to burials with one axe and a horse harness. The fourth group contains one axe and one or two spearheads, whereas the fifth combination includes one axe, one or two spearheads together with a horse harness (Ebner-Baur 2020, 197, 198). Tomedi describes and maps 19 graves with weaponry (Tomedi 2002, 313–320).

Graves with weaponry occur at a rate of 13 to 4 comparing the phases Frög 1–2 and Frög 3–4. In the early stages, more men were equipped with only one type of weapon: one or two axes or one or two spears, whereas in later periods men got two weapon types: one or two axes and a sword or an axe and two spears.

Personal outfit – female and male burials

For female burials five fitment-patterns can be distinguished, which consist of different kinds of fibulae, neck and arm rings (e. g. Teržan 1988/89, 75). The basic equipment consists of one or two fibulae of the same kind (Fig. 9). The second fitment-pattern refers to the combination of a fibula and an arm ring, the third comprises a fibula and a neck ring. The fourth combination consists of a fibula as well as an arm and a neck ring. The fifth equipment pattern summarises graves with more than two fibulae as elements of the female attire (Ebner-Baur 2020, 194–196).

Four women in the graves BDA193/2, T50/2, T168/1 and T230 were buried with a very rich splendour attire (*Prunktracht*). All these graves contained objects connected to textile production: spindle whorls were found in an exceptionally large number in grave BDA193/2 (Fig. 10), in grave T50/2 a magnificent distaff with a glass spindle whorl was placed and grave T70 included a burnt loom (Ebner-Baur 2020, 210, 211; Tomedi 2002, 160, 453). The graves BDA193/2 and T50/2 were part of double burials while graves T168/1 as well as T230 contained single burials. The rich jewellery was unburnt; it showed traces of fire contact only in grave BDA193/2.

If we postulate grave BDA430 from the initial phase to be a secondary burial it seems like individual female graves were not foreseen at the very beginning of the occupancy of the

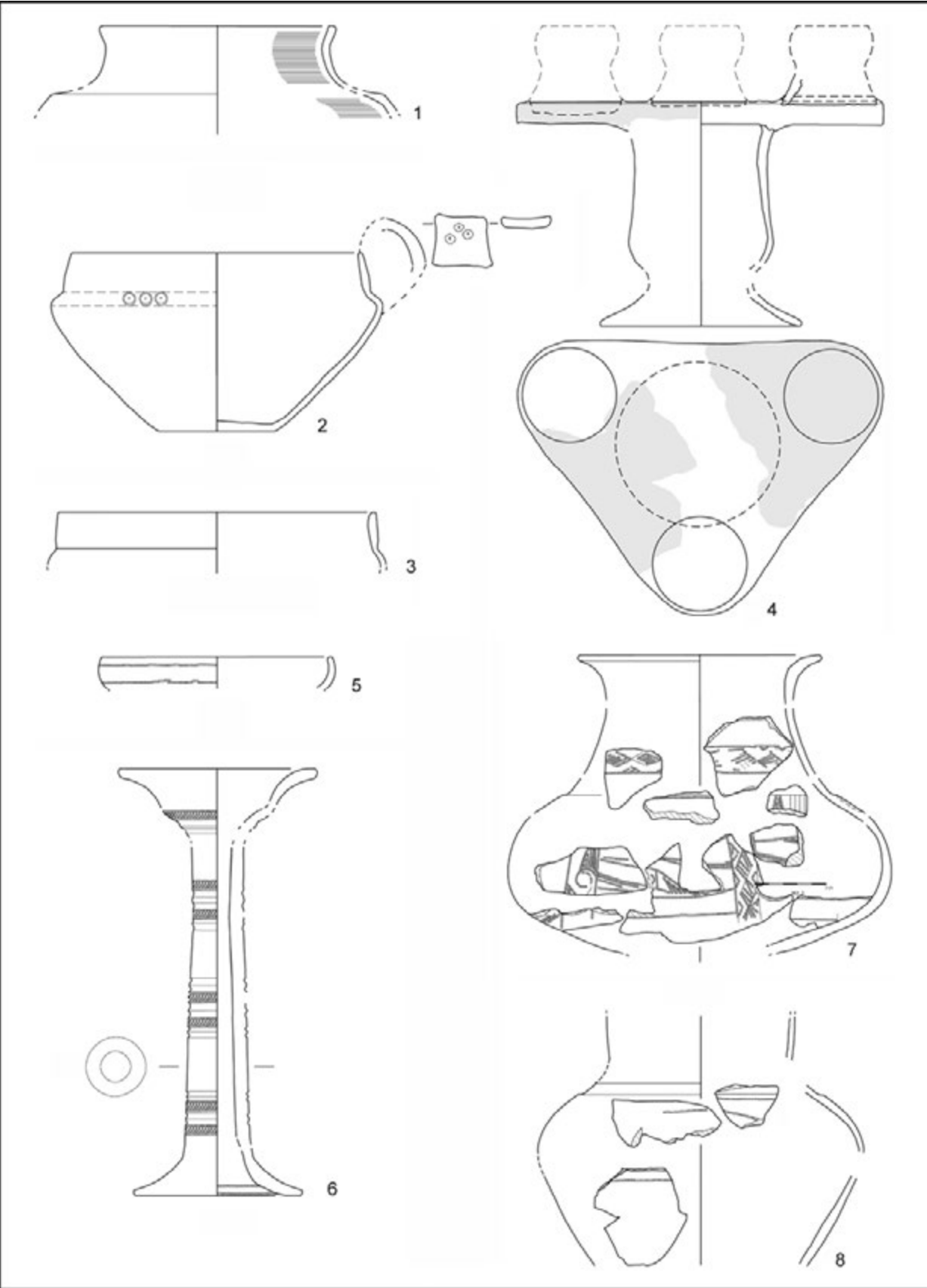


Fig. 12. Imported pottery and Basarabi-styled pottery (Ebner-Baur 2020).

Pottery

The pottery at Frög is uniform and was locally produced, although the natural clay deposits and the ceramic workshops are unknown. Its colour is brown-black in various nuances, with a smooth polished surface on the outside. The inner surface is usually smoothed and only polished in the upper part of the vessel.

It is difficult to assess the original appearance of the pottery, especially since fragments from the same vessel can differ from one another due to secondary firing and storage conditions in the ground. The most popular vessel forms are shallow bowls with an inward rim (*Einzugsrandschale*), followed by vessels with a conical neck (*Kegelhalsgefäß*) and shallow bowls on a foot (*Standfußschale*). The presence of imported ceramics testifies the versatile cultural contacts of the inhabitants of Frög.

The repertoire corresponds mainly to forms from the Southeastern Alpine region. Forms and decorations are influenced by the Lower Danube and the Mediterranean regions. In addition, imported pottery from the Kalenderberg culture, the Lower Danube area as well as Northern Italy and from the Alpine foothills reached Early Iron Age Frög.

The disc-turned vessel with a conical neck from grave BDA411 (Fig. 12: 1), the big handled cups with decoration of bronze nails (*Bronzenagelzier*) from grave BDA124, BDA125 (Fig. 12: 2, 3) and T192 (Tomedi 2002, pl. 86A: 1), the ceramic situla with horizontal ribs from grave T181 (Tomedi 2002, pl. 83: 6) and the presentatio from grave BDA202 (Fig. 12: 4) probably originated in Italy. Numerous fragments and some complete red-black painted vessels from the northwestern Alpine foothills are present as well, as well as pottery imports from the Kalenderberg culture.

In the absence of evidence for ceramic workshops and without any natural scientific analysis for reference groups the given thoughts and conclusions are theoretical.

The Basarabi-style ceramics were already treated in detail (Metzner-Nebelsick 1992; 2019). These objects are most likely of local production, inspired by the ornamental style of the Basarabi culture, like the hollow stand (*Tonständer*; Fig. 12: 6), the shallow bowl with an inward rim¹² (Fig. 12: 5) and the vessels with conical neck from grave BDA202 (Fig. 12: 7, 8). Although the grave was massively robbed and excavated in the 19th century the excavators in the 1960s recovered hundreds of pottery sherds and a lead equestrian. The ceramic equipment was immense: the rate of imported and Basarabi-inspired pottery is remarkable. The buried woman of this grave wore bronze and iron crescent fibulae, which date the grave to Frög 2–3 (Ebner-Baur 2019a; Tomedi 2002, 175–177).

Several times imitations of metal vessels can be observed, like the mentioned presentatio of grave BDA202 (Fig. 12: 4) and situlae in various graves (Ebner-Baur 2020, 105–107). All in all, the evaluation of ceramics from the grave inventories of Frög shows the importance of locally produced pottery, where role models and impulses from surrounding areas and cultures were implemented.

Vessel combinations

The analysis of the combination of vessels is based on the work of Louis D. Nebelsick, who analysed pottery sets in rich graves of the Late Bronze and Early Iron Age in the Carpathian Basin and attempted to reproduce the drinking modalities linked with those pottery sets (Nebelsick 2000, 220, 221; 2017).

Due to the selective preservation of the pottery in the 19th century only the features from the BDA excavations were considered for the analyses of the dishes at Frög (Fig. 13).

Some indications of libation rites became evident through the remaining vessels and the precise observation of their arrangement in the graves. More data would be needed for further conclusions.

First, simple drinking sets are attested in graves from the early phases.¹³ They consist of a vessel with conical neck and either a double-handled vessel or pot as well as a handle cup and a shallow bowl with an inward rim. The vessels were arranged directly on or in the cremated bone depositions, which might indicate the ownership of the pottery.

Second, the most extensive ceramic sets from undisturbed graves, probably intended for several people, date to Frög 3. These are sets of drinking and eating pottery and they include a vessel with conical neck for mixing as well as two vessels for serving, consisting of a situla and/or wide-necked

¹² Hollow stands (*Tonständer*) were probably used (also) as a pedestal for bowls with an inward rim. A use as an incense burner of this object combination is likely.

¹³ A simple drinking vessel is also attested for grave BDA412. However, since the burial was robbed, it was excluded for methodological reasons.

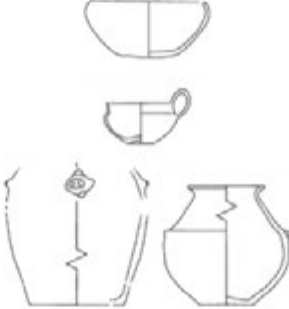
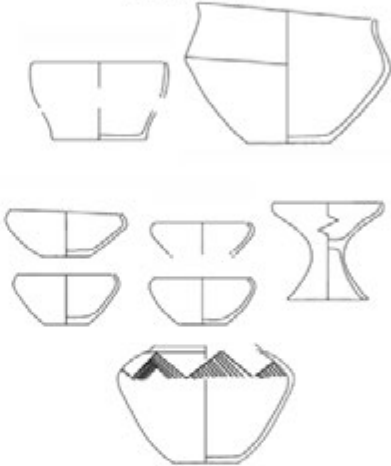
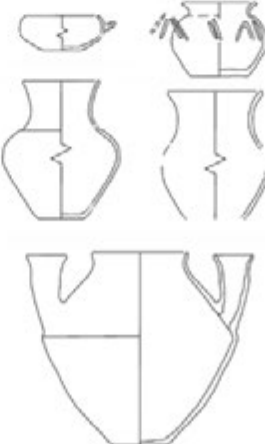
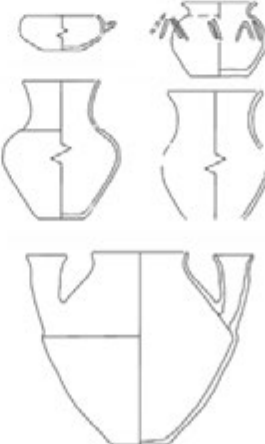
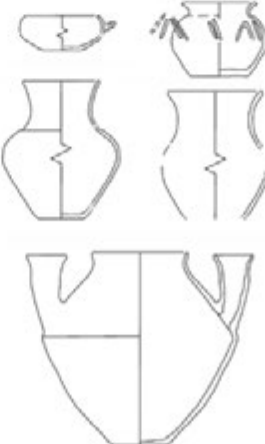
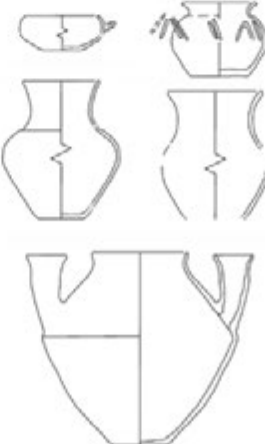
wining and dining scooping and drinking keeping and mixing	BDA68 		BDA128 	
	BDA411 		BDA414/1 	
	BDA420 		BDA415 	
cutting wining and dining liquid keeper mixing	BDA422 		BDA415 	
	BDA422 		BDA415 	
	BDA422 		BDA415 	

Fig. 13. Vessel combinations at Frög (Ebner-Baur 2020).

bowls. Several shallow bowls with an inward rim or bowls on a foot served for wining and dining. The vessels were neatly arranged near the cremated bones.

The third vessel combination is supplemented by an iron knife. This combination appears in the phases Frög 3 and Frög 4 and consists of a large mixing vessel, i.e. a vessel with conical neck, a pseudo-kernos or a situla, two (identically shaped) liquid containers as well as at least two bowls and/or pots for wining and dining. An iron knife supplements the ceramic set. The vessels were arranged near the cremated bones as well as partly on or in the depositions of unseparated cremations.

Lead objects

Two groups of lead objects occur at Frög, which must be strictly separated from each other. On the one hand, these are the well-known lead figurines, one of the most characteristic features of the burial site of Frög, and on the other hand, there are ceramic vessels decorated with flat-rolled lead applications. A well-preserved example for the latter is the urn from grave BDA430 (Fig. 14).

The vessel with conical neck appears dark brown to black and is broad in shape, softly profiled, round bodied, and has a short neck. The rim diameter is slightly smaller than the body of the receptacle. The surface was smoothed with a spatula, neck and rim were also polished. A circular 4.3 cm wide frieze with a diamond pattern made of thin flat-rolled lead wire was applied on the vessel's body with an adhesive that has now turned black.



Fig. 14. The lead-wire decorated vessel with conical neck from grave BDA430 dated to Frög 1 (Ebner-Baur 2019b, 189, fig. 5).

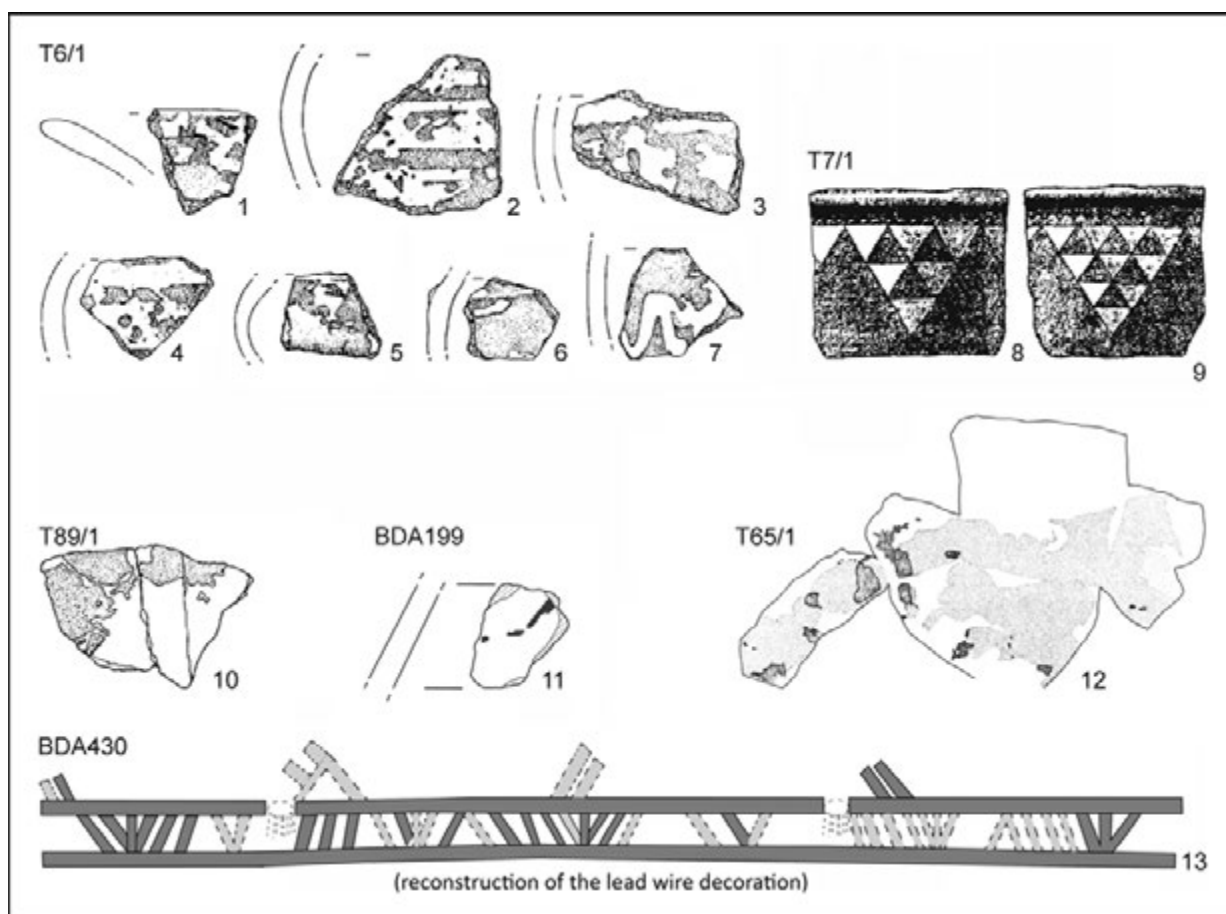


Fig. 15. Pottery with remains of geometric-style lead wire decoration (Ebner-Baur 2019b, 190, fig. 6).

A knob with a bundle of four channellings underneath interrupts the frieze. Neither an opposing knob nor the channellings have been preserved. Remains of four more lead ornaments are present on the neck of the vessel. Additionally, a 14 mm wide U-shaped lead band was folded over the rim.

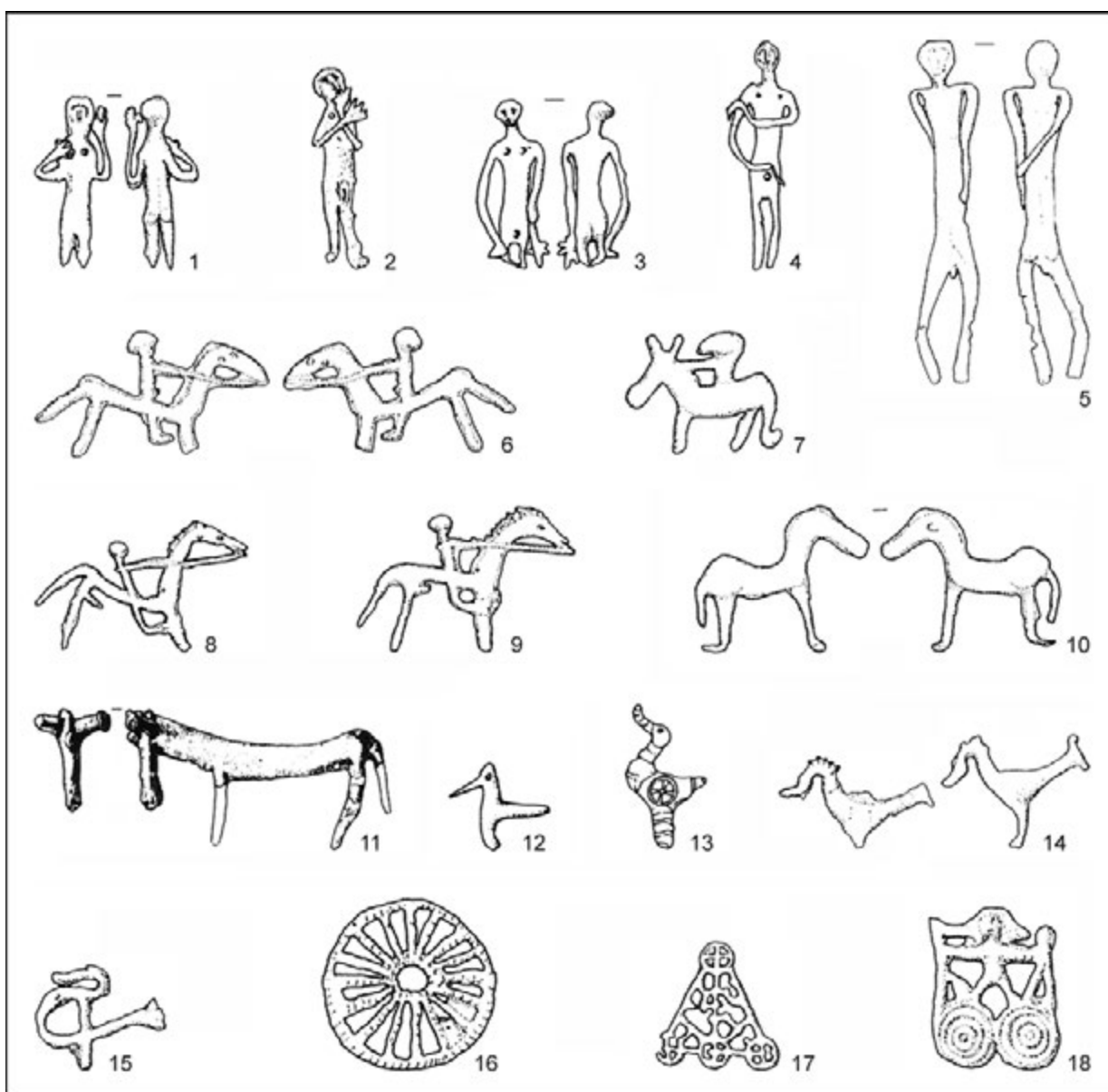


Fig. 16. Lead figurines from Frög (picture by G. Tomedi; *Tomedi 2002*, 257, fig. 42).

A comparative find for the shape of the vessel comes from burial mound 7 from Tscherberg, whose pottery is similar to that of the Maria-Rast group. Martin Fera dates the grave to Ha B3 (*Fera 1998*, 17, pl. 3: 1).

Remains of lead on vessels are also known from some old finds, which also bear – if still recognizable – geometrical patterns in horizontal bands (Fig. 15; *Ebner-Baur 2019b*, 189, 190).

Ceramic vessels with metal applications are widespread in the Eastern Alps and especially in the Villanova culture. More often tin or bronze is used instead of lead. Meanders are most common, more rarely angular stripes and small triangular plates are to be found. Figural decorations, though, are so far non-existent. In addition to Frög, Claus Dobiak also mentions Kobarid, Poreč, Sveta Lucija/Most na Soči and Bermo/Vermo with finds of vessels decorated with lead (*Dobiak 1980*, 130–133, List of finds 3).

The majority of the several hundred lead figurines (Fig. 16) are stray finds, since figurines of the same shape were often archived under the same inventory number without regarding the context of the findings. The spectrum of lead figurines consists of human, animal and geometric shapes.

From the beginning of the excavations, the semi-plastic lead figures were understood as applications for ceramic vessels (Hauser 1888, 84; Kanitz 1884, 143). Less carefully crafted males and equestrians, for example, lay in a ceramic bowl on the grave sole of barrow T168 next to the cremation. Having rejected his earlier interpretations as children's toys due to the high occurrence density, Hauser thought of a production exclusively for the burial and connected it with the burial ceremony (Hauser 1888, 84).

Later the figurines were interpreted as a primitive interpretation of the Situlae Art (Pittioni 1954, 632) or as the emblem of a family or clan (Teržan 1988/89). Tomedi associated burial rituals with the lead figurines, analogous to finds and findings from the Geometric and Archaic periods in Greece (Tomedi 2002, 279). He was followed by Katharina Rebay-Salisbury, who dealt with figurines made of different materials in Europe. She pointed out that especially the objects coming from shrines or graves were less carefully crafted and were probably made specifically as an offering or for burials. The lead figurines were relatively easy to produce using the open-sand-casting-process, and the soft material was easy to work with. This suggests not only professional craftworkers as producers (Rebay-Salisbury 2016, 173–177).

The lead figurines certainly played an important role in the belief of the people at Frög. The equestrians could have served as stylised protectors for a safe attendance into the world of the dead. Additionally they could have served as equipment for the next life. As aquatic or flying animals, birds move between two elements and symbolise a transition to a different state of body and soul. In this context, the wheels would symbolize chariots, which transported the deceased to the world of the dead (Tomedi 2002, 263).

Many figurines, at least those exhibited in the newly opened *kärnten.museum*, show one or two pin-sized holes in their body. It is possible that these figures were sewn onto textiles, serving as clothes wrapped around the urn.

SUMMARY AND CONCLUSION

The Hallstatt period burial site of Frög has attracted international attention since the discovery of the famous lead wagon at the end of the 19th century, and the 'archaeological' investigation has begun.

The *Bundesdenkmalamt* carried out emergency excavations in burial mounds in the 1960s.

The chronological structure outlined by Gerhard Tomedi is still up to date. The published phases Frög 1–5 follows a short-lasting final phase Frög 6. In absolute chronological terms, the burial site was frequented between 820/810 and 550/530 BC. Findings of Lt A–Lt C indicate a not further definable frequentation during that time. The secondary burial BDA428/1 dates to Lt D1.

Barrows are the dominant grave form. A significant number of graves were dug in a natural ground formation.

The unseparated cremation in collective burials is the favoured burial rite and burial form.

For female burials five fitment-patterns can be distinguished, which consist of different kinds of fibulae, neck and arm rings. Four to the textile production linked women were buried with a very rich attire (*Prunktracht*). In men's graves only two equipment combinations, namely with one or more dress pins, are tangible. Weapons, harnesses and craft tools such as files or grindstones found their way into the grave 'inventories' less often.

The pottery at Frög is uniform and was produced locally, and to some extent even particularly for burials. The most popular forms are shallow bowls with an inward rim, followed by vessels with a conical neck and shallow bowls on a foot. Pots are not present regularly. The local ceramics is comparable to products from other sites in the Eastern Alps.

The international forms of metal objects find similarities in Italy, in the north of the Alps as well as in the Northeastern and Southeastern Alps.

One of the characteristic features of the Frög necropolis is the regular deposition of lead figurines, probably fixed on textiles. At least some were particularly made for burials. Additionally, ceramic vessels were decorated with geometrical motifs made of lead wire. The latter have counterparts in Villanova culture.

Frög has been a melting pot of different, sometimes very distant, fashions.

The Fröger Group belongs to the Southeast Alpine Hallstatt culture, with the strongest connections to the Styrian-Pannonian group. The lowest common denominator of graves in the Southeastern

Alpine Hallstatt group are cremation burials under earth hills with or without a burial chamber made of stones (or wood?), locally produced and – to a lesser extent – imported grave ceramics as well as ‘international’ traded metal forms.

The strategically advantageous location of Frög next to the navigable Drava River let to intensive cultural contacts not only within the Alpine region, but also with Early Iron Age cultural groups in Italy as well as the Middle Danube region and the Carpathian Basin. The route from the Adriatic Sea runs along the Tagliamento through the Canal Valley. Leading to the west it crosses the Alps over the Plöckenpass (= Monte Croce Carnico) and moves eastwards through the Gailtal Valley. The eastern route runs at Pontebba and Malborghetto to the Federauner Sattel (Coccau). In Arnoldstein it encounters the road from the west and leads north into the Drautal. Traders and travellers used the connection from the Black Sea via the Danube, the Sava and the Drava to the west. Without a doubt, Frög was an important Hallstatt centre for trade between Italy, the Eastern Alps, the Balkan Peninsula and Central Europe.

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140 rokov výskumu na pohrebisku z doby halštatskej vo Frögu v Korutánsku (Rakúsko) – a teraz i nové fakty

Desiree Ebner-Baur

Súhrn

Pohrebisko z doby halštatskej vo Frögu vzbudilo medzinárodnú pozornosť od objavu slávneho oloveného voza koncom 19. storočia a začal sa tu „archeologický“ výskum.

Spolkový pamiatkový úrad (*Bundesdenkmalamt*) vykonal v 60. rokoch 20. storočia záchranné výkopy v mohylách.

Jedným z charakteristických znakov pohrebiska vo Frögu je pravidelné ukladanie olovených figúrok, pravdepodobne upevnených na textíliách, do hrobov. Prinajmenšom niektoré z nich boli špeciálne vyrobené pre pohrebné obrady. Okrem toho boli keramické nádoby zdobené geometrickými motívami z oloveného drôtu. Tie majú obdobu vo vilanovskej kultúre.

Miestna keramika, do istej miery vyrábaná najmä na pohreby, je porovnateľná s výrobkami z iných lokalít vo Východných Alpách.

Nadregionálne tvary kovových predmetov nachádzajú podobnosti na území Talie, v severnej časti Álp, ako aj v severovýchodných a juhovýchodných Alpách.

Frög bol taviacim kotlom rôznych, niekedy veľmi vzdialených módných foriem.

Najmenším spoločným menovateľom hrobov v halštatskej skupine juhovýchodných Álp sú žiarové hroby pod zemnými násypmi s hrobovou komorou vybudovanou z kameňa (alebo z dreva?), alebo bez hrobovej komory, lokálne vyrábaná a – v menšej miere – importovaná hrobová keramika, ako aj nadregionálne obchodované kovové tvary.

Strategicky výhodná poloha Frögu pri splavnej rieke Dráva umožnila intenzívne kultúrne kontakty nielen v rámci alpského regiónu, ale aj s kultúrnymi skupinami staršej doby železnej v Talii, ako aj v strednom Podunajsku a v Karpatskej kotline. Cesta od Jadranského mora vedie pozdĺž rieky Tagliamento cez Val Canale (údolie v Alpách). Smerom na západ prekračuje Alpy cez priesmyk Plöckenpass (Monte Croce Carnico) a pokračuje na východ údolím rieky Gail. Východná trasa vedie cez obce Pontebba a Malborghetto do sedla Federaun (Coccau). V Arnoldsteine sa stretáva s cestou zo západu a vedie na sever do údolia Drávy. Obchodníci a cestujúci využívali spojenie od Čierneho mora cez Dunaj, Sávu a Drávu na západ. Frög bol bezpochyby dôležitým halštatským centrom obchodu medzi Itáliou, východnými Alpami, Balkánskym polostrovom a strednou Európou.

Obr. 1. Poloha Frögu a súvisiacich centier doby halštatskej.

Obr. 2. Pohrebisko Frög podľa máp zo 60. a 80. rokov 20. stor. (Ebner-Baur 2020). Legenda: a – mohyly zamerané v roku 1986; b – mohyly zamerané v roku 1965; c – mohyly skúmané BDA v 60. rokoch 20. stor.; d – potenciálny plochý hrob.

Obr. 3. Fotodokumentácia výskumu pamiatkového úradu (1962–1969), hroby BDA6, BDA128, BDA143, BDA180, BDA410, BDA429 a BDA430 (fotoarchív pamiatkového úradu, Frög, č. 1271, 1357, 1530, 1576, 1594, 1633 a 1698; © BDA).

Obr. 4. Chronologická tabeľa doby halštatskej v strednej Európe (Ebner-Baur 2020).

Obr. 5. Príklady zastúpených typov hrobov. BDA422: a – nepravidelné uloženie kameňov, b – obrys kamenného príkrovu nad hrobom, c – neroztriedené zvyšky kremácie so súčasťami odevu, d – hrobové prídavky; BDA415: a – hrobová jama, b – neroztriedené zvyšky kremácie so súčasťami odevu, c – hrobové prídavky, d – hranica sondy; BDA417: a – kamenná skrinka, b – neroztriedené zvyšky kremácie so súčasťami odevu; BDA3: a – kamenná ohrada s kamennou platňou/kamennými platňami, b – koncentrácia uhlíkov; BDA128: okrúhla a uzatvorená kamenná ohrada; BDA142: kamenný príkrov. Bez severky; pre podrobný opis pozri Ebner-Baur 2020. Diagram: a – zemný násyp, b – kamenná konštrukcia, c – neurčiteľné.

Obr. 6. Príklady zastúpených typov pohrebného ritu. BDA420: a – neroztriedené zvyšky kremácie so súčasťami odevu roztrúsené po zemi, b – zvyšky pohrebnej hranice s keramickými črepmi, c – hrobové prídavky (súbor keramických nádob a železný nôž), d – kamenná konštrukcia; BDA430: a – urna s neroztriedenými zvyškami kremácie a so súčasťami odevu, b – neroztriedené zvyšky kremácie s dvomi nespálenými sponami, c – hrobová jama, d – zvyšky kamennej konštrukcie (ohrady?), e – stredoveká vykrádačská jama datovaná na základe keramiky; BDA18: a – neroztriedené zvyšky kremácie v jame, hrob 1, b – neroztriedené zvyšky kremácie v jame a keramické črepy na vrchu, hrob 2, c – keramické črepy v koncentrácii uhlíkov, d – zvyšky kamennej ohrady, e – rekonštruovaný obrys kamennej ohrady, f – vykrádačská jama; BDA3: a – *bustum* (neroztriedené zvyšky kremácie so súčasťami odevu), b – kamenná ohrada s dvomi kamennými platňami, c – zemná výplň, d – ornica. Bez severky; pre podrobný opis pozri Ebner-Baur 2020. Diagram zastúpených typov pohrebného ritu: a – neroztriedené zvyšky kremácie, neklasifikované, b – *ossilegium*, c – *bustum*, d – neroztriedené zvyšky kremácie roztrúsené po zemi, e – neroztriedené zvyšky kremácie v urne, f – neroztriedené zvyšky kremácie v jame (Ebner-Baur 2020, 183).

Obr. 7. Pôdorys hrobu BDA414: a – hrob 1 (neroztriedené zvyšky kremácie so súčasťami odevu a s keramickými hrobovými prídvkami), b – hrob 2 (neroztriedené zvyšky kremácie s keramickými črepmi), c – keramické črepy a kosti

- nad hrobom 2, d – hrobová konštrukcia, obrys prvej vrstvy kameňov; profil A–B: a – úroveň hrobu 1, b – úroveň hrobu 2, c – úroveň uložených keramických črepov a kostí (*Ebner-Baur 2020*).
- Obr. 8. Pôdorys hrobu BDA128: a – neroztriedené zvyšky kremácie so súčasťami odevu, b – zvyšky pohrebnej hranice s hrobovými prídavkami, c – hrobová konštrukcia, najnižší rad kameňov v kamennom obložení, d – voľný priestor (*Ebner-Baur 2020*).
- Obr. 9. Spony z Frögu (podľa *Gleirscher 2002; Tomedi 2002*; upravené a doplnené *Ebner-Baur 2020*).
- Obr. 10. Prierez hrobu BDA193: a – hrob 2 s praslenmi, b – zaplnený výkop z 19. stor., c – násyp mohyly, d – geologická pôda, e – ornica (*Ebner-Baur 2020*); detailný pôdorys hrobu BDA193/2: 1 – hrobová jama vyplnená popolom, spálenými kosťami, keramickými črepmi, bronzovými predmetmi, mušľami a praslenmi, 2 – 34 praslenov a dva keramické rozdeľovače, 3 – bronzový predmet (*Ebner-Baur 2020*; foto objektu: fotoarchív pamiatkového úradu, Frög č. 1387; © BDA).
- Obr. 11. Ihlice z Frögu (podľa *Gleirscher 2002; Tomedi 2002*; upravené a doplnené *Ebner-Baur 2020*).
- Obr. 12. Importovaná keramika a keramika basarabského štýlu (*Ebner-Baur 2020*).
- Obr. 13. Kombinácie nádob vo Frögu (*Ebner-Baur 2020*).
- Obr. 14. Nádob s kónickým hrdlom, zdobená oloveným drôtom, z hrobu BDA430, datovaná do fázy Frög 1 (*Ebner-Baur 2019b*, 189, obr. 5).
- Obr. 15. Keramika so zvyškami výzdoby oloveným drôtom v geometrickom štýle (*Ebner-Baur 2019b*, 190, obr. 6).
- Obr. 16. Olovené figúrky z Frögu (obrázok G. Tomedi; *Tomedi 2002*, 257, obr. 42).

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THE CHRONOLOGY OF THE HALLSTATT PERIOD IN MORAVIA

Impact of the Wagon Graves for Synchronisation of East and West Hallstatt Cultures

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The Moravian region occupies a central position in the Northern part of the East Hallstatt culture. There are two regional groups – the Horákov and Platěnice groups. Both of them provide numerous information for the study of chronology. Priority are chosen burial sites with suitable dates, which can be classified into the individual stages, phases and sub-phases of Reinecke's or horizons of Parzinger's periodisation. Within the Platěnice group these are namely the burial grounds in Moravičany, Dílečky, and Seloutky, Na Šťastných. Within the Horákov group we deal with the necropolises in Modřice, Rybníky and Sádky, and Vojkovice, Vojkovické nivy. The central burial ground including cave sanctuary Habrůvka, Býčí skála (not place of sacrifice), is related to both regions. The wagon graves are of strategic importance for the interregional chronology. While the Horákov group offers five of them, the first one in the Platěnice group has been identified at the burial site of Seloutky, Na Šťastných, which is quite newly introduced among the older sites. The fact that the wagon was recognized in a grave with cremation burial is of key importance. Habrůvka, Býčí skála, then offers six unique wagons. Moravia plays an important role for comparison of chronology with neighbouring Bohemia, Slovakia, Austria and Poland. Graves with wagons allow correlations across distant regions up to Bavaria, Baden-Württemberg or Eastern France.

INTRODUCTION

Periodization of the Hallstatt period in Moravia was presented in several works in the 1990s (*Nekvasil 1993; Říhovský 1993; Stegmann-Rajtár 1992*). All these works are now outdated. A special meaning for the Moravian region had the evaluation of the cave site Habrůvka, Býčí skála, which has been the local leitmotif of this era for 150 years (*Parzinger/Nekvasil/Barth 1995*). In this time Moravia became part of the European systems of the Hallstatt period (*Pare 1998; 1999; Torbrügge 1992*). Subsequent research on the periodization of the Hallstatt period followed the line of domestic research with a number of local works on the topic of graves, which did not correlate with neighbouring regions, however (e.g. *Golec 2005; Kos 2004; 2011; 2014; 2015; Makarová 2017*). In the last 30 years, a considerable amount of data has been collected and evaluated, and we draw on this data for the study of chronology. The most recent summary of chronology based on grave data has been presented recently (*Golec/Fojtík 2020, fig. 68; Kos et al. 2022a; 2022b*).

This paper aims to structure the most significant data from the burial sites and correlate them with neighbouring and distant regions. Two chronological lines are crucial for Moravia: in the Southern direction those of the regions along the branches of the Amber Road within the East Hallstatt culture – Eastern Austria, Western Slovakia, Western Hungary, as well as Slovenia, Croatia, Serbia and Italy (latter three are beyond the topic of this paper); in the Western direction chronology of the regions within the West Hallstatt culture – Bohemia, Western Austria, Bavaria, Baden-Württemberg and Eastern France. The region of Poland in the north should be revised in the future. The Eastern direction outside the Hallstatt culture poses a specific problem that goes beyond the scope of the present paper. Linking of wagon (and horse harness) graves across regions appears to be crucial for interregional chronology, as these assemblages respond very quickly and subtly to stylistic changes over large areas.

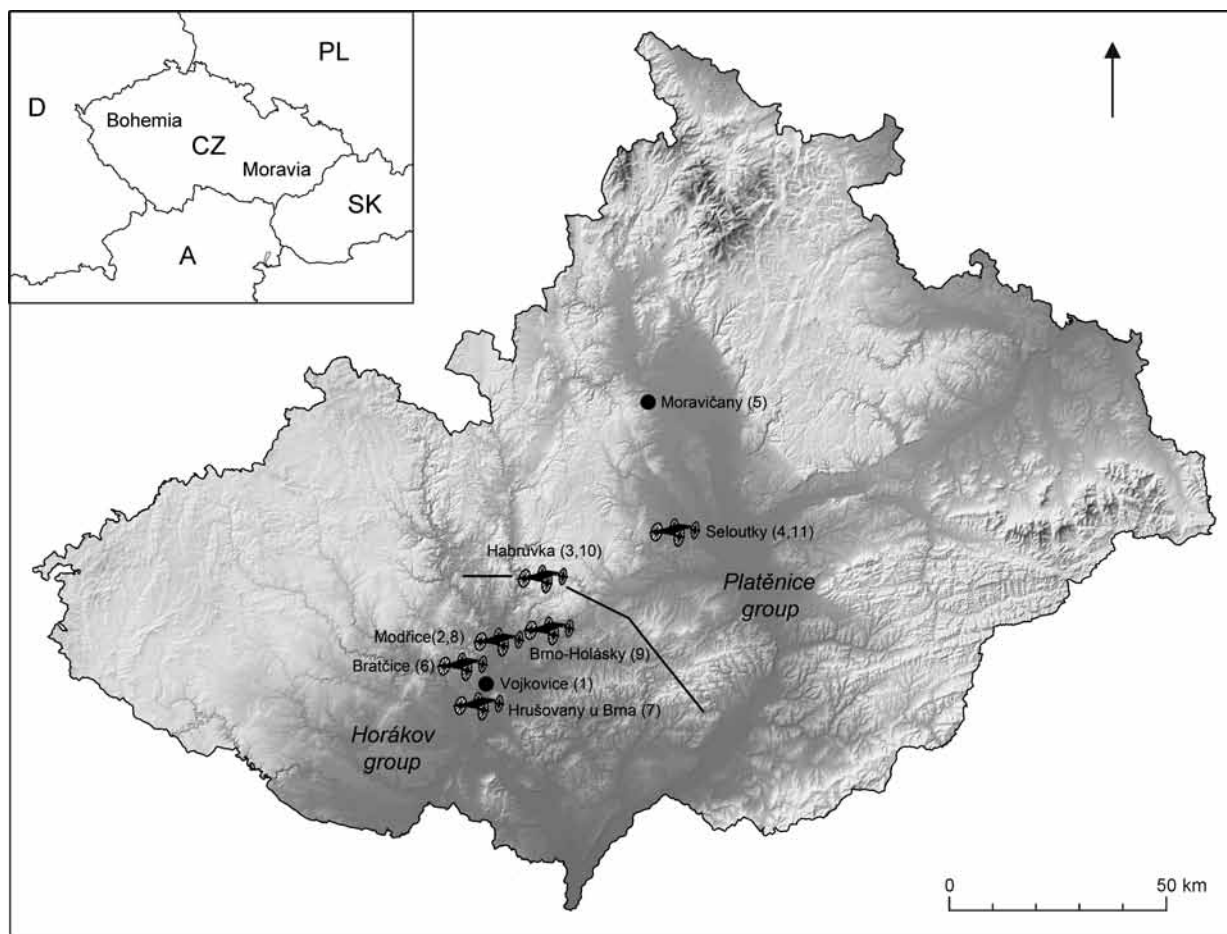


Fig. 1. Burial grounds of the Horákov and Platěnice group (Ha C1–Ha D1) and the former Horákov and Platěnice group in the Late Hallstatt period (Ha D2–Ha D3) in Moravia: 1 – Vojkovice, Vojkovické nivy; 2 – Modřice, Rybníky and Sádky; 3 – Habrůvka, Býčí skála (burial ground in a cave sanctuary); 4 – Seloutky, Na Šťastných; 5 – Moravičany, Dilečky. Graves with four-wheeled wagons of the Horákov and Platěnice group (Ha C2–Ha D1) and the former Horákov group in the Late Hallstatt period (Ha D2–Ha D3) in Moravia: 6 – Bratčice, Mělčanská, grave H1; 7 – Hrušovany u Brna, U Tří mostů, grave H1; 8 – Modřice, Rybníky, grave H3515; 9 – Brno-Holásky, U Tuřan, graves H1 and H2; 10 – Habrůvka, Býčí skála, wagons V1–V6; 11 – Seloutky, Na Šťastných, grave H2/1926.

SELOUTKY BURIAL GROUND

In 2020 a new burial site was published – Seloutky, Na Šťastných, Prostějov District (Golec/Fojtík 2020). It offers a significant set of information on the chronology of the Platěnice group in Moravia (Fig. 1). While a much larger amount of information on graves was known from the more southerly situated Horákov group (Fig. 1), we have so far lacked such a representative site from the Platěnice group that offers possibility for correlation with neighbouring regions.

The burial ground of Seloutky, Na Šťastných (Fig. 1: 4), was excavated in two periods – in 1923, 1926, 1932, 1934, and after a long pause, in 2012, 2017, 2019, and 2020, with modern documentation methods (Golec/Fojtík 2020). Between 1923 and 1934, 26 graves were investigated, at least three of which are chamber graves (H2/1926, H24/1934, H26/1934). Many graves from 1923–1934 cannot be analysed in detail due to lacking documentation. Grave H2/1926, as it will be discussed below, proved to be crucial as containing parts of a burnt four-wheeled wagon (Fig. 1: 11). Renewed rescue excavation at the new house parcels in 2012 revealed 11 graves, of which four were chamber graves (H1/2012 Kašina; H6/2012, H8/2012, H10/2012). In 2017, additional ten graves were researched, of which four were chamber graves (H1/2017–H4/2017; 1 grave H11/2017 unexcavated). The last graves were discovered in 2019, namely two chamber graves (H1/2019–H2/2019), and in 2020 – three graves, of which one was a chamber grave

(H3/2020). Between 1923 and 2020 in Seloutky, Na Šťastných, were researched 53 graves and cremation ground near H20/1932 grave. 15 of them were chamber graves, in total 28.3% of all graves, others were classified as pit graves or small pit graves. Combining the anthropological and archaeological methods it could have been proved that female graves occur in larger number than male graves (ratio 7:1), for chamber graves the ratio of female to male graves is 3:1. Two chamber graves can belong to both sexes. All graves were cremation burials that is typical attribute for the Platěnice group in Central Moravia. All chamber graves had wooden log construction and were lined on the sides and on the ceiling with stones.

In 2020, 125 graves (and burials in the tomb of the cave sanctuary Habrůvka, Býčí skála) were chronologically classified using the metal and glass inventories from the Horákov and Platěnice group in Moravia (*Golec/Fojtík 2020, 220*). Graves with metal and glass inventory from Seloutky, Na Šťastných, belong to two phases: Ha C2 – Seloutky, ‘hrob bez kontextu’ (grave without context), H24/1934, H4/2012 and H10/2012, respectively Ha C2b – Seloutky H2/1926, H4/2017, and H2/2019; Ha D1 – Seloutky H1/2012 Kašina, H8/2012, H3/2017, and H1/2019; the cremation ground near H20/1932 is assigned to the Ha D1–Ha D2 (*Golec/Fojtík 2020, fig. 68*). Grave H3/2020 was the last grave at the site researched; it falls into the Ha D1 phase and was not included in mentioned monograph (and is not yet published). Thus, in total, at the burial site with 53 excavated graves, we can classify 12 graves (that is 1/4 of the graves) and one grave without context into the range of one phase or subphase. At the same time, it is about 1/10 of all dated graves of the Horákov and Platěnice group (Ha C1 – Ha D1) and the former Horákov and Platěnice group in the Ha D2–Ha D3 phase, when we no longer distinguish local groups due to the absence of different elements on the ceramics in the whole territory of Moravia. The contribution of the burial ground Seloutky, Na Šťastných, to the chronology of the Moravian Hallstatt period is obvious. It has potential especially for the correlation with the north lying regions (Poland). Whole Platěnice group in Moravia formally represents the southern edge of the older Lusatian culture (style), but it is fully transforming at this time under a new and progressive Hallstatt style.

SELECTED MORAVIAN BURIAL GROUNDS

The basis for the chronology of the Moravian Hallstatt period are burial grounds with more phases. Five sites offer the greatest potential (Fig. 1; Table 1). Two of them are located in the Horákov (and former Horákov) group in South Moravia – Vojkovice, Vojkovické nivy (Fig. 1: 1; Table 1: 1), and Modřice, Rybníky and Sádky (Fig. 1: 2; Table 1: 2); two are located in the Platěnice (and former Platěnice) group in Central Moravia – Seloutky, Na Šťastných (Fig. 1: 4; Table 1: 3), and Moravičany, Dílečky (Fig. 1: 5; Table 1: 4). A unique cave burial ground Habrůvka, Býčí skála (Fig. 1: 3; Table 1: 5), on the border of South and Central Moravia belongs to both areas as a central site.

Table 1. Overview of selected burial grounds forming the basic dataset for the chronology of the Hallstatt period in Moravia (after *Golec/Fojtík 2020, fig. 68*).

Site and position	Total graves	Total dated graves by metal and glass	Elite graves	Wagon graves	Chronology of site
1. Vojkovice, Vojkovické nivy	23	11	1	0	Ha C(1)2–Ha D2a
2. Modřice, Rybníky and Sádky	100	17	3	1	Ha C1b–Ha D1 (D2?)
3. Seloutky, Na Šťastných	53	12	1	1	Ha C2–Ha D2
4. Moravičany, Dílečky	330	17	0	0	Ha C(1)2–Ha D3
5. Habrůvka, Býčí skála	min. 40 (burials)	min. 12 (burials)	min. 12 (burials)	6 (burials)	Ha D1b–Ha D3

Burial ground Vojkovice, Vojkovické nivy, Brno-venkov District, was researched in 1994. It was chronologically evaluated in an unpublished Ph.D. thesis in 2005 (*Golec 2005, 141–267*). The largest burial ground of the Horákov group – Modřice, Sádky and Rybníky, Brno-venkov District, was researched in 1995, 1997, 2003–2009 and 2015 (*Kos 2015, 4; Kos et al. 2022a, fig. 1*). The chronology of

Modřice sites has been summarised (Kos 2022a, fig. 101) and discussed and correlated in Table 3. As already mentioned, the burial ground Seloutky, Na Šťastných, Prostějov District, researched in 1923, 1926, 1932, 1934, 2012, 2017 and 2019–2020, has been published with a chronology (Golec/Fojtík 2020, fig. 68). The largest Platěnice burial ground Moravičany, Dílečky, Šumperk District, was researched in 1953–1968. A catalogue of inventories, but not plans of graves, was published in 1982 (Nekvasil 1982). The site became the subject of an unpublished Ph.D. thesis by E. Makarová, who, however, did not present the overall chronology of the site (Makarová 2017). The central cave site with a higher number of elite burials is Býčí skála in Habrůvka, Blansko District. The site was investigated already in 1872. A catalogue of the finds and a detailed chronology was published in 1995 (Parzinger/Nekvasil/Barth 1995). New evaluation of the four-wheeled wagons from the site enabled determination of their number (wagons V1–V6) and chronology (Mírová 2019, 88–96, fig. 67). The chronological position of the site was presented recently (Golec/Mírová 2020).

All five above mentioned sites have been presented in the chronological model for Moravia together with other graves and hoards of the Platěnice group (Golec/Fojtík 2020, fig. 68).

WAGON GRAVES AND BURIALS IN MORAVIA

The evidence of Hallstatt period graves with wagons in Moravia is of relatively recent date. As late as 2008, two chambered graves with traces of wagon wheel troughs were found at two sites – at Hrušovany u Brna, U Tří mostů, grave H1 (Fig. 1: 7; Table 2: 2; Kos 2011, 173, fig. 1), and at Modřice, Rybníky, grave H3815 (Fig. 1: 8; Table 2: 3; Kos 2014, fig. 81; 2015, 49–58; Kos *et al.* 2022a, 60–67, fig. 72–75, 79, 94: 1; 2022b, table 171–178; Mírová 2019, 74, fig. 67). It should be noted, however, that these tracks, i.e. the wheel depressions of a four-wheeled all-wood wagon, were first interpreted only as *pars pro toto* and not as an real wagon. However, this interpretation has since been abandoned, not least because of the presence of similar wheel troughs from wagon-like sites from, for example, Bohemia, Eastern France or Bavaria (cf. e.g. Lambot 2018, fig. 15; 81; 84; 88; 107; 108; 217; 324; 341; 395; 453; Pare 1992, fig. 157; 186; 212; Soudská 1994, fig. G4). For a definitive classification of graves with wagons, it is necessary to combine the inclusion of parts from the wagon, if available, and also the usually attached various horse harness.

The grave from Hrušovany u Brna, U Tří mostů, grave H1 (Fig. 1: 7; Table 2: 2) contained, besides the wagon, a yoke richly decorated with studs, nails, rivets and sheets (altogether almost 2000 pieces) with fastening by four toggles of the Lhotka type (KNE 05c after Trachsel 2004; M YT3 after Mírová 2019). Other parts of the harness are two twisted Brno-Holásky type bits (MST 09a after Trachsel 2004; M BB6 after Mírová 2019) and one piece of the Kameniec type bit (MST 09x after Trachsel 2004; M BB7 after Mírová 2019). One piece of the bit was equipped with the Schöngesing type side hook (ZHK 03a after Trachsel 2004; M BH1 after Mírová 2019) and two pieces of a tutuli-like knob with eight eyelets on the sides of the Gendorf type (TUT 01b after Trachsel 2004; M BDk6 after Mírová 2019). Based on the wagon, yoke and horse harness, the grave can be conclusively dated to Ha C2b.

A similar case is the grave from Modřice, Rybníky, grave H3815 (Fig. 1: 8; Table 1: 2; 2: 3). Here, only the troughs of the wheels are preserved from the all-wooden wagon, and two regularly spaced lacing rings are located along the yoke. From the harnesses we can classify two pieces of the Brno-Holásky type twisted bits (MST 09a after Trachsel 2004; M BB6 after Mírová 2019), hemispherical knobs of the Beratzhausen type (KNO 01d after Trachsel 2004; M BDk7 after Mírová 2019), drag decoration of the Lhotka type (RFK 05b after Trachsel 2004; M BDd10a–b after Mírová 2019), arched drag decoration with crossed ribbons of the Mitterkirchen type (KNO 03d after Trachsel 2004; M BDd11 after Mírová 2019). Based on these components, the grave can be safely dated to Ha C2a.

Two more wagons were evidenced by the 2018 revision at the site researched in 1925 in Brno-Holásky, U Tuřan, graves H1 and H2 (Fig. 1: 9; Table 3: 4; Mírová 2019, 74, fig. 67; Mírová/Golec 2018). In both of them, apart from the relics of a four-wheeled wagon – fragments of Brno-Holásky type tyre rim fittings (M WT1 after Mírová 2019), iron nails, decorated nave cap of the wheel hub, and fragments of a yoke (wooden and leather parts), Annelöv type toggle (KNE 05b after Trachsel 2004; M YT2 after Mírová 2019), numerous parts of horse harnesses were found – e.g. twisted bits of the Brno-Holásky type (MST 09a after Trachsel 2004; M BB6 after Mírová 2019), tutuli-like knobs of the Morašice type (TUT 02c after Trachsel 2004; M BDk5 after Mírová 2019), hemispherical knobs of the Beratzhausen type (KNO 01d after Trachsel

Table 2. Overview of graves and burials with wagons in the Hallstatt period in Moravia (after *Mírová 2019*, fig. 67). H ('hrob') – grave; V ('vůz') – wagon.

Site	Total graves	Wagon graves	Dating of wagon graves
1. Bratčice, Mělčanská, grave H1	1	1	Ha D1a
2. Hrušovany u Brna, U Tří mostů, grave H1	2	1	Ha C2b
3. Modřice, Rybníky, grave H3815	100	1	Ha C2a
4. Brno-Holásky, U Tuřan, graves H1 and H2	4	2	Ha C2a
5. Seloutky, Na Šťastných, grave H2/1926	53	1	Ha C2b
6. Habrůvka, Býčí skála, wagons/burials V1–V6	min. 40	6	V1 and V5 – Ha D1b–Ha D2a; V2 and V4 – Ha D2; V3 – Ha D2b; V6 – Ha D3

2004; M BDK7 after *Mírová 2019*), tutuli-like drags of the Buchheim type (RFK 07 after *Trachsel 2004*; M BDd5 after *Mírová 2019*), open tutuli-like drag decorations with five thorns of the Niederfellabrunn type (RFK 08 after *Trachsel 2004*; M BDd6 after *Mírová 2019*) or cross drag decorations of the Pullach type (KZR 02 after *Trachsel 2004*; M BDd12 after *Mírová 2019*) and the Legrad type (KZR 03 after *Trachsel 2004*; M BDd13 after *Mírová 2019*). Both graves can thus be dated identically to Ha C2a.

Another wagon has been identified by revision in the chamber grave H1 in Bratčice, Mělčanská (Fig. 1: 6; Table 2: 1; *Mírová 2019*, 74, fig. 67). Only two reparation elements have been preserved from the wagon – the clamps of the Bratčice type wheel felloes (M WCL1; *Mírová 2019*, 82, pl. 24: 15, 16). The grave is dated on the basis of other inventory items – e.g. four pieces of toreutics, an iron twisted spit and an iron belt with clamps and rings (see *Golec/Mírová 2020*, fig. 4) to Ha D1a.

All of the above pieces of wagons belong to the Horákov group.

A significant surprise was the discovery of a wagon in the cremation grave H2/1926 of the Platěnice group in Seloutky, Na Šťastných (Fig. 1: 11; Table 2: 5; *Mírová 2019*, 74, fig. 67). Only by a lucky coincidence (the whole cremation was never deposited in the urn graves of the Platěnice group, only the absolute – rather symbolic – minimum), small fragments of the Brno-Holásky (M WT1 wheel rim fittings after *Mírová 2019*), wheel nails and 1 Seloutky-type wheel linchpin (M WL1 after *Mírová 2019*) were recovered from the cremation and placed in the grave. This is the first wagon from the Hallstatt period in Moravia discovered in a cremation grave. A similar one is known from Bohemia only from Praha-Bubeneč, U Modré růže, grave H3, but there the cremation was deposited on a complete unburnt wagon (Table 3; *Koutecký 1968*, 422), the same case was e.g. in Bavaria in Leipheim, Waldteil Justing-West, T14 (*Pare 1992*, 301), or in Western Hungary in Somlóvásárhely, T1 (Table 4; *Trachsel 2004*, 423). The dating of the grave H2/1926 from Seloutky, Na Šťastných, to Ha C2b is supported not only by the horse harnesses – the younger smooth bits of the Grosseibstadt type (MST 12b after *Trachsel 2004*; M BB8 after *Mírová 2019*), the side hook of the Mokrá-Horákov type (M BH2), the hemispherical knobs of the Beratzhausen type (KNO 01d after *Trachsel 2004*; M BDK7 after *Mírová 2019*), and drag decoration with a surface and hemispherical protrusion of the Solany type (RFK 10c after *Trachsel 2004*; M BDd7 after *Mírová 2019*) – but also by other inventory (in particular a male iron belt with clamps and rings; see *Golec/Fojtík 2020*, fig. 44).

The situation with the wagons from the cave of Habrůvka, Býčí skála (Fig. 1: 10; Table 2: 6), was quite complicated. The wagon was known here since the discovery of the site in 1872, but the evaluation is of much younger date and a larger number of wagons was proved. F. E. Barth presented extensive catalogue of the wagon parts; he managed to associate the parts of three different wheels with three different wagons and managed to assign a body to one of them (*Barth 1987; 1995*), but he did not perform typological-chronological analysis. Ch. Pare detected five different wagon types (*Pare 1992*). Finally, M. *Trachsel (2004)* described ten wagon 'units', however, he didn't set a final number of wagons. New revision was performed in 2019 (*Mírová 2019*, 88–96), concerning also parts of wagons from Moravian Museum in Brno and parts of wagon bodies and construction elements. New chronological-typological evaluation of all pieces that could be related to the wagon were arranged (*Mírová 2019*, fig. 26). Then, with clearly defined methodology (1. chronological-typological evaluation; 2. typological and chronological contem-

Table 3. Chronologically classified selected burial grounds, graves with wagons or chronology systems of selected sites from Moravia (dated by metal or glass items) and Bohemia. Graves with wagons are marked in bold; T – tumulus; H ('hrob') – grave; V ('vůz') – wagon.

Phase		Moravia (East Hallstatt culture)						Bohemia (West Hallstatt culture)				
		Seloutky, Na Stastných	Moravičany, Dlečky	Vojkovice, Vojkovické nivy	Modřice, Sádky and Rybníky	Habrůvka, Byčí skála	Other wagon graves	Lovosice, Aoyama	Hradenín	Other wagon graves	Dolní Břežany, Závist	Manětín-Hrádek
Ha C1a			graves (dated by ceramics?)	H93, H124 (dated by ceramics)				Lovosice I (H1/2002, H28A/2002)		Rovná u Strakonice T1 burial 1 (826–778 BC)		
Ha C1b								Lovosice II (H16/2002, H19/2002)	H24	H1		
Ha C2 (a and b)	Hwithout context, H26/1934, H4/2012, H10/2012	H21, H103, H220, H966, H1023, H1099, H1128, H1167	H22, H25, H62, H67, H109	H3846	H3815	H2/1997, H3814	Brno-Holásky H1 and H2	Lovosice III (H17/2002, H18/2002, H24/2002, H26/2002, H27/2002, H32/2002)	H18, H30, H33, H46, H58	Nehvizdky H1, Ohrada u Kolína	Dýšina T2, Miškovice	I
Ha D1 (a and b)	H1/2012 Kašina, H8/2012, H3/2017, H8/2017, H1/2019, H3/2020	H31, H1119, H1145	H4, H60, H110	H1801–1803, H1862, H1864–1865, H2891	H1865		Bratčice	Lovosice IV (H28B/2002, H23/2002)	H5	H28		II
Ha D2 (a and b)	cremation ground by H20/1932		H117	graves (dated by ceramics?)	BS1 (burial 1–2, 5, wagons V1, V5)	(burial 3–4, wagons V2, V4)						III
		H1154	BS2 (wagon V3)									
Ha D3		H1247			BS3 (wagon V6)					Hanov T1/1895, Kladruby, Praha-Bubeneč H3, Rovná u Strakonice T1 burial 2	horizon 2	
LT A										Hořovičky, Lučice, Manětín-Hrádek H196, Mírkovice T9, Skalce nad Lužnicí T1, Sedlec-Hůrka, Želkovice	horizon 3 and 4	IV

poraneity parts; 3. minimal number of various parts; 4. style similarity), final number of wagons was set up (Mírová 2019, fig. 27). In total, seven contexts of wagons from Habrůvka, Býčí skála, were described. Six contexts show the physical existence of six various wagons, seventh context (V7) is constituted by unrecognized semi-finished products for the production of sheet metal parts of the body of the wagon, which demonstrates the existence of a wagon production workshop. Their dating is following: wagons Habrůvka, Býčí skála, V1 and V5, are dated to Ha D1b–Ha D2a, just as the semi-finished product from Habrůvka, Býčí skála, V7. The wagons Habrůvka, Býčí skála, V2 and V4, fall into Ha D2, the wagon Habrůvka, Býčí skála, V3, to Ha D2b, the wagon Habrůvka, Býčí skála, V6, is then the latest appearance of the wagon – it belongs to Ha D3. Most of the analogies (and closest analogies) for these wagons can be found in Baden-Württemberg (see following chapter). Dating of these wagons is supported by other harness components: yoke pendant of the Woskowice type (M YP1 after Mírová 2019), flat phalerae of the Opařany type (FAL 16b after Trachsel 2004; M BDf10 after Mírová 2019); phalerae of the Obernricht type (FAL 17b after Trachsel 2004; M BDf11 after Mírová 2019), and stepped phalera of the Niederrieden type (FAL 17d after Trachsel 2004; M BDf12 after Mírová 2019). Their dating well suits into Ha D1b–Ha D3, same as the wagons dating. It is thus most likely that these were burial wagons; after all, all analogous wagons have only been found in grave contexts; moreover, the finder H. Wankel describes a human burial/skeletal parts at wagon V1 (see Mírová 2019, 93, 96).

Today we know six sites in Moravia with a total number of 12 wagons (parts of wagons from hoards are not included). The wagons are a key source for understanding the chronology, as they are in fact one artefact as such, but composed of many different parts. Wagon parts are often supplemented by yoke and harness components, not to mention that wagons are always found in the graves of the elites; i.e. they are intertwined with other black and often chronologically significant objects. The wagons themselves, however, especially in Ha D, are never quite identical. Each region combines local, typical elements, probably based on a tradition of wagons modifications from the Late and Final Bronze Age, and then components that are found across the whole of the Hallstatt area. They are also the largest and most luxurious objects ever made in European prehistory, thus, the modifications to suit the owner's wishes are quite likely. They can therefore be compared across vast European regions, even though the most luxurious ones cannot be expected to be absolutely identical (see the case of the Habrůvka, Býčí skála, wagons). Moravia is similar to other regions in this point of view, but it is quite exceptional within the East Hallstatt culture, both in having the highest number of fully metal-plated wagons and in having their closest analogies in the Baden-Württemberg.

WAGON GRAVES IN BOHEMIA AND OTHER REGIONS

The wagon is the best chronological source of data for several reasons. As it is an elite object deposited in grave, the rapid turnover of elite modes allows for relatively detailed and precise correlation across regions (Mírová 2019; Pare 1992). Moreover, it is an object composed of several types of items (e.g. wheel tyres, fittings of the wheel naves and sockets, wagon body decorations), and the combination of these elements further allows for precise dating – it is not a 'single object' in the strict sense of the word, but a combination of individual parts (it has recently been experimentally verified that the most elaborate, fully plated wagons carry up to 1000 parts). Graves with wagons are always associated with other horse harnesses and elite objects (toreutics, weapons, gold, glass and amber, etc.), so dating can be further correlated and refined. Thanks to their chronological potential, the wagon graves allow us to synchronise the Moravian region with the surrounding regions; as mentioned above, priority is given to the analogies from the Western direction, i.e. Bohemia, Bavaria, Western Austria, Baden-Württemberg and Eastern France. Then it is the Southern direction along the Amber Route, i.e. Eastern Austria, Western Slovakia and Western Hungary; Slovenia is only marginally mentioned for the scope of the paper. Here, however, graves with wagons are hardly to be found. A comparative source of data are graves with horse harnesses, which correlate and modify the chronology. Western Slovakia and Poland either do not offer wagons or horse harnesses (probably because of the existence of all-wood wagons; in Northern Poland we find pictures of wagons on ceramics) or only exceptionally, and the chronology must be based on another source of data. It is also necessary to note that, as in the past in the case of the wagons of the Horákov group, in the Bylany culture (group of West Hallstatt culture) some graves with linchpins were considered to be only wagons *pars pro toto*. This discourse is no longer held by most scholars (e.g. Pare 1992, 122).

Western direction

Bohemia

Many graves with wagons come from this territory (Table 3). The richest site in Central Bohemia (Bylany culture) with this type of graves is Hradenín burial ground (*Dvořák 1934–1935; 1936–1938; 1938; Koutecký 1968; Pare 1992, 321–329, pl. 108B–114; Trachsel 2004, 391–393*). 64 graves were excavated, 43 published (at least partially). For chronological correlation, units with closer dating and parts of wagons and harnesses that have a narrower dating frame are selected. Chronological sequence of the Hradenín burial ground lies between Ha C1b–Ha D1. There are 9 wagon graves chronologically listed below, which is a unique situation in Hallstatt period Europe (see Table 3).

We consider the oldest grave with a wagon to be the grave Hradenín H24 (*Dvořák 1936–1938, fig. 9, 11; 12; 13: 4–6; 14; 15: 1, 2; 1938, fig. 24; 25: 4–6; 26; Pare 1992, 323, 324, pl. 109; Trachsel 2004, 392*). On the basis of the parts of the wagon, yoke and horse harnesses, metal parts of wagons – nave fittings of the Dietfurt type (NBH 02b) and Tanheim type (NBR 01b), tyres of Lhotka type (RDR 02a), yoke decorations of the Maisach type (JOCH 02) and (JOCH 03) metal strips (*Blehbänder*; all after *Trachsel 2004*), harnesses – bits of the Miškovice type (MST 12a after *Trachsel 2004*) or maybe more-likely Brno-Holásky type (M MB6 after *Mírová 2019*), cheek-pieces of the Beilngries type (TKN 07d), side hook Lovosice type (ZHK 03b), and decorations of the Solniki type (GRZ 03), Lhotka type (KNE 05c; after *Trachsel 2004*; M YT3 after *Mírová 2019*), Estorf type (KNO 01b), Dýšina type (KNO 02b), Aubstadt type (KNO 19), Buchheim type (RFK 07 after *Trachsel 2004*; M BDd5 after *Mírová 2019*), Hradenín type (RFK 10a) – D. Koutecký dates it to the middle period (i.e. Ha C1b), M. Trachsel to Ha C1 spät (i.e. Ha C1b). Although most of the items have a longer time span, the wagon can be safely classified to Ha C1b (Table 3).

The presence of a wagon in grave Hradenín H1 (*Dvořák 1934–1935, fig. 2; pl. 1*) is indicated by the presence of wooden boards from the wagon body, parts of wagons and harnesses. Its dating is more problematic, as the horse harness components are very archaic – knobs and cheek-pieces of the bit are dated to Ha C1 – Challans type (KNO 03a), Bács-Bodrog type (KNO11a), Maxlan type (TKN 07e), Obernricht type (KNO11b after *Trachsel 2004*; M BDk11 after *Mírová 2019*) and a knife with a protruded handle reminiscent of the Late Bronze Age tradition (?), other inventory suggests more Ha C2 – iron bits of the Brno-Holásky type (M MB6 after *Mírová 2019*), iron sword of the Mindelheim type, ending of the sword sheath of the Oberwaldbehrungen type (after *Gerdson 1986*). Metal parts of the wagon are not available, so we suggest for the time being the dating according to D. Koutecký (1968) to Ha C1b–Ha C2, slightly shifted from M. Trachsel's dating to Ha C1 früh (did not consider other inventory; Table 3).

Younger graves can be dated to Ha C2. Graves Hradenín H18, H30, H33, H46 and H58 also belong to this group. Grave Hradenín H46 (*Dvořák 1938, 39–48, fig. 41–46; Pare 1992, 326–328, pl. 112B–114A*) bears most of the convincing parts of the wagon belonging mostly to Ha C2, such as naves fittings of Marbach type (FBS 01c), Dietfurt type (FBS 03a), Deising type (FBS 05b), Dietfurt type (NBH 02b), Dittenheim type (NBR 01c), Marbach type (NBS 03), tyres of the Niederhofen type (RDR 03b). Part of the wagon, harness and yoke bears the dating Ha C1b–Ha C2 – linchpin of Kolín type (RVS 01), yoke decorations of Maisach type (JOCH 02c), bridle bits of Miškovice type (MST 12a), cheek-pieces and side hooks of Beilngries type, Lovosice type (ZHK 03b), harness decorations of Illerberg type (GRZ 01), Solniki type (GRZ 03), Aubstadt type (KNO 19), Lhotka type (KNE 05c; all after *Trachsel 2004*; M YT3 after *Mírová 2019*), or pure Ha C2 – Lipno type (KNO 06d) and Hradenín type (RFK 10). D. Koutecký dates this grave to his middle period, M. Trachsel to Ha C2 mitte and we can agree with their dating to Ha C2 (Table 3). Another grave is Hradenín H18 (*Dvořák 1934–1935, fig. 1; 5; Pare 1992, 322, 323, pl. 108C*), which can be dated by parts of the wagon – linchpin of the Kolín type (RVS 01), bridle bit of Miškovice type (MST 12a) –, and harness decoration of Deising type (KNO 09a; all types after *Trachsel 2004*). The grave is dated both by D. Koutecký (1968) and M. Trachsel (2004) to Ha C2; authors of this article agree with their dating (Table 3). The dating of the grave Hradenín H30 (*Koutecký 1968, 414, 407, fig. 2b; Trachsel 2004, 393*) is questionable (and therefore tentative) according to parts of the wagon – linchpin of the Kolín type (RVS 01) –, and horse harnesses – tutuli-like drags of the Buchheim type (after *Trachsel 2004*; M BDd5 after *Mírová 2019*), and two bridle bits and toggle. Most of the inventory falls to Ha C2 and not younger (Table 3). Same is valid for the grave Hradenín H33 (*Koutecký 1968, 415, 409, fig. 2d*). It consists of the parts of the wagon – linchpin of the Kolín type (RVS 01) –, and horse harnesses (unknown toggle), but regarding the presence of toggle, it should be no younger than Ha C2 (Table 3). Latest wagon is Hradenín H58 (*Koutecký 1968, 416, 419, fig. 10*) safely dated to Ha C2, according to parts of the wagon and yoke – linchpin of the Kolín type (RVS 01), pendants of the yoke of Budyně type (RVT 02) and Hradenín type (RVT 03) and harness – bridle

bits of Miškovice type (MST 12a). This grave is dated to the middle period after *D. Koutecký* (1968) and Ha C2 früh (Ha C2a) according to *M. Trachsel* (2004). Authors agree with this dating to Ha C2 (Table 3).

The youngest graves with wagons are Hradenín H5 and H28. Hradenín H28 (*Dvořák* 1936–1938, fig. 20–22; 1938, fig. 34, 36–38, 40; *Pare* 1992, 324–326, pl. 110–111A) carries parts of wagon and harnesses occurring within a longer time span – tyres of the Haidensbuch type (RDR 03c), linchpins of the Kolín type (RVS 01), wagon perch of the Geislingen type (WUB 02), bits of the Deising type (MST 12c), side hook of the Lovosice type (ZHK 03b), decoration of the Deising type (KNO 09a). However, it is the advanced components of the wagons – nave fittings of Hradenín type (FBS 04a), Marinville type (NBH 06a), Nymburk type (NBR 02f), Nymburk type (NBS 05b), Hochmichele type (NBV 01b), wagon body fittings of Uffing type (WKB 13b), decorative nails of Plattenhardt type (ZNG 03b) –, and harnesses – phalerae of the Strettweg type (FAL 16a) and Ludwigsburg type (FAL 1c) that are decisive, dated verifiably only to Ha D1b (all types and dating after *Trachsel* 2004). We agree with the dating of *M. Trachsel* to Ha D1 (thus he dates harness to Ha C2 and wagon to Ha D; Table 3). Another grave dated to Ha D1 is Hradenín H5 (*Dvořák* 1934–1935, fig. 2; pl. 2), consisting of wooden parts of the wagon body and metal parts. The wagon does not offer the elements for finer dating – linchpins of the Kolín type (RVS 01), however, the horse harness in correlation with Moravia shows younger elements – smooth bits of the Grosseibstadt type (MST 12b after *Trachsel* 2004; M BB8 after *Mírová* 2019); Deising type (KNO 09a after *Trachsel* 2004). *M. Trachsel* (2004) dates it to Ha C2 mitte to spät (i.e. Ha C2b), *D. Koutecký* (1968) to Ha C1b–Ha C2. The authors do not consider this dating correct and lean towards the younger dating to Ha D1, Ha D1b in the case of H28 (Table 3).

Second most important burial ground in Central Bohemia is Lovosice, Ayoama (*Půlpán* 2012). Most of the graves' datation is based on the jewelry (bracelets, pins) or horse harnesses. Moreover we register three graves with wagons – H17/2012 (*Půlpán* 2012, pl. 11–14); H18/2012 (*Půlpán* 2012, pl. 15–20) and H32/2012 (*Půlpán* 2012, pl. 42–47). They are all dated to Ha C2 (Table 3), based on wagon parts – linchpins of the Kolín type (RVS 01) –, and harnesses – bits of the Kameniec type (MST 09x after *Trachsel* 2004; M BB7 after *Mírová* 2019) and Miškovice type (MST 12a after *Trachsel* 2004), side hooks of the Schöngesing (HK03a after *Trachsel* 2004 and M BH1 after *Mírová* 2019), decorative knobs of the Emmerting type (KNO 06e) and Rvenice type (KNO 06f after *Trachsel* 2004).

Outside these extensively studied burial grounds, we record graves from smaller burial sites, mounds or solitary graves. The oldest of them is Rovná u Strakonice T1 burial 1 (*Chytráček* 2021) dating back to Ha C1a. Although the parts of the four-wheeled wagon would rather correspond to the earliest Ha C1b – it can be well correlated e.g. with Hradenín H24, which bears identical linchpins of the Kolín type (RVS 01), nave fittings of the Dietfurt type (NBH 02b) and Tanheim type (NBR 01b after *Trachsel* 2004) – this dating was absolutely established from the bones of the burial to 826–778 calBC (Table 3).

Two graves from other sites can be dated to Ha C2a – Dýšina T2 (*Pare* 1992, 321, pl. 108A; *Šaldová* 1968, fig. 23; 24) and Miškovice (*Pare* 1992, 330, 331, pl. 119B). Dýšina T2 dating is based on the wagon – nave fittings of the Lhotka type (NBH 03), yoke decorations of Maisach type (JOCH 02c), toggles of the Lhotka type (KNE 05c after *Trachsel* 2004; M YT3 after *Mírová* 2019) –, and horse harnesses parts – cheek-pieces of the Süttö (TKN 09a), phalerae of the Stična type (FAL 10b), knobs of Illerberg type (GRZ 01), Pullach type (GRZ 02), knobs of the Beratzhausen type (KNO 01d after *Trachsel* 2004; M BDk7 after *Mírová* 2019), Aubstadt type (KNO 19), Lhotka type (RFK 05b after *Trachsel* 2004; M BDd10a–b after *Mírová* 2019). Its dating points to Ha C2a (Table 3; also thanks to bronze plate-like vessel and sword of the Mindleheim type), but delicate glass rings and other vessels maybe also to Ha D1. It is not certain, whether this grave doesn't include two burials and need to be revised once. The dating of the grave from Miškovice is based on harness parts – bits of the Miškovice type (MST 12a), decorations of Grosseibstadt (KNO 01c) and Aubstadt type (RFK 10b) – that correspond to *Trachsel's* dating to Ha C2 (C2a) früh after *Trachsel* 2004 (Table 3).

Two graves, based on their inventory, can be dated to whole Ha C2 (Table 3). First is the grave from Nehvizdky H1 (*Koutecký/Špaček* 1982, fig. 5; 8–12), consisting of wagon parts – linchpin of Kolín type (RVS 01) –, and harness parts – smooth bits of the Grosseibstadt type (MST 12b after *Trachsel* 2004; M BB8 after *Mírová* 2019), cheek pieces of the Süttö type (TKN 09a), decorations of Emmerting type (KNO 06e) and Aubstadt type (RFK 10b). Second grave comes from Ohrada u Kolína (*Dvořák* 1938, 49; *Pare* 1992, 333, pl. 119C) with wagon parts – linchpin of the Kolín type (RVS 01), yoke – pendants of the yoke of Budyně type (RVT 02) and Hradenín type (RVT 03) –, and harness of Aubstadt type (KNO 19).

To the younger phase – Ha C2b, we can date four graves (Table 3) – Dolany (*Pare* 1992, 321, pl. 107A), Poláky H21 (*Pare* 1992, 334, pl. 122A), Praha-Vinoř (*Fridrichová et al.* 2020) and Straškov-Račíněves (*Dvořák* 1938, 14–16, fig. 14–18; *Pare* 1992, 336, 337, pl. 125–126A). These graves include parts of the wagon – nave

fitting of Albertshofen type (FBS 03b), linchpins of Kolín type (RVS 01), tyres of Leipheim type (RDR 04a) or Poláky type (RDR 04b), clamps of the Lisbühl type (FBS 01a) and Straškov type (FBS 05d), yoke – pendants of the yoke of Budyně type (RVT 02) –, and parts of the horse harnesses – bits of Bošovice type (MST 07b after *Trachsel* 2004, M BB5 after *Mírová* 2019), Brno-Holásky type bits (MST 09a after *Trachsel* 2004; M BB6 after *Mírová* 2019) and unknown twisted type (MST 12x), cheek-pieces of Rappenau type (KNE 03) and Plaňany type (KNE 05 after *Trachsel* 2004, M YT1 after *Mírová* 2019), side hooks of the Lovosice type (ZHK 03b), decorations of Lipno type (KNO 06d), Emerting type (KNO 06e), Lhotka type (RFK 05b after *Trachsel* 2004; M BDd10a–b after *Mírová* 2019), Rvenice type (KNO 06f), Buchheim type (RFK 07), Aubstadt type (RFK 10b), Solany type (RFK 10c after *Trachsel* 2004; M BDd7 after *Mírová* 2019).

A chronologically transitional type of grave with a wagon is represented by the site Švihov-Červené Poříčí (*Chytráček* 1988; *Pare* 1992, 337, 338, pl. 126B). It is dated to Ha C2b–Ha D1a based on the parts of the wagon – tyres of Poláky type (RDR 04b) or Sulz type (RDR 05a), nave fittings of Lhotka type (NBH 03) or Marbach type (NBH 04) or Geisslingen type (NBH 05; Table 3).

Younger graves with wagons dated purely to Ha D1 (Table 3) come from Nymburk-Habeš (*Pare* 1992, 332, 333, pl. 120) and Opařany T2 (*Michálek* 2017a, 284–287; 2017b, pl. 207–213). Nymburk-Habeš grave includes wagons parts – nave fittings of Marinville type (NBH 06a), Nymburk type (NBR 02f), Nymburk type (NBS 05b), Sulz type (NBV 01a), tyres of Nymburk type (RDR 05b), linchpin of Kolín type (RVS 01m), decorative nails of the Plattenhardt type (ZNG 03) –, and harness parts – bits of the Untereggersberg (MST 13) and Britzgyberg type (KNO 07b). Opařany T2 grave contains decorative nails of the Plattenhardt type (ZNG 03b) and flat phalerae of the Opařany type (FAL 16b after *Trachsel* 2004; M Bdf10 after *Mírová* 2019).

In the Late Hallstatt and Early La Tène periods, a centre developed in Bohemia with a hillfort of the Fürstensitz type at Dolní Břežany, Závist (also Závist u Prahy). An acropolis was explored on its summit. Four chronological horizons (1–4) were defined for the site: horizon 1 = Ha D2–Ha D3; horizon 2 = Ha D2–Ha D3/Lt A; horizon 3 = Lt A; horizon 4 = Lt A/Lt B1 (Table 3; *Drda/Rybová* 2008, 58–67). Near the second central site from Bohemia – Fürstensitz type at Žlutice, Vladař, lies the Manětín-Hrádek burial ground chronologically divided into phases I–V, which corresponds to Ha C2–Lt A: phase I = Ha C2; phase II = Ha D1; phase III = Ha D2; phase IVA–C = Ha D3/Lt A (with wagon grave H196); phase V = Lt A (Table 3; *Soudská* 1994, 38–40).

There are four wagons from Bohemia dated to Ha D3, no wagons from Ha D2 yet. The first of them is a grave from Praha-Bubeneč H3 (*Pare* 1992, 334, 335, pl. 122B–124A) dated on the basis of the parts of the wagons – nave fittings of Kiclingen type (NBB 04), Reppendorf type (NBK 04g), Reppendorf type (NBS 07c), construction elements of the Bubeneč type (WUB 08b; all after *Trachsel* 2004), tyres of the Bubeneč type (RDR 07d after *Trachsel* 2004; M WT4 after *Mírová* 2019) – without doubts to Ha D3 (Table 3). Another grave with wagon is Hanov T1/1895 (*Michálek* 2017a, 99–103; 2017b, pl. 43–45), which can be dated with the help of wagon parts – nave caps of the Blatec type (NBS 09 after *Trachsel* 2004; M WN2 after *Mírová* 2019), tyres of the Bubeneč type (RDR 07d after *Trachsel* 2004; M WT4 after *Mírová* 2019) – to Ha D3 (Table 3). The grave with wagon from Kladruby (*Drda/Rybová* 1998, 36, 37; *Pare* 1992, 329, pl. 115–116A) was originally dated by *M. Trachsel* (2004) to Lt A, but concerning the wagon and horse harnesses parts – nave fitting of the Vix type (NBK 04e), nave cap of the Blatec type (NBS 09), tyres of Grandvillars type (RDR 07), bit of the Kladruby type (MST 15c), phalerae of Most na Soči type (FAL 16c), knob of Kladruby type (KNO 16a; all after *Trachsel* 2004) –, we can safely rank it in Ha D3 (Table 3). Latest is the burial with two-wheeled wagon in Rovná u Strakonice burial 2 (*Chytráček* 2021, with argumentation). Significant wagon parts are nave caps of the Blatec type (NBS 09 after *Trachsel* 2004; M WN2 after *Mírová* 2019), balustrade columns of the wagon body with an antler collet of the Rovná type (M WB9), antler plates of the wagon body of the Rovná type (M WB10 after *Mírová* 2019). Tyres doesn't correspond to any known type because of its width. According to another inventory, we can assign it safely to Ha D3 (Table 3).

In Lt A we find a large number of graves with already two-wheeled wagons especially in the area of the former Hallstatt Tumulus culture in Southern and Western Bohemia. These wagons are identified mainly through the presence of the two-wheeled wagon itself, by the parts of the wagons – nave cap of the Sillery type (AKP 04b), nave fittings of Chouilly type (NBR 01f), Hundheim type (NBR 01g), tyres of Weilerbach type (RDR 09a), Offaing type (RDR 10a), construction elements of Mirkovice type (WUB 06a), Hillesheim type (WUB 06c), Kobern type (WUB 06d), Gransdorf type (WUB 07a) –, harness parts – bridle bits of Hořovičky type (MST 16a), Sedlec type (MST 16b) and Beine type (MST 16c), cheek-pieces of Křinec type (TKN 14a), Donauwörth type (TKN 15a), Berru type (TKN 15b) –, and decorations – phalerae of the Želkovice type (MST 18), or Sefferweich type (FAL 20c) – are dominant, knobs of the Bechyně type

(KNO 12g; all after *Trachsel* 2004) appear. In the graves there is additional inventory such as beaked jugs or Early La Tène cleavers. These include Hořovičky (*Drda/Rybová* 1998, 50–52), Lučice (*Chytráček* 1999, 368, 369, fig. 10), Manětín-Hrádek H196 (*Soudská* 1994, 198, 199, fig. B30), Mírkovice T9 (*Chytráček* 1990, 87–97, fig. 12–16), Skalice nad Lužnicí T1 (*Michálek* 2017a, 384–387; 2017b, pl. 297–309), Sedlec-Hůrka (*Drda/Rybová* 1998, 39, 40) or Želkovice (*Chytráček* 1999, 367, fig. 8) sites (see Table 3).

Bavaria

Bavaria offers probably the highest concentration of wagon graves among European regions. The oldest grave with wagon, Wehringen, Hexenberg, T8 (Table 4; *Hennig* 2001, 259–268, pl. 102–114), can be dated to Ha C1a, based on obtained dendrochronological date 783–773 BC. This grave contains parts of the wagon and harness which can be dated at the turn of Ha B3 and Ha C1a – nave fittings of Bad Homburg type (NBH 01), wagon body fittings of Bad Homburg type (WKB 01), Lusehøj type (WKB 02), Beratzhausen type (WKB 03b), construction elements of Nächstebach type (WUB 01; after *Trachsel* 2004).

Three sites offer younger dating to Ha C1b (*Trachsel's* Ha C1 mitte–spät) – Beratzhausen T3 (Table 4; *Pare* 1992, 281, pl. 63), Großebstadt I/1 (Table 4; *Kossack* 1970, 45–61, pl. 29–44) and Olching-Neu Esting (Table 4; *Pare* 1992, 306–308, pl. 86B). This dating is based on wagon parts – nave fittings of Beratzhausen type (NBR 01a), Tanheim type (NBR 01b), Dietfurt type (NBH 02b), Beratzhausen type (NBS 01), Gündlingen type (NBS 02), Grosseibstadt type (NBK 01), clamps of Albertshofen type (FBS 03b), Grosseibstadt type (FBS 01b), Straškov type (FBS 05d), tyres of Somlóvásárhely type (RDR 01), Lhotka type (RDR 02a), wagon body of Beratzhausen type (WKB 03b), Lengenfeld type (WKB 03d), Hossingen type (WKB 06b), decorative nails of Moritzbrunn type (ZNG 01) and Beratzhausen type (ZNG 02) –, yoke – toggles of Grosseibstadt type (KNE 02b) –, and horse harness – bits of Bošovice type (MST 07b after *Trachsel* 2004; M BB5 after *Mírová* 2019), decorations of Illerberg type (GRZ 01), Dinnyés type (FAL 12c), Triglitz type (FAL 13), Beratzhausen type (KNO 01d after *Trachsel* 2004; M BDk7 after *Mírová* 2019), Aubstadt type (KNO 19), Lhotka type (RFK 05b after *Trachsel* 2004; M BDd10a–b after *Mírová* 2019) and Retz type (TUT 02b).

Three graves can be dated to the turn of Ha C1b and Ha C2a, which may bear older types of wagons and harnesses, but their dating is supported, for example, by the presence of advanced toreutics – Adeschlag, Moritzbrunn (Table 4; *Kossack* 1954, 153, fig. 26D), Lupburg T1 (Table 4; *Pare* 1992, 302, 303, pl. 83B–84A) and Wehringen, Hungerbrunnenmähder, T1 (Table 4; *Hennig* 2001, 269–271, pl. 115: 4–17; 116; 117). Dating is based on wagon parts – naves of Mitterkirchen type (NBR 02a), tyres of Somlóvásárhely type (RDR 01), Lhotka type (RDR 02a), linchpins of Gottesberg type (RVS 02), wagon body of Lengenfeld type (WKB 03d), Hossingen type (WKB 06b), decorative nails of Moritzbrunn type (ZNG 01) –, yoke – toggles of Annelöv type (KNE 05b) –, horse harness parts – bits of Beilngries type (MST 11), decorations of Dinnyés type (FAL 12c), Triglitz type (FAL 13), Illerberg type (GRZ 01), Mitterkirchen type (KNO 01a), Estorf type (KNO 01b), Beratzhausen type (KNO 01d after *Trachsel* 2004; M BDk7 after *Mírová* 2019), Lhotka type (RFK 05b after *Trachsel* 2004; M BDd10a–b after *Mírová* 2019).

The subsequent phase Ha C2a is represented only by one grave with wagon from Schmidmühlen (Table 4; *Pare* 1992, 311, pl. 89A). This grave bears wagon elements – tyres of the Lhotka type (RDR 02a), linchpin of the Gottesberg type (RVS 02) –, yoke – pendant of the yoke of the Budyně type (RVT 02), toggle of the Lhotka type (KNE 05c; all after *Trachsel* 2004; M YT3 after *Mírová* 2019) –, and horse harness – bits of the Beilngries type (MST 11), decorations of Beratzhausen type (KNO 01d after *Trachsel* 2004; M BDk7 after *Mírová* 2019). Grave from Ehingen T104 (Table 4; *Pare* 1992, 288, pl. 71A) is then dated to the following Ha C2b. The dating is based on the components of the wagon – nave of Geisslingen type (NBH 05), Geisslingen type (NBK 02b), Dittenheim type (NBR 01c), Taxham type (NBS 04), clamps of Albertshofen type (FBS 03b), tyres of Niederhofen type (RDR 03b), wagons body of Aislingen type (WKB 13a) –, and harness – bit of the type MST 12x, decorations of the Sesto Calende type (RVT 04; all after *Trachsel* 2004).

Solely to Ha C2 can be dated three wagon graves – Dietfurt G87 (Table 4; *Pare* 1992, 281–284, pl. 64–67 – marked incorrectly as G31), Großebstadt I/4 (Table 4; *Kossack* 1970, 75–84, pl. 59–67) and II/14 (Table 4; *Pare* 1992, 292–294, fig. 188; pl. 47B; *Wamser* 1981).

Their dating is again based on the parts of the wagon – naves of Dietfurt type (NBH 02b), Tanheim type (NBR 01b), Lhotka type (NBR 01e), Breitenbrunn type (NBR 02b), Grosseibstadt type (NBK 01), clamps of Dietfurt type (FBS 03a), tyres of Marbach type (RDR 02b) –, yoke – toggles of Grosseibstadt type (KNE 02b) –, and harness – bits of Grosseibstadt type (MST 12b after *Trachsel* 2004; M BB8 after *Mírová* 2019) and Miškovice type (MST 12a), side hooks of Lovosice type (ZHK 03b), decorations of Grosseibstadt (KNO 01c), Mesteri type (KNO 06g), Aubstadt type (KNO 19), Buchheim type (RFK 07 after *Trachsel* 2004; M BDd5 after *Mírová* 2019) and Grosseibstadt type (RFK 10d).

Only to Ha D1 is dated the grave with the wagon from Riedenheim burial 1 (Table 4; *Wamser 1980*, 122–127, fig. 28–31), based on the parts of the wagon – spoke fittings of the Ins type (SPB 03) and/or Vilsingen type (SBP 04). We date two wagon graves from Uffing T1 (Table 4; *Pare 1992*, 311, 312, pl. 90A) and T6 (Table 4; *Pare 1992*, 312, 313, pl. 90C–91) to Ha D1b according to wagon parts – nave fittings of Hügelsheim type (NBB 01), Mauenheim type (NBB 02), Winterlingen type (NBH 06b), Nymburk type (NBR 02f), Hügelsheim type (NBR 02g), Kappel type (NBK 03), Nymburk Type (NBS 05b), Vilsingen type (NBS 06), tyres of Nymburk type (RDR 05b), Vilsingen type (NBV 02), wagon body of Uffing type (WKB 13b), decorative nails of Quinçai type (ZNG 06), construction elements of Sternberg type (WUB 08a) –, and harness – decorations of the Hügelsheim type (KNO 12e; all after *Trachsel 2004*).

Phase Ha D2 is again represented by three graves with wagons – Augsburg, Wellenburg, T1 (Table 4; *Hennig 2001*, 235–240, pl. 76–82), Donnauwörth, Riegelholz, T10 burial 2 (Table 4; *Hennig 2001*, 195–197, pl. 40–44) and Starnberg-Mühlthal T1 (Table 4; *Pare 1992*, 311, pl. 89B). They include parts of wagons – naves of Wellenburg type (AKP 02a), Wellenburg type (NBB 03), Rumpenheim type (NBH 07), Wellenburg type (NBS 07b), Mühlthal type (NBS 08b), Ludwigsburg type (NBZ), spokes of Nürtingen type (SPB 05), Wellenburg type (FBS 05c), drawbar clamps of Wellenburg type (DEI 01), tyres of Wellenburg type (RDR 07b), Bubeneč type (RDR 07d), wagon body of Wellenburg type (WKB 05a), Donnauwörth type (WKB 05b), Allenlüften type (WKB 11), Hochdorf type (WKB 16a) –, and harnesses – cheek-pieces of Heuneburg type (TKN 11c), decorations of Obernricht type (FAL 17b after *Trachsel 2004*; M Bdf11 after *Mírová 2019*), Wellenburg type (KNO 06h). Many of these parts can be found in Czechia in Habrůvka, Býčí skála cave.

Transitional phase Ha D2b/Ha D3 represents grave from Niederrieden (Table 4; *Pare 1992*, 306, pl. 86A), with wagon parts – naves of Bad Cannstatt type (NBH 08), drawbar clamps of Wellenburg type (DEI 01) –, and harnesses parts – decorations of Niederrieden type (FAL 17d after *Trachsel 2004*; M Bdf12 after *Mírová 2019*), Kicligen type (KNO 06k).

Ha D3 phase represents five wagon graves – Demmelsdorf burial 2 (Table 4; *Schußmann 2019*, 204, 205, fig. 268; 269), Dillingen T9 (Table 4; *Pare 1992*, 284, 285, pl. 68A), Hilpoltstein-Weinsfeld T4 G5 (*Pare 1992*, 296, 297, pl. 76–77A), Leinach-Oberleinach (*Pare 1992*, 301, pl. 78) and Kitzingen-Reppendorf (Table 4; *Pare 1992*, 298–300, fig. 191; 192; pl. 79B–82). We find advanced wagon parts – naves of Kicligen type (NBB 04), Kicligen type (NBH 09), Reppendorf type (NBK 04f), Reppendorf type (NBS 07c), clamps of Witry type (FBS 05a), tyres of Wellenburg type (RDR 07b), Bubeneč type (RDR 07d), Grandvillars type (RDR 07e), wagon body of Cannstatt type (WKB 12), Vix type (WKB 17) –, and harnesses – hooks of Bannwil type (HKN 04), decorations of Niederrieden type (FAL 17d after *Trachsel 2004*; M Bdf12 after *Mírová 2019*), Wellenburg type (KNO 06h), Kicligen type (KNO 06k), Talhau type (KNO 09b). These wagon parts are also most common analogies to the wagons from the Habrůvka, Býčí skála cave.

Baden-Württemberg

From this region, we also know many wagon graves. Oldest can be dated to Ha C1b – Unlingen T3 (Table 4; *Hansen/Meyer/Tarpini 2018*), according to parts of the wagon body of the Hossingen type (WKB 06b). We also know one grave from Ha C2 from Köngen (Table 4; *Echinger 2017*), bearing parts of the wagon – nave fittings of Mitterkirchen type (NBR 02a), clamps of Lisbühl type (FBS 01a), tyres of Lengenfeld type (RDR 03a), wagon body of Lengenfeld type (WKB 03d), Hossingen type (WKB 06b) –, and harnesses – bits of the Bošovice type (MST 07b after *Trachsel 2004*, M BB5 after *Mírová 2019*), drags of the Lhotka type (RFK 05b after *Trachsel 2004*; M BDd10a–b after *Mírová 2019*).

Phase Ha D1 represents graves without wagon, but with dendrodates captures Bettelbühl T4 – 583 BC (Table 4; *Krausse/Ebiger-Rist 2018*) and Magdalenenberg bei Villingen, central grave – 616 BC (Table 4; *Koch 2017*, 40). Two graves can be safely classified – Kappel am Rhein T3 (Table 4; *Dehn/Egg/Lehnert 2005*) generally to Ha D, with wagon – naves of Cordast type (AKP 01), Hügelsheim type (NBB 01), Kappel type (NBK 03), Vilsingen type (NBS 06), Vilsingen type (NBV 02), clamps of Hradenín type (FBS 04a), tyres of Nymburk type (RDR 05b), decorative nails of Quinçai type (ZNG 06) –, and harness parts – bits of Obernricht (MST 14) and decorations of Sesto Calende type (RVT 04). Both wagon graves from Altheim-Heiligkreutzthal, Hochmichele, central grave (Table 4; *Kurz/Shiek 2002*, 77, fig. 13: 1–3) and GVI (*Kurz/Shiek 2002*, 80, fig. 13: 4) belong to younger Ha D1b phase, containing wagon parts – naves of Mauenheim type (NBB 02), Winterlingen type (NBH 06b) or Rumpenheim type (NBH 07), Mauenheim type (NBS 08a), Rumpenheim type (NBK 04a), Hochmichele type (NBV 01), Vilsingen type NBV 02, tyres of Wellenburg type (RDR 07b), wagon body of Hügelsheim (WKB 04a), Wellenburg type (WKB 05a), construction elements of Sternberg (WUB 08a) –, and harness – cheek-pieces of Hochmichele type (TKN 11b), hooks of Hochmichele type (HKN 02), decorations of Wellenburg type (KNO 06h), Hochmichele type (KNO 11c), Kappel type (RVT 06; all after *Trachsel 2004*) parts.

To the whole Ha D2 belong two graves from Herberlingen-Hundersingen, Gießhübel-Talhau, T1 central grave and G1 (Table 4; *Kurz/Shiek* 2002, 94–100, fig. 25; pl. 9–15) and T4 central grave (Table 4; *Kurz/Shiek* 2002, 116–121, fig. 44; 45; pl. 29–32). Both are dated by the following components: wagon parts – naves of Wellenburg type (AKP 02a), spoke fittings of Ludwigsburg type (SPB 08b), tyres of Bubeneč type (RDR 07d), drawbar clamps of Wellenburg type (DEI 01), construction elements of Bubeneč type (WUB 08b) –, and harnesses – cheek-pieces of Heuneburg type (TKN 11c), hooks of Hassle type (HKN 03), decorations of Heuneburg type (ANH 02), Talhau type (KNO 09b), Hochmichele type (KNO 11c), La Butte type (KNO 06i) and Simmrigen type (RVT 07 D2). Younger Ha D2b phase represents only the wagon grave from Eberdingen-Hochdorf (Table 4; *Koch* 2006). Its dating is based on the components of the wagon – naves of Ludwigsburg type (AKP 02b), Wellenburg type (NBB 03), Rumpenheim type (NBH 07), Uttendorf type (NBK 04b), Rumpenheim type (NBS 07a), Quinçai type (NBV 03), Apremont type (NBZ 02), clamps of Witry type (FBS 05a), spoke fittings of Apremont type (SPB 06), Hochdorf type (SPB 08a), tyres of Rumpenheim type (RDR 07c), drawbar clamps of Wellenburg type (DEI 01), wagon body of Wellenburg type (WKB 05a), Dotternhausen (WKB 10), Allenlüften type (WKB 11), Hochdorf type (WKB 16a) –, and harness – cheek-pieces of Heuneburg type (TKN 11c), hooks of Hochmichele type (HKN 02), Hassle type (HKN 03), decorations of Heuneburg type (ANH 02), La Butte type (KNO 06i), Simmrigen type (RVT 07; all after *Trachsel* 2004). It is the most accurate analogy to the wagon Habrůvka, Býčí skála, V3 (*Mírová* 2019).

Important wagon grave from Stuttgart-Bad Cannstatt (Table 4; *Pare* 1992, 268, 269, pl. 48) can be dated to the range Ha D2b–Ha D3, according to wagon parts – naves of Niederweiler type (AKP 02c), Wellenburg type (NBB 03), Bad Cannstatt type (NBH 08), Bad Cannstatt type (NBK 04c), Wellenburg type (NBS 07b), Ludwigsburg type (NBZ 01), clamps of Witry type (FBS 05a), tyres of Wellenburg type (RDR 07b), wagon body of Cannstatt type (WKB 12), Cannstatt type (WKB 15b), construction elements of Bubeneč type (WUB 08b) –, and harness – bits of Niederambach type (MST 15b), cheek-pieces of Bad Cannstatt type (TKN 12), hooks of Bannwil type (HKN 04), decorations of Wellenburg type (KNO 06h). Latest grave with wagon from this region is Asperg, Grafenbühl (Table 4; *Pare* 1992, 244, pl. 30–31A) dated solely in Ha D3, with the wagon components – naves of Vix type (AKP 02d), Wellenburg type (NBB 03), Bad Cannstatt type (NBH 08), Grafenbühl type (NBK 04d), Urtenen type (NBS 08c), Ludwigsburg type (NBZ 01), tyres – of Urtenen type (RDR 08), wagon body of Vix type (WKB 17), decorative nails of Bell type (ZNG 07; all after *Trachsel* 2004).

Eastern France

Graves with wagons with additional dating support come from Eastern France as far back as Ha C2. As an example we present site (former Blotzheim, Lisbühl) Saint-Louis-la-Chaussée (Table 4; *Pare* 1992, 222, 223, pl. 8B–9A), with wagon parts – naves of Mitterkirchen type (NBR 02a), clamps of Lisbühl type (FBS 01a), wagon body of Lengenfeld type (WKB 03d), Hossingen type (WKB 06b) –, and harness components – bits of Kameniec type (MST 09x after *Trachsel* 2004; M BB7 after *Mírová* 2019), decorations of Illerberg type (GRZ 01), Estorf type (KNO 01b), Lhotka type (RFK 05b after *Trachsel* 2004; M BDd10a–b after *Mírová* 2019). Wagon and harness are dated to Ha C2, but there is also a fibula from Ha D, which can indicate an additional burial.

Other graves with wagons are known only from Ha D2 – Apremont, Tumulus de la Motte, T1 (Table 4; *Pare* 1992, 220–222, pl. 6B) and T2 (Table 4; *Pare* 1992, 222, pl. 7; 8A), Saint Colombe, Tumulus de la Butte (Table 4; *Pare* 1992, 228, 229, pl. 16). Their dating is based on the wagon components – naves of Ludwigsburg type (AKP 02b), Niederweiler type (AKP 02c), Bad Cannstatt type (NBH 08), Uttendorf type (NBK 04b), Cannstatt type (NBK 04c), Wellenburg type (NBS 07b), Quinçai type (NBS 08e), Ludwigsburg type (NBZ 01), Apremont type (NBZ 02), spoke fittings of Apremont type (SPB 06), La Butte type (SPB 07), tyres of Wellenburg type (RDR 07b), Rumpenheim type (RDR 07c), drawbar clamps of Wellenburg type (DEI 01), wagon body of Apremont type (WKB 04b), Wellenburg type (WKB 05a), Allenlüften type (WKB 11), La Butte type (WKB 15a), Cannstatt type (WKB 15b), Hochdorf type (WKB 16a), construction elements of Wellenburg type (WUB 5a) –, and harness parts – bits of Niederambach type (MST 15b), cheek-pieces of Hochmichele type (TKN 11b), decorations of Ludwigsburg type (FAL 17c) and La Butte type (KNO 06i) again.

Most of the graves from Eastern France can be dated to Ha D3. Here are named some of them: Diarville T7 G1 (Table 4; *Egg/Lehnert* 2000), Grandvillars (Table 4; *Pare* 1992, 224, 225, pl. 9B), Hatten (Table 4; *Pare* 1992, 225, 226, pl. 10D), Saint Colombe, Tumulus de la Garenne (Table 4; *Pare* 1992, 229, 230, pl. 17; 18) and Vix (Table 4; *Egg/France-Lanord* 1987). The dating of these graves is again based on wagon – naves of

Ludwigsburg type (AKP 02b), Vix type (AKP 02d), Wellenburg type (NBB 03), Kiclingen type (NBB 04), Vix type (NBK 04e), Reppendorf type (NBK 04f), Veuxhaulles type (NBS 07d), Saraz type (NBS 08d), Kocanda type (NBS 09), Grandvillars type (NBV 05), Ludwigsburg type (NBZ 01), clamps of Bell type (FBS 05e), tyres of Bubeneč type (RDR 07d), Grandvillars type (RDR 07e), wagon body of La Garenne type (WKB 16b), Vix type (WKB 17), decorative nails of Bell type (ZNG 07), construction elements of Grandvillars type (WUB 04a), La Garenne type (WUB 04b), Dürdingen type (WUB 04c), Mirkovice type (WUB 6a) –, and harness parts – decorations of Most na Soči type (FAL 16c; all after *Trachsel 2004*). Graves from Ha D2–Ha D3 make chronological support to the wagons from Habrůvka, Býčí skála, as well.

Western Austria

A chronologically significant group of wagons is found in Upper Austria in the Salzach and Mattig river basins. It is noteworthy that these are graves with wagons and burnt individuals. We date the grave from Salzburg-Taxham to Ha D1a (Table 4; *Stöllner 1996*, 223–225, pl. 152B–154A). M. Trachsel dates it to Ha C2b on the basis of the wagons – naves of Geisslingen type (NBH 05 and NBK 02b), Taxham type (NBR 02c and NBS 04), tyres of Haidensbuch type (RDR 03c). However, harnesses – bits of the Untereggersberg (MST 13), cheek-pieces of the Sesto Calende type (TKN 09b), dagger, T-form belt buckle – support rather younger dating to Ha D1a. We agree with M. Trachsel's dating of other three wagons. Schalchen-Unterlochen T2 (Table 4; *Stöllner 1996*, 64, 65, pl. 31B) is dated to Ha D1b thanks to the wagon parts – naves of Rumpenheim type (NBK 04a), Vilsingen type (NBV 02), tyres of Nürtingen type (RDR 07a). A single wagon belongs to Ha D2 – Schalchen-Unterlochen T5 (Table 4; *Stöllner 1996*, 64–66, pl. 32–34A) according to the wagon – naves of Wellenburg type (NBB 03), Uttendorf type (NBK 04b), Rumpenheim type (NBH 07), Wellenburg type (NBS 07b), Nürtingen type (NBV 04), Ludwigsburg type (NBZ 01), tyres of Wellenburg type (RDR 07b), construction elements of Bubeneč type (WUB 08b) –, and harness components – bits of Uttendorf type (MST 15a), cheek-piece of Hochmichele type (TKN 11b), decorations of Ludwigsburg type (FAL 17c), Wellenburg type (KNO 06h) and Uttendorf type (KNO 12f). A grave with a wagon from Lengau T2 (Table 4; *Stöllner 1996*, 35–38, pl. 15E–17A) can be seen as the youngest, Ha D3, depending on the wagon parts dating – naves of Kiclingen type (NBH 09), Reppendorf type (NBK 04f), tyres of Bubeneč type (RDR 07d; all after *Trachsel 2004*). This region is important for correlation to Habrůvka, Býčí skála, in Moravia.

Southern direction

Eastern Austria

There are rarely graves with wagons in Lower Austria. The two oldest graves with wagons (Ha C1b–Ha C2) are found at the sites Gemeinlebarn T1 and Mitterkirchen T10 G1, but due to incomplete publication we only mention them as published by e.g. M. Trachsel (Table 4; *Trachsel 2004*, 347).

Significant is the chronology of the central site Kleinklein in Styria, where four princely graves have been evaluated – Hartnermichelkogel G1 and G2 from Ha C1b, Pommerkogel from Ha C2, and Kröllkogel from Ha D1 (all Table 4; *Egg 2010*, fig. 7; *Egg/Kramer 2013*, table on p. 391; 2016, 203–211, table 3). Table 4 presents the chronology of Slovenia correlated with Kleinklein (Table 4; Ha C1a/Podzemelj 1 = 800–725 BC; Ha C1b/Podzemelj 2 = 725–670 BC; Ha C2/Stična 1 = 670–620 BC; Ha D1a/Stična 2 = 620–580 BC; Ha D1b–Ha D2a/serpentine fibula horizon = 580–540 BC; after the end of Kleinklein Ha D2b–D3/Certosa fibula horizon = 540–450 BC) and chronologically significant graves from the Sulmtal group, Burgenland, Western Hungary, Slovenia, Croatia or Northern Italy are included. A similar chronological evaluation is offered by the Frög site in Carinthia (Table 4; *Ebner-Baur 2020*, fig. 54). Within the Hallstatt period the site is divided into Frög 2–6 (Frög 1 = Ha B2–B3) phases. Correlations have been made to Kleinklein, Slovenia or the Este culture in Northern Italy: Frög 2 = Ha C1a (Podzemelj 1; Este IIB–C; 810/780–730/720 BC); Frög 3 = Ha C1b (Podzemelj 2; Este IIIA; 730/720–680/670 BC); Frög 4 = Ha C2 (Stična 1; Este IIIB; 680/670–610/600 BC); Frög 5 = Ha D1 (Stična 2 = Ha D1a; serpentine fibula horizon = Ha D1b; Este IIIC; 610/600–580/550 BC) a Frög 6 = Ha D2 (Certosa fibula horizon; 580/550–500 BC).

Western Slovakia

The Nové Košariská burial ground is a valuable source for chronology in Western Slovakia. M. Pichlerová divided five mounds into chronological stages: mound II = Ha C1, mounds I and VI = Ha C2, and mounds III and IV = Ha D1 (Table 4; *Pichlerová 1969*, 191). However, we suggest following dating

on the basis of metal finds: mound II = Ha C1, mounds III, IV and VI = Ha C2 (pins with multiple head, Statzendorf type pins, triangular applications) and mound I = Ha D1 (same ordering also suggested by *Stegmann-Rajtár* 1992, 108). The central hillfort of Fürstensitz type – Smolenice, Molpír, in Southwestern Slovakia (Table 4) – is a crucial site, especially considering the absence of burials with metal inventory. The main phase of use of the hillfort belongs to Ha C2–Ha D1a according to S. Stegmann-Rajtár's chronology, which was recently extended to whole Ha D1, with the possibility of existence of a later settlement in Ha D2–Ha D3 (*Stegmann-Rajtár* 2017, table 1). A dendrochronological date from a cistern on the acropolis provided an absolute date of 605–585 BC (*Barta et al.* 2017), suggesting the use of the site in Ha D1b. Former problem with the site's chronology was, however, the inaccurately dated youngest range of navicella fibulae (e.g., the Šmarjeta type, the type with regular transverse bundles of grooves/sheets on the bow, etc.) that circulate throughout the Ha D1 phase, even in the serpentine fibula horizon, i.e. Ha D1b phase (cf. Stična elite female grave 27/mound 48 with serpentine fibulae; *Gabrovec et al.* 2006, table 16; 18: 34–39; *Gabrovec/Teržan et al.* 2008 [2010], 288, fig. 42) both in Slovenia and here. Fragments of serpentine (dragon) fibulae Ha D1b were found in houses number 16 (serpentine fibula VIIb type after *Tecco Hvala* 2014) and 18 (*Dušek/Dušek* 1984, pl. 118: 14; 140: 24). A similar dating of the site to whole Ha D1 was also indicated by six hoards from the acropolis of the hillfort (*Čambal/Makarová* 2020): hoard 1 = Ha C2b–Ha D1a, hoards 2–6 = Ha D1. In our opinion, the external attack on this hillfort evidenced by bronze arrowheads of the Eastern type with an outer socket found on the site can be dated to the subphase Ha D1b, which corresponds to the range 575–550 BC and is identical to a similar attack on the Southern Polish hillfort of Wicina built in 574 BC (see below). Thus, the peak of the existence of Molpír hillfort can be put to Ha D1 and can be correlated with phase IV at Heuneburg hillfort in Baden-Württemberg (see Table 4).

Western Hungary

There is an example of a wagon grave from the Somlóvásárhely TI (Table 4; *Patek* 1993, fig. 54–64) from Western Hungary. M. Egg first dated it to Ha C2 (*Egg* 1996), then reclassified it to Ha C1b (*Egg* 2010, fig. 7). Based on the wagon's components – tyres of the Somlóvásárhely type (RDR 01 after *Trachsel* 2004), probably nave caps of the Brno-Holásky type (M WN1? after *Mírová* 2019) –, and harness parts – Brno-Holásky type bits (MST 09a after *Trachsel* 2004; M BB6 after *Mírová* 2019), decorations of the Niederfellabrunn type (RFK 08 after *Trachsel* 2004; M BDd6 after *Mírová* 2019) and Gendorf type (TUT 01b after *Trachsel* 2004; M BDk6 after *Mírová* 2019) – we can date this grave to Ha C2 (Table 4). The grave synchronises very well with the most distinct wagon horizon in Moravia and Bohemia (cf. Table 3). Another grave with a wagon (?) is recorded from the Györujbarát-Nagybarát TI site (Table 4; *Patek* 1993, fig. 88–92). The wagon is evidenced by probable nave cap of the Brno-Holásky type (M WN1 probably; function yet unclear), parts of the yoke – toggles of Plaňany type (KNE 05 after *Trachsel* 2004; M YT1 after *Mírová* 2019), Annelöv type (KNE 05b after *Trachsel* 2004; M YT2 after *Mírová* 2019) –, and harness parts – bits of the Miškovice type (MST 12a after *Trachsel* 2004), smooth bits of the Grosseibstadt type (MST 12b after *Trachsel* 2004; M BB8 after *Mírová* 2019), cheek-pieces of the Süttö type (TKN 09a), decorations of Mesteri type (KNO 06g) and the Buchheim type (RFK 07 after *Trachsel* 2004; M BDd5 after *Mírová* 2019). The dating to Ha C2 (Table 4) is well supported by belt clamps found at Moravian sites. The last grave with a possible wagon is Vaszar TV (Table 4; *Patek* 1993, fig. 74–76). It consists of wagon parts – probably nave cap of the Brno-Holásky type (M WN1 after *Mírová* 2019) –, and horse harnesses – Brno-Holásky type bits (MST 09a after *Trachsel* 2004; M BB6 after *Mírová* 2019); knobs show to be predecessor of the Niederfallabrunn type. We suggest preliminary dating in Ha C1b–Ha C2a (Table 4).

The newest addition to the Hungarian wagons is the Regöly site – a magnate mound, probably a tomb. Inside were many contexts containing weapons, armour, toreutics, pottery and other objects. However, the authors do not discuss one of the best dating materials, the wagon parts that remained unrecognized. We can safely distinguish one wagon context – for now, we can call it Regöly V1 – located mainly in context RHQ20. Apparently, it was a wagon with a wheel, covered with metal parts – we record central fittings of the wheel naves of the Apremont type (NBZ 02 after *Trachsel* 2004; M WC3 after *Mírová* 2019), fittings of the wheel felloes of the Habrůvka type (M WF1c after *Mírová* 2019), fittings of the central part of the wheel naves of the Bad Cannstatt type (NBH 08 after *Trachsel* 2004; M WNSc1 after *Mírová* 2019), fittings of wheel nave of the Wellenburg type (NBS 07b after *Trachsel* 2004; M WN4 after *Mírová* 2019) and corner metal hemispherical fittings of the body of wagon of the Habrůvka type (M WB 6 after *Mírová* 2019). We also record a large number of wagon tyres from the site, which, however, cannot be safely determined due to the lack of profiles. Most of these wagon parts are securely dated to Ha D2 and have the best analogy in Habrůvka, Býčí skála. The authors date the site to Ha D1–D2 (*Szabó/Fekete* 2024), which is confirmed by the wagon dating (Table 4).

At this point, it is necessary to mention other graves from the territory of present-day Hungary, from its Eastern part. These are specific Vekerzug culture wagons, which of course, together with harnesses, penetrated from Ha D1 into the area of Central Europe and the Balkans. These are for example the Gyöngyös, Miskolc-Diósgyőr and Szentes-Vekerzug graves (Szentes-Vekerzug grave No. 13; *Teleaga 2017*). Wagon parts and horse harnesses are rarely found in hoards, e.g. at the hillfort Dédestapolcsány-Verebcebérc¹ (*Szabó et al. 2022; 2023*).

Outside the Hallstatt territory – Balkan area and Italy

Although the article does not allow to fully discuss the graves with wagons outside the area of the Hallstatt culture, it is nevertheless worth mentioning at this point at least the most characteristic cases connected by other material and offering further dating potential. In the Italian environment, mostly two-wheeled chariots are found. In Northern Italy, for example, a two-wheeled carriage from Sesto Calende, Tomba 2, dated to Ha D1 (*De Marinis 2009*). A two-wheeled chariot dating to Phase 1 (Piceno III final, 625–580 BC; *Bardelli 2022, 341*) comes from the Central Italian site of Sirolo-Numana, Circolo delle Fibule, tomba 7. From the 6th century BC also comes chariot parts from Belmonte Piceno, Tomb 163 (Tomb of the Duce). This is the largest ever collection of two-wheeled chariots from all of Italy. Belmonte Piceno, Malvatani Tomb 17, and Belmonte Piceno, Grave 1/2018, bears the same dating. At least 22 chariots then come from the site (*Weidig 2021; 2024*). For a more detailed study of the two-wheeled chariots see *Woytowitsch 1978* and *Emiliozzi 1997*. However, four-wheeled wagons are also recorded. A grave with a four-wheeled wagon from Como Ca' Morta, newly dated to Ha D3, should be mentioned (*Chaume, in press*). Two graves with wagon and chariot are known from Serbia, from the site of Atenica, Mound 2, contained an older 'Central European type' four-wheeled wagon, earliest from Ha D1b, with a similarly dated horse harness originating from the Vekerzug culture. In Mound 1, dated to 500 BC, a Greek-type chariot with specific wheel decoration was then found (*Dmitrović 2024; Teleaga 2017*).

Northern direction

Southern Poland

Upper and Lower Silesia does not yet yield graves with wagons, therefore for chronology it is necessary to work mainly with chamber graves with other metal and glass inventory, similarly to Moravia (Table 3). The current synchronisation between Moravia and Southern Poland is not complete and the future task is to establish it. The essential task for establishing the chronology for the territory of present-day Poland is to verify the possibility of classification of the burial sites with longer development, embracing also the period of the 'top occurrence of graves' from Ha C2 and Ha D1 phases. In the chronology for Polish territory there are graves dated to the long time span of Ha C–Ha D1 and subsequent phases are supposed to be absent (cf. *Gediga et al. 2020, table 10*). These are burial grounds with newly published catalogues, such as Świbie (Table 4; *Dzięgielewski/Michnik 2022, table 4.1; Michnik 2022*), Kietrz near the Czech border that is dated from Ha C1 to Ha D3 (Table 4; *Gedl 1973; 2004, pl. 107: B–D*), and especially well-documented largest burial site in Southern Poland – Domasław – that again was in use longer, namely from Ha C1 to Lt A (Table 4; *Gediga/Józefowska 2018a; 2018b; 2018c; Józefowska/Kamyszek/Żygadło 2021*). The second task is to verify the synchronisation of Polish data with Reinecke's phases and absolute dating, which is 'delayed' here compared to the neighbouring Czech Republic and other regions. The chronology set up in this way requires detailed revision. The Platěnice group in Moravia, as the Southern part of the disintegrating large Lusatian culture (style group), should play a significant role in the synchronisation.

Considerable potential also lies in hoards of this area. As an example, the Woskowice Małe 1 hoard with cheek-pieces of a horse bit dated to Ha D1 (Table 4; *Gedl 2000, pl. 56B–59A*) has analogies (cheek-pieces TNK 09b of the Sesto Calende type, decorations of the Sesto Calende type RFK 11a and Sesto Calende type KNO 07a; all after *Trachsel 2004*, pendant of the yoke of the Woskowice type M YP1 after *Mírová 2019*) in Northern Italy in the Golasecca culture equipment in the Sesto Calende B wagon grave (*De Marinis 2009*), dated also to Ha D1 (*Egg/Kramer 2016, table 3*). Second important hoard (but maybe also grave, discovered in 1894) is Solniki Małe (Table 4; *Gedl 2000, pl. 54: C; 55: A; 82*) containing tutuli-like

¹ Due to preliminary publication, the material is not precisely dated; however, the horse harness and wagon material points to the broader dating of the site from Ha C2 to Ha D3.

drags of the Buchheim type (RFK 07 after *Trachsel* 2004; M BDd5 after *Mírová* 2019), harness decoration of the Solniki type (GRZ 03 after *Trachsel* 2004) and hemispherical knobs of the Beratzhausen type (KNO 01d after *Trachsel* 2004; M BDk7 after *Mírová* 2019). Dating to Ha C2 is also supported by the presence of ribbed cista with geometrical decoration.

Chronologically significant in Southern Poland is the Wicina hillfort, which provided numerous dendrodates dating its construction to 571 BC (Table 4; *Jaszewska/Kałagate* 2016, 230), which can be correlated with the transition of the Ha D1a and Ha D1b subphases (Table 4). Metal artefacts are dated in Ha D1 or Ha D2 as Eastern type of arrowhaeds, chakans and earrings, fibulae with decorated foot and cross winding (*Jaszewska* 2011, fig. 32: 4, 5; 33: 1–3; 65; 66). More complicated is dating of horse harness (*Jaszewska* 2011, fig. 34; 35: 1, 2, 4, 5; 56; 57: 1–5, 7, 8), because of the presence of archaic-looking parts of the horse harnesses: knobs of the Beratzhausen (KNO 01d after *Trachsel* 2004; M BDk7 after *Mírová* 2019) and Holásky type (M BDk10 after *Mírová* 2019), drag decoration of the Niederfellabrun type (RFK 08 after *Trachsel* 2004; M BDd6 after *Mírová* 2019), Solany type (RFK 10c after *Trachsel* 2004; M BDd7 after *Mírová* 2019) and Mitterkirchen type (KNO 03d after *Trachsel* 2004; M BDd11 after *Mírová* 2019), which can be dated in Central Europe to the Ha C1b–Ha C2 phase, but they also occur in the graves of the Vekerzug culture in Ha D1–Ha D2, eventually Ha D3 (*Kozubová* 2019). However, we can also find precisely dated Central European parts of the horse harnesses: knobs of the La Butte type (KNO 06i after *Trachsel* 2004; M BDd9 after *Mírová* 2019), Uttendorf type (KNO 12f after *Trachsel* 2004), phalera of the Obernrich type (FAL 17b after *Trachsel* 2004; M BDf11 after *Mírová* 2019), hooks of the Salem (HKN 01 after *Trachsel* 2004) and Hochmichele type (HKN 02 after *Trachsel* 2004) and rings of the Kappel type (RNG 03d after *Trachsel* 2004). All can be dated to Ha D1b–Ha D2. This dating confirms the content of one Wicina hoard (found in 1902) containing fibula with decorated foot (Table 4; *Gedl* 2004, pl. 110: C). A voluminous Bieszków hoard was found near the hillfort, which date the youngest objects – e.g. a stepped knobs of the La Butte type and an arched fibula with a cross winding similar to pcs. from Wicina (*Orlicka-Jasnoch* 2013, table 2: 5; 8: 3, photo 21) to Ha D2 (Table 4). A similar date to Wicina hillfort comes from Smolenice, Molpír, hillfort, where the cistern is dated after 585 BC. Both hillforts were attacked by external invaders who used bronze arrows of the eastern type with an outer socket. Both attacks are identically dated to Ha D1b, i.e. 575–550 BC (same dating *Chochorowski/Krapiec* 2020, 1622 – episode 2 dated to years 570–560 BC; *Kozubová/Golec* 2020, 350). Moravia is located between named two regions. The evidence on identical external raid that took place in Ha D1b comes also from the ‘Moravian Molpír’, i.e. from the site Provodov, Rysov, settlement (*Čižmář/Golec Mírová/Golec* 2021, fig. 3).

HALLSTATT PERIOD CHRONOLOGY IN THE CZECH REPUBLIC AND CORRELATION OF WAGON GRAVES

The chronological system of the Hallstatt period in Bohemia was published in 2008 by a team of authors led by N. Venclová (*Venclová et al.* 2008, 26, 27, table 1). A member of this team was D. Koutecký, who earlier dealt with the chronology of chamber graves of the Bylany culture, among which were also graves with wagons, especially from the site in Hradenín (*Koutecký* 1968). Thus, his original division into Ha C1, Ha C2, Ha C3 and Ha D1 phases was ‘converted’ to the current system, introduced in 2008 with Ha C1a, Ha C1b, Ha C2 and Ha D1 phases and subphases (Table 5). For terminological correlation, the subdivision of Ch. Pare of Ha C1 phase into Ha C1a and Ha C1b subphases was introduced in 1998–1999 over a wide range of European regions (Table 5; *Pare* 1998; 1999). Pare’s division of Ha D stage can be found in detail in the study on Hallstatt graves with wagons (*Pare* 1992). Reinecke’s periodization for Bohemia fully coincides with his ‘global’ Hallstatt period division, represented, for example, by H. Hennig’s system for Bavarian Swabia correlated by numerous dendrodates (Table 5; *Hennig* 2001, table 1). From Bohemia and Moravia, we lack such data, yet, and therefore the chronology is based only on a comparative typology correlated with existing systems. This method was used by H. Parzinger, who divided the period 750–370 BC into ten horizons (Table 5), tracing again (as Ch. Pare) over large Central European regions (*Parzinger* 1988, 124, 125). His ten-horizon system essentially tested the possibility of a finer subdivision of the Reinecke phases into shorter subphases. Parzinger’s chronological analyses of the material-rich site Habrůvka, Býčí skála, brought this system into Moravia (*Parzinger* 1995, 179–183, fig. 1). The only category of artefacts that Parzinger did not devote such close attention was four-wheeled wagon. Their analyses were earlier elaborated by F. E. Barth (1987). However, Barth did not deal with chronology in his

Table 5. Reinecke's periodization and absolute dating of the Hallstatt period in Moravia (after *Golec/Fojtík 2020*, fig. 68; *Mírová 2019*, fig. 67) and Bohemia (after *Koutecký 1968*; *Venclová et al. 2008*, table 1) with the correlation of the system of *Ch. Pare* (1992, 136–164; 1998, table 5), *H. Hennig* (2001, table 1), *H. Parzinger* (1988, 124, 125; 1995, fig. 1), and *M. Trachsel* (2004, fig. 84; 165; 179).

BC	<i>Koutecký 1968</i>	<i>Parzinger 1988; 1995</i>	<i>Pare 1992; 1998</i>	<i>Hennig 2001</i>	<i>Trachsel 2004</i>	<i>Venclová et al. 2008</i>	<i>Mírová 2019; Golec/Fojtík 2020</i>
800–780	Ha C1		Ha C1a	Ha C0	Ha C1 früh	Ha C1a	Ha C1a
780–750					Ha C1 mitte		
750–725		1			Ha C1 spät		
725–700	Ha C2		Ha C2 früh	Ha C1b	Ha C1b		
700–675			2			Ha C2 mitte	
675–650	Ha C3	3	HaC2	Ha C2	Ha C2 spät	Ha C2	Ha C2a
650–625		4			Ha D1 früh		Ha C2b
625–600	Ha D1	5	HaD1	Ha D1	Ha D1 mitte + spät	Ha D1	Ha D1a
600–575		6			Ha D2 früh + spät		
575–550					Ha D3 früh		Ha D1b
550–525		7a	Ha D2	Ha D2	Ha D3 mitte + spät	Ha D2	Ha D2a
525–500		7b/c			Ha D2		LT A früh
500–450		8	Ha D3	Ha D3	LT A mitte	Ha D3	Ha D3
450–425		9		LT A	LT A spät	LT A	LT A
425–370		10					

paper. In 1995, his earlier text was reprinted, but remained unedited. In the meantime, however, Ch. Pare significantly advanced the issue of wagons and especially their chronology (*Pare 1992*). Ten years later, the wagons were again taken up as the basic foundation of the chronology by M. Trachsel in 2004, who again worked on a broad European territory (Table 5; *Trachsel 2004*). His chronological conclusions are basically correct, but his division of Reinecke's phases each into three subphases is already too subtle and much more appropriate is division into two subphases. However, T. Stöllner was the first to try to divide the Reinecke's phases into three parts (*Stöllner 1996*). Trachsel's correlation of the absolute data of the Central European chronological system to the Italian region is rather problematic, thereby moving it considerably 'up' one Reinecke phase. Working with Trachsel's chronological groups without back-correlation to absolute dates will pose problems in sorting out the wagon sets (cf. Table 5). It must be said, however, that Trachsel's chronological sequence and general dating basically works well and there is only a shift in dating in some regions within the subphases.

For the chronology of Moravia the wagon graves were recently used by Z. Golec Mírová (Table 5; *Mírová 2019*). The chronological classification of other graves and hoards with metal and glass objects in Moravia, with the incorporation of the chronology of wagons, has been also presented recently (Table 5; *Golec/Fojtík 2020*, fig. 68). The correlation of Moravian chronology with other regions is, due to the absence of dendrodata, so far possible only by the typological method. Moravia takes advantage of its geographic location in the vicinity of the Western Hallstatt culture, making it within the Eastern Hallstatt culture exceptional mainly by the occurrence of the graves with wagons (cf. Table 3; 4). It is therefore a territory suitable for synchronizing two main parts of the Hallstatt culture. It is the Central European chronology created on the base of the components of wagons that may primarily help to divide Reinecke's phases Ha C2, Ha D1 and Ha D2 into subphases.

For the chronological synchronization of Moravia in the Hallstatt period, two directions – Western and Southern – must be followed: the Western direction is represented by the regions of the Western Hallstatt culture – we observe rich connections with Bohemia, Western Austria, Bavaria, Baden-Württemberg and Eastern France. Many of the Moravian analogies lie not in neighbouring, but even in more distant regions; for Ha D stage wagons, especially in Bavaria, Baden-Württemberg and Eastern France (cf. Table 4).

The Southern direction is represented (along the Amber Road) by the regions of the East Hallstatt culture – Eastern Austria, e.g. the Kleinklein site in Styria (cf. Table 4), which connects Moravia with Western Hungary, Slovenia and Northern Italy (Egg/Kramer 2016, table 3). The central site Kleinklein with its princely tombs is the well-known site in the southern part of the East Hallstatt culture and its chronology is broadly reflected. In Moravia, the development of the elites in Ha D was not considered in the past and chronological model was subjected to the ‘decline’ within the East Hallstatt culture in general (cf. Stegmann-Rajtár 1992, fig. 63). Considerable potential for the Central European chronology still holds central tomb of the elites (situated in a cave sanctuary and erroneously assessed by H. Parzinger as a ‘place of sacrifice of the elites’) Habrůvka, Býčí skála, with development in Ha D1b–Ha D3. It coincides with Kleinklein, Kröllkogel, only in the Ha D1 phase, that corresponds to Býčí skála 1 phase (Ha D1b–Ha D2a) phase. While the Styrian centre ends at that time, Habrůvka, Býčí skála, use culminates in Býčí skála 2 (Ha D2b) phase and ends in Býčí skála 3 (Ha D3) phase. In the Southern direction, Moravia, with the absence of younger development in Kleinklein, corresponds only to the development with the appearance of elites in Slovenia, chronologically correlated, for example, with mound 48 in Stična during Ha D stage in horizons of serpentine and Certosa fibulae (Golec/Mírová 2020, 125, fig. 8; 9).

CONCLUSIONS

The chronology of the Hallstatt period in Moravia depends on two groups of dates: 1 – burial grounds with a longer time span of several phases and graves containing numerous metal and glass objects; 2 – graves with four-wheeled wagons (and horse harnesses). Five burial grounds have the greatest potential (Fig. 1): Vojkovice, site Vojkovické nivy, Modřice, site Rybníky and Sádky, Seloutky, site Na Šťastných, Moravičany, site Dílečky, and Habrůvka, site Býčí skála. These burial grounds are further correlated with hoards (Table 1; Golec/Fojtík 2020, fig. 68).

The wagons are the ‘red thread’ of chronology across very distant regions. Their chronological classification depends on many metal parts from wheels and wagon bodies. They are luxury items, they evolve rapidly, they are found in many regions, and graves with wagons often contain other datable material such as yokes, horse harness, toreutics, weapons, and jewelry, further supporting the correlation of chronology. The advantages of this methodology have been observed in the large collections of Ch. Pare (1992), M. Trachsel (2004), and Z. Mírová (2019).

When working with wagon graves, attention must be paid to careful review of especially older data. In the case of significantly different typological objects, there is a risk of unrecognised mixing of subsequent burials in the same grave. The use of an older harness and a younger wagon can also cause problems. The employment of different ways of burial on wagons – skeletal on an unburnt wagon, biritual, cremation on an unburnt wagon and cremation on a burnt wagon – should not surprise us either. All these ways are legitimate and reflect rather regional customs. For Moravia, the classification of wagons was developed recently (Mírová 2019, fig. 67). We recorded six sites with 12 wagons (Table 2).

Graves with wagons from Moravia from Ha C2–Ha D3 correlate typologically very well with the West Hallstatt culture – with Bohemia (Table 3; e.g. Hradenín, Lovosice), but also with more distant regions (Table 4) of Western Austria (e.g. Schalchen-Unterlochen, Lengau), Bavaria (e.g. Wehringen, Großesbald, Augsburg), Baden-Württemberg (e.g. Herbertingen-Hurdensingen, Hochdorf), and Eastern France (e.g. Vix, Apremont). In the East Hallstatt culture, wagon graves are rarely found, and Moravia clearly forms the eastern edge of their extension in Central Europe. Westwards they are found as far as Eastern (and probably Central and Western) France. This fact makes their chronological position significant. Chronological system based on division of wagon components can be well correlated in a southerly direction with the regions of the East Hallstatt culture (Table 4) – with Eastern Austria (e.g. Kleinklein and Frög), which is well linked to Slovenia (e.g. Stična, mound 48) and Northern Italy (Egg/Kramer 2016, table 3). The Moravian chronology can also be linked to Western Slovakia and Western Hungary (Table 4). Data revision will require correlation with Southern Poland and regions of France, or with the regions of the North Atlantic (Belgium, the Netherlands, etc.).

The authors present the current chronological system of Moravia correlated within the Czech Republic and with other systems (Table 5). The wagons and their further inventory allow in some cases to divide Moravian graves into chronological subphases. As shown by grave H2/1926 in Seloutky, Na Šťastných, graves with wagons may not only be found in skeletal graves, but also in cremation graves and even

with burnt wagons. Such cases can also be found in the 'core of Central European hallstattisation', e.g. Schalchen-Unterlochen and Lengau in Western Austria. A review of data in many regions where wagons were not counted at all may thus bring new surprises.

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Chronologie doby halštatské na Moravě

Význam hrobů s vozy pro synchronizaci východo- a západohalštatské kultury

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Souhrn

Chronologie doby halštatské na Moravě je závislá na dvou skupinách dat: 1 – pohřebišťích s delším časovým rozsahem několika fází a hrobech obsahujících četné nálezy kovových a skleněných předmětů; 2 – hrobech se čtyřkolovými vozy (a koňskými postroji). Pět pohřebišť má největší potenciál (obr. 1): Vojkovice, poloha Vojkovické nivy, Modřice, poloha Sádka a Rybníky, Seloutky, poloha Na Šťastných, Moravičany, poloha Dílečky, a Habrůvka, poloha Býčí skála. Tato pohřebišť jsou dále korelována s depoty (tabela 1; Golec/Fojtík 2020, fig. 68).

Vozy jsou „červenou nití“ chronologie napříč velmi vzdálenými regiony. Jejich časové zařazení je závislé na mnoha kovových dílech z kol a koreb. Jsou luxusními předměty, rychle se vyvíjejí, nalezneme je v mnoha regionech a hroby s vozy obsahují často další datovatelný materiál, jako jha, koňský postroj, toreutiku, zbraně a šperky, což dále podporuje korelaci chronologie. Výhody této metodiky sledovali na rozsáhlých souborech Ch. Pare (1992), M. Trachsel (2004) a Z. Mírová (2019).

Při práci s hroby s vozy je nutné dbát na pečlivou revizi zejména starších dat. V případě výrazně odlišných typologických předmětů hrozí nerozpoznané smíchání následných pohřbů v jednom hrobu, problém může působit i využití staršího postroje a mladšího vozu. Nemělo by nás také překvapit využití různých způsobů pohřbívání na vozech – kostrově na nespáleném voze, birituálně, žárově na nespáleném voze a žárově na voze spáleném. Všechny tyto způsoby jsou legitimní a odrážejí spíše regionální zvyklosti. Pro Moravu vzniklo rozřazení vozů nedávno (Mírová 2019, obr. 67). Evidujeme šest lokalit s 12 vozy (tabela 2).

Hroby s vozy z Moravy z HC2–HD3 velmi dobře typologicky korelujeme západním směrem se západohalštatskou kulturou – s Čechami (tabela 3; např. Hradenín, Lovosice), i se vzdálenějšími regiony (tabela 4) – se západním Rakouskem (např. Schalchen-Unterlochen, Lengau), Bavorskem (např. Wehringen, Großebstadt, Augsburg), Bádenskem-Württemberskem (např. Herbertingen-Hurdensingen, Hochdorf) a východní Francií (např. Vix, Apremont). Ve východohalštatské kultuře se hroby s vozy nacházejí výjimečně a Morava zde evidentně tvoří východní okraj jejich

rozšíření, západním směrem je nacházíme až do východní (a pravděpodobně i střední a západní) Francie. Díky této skutečnosti je jejich chronologická pozice významná. Takto „kalibrovaný“ chronologický systém lze dobře korelovat také jižním směrem s regiony východohalštatské kultury (tabela 4) – s východním Rakouskem (např. Kleinklein a Frög), které je dobře navázáno na Slovinsko (např. Stična, mohyla 48) a severní Itálii (Egg/Kramer 2016, tabela 3). Moravskou chronologii můžeme propojit také na západní Slovensko, západní Maďarsko (tabela 4), revizi dat bude vyžadovat korelace s jižním Polskem a regiony Francie, případně regiony severního Atlantiku (Belgie, Nizozemí ad.).

Autoři příspěvku představují aktuální chronologický systém Moravy korelovaný v rámci České republiky a s dalšími systémy (tabela 5). Vozy a jejich další inventář dovoluje v některých případech dělit moravské hroby až na subfáze. Jak ukázal hrob H2/1926 v Seloutkách, Na Šťastných, hroby s vozy se nemusí nacházet pouze v kostrových hrobech, ale též žárovém a dokonce se spáleným vozem. Takové případy registrujeme i v „jádro středoevropské halštatické“, např. na lokalitách Schalchen-Unterlochen a Lengau v západním Rakousku. Revize dat v mnoha regionech, kde se s vozy vůbec nepočítalo, tak může přinést nová překvapení.

Obr. 1. Pohřebiště horákovské a platěnické skupiny (Ha C1–Ha D1) a bývalé horákovské a platěnické skupiny v pozdní době halštatské (Ha D2–Ha D3) na Moravě: 1 – Vojkovice, Vojkovické nivy; 2 – Modřice, Rybníky a Sádky; 3 – Habrůvka, Býčí skála (pohřebiště ve svatyni); 4 – Seloutky, Na Šťastných; 5 – Moravičany, Dílečky. Hroby se čtyřkolovými vozy horákovské a platěnické skupiny (Ha C1–Ha D1) a bývalé horákovské a platěnické skupiny v pozdní době halštatské (Ha D2–Ha D3) na Moravě: 6 – Bratčice, Mělkanská, hrob H1; 7 – Hrušovany u Brna, U Tří mostů, hrob H1; 8 – Modřice, Rybníky, hrob H3515; 9 – Brno-Holásky, U Tuřan, hroby H1 a H2; 10 – Habrůvka, Býčí skála, vozy V1–V6; 11 – Seloutky, Na Šťastných, hrob H2/1926.

Tabela 1. Přehled vybraných pohřebišť tvořících základní soubor dat pro chronologii doby halštatské na Moravě (dle Golec/Fojtík 2020, obr. 68).

Tabela 2. Přehled hrobů a pohřbů s vozy v době halštatské na Moravě (dle Mírová 2019, obr. 67). H – hrob; V – vůz.

Tabela 3. Chronologicky zařazená vybraná pohřebiště, hroby s vozy nebo chronologické systémy vybraných lokalit z Moravy (datované podle kovových nebo skleněných předmětů) a Čech. Hroby s vozy jsou vyznačeny tučně; T – mohyla; H – hrob; V – vůz.

Tabela 4. Chronologicky zařazené vybrané lokality, hroby s vozy nebo chronologické systémy vybraných lokalit/regionů východohalštatské a západohalštatské kultury. Hroby s vozy jsou vyznačeny tučně; T – mohyla; G – hrob.

Tabela 5. Reineckova periodizace a absolutní datování doby halštatské na Moravě (dle Golec/Fojtík 2020, obr. 68; Mírová 2019, fig. 67) a v Čechách (dle Koutecký 1968; Venclová et al. 2008, tabulka 1) s korelací systému Ch. Pareho (1992, 136–164; 1998, tabela 5), H. Hennig (2001, tabela 1), H. Parzinger (1988, 124, 125; 1995, obr. 1), a M. Trachsela (2004, obr. 84; 165; 179).

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BIOLOGICAL ANTHROPOLOGICAL EXAMINATION OF A FEW IRON AGE BURIALS FROM PILISMARÓT-BASAHARC¹

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Pilismarót-Basaharc is a biritual Iron Age cemetery in Hungary. In this study the preliminary results of the anthropological investigations are summarized. We selected a few graves to present the human remains as representative examples. During the analysis, we primarily focused on biological age, morphological sex and paleopathological alterations that can be observed on the bones, as well as different anatomical variations.

INTRODUCTION

Given the importance of the archaeological material, we here offer a detailed description of the anthropological remains from the Iron Age cemetery in Pilismarót-Basaharc, located in the Danube Bend in nowadays Hungary, of the selected individuals, as well as a brief overview of the burial site at the current state of research.

METHODS

In the case of children, biological age was estimated by the diaphyseal measurements of long bones (Bernert/Évinger/Hajdu 2008; Stloukal/Hanáková 1978), the degree of ossification (Schinz/Case 1952) and the development of the teeth (Schour/Massler 1941; Ubelaker 1989). Regarding adults, age estimation was based on the surface alterations of the facies *symphysialis ossis pubis* (Brooks/Suchey 1990) and the sternal rib ends (DiGangi et al. 2009; Iscan/Loth/Wright 1984; 1985) as well as the obliteration of the cranial sutures (Meindl/Lovejoy 1985). Sex determination was carried out using the method of K. Éry, A. Kralovánszky and J. Nemeskéri (Éry/Kralovánszky/Nemeskéri 1963). The skull and the long bones were measured according to R. Martin and K. Saller (Martin/Saller 1957), then classified in accordance with V. P. Alekseev and G. F. Debets (Alekseev/Debets 1964). Stature was calculated based on the method of T. Sjøvold (Sjøvold 1990). The anatomical variations were identified in accord with R. W. Mann, D. R. Hunt and S. Lozanoff (Mann/Hunt/Lozanoff 2016). The pathological alterations were identified by the macromorphological observations established by D. J. Ortner (Ortner 2003), A. C. Aufderheide and C. Rodríguez-Martín (Aufderheide/Rodríguez-Martín 1998) and T. Waldron (Waldron 2009). The oral pathologies were examined according to J. E. Buikstra and D. H. Ubelaker (Buikstra/Ubelaker 1994), D. R. Brothwell (Brothwell 1981), B. H. Smith (Smith 1984), S. E. Lavigne and J. E. Molto (Lavigne/Molto 1995), A. H. Goodman and J. C. Rose (Goodman/Rose 1990), J. F. Metress and T. Conway (Metress/Conway 1975), M. L. Powell (Powell 1985) and B. Bonfiglioli, V. Mariotti, F. Facchini, M. G. Belcastro and S. Condemi (Bonfiglioli et al. 2004). The cremains were analysed with the method of J. Nemeskéri and L. Harsányi (Nemeskéri/Harsányi 1968) and D. H. Ubelaker (Ubelaker 2009).

¹ Archaeological facts related to this paper are presented in the article by E. Jerem and K. Tankó in this volume.

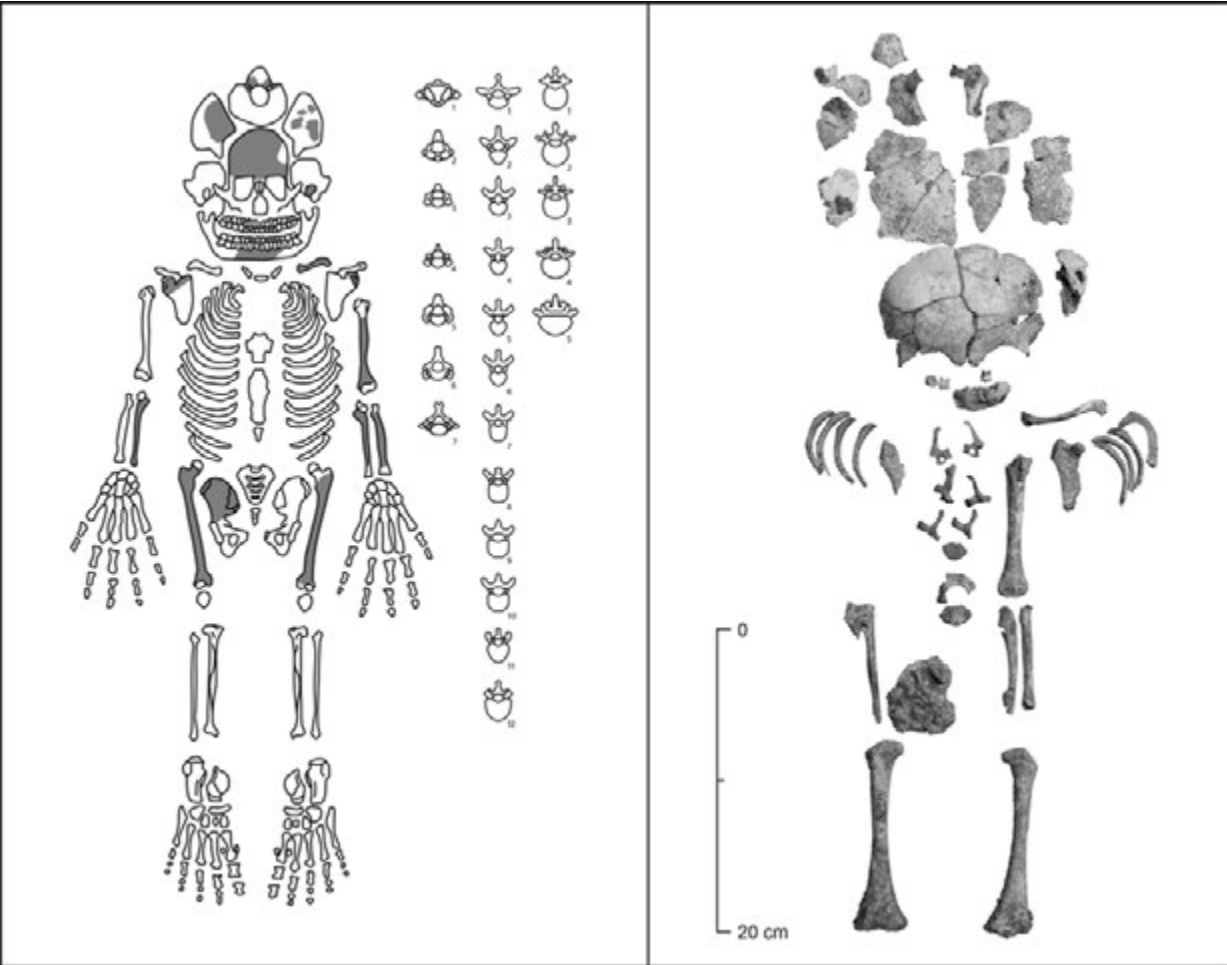


Fig. 1. Skeletal remains of a child from Grave 53.

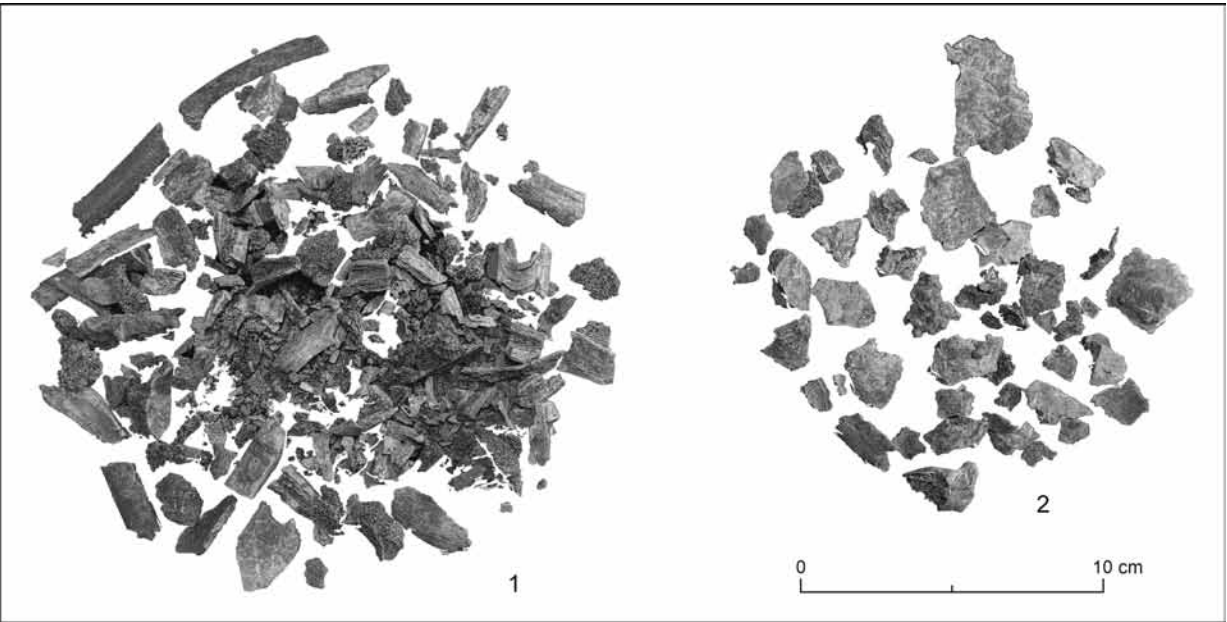


Fig. 2. Cremains from Grave 265.

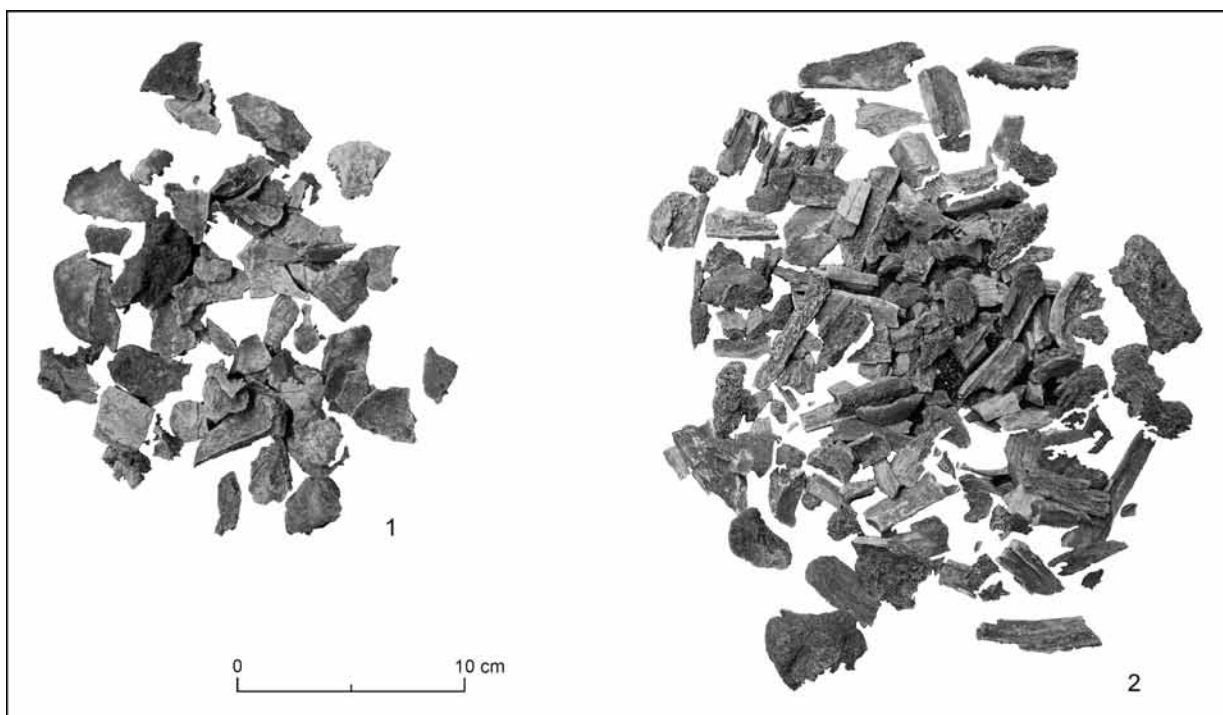


Fig. 3. Cremated remains from Grave 280.

RESULTS

Grave 53

Incomplete skeleton of a child aged 1–1.5 years. Both the skull and the postcranial elements were poorly preserved (Fig. 1). The bones did not reveal any pathological changes.

Grave 265

Incompletely burnt, slightly robust remains of an adult male (Fig. 2). The size of the fragments ranged between 0.4 cm and 6 cm, their colour varied from greyish to brownish and even bluish. Among the approximately 55 pieces of the skull, which weighed 45 g, fragments of the frontal bone, the parietal bone and the zygomatic bone could be identified. The ca. 255 elements belonging to the postcranial skeleton, which weighed 125 g, comprised parts of the vertebrae, pelvis, and the bones of the lower limbs. Based on the curved and straight transverse fracture pattern of the bones, the deceased was cremated shortly after death, while still covered by soft tissue with higher water content.

Grave 280

Incompletely burnt, robust remains of an adult male (Fig. 3). The greyish-brownish fragments ranged between 0.5 cm and 6 cm in size. Among the approximately 50 pieces of the skull, which weighed 104 g, the fragments of the parietal bone, the frontal bone, the temporal bone, the occipital bone, and parts of the mandible could be found. The ca. 295 pieces of the postcranial skeleton, which weighted 245 g, included elements of the upper and lower limbs, the spine, and the pelvis. Based on the straight transverse fracture pattern of the bones, it can be concluded that the deceased was cremated shortly after death.

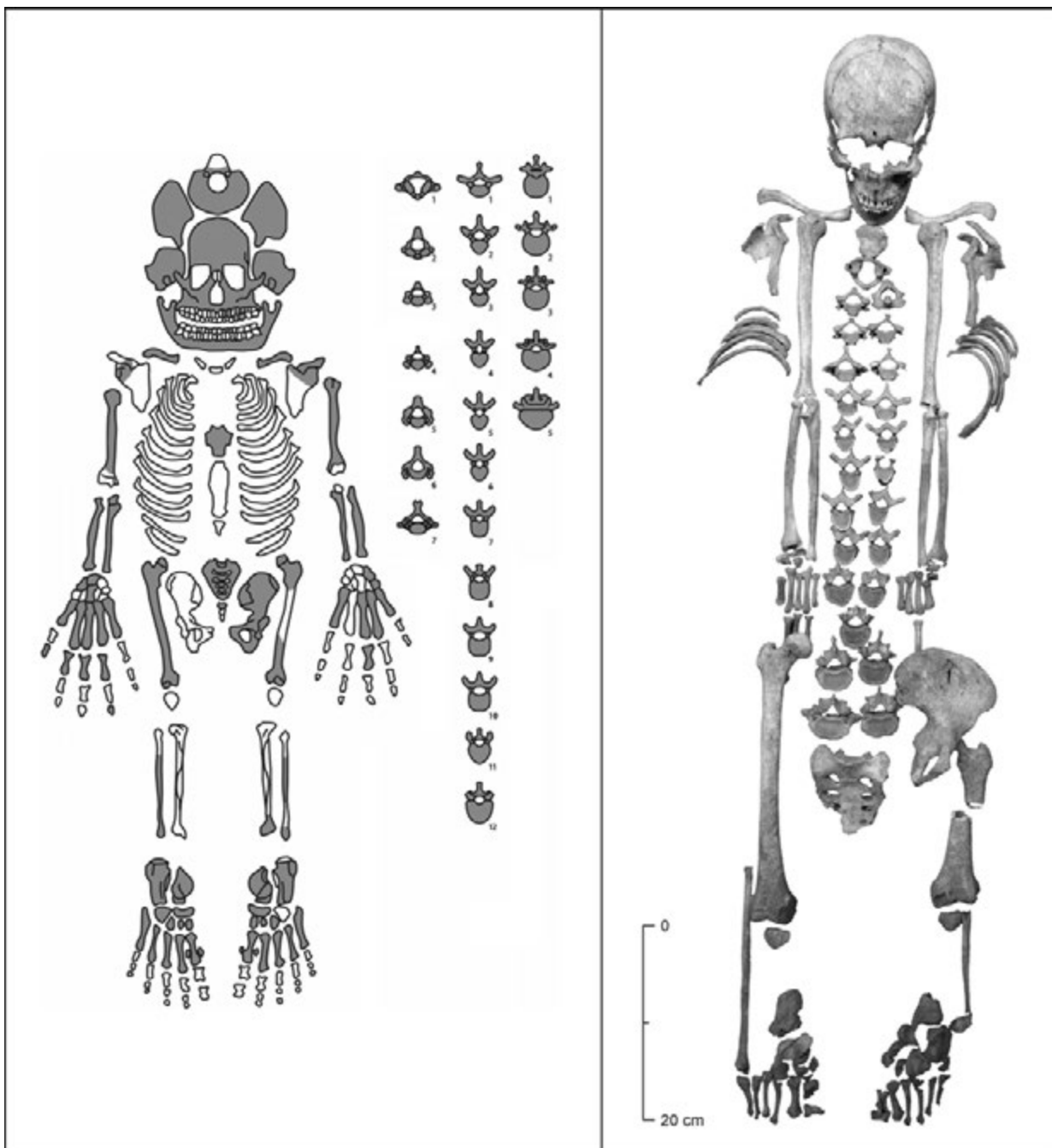


Fig. 4. Skeletal remains of a female from Grave 332.

Grave 332

Relatively well-preserved but incomplete skull and postcranial skeleton of a female aged 30–40 years (Fig. 4).

The neurocranium was very short (hyperbrachycranic), while the length-height and width-height indices were low and very low (chamaecranic and hypertapeinocranic), respectively. The forehead could be described as narrow (stenometopic). The stature of the individual was 150.74 cm, calculated from the femoral length. The lambdoid suture contained Wormian bones on each side.

Spondylarthrosis was observed in the cervical, dorsal, and lumbar spine. Traces of osteoarthritis could be seen on both shoulders, wrists, and ankle joints. Pacchionian impressions were identified on the inner surface of the parietal bones.

The total number of preserved teeth was 31 (16 maxillary and 15 mandibular), while the number of fully preserved alveoli was 20, of which 13 belonged to the maxilla and 7 to the mandible. The individual did not have antemortem tooth loss. Three teeth were affected by caries (RP⁴, RM¹, LM³: 9.7% of the teeth sample), while 16 teeth displayed calculus (LM³, LM¹, LP⁴, LP³, RM³, LM³, LM², LP⁴, L^c, LI², LI¹, RI¹, R^c, RP⁴, RM¹, RM²: 51.6% of the teeth sample). Four anterior teeth were impacted by linear enamel hypoplasia (LI¹, RI¹, L^c, R^c: 33.3% of the anterior teeth). The mean age of manifestation was 3.2 years old. Only one tooth exhibited abscess (RM¹: 3.2% of the teeth sample). Among the fully preserved alveoli, 12 showed periodontitis (LM³, LM², LM¹, LP³, RI¹, RI², R^c, RP³, RP⁴, RM¹, LM², LI²: 60% of the preserved alveoli sample). Five teeth revealed chipping (LI², LI¹, RI¹, RI², RI²: 16.1% of the teeth sample). Light occlusal wear (degrees 1 and 2) could be observed on 6 teeth (LM³, RP³, RM³, LM³, LP⁴, RP⁴: 21.4% of the total sample of worn teeth). Average occlusal wear (degrees 3 and 4) affected 11 teeth (LM², LM¹, LP⁴, LP³, RP⁴, RM², LM², LM¹, RP³, RM¹, RM²: 39.3% of the total sample of worn teeth). Heavy occlusal wear (degrees from 5 to 8) altered 11 teeth (L^c, LI², LI¹, RI¹, RI², L^c, LI², LI¹, RI¹, RI², R^c: 39.3% of the total sample of worn teeth).

Grave 370

Relatively well-preserved but incomplete skull and postcranial skeleton of a juvenile aged 17–19 years (Fig. 5).

Extra bones were detected in the sagittal and on both sides of the lambdoid suture.

Porotic hyperostosis exhibited cribrotic stage in the left orbit. The lesion was 2.3 cm wide and 1 cm high. In the left orbit, the alteration showed porotic level with 1.4 cm width and 0.5 cm height. The palatine process of the maxilla revealed signs of inflammation. Both the anterior, posterior, and lateral sides of the upper two-thirds of the right femur were affected by periostitis.

The total number of preserved teeth was 29 (15 maxillary and 14 mandibular). The number of fully preserved alveoli was 18 (11 maxillary and 7 mandibular). The individual was not affected by either caries, abscess, or antemortem tooth loss; however, 19 teeth exhibited calculus (LM³, LP⁴, LP³, L^c, RP³, RM², LM³, LM², LM¹, LP³, L^c, LI², RI¹, R^c, RP³, RP⁴, RM¹, RM², RM³: 65.5% of the teeth sample). Four anterior teeth revealed linear enamel hypoplasia (L^c, LI¹, RI¹, R^c: 40% of the anterior teeth). The mean age of manifestation was 3.2 years old. Among all the fully preserved alveoli, two showed periodontitis (RI², RI¹: 11.1% of the preserved alveoli sample). Two teeth were afflicted by chipping (LI¹, RI¹: 6.9% of the teeth sample). Light occlusal wear (degrees 1 and 2) could be observed on 26 teeth (LM³, LM², LM¹, LP⁴, LP³, L^c, LI², LI¹, RI¹, RI², R^c, RP³, RP⁴, RM¹, RM², LM³, LM², LP⁴, LP³, L^c, LI², R^c, RP³, RP⁴, RM², RM³: 89.7% of the total sample of worn teeth). Average occlusal wear (degrees 3 and 4) affected three teeth (LM¹, RI¹, RM¹: 10.3% of the total sample of worn teeth).

BRIEF OVERVIEW OF THE PILISMARÓT-BASAHARC CEMETERY

The anthropological material could be identified clearly in case of 57 inhumation and 33 cremation burials. In addition, skeletal remains from nine pit graves were also recovered. Only skulls were retrieved alongside the animal bones from Graves 75, 91, 155, 183, 228, and 247, whereas in Graves 173, 234, and 328 postcranial elements were also found. A grave without archaeological material was also uncovered, namely Grave 379, which only included parts of a skeleton. Graves 158 and 173 each yielded the remnants of two individuals, while Grave 183 at least four individuals. Seven graves lacked human remains, while the anthropological material of 16 graves was lost.

Regarding the inhumation burials, 9 males, 16 females, 5 juveniles, and 28 children were identified. Concerning the pit graves, from Graves 234 and 328 children were unearthed. Furthermore, fragments of male skulls were recovered from Graves 91, 155, and 228, while Grave 183 contained, in addition to the crania of two females and two males, a mandible of an adult individual and cremains with fragment sizes below 1 cm. The anthropological material of Grave 173 consisted of the skull and postcranial skeleton of a male and an additional male skull. From Graves 75 and 247 fragments of adult skulls were uncovered. Grave 379 hid the remains of a child. The majority of the skeletal burials contained subadults among whom the younger age groups were more represented. Children no older than two years old were recovered from 20 graves.

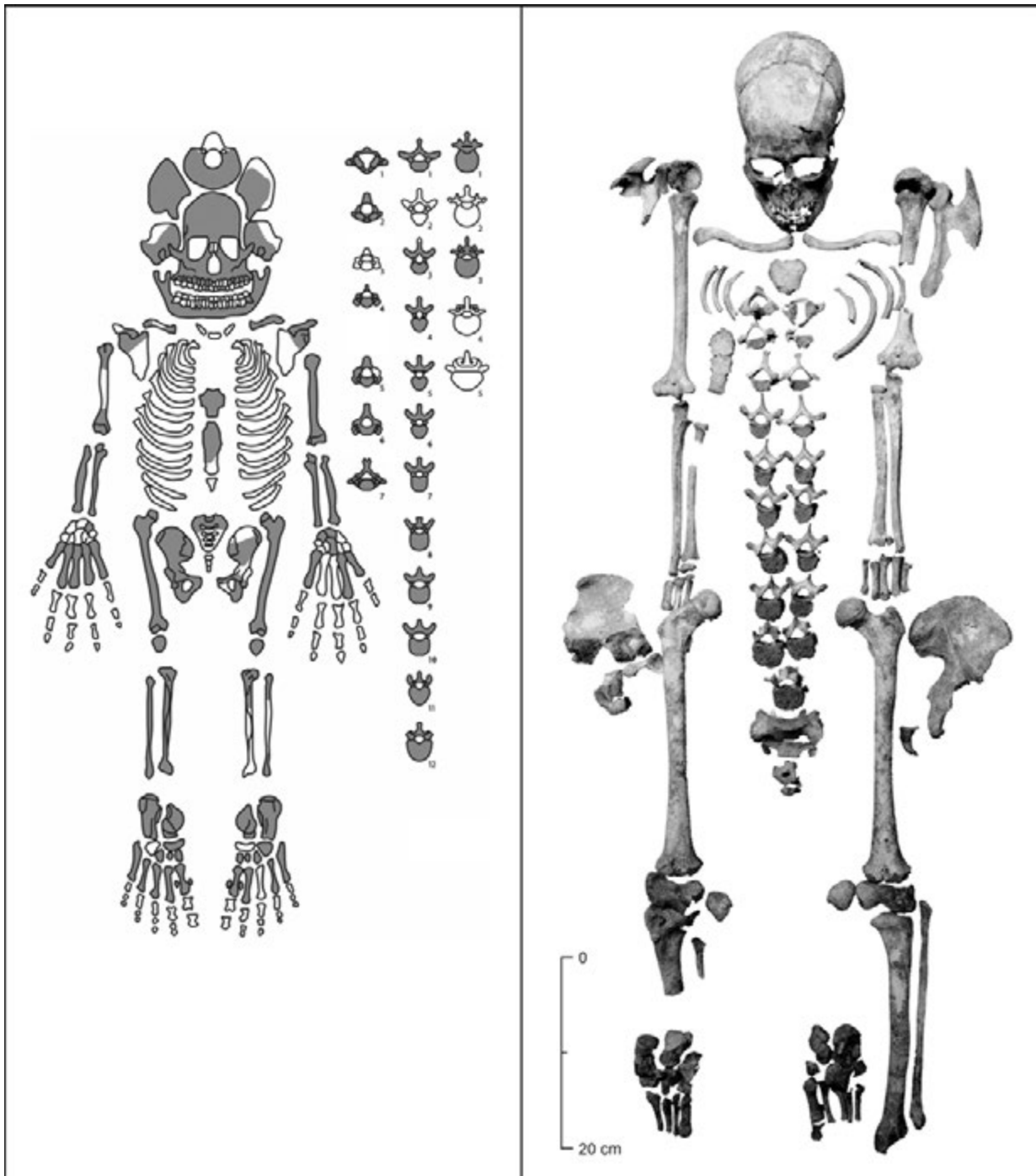


Fig. 5. Skeletal remains of a juvenile from Grave 370.

Due to the poor preservation and fragmentation of the anthropological material, both skull and long bone measurements could only be taken in a small proportion.

Most of the identified pathological conditions such as degenerative changes of the spine (spondylosis deformans, spondylodiscitis, spondylarthrosis) and the joints (osteoarthrosis) as well as periosteal alterations are commonly found among prehistoric populations. Moreover, porotic hyperostosis, which is the osteological manifestation of various haematological disorders and endocranial lesions, the alteration resulting from inflammation or vascular reaction around the meninges, occurred to a greater extent among subadults. These alterations are more common among younger

individuals and are considered a general sign of physiological stress and infections, respectively (Lewis 2006). Regarding the oral pathologies, antemortem tooth loss, attrition, caries, dental cyst, and abscess, as well as developmental disorders of the enamel such as linear enamel hypoplasia were observed frequently. However traumatic lesions like fractures rarely occurred, and all of them were healed. On the right clavicle of a male individual (Grave 286) a fracture possibly caused by an accident was detected with slight axial deviation. The distal end of the left radius of a juvenile individual (Grave 309) as well as a phalanx of a female (Grave 275) were also broken. On the right fibula of a male individual periosteal reaction of traumatic origin occurred (Grave 301). Besides, the abnormal curvature of the right radius of a male individual (Grave 56) indicated a greenstick fracture. Developmental disorders were identified in the forms of partial sacralisation and lumbalisation. In the case of the former, the last lumbar vertebra is connected to the sacrum, while regarding the latter, the first segment of the sacrum formed a separate vertebra. Among the hormonal-metabolic diseases, *hyperostosis frontalis interna* (HFI) was identified in a female over the age of 40 (Grave 101). HFI is characterized as bony overgrowth on the inner surface of the frontal bone, and it mainly affects older females (Ortner 2003).

Finally, it should be stressed that the anthropological analysis is still unfinished therefore only preliminary results are presented here. We must emphasize this also in connection with the most recent DNA sampling. These data have not yet been evaluated but results are expected in the near future which can provide better understanding of the Iron Age population of Pilismarót-Basaharc.

Acknowledgments

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Biologický antropologický výskum niekoľkých hrobov z pohrebiska doby železnej Pilismarót-Basaharc

Katalin Gyenesei – Erica Piccirilli – Sándor Évinger –
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Súhrn

Pilismarót-Basaharc je birituálne pohrebisko z doby železnej v Maďarsku. V tejto štúdii sú zhrnuté predbežné výsledky antropologického výskumu. Vybrali sme niekoľko hrobov, na ktorých ilustrujeme výpovedné možnosti analýzy ľudských pozostatkov. Pri analýze sme sa zamerali predovšetkým na biologický vek, morfológické pohľady a paleopatologické zmeny, ktoré možno pozorovať na kostiach, ako aj na anatomickej odchýlke.

V hrobe 53 sa nachádzala zle zachovaná, neúplná kostra dieťaťa vo veku 1–1,5 roka. Hroby 265 a 280 obsahovali kremačné pozostatky dospelých mužov. V hrobách 332 a 370 sa našla pomerne dobre zachovaná, ale neúplná lebka a postkranialny skelet ženy vo veku 30–40 rokov a mladistvého vo veku 17–19 rokov.

Antropologický materiál bolo možné jednoznačne identifikovať pre 57 kostrových a 33 žiarových hrobov. Okrem toho sa kostené pozostatky našli aj v deviatich jamových hrobách. Odkrytý bol aj jeden hrob bez archeologického materiálu. V kostrových hrobách bolo identifikovaných 9 mužov, 16 žien, 5 mladistvých a 28 detí. V jamových hrobách sa našli pozostatky detí, ale aj dospelých mužov a žien. Väčšina zistených patologických stavov sa u pravekého obyvateľstva vyskytuje bežne, okrem *hyperostosis frontalis interna* (HFI), ktorá bola rozpoznaná u ženy vo veku nad 40 rokov (hrob 101).

Obr. 1. Kostené pozostatky dieťaťa z hrobu 53.

Obr. 2. Žiarové pozostatky z hrobu 265.

Obr. 3. Žiarové pozostatky z hrobu 280.

Obr. 4. Kostené pozostatky zo ženského hrobu 332.

Obr. 5. Kostené pozostatky mladistvého z hrobu 370.

Text translated by the authors

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PILISMARÓT-BASAHARC: A LATE HALLSTATT/EARLY LA TÈNE CEMETERY PRESENTED THROUGH A FEW SELECTED BURIALS¹

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DOI: <https://doi.org/10.31577/szausav.2024.71.18>

Keywords: Danube Bend, Hungary, Late Hallstatt/Early La Tène transition period, Čurug-type fibulae, coral, amber, glass and amphora-shaped glass beads

Pilismarót-Basaharc is a key site of the transition between the Early and the Late Iron Age, as well as of early Celtic presence in the Carpathian Basin. This study offers a brief overview of the site's archaeological research and the employed excavation methods, followed by a description and discussion of the typical burial rites and the most frequent grave good types through five selected burials, with a special focus on amber, coral and glass beads, and on the origins and distribution of glass amphora beads in particular. The most distinctive artefact types of the Late Hallstatt and Early La Tène cultures attested at Pilismarót are reviewed and discussed, in particular Čurug-type and Early La Tène brooches. In addition to the archaeological finds, the assessment of the human remains was also undertaken. The broad picture emerging from the assessment of the finds is that the archaeological heritage of the Iron Age community which interred its dead at Pilismarót reflects both local traditions and strong Balkanic connections, alongside a pronounced process of early laténisation.

INTRODUCTION

Pilismarót-Basaharc is a key site of the transition between the Early and the Late Iron Age, as well as of early Celtic presence in the Carpathian Basin. This remarkable cemetery has since long been known for its extraordinary archaeological finds. It became clear already during its early investigation that the burials uncovered at this site differ substantially from the interments in the period's other burial grounds in Hungary in terms of their burial rite and the composition of the grave goods. Very few comparable finds were previously known from the Iron Age of the Carpathian Basin. Half a century ago, there was barely any information on the transition between the Early and the Late Iron Age, or on the earliest appearance of the Celts in Central Europe and the Northern Balkans, this being the main reason that the first preliminary reports offered little more than some generalities and usually presented a few artefacts divorced from their one-time contexts (Bognár-Kutzián 1975, 35–46; 1983, 30–37). It must also be borne in mind, given the novelty and uniqueness of the finds, that personal ambitions and professional interests both hindered – and in some cases downright thwarted – the systematic and meticulous examination of the grave inventories and ultimately of a final report with an assessment of the site and its finds. This situation has changed significantly 55 years after the excavation. The finds and the documentation are now accessible for study, and as we shall discuss in detail below, Pilismarót can now be fitted into the Early/Late Iron Age transition of Central Europe and the Balkans as well as into the overall picture of early laténisation.

The present study is a token of our intention to prepare a full assessment of this important Iron Age cemetery and to publish the results. The review of the available field documentation and the evaluation of the archaeological finds are still in their initial phase and the same holds true for the recently begun interdisciplinary studies, for which only preliminary results are available, with the full assessment of the findings planned for a later date. It has become clear that there are many gaps and mix-ups both in

¹ The osteoarchaeological analysis of the remains from the graves discussed in this paper is presented in the article by K. Gyenesei et al. in this volume.

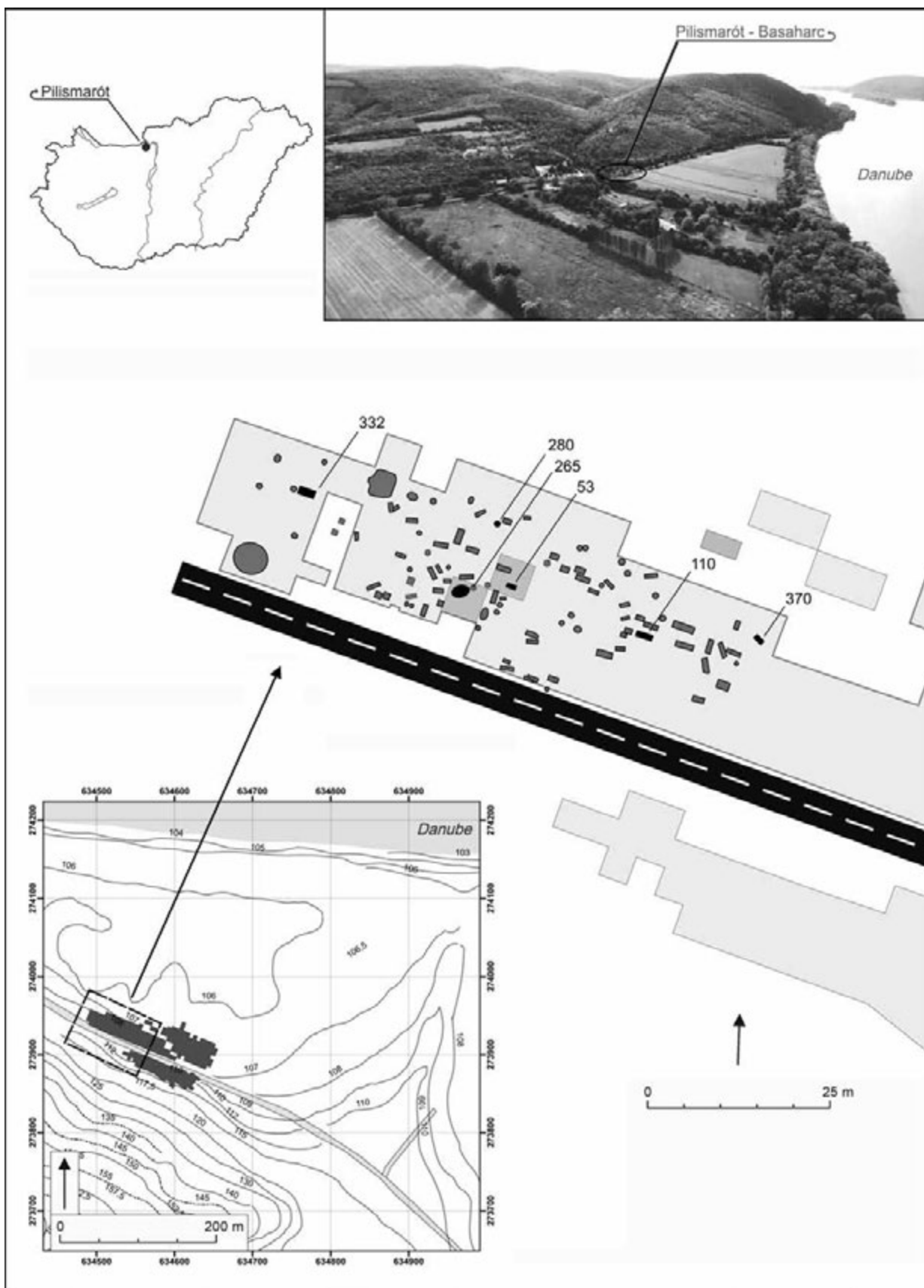


Fig. 1. Pilismarót-Basaharc. Location, photo and topographic plan of the site. General plan of the excavated areas and plan of the Iron Age cemetery (drawing K. Tolnai and K. Tankó).

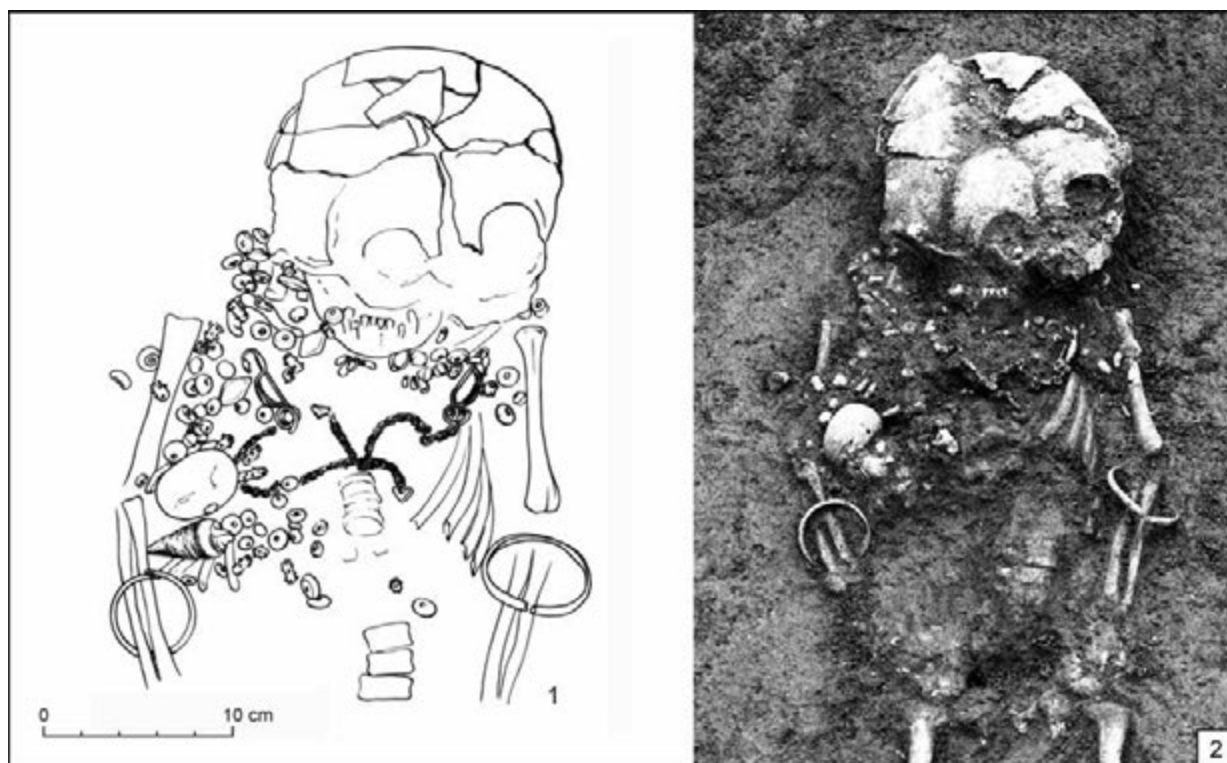


Fig. 2. Pilismarót-Basaharc. Grave 53 (photo and drawing from the original field documentation of the excavation).

the find material and in the documentation. In the light of the above, as well as owing to the journal's formal requirements, we can here only offer a brief overview. Some of the finds presented here have already been published (Bognár-Kutzián 1975, 35–46; 1983, 30–37; Szabó/Petres 1974, 72, 80, Cat. Nos. 102, 153–155) and a brief description of the site as well as some photos of the finds appeared in the catalogue to the Celtic exhibition held in Venice in 1991 (Moscati 1991, 282, 284, 778, 779) and in the *Lexikon zur keltischen Archäologie* published in Vienna (Jerem 2012). However, a critical review of various contentions and claims made in previous publications and the setting of the individual finds previously selected for publication in their original context as well as their fresh interpretation is indispensable. With these considerations in mind, we selected a few grave assemblages that we deemed as being representative, which would offer a good overall picture of the cemetery's spatial organisation, its chronology, its burial rites, and its regional and inter-regional connections. Our main motivation was the undisputed significance of the Iron Age cemetery excavated at Pilismarót.

PREVIOUS RESEARCH AND THE SITE'S TOPOGRAPHIC SETTING

We shall begin with a brief description of the site, its research history and the excavation techniques employed during its investigation. Pilismarót-Basaharc lies in the Danube Bend, on the southern bank of the Danube, opposite the confluence of the Ipoly (Ipel/Eipel). The archaeological site is located on the edge of the pre-regulation floodplain, 107–112 meters a.s.l. (Fig. 1). Several salvage excavations were conducted in the area prior to the construction of planned Gabčíkovo-Nagymaros hydropower plant, which was never built on the Hungarian side. One of these was undertaken at Pilismarót-Basaharc, where several campaigns were conducted between 1959 and 1979. Archaeological work on behalf of the Archaeological Research Group of the Hungarian Academy of Sciences was first directed by Nándor Fettich, followed by István Torma, and finally by Ida Bognár-Kutzián. The excavation techniques employed during the fieldwork conformed to the period's general practice: the investigated area was divided into 5 m by 5 m squares and then excavated by pick-and-shovel men. The Copper Age, Iron Age and Avar-period burials and other features were numbered sequentially. The Avar-period burials were the first to be published, while the final report on the Copper Age cemetery in monographic format appeared more recently

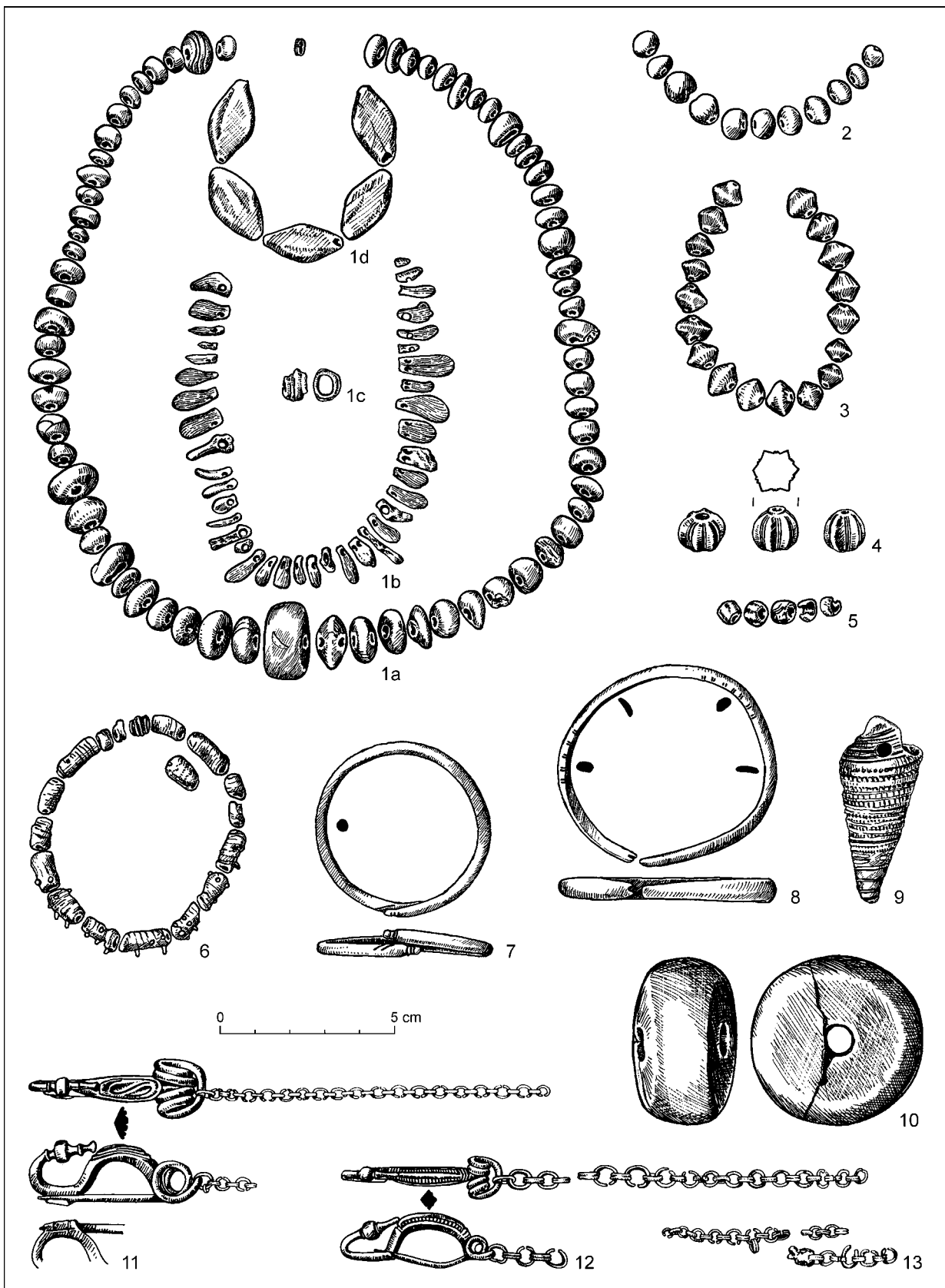


Fig. 3. Pilismarót-Basaharc. Grave goods from Grave 53. 1 – glass, amber and coral beads; 2, 3, 5, 6 – glass beads; 4 – silver bead; 7, 8 – bronze bracelets; 9 – *Turritella* snail; 10 – amber bead; 11, 12 – bronze brooches; 13 – bronze chain with an amber bead pendant (drawing Á. Dékány and N. Mészáros).

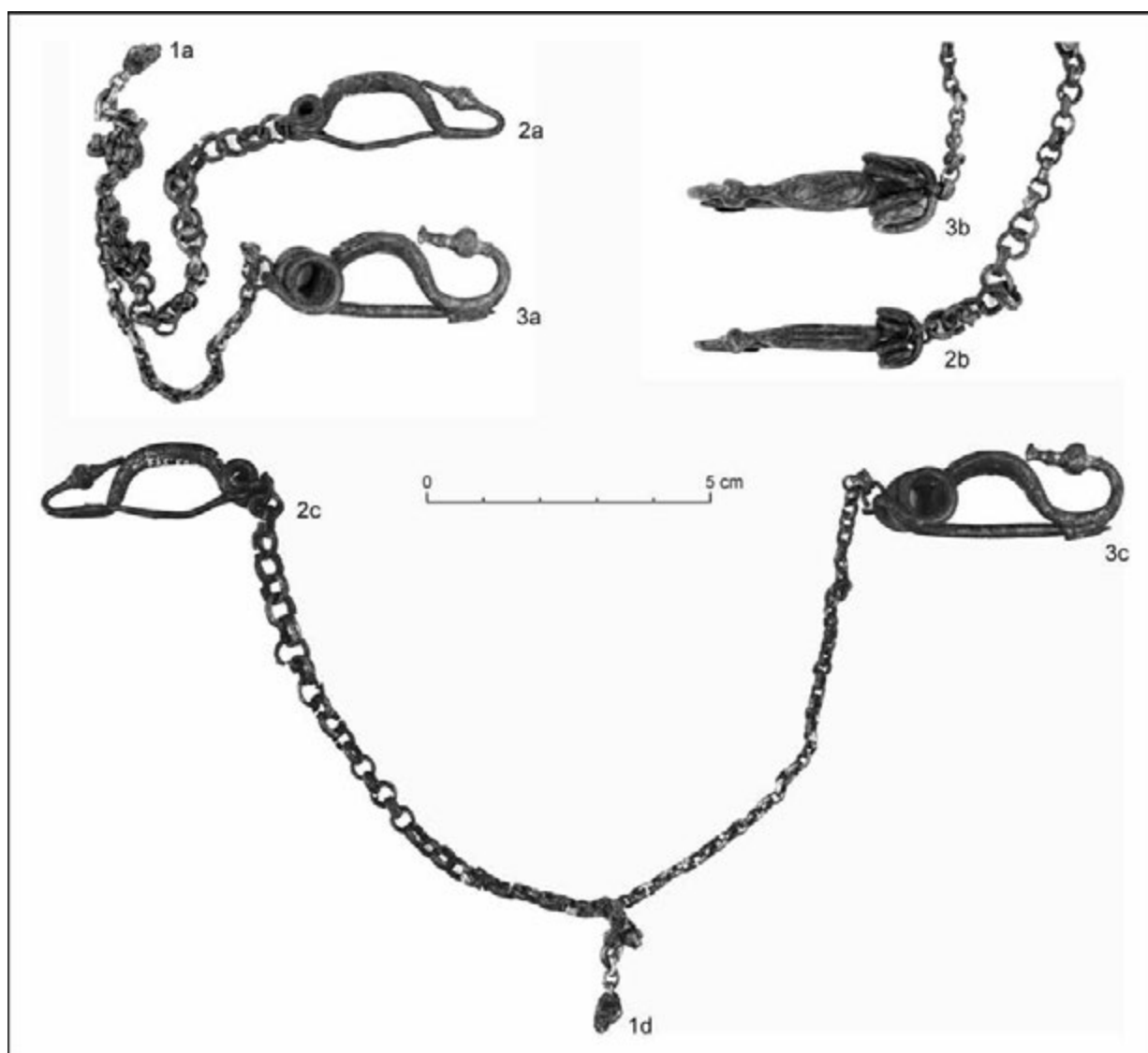


Fig. 4. Pilismarót-Basaharc. Pair of brooches linked by a chain with an amber bead pendant from Grave 53 (photo K. Tankó).

(Bondár 2015; Fettich 1965). Currently, only the Iron Age relics still await publication. In addition to the burials dating from the Early/Late Iron Age transition, most of the graves uncovered on the site fall into the Lt B1 period and a scatter of Late La Tène settlement features, mainly pits, were also brought to light.

Our main goal in this study is to present a few representative grave assemblages through which we can offer an overall picture of the date, the burial rites and cultural connections of the Iron Age burials as well as the physical anthropology of the human remains. We selected the burials described below.

DESCRIPTION OF THE GRAVES

Grave 53

Inhumation burial uncovered in Square m/2. The exact form and depth of the grave pit could not be established. W – E oriented inhumation burial laid in a supine position. Silver, glass and amber beads around the neck and on the chest; a bronze brooch on the right and left side of the chest, linked by a slender bronze chain; a bronze bracelet on each forearm; a clay vessel between the legs (Fig. 2; Fettich 1965, 33, pl. IX: 4).

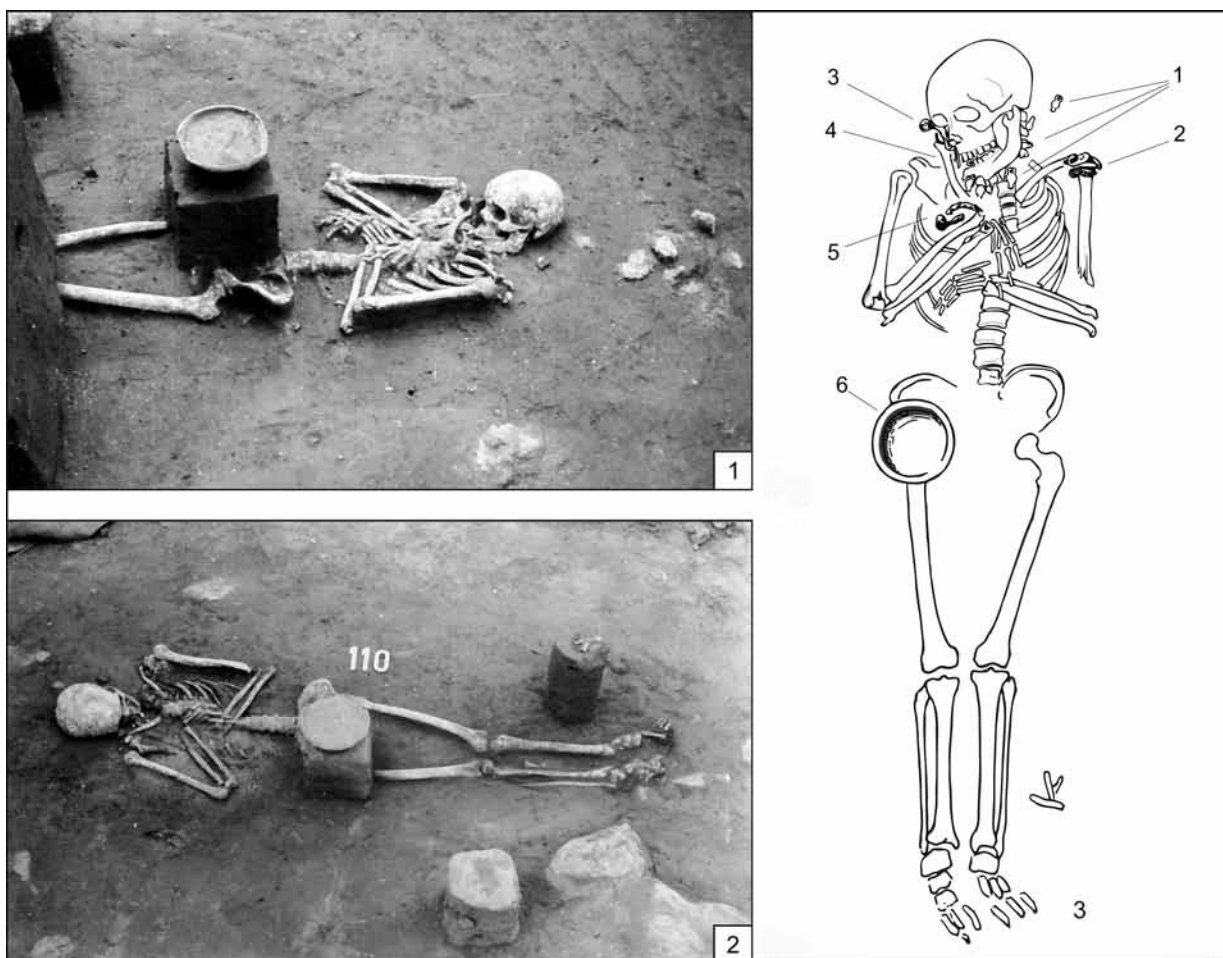


Fig. 5. Pilismarót-Basaharc. Grave 110 (photo and drawing from the original field documentation of the excavation).

Grave goods

1. Amber bead. Diam.: 42 mm, Th.: 28 mm, diam. of perforation: 8 mm (Fig. 3: 10).
2. Snail. 50 × 22 × 22 mm (Fig. 3: 9; *Moscatti 1991*, 282).
3. Amber beads of different shapes and sizes: 69 pieces (Fig. 3: 1a; *Moscatti 1991*, 284).
4. Glass beads. Green glass, seven pieces (Fig. 3: 2).
5. Glass beads. Clear, colourless, rhomboidal, five pieces. 22 × 13 × 4 mm (Fig. 3: 1d).
6. Glass beads. Green, ten pieces (Fig. 3: 1c).
7. Glass beads. Colourless, eight pieces (Fig. 3: 5).
8. Red coral beads. 29 pieces (Fig. 3: 1b).
9. Biconical glass beads. Blue, 17 pieces (Fig. 3: 3).
10. Biconical glass bead. Clear, colourless (Fig. 3: 3).
11. Silver beads. Hollow melon beads, three pieces. Diam.: 12 mm, L.: 12 mm, diam. of perforation: 3 mm (Fig. 3: 4).
12. Bronze chain, fragmented.
13. Bronze bracelet. Penannular, with overlapping pointed terminals, oval cross-section. Diam.: 45 mm, Th.: 4 × 2 mm (Fig. 3: 7).
14. Bronze bracelet. Penannular, with tapering terminals, D-shaped cross-section. Diam.: 50 × 55 mm, Th.: 6 × 2 mm (Fig. 3: 8).
15. Pair of bronze brooches linked by a slender bronze chain with a small amber bead strung onto the chain (Fig. 3: 11–12; 4; *Moscatti 1991*, 779).

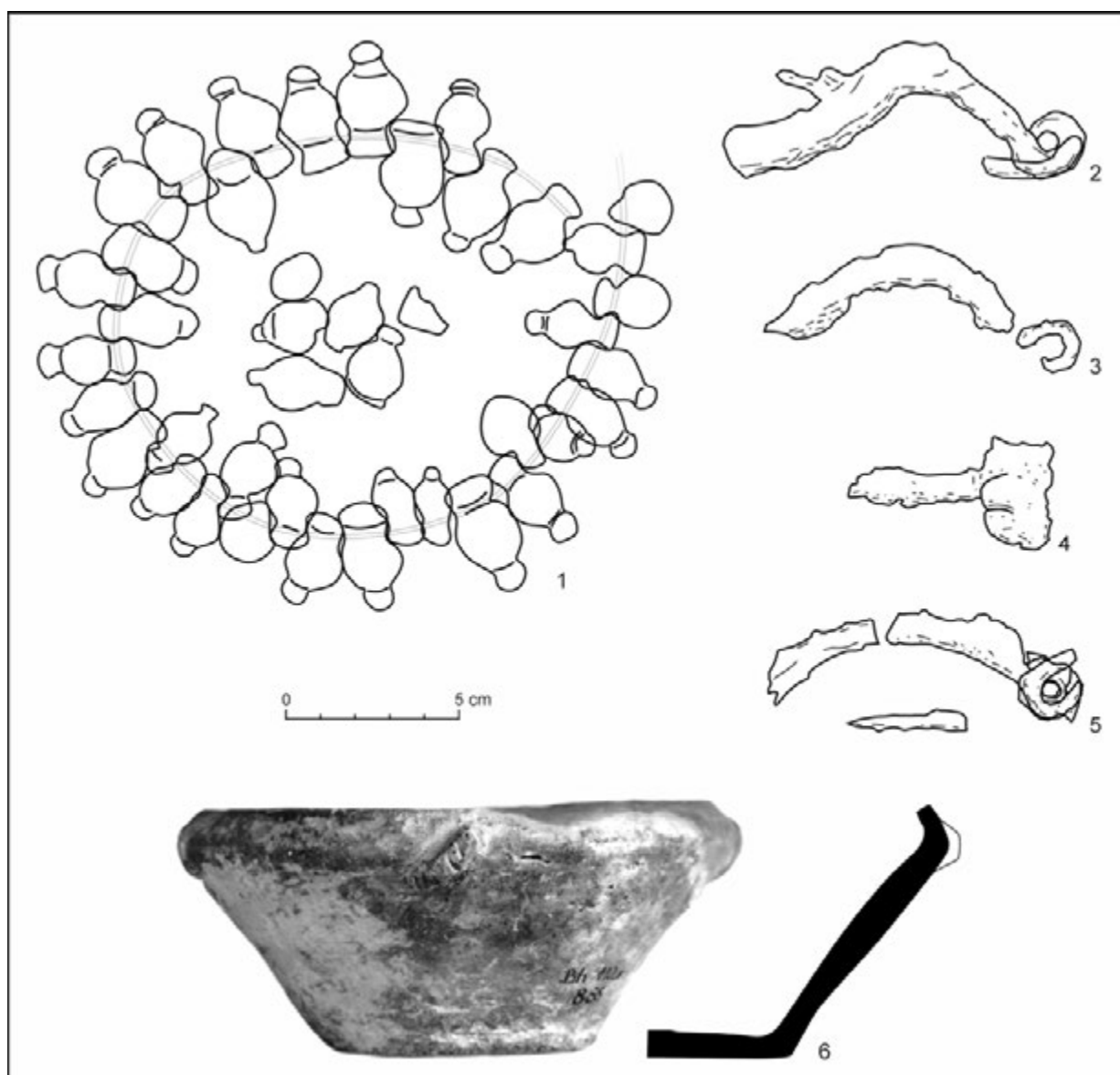


Fig. 6. Pilismarót-Basaharc. Grave goods from Grave 110. 1 – amphora-shaped glass beads; 2–5 – iron brooches; 6 – pottery (drawing K. Tankó).

Grave 110

Inhumation burial laid in a supine position. The exact form and depth of the grave pit could not be established. Amphora-shaped glass beads around the neck; an iron brooch on the right and left side of the chest, and two other brooches beside and under the skull; a clay vessel above the right leg (Fig. 5).

Grave goods

1. Amphora-shaped glass beads. 42 pieces. Clear, colourless (Fig. 6: 1).
2. Iron brooch. Strongly corroded (Fig. 6: 2).
3. Iron brooch. Strongly corroded (Fig. 6: 3).
4. Iron brooch. Strongly corroded (Fig. 6: 4).
5. Iron brooch. Strongly corroded (Fig. 6: 5).
6. Bowl. Greyish-brown, hand-thrown conical bowl with indrawn rim and smoothed exterior. Refitted and restored. Diam. of rim: 115 mm, Th. of rim: 6 mm, H.: 65 mm, diam. of base: 60 mm (Fig. 6: 6).

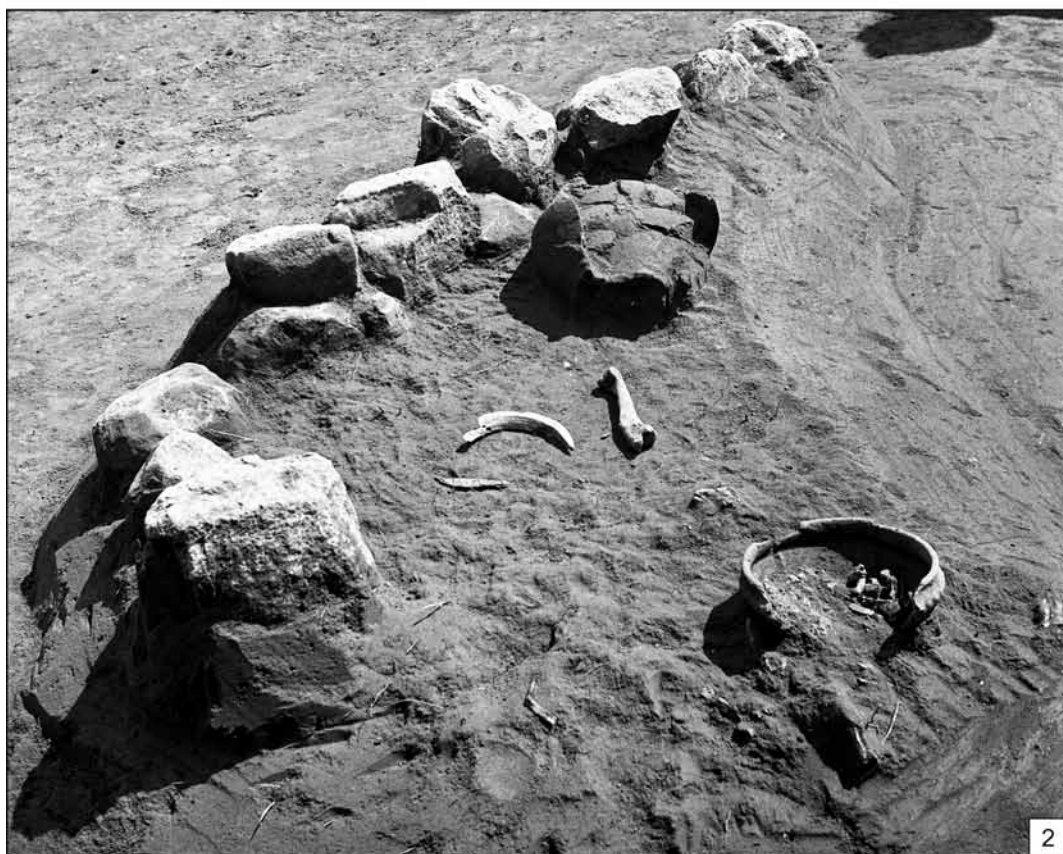


Fig. 7. Pilismarót-Basaharc. Grave 265 (original photographs of the excavation).

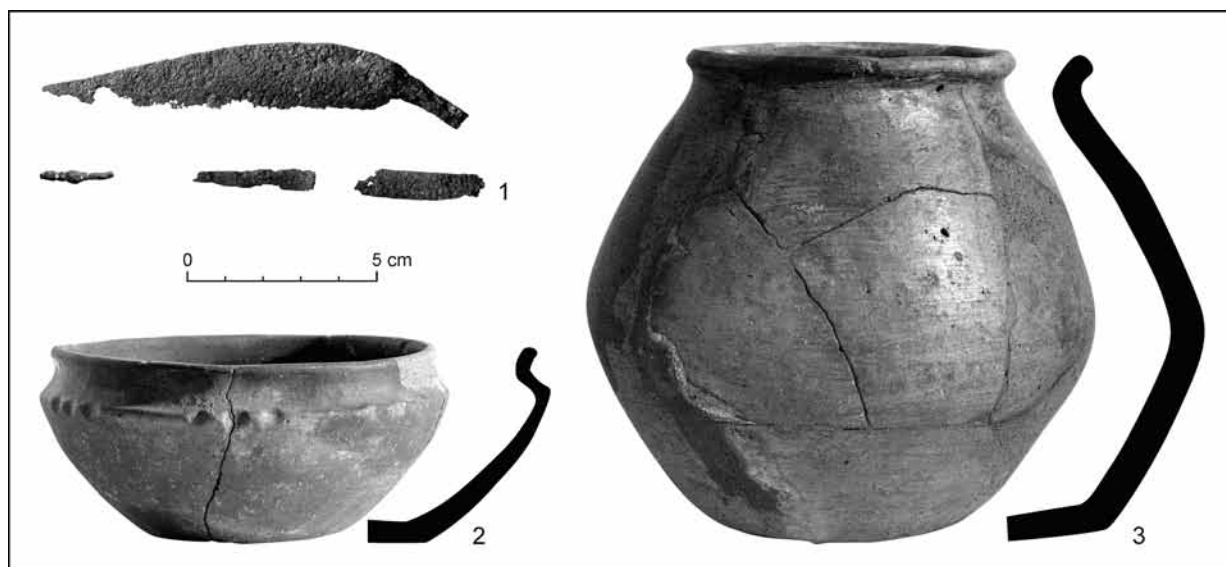


Fig. 8. Pilismarót-Basaharc. Grave goods from Grave 265. 1 – iron knife and various iron fragments; 2, 3 – pottery (original photos of the finds taken in the 1970s).

Grave 265

Cremation burial uncovered in Square n/1. The cremains were deposited in a bowl. Beside the bowl lay animal bones and a pot. The fragments of a bronze brooch, an iron knife and a bent iron plate had probably lain among the cremains. Large stones were arranged in a semi-circle in the grave pit's eastern half (Fig. 7; *Fettich* 1965, 89).

Grave goods

1. Bowl. Greyish-brown, hand-thrown, conical bowl with sharp shoulder carination, S-profile and smoothed exterior (Fig. 8: 2).
2. Pot. Greyish-brown, hand-thrown, barrel-shaped pot with smoothed exterior (Fig. 8: 3).
3. Iron knife. Curved back, inner cutting edge, strongly corroded and fragmented (the original photo taken in the 1970s: Fig. 8: 1, and a recent drawing: Fig. 9: 1).
4. Various iron fragments (Fig. 8: 1).

Grave 280

Cremation burial uncovered in Square n/3. The cremains were deposited in a vessel, which was then covered with a bowl placed over it upside-down. An iron knife and a whetstone were found on the cremains, a bent spearhead under the urn (Fig. 10).

Grave goods

1. Bowl. Greyish-brown, hand-thrown conical bowl with indrawn rim and smoothed exterior. Refitted and restored. Diam. of rim: 145 mm, Th. of rim: 6 mm, H.: 35 mm, diam. of base: 69 mm (Fig. 11: 1).
2. Pot. Greyish-brown, hand-thrown, biconical pot with everted rim and smoothed exterior (Fig. 11: 2).
3. Iron spearhead. Narrow, willow-leaf-shaped spearhead with open socket, decorated with two engraved circumferential lines around the base. Strongly corroded. L.: 145 mm, diam. of socket: 25 mm (Fig. 9: 4).

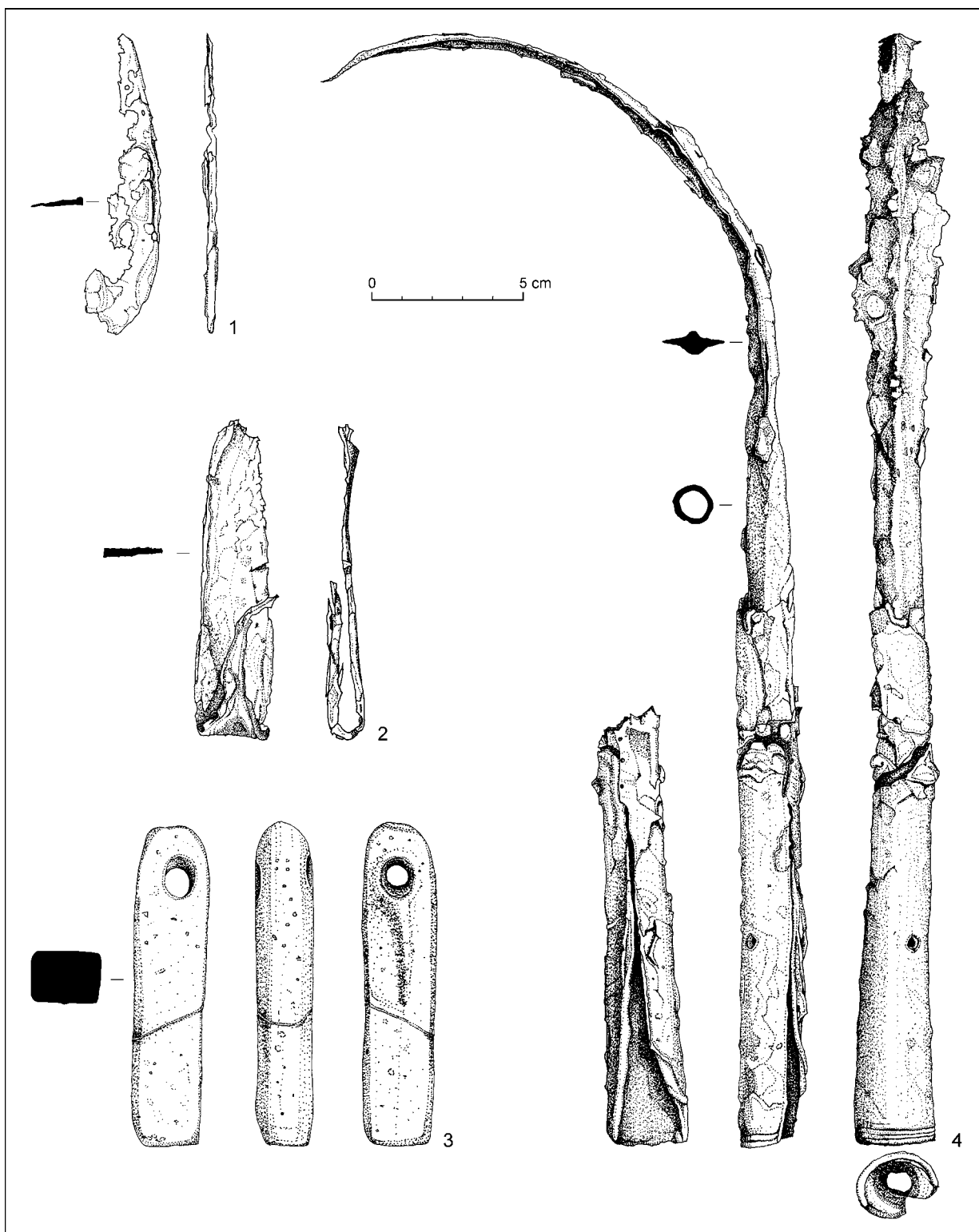


Fig. 9. Pilismarót-Basaharc. Grave goods from Graves 265 and 280. 1 – iron knife from Grave 265; 2 – iron knife from Grave 280; 3 – whetstone from Grave 280; 4 – iron spearhead from Grave 280 (drawing N. Mészáros).

4. Whetstone. One end rounded and perforated, square cross-section. $100 \times 22 \times 14$ mm, diam. of perforation: 10 mm (Fig. 9: 3).
5. Iron knife. Curved back, inner cutting edge, strongly corroded and fragmented. $88 \times 18 \times 3$ mm (Fig. 9: 2).

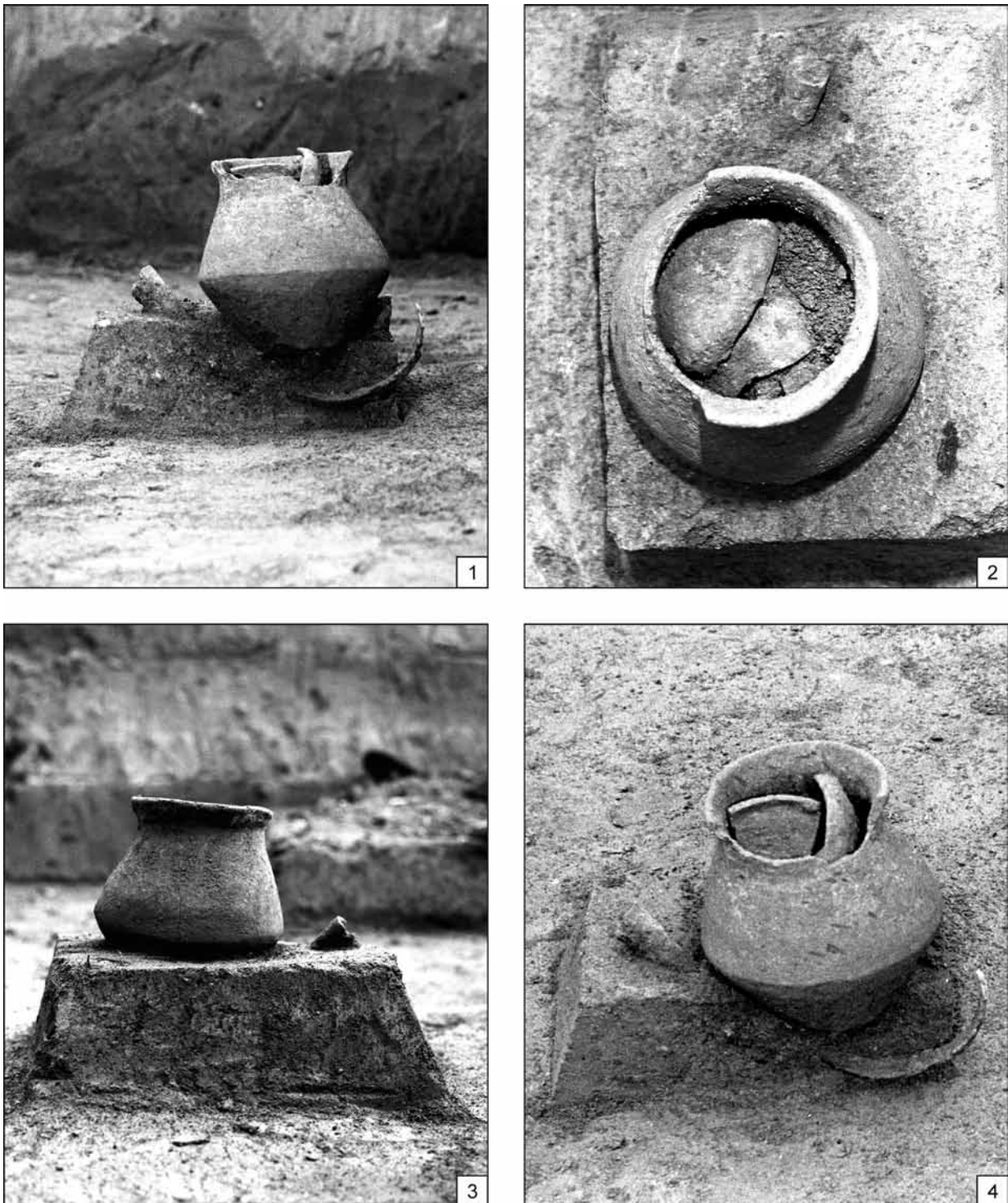


Fig. 10. Pilismarót-Basaharc. Grave 280 (original photographs of the excavation).

Grave 332

Inhumation burial uncovered in Square s/2. Charred remains of a coffin or a burial chest. Inhumation burial laid in a supine position with the arms placed across the chest. Beads around the neck and under the skull. A pair of bronze brooches linked by a chain and triangular (perhaps rhomboidal) pendants.

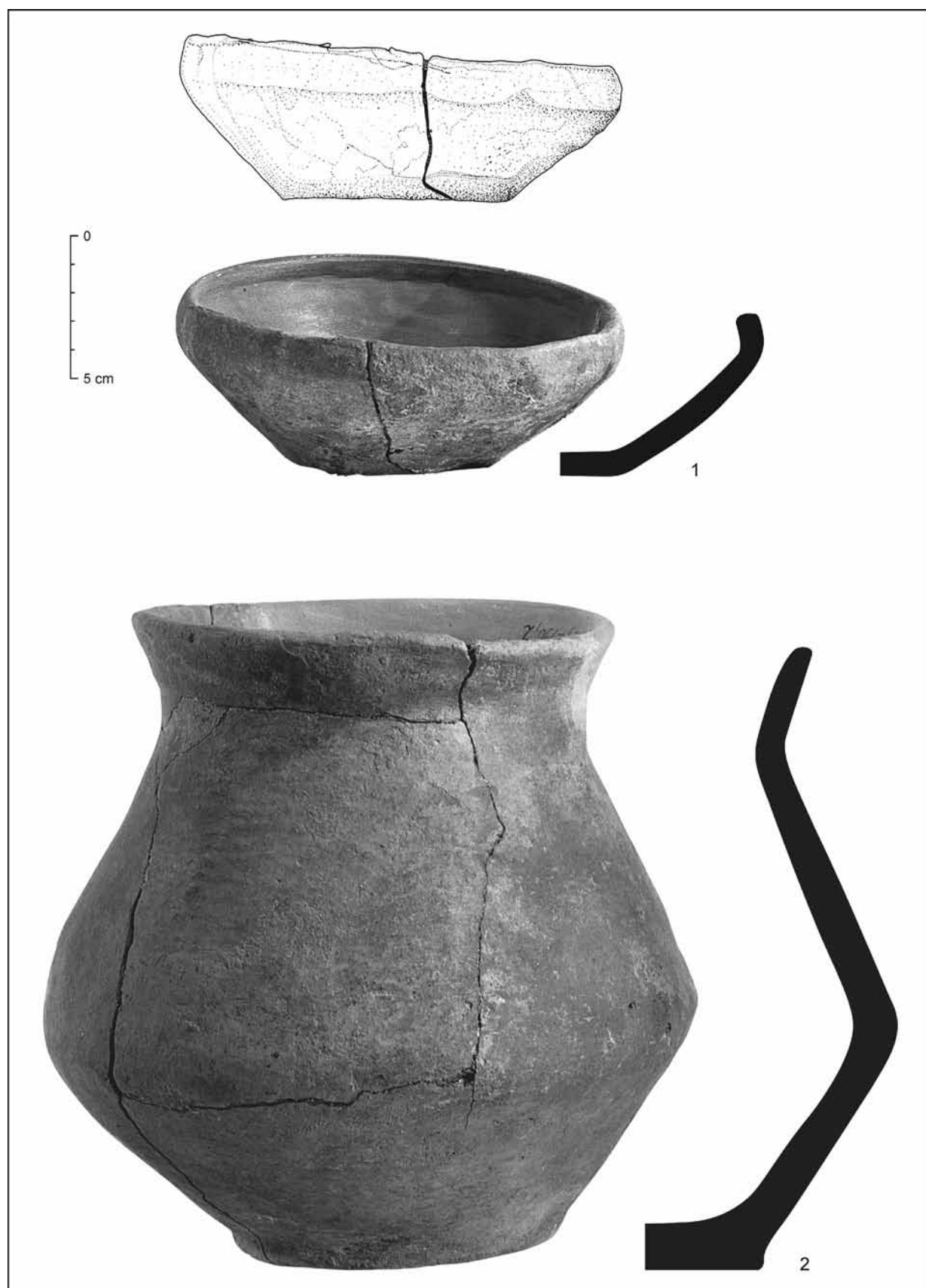


Fig. 11. Pilismarót-Basaharc. Pottery from Grave 280 (original photos and recent drawing of the finds N. Mészáros).

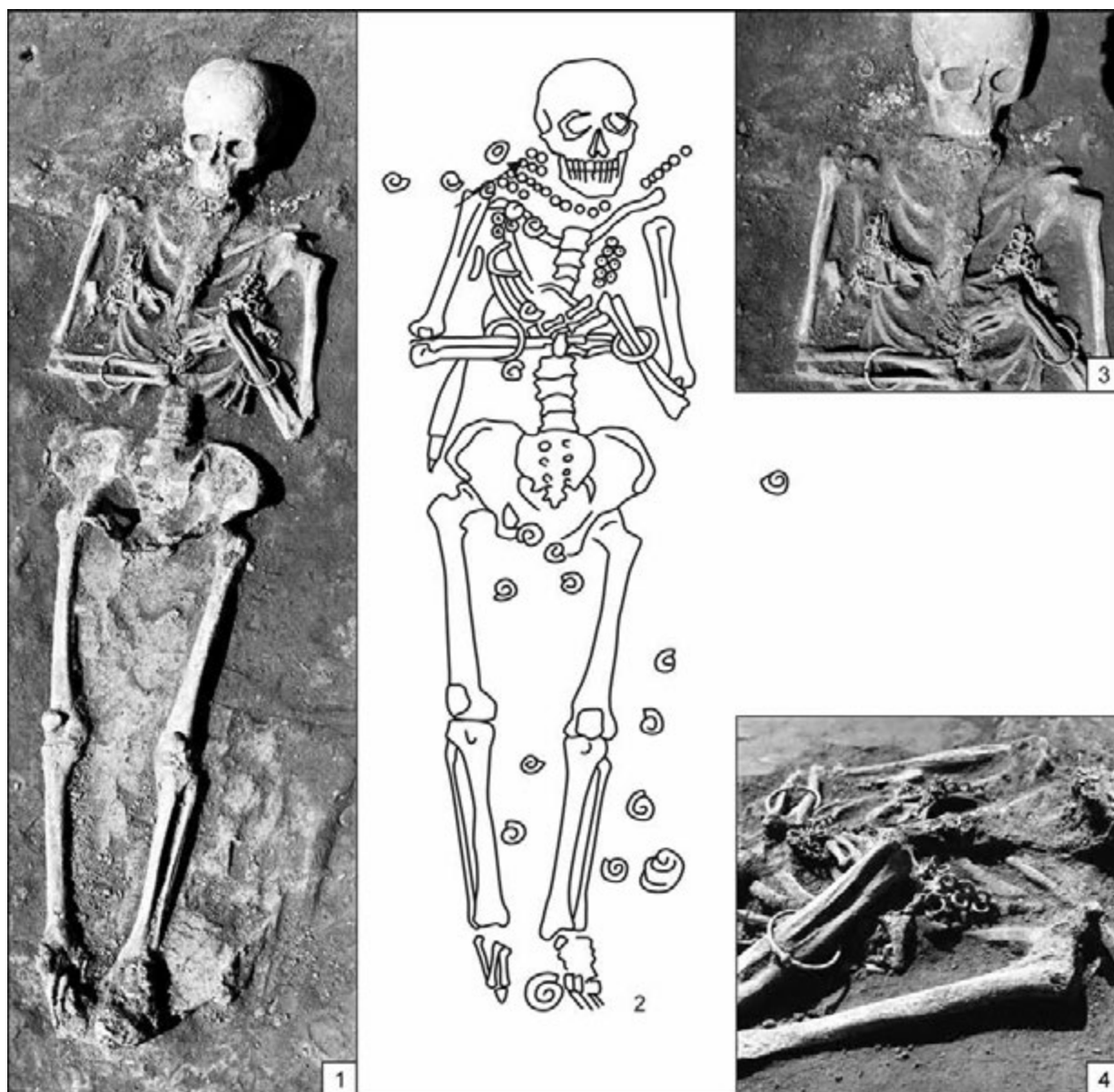


Fig. 12. Pilismarót-Basaharc. Grave 332 (original photographs and drawing of the grave).

A bronze bracelet on each forearm, one (or perhaps two) iron bracelets on the right forearm. An iron knife by the right hip. 28 snails around the body (Fig. 12; *Bognár-Kutzián 1983, 31*).

Grave goods

1. Iron bracelet. Strongly corroded and fragmented (Fig. 13: 3).
2. Glass beads. White translucent (105 pieces), blue (31 pieces) and brown (7 pieces) biconical and/or spherical glass beads (Fig. 13: 1, 2, 14: 1–3a).
3. Red coral beads. 168 pieces (Fig. 13: 4; 14: 3b).
4. Bronze earring. Penannular, with one pointed terminal, round cross-section. 26 × 22 mm, Th.: 3 mm (Fig. 14: 5).
5. Bronze bracelet. Penannular, both terminals thickened, round cross-section. Diam.: 57 mm, Th.: 4 mm (Fig. 14: 6; *Bognár-Kutzián 1975, pl. VII: 2a, b*).
6. Bronze bracelet. The two ends fit into each other with a tenon clasp and pin, round cross-section. Diam. 57 mm, Th.: 4 mm (Fig. 14: 4; *Bognár-Kutzián 1975, pl. VII: 3, 4*).

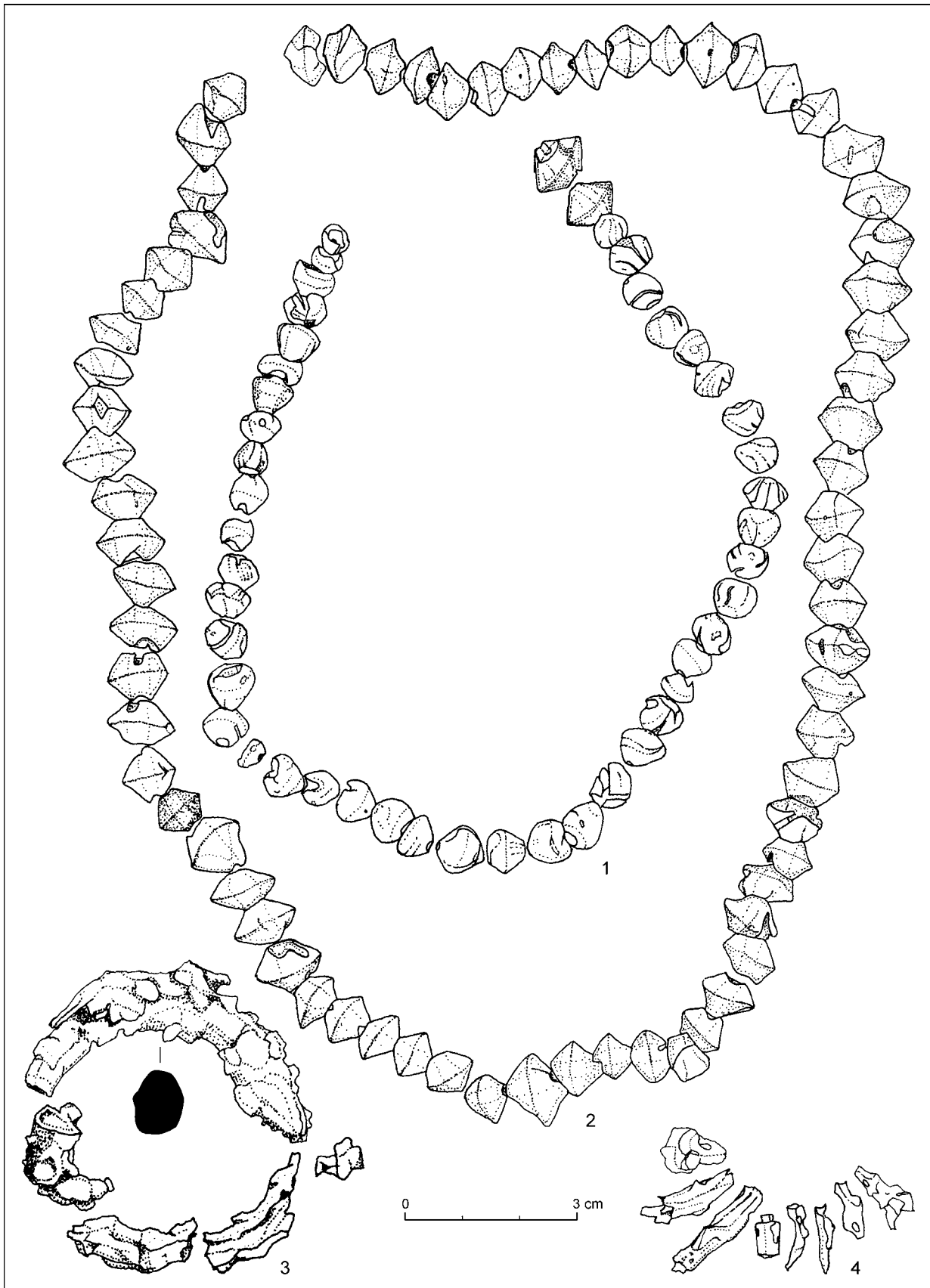


Fig. 13. Pilismarót-Basaharc. Grave goods from Grave 332. 1, 2 – glass beads; 3 – iron bracelet; 4 – coral beads (drawing N. Mészáros).

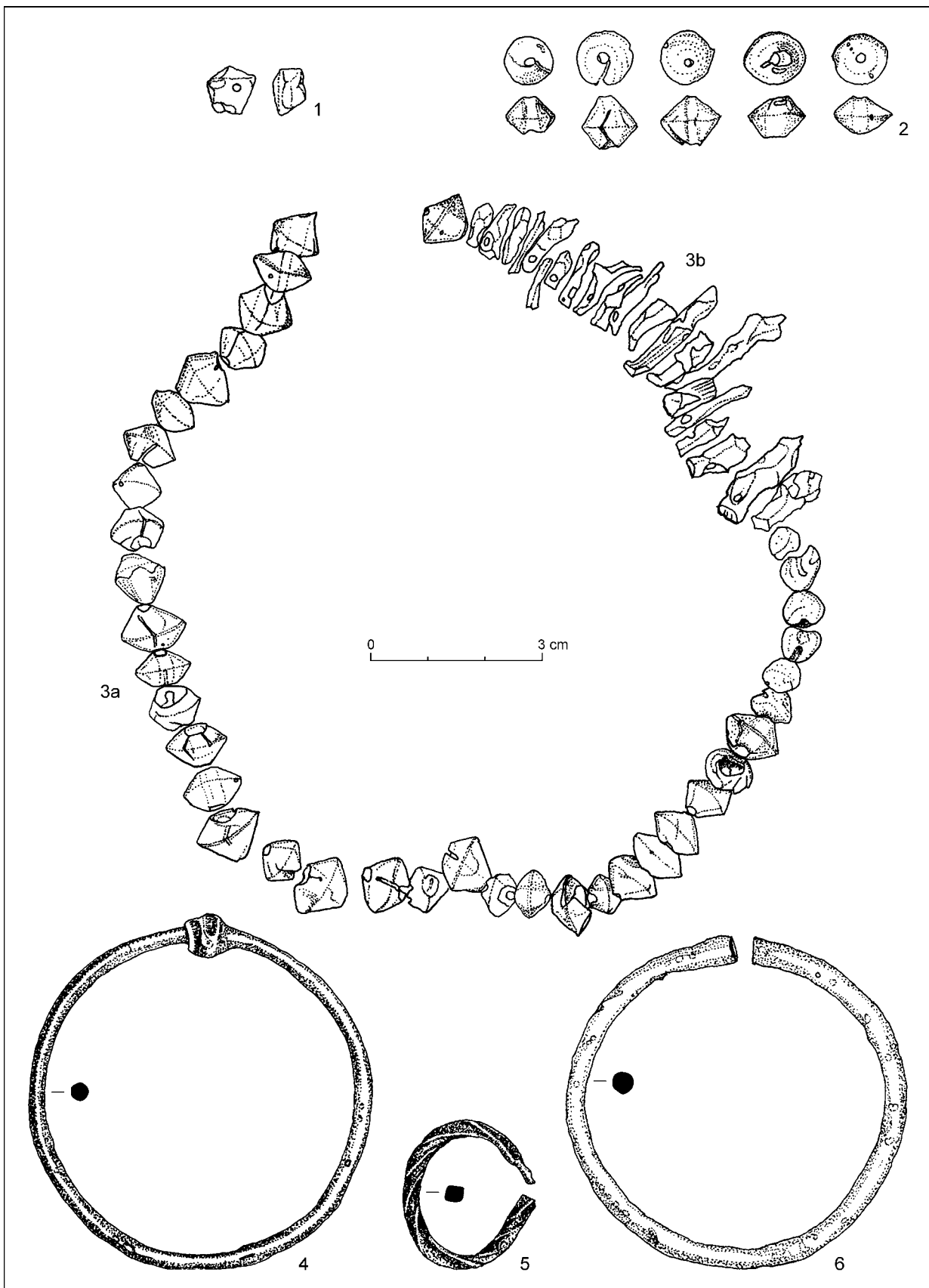


Fig. 14. Pilismarót-Basaharc. Grave goods from Grave 332. 1–3 – glass and coral beads; 4, 6 – bronze bracelets; 5 – bronze earring (drawing N. Mészáros).

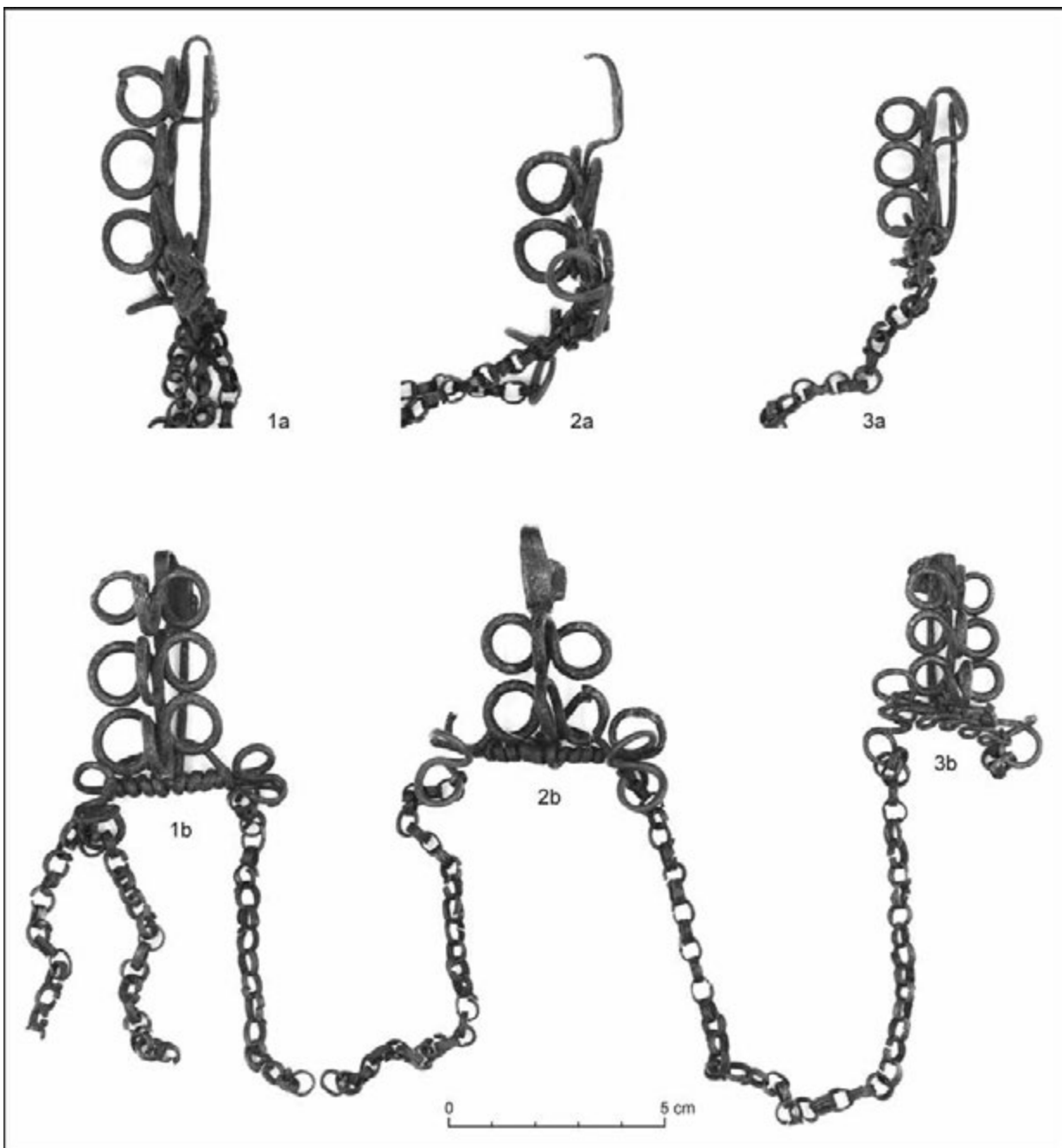


Fig. 15. Pilismarót-Basaharc. Bronze brooches linked by a chain from Grave 332 (photo K. Tankó).

7. Bronze brooch and bronze chain fragments (Fig. 15; 16: 1; *Bognár-Kutzián* 1975, pl. VI: 1; 1983, fig. 3).
8. Bronze brooch and bronze chain fragments (Fig. 15; 16: 2; *Bognár-Kutzián* 1975, pl. VI: 1; 1983, fig. 3).
9. Bronze brooch and bronze chain fragments (Fig. 15; 16: 3; *Bognár-Kutzián* 1975, pl. VI: 1; 1983, fig. 3).
10. Trapezoidal bronze pendant. Fitted together from two bronze sheets with repoussé decoration and a suspension ring. $47 \times 10 \times 3$ mm (Fig. 16: 4; *Bognár-Kutzián* 1975, pl. V: 1; 1983, fig. 3).
11. Trapezoidal iron pendant. Fitted together from two iron sheets. Strongly corroded, fragmented. $35 \times 7 \times 5$ mm (Fig. 16: 5; *Bognár-Kutzián* 1975, pl. V: 1; 1983, fig. 3).
12. Trapezoidal bronze pendant. Fitted together from two bronze sheets with repoussé decoration. $45 \times 22 \times 3$ mm (Fig. 16: 6; *Bognár-Kutzián* 1975, pl. V: 1; 1983, fig. 3).

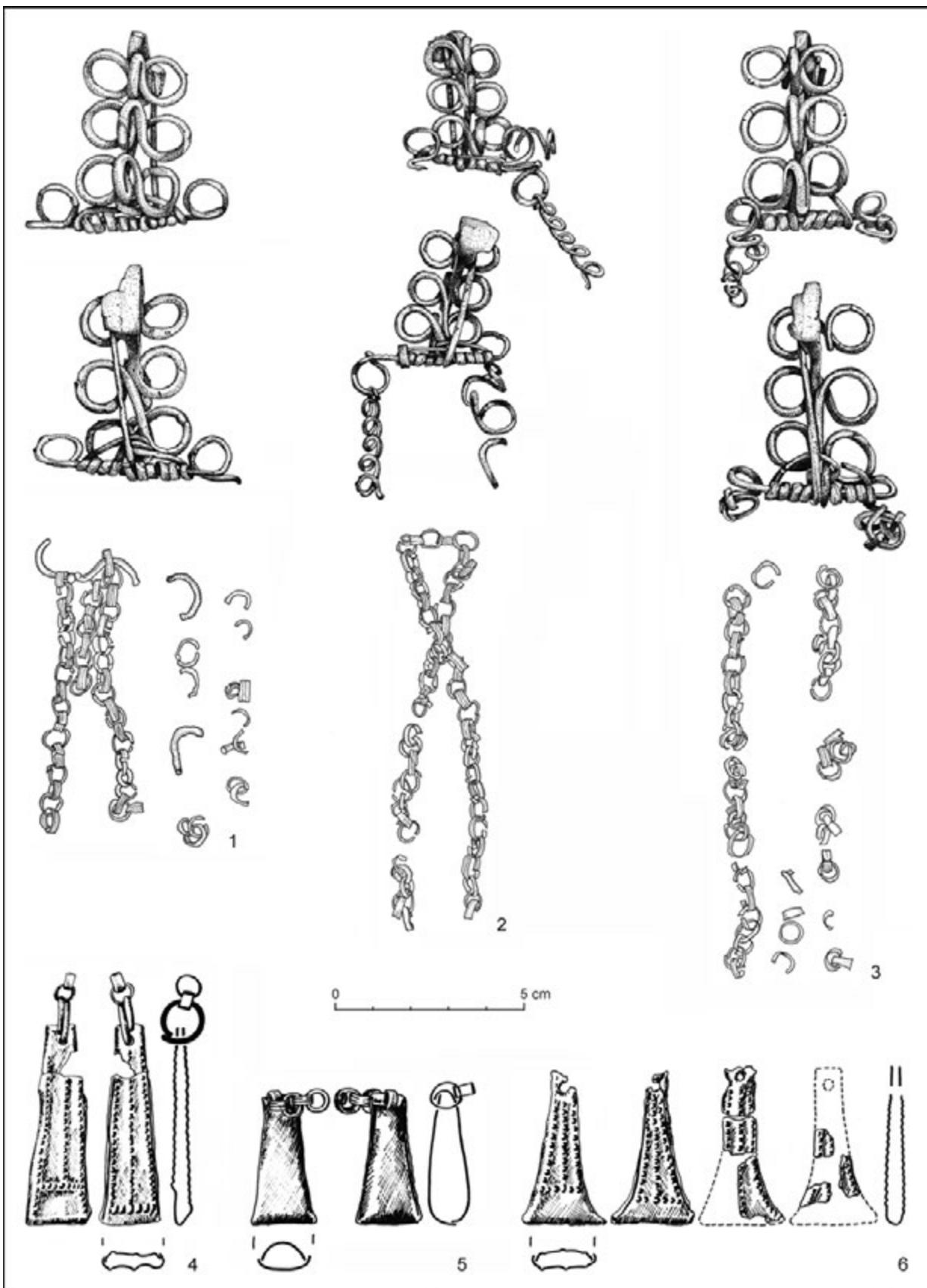


Fig. 16. Pilismarót-Basaharc. Grave goods from Grave 332. 1–3 – bronze brooches linked by a chain; 4–6 – bronze pendants (drawing N. Mészáros).

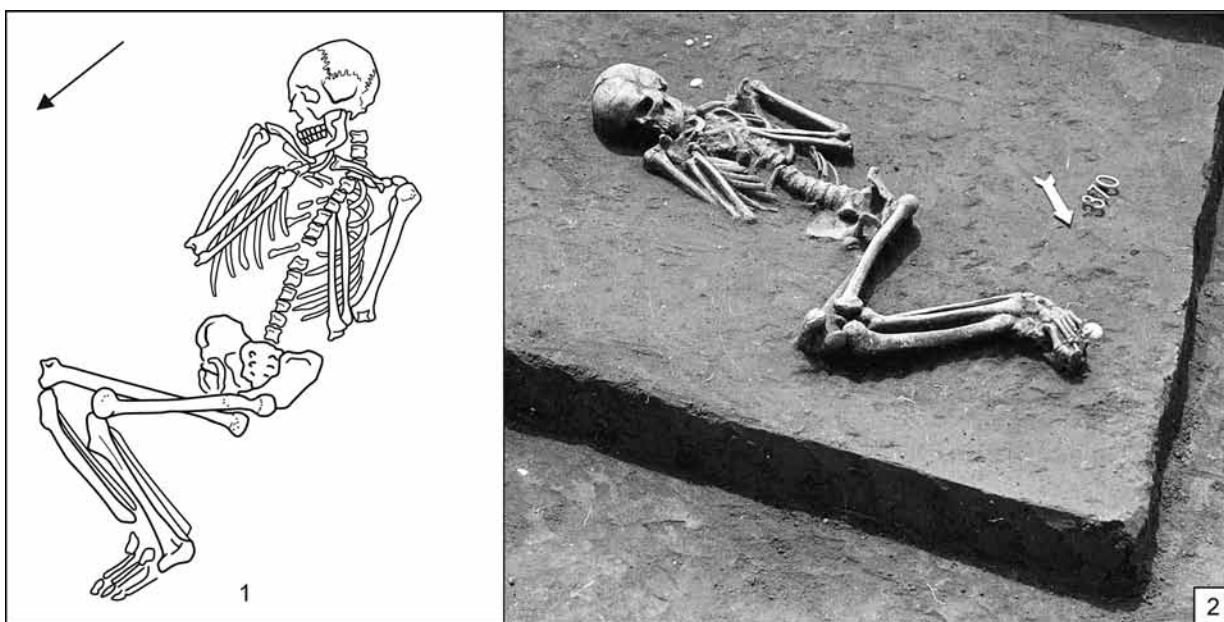


Fig. 17. Pilismarót-Basaharc. Grave 370 (original photo and drawing of the grave).

Grave 370

Inhumation burial uncovered in Square f/3. Inhumation burial laid supine in a semi-crouched position with the arms drawn up and the hands clasped under the chin, and the legs bent at the knees and drawn up on the right side. Two bronze brooches and an iron knife. A 'flintstone' under the skull and the pelvis. Snails around the body (Fig. 17).

Grave goods

1. Two identical bronze brooches. Arched bow, six-coil spring, globular moulding on the returned foot. Both are fragmented. Reconstructed dimensions: ca. $30 \times 9 \times 3$ mm (Fig. 18: 1, 2).
2. Chipped stones. Two pieces, prehistoric. $20 \times 15 \times 5$ mm, $16 \times 23 \times 3$ mm (Fig. 18: 6).
3. Bronze ring with boss. Diam.: 15 mm, Th.: 3 mm (Fig. 18: 5).
4. Bronze fragment. L.: 22 mm, Th.: 5 mm (Fig. 18: 1).
5. Iron fragments. Strongly corroded (Fig. 18: 3, 4).
6. Iron knife. Straight back, straight blade, downward-curved tang. Bent, strongly corroded. L. (total): 145 mm, W.: 21 mm, Th.: 3 mm.

DISCUSSION

The Iron Age burials lay mainly in the north-western part of the site's investigated area. However, it cannot be excluded that the Iron Age cemetery extended south-westward into the unexcavated area (Fig. 1), and therefore the cemetery's size can only be estimated at best. One crucial issue is the date of the earliest burials at the time the cemetery was opened. The burials with mortuary rites reflecting typical local traditions of the Early Iron Age form a distinct cluster at Pilismarót. Graves 265, 280 and 370 represent this group. These burials are characterised by a cremation or inhumation rite based on local traditions and grave goods of the Late Hallstatt period, which can best be traced in the grave pottery. Grave 265, a cremation burial, had the cremains deposited in a bowl, beside which lay animal bones and a pot (Fig. 7). Despite the uncertainties in the field documentation, the fragments of what was probably a bronze brooch, an iron knife and the fragment of a curved iron sheet had probably lain among the cremains (Fig. 8: 1; 9: 1). The cremains were deposited in a pot covered with a bowl in Grave 280 (Fig. 10; 11: 1, 2). An iron knife and a whetstone had been placed on the cremains, while a bent iron

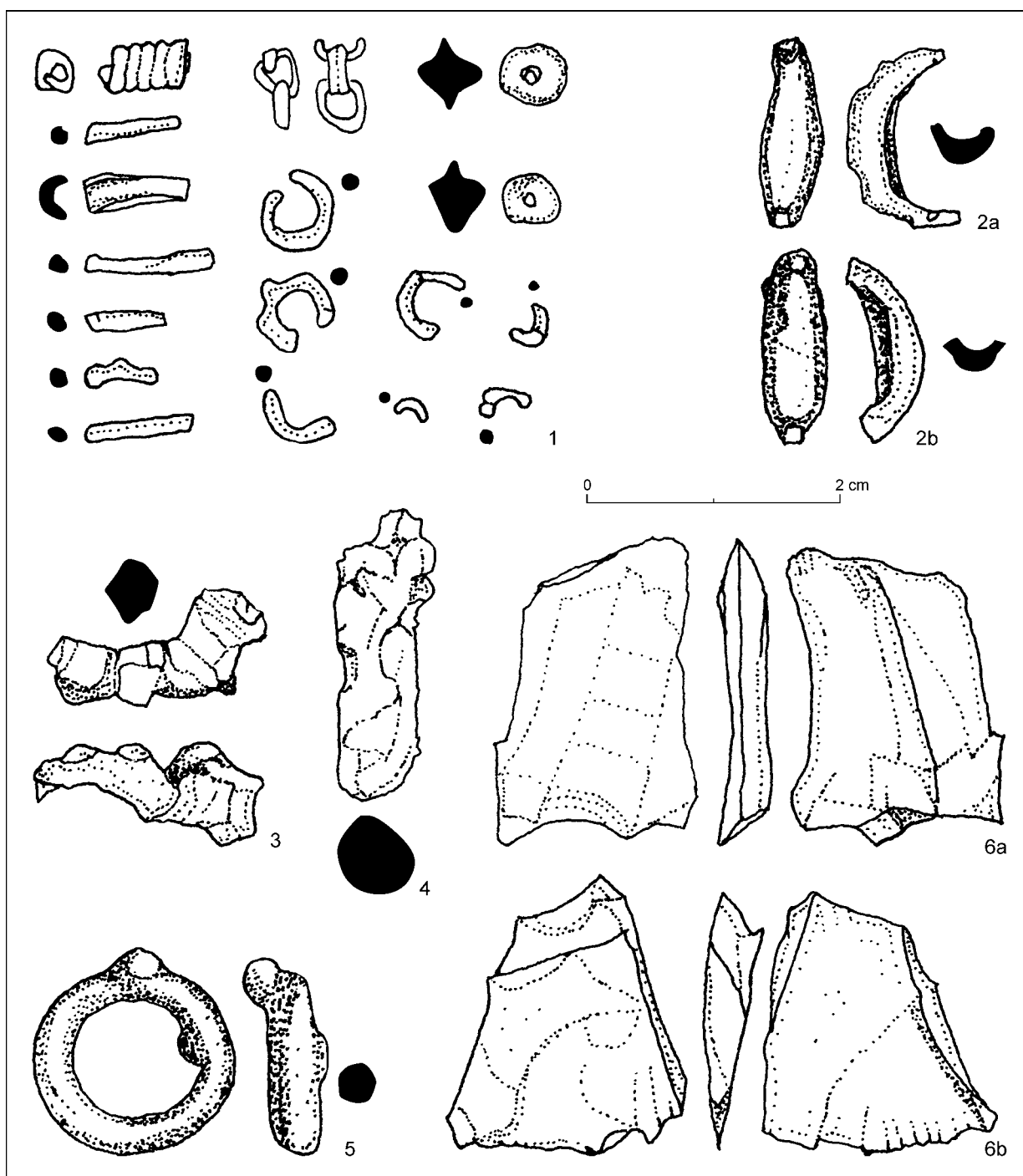


Fig. 18. Pilismarót-Basaharc. Grave goods from Grave 370. 1, 2 – fragments of two bronze brooches; 3, 4 – iron fragments; 5 – bronze ring; 6 – chipped stones (drawing N. Mészáros).

spearhead was found under the urn (Fig. 9: 2, 3). Grave 370 was an inhumation burial with the deceased laid to rest in a semi-crouched position (Fig. 17). The grave inventory comprised two bronze brooches, a bronze ring and an iron knife (Fig. 18: 1–6). Although their overall number is low, the burials resembling these three burials are nevertheless significant in terms of their nature. It is also quite possible that a larger number of graves containing burials deposited according to a similar rite and furnished with comparable grave goods lie in the cemetery's still unexcavated south-western part. Burial rites and artefact combinations of a similar type are often encountered in Early Iron Age cemeteries. Cremation was the dominant rite in the Eastern Hallstatt culture, with a part of the cremains generally deposited

in a vessel used as an urn (Molnár 2006, 205, 206, 216; Rebay-Salisbury 2016, 63–74). The growing proportion of inhumation burials can be noted from the sixth century BC onward, during the final phase of the Eastern Hallstatt culture in Transdanubia, where this rite dominated in some cemeteries (Jerem 1987; Metzner-Nebelsick 2002, 203, 204). One good parallel to Grave 370 of Pilismarót can be cited from nearby Süttő, where the graves of the flat cemetery lying between the tumuli also included burials deposited in a crouched position (Novinszki-Groma 2017, 474, pl. IV; VI). Small iron knives of the type found in Graves 265 and 370 at Pilismarót were also frequently deposited in the flat cemeteries of the Early Iron Age in Transdanubia, where they occur in both male and female burials (Đurković 2009, 79; Groma 2015, 158). The spearhead found in Grave 280 was the typical weapon of Eastern Hallstatt warriors (Egg 1996; Jerem 1981a, 108, fig. 5; 1981b, pl. V: 1–5; Nebelsick 1997). Weapons can usually be regarded as personal items that reflected the social status and the prestige of the deceased. The culture's imagery indicates that spears were used not only in war, but also in hunting and for slaughtering animals in a sacrificial context (Rebay-Salisbury 2016, 82, 202).

Cultural impacts from the Vekerzug culture can be reckoned with regarding both the burial rite and the grave goods. Inurned cremation burials and inhumation burials – the latter often with the body laid in a crouched position – were common both in the flat cemeteries of the Eastern Hallstatt culture and the biritual burial grounds of the Vekerzug culture (Đurković 2009; Kemenczei 2009, 27–34; Kozubová 2013, 238–266; Molnár 2006; Novinszki-Groma 2017). Additionally, countless similarities can be noted in the material record, particularly the pottery, of the eastern and western half of the Carpathian Basin in the latest phase of the Hallstatt period, during the sixth and fifth centuries BC. Burials of the Early Iron Age population of the type attested on the Hungarian Plain, in Northeastern Hungary and in Southwestern Slovakia have also been uncovered in the Danube Bend (Ilon 1985; Kemenczei 2010), suggesting that this region was a major contact zone between the archaeological cultures with cultural ties predominantly towards the west and the cultures maintaining contact with the east in the Carpathian Basin. However, the presence of elements of the Vekerzug culture in the Pilismarót cemetery can hardly be interpreted as an indication of a 'Scythian' presence or influence. It must be borne in mind that the Vekerzug culture can in part be derived from distinctive local traditions and that the eastern 'Scythian' element is merely one of the components in the culture's make-up, the implication being that the identification of the culture's population with the Scythians as an ethnic group remains controversial, as has been recently convincingly demonstrated (Kozubová 2019).

It would appear that the earliest horizon of the excavated section of the Pilismarót burial ground is represented by Graves 265 and 280, both cremation burials. The burial rite and the grave goods of these two burials have much in common with the sixth–fifth-century burials of the Late Hallstatt culture and the Vekerzug culture, with which they were probably contemporaneous. The semi-crouched inhumation burial of Grave 370 was probably slightly later. This burial rite also has its analogies in the sixth–fifth-century BC burial grounds of the Late Hallstatt and Vekerzug cultures. It would thus appear that the beginning of the cemetery's use can be dated to the Ha D2–3/Lt A2 transitional period, the middle and final third of the fifth century BC.

The burials of the individuals interred in costumes lavishly outfitted with bead jewellery form a well-definable group in the cemetery's next phase. Outstanding among these burials is Grave 332, whose brooches (Fig. 15; 16: 1–3) garnered much scholarly attention following their publication (Bognár-Kutzián 1975, 37, pl. VI: 1), principally because a typologically identical brooch came to light at Čurug, a village on the Tisza in the Bačka region of Serbia (Garašanin 1954, 40, fig. 5; 6; pl. 28; Grbić 1928, 10–22, pl. 1: 5). However, the assemblage from Čurug was not recovered from a burial, but was a lavish silver hoard made up of local and imported articles, the latter with rich filigree decoration, which has been discussed from several aspects in international scholarship (Ljuština 2013, 99; 2014, 167–169; Márton 1933, 81, 82; Sörös 2021, 110; Vasić 1995, 83–85). The outstanding significance of the Čurug hoard is reflected in that it was designated as representing a separate chronological phase characterised by the joint occurrence of Late Hallstatt and Early La Tène female costume accessories. The Čurug phase was correlated with the Central European La Tène B1 (Božić 1981, 315, 316; Dizdar 2012, 13). From our perspective, one of the important aspects is that this hoard – alongside other assemblages – provides incontestable proof of the first contacts between local communities and the Celtic world, as indicated by the Dux/Duchcov-type bronze brooch in the Čurug hoard (Ljuština 2020, 338; Sörös 2021, 111). The other articles in the hoard can in part be linked to the Thracian cultural province where several similar hoards of silver jewellery have been found, which are dated to the fourth century BC. However, the use of certain articles in the Thracian hoards spanned a relatively long period of time, from the sixth to the fourth century BC (Simon

2022, 276). Čurug-type brooches and exemplars with passementerie bows can be assigned to the late fifth and the fourth century (Kozubová 2013, 53, note 89; Ljuština 2010, 61; 2020, 338; Potrebica/Dizdar 2014, 152; Rustoiu 2022, 53). Aside from the exemplars recovered from Grave 332 of the Pilismarót cemetery (Bognár-Kutzián 1975, 38, pl. VI: 1), Čurug-type brooches have also been found at Mikulčice in Moravia (Ludikovský 1962, fig. 1: 3, 5) and in the Vratnica II tumulus in Northern Macedonia (Čović 1987, 633, pl. LXV: 3, 7). At Pilismarót, the Čurug-type brooches were adorned with triangular bronze pendants suspended from chains. These pendants are typical types of the Hallstatt culture, coming both in cast solid varieties and hollow variants made from two metal sheets fitted together. Some are plain, others are decorated with rows of repoussé punctates (Laharnar 2018, 230, 231, fig. 10). Trapezoidal bronze pendants are known from Solymár (Maróti/Kecskés 2008, 55, fig. 5), Ménfőcsanak (attached to a bird-headed brooch; Vaday/Tankó 2020, fig. 15: 2, 3), Sopron, Graves 18 (Jerem 1981b) and 29 (Jerem 1981a, 114, 115, fig. 7: 7–10), and Balf in Hungary (Jerem 1981b, 203, Fn. 15), as well as from Mannersdorf (Ramsl 2011, 133, pl. 79: 7b) and Dürrenberg in Austria (Penninger 1972, pl. 24: B3). Comparable pendants have been reported from the Northwestern Balkans, too, for example from Most na Soči and Posočje (Laharnar 2018, 226, fig. 7: 15–19; Teržan/Lo Schiavo/Trampuž-Orel 1984–1985, 34, 35, No. 14), Grobnik (Hunyady 1942–1944, fig. 1: 1; Ljubić 1889, pl. 33: 246) and Osijek (Todorović 1975, fig. 13), usually recovered from burials or from sites regarded as cult locations. In our view, the archaic modelling of Čurug-type brooches and the triangular bronze pendants attached to them by chains clearly hark back to Early Iron Age traditions of costume accessories and are not the products of the La Tène culture. Given their archaic nature, the use of Čurug-type brooches probably began at roughly the same time as the fashion of Velem-type brooches ornamented with triangular plates (Jerem 1996, 92–97), i.e. in the fifth century BC.

Similarly to the other female and girl-child burials at Pilismarót, Graves 53 and 332 contained a high number of glass beads in the area of the head and on the upper body of the deceased (Fig. 2; 12). In view of their position in the burials, the beads had been strung into necklaces, or had perhaps been used for trimming the costume, or had been braided into the hair. However, further studies are needed to exactly determine how they had been worn. The many glass bead finds attest to their immense popularity as jewellery items, particularly during the Late Hallstatt and Early La Tène period in Transdanubia and in the regions to its west and south. Suffice it here to mention the translucent blue glass beads, the large translucent turquoise biconical glass beads and the hyacinth blue globular and disc glass beads from Ménfőcsanak (Uzsoki 1987, 34, pl. 7: 3b; Vaday/Tankó 2020, 508, 509, fig. 4: 8; 5: 4). Good analogies to the turquoise biconical glass beads are known from Dürrenberg (Moser/Tiefengraber/Wilschke-Schrotta 2012, 198, 199), Pottenbrunn (Ramsl 2002, 63, fig. 58, pl. 49: 4), Mannersdorf (Ramsl 2011, 131, fig. 105), Au am Leithaberge (Ramsl 2011, 131, fig. 105), Dubník (Bujna 1989, pl. 24: 8a–f) and Solymár (Maróti/Kecskés 2008, 55, fig. 4). The biconical and rhomboidal beads found at Pilismarót are also attested in Eastern Europe, in the Northern Pontic region, where the monochrome biconical and rhomboidal beads can be assigned to the relatively short time-span between the later fifth century and the initial quarter of the fourth century BC in the chronological framework based on Greek pottery and Scythian arrowheads (Polin/Daragan 2021). However, only after the detailed archaeometric analyses of trace elements can it be determined with any degree of confidence whether, aside from the similarities in colour and form, there was a closer connection – such as a shared origin or workshop – between the glass beads of the steppe region and the Carpathian Basin.

Of the glass beads recovered from the Pilismarót burials, the amphora beads merit special attention (e.g. 42 pieces were found in grave 110, see Fig. 6: 1). These remarkable beads have attracted much scholarly attention during the past decades, with several studies devoted to their distribution, chronological position and cultural significance. There is a general consensus that the production and use of glass amphora beads falls between the later fifth and the earlier third centuries BC (Meduna 1970, 231, 235; Venclová 1990, 59). It was previously thought that they first appeared in the female burials of Macedonia, followed by their spread to the Carpathian Basin along the Danube and to the Western Balkans along the Adriatic coast (Popović 1997, 168). The archaeological record indicates that amphora beads occur in high numbers in the Eastern Balkans and on the Pontic littoral (Rustoiu 2008, 52–75). It has been suggested that glass amphora beads had chiefly been the products of Macedonian workshops (Laharnar 2018, 215; Popović 1997). Another interesting point raised more recently is that necklaces with amphora beads were perhaps a reflection of the Celts' interest in Mediterranean wares, which waned after the aborted Celtic campaigns in the Southern Balkans (Popović 2000, 274, 275). Yet, it must here be noted that amphora beads, although in much lower numbers, have also been found in Italy, mostly in the northerly regions, where they were recovered from female and child burials of the fourth century BC (Vellani 2000, 42–45). At the

same time, there are few other articles of Southern Balkanic origin or reflecting its traditions in the Danube region. It would appear that the booty from the Balkanic campaigns rarely made it back to Central Europe. While the route of the glass amphora beads can perhaps be most easily traced, these beads could only be plausibly linked to the Celts' Balkanic campaigns if this distinctive jewellery item had reached the Carpathian Basin in the third century BC or later (*Schönfelder 2007*, 308, 309). However, most of the currently known assemblages containing amphora beads are much earlier, dating from the fifth and fourth centuries BC in the Middle Danube region. More recent evidence would suggest that aside from Greece, amphora beads had also been produced in Adriatic and Pontic workshops (*Blečić-Kavur/Kavur 2017*, 103, 104; *Rustoiu 2015*, 365). It must also be borne in mind that on some sites, glass amphora beads were found together with other glass, coral and amber beads, usually strung into the same necklace. It would appear that these articles were diffused together, spreading either through trade or other contacts, and that the Amber Road probably played an important role (*Rustoiu 2015*, 365–369). This artefact type also occurs in significant numbers in regions such as Bosnia and Slavonia, both of which lay farther from the trade artery reconstructed as the Amber Road in the Eastern Alpine region (*Dizdar/Potrebica 2002*, 123–129). The finds from these regions and the pieces brought to light along the Vardar-Morava route clearly indicate that glass amphora beads and associated finds circulated north of Macedonia along this route, which had been intensely used during the Early Iron Age (*Potrebica 2008*, 198, fig. 3; *Rustoiu 2022*, 53). An association was earlier posited between the Čurug hoard and the clear colourless or, more rarely, coloured (blue or green) amphora beads, which in the Northern Balkans represent a well-definable chronological horizon that can be correlated with the La Tène B1 (*Božić 1981*, 315). Amphora beads had probably been prestigious commodities that reached westerly and northerly regions in the wake of the increasingly dynamic contacts between Celtic communities and the Mediterranean cultures (*Blečić-Kavur/Kavur 2017*, 103, 104, fig. 4). The presence of glass beads in the Middle Danube region provides tangible proof of these contacts. The most important sites yielding glass beads in the Carpathian Basin are Budapest, Csepel Island (*Horváth 2016*, pl. 2: 1–8; 2018, pl. 2: 1–7; 2019, 26, Cat. No. 70), Pilismarót, Ménfőcsanak (*Vadai/Tankó 2020*, 509, pl. XI: 3) and Mannersdorf (*Ramsl 2011*, 131, fig. 105; pl. 81: 8), while the distribution of the beads can be traced as far as Brno in Moravia in the north (*Čížmářová H. 2021*, 245, 246, fig. 13; *Čížmářová J. 2011*, 81, 108, 109, pl. 5: 8; 30: 13; *Ludikovský 1962*, 78, fig. 4). In sum, the appearance of glass amphora beads provides yet another archaeological confirmation – in addition to several others – of the close connections between the Balkans and Central Europe in the early phase of the La Tène culture (*Rustoiu 2022*, 51–53), connections whose origins lie in the Late Hallstatt period (*Soós 2021*).

A bronze pendant resembling the amphora beads came to light from the fill of a Late Hallstatt/Early La Tène building at Most na Soči (*Laharnar 2018*, 215, fig. 6: 1). A similar amphora pendant of bronze was part of a remarkable set of bronze pendants strung on a spiral wire found by a metal detectorist at Loge near Bodrež (*Guštin 1991*, 12, pl. 40: 22; *Laharnar 2018*, 215, fig. 6: 3). This piece is all the more important because the amphora pendant and the triangular pendant were both suspended from the bronze spiral wire (perhaps once part of a brooch), providing not merely a contextual analogy, but also a direct formal connection.

Aside from the glass beads, the grave assemblages uncovered at Pilismarót included amber beads of various forms and sizes (Fig. 3: 1, 10). The generally accepted view is that the wide array of amber articles reached Central Europe through the inter-regional contacts along the Amber Road. Regional variations can be noted in the quantity and types of amber articles, the way they were worn and their deposition pattern, which underwent certain changes during the Early Iron Age. Some burials of the Hallstatt culture were lavishly outfitted with amber costume accessories (*Duleba/Markiewicz 2022*). The high number of amber beads found in Iron Age burials is an indication that in addition to the Carpathian Basin, the Northern and Central Balkans were also important markets for amber from the seventh century BC onward. Trade in amber peaked in the later sixth and earlier fifth centuries, when amber articles became requisite grave goods of the burials of the elite in the Northern and Central Balkans. It would appear that amber reached the Central Balkans along the Eastern Alpine trade artery, through Italy, as shown by the stylistic traits of the rare figural carvings (*Palavestra 2006*, 52–64). In addition to the trade route from Italy across the Adriatic, another route is posited along the Vardar–Morava corridor to the Central Balkans, perhaps a less significant or more dangerous one (*Palavestra 2006*, 52–64, fig. 32; 34). Amber remained a popular raw material of jewellery in Central Europe during the La Tène period, too, although its use declined significantly, as did its quantity, from the later fourth century BC (*Duleba/Markiewicz 2022*, 5–14).

The high number of amber beads recovered from the Pilismarót burials is outstandingly important for the reconstruction of the assumed amber trade route along the Danube. Some of these beads have

an impressive size (e.g. the piece from Grave 53; Fig. 3: 10). Female costume embellished with strands of amber beads have been found in other early Celtic burials in the Danube Valley and in its proximity, for example at Paks-Gyapa (Tankó 2012), Budapest-Csepel (Horváth 2019, 60, Cat. Nos. 73, 74), Ménfőcsanak (Uzsoki 1987, 34, 35, pl. 7: 1; Vaday/Tankó 2020, pl. IV: 18; V: 3; XI: 2–5), Alsónyék (Soós 2021, fig. 6: 11) and Sopron-Krautacker (Jerem 1981a, fig. 7: 3), as well as at Mannersdorf (Ramsl 2011, 131, fig. 105) and Pottenbrunn in Austria (Ramsl 2002, 64, fig. 58).

Aside from amber and glass, the other notable raw material of the beads from the Pilismarót burials was coral (Fig. 3: 1b; 13: 4; 14: 3b). Coral beads and other jewellery items were traditionally made from Mediterranean red coral (*Corallium rubrum* L.) in the Iron Age. Red coral is a sessile coelenterate characterised by a dense calcareous axial skeleton. Currently, its geographical distribution covers the entire western basin of the Mediterranean, a part of the Adriatic and some isolated points of the Eastern Mediterranean, as well as the Atlantic in the vicinity of Gibraltar. It grows on rocky surfaces in dark environments, usually in depths exceeding 10 meters under sea level. Although characterised by a low growth, the species is fertile early, ensuring that overfishing does not threaten the colonies (Harmelin 2000, 11, fig. 4). This was particularly true in ancient times when harvesting was done with simple techniques involving fishermen diving naked from their small boats and collecting the branches growing in shallow depths by hand. Harvesting coral was a dangerous undertaking owing to the rudimentary diving techniques employed in prehistory, making coral, the ‘red gold of the Mediterranean’, a rare and highly prestigious commodity in the Iron Age (Bresc 2000, 41). Coral was principally harvested in the Western Mediterranean during Antiquity; more recently, it has been suggested that other regions such as the Dalmatian coast, which maintained direct contact with the Carpathian Basin, had also been important sources of red coral (Schmid-Sikimić 2000, 147).

Coral beads and jewellery embellished with coral inlay were widely used in Central Europe. The distribution of the finds indicates that the main trade routes from the Mediterranean to the Late Hallstatt and, later, the Early La Tène culture led through the Rhône Valley and the Alpine passes in the west, and along the Amber Road in the Eastern Alpine region. The grave assemblages reveal that as a prestigious jewellery item, red coral was mainly worn by children and young women (Fürost 2014) and it seems likely that one of the reasons for the use of coral as jewellery was its vivid colour in an age when few materials with bright colours were available. Archaeological corals were exposed to various chemical and physical processes during the past two thousand years, as a result of which their colour can fade to a whitish hue. A recently proposed modern analytical procedure enables the secure differentiation of jewellery items made from coral and other raw materials. An adornment made from bone or with bone inlay was probably less valuable than a piece embellished with exotic red coral, even if smaller in size (Fürost et al. 2016). DNA fingerprinting for the taxonomic identification of corals is another promising method (Lendvay et al. 2020). At a time when vivid colours were rare, corals with their bright red colour probably signalled social status (Fürost et al. 2016, 19). The distribution of coral and the extent of its use allow the mapping of trade routes as well as of distribution and consumption centres. Looking at coral together with other minerals and products offers an insight into, and a better understanding of, Iron Age trade, communication and social organisation. Aside from Pilismarót, coral beads have been found at Sopron (Jerem 1981a, fig. 7: 4), Kosd (Schmid-Sikimić 2000, fig. 8: 10–11), Ménfőcsanak (Uzsoki 1987, 35, pl. 7: 2; 18: 2; Vaday/Tankó 2020, pl. IV: 3–7; V: 5) and Budapest-Csepel (Horváth 2019, 59, Cat. Nos. 61, 69) in the Carpathian Basin; similarly to Čurug-type brooches and amphora and amber beads, coral travelled as far as the Brno area in Moravia to the north (Čiřmářová H. 2021, 244–246, fig. 13) and Dürrenberg in the Alps to the west (Wendling 2014, 10, 11, fig. 3).

The remarkable finds from the Pilismarót cemetery include the silver melon beads from Grave 53 (Fig. 3: 4). Melon beads made of precious metal represent a distinctive type in the Northern Balkans and are also attested, although more rarely, in the Carpathian Basin. The closest analogies to the Pilismarót beads are the silver filigree-decorated melon beads from the Beremend and Szentlőrinc cemeteries in Transdanubia (Jerem 1968, 25, fig. 41: 1, 26; 44: 2; pl. XL: 3; 1973, 66, fig. 5: 5; Soós 2021, fig. 1B: 9), and Umčari near Belgrade and Glasinac in the Northern Balkans (Benac/Čović 1957, 114, pl. XXXVII: 10; XLVII: 16–18; Garašanin 1960, 86–91, fig. 8: 9). Several variants of silver beads are known in the Northern Balkans and the Carpathian Basin, including barrel-shaped, spherical, conical and melon varieties, some with filigree decoration: most were recovered from pre-Celtic and Celtic contexts and date from the sixth and fifth centuries BC (Rustoiu 2017, 195–197).

The grave inventory of Grave 53 included a pair of bronze brooches linked by a chain, a product of the Early La Tène culture (Fig. 3: 11–13). The bow of one brooch is decorated with an S-motif (Fig.

3: 11), an ornamental element of early Celtic art (Nortmann 2016). A similar decoration appears on the pre-Dux/Duchcov-, Dux/Duchcov- and Münsingen-type brooches in the core territory of the La Tène culture (cf. Giessler/Kraft 1944, 68, fig. 13: C/8; Hodson 1968, pl. 22, Cat. No. 799; Kaenel 1990, 65, 66, pl. 5; Corsier T.1: 2, pl. T.68: 1). The bow of the other brooch is grooved, which is also attested in the Lt B1 period (e.g. on Münsingen-type brooches; Hodson 1968, Cat. Nos. 529, 582, pl. 31; 36; Kaenel 1990, pl. 51; T. 63: 1). It must here be noted that the brooch types of the Pilismarót cemetery have much in common with the analogous fourth-century pieces from Velika, an oft-quoted site with a major relevance for the interpretation of cultural connections. The finds from this site include a rich array of costume accessories, among which Early La Tène zoomorphic brooches and Sanski Most-type brooches of the Northwestern Balkans are both represented. Other costume accessories were bronze and silver bracelets and bead strands strung of amber and glass beads, the latter including a handful of amphora beads (Dizdar/Potrebica 2002, 114, 115, pl. 1–4; Drnić 2020, 427, fig. 2; Majnarić-Pandžić 1996, 35–37, fig. 1; 2). One point that emerges clearly is that the grave inventories from Velika comprise both articles that can be associated with the Central European La Tène culture and elements of local Balkanic origin (Dizdar/Potrebica 2002, 114, pl. 1–4; Popović 1996, 106, fig. 2; 3). It would appear that the individuals interred at Velika had followed the Central European La Tène tradition in terms of their costume, to which they added a few local elements. The site illustrates the acculturation process along the north to south communications route in the Southern Pannonian contact zone: the archaeological record from Pilismarót would suggest that the impact of this process extended as far as the Danube Bend. Recent research findings and particularly one of the burials uncovered at Aradu Nou in Romania indicate that a communications channel similar to the one between the Western Balkans and the Middle Danube region can be postulated between the Western Balkans and Transylvania (Rustoiu 2022, 56, 57, fig. 9; 10).

The snail from Grave 53 (Fig. 3: 9) is another noteworthy find. The *Turritella* snail was deposited as an amulet in the child burial. This exemplar is perforated and has a strongly worn surface, an indication that it had been worn for a long time. Although the exact species identification is lacking, the primary external traits suggest that it is a marine snail originating from the Mediterranean, which is hardly surprising in view of the fact that marine molluscs, mainly of the Cypraeidae family, have been brought to light on several sites in the Carpathian Basin, reflecting their widespread use as jewellery during the Ha D2–3/Lt A transitional period (Kozubová et al. 2022, 289–293).

Relatively few vessels came to light from the Pilismarót burials. The closest analogy to the bowl from Grave 265 is known from Zagersdorf, where it was found together with a Velem-type brooch (Jerem 1996, 92, 93, fig. 2; 3), Sopron-Krautacker (Jerem 1981a; 1981b; 1987) and the Bučany cemetery, where a horn-handled cup with a similar impressed decoration around the shoulder of the Ha D2–3 period also came to light (Bujna/Romsauer 1983, pl. II: 10; X: 3; XIII: 2), similarly as at Sopron (Jerem 1981a, fig. 8: 2; 1987). Parallels to the globular vessel from Grave 265 and the typologically similar, but biconical vessel from Grave 280 can similarly be cited from the Bučany cemetery (Bujna/Romsauer 1983, pl. III: 11; VIII: 14; XI: 19). Good analogies to the bowls and the biconical vessels from Pilismarót occur in the find material from Sopron-Krautacker and Bučany, generally from Ha D2–3/Lt A contexts (Bujna/Romsauer 1983, pl. IV: 17; X: 17; Jerem 1981b, pl. 3: 17; Schweltnus 2011, 366, 367, fig. 7), although their use can be traced to the Lt B1 phase, which saw the appearance of wheel-turned vessels.

A look at the distribution of amphora and other glass beads as well as of coral and amber jewellery reveals that they mainly occur in regional central areas that played a prominent role in long-distance trade and were simultaneously arenas of political and cultural interactions. It is also striking that most of these jewellery items were recovered from a specific group of female and child burials. On the testimony of the current record, it would appear that certain costume accessories and find combinations played a prominent role in signalling gender identity during this phase of the Iron Age (Rustoiu 2022, 51–58). Colourful costumes richly adorned with beads probably also indicated the deceased's high status. The two coral amphora beads found at the Thesmophorion of Oria in Southern Italy where women's festivals were held can likewise be linked to female identity (Ugolini/Rondi-Constanzo/Perrin 2000, 142, fig. 4). Gender identity could be clearly demonstrated in the Early Iron Age cemetery of Szentlőrinc (Jerem 1968) – the multivariate statistical analysis of the grave goods revealed that the artefact types of one group consistently came from grave assemblages of individuals of the same sex. Brooches, amber and glass beads, and spindle whorls appear to have exclusively accompanied women, while the male burials were generally furnished with iron spears, iron belt plates and long iron knives (Schneider 2020, 124, 125, fig. 22). At the same time, objects often associated with females were not restricted to adult burial assemblages. Brooches as well as

necklaces strung of amber and glass beads were recovered from the burials of the youngest age groups in the Sopron-Krautacker, Szentlőrinc and Alsónyék cemeteries (*Jerem 1981b*, 209, 210, 212, Fn. 59–60, pl. 3: 1–11; *Soós 2022*, 183–185).

The articles drawn from different cultural traditions and reflecting diverse regional traits recovered from burials uncovered on various sites indicate that amphora beads as well as coral and amber jewellery were prestigious elements of an international fashion that was adopted in both Central Europe and the Balkans in the fifth and fourth centuries BC, i.e. during the early phase of laténisation. At the same time, these costume accessories clearly signalled their owners' higher social status, economic potential and their prominent role in long-distance trade (*Blečić-Kavur/Kavur 2017*, 104).

CONCLUSION

In the light of the above, Pilismarót can be regarded as a key site of Central Europe in several respects. The earliest burials and the layout and expansion of the cemetery demonstrate that the local Late Hallstatt population and the early Celts arriving from the west were part of the same community, in which they commingled culturally, and that they interred their dead in the same burial ground. The transition between Late Hallstatt and Early La Tène can be clearly traced in the later fifth and the earlier fourth centuries; the assessment of the grave inventories, the study of the cemetery's horizontal stratigraphy and the creation of a fine-tuned chronology will no doubt add a wealth of new details to this process. The appearance of western jewellery items in the burials characterised by local burial rites that were furnished with grave goods reflecting local traditions offers tangible proof of early laténisation. The mortuary population at Pilismarót included individuals who expressed their identity through bronze and glass amphora beads as well as coral and amber jewellery. Together with the silver melon and biconical beads and the Čurug-type brooches, these jewellery items point towards dynamic contacts with the south, which in turn indicates that Pilismarót was a major hub in west to east and south to north trade and cultural connection, a role arising also from its geographic location. The focused study of these connections, including the identification of possible kinship relations, is currently in progress as part of the assessment of the burials. The initial findings of the DNA analyses suggest that the network of connections was far more intricate than previously assumed.

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Pilismarót-Basaharc: Pohrebisko z neskorej doby halštatskej/staršej doby laténskej predstavené na základe niekoľkých vybraných hrobov

Erzsébet Jerem – Károly Tankó

Súhrn

Pilismarót-Basaharc je kľúčovou lokalitou pre výskum prechodu medzi staršou a mladšou dobou železnou, ako aj pre poznanie včasných dokladov prítomnosti Keltov v Karpatskej kotline. Pilismarót-Basaharc leží v ohybe Dunaja na južnom brehu, oproti sútoku tejto rieky s Ipľom. Archeologická lokalita sa nachádza na okraji územia pravidelne zaplavovaného v obdobiach pred reguláciou koryta. Táto štúdia ponúka stručný prehľad archeologického výskumu lokality a použitých výskumných metód, po ktorom nasleduje opis a diskusia o typických pohrebných obradoch a o najčastejších typoch hrobových prídavkov na základe rozboru piatich vybraných hrobov. Osobitne sa zameriavame na jantárové, korálové a sklenené koráliky, a najmä na pôvod a rozšírenie sklenených amforovitých korálikov. Zdá sa, že podobné pohrebné rituály a kombinácie artefaktov sa na pohrebiskách zo staršej doby železnej vyskytujú často. V súvislosti s pohrebným rítom aj s hrobovým inventárom možno počítať s kultúrnymi vplyvmi z východohalštatskej a vekezugskej kultúry. Analyzované a prediskutované sú najvýraznejšie typy artefaktov kultúr zo staršej doby železnej doložené v Pilismaróte, najmä spony typu Čurug a ďalšie predmety. Početné nálezy sklenených korálikov svedčia o ich obrovskej obľube ako šperkov, najmä v neskorej dobe halštatskej a na začiatku doby laténskej v Zadunajsku a v regiónoch západne a južne od neho. Amforovitým korálikom sa v tejto štúdii venuje osobitná pozornosť.

Okrem sklenených korálikov sa v hroboch objavených v Pilismaróte nachádzali aj jantárové koráliky rôznych tvarov a veľkostí. Vysoký počet jantárových korálikov získaných z hrobov v Pilismaróte je mimoriadne dôležitý pre rekonštrukciu predpokladanej obchodnej cesty s jantárom pozdĺž Dunaja. Ďalšou významnou surovinou korálikov z hrobov v Pilismaróte bol stredomorský červený koral. Koral ako surovina v kontexte s ďalšími minerálmi a výrobkami umožňuje nahliadnuť do obchodu, komunikácie a sociálnej organizácie v dobe železnej a lepšie ich pochopiť. K pozoruhodným nálezom z pohrebiska v Pilismaróte patria strieborné melónové koráliky z hrobu 53, ktoré majú analógie na severnom Balkáne a v Karpatskej kotline, vrátane súdkovitých, guľovitých, kužeľovitých a melónovitých typov, niektorých i s filigránovou výzdobou, z ktorých väčšina bola získaná z predkeltských a keltských kontextov a datuje sa do 6. a 5. stor. pred n. l. Hrobový inventár hrobu 53 obsahoval dvojicu bronzových spôn spojených retiazkou, ktoré sú produktom včasnej laténskej kultúry (obr. 3: 11–13; 4).

Lučík jednej zo spôn je zdobený esovitým motívom, ornamentálnym prvkom raného keltského umenia. Najstaršie pohreby, organizácia a rozrastanie pohrebiska dokazujú, že miestne neskorohalštatské obyvateľstvo a raní Kelti prichádzajúci zo západu boli súčasťou toho istého spoločenstva, v ktorom sa kultúrne premiešavali, a svojich mŕtvych pochovávali na tej istej nekropole. Prechod medzi neskorou dobou halštatskou a včasnou dobou laténskou možno jasne sledovať v závere 5. a v 4. stor. pred n. l. Vyhodnotenie hrobových nálezov, štúdium horizontálnej stratigrafie pohrebiska a vytvorenie presnej chronológie nepochybne prispeje k lepšiemu pochopeniu procesu prechodu množstvom nových detailov. Výskyt západných šperkov v hroboch charakterizovaných miestnym pohrebným rítom, ktoré boli vybavené hrobovými predmetmi odrážajúcimi miestne tradície, ponúka hmatateľný dôkaz ranej latinizácie. Medzi pochovanými na pohrebisku v Pilismaróte boli jedinci, ktorí vyjadrovali svoju identitu prostredníctvom bronzových

a sklenených amforovitých korálikov, ako aj koralových a jantárových šperkov. Spolu so striebornými melónovitými a bikónickými korálikmi a sponami typu Čurug tieto šperky poukazujú na dynamické kontakty s juhom, čo tiež naznačuje, že Pilismarót bol významným centrom obchodu a kultúrneho spojenia zo západu na východ a z juhu na sever, čo vyplývalo aj z jeho geografickej polohy.

Obraz vytvorený na základe analýzy prameňov ukazuje, že archeologické dedičstvo komunity z doby železnej, ktorá pochovávala svojich mŕtvych v Pilismaróte, odráža miestne tradície, ale aj silné balkánske väzby, a zároveň dokumentuje výrazný proces včasnej latenizácie. Nekropola v Pilismaróte tak ilustruje rôzne akulturačné procesy v kontaktnej zóne križovatky komunikačných ciest zo západu na východ, a tiež zo severu na juh.

Obr. 1. Pilismarót-Basaharc. Poloha, fotografia a topografický plán náleziska. Celkový plán skúmaných plôch a plán pohrebiska z doby železnej (kresba K. Tolnai a K. Tankó).

Obr. 2. Pilismarót-Basaharc. Hrob 53 (fotografia a kresba z pôvodnej výskumnej dokumentácie).

Obr. 3. Pilismarót-Basaharc. Hrobové nálezy z hrobu 53. 1 – sklenené, jantárové a koralové koráliky; 2, 3, 5, 6 – sklenené koráliky; 4 – strieborný korálik; 7, 8 – bronzové náramky; 9 – ulitník *Turritella*; 10 – jantárová perla; 11, 12 – bronzové spony; 13 – bronzová retiazka s jantárovým príveskom (kresba Á. Dékány a N. Mészáros).

Obr. 4. Pilismarót-Basaharc. Dvojica spôn spojených retiazkou s jantárovým príveskom z hrobu 53 (foto K. Tankó).

Obr. 5. Pilismarót-Basaharc. Hrob 110 (fotografia a kresba z pôvodnej výskumnej dokumentácie).

Obr. 6. Pilismarót-Basaharc. Hrobové nálezy z hrobu 110. 1 – amforovité sklenené koráliky; 2–5 – železné spony; 6 – keramika (kresba K. Tankó).

Obr. 7. Pilismarót-Basaharc. Hrob 265 (pôvodná fotodokumentácia výskumu).

Obr. 8. Pilismarót-Basaharc. Hrobové nálezy z hrobu 265. 1 – železný nôž a rôzne železné fragmenty; 2, 3 – keramika (pôvodné fotografie nálezov zo 70. rokov 20. stor.).

Obr. 9. Pilismarót-Basaharc. Hrobové nálezy z hrobov 265 a 280. 1 – železný nôž z hrobu 265; 2 – železný nôž z hrobu 280; 3 – brúsik z hrobu 280; 4 – železný hrot oštep z hrobu 280 (kresba N. Mészáros).

Obr. 10. Pilismarót-Basaharc. Hrob 280 (pôvodná fotodokumentácia výskumu).

Obr. 11. Pilismarót-Basaharc. Keramika z hrobu 280 (pôvodné fotografie a súčasná kresba N. Mészáros).

Obr. 12. Pilismarót-Basaharc. Hrob 332 (pôvodné fotografie a kresba hrobu).

Obr. 13. Pilismarót-Basaharc. Hrobové nálezy z hrobu 332. 1, 2 – sklenené koráliky; 3 – železný náramok; 4 – koralové koráliky (kresba N. Mészáros).

Obr. 14. Pilismarót-Basaharc. Hrobové nálezy z hrobu 332. 1–3 – sklenené a koralové koráliky; 4, 6 – bronzové náramky; 5 – bronzová náušnica (kresba N. Mészáros).

Obr. 15. Pilismarót-Basaharc. Bronzové spony spojené retiazkou z hrobu 332 (foto K. Tankó).

Obr. 16. Pilismarót-Basaharc. Hrobové nálezy z hrobu 332. 1–3 – bronzové spony spojené retiazkou; 4–6 – bronzové závesky (kresba N. Mészáros).

Obr. 17. Pilismarót-Basaharc. Hrob 370 (pôvodná fotografia a kresba hrobu).

Obr. 18. Pilismarót-Basaharc. Hrobové nálezy z hrobu 370. 1, 2 – fragmenty dvoch bronzových spôn; 3, 4 – železné fragmenty; 5 – bronzový krúžok; 6 – štiepaná industria (kresba N. Mészáros).

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NOT LOST IN TIME¹

Organic Remains from the Hallstatt Period Cemetery in Domasław (PL)

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The vast necropolis from the Hallstatt period with 803 cremation burials, including about 300 chamber graves, was discovered in Domasław, near Wrocław in Lower Silesia (Poland). It appears that those who buried the dead at the cemetery maintained extensive contacts with the important Early Iron Age centres and adopted the customs of the Hallstatt elites among the local community. One of the notable practices was wrapping urns, jewellery, dress accessories, tools and weapons in fabric. The remnants of textiles were preserved in 62 graves, but their presence was confirmed in many others.

Exceptionally numerous organic remnants were preserved in the graves. The pieces of bark have been found on and underneath the urns and grave goods. In the most opulent burials in the necropolis, the remnants of the wickerwork, including baskets with bronze vessels, were uncovered. The unique discoveries on this site are a wooden needle and beetles coiled on a blade of grass, the latter one is most likely a form of decoration or amulet. All these findings may contribute to understanding the organization of funeral ceremonies, including the intentions behind these customs. Clearly, these practices allow to connect local rituals with cultural traditions of European communities.

INTRODUCTION

The vast cemetery from the Urnfield and Hallstatt period has been excavated in Domasław, Wrocław County, Lower Silesian Voivodeship (*Gediga/Józefowska 2019; Gediga et al. 2020*, with references). The eastern part of necropolis with over one thousand objects such as graves, ceramic deposits and ditches, dates to the Early Iron Age. In this period, strong influences from the Hallstatt circle had led to changes in beliefs and cultural practices what can be seen in the rituals and in the origin and types of goods placed in the graves, particularly the opulent ones. The local elites adopted practices of the aristocracy in Iron Age Europe, such as building internal, wooden chambers, patterns of grave goods with drinking and dining equipment (*Gediga 2010; Gediga/Bugaj 2022; Gediga/Józefowska 2019; Gediga et al. 2020; Józefowska 2018*), as well as the custom of wrapping up objects in fabric (*Gleba 2014*, with references).

An organic residue layer preserved around metal objects was uncovered in most of the chamber graves in Domasław (Fig. 1). The residues were the remains of textiles and other materials of plant and animal origin. Preserved fabrics, bark, wicker and leaves (in the past probably also roots, phloem, leather, and fur) served as a wrapping for the urns and grave goods, containers, lids and pads, as well as a lining on the bottom of the chests. Some other organic residue was mineralized wood from the floor of the chambers or biers (*Sady-Bugajska 2020*).

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Fig. 1. Domasław 10/11/12, Wrocław district. Organic residue layer in the grave No. 10000. Photo L. Nowaczyk.

REMAINS OF TEXTILES

Ninety-three textile fragments were found in sixty-two graves, but their presence was confirmed in many other burials during excavation and pre-laboratory works. Corroded pieces of fabric were discovered mainly on the iron objects because the metal corrosion compounds had preserved the fibres. They are completely mineralized, and this prevents determining what raw material they were made from. Neither is it possible to recreate their original size, appearance and colour. The analysed pieces (thirty-six samples from nineteen graves; *Maik/Rybarczyk 2015; 2016*) were probably made of wool, while the other fragments, which appear to be more delicate, may have been woven from flax. They are spun solely in Z-twist, generally of a single yarn. The textiles from six burials are woven in 2/2 twill (Fig. 2), eleven in tabby, two in rep-weave and one in tablet weave. A delicate piece of textile from the grave No. 4269 has two weaves, tabby and repp, which gives an impression of elongated strips. In three graves, two types of textiles were found. In the grave No. 5970 pieces of textile woven in rep-weave and the remains of a tablet-woven ribbon were found. The warp in a thick textile in repp was spun from S/2Z-plied yarn and the weft is in Z-single yarn (*Maik/Rybarczyk 2016, 38*).

The twills from Domasław are the oldest discoveries of such a type in Poland and resemble other discoveries of the Hallstatt culture from the sites in Hallstatt and Dürrnberg near Hallein in Austria and Langenthal, Ersingen, Subingen in Switzerland (*Grömer 2012; Rast-Eicher 2012*). Similar textiles were also found in the princely grave in Eberdingen-Hochdorf in Southern Germany, as well as in Verucchio, Saso di Furbara, Vedretta di Ries, Tarquinia, and San Basilio in Northern and Central Italy (*Maik/Rybarczyk*



Fig. 2. Domasław 10/11/12, Wrocław district. Delicate textile from the grave No. 283 in 2/2 twill. Photo J. Słomska; after *Maik/Rybarczyk 2016, fig. 10*.

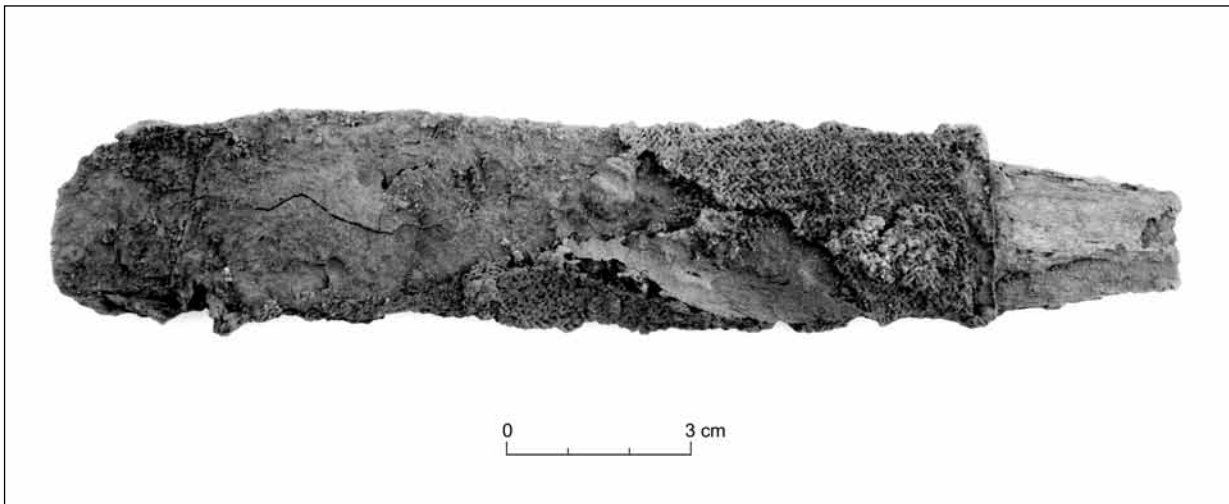


Fig. 3. Domasław 10/11/12, Wrocław district. Knife from the grave No. 8943. Photo I. Dolata-Daszkiewicz.

2016, 35, 36). It should be emphasized that textiles in a 2/2 twill weave are unknown around the Lusatian Culture settlement. Therefore, the findings from Domasław are unique and strengthen the hypothesis that Silesia is the north-eastern region of the Hallstatt culture (*Gediga 2010; 2011; Słomska-Bolonek/Antosik 2022, 234*).

The textiles in the graves in Domasław were preserved on jewellery and dress accessories, tools and weapons deposited in the grave pits, besides and on urns. It can be considered that they wrapped urns and objects, either individually or together. As fabrics have been preserved also on the grave goods inside urns (22), it is likely that the items or the bones were wrapped in cloth.

The fabrics were discovered on seventeen knives. As knives were found at a certain distance from urns, one can assume that the knives were separately wrapped in fabrics. On three items, the direction of wrapping can be traced. On the knife from the grave No. 8943, textile seems to have constituted an outer layer of the sheath (Fig. 3). In contrast to the knives, the eight swords found in Domasław bear no traces of textile. Three objects were placed in wooden scabbards, one in a leather sheath. It is unclear whether other swords were deposited without a 'wrapping' or whether organic scabbards and textiles were not preserved.

In twelve graves, the remains of the textiles were preserved on the toiletry sets. Clearly, they might have served as belts to hang the toiletries and the pouches to store them. In one case, the ribbon wrapped around the tweezers was found. In twenty-two graves, the remains of textiles were present on pins which could hold the fabrics together. The pieces of fabric have also survived on necklaces, bracelets, needles, chisels, a sickle, arrowheads, fibulae, spiral, and plaques. Sometimes these are single pieces of fabric in graves, but occasionally there are multiple objects with textiles in them.

In the grave No. 4269, the urn was surrounded by an organic residue. The remains of delicate textile have been preserved on iron and iron-bronze grave goods placed on the urn with other objects. On the urn, a strip of other fabric was also uncovered. It was likely a kind of a belt or headband with at least two hundred delicate bronze staple plaques stuck densely in rows. In the grave No. 283, two types of delicate textiles have been survived, one may have been attached to the toiletry set and the second covered the vessel. Also, the urns in graves Nos. 384 and 5611 were wrapped up in a dress. The vessels and the metal objects gathered on and near vessels were covered with an organic substance, and textiles have been preserved between the iron objects and the vessels' walls. In the grave No. 4297, textiles were found on the metal objects on the urn.

The imprints of fabric were found on the wood preserved under the binocular pendants in the grave No. 3797. In the grave No. 612, the impression of textile has survived on the patina covering the plant remains (such as flax) wrapping the bronze bracelet.

In many graves, wrapping up urns was confirmed by the positions of the objects in relation to the walls of urns. The pins, fibulae, rings, spirals which would have fallen off the ceramic surface if they had not been fastened the textile (Fig. 4). The pins placed on the urns in the graves Nos. 1849, 2877, 3311, 3318,



Fig. 4. Domasław 10/11/12, Wrocław district. Urn in the grave No. 8888. Photo A. Józefowska.

8946, might also have been fixed to the material. The perpendicular position of gold spirals to the vessel's wall in the grave No. 360 proves that they were originally attached to the fabric.

It seems that the delicate bronze spirals found in nineteen graves may have been attached to headbands or bonnets or strung on hair (the remains of textiles were preserved only on the spiral in the grave No. 570). Headbands and belts were probably made of textile, leather, and fabrics sewn with leather. In seven graves semi-circular looped buttons were found (in amount 1–7). They were probably used to decorate dresses, bands and belts. Similar items ornamented the robes of the dead in Germany, Austria and Italy (*Ślomska/Antosik 2018, 60, 61*). A great example of a ceremonial cloth was found in the grave in Stična in Slovenia, where a woman was buried in an elaborately decorated dress and had a headdress with gold elements [*Hellmuth 2008 (2010)*].

In two graves in Domasław, tutuli-like buttons that decorate a horse harness were found. They were discovered along with the remains of textiles in the grave No. 460, and surrounded by an organic residue while in the grave No. 4857. Although the amber and glass beads were usually strung on strings, they could also be sewn onto textiles or used as a pendant (such is the case of the toiletry set in the grave No. 3795).

The practices recorded in burials in Domasław can be easily traced to the Hallstatt culture influences. Likewise, similar customs were observed in the Greek and Roman antiquity (*Gleba 2014, 143, 144, with references*). Objects wrapped in textiles were found in the cemetery in Hallstatt and in the grave in Eberdingen-Hochdorf, where all the rich equipment, including a wagon, was wrapped in cloth (*Banck-Burgess 1999, 18–32; 2012, 143; 2014; Biel 1985; Grömer 2010, 272–275; 2012, 39, fig. 1: 10; 2016*). Finally, the pieces of fabric on the wagon wheels and bronze applications were also recorded on the burial side in Apremont, where the bronze cauldron, iron sword, razor and all the iron parts of the chariot were found with fabric remnants (*Gleba 2014, 143; Masurel 1990*).



Fig. 5. Domasław 10/11/12, Wrocław district. Braided horsetail in the grave No. 6691. Photo L. Nowaczyk.

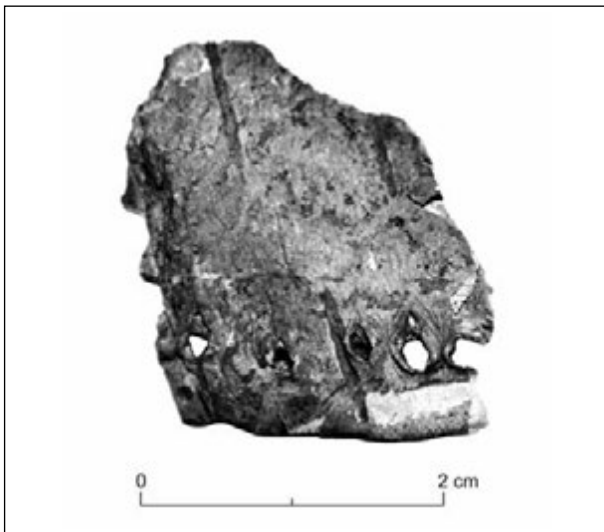


Fig. 6. Domasław 10/11/12, Wrocław district. Fragment of birch bark with stitch holes from the grave No. 543. Photo A. Sady-Bugajska; after *Sady-Bugajska 2020*, fig. 2.

REMNANTS OF WICKERWORK, BARK AND WOOD

Small fragments of wickerwork were found in three urns, while softwood sticks, most likely poplar or willow, in two others. On the bronze necklace placed on the urn in the grave No. 6691, a horsetail woven was uncovered (Fig. 5), a plant often recognized in organic remains in Domasław (*Sady-Bugajska 2020*). The remnants of a wicker basket were discovered outside the chamber in the grave No. 4851. Unfortunately, the basket did not last.

In the urn in grave No. 543, where the remains of two different kinds of textile were found, there was a bronze fibula with a wattle from thin wicker sticks attached, as well as a decoration or amulet made of seventeen mid-trunks of beetles threaded onto a grass. Braided stalks of plants were likely attached to it. Above the fibula, there was an oval-shaped object of birch bark with holes for sewing. In the past, it might have been attached to the wickerwork (Fig. 6). Because fibula protruded over the urn's rim and the cremated bones did not fill even half of the vase, one can conclude that the fibula must have been hung or at least fastened to something else. In the eastern part of the chamber, there were remains of belt with the bronze clasp as well as a stone tinder, iron chisel, razor, tool and seven bronze looped buttons. On the belt, there were eight bronze rings that might have served as a tool to tie leather or textile strings to them. The remnants of the braid and a piece of leather were preserved underneath metal elements. Clasps were found in seven other graves, but no remains of fabric or leather were found with them. The clasps appear to have been attached to one end of the belt and then hooked through a corresponding hole at the end of another leather or woollen object. One clasp was found near the toiletry set, which allows to conclude that the latter had been attached to a belt. In several graves, the arrangement of toiletry objects has indicated that these items used to be hung. The examples are the grave No. 2834 with clasp, the grave No. 3795 with a belt hook, pins, three bronze rings and amber beads. Large amber rings found in eleven graves might have also served as belt fasteners. In the graves Nos. 619, 1017, 3412, 3798, 8905, they were additionally accompanied by toiletry sets.

Two rectangular spaces composed of dark humus were discovered in the lavish chamber grave No. 390. The shapes indicate that there must have been some containers in the past. These spaces were delineated by black-coloured walls, which are likely the traces of baskets and chests made of young bark, wood planks or wicker (Fig. 7). In the first space, there were the urn, toiletry sets, a pin, and the bronze

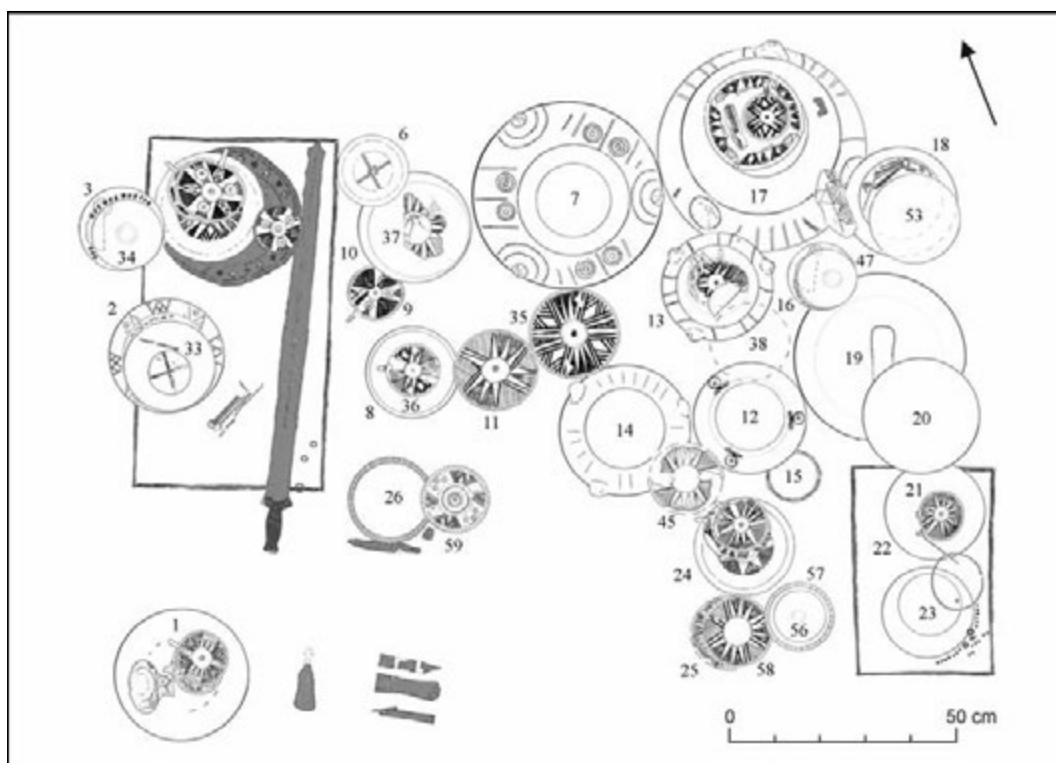


Fig. 7. Domasław 10/11/12, Wrocław district. Chamber grave No. 390. Picture A. Józefowska.



Fig. 8. Domasław 10/11/12, Wrocław district. Chamber grave No. 4269. Photo A. Woźniak.

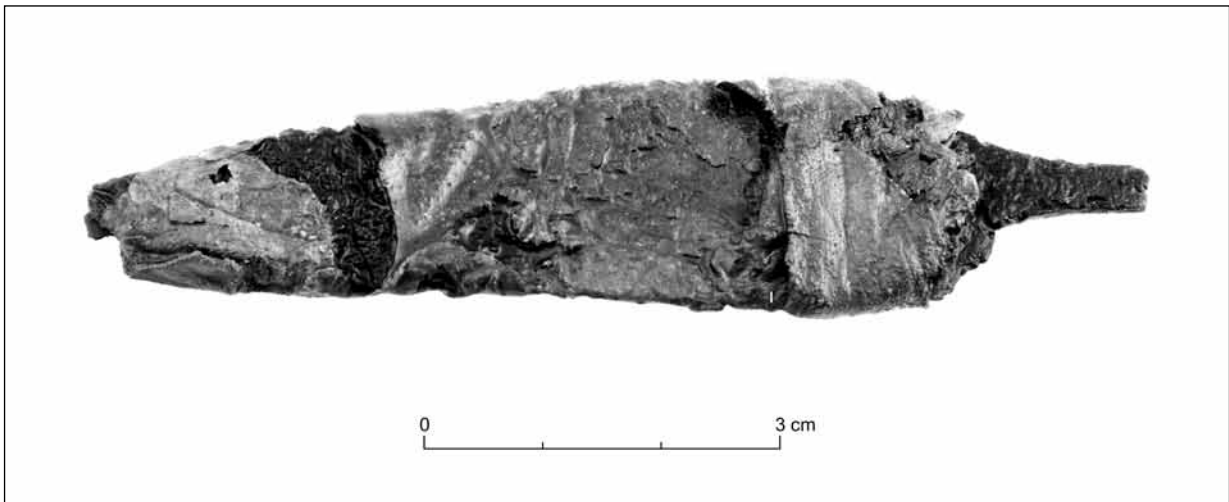


Fig. 9. Domasław 10/11/12, Wrocław district. Iron knife from the grave No. 8943. Photo I. Dolata-Daszkiewicz.

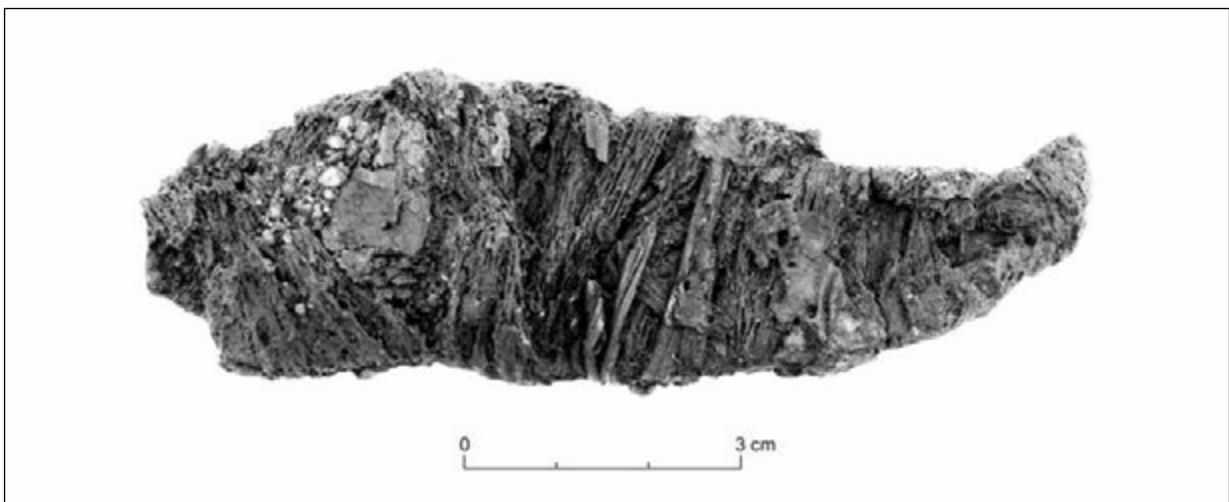


Fig. 10. Domasław 10/11/12, Wrocław district. Iron razor from the grave No. 543. Photo I. Dolata-Daszkiewicz.

vessel covered with bark. A few centimetres thick organic layer lining the basket is likely to be remnants of textiles, plants, bark and/or fur. The second basket contained the urn, bronze and amber ornaments. In the grave No. 8905 with a sword, there was also a regular internal space filled with dark organic matter around the bronze vessel.

In the grave No. 4269, the traces of a rectangular shaped structure have been preserved. Due to the presence of iron fittings and the thin black wall-like layer of darker colour, the structure can be considered the remains of a wood or bark container (Fig. 8). Regular walls of the container were also detected in cross-section view. The container had the urn and a set of ornaments wrapped in textiles inside it. Additionally, in the graves Nos. 528 and 1014, very shallow objects with a regular outline were discovered at the bottom of the chests; they can be the remains of mats or platforms.

It is noteworthy that wicker objects are rarely found in the Hallstatt period. The remains of wicker objects were found on a bronze bucket in the wagon grave No. 6 of the Bylany culture in Prague-Letňany (Trefný *et al.* 2019). In the grave in Pürger, Bavaria, a bronze bowl contained the remains of a wicker basket and a small clay vessel. The bronze vessel was covered with birch bark (Hundt 1962, 182; Kossack 1959, 209). The remains of wicker near or in a bronze vessel was already described by M. Egg, it points to the conclusion that the use of wicker containers or mats was characteristic of wealthy social elite graves (Egg 1985, fig. 41).

The remains of bark were found inside, underneath and around the urns and on the jewellery and toiletry sets in at least twenty-one graves. The patches of birch bark have been preserved on the necklace and bracelets and on the urn in the grave No. 521. The oval birch patches had the shape of round lids. In the grave No. 1014, large fragments of bark were uncovered on the urn but under the jewellery arranged on vessel. The bark was also preserved on four knives: probably as remains of pouches/sheaths (Fig. 9). The iron razor from the grave No. 543 was wrapped in leaves (Fig. 10). Plant fibres, flax and hemp have been preserved on metal objects in several urns (e.g., in graves Nos. 612, 3317) and above the knives in the grave No. 366. The 'beads' made of beetles from the grave No. 543 and beads of glass from the grave No. 5977 were hung on blades of grass.

Just like in the case of the cemetery in Świbie (*Michnik/Dzięgielewski 2022*), the remnants of mineralized construction wood from were often found in graves in Domasław. Most of the elements of the chests and/or biers exposed under the grave goods were made of oak wood (*Sady-Bugajska 2020*). Thank to pieces of tiny sheet bronze, large pieces of oak have been preserved in the ceramic vessel in the grave No. 8919. Likely, the bronze sheet with an incised ornament would have serve as a prestigious cover for a wooden bucket. Wood was also preserved on the spikes of iron knives as remnants of organic handles, and in the sleeves of socketed axes, spearheads and chisels. The swords in graves Nos. 7429 and 8905 were placed in wooden scabbards with bronze fittings. The pieces of wood, possibly from the sheath, were discovered on the sword in the grave No. 8956. The remnants of wood, on the blade's upper part as well as the leather covering the cutting edge, were found on the sword in the grave No. 390. A unique discovery is a wooden needle with a pointed end found in one of tubes of the needle holder in the grave No. 8946 (Fig. 11).

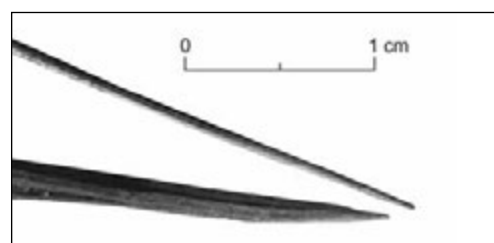


Fig. 11. Domasław 10/11/12, Wrocław district. Wooden needle from the grave No. 8946 (down) juxtaposed with a contemporary metal needle (up). Photo R. Kosina.

CONCLUSIONS

The ritual of wrapping urns and grave objects might have had many meanings and intentions. However, based on the analysis of findings from the Hallstatt culture, it can be assumed that the textiles placed in burials, including those from Domasław, were not only decorations but also an element of the funeral ceremonies. Such burial practices existed in Italy, Greece, France and in the Alpine area, so the custom of wrapping of funeral objects had a wide, pan-European significance (*Gleba 2014*, 135, with references). It is still unclear whether the custom of grave goods' wrapping should be treated symbolically, as an element of 'clothing' and/or 'hiding', or as a protection, cover, a way of carrying, storing, and assembling bones and objects. The urns were dressed in 'clothes' that reflected the status, gender, age and origin of the deceased. Textiles placed on urns, possibly as dresses, cape, belts, caps or headbands, might have served as shrouds covering the body of the dead, just like the bags into which burnt bones were poured. Furthermore, it is also possible that the fabrics were also used to decorate chests.

In Domasław, the grave goods were not only wrapped up, but also placed in organic pouches and covers. It can be assumed that the clusters of bones exposed in the necropolis were also wrapped in fabric or placed in containers.

The bark was used to cover and/or pack the urn and grave goods. We cannot rule out that the urns were secured in this way. It is also possible that bark was used to line the chambers. Exceptionally, the bronze vessel from the grave No. 390 was covered with bark. The modest remains of wickerwork and braids give only clues about their use in the funeral aspect by the communities of that time. Horsetail recorded in several graves may also have been used to braid. Grave goods from Domasław were certainly wrapped in textiles, plants, bark. The discoveries of the remains of textiles in Domasław indicate the adaptation of the customs of the Hallstatt elites. Therefore, it seems probable that the local community from Domasław adopted the use of textiles as one of the elements of the symbolic meaning of the grave. Their use proves the existence of a strong interregional network of contacts in the Early Iron Age and the exercise of similar practices by people living in distant areas.

The fragmentary nature of the organic remains does not allow for a full reconstruction of the funeral scenario. However, the unique preservation of organic remnants in graves can help us understand the different rituals and intentions behind burial practice of the Hallstatt societies and allows to imagine a wide variety of chamber decorations, colourful textiles, flowers, feathers, mats and baskets, important elements of funeral rite.

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Zachované v čase

Organické zvyšky z pohrebiska doby halštatskej v Domasławie (PL)

Anna Józefowska – Lidia Kamyszek – Leszek Żygadło

Súhrn

Na pohrebisku Domasław neďaleko Wrocławu v Dolnom Sliezske bolo objavených 803 žiarových hrobov z doby halštatskej, z nich 300 hrobov bolo komorových. Komunita pochovávala svojich mŕtvych na tejto nekropole udržiavala intenzívne kontakty s dôležitými európskymi centrami staršej doby železnej, a prispôbovala si zvyklosti halštatských elít. Jednou z významných praktík bolo obaľovanie urien, šperkov, súčastí odevu, nástrojov a zbraní do textílií. Zvyšky textílií sa zachovali v 62 hroboch, a ich prítomnosť bola potvrdená aj v mnohých ďalších.

Na základe analýz nálezov z halštatskej kultúry sa dá predpokladať, že textílie umiestňované do hrobov, aj do tých z Domasławu, slúžili nielen na ozdobu, ale boli významným prvkom pri pohrebných obradoch. Podobné pohrebné rituály sú známe aj z Itálie, Grécka, Francúzska a z alpskej oblasti, to znamená, že zvyk obaľovať predmety vkladané do hrobov mal široký paneurópsky význam. Treba zdôrazniť, že textílie tkané v 2/2 keprovej väzbe nájdené v Domasławie potvrdzujú hypotézu, že Sliezsko bolo severovýchodným regiónom halštatskej kultúry.

Fragmenty kôry sa našli najmenej v 21 hroboch na alebo pod hrobovými prídkami, urnami, a tiež na bronzovej nádobe. V najhonosnejších hroboch boli identifikované zvyšky opaskov, ozdôb hlavy (čeleniek), ale aj prútených košíkov pre bronzové nádoby. Skromné zvyšky prútených a pletených výrobkov poskytujú len indicie k porozumeniu ich významu v pohrebných obradoch vtedajších komunit. Praslička zaznamenaná v niekoľkých hroboch mohla byť tiež použitá na pletenie. Čepele nožov boli obaľované do textílií, rastlín, kôry. K unikátnym nálezom patrí ozdoba či amulet z tiel chrobákov a drevená ihla.

Doklady použitia textílií a kôry na rozličné typy obalov vo funerálnom kontexte umožňujú hľadanie súvislostí medzi lokálnymi pohrebnými obradmi s praktikami európskych komunit. Textílie v hroboch v Domasławie naznačujú

adaptáciu zvyklostí halštatských elit. Zdá sa byť preto pravdepodobné, že lokálna komunita v Domasławe prevzala zvyk používania textílií ako jeden zo symbolických prvkov pri pochovávaní svojich mŕtvych. Ich použitie dokazuje existenciu silnej medziregionálnej siete kontaktov v staršej dobe železnej a praktizovanie podobných zvyklostí aj vo vzdialených regiónoch. Unikátne zachované organické zvyšky v Domasławe môžu pomôcť pri pochopení rozličných rituálov a zámerov súvisiacich s pohrebným obradom halštatských spoločností a dovoľujú vytvoriť si predstavu o pestrej škále výzdoby pohrebných komôr, o využívaní farebných textílií, kvetov, vtáčích pier, podložiek a košov ako dôležitých súčastí pohrebného ritu.

Obr. 1. Domasław 10/11/12, okres Wrocław. Vrstva organických zvyškov v hrobe č. 10 000. Foto L. Nowaczyk.

Obr. 2. Domasław 10/11/12, okres Wrocław. Jemná textília z hrobu č. 283 v 2/2 keprovej väzbe. Foto J. Słomska; podľa *Maik/Rybarczyk* 2016, obr. 10.

Obr. 3. Domasław 10/11/12, okres Wrocław. Nôž z hrobu č. 8943. Foto I. Dolata-Daszkiewicz.

Obr. 4. Domasław 10/11/12, okres Wrocław. Urna z hrobu č. 8888. Foto A. Józefowska.

Obr. 5. Domasław 10/11/12, okres Wrocław. Pletená praslička v hrobe č. 6691. Foto L. Nowaczyk.

Obr. 6. Domasław 10/11/12, okres Wrocław. Fragment brezovej kôry s dierami po zošívani z hrobu č. 543. Foto A. Sady-Bugańska; podľa *Sady-Bugańska* 2020, obr. 2.

Obr. 7. Domasław 10/11/12, okres Wrocław. Komorový hrob č. 390. Obrázok A. Józefowska.

Obr. 8. Domasław 10/11/12, okres Wrocław. Komorový hrob č. 4269. Foto A. Woźniak.

Obr. 9. Domasław 10/11/12, okres Wrocław. Železný nôž z hrobu č. 8943. Foto I. Dolata-Daszkiewicz.

Obr. 10. Domasław 10/11/12, okres Wrocław. Železná britva z hrobu č. 543. Foto I. Dolata-Daszkiewicz.

Obr. 11. Domasław 10/11/12, okres Wrocław. Drevená ihla z hrobu č. 8946 (dole) porovnaná so súčasnou kovovou ihlou (hore). Foto R. Kosina.

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‘FROM THE OTHER SIDE OF THE DANUBE’

Finds of the Eastern Type from the Late Hallstatt and Early La Tène Periods in Transdanubia¹

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Keywords: Transdanubia, Late Hallstatt and Early La Tène periods, Eastern Hallstatt culture, Vekerzug culture, weapons, horse harness, jewellery, wheel-turned pottery, eastern contacts, innovations

The paper deals with the cultural and spatial evaluation of numerous finds of the eastern type from Transdanubia, dated to the Ha D–Lt A stages. The main point of our interest was to provide a complex overview of these finds, focused mainly on the provenance, chronological aspect and possible interpretations of their occurrence in Transdanubia. Based on a detailed analysis of finds of the eastern type, it was possible in terms of their origin to determine four groups of finds in Transdanubia – finds of the Vekerzug culture from the first group and older types of arrowheads with an outer socket from the fourth group are most frequent. The occurrence of finds of the eastern type in Transdanubia shows similar tendencies as in the neighbouring regions of the Eastern Hallstatt culture, especially in Moravia. Both regions are special in terms of the frequency and type variability of Vekerzug finds. Especially arrowheads with an inner socket point to a new tradition in production of efficient weapon types in East-Central Europe and are, above all, an indicator of technological innovations. There are several concentrations of Vekerzug finds in Transdanubia: in its north-western and south-eastern parts, around Lake Balaton and in the Danube Bend area. The frequent presence of Vekerzug finds across Transdanubia shows the active contacts and peaceful interactions between the Vekerzug culture and the cultural regions to the west. We can consider the expansion of Vekerzug people into the western Budapest area and its surroundings. However, in other parts of Transdanubia, Vekerzug finds are evidence for cultural contacts of the local Hallstatt population with the Vekerzug culture.

INTRODUCTION

In the Ha D and Lt A stages, types of objects whose origin and/or main distribution territory is located in the eastern part of the Carpathian Basin, specifically in the Vekerzug culture (VC) and the Ciumbrud culture, as well as in the Early Iron Age communities in the East European steppe and forest-steppe and in the North Caucasus, were documented in the East Hallstatt region. Finds of the eastern type and their significance for the Central European Hallstatt and Early La Tène periods have been subject to long and controversial scientific discussions, focused on their chronology, origin and interpretation. While these finds from Transdanubia remain on the fringes of scientific interest (see *Kemenczei 2008–2010* for a last overview), similar finds from Moravia and Bohemia have recently received increased attention, with a focus especially on their comprehensive and detailed evaluation (e.g. *Bartík et al. 2017; Klápa 2017; Kozubová/Fojtík 2021; Kozubová/Golec 2020; Kozubová et al. 2022*). Recent publications on sites from the Late Hallstatt and Early La Tène period in Transdanubia have not evaluated finds of the eastern type in the context of other objects of the same type (e.g. *Czigáni/Molnár 2020; Horváth 2015; Ilon 2017a; Jáky 2017; Molnár/Ujvári 2020*). The finds from Moravia and Bohemia and the current state of research on the VC show that it is necessary to reconsider the interpretation of finds of the eastern type in the individual regions of the (Eastern) Hallstatt culture. It is equally important to classify the objects under discussion correctly. The

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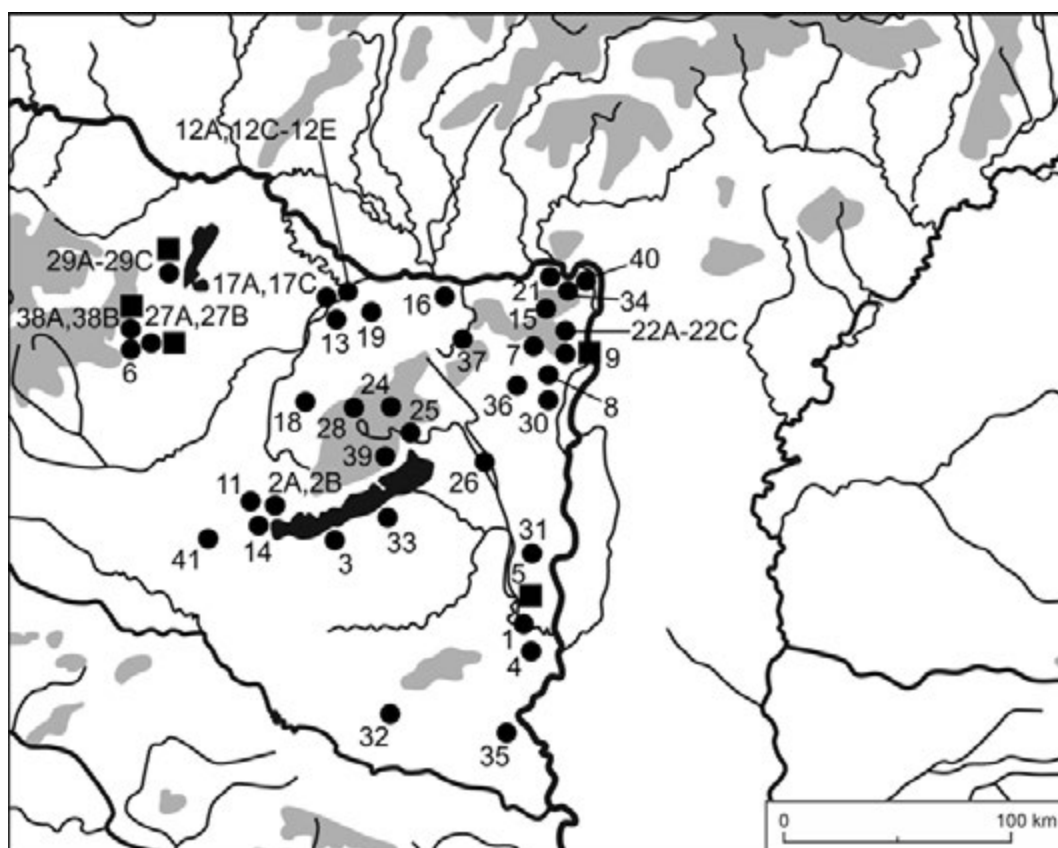


Fig. 1. The distribution of finds of the eastern type from Ha D–Lt A in Transdanubia – the first (circle) and second groups of origin (square). For numbering of sites and references see *Catalogue*. Author A. Kozubová.

use of the term ‘Scythian’ (type, find/s, period/age², origin, influence/s etc.) is incorrect in the case of Iron Age archaeological records from Central Europe,³ a more neutral classification as finds of the eastern type seems more appropriate. This classification reflects an exclusively geographical consideration: these types of objects have their origin to the east of the Hallstatt culture in different cultures and cultural groups of the Iron Age, including, e.g., the VC⁴ (see more Kozubová/Fojtík 2021, 77–80 on this topic).

This article evaluates previously published finds of the eastern type from the Late Hallstatt and Early La Tène periods (from Ha D1 to Lt A) in Transdanubia with a focus on the cultural and spatial, chronological and interpretive aspects of their occurrence in the western part of the Carpathian Basin and in other regions of the (Eastern) Hallstatt culture. The number of sites with these finds in Transdanubia has slightly increased since the last inventory by T. Kemenczei (2008–2010). To date, we have at least 1171 finds of the eastern type⁵ with typologically reliable identification, which come from 52 archaeological sites

² Although the term ‘Scythian’ is also used in archaeological research in Eurasia a synonym for the Early Iron Age, i.e. for the period during which the Scythian culture has existed, the term ‘Scythian period’ can be used only with those regions, where we are able to give a reliable evidence for a permanent presence of the Scythians or Scythian culture with the help of archaeological and/or written sources. But this is not the case with Central Europe. The territory occupied by the VC is indisputably located outside the territory of both the Scythian culture and the Scythians themselves. Using the term ‘Scythian period’ or ‘Scythian Age’, which is still common in Hungarian archaeological research to this day, is therefore scientifically unfounded in the case of the Hallstatt and Early La Tène periods in the Carpathian Basin (Kozubová/Fojtík 2021, 79).

³ The same applies to the term Scythoid.

⁴ The term ‘eastern’ in the VC, similarly as in archaeological cultures and groups of the Hallstatt and Early La Tène periods in Central and Southeastern Europe, is thus not synonymous with the term ‘Scythian’ or ‘equestrian nomadic’. On the problem of using the term Scythian in connection with the VC and finds from sites of the Hallstatt culture see more Kozubová 2019, 56–58; 2021, 83, 84; Kozubová/Fojtík 2021, 78–80. For a recent discussion about the eastern influences in the VC with a critique of this topic see Kozubová 2019; 2021, 81–95, 102–106.

⁵ Of these, 900 are armour scales from Regöly, Strupka-Magyar birtok (Tolna County; Cat. No. 24).

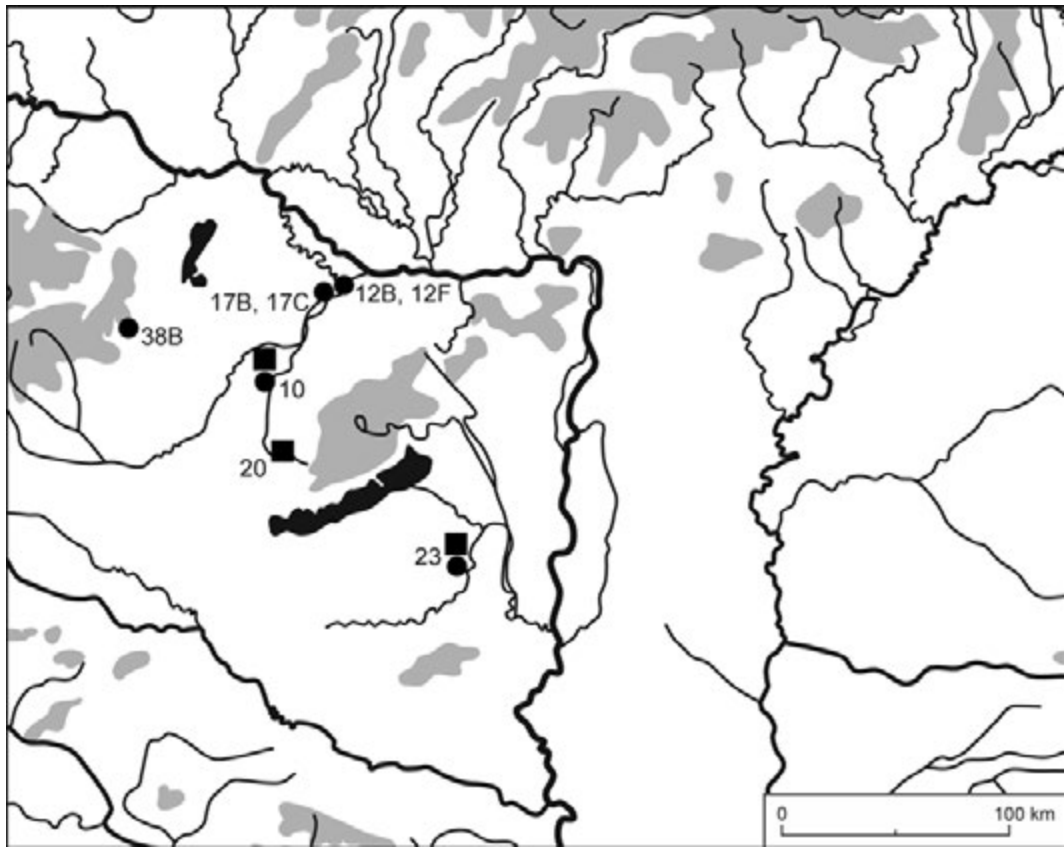


Fig. 2. The distribution of finds of the eastern type from Ha D–Lt A in Transdanubia – the third (circle) and fourth groups of origin (square). For numbering of sites and references see *Catalogue*. Author A. Kozubová.

from Ha D–Lt A (see catalogue; Fig. 1; 2). Although most finds analysed in this article were published in the catalogue by T. Kemenczei (2008–2010, 101–114, fig. 1–9), this article aims to correct the catalogue. The new catalogue excludes artefacts whose Transdanubian context is disputable⁶ or whose eastern origin is questionable in the Central European context.⁷ Furthermore, the finds that are not depicted in publications and their general description does not allow a precise typological classification were not taken into account.⁸

CULTURAL AND SPATIAL EVALUATION OF FINDS – GROUPS OF ORIGIN

The analysed set contains types of artefacts that have their origin or are distributed in different cultural and geographical regions. The finds of the eastern type from Transdanubia may be broadly divided into four groups by origin (Fig. 1–3). While the first two groups are related to the VC, the remaining two are associated with cultural regions to the east of the territory occupied by the VC.

⁶ E.g. bronze cauldron from 'Komárom, Szőny'/'Ó-Szőny' (Komárom-Esztergom County; Patay 1990, 81, pl. 68: 148; Kozubová 2019, 135, footnote 87).

⁷ E.g. iron axes from Somló-hegy (Veszprém County; Kemenczei 2008–2010, 108, fig. 6: 6, 7).

⁸ Arrowheads from Bakonyszentlászló, Győrszabadi, Tét (all three Győr-Moson-Sopron County), Bögöt (Vas County), Keszthely-Fenékpuszta (Zala County) and Vereb (Fejér County; Párducz 1965b, 274–277); a number of bronze arrowheads from the Balaton Museum in Keszthely (Zala County; Bakay/Kalicz/Sági 1970, 213); a snake-shaped temple ring from Celldömölk, Ság-hegy (Vas County; Kemenczei 2008–2010, 102; Párducz 1965b, 276), and some snake-shaped temple rings from Velem, Szent Vid-hegy (Vas County; Ilon 2017b, 99); a clay stamp from a well at Törökbálint, Topárk (Pest County; Maróti 2003, 229). Without a precise typological classification, it is not possible to assign these finds to one of the four groups of origin.

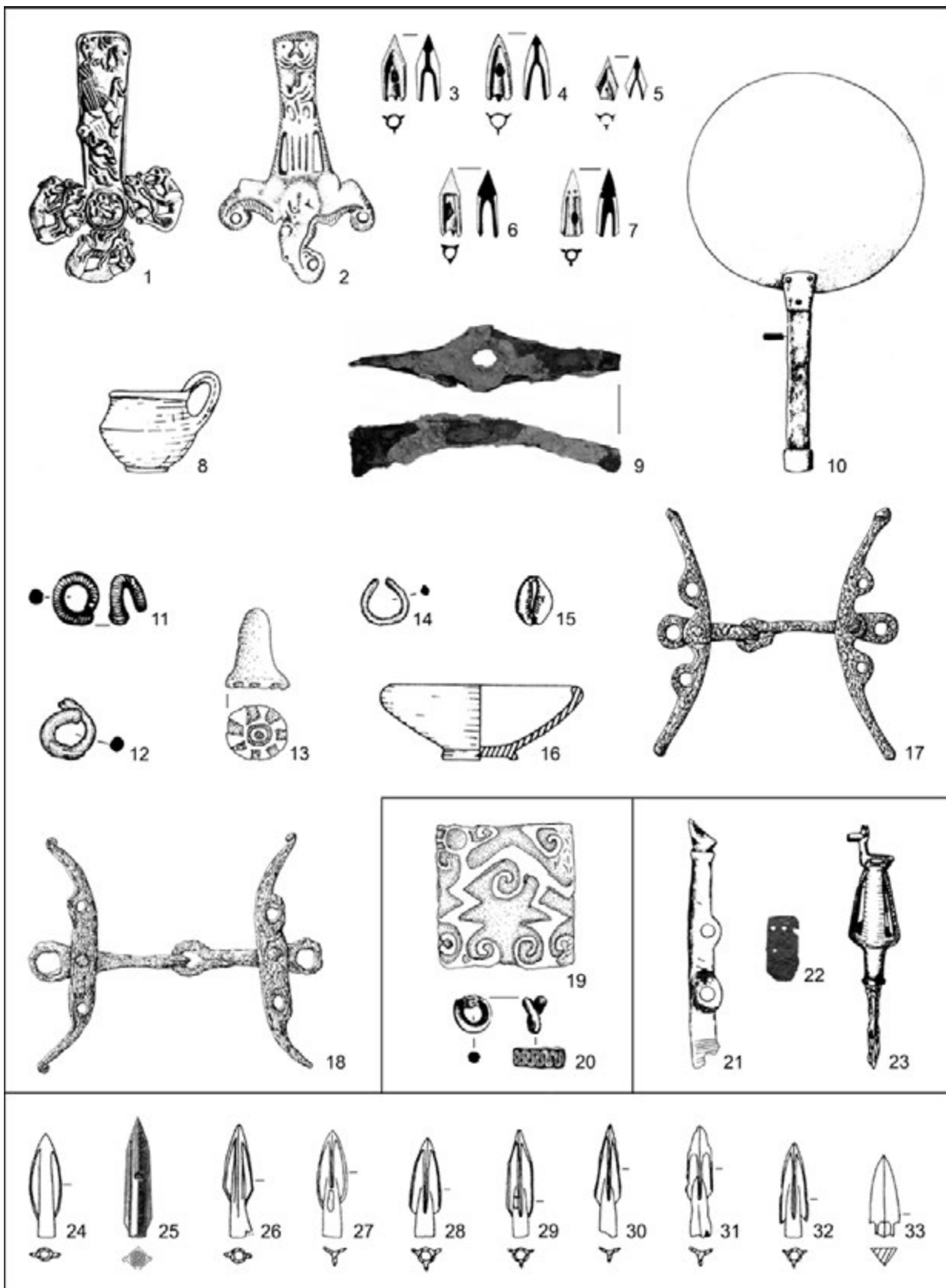


Fig. 3. The typological spectrum of finds of the eastern type from Ha D-Lt A in Transdanubia according to groups of origin. 1-18 – the first group of origin; 19, 20 – the second group of origin; 21-23 – the third group of origin; 24-33 – the fourth group of origin. Different scales. Author A. Kozubová.

First group of origin

The first and typologically most diverse group of origin (Fig. 1: 1, 2A, 2B, 3, 4, 6–9, 11, 12A, 12C–12E, 13–16, 17A, 17C, 18, 19, 21, 22A–22C, 24–26, 27A, 28, 29A, 29B, 30–37, 38A, 39–41; 3: 1–18) is represented by finds of the VC (bronze triblade and trilobate-triblade arrowheads with an inner socket of types I and II according to A. Kozubová; bronze cross-shaped quiver decorations; iron battle axes of type I according to A. Kozubová; iron bits of type Szentes-Vekerzug; bronze snake-shaped temple rings of types I and II according to A. Kozubová; bronze circular ear/temple rings of type I according to A. Kozubová; bimetallic mirrors with a side handle; clay stamps; wheel-turned pottery) and artefacts whose occurrence in Transdanubia was related to the activities of the VC (cowrie shells).⁹

A total of 82 *bronze arrowheads with an inner socket* were found at 14 sites in Transdanubia, of which 62 were found by detector prospecting at Győr-Ménfőcsanak, Széles-földek (Győr-Moson-Sopron County) – the highest number from one site outside the VC territory (Cat. No. 12E; *Ilon 2017a*, 192, fig. 8: 1, 2, 4–14; 2019, 255, pl. I: 1–24; II: 1–24). Almost all types of arrowheads with an inner socket and their variants or subvariants according to typology by A. Kozubová (2009, 68–86, fig. 1) known from sites of the VC¹⁰ were found in Transdanubia: triblade arrowheads of variants I1, I2 and I3 (Fig. 3: 3–5; Cat. Nos. 2A, 2B, 12E, 17A, 17C, 19, 27A, 28, 29A, 36, 38A; *Chochorowski 1985*, fig. 6: 31; *Czigáni/Molnár 2020*, 99, pl. 9: 3; 13: 3; *Gál/Molnár 2004*, pl. 13: 1; *Horváth 2015*, fig. 5: 22, 23; *Ilon 2017a*, fig. 8: 8–11, 14; 2019, pl. I: 1–5, 7, 9–12, 16, 17, 21; II: 1–24; *Maróti 2001*, fig. 2: 2; *Molnár 2013*, fig. 8: 8; *Schwellnus 2011*, fig. 8: F), trilobate-triblade specimens of variants II2 and II3 (Fig. 3: 6, 7; Cat. Nos. 2A, 12E, 17A, 19, 31, 37, 38A; *Chochorowski 1985*, fig. 6: 23, 29; *Czigáni/Molnár 2020*, pl. 9: 4; *Horváth 2015*, fig. 5: 21; *Ilon 2017a*, fig. 8: 1, 2, 4–6, 12, 13; 2019, pl. I: 6, 8, 13–15, 18–20, 22–24; *Kemenczei 2008–2010*, fig. 7: 11, 13; *Molnár 2013*, fig. 8: 9) and trilobate arrowheads (Cat. No. 12E; *Ilon 2017a*, fig. 8: 7). Most sites with arrowheads with an inner socket are concentrated in Northwestern Hungary (*Kozubová et al. 2022*, fig. 16). The variants of arrowheads with an inner socket from Transdanubia can be divided into three groups. The first group is characteristic for the VC, with sporadic finds in Eastern Europe (variant II2). The Vekerzug arrowheads are characterised by a tower-shaped blade. The variant II3 can also be included in this group. Although this variant is as frequent in the East as in the VC, the Eastern European specimens are smaller than VC ones, typically with a short blade in the form of an equilateral triangle or an ogival shaped blade with a broad base (see e.g. *Daragan 2017*, 88; *Klápa 2019*, 77; *Kozubová 2009*, 77, 78, 80, 97, 98; *Kozubová et al. 2022*, 298–301, with references). Arrowheads of variant I3 from the second group are popular shapes in both Eastern Europe and VC (*Kozubová 2009*, 74, 76, 77, 96, 97; *Kozubová et al. 2022*, 284, with references). In contrast, variants I1 and I2 from the third group are rare in both regions (*Kozubová 2009*, 71–74; *Kozubová et al. 2022*, 281, 283, 296, 298). Arrowheads with an inner socket are not reliable for dating as they were used during the whole existence of the VC (from Ha D1 to Lt A). The only exception is the variant I1 from Ha D2–Ha D3 (*Kozubová et al. 2022*, 285, 296, 298). The vast majority of arrowheads from Transdanubia were found by detector prospecting or accidentally. Only a few of them are settlement finds with more precise dating to Ha D2–Ha D3 or Lt A (Cat. Nos. 17A, 27A, 29A).

Three *bronze cross-shaped quiver decorations* with zoomorphic ornaments were found in Transdanubia (Fig. 3: 1, 2) – the one from Komárom-Esztergom County (Fig. 3: 2; Cat. No. 16) was classified as variant I1 according to A. Kozubová (or first group/type 3 according to Yu. B. Polidovych; *Kozubová 2009*, 101; *Polidovych 2000*, 36, 37), and decorations from Budajenő (Pest County; Cat. No. 7) and Mezőlak (Veszprém County; Fig. 3: 1; Cat. No. 18) were classified as variant I2 (or first group/type 4 according to Yu. B. Polidovych; *Kozubová 2009*, 105; *Polidovych 2000*, 36, 37). The bronze and bone/antler cross-shaped quiver decorations with zoomorphic and geometric ornaments are typical for the material content of the Vekerzug culture (at least 15 pieces) and Ciumbrud culture (9 pieces).¹¹ Outside their main distribution territory in the East Carpathian region with 32 pieces (Fig. 4),¹² 10 quiver decorations with zoomorphic ornaments were found

⁹ The cultural provenance of a bronze phalera of the Magdalenska gora type from Somló-hegy (Veszprém County; a stray find) is questionable (*Soós/Tarbay/Péterváry 2023*, 128, fig. 4: 2). This Late Hallstatt form of horse harness decoration has been found in large numbers at sites in Eastern Slovenia and in the cemetery of Szentes-Vekerzug (Csongrád-Csanád County/HU). In other cemeteries of the VC, these phalerae are rare (see more *Dizdar 2023*, 132–140, with references, map 2).

¹⁰ Circa 595 published pieces are evidenced in the VC (*Kozubová 2021*, 84; *Kozubová et al. 2022*, fig. 16; for new finds see *Keresztes et al. 2021*, pl. 10: 3; 11: 4; *Kovács/Németh 2023*, 40).

¹¹ On the question of their origin in the eastern part of the Carpathian Basin see e.g. *Hellmuth 2007*, 67; *Kozubová 2019*, 66–68.

¹² Of these, 5 bronze quiver decorations are stray finds from Hungarian unknown sites (*Kemenczei 1986*, 127, fig. 8: 3–6; *Patay/Scholtz/Scard 2017*, 475, fig. 5).

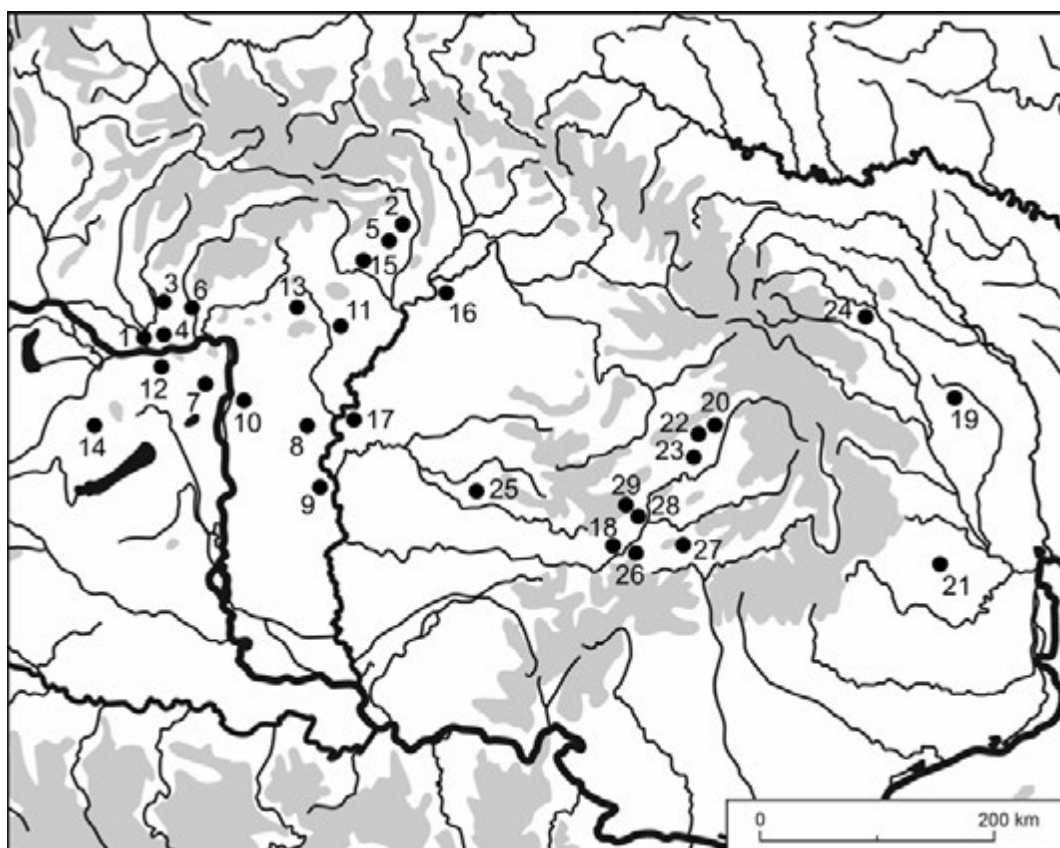


Fig. 4. The distribution of bronze and bone/antler cross-shaped quiver decorations from Ha D in East-Central Europe. *Slovakia*: 1 – Chotín IA; 2 – Košice; 3 – Maňa; 4 – Modrany; 5 – Seňa, Pri lánoch; 6 – Želiezovce. *Ungarn*: 7 – Budajenő; 8 – Cegléd, Hordógyár; 9 – Csanytelek, Tömörkényi utca; 10 – Gyömrő, Kő-határ-dűlő; 11 – Kál; 12 – Komárom-Esztergom County; 13 – Mátraszele; 14 – Mezőlak; 15 – Szendrő, Ördögáti, Csengőbarlang; 16 – Tiszalök, Börtön; 17 – Törökszentmiklós, Surján. *Romania*: 18 – Alba Iulia; 19 – Armaşoaia; 20 – Băiţa; 21 – Birseşti; 22 – Comlod; 23 – Mădăraş; 24 – Roşiori-Dulceşti; 25 – Salonta; 26 – Săncrâi; 27 – Şeica Mică; 28 – Teiuş; 29 – Ţelna. Graphic by A. Kozubová, after Kemenczei 1986, with additions by A. Kozubová.

in Eastern Europe at Early Iron Age/Early Scythian sites in addition to those from Transdanubia (see Kemenczei 1986; Kozubová 2021, 86, with references; Polidovych 2000, 35, with references, fig. 1–3; Vasiliev 1980, 142, 144, 147, 150, 151, pl. 21: 1–3; 22: 1–5; 23: 1).¹³ The finds from Transdanubia belong to the most westerly documented finds of this type of quiver decorations (Fig. 4) – two of them come from sites in the close neighbourhood of VC (Cat. Nos. 7, 16). All such quiver decorations from Transdanubia are stray finds that cannot be dated precisely. Bronze cross-shaped quiver decorations were used in the VC during the whole 6th century to the beginning of the 5th century BC (see more Kozubová 2009, 101–110; 2021, 86, footnote 15).

One *iron single-edged battle axe* with a symmetrically located shaft hole of variant II according to A. Kozubová (2010, 49) was found in the cremation grave 9 at Szólád, Kertek mögött (Somogy County), from Ha D2 (Fig. 3: 9; Cat. No. 33). Battle axes of type I are the most frequent impact weapons in the VC. They are almost identical in shape to iron battle axes of the Koban culture and from protomaeotian and early Maeotian sites in the Northwest Caucasus (from Ha B3 to Ha D1), but they differ from the less numerous battle axes from the Ukrainian forest-steppe region, including those from the Western Podolian group (see more Kozubová 2010, 49–51; 2019, 72, 73; 2021, 87, 91, with references; see also e.g. Burghardt 2015, 152–154, fig. 6; Shelekhan' 2012, 5–7, 9, 10, fig. 1–3). In the VC, battle axes of type I are dated broadly from early Ha D1 to late Ha D3, with a possible overlap into Lt A (Kozubová 2010, 51–53; 2019, 72). Type I has two main areas of

¹³ Outside of East-Central and Eastern Europe, two other bronze cross-shaped quiver decorations with zoomorphic ornaments were found in Bulgaria – a stray find from Veliko Tărnovo/Велико Търново (Veliko Tărnovo Province; Agre 1994, fig. 1) and a find in the Varna Archaeological Museum (Ivanov 2018, 26, with references, fig. 10: 9).

distribution in Central Europe. Its primary distribution territory is in the VC, especially in Northeastern Hungary. A further concentration was found at sites of the Ciombrud culture and the Transylvanian battle axes are among the most easterly finds of this type of weapons (Kozubová/Fojtík 2021, fig. 16; see also e.g. Ferencz/Barbu 2018, 143, 144, pl. II; III; Kemenczei 2009, 179, 180, list 2; Marinescu 1984, fig. 13: 5; Vasiliev 1980, 142, 144–146, 150, pl. 15: 3–8). Vekerzug-type battle axes are rare outside these two concentrations.¹⁴ The battle axes of type I were not found beyond Austria in the west (grave finds from Hallstatt/Gmunden District), the Eastern Slovenian ones from Libna (Občina Krško) and Volčje njive (Občina Mirna) are the southernmost finds, and the Southeastern Polish finds from Werchrata (Lubaczów County) and Żuklin (Przeworsk County) are the northernmost finds in Central Europe (see Kozubová/Fojtík 2021, 81, with references, footnotes 37, 38, fig. 16).

Five iron horse bits of type Szentes-Vekerzug (Fig. 3: 17, 18) were found in Transdanubia: one at Cserszegtomaj (Zala County; Cat. No. 11) and four at Szentlőrinc (Baranya County; Cat. No. 32). The stray find from Cserszegtomaj (Fig. 3: 17) was classified as variant I2 according to A. Kozubová (or variant 2 according to T. Kemenczei or type II/variant A1 according to W. M. Werner) given its arched cheek-pieces with three loops and without plate-like central part. Their endings are button-like and/or conical (Kemenczei 1985, 51; Kozubová 2011, 76; Werner 1988, 13, 14, fig. 4: A1). This variant was also found in horse grave 61 at Szentlőrinc (Werner 1988, 16, pl. 4: 21). The remaining three horse bits of variant II4 according to A. Kozubová (or type II/variant B1 according to W. M. Werner) from horse graves 52, 58 and 60 at Szentlőrinc are characterised by slightly arched cheek-pieces with three holes and plate-like central part (Fig. 3: 18). Their endings are button-like and/or conical (Kozubová 2011, 83; Werner 1988, 13, 14, fig. 4: B1). The bits of variant I2 from Transdanubia have numerous analogies at sites of the VC from the Ha D stage and also in Ha D3 finds from Eastern Slovenia, whose chronology is the same as the bit from grave 61 at Szentlőrinc (see Kozubová 2011, 76, 77, 79; Werner 1988, 15, 16, pl. 1: 7; 2: 8, 9, 11–13; 3: 14–17; 4: 2, 3). Compared to variant I2, the less frequent bits of variant II4 are more dispersed outside the territory of the VC, especially at the Ferigile culture sites in the Southern Carpathian-Danube region (Kemenczei 1985, 59, 60, fig. 7: 3, 6, 7; Werner 1988, 19, 20, pl. 8: 43–46; 9: 48, 49). Sporadic finds were documented in Northern Bosnia and Herzegovina (Donja Dolina/Opština Gradiška), Burgenland and Western and Southeastern Poland (Bochnak/Skowron 2022, fig. 32: 1–6; 33; Werner 1988, 19, 20, pl. 8: 42, 47; 9: 53). The bits of variant II4 from graves 52, 58 and 60 at Szentlőrinc likely belong to the Ha D3 phase, possibly to Lt A (Kozubová 2011, 83, 84). Outside the main distribution area in the VC (with more than 60 pieces),¹⁵ smaller concentrations of finds of Vekerzug-type iron horse bits were documented in Eastern Slovenia¹⁶ and in the Ferigile culture, with sporadic finds elsewhere in Central Europe – Poland, Eastern Austria, Transdanubia, Eastern Bohemia¹⁷ –, and Southeastern Europe – Croatia, Bosnia, Serbia (Fig. 5; see e.g. Bochnak/Skowron 2022, fig. 32: 1–6; 33; Jevtić 2006, fig. 18: 13–16; Kemenczei 2009, 181, list 5; Kozubová 2021, 94, footnote 36, with references; Kvietok 2017, 455, pl. VI: 17; Măndescu 2019, fig. 6: 1; Romsauer 1993, fig. 10: 3; pl. VI: 25; Werner 1988, 12–30, Taf. 1: 7; 2–13; 14: 83–93; 68A). The two easternmost finds come from Southwestern Ukraine (Nevytske/Невицьке/Uzhhorod Raion; Perebykivtsi/Перебіківці/Dnistrovskyi Raion; Kemenczei 2001–2002, 45, with references, fig. 12: 15; Smirnova 1993, fig. 7: 4).

In the VC, finds of snake-shaped temple rings of types I and II according to A. Kozubová (2013a, 27, 28, fig. 4), cowrie shells, mirrors and clay stamps are related exclusively to the female sphere (see more Kozubová 2013a, 171–177, 197, 198 for structure of grave goods). Most of the snake-shaped temple rings¹⁸ from Transdanubia belong to type I (Fig. 3: 12) with plain body with a circular section and with or without a preserved conical head (Cat. Nos. 1, 2A, 6, 12E, 22B, 28, 29A, 38A; Chochorowski 1985, fig. 6:

¹⁴ At least 113 battle axes of types I and II are known from the territory of the VC (Kozubová 2021, 87).

¹⁵ As regards the construction, the bits of type Szentes-Vekerzug differ not only from the horse bits of Hallstatt culture, but also from the bits from the Late Bronze Age and Early Iron Age sites in Eastern Europe and in the Caucasus. In the Late Bronze/Early Iron Age, bronze horse bits with movable cheek-pieces also were used in multiple distribution areas, but they were likewise different from iron bits of the VC. Among all the horse bits with unmovable connection of the mouthpiece with cheek-pieces, the riveted attachment of cheek-pieces was only detected with bits of type Szentes-Vekerzug. This fact probably indicates their autochthonous development, in which the regions to the west and east of the VC and the domestic base played no role (Kozubová 2011, 74; 2021, 92, footnote 41).

¹⁶ These horse bits are evidence for cultural contacts of the local Hallstatt population with the VC, not as evidence of Scythian influences (see footnote 15; see also Kozubová/Fojtík 2021, 78).

¹⁷ An unpublished find from Myštěves (Hradec Králové District). I thank Dr. Tomáš Mangel (Hradec Králové) for the information.

¹⁸ See Ilon 2017b, 97 for an overview of their terminology.

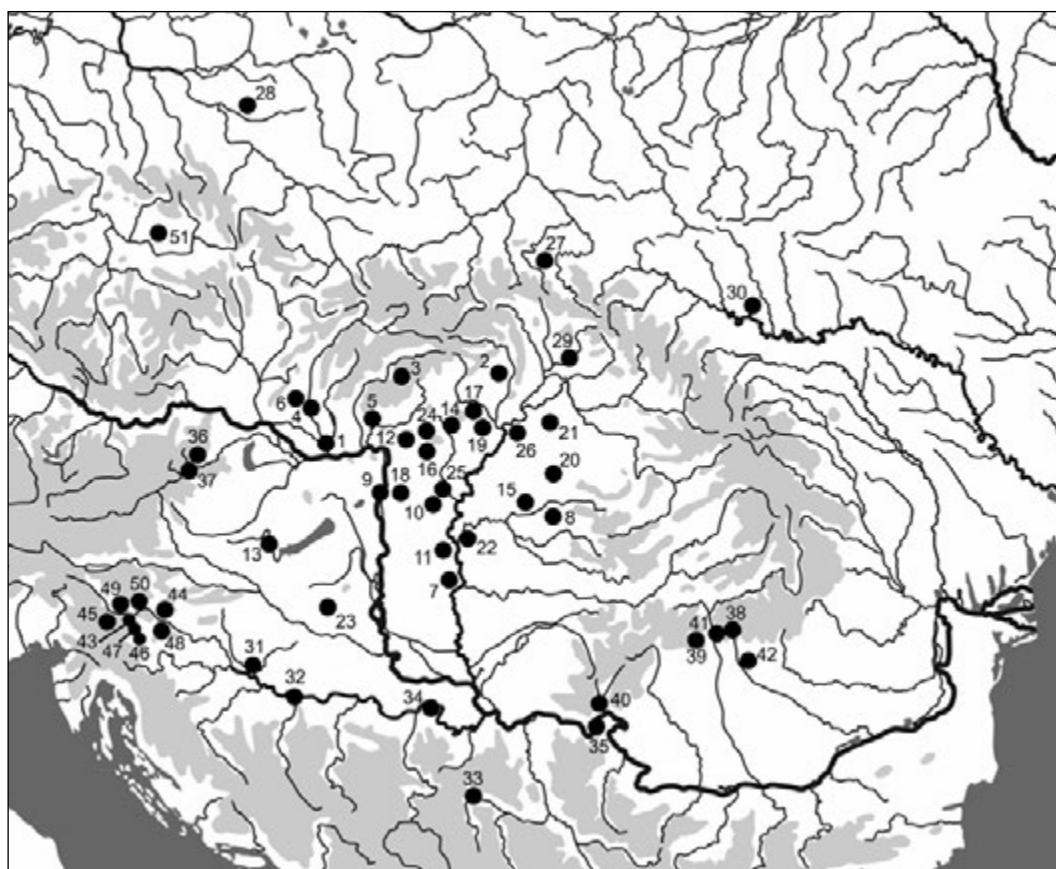


Fig. 5. The distribution of iron horse bits of type Szentes-Vekerzug. *Slovakia*: 1 – Chotín IA; 2 – Košice; 3 – Lubietová, Vysoká; 4 – Nitra-Dolné Krškany, Nitra-Mikov dvor; 5 – Preseľany nad Ipľom; 6 – Radošina, Pri Kornútovej chate. *Ungarn*: 7 – Algyó, Bartók Béla utca; 8 – Ártánd, Zomlin puszta; 9 – Budapest-Soroksár, Akácós-dűlő; 10 – Cegléd; 11 – Csanytelek, Újhalastó; 12 – Cserhátszentiván; 13 – Csereszegtomaj; 14 – Eger-Nagy Eged; 15 – Füzesgyarmat; 16 – Gyöngyös; 17 – Miskolc-Diósgyőr, Kerekdomb; 18 – Nagytarcsa; 19 – Nyékládháza-Mezőnyék; 20 – Nyírmárfalva, Kutyaabagos puszta; 21 – Nyíregyháza, Nyírfu utca; 22 – Szentes-Vekerzug; 23 – Szentlőrinc; 24 – Szurdokpüspöki; 25 – Tápiószéle, Szumrák; 26 – Tiszavasvári, Csárdapart, Tiszavasvári, Dózsa-telep. *Poland*: 27 – Międzybrodzie; 28 – Wymysłowo. *Ukraine*: 29 – Nevytske/Невицьке; 30 – Perebykivtsi/Перебиківці. *Croatia*: 31 – Sisak. *Bosnia and Herzegovina*: 32 – Donja Dolina. *Serbia*: 33 – Atenica; 34 – Badovinici; 35 – Mihajlov ponor. *Austria*: 36 – Oberpullendorf; 37 – Schandorf. *Romania*: 38 – Curtea de Argeș; 39 – Ferigile; 40 – Ieșelnița; 41 – Tigveni; 42 – Valea Stâni. *Slovenia*: 43 – Brezje pri Trebelnem; 44 – Libna; 45 – Magdalenska gora; 46 – Novo mesto; 47 – Stična; 48 – Šmarjeta; 49 – Vače; 50 – Zagorje ob Savi. *Czechia*: 51 – Myštěves. Graphic by A. Kozubová, after Werner 1988, with additions by A. Kozubová.

15, 19; Horváth 2015, fig. 5: 19; Ilon 2017b, 98, 100, pl. I: 1, 8–10; II: 1; Kemenczei 2008–2010, 108; Schwel-l-nus 2011, fig. 8: E; Soós 2020, fig. 3: 1; Soós/Tarbay/Péterváry 2023, 130, pl. 5: 3). Only five snake-shaped temple rings of type II with segmented body and with or without a preserved conical head (Fig. 3: 11) were found in Transdanubia (Cat. Nos. 13, 28, 29B, 38A; Chochorowski 1985, fig. 6: 17; Jerem 1981b, fig. 7: 12, 13; Párducz 1965b, 275, 276; Soós/Tarbay/Péterváry 2023, 130, pl. 5: 1). Both types are very homogeneous typologically and their finds in Central Europe are concentrated in the territory of the VC (see Kozubová 2018, table 1; 2019, 106–109, fig. 28; 31; Kozubová/Fojtík 2021, 81, 83, 86, fig. 17; for new finds see e.g. Keresztes et al. 2021, pl. 4: 2; 6: 5). While type I was found outside its main distribution territory in Eastern Hungary and Southwestern Slovakia, type II remains restricted to the territory of the VC, with a few exceptions from Transdanubia (see above) and Central Moravia (Měrovice nad Hanou, Babiny/ Přerov District; Bartík et al. 2017, 52, fig. 5: 112). Smaller concentrations of type I were documented in Moravia and Northwestern Hungary. With the exception of six snake-shaped temple rings from Northwestern Romania, Transylvania and Transcarpathia, type I was not found east of Hungary. The westernmost temple ring of type I was found at Břežánky (Teplíce District) in Northern Bohemia and

its northernmost find comes from Stary Machnów (Tomaszowski County) in Southeastern Poland (see Kozubová/Fojtík 2021, 81, 83, 86, with references, footnote 39, with references, fig. 17; see also e.g. Bartík et al. 2017, 43, 48, 54, fig. 5: 9, 57, 64, 132, 134; Ilon 2017b, fig. 1; Kozubová et al. 2022, Cat. No. 1: 2, 9, 22, 31B; Némethi 1982, 123, fig. 8: 13, 14; 13: 21, 22). The snake-shaped temple rings as head ornaments of exclusively female costume can be documented as local and specific for the material content of the VC (see more Kozubová 2018; 2019, 108, 109, 149). Their considerable popularity corresponds to their broad dating to Ha D1–Lt A (Kozubová 2013a, 29–31). Of the Transdanubian snake-shaped temple rings, only those from grave 1 from Alsónyék, Hosszú-dűlő (Tolna County), can be dated precisely to Lt A, those from settlement feature 268 at Alsópáhok, Hévízdomb I (Zala County), to Ha D1–Ha D2, those from grave 29 at Sopron, Krautacker-dűlő (Győr-Moson-Sopron County), to Ha D2–Ha D3, and those from Late Hallstatt settlement feature 168 at Sopron, Krautacker-dűlő (Cat. Nos. 1, 2A, 29A, 29B). Other Transdanubian specimens are either stray finds with a dating from Ha D1 to Lt A (Cat. Nos. 12E, 13, 22B, 28, 38A), or come from settlement features with a broader dating to Ha D, possibly with an overlap into Lt A (Cat. No. 6).

Grave 1 at Alsónyék, Hosszú-dűlő, from Lt A contained one *small bronze circular ear/temple ring* with meeting rounded ends of variant II according to A. Kozubová (2013a, 32, fig. 6), in addition to a snake-shaped temple ring of type I (Fig. 3: 14; Cat. No. 1; Soós 2020, fig. 3: 2). Small bronze circular ear/temple rings of various shapes are relatively frequent grave goods at Vekerzug cemeteries (see more Kozubová 2013a, 32–34, fig. 6; 2018, 16). However, in Eastern Hungary and Southwestern Slovakia they are not chronologically significant, as they were documented during the whole existence of the VC (Kozubová 2013a, 33, 34; 2019, 107).

In Transdanubia, shells of molluscs – gastropods of the genus *Cypraea* (Fig. 3: 15) have only been documented at two sites: 47 specimens in graves 1, 13, 18 and 29 at Sopron, Krautacker-dűlő (Győr-Moson-Sopron County), and three pieces in a grave at Tolna-Mőzs, Icsi-dűlő (Tolna County; Cat. Nos. 29B, 35; Jerem 1981a, pl. 3: 11, 13; 1981b, fig. 7: 5; Kovács 2008, 232, 233, 427). In Europe in the Iron Age, *small cowrie shells* of the species *Cypraea annulus* and *Cypraea moneta* were distributed in two territories: one in the East European steppe and forest-steppe zones, in the North and Central Caucasus and in the Western and Northwestern Black Sea region (see e.g. Bruyako 2007, fig. 1; appendix; Kovács 2008, 56, 57, 66–77; Kozubová 2013a, 50, with references; Teleaga/Zirra 2003, 83, 84, map 84),¹⁹ the other in the eastern part of the Carpathian Basin in graves of the VC (almost 400 specimens) and Ciumbrud culture (almost 200 pieces; Kozubová 2019, 100, 101; Kozubová et al. 2022, fig. 9; for new finds in the VC see Keresztes et al. 2021, pl. 3: 2, 3).²⁰ West and south of the main area of distribution in the East Carpathian region, cowrie shells in Central Europe were sporadically found in Transdanubia, Moravia, Upper Austria, Southwestern Germany and Northeastern Serbia (Bartík et al. 2017, 49, 54, 55, fig. 6: 137, 138; Ljuština/Radišić/Ninčić 2019, fig. 2; Schönfelder 2001, 318, 319, fig. 6: 7; table 1). The concentration of cowrie shells in Northern and Eastern Bohemia and Northeastern Poland (in Pomeranian culture), which are geographically quite distant from the primary occurrence of cowrie shells in the eastern part of the Carpathian Basin, is surprising (Kovács 2008, 80, 81, 239, 240; Kozubová et al. 2022, Cat. No. 1: 3, 5, 7, 14, 15B, 18B, 19B, 20, 27, 29B, 35, 36B, 37A–37C; Malinowski 1982, 118–120).²¹ However, no cowrie shells were found in the Polish Silesia and, surprisingly, in Southeastern Poland (Kozubová/Fojtík 2021, fig. 18). In the Ciumbrud culture, cowrie shells were found in graves from Ha C2b–Ha D1 phases. Although their occurrence in the VC is broadly dated from early Ha D1 to late Ha D3, possibly to Lt A, they are primarily concentrated in the Late Hallstatt period (Kozubová 2013a, 49–51, footnote 80; 2019, 100, 101). Cowrie shells found in the graves from Sopron, Krautacker-dűlő, are also dated to the Late Hallstatt period. The grave at Tolna-Mőzs, Icsi-dűlő, is tentatively dated to the 6th–5th centuries BC (Kovács 2008, 232, 427).

The goods in grave 29 from Sopron, Krautacker-dűlő (Győr-Moson-Sopron County; Fig. 3: 10; Cat. No. 29B), also included a *bimetallic mirror* of type II or type Chotín according to A. Kozubová (2019, 126). The iron handle is decorated with bronze applications in the shape of a fan at the upper end and square

¹⁹ On dating of cowrie shells in Eastern Europe and in the Caucasus see Bruyako 2007, 231; Kozubová 2013a, 50, footnote 78; Treyster 2021, 25.

²⁰ Their occurrence in the Vekerzug and Ciumbrud cultures could be related either to the Caucasus region, from where they could have reached the East Carpathian region via the East European steppe and forest-steppe, or to the Western or Northwestern Black Sea region, which could have been reached from the Red Sea via the Eastern Mediterranean (Kozubová 2013a, 49–51, with references; Kozubová/Fojtík 2021, 86, footnote 41).

²¹ The cowrie shells probably reached the lower course of the Visla River from the Eastern Carpathian Basin in a northerly direction along the so-called Tarnobrzeg-Vekerzug Amber Road (see Dziegielewska 2017, 328; Kozubová 2019, 101, 102).



Fig. 6. Clay stamps from Ha D–Lt A found in Transdanubia. 1, 3 – Alsópáhok, Hévízdomb I (Cat. No. 2A); 2, 5 – Keszthely, Apátdomb (Cat. No. 14); 4 – Budaörs, Kamaraerdei-dűlő (Cat. No. 8); 6 – Százhalombatta (Cat. No. 30); 7 – Tokod-Altáró, Erszébet akna (Cat. No. 34); 8 – Zalaszentmihály (Cat. No. 41); 9–11, 13, 14, 19 – Velem, Szent Vid-hegy (Cat. No. 38A, 38B); 12 – Pomáz, Zdravlyák-dűlő (Cat. No. 22A); 15 – Budapest-Csúcshegy, Harsánylejtő (Cat. No. 9); 16 – Sopron, Krautacker-dűlő (Cat. No. 29A); 17, 18 – Sopron, Himmelstrom (Cat. No. 29C); 20 – Bátaszék, Körtvélyes-dűlő (Cat. No. 5); 21 – Sé, Doberdó (Cat. No. 27B). After Chochorowski 1985; Horváth 2015; Ilon 1999; Kemenczei 2008–2010; Kisfaludi 1997; Schwelhnus 2010; Tóth 2017. Different scales. Graphic by A. Kozubová.

at the lower end (*Jerem 1981b*, fig. 7: 11).²² The occurrence of mirrors with a side handle at the Early Iron Age sites in the East Carpathian region represents a foreign element taken from the North Pontic region; however, it is not an eastern or Scythian element in the material content of the Vekerzug and Ciombrud cultures.²³ These mirrors show links between the VC and the ancient Greek milieu in the Northwestern Black Sea region. It is an ancient Greek element in the material content of the VC. They may have reached the VC from production and distribution centres in the Greek colonies in the Northwestern Black Sea region directly or indirectly via the Ukrainian forest-steppe zone (see more *Kozubová 2019*, 125–127 on this topic). Given their morphological peculiarities, bimetallic mirrors from sites of the VC are local products dated to the Late Hallstatt period (more precisely to Ha D2–Ha D3). In Ha D3 at the latest, they completely replaced the bronze Borisfen-type mirrors with zoomorphically decorated handles²⁴, imported from the East. These were used throughout the 6th century BC (see *Kozubová 2013a*, 83; 2019, 126, 127). In addition to the mirror from Sopron, Krautacker-dűlő, another three bimetallic mirrors of type II were documented in the Carpathian Basin, all of them at sites of the VC: in cremation grave at Aldebrő, Ilona-tábla (Heves County/HU; *Gutay et al. 2021*, fig. 35), in cremation grave 76/53 at Chotín IA (Komárno District/SK; *Kozubová 2013b*, 32, tab. 24: 16), and in cremation grave 38 at Hajdúnánás, Verestengerjártás (Hajdú-Bihar County/HU; *Fodor 2013*, 832, fig. 3). Except for the mirror from Aldebrő from Ha D1 (*Gutay et al. 2021*, 42), all the other specimens from the VC are dated to Ha D2–Ha D3 (*Kozubová 2019*, 126).

A total of 13 clay stamps (or pintadere) of the Vekerzug type (Fig. 3: 11; 6: 1–13) with typical geometric motifs on the sealing surface were found at eight sites in Transdanubia. Nine of them belong to group 1 according to J. Kisfaludi/F. Schweltnus or type I according to A. Kozubová given the large quadrangle (square or rectangular) or oval sealing surface with dimensions of over 5.0 cm (Fig. 6: 1–3, 5–8, 13; Cat. Nos. 2A, 14, 30, 34, 38A, 41). The remaining five specimens have a small sealing surface up to 5.0 cm and belong to group 2 according to J. Kisfaludi/F. Schweltnus or type II according to A. Kozubová (Fig. 3: 11; 6: 4, 9–12; Cat. Nos. 8, 22A, 38A; see *Kisfaludi 1997*, 76; *Kozubová 2013a*, 128–131; *Schweltnus 2010*, 211, 212). Compared to Transdanubia, clay stamps of type II are much more frequent in the VC than those of type I. Stamps of type II also have more variable decorative motifs on the sealing surface of circular, square, triangular, oval or rhombus shape (see more *Kisfaludi 1997*, fig. 3–12; *Kozubová 2013a*, fig. 43; 44; *Schweltnus 2010*, 212, 213, fig. 4; 5). Geometric motifs on the sealing surface like concentric rings (Fig. 6: 9) a double spiral (Fig. 6: 12), a schematised rosette (Fig. 6: 10, 11) and the swastika motif (Fig. 6: 4) were frequent on the Vekerzug clay stamps of type II (see e.g. *Kisfaludi 1997*, fig. 7: 5–17; 8: 1–6, 8; 9: 3–12, 17, 18; *Kovács/Németh 2023*, fig. 24: 6, 8, 9, 12, 13). Three basic geometric motifs can be distinguished for clay stamps of type I from Transdanubia: concentric rhombuses (Fig. 6: 5), rows of the swastika motif (Fig. 6: 1, 6–8) and one or more rows of a meander motif (Fig. 6: 2, 3, 13). While concentric rhombuses have direct analogies on both types of clay stamps from sites of the VC (see e.g. *Kisfaludi 1997*, fig. 3: 2; 6: 1; 10: 1–6, 10), the remaining two motifs from Transdanubia have local peculiarities. In the VC, the motif of a repeating swastika does not occur on stamps of type I and the meander motif has a rhombus shape (see e.g. *Kisfaludi 1997*, fig. 5: 1–3). Vekerzug-type clay stamps were found only sporadically outside the territory of the VC (here with approx. 150 pieces; *Kozubová 2019*, 136, fig. 35; *Kovács/Németh 2023*, 36, fig. 24; 25).²⁵ Smaller concentrations of these objects were found in Moravia (*Bartík et al. 2017*, 48, 53, fig. 6: 60, 61, 124) and in Transdanubia. With the clay stamp from Führholz (Völkermarkt District/AT; *Teržan 1998*, pl. 12: 7)

²² Bimetallic mirrors with a side handle from sites of the Vekerzug and Ciombrud cultures can be divided into three types based on the handle decoration (see more *Kozubová 2019*, 126). The iron handle of mirrors of type I (or type Tápiószéle) is decorated at the lower end with a double-sided volute (grave 8/61 from Chotín IB/Komárno District/SK; stray find from Tápiószéle, Sumrák/Pest County/HU; *Kozubová 2013b*, 118, pl. 92: 1–11; *Párducz 1966*, 45, pl. XXXVII: 1, 2). The handle of mirrors of type II (or type Chotín) is decorated at both ends with bronze applications of geometric shape – square/rectangle, fan/trapezoid. The iron handle of mirrors of type III (or type Törökszentmiklós) is not decorated (grave 71 from Törökszentmiklós, Surján/Jász-Nagykun-Szolnok County/HU; grave from Comlod/Județul Bistrița-Năsăud/RO; probably also a stray find from Csanytelek, Újhalastó/Csongrád-Csanád County/HU; *Kemenczei 2009*, 119, 158, pl. 16: 6; 128: 9; *Tézer 2005*, 9, fig. 12: 6a, 6b).

²³ Also in the East European steppe and forest-steppe, mirrors with a side handle do not have their origin in local cultures and cultural groups. They are mostly products of Greek workshops in the North Pontic region. Some of them, such as the bimetallic one, may have been produced locally according to Greek prototypes (see more e.g. *Kuznetsova 2002*; *Zuev 2018*).

²⁴ See their list in *Tézer 2005*, 5–9, 15–20, fig. 1; 8: 1a–1c, 4c, 4d; 9: 1a, 3a, 4a–4c; 10: 1b, 2a, 4a–4d; see also *Kemenczei 2009*, 66–68, 120, 122, 126, 138, 169, 171, 173, 174, 178, pl. 17: 3; 22: 1; 35: 9; 87: 12; 159: 1, 2; 162: 1; 171: 25; 177: 4; 178: 4.

²⁵ In the VC, this type of finds is local, unrelated to the cultural impulse from the Caucasian region (see more *Kozubová 2019*, 136, 137 on this topic). It is likely a periodically-occurring category of finds without genetic links to a previous period or links to foreign cultural impulses (*Schweltnus 2010*, 219).

from Ha D3, they represent the westernmost finds of Vekerzug-type stamps (Kozubová/Fojtík 2021, 88, 89, fig. 20). Clay stamps are finds that were used for a long time in the VC – from early Ha D1 to Lt A (Kozubová 2013a, 132, 133). Of the Transdanubian specimens, only those from settlement features 98 and 295 at Alsópáhok, Hévízdomb I (Zala County; Cat. No. 2A), and from grave 12 at Pomáz, Zdravlyák-dűlő (Pest County; Cat. No. 22A), can be dated precisely to Ha D1–Ha D2 (Horváth 2015, 245, 247, 249; Kemenczei 1977, 72, fig. 3: 6; 4: 8). Other Transdanubian specimens are either stray finds, or come from settlement features with a broader dating to Ha D, possibly with an overlap into Lt A.

In contrast to other areas of the Hallstatt culture (Moravia, Bohemia and Austria) with sporadic finds of Vekerzug wheel-turned pottery, Northwestern Hungary and Southeastern Poland have a higher concentration of this type of pottery outside its main distribution territory in Eastern Hungary and Southern Slovakia (see Kozubová/Fojtík 2021, 86–88, with references, fig. 19). The shapes of Vekerzug wheel-turned pottery from Transdanubian sites is limited to bowls and jugs, in contrast to the finds of bowls, jugs, bottles and vessels with a conical neck from settlements and graves of the Tarnobrzeg Lusatian and Pomeranian cultures in Southeastern Poland dated from Ha D2 to Lt A (Czopek 1993; 2012, fig. 4; table 1).²⁶ Fragments of a larger vessel with a conical neck or bottle from Koroncó, Bábota (Győr-Moson-Sopron County), are an exception (Cat. No. 17A; Czigáni/Molnár 2020, 99, pl. 9: 5). The collection of over 41 whole vessels and pottery fragments from 20 Transdanubian sites is dominated by biconical high-handled jugs of type I according to A. Kozubová (Fig. 3: 8; Cat. Nos. 12C, 22A, 22B, 22C, 24, 26, 27A, 38A, 39; Kozubová 2013a, 165, fig. 64) over bowls with a inverted rim of type I according to A. Kozubová (Fig. 3: 16; Cat. Nos. 3, 4, 15, 17A, 21, 24, 25, 34; Kozubová 2013a, 162, fig. 63).²⁷ The typologically variable biconical jugs and bowls with an inverted rim are the most typical and widespread shapes of local wheel-turned pottery at cemeteries and settlements of the VC (see e.g. Czifra et al. 2017, 266; Kozubová 2013a, 162–165; Romsauer 2019, 32, 33). Many shapes of wheel-turned pottery, especially jugs and some types of bowls (including type I), were present during the whole existence of the VC without significant morphological changes. Consequently, their chronological sensitivity is insufficient and they are unsuitable for precise dating (Kozubová 2013a, 158–168; Romsauer 2019, 31–33). Many of the wheel-turned vessels from sites in Transdanubia are stray finds (Cat. Nos. 4, 15, 22B, 22C, 25, 26, 34, 38A, 39). Other vessels were found in settlement features and graves without chronologically significant accompanying finds with broader dating to Ha D or Lt A (Cat. Nos. 3, 12C, 12D, 21, 24, 40). Other finds of wheel-turned pottery come from the Late Hallstatt to Early La Tène find contexts (Cat. Nos. 12A, 17A, 27A, 29A).²⁸

Second group of origin

The second group of origin is related to the first group of origin. It includes artefacts that had precursors in the material content of the VC, in Transdanubia they appeared already in a modified, local form (snake-shaped temple rings of types III; clay stamps; Fig. 1: 5, 9, 27B, 29A–29C, 38B; 3: 19, 20).

Seven *snake-shaped temple rings*, classified as typologically very variable type III according to A. Kozubová (2013a, 28, fig. 4), were found at three sites in Transdanubia. It covers specimens with a plain body of square and polygonal sections (Fig. 7: 1, 2, 8, 10). However, some temple rings have embossed body (longitudinal band: plain or with a wave or fishbone motif or with transverse or vertical grooves; multiple longitudinal bands; small holes; Fig. 7: 3, 5–7, 11), while others have a plain body with an animal or non-conical head (Fig. 7: 4, 12; see Kozubová 2019, 106). Snake-shaped temple rings of type III are rare in the VC and, with two exceptions,²⁹ they are stray finds with mostly a plain body of polygonal section (Kozubová/Fojtík 2021, 91, 92, with references, fig. 21). Outside the territory of the VC, type III was documented, besides Northwestern Hungary, in Moravia and two specimens were found in Northern Bohemia (Bartík et al. 2017, 52, 54, 55, fig. 5: 108, 109, 111, 127, 146; Kozubová et al. 2022, 289, fig. 8; Cat. No. 1: 4, 13). Snaked-

²⁶ A set of Vekerzug wheel-turned pottery comparable in quantity and variability of shapes to that in Poland comes from Late Hallstatt settlement features at Inzersdorf-Walpersdorf (St. Pölten District) in Lower Austria (Ramsl 1998, 27, 49, fig. 33; pl. 58: 360–368; 59: 369–372; 62: 409; 72: 547).

²⁷ Two bowls with a slightly funnel-shaped rim from Győr-Ménfőcsanak, Széles-földek (Győr-Moson-Sopron County), are an exception (Molnár 2007, 61, pl. 2: 3, 4).

²⁸ Grave 11 at Pomáz, Zdravlyák-dűlő, from Ha D1 is an exception (Cat. No. 22A; Kozubová 2013a, 60).

²⁹ Cremation grave 34/53 at Chotín IA (Komárno District/SK; Kozubová 2013b, 18, pl. 10: 5) and grave at Tiszakeszi, Fáy-kert (Borsod-Abaúj-Zemplén County/HU; Kemenczei 2009, 140, pl. 81: 13).

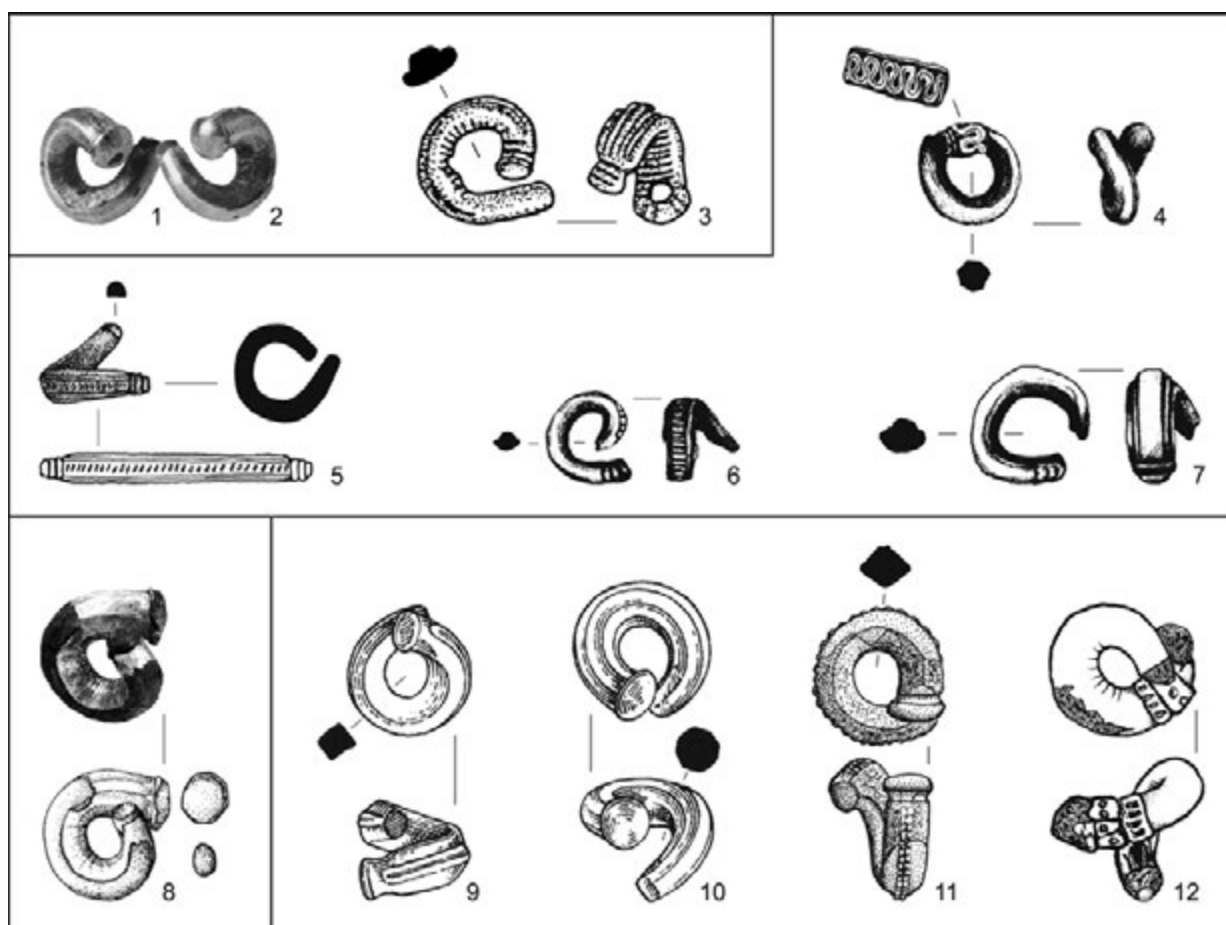


Fig. 7. Snake-shaped temple rings of type III according to A. Kozubová from Central Europe. 1, 2 – Kunszentmárton, Nagy-Éri-Főcsatorna (Jász-Nagykun-Szolnok County/HU); 3 – Tiszakeszi, Fáy-kert (Borsod-Abaúj-Zemplén County/HU); 4 – Sé, Doberdó (Vas County/HU); 5–7 – Velem, Szent Vid-hegy (Vas County/HU); 8 – Kozinec, Holubí háj (Praha-západ District/CZ); 9, 10 – Měrovice nad Hanou, Babiny (Prostějov District/CZ); 11 – Práche, U Prosiměřic (Znojmo District/CZ); 12 – Suchohrdly, Nad přehradou II (Znojmo District/CZ). Different scales. After Kozubová et al. 2022.

shaped temple rings of type III are typologically most diverse in Transdanubia, with variants (e.g. with longitudinal band with a wave or fishbone motif; Fig. 3: 20; 7: 4–6) that have not yet been found in the VC, in Moravia and Bohemia (Cat. Nos. 27B, 29B, 38B; *Ilon 2017b*, pl. I: 2, 3, 5–7; II: 2, 3, 5–7; *Jerem 1981b*, fig. 7: 14, 15). This finding could indicate their local production. Only specimens from grave 29 at Sopron, Krautacker-dűlő (Győr-Moson-Sopron County), from Ha D2–Ha D3 and from settlement feature 158 at Sé, Doberdó (Vas County), from Ha D3–Lt A can be dated with greater precision (*Gáll/Molnár 2004*, 162; *Jerem 1981b*, 108, 111; *Kozubová 2013a*, 82, footnote 162).³⁰

Eight clay stamps come from six sites in Transdanubia – their sealing surface is decorated in a way that is not typical for Vekerzug clay stamps or differs significantly (Fig. 6: 14–21). Smaller specimens from Budapest-Csúcshegy, Harsánylejtő (Pest County; Fig. 6: 15), and Sopron (Himmelstrom and Krautacker-dűlő/Győr-Moson-Sopron County; Fig. 6: 16–18; Cat. Nos. 9, 29A, 29C; *Kisfaludi 1997*, 92, fig. 12: 9, 10; *Schwellnus 2010*, fig. 1: 1a, 1b) with a sealing surface of rhombus or quadrangle shape are decorated geometrically – the hourglass motif, the multiple concentric rhombuses³¹ and the fishbone motif (combined with rows of small rectangles) have not yet been found in the VC. A clay with a sealing surface of square shape from Velem, Szent Vid-hegy (Vas County), decorated by a swastika motif combined with concen-

³⁰ The temple ring from settlement feature 3 (probably craft workshop) at Kozinec, Holubí háj (Praha-západ District/CZ), is dated to Lt A (*Stolžová/Šulová 2011*, 357, 362, fig. 8: 1; pl. 9: 2, 3).

³¹ The fragmented clay stamp from settlement feature 3817 at Hulín-Pravčice (Kroměříž District/CZ) is similarly decorated as specimens from Sopron, Himmelstrom (*Bartík et al. 2017*, 48, fig. 6: 61).

tric squares in three rows can also be included in this group (Fig. 6: 19; Cat. No. 38B; *Kisfaludi* 1997, fig. 5: 6). The swastika motif has been documented for the Vekerzug-type stamps, but not in combination with concentric squares. Although the clay stamps from Budapest-Csúcshegy, Sopron and Velem are a local variant, they were likely based on the Vekerzug-type stamps in shape and function. The same applies to the larger clay stamps with a sealing surface of square shape from Bátaszék, Körtvélyes-dűlő (Tolna County; Fig. 6: 20), Sé, Doberdó (Vas County; Fig. 6: 21), and Velem, Szent Vid-hegy (Fig. 3: 19; 6: 14), with schematic zoomorphic motifs – griffin (combined with the figure of a small four-legged animal), deer with claws or figure of an unidentifiable animal (Cat. Nos. 5, 27B, 38B; *Ilon* 1999, fig. 1; *Kemenczei* 2008–2010, fig. 1: 1; *Kisfaludi* 1997, fig. 1: 1). The decoration by stylised animal figures is not typical for the Vekerzug clay stamps and has only been documented for three specimens,³² each with distinctive decoration (see e.g. *Schwellnus* 2010, 214, 215, fig. 6). Only stamp from settlement feature 98 at Sé, Doberdó, can be dated precisely to Ha D3–Lt A (*Gál/Molnár* 2004, 162). In addition to Transdanubia, a small group of clay stamps from the second group of origin was also documented in Moravia (see more *Kozubová/Fojtík* 2021, 92, with references, fig. 14: 23–25).

Third group of origin

The third group of origin (Fig. 2: 10, 20, 23; 3: 21–23) includes types of artefacts distributed in the East European steppe and forest-steppe zones and in the North Caucasus (predominantly in the Ukrainian forest-steppe), where they occur in the material content of many cultures and cultural groups. They are very rare in Central Europe.

Antler cheek-piece with a hoof-like ending from Celldömölk, Ság-hegy (Vas County), is one of a kind in Transdanubia (Fig. 3: 21; Cat. No. 10; *Mozsolics* 1953, fig. 35; pl. XV: 8). Bone/antler cheek-pieces with zoomorphic endings (an animal head at one end and a hoof at the other) are typically associated with cultures/cultural groups of the early Scythian period (Ha C2–Ha D1) in the East European forest-steppe and partly also in the North Caucasus (see e.g. *Mohilov* 2008, 24–29, fig. 40–56), but they were used in the VC only sporadically (see below). Moreover, the finds from settlements of the VC are morphologically different from the East European specimens, which indicates their local origin (*Kozubová/Fojtík* 2021, 94, 95). On the other hand, a cheek-piece from Celldömölk, Ság-hegy, exhibits distinct similarities in shape with the East European finds. Only six similar cheek-pieces were documented in the Carpathian Basin,³³ where their occurrence had only an episodic character.³⁴ This type of horse harness, unlike iron horse bits of type Szentes-Vekerzug (see above), was not widely used in the VC.

Burial mound from Regöly, Strupka-Magyar birtok (Tolna County), contained a total of 900 whole and fragmented iron (790) and bronze (110) components of *scale armour* (Fig. 3: 22), which were found in several layers (Cat. No. 23; see *Horváth/Szabó* 2015, 101). Protective armours composed of hundreds of similar metal scales, as we know them from Regöly, were commonly found in graves in the East European steppe and forest-steppe zones and in the North Caucasus during the whole Early Iron Age.³⁵ The finds of such armours, often in association with warrior belts, are known here from at least 350 sites (see e.g. *Černenko* 2006; *Kozubová* 2013a, 111, footnote 219, with references; *Măndescu* 2023, 222–224). In the Carpathian Basin, metal parts of scale armour are evidenced in only nine sites, the biggest number of them comes from Regöly (Fig. 8). Outside the Carpathian Basin, similar bronze and iron scales were found also in burial mound 2 at Jalžabet (Varaždin County) in Northwestern Croatia (*Šimek* 1998, 500, 501, 509, fig. 8: 5, 6, 8) and in burial mounds 7, 8, 11, 12, 22, 24 and 26 at Valea Stâinii (Argeş County) in Southern Romania (*Măndescu*

³² Gyula (Békés County/HU), Kecel (Bács-Kiskun County/HU) and Preseľany nad Ipľom (Levice District/SK; *Kisfaludi* 1997, 88, 92, fig. 2: 2–4).

³³ Five pieces from sites of the VC in Eastern Hungary: Aldebrő, Ilona-tábla (Heves County; two settlement finds; *Gutay et al.* 2021, fig. 25; 26), Mátraszele (Nógrád County; grave; *Kemenczei* 1986, 122, fig. 3: 2), Pusztataskony, Ledence 1 (Jász-Nagykun-Szolnok County; feature 484; *Tot* 2015, fig. 2), Budapest-Rákospalota, Újmajör (Pest County; feature 128; *Horváth* 2002, 106, fig. 10: 6).

³⁴ Outside the Carpathian Basin, a cheek-piece with zoomorphic endings at Habrůvka-Býčí skála (Blansko District/CZ), was found, which is most similar to the one from Budapest-Rákospalota, Újmajör. It is probably a locally modified product based on East European forest-steppe precursors, made either in the VC or directly in Moravia (*Bartík et al.* 2017, 45, fig. 6: 28; *Kozubová/Fojtík* 2021, 94, 95).

³⁵ Their oldest finds here are dated to the late 8th century BC, but most of the scale armor is evidenced in graves from the 4th and 3rd centuries BC (*Černenko* 2006, 135).

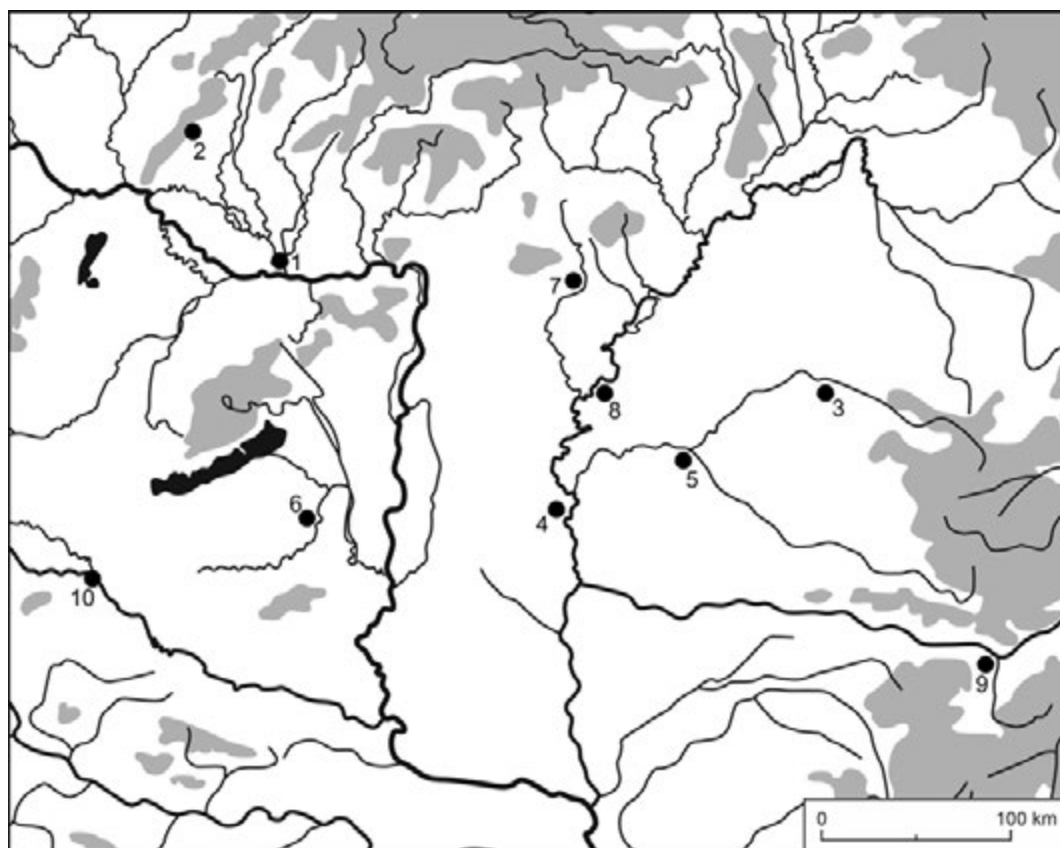


Fig. 8. The distribution of metal armour scales from Ha D in East-Central Europe. *Slovakia*: 1 – Chotín IA; 2 – Smolenice, Molpír. *Ungarn*: 3 – Ártánd, Zomlin puszta; 4 – Csanytelek, Újhalastó; 5 – Csárdaszállás, Hanzéltanya; 6 – Regöly, Strupka-Magyar birtok; 7 – Tarnabod, Téglásdomb; 8 – Törökszentmiklós, Surján. *Romania*: 9 – Simeria. *Croatia*: 10 – Jalžabet. Author A. Kozubová.

2023, 222, fig. 1; 2). The interpretation of scale-shaped objects from sites in the Carpathian Basin (six of them are Vekerzug sites) as armour scales is not entirely clear. The finds from Ártánd, Zomlin puszta (Hajdú-Bihar County/HU; *Párducz 1965a*, 145, pl. XI: 1–22; XII: 1–26; XIII: 1–28), Jalžabet, Regöly and grave 1 at Tarnabod, Téglásdomb (Heves County; *Párducz 1969*, 38, pl. III; IV), can with no doubts be considered as parts of scale armour, but the remaining assemblages of finds³⁶ do not enable such indisputable interpretation. Each of these assemblages contained one to five scale-shaped objects, whose interpretation as components of scale armour might rather indicate their symbolic deposition in the grave (*Kozubová 2013a*, 111; 2019, 91, 92). The occurrence of scale armour in the Carpathian Basin had only an episodic character, chronologically delimited by the Ha D1 phase (*Kozubová 2013a*, 111, 112; *Šimek 1998*, 509).

The third group of origin includes stray finds of four *bronze rattles* decorated with schematic animal figures from Mihályfa, Fenyőös-dűlő (Zala County), despite the fact that their occurrence in Transdanubia is probably related to activities of the VC (Fig. 3: 23; Cat. No. 20). The main distribution territory of similar artefacts is located in the North Caucasus and in the Ukrainian forest-steppe – on the early Scythian sites (see e.g. *Frunt 2023*; *Illins'ka 1963*; *Kemenczei 2009*, 62, 63, with references; *Perevodchikova 1980*; *Ryabkova 2016*, 216, with references). Thirteen rattles from six sites have been documented in the VC (stray finds or finds with unclear circumstances of finding);³⁷ some of these could have been imported to the Carpathian Basin from the East, while other, given their stylish peculiarities, may have been local imitations of eastern

³⁶ Two graves at Csanytelek, Újhalastó (Csongrád-Csanád County/HU), grave 17 at Csárdaszállás, Hanzéltanya (Békés County/HU), cremation grave 86/54 at Chotín IA (Komárno District/SK), grave 3 at Simeria (Hunedoara County/RO), grave 90 at Törökszentmiklós, Surján (Jász-Nagykun-Szolnok County/HU; for references see *Horváth/Szabó 2015*, 102; *Kozubová 2013a*, 110, 111).

³⁷ Aszód (Pest County), Balassagyarmat (Nógrád County), Bánhorváti (Borsod-Abaúj-Zemplén County), Gyöngyös (Heves County), Nagytarcsa (Pest County), Szurdokpüspöki (Nógrád County; *Kemenczei 2009*, 167, 168, 171, 175, pl. 144: 2; 145: 1, 3; 148: 1–6; 164: 1–3, 178: 1).

precursors (see *Kemenczei* 2009, 63; *Párducz* 1970, 52–55). However, it should be emphasised that rattles did not find their broader use in the VC. Unlike their territory of origin in the East European steppe and forest-steppe zones and in the North Caucasus, the occurrence of rattles in the eastern part of the Carpathian Basin was short-term and their further typological and chronological development was not documented here (*Kozubová* 2019, 136).

Fourth group of origin

A typologically homogeneous fourth group of finds (Fig. 2: 10, 12B, 12F, 17B, 17C, 23, 38B; 3: 24–33) consists of *bronze arrowheads with an outer socket* – specifically their older types (see *Kozubová* 2019, 62), whose occurrence in East-Central Europe (in the East Hallstatt milieu) is probably related either to the Middle Dnieper region or to the Middle Dniester region (to the Western Podolian group) and/or to Transylvania (to the Ciombrud culture; on this topic see more *Hellmuth* 2006, 137–154, fig. 115; 2010, 359, 360; *Hellmuth Kramberger* 2021, 172, 173, 175).³⁸ The older types of arrowheads with an outer socket are distributed in different Early Iron Age communities in the East European steppe and forest-steppe and in the North Caucasus (e.g. *Daragan* 2015; 2016; *Hellmuth* 2006, 15, with references; 2010). They are characterised by considerable typological variation and include the following groups and their variants in Transdanubia according to the typological scheme by A. *Hellmuth* (2006): biblade specimens of groups I.A, I.C and I.D (Fig. 3: 24–26; Cat. Nos. 10, 12B, 17B, 23, 38B; *Chochorowski* 1985, fig. 3: 2, 21; 6: 35; *Czigáni/Molnár* 2020, pl. 13: 3; *Szabó/Fekete* 2011, pl. 20: 13), triblade arrowheads of groups II.A, II.B, II.C, II.D and II.G (Fig. 3: 27–30, 32; Cat. Nos. 10, 12F, 38B; *Chochorowski* 1985, fig. 3: 3–9, 11, 13, 14, 17–20, 22–27; 6: 34, 36, 38; *Ilon* 2017a, fig. 8: 3), trilobate-triblade specimens of groups II.E or II.F (Fig. 3: 31; Cat. Nos. 10, 23; *Chochorowski* 1985, fig. 3: 10, 12; *Szabó/Fekete* 2014, pl. 113: RHF1.8.) and trilobate arrowheads of group III (Fig. 3: 33; Cat. Nos. 10, 17C, 38B; *Chochorowski* 1985, fig. 3: 16; 6: 37; *Czigáni/Molnár* 2020, pl. 9: 4). The arrowheads with an outer socket can be divided into two groups based on the frequency of their finds in Central and Eastern Europe. Arrowheads from the first group are common in both regions (groups I.A, II.B, III). However, specimens from the second group are not very common in Central or Eastern Europe (groups II.C, II.G; see *Kozubová/Fojtík* 2021, 66, 68, 69, with references). Several concentrations of arrowheads with an outer socket were found in Central Europe – in Moravia, Southwestern and Southeastern Poland and Transylvania, partly also in Bohemia and Eastern Slovenia (*Kozubová et al.* 2022, fig. 21). The largest set of these arrowheads (at least 400 pieces) comes from the Molpír hillfort in Smolenice (Trnava District/SK; *Hellmuth Kramberger/Čambal* 2019, 89). Arrowheads with an outer socket are not frequent in Transdanubia compared to other regions in Central Europe: out of 35 typologically reliably identified finds from six sites in its north-western part (Fig. 2), 26 specimens were found at the hillfort in Celldömölk, Ság-hegy (Vas County; Cat. No. 10). With the exception of finds from Regöly, Strupka-Magyar birtok (Tolna County; Cat. No. 23), arrowheads with an outer socket from Transdanubia are stray finds, or finds with unclear circumstances of finding. The exact dating of arrowheads with an outer socket from Central European sites continues to be a topic of ongoing debate – but remains problematic for the following reasons. This typological highly variable long-ranged weapon was used for a long time in the East – from the late 8th/early 7th to the mid-6th century BC (see e.g. *Daragan* 2015; 2016; 2017, 85–89; *Makhortykh* 2022, 106, 109). The majority of arrowheads from Central Europe were found by surface prospecting or are stray finds (see *Bartík et al.* 2017; *Hellmuth* 2006; *Kozubová/Fojtík* 2021; *Kozubová et al.* 2022; *Novák* 2017; 2020, with references). On the basis of some closed assemblages, such as the Molpír hillfort in Smolenice or the hillfort in Wicina (Żarski County/PL; here supported by dendrodata³⁹), the prevailing opinion among researchers is that the presence of arrowheads with an outer socket in East-Central Europe can be dated to the late 7th – the first quarter/the first half of the 6th century BC, i.e. to Ha D1 (e.g. *Chochorowski* 2014, 41; *Khokhorovski* 1994, 55, 57, 58; *Klápa* 2017, 71, 72, 74; 2019, 72, 73; *Novák* 2017, 205–207; 2020, 97).⁴⁰

³⁸ Some researchers suppose that inhabitants of the settlement agglomeration of the so-called Scythian-type hillfort at Chotyniec (Jarosław District) in Southeastern Poland may have participated in the distribution of some arrowheads with an outer socket to the west and southwest (see *Burghardt* 2020, 352, 353).

³⁹ According to dendrochronology, the time of the last repair of wooden defensive structures and thus the date of the destruction of the hillfort is determined to be circa 571 BC (*Krapiec/Szychowska-Krapiec* 2013, 371–374).

⁴⁰ The dating of these arrowheads and the related possible military activities, suggested by some authors (e.g. *Hellmuth* 2006, 154; 2010, 360–362, 364; *Hellmuth Kramberger* 2021, 176; *Szabó/Czajlik/Reményi* 2014, 6; *Tóth* 2019, 486) to occur as early as the late Ha C2 or Ha C2/Ha D1 phase (the third quarter or alternatively the second half of the 7th century BC), currently remains questionable due to the lack of well-dated finds.

CONCLUSIONS

The interpretation of the occurrence of finds of the eastern type in Transdanubia involves four key questions. In addition to establishing their cultural provenance and dating, it is also important to consider their find contexts and the related question whether their occurrence documents military activities or whether they represent a different form of contact or activity. The different find contexts of these artefacts and their varied cultural origin imply different reasons for their occurrence in Transdanubia and in other regions of the (Eastern) Hallstatt culture. The tendencies in the occurrence of finds of the eastern type in Transdanubia and in the neighbouring regions of the Eastern Hallstatt culture are similar (see e.g. *Kozubová/Fojtík 2021; Kozubová et al. 2022*). Finds of the VC (more than 211 pieces) and older types of arrowheads with an outer socket from the fourth group of origin (at least 38 pieces) are most frequent.

Finds of the VC were documented throughout the entire East Hallstatt region, in Bohemia, in the Central and Eastern Balkans and in Southeastern Poland (*Kozubová/Fojtík 2021, 91*). There are differences in the occurrence of Vekerzug finds in individual regions of the Eastern Hallstatt culture, such as the number of finds and their type variability. Moravia and Transdanubia are special in terms of the frequency and type variability of these finds (Fig. 1; 3: 1–18; *Kozubová/Golec 2020, fig. 1; 2*).⁴¹ In Moravia, the first group of origin is represented by weapons (arrowheads, battle axes), jewellery (snake-shaped temple rings, circular ear/temple rings, cowrie shells), wheel-turned pottery, Vekerzug-type clay stamps and spindle whorls (see more *Kozubová/Fojtík 2021, 80–91, fig. 14*). A comparable typological diversity of Vekerzug finds was also documented in Transdanubia; however, the first group of origin is complemented by other categories of artefacts (cross-shaped quiver decorations, horse bits, mirrors). In contrast to Moravia, where the first group of origin consists almost exclusively of stray finds and artefacts with unclear circumstances of finding, there is a higher frequency of Vekerzug finds in settlement features (dated generally to the Late Hallstatt and Early La Tène periods) and in graves in Transdanubia. There are several concentrations of finds of the VC in Transdanubia: in its north-western part (especially around Sopron, Győr and Velem), around Lake Balaton, in the Danube Bend area (including the Budapest area west of the Danube – the Buda side – and its surroundings) and also in the south-eastern part of Transdanubia on the right bank of the Danube (Fig. 1). The area of Budapest is significant in the debate on the interactions between the local Hallstatt communities of Transdanubia and the VC. Nine Vekerzug sites⁴² have been identified in the eastern part of the city (the Pest side), which shows that this side of Budapest was once part of the territory of the VC. There are also numerous Vekerzug sites around the city (see *Czifra et al. 2017; Kemenczei 2008–2010, 114, footnote 9, with references; Tézer 2011; Tóth 2019, 486, fig. 1*). On the other hand, several Hallstatt settlements were discovered in the western Budapest area (the Buda side) and its surroundings, which was the eastern border of the territory of the local Transdanubian Hallstatt group. Finds of the VC were found at some of those settlements, e.g. from Budapest-Csúcshegy, Harsánylejtő (Cat. No. 9) or Törökbalint, Topárk (Cat. No. 36; see more *Kemenczei 2008–2010, 116, footnote 10, with references; Tóth 2019, 486, 487, fig. 1*). Recently published cremation graves from Budapest-Békásmegyer, Északi városkapu, and Budapest-Nagytétény, Tétényliget, as parts of only partially excavated cemeteries of the VC document the infiltration of Vekerzug people west of the Danube (see *Tóth 2019, 476–484, fig. 2–5*). The Danube was often not only a natural border between Hallstatt and Vekerzug communities, but also a communication route. The above find complexes from the western Budapest area, along with the frequent presence of Vekerzug finds in the settlement features across Transdanubia show the relatively active contacts and peaceful interactions between the VC and the cultural regions to the west. On the basis of Vekerzug type graves from Békásmegyer and Nagytétény, we can consider the expansion of the VC into the western Budapest area and its surroundings. However, in other parts of Transdanubia, finds of the VC suggest closer cultural contacts between the local Hallstatt population and Vekerzug people. Also the cemetery at Szentlőrinc (Baranya County) is special with respect to the first group of origin, containing six horse burials in separate pits with or without bits of type Szentes-Vekerzug (Cat. No. 32; *Jerem 1968, 169–171*). They show the link between the Southern Carpathian Basin and the VC given the finds and the Vekerzug influences on the local funerary customs (see more *Kmeťová 2014, 250–253; 2018, 276–280 on this topic*).⁴³

⁴¹ For the occurrence of Vekerzug finds in other regions of the Eastern Hallstatt culture, in Bohemia and in Poland, see *Kozubová et al. 2022* (a recent overview).

⁴² Including the larger cemetery in Budapest-Soroksár, Akácós-dűlő (*Bencze/Böröczky/Szigeti 2010*).

⁴³ With the exception of horse burials in separate pits (Szentlőrinc), eastern influences are not evidenced in the funerary customs of the local Hallstatt communities of Transdanubia.

The contacts of the VC with the Eastern Hallstatt culture are evidenced by numerous types of finds (mainly jewellery and pottery, but also weapons and horse harness), both those of the Hallstatt type and those reflecting the Early Hallstatt traditions (see more *Kemenczei* 2009, 112, 113; *Kozubová/Horváth* 2019, 146, 150). Some of them, such as, e.g., Velem-type fibulae from Malé Kosihy (Nové Zámky District/SK), Zalaba (Levice District/SK), Bükkábrány, Bánya, and Sajópetri, Hosszúrét (both Borsod-Abaúj-Zemplén County/HU), belong to local specifics of the Transdanubian Late Hallstatt milieu (*Kemenczei* 2009, 76, with references; *Kovács/Németh* 2023, 40; *Romsauer* 1996, 434, 441, fig. 1; 2: 21).

Similar to Moravia, finds from the second group of origin are not frequent in Transdanubia (15 pieces) and they are concentrated at sites in its north-western part (with the exception of the clay stamps from Bátaszék/Tolna County and Budapest-Csúcshegy, Harsánylejtő/Pest County; Fig. 1). The group consists of the same categories of finds for which local production can be assumed (snake-shaped temple rings of type III, local variants of clay stamps; for Moravia see *Kozubová/Fojtík* 2021, 91, 92). In addition to the two above regions, the second group of origin was sporadically documented in Bohemia (snake-shaped temple rings of type III; see *Kozubová et al.* 2022, 289, 306) and Eastern Slovenia, where a local, already Early La Tène variant of the Vekerzug-type bits had been developed (of type II/variant A2 according to W. M. *Werner* 1988, 13, 14, 16, 17, fig. 4: A2; pl. 5: 24–26).

The significance of the finds from the third group of origin in Transdanubia is minimal due to their limited number – apart from 900 armour scales from one site (Regöly, Strupka-Magyar birtok/Tolna County) only five pieces from two sites are evidenced (Fig. 2). These types of artefacts are either unique in the Hallstatt milieu (rattles from Mihályfa, Fenyő-s-dűlő/Zala County) or similar finds are sporadically found in Moravia (cheek-piece from Celldömölk, Ság-hegy/Vas County). With a few exceptions from Transdanubia and Slovenia (one bronze drag decoration of the harness in shape of a bird's beak from Novo mesto, Malenškova gomila/Občina Novo mesto; *Guštin/Teržan* 1975, 190, pl. 3: 3), the occurrence of finds from the third group of origin in the Hallstatt region is limited to Moravia and Bohemia. In Moravia, this group is typologically more diverse than in Bohemia (see more *Kozubová/Fojtík* 2021, 92–95; *Kozubová et al.* 2022, 306, 307). The find contexts of artefacts from the third group of origin do not document a military cause of their occurrence in Transdanubia or in other regions of the Hallstatt culture.

The local find contexts (they are mostly stray finds) and the chronological classification of the objects in their regions of origin make it possible to date most finds of the eastern type from Transdanubia broadly to Ha D–Lt A, with the exception of the fourth group of origin probably from Ha D1 (see above). The exceptions include finds from the first and second groups of origin from settlement features and graves, which are generally dated to Ha D2–Ha D3 and Lt A.

Older types of arrowheads with an outer socket from Central European sites have more numerous analogies in the East European cultural milieu than specimens with an inner socket. This is related to their find contexts, which are different from the find contexts of arrowheads with an inner socket. Some of them were found in graves of the Ciumbrud culture, but they are also frequent at Hallstatt hillforts west and north-west of the VC territory (in Southwestern Slovakia, Moravia, Southwestern Poland and Transdanubia), some of them in find contexts that are related to the horizon of their destruction (e.g. Smolenice, Molpír/Trnava District/SK, Celldömölk, Ság-hegy/Vas County/HU, Strzegom/Świdnica County/PL, Wicina/Żarski County/PL, probably also Provodov-Ludkovice, Rysov/Zlín District/CZ; see *Chochorowski* 2014, 32, with references; *Hellmuth* 2006; *Hellmuth Kramberger* 2021, 164–171, with references; *Novák* 2017; 2020).⁴⁴ Therefore, it is evident that the occurrence of arrowheads with an outer socket in the East Hallstatt milieu was related to a different phenomenon than the occurrence of arrowheads with an inner socket. It may have been due to the population migrations – and the resulting possible military activities – from Transylvania and/or the Middle Dniester region and/or the Middle Dnieper region (and possibly even from the Lower Volga region)⁴⁵ and/or the settlement agglomeration of the hillfort at

⁴⁴ Outside the territory of the Eastern Hallstatt culture a similar situation is evidenced also in the hillfort at Dédestapolcsány, Verebce-bérc (Borsod-Abaúj-Zemplén County), in Northeastern Hungary (*Szabó/Czajlik/Reményi* 2014).

⁴⁵ This hypothesis could be confirmed by new (stray) finds from the Early Iron Age hillfort at Dédestapolcsány, Verebce-bérc – a iron dagger of type Posmuş and three iron battle axes (*Szabó et al.* 2023, 608, fig. 6: 1–3, 6). In East-Central and South-eastern Europe, the Posmuş-type daggers represent an early variant of akinakes-type cutting weapons, with their main distribution area located in Transylvania at sites of the Ciumbrud culture (see more *Kozubová* 2021, 93, with references; *Topál* 2021, 91–95, fig. 30). Only one specimen has been known from Hungary until now – a stray find from Tiszabercel (Szabolcs-Szatmár-Bereg County; *Kemenczei* 2009, 139, pl. 91: 6). On the other hand, the three iron battle axes with a symmetrically located shaft hole are associated with the Ukrainian forest-steppe zone. Based on such typological features such as the very broad fan-shaped blade, the significantly thickened shaft hole on both sides, and the discoid or very broad hammer-

Chotyniec (Jarosław District) in Southeastern Poland sometime during Ha D1. These may have been multiple waves of migration over time (see e.g. *Burghardt 2020*, 352, 353; *Chochorowski 1985*, 230–232; *2014*, 41, 42; *Hellmuth 2006*, 145, 149–154; *2010*, 340, 341, 359–365; *Hellmuth Kramberger 2021*, 171–176; *Khokhorovski 1994*, 55, 57, 58).⁴⁶

Among the finds of the eastern type, bronze arrowheads are most abundant in Transdanubia and in other regions of East-Central Europe. Arrowheads of the eastern type are an important element for the discussion on eastern influences on the individual groups of the Hallstatt and Early La Tène cultures in Central Europe, and also for the hypothesis that the finds of these arrowheads in the East Hallstatt region can be linked to the violent military activities of Scythian (or East European) equestrian nomads (see e.g. *Chochorowski 2014* for a broader discussion). However, it should be emphasised that the arrowheads of the VC (i.e. those with an inner socket⁴⁷) cannot be considered as evidence of violent military activities. Their distribution to Central and Southeastern Europe was influenced by other factors than was the case for arrowheads with an outer socket, such as cultural and trade contacts, transfer of technological innovations or VC's effort to build a sphere of influence (*Kozubová/Golec 2020*, 357). The interpretation of the occurrence of finds of the eastern type cannot be based on arrowheads alone. Other weapons of the eastern type and a number of other categories of finds are also represented at Central European sites, which are related to either an exclusively female (jewellery, clay stamps, mirrors) or a non-military sphere (wheel-turned pottery). Relatively numerous Vekerzug wheel-turned pottery comes in Transdanubia from find contexts with local, Late Hallstatt pottery production. However, the occurrence of weapons does not automatically document military activities by strangers because weapons (including arrowheads) and horse harness of the VC in the East Hallstatt region were found among grave goods of local Hallstatt communities (they are often of elite nature – see Slovenia; *Kozubová/Fojtík 2021*, 78, 96, 97; *Teržan 1998*, 528–530). An other than destructive type of relations of Transdanubia and other regions of the Eastern Hallstatt culture with eastern neighbouring cultural regions (especially with the VC) is also documented by the finds from the second and partly the third group of origin (locally-modified types of objects based on Vekerzug and other eastern precursors). Therefore, the finds of the VC indicate its active, far-reaching interregional contacts in the Ha D and Lt A stages. Arrowheads with an inner socket point to a new tradition in production of efficient weapon types in East-Central Europe and are, above all, an indicator of technological innovations and not an evidence for the influx of foreign populations from the VC and/or from Eastern Europe (*Kozubová 2019*, 64). A slightly different situation is documented for arrowheads with an outer socket: their higher frequency at some hillforts in Moravia, Southwestern Poland and Southwestern Slovakia could indicate local military activities (see more e.g. *Hellmuth Kramberger 2021*). However, the mere occurrence of arrowheads at a site is not sufficient to argue for violent military activities, unless the arrowheads occur in find contexts that reliably confirm such destructive activities. While only arrowheads with an outer socket were documented from the hillfort at Celldömölk, Ság-hegy, in the hillfort at Velem, Szent Vid-hegy (both Vas County), occurred a few arrowheads with both an outer and inner socket as well as finds from the first and second groups of origin (all with unclear circumstances of finding).

shaped butt, specimens at Dédestapolcsány are morphologically different from the slender Vekerzug-type battle axes with a narrow fan-shaped blade (see e.g. *Burghardt 2015*, 152–154, fig. 6; *Kozubová 2019*, 73; *Melyukova 1964*, pl. 21: 8–23; *Shelekhan' 2012*, 5–7, fig. 1–3). One of the two massive battle axes from Dédestapolcsány (*Szabó et al. 2023*, fig. 6: 3) has close parallels e.g. to axes from Kruhlyk/Круглик (Dnistrovskyi Raion) and Vovkivci/Вовківці (Romny Raion; *Melyukova 1964*, pl. 21: 19; *Smirnova 1993*, fig. 4: 7). A specimen with a discoid butt (*Szabó et al. 2023*, fig. 6: 1) has direct analogies especially among the finds from the Middle Dnieper region (see *Burghardt 2015*, fig. 6: 4; *Melyukova 1964*, pl. 21: 11–15, 21).

⁴⁶ Given the large distances between hillforts in East-Central Europe where arrowheads with an outer socket have been found, and considering the uncertainties regarding the direction(s) from which attacks on these hillforts may have originated, it is not possible to automatically assign all sites with such arrowheads to the same time period.

⁴⁷ Arrowheads with an outer socket can not be connected with the VC. None of the closed assemblages of the VC (neither from graves nor from settlement features) have yet provided reliable evidence for the co-occurrence of arrowheads with both an outer and inner socket and thus the use of those with an outer socket by Vekerzug people (*Khokhorovski 1994*, 58; *Kozubová 2009*, 95, 96). A few exceptions from Eastern Hungary are: two bronze pieces from grave A at Sajószentpéter with a very archaic, for the VC completely atypical equipment and one bronze arrowhead from grave 71 at Alsótelekes, Dolinka (both Borsod-Abaúj-Zemplén County), one piece from Ha D3 grave 48 at Tiszavasvári, Csárdapart (Szabolcs-Szatmár-Bereg County), and one arrowhead from grave 26 at Hódmezővásárhely, Kishomok (Csongrád-Csanád County; see *Kemenczei 2009*, 123, 133, 156, 157, 163, pl. 19: 4; 59: 12, 13; 124: 31; 136: 2) – in both of the last-mentioned graves, most likely as antiquarian pieces.

CATALOGUE OF THE LATE HALLSTATT AND EARLY LA TÈNE FINDS
OF THE EASTERN TYPE IN TRANSDANUBIA
(Fig. 1; 2)

1. Alsónyék (Tolna County)

Location: Hosszú-dűlő.

Finding circumstances: cemetery (grave 1).

Finds: bronze snake-shaped temple ring (type I according to A. Kozubová; Fig. 3: 12); bronze circular ear/temple ring (variant II according to A. Kozubová; Fig. 3: 14).

Group of origin: first.

Dating: Lt A.

Literatur: *Soós 2020*, 51, fig. 3: 1, 2.

2A. Alsópáhok (Zala County)

Location: Hévízdomb I.

Finding circumstances: settlement (features 98, 147, 268, 295; stray find).

Finds: bronze triblade arrowhead with an inner socket (subvariant I3c according to A. Kozubová); fragment of a bronze trilobate-triblade arrowhead with an inner socket (variant II3 according to A. Kozubová); bronze snake-shaped temple ring (type I according to A. Kozubová); fragment of a clay stamp with a sealing surface of square or rectangular shape (group 1 according to J. Kisfaludi), with rows of a swastika motif (Fig. 6: 1); fragment of a clay stamp with a sealing surface of square or rectangular shape (group 1 according to J. Kisfaludi), with rows of a meander motif (Fig. 6: 3).

Group of origin: first.

Dating: Ha D1–Ha D2.

Literatur: *Horváth 2015*, 241, 245, 249, fig. 5: 19, 21, 22; 6: 27, 28.

2B. Alsópáhok

Location: Hévízdomb II.

Finding circumstances: settlement (stray find).

Finds: bronze triblade arrowhead with an inner socket (variant I3 according to A. Kozubová).

Group of origin: first.

Dating: Ha D–Lt A.

Literatur: *Horváth 2015*, 241, 249, fig. 5: 23.

3. Balatonboglár (Somogy County)

Location: Berekre-dűlő.

Finding circumstances: settlement (pit from 1981).

Finds: wheel-turned bowl (type I according to A. Kozubová).

Group of origin: first.

Dating: Ha D.

Literatur: *Honti/Költő/Németh 1988*, 21, pl. VII.

4. Bába (Tolna County)

Finding circumstances: stray find.

Finds: wheel-turned bowl (type I according to A. Kozubová).

Group of origin: first.

Dating: Ha D–Lt A.

Literatur: *Kemenczei 2008–2010*, 102, fig. 2: 1.

5. Báticasék (Tolna County)

Location: Körtvélyes-dűlő.

Finding circumstances: settlement (without further information).

Finds: clay stamp with a sealing surface of square shape (group 1 according to J. Kisfaludi), with a zoomorphic motif (Fig. 6: 20).

Group of origin: second.

Dating: Ha D–Lt A.

Literatur: *Kemenczei 2008–2010*, 102, with references, fig. 1: 1.

6. Bucsú (Vas County)

Location: Rétmelléki-dűlő II.

Finding circumstances: settlement (feature 77/a).

Finds: bronze snake-shaped temple ring (type I according to A. Kozubová).

Group of origin: first.

Dating: Ha D–Lt A.

Literatur: *Ilon 2017b*, 98, pl. I: 1; II: 1.

7. Budajenő (Pest County)

Finding circumstances: stray find.

Finds: bronze cross-shaped quiver decoration with zoomorphic ornaments (variant I2 according to A. Kozubová).

Group of origin: first.

Dating: Ha D1–Ha D2.

Literatur: *Kemenczei 1986*, 117, 118, fig. 2: 1; *Párducz 1954*, fig. 31: 1, 1a.

8. Budaörs (Pest County)

Location: Kamaraerdei-dűlő.

Finding circumstances: settlement (without further information).

Finds: clay stamp with a sealing surface of circular shape (group 2 according to J. Kisfaludi), with a swastika motif (Fig. 6: 4).

Group of origin: first.

Dating: Ha D– Lt A.

Literatur: *Ottományi 2008*, 50 with fig. 1; *Kemenczei 2008–2010*, 102, fig. 1: 3.

9. Budapest (Pest County)

Location: Csúcshegy-Harsánylejtő (in Budapest District III).

Finding circumstances: settlement (without further information).

Finds: bronze triblade or trilobate-triblade arrowhead with an inner socket (probably variant I3 or II3 according to A. Kozubová; without depiction in publication); fragment of a clay stamp with a sealing surface of square or rectangular shape (group 1 according to J. Kisfaludi), with a fishbone motif combined with rows of small rectangles (Fig. 6: 15).

Group of origin: first (arrowhead), second (clay stamp).

Dating: Ha D.

Literatur: *Tóth 2017*, 55, 61, Cat. Nos. 68, 69.

10. Celldömölk (Vas County)

Location: Ság-hegy.

Finding circumstances: hillfort (stray finds).

Finds: fragmented antler cheek-piece with three holes and a zoomorphic ending in the shape of a hoof (Fig. 3: 21); two bronze biblade arrowheads with an outer socket (groups I.A and I.D according to A. Hellmuth; Fig. 3: 24, 26); 20 bronze triblade arrowheads with an outer socket (2 × group II.A; 10 × group II.B, 4 × group II.C; 3 × group II.D; 1 × group II.G according to A. Hellmuth; Fig. 3: 27–30, 32); two bronze trilobate-triblade arrowheads with an outer socket (group II.E or II.F according to A. Hellmuth; Fig. 3: 31); bronze trilobate arrowhead with an outer socket (group III according to A. Hellmuth; Fig. 3: 33); fragment of a bronze arrowhead.

Group of origin: third (cheek-piece), fourth (arrowheads).

Dating: probably Ha D1.

Literatur: *Chochorowski 1985*, fig. 3: 1–27; *Kemenczei 2008–2010*, 102, fig. 3: 1, 3; *Molnár 2019*, fig. on page 20; *Mozsolics 1953*, 94, fig. 35; pl. XV: 8.

11. Cserszegtomaj (Zala County)

Finding circumstances: stray find.

Finds: iron bit of type Szentes-Vekerzug (variant I2 according to A. Kozubová; Fig. 3: 17).

Group of origin: first.

Dating: Ha D.

Literatur: *Kemenczei 1985*, 52, pl. 4: 4; *Párducz 1952*, 152, pl. LXI: 2; *Werner 1988*, 15, pl. 2: 10.

12A. Győr (Győr-Moson-Sopron County)

Location: Káptalandomb.

Finding circumstances: settlement (stray find).

Finds: fragment of a wheel-turned jug.

Group of origin: first.

Dating: Ha D2–Lt A.

Literatur: *Molnár/Ujvári 2020*, 404, 405, pl. 2: 1.

12B. Győr

Finding circumstances: stray find.

Finds: fragment of a bronze biblade arrowhead with an outer socket.

Group of origin: fourth.

Dating: probably Ha D1.

Literatur: *Bottlyán 1955*, pl. 36: 17; *Chochorowski 1985*, fig. 5: 3.

12C. Győr

Location: Ménfőcsanak, Széles/Eperföldek.

Finding circumstances: settlement, research from 1968 (finds from a feature).

Finds: fragments of two wheel-turned jugs (type I according to A. Kozubová); two fragmented wheel-turned bowls, with a slightly funnel-shaped rim; fragments of a wheel-turned vessel.

Group of origin: first.

Dating: Ha D–Lt A.

Literatur: *Molnár 2007*, 61, pl. 2: 1–4; 2013, 194, 198, fig. 8: 10–12.

12D. Győr

Location: Ménfőcsanak, Széles-földek.

Finding circumstances: settlement excavated between 2009–2011 (finds from features).

Finds: wheel-turned vessels (at least a bowl of type II according to A. Kozubová and two jugs).

Group of origin: first.

Dating: Ha D–Lt A.

Literatur: *Đurković 2015*, fig. 9: 7; 2016, fig. 4: Nysz.1.34305.4205.27, Nysz.1.34305.7168.3, Nysz.1.34305.8424.8. 2017,

12E. Győr

Location: Ménfőcsanak, Széles-földek.

Finding circumstances: stray finds.

Finds: 43 bronze triblade arrowheads with an inner socket (9 × variant I1; 21 × variant I2; 13 × variant I3 according to A. Kozubová; Fig. 3: 3–5); 16 bronze trilobate-triblade arrowheads with an inner socket (13 × variant II2; 3 × variant II3 according to A. Kozubová; Fig. 3: 6, 7); bronze trilobate arrowhead with an inner socket; four bronze snake-shaped temple rings (type I according to A. Kozubová).

Group of origin: first.

Dating: Ha D–Lt A.

Literatur: *Ilon 2017a*, 192, fig. 8: 1, 2, 4–14; 2017b, 100, pl. I: 8–10; 2019, 255, pl. I: 1–24; II: 1–24.

12F. Győr

Location: Ménfőcsanak, Széles-földek.

Finding circumstances: stray find.

Finds: bronze triblade arrowhead with an outer socket (variant II.3.D.a according to A. Hellmuth).

Group of origin: fourth.

Dating: probably Ha D1.

Literatur: *Ilon 2017a*, 192, fig. 8: 3.

13. Győrszemere (Győr-Moson-Sopron County)

Finding circumstances: stray find.

Finds: bronze snake-shaped temple ring (type II according to A. Kozubová).

Group of origin: first.

Dating: Ha D–Lt A.

Literatur: *Kemenczei 2008–2010*, 105; *Molnár 2013*, 194, 198; *Párducz 1965b*, 275, 276.

14. Keszthely (Zala County)

Location: Apátdomb.

Finding circumstances: settlement (feature 126).

Finds: clay stamp with a sealing surface of rectangular shape (group 1 according to J. Kisfaludi), with a row of concentric rhombuses (Fig. 6: 5); clay stamp with a sealing surface of square shape (group 1 according to J. Kisfaludi), with rows of a meander motif (Fig. 6: 2).

Group of origin: first.

Dating: Ha D–Lt A.

Literatur: *Horváth 2015*, 245, 250, fig. 6: 41, 42; *Kemenczei 2008–2010*, 105, fig. 2: 8; *Kisfaludi 1997*, 88, with references.

15. Kesztlőc (Komárom-Esztergom County)

Location: Sármáczka-barlang.

Finding circumstances: stray finds.

Finds: fragments of wheel-turned bowls (type I according to A. Kozubová).

Group of origin: first.

Dating: Ha D–Lt A.

Literatur: *Kemenczei 2008–2010*, 105, with references.

16. Komárom-Esztergom County

Finding circumstances: find with unclear circumstances of finding.

Finds: bronze cross-shaped quiver decoration with zoomorphic ornaments (variant I1 according to A. Kozubová; Fig. 3: 2).

Group of origin: first.

Dating: Ha D1–Ha D2.

Literatur: *Fettich 1928*, pl. IX: 2, 2a; *Kemenczei 1986*, 122, fig. 2: 3.

17A. Koroncó (Győr-Moson-Sopron County)

Location: Bábota.

Finding circumstances: settlement (feature 133).

Finds: bronze triblade arrowhead with an inner socket (subvariant I3a according to A. Kozubová); bronze trilobate-triblade arrowhead with an inner socket (subvariant II2a according to A. Kozubová); fragmented wheel-turned bowl (type I according to A. Kozubová); fragments of two wheel-turned jugs; fragments of a larger wheel-turned vessel.

Group of origin: first.

Dating: Ha D2–Ha D3.

Literatur: *Czigáni/Molnár 2020*, 99, pl. 9: 3–9.

17B. Koroncó

Location: Templom-domb.

Finding circumstances: stray find.

Finds: bronze biblade arrowhead with an outer socket (variant I.3.C.a according to A. Hellmuth; Fig. 3: 25).

Group of origin: fourth.

Dating: probably Ha D1.

Literatur: *Czigáni/Molnár 2020*, 93, with references, 101, pl. 13: 2.

17C. Koroncó

Finding circumstances: stray finds.

Finds: fragmented bronze triblade arrowhead with an inner socket (variant I3 according to A. Kozubová); bronze trilobate arrowhead with an outer socket (variant III.2.a according to A. Hellmuth).

Group of origin: first (arrowhead of variant I3), fourth (arrowhead of variant II.2.a).

Dating: Ha D–Lt A (variant I3), probably Ha D1 (variant II.2.a).

Literatur: *Czigáni/Molnár 2020*, 94, 95, with references, 101, pl. 13: 3, 4.

18. Mezőlak (Veszprém County)

Finding circumstances: stray find.

Finds: bronze cross-shaped quiver decoration with zoomorphic ornaments (variant I2 according to A. Kozubová; Fig. 3: 1).

Group of origin: first.

Dating: Ha D1–Ha D2.

Literatur: *Fettich 1928*, pl. IX: 1, 1a; *Kemenczei 1986*, 122, fig. 2: 4.

19. Mezőörs (Győr-Moson-Sopron County)

Location: Alsó-tag.

Finding circumstances: stray finds.

Finds: bronze triblade arrowhead with an inner socket (subvariant I2b according to A. Kozubová); bronze trilobate-triblade arrowhead with an inner socket (subvariant II3b according to A. Kozubová).

Group of origin: first.

Dating: Ha D–Lt A.

Literatur: *Molnár 2006*, 342, fig. 2: 3, 4; 2013, 194, 198, fig. 8: 8, 9.

20. Mihályfa (Zala County)

Location: Fenyő-s-dűlő.

Finding circumstances: stray finds.

Finds: four bronze rattles of a conical shape decorated with schematic animal figures (Fig. 3: 23).

Group of origin: third.

Dating: Ha D1–Ha D2.

Literatur: *Bakay 1971*, pl. 12: 1, 2; *Kemenczei 2008–2010*, 105, with references, fig. 4: 6–9.

21. Pilismarót (Komárom-Esztergom County)

Location: Szobi-rév.

Finding circumstances: settlement (pit 41; finds from cultural layer).

Finds: fragments of at least three wheel-turned bowls (type I according to A. Kozubová).

Group of origin: first.

Dating: Ha D (probably Ha D2–Ha D3).

Literatur: *Wollák 1979*, 50–52, 55, fig. 4: 4, 7; 9: 5.

22A. Pomáz (Pest County)

Location: Zdravlyák-dűlő.

Finding circumstances: cemetery (graves 11, 12).

Finds: wheel-turned jug (type I according to A. Kozubová); clay stamp with a sealing surface of oval shape (group 2 according to J. Kisfaludi), with a double spiral motif (Fig. 6: 12).

Group of origin: first.

Dating: Ha D1 (grave 11), Ha D1–Ha D2 (grave 12).

Literatur: *Kemenczei 1977*, 70, 72, fig. 3: 7; 4: 2; *Kisfaludi 1997*, 92, fig. 9: 20.

22B. Pomáz

Location: Új-dúlő, Prekobrodica.

Finding circumstances: stray finds.

Finds: bronze snake-shaped temple ring (type I according to A. Kozubová); two wheel-turned jugs (type I according to A. Kozubová).

Group of origin: first.

Dating: Ha D–Lt A.

Literatur: *Kemenczei 2008–2010*, 108, fig. 5: 7, 8.

22C. Pomáz

Finding circumstances: stray find.

Finds: wheel-turned jug (type I according to A. Kozubová).

Group of origin: first.

Dating: Ha D–Lt A.

Literatur: *Kemenczei 2008–2010*, 108, fig. 5: 9.

23. Regöly (Tolna County)

Location: Strupka-Magyar birtok.

Finding circumstances: burial mound.

Finds: bronze biblade arrowhead with an outer socket (variant I.A.1.b according to A. Hellmuth); bronze triblade arrowhead with an outer socket, strongly deformed; bronze trilobate-triblade arrowhead with an outer socket, deformed (group II.E or II.F according to A. Hellmuth); at least three bronze arrowheads, strongly deformed (typologically not specified); 790 whole and fragmented iron scales and 110 whole and fragmented bronze scales (as components of scale armour; Fig. 3: 22).

Group of origin: third (scale armour), fourth (arrowheads with an outer socket).

Dating: Ha D1.

Literatur: *Horváth/Szabó 2015*, 111, fig. 3–5; *Szabó/Fekete 2011*, pl. 1: 1, 2; 20: 13, 14; 25: 1–12; 26: 8; 2014, 12, pl. 113: RHF1.8., RHF1.9.; 114: RHF1.33.–RHF1.53.; 120: RHF6.15–RHF6.19., RHF7.1–RHF7.7.; 123: RHF8.45–RHF8.84.; 126: RHF9.24–RHF9.26.; 131: RHF10.99–RHF9.104.

24. Románd (Veszprém County)

Location: Homokbánya.

Finding circumstances: inhumation grave.

Finds: wheel-turned bowl (type I according to A. Kozubová); wheel-turned jug (type I according to A. Kozubová).

Group of origin: first.

Dating: Ha D–Lt A.

Literatur: *Kemenczei 2008–2010*, 108, with references, fig. 5: 10, 11.

25. Sárkeresztes (Fejér County)

Location: Határialalom.

Finding circumstances: stray find.

Finds: wheel-turned bowl (type I according to A. Kozubová).

Group of origin: first.

Dating: Ha D–Lt A.

Literatur: *Kemenczei 2008–2010*, 108, fig. 5: 12; *Párducz 1965b*, 276, pl. II: 7.

26. Sárkeresztúr (Fejér County)

Finding circumstances: stray find.

Finds: wheel-turned jug (type I according to A. Kozubová).

Group of origin: first.

Dating: Ha D–Lt A.

Literatur: *Bottyán 1955*, pl. XXXII: 19; *Kemenczei 2008–2010*, 108.

27A. Sé (Vas County)

Location: Doberdó.

Finding circumstances: settlement (feature 114; destroyed pit).

Finds: bronze triblade arrowhead with an inner socket (variant II according to A. Kozubová); wheel-turned bowl (type I according to A. Kozubová); fragments of wheel-turned vessels (probably jugs).

Group of origin: first.

Dating: Ha D3–Lt A.

Literatur: *Gál/Molnár 2004*, 174, 175, pl. 10: 4–6; 13: 1.

27B. Sé

Location: Doberdó.

Finding circumstances: settlement (features 92, 158).

Finds: bronze snake-shaped temple ring (type III according to A. Kozubová; Fig. 3: 20); clay stamp with a sealing surface of square shape (group 2 according to J. Kisfaludi), with a zoomorphic motif (Fig. 6: 21).

Group of origin: second.

Dating: Ha D3–Lt A.

Literatur: *Gáll/Molnár 2004*, 172, 174, pl. 9: 1; 14: 1; *Ilon 1999*, fig. 1; *2017b*, 98, pl. I: 2; II: 2.

28. Somló-hegy (Veszprém County)

Finding circumstances: stray finds found in 2023.

Finds: bronze triblade arrowhead with an inner socket (variant II according to A. Kozubová); two bronze snake-shaped temple rings (types I and II according to A. Kozubová).

Group of origin: first.

Dating: Ha D–Lt A (temple rings), Ha D2–Ha D3 (arrowhead).

Literatur: *Soós/Tarbay/Péterváry 2023*, 128, 130, pl. 5: 1–3.

29A. Sopron (Győr-Moson-Sopron County)

Location: Krautacker-dűlő.

Finding circumstances: settlement (house 1; pits 7, 168, 236a; stray find).

Finds: two bronze triblade arrowheads with an inner socket (subvariant I3c according to A. Kozubová); bronze snake-shaped temple ring (type I according to A. Kozubová); wheel-turned jug; clay stamp with a sealing surface of rhombus shape (group 2 according to J. Kisfaludi), with a hourglass motif combined with concentric rings (Fig. 6: 16).

Group of origin: first (arrowheads, temple ring, jug), second (clay stamp).

Dating: Ha D2–Ha D3, alternatively Lt A.

Literatur: *Jerem 1981a*, pl. 1: 10; *Jerem et al. 1984*, 152, fig. 11: 168/1; *Schwellnus 2009*, 248; *2010*, 207, 208, fig. 1: 1a, 1b; *2011*, 368, 369, fig. 8: E, F.

29B. Sopron

Location: Krautacker-dűlő.

Finding circumstances: cemetery (graves 1, 13, 18, 29).

Finds: two bronze snake-shaped temple rings (type II according to A. Kozubová); two bronze snake-shaped temple rings (type III according to A. Kozubová); 47 cowrie shells (with removed dorsum; Fig. 3: 15); bimetallic mirror (type II according to A. Kozubová; Fig. 3: 10).

Group of origin: first (temple rings of type II, cowrie shells, mirror), second (temple rings of type III).

Dating: Ha D2–Ha D3, alternatively Lt A.

Literatur: *Jerem 1981a*, pl. 3: 5, 11, 13; *1981b*, 114, fig. 7: 5, 11–15; *Kovács 2008*, 232, 233.

29C. Sopron

Location: Himmelstrom.

Finding circumstances: settlement (stray finds).

Finds: two fragmented clay stamps with a sealing surface of square or rhombus shape, with multiple concentric rhombuses (Fig. 6: 17, 18).

Group of origin: second.

Dating: Ha D–Lt A.

Literatur: *Kisfaludi 1997*, 92, fig. 12: 9, 10.

30. Százhalombatta (Pest County)

Finding circumstances: stray find.

Finds: fragment of a clay stamp with a sealing surface of square or rectangular shape (group 1 according to J. Kisfaludi), with rows of a swastika motif (Fig. 6: 6).

Group of origin: first.

Dating: Ha D–Lt A.

Literatur: *Kemenczei 2008–2010*, 111, fig. 7: 14; *Kisfaludi 1997*, 93, fig. 4: 2.

31. Szekszárd (Tolna County)

Finding circumstances: stray find.

Finds: bronze trilobate-triblade arrowhead with an inner socket (subvariant II3b according to A. Kozubová).

Group of origin: first.

Dating: Ha D–Lt A.

Literatur: *Kemenczei 2008–2010*, 111, with references, fig. 7: 11.

32. Szentlőrinc (Baranya County)

Finding circumstances: cemetery (horse burials 52, 58, 60, 61).

Finds: iron bit of type Szentes-Vekerzug (variant I2 according to A. Kozubová); three iron bits of type Szentes-Vekerzug (variant II4 according to A. Kozubová; Fig. 3: 18).

Group of origin: first.

Dating: Ha D3–Lt A.

Literatur: *Jerem 1968*, 169–171, fig. 26: 52/1; 28: 58/1, 60/1, 61/1; *Werner 1988*, 16, 19, 20, pl. 4: 21; 9: 50–52.

33. Szólád (Somogy County)

Location: Kertek mögött.

Finding circumstances: cemetery (grave 9).

Finds: iron battle axe (variant II according to A. Kozubová; Fig. 3: 9).

Group of origin: first.

Dating: Ha D2.

Literatur: *Jáky 2017*, 385, pl. III: 3.

34. Tokod (Komárom-Esztergom County)

Location: Altáró, Erszébet akna.

Finding circumstances: stray finds.

Finds: clay stamp with a sealing surface of rectangular shape (group 1 according to J. Kisfaludi), with rows of a swastika motif (Fig. 6: 7); fragments of two wheel-turned jugs; wheel-turned bowl (type I according to A. Kozubová).

Group of origin: first.

Dating: Ha D–Lt A.

Literatur: *Kemenczei 2008–2010*, 111, with references, fig. 8: 1–4; *Kisfaludi 1997*, 99, fig. 4: 1.

35. Tolna (Tolna County)

Location: Mőzs, Icsi-dűlő.

Finding circumstances: grave.

Finds: three cowrie shells (with removed dorsum).

Group of origin: first.

Dating: Ha D–Lt A.

Literatur: *Kovács 2008*, 427.

36. Törökbálint (Pest County)

Location: Tópark.

Finding circumstances: settlement (feature 9).

Finds: fragmented bronze triblade arrowhead with an inner socket (variant I3 according to A. Kozubová).

Group of origin: first.

Dating: Ha D–Lt A.

Literatur: *Maróti 2001*, 47, fig. 2: 2.

37. Vál (Fejér County)

Finding circumstances: stray find.

Finds: bronze trilobate-triblade arrowhead with an inner socket (subvariant II3b according to A. Kozubová).

Group of origin: first.

Dating: Ha D–Lt A.

Literatur: *Bottlyán 1955*, pl. 36: 19; *Kemenczei 2008–2010*, 111, fig. 7: 13.

38A. Velem (Vas County)

Location: Szent Vid-hegy.

Finding circumstances: hillfort (stray finds).

Finds: bronze triblade arrowhead with an inner socket (subvariant I3a according to A. Kozubová); two bronze trilobate-triblade arrowheads with an inner socket (1 × variant II2; 1 × variant II3b according to A. Kozubová); three bronze snake-shaped temple rings (2 × type I; 1 × type II according to A. Kozubová; Fig. 3: 11); three clay stamps with a sealing surface of circular shape (group 2 according to J. Kisfaludi), with concentric rings and a schematised rosette motif (Fig. 3: 13; 6: 9–11); clay stamp with a sealing surface of rectangular shape (group 1 according to J. Kisfaludi), with a row of a meander motif (Fig. 6: 13); two wheel-turned jugs (type I according to A. Kozubová).

Group of origin: first.

Dating: Ha D–Lt A.

Literatur: *Chochorowski 1985*, fig. 6: 8–10, 12, 13, 15, 19, 23, 29, 31, 40; *Ilon 2017b*, 99, pl. I: 4; II: 4; *Kemenczei 2008–2010*, 114, fig. 9: 2, 3, 5–7; *Kisfaludi 1997*, 103, fig. 6: 4; 7: 18; 8: 9; *Miske 1908*, pl. XLIII: 72, 73; *Párducz 1965b*, 276, 277, pl. I: 1, 2, 5, 6; II: 4.

38B. Velem

Location: Szent Vid-hegy.

Finding circumstances: hillfort (stray finds).

Finds: bronze biblade arrowhead with an outer socket (variant I.D.1.a according to A. Hellmuth); three bronze triblade arrowheads with an outer socket (2 × group II.A; 1 × group II.D according to A. Hellmuth); bronze trilobate arrowhead with an outer socket (group III according to A. Hellmuth); four bronze snake-shaped temple rings (type III according to A. Kozubová); clay stamp with a sealing surface of square shape (group 1 according to J. Kisfaludi), with a zoomorphic motif (Fig. 3: 19; 6: 14); clay stamp with a sealing surface of square shape (group 1 according to J. Kisfaludi), with rows of a swastika motif combined with concentric squares (Fig. 6: 19).

Group of origin: second (temple rings, clay stamps), fourth (arrowheads).

Dating: Ha D–Lt A (temple rings, clay stamps), probably Ha D1 (arrowheads).

Literatur: *Chochorowski 1985*, fig. 6: 7, 11, 14, 34–38; *Ilon 2017b*, 99, pl. I: 3, 5–7; II: 3, 5–7; *Kemenczei 2008–2010*, 114, fig. 9: 1, 4; *Kisfaludi 1997*, 99, 103, fig. 2: 1; 5: 6; *Miske 1908*, pl. XLIII: 71; *Párducz 1965b*, 277, 277, pl. I: 4, 7.

39. The vicinity of Veszprém (Veszprém County)

Finding circumstances: find with unclear circumstances of finding.

Finds: wheel-turned jug (type I according to A. Kozubová).

Group of origin: first.

Dating: Ha D–Lt A.

Literatur: *Kemenczei 2008–2010*, 114, fig. 7: 12; *Párducz 1965b*, 277, pl. II: 9.

40. Visegrád (Pest County)

Location: Csemetekert.

Finding circumstances: settlement (pit 2).

Finds: fragments of at least three wheel-turned vessels.

Group of origin: first.

Dating: Ha D.

Literatur: *Gróh 1984*, 56, 61, fig. 7: 3, 4, 9.

41. Zalaszentmihály (Zala County)

Finding circumstances: stray find.

Finds: fragment of a clay stamp with a sealing surface of square or rectangular shape (group 1 according to A. Kozubová), with a swastika motif (Fig. 6: 8).

Group of origin: first.

Dating: Ha D–Lt A.

Literatur: *Kemenczei 2008–2010*, 114, fig. 9: 8; *Kisfaludi 1997*, 103, fig. 4: 3; *Párducz 1965b*, pl. III: 3a, 3b.

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„Z opačnej strany Dunaja“

Nálezy východného typu z neskorej doby halštatskej a včasnej doby laténskej v Zadunajsku

Anita Kozubová

Súhrn

V priebehu stupňov HD a LTA zaznamenávame vo východohalštatskej oblasti prítomnosť takých typov predmetov, ktorých pôvod a/alebo ťažisko rozšírenia sa nachádza jednak vo východokarpatskom priestore (vo vekerzugskej a ciombrudskej kultúre) a jednak v spoločenstvách východoeurópskej stepnej a lesostepnej oblasti a na severnom Kaukaze. Kým nálezy východného typu zo Zadunajska naďalej ostávajú na okraji vedeckého záujmu, podobným nálezom z Moravy a Čiech bola v poslednom období venovaná zvýšená pozornosť. Nálezy z Moravy a Čiech spolu so súčasným stavom bádania k vekerzugskej kultúre (ďalej VK) jasne poukazujú na potrebu prehodnotenia interpretačných rovin výskytu nálezov východného typu v jednotlivých regiónoch východohalštatskej kultúry. Nemenej dôležité je aj správne označenie diskutovaných predmetov. V ich prípade je používanie výrazov ako „skýtsky“ nekorektné a ako vhodnejšie sa javí ich neutrálnejšie označenie ako „nálezy východného typu“. To odráža výlučne geografické hľadisko – ide o typy predmetov, ktorých pôvod sa nachádza východne od rozšírenia halštatskej kultúry v rôznych kultúrach a skupinách.

V článku sa zaoberám vyhodnotením doteraz publikovaných nálezov východného typu z doby halštatskej a včasnej doby laténskej zo Zadunajska, najmä s ohľadom na kultúrno-priestorové, chronologické a interpretačné hľadisko ich výskytu v západnej časti Karpatskej kotliny a v ostatných regiónoch východohalštatskej kultúry. K dnešnému dňu je zo Zadunajska k dispozícii minimálne 1171 typologicky spoľahlivo identifikovaných nálezov východného typu z 52 lokalít.

Z hľadiska pôvodu sa dajú nálezy východného typu zo Zadunajska rozdeliť do štyroch skupín. Prvú skupinu pôvodu tvoria nálezy VK, a tiež artefakty, ktorých výskyt v Zadunajsku súvisel s aktivitami VK (kauri mušle). S VK je spätá aj druhá skupina. K nej radíme artefakty, ktoré síce majú predlohy v materiálnej náplni VK, v Zadunajsku sa však vyskytli už v lokálnej podobe. Do tretej skupiny pôvodu možno zaradiť také typy predmetov, ktorých ťažisko výskytu sa nachádza v stepnej a lesostepnej oblasti východnej Európy a na severnom Kaukaze, kde sa objavujú v materiálnej náplni mnohých kultúr a skupín (ako zriedkavé nálezy bočnic z kosti/parohoviny so zoomorfne ukončenými koncami, hrkálók zdobených zvieracími postavami a súčastí šupinových pancierov). Štvrtú skupinu nálezov tvoria bronzové hroty šípov s vysunutou tuľajkou, ktorých výskyt v strednej Európe súvisel pravdepodobne buď s lesostepným Podneprím, alebo s lesostepným Podnestrím a/alebo s ciombrudskou kultúrou.

Vo výskyte nálezov východného typu v Zadunajsku pozorujeme podobné tendencie ako v susedných regiónoch východohalštatskej kultúry. Najviac sú tu zastúpené nálezy VK a hroty šípov s vysunutou tuľajkou. Nálezy VK sú doložené v celej východohalštatskej oblasti, kde môžeme pozorovať v jej jednotlivých skupinách určité rozdiely vo výskyte nálezov VK prejavujúce sa ako v početnosti nálezov, tak aj vo výbere ich typov. S ohľadom na frekvenciu výskytu a typovú variabilitu týchto nálezov zaujímajú osobitné postavenie Morava a Zadunajsko, kde je doložená podobná typologická rôznorodosť nálezov. Na rozdiel od Moravy, kde prvú skupinu pôvodu tvoria takmer výlučne náhodné nálezy a artefakty bez bližších náleзовých okolností, v Zadunajsku zaznamenávame zvýšenú frekvenciu výskytu nálezov VK v sídliskových objektoch a sčasti aj v hrobách. V Zadunajsku pozorujeme viaceré koncentrácie vo výskyte vekerzugských nálezov: v jeho severozápadnej (najmä v okolí Soprone, Győru a Velému) a juhovýchodnej časti, v okolí Balatonu a v oblasti ohybu Dunaja vrátane západnej časti Budapešti a jej okolia. V diskusii o interakciách medzi halštatským osídlením Zadunajska a VK má dôležité postavenie územie Budapešti. Jej východná časť tvorila súčasť vekerzugského osídlenia. Kým v prípade západnej časti Budapešti môžeme uvažovať o prenikaní vekerzugského osídlenia

do tejto oblasti, v prípade ostatných častí Zadunajska ukazuje výskyt nálezov VK skôr na aktívne kultúrne kontakty medzi miestnou halštatskou a vekerzugskou populáciou. Osobitné postavenie v rámci prvej skupiny pôvodu má tiež pohrebisko v Szentlőrinci, kde sa okrem zubadiel vyskytli aj samostatné hroby koní. Tie ukazujú na prepojenie južných častí Karpatskej kotliny s VK – a to nielen vo výskyte nálezov, ale aj vo vplyvoch VK na miestny pohrebný rítus. Podobne ako na Morave ani v Zadunajsku nie sú nálezy z druhej skupiny pôvodu početné a koncentrujú sa na lokalitách v jeho severozápadnej časti. Význam nálezov z tretej skupiny pôvodu je v Zadunajsku vzhľadom na ich obmedzenú početnosť minimálny. Ide o také typy artefaktov, ktoré sú buď v halštatskom prostredí jedinečné, alebo podobné nálezy sporadicky nachádzame aj na Morave. Nálezové kontexty predmetov z tretej skupiny nepotvrdzujú vojenské pozadie ich výskytu ani v Zadunajsku, ani v ostatných oblastiach halštatskej kultúry. Staršie typy hrotov šípov s vysunutou tuľajkou zo stredoeurópskych lokalít sa vyskytli v čiastočne odlišných nálezových kontextoch, než sú tie, v ktorých boli nájdené hroty šípov so skrytou tuľajkou. Časť z nich pochádza z hrobov ciumbudskej kultúry, ale v oblastiach ležiacich západne a severozápadne od územia rozšírenia VK je pozorovaná zvýšená frekvencia ich výskytu na hradiskách – na niektorých z nich dokonca v takých nálezových kontextoch, ktoré súvisia s horizontom ich zničenia.

Výskyt hrotov šípov východného typu je vo východohalštatskom prostredí často spájaný s násilnými bojovými aktivitami skýtskych jazdeckých nomádov. Toto konštatovanie čiastočne platí len v prípade exemplárov s vysunutou tuľajkou, ktorých vyšší počet na niektorých hradiskách na Morave, v juhozápadnom Poľsku a na juhozápadnom Slovensku by mohol naznačovať lokálne obmedzené bojové akcie. Naopak, hroty šípov VK nie je možné považovať za doklad násilných bojových aktivít. Na ich rozšírení do strednej, ako aj do juhovýchodnej Európy sa podieľali iné faktory než v prípade hrotov šípov s vonkajšou tuľajkou – a to kultúrne a obchodné kontakty, výmena technológií, prípadne snaha o vybudovanie sféry vplyvu zo strany VK. Nálezy VK indikujú jej intenzívne a ďaleko siahajúce nadregionálne kontakty a mierumilovné interakcie s kultúrnymi regiónmi ležiacimi západne od nej v stupňoch HD a LTA.

- Obr. 1. Rozšírenie nálezov východného typu z neskorej doby halštatskej a včasnej doby laténskej (HD–LTA) v Zadunajsku – prvá (krúžok) a druhá skupina pôvodu (štvorec). K číslovaniu a odkazom pozri *Katalóg*. Autor A. Kozubová.
- Obr. 2. Rozšírenie nálezov východného typu z neskorej doby halštatskej a včasnej doby laténskej (HD–LTA) v Zadunajsku – tretia (krúžok) a štvrtá pôvodu (štvorec). K číslovaniu a odkazom pozri *Katalóg*. Autor A. Kozubová.
- Obr. 3. Typologická škála nálezov východného typu z neskorej doby halštatskej a včasnej doby laténskej (HD–LTA) v Zadunajsku podľa skupín pôvodu. 1–18 – prvá skupina; 19, 20 – druhá skupina; 21–23 – tretia skupina; 24–33 – štvrtá skupina. Rôzne mierky. Autor A. Kozubová.
- Obr. 4. Rozšírenie bronzových a kostených/parohovinových krížových ozdôb tulcov na šípy z doby halštatskej vo východnej časti strednej Európy. 1–6 – Slovensko; 7–17 – Maďarsko; 18–29 – Rumunsko. Grafika A. Kozubová, podľa *Kemenczei 1986*, doplnené A. Kozubovou.
- Obr. 5. Rozšírenie železných zubadiel typu Szentes-Vekerzug. 1–6 – Slovensko; 7–26 – Maďarsko; 27, 28 – Poľsko; 29, 30 – Ukrajina; 31 – Chorvátsko; 32 – Bosna a Hercegovina; 33–35 – Srbsko; 36, 37 – Rakúsko; 38–42 – Rumunsko; 43–50 – Slovinsko. 50 – Česko. Grafika A. Kozubová, podľa *Werner 1988*, doplnené A. Kozubovou.
- Obr. 6. Hlinené pečatidlá z neskorej doby halštatskej a včasnej doby laténskej (HD–LTA) zo Zadunajska. 1, 3 – Alsópáhok, Hévízdomb I (kat. 2A); 2, 5 – Keszthely, Apátdomb (kat. 14); 4 – Budaörs, Kamaraerdei-dűlő (kat. 8); 6 – Százhalombatta (kat. 30); 7 – Tokod-Altáró, Erszébet akna (kat. 34); 8 – Zalaszentmihály (kat. 41); 9–11, 13, 14, 19 – Velem, Szent Vid-hegy (kat. 38A, 38B); 12 – Pomáz, Zdravlyák-dűlő (kat. 22A); 15 – Budapest-Csúcshegy, Harsánylejtő (kat. 9); 16 – Sopron, Krautacker-dűlő (kat. 29A); 17, 18 – Sopron, Himmelstrom (kat. 29C); 20 – Bátaszék, Körtvélyes-dűlő (kat. 5); 21 – Sé, Doberdó (kat. 27B). Podľa *Chochorowski 1985; Horváth 2015; Ilon 1999; Kemenczei 2008–2010; Kisfaludi 1997; Schwelhus 2010; Tóth 2017*. Rôzne mierky. Grafika A. Kozubová.
- Obr. 7. Hadovité záušnice typu III podľa A. Kozubovej zo strednej Európy. 1, 2 – Kunszentmárton, Nagy-Éri-Főcsatorna (Jasovsko-veľkokumánsko-solnocká župa/HU); 3 – Tiszakeszi, Fáy-kert (Boršodsko-abovsko-zemplínska župa/HU); 4 – Sé, Doberdó (Vašská župa/HU); 5–7 – Velem, Szent Vid-hegy (Vašská župa/HU); 8 – Kozinec, Holubí háj (okr. Praha-západ/CZ); 9, 10 – Měrovice nad Hanou, Babiny (okr. Prostějov/CZ); 11 – Práche, U Prosiměřic (okr. Znojmo/CZ); 12 – Suchohrdly, Nad přehradou II (okr. Znojmo/CZ). Rôzne mierky. Podľa *Kozubová et al. 2022*.
- Obr. 8. Rozšírenie kovových šupín z pancierov z doby halštatskej vo východnej časti strednej Európy. 1, 2 – Slovensko; 3–8 – Maďarsko; 9 – Rumunsko; 10 – Chorvátsko. Autor A. Kozubová.

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THE 'CENTRAL ORAVA' MICROREGION DURING THE LATE HALLSTATT TO MIDDLE LA TÈNE PERIOD¹

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The Iron Age is a period during which many mountainous areas of East Central Europe, usually considered marginal or contact zones, were intensively settled, and exploited. We bring results of archaeological excavations of two hilltop fortified sites – Nižná, Ostražica, and Podbiel, Biela skala (district of Tvrdošín, northern Slovakia) and systematic long-term surface prospection of their environs within the 'Central Orava' microregion. Recovered assemblages of pottery, plant macro remains, animal bones, radiocarbon dates on short-lived ecofacts and spatial analyses of available data bring evidence on more precise dating and character of human activities at and around these two sites. The findings at Ostražica show the continuity of the material culture tradition of the so-called 'Orava group of the Lusatian culture' (OLC) and the 'pre-Púchov stage' (PPS) from the stage Ha C2 or Ha D1 to Lt C1, the period correlated with the earliest significant occupation phase of Ostražica hilltop. Several new contemporary habitation areas and zones with scarcity or absence of artefactual evidence were detected by prospection. They were interpreted as economic hinterland ('settlement area' sensu E. Neustupný 1986 and site catchment analysis theory – maximum measured time estimated for the effort used to attain grass for flocks varies from ca. 1 hour to 2 hours) of the local, almost exclusively, agro-pastoral communities. The concentration of sites around the hilltop ('settlement complex') covers approximately 200 ha and includes residential areas, fields, and pastures (determined by a combination of archaeological excavation, prospection and GIS-based analysis – slope analysis, path distance analysis, and Travel time using Tobler's hiking function). A similar situation is expected at Biela skala. Positions (areas and zones including the area of the burial ground) that have been evaluated as negative by repeated surveys limit the extent of settlement complexes and represent their possible boundaries, which might be sporadically exploited for hunting or collecting raw materials. The results of our study help to understand the lives of human societies inhabiting the mountain and/or marginal zones of Iron Age Central Europe.

INTRODUCTION

The 'Central Orava' microregion can be described as the area around the Iron Age hilltop hillforts – Ostražica in Nižná, and Biela skala in Podbiel; located in the district of Tvrdošín. We use the term 'Central Orava' to more accurately define the area since it is located on the border of the so-called Lower and Upper Orava regions. Recently, B. Lofajová Danielová has carried out archaeological excavations at both sites. In the microregion, she and her team have been carrying out surface collection surveys for the last five years at several upland locations intending to find new archaeological sites. In 2022, a detailed detector and surface survey took place in the surroundings of the Ostražica hillfort, where no archaeological sites were known until now. The goal was to identify whether there are contemporary settlements, and/or other sites, in the area of the hillfort, as in the Biela skala area. Based on a detailed prospecting of the microregion – including archaeological excavation, radiocarbon dating, archaeobotanical and archaeozoological analysis – the paper aims to define the extent of settlement complexes and presume their settlement areas by a combination of archaeological research and GIS-based slope and path distance analysis. The estimated travel time from settlements was calculated using Tobler's hiking distance function (Tobler 1993) to the current DEM data of the territory of Slovakia (data source:

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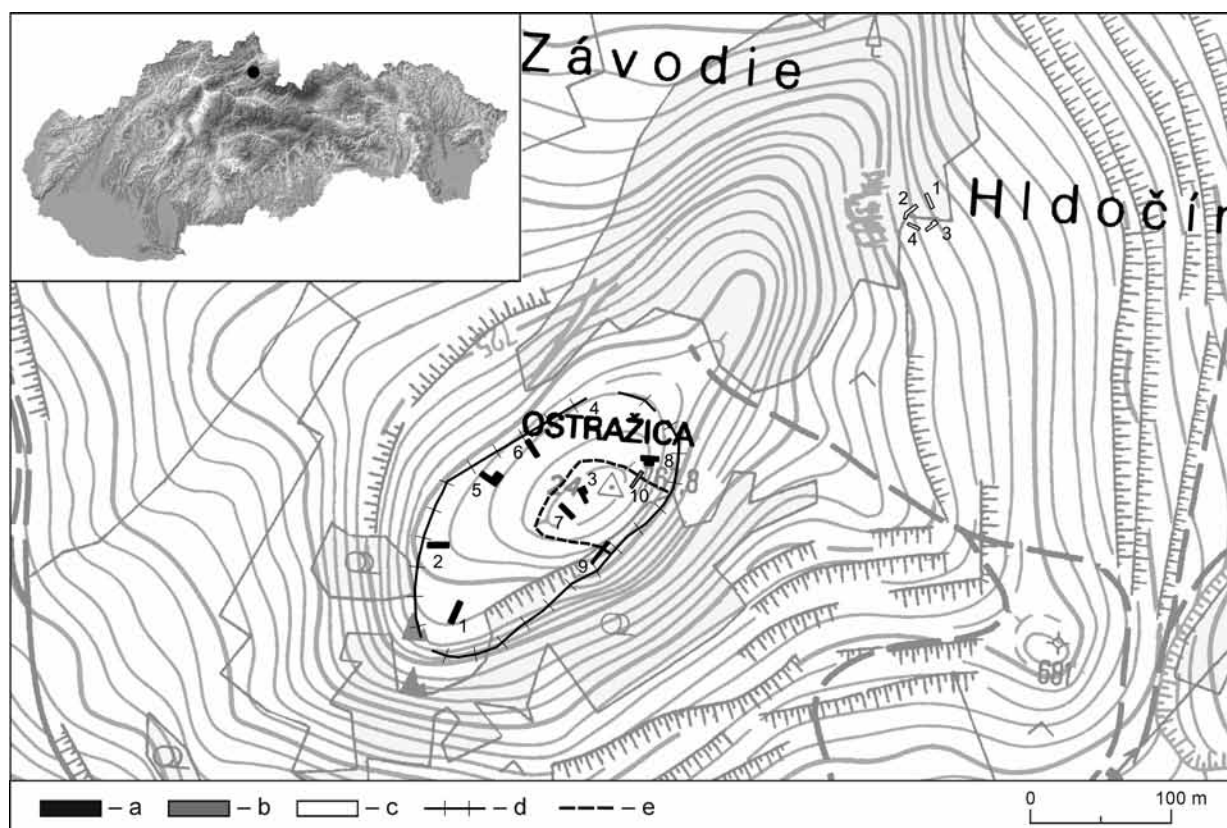


Fig. 1. Nižná, sites Ostražica and Hlodočín. Excavated area and fortifications system. Legend: a – trenches 2018; b – trenches 2019; c – trenches 2020; d – palisade; e – rampart. Data source: ZBGIS (www.geoportal.sk). Author B. Lofajová Danielová.

ÚGKK SR²). We also attempt to discuss the possible economy, and probable function, of the upland sites in the microregion of ‘Central Orava’ during the Late Hallstatt to Middle La Tène periods. In the paper, we use two terms for upland archaeological site/settlement: ‘hilltop’ (situated on a peak that can be fortified traditionally called a ‘hillfort’ or unfortified/open) and ‘hillside’ (situated on the slope of the hill that is unfortified/open).

NIŽNÁ, OSTRAŽICA

Archaeological excavation

Ostražica is a limestone hill (767 m a.s.l.), which towers over a bend in the Orava River. It was previously excavated and researched in the 19th century (*Kubíny* 1892, 160, 161), then by Orava Museum over several years (1965, 1979, and 1989) – focusing on the fortification system. The terrain of the hilltop area has been modified by construction of two separate fortification systems. The first of them lines the terrain below the summit (peak) in the form of a palisade. The second fortification system was supposed to be a timber-laced rampart with stone facing from both sides, according to P. Čaplovič, which enclosed the peak (‘acropolis’). He identified the site as a ‘Hallstatt hillfort’ (*Čaplovič* 1987, 149–155, fig. 73). In 2018, the first author carried out an archaeological excavation in the inner area of the fortification to identify the occupation layer, and possibly the settlement features (within the scope of employment at the Orava Museum; *Lofajová Danielová* 2019).³ Eight trenches were excavated (Fig. 1: a). Based on the relative chronology of the archaeological finds (pottery), the site was dated to the following phases: from the Late Hallstatt to the Early La Tène period (the so-called Orava group of the Lusatian culture;

² Online available at: <https://zbgis.skgeodesy.sk/mkzbgis/sk>.

³ Head of research I. Záhorec, ARCHEOVÝSKUM, Ltd.

Table 1. Nižná, Ostražica. Results of radiocarbon AMS dating carried out by M. Krápiec (Laboratorium Datowań Bezwzględnych, Kraków). Calibrated by OxCal v4.4.4. IntCal 20 curve (Bronk Ramsey 2021; Reimer et al. 2020). Online available at: <https://c14.arch.ox.ac.uk/oxcal.html>.

ID	Laboratory code	BP	Sample type	Context	cal BC/AD 2σ
1	MKL-A5002	2154 ±19	<i>Triticum spelta</i>	Feautre No. 1/18	351–293 cal BC (32.4%) 209–102 cal BC (62.8%)
2	MKL-A5003	2497 ±19	<i>Triticum spelta</i>	Feature No. 4/18	771–725 cal BC (18%) 706–662 cal BC (18.9%) 651–544 cal BC (58.6%)
3	MKL-A5004	2179 ±18	<i>Hordeum vulgare</i>	Feature No. 4/19	356–280 cal BC (56.3%) 232–167 cal BC (38.5%)
4	MKL-A5005	2159 ±21	<i>Ovis aries</i>	K5; Layer 207	352–287 cal BC (38.1%) 211–106 cal BC (55.9%)
5	MKL-A5006	2386 ±22	<i>Bos taurus</i>	K4; Layer 206	540–397 cal BC (95.4%)
6	MKL-A5035	2291 ±24	<i>Ovis aries</i>	Feature No. 6/19	402–355 cal BC (71%) 282–231 cal BC (24.4%)
7	MKL-4210	2200 ±70	wood; unidentified conifers	Feature No. 1/18	395–93 cal BC (92.6%) 77–55 cal BC (2.9%)
8	MKL-4211	1970 ±100	wood; unidentified conifers	Feature No. 4/18	201 cal BC–253 cal AD (93%)

hereinafter referred to as 'OLC'), from the Early to the Middle La Tène period (the so-called pre-Púchov stage; hereinafter referred to as 'PPS', the archaeological material of PPS is most likely synchronic with the OLC in the Early La Tène period) and to the La Tène phase of the Púchov culture (hereinafter referred to as 'PC'). In 2018, two samples (charred wood taxonomically not identified) from Features 1/18 and 4/18 were dated by radiocarbon analysis (Lofajová Danielová 2019, 107).

In 2019, a magnetometric geophysical survey of the entire fortified area was carried out.⁴ It discovered that the rampart descends on the steep south-eastern slopes below the acropolis, which would imply that the acropolis was not enclosed. The archaeological excavation in 2019 was therefore focused on verifying this information (Fig. 1: b). A large number of geomagnetic anomalies that were discovered within the fortifications indicate a well-organised layout of the settlement space, and the presence of settlement features also outside the area surrounded by the palisade (Felcanová/Felcan/Lieskovský 2021, 101–112; Lofajová Danielová et al. 2021, fig. 1). The collected archaeobotanical samples were prepared by the first author⁵ and analysed by M. Hajnalová. Animal bones were analysed by K. Šimunková.

Two test trenches (9/19 and 10/19) confirmed that the rampart ran across the steep south-eastern slope, and thus, that P. Čaplovič's assumption about the enclosure of the acropolis (Čaplovič 1987, 151) was incorrect. Two 'terraces' were surrounded by the rampart – the acropolis, and the southeast terrace – between which there is a slope with a gradient of more than 25°, and with an elevation of 13 m. The rampart was constructed on a levelled gravel base (K4; Fig. 2: B) as a gravel-clay embankment, probably with a timber-laced construction which was approx. 4 m wide (K1). The frontal wall from sandstone blocks was also identified (K2, 9, 10; Fig. 2: 3). It is a type of the so-called *Pfostenschlitz* wall, i.e. wall face featuring dry stone masonry interrupted by vertical earthfast posts which are cross-anchored in the earth rampart. They appear in the Northwest Alpine Hallstatt Circle from the Late Hallstatt period (Ballmer 2018). In front of the outer facade in the trench 10/19 (K9) was a protruding stone foundation (K11), on which a wooden structure stood, and may have been connected to the fortifications (K11; Fig. 3). The space between the rampart and the timber structure was initially empty, and it was only filled with a layer of gravel (K12) after the outer shell began leaning towards the interior of the embankment. The recorded construction of the rampart is typical for the territory of Northwestern Slovakia during Lt B2, and especially in Lt C stages – for example at Liptovská Sielnica, Liptovská Mara I (Pieta 1996, 60). In both trenches, previous settlement activities were captured – in trench 9/19, a burnt feature/layer (K5) and an occupation layer in the SE parts (K6; Fig. 2), in trench 10/19, it is Feature No. 6 located under the rampart (K13; Fig. 3). Samples of charred cereal grains and animal bones from the abovementioned strata were analysed by the radiocarbon method. Because the life expectancy of

⁴ Financed by the municipality of Nižná.

⁵ Flotation was carried out manually, on a 0.25 mm analytical sieve using the 'flotation' and 'wash-over' techniques.

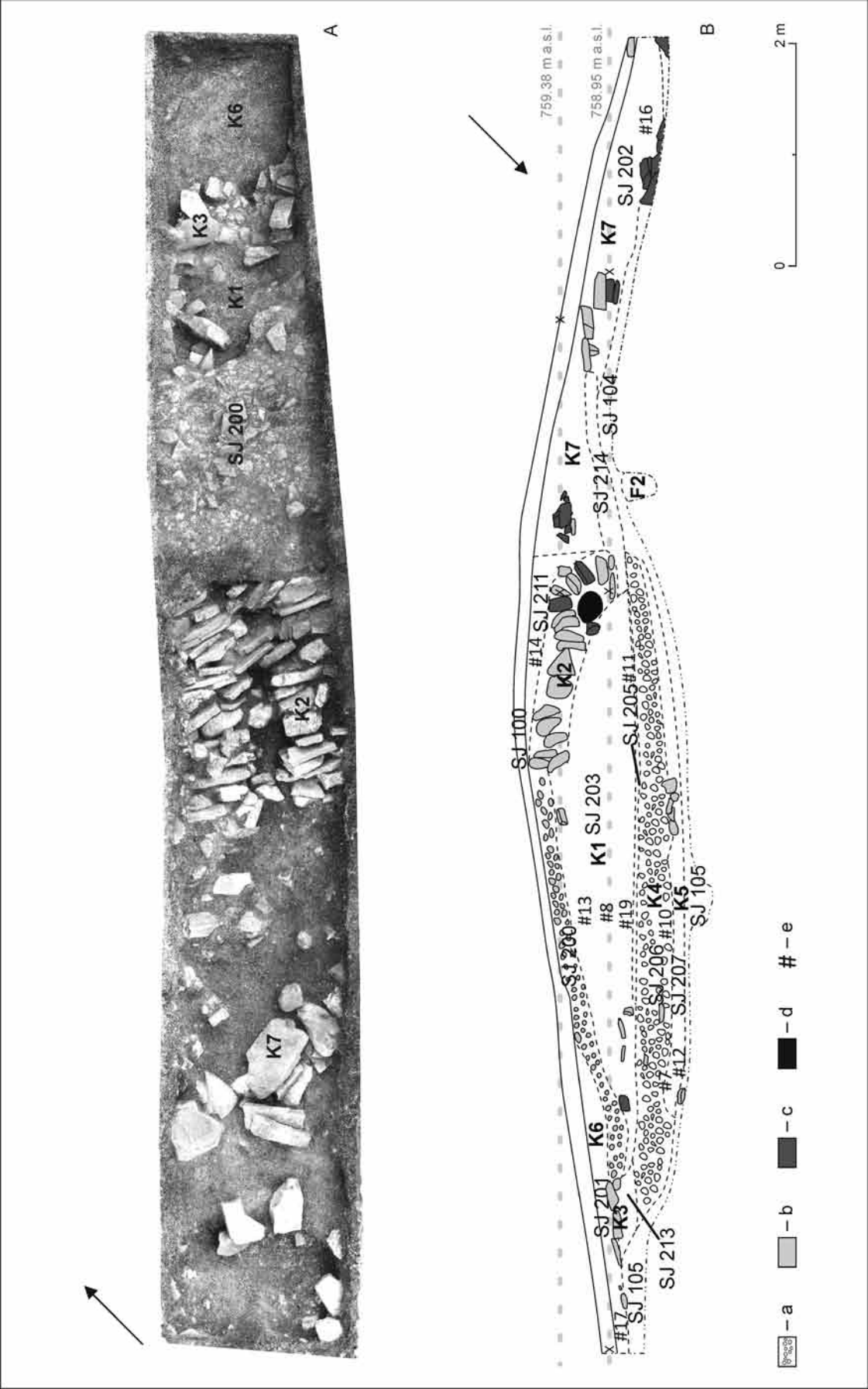


Fig. 2. Nižná, Ostražica. Trench 9/19. A – ground plan on the level of the destruction of the embankment; B – SE profile. Legend: a – gravel; b – sandstone; c – limestone; d – river stone; e – archaeobotanical sample position; SJ – stratigraphic unit; K – context. Author B. Lofajová Danielová.

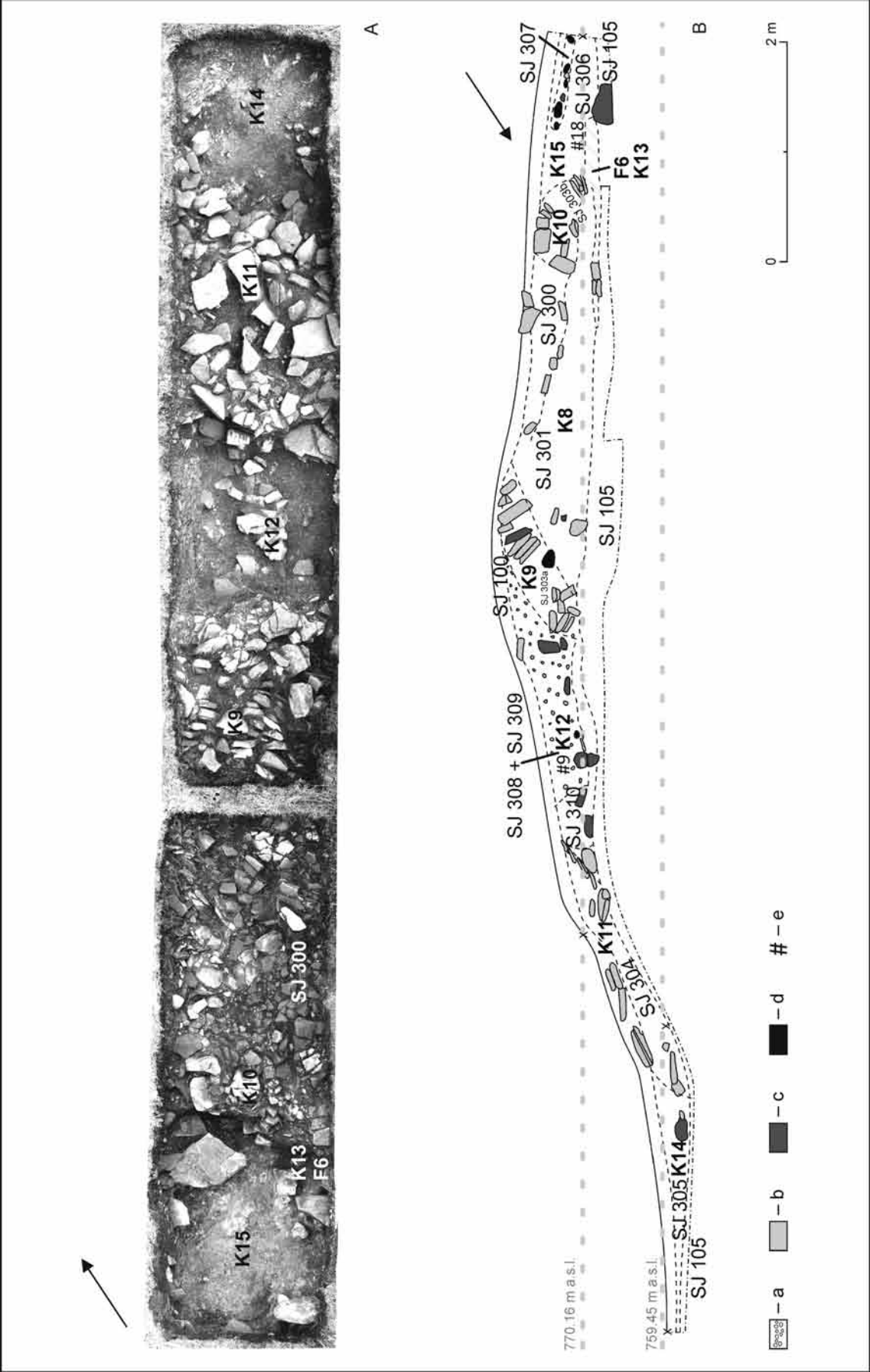


Fig. 3. Nižná, Ostražica. Trench 10/19. A – ground plan on the level of the destruction of the embankment; B – SE profile. Legend: a – gravel; b – sandstone; c – limestone; d – river stone; e – archaeobotanical sample position. Author B. Lofajová Danielová.

herbivore animals (like sheep and cattle) with a typically not aquatic diet is up to 20 years, we view the ^{14}C sample from the bone collagen, similar to dates on cereal grains, as a short-lived sample. This is because, from the point of measurement uncertainty in conventional ^{14}C age (e.g. 20 BP-yrs), the lifetime of the animal is covered by the error term. Accordingly, the calibrated age of such a sample is a *terminus a quo* for human activity associated with the animal's life and a *terminus post quem* for any later human activity. The samples were selected as their stratigraphic position suggests the *post quem* date for the fortification. A total of eight samples from the Ostražica hilltop settlement were dated, which determines the age of the embankment in trenches 9/19, and 10/19, and date the features numbered 1/18 and 4/18 (Table 1). Most of the dates have already been published (Lofajová Danielová 2019; Lofajová Danielová et al. 2021). The new AMS dates are discussed below.

Chronology

Bronze hoards from the Late (Nižná, Lazy) and Final Bronze Age (Tvrdošín, Medvedzie) near the site indicate that Ostražica could have been already inhabited in the Bronze Age (Čaplovič 1987, 161–167; Kavuljak 1940). L. Benediková assigns the site to the Late Bronze Age based on the amphora fragment (Benediková 2006, fig. 50: 4). However, this dating is not archaeologically supported by new research – neither in any archaeological material or radiocarbon-dated plant and animal remains.

Although the site is known as the 'Hallstatt Hillfort' (Čaplovič 1987, 149–155), during the latest research we found that the rampart fortification of the site was built in La Tène period (see below; Lofajová Danielová et al. 2021). There might have been a simple palisade constructed during the Hallstatt period (Čaplovič 1987, 150), but this needs to be confirmed by new archaeological excavation. Some pottery fragments (from the inner area or embankment of the rampart) have analogies in the OLC, and we could date them to the turn of the Late Hallstatt and La Tène periods. These are primarily amphora-shaped vessels, with four handles, decorated with horizontal and obliquely engraved lines, for example, in Feature No. 1/18 (Fig. 4: 1; Pl. I: 1). Amphora fragments were found on the bottom of the feature where some wood was laid that resembled a trough (Fig. 4: A, B). The sample of indeterminate coniferous wood was AMS dated to 395–93 (92.6%), which corresponds to a long interval Lt B–Lt D1, and partially fits the assumption of the dating of these vessels to the stage Ha D–Lt A/Lt B1 (Lofajová Danielová 2019, 107; pl. 1). However, recently dated spelt grains (*Triticum spelta*) from this feature, originate with the 62.8% probability from the period 209–102 cal BC (Table 1), which in relative chronology corresponds to Lt C1–Lt D1 (Venclová et al. 2013, 21, 22). Therefore, based on the above, the material within the feature (and the feature itself) could be dated to the Middle La Tène period. The material from Feature No. 3/18 (Fig. 4: A), which is stratigraphically older (disturbed by Feature No. 1/18), mainly contained sherds from barrel-shaped pots with circular and tongue-shaped plastic protuberances (Fig. 4: 4–7). The fragment of a handle decorated with irregularly engraved lines (Fig. 4: 4) resembles the handle decoration on amphora-shaped vessels from the turn of the Hallstatt and La Tène periods – to which it was originally dated by the first author (Lofajová Danielová 2019, 105). However, it is a handle placed on the rim of the vessel – cup/jug with analogies in the PPS material (compare Pl. I: 5). Therefore, we could also date Feature No. 3/18 to the La Tène period (from the Lt B stage at the earliest). The archaic sherds in Feature No. 1/18 could be a consequence of the location in a secondary position, or it could possibly document the long-term use of archaic pottery, and continuity in ceramic production.

The charred seed of *Triticum spelta* from Feature No. 4/18 (Fig. 5; Table 1) most likely (58.6%) dates back to the Hallstatt period (651–544 cal BC). In relative chronology, it is the stage Ha C2–Ha D1/2 (Trachsel 2004). In this case, the accompanying ceramic material belongs to the period of the PC (Fig. 5: 1–5), including the date of the charred wood sample (Lofajová Danielová 2019, 105). A date obtained from a fragment of the femur of a *Bos taurus* extracted from the gravel layer under the La Tène rampart in the trench 9/19 (K4; Fig. 2: B) falls most likely, to the interval 540–397 cal BC (95.4%), which corresponds to Ha D2–Lt A (Table 1; Pl. I). The bone was found in a levelled layer – so, it could have originated in any part of the site (feature/occupation layer). Although both ecofacts from the Hallstatt period are located in a secondary position, they confirm the settlement of the hilltop position from at least the Late Hallstatt period – when probably only a simple fortification (palisade) existed. Ceramic finds of the oldest phase from Ostražica represent several fragments from different contexts (layers, features – see above, e.g., Feature No. 1/18; Fig. 4: 1). Sherds from amphora-shaped vessels decorated with engravings belong there (Pl. I: 1, 3), which have numerous analogies in the OLC material, for example, in the burial ground in Dolný Kubín, position II (Čaplovič 1977). A fragment of the amphora/vase decorated with an engraved

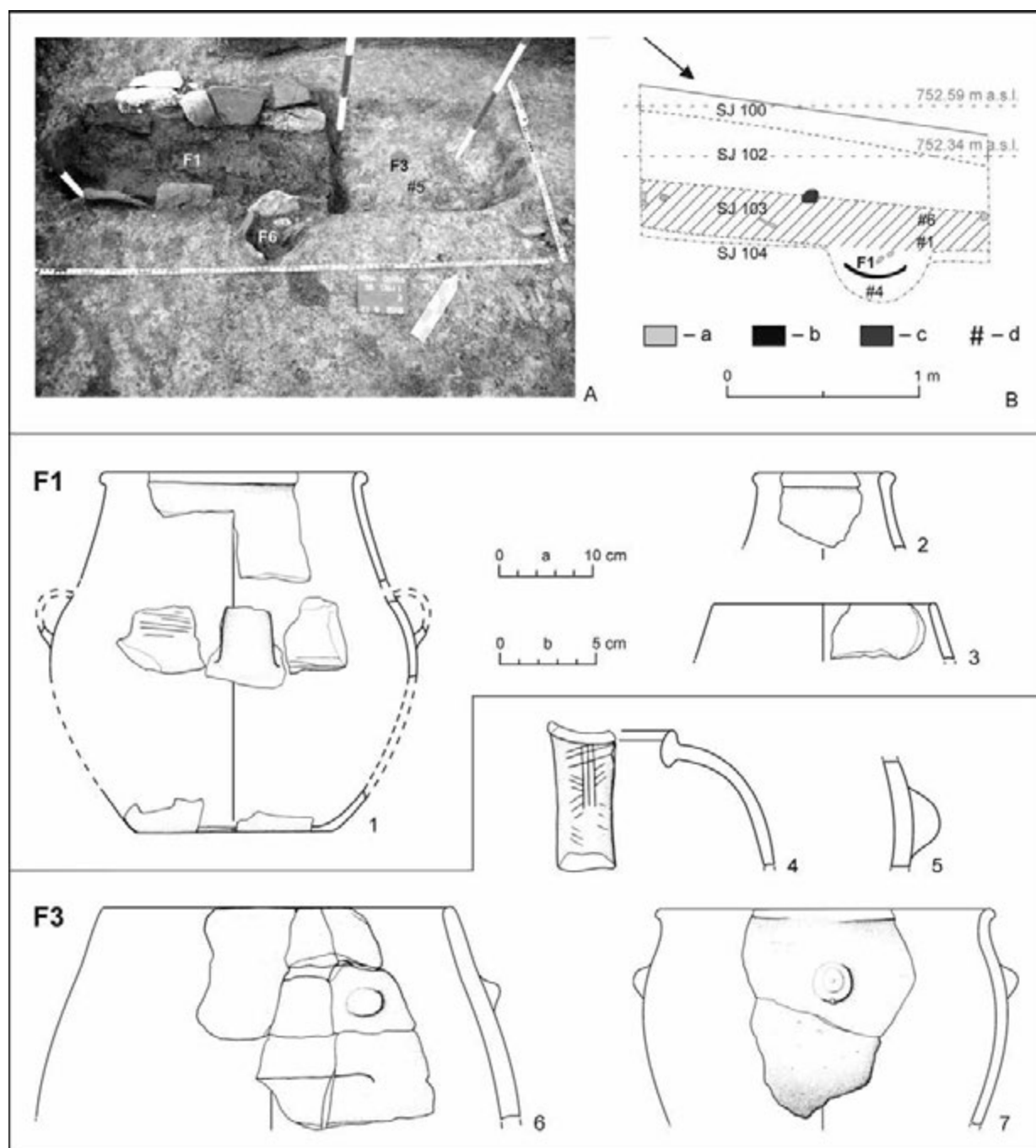


Fig. 4. Nižná, Ostražica. Features Nos. 1/18, 3/18, and 6/18 (trench 5/18). A – ground plan; B – SW profile; 1–7 – the selection of pottery from feature 1/18 and 3/18. Legend: a – sandstone; b – charred wood; c – limestone; d – archaeobotanical sample position; Sj – stratigraphic unit; F – feature; K – context. Scale: a – 1; b – 2–7. Photo and drawing B. Lofajová Danielová.

inverted hatched triangle could also be dated to the oldest phase (Pl. I: 2). Irregular narrow engravings are characteristic of the material from the Hallstatt period. Hatched triangles are often represented in this period, e.g. on a terrine vessel from territorially close Kvašov, Ostrá hora, which L. Benediková dates to Ha C–Ha D1 (Benediková 2006, 241 f., pl. LXVII: 2).

The next phase of the Ostražica settlement is represented by the settlement in the PPS period, which is characterised by pottery with various plastic applications in the form of horseshoe-shaped and vertical protuberances, strap handles, variously decorated jugs, cups (also partly jiggered), and amphora-shaped vessels (Benediková/Pieta 2020; Pieta 1982, pl. XXII; XXIII; 2008, pl. 89: 1–7, 9, 10). This pottery was found

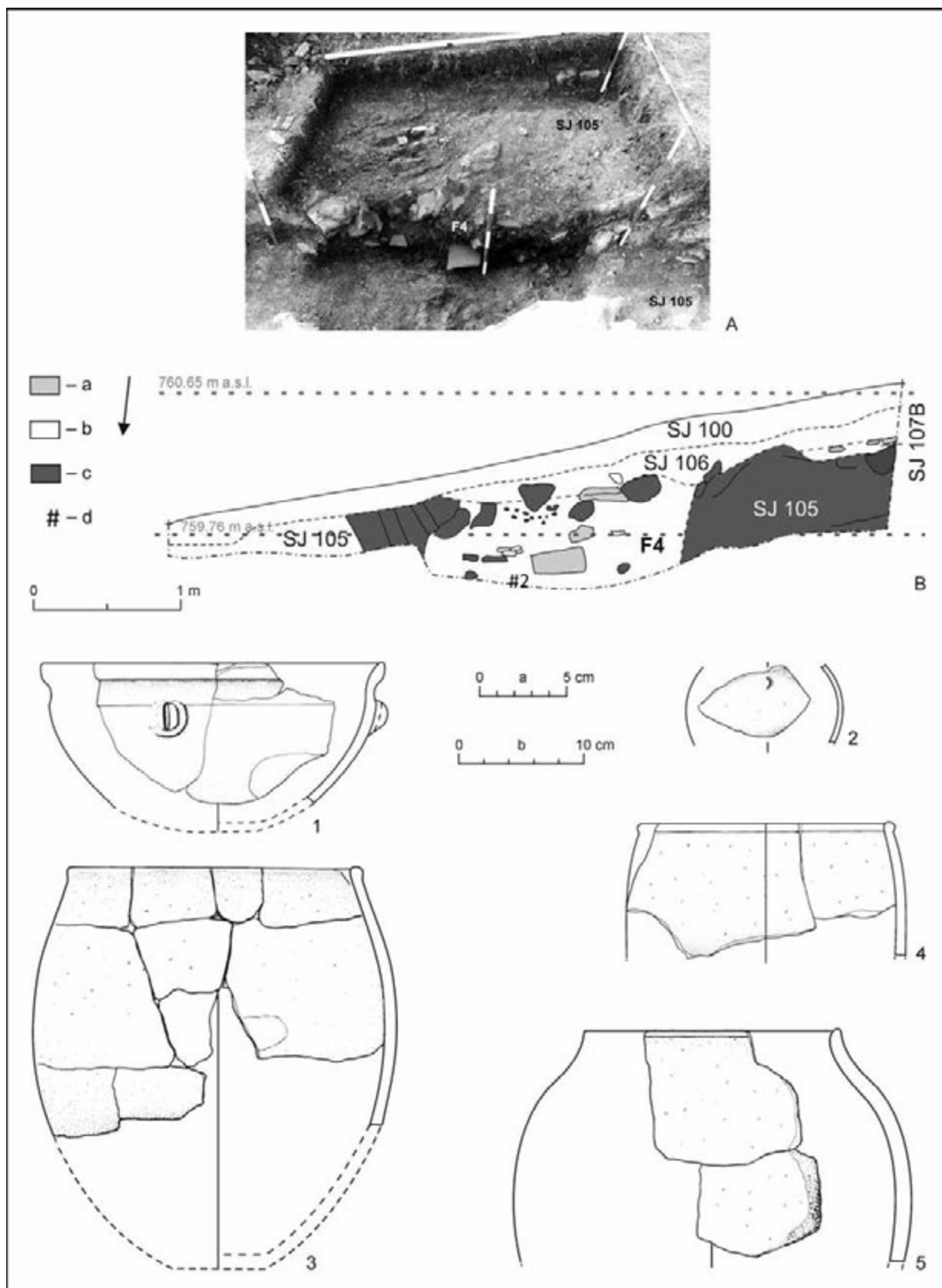


Fig. 5. Nižná, Ostražica. Feature No. 4/18 (trench 8/18). a – ground plan of feature No. 4/18 at the level of bedrock; b – S profile of trench 4/18; 1–5 – selection of pottery. Legend: a – sandstone; b – pottery fragments; c – limestone; d – archaeobotanical sample position; SJ – stratigraphic unit; F – feature. Scale: a – 1, 2, 4, 5; b – 3. Photo and drawing B. Lofajová Danielová.

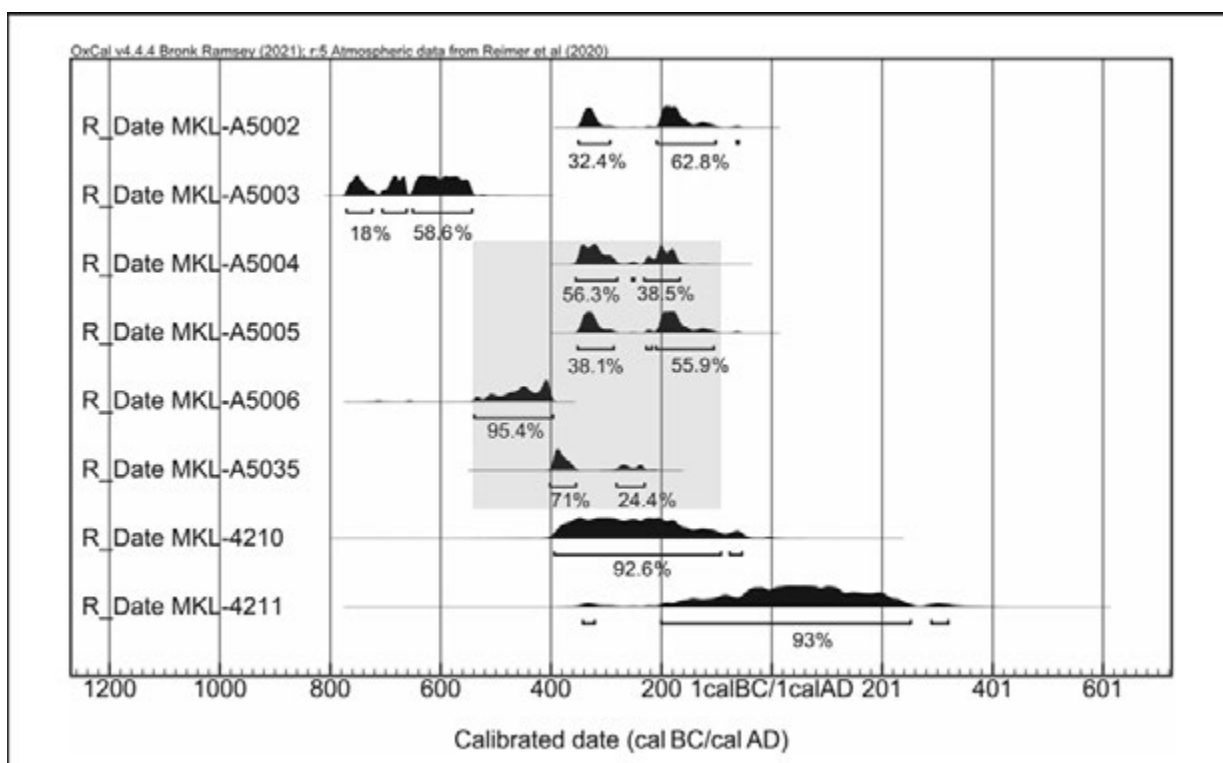


Fig. 6. Nižná, Ostražica. Radiocarbon data after calibration. Grey area – strata under the rampart construction. By OxCal v4.4.4. IntCal 20 curve (Bronk Ramsey 2021; Reimer et al. 2020). Online available at: <https://c14.arch.ox.ac.uk/oxcal.html>.

mainly in the embankment and strata related to its construction (Pl. I: 5–7; Lofajová Danielová et al. 2021, fig. 13). The rampart fortifications were dated to approximately the same period in both locations – strata under the construction of the rampart have been dated to 540–106 calBC. With the exception of the Hallstatt period sample, which was probably in secondary position (MKL-A5006), the others are most likely to be from 402–287 calBC. Sample MKL-A5005, although dated towards 211–106 calBC (55.9% probability), is most likely to be earlier, from 352–287 calBC (38.1% probability), considering the other samples (MKL-5004 and MKL-A5035) and the archaeological finds (Table 1; Fig. 2; 3; 6). In cooperation with M. S. Przybyła, the results were compared with the Maszkowice, Góra Zyndrama, and Zabrzeż, Babia Góra hillforts in Lesser Poland (Lofajová Danielová et al. 2021). The archaeological materials from all the aforementioned sites are related to and correspond to the archaeological materials of the PPS. The dating of all the fortifications overlaps in the 4th–3rd century BC, which is significantly earlier than PPS horizon has been dated in the past (to stages Lt B2–Lt C2; Pieta 1982, 157). After comparison with the relative chronology (Ballmer 2018), we can date the first construction of the Ostražica hillfort probably to the stages Lt B1 and Lt B2, perhaps at their transition (Fig. 6). This assumption is confirmed by the fact that finds with analogies in the previous phase were found sporadically in the embankment, but finds that could be associated with the following La Tène phase of the PC were absent. The presumption of K. Pieta about the dating of the rampart to the Late La Tène period was incorrect (Pieta 2008, 119). Similar result – the long existence of the PPS already from stage Lt B1 is demonstrated by new studies in the Liptov region (Benediková/Pieta 2020), inclusive of radiocarbon data (Pieta/Barta/Benediková 2021).

The third phase of the settlement could be associated with the La Tène phase of the PC. It is presented by fragments of graphite situla-shaped vessels with combing (Pl. I: 11, 12), as well as the bead rim of a barrel-shaped vessel that could belong to the Middle and Late La Tène period (Pl. I: 10). From residents we have oral information about the recovery of 'Celtic coins' at the site with metal detectors, but the artefacts are unavailable.

K. Pieta assumed that the site was settled by the PC only in the La Tène phase (Pieta 1982, 221). However, the latest surface survey proved that the site was also inhabited at the beginning of the Roman period (Pl. I: 14). The pottery fragment with fingernail and finger-tip-impressed decoration (*Fingertupfen*) has analogies with, for example, the settlement at Slovenské Pravno, Feature No. 1/70, which the author

dates to the younger phase of the Early Roman period – stages B2–B2/C1 (*Pieta 1982*, 167, pl. LIII). A pottery fragment from the occupation layer in the trench 4/18 could also belong to this period (*Lofajová Danielová 2019*, pl. 1: 10). The radiocarbon dating of the charred wood fragment from Feature No. 4/18 (Table 1; Fig. 6; *Lofajová Danielová 2019*, 105) fits within the 400-year interval from the Late La Tène to the Early Roman period. An S-shaped probably-jiggered bowl (Fig. 5: 1; Pl. I: 9) corresponds typologically to bowls from stages Lt C1 and Lt C2 (*Repka 2020*, 142). The fingernail decoration (Fig. 5: 2), and the S-shaped pot (Fig. 5: 5), could also belong to the Roman phase of the PC (*Pieta 1982*, pl. L; LIII). Continuity between the Late La Tène and Early Roman phases is currently not proven. According to K. Pieta the fortified hilltop settlements of the PC settled mostly in the Late La Tène period were abandoned in the younger phase of the Early Roman period, and only a few of them were used sporadically – the authors consider them rather as refuge places than settlements. During this period, we document the large settlements in the lowlands in the territory of the Púchov culture in NW Slovakia (*Ježišková/Pieta 2019*, 84; *Pieta 2008*). Elevated open settlements in the younger phase of the Early Roman period were recently documented in the Liptov region – Likavka, Predné Hony/Predný Lán (*Benediková et al. 2020*), or Liptovský Ján, Pod hrádkom (*Furman/Repková 2016*). Based on the small scale of the excavations at the Ostražica hillfort, we cannot rule out settlement activities on the hilltop in this period.

The radiocarbon data and ceramic material from Ostražica, reflect a long-lasting and most likely continuous settlement of the hilltop from the Hallstatt period (starting from Ha C2 or Ha D1) to the beginning of the Middle La Tène period (Lt C1). Most likely the site was used continuously also during the later stages of the La Tène period (Lt C2–Lt D), it means during the PC. The latest studies, which also include radiocarbon data from Liptovská Sielnica, Liptovská Mara II, and Demänovská hora in the Liptov region also point to continuity between the OLC and PPS materials (*Benediková/Pieta 2018*; *Pieta/Barta/Benediková 2021*). We presume a similar situation also at other sites in the northern part of the Western Carpathians – NW Slovakia (e.g. in Turiec, or the upper Považie regions). Here we also document predominantly repeatedly used upland sites settled in both phases (OLC and PPS), and an almost identical settlement strategy – the choice of the same type of landscape (promontories, and hilltops mostly with lower elevation), the close distance to the main waterways (Váh, Orava, and Turiec rivers), and a preference for limestone/dolomite substrate.⁶

Archaeobotany

With the aim to provide information about the plant-food-related economy and to secure samples suitable for dating of human activities at Ostražica hillfort, nineteen deposit samples for flotation and subsequent archaeobotanical analyses were collected during the 2018 and 2019 excavations. They originate from variety of contexts – the fills of four pits Nos. 1/18 (#4; Fig. 4: B), 3/19 (#5; Fig. 4: A), 4/18 (#2; Fig. 5: 1–5), 4/19 (#15), the layers below, or possibly forming the base of the rampart (#7, 10, 11, 12; Fig. 2: 3), the layers forming the body of the rampart (#8, 13, 19; Fig. 2), layer connected to the rampart destruction (#14 and possibly #9; Fig. 2: 3) and various cultural layers situated *intra-* (#1, 3, 6; Fig. 4: B) and *extra muros* (#17, 16; Fig. 2). Plant macro remains were extracted from the deposits in laboratory using the combination of three manual flotation⁷ methods (flotation, wash-over and wet sieving, with the smallest mesh of 0.25 mm; cf. *Hajnalová M. 2022*, 46–54). The dried light fractions were sorted⁸ in their entirety. Wood charcoal fragments were only sorted and counted from a fraction larger than 2 mm and they are not yet taxonomically identified. Material suitable for AMS dating – represented by short-lived samples (charred grains of cereals) was selected and dated from four samples (#2, 4, 10, 15; Fig. 2–4).

In total the deposit samples provided 199 plant macro remains and over 1250 wood charcoal fragments. In general terms, it is a very modest ‘finds-poor’ assemblage, where 79% of seeds concentrate in two samples (#1 and 2) and seven samples (#6, 7, 11, 14, 16, 18, 19) do not contain any seeds. Despite these obstacles, we use archaeological and radiocarbon dating for diachronic evaluation of the material (Table 2; Fig. 7).

One sample (#2) from the Late Hallstatt phase (Ha C2–Ha D) of the occupation of Ostražica is the richest in the assemblage and comprises 68% of all charred seed finds. There are four species of

⁶ A detailed analysis of upland sites of NW Slovakia is published in a dissertation by B. Lofajová Danielová (2024).

⁷ Flotation was carried out by Barbora Lofajová Danielová.

⁸ Sorting of the samples was done by Ing. Eva Hajnalová, DrSc.

Table 2. Nižná, Ostražica. Plant macro remains grouped according to dating. Numbers refer to NISP values. Underlined are samples with specimens dated by AMS. Author M. Hajnalová.

Phase	Ha C2–Ha D	Ha D2–Lt A	Lt B1–Lt B2	Lt C(1?)	Ha C2–Lt C(1?)	Lt C2–Lt D	Lt D	Ha C2–Lt D
No. of samples	1	1	7	2	1	2	1	4
Volume (l)	3.5	5	28	6	4	9	3	25
Crops								
<i>Triticum spelta</i>	33	–	1	3	2	6	–	1
<i>Triticum monococcum</i>	–	–	–	–	–	1	–	–
<i>Triticum</i> sp.	–	–	–	–	–	6	–	–
<i>Hordeum vulgare</i>	–	–	5	1	–	4	–	5
<i>Triticum/Hordeum</i>	23	–	1	2	1	–	–	3
<i>Setaria italica</i>	2	–	–	–	–	–	–	–
<i>Panicum miliaceum</i>	–	–	1	1	–	1	–	–
<i>Avena</i> sp.	4	–	–	–	–	1	–	–
<i>Cerealia</i>	–	–	3	–	–	–	–	–
<i>Triticum spelta</i> (glume bases)	6	–	–	–	1	–	–	–
<i>Cerealia</i> (nodium)	1	–	1	–	–	–	–	–
<i>Vicia faba</i>	2	1	–	–	–	–	–	–
<i>Pisum sativum</i>	11	1	–	–	–	–	–	–
<i>Pisum/Vicia</i>	1	–	–	–	–	–	–	–
Wild plants								
<i>Fallopia convolvulus</i>	14	–	1	–	–	–	–	–
<i>Chenopodium/Atriplex</i>	11	–	1	–	–	–	–	–
<i>Atriplex</i> spp.	5	–	–	–	–	–	–	–
<i>Galeopsis</i> cf. <i>segetum</i>	6	–	–	–	–	–	–	–
<i>Galium spurium</i>	3	–	2	–	–	–	–	1
<i>Vicia</i> cf. <i>tetrasperma/hirsuta</i>	3	–	–	–	–	–	–	–
<i>Melilotus alba/officinalis</i>	–	–	–	2	–	–	–	–
<i>Medicago lupulina</i>	–	–	2	–	–	–	–	–
<i>Polygonum aviculare</i>	3	–	–	–	–	–	–	–
<i>Persicaria maculata</i>	1	–	–	–	–	–	–	–
<i>Polygonaceae</i>	2	–	–	–	–	–	–	–
<i>Bromus</i> cf. <i>arvensis</i>	2	–	–	–	–	–	–	–
<i>Euphorbia helioscopia</i>	–	–	1	–	–	–	–	–
<i>Cardaria draba</i>	–	–	–	–	–	1	–	–
<i>Brassicaceae</i>	1	–	–	–	–	–	–	–
<i>Valerianella dentata</i>	1	–	–	–	–	–	–	–
indet.	3	–	1	–	–	–	–	–
Wood charcoal fragments	399	53	313	149	75	75	1	192
Uncharred seeds	–	–	1	–	–	1	50	338
Density of charred seeds	39.4	0.4	0.7	1.5	1.0	2.2	0	0.4

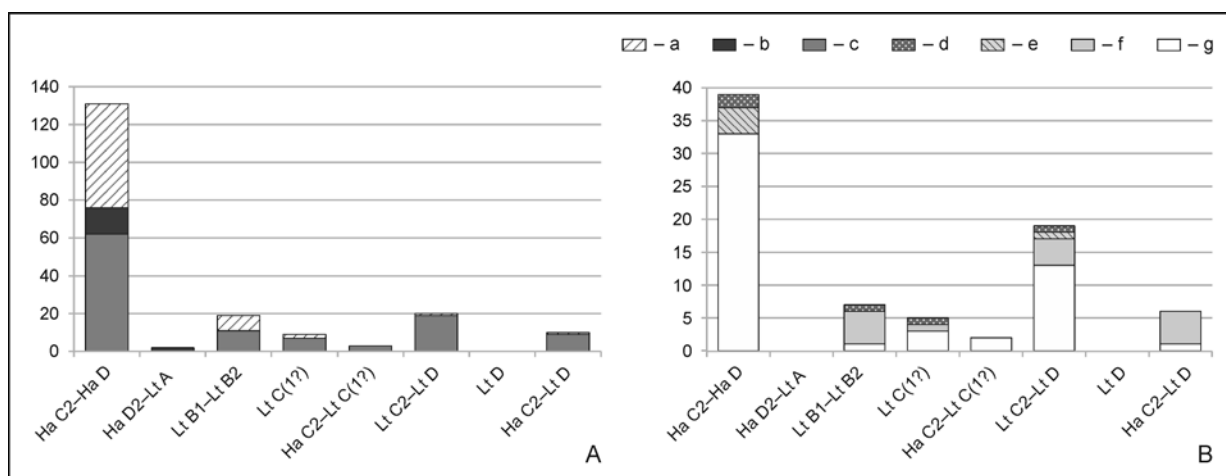


Fig. 7. Nižná, Ostražica. Charred plant macro remains. A – the proportion of main types of macro remains (excluding wood charcoal); B – proportion of determined cereal crop species. Numbers on the left axes represent NISP values. Legend: a – weeds; b – pulses; c – cereals; d – millets; e – oat; f – barley; g – glume wheats. Author M. Hajnalová.

cereals – spelt (*Triticum spelta*), einkorn (*T. monococcum*), foxtail millet (*Setaria italica*) and oat (*Avena* sp.), two pulse crops – sweet pea (*Pisum sativum*) and Celtic bean (*Vicia faba*), and twelve wild plants taxa typical of arable or garden plots. The sample (#10) from the next phase from the end of the Hallstatt and the beginning of the La Tène period (Ha D–Lt A) provided only two seeds of pulses. From the following, the Early and Middle La Tène period (Lt B–Lt C), the plant macro-remains are rare, even though there are nine samples available (three from the pits, and six from the rampart). Pulse crops and foxtail millet disappear from the record. From cereals, there are only spelt, and broomcorn millet (*Panicum miliaceum*) accompanied by five species of possible arable weeds. The sample (#9) dated less precisely (Ha C2–Lt C[1?]) contains the same taxa as recorded in previous phases. In the sample dated to Lt C2–Lt D einkorn appears for the first time, and is accompanied by spelt, barley, millet, and oat. However, the only sample dated exclusively to the Lt D (#14), and possibly representing the rampart destruction, contained a single (misplaced?) charcoal fragment and no seeds. Among the remaining four samples dated widely as the Iron Age (Ha C2–Lt D) two did not contain any seeds (#16, 18) and two (#3, 17) had few grains of already identified taxa.

Identified species of crops fit well with data from the contemporary sites in the mountain regions of Northern Slovakia (see below) and it is clear, that they do not indicate settlement activities at Ostražica in other archaeological or historical periods.

The remains of recovered charred seeds could be interpreted as residues from household activities. The wide spectrum and high proportion of weeds (ca. 40%) in the sample from the Hallstatt period indicate that it represents the crop cleaning residue, possibly mixed with some kitchen (food) waste. The high density of finds points to the primary context (finds *in situ*). The other, younger samples, with a much lower density of plant remains probably represent moved, (possibly repetitively) displaced household wastes. The absence of finds in two (out of possibly three) youngest samples either from the transition of the Middle to the Late or Late La Tène period may indicate that the intensity of household-related settlement activities at the site changed or ceased in excavated areas.

Archaeozoology

The presented results are based on a study of a total of 554 bone fragments weighing approx. 2.7 kg. Of these, 60 bone fragments originating from layers that could have been contaminated by modern intrusions, were excluded from interpretation. The osteological material could be divided into three time periods (Table 3): 1. OLC and PPS (219 bone fragments), 2. La Tène phase of the PC (51 bones) and 3. Iron Age to the younger phase of the Early Roman period – from the Hallstatt period to the Roman phase of the PC (224 bones coming from shallow occupation layers destroyed by erosion at the top of the acropolis).

Table 3. Nižná, Ostražica. Quantitative representation of animal species at Ostražica hillfort. Author K. Šimunková.

Species		OLC + PPS			La Tène phase of PC			Iron Age to Roman phase of PC		
		NISP	MNI	Weight [g]	NISP	MNI	Weight [g]	NISP	MNI	Weight [g]
Cattle	<i>Bos taurus</i>	48	2	711.22	9	1	77.78	25	1	290.79
Sheep/goat	<i>Ovis/Capra</i>	72	3	295.09	10	2	32.13	83	3	328.6
Pig	<i>Sus domesticus</i>	20	1	150.55	2	1	21.07	33	4	223.92
Chicken	<i>Gallus domesticus</i>	1	1	1.86	–	–	–	2	1	0.71
Red deer	<i>Cervus elaphus</i>	–	–	–	2	1	48.03	10	1	98.57
Roe deer	<i>Capreolus capreolus</i>	1	1	33.13	–	–	–	–	–	–
Hare	<i>Lepus europaeus</i>	–	–	–	–	–	–	4	1	2.01
Beaver	<i>Castor fiber</i>	–	–	–	–	–	–	2	1	3.71
Wild boar	<i>Sus scrofa</i>	1	1	23.67	–	–	–	2	1	12.45
Fish	<i>Pisces</i> sp.	2	1	0.34	–	–	–	–	–	–
Indet.		30	–	7.63	21	–	1.13	21	–	22.34
Small mammal		1	–	0.65	–	–	–	7	–	5.13
Medium mammal		35	–	25.87	6	–	5.8	28	–	39.19
Large mammal		8	–	13.32	1	–	13.41	7	–	29.32
Total		219		1263.33	51		199.35	224		1056.74

Among the analysed species, the following were determined: domestic species represented by a domestic bull (*Bos taurus*), domestic sheep (*Ovis aries*), domestic pig (*Sus domesticus*) and domestic chicken (*Gallus domesticus*). Wild species were represented by red deer (*Cervus elaphus*), roe deer (*Capreolus capreolus*), European beaver (*Castor fiber*), hare (*Lepus europaeus*) and wild boar (*Sus scrofa*). The bones, which were not determined by species, were classified into groups: sheep/goat (*Ovis/Capra*), fish (*Pisces* sp.), and unidentifiable fragments were marked with the abbreviation *Indet.* The auxiliary categories 'small mammal', 'medium mammal' and 'large mammal' were also used based on the size, weight, and structure of the fragment.

Unidentified fragments (along with the auxiliary categories small, medium, and large mammal) accounted for 33.4%, indicating relatively high fragmentation. The size of the individual fragments also proves the high level of fragmentation, with 47.8% of the bones reaching only 10 to max. 25% of the size of the corresponding bone. According to A. K. Behrensmeyer (1978), the state of preservation of the bones was relatively good and fell into grades 1 to 3. This indicates that the bones were relatively little subject to abiotic factors such as weathering or soil pH. Of the entire assemblage, only 77 bone fragments (15.6%) showed contact with fire, and only 20 fragments (4%) bore traces of chopping and cutting.

As can be seen from Table 3, the fewest animal bones came from the La Tène phase of the PC. Despite the disparity in values, it is possible to say a few interesting results. Although we have a greater number of wild species (wild boar, fish, roe deer) in the period of the OLC and PPS, and we also have more bone remains, we have no evidence of deer. Also, in this phase of settlement, a low percentage of wild animals was found (only 1.8%), while in the La Tène phase of the PC, it is up to 3.9% (although a very small sample of material must be considered), and in the wider period of the Iron Age do Early Roman period the percentage is wild animals 8%. The wild species present point to the existence of a mixed forest in the vicinity of the site.

Domestic animals were approximately equally represented in all monitored periods, around 63.8–64.4%. The same anatomical elements were observed in both periods. There were fragments of skulls (lower jaws, horns, individual teeth), lower and upper limbs (especially their fleshy parts), but also a few finger joints. We, therefore, assume that whole animals were butchered at the hillfort, and exclude the import of only certain parts of animals. Similar results are documented in the Liptov region – the predominance of cattle and sheep/goat breeding in the long period from the Later Prehistory to the

Early Roman period, e.g. in Liptovská Sielnica, Liptovská Mara settlements (Bielichová 2019, 215–217), or in Ploštín (hilltop fortification Rohačka and open settlement Pod Rohačkou). The authors presume the continuity of herding of small ruminants and cattle in the mountainous regions throughout the Iron Age and PC period, which is different from the La Tène settlements from Southwestern Slovakia, where an increasing number of domestic pigs is recorded (Benediková *et al.* 2019, 70, 71).

However, the picture obtained from Ostražica can be influenced both by the size and significant fragmentation of the osteological sample as well as by the uncertainty of dating for majority of the samples.

NIŽNÁ, HLDOČÍN

The Hldočín site is located on the north-eastern and eastern slopes of Ostražica Hill. During an archaeological excavation in Ostražica; a local citizen informed us that in the past he found sherds in a badger burrow, which he believed to be prehistoric. During the surface survey in 2019, we found several sherds that came from the occupation layer contemporary with the hilltop settlement (Lofajová Danielová 2020, pl. I–V). The burrow was located near large stone blocks that seemed to be placed in a circle; indicating a cult site. Close to the largest of the rocks the archaeological findings were concentrated. The first author carried out an archaeological excavation in August 2020 (the Orava museum in cooperation with the Nižná municipality).⁹ Its goal was to identify the character of the archaeological site (settlement or possibly cult place), and its chronology. At the same time, the intention was to find out whether the stone blocks were part of the archaeological site, or not related to it. Four trenches were excavated around the stone blocks, and on the nearby terrace (Fig. 1: c). An occupation layer (Fig. 8; SJ 111, 104, 106), and two probable features were found (Fig. 8: A, B, E). In the area containing the stone blocks; a large number of pottery, and animal bones, were found. In these places the occupation layer was mixed with strata of stone destruction (Fig. 8: A–D), which also contained recent waste (plastics, glass, etc.). The stratigraphic situation of the stone blocks documents that they fell on the site long after their persistence. They probably fell on the site from a nearby quarry during some blasting in the last century. The quarry was located above the researched settlement underneath the hilltop. Activities in the quarry also caused the disturbance and replacement, of the occupation layer in the area of Trenches 2 and 4 – within which there was recent material (Fig. 8: A–D). Trenches on the terrace (1, 3) likewise proved an occupation layer, however, mostly disturbed by topsoil (SJ 103; Fig. 8: E).

Apart from the occupation layer, the settlement character of the newly discovered site is well documented by artefacts (Pl. II; III: 1–7): pottery (fragments of a strainer, and storage vessels), building construction imprints in daub (wattle and daub construction of buildings), animal bones, and small objects (fragments of a round loom weight, and whetstones).

Pottery

The pottery fragments can be assigned to different phases of the Iron Age. Among the most chronologically sensitive are decorated fragments of amphora-shaped vessels, bowls, and pots. The rim of the pot/vase with horizontally engraved lines, and short oblique notches (Pl. II: 1), is similar the urns found in the burial ground Podbiel, Za Bielym (Čaplovič 1968, fig. 10: 2; 12: 4). The horizon of the mentioned grave pottery is dated by L. Benediková to Ha D2/3 – Lt A/Lt B1 (Benediková 2006, 144). Analogies are also found in the settlement Podbiel, Biel, and several sites in the Liptov region (Lofajová Danielová 2022, 34, fig. 15: 1; 19: 1–4; with references). To the oldest phase, we could date a fragment of a fine-grained smooth-surfaced amphora that is decorated with engraved horizontal lines, and a bunch of oblique/round lines (Pl. II: 4). There are numerous analogies to this, for example, in the burial ground Dolný Kubín II (Čaplovič 1977). Fragments of coarse-grained reduction-fired amphora decorated with deeply engraved lines come from similar vessels (Pl. II: 6).

The classification of the rim of the bowl that has a pair of tongue-shaped protuberances under the rim, and bunches of obliquely engraved lines is questionable (Pl. II: 3) – we have not found an ap-

⁹ Head of research Ľ Záhorec, ARCHEOVÝSKUM, Ltd. The detailed field situations will be published in a dissertation by the author of the research.

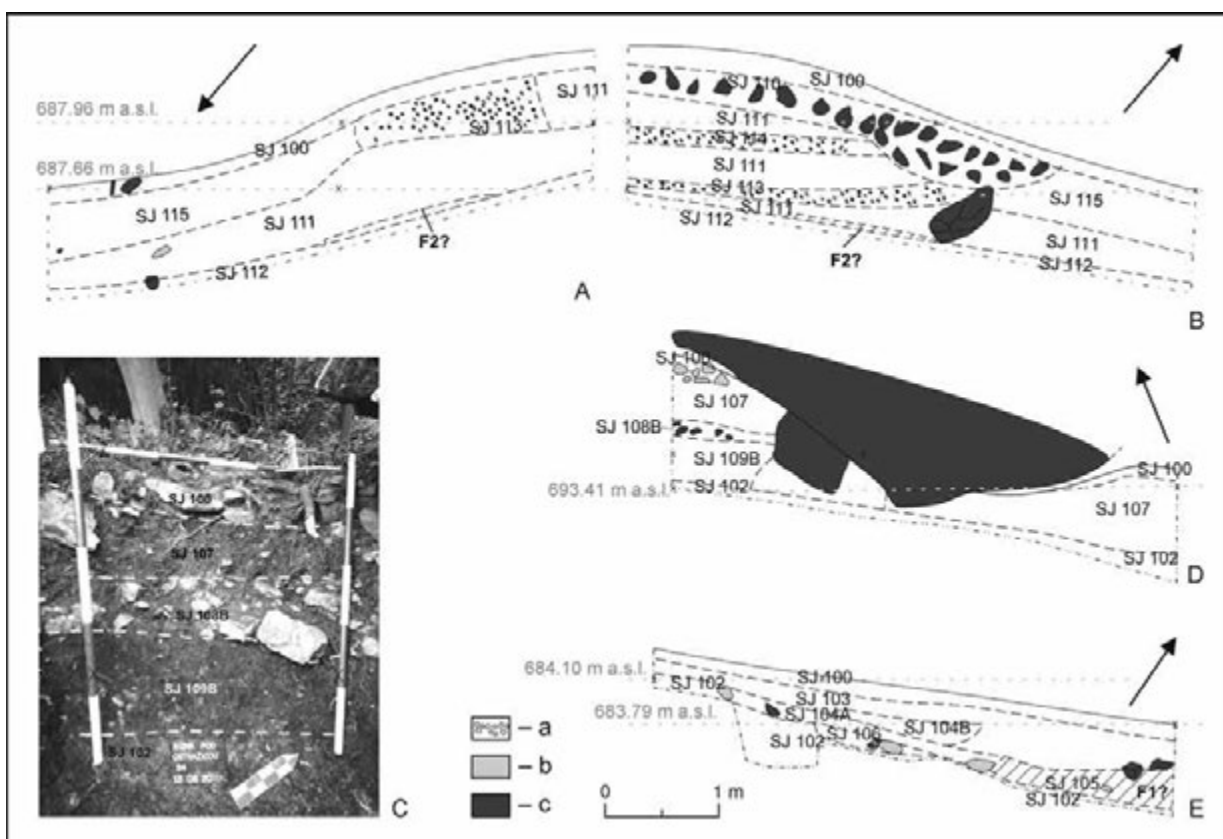


Fig. 8. Nižná, Hlodočín, excavation in 2020. A – trench 2/20, SE profile; B – trench 2/20, NW profile; C – trench 4/20, NW profile; D – trench 4/20, NE profile; E – trench 3/20, NW profile. Legend: a – gravel; b – sandstone; c – limestone; Sj – stratigraphic unit; F – feature. Photo and drawing B. Lofajová Danielová.

appropriate analogy. Double plastic protuberances without engraved decoration appear in the settlement Detva, Kalamárka (Šalkovský 2002, fig. 4: 8), which dates to the interval of the Early to Middle La Tène period (Benediková 2006, pl. LVII: 8; Šalkovský 2002, 103–107). In terms of production material, the sherd does not differ from the others – it is made of fine-grained clay, with reduction firing, and a smooth surface. A fragment of a fine-grained polished vase/cup with irregular bunches of obliquely engraved lines (Pl. II: 9) has direct analogies at the Ostražica hillfort – under the embankment in a burnt layer dated to PPS (Pl. I: 5). A fragment of an orange thin-walled fine-grained vessel with a polished surface, decorated with wide vertical grooves (Pl. II: 5), may also come from the PPS period. Parallels are, for example, in bowls from Liptovská Sielnica, Liptovská Mara II (Pieta 2000, fig. 8: 5). The fragment from the context SJ 115 (Pl. II: 2) is made of the same ceramic material and has the same surface finish. The rim of a bottle-shaped vessel (Pl. II: 12) is similar to the La Tène type dated back to the Lt C1 stage (Repka 2020, 142, 143). Ceramic material, which would be typical for the Púchov culture, is absent from the Hlodočín settlement.

The most represented ceramic types from the settlement are bowls or pots with round plastic protuberances below the rims (Pl. II: 8, 10, 11). They occur over a large horizon from the Late Hallstatt to the Middle La Tène period – for example, in the secondary graves of the mound in Liptovský Trnovec, Konislava, dated to the OLC (Benediková/Pieta 2018, pl. I: 12, 16). They also appear in the PPS material, e.g., Liptovská Sielnica, Liptovská Mara VII (Pieta 1982, pl. XXIII: 8).

Fragments of daub were found mainly in the occupation layer. They are marked exclusively by wattle impressions with a diameter of approx. 2.4–4.2 cm (Pl. III: 1, 3, 5–7) – some of them come from the walls of the structures (Pl. III: 2, 4, 5). One daub fragment has an imprint of a board (Pl. III: 1) probably coming from the inner wall of a building with an unknown function. Fragments from Feature No. 2 (Fig. 8: A, B; Pl. III: 3) come from the wall of a wicker structure with a diameter of approx. 5 cm.

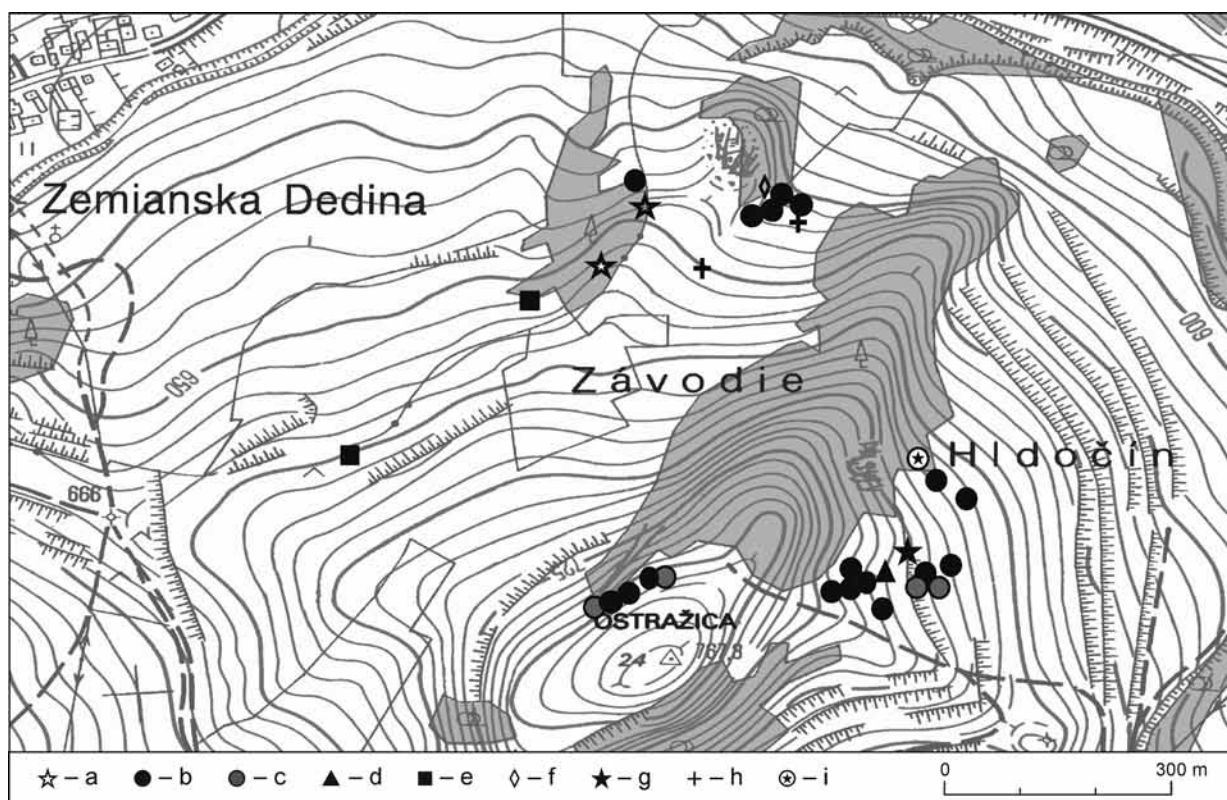


Fig. 9. Nižná, sites Skalica/Závodie and Hlodočín. Survey in 2022 of the surroundings of Ostražica. The relevant archaeological finds. Legend: a – bronze; b – pottery; c – iron; d – daub; e – hand grinding stone; f – sandstones; g – test pit; h – water spring; i – the location of the archaeological excavation in 2020. Data source: ZBGIS (www.geoportal.sk). Author B. Lofajová Danielová.

Survey prospecting 2022

A detailed prospection of the position Hlodočín was carried out in May 2022, by detector survey, and surface collection, as part of a detailed prospecting of the Ostražica area. The initial goal of the survey was to determine the extent of the settlement. The eastern slope and meadows are currently used as pastures. No finds were found there, nor on the eastern edge of the terrace above the stream. We assume that the settlement did not interfere with this space. In the south-western direction towards the Ostražica hillsides, several sherds were found in the place of the 'basin' that is protected from bad weather, and also at two short artificial terraces in the forest (Fig. 9). Due to the increased concentration of findings, a test pit was carried out (Trench 1; Fig. 9: g). Sherds, including decorated ones, and daub fragments, were found (Pl. III: 8–18), which correspond to the presented findings from research in 2020 (Pl. II; III: 1–7). The finds are concentrated in the primary position in the occupation layer, and document settlement activities in this space. Only ceramic material comes from the site, all metal objects from the site are recent. An animal bone from trench 1 of the cultural layer was dated with the highest probability (95.4%) to the Hallstatt period 770–544 calBC (Ha C1–Ha D1), with a higher probability (60.6%) to 651–544 calBC, which in relative chronology represents the period Ha C2–Ha D1 (Lofajová Danielová 2024, 193, fig. 92).

We assume that it was probably one open hillside settlement from Ha C2–Lt C1 (Fig. 11: 2). It was situated on the artificial terraces of the eastern and north-eastern slopes of Ostražica hill, which, according to the current state of knowledge, has a total area of at least 5.5 ha (Fig. 14: a). Continuation of the settlement in a south-eastern direction is probable.¹⁰

¹⁰ This area was not researched for legislative reasons. The parcels were not part of the Monument Board in Žilina's ruling.

NIŽNÁ, THE NORTHERN SLOPES OF OŠTRAŽICA HILL (SITE SKALICA/ZÁVODIE)

On the north-western slope, in front of the fortification, there is a shorter artificial terrace (Fig. 9). A detailed prospection in 2022 revealed atypical sherds at this position – probably from the Iron Age. At this location, recent ploughing has also been documented, and two fragments of an iron sickle have been found (Pl. IV: 1). This finding can probably be dated to the Iron Age, or at the earliest; to the turn of the Hallstatt and the La Tène period (Lofajová Danielová/Furman 2022, 103, with references). There is a relatively large area on the artificial terrace suitable for agricultural activities. Subsequently, the forest access road to the Oštražica hillfort from the north-eastern side was researched. This part is also assumed to be the entrance to the hillfort, as the slope is too steep on all the other sides, and no significant breaches of the fortification system are visible on the LIDAR images. No relevant finds were found in either of these locations.

The survey also aimed on the meadows near the so-called 'Skalica' – a recent quarry (Fig. 11: 4) that destroyed the 'Hallstatt' site already mentioned by P. Čaplovič (1987, 155). Through surface prospection we have found small pottery fragments and also sandstones on the surface, confirming this information. In addition, small sherds were also found in the nearby meadow – in the area of the spring, and even directly in the spring (Fig. 9: h; 11: 7). There was a relatively-deep disturbed profile to a depth of about 2 m, based on which we propose that no occupation layer is present in these places. The springs now serve as water sources for a herd. The site may have been used for these purposes in the Iron Age as well.

On the north-western slopes of Oštražica, the metal detector survey was complicated – due to the influence of long years of ploughing; only recent iron objects were found. This area is also intensively used as grazing land, and some places cannot be explored at all. No relevant finds were detected by the surface survey, only a granite stone that was probably a grinding stone (Fig. 9: e), and may document settlement activity in this area as well.

Through surface survey at the site Závodie (a promontory west of the Skalica site), we have found prehistoric sherds – mainly on the slopes (Fig. 9; 11: 3). In some places artificial 'terraces' are recognizable in the terrain. However, the surface has been destroyed, and the occupation layer was not recorded in this position. In addition to the sherds, a larger bronze ingot (probably waste from production), and a fragment of a bronze bracelet were found (Fig. 9: a; Pl. IV: 2). A grinding stone was also found at the secondary position (Fig. 9: e). Since no remains of occupation strata were recorded at any site (nor in tree uproots, and exposed slopes), we assume that the site was destroyed by stone quarrying similar to the 'Skalica' site. Either that, or this situation is related to activities conducted during World War II, as is generally known in this location. This would be confirmed by the terrain situation of large craters throughout the slope, which are probably not natural. Based on the archaeological material (grinding stone, bronze ingot), and the presence of artificial terraces, we suggest that there may have been a terraced Iron Age settlement most likely contemporary with the fortified area at Oštražica hilltop.

NIŽNÁ, KRIVÉ HONY

This location represents the southern and south-eastern slopes of Oštražica Hill with a moderate slope (gradient 3°–7°) at an altitude of 595 m a.s.l. In 2018, the first author found pottery fragments here (Fig. 10: A: 2; Lofajová Danielová/Furman 2019). This position today has been built on by a house (Parcel KNC-1188/3). During the inspection by M. Furman (Regional Monument Board Žilina) of the nearby house construction in 2019 on plot No. KNC-1188/37, he documented a disturbance of the occupation layer at the NE part of the house (Fig. 10: A: 1), but the foundations were already concreted. In agreement with the owner, M. Furman prescribed archaeological excavation in the place of the disturbed layer. Archaeological excavation was carried out by the first author in April 2020. A trench measuring 7 × 1.6 × 2.8 m was dug around the terrace of the house in the northern and north-eastern corners of the terrace (Fig. 10: B).

Relevant archaeological layers were only recorded to the north-east from the terrace of the house. Two layers were recognisable: in the northern part, a layer of clay consistency with archaeological material (sherds, animal bones, daub, polishing stone, and whetstones), and in the southern part, a clay layer with only small fragments of pottery. As a consequence of groundwater displacement, it was not possible to excavate the layers down to the subsoil level, and therefore impossible to specify more precisely if

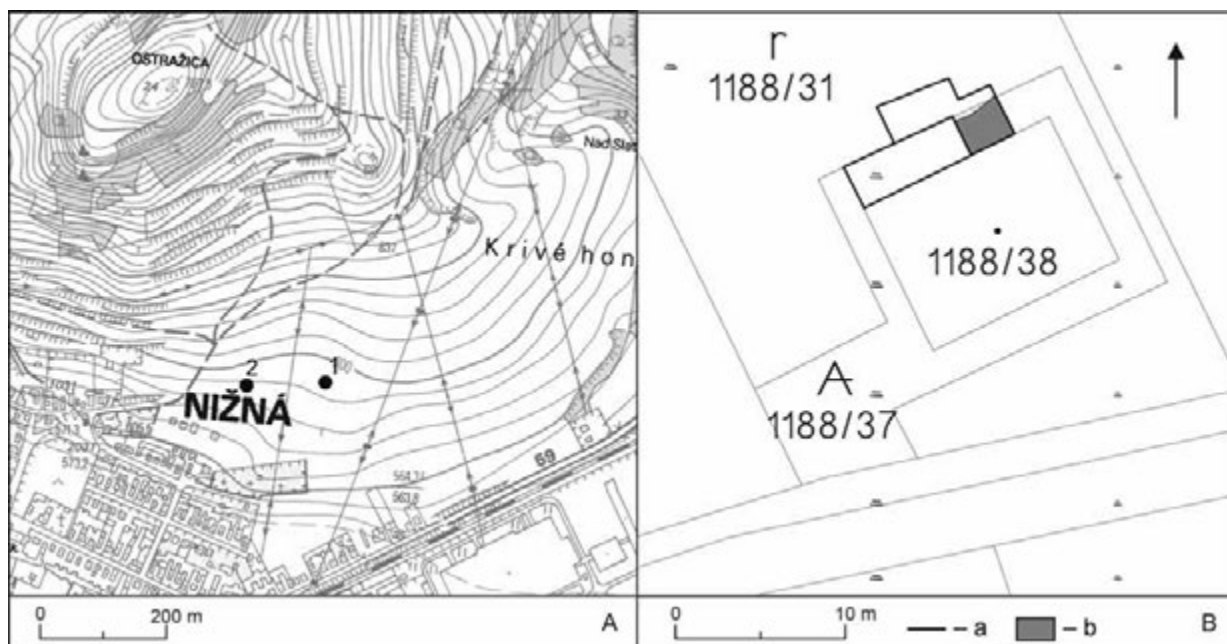


Fig. 10. Nižná, Krivé Hony. A – position of the excavated area under a family house in 2020 (1) and the pottery fragments found by surface collecting in 2018 (2); B – excavated trench in 2020 on the cadastral map. Legend: a – trench; b – archaeological feature/occupation layer. Data source: ZBGIS (www.geoportal.sk). Author B. Lofajová Danielová.

it is a larger settlement feature, or an occupation layer. Based on the archaeological material – which includes pottery (Pl. IV: 4–8, 11, 12), small fragments of daub, animal bones, a fragment of red radiolarite core (Pl. IV: 9), three sandstone whetstones, one polishing stone (Pl. IV: 10), and a fragment of grinding hand stone – this is most likely a settlement. Based on analogies to pottery, e.g. the rim of a vase-shaped reduction-fired vessel with a smooth surface (Pl. IV: 5), which has parallels among pots in the Biela skala area (Čaplovič 1968), the fragment of a larger coarse-grained brownish-black amphora (Pl. IV: 8), we date the settlement to the turn of the Hallstatt and La Tène periods at the earliest. Barrel-shaped bowls/pots (Pl. IV: 6, 7) can be dated in a wide range from the Late Hallstatt to the Middle La Tène period (see above).

Detailed survey prospecting was also carried out at other locations west of Ostražica. Seven positions were studied in detail, of which only two could be associated with the prehistoric or protohistoric settlement – Rúbanka (Fig. 11: 6), and Lazy (Fig. 14: g). Although the other researched locations are in strategic positions – Lučivný vrch, Kováčová, Klinková, Červená skala, or Kozí vršok (above the bend of the Orava River, near the confluence with Studený potok) – no relevant archaeological finds have been identified. In these places we have found finds from the Middle Ages, the Modern Age and the World Wars.

THE SETTLEMENT COMPLEX NIŽNÁ, OSTRAŽICA

In several years of detailed research (surface collection and metal detector surveys), and also in cooperation with local citizens, we have identified eight new sites in the vicinity of Ostražica (Fig. 11). Three of them – the sites Hlodočín, Krivé Hony and Závodie (Fig. 11: 2–5) – can be defined as open settlements. The predominant pottery acquired from these settlements is dated to the long interval from the Late Hallstatt to the beginning of the Middle La Tène period. We assume the continuous occupation of hillside open settlements, as similarly demonstrated by the proposed chronology of the Ostražica hilltop settlement (Pl. I). The second and third phases at Ostražica, with the material of the Púchov culture (the La Tène and Early Roman phases), are not proven at any newly discovered open hillside settlement. It is therefore likely that the settlements were contemporary with the hillfort only in the first phase of settlement and were subsequently abandoned. Open settlements of the Púchov culture could be concentrated in the lowland (cf. Pieta 1982), or settlement density may have been reduced. Lowland sites in 'Central Orava' are not known from the studied period, except for the mention of two urns from the intramural area of

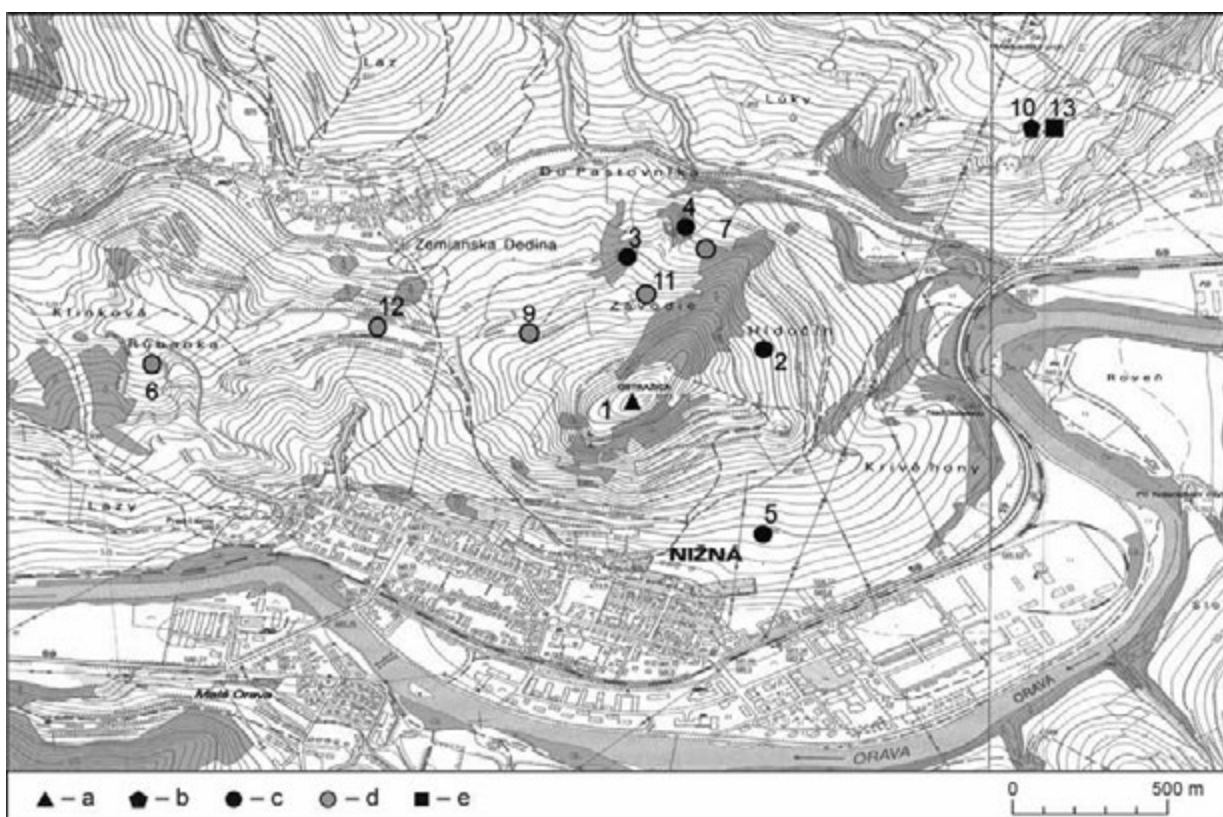


Fig. 11. Sites and interpretation of findings in the surroundings of the Ostražica hill. a – fortified settlement; b – fortified settlement; c – unfortified settlement; d – stray finds; e – hoard. 1 – Ostražica; 2 – Hlodočín; 3, 7, 9, 11 – Závodie; 4 – Skalica; 5 – Krivé Hony; 6 – Rúbanka; 10, 13 – Vápence; 12 – Tvrdošín (numbering corresponds to table 4). The source of the ALS Products: 'ÚGKK SR'. Author B. Lofajová Danielová.

Zemianska Dedina, which were found with a bronze inventory (the material has been lost).¹¹ The result of prospection in the lowland zone, on the first terraces of the Orava River – nowadays used as arable land – is problematic. Until the regulation of the river and the construction of the Orava water reservoir, the area was regularly flooded. There is a river alluvium (silt) over 2 m thick in these places. The archaeological material-bearing layer can be therefore buried very deep and is not disturbed by ploughing (a deep-buried occupation layer from the Iron Age is recorded, e.g., in Lower Orava region). The first author has recently documented a new settlement in a lowland (valley bottom) zone north of the Ostražica – which at the moment represents the northernmost Iron Age archaeological site of Orava. Therefore, we should consider the possibility of Iron Age settlement activities also in some valley-bottom positions. Based on the archaeological artefacts, we can assume hillside settlements in Krivé Hony and Hlodočín locations (Fig. 11: 2, 5) where settlement features, and buildings, are documented by daub and cultural layer. Daub is absent only from the Skalica/Závodie site, which were destroyed by quarrying. Moreover, the survey at Závodie location was limited to non-destructive prospection. A bronze ingot was found at Závodie site (probably a settlement), and may evidence bronze casting activities at this area. Apart from this site, some strategic features (fords, confluence, and communication) are in visual contact with all other sites (from Závodie settlement it was not possible to see more than the valley of the local stream named Hlodočín). At the Závodie site, there are also local springs close to or within the settlement (Fig. 9: h). The most distant from the nearest water sources is Krivé Hony settlement, however, groundwater in relatively shallow depth and water which may have emerged from the subsoil is accessible on the site.

In terms of relative elevation, only Ostražica and Hlodočín settlements are situated higher (a relative elevation of up to 300 m, the rest of settlements are elevated up to 150 m). From these two sites, all the

¹¹ P. Čaplovič assumed that it could have been a burial ground associated with an unknown settlement in the center of Zemianska Dedina village (Čaplovič 1987, 155). However, it is possible that it was a burial ground belonging to the settlement area of Ostražica, as no other burial ground was found here by the B. Lofajová Danielová meticulous research.

Table 4. Overview of selected attributes of archaeological sites in the Ostražica area from phase Ha C2–Lt C1 (numbering corresponds to Fig. 11). *ABM – archaeobotanical material; AZOO – archaeozoological material; BR – bronze; DA – daub; GS – grinding stone; CHS – chipped stone; LW – loom weigh; PS – pottery sherds; SI – sickle; WS – whetstone. Author B. Lofajová Danielová.

ID	Site	Type of site	Landscape formation	Area [ha]	Relative elevation [m]	Geological basis	Hydrological distance [m]	Visual control of strategic points			Inner building	Artifacts*
								Fort	Confluence	Communication		
1	Ostražica	fortified settlement	hilltop, hillside, artificial terrace	1.95	120	limestone	360	x	x	x	x	ABM, AZOO, BR, DA, GS, LW, PS, SI, WS
2	Hlodočín	open settlement	hillside, artificial terrace	5.50	155	sandstone, slate	300	x	x	x	x	AZOO, DA, PS, LW, WS
3, 4	Skalica, Závodie	open settlement	promontory, artificial terrace	0.92	45	limestone	0	–	–	–	?	BR, GS, PS
5	Krivé Hony	open settlement	hillside, artificial terrace	1.93	207	sandstone, slate	626	x	–	x	x	AZOO, DA, CHS, PS, WS

strategic points in the landscape are visible – several fords over the Orava River, the confluence with the Ráztoka stream, and the communication along the river (Table 4). We suggest that they may have been involved in the control of the communication, the use of which at the turn of the Hallstatt and La Tène periods, is confirmed by the bronze hoard from Krásna Hôrka site. This hoard has analogies mainly in the territory of present-day Poland, and within the Carpathian Basin as well, which is confirmed by the chemical analysis of the selected objects (Danielová 2018). In the past, the hoard was associated with the Ostražica hillfort (Čaplovič 1987, 166). However, at that time, the previously destroyed settlement in the location ‘quarry Vápence’ (an upland, potentially fortified settlement), which was located at the place of the hoard discovery, was not known (Fig. 11: 10, 13; Lofajová Danielová 2020, 31–36).

Discovered open settlements concentrated on slopes with a higher inclination (to 35°) are situated on most likely artificial terraces (Fig. 12: A), which are in close distance to each other (0.5–1 hour accessibility).

The economy of the settlement complex around Ostražica

Both the plant remains and animal bones document that Ostražica was a place where agro-pastoral communities chose to live and perform various household activities from the Late Hallstatt to the Middle La Tène period. Although the assemblage of plant remains from the Late Hallstatt to the Middle La Tène period is rather limited, its absolute dating and data patterning might be seen as indicators of variation or changes in culinary and/or cultivation traditions or use of the space within the settlement. This is captured by the density (or absence/presence) of finds and the change of the crop spectra. The variation in densities of plant macro remains in sampled deposits indicate (alongside with other archaeological evidence like presence/absence of features, types of finds, etc.) that in time the excavated areas have changed their function or the way they were used. First it is important to note, that legumes are generally underrepresented in archaeobotanical records. One of the main reasons is that they are prepared by cooking in water, unlike cereals parched or baked directly on fire and so the legumes have a smaller chance to become charred and preserved. It is exactly for this reason, that their occurrence, higher numbers, frequencies, or concentrations, should be considered and interpreted. We propose that charred seeds from all phases originated from the same activity (e.g. discard of kitchen wastes) as there is no

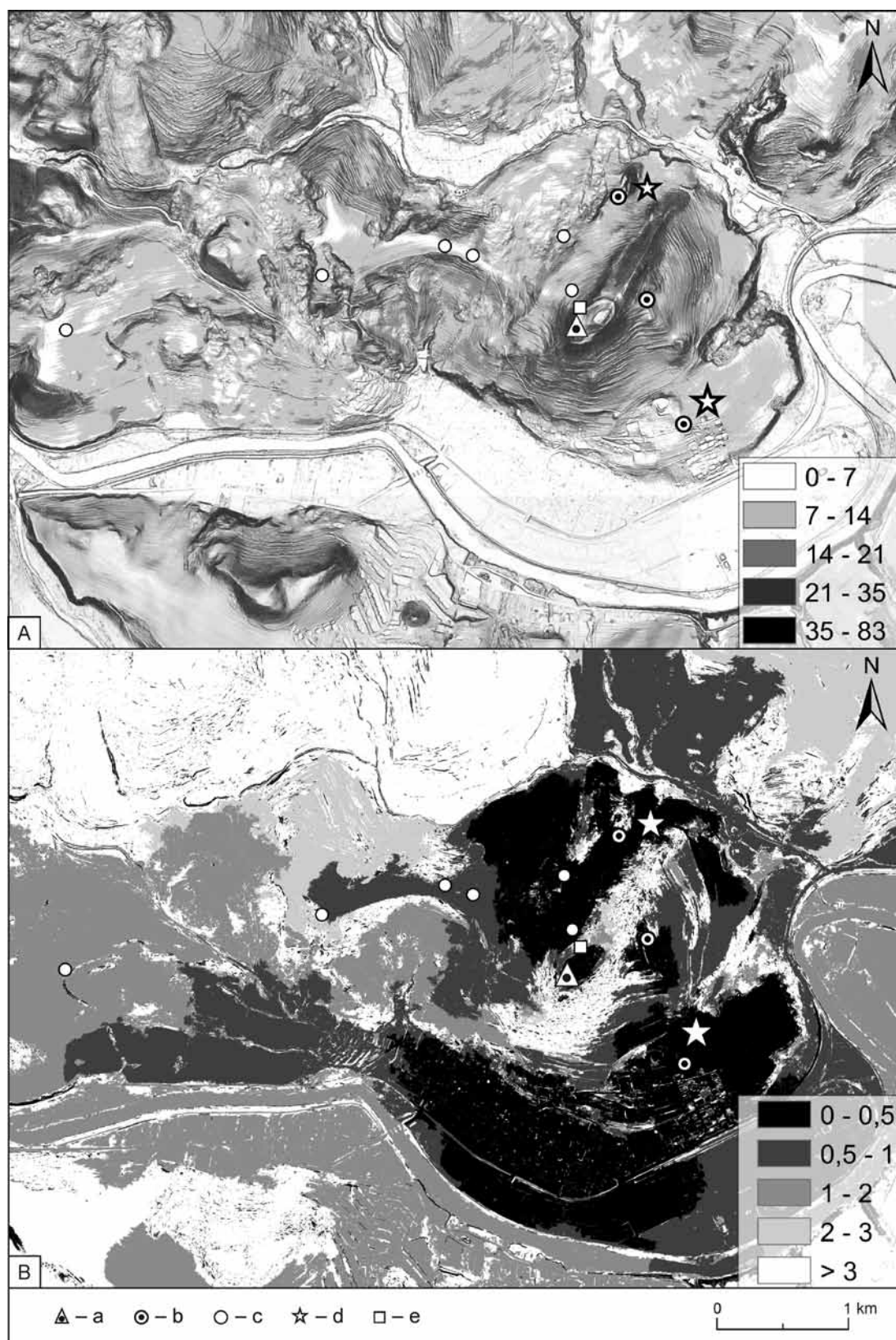


Fig. 12. Settlement complex of upland sites around Nižná, Ostražica hillfort. 1 – slope analysis (inclination in degrees); 2 – path distance analysis using Tobler's hiking function (in hours) from upland settlements. Legend: a – fortified hilltop settlement; b – open hillside settlement; c–e – stray finds: c – pottery fragments; d – pottery in local water spring; e – iron sickle. The source of the ALS Products: 'ÚGKK SR'. Author B. Lofajová Danielová.

evidence that any sample should originate from other activity (e.g. accidental burning of a store *in situ*). As such we compare them directly. Legumes, here sweet pea and Celtic bean, which are often grown as garden crops were more abundant in the Early Iron Age phase (in sample dated by AMS to Hallstatt period) but later receded and were substituted by cereals, cultivated on larger field plots. Field and garden weeds recorded at Ostražica have almost exclusively relatively heavy seeds that survive the first stages of crop processing, and can be found in unsieved or only coarsely sieved stored seed crops. This suggests that first stages of crop processing (threshing and winnowing) might took place elsewhere – either away from the site or in the area which was not excavated and sampled. Whether these hypotheses are valid have to be validated by further research. As the majority of weeds are not soil pH specific, we cannot say whether the fields or garden plots where the crops grew were situated close to the site on the calcareous soils or on acidic soils found further afield. Two tentatively determined species – *Bromus arvensis* and *Melilotus albus* – are species of basic soils, while *Vicia hirsuta* grows on slightly acidic soils. Although there are distinct artificial terraces on the hilltop and slopes of Ostražica hill, most of them are the result of farming activities of the last two centuries. The so-called ‘terrace farming’ was typical for Orava since the Late Middle Ages, and considerably altered the landscape. It is therefore difficult to recognize remnants of prehistoric field systems in the landscape. Equally problematic are the detector surveys of the long-used topsoil, which covers most of Ostražica, except some presently forested areas. An iron sickle was found on a narrow artificial terrace on the northern slope below the fortification (Fig. 12: e; Pl. IV: 1), which probably documents agricultural activities in this area. A flat area to the west of Ostražica with the lowest slope inclination up to 7° (Fig. 11: 9, 12; 12: A) where prehistoric sherds were ploughed out in the past may hypothetically have been used as a field in the Iron Age. This is the only one flat area in the upland surrounding the Ostražica hill (Fig. 12: A), close to settlements accessible to 0.5 max. 1 hour of walking (Fig. 12: B). This location has been laid a fallow already for many years.

Archaeozoology document that sheep/goats and cattle were kept and consumed at the site and probably grazed around the Ostražica hill (see above). On both the northern and western slopes of Ostražica, there are plenty of suitable areas for pastures (and less suitable for fields). In addition, local sources of water can be directly found in the meadows, and may have been used for watering the herds, as they are still used for these purposes today. The herding activities in the Iron Age could be documented by isolated pottery finds without context (no evidence of occupation layer), for example, at the local water source at the Závodie and Krivé Hony sites (Fig. 12: d), or the more distant Rúbanka or Lazy locations (Fig. 11: 6; 12: c). According to the site catchment theory the maximum measured time estimated for the effort used to attain grass for flocks varies from ca. 1 hour to 2 hours (Lönnqvist *et al.* 2009). All mentioned stray finds are within 2 hours radius, therefore could be taken as evidence of pastoral or other activities (hunting area, visual control of strategic points and others). The wild game (wild boar, roe deer) hunted in the surrounding mixed forests also had a role in the diet. The forest near Ostražica was also important source of timber wood used for constructions of fortifications, terraces, and dwellings, and for fuel. This is documented by several fragments of daub with imprints of logs and charred timbers (not analysed) found *in situ* at the hilltop settlement. The areas of the microregion that were repeatedly assessed by prospection as being negative for habitation activities – for example at Lučivný vrch, Klinková, or other locations north of Ostražica – may also have been forested and exploited as a source of raw materials and occasional gathered/hunted wild foods. The imprints of smaller diameter poles imprinted in the daub indicate possible management of some selected trees by coppicing, pollarding or shredding. As fragments of wattle-and-daub construction originate exclusively from Hlodočín and Krivé Hony sites (Fig. 11: 2, 5), situated near the river, we speculate that willows that grow along the water streams were managed by coppicing. That the Orava River itself was also used as a source of sustenance is documented by presence of fish bones and European beaver. The river valley is also located at a close distance to the settlements within a maximum of 1 hour (Fig. 12: B). As mentioned above, research in these areas is difficult due to long-term river deposits and floods, archaeological sites can be buried very deep.

Another important raw material that was extracted from the surroundings of the Ostražica hillfort was sandstone, which was used for the reinforcement of terraces (it is documented in the entire intra muros area), and also for the construction of the frontal wall of the rampart. It should be mentioned that the stone wall was made of sandstone blocks that were more or less constant in size and shape. The blocks are of quadratic shape, mostly 20 to 30 cm long, 6 to 10 cm wide, and 5 to 6 cm thick. As the bedrock of Ostražica hill is limestone (Table 4), all the sandstone has been brought to the site. The nearest possible sources are located on the south-eastern slopes of Ostražica in the area of the settlements of Hlodočín and Krivé Hony (Table 4). The inhabitants of the settlements may have been directly involved

in the extraction and processing of the sandstones. Alternatively, sandstone could have been quarried at the area west of Ostražica, i.e. at Rúbanka or Lučivný vrch hills. In all these areas there are terrain relics visible also on LIDAR images that could be associated with stone breaking or quarrying. This hypothesis has not yet been confirmed by petrographic analysis.

Apart from sporadic bronze fragments (e.g. a bronze bead), there are no finds on the Ostražica hillfort that could be attributed to the social 'elite'. The rampart fortification that distinguishes the hilltop settlement from the unfortified hillside settlements, was only constructed in the developed PPS period. Provided the fortified and unfortified sites are contemporaneous until the Early La Tène period, in phase Ha C2/Ha D1–Lt B1/Lt B2 (c. 250 years) the hilltop was unfortified, possibly with only a surrounding palisade. Thus, the hilltop settlement was not significantly different from the hillside settlements, apart from the use of the dominant position with good visibility, and the possible palisade. However, the first phase of settlements is a long period (Late Hallstatt to the beginning of the Middle La Tène period), which we are unable to divide more precisely through the current state of knowledge (especially in the hillside settlements where radiocarbon dating is not yet available). At the moment we presume food self-sufficiency of all of the presented settlements – including the Ostražica hilltop; based on the presented archaeobotanical, archaeozoological, and archaeological finds (agricultural tools and artificial terraces). The surrounding upland landscape provided suitable conditions for cattle or sheep/goat breeding, and perhaps also agriculture (the sufficiency of space, water sources, and flat plots for arable lands). However, we cannot exclude settlement or agro-pastoral activities in the lowlands as well.

A possible oscillation of people between open settlements (an alternation of settlement locations) during shorter periods cannot be excluded due to the long-studied interval (ca. 350 years). Such a practice is assumed in the Hallstatt period, e.g. in the area of Thuringia (approx. 100–150 annual intervals of alternation of upland and lowland locations). Upland sites are also considered to be food self-sufficient there. Also, an agro-pastoral way of life prevailed at this location, with a dominance of cattle breeding, similar to the results from Ostražica. According to the authors, livestock herding was easier in the mountainous landscape – it offered more possibilities for moving and protecting the herd (Köhler 1995, 163, 164).

THE SETTLEMENT COMPLEX AROUND PODBIEL, BIELA SKALA

At a distance of only 3 km to the south-west, there is a similar settlement complex from the Iron Age in the area of Biela skala in Podbiel. At the transition of the Hallstatt and La Tène period (Ha D–Lt A/Lt B1), four sites coexisted in this area – three settlements, and one burial ground (Fig. 13). However, unlike Ostražica, continuity up to Lt C1 has not yet been proven. Based on the finds from the top of Biela skala (Fig. 13: 3), there is a possibility that, except for the burial ground, the settlements could have continued until the Middle La Tène period. Subsequently, only the La Tène phase of the Púchov culture is well documented (Lofajová Danielová 2022, 22). The fifth site – a settlement in the location 'Platô nad Pohrebiskom' (Fig. 13: 2) was dated to the 'Púchov Culture' (Točík 1980, 213) – from which the material is absent, and therefore earlier dating is also possible. Recent excavation in the Biela skala area was carried out but only in the settlements of Biel and Za Pivovarom (Fig. 13: 1, 2; Lofajová Danielová 2022). Both sites were heavily disturbed by ploughing during the last century. The stratigraphic situations were in most cases unsuitable for sampling.

Archaeobotany

The aim of the archaeobotanical sampling at Podbiel, Biel, and Podbiel, Za Pivovarom sites, was the same as above – to gain material suitable for radiocarbon dating and to obtain data on cultivated and gathered plant foods. Only four contexts in Biel, dated by accompanying materials widely and tentatively as PPS? (Lt B1–Lt C1), and three in Za Pivovarom, dated generally to the Iron Age (probably Ha C2–Lt C1), seemed to be undisturbed and were sampled for archaeobotany (Table 5).

At Biel one sample (#1) originates from a cultural layer (SJ 107) situated directly over the bedrock, two samples (#2, 3) represent a fill of a ditch (SJ 105) and the last sample (#4) which contained only wood charcoal and no seeds come from a 'burned' culture layer (SJ 106). The samples yielded only 10 fragments of seeds and exclusively of crop plants. Even if the recovered taxa – oat (*Avena* sp.) and broomcorn millet (*Panicum miliaceum*) – occur in the region in the Iron Age, their combination (together with absence of finds of glume wheats) is more characteristic for younger (medieval and postmedieval) period. The remaining finds could

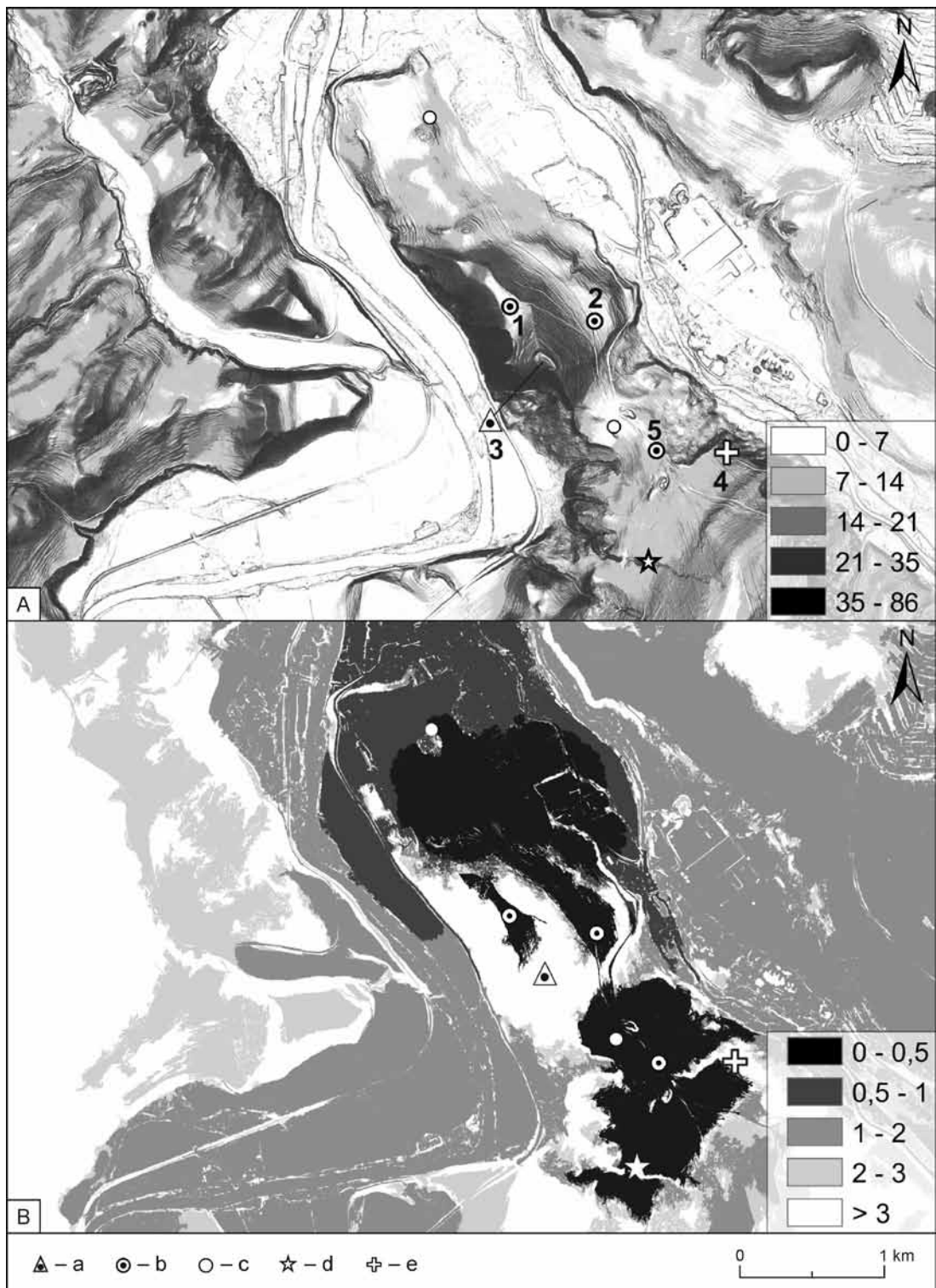


Fig. 13. Settlement complex of upland sites around Podbiel, Biela skala hillfort. A – slope analysis (inclination in degrees; 1 – Biel; 2 – Za Pivovarom; 3 – top of Biel/Biela skala; 4 – Za Bielym; 5 – plató above burial ground); B – path distance analysis using Tobler's hiking function (in hours) from settlements. Legend: a – fortified hilltop settlement; b – open upland settlement; c, d – stray finds (c – pottery fragments; d – pottery in local water spring); e – burial ground. The source of the ALS Products: 'ÚGKK SR'. Author B. Lofajová Danielová.

Table 5. Podbiel, Biel and Za Pivovarom. Plant macroremains grouped according to dating and/or context. Numbers represent NIPS values. Author M. Hajnalová.

Podbiel site area	Biel			Za Pivovarom
Dating	Lt B1–Lt C1?			Ha C2–Lt C1?
Sample No.	1	2, 3	4	1, 2, 3
Volume (l)	6	11	2	3.4
Crops				
<i>Panicum milliaceum</i>	1	2	–	–
<i>Avena</i> sp.	3	–	–	–
<i>Triticum/Hordeum</i>	1	–	–	–
Leg. sat.	–	2	–	–
Wood charcoal fragments	239	161	48	308
Uncharred seeds	0	5	0	2
Density of charred seeds	0.8	0.5	0	0

only be identified to broad categories of cereal grains (*Cerealia*) and cultivated legumes (*Leg. sat.*). All three samples from Za Pivovarom represent fill of two postholes – No. 1 (#1) and No. 3 (#2, 3). They contained only small fragments of wood charcoal and were void of finds of seeds. Before any interpretation of recovered plant remains is drawn, it is necessary to ascertain their Iron Age origin by their direct radiocarbon dating.

The economy of the settlement complex at Biela skala

The low representation of seeds of crops and field weeds in Biel and their absence in Za Pivovarom is most probably a consequence of the disturbance of the original cultural layer by ploughing and its subsequent erosion, and of the small number of samples (taken only in places where recent destruction was not expected).

Table 6. Overview of selected attributes of archaeological sites in the Biela skala area from Ha C2–Lt B (numbering corresponds to Fig. 13). *ABM – archaeobotanical material; AZOO – archaeozoological material; BR – bronze; DA – daub; GS – grinding stone; PS – pottery sherds; SI – sickle; WS – whetstone.

ID	Site	Type of site	Landscape formation	Area [ha]	Relative elevation [m]	Geological basis	Hydrological distance [m]	Visual control of strategic points			Inner building	Artifacts*
								Fort	Confluence	Communication		
1	Biel	fortified settlement?	promontory	1.65	150	limestone	527	x	x	x	x	ABM, AZOO, BR, DA, PS, WS
2	Za Pivovarom	open settlement	hillside, artificial terrace	1.60	70	limestone	320	–	–	x	x	DA?, PS
3	Vrchol Bielej skaly	fortified settlement	hilltop, artificial terrace	0.11	207	limestone	400	x	x	x	x	ABM, DA, GS, PS
4	Za Bielym	burial ground	hillside	0.20	44	rubble	600	–	–	x	x	BR, PS
5	Platô nad pohrebiskom	open settlement?	sedlo	?	67	rubble	164	x	–	x	?	PS

However, numerous grains of barley (*Hordeum vulgare*), and emmer (*Triticum diococum*), together with seeds of sweet pea and Celtic bean were recovered in the past from a burnt layer of crops (Hajnalová E. 1993, 117). This find interpreted as 'the burned storage of crops' that 'laid originally on straw bedding' was found on a small summit plateau (11 m²) fortified with a sandstone stone wall (Čaplovič 1987, 148, 149; Hajnalová E. 1993, 117) resembling the fortification wall at Ostražica. New AMS data on charred seeds of pulses (*Pisum sativum*) from layer of crops excavated in 1965 (Čaplovič 1987, 149) date this layer to 2395 ± 24 (DeA-46557), with a high probability to 541–400 cal BC (98%), to Late Hallstatt to Early La Tène period. A graphite situla-shaped vessel with combing from the period of the PC (Čaplovič 1968, 177, 178) was found there, alongside artefacts that could date to the PPS (Lofajová Danielová 2022, 22). We assume that 'normal' or habitation/residential activities could not take place within such a small, fortified area, but that this enclosed place was an integral part of the settlement situated on the nearby promontory of the Biel hill (Fig. 13: 1; 14). The layouts of postholes and numerous fragments of daub with impressions

of both wattle and timber constructions found at Biel promontory settlement indicate the presence of several buildings of different (or combined) construction (Čaplovič 1987, 147; Lofajová Danielová 2022). The residential function is also evident by artefacts – polishing stones, grinding stones, whetstones, etc. In addition, the inner layout of the Biel settlement is confirmed by magnetometric prospection (Felcanová/Felcan/Lieskovský 2021, 113–117). We presume that similar to Ostražica, the Biel settlement was also surrounded by a palisade, yet to be archaeologically verified.

In contrast to Nižná, in Podbiel upland settlements are situated only on flatter areas with low inclination (7°–14°; Fig. 13: 2). Except for the hilltop settlement of Biela skala, all the other upland settlements are easily accessible. They are situated in a hilly area with a relative elevation of maximum 150 m above the surrounding terrain. The bedrock of the settlements consists mainly of limestone (Table 6). All the strategic points were only visible from the settlements of Biel and the top plateau of Biela skala – the fords, the confluence of the Orava River with the stream Studený potok, and the Orava River itself – the main regional waterway. Only part of the Studený potok stream was visible from the settlement Za Pivovarom. The calcareous soils that developed on carbonate geological substrates at the settlements of Biel and Za Pivovarom were suitable for farming, as the rendzina is more permeable than the heavy clay soils situated on the sandstones, usually prevailing in the area. As in the very recent history, they yielded cereal and pulse crops already in Iron Age as is recorded through archaeobotany. In the Biela skala area, the plain upland or lowland positions to the north of the Biel settlement could serve as pastures or fields (like today). This area is the flattest and the quickest accessible (0.5 to 1 hour) from the settlements Biel and Za Pivovarom (Fig. 13: 2).

THE MICROREGION OF 'CENTRAL ORAVA'

A detailed multi-year surface survey in 'Central Orava' has also enabled the identification of sites where no finds have been found, and where permanent settlement is not assumed (Fig. 14: c). Due to this, we can determine the approximate area of the settlement complexes of Nižná, Ostražica, and Podbiel, Biela skala, where everyday settlement and economic activities took place. On the other hand, we can also presume sporadic human activities in these places – for example, the hunting or collection of raw materials. We have not found sites in any of the studied complexes in 'Central Orava' that could be used as places of refuge (characteristic for Ha D–Lt A/Lt B1 period in Northern Slovakia; see Pieta/Barta/Benediková 2021), although prospection has been carried out at almost all the high-elevated positions (most extensively in the area of Nižná). The situation can be interpreted mainly in two ways: there was no need to build places of refuge in the 'Central Orava' microregion, as this area was beyond real physical danger and a potential enemy. This could be confirmed by the fact that no weapons, nor direct evidence of a 'catastrophic horizon' from this period come from Nižná or Podbiel. The situation is different in Lower Orava, where at the fortified hilltop settlement of Tupá skala in Vyšný Kubín (Čaplovič 1964; 1987, 197), or in Istebné, Hrádok, arrowheads and burnt layers (with human remains) have also been found in the strata of destruction (Čaplovič 1957; 1987, 136). The other, less likely interpretation is that the refuge places are situated deeper in mountains that have not been researched yet (e.g. Javorový vrch in Tvrdošín).

The natural border that separates the presented settlement complexes is the Orava River, as each complex is located on the opposite bank (Fig. 14). A similar situation is registered in Lower Orava, where two settlement complexes in Sedliacka Dubová (Ohrádza and Háj) are also separated by the Orava River (Lofajová Danielová/Furman 2022). There are no finds from the area to the north-east of Biela skala, where the first author prospected almost all of the upland positions (Fig. 14: c, f). This area is situated more than 2–3 hours of walking from both settlement complexes (Fig. 12; 13), hypothetically this could have been a kind of respected boundary, which spatially and visually separated individual communities of settlement complexes around Ostražica, and Biela skala. The estimated area of the settlement complex, including the residential area(s) (defined by archaeological excavation and prospection as an extent of settlement; Fig. 14: a) and nearby hypothetic agro-pastoral hinterland (defined on the basis of the stray finds without context and pottery found in local water springs in the locations accessible by walking in max. 1 hour; Fig. 14: d), is about 200 ha. When other activity areas (sensu Neustupný 1986) like hunting grounds or more distance pastures and sources accessible within 1 to 2 hours of walking are included – the extent of the 'settlement area' would increase, and cover about 300 ha including the lowland positions (Fig. 14: e, h). At the turn of the Hallstatt and La Tène periods,

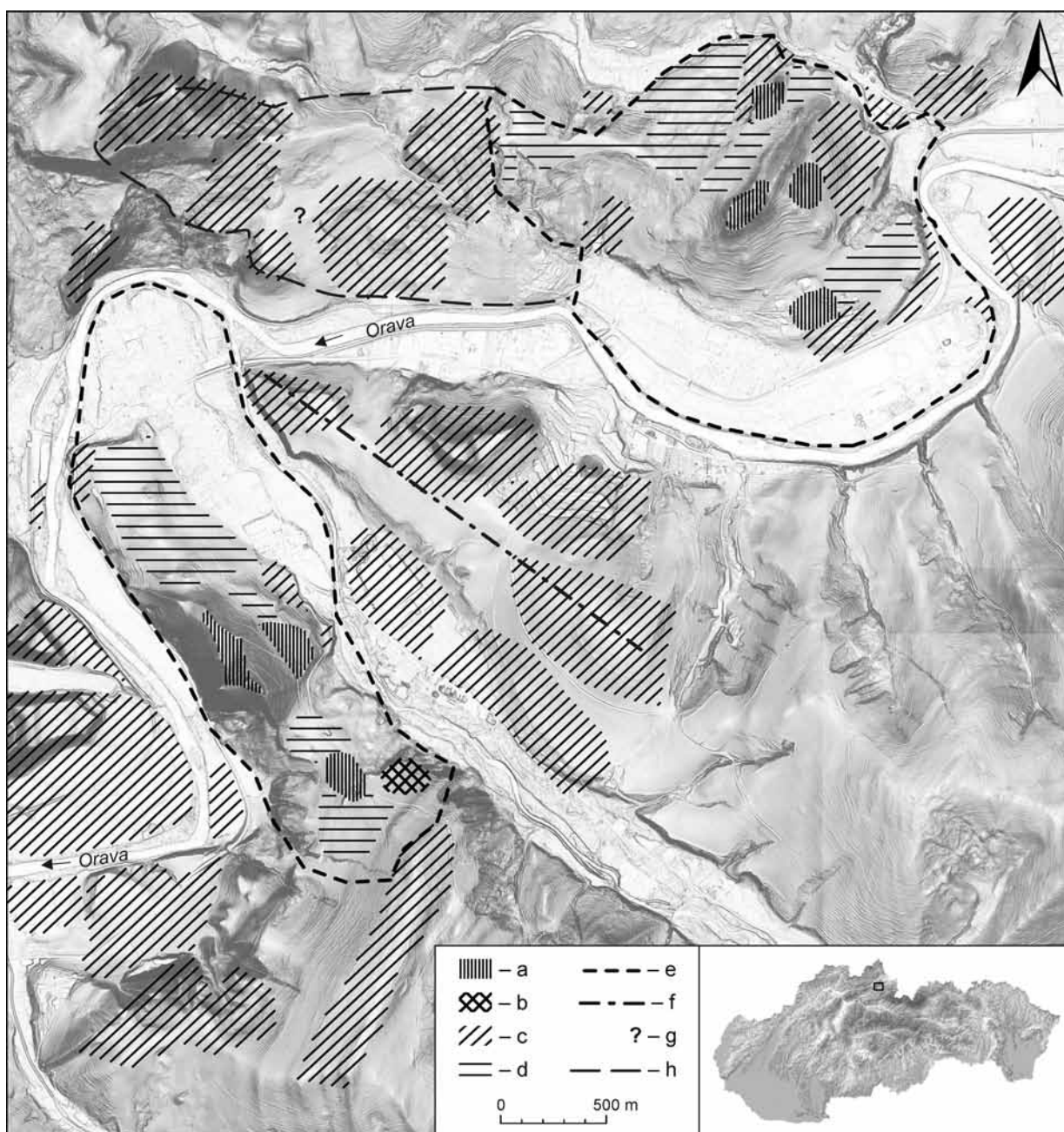


Fig. 14. Microregion 'Central Orava' and the interpretation of areas of activities in settlement complexes in Nižná (northern) and Podbiel (southern). a – residential area (extent of settlements according to recent archaeological excavation and prospection); b – burial ground area; c – researched area with no archaeological finds (unused/source of raw material/hunting area/border); d – presumed hypothetical agro-pastoral hinterland (stray finds); e – presumed 'settlement area' of everyday activities (accessible in max. 1 hour by walking, archaeological sites and finds); f – potential upland border between settlement complexes; g – site Nižná, Lazy (pottery finds); h – presumed settlement area with larger agro-pastoral hinterland (accessible in max. 2 hours by walking). The source of the ALS Products: 'ÚGKK SR'. Author B. Lofajová Danielová.

there were most likely two coexisting settlement complexes of several upland settlements centred around a fortified hilltop settlement on a dominant 'rock' (Ostražica, Biela skala). Individual settlement complexes probably functioned independently and continuously in the Ha C2–Lt C1 phase. Based on the almost identical settlement strategy, and archaeological material, these complexes are probably related cultural units that inhabited the 'Central Orava' microregion. In the Late Hallstatt period, similar settlement complexes were also found in Lower Orava (e.g. the abovementioned Sedliacká Dubová, Ohrádza, or Ostrá and Tupá skala in Vyšný Kubín).

We suppose that the presented settlement complexes functioned mainly at the level of local communities. The fortified hilltop settlements at Ostražica and Biela skala could have served to demonstrate their identity, as is already assumed in the Late Bronze Age (Blair Gibson/Geselowitz 1988, 26; Furmánek 2015, 266, 267), because they were clearly visible – situated on limestone cliffs, which are few in the country, but dominant for a person who moves in the lowlands included travellers and traders. Using P. Ramsel's terminology of social organisation for the Early to Middle La Tène period, we could describe the settlement complexes in the 'Central Orava' microregion as 'local groups', which he identifies as people in daily contact, and in a reduced social context. They are organised in smaller units such as farmsteads or their groups, and bury their dead in local burial grounds (Ramsel 2020, 18, 19) as in Podbiel case (Fig. 14: b). These units could be grouped into regional groups, and larger collectives ('tribes'), which is a generally accepted phenomenon in the Hallstatt and the Early La Tène periods (Fernández-Götz/Krausse 2013, 484; Johnson/Earle 2000; Moore 2011). At the turn of the Hallstatt and La Tène periods, the territory of Northwestern Slovakia shows elements of unified material culture, and especially of regional exchange/contact (specific pottery and bronze objects of the OLC are widespread in Liptov, Orava, Spiš, and upper Považie regions). There are also already elements of interregional relations at the end of the Hallstatt period (Benediková 2007, 82; 2017), and in the Early La Tène period (Pieta/Barta/Benediková 2021, fig. 6). Based on the culturally mixed bronze hoard from Krásna Hôrka near Ostražica (the origin of bronze artefacts in the territory of Greater Poland, and also in the Carpathian Basin; Danielová 2018), 'Central Orava' was surely part of the Transcarpathian communication networks. All the hilltop settlements in Orava region had significant strategic points in visual control (fords, confluences, and main waterway communication – Orava River) and they were in mutual visual contact. To what extent the sites themselves could participate in the exchange is presently unclear. M. Novák, who researched upland sites in the Hallstatt period in Moravia and Silesia, also identifies similar 'complexes' in Late Hallstatt period as in Orava region. Based on their distribution, he assumes that they were not the centres/residences of the elites, they are mainly found above roads which are interpreted as an amber or salt roads. He interprets high-altitude sites primarily as places of control and support points of communication routes (also as supra-community areas) providing protection to traders, and storing goods. He does not exclude the function of a regional assembly place, or a seasonal cult area (Novák 2023, 317–319). The studied 'Central Orava' region is also located on the side branch of the presumed amber road (Novák 2023, fig. 117). We can agree that 'Central Orava' upland settlements are probably related to a trade route – perhaps not the amber road (lack of amber artefacts), but another transcarpathian communication. Whether they served for cult or assembly purposes, we cannot say. First of all, we interpret the fortified hilltop settlements in the studied period from the Late Hallstatt to the beginning of the Middle La Tène periods as ordinary and regular settlements within settlement units ('complexes'). As mentioned above, the presented upland sites used an agro-pastoral way of life, with cattle, and sheep/goat breeding being important. The upland settlement was therefore relatively wise and not so uncomfortable choice to agro-pastoral economic strategy of societies.

The presence of a 'chieftain/elite' in 'Central Orava' has not yet been archaeologically documented. However, the presence of the elite at upland sites should not be excluded. In the area of Northwestern Slovakia, parts of horse harnesses (mainly strap dividers), which are considered to be a manifestation of the 'equestrian elite' of the Hallstatt period (Benediková 2017, 347–350; Kmeťová/Stegmann-Rajtár 2015; Metzner-Nebelsick 2002, 489–492) are found in addition to graves, especially at hilltop sites (Lofajová Danielová 2024). The graves at the burial ground in Podbiel used relatively uniform burial equipment (Čaplovič 1968). The stratification of society in Lower Orava region is confirmed by some graves from Dolný Kubín II in the Ha D stage (Benediková 2007, 348). At the nearby hilltop site Tupá skala in Vyšný Kubín, in addition to the rampart fortification, a well-organised inner space (which we did not detect in the 'Central Orava') was uncovered by archaeological excavation. These are lines of buildings with stone foundations used as dwellings, or craft workshops. Void areas laid between the lines of the buildings were interpreted as pathways or streets (Čaplovič 1987, fig. 57). A recent geophysical survey of the fortified area confirmed the assumption that the settlement had a planned, and well-organised pattern and filled almost the entire area (Felcanová/Felcan/Lieskovský 2021, 123–131). In the Late Hallstatt and Early La Tène periods, large fortified settlements with pre-planned organised spaces that include complicated building structures are well known also in Western Europe (Fernández-Götz/Krausse 2013). In contrast to Tupá skala, there are numerous imports from the more distant regions of Europe. The archaeological material from Tupá skala essentially corresponds to the regionally specific artefacts (pottery and bronze objects) of the territory of present-day Northwestern Slovakia.

CONCLUSION

The research at the sites of Ostražica in Nižná and Biela skala in Podbiel revealed basic information about the chronology and function of these upland sites. Nižná, Ostražica referred to in the literature as a 'Hallstatt hillfort' (Čaplovič 1987) did not have rampart fortification during the Hallstatt period – if protected at all, than possibly by a simple palisade. At the Ostražica hilltop settlement, we assume continuity at least from Ha C2 or Ha D1 to Lt C1 – based on radiocarbon data and the relative chronology of the pottery. At Biela skala, we assume similar situation. Settlement during the following La Tène phase of the PC was confirmed at both hilltop settlements (continuity is also very likely), while new surface surveys at Ostražica also confirmed its previously unknown Roman phase of the PC. However, apart from the fortification, the open hillside settlements around the Ostražica hill were occupied only in the first phase and then perhaps abandoned (we can assume lowland settlements). Eight new sites were found in the Ostražica area, of which three (or four) are settlements (Hlodočín, Krivé Hony, and Skalica/Závodie) contemporary with a hilltop/hillfort in the Late Hallstatt to the beginning of the Middle La Tène periods.

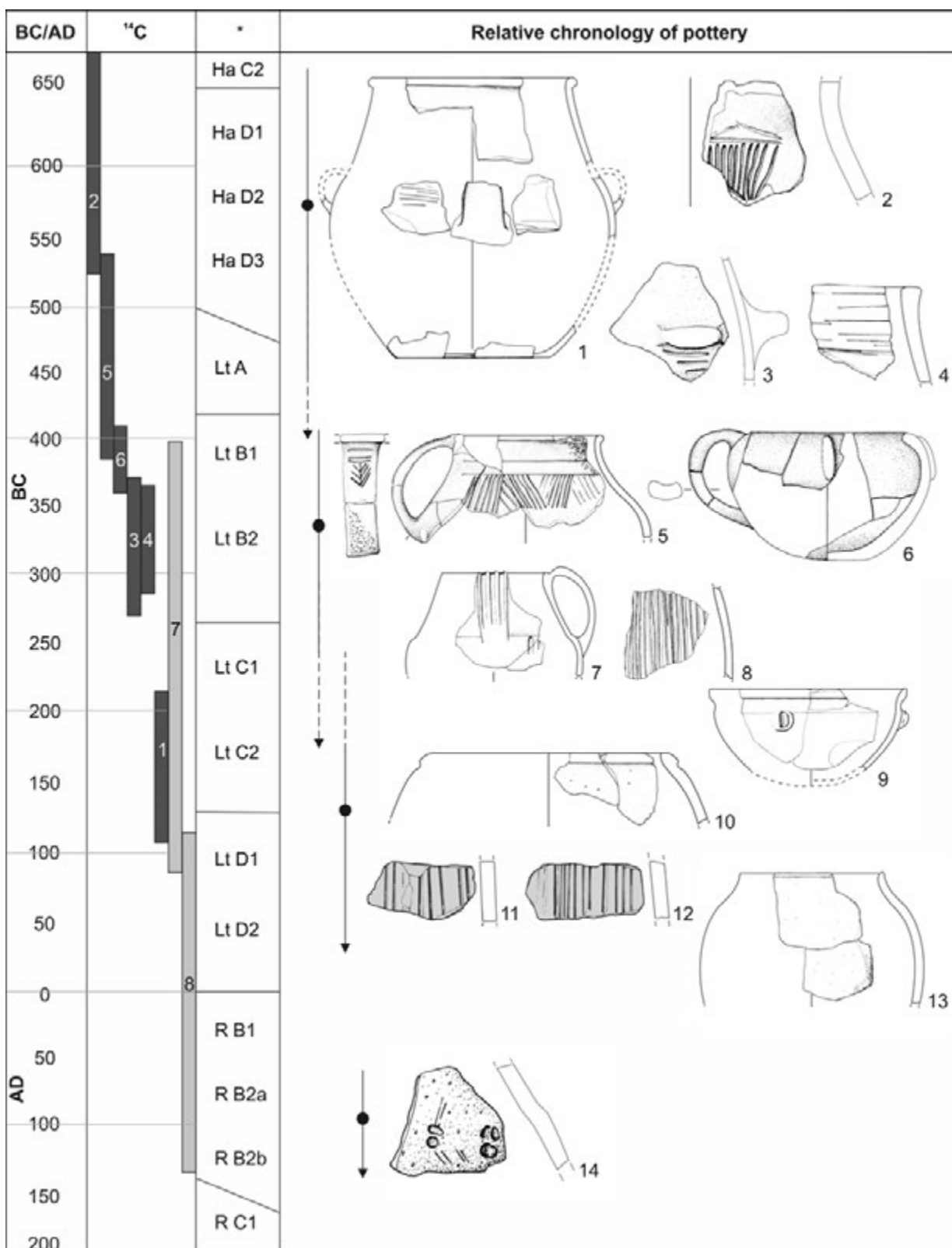
The archaeobotanical and archaeozoological analysis carried out by the co-authors document agro-pastoral subsistence as the leading economy not only for the open settlements, but also for the Ostražica hilltop site (and for its both unfortified and fortified phases). The positions of fields in the flat parts of the surrounding reliefs is (at present) only hypothesised. However, the proposed extent and position of grazing grounds in the surroundings of both hilltop settlements is based on the distribution of the pottery sherds found without context and on the presence of (still active) water springs in the distance accessible within 1 hour walking distance from the settlement (Fig. 14: d). We assume that the upland settlements (including the fortified ones) could be self-sufficient in procurement of food supplies and did not have to rely on supplies from settlements in the lowlands. However, we cannot rule out the existence of settlements lying in lower locations and agro-pastoral hinterland in lowland at nearby and easily accessible flat lands as evidenced by newly discovered lowland settlement in Tvrdošín, Krásna Hôrka. Moreover, the evidences for the flat land settlements and agro-pastoral hinterland may be buried under the thick layers of river alluvium at the first river terrace, as the area was regularly flooded until the regulation of the Orava River and the construction of the Orava water reservoir.

Based on the culturally mixed content of the bronze hoard from Krásna Hôrka (the origin of bronze objects in the territory of Greater Poland, and also in the Carpathian Basin), 'Central Orava' region was surely part of the Transcarpathian communication networks. All the hilltop settlements had significant strategic points in visual contact (fords, confluences, and communications). To what extent the sites themselves could participate in the exchange is presently unclear. The settlements located on the slopes had only limited view to strategic points and could monitor only a small part of the valleys of the local streams. Apparently, these were mostly habitation areas of the agro-pastoral communities that occasionally performed other activities (like presumed bronze casting at the Závodie site). Some might have been involved in the processing of local sandstone (e.g. Hlodočín and Krivé Hony settlements), which was used for the construction of fortifications, and for the strengthening of the artificial terraces at the Ostražica hillfort.

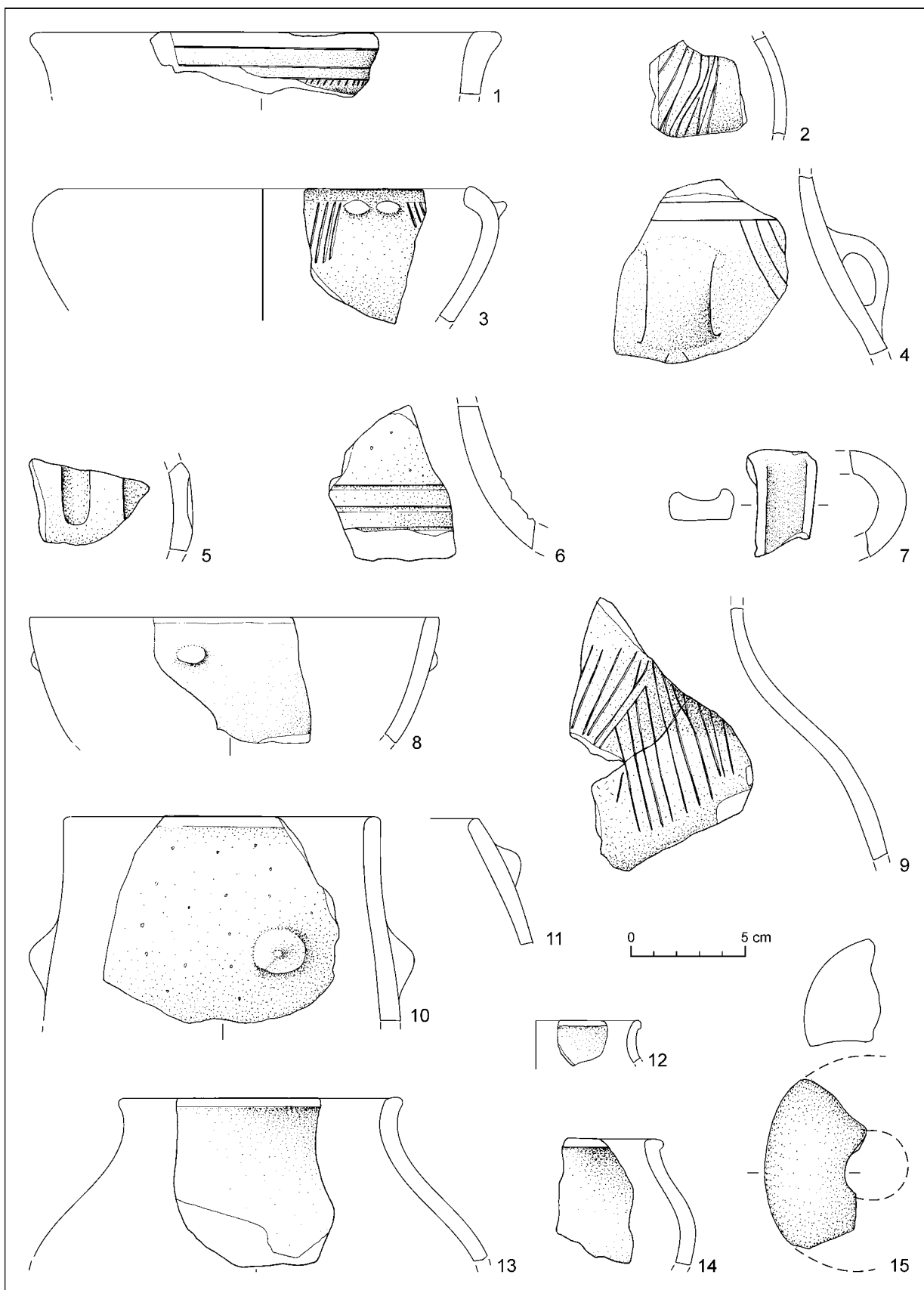
Based on the present data, in the 'Central Orava' microregion, from the Late Hallstatt to the Middle La Tène periods, there were two separate settlement complexes, which probably functioned at the level of local communities (Fig. 14: a). These were culturally related units, territorially separated by the river, and perhaps by the low mountain ridge west of Prasatín, where no archaeological finds were detected during several-years repeated field prospection (Fig. 14: f). The assumed area of the residential and mixed agro-pastoral activities of both settlement complexes covered an area of approx. 200 ha (area accessible in 1 hour walking distance). If areas of other activities (like hunting grounds or mineral resources) are included, the extent of the hinterland (or settlement area) will reach up to 300 ha and would cover nearby areas with only sporadic or no archaeological finds accessible within 1 to 2 hours by walking (e.g. Nižná, Lazy, in the case of Ostražica; Fig. 14: g, h). The results of presented 'Central Orava' microregional study help to understand the lives of human societies inhabiting the mountain and/or marginal zones of the Iron Age Central Europe.

Acknowledgments

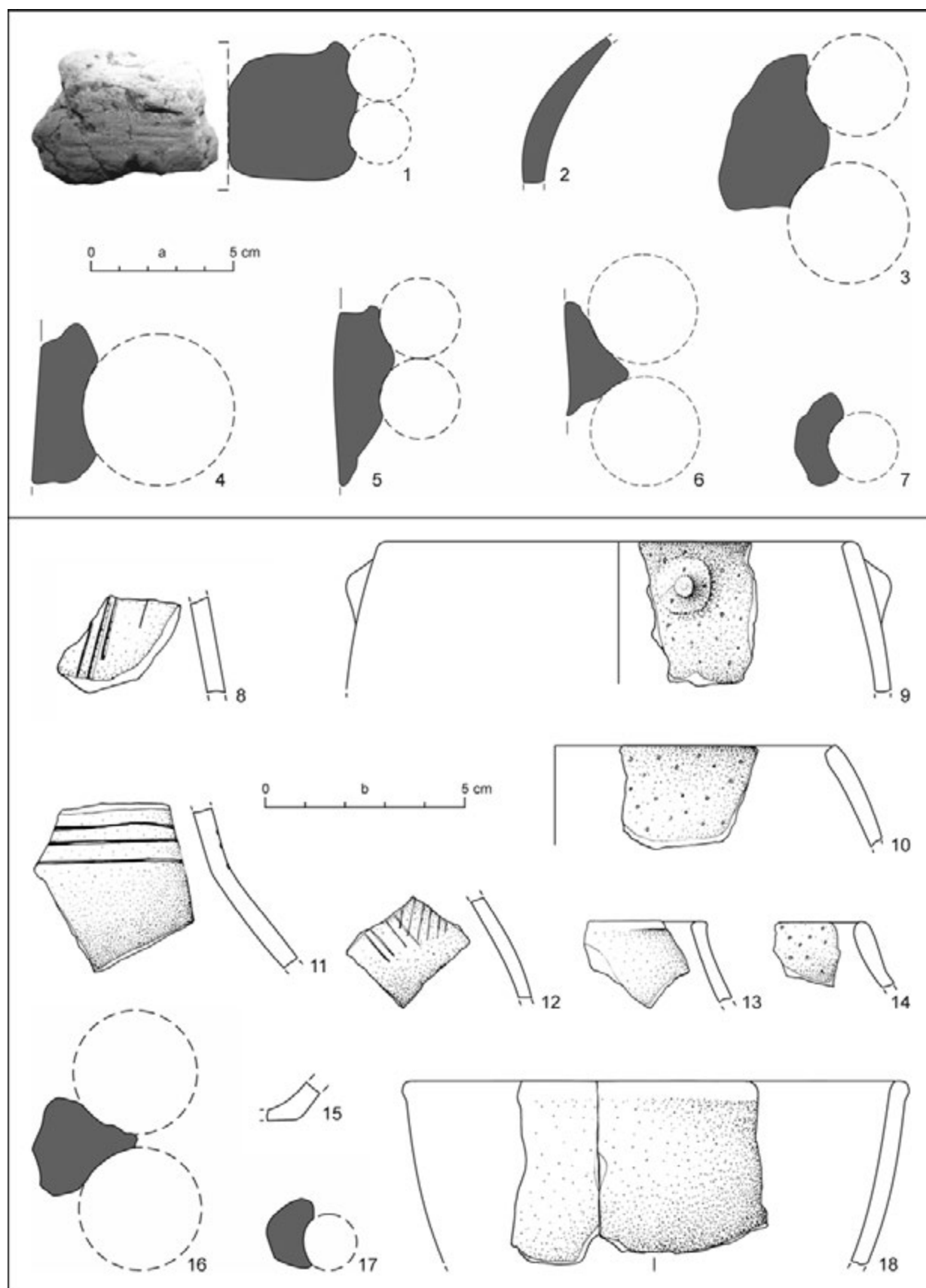
We are grateful to all those who participated in the fieldwork and prospection around Ostražica surroundings in their free time (mainly Martin Žuffa and Mojmír Krajčí). Special thanks goes to Paul Heighway for editing and helping with the translation of the text.



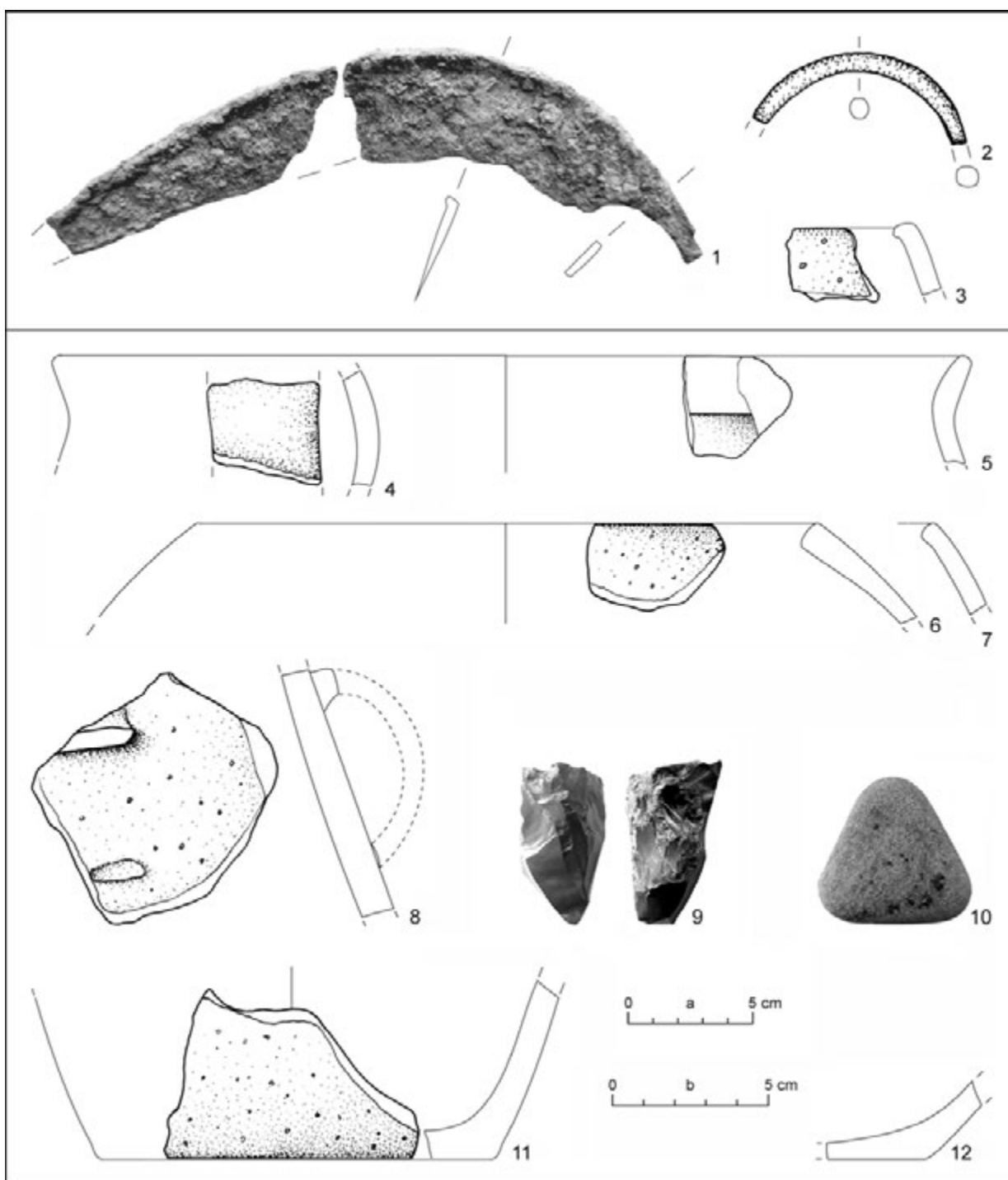
Pl. I. Nižná, Ostražica. Proposed chronology of the hilltop settlement. Overview of absolute data (darker lines – crops/animal bones; lighter lines – wood; numbering of samples corresponds to Table 1) and relative chronology of the selected pottery fragments (* – relative chronology by Brandt 2001; Salač 2008; Trachsel 2004). Different scale. Author B. Lofajová Danielová.



Pl. II. Nižná, Hlodočín 2020. Selected pottery. Drawing B. Lofajová Danielová.



Pl. III. Nižná, Hlodočín. 1–7 – daub fragments (excavation 2020); 8–18 – pottery and daub fragments (prospection 2022). Scale: a – 1–7; b – 8–18. Drawing B. Lofajová Danielová.



Pl. IV. Nižná, northern slopes of Ostražica, Závodie (1-3) and Krivé Hony (4-12). Selected archaeological artefacts. 1 – iron; 2 – bronze; 3-8, 11, 12 – ceramic; 9 – radiolarite; 10 – stone. Scale: a – 1-8, 11, 12; b – 9, 10. Photo and drawing B. Lofajová Danielová.

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Mikroregión „stredná Orava“ v dobe halštatskej až strednej dobe laténskej

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Súhrn

Výskumy B. Lofajovej Danielovej na lokalitách Ostražica a Biela skala v Podbieli poskytli zásadné informácie o chronológii a charaktere výšinných lokalít. Počas viacročného výskumu so začiatkom v roku 2018 bolo na Ostražici okrem iného zistené, že valové opevnenie s kamennou plentou je až z obdobia predpúchovského horizontu, najskôr z prelomu stupňov LTB1 a LTB2 (Lofajová Danielová a i. 2021), klesá juhovýchodným strmým svahom a neuzatvára vrcholovú akropolu (obr. 1–3), ako sa domnievali autori v minulosti (Čaplovič 1987, 149–155, obr. 73; Pieta 2008, 119). Archaický archeologický materiál (obr. 4: 1) sa vyskytuje v sekundárnej polohe aj v objektoch (napríklad objekt 1/18), ktoré sú datované s najväčšou pravdepodobnosťou až do stupňa LTC (obr. 4: 1–7; tabeľa 1). Na základe rádiouhlíkových dát získaných z ekofaktov z rôznych kontextov a na základe keramického materiálu môžeme predpokladať kontinuitu osídlenia na vrcholovom sídlisku Ostražica od HC2 alebo HD1 do LTC1 (obr. 5; 6; tab. I). Túto fázu však nie sme zatiaľ schopní archeologicky precíznejšie rozdeliť. V prípade Bielej skaly je potvrdená kontinuita od stupňa HC do počiatku stupňa LTB1, predpokladáme však podobnú situáciu ako na Ostražici (Lofajová Danielová 2022). Na obidvoch vrcholových lokalitách bolo potvrdené osídlenie aj v laténskej fáze púchovskej kultúry (kontinuita je vysoko pravdepodobná),

pričom na Ostražici nové povrchové prieskumy pravdepodobne dokumentujú tiež jej rímsku fázu, ktorá nebola doteraz známa (tab. I: 14).

V okolí Ostražice bolo zistených osem nových polôh, z toho tri/štyri interpretujeme ako sídliská (Hlodočín, Krivé Hony, Skalica/Závodie; obr. 8–11; tab. II–IV), ktoré boli súčasné so sídliskom na vrchole pravdepodobne len v prvej fáze (neskorá doba halštatská až počiatok strednej doby laténskej) – z týchto polôh absentuje akýkoľvek archeologický materiál z obdobia púchovskej kultúry, či už laténskej, alebo z rímskej fázy.

Archeobotanická analýza M. Hajnalovej poskytla sortiment pestovaných rastlín známy aj z iných súvekých lokalít na severe Slovenska. Hoci je súbor skromný, absolútne datovanie samotných zvyškov rastlín umožnilo hodnotiť súbor diachronicky a zaznamenať tak, že stravovacie a/alebo pestovateľské tradície sa od neskej doby halštatskej po strednú dobu laténsku pravdepodobne zmenili. Dokladá to zmena druhovej skladby pestovaných plodín a hustota nálezov v uloženinách. Strukoviny (hrach a bôb konský), ktoré sa často pestujú ako záhradné plodiny, boli početnejšie práve v staršej dobe železnej. Neskôr ustúpili a nahradili ich obilniny pestované na poličkách väčších rozmerov. Úplná absencia nálezov vo vzorkách z neskej doby laténskej naznačuje, že aktivity, ktoré by sa dali spájať s existenciou a chodom domácností, sa v skúmanom priestore zredukovali, prípadne vymizli a nahradili ich aktivity iného charakteru. Tieto zistenia však môžu vyplývať aj z malého rozsahu skúmanej plochy, a tým aj z nízkeho počtu analyzovaných vzoriek.

Súbor zvieracích kostí analyzovaných K. Šimunkovou dokladá v celom úseku doby železnej najmä chov hovädzieho dobytka a menších prežúvavcov (ovce a kozy), a v malej miere aj prasaťa, podobne ako na území Liptova (Benediková et al. 2020; Bielichová 2019). Lov divej zveri indikujú kosti jeleňa, srnca, diviaka a zajaca a zároveň potvrdzujú v krajine prítomnosť lesov aj bezlesných trávnatých porastov. Na využitie blízkeho vodného toku Oravy poukazujú aj pozostatky rýb a bobra európskeho (tabela 3).

Na základe environmentálnych dát predpokladáme, že hlavnou subsistenčnou stratégiou všetkých miestnych komunít bolo v sledovanom období „zmiešané“ poľnohospodárstvo – t. j. pestovanie rastlín a chov zvierat. V zázemí obidvoch vrcholových výšinných lokalít (Biela skala a Ostražica) sa nachádza dostatok vhodných plôch ako pre polia (plošiny a svahy s nižším sklonom), tak trávnaté pastviny (aj strmšie svahy). V areáli Ostražice môže ísť o polohy, kde boli povrchovým prieskumom nájdené črepy bez kontextu (absencia kultúrnej vrstvy) – západne a severovýchodne od vrcholu, a kde sa na miestach (aj dnes aktívnych) prameňov našli črepy (obr. 11). V areáli Bielej skaly by pre agropastorálne aktivity mohli slúžiť mierne svahy na sever od lokality (obr. 13). Domnievame sa, že výšinné sídliská (vrátane opevnených vrcholových polôh) boli potravinovo sebestačné a neboli závislé od poľnohospodárskeho zázemia v (riečnom) údolí. Využitie údolných polôh však nemožno vylúčiť na základe novoobjaveného nížinného sídliska v Tvrdosíne-Krásnej Hôrke. Identifikácia sídel či využívaných plôch v údolí je problematická vzhľadom na prítomnosť hrubých riečnych nánosov (s mocnosťou miestami viac ako 2 m), ktoré sa v minulosti pravidelne a dlhodobo tvorili až do regulácie toku rieky Oravy a do vybudovania Oravskej priehrady. Archeologické situácie preto môžu byť pochované hlboko, podobne ako na dolnej Orave v oblasti Dolného Kubína alebo Sedliackej Dubovej, kde sa osídlenie z doby železnej našlo pod riečnymi nánosmi v hĺbke viac ako 1,5 m.

Kultúrne heterogénny depot z Krásnej Hôrky (pôvod bronzových predmetov z územia dnešného Veľkopoľska aj z Karpatskej kotliny) ukazuje, že Orava nepochybne bola súčasťou transkarpatskej komunikačnej siete. Všetky vrcholové polohy sídliskových komplexov mali vo vizuálnej kontrole významné brody cez rieku a jej sútoky (tabela 4; 6). Z aktuálneho stavu poznatkov je však nejasné, do akej miery sa na výmene tovaru mohli podieľať obyvatelia žijúci v sídliskových komplexoch okolo Ostražice a Bielej skaly. Sídliská situované na svahoch mali viditeľnosť strategických prvkov obmedzenú. Napríklad zo sídlisk Závodie v Nižnej a Za Pivovarom v Podbieli boli viditeľné len lokálne potoky. Zrejme sa v nich odohrávali najmä bežné sídelné, zriedkavo aj ďalšie (špecifické) aktivity – napríklad v polohe Závodie mohlo ísť o kovolejárstvo (bronzový zliatok; obr. 9: a). V Hlodočíne a Krivých Honoch predpokladáme tiež spracovanie/lámanie miestneho pieskovca pre potreby výstavby opevnenia a spevňovania terás na Ostražici (obr. 2: b; 3: b), kde tvorí podložie vápenec.

V mikroregión „stredná Orava“ koexistovali v období neskej doby halštatskej až strednej doby laténskej dva samostatné sídliskové komplexy, ktoré fungovali zrejme na úrovni lokálnych komunít (obr. 14). Nepochybne ide o kultúrne príbuzné jednotky, ktoré boli vizuálne oddelené nielen riekou, ale pravdepodobne aj nižším hrebeňom západne od Prasatina, na ktorom neboli ani po opakovanej a viacročnej terénnej prospekcii B. Lofajovej Danielovej zistené žiadne archeologické nálezy (obr. 14: c, f). Vráťane predpokladaného poľnohospodárskeho zázemia a areálu najbližších zdrojov dostupných do jednej hodiny chôdze (obr. 12: B; 13: B) mohli mať sídliskové komplexy rozlohu cca 200 ha (obr. 14: e). Pri zahrnutí ďalších potenciálnych areálov aktivít, napríklad vzdialenejších pasienkov alebo iných areálov (lovu, zberu plodín, získavania surovín), ktoré sa mohli nachádzať na blízko situovaných plochách prevažne bez archeologických nálezov vo vzdialenosti do dvoch hodín chôdze (napríklad Nižná, Lazy; obr. 12: B; 14: g), by v prípade Ostražice išlo o sídliskový areál s rozlohou do 300 ha (obr. 14: h).

Obr. 1. Nižná, polohy Ostražica a Hlodočín. Skúmané sondy a opevnenie. Legenda: a – sondy 2018; b – sondy 2019; c – sondy 2020; d – palisáda; e – valové opevnenie. Zdroj dát: ZBGIS (www.geoportal.sk). Autor B. Lofajová Danielová.

Obr. 2. Nižná, Ostražica. Sonda 9/19. A – pôdorys na úrovni deštrukcie valu; B – JV profil. Legenda: a – štrk; b – pieskovec; c – vápenec; d – riečne okruhyliaky; e – poloha odobratých archeobotanických vzoriek; SJ – stratigrafická jednotka; K – kontext. Autor B. Lofajová Danielová.

Obr. 3. Nižná, Ostražica. Sonda 10/19. A – pôdorys na úrovni deštrukcie valu; B – JV profil. Legenda: a – štrk; b – pieskovec; c – vápenec; d – riečne okruhyliaky; e – poloha odobratých archeobotanických vzoriek; SJ – stratigrafická jednotka; F – objekt; K – kontext. Autor B. Lofajová Danielová.

- Obr. 4. Nižná, Ostražica. Objekty 1/18, 3/18 a 6/18 (sonda 5/18). A – pôdorys; B – JZ profil; 1–7 – výber keramiky z objektu 1/18 a 3/18. Legenda: a – pieskovec; b – zuhoľnatené drevo; c – vápenec; d – poloha odobratých archeobotanických vzoriek; SJ – stratigrafická jednotka; F – objekt; K – kontext. Mierka: a – 1; b – 2–7. Foto a kresby B. Lofajová Danielová.
- Obr. 5. Nižná, Ostražica. Nižná, Ostražica. Objekt 4/18 (sonda 8/18). A – pôdorys objektu 4/18 na úrovni podlažia; B – J profil sondy 4/18; 1–5 – výber keramiky. Legenda: a – pieskovec; b – keramika; c – vápenec; d – poloha odobratých archeobotanických vzoriek; SJ – stratigrafická jednotka; F – objekt; K – kontext. Mierka: a – 1, 2, 4, 5; b – 3. Foto a kresby B. Lofajová Danielová.
- Obr. 6. Nižná, Ostražica. Rádiokarbonové dáta po kalibrácii. Šedá oblasť – vrstvy uložené pod konštrukciou valu. Vytvorené pomocou OxCal v4.4.4, krivka IntCal 20 (Bronk Ramsey 2021; Reimer et al. 2020). Dostupné na: <https://c14.arch.ox.ac.uk/oxcal.html>.
- Obr. 7. Nižná, Ostražica. Zuholnatené zvyšky rastlín. A – zastúpenie hlavných typov rastlinných makrozvyškov (bez uhlíkov); B – zastúpenie určených druhov obilnín. Čísla na ľavej osi predstavujú hodnoty NISP. Legenda: a – buriny; b – strukoviny; c – obilniny; d – proso; e – ovos; f – jačmeň; g – plevnaté pšenice. Autor M. Hajnalová.
- Obr. 8. Nižná, Hlodočín, výskum v roku 2020. A – sonda 2/20, JV profil; B – sonda 2/20, SZ profil; C – sonda A/20, SZ profil; D – sonda 4/20, SV profil; E – sonda 3/20, SZ profil. Legenda: a – štrk; b – pieskovec; c – vápenec; SJ – stratigrafická jednotka; F – objekt. Foto a kresby B. Lofajová Danielová.
- Obr. 9. Nižná, polohy Skalica/Závodie a Hlodočín. Prieskum okolia Ostražice v roku 2022. Relevantné archeologické nálezy. Legenda: a – bronz; b – keramika; c – železo; d – mazanica; e – trecí kameň; f – pieskovec; g – zisťovacia sonda; h – zdroj vody (prameň); i – vyznačenie miesta archeologického výskumu v roku 2020. Data source: ZBGIS (<http://www.geoportal.sk/>). Autor B. Lofajová Danielová.
- Obr. 10. Nižná, Krivé Hony. A – poloha skúmaného rodinného domu v roku 2020 (1) a nálezov keramiky zistených povrchovou prospekciou v roku 2018 (2); B – sonda skúmaná v roku 2020 na podklade katastrálnej mapy. Legenda: a – sonda; b – archeologický objekt/kultúrna vrstva. Zdroj dát: ZBGIS (<http://www.geoportal.sk/>). Autor B. Lofajová Danielová.
- Obr. 11. Lokalita a interpretácia nálezov v okolí vrchu Ostražica. a – opevnené sídlisko; b – pravdepodobne opevnené sídlisko; c – neopevnené (otvorené sídlisko); d – náhodné nálezy?; e – depot. 1 – Ostražica; 2 – Hlodočín; 3, 7, 9, 11 – Závodie; 4 – Skalica; 5 – Krivé Hony; 6 – Rúbanka; 10, 13 – Vápence; 12 – Tvrdošín (číslovanie zodpovedá číslovaníu v tabele 4). Zdroj produktov LLS: ÚGKK SR. Autor B. Lofajová Danielová.
- Obr. 12. Sídliskový komplex výšinných lokalít v okolí hradiska Nižná, Ostražica. A – analýza sklonu terénu („slope analysis“ v °); B – analýza vzdialenosti z výšinných sídlisk („path distance analysis“) pomocou funkcie „Tobler’s hiking“ (v hodinách). Legenda: a – opevnené výšinné sídlisko; b – otvorené výšinné sídlisko na svahu; c–e – náhodné nálezy: c – fragmenty keramiky; d – keramika nájdená v lokálnych zdrojoch vody; e – železný kosák. Zdroj produktov LLS: ÚGKK SR. Autor B. Lofajová Danielová.
- Obr. 13. Sídliskový komplex výšinných lokalít v okolí hradiska Podbiel, Biela skala. A – analýza sklonu terénu („slope analysis“ v °; 1 – Biel; 2 – Za Pivovarom; 3 – vrchol Bieleho/Bielej skaly; 4 – Za Bielym; 5 – plató nad pohrebiskom); B – analýza vzdialenosti z výšinných sídlisk („path distance analysis“) pomocou funkcie „Tobler’s hiking“ (v hodinách). Legenda: a – opevnené sídlisko na vrchole; b – otvorené sídlisko na svahu; c, d – náhodné nálezy (c – keramika; d – keramika nájdená v lokálnych zdrojoch vody); e – pohrebisko. Zdroj produktov LLS: ÚGKK SR. Autor B. Lofajová Danielová.
- Obr. 14. Mikroregión „stredná Orava“ a interpretácia areálov aktivít v sídliskových komplexoch v Nižnej (severne) a v Podbieli (južne). a – rezidenčný areál (rozsah sídlisk zistený archeologickým výskumom a prospekciou); b – pohrebny areál; c – skúmané územie bez archeologických nálezov (nevyužívané/zdroje surovín/lovný revír/hranica); d – hypotetické agro-pastorálne zázemie (sporadické nálezy); e – predpokladaný sídliskový areál každodenných aktivít (vo vzdialenosti do 1 hodiny chôdze, archeologické lokality a nálezy); f – potenciálna hranica vo výšinnej polohe medzi sídliskovými komplexmi; g – lokalita Nižná, Lazy (nálezy keramiky); h – predpokladaný sídliskový areál s väčším agro-pastorálnym zázemím (vo vzdialenosti do 2 hodín chôdze). Zdroj produktov LLS: ÚGKK SR. Autor B. Lofajová Danielová.

Tabela 1. Nižná, Ostražica. Rádiokarbonové dáta, analyzoval M. Krapić (Laboratorium Datowań Bezwzględnych, Kraków). Kalibrovane pomocou OxCal v4.4.4., krivka IntCal 20 (Bronk Ramsey 2021; Reimer et al. 2020). Dostupné na: <https://c14.arch.ox.ac.uk/oxcal.html>.

Tabela 2. Nižná, Ostražica. Rastlinné makrozvyšky zoskupené podľa datovania. Čísla predstavujú hodnoty NISP. Podčiarknuté sú vzorky z nálezmi priamo datovanými AMS. Autor N. Hajnalová.

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Tabela 4. Prehľad vybraných atribútov archeologických lokalít v okolí Ostražice vo fáze HC2–LTC1 (číslovanie korešponduje s číslovaním na obr. 11). *ABM – archeobotanický materiál; AZOO – archeozoologický materiál; BR – bronz; DA – mazanica; GS – trecí kameň; CHS – štiepaná industria; LW – tkáčske závažie; PS – keramika; SI – kosák; WS – brúsik. Autor B. Lofajová Danielová.

Tabela 5. Podbiel, Biel and Za Pivovarom. Rastlinné makrozvyšky zoskupené podľa datovania a/alebo kontextu. Čísla predstavujú hodnoty NISP. Autor M. Hajnalová.

Tabela 6. Prehľad vybraných atribútov archeologických lokalít v okolí Bielej skaly vo fáze HC2–LTB (číslovanie korešponduje s číslovaním na obr. 13). *ABM – archeobotanický materiál; AZOO – archeozoologický materiál; BR – bronz; DA – mazanica; GS – trecí kameň; PS – keramika; WS – brúsik.

- Tab. I. Nižná, Ostražica. Chronológia lokality. Prehľad absolútnych dát (tmavšie pásy – obilniny/zvieracie kosti; svetlejšie pásy – drevo; číslovanie zodpovedá číslovaníu v tabele 1) a relatívna chronológia vybraných keramických nálezov (* – relatívna chronológia podľa Brandt 2001; Salač 2008; Trachsel 2004). Rôzne mierky. Autor B. Lofajová Danielová.
- Tab. II. Nižná, Hldočín 2020. Vybrané keramické nálezy. Kresba B. Lofajová Danielová.
- Tab. III. Nižná, Hldočín. 1–7 – fragmenty mazanice (výskum 2020); 8–18 – keramika a mazanica (prospekcia 2022). Mierka: a – 1–7; b – 8–18. Kresba B. Lofajová Danielová.
- Tab. IV. Nižná, severné svahy Ostražice, Závodie (1–3) a Krivé Hony (4–12). Vybrané archeologické nálezy. 1 – železo; 2 – bronz; 3–8, 11, 12 – keramika; 9 – rádiolarit; 10 – kameň. Mierka: a – 1–8, 11, 12; b – 9, 10. Foto a kresby B. Lofajová Danielová.

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RESEARCH ON THE SO-CALLED MUSKERVASTLWALD GRAVEYARD AT BURGSTALLKOGEL, KLEINKLEIN, STYRIA (AUSTRIA)

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In the well-known and important Early Iron Age Sulmtal necropolis in Western Styria, an archaeological excavation was carried out because of woodworking in 2018 in the so-called Muskervastlwald group, which was relatively unexplored until now. In the course of the excavation, four cremation burials were discovered, which were only partially preserved due to the levelling. The funeral rite shows cremation pourings and urn graves. The pottery shows cone neck vessels, collar rim vessels, and bowls with inserted rims, which also fit together with the decorations into the known forms of the Styrian-Pannonian group of the Hallstatt period. Remarkable vessels also point to more far-reaching relationships with the surrounding cultural groups, such as the Kalenderberg group or in the Inner Alpine region. Based on the metal finds, it is possible to record both, burials of warriors with spearheads and parts of belts and burials with fine jewellery. The occupation period of the cemetery ranges from the phase Ha C1 (NT I), which can be determined by old finds, with a focus in the period Ha C2 and at the transition from Ha C2 to Ha D1, which are comparable to the occupation phases NT IIa and NT IIb of the Nova tabla cemetery.

In the Sulmtal, about 30 km south of Styria's capital Graz, one of the important, biggest and famous necropolises of the Early Iron Age is known around the Burgstallkogel hill, the so called Sulmtal necropolis. This necropolis is located in the municipalities of Großklein and Gleinstätten and contains about 700 tumuli. Beneath big graveyards like the so called 'Hörschusterwald' or the 'Grellwald', also some smaller cemeteries are known, like the 'Haiblwald' or the 'Masser -Kreuzbauer'. One of these small cemeteries is so called 'Muskerwastlwald', where 2018 excavations were done and the results are going to be presented below (Fig. 1).

TOPOGRAPHY

The Muskervastlwald cemetery is located on the eastern slope of the Burgstallkogel and is distributed on two plateaus, which are today separated by a road. Most of the burial mounds are located on the upper plateau, which is limited by two sharp slopes in the south and the northeast, in the east side of the graveyard is limited by the street. The second part of the cemetery is situated on a lower level and there a few tumuli from Muskervastlwaldgroup, three other tumuli are located on a different property, so it was called the Kröllwaldgroup. All lower levelled burial mounds are situated on a flat plateau surrounded by slopes except the Southwestern part, which is limited by the street (Fig. 2).

RESEARCH HISTORY

First excavations were done by W. Radimský and J. Szombathy in 1883, the findings of the excavations of Radimský were published by Claus Dobiat, who presented a complete overview on the Sulm Valley necropolis and its ceramics. The only known finding from Tumulus 1 is a fragment of a boat fibula, from Tumulus 2 we know fragments of a rim and wall piece of a cone-necked vessel (Dobiat 1980, 217,

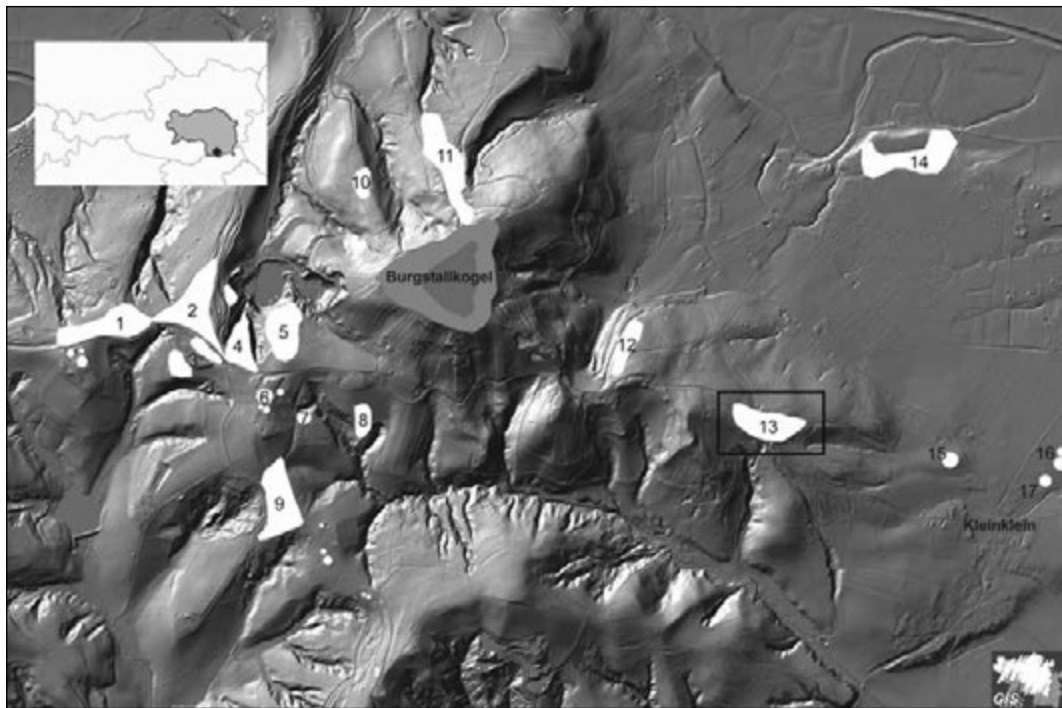


Fig. 1. Overview of the graveyards on Burgstallkogel near Großklein. 1 – Forstwaldgroup; 2 – Kaiserschneiderwaldgroup; 3 – Tschoneggerfranzlwaldgroup; 4 – Ofenmacherwaldgroup; 5 – Höchschusterwaldgroup; 6 – Tschoneggerfranzl Tumulus 2; 7 – Kürbischhansl Tumulus; 8 – Masser-Kreuzbauer; 9 – Grellwaldgroup; 10 – Haiblawaldgroup; 11 – Leitengritschwaldgroup; 12 – Karnerwaldgroup; 13 – Muskervastlwaldgroup; 14 – Pommerkogel; 15 – Precklwaldgroup; 16 – Hartnermichlkogel 1 and 2; 17 – Kröllkogel. After Mele 2012, fig. 1. Courtesy of Marko Mele, UMJ.

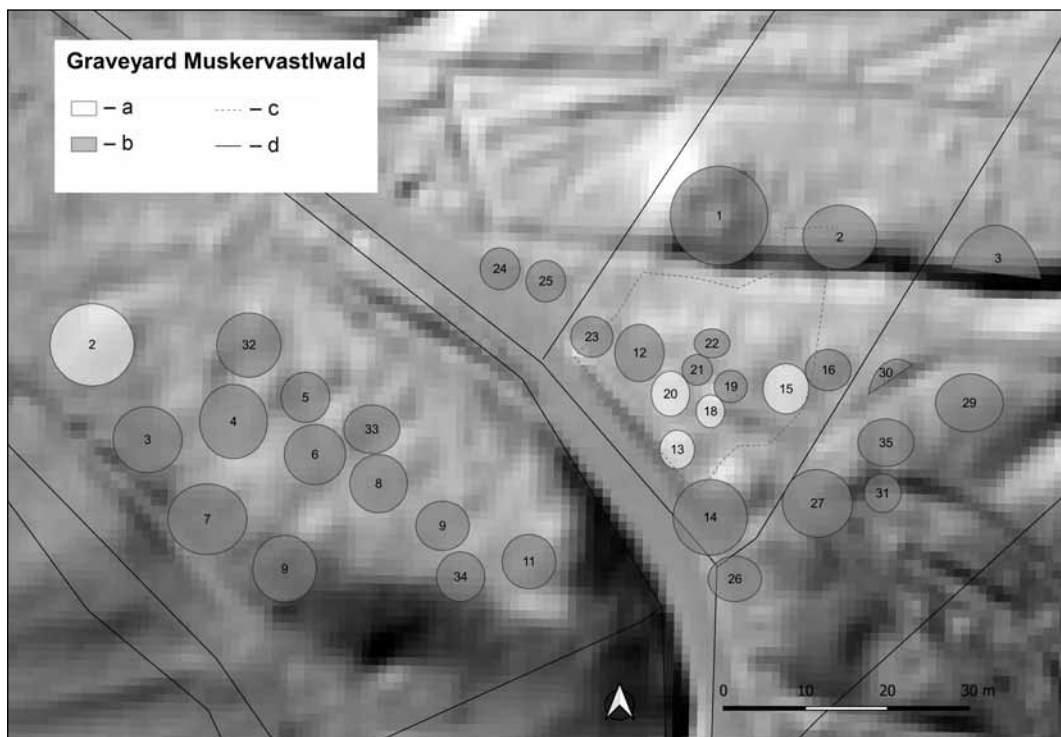


Fig. 2. Muskervastlwald. Overview of the tumuli. Graphics F. Mauthner. Legend: a – researched burial mounds; b – unresearched burial mounds; c – excavated area; d – plots.

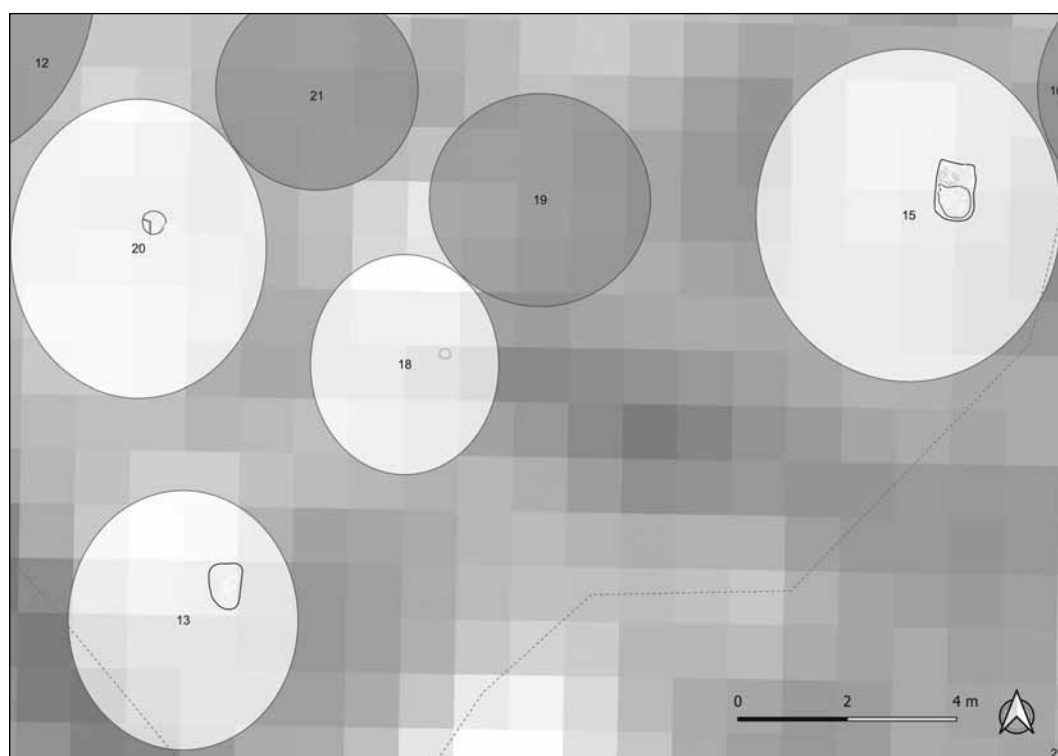


Fig. 3. Muskervastlwald. Situation of the structures in the tumuli. Graphics F. Mauthner.

Cat. No. 66, 67, 288; pl. 31: 1, 2; *Radimský-Szombathy 1885*, 162, 163.). After Dobiat, Muskervastl 2 could be dated into Burgstall phase I (Ha C1; *Dobiat 1980*, 168) and Muskervastl 1 could be dated into Burgstall phase II (Ha C2; *Dobiat 1980*, 169).

In 2014 the cemetery was inspected by the *Universalmuseum Joanneum* in Graz and re-recorded, so that a total of 20 tumuli could be counted (Interarch Database¹). With the help of new LiDAR – data, up to 35 burial mounds have been identified by data analysis and surveys conducted by the Archeo Norico Burgmuseum Deutschlandsberg.

THE ARCHAEOLOGICAL EXCAVATION 2018

Due to the partial destruction of burial mounds in the course of forestry work, archaeological investigations in the graveyard took place in 2018, which were carried out by the *Archäologisch-Soziale Initiative Steiermark* and the *Archeo Norico Burgmuseum Deutschlandsberg* on behalf of the Federal Monuments Authority (*Dobiat 1980*, 48).

The excavated area was approximately 550 m², and the soil was found to be heavily ransacked due to clearing and logging (Fig. 3).

The burials

The archaeological rescue excavation in the Muskervastlwald group in 2018 made it possible to record several features, including cremation burials in various forms, some of which were very badly affected by the levelling work and must therefore be considered incomplete in their inventory. Nevertheless, it was possible to assign the features to the originally existing four tumuli – 13, 15, 18 and 20.

¹ Interarch.eu: Datenbank interarch.eu, Fundstellenbezeichnung: Leibnitz.66003.5. Online available at: <http://www.interarch-steiermark.eu/datenbank/fundstellen/details.html?item=4dbe8ae7-d2b1-1315-e56e-54b66b6fd3c5> [04. 12. 2020].

Grave forms and burial types

All the graves are cremation graves and it was possible to distinguish between cremation pit graves (Tumulus 13, 15 and 20) and an urn grave (Tumulus 18).

By cremation graves we understand, based on Claus Dobiat's investigations, burials in whose grave pits, in addition to a few burnt pottery fragments and cremated remains, the remains of the funeral pyre were also filled in. In contrast, in an urn grave the selected cremated remains were collected and deposited together with the grave goods, and the urn was buried in a grave pit.

The shape of the cremation pits varied in the cemetery – oval (Tumulus 13), rectangular (Tumulus 15 and 20) and round (Tumulus 15) pits were distinguished. The size of the burial pits can be given as 0.86×0.6 m for the oval pit, 1×0.7 m or 0.85×0.55 m in the case of the rectangular pits, and a diameter of 0.6 m for the round pit.

With regard to the depth of the burial pits, only limited information is possible, as the burials have not survived intact. The depth of the round burial pit in Tumulus 15 was still 0.26 m.

Inventory and grave goods

All statements concerning the pattern of equipment and the custom of offering graves from the Muskervastlwald group have limitations. The inventory of all four cemeteries is not complete, and the number of graves is insufficient for more detailed analyses within the cemetery.

Nevertheless, the objects found in the graves can be divided into three large groups. These include, for example, dress components that were burnt at the funeral pyre and show more or less clear traces of burning.

In this context, the rod-shaped bead and the fragments of fine bronze rings from Tumulus 13 should be mentioned, which are thought to be the remains of neck jewellery.

A second group includes objects of personal possession that can also be interpreted as attributes of a social group or gender-specific items. These include, for example, the iron belt rings (coupling rings) from Tumulus 18 and the lance tip from Tumulus 20, objects associated with male burials (warrior status).

The third group comprises the vessel furnishings in the graves, whereby in the burials investigated the focus is on pyre pottery, i.e. *pars pro toto* pottery that entered the grave and mostly also heavily burnt remains of the vessels. Among the reconstructed vessel forms are conical neck or collar rim vessels, bowls with a rim, handle cups as well as barrel-shaped vessels and, as special forms, a suction or hanging vessel.

Whole vessels, which would be placed in the grave as containers for food and drink, are completely missing.

Better equipped graves, such as Tumulus 20, contain the remains of a set of pottery. This consists mainly of mixing and drinking vessels. The barrel-shaped vessels can possibly be interpreted as storage or cooking vessels.

Tumulus 13

In the southern part of the investigated area, an oval pit (0.86×0.6 m) oriented north to south was uncovered, which could be interpreted as remains of Tumulus 13. The cremated bones and the ceramics were spread in the eastern part of the pit, in the north and northwest no objects could be found and even no urn was perceptible (Fig. 4).

A total of four vessels were found in the cremation burial, all of which were heavily fragmented and sometimes secondarily burned.

The fragments of a collar rim bowl (Pl. I: 1), which possibly belonged to a vessel with a stand, show an S-shaped profiling, whereby the short collar rim was clearly set off from the shoulder. The shoulder-abdomen border of the vessel is subdivided at regular intervals by vertical or slightly curved narrow plastic ribs. The areas between the ribs were originally painted alternately red and black with graphite, as sufficient traces still indicate, with the painting extending into the belly area of the bowl.

From the inventory of the Wiesenkaiser Tumulus No. 4, a richly furnished burial at the western extension of the Sulmtal necropolis, a profiled bowl is available, which is characterized by knobs, a verti-

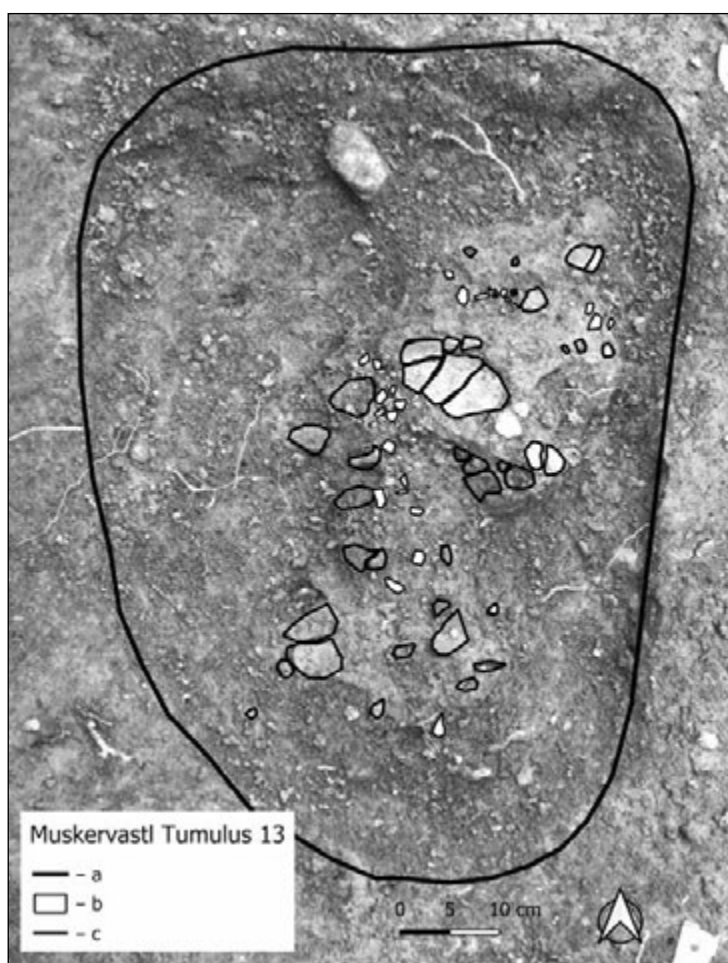


Fig. 4. Muskervastlwald. Tumulus 13, plan. Graphics F. Mauthner.
Legend: a – gravepit; b – cremated bones; c – ceramics.

from the Grellwald group, for example Grellwald 30 (Dobiat 1980, pl. 71: 5).

The coherent bottom-belly pieces of a coarse-toned, heavily secondary-burned vessel should also be mentioned (Pl. I: 4).

In addition to the pottery finds, remarkable filigree bronze objects were also uncovered, some of them had been partially melted in the course of burning at the pyre.

These include, small, fine bronze rings (Pl. I: 5) and a rod-shaped bead (Pl. I: 6). The bead is hollow inside and has a length of 18 mm, its cross-sectional diameter is 4.5 mm, and the two end pieces are four-ribbed. Very similar ribbed bronze rods or beads come from the cemetery of Frög-Rosegg in Carinthia, which are assigned to the phase Frög 2–3 (Ebner-Baur 2020, 142, Cat. No. 85; fig. 92).

The incomplete and fragmentary inventory of the burial in Tumulus 13 belongs chronologically to phase NT IIb, a transitional stage from Ha C2 to Ha D1. The phase classification follows the scheme drawn up by G. Tiefengraber (2019, 422, 423) for the cemetery of Nova tabla in Slovenia.

In Tumulus 13, only 7 g of cremated bones were preserved, which is why anthropological analysis yielded an 'adult' age determination between 19 and 60 years, without possible sex determination, however (Renhart 2020, 1).

Tumulus 15

In the eastern part of the excavation area some individual vascular findings turned out to be another disturbed burial mound (Tumulus 15). The burial pit has a rectangular shape (1 × 0.7 m), which yielded smaller rectangular pottery concentration (0.4 × 0.25 m) in the north-west. In this, remains of a conical neck vessel were excavated, which may have been intentionally broken into many very small fragments.

cally fluted shoulder as well as by the black-red painting (Hack 2001, 30, pl. 13: 2).

Shoulder and belly fragments and single rim pieces can be assigned to a conical neck vessel (Pl. I: 2), which shows remarkable graphite stripe painting, but no secondary burning marks. On the one hand, the graphite stripes emphasize a shoulder furrow and also a circular dent. Both motifs fit into a partially preserved diamond decoration, which are followed along the shoulder by further, obliquely running graphite stripes. In the lower part of the vessel, the entire decoration is bordered by a horizontal graphite stripe.

A decoration consisting of diamond-shaped graphite stripes is also found, for example, on the shoulder-abdominal circumference of conical neck vessels of the Sulmtal necropolis, which were discovered in the burials of Hörschusterwald 1 (Dobiat 1980, pl. 1: 11) and Ofenmacherwald 43 (Dobiat 1980, pl. 19: 1).

A type of bowls with inverted rim, which are popular in the burials of the Sulmtal necropolis could also be found in Tumulus 13. The surface of the bowl (Pl. I: 3) shows secondary burn marks, the bowl has a flat base and can be compared with pieces

In addition to this, fragments of another conical neck vessel are also documented, but interestingly, no cremated bones were found. This structure gives the impression that these vessel pottery fragments were laid down in a past container.

The southern part of the burial pit includes a roundish pit with a diameter of 0.6 m and a depth of 0.26 m, filled with a mixture of pottery fragments, charcoal remains, and mortuary cremated remains, suggesting a burial as cremation fill in a pit (Fig. 5).

A total of seven vessels' remains were uncovered from the pyre filling in the pit.

A fragmentary preserved collar rim vessel (Pl. II: 1) could be found in both areas described above. All parts of the vessel still have their original dark-black surface and apparently were not exposed to the heat of the pyre. A shoulder furrow runs under the short neck of the collar; the shoulder of the vessel was originally adorned with four crosswise distributed knobs, which in turn are bordered by narrow semi-circular channellings.

From the Sulmtal necropolis a comparable vessel is known from burial mound 45 of the Grellwald Group, which is decorated with additional angular channelling around the shoulder and belly (Dobiat 1980, pl. 82: 4).

A very similar collar neck vessel, but with additional dot decoration around the channelling, comes for example from the important hilltop settlement at Hoarachkogel-Bubenberg/Novine, located directly at the Austrian-Slovenian state border (Vinazza *et al.* 2015, 192, pl. 5: 5). The vessel from the Hoarachkogel, which served as an urn for a cremation burial with a covering shell, was assigned to the Ha C2 phase (Črešnar/Vinazza 2019, 465; pl. 5: 10).

From the multi-phase hilltop settlement on Poštela near Maribor/Marburg, Slovenia, not far from Hoarachkogel, we know a comparable shoulder fragment with knob and surrounding semicircular fluting (Teržan 1990, 143, pl. 40: 11).

Finally, it should be noted that especially conical neck vessels, such as a specimen from the Iron Age cemetery of Nova tabla near Murska Sobota in Slovenia, were decorated with this characteristic pattern canon (Guštin *et al.* 2017, grave 45, 461, fig. 1474).

A so-called spouted vessel (Pl. II: 2), heavily fragmented, is also part of the burial equipment, which can probably be reconstructed as a collar rim vessel with a straight, tubular spout. Such spouted vessels, also called suction vessels, are found three times in the cemetery of Statzendorf in Lower Austria and are assigned to the Kalenderberg culture (Rebay 2006, e.g. grave B127, 106, 107, pl. 135: PA43104). Further comparisons can be found, for example, in the settlement at Burgstallkogel near Kleinklein, which also has a straight tube (Smolnik 1994, 56, 57, pl. 3: 17) or in the Hallstatt period burial ground of Nova tabla near Murska Sobota, Slovenia. Here this vessel was found in a grave of an infant (Guštin *et al.* 2017, grave 68,



Fig. 5. Muskervastlwald. Tumulus 15, plan. Graphics F. Mauthner. Legend: a – ceramics; b – ceramic in box; c – charcoal; d – grave pit.

491, fig. 1630) and can be attributed on the basis of chronological aspects to phase NT IIB, i.e. to the transition from stage Ha C2 to Ha D1 (*Tiefengraber 2019*, 424–426).

In the rectangular pottery concentration mentioned above, the fragments of a heavily secondarily burnt conical neck vessel were deposited (Pl. II: 6). The remarkable high neck area is decorated up to the shoulder by horizontal channelling. The shoulder of the vessel was originally decorated by four crossed knobs framed by a triple bundle of channelling, the ends of which converged towards the bottom in an acute triangular shape.

Another single shoulder fragment of the conical neck vessel has a very similar decoration consisting of the same channelling bundle, with the triangular zone in the spandrel between the shoulder furrow and the channelling designed by shallow circular impressions. The channelling bundles may have originally run in zigzag mode along the vessel shoulder, to which some parallels are known from the Sulmtal necropolis grave inventories (*Dobiat 1980*, e.g. Grellwald 34, pl. 73: 2; Grellwald 54, pl. 87: 5). The characteristic neck area of the conical neck vessel, which was designed by surrounding horizontal channelling, finds good comparisons in the Sulmtal necropolis (*Dobiat 1980*, e.g. Grellwald 55, pl. 89: 1) as well as in the material from the settlement of Kalsdorf. The decoration is a culmination of the 'high baroque' conical neck vessels of type 5 according to Dobiat, which were defined as important representatives of the latest occupation phase of Kleinklein (*Tiefengraber 2005*, 166, pl. 31: 1).

Strongly secondarily burned fragments of a collar rim vessel has a vertical eyelet (Pl. II: 5) at the shoulder-abdominal boundary. For this rare cord eyelet, which identifies our fragment as a hanging vessel, a comparison from the burial Kaiserschneiderwald 40 is available (*Dobiat 1980*, pl. 28: 11).

For the small, double conical profiled vessel (Pl. II: 3), which has been preserved from the flat standing surface up to the shoulder-belly-part, reference can be made to a similar piece from the cemetery of Nova tabla in Slovenia (*Guštin et al. 2017*, grave 18, 430, 431, fig. 1317).

Further vessel fragments could be reconstructed to a vessel with high collar rim and pressed spherical belly part (Pl. II: 4), whereas the standing surface is completely missing. A collar rim vessel with very similar profiling comes, for example, from the burial of Leitengritschwald 41 (*Dobiat 1980*, pl. 102: 2).

The finds from Tumulus 15 point to a dating to the NT IIB phase, i.e. to the transition from the Ha C2 to the Ha D1 phase, but there are no chronologically sensitive metal finds.

The anthropological age and sex analysis shows that this is the incomplete cremation of a young individual who died between the ages of 13 and 18 (*Renhart 2020*, 1).

Tumulus 18

Already after removal of the coarse dirt, a circular structure with a diameter of 0.2 m was detected in the middle of the excavation area, a few metres north of Tumulus 13. This layer turned out to be the remnant of a ceramic urn with cremated bones and could be seen as the last remains of burial mound number 18 (Fig. 6).

Pieces of the urn's belly and base (Pl. III: 1) have been preserved, which can probably be reconstructed as a collar rim or conical neck vessel due to the protruding belly. The contents of the urn showed selected pieces of cremated bones, from which further finds, such as a knife and three rings of iron could be recovered.

The iron rings (Pl. III: 4) have a diameter between 4.2 and 5.4 cm, with the smaller ring having a round-bar cross-section and the two larger rings having a squashed spherical cross-section. Pieces of bone corroded onto the rings, and the two larger rings were encountered in the urn slightly overlapping and corroded to each other.

These characteristic iron rings are often found in warrior graves and are interpreted as parts of a belt, for example in the Tumulus Forstwald 21 (*Dobiat 1980*, pl. 37: 10a–c), where an armament with two pieces of lances was documented. Further comparisons are available within the Sulmtal necropolis in the graves Leitengritschwald 2 (*Dobiat 1980*, pl. 98: 7) and Kaiserschneiderwald 123A (also labelled as 146; *Bernhard/Weihs 2003*, pl. 47: 7), where in the latter one, three pieces of iron rings were rusted at the bottom of the urn.

From the cemetery of Nova tabla in Slovenia iron rings were published, which were also found in triplicate, with a diameter of about 5 cm. The equipment of grave 66 mentioned here also includes the broken tip of an iron knife (*Guštin et al. 2017*, 486, fig. 1612–1614).

The iron knife (Pl. III: 3) has a curved back and a handle mandrel, whereby the knife tip and the end of the grip tang has been broken in antiquity. There are also corroded residues of cremated bones on the knife. Parallels to our iron knife, which is to be addressed as an equipment element, can be found in the

Sulmtal necropolis, for example with in the burial of Forstwald 50 (*Dobiat 1980*, pl. 40: 6), or from the cemetery of Nova tabla in Slovenia (*Guštin et al. 2017*, grave 70, 494, fig. 1659).

A second pottery vessel could be mentioned in the inventory of the burial. It is the fragmented cup with a high, over-edged handle of a relatively wide, flat cross-section (Pl. III: 2). The cup with the handle, the base of which has not been preserved, can be described by a high straight neck as well as by a sharply profiled shoulder-abdominal transition.

Within the Sulmtal necropolis, this type of cup belongs to a younger horizon of graves, as showed by the comparable finds from the burials of Grellwald 55 and Tschoneggerfranzl 2 (*Dobiat 1980*, pl. 54: 11; 92: 1, 2).

Phase NT IIb, i.e. the transitional horizon of Ha C2/Ha D1, can be attributed to the few pottery finds and metal objects from the urn burial in Tumulus 18.

Some cremation bone fragments showed a rust-brown discolouration due to the iron oxide. Animal bones were also burnt and separated out during analysis. As far as pathological conditions are concerned, fine porosities called *cribra cranii* were found on some skull remains, indicating deficiency diseases. The cremated bones came from a medium robust to robust and probably strong man, who died between the 31st and 50th year of his life (late adulthood – early maturity; *Renhart 2020*, 2).

Tumulus 20

In the western part of the investigated area some fragments of pottery vessels were unearthed, which were seen as remains of Tumulus 20. Based on the consistency of the earth material, a rectangular burial pit can be recognized, the dimensions of which are 0.85 × 0.55m (Fig. 7).

During the preparation of the block recovery of the upper vessels, a black charcoal layer was found c. 30 cm deeper north of the ceramic fragments. After the block recovery of this pit, during the restauration, this layer could be divided into three fillings. The upper filling shows a few charcoal fragments and no bones. The next filling contains very much charcoal and burned wood without any main orientation, so an organic container is excludable. In addition to some cremated bones and vessel remains a fragment of a spearhead have been documented. The final filling on the bottom of the pit consisted of a few fragments of charcoal, sandy clay and burned stones. In this filling the rest of the spearhead has been uncovered, so we can prove the he was in an upright position.

Some vessel fragments were found in both layers, so they were created at the same time.

The fragments of a collar rim vessel (Pl. IV: 1) come from the upper area of the burial, whereby the characteristic collar rim has only been preserved in the base. Along the shoulder runs a circumferential sloping channelling, the squeezed spherical belly part ends in a flat base. A vessel comparable in its basic form and decoration is known, for example, from the grave Leitengritschwald 46 (*Dobiat 1980*, pl. 103: 10) of the Sulmtal necropolis.

Another collar rim vessel (Pl. IV: 3) consists of individual base and belly fragments as well as a rim and a shoulder piece. It is decorated by a slightly high oval dent at the shoulder-abdominal transition. The decoration with the dent is known from the grave Grellwald 45 (*Dobiat 1980*, pl. 83: 2), even if this comparison piece has more decorations.

A strongly fragmented conical neck vessel (Pl. IV: 5) with a folded rim could also be recovered, which shows four crosswise distributed knobs as well as a diagonal channelling decoration along the shoulder-

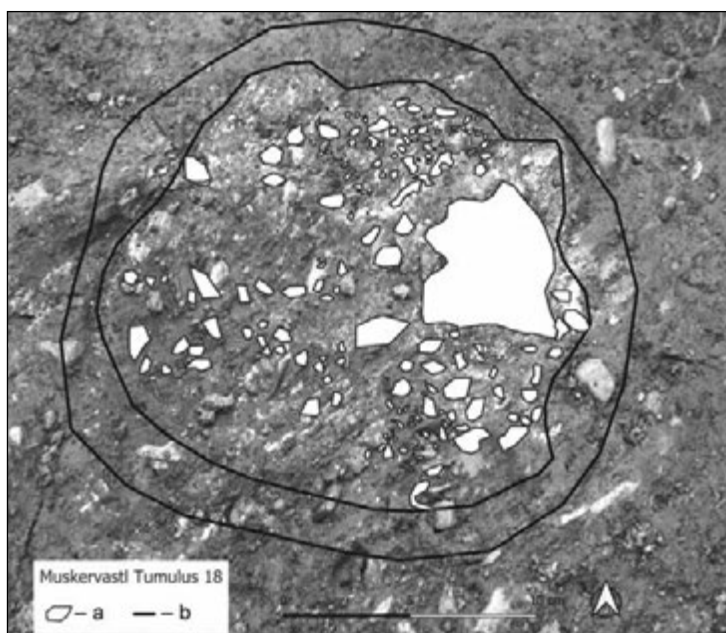


Fig. 6. Muskervastlwald. Tumulus 18, plan. Graphics F. Mauthner. Legend: a – cremated bones; b – ceramics.

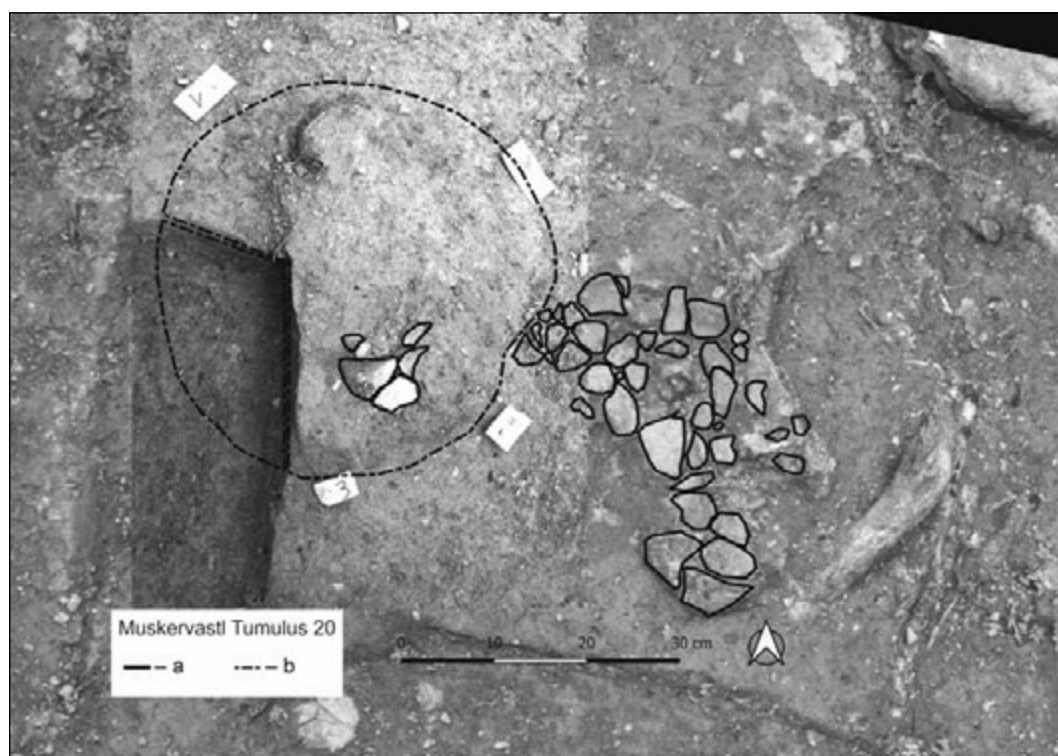


Fig. 7. Muskervastlwald. Tumulus 20, plan. Graphics F. Mauthner. Legend: a – ceramics; b – charcoal.

abdominal transition. Parallels can be found in the material from the neighbouring Slovenian Styria, for example in Šentjanž pri Rečici, grave 2 (Teržan 1990, pl. 81: 1) or at the cemetery of Nova tabla near Murska Sobota, where the channelling, however, is oriented to the right (Guštin *et al.* 2017, grave 78, 503, fig. 1699). At the Nova tabla cemetery, conical neck vessels of this form and decoration appear as typical representatives of phase NT IIa, a chronological classification corresponding to phase Ha C2 (Tiefengraber 2019, 424).

The strongly secondarily burned bowl with inverted rim (Pl. IV:2) with hemispherical profiling finds comparisons in the inventory of the burial of Leitengritschwald 27 (Dobiat 1980, pl. 99: 10).

With the barrel-shaped vessel (Pl. IV: 4), whose fragments are strongly secondarily burned, another widespread vessel form can be recorded, which has, for example, comparisons in the graves Kaiserschneiderwald 40 (Dobiat 1980, pl. 27: 8), Grellwald 45 (Dobiat 1980, pl. 83: 6) and Leitengritschwald 46 (Dobiat 1980, pl. 103: 13).

Besides the ceramic vessels, two metal objects were found. A spearhead made of iron (Pl. IV: 7) with a broken tip and a roof-shaped central ridge with a cross-shaped cross-section.

The ring-like end of its shaft has three horizontal grooves and appears to be upshifted, as shown in the X-Ray. A similar designed spearhead is known, for example, from the Tumulus Forstwald 21 (Dobiat 1980, pl. 37: 9) of the Sulmtal necropolis.

In this context it is necessary to mention a characteristic way of depositing spearheads in Southwestern Styria, because already V. Radimský, in the course of the excavation of Tumulus 21 of the Forstwald group, came across a burnt layer (bustum), where two iron spearheads were driven into the grown soil side by side, with the tips downwards (Radimský 1883, 122). A comparable deposition of the lance tip(s) is also present by the specimens from graves Forstwald 50 and 51 (Dobiat 1980, 62, 63).

The second iron object is a phalere-like disc (Pl. IV: 6) made of thin iron sheet with a slightly curved cross-section, which has a radial fine notch decoration on the upper surface. On the other side there is a mounting bracket with a button-shaped end. With regard to their shape or the possible purpose of use, comparable objects were published from the cemetery of Nova tabla, Slovenia. These are two fragmented round iron plates, once with central perforation, with diameters between 2.8 and 2.9 cm (Guštin *et al.* 2017, grave 48, 466 f., fig. 1510; 1511).

From the elaborately equipped graves of Magdalenska gora in Slovenia we know high quality metal belts, which besides the belt plates also have trimmings made of bronze, which, however, belong to a much later period than our specimens made of iron. The small metal discs, also decorated with radial notches, were mounted on the belt, and a bronze loop with an attached ring may also have been mounted on the disc (*Tecco Hvala/Dular/Kocuvan 2004*, mound 2, grave 13, pl. 24: 5, 6; mound 4, grave 1, pl. 64: 10).

Our warrior burial in mound 20 may be dated to phase NT IIa, i.e. Ha C2 based on the pottery and metal artefacts.

The eleven find spots of bones from burial mound number 20 probably belong to a medium-bodied and medium-robust man, who died between the age of 19 and 40. Some of the mostly milky-white to old white coloured bone remains (only two show blue-grey to milky-white colour) show iron oxide discolouration (*Renhart 2020*, 2, 3).

RESULTS

In the eastern part of Muskervastlwaldgroup in total 19 burial mounds could be expected regarding the LiDAR data. In the area of the woodworking, about eleven burial mounds had been suspected. Through the excavation, the remains of four tumuli have been documented.

The remains of Tumulus 15 and Tumulus 20 show a rectangular burial place with rounded corners, Tumulus 13 has an oval shape. Tumulus 18 has a round shape, so in fact, all common shape types of the Styrian-Pannonian group were recognized (*Teržan 2019*, 319–334), as we can see for example in the graveyard Masser-Kreuzbauer at Burgstallkogel (*Bernhard/Weihs 2003*, 17–24) or Nova tabla near Murska Sobota (*Tiefengraber 2019*, 410).

All researched graves of the Muskervastlwaldgroup are cremations and thus fit well into the known burial custom of the entire Styrian-Pannonian group, where no inhumation graves are tangible so far (*Tiefengraber 2019*, 410). The funeral rite is different and shows urn graves as well as cremation pouring, as it can be expected in the entire necropolis (*Dobiat 1980*, 47–52).

In Tumulus 18 are remains of a ceramic urn filled with separated or selected cremated bones, where the ceramic urn was dug into the ground without larger pit. Parallels to such way of burying the urn can be found in the Sulmtal necropolis with the graves Hörschusterwald 6 and 27, Forstwald 19, and Leitengritschwald 2, 56 and 138 (*Dobiat 1980*, table 1) as well as in Nova tabla, graves 75 and 90 (*Guštin et al. 2017*, 144, 146).

In Tumulus 20, a cremation pouring in a pit, which contains a mixture of ash and bones, was excavated, which is comparable with Tumulus 201 in the graveyard of Frög (*Ebner-Baur 2020*, 371–377). The partially preserved remains of grave 13 also point to a cremation pit grave, but a comparison is not made due to the advanced state of destruction. A cremation pouring with unseparated bones has been documented in Tumulus 15. Tumulus 15 shows a burial pit filled with shattered pottery and cremated remains, with a rectangular container, probably made of organic material, laid over it, which is also filled with broken pottery. In this context, it must be assumed that pottery and metal objects were deliberately destroyed in the course of burial (*Dobiat 1980*, 63).

The present remains of cremation bones are all incompletely preserved, fragmented to a very small pieces and indicating very high combustion temperatures over 650–700 °C due to their colouration and degree of combustion. Overall, these factors indicate a very intense and extensive burning rite. The identified bone fragments allow conclude on rather ‘accidental’ or even careless picking up of the bone remains from the funeral pyre (*Renhart 2020*, 3).

The collection of pottery found in the burials includes conical neck and collar rim vessels, as well as single-handled rim bowls, handle cups and barrel-shaped pots, with the vessel remains always ending up in the cremation pits more or less fragmented and severely burnt by secondary incineration.

The ornamental and decorative elements show the typical spectrum of (Late) Hallstatt forms in the Sulmtal necropolis, but also in the Styrian-Pannonian Group, with channelling, knobs, dents, and red and graphite painting. Two special forms, the spouted vessel and the hanging vessel, which are rare in the Southeastern Alps, are of particular interest from Tumulus 15.

The burials in Tumulus 13, 18 and 20 yielded metal objects that may have been dress accessories or gender-specific objects. In addition to Tumulus 13, which yielded a rod-shaped bead and fragments of

fine bronze necklaces, the urn grave in Tumulus 18 should be mentioned. It yielded three pieces of iron coupling rings and an iron knife with a handle.

Tumulus 20 can be regarded as a warrior burial, in which a small round iron belt item was found in addition to an iron spearhead deposited vertically at the bottom of the pit.

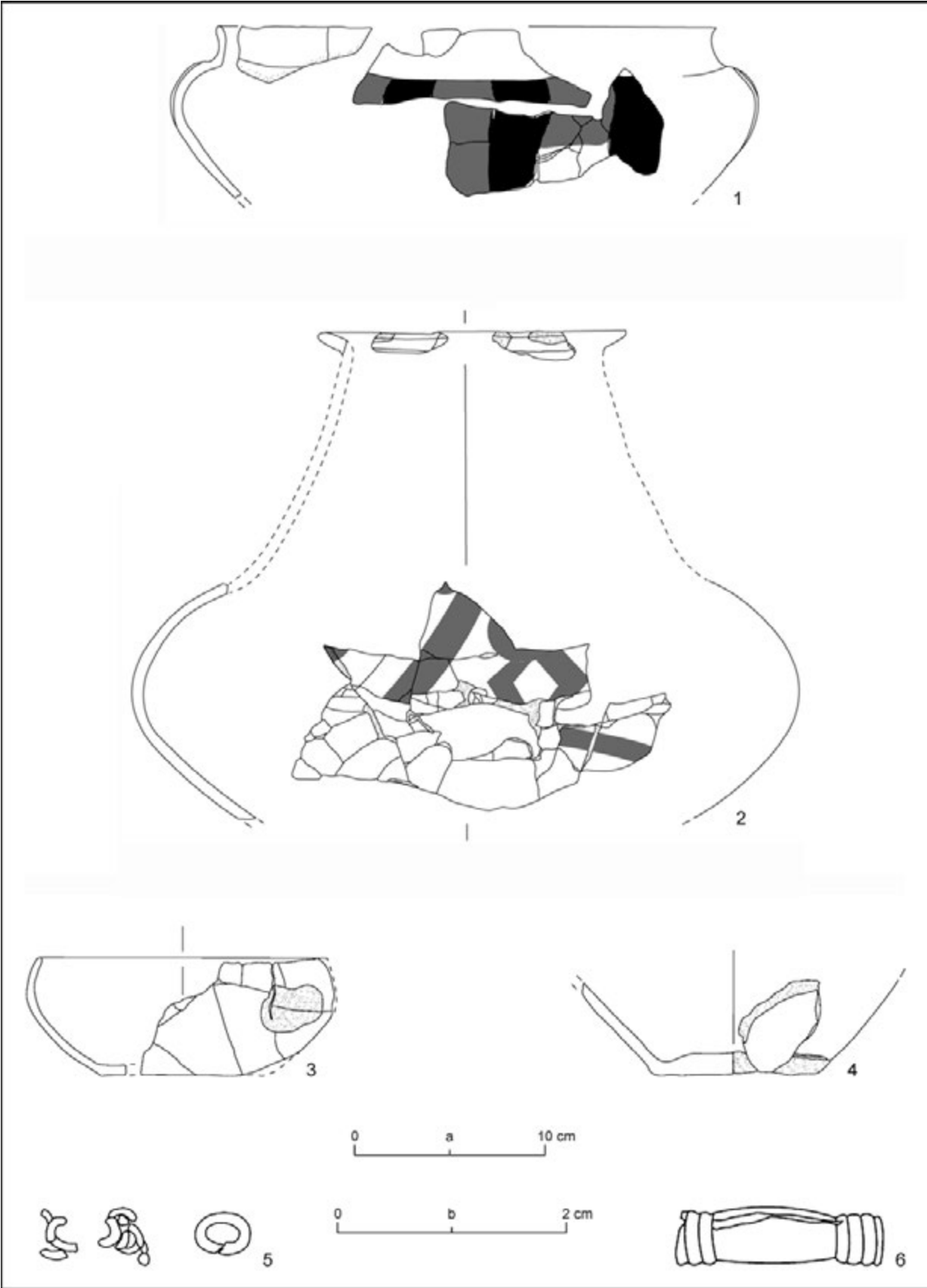
The finds of the Muskervastlwald group have, as has been shown, good analogies within the Sulmtal necropolis in the Grellwald, but also in the Forstwald group. Naturally, there is also a good comparability with other cemeteries of the Styrian-Pannonian group, such as in Nova tabla near Murska Sobota (Guštin *et al.* 2017, 81–99, 126–148, 416–537; Tiefengraber 2019) or in Hoarachkogel/Novine near Spielfeld (Črešnar/Vinazza 2019, 465).

Some objects testify to wide cultural contacts with the surrounding areas – e.g. spouted vessels have analogies in Statzendorf (Rebay 2005, 106, 107) and as such point to the Kalenderberg culture.

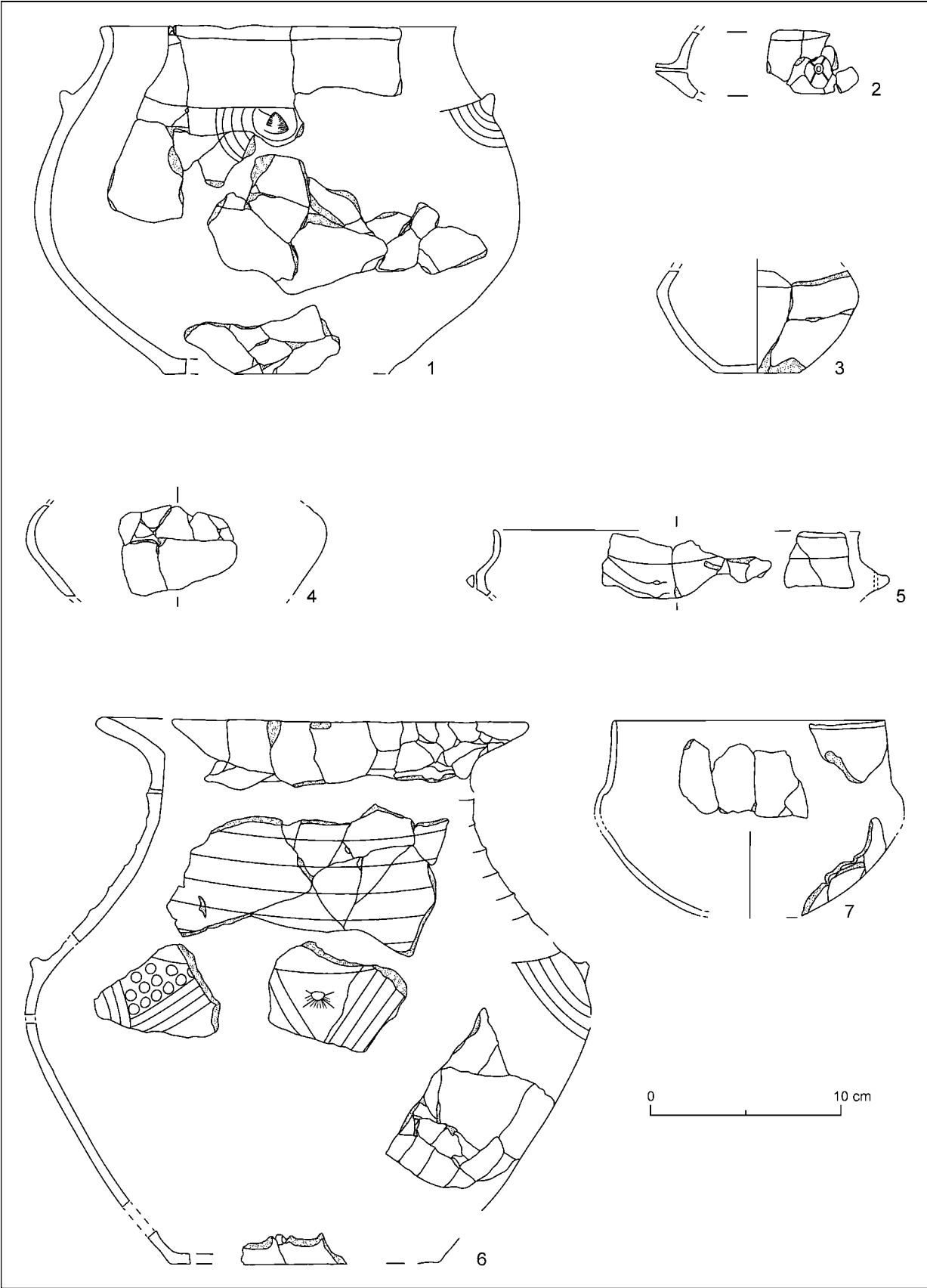
Other finds point to the direction of the Inner Alpine Carinthian area, where comparisons can be found in Frög-Rosegg, as shown by the funeral rite of Muskervastl 20 and Frög mound 201 (Ebner-Baur 2020, 371–377). Also, with regard to specific finds like the bronze rod bead (Ebner-Baur 2020, 142, Cat. No. 85, fig. 92), further relations to the Inner Alpine area, can be shown.

On the basis of the old finds published by C. Dobiat (1980, 217, Cat. Nos. 66, 67, 288, pl. 31: 1, 2) and the excavation results, an occupation period from Ha C1 to the main occupation stage Ha C2 (phase NT IIa) as well as the transitional horizon Ha C2/Ha D1 (phase NT IIb) can be assumed defined at the cemetery.

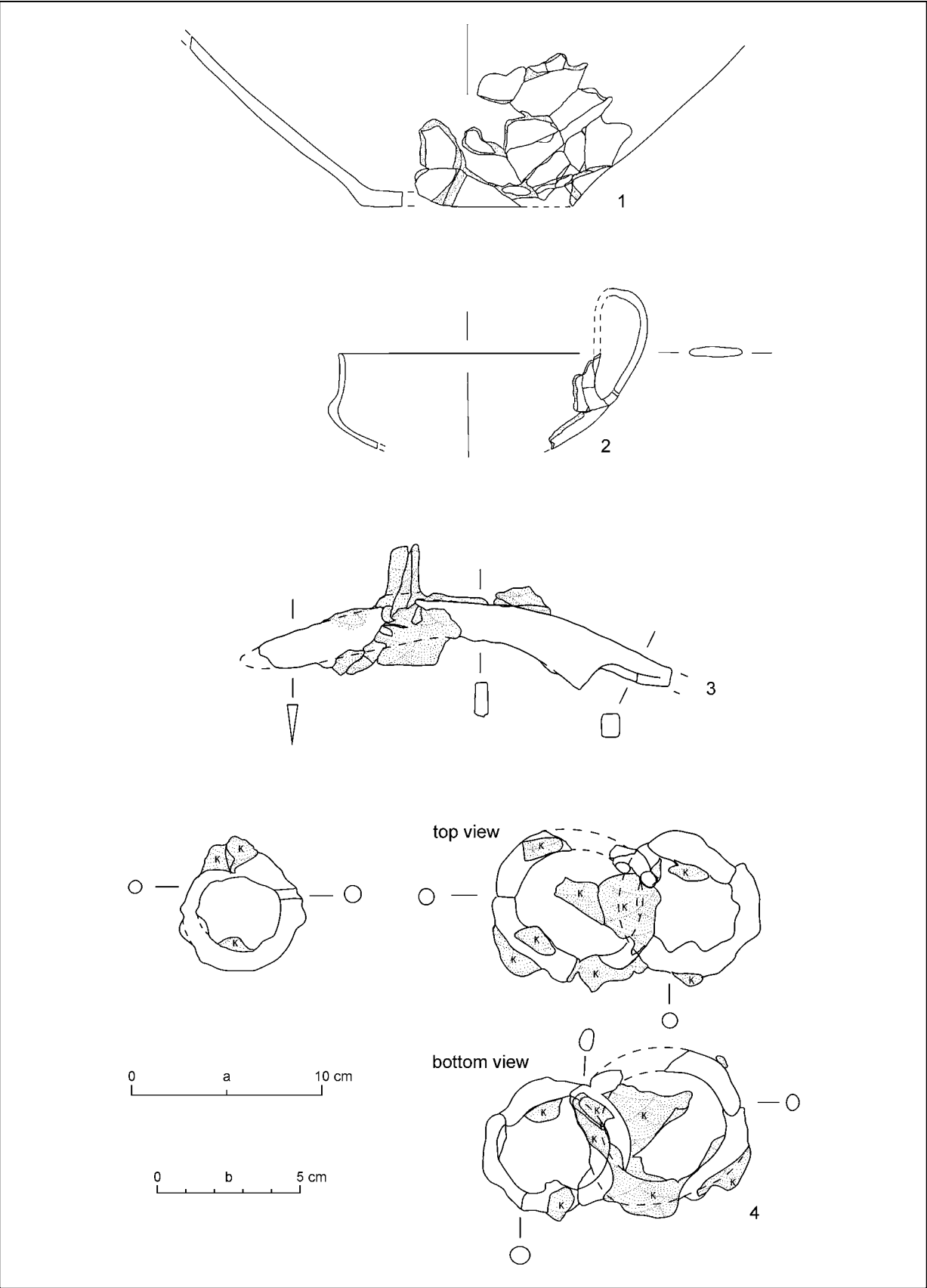
The topographical situation of the Muskervastlwaldgroup indicates, correlated with the chronological assignment of the graves found, also a horizontal stratigraphy of the Sulmtal necropolis. The earlier graveyards like the Masser-Kreuzbauer, Höschuster or Leitengritschenwald are located near the settlement zone of the hilltop settlement Burgstallkogel. With the progressive occupation of the grave fields, new groups were established further and further down the Burgstallkogel. In addition to the Forstwald and Grellwald groups, these now also include the Muskervastlwald group as well as the separate princely graves on the Pommerkogel (Egg/Kramer 2016, 53–180) and Kröllkogel (Egg/Kramer 2015).



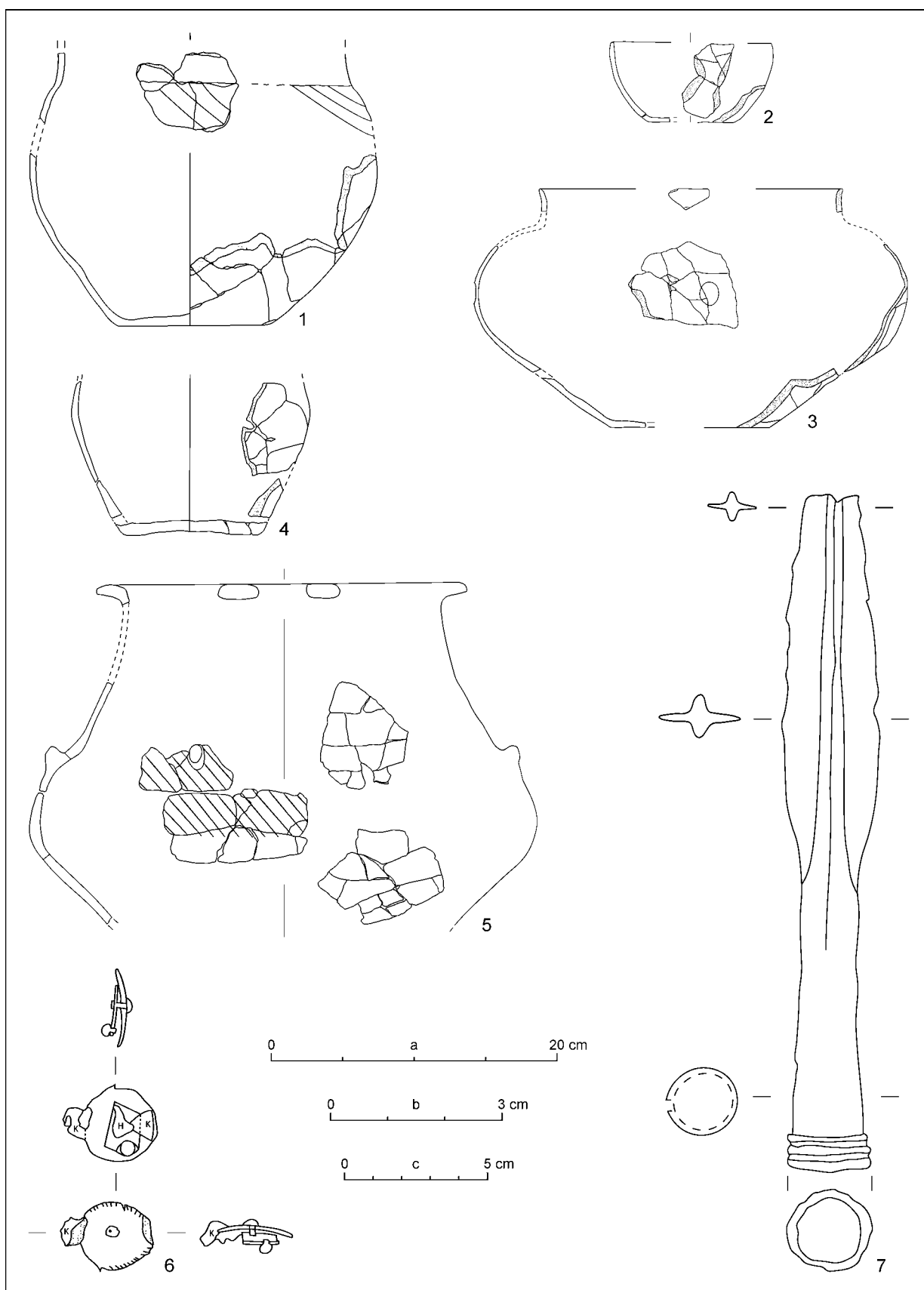
Pl. I. Muskervastlwald, Tumulus 13. 1–4 – pottery, 5, 6 – bronze objects. Drawings V. Vidoz; graphics F. Mauthner. Scale: a – 1–4; b – 5, 6.



Pl. II. Muskervastlwald, Tumulus 15. Pottery. Drawings V. Vidoz; graphics F. Mauthner.



Pl. III. Muskervastlwald, Tumulus 18. 1, 2 – pottery, 3, 4 – iron objects. Drawings V. Vidoz; graphics F. Mauthner. Scale: a – 1, 2; b – 3, 4.



Pl. IV. Muskervastlwald, Tumulus 20. 1–5 – pottery, 6, 7 – iron objects. Drawings V. Vidoz; graphics F. Mauthner. Scale: a – 1–5; b – 6; c – 7.

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Výskum pohrebiska Muskervastlwald v blízkosti polohy Burgstallkogel v Kleinkleine v Štajersku (Rakúsko)

Florian Mauthner – Andreas Bernhard

Súhrn

Výskum skupiny mohýl Muskervastlwald Spolkového pamiatkového úradu sa realizoval v roku 2018 v súvislosti s lesnými prácami. Výskum sa uskutočnil prvýkrát od výskumu W. Radimského v 19. storočí na doteraz málo známom pohrebisku a identifikovali sa štyri hroby.

Typy hrobov zodpovedajú bežným žiarovým hrobom a urnovým hrobom na sulmtalskej nekropole.

Rovnako aj nájdený keramický materiál, ako sú nádoby s kónickým hrdlom, nádoby s golierovým okrajom alebo misy so zatiahnutým okrajom, ako aj výzdoba a kovové artefakty zodpovedajú tvarosloviu štajersko-panónskej skupiny, pričom najbližšie paralely sa, prirodzene, nachádzajú v rámci pohrebných skupín v okolí Burgstallkogelu, najmä v skupine Forstwald a Grellwald, ale aj na pohrebisku Nova tabla v Slovinsku.

Na kontakty s okolitými kultúrnymi skupinami doby železnej poukazujú na jednej strane sacie nádoby známe v kalendarberskej skupine, na druhej strane analógie z pohrebiska Frög-Rosegg, a možno zistiť aj paralely na lokalitách vo vnútroalpskej oblasti.

Obdobie používania pohrebiska v Muskervastlwalde začína vo fáze HC1, ktorú možno definovať na základe nálezov publikovaných C. Dobiatom (1980, 217, kat. č. 66, 67, 288, tab. 31: 1, 2). Hlavná fáza pochovávania nastala vo fáze HC2 (fáza NT IIa) a pohrebisko sa používalo do prechodného horizontu HC2/HD1 (fáza NT IIb), čo dokumentuje predovšetkým nálezový materiál z mohýl 20 (HC2) a 15 (HC2/HD1).

Obr. 1. Pohrebiská v okolí Burgstallkogelu pri Großkleine. 1 – skupina Forstwald; 2 – skupina Kaiserschneiderwald; 3 – skupina Tschoneggerfranzwald; 4 – skupina Ofenmacherwald; 5 – skupina Höschusterwald; 6 – Tschoneggerfranzl, mohyla 2; 7 – Kürbischhansl, mohyla; 8 – Masser-Kreuzbauer; 9 – skupina Grellwald; 10 – skupina Haiblawald; 11 – skupina Leitengritschwald; 12 – skupina Karnerwald; 13 – skupina Muskervastlwald; 14 – Pommerkogel; 15 – skupina Precklwald; 16 – Hartnermichlkogel 1 a 2; 17 – Kröllkogel. Podľa Mele 2012, obr. 1. S láskavým dovolením Marka Meleho, UMJ.

Obr. 2. Muskervastlwald. Situačný plán mohýl. Grafika F. Mauthner. Legend: a – skúmané mohyly; b – neskúmané mohyly; c – skúmaná oblasť; d – parcely.

Obr. 3. Muskervastlwald. Štruktúry v rámci mohýl. Grafika F. Mauthner.

Obr. 4. Muskervastlwald. Mohyla 13, plán. Grafika F. Mauthner. Legenda: a – hrobová jama; b – spálené kosti; c – keramika.

Obr. 5. Muskervastlwald. Mohyla 15, plán. Grafika F. Mauthner. Legenda: a – keramika; b – keramika v schránke; c – uhlíky; d – hrobová jama.

Obr. 6. Muskervastlwald. Mohyla 18, plán. Grafika F. Mauthner. Legenda: a – spálené kosti; b – keramika.

Obr. 7. Muskervastlwald. Mohyla 20, plán. Grafika F. Mauthner. Legenda: a – keramika; b – uhlíky.

Tab. I. Muskervastlwald, mohyla 13. 1–4 – keramika, 5, 6 – bronzové predmety. Kresby V. Vidoz; grafika F. Mauthner. Mierka: a – 1–4; b – 5, 6.

Tab. II. Muskervastlwald, mohyla 15. Keramika. Kresby V. Vidoz; grafika F. Mauthner.

Tab. III. Muskervastlwald, mohyla 18. 1, 2 – keramika, 3, 4 – železné predmety. Kresby V. Vidoz; grafika F. Mauthner. Mierka: a – 1, 2; b – 3, 4.

Tab. IV. Muskervastlwald, mohyla 20. 1–5 – keramika, 6, 7 – železné predmety. Kresby V. Vidoz; grafika F. Mauthner. Mierka: a – 1–5; b – 6; c – 7.

Text translated by the authors

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WHAT IS HIDDEN BENEATH THE EARTHEN MANTLES OF EARLY IRON AGE BARROWS AT THE FRINGES OF THE EASTERN ALPS?

Recent Results from Geophysical Prospections at Poštela (NE Slovenia)

Branko Mušič – Barbara Horn – Matija Črešnar

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Keywords: Poštela archaeological complex, Northeastern Slovenia, Early Iron Age, barrows, multi-method geophysical research, non-invasive investigations

The history of research on the Early Iron Age (EIA) hillfort of Poštela and its cemeteries began in the 19th century. One of the most popular targets for excavations were barrows, which are still being researched today. However, the research techniques and approaches have changed quite importantly. One of the most important changes has been a shift toward non- and low-invasive techniques, which have led to a number of important findings. The examples presented below highlight a number of case studies of barrow research from the Poštela archaeological complex near Maribor in Northeastern Slovenia. This is also where the first geophysical prospection of EIA barrows was carried out in 2006. However, the survey of a group of flattened barrows at Pivola, one of the cemeteries of the Poštela hillfort, was only the beginning of a long-term multi-method investigation of a number of barrow groups as well as several individual barrows in the area. Because the barrows are located in different natural environments and differ in their characteristics, continuous adaptations to the research approach were necessary, including the data acquisition and processing procedures required for archaeologically relevant interpretations.

INTRODUCTION

Early Iron Age (EIA) barrows, also called burial mounds or tumuli and occurring individually or in groups, characterise the cultural landscapes of Southeastern Alpine region and the Pannonian plain up to the present day. They are one of the most distinct remains of the EIA in the region, which stretches from the Eastern Alps all the way to the Danube River. As they are clearly recognizable in the landscape and often hold precious artefacts, they were among the first ‘targets’ of early antiquarians, collectors and the first established museums since the 19th century. Archaeological excavations, which were also born in that period, are still the most common way to research barrows, albeit the methods have undergone drastic evolution. However, geophysical methods, often combined with other non- or low-invasive methods, are increasingly gaining a reputation when it comes to investigations of EIA barrows. But what are the advantages of such research approaches, and what can be added to the information and knowledge gained by traditional research?

The examples presented below highlight a series of case studies of barrow research from the archaeological complex of Poštela near Maribor in Northeastern Slovenia. They share several characteristics, but also reveal a considerable diversity connected to their basic form, natural environment and their state of preservation. These techniques are therefore more than adequate to help sketch out the broad span of challenges we encounter when researching barrows in this way, although the examples are not representative of all possible scenarios.

Prehistoric archaeological contexts are, in general, the most delicate environments for effective geophysical research design. There is no unique strategy for field procedures applied for data acquisition nor for efficient processing flows required for archaeologically relevant interpretations. This is especially true for barrows. The effectiveness of a research design that is based on remote sensing methods and

applied to specific archaeological features, such as barrows, relies largely on the selection of geophysical methods. It depends on their ability to reveal relatively small, central or eccentric burial chambers of different sizes and construction techniques. Furthermore, they are covered by mantles of varying composition, which also reflect the geological peculiarities of their surroundings. Additional challenges are their size and shape, with often steep slopes. As most of the better preserved EIA barrows in the Štajerska region (Slovenian Styria) are located in forested areas, the overgrown surface of the barrows poses an additional hindrance for successfully obtaining measurements. All of the above is a guarantee that this is no easy task even for modern technologies, and routine, 'cookbook' strategies are in these cases often less effective.

Due to similar constraints, a wide range of geophysical methods have been used for exploration elsewhere: seismic (Forte/Pipan 2008, 2614–2623; Tsokas *et al.* 1995, 1735–1742; Vafidis *et al.* 1995, 119–128), resistivity mapping (Teržan/Črešnar/Mušič 2012, 17–58; Tonkov 1996, 209–217; 2008, 325–328), resistivity tomography (Mušič *et al.* 2015, 37–64; Papadopoulos *et al.* 2010, 192–205), ground penetrating radar (Forte/Pipan 2008, 2614–2623; Goodman *et al.* 2009, 479–508; Mušič/Črešnar/Medarić 2014, 19–47; Verdonck *et al.* 2009, 193–202), low frequency electromagnetic (Basar *et al.* 2020, 123–145; Bevan/Roosvelt 2003, 287–331; Mušič/Črešnar/Medarić 2014, 19–47), and magnetic (Bevan/Roosvelt 2003, 287–331; Gorka/Fassbinder 2011, 183–186; Mušič *et al.* 2015, 37–64; Osten-Woldenburg/Chaume/Reinhard 2002, 465, 466; Smekalova/Voss/Smekalov 2008). Each of the methods used has proven successful in certain circumstances, but there is (as yet) no universal solution to the approach of mound research.

POŠTELA ARCHAEOLOGICAL COMPLEX

The Poštela archaeological complex is centred around the Poštela fortified hilltop settlement, which occupies a strategic position, controlling the entire Drava-Ptuj plain, as well as the fringes of surrounding hills (Fig. 1). On the Habakuk plateau, just under the settlement, there were burials in flat cremation (urn) graves, as well as in barrows. The latter were arranged in two groups, namely the southern and the northern, stretching over two slightly sloping ridges. A series of individual barrows can be found on the slopes to the south-east of the settlement all the way to the lowlands. The largest group of barrows can be found at Pivola (Botanical Garden; Fig. 1; 2). It is, similar to the Habakuk barrow groups, associated with an urnfield (Črešnar/Vinazza/Mušič 2019, 439–448).

The research of the barrows on the Habakuk plateau (Fig. 1–3) began before the end of the 19th century and continued throughout the beginning of the 20th century. At least 15 barrows were excavated in that period, but, as expected, the data from these excavations is very scarce. Nevertheless, the study of the remaining finds and data led to an interesting conclusion, namely that the burials possibly belonged to two communities, who, judging by their grave goods, participated in different activities while alive (Teržan 1990, 55–70, 307–326).

The Pivola barrow group is located in the lowlands over 2 km air distance from the settlement. It is the largest closely joined barrow group belonging to the Poštela hillfort (Fig. 1; 2; 14; 15), although individual barrows in the surroundings and several notices of excavated barrows all the way from the mid-19th century onwards, point to possibly more lowland barrow groups.

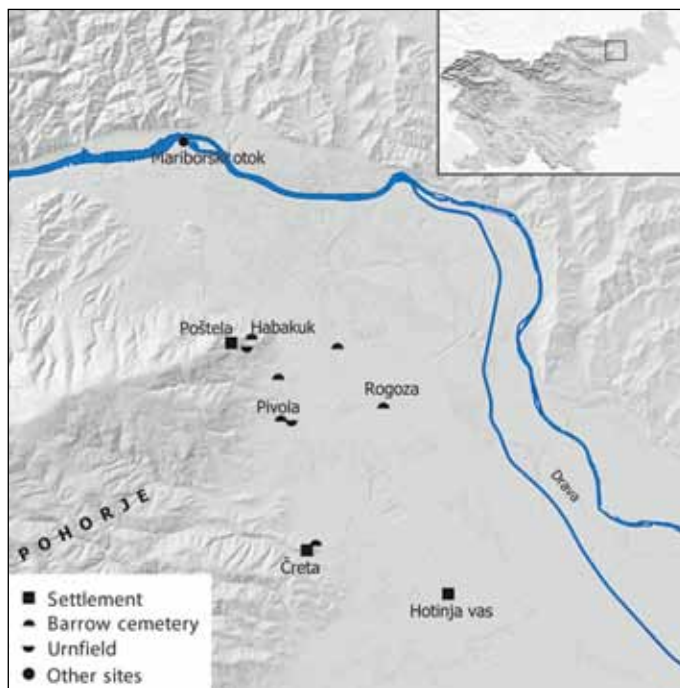


Fig. 1. Most important Early Iron Age sites between the Pohorje massif and the Drava River.



Fig. 2. Location of Poštela (near Maribor) archaeological complex, with Habakuk and Pivola cemeteries on LiDAR derived DTM (DTM by D. Mlekuž).

401–410; Teržan 1990, 326–329; Teržan/Črešnar/Kramberger 2021, 411–422; see also Teržan/Črešnar/Mušič 2015 61–82).

For this article, we are focussing on selected results of geophysical investigations on a number of barrows within the necropolises of Habakuk and Pivola (Fig. 1–4; 14; 15), once again elucidating some of our already published investigations (e.g. Teržan/Črešnar/Mušič 2015, 61–82). The present study is to be understood as a continuation of our research and a deepening of the topic.

As previous research has clearly shown, it is necessary to adapt the strategy of geophysical research to the size of the tumuli (especially the height and inclination of the slopes). Adjusted to the regional characteristics of barrows, our division consists of three groups: low (< 1 m), medium (1–3 m) and high (> 3 m; see Mušič/Črešnar/Medarić 2014, 19–47; Mušič et al. 2015, 37–64; 2018, 317–334).

GENERAL DESCRIPTION OF THE GEOPHYSICAL RESEARCH DESIGN AND ARCHAEOLOGICAL IMPLICATIONS

In recent years, our research on the Poštela complex has been primarily focused on non- and low-invasive research (Fig. 2–4; 14; 15). As will be discussed later, we used ALS, which provided us with a ‘base map’ for a better understanding of the broader landscape and for a more comprehensive correlation of all the existing data. Furthermore, we have conducted intensive multi-method geophysical surveys followed by surface verification of ALS, and only occasionally also conducting targeted small-scale excavations for verification of geophysical results (Fig. 3; Črešnar/Vinazza/Mušič 2019, 443–446, fig. 3; 5–7). Despite the non-/low-invasiveness of the approach, important new data were gained. One of the more important findings, which led to a series of new conclusions, was the recognition of circular ditches, surrounding most if not all barrows in all the cemeteries around Poštela. First identified during the ALS data analysis, it furthermore, in combination with geophysical measurements, provided a basis for recognizing the chronological sequences of barrows of the northern Habakuk barrow group (Fig. 4; 5), which is explained elsewhere (Črešnar/Vinazza/Mušič 2019, 445, 446, fig. 6).

It comprises over 80 barrows, which can be separated into three groups based on their preservation. The forested southern part is the most extensive. This area was only recently turned into an archaeological park and enclosed into the Botanical Garden of the University of Maribor. The barrows of this group look mostly undamaged (Fig. 14: A). There is another group of barrows to the north, which lies on the ground of a former military base and therefore a series of barrows were reshaped into earthen shelters (Fig. 14: B). Barrows even further to northeast are located on agricultural fields and are therefore almost unrecognizable (Fig. 14: C). This group of barrows was the most badly damaged, as stones from the burial chambers of some barrows were already ploughed away. This is partly evident in the fields, but even more so from ground penetrating radar (GPR) results (Fig. 17; 18). For this reason, rescue excavations were conducted on barrows 13 and 14 (Fig. 14; 15), both holding remains of EIA horseman. The more important of these two is barrow 14, which belonged to a highly-ranked male warrior-horseman (Strmčnik-Gulič/Teržan 2004, 217–238; 2021,

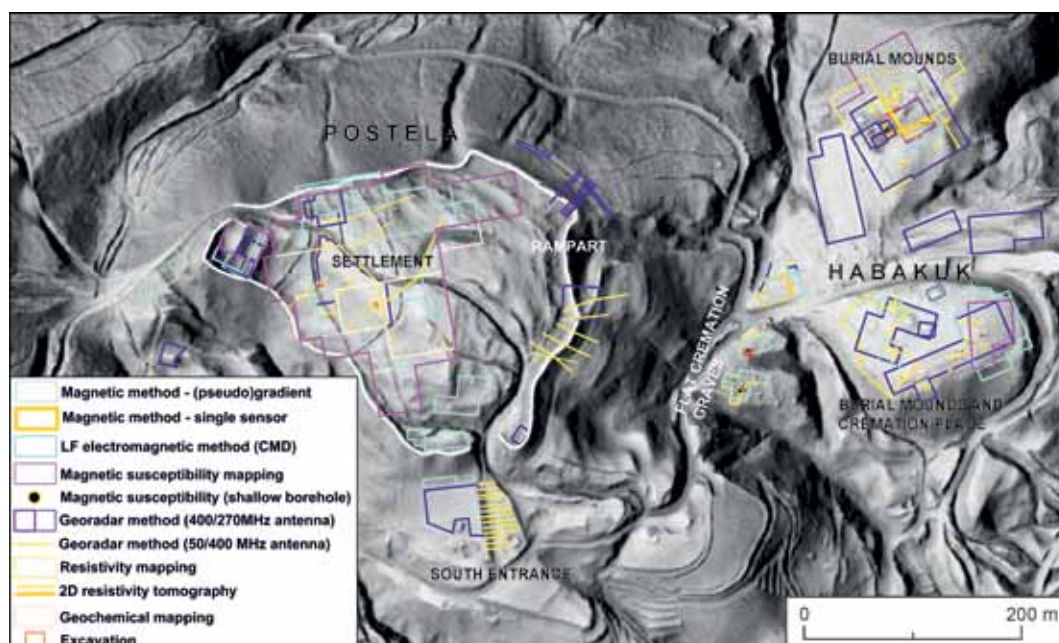


Fig. 3. Poštela hillfort and Habakuk cemetery. Geophysically surveyed areas, investigated by various geophysical methods, shallow drilling and trial trenching (see Fig. 2; DTM by D. Mlekuž; adapted from Mušič/Črešnar/Medarič 2014, fig. 2; Mušič *et al.* 2015, fig. 8).

In 2006, a geophysical survey, followed by archaeological excavations, was conducted for the first time in Slovenia as part of a rescue investigation of an EIA barrow. It was included in the research of barrow 13 of the cemetery at Pivola (Teržan/Črešnar/Mušič 2012, 17–58; 2015). Since this mound was later excavated, we were able to compare the results and find good agreement between the results of both approaches (see Mušič/Črešnar/Medarič 2014, 19–47; Teržan/Črešnar/Mušič 2007, 159, 160; 2012, 17–58; 2015, 61–82). The conclusions of this investigation provided a solid starting point for further geophysical exploration of other barrows, even though the very different circumstances required continuous additions to the approach. However, since then, geophysical methods have become one of the cornerstones of all further investigations on prehistoric necropolises with barrows (see e.g. Črešnar/Mlekuž 2014, 18–32). Different measurement methods were introduced step by step, and the results were compared to find the most suitable solutions for their integrated use and presentation.

Numerous barrows, ranging from slightly different geometric proportions and dimensions at the Habakuk necropolis to the extreme variability at Pivola, were a great challenge for us for the reasons described above. Our focus for this article is on barrow investigations in different circumstances, namely on smaller and medium-sized mounds on the Habakuk necropolis, located in a forested area, and on several smaller mounds at Pivola, located in the lowland agricultural zone. The latter were moreover partially damaged or even completely destroyed by ploughing.

Following the field conditions of each selected part of the Poštela complex, namely Habakuk and Pivola, various geophysical techniques were applied. We highlight the analyses of results from ground penetrating radar (GSSI SIR3000, 400 MHz antenna), magnetic method (Geometrics G-858, gradient mode), magnetic susceptibility (KM-7, SatisGeo), resistivity mapping (Geoscan RM15, twin probes array), and 2D resistivity tomography (ARES, GF Instruments; mostly dipole-dipole array). Surveys were conducted on a case-by-case basis, using the geophysical method best suited to the extent of the survey area, the expected potential for finds, and/or estimated efficiency. In this paper, we emphasise the somehow innovative research design for the geophysical exploration of EIA barrows.

The natural conditions in the northern part of the Pivola necropolis, partly extending into the agricultural zone, i.e. uniform geological composition of quaternary sandy clays with rare gravel intercalations (medium low magnetic susceptibility, medium resistivity and medium dielectric permittivity), are favourable for all applied geophysical techniques. On the contrary, the explorations of the southern part of Pivola necropolis within the Botanical garden, and the Habakuk northern barrow group were especially delicate and required adequate, site sensitive, multi-method approaches. The first one has a more chaotic

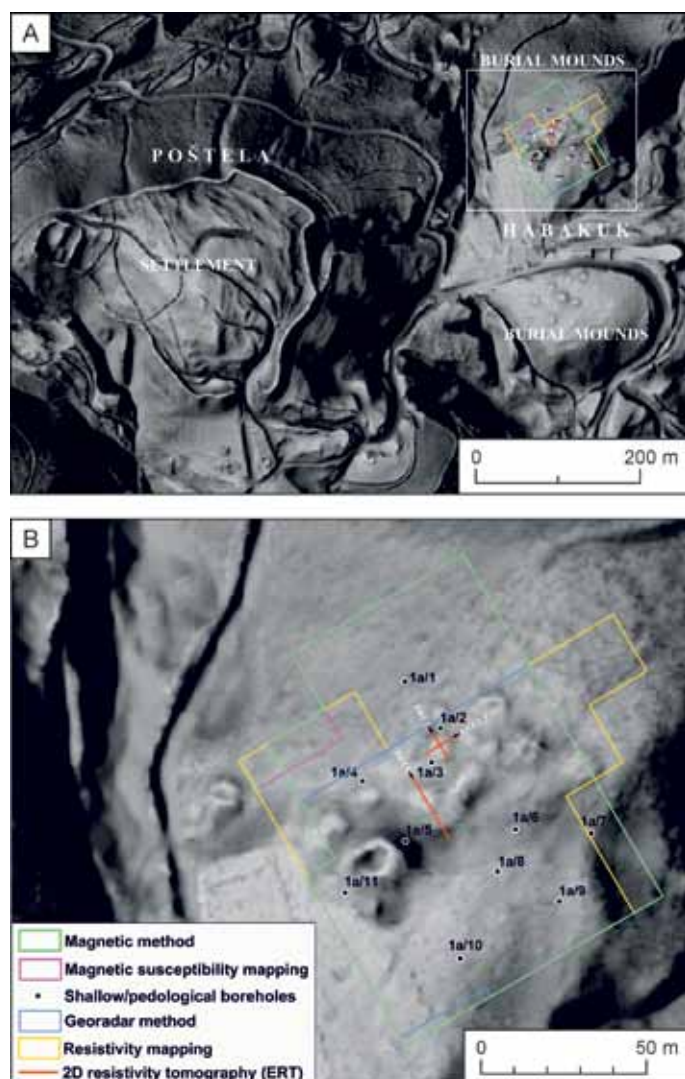


Fig. 4. Poštela hillfort and Habakuk cemetery (A). Northern part of the cemetery (B), investigated with magnetometry, GPR, resistivity mapping and selected profiles for 2D resistivity tomography (adapted from Mušič *et al.* 2018, fig. 1; 4).

3.5 ha within the Pivola necropolis and about 4 ha in selected areas of the Poštela settlement, as well as more than 2.5 ha in the necropolis with barrows on the Habakuk plateau were investigated. The ever-evolving multi-method approach included magnetic, GPR and low frequency electromagnetic methods, resistivity and magnetic susceptibility mapping, as well as 2D resistivity tomography profiles over barrows, fortifications, etc. (Fig. 2; 3; see also Medarić/Mušič/Črešnar 2016, 67–93; Mušič/Črešnar/Medarić 2014, 19–47; Mušič *et al.* 2013; 2015, 37–64; 2018, 317–334; Teržan/Črešnar/Mušič 2015, 61–82).

The magnetic method produced exceptionally meaningful results for the Habakuk and Pivola barrow groups. For magnetic prospections a total field magnetometer *Geometrics G-858* was used in gradient mode, which generally amplifies the weak magnetic anomalies of small structures at shallow depths in favour of long-wave anomalies caused by the geological background. Measurements of the apparent magnetic susceptibility (KM-7, SatisGeo) of samples of top soil revealed rather low values in the range between 0.05×10^{-3} SI and 0.9×10^{-3} SI (mean: 0.23×10^{-3}) at Habakuk and medium susceptibility values in the range between 0.39×10^{-3} SI and 1.01×10^{-3} SI (mean: 0.57×10^{-3} SI) at Pivola. These preliminary results show surprisingly significantly higher values at Pivola. The magnetic susceptibility variations created more complex magnetograms at Pivola than at Habakuk. Nevertheless, the induced magnetization at Pivola clearly shows the ring-ditches around barrows (Fig. 16). An archaeologically identical situation with ring-ditches around barrows is more clearly visible at Habakuk (Fig. 9). Besides ditches, other

geological composition with prevailing gravel sediments in quaternary deluvial and alluvial (proluvial) sediments (low magnetic susceptibility, high resistivity and high dielectric permittivity). The Habakuk plateau is characterized by hard geology composed of variable metamorphic rocks (low, medium to possibly high magnetic susceptibility, high to very high resistivity and medium to low dielectric permittivity). According to the geological map of the Geological Survey of Slovenia (Žnidarčič/Mioč 1988) and on-site observations (Rižnar 2011a; 2011b), the dominant stone type at the Poštela site is amphibolite metamorphic facies, which consist of rather weakly magnetic mineral assemblages. The prevailing minerals are hornblende and amphibole. Excavations have shown that quartzite inclusions in amphibolite bedrock are strong sources of negative magnetic gradients, while in places a high proportion of magnetite in amphibolite causes extremely strong positive gradients. All of these magnetic anomalies were erroneously attributed to archaeological remains at the beginning of the investigations. Therefore, the most appropriate research design was determined based on the previous geophysical results and the evidences from the various small-scale excavations still in progress.

A testing polygon was initially selected within the necropolis at Pivola to verify the reliability of the results using the data from the rescue excavation of barrow 13 conducted in 2006 (Teržan/Črešnar/Mušič 2007, 159, 160; 2012, 17–58; 2015, 61–82). In the meantime (2006–2022), more than

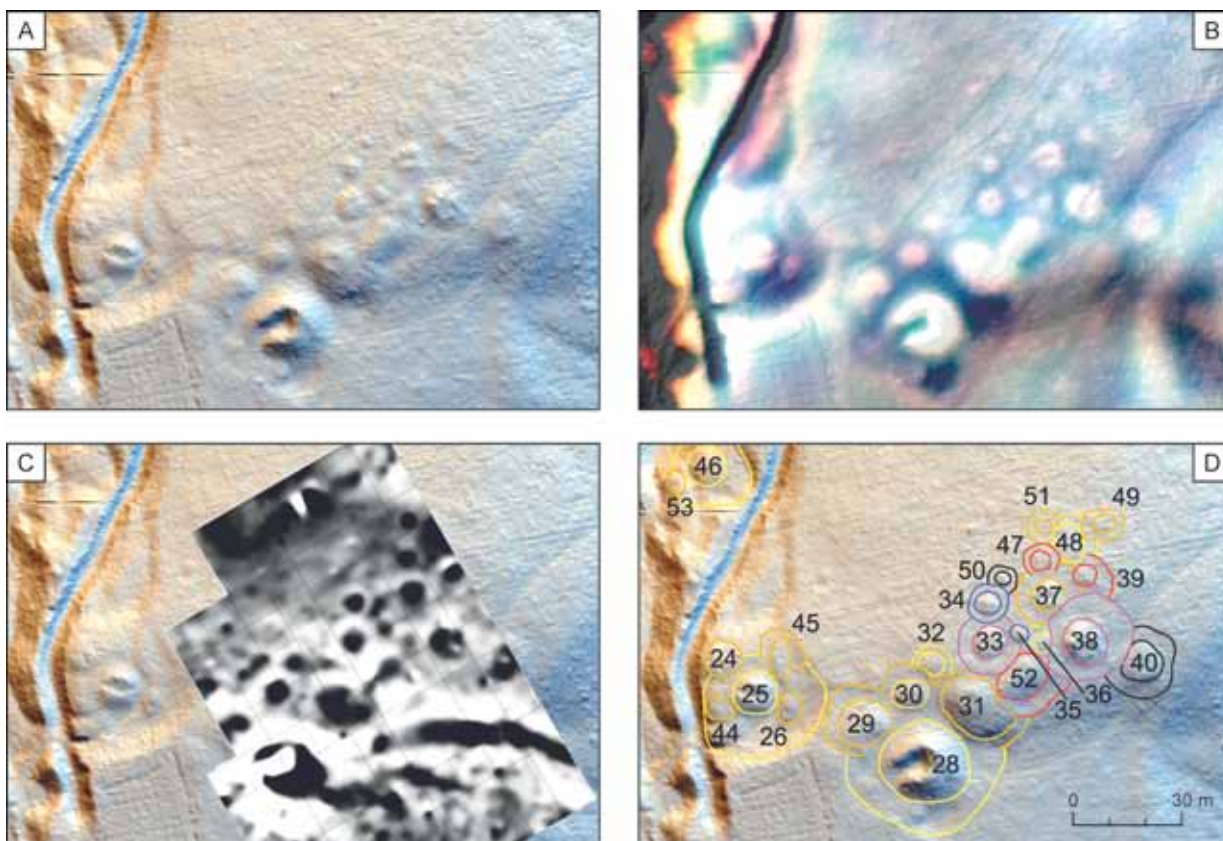


Fig. 5. Habakuk. The northern part of the necropolis. A – shaded DTM; B – local relief analysis (execution D. Mlekuž); C – results of magnetic measurements; D – ‘horizontal stratigraphy’ of a group of mounds with relative construction phases (sequence: yellow – orange – red – magenta – blue; black coloured mounds are not sufficiently dated; after Črešnar 2017, fig. 3; Črešnar/Vinazza/Mušič 2019, fig. 6).

archaeologically relevant magnetic anomalies and areas were identified on the basis of magnetic background variability. These can probably be interpreted as areas of different human activities within or in the immediate vicinity of the barrow groups.

A more reliable recognition of archaeologically relevant magnetic anomalies was assured by determining the deeper magnetic sources with a significant background noise reduction using the *Upward continuation* (Fig. 9: A, C, D; Mušič 2008, 53–67; Telford/Geldart/Sheriff 1990). Transformations like *Vertical derivatives* (Fig. 9: B) are opposed to the *Upward continuation*, and are normally used for the recognition of high frequency magnetic disturbances from sources close to the surface. High frequency spatial distribution of *Vertical derivatives* often corresponded to areas diffusely polluted by strongly magnetic iron minerals of archaeological, modern or natural origin. Due to the bipolar nature of the geomagnetic field, magnetic anomalies located away from the magnetic poles are asymmetric. In general, the *Reduction to the pole* transformation (RTP; see Martens et al. 2012, 84–93; Mušič 2008, 53–67, fig. 4; 8; Telford/Geldart/Sheriff 1990) significantly reduces the complexity of the distinctive bipolarity of induced magnetic anomalies. This transformation should be taken into account in areas with complex magnetic anomalies to reduce their bipolarity and enable more reliable interpretation. The first experiments at the Habakuk northern barrow group showed rather limited efficiency of the RTP on the ‘raw’ magnetograms in such specific conditions, and was instead applied together with the *Upward continuation* algorithm which made the magnetic interpretation easier and more exact (Fig. 9: E).

Ground penetrating radar (GSSI SIR3000, 400 MHz antenna), resistivity mapping (Geoscan RM15, Twin probes array) and 2D resistivity tomography (ARES, dipole-dipole array) were preferred methods to discover stone chambers in the central parts of the barrows. The selection of each method, or combination of methods, was based largely on the size of the mounds, their overgrowth and thus their accessibility for measurement, and the composition of the mound mantles, which was predicted based on the geological composition of the necropolis.

THE HABAKUK CEMETERY

Geophysical surveys were carried out in the wider surroundings of the Poštela archaeological complex in many separate areas, in a manner dictated by the specific circumstances related to the defined objectives, and with limitations due to the diverse and often changing environmental conditions. The manner of surveying depends on the scale, especially considering the demanding conditions of fieldwork and the range of techniques used. To illustrate the point, we have chosen the example of the northern mound group of the Habakuk necropolis (Fig. 3; 4). It provides a detailed insight into the complexity of the data obtained by geophysical surveys. It also shows the complementary nature of the data obtained by LiDAR scans and various geophysical methods, where these data were used for gaining insight into the evolution of the barrow group (Fig. 5; Črešnar 2017, 257–259; Črešnar/Vinazza/Mušič 2019, 445–447).

On the LiDAR derived DTM, the location of the entire group of barrows is so clear that even the smallest barrows can be recognized. It is located in an area that rises slightly above the immediate surroundings. On the north to northwest side, the plateau with the barrows gradually merges into a slope with a gentle incline, while to the northeast the plateau becomes a very gentle slope, which continues all the way to the lowlands and on which holloways testify to ancient communications (Mlekuž/Črešnar 2014). On the south or southeast side, the plateau drops steeply, with a height difference of several meters. From the south or southeast side, the difference in elevation between the viewer's location and the plateau with the mounds is clearly perceptible, and thus the plateau is also the central topographical feature of this area (Fig. 4: B).

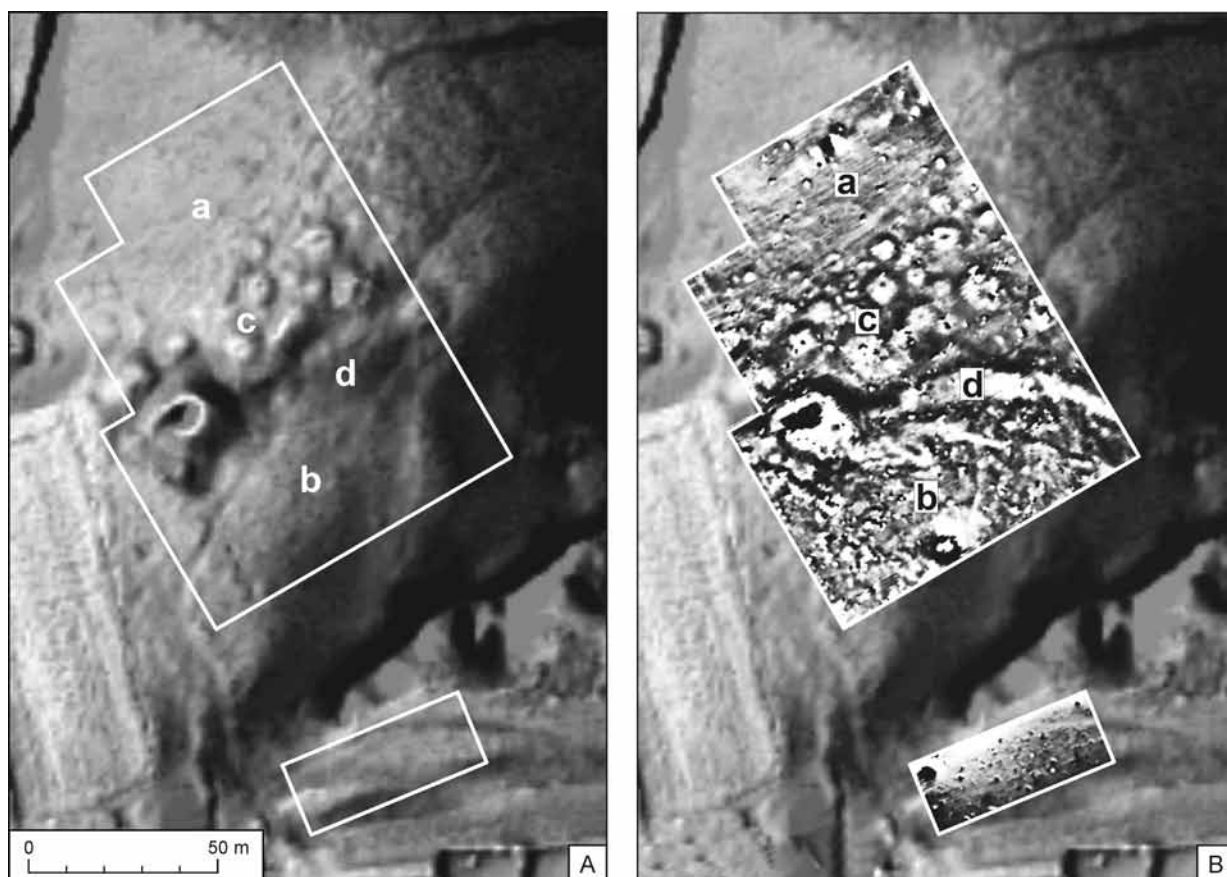


Fig. 6. Habakuk. The northern part of the necropolis, surveyed by the magnetic gradient method on DTM (A) and the magnetogram of the gradient of the total magnetic field (B). Magnetically 'silent' area (a), area with variable magnetic susceptibility of the upper soil layer (b), central part of the mound necropolis with circular ditches around barrows and some approximately roughly square shapes of possible central stone chambers (c), broad band with stronger magnetic anomalies of natural origin (d; adapted from Mušič *et al.* 2018, fig. 2).

Magnetic method and magnetic susceptibility measurements

Magnetic prospecting was carried out with a Geometrics G-858 magnetometer in (pseudo)gradient mode with a distance of 0.7 m between two vertically placed sensors, where the lower sensor was 20–30 cm above the ground, in the distance between parallel profiles 0.5 m.

The mantles of the mounds at the Habakuk necropolis are characterized by relatively higher magnetic field gradients than the immediate surroundings, while the magnetic gradients in the area of the circular ditches around the barrows, which were created during the extraction of soil for the erection of the mound, are slightly negative (Fig. 5: C; 6: B; 7: B; 9). Such archaeological forms are often preserved bellow the ground, even in cases where the body of the barrow has already been completely levelled with the surroundings due to interventions in modern times. In such cases, the research strategy and

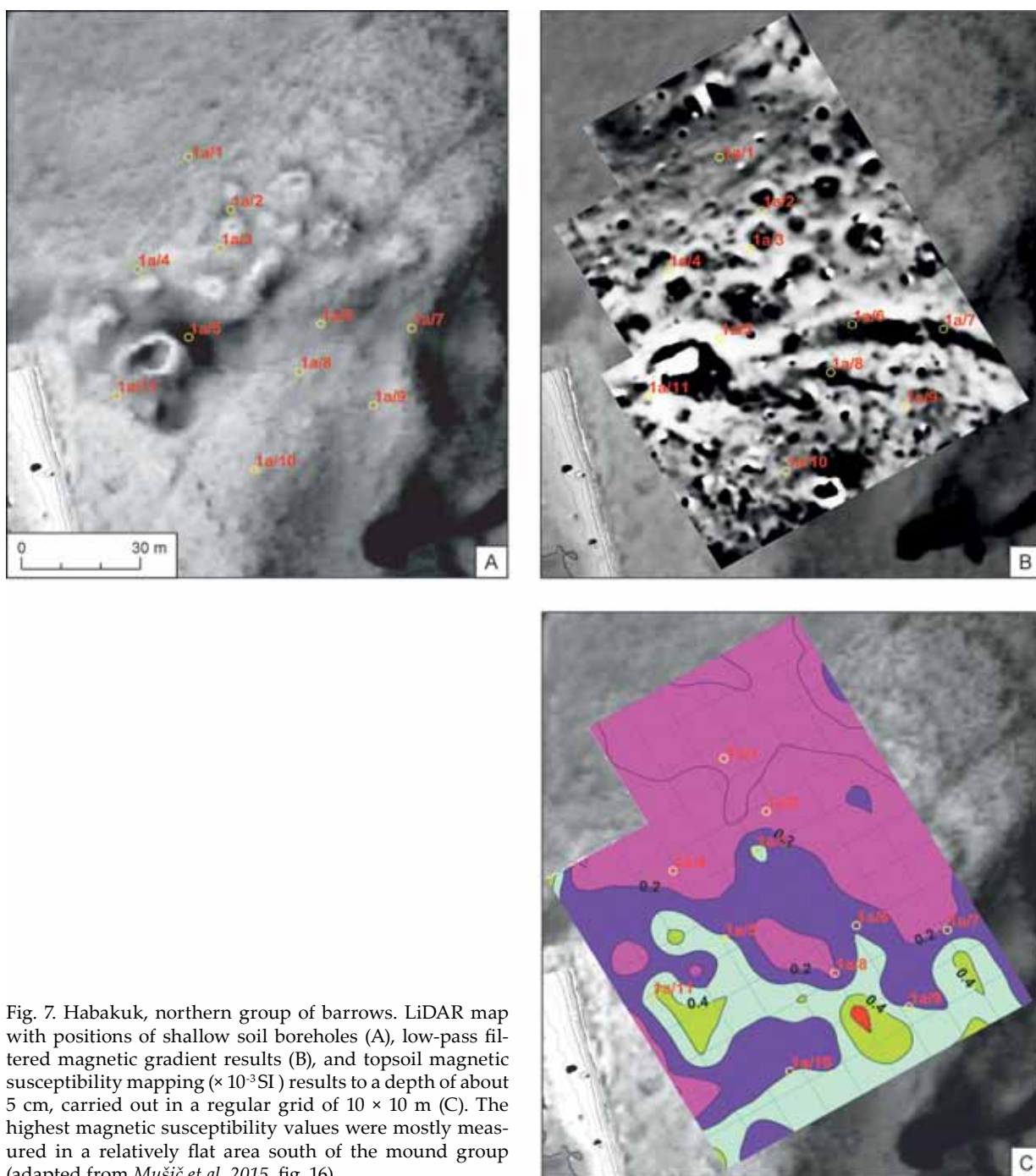


Fig. 7. Habakuk, northern group of barrows. LiDAR map with positions of shallow soil boreholes (A), low-pass filtered magnetic gradient results (B), and topsoil magnetic susceptibility mapping ($\times 10^{-3}\text{SI}$) results to a depth of about 5 cm, carried out in a regular grid of 10×10 m (C). The highest magnetic susceptibility values were mostly measured in a relatively flat area south of the mound group (adapted from Mušič *et al.* 2015, fig. 16).

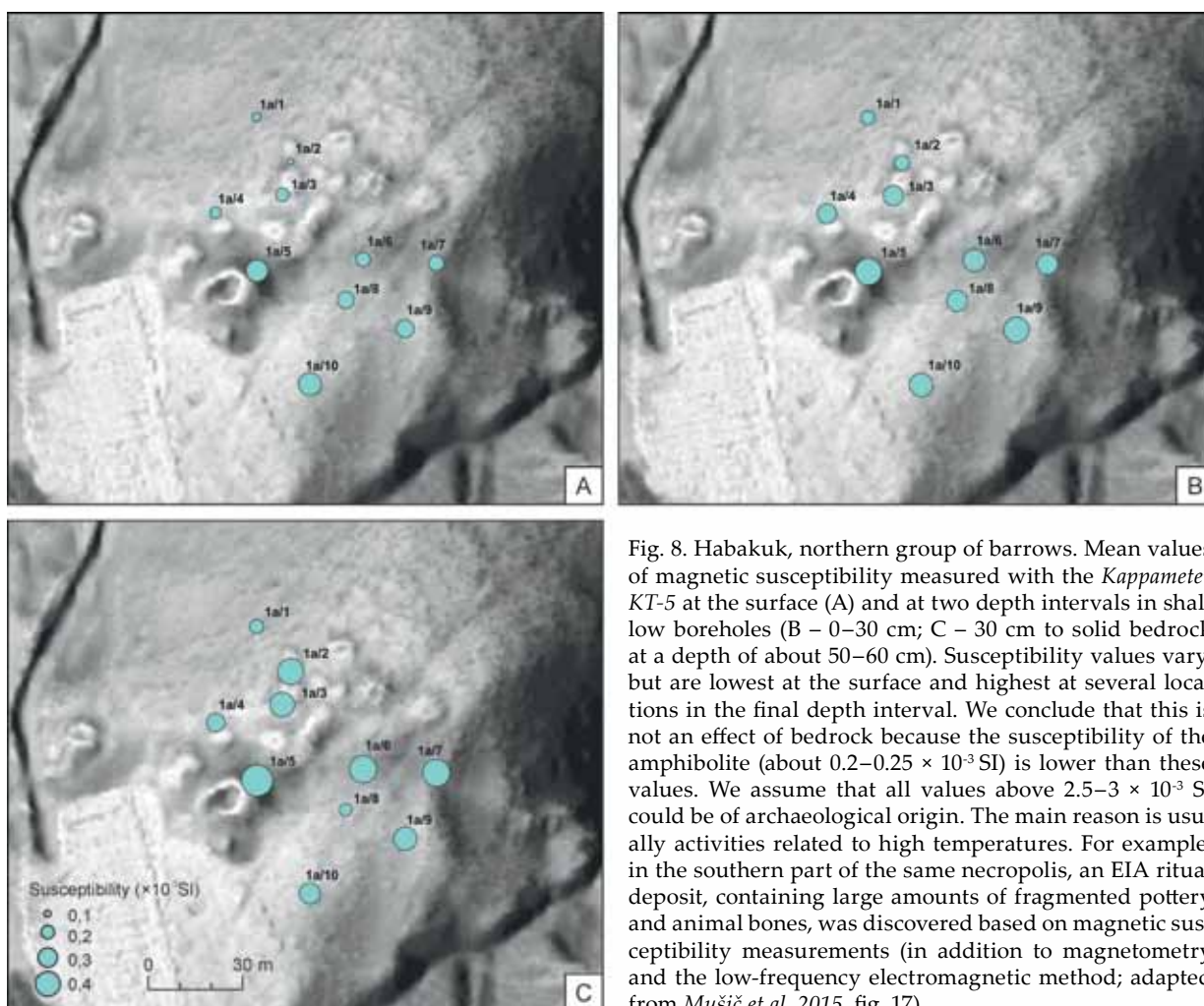


Fig. 8. Habakuk, northern group of barrows. Mean values of magnetic susceptibility measured with the *Kappameter* KT-5 at the surface (A) and at two depth intervals in shallow boreholes (B – 0–30 cm; C – 30 cm to solid bedrock at a depth of about 50–60 cm). Susceptibility values vary, but are lowest at the surface and highest at several locations in the final depth interval. We conclude that this is not an effect of bedrock because the susceptibility of the amphibolite (about $0.2\text{--}0.25 \times 10^{-3}$ SI) is lower than these values. We assume that all values above $2.5\text{--}3 \times 10^{-3}$ SI could be of archaeological origin. The main reason is usually activities related to high temperatures. For example, in the southern part of the same necropolis, an EIA ritual deposit, containing large amounts of fragmented pottery and animal bones, was discovered based on magnetic susceptibility measurements (in addition to magnetometry and the low-frequency electromagnetic method; adapted from Mušič *et al.* 2015, fig. 17).

the interpretation of the results, e.g. the magnetic method, do not differ from conventional procedures (Mušič *et al.* 2015, 37–64). The relatively rapid execution of measurements even in difficult environments, enables large areas to be covered in a relatively short time. This makes the magnetic method particularly effective for the delineation of necropolises by the identification of barrow perimeter/circular ditches alone (see e.g. Czajlik *et al.* 2016, 57–73; Osten-Woldenburg/Chaume/Reinhard 2002, 465, 466).

In general, the situation is entirely opposite, when the possibility of the magnetic method for central stone burial chambers recognition is under detailed inspection. Namely, stone made chambers are rarely clearly visible in the central part of barrows on the results of the magnetic method.

Contrary to this general statement, at the Habakuk necropolis there are more or less obvious in several places in the form of roughly square floor plans of relatively stronger positive gradients (Fig. 6: B; 7: B; 9).

All prominent magnetic anomalies in the immediate vicinity of barrows clusters are also very important. These may represent the magnetic effect of various remains associated with different funeral activities, etc. (see e.g. Mušič/Črešnar/Medarić 2014, fig. 16).

On the southern slope under the plateau with the mounds, the results of the magnetic method clearly show a 5 to 10 m wide bend of weakly positive magnetic gradients, which runs approximately in the east-west direction towards the largest barrow (Fig. 9: A: b). The magnetic gradient does not exceed 3 nT/m, which means that it can be a weak magnetic source at a shallow depth or a stronger source at a greater depth. It is an unusual form of magnetic anomaly, which we have not seen elsewhere in the area of the Poštela complex (see the explanation in the caption to Fig. 11).

Although the large ratio between the mantle volume and stone burial chambers often makes it difficult to identify their magnetic effect, in some cases it is still possible to observe anomalies that could indicate the contents of the mounds (Bevan/Rossvelt 2003, 287–331; Fassbinder *et al.* 2009, 59–61; Gorka/Fassbinder 2011, 183–186). Caution is required when interpreting the results of magnetic measurements,

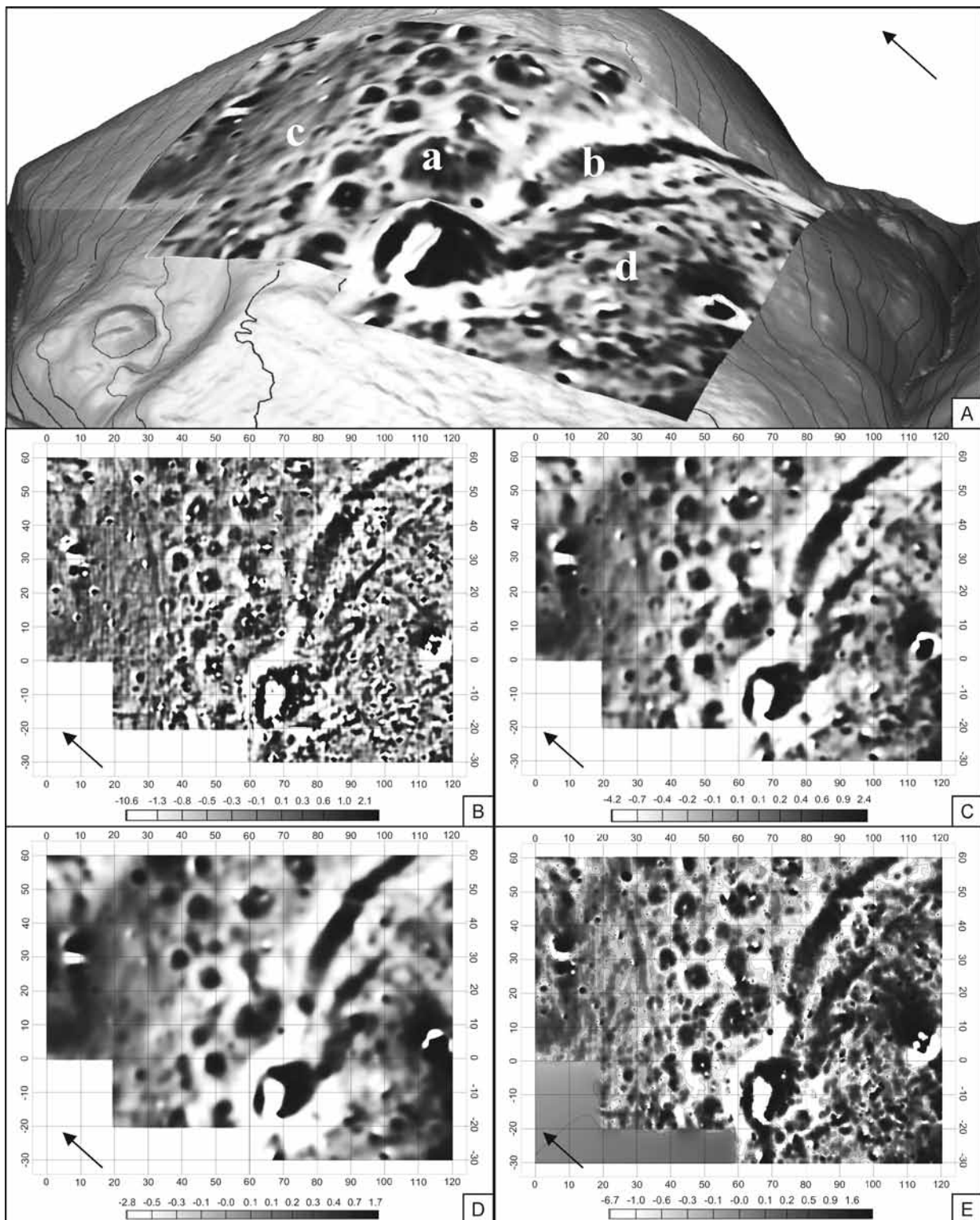


Fig. 9. Habakuk, northern group of barrows. Magnetic map on the LiDAR derived DTM for an arbitrarily selected 3D view of the magnetic response of the mounds after applying the *Upward continuation* algorithm (A). Advanced magnetic processing steps: *Vertical derivatives* (B), *Upward continuation* with recalculated magnetic anomalies at 0.75 m (C) and 1.5 m above the actual height of the magnetic profiles (D), *Reduction to pole* and *Upward continuation* 0.3 m above the actual height of the magnetic profiles (E). Central parts of barrows, surrounded by circular ditches with a diameter correlating with the barrows (a), wide band of relatively stronger magnetic anomalies of geological origin along the eastern edge of the topographic elevation with barrows (b), magnetically 'quiet' area (c), and area with variable magnetic susceptibility of possibly archaeological origin (d; adapted from Mušič *et al.* 2018, fig. 3; 10).

as the anomalies can be partly caused by the shape of the mound. Without understanding the effect of topography, we can reach premature conclusions about the archaeological structures in the central part of the mound. The topographic effect increases strongly with the slope of the mound, less so with its height, so that the effect is much more pronounced for smaller mounds with a steep slope (Bevan/Roosvelt 2003, 287–331; Smekalova/Bevan 2002). The small height of the mounds, on the other hand, means that potential chambers and other burial structures are located closer to the surface. This increases the possibility that, in cases where there are sufficient differences in susceptibility between the material in the mound fill and the rock material of the burial chambers, we can actually identify them with magnetometry (see Mušič *et al.* 2018, 317–334).

The data on the relatively low magnetic susceptibility of amphibolites, metamorphic rocks forming the eastern part of the Pohorje Mountain (Rižnar 2011a; 2011b; Žnidarčič/Mioč 1988), are important for the magnetic exploration of the barrows of the Habakuk necropolis. The apparent magnetic susceptibility (KM-7, SatisGeo) of the upper part of the strongly weathered amphibolite is at most 0.3×10^{-3} SI. The highest values of the magnetic susceptibility of the silty layer above the weathered amphibolite are about 0.45×10^{-3} SI. Such a small difference in magnetic susceptibility between soil variations and rock material, from which the burial chambers in the mounds were also built, did not give much hope for their identification on magnetograms (Mušič/Črešnar/Medarić 2014, 19–47; Mušič *et al.* 2015, 37–64).

Despite the small measured differences in magnetic susceptibility between soil and bedrock, the results of magnetic measurements were useful for reliable archaeological interpretation (Fig. 5). The results of the gradient measurements of the magnetic field gave good results regarding the circular ditches, which were also recognized in the analysis of the LiDAR data (Črešnar/Mlekuž 2014, 18–32) and possibly also some stone chambers (see Mušič/Črešnar/Medarić 2014, 19–47; Mušič *et al.* 2015, 37–64; 2018, 317–334).

The circular ditches are already clearly visible on the displays of the 'raw' values of the gradient measurements (Fig. 6: B; 7: B) and after the application of the *Upward continuation* algorithm (Fig. 7: B; 9: C, D). With regards to identifying possible stone burial chambers in the central parts of the mounds, we have to compare the results of different processing steps, whereby we also introduced the calculation of *Vertical derivatives*, which slightly emphasizes lateral changes in magnetic anomalies (Fig. 9: B) and *RTP transformation*, which reduces bipolarity of magnetic anomalies (Fig. 9: E). In some places, approximately square shapes can be seen fairly clearly in the central parts of the mounds. This suggests that it is most likely the magnetic response of stone burial chambers, but such an interpretation requires caution. Such shapes can also be the result of the shape of the mounds, the heterogeneous composition of the mantle, and/or the diverse archaeological remains in the central part of the mound. In addition to the induced magnetization in the areas of stone chambers, remains with a relatively stronger thermoremanent magnetization can also be expected (ceramic pots and burnt clay), which, in addition to other factors already mentioned, visually change the original magnetic response of the chamber.

If we summarize the findings, it appears that in the analysis of the northern group of mounds on Habakuk, we can recognize at least five phases of the expansion of the burial ground, while some mounds cannot be precisely placed due to their poor relationships with other mounds. Confirmation that our analysis is going in the right direction is also the fact that we can identify mound 38 (Fig. 5) as one of the youngest mounds, in which a female person with a rich bronze costume was buried, according to which we can date it to the last phase of the settlement of Poštela in the Early Iron Age or Ha C2/Ha D1 (Teržan 1990, 66–70, pl. 61).

Ground penetrating radar method

The results of the GPR method using a 400 MHz high-frequency antenna (Fig. 10), were quite similar to those obtained by geoelectric resistivity mapping described in next chapter (Fig. 12). The strongest GPR reflections were measured on the mounds, which we interpret as effects of the rock composition of the mound mantles and possibly partly also the effect of central stone chambers. The distinct GPR signals occur frequently also in the spaces between the mounds, which is mostly consequence of a solid bedrock at a depth of less than 1 m (Fig. 10).

Besides the dominating archaeological topics, we are also interested in the explanations of some archaeologically relevant natural phenomena that can be understood from the results of geophysical research. One of them is the plateau on which the mounds were placed. The mound necropolis is located on an amphibolite plateau that rises several meters above the immediate surroundings. The assumption is that it was most likely a tectonically uplifted amphibolite block. The rapid lateral transition in the solid

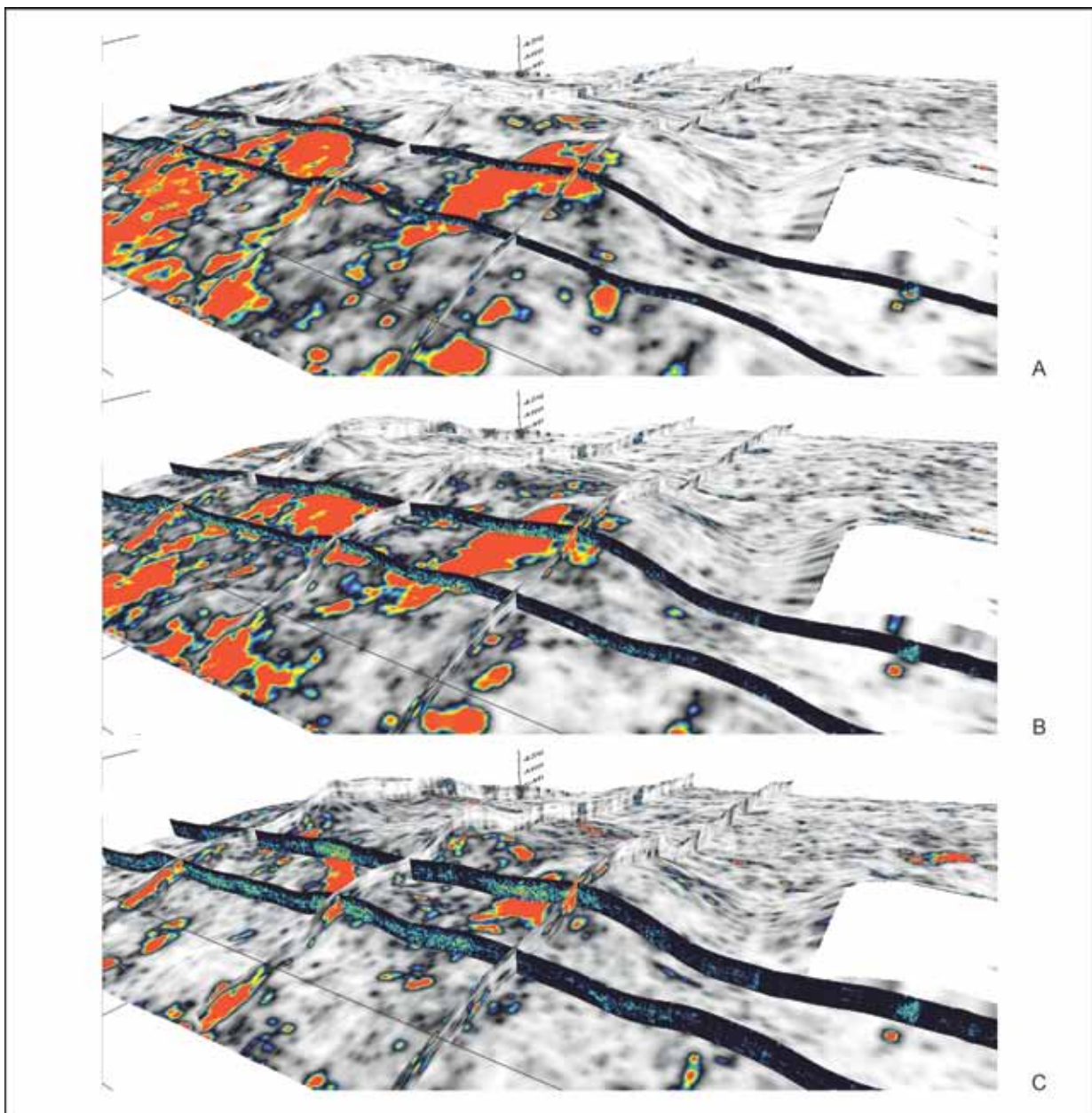


Fig. 10. Habakuk, northern group of barrows. 3D representation of GPR signals recorded with a 400 MHz antenna on LiDAR derived topography at three depth intervals. A – 0–0.5 m; B – 0.5–1 m; C – 1–1.5 m. Relatively strong GPR reflections were measured both above and between the barrows (view from the northwest; adapted from Mušič *et al.* 2015, fig. 11).

bedrock on the east side of the plateau is very evident on the magnetic (Fig. 11: MAG) and GPR results (Fig. 11: GPR).

Using the GPR method, we examined the eastern steep edge of the plateau with the mounds (Fig. 11: DEM and GPR) for a possible step between the bedrock and sediments deposited as a mass flow adjacent to the plateau where the mounds are located. On the horizontal slices of the GPR signals, this boundary of solid bedrock is very evident at depths between 1 and 2 m (Fig. 11: GPR). Strong GPR echoes at the bedrock edge correspond to a broad band of magnetic anomalies, confirming their natural origin (Fig. 11: MAG). Throughout the south-eastern half of the study area, the absence of GPR reflections is due to attenuation of GPR signals in gravitationally transported fine-grained material or colluvium. We were interested in the explanation of all these consistent findings, which we further supported with ERT measurements (Fig. 11: ERT).

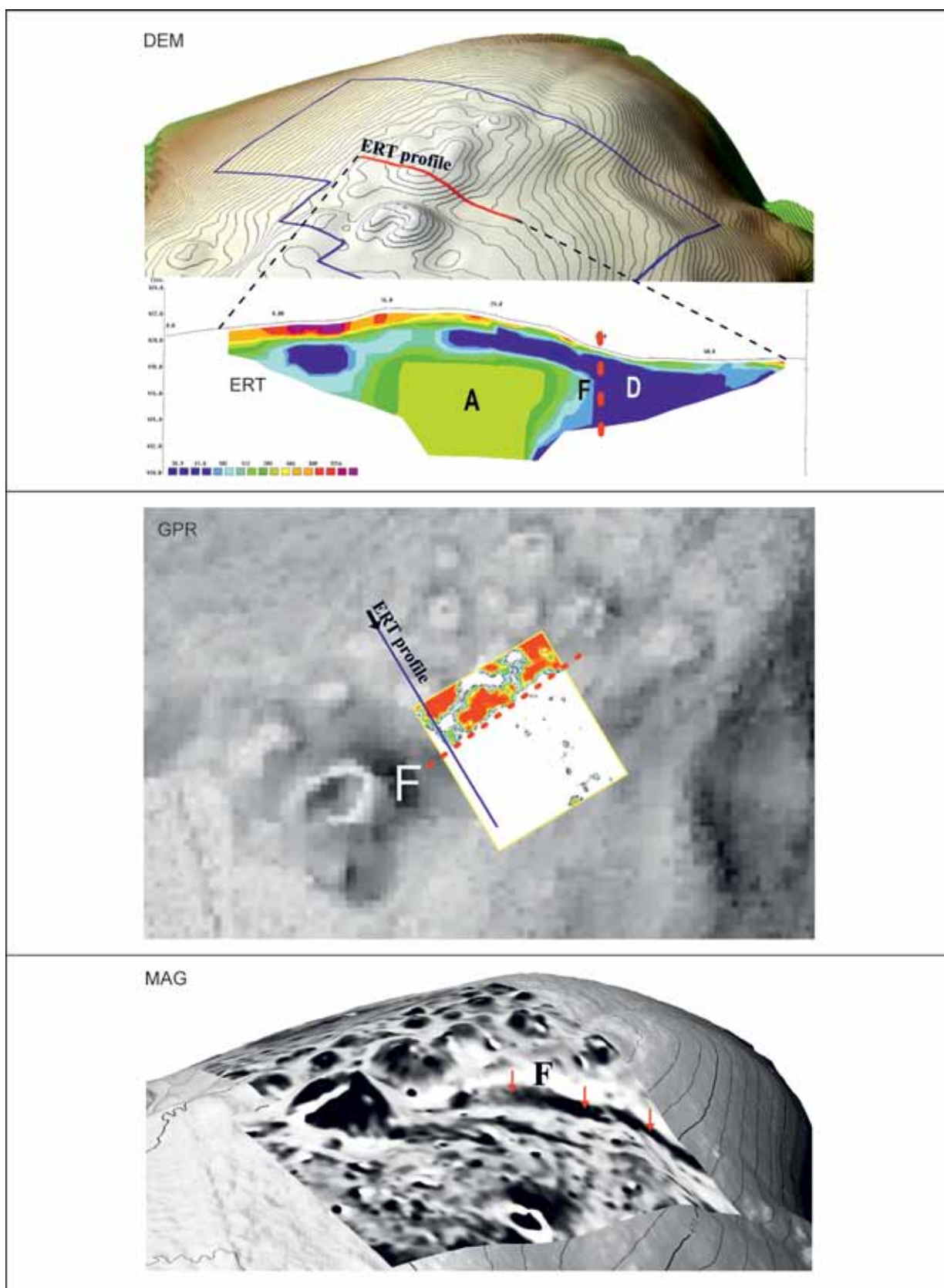


Fig. 11. Habakuk, northern group of barrows. Uplifted solid bedrock block of amphibolite (A), electrically highly conductive material (gravitationally transported material/colluvium/mass flow [D]), steep vertical boundary (fault?) between solid bedrock and fine grained gravitationally transported sediment (sand/silt [F]; adapted from *Mušič et al. 2015*, fig. 13; 14; 20).

The amphibolite block itself is clearly visible on the ERT profile model measured by *Wenner alpha* electrode array (Fig. 11: ERT). The transition between the high-resistivity amphibolite block (Fig. 11: A) and the low-resistivity silty sediment on the east side (Fig. 11: D) coincides with magnetic and GPR anomalies at this location. We assume that this extremely sharp geological boundary represents one of the faults along which the amphibolite block was uplifted (Fig. 11: F), which later served as a topographically elevated auditorium for burials in prehistoric times.

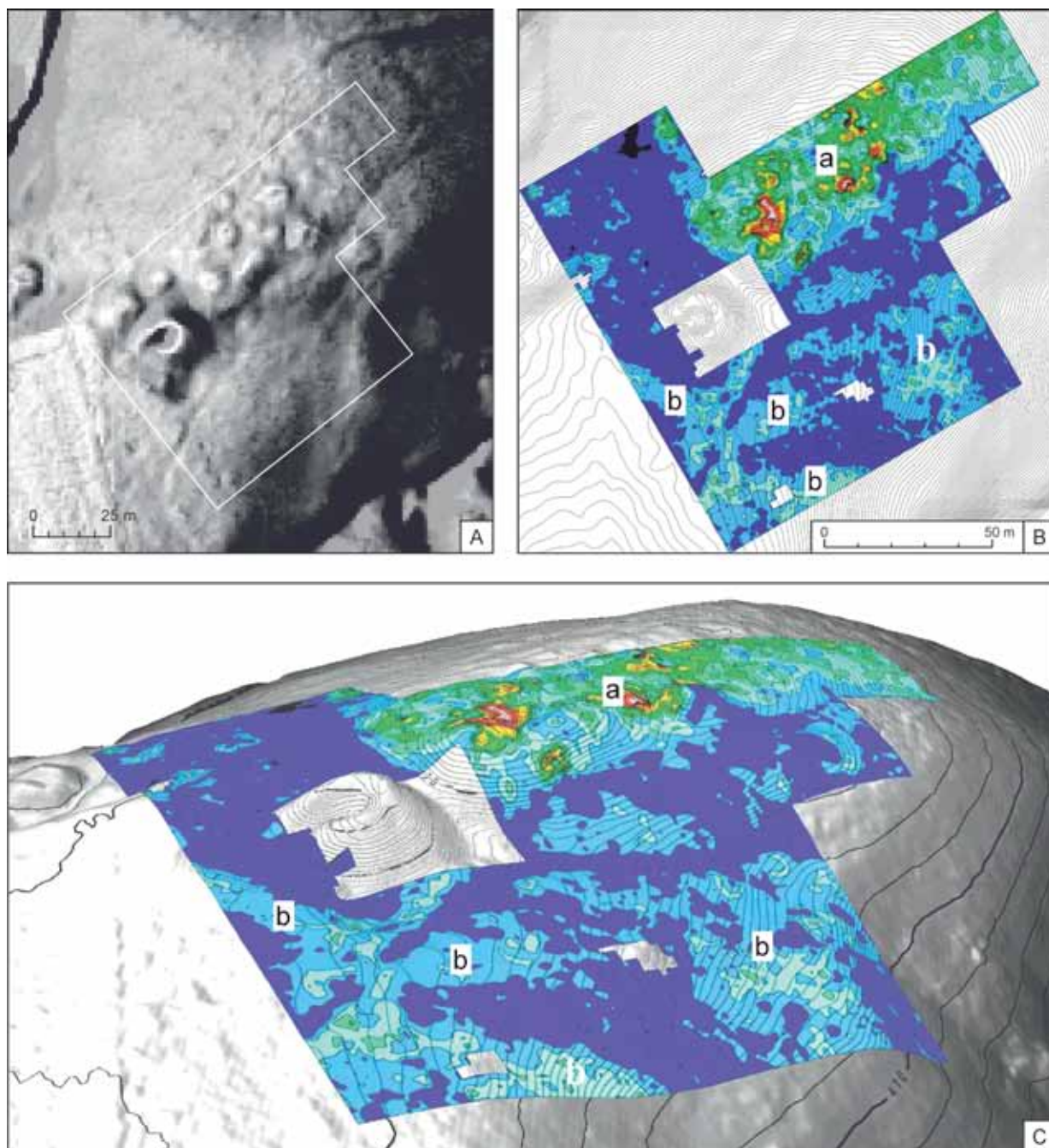


Fig. 12. Habakuk, northern group of barrows. Area covered by resistivity mapping (A). In general, the highest resistance values were measured on the slightly elevated plateau with barrows (B: a), which is most evident in the 3D view (C: a). Possible stone chambers cannot be clearly identified due to the heterogeneous composition of the mound mantles with a high percentage of rock debris. Somewhat higher resistivity values than the local background are also found on the south side on a relatively flat surface, which could be an anthropogenically altered composition, but a natural origin cannot be completely ruled out (B: b; C: b; adapted from Mušič *et al.* 2015, fig. 10).

Geoelectric resistivity method

Resistivity mapping

We used the geoelectric resistivity method in the manner of geoelectric mapping (Geoscan RM15) to primarily determine the high-resistivity effect of rock material in barrows and shallow-lying bedrock using the Twin probes array technique (see e.g. *Mušič/Horvat 2007*, 219–283). The highest resistivity values were measured on a slightly higher part of the terrain with a northern group of barrows on Habakuk (Fig. 12: A, B). Comparison with isohypses on DEM explains that smaller areas of markedly high resistivity are present both in mounds and in the spaces between mounds (Fig. 12: C). High-resistivity anomalies up to 1 m depth most likely represent the effect of the high-resistivity composition of the barrows mantle with stone made chambers, as well as solid geological bedrock in the intermediate spaces between the mounds. The high-resistivity composition of the mound mantles may indicate a relatively high proportion of rock debris, but we assume that some of these anomalies are also due to the stone-made chambers, as shown by the results of 2D resistivity tomography (Fig. 13: k). For the space between the mounds, it was confirmed by shallow pedological drilling that fragments of weathered amphibolite bedrock can already be found in some places at a depth of 0.5 m. Shallow pedological boreholes were placed based on the results of the magnetic method and were primarily intended for measuring the magnetic susceptibility of the drilled samples at two depths, thereby checking the shallow sources of magnetic anomalies (Fig. 8). Along with the data on the thickness of the amphibolite silty-sand weathered material above the solid bedrock on the plateau with barrows, these results were useful for understanding the results of the resistivity mapping and GPR methods. When we used the GPR method with a high-frequency 400 MHz antenna (GSSI SIR3000), we obtained similar results to the geoelectric mapping. The most pronounced reflections were measured on parts of the mound mantles, which we interpret as the combined effect of the rock composition of the mound mantles and stone made chambers, as well as on the intermediate spaces between the mounds, which is the result of a solid bedrock at depths of less than 1 m.

Electrical resistivity tomography

In 2015, the first electrical resistivity tomography measurements (ERT) for the purpose of (geo) archaeological research in Slovenia were carried out in the northern part of the Habakuk mound necropolis (*Mušič et al. 2015*, 37–64; 2018, 317–334).

The higher resistivity amphibolite bedrock of the plateau with barrows, and the gravity-transported material with better electrical conductivity (mainly silt and sand) at the lower, relatively flat area to the south, were defined on the 2D resistivity models (see *Mušič et al. 2015*, 37–64). These models of the profile ERT 1 over the medium-high barrow 31 (Fig. 13), were created using measurements from three different electrode arrays (dipole-dipole, Wenner alpha and Wenner-Schlumberger; see *Mušič et al. 2015*, 37–64). Subsequently, low mound 33 was also investigated using the ERT method (Fig. 13).

Barrow 31

Since the dipole-dipole electrode array proved to be the most appropriate of the three previously verified electrode arrays that we had at our disposal for the investigation of the internal structure of mound 31 (Fig. 13: ERT 1), we mainly used this technique for the ERT investigation of the barrows. With the ERT 1 profile, we wanted to get a more detailed insight into the composition of mound 31 with a shorter inter-electrode distance (0.5 m) and thus better resolution. In the resistivity tomography model, the high-resistivity anomalies representing the remains of the stone made burial chamber (Fig. 13: k) are well separated from the lower-resistivity of weathered amphibolite material (Fig. 13: b, c) above the higher-resistivity solid amphibolite bedrock (Fig. 13: d). The diameter of mound 31 is around 18 m, and the chamber was probably built of amphibolite rocks using the dry-wall technique, given the resistance values (300–750 Ω m). The diameter of the chamber in the direction of the ERT profile is approx. 4.5 m, and its height is about 1 m. The very high resistivity surface layer above the chamber extends to a depth of approximately 0.5 m. The chamber is located at a depth interval approximately between 0.3 and 1.5 m below the surface.

Barrow 33

The ERT profiles (ERT 2 and ERT 2_1) with a length of 11.7 m, measured in two mutually perpendicular directions (Fig. 13: ERT 2, ERT 2_1), with inter-electrode distances of 0.3 m and a dipole-dipole electrode configuration, clearly defined the remains of stone burial chambers in the central part of the mound with a diameter of about 10 m. At the location of the burial chamber there are very high resistivity values (700–8000 Ωm). In the direction of the profile ERT 2 the assumed diameter of the chamber is about 2.5 m, in the direction of the profile ERT 2_1 it is 3 m. The height of the preserved part of the chamber is approx. 0.75 m in both ERT profiles (Fig. 13: C, D). The resistivity values of the weathered amphibolite in most of the base of mound 33 (200 Ωm ; only at the extreme NE edge of the ERT 2_1 profile is 700 Ωm reached) are similar to those of the ERT 1 profile on the NW side of mound 31. This most likely means that a relatively larger proportion of rock debris of the weathered amphibolite is present in a large area of the NW part of the mantle, which was also confirmed by shallow drilling for magnetic susceptibility measurements at depths of 0–0.5 m and 0.5–1 m (Fig. 8; see also Mušič *et al.* 2015, 37–64, fig. 16; 17).

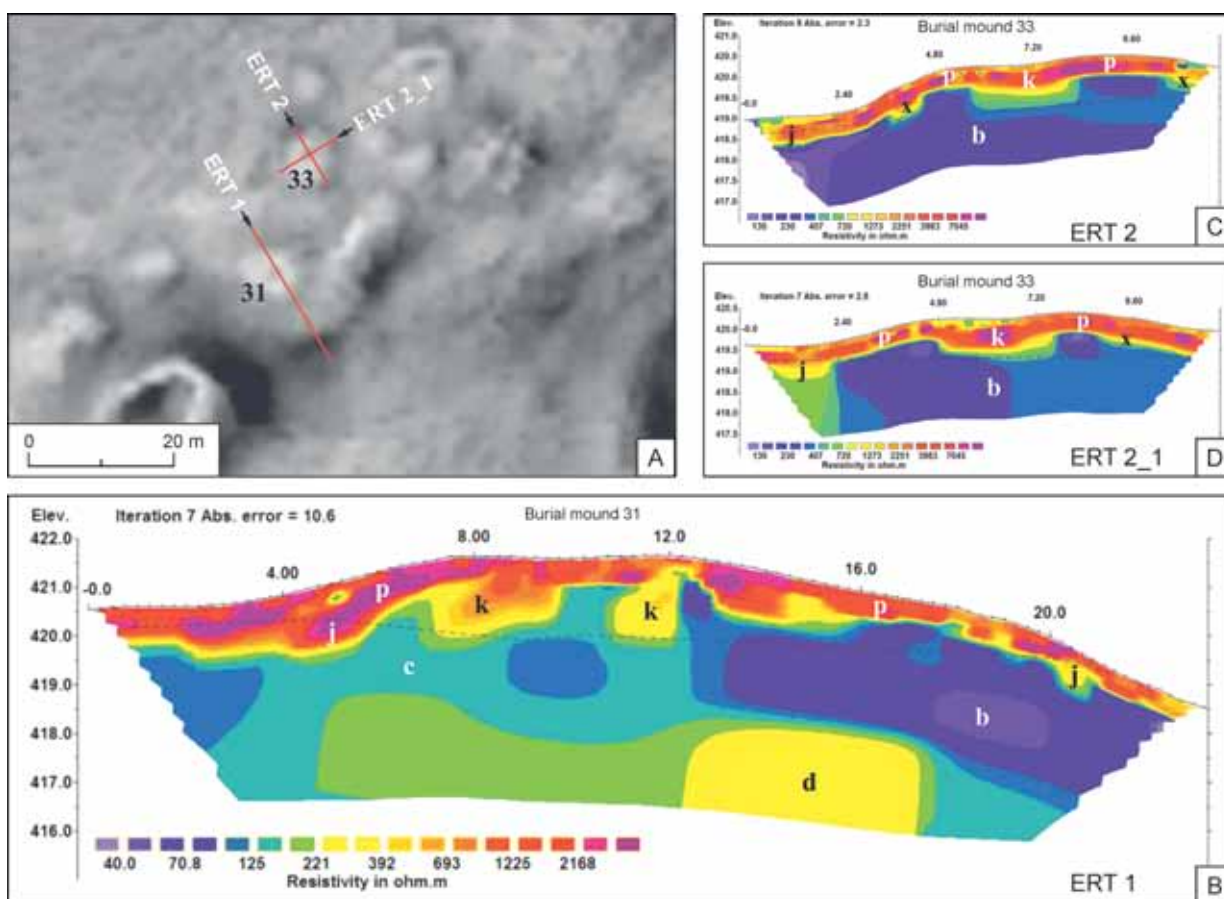


Fig. 13. Habakuk, northern group of barrows. Barrow 31 (B): 2D ERT model of profile ERT 1. k – remains of a stone chamber with high resistivity (300–750 Ωm); p – very high resistivity barrow mantle (over 1500 Ωm) near the surface and low resistivity inner part of barrow below the depth of 0.5 m (60–150 Ωm); j – most likely a mound circular ditch filled with highly resistive material; b – fine-grained material with a high moisture content (up to 100 Ωm); c – water saturated amphibolite substrate (100–200 Ωm); d – higher resistivity suggests partially weathered amphibolite bedrock. Barrow 33: 2D ERT model of profiles ERT 2 (C) and ERT 2_1 (D) measured in perpendicular directions (A). k – very high resistivity remains of a stone chamber (700–8000 Ωm); most likely, the ceiling of the chamber has settled, also inferred from the concave central part of the mound above the chamber; p – the mantle of the mound with high resistivity (over 1000 Ωm) extends to 0.5 m below the surface, with much lower resistivity values of 150–400 Ωm in the inner part of the mound; j – the circumferential ditch around the mound, which was later filled with higher resistivity material gravitationally transported from the mound, corresponds in location to the circular magnetic anomaly; x – stone structures with high resistivity, 0.7 m wide and 0.3 m high, remain unexplained; b – weathered remains of amphibolite bedrock (200–700 Ωm ; adapted from Mušič *et al.* 2018, fig. 4–6).

THE PIVOLA CEMETERY

As described above, the area at Pivola is very complex also because of the different ways of land use, which importantly affected our research approach (Fig. 14; 15).

Magnetic method

Under these circumstances we should not expect magnetic anomalies that would indicate the presence of burial chambers, but we can expect magnetic anomalies from possible circular ditches, which were confirmed by magnetic measurements (Fig. 16). In this way we supplemented the results of the georadar method, which did not, on their own, clearly confirm the presence of perimeter ditches, as well as the results of excavations that mostly targeted only the central burial chambers (Fig. 17–20). In the case of barrow 13, where three trial trenches were laid out to target the circular ditch, it was only possible to identify the remains of the mantle.

Ground Penetrating Radar method

This GPR method, using a 400 MHz antenna, was preferred for solving research questions concerning the exact location and size of dry-stone burial chambers in barrows as well as their preserved height

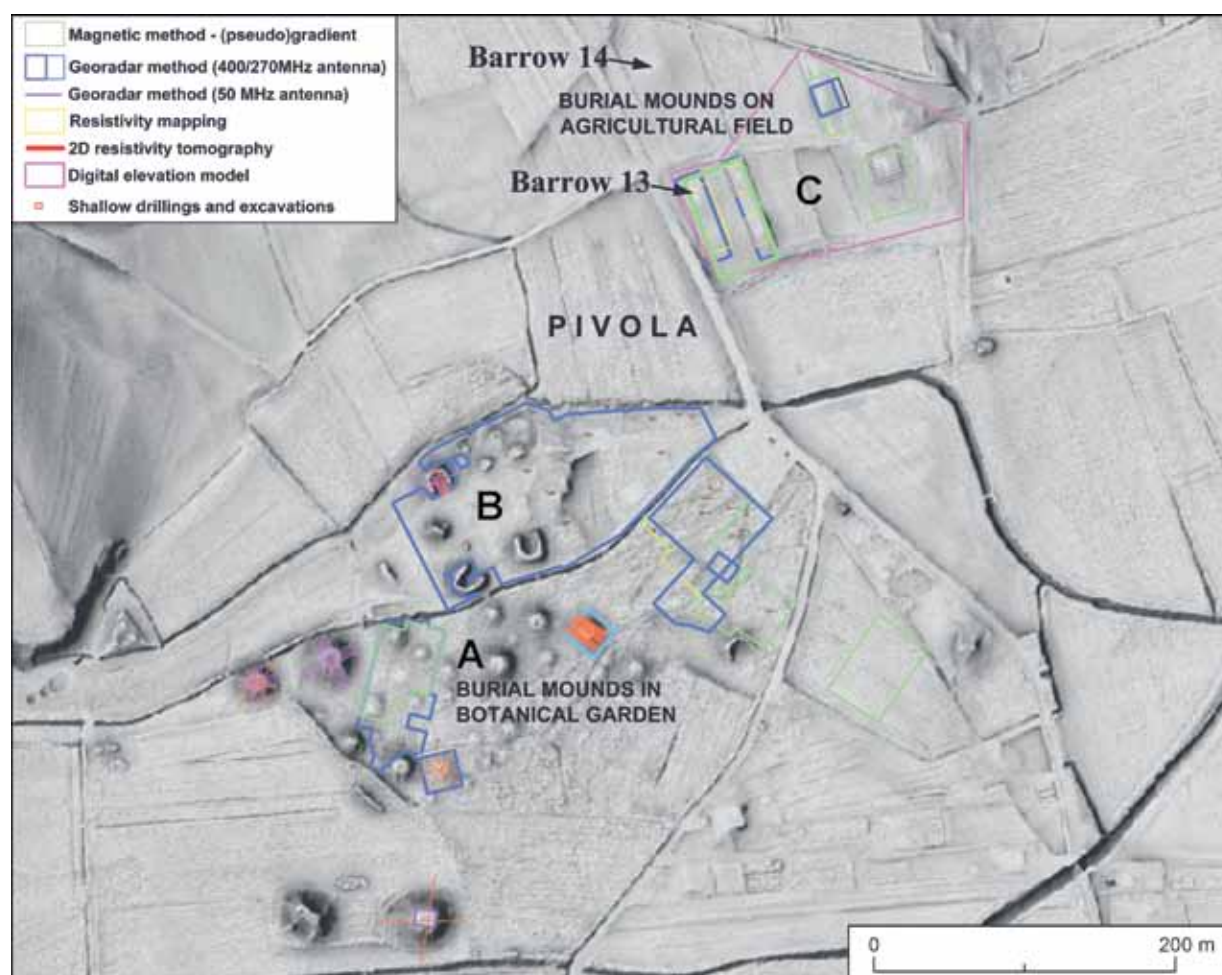


Fig. 14. Pivola cemetery (areas A, B and C) with the mapped geophysically surveyed areas, investigated by various geophysical methods, shallow drilling and small excavations (see Fig. 2). A – former forest, never cultivated and thus well preserved barrows; B – former military base, reshaped barrows; C – agricultural area, barrows are almost levelled (LiDAR map created by D. Mlekuž).

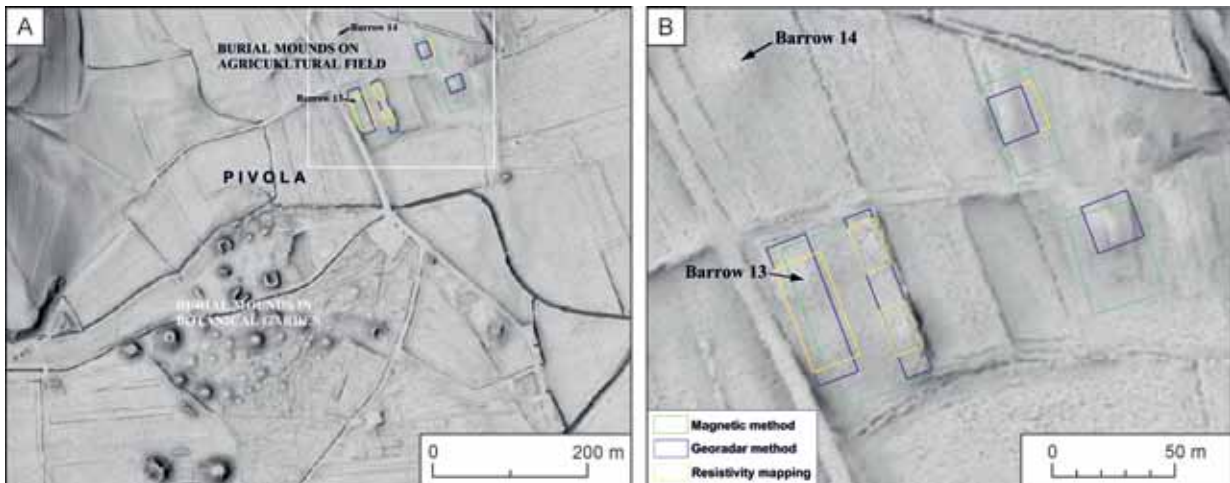


Fig. 15. Pivola cemetery. Areas in the northern part of the necropolis at agricultural fields with almost levelled barrows in Pivola (A), investigated with magnetometry, GPR and resistivity mapping (B; LiDAR map created by D. Mlekuž).

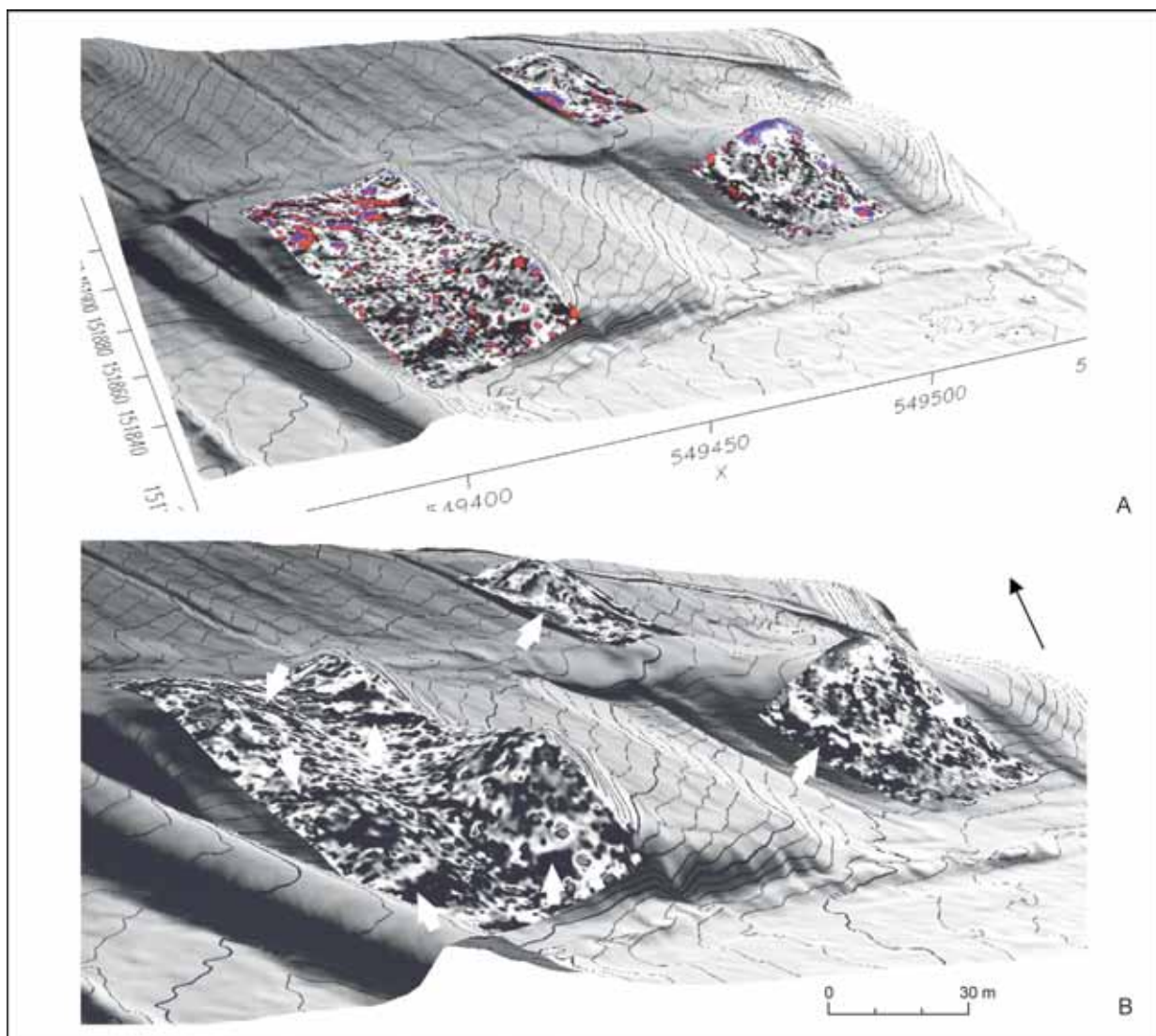


Fig. 16. Pivola cemetery, northern group of barrows. Magnetic maps on a digital elevation model. Strong, point-like magnetic anomalies are the result of many small iron objects on the modern agricultural field (A). The ditches around the tumuli identified on the magnetograms are marked by white arrows (B; adapted from Teržan/Črešnar/Mušič 2015, fig. 8).

(Fig. 17–20). Advanced processing flow with topographic correction was applied for a more intensive study of barrow composition (Fig. 18; see *Goodman et al. 2006*, 157–161). After case sensitive processing flow, the noise was significantly reduced and slight irregularities in mound composition appeared as faintly visible background variability with sparse remains of dry-stone chambers. To represent the GPR results, the *time slices method* was used. This shows a series of parallel, equally spaced profiles in distance of 0.5 m (Fig. 17; 19).

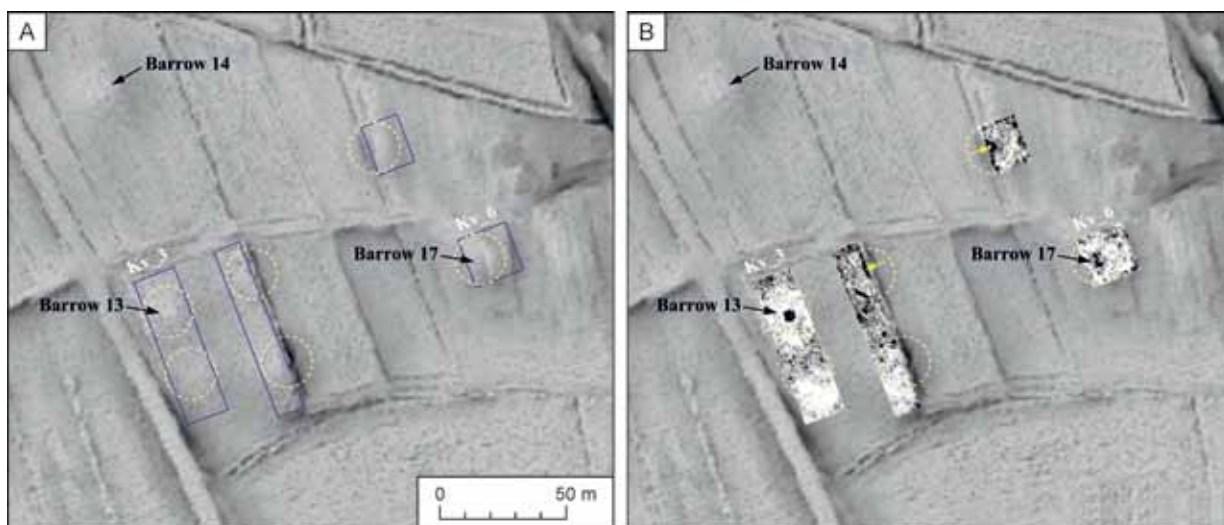


Fig. 17. Pivola cemetery, northern group of barrows. A – areas surveyed by GPR on LiDAR derived DTM with yellow circles indicating mound location and size; B – GPR results in the depth interval 70–80 cm (LiDAR map created by D. Mlekuž).

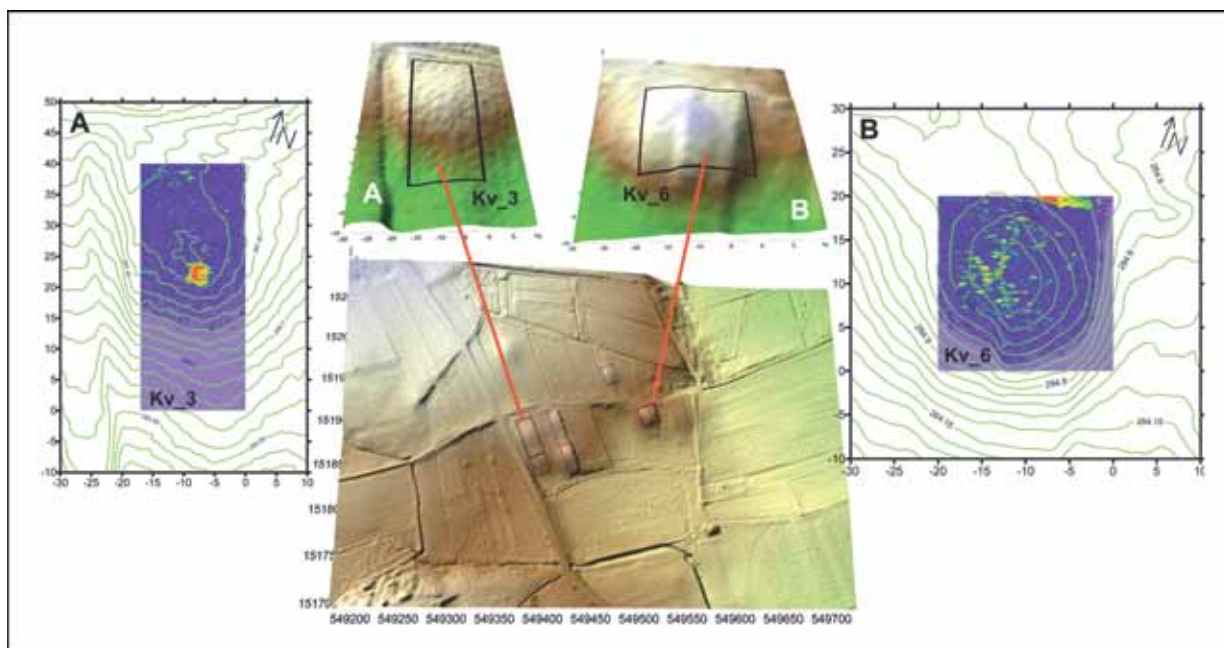


Fig. 18. Pivola cemetery, northern group of barrows. Topographic correction of the results of the GPR method with a 400 MHz antenna (A and B). The figure shows an eccentric position of the burial chambers and a clear difference in the degree of preservation. The chamber of barrow 13 (A – Kv_3) is well preserved (see Fig. 17; 19; 20), while the chamber of barrow 17 (B – Kv_6) is almost completely destroyed by deep ploughing (see Fig. 17). After the topographic correction, the mantle of the mound with a strong attenuation of the GPR signals (dark blue areas) is also in its original position (adapted from *Mušić/Črešnar/Medarić 2014*, fig. 4).

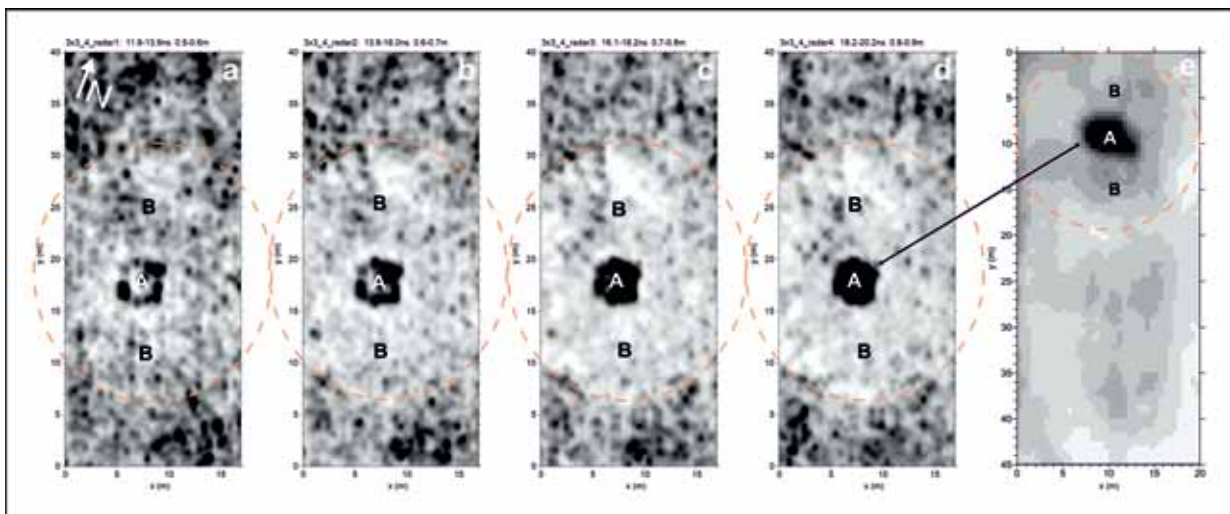


Fig. 19. Pivola cemetery, northern group of barrows, barrow 13. GPR time-slices for four depth intervals from 0.5 to 0.9 m (a–d) and resistivity mapping (e). Distinct georadar reflections from the stone burial chamber and high resistivity values in the central part of the mound are clearly visible (A). The size of the almost entirely destroyed mound is determined based on the attenuation of GPR signals and significantly lower resistivity in the area of the barrow mantle (B, indicated by circles).

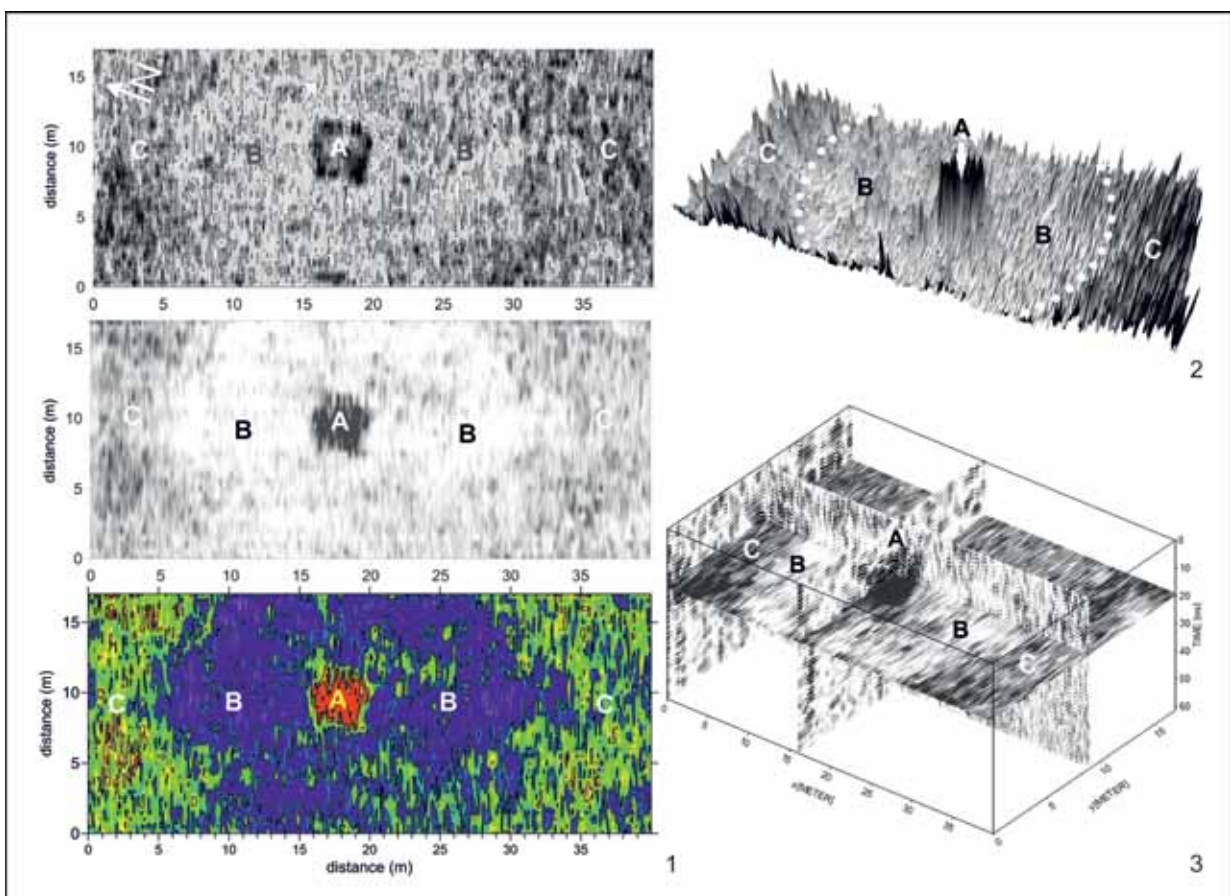


Fig. 20. Pivola cemetery, northern group of barrows, barrow 13. The GPR time-slice at the depth interval 60–70 cm (1) represents distinct echoes from a dry-stone burial chamber in the barrow centre (A), attenuation of the GPR signal in the water saturated mound mantle made of sandy clay (B) and chaotic echoes in the nearby surroundings on sandy gravel in the modern agricultural field (C). Display of GPR amplitudes (2) and 3D view (3; adapted from Mušič/Črešnar/Medarić 2014, fig. 6; Teržan/Črešnar/Mušič 2015, fig. 13; 16).

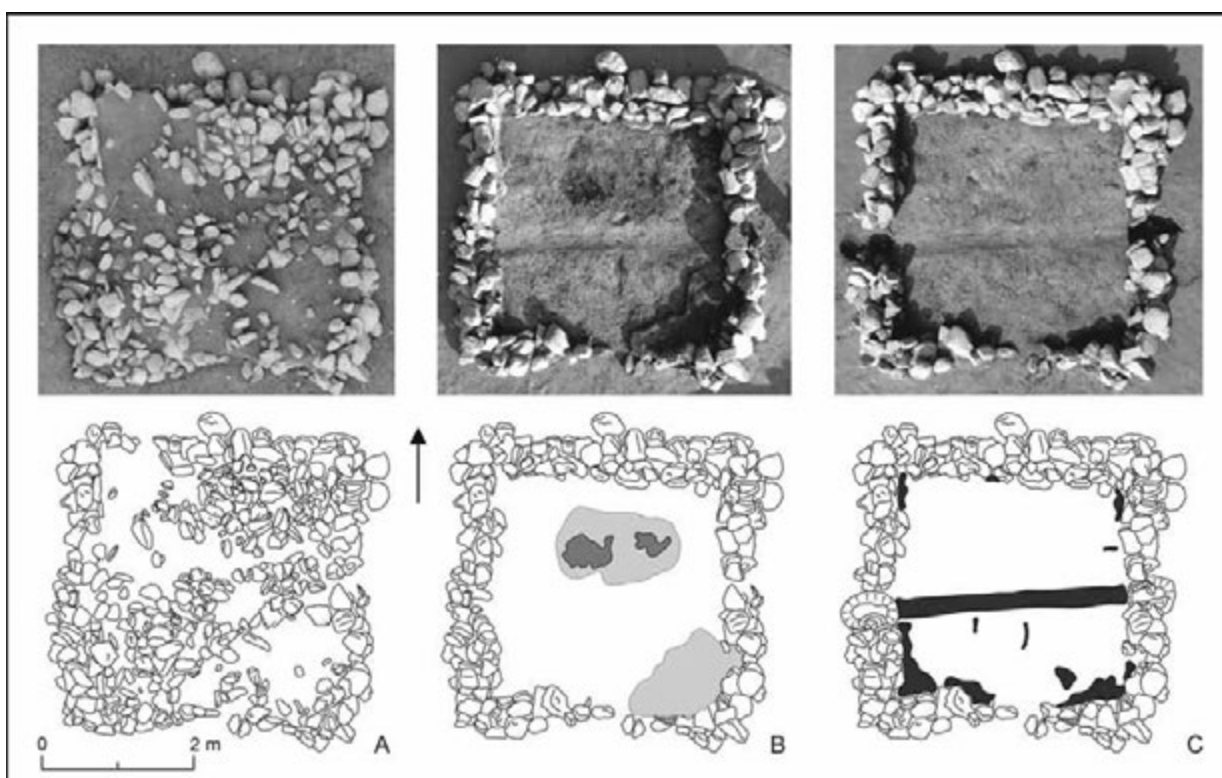


Fig. 21. Pivola, barrow 13. Display of the three successive phases of excavation of the burial chamber on a georeferenced vertical photography and in a computer rendering made on the basis of this photographs. When the burial chamber was discovered, it was covered and filled with a rubble layer of stone (A), after its removal, two larger concentrations of burnt soil and burnt human remains (B) were discovered. The emptied mound revealed details important for understanding its construction, as there were two pits for vertical wooden poles in the eastern and western walls. Along the inner sides of the chamber and at the bottom we found the remains of a weathered layer that indicates a former wooden construction (C).

High quality GPR data enabled a precise 3D visualization as well as analyses of the measurement results in a 3D environment (Fig. 20). Within this 3D mode, the distinct GPR echoes become archaeologically relevant by providing cross sections of the investigated soil volume in arbitrary directions, as well as detailed insight into the spatial relationships of the dry-wall structures, their depths, widths and level of preservation.

As is clear from the results of the ground-penetrating radar measurements, most of the barrows located on cultivated land have been badly damaged by ploughing, and the central stone chambers are rarely well preserved (Fig. 17–20). In most cases, the burial chambers are badly damaged or completely destroyed. Of the six barrows investigated by the georadar method, the burial chamber was at least partly preserved only at mound 13 (Fig. 18–20), which was for that reason also (rescue) excavated (Fig. 21). The presence of remains of burial chambers can be mostly recognized from the loose stone material in the central parts of the mounds, in some places with sparse remains of the chambers in the original position.

DISCUSSION

The recent decades of intensive archaeological investigations have resulted in many new data related to the Late Bronze Age and the Early Iron Age of Northeastern Slovenia.¹ However, the construction related

¹ The majority of sites excavated during development-led investigations are not published, but there are several exceptions. The best example is the *Arheologija na avtocestah Slovenije – AAS* (Archaeology on Slovenian Highways) series, which will include over 150 excavated sites from the excavations, accompanying the building of the Slovenian highways. The monographs can be freely downloaded on the web page of the Institute for the protection of Cultural heritage of Slovenia (<https://www.zvkds.si/eng/publications/aas-collection/>).

interventions, which present the vast majority of research, are never aimed at specific questions, so it is hardly to be expected that they will answer any of them. At the opposite end of the spectrum, however, there are some research projects that do target well-considered goals (e.g. Črešnar/Mele 2020; Teržan/Črešnar 2014; 2021). All, however, having the same goal – the broader understanding of Poštela (one of the most important archaeological sites in Northeastern Slovenia) and its region in the Late Bronze and Early Iron Ages.

The steps taken until now helped us to get a new insight into the Poštela complex. The LiDAR deriving DTM, already processed by D. Mlekuž back in 2010, when Poštela became one of the first intentionally scanned Early Iron Age complexes in the region, has pronounced the individual ‘features’ to be parts of one organism. These can, however, only be understood by researching each of them both separately and interwoven with its surroundings (Črešnar/Mlekuž 2014, 18–32).

Confrontation of archaeological data and the results of LiDAR DTM analysis brought about a list of locations and areas, which were chosen for further research. The next step taken was, as a rule, to use the geophysical methods, which were presented in detail in this article, but they were occasionally also followed by other means of ground truthing. The Poštela and Pivola barrow necropolises are used here to illustrate the complexity of individual archaeological situations that require an investment of effort to employ different research procedures, thereby avoiding simplistic interpretation. The results of some geophysical surveys are informative in this sense, but it is obvious that in different natural environments of time-synchronous but different-sized mounds, the best results can only be obtained by using different geophysical methods (multi-method geophysical approach). During our work, it was ascertained that due to the different composition of mound mantles and different geological peculiarities, all geophysical methods are not always equally effective for determining the composition of mounds.

Verification approach includes also low-invasive methods such as drilling or trial trenching, which are limited to areas where most informative results are expected. These methods must be correctly located and conducted to yield maximum results for a particular site, but may also be used for similar situations in broader areas studied with other methods.

There are many different details and examples of how we can use data integration to make important discoveries in non-invasive research. With the first geophysical surveys of barrows in 2006, we began to learn about the possibilities of archaeological geophysics at prehistoric sites. The results allowed us to better plan the excavation of the already selected barrow 13 at Pivola. By examining other mounds on farmland in the surroundings, we were able to determine that many of them were already severely damaged. Special care is needed to prevent their complete destruction and erasure from the cultural landscape (Teržan/Črešnar/Mušič 2012, 17–58; 2015, 61–82).

With the research starting in 2011, we took a new path, as the results from non-invasive methods, i.e. geophysics and LiDAR, became our guides for our further research steps, i.e. coring, trial trenching and small-scale excavations. At the same time, after the excavations, we often revisited the baseline data, reviewing and re-analysing it to extract even more from it, since we only recognized certain features during excavations, which were not visible or understandable in the primary results of the geophysical measurements or vice-versa. That is for instance the case of barrow 13, where only the excavation could show the distinction between the various parts of the stone remains of the burial chamber construction and discern between the rubble and the dry-stone construction and its wooden elements (Fig. 21).

Along this research path, we often encountered situations that we could not explain at the time, but the new approaches that the results required often improved already established procedures (e.g. Mušič *et al.* 2015, 37–64; 2018, 317–334). There are many examples of how, with the help of the integration of archaeological data with non-invasive research, we arrive at important findings also at Early Iron Age barrow necropolises.

The research at the Poštela Early Iron Age complex and its surroundings is far from finished, as there is no end in sight to the new questions raised by our research, the number of which always outruns the number of answers we get.

CONCLUSIONS

With the first geophysical surveys of barrows in 2006, we began to learn about the possibilities of archaeological geophysics at prehistoric necropolises. With this results, we were able to better plan the excavation of the already selected object, mound 13 at Pivola (Fig. 15; 17–21). By researching other mounds on agricultural land in the surrounding area, we were able to assess that many of them are already badly damaged (Fig. 17; 18) and that special care is therefore needed to prevent their complete destruction and erasure from the cultural landscape (Teržan/Črešnar/Mušič 2012; 2015). With research from 2011 onwards, we turned the way of our research, as geophysics, in addition to ALS, became a guide for our new excavations.

Generally speaking, stone made chambers are rarely clearly visible on the results of magnetic method. Small differences in magnetic susceptibility between soil variations, weathered amphibolite and solid rock material, from which the burial chambers were also built, did not give much hope for their identification on magnetograms on Habakuk necropolis. With regards to identifying possible stone burial chambers, we introduced the calculation of *Vertical derivatives* (Fig. 9: B) and *RTP transformation* (Fig. 9: E). It can be concluded that contrary to general assumption, stone chambers are quite obvious in several places in the form of roughly square floor plans of relatively stronger positive gradients (Fig. 6: B; 7: B; 9). However, this suggests that the magnetic response of stone burial chambers is recognizable. Such an interpretation requires caution due to possible magnetic effect of heterogeneous composition of the mound mantle.

One of the more important findings, which led to a series of new conclusions, was the recognition of circular ditches, surrounding most if not all barrows. The analyses of the ALS data clearly revealed ditches around the barrows. The ditches even intersect in places, suggesting stages of development of the barrow groups (Fig. 5: D). At the northern group of mounds on Habakuk, we can recognize at least five phases of the expansion of the burial ground. We can identify mound 38 (Fig. 5) as one of the youngest mounds, in which a female person with a rich bronze costume was buried, according to which we can date it to the last phase of the settlement of Poštela in the Early Iron Age or Ha C2/Ha D1 (Teržan 1990, 66–70, pl. 61).

The circular ditches are already clearly visible on the displays of the 'raw' values of the magnetic gradient measurements (Fig. 6: B; 7: B) and better after application of the *Upward continuation* algorithm (Fig. 7: B; 9: C, D). The mantles of the mounds at the Habakuk necropolis are characterized by relatively higher magnetic field gradients, while the magnetic gradients above circular ditches around the barrows, are slightly negative (Fig. 5: C; 6: B; 7: B; 9).

The GPR method results revealed numerous areas of strong georadar reflections in the area of the barrows and also in the spaces between them. Distinct GPR reflections on the mounds which we interpret as effects of the coarse-grained rock material in composition of the mound mantles and most probably also the effect of stone burial chambers (Fig. 10).

With the resistivity mapping the highest values were measured on a slightly higher part of the terrain with a northern group of barrows on Habakuk (Fig. 12: B: a). Similarly to GPR survey results high-resistivity anomalies most likely represent the effect of the high-resistivity composition of the barrows mantle with stone made chambers, as well as solid bedrock in the intermediate spaces between the mounds. Comparison of resistivity measurements with isohypses on DEM explains that smaller areas of markedly high resistivity are present on mounds (Fig. 12: C: a). We assume that some of these anomalies are due to the stone-made chambers also on the basis of the results of 2D resistivity tomography (Fig. 13: k).

Since the dipole-dipole electrode array proved to be the most appropriate for 2D resistivity tomography (ERT) surveys on barrows, we used this technique for the ERT investigation of the barrows at Habakuk necropolis. With the ERT 1 profile, we wanted to get a detailed insight into the composition of mound 31 with a short inter-electrode distance of 0.5 m and thus better resolution (Fig. 13: ERT 1). In the resistivity tomography model, the high-resistivity anomalies (300–750 Ω m) representing the remains of the stone made burial chamber (Fig. 13: k) are well separated from the lower-resistivity of weathered amphibolite material (Fig. 13: B, C) above the higher-resistivity solid amphibolite bedrock (Fig. 13: D). The diameter of the chamber in the direction of the ERT profile is approx. 4.5 m, and its height is about 1 m. The chamber is located at a depth interval approximately between 0.3 and 1.5 m below the surface.

The ERT profiles (ERT 2 and ERT 2_1), measured in two mutually perpendicular directions (Fig. 13: ERT 2, ERT 2_1), with inter-electrode distances of 0.3 m and a dipole-dipole electrode configuration, clearly defined the remains of stone burial chambers in the central part of the mound (700–8000 Ωm). In the direction of the profile ERT 2 the assumed diameter of the chamber is about 2.5 m, in the direction of the profile ERT 2_1 it is 3 m. The height of the preserved part of the chamber is estimated to 0.75 m in both ERT profiles (Fig. 13: C, D). The height of the preserved part of the chamber is approx. 0.75 m in both ERT profiles. The resistivity values of the weathered amphibolite in the base of mound 33 (200 Ωm) are similar to those of the ERT 1 profile across the mound 31. This most likely means that a relatively larger proportion of rock debris of the weathered amphibolite is present in a large part of the mantle, which was also confirmed by shallow drilling for magnetic susceptibility measurements at depths of 0–0.5 m and 0.5–1 m (Fig. 8; see Mušič *et al.* 2015, 37–64, fig. 16; 17).

Results of the magnetic method clearly show a wide bend of weakly positive magnetic gradients, which runs approximately in the east–west direction towards the largest barrow (Fig. 5: C; 6: B; 7: B; 9: A: b). This is a unique type of magnetic anomaly not known anywhere else at Poštela. Using 2D resistivity tomography and GPR, it was proved that there is an abrupt lateral transition between a larger amphibolite block and fine-grained sediments. We assume that this extremely sharp geological boundary represents the fault along which the amphibolite block was uplifted (Fig. 11: F), which served as a topographically elevated auditorium for burials in the Early Iron Age.

At the Pivola necropolis faintly visible circular ditches were revealed by magnetic method measurements (Fig. 16). In this way we supplemented the results of the GPR method, which did not clearly confirm the presence of perimeter ditches, as well as the results of excavations that in the case of barrow 13 mostly targeted only the central burial chamber, which was previously recognized by the GPR results (Fig. 17–21).

GPR results show that most of the barrows on agricultural land have been badly damaged by ploughing, and in most cases the burial chambers are badly damaged or completely destroyed (Fig. 17; 18). Of the six barrows investigated by the georadar method, the burial chamber was relatively well preserved only in the mound 13. Distinct GPR reflections from the stone burial chamber and high resistivity values in the central part of the mound are clearly visible. The size of the almost entirely destroyed mound is determined based on the attenuation of GPR signals and significantly lower resistivity in the area of the barrow mantle (Fig. 19).

High quality GPR data at the mound 13 enabled a 3D visualization as well as analyses of the measurement results in a 3D environment (Fig. 20). Within 3D mode, the distinct GPR echoes become archaeologically informative by providing detailed insight into the spatial relationships of the dry-stone structures, their depths, widths and level of preservation.

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Čo sa skrýva pod zemnými násypmi mohýl zo staršej doby železnej na okraji Východných Álp?

Aktuálne výsledky geofyzikálneho výskumu v Poštele (SV Slovinsko)

Branko Mušič – Barbara Horn – Matija Črešnar

Súhrn

Mohyly (tumuli) zo staršej doby železnej (ďalej EIA, z angl. *Early Iron Age*), ktoré sa vyskytujú jednotlivo alebo v skupinách, charakterizujú kultúrnu krajinu regiónu juhovýchodných Álp a Panónskej nížiny až do súčasnosti. Sú jedným z najvýraznejších pozostatkov EIA v regióne, ktorý sa rozprestiera od Východných Álp až po Dunaj. Keďže sú v krajine jasne rozpoznateľné a často sa v nich nachádzajú vzácne artefakty, patrili medzi prvé „ciele“ raných zberateľov starožitností a zbierkotvorcov prvých založených múzeí od 19. storočia. Archeologické vykopávky, ktoré sa tiež zrodili v tom období, sú stále najbežnejším spôsobom výskumu mohýl, hoci metodológia prešla dramatickým vývojom. Geofyzikálne metódy, často v kombinácii s inými neinvazívnymi alebo málo invazívnymi metódami, získavajú pri výskume mohýl EIA čoraz väčšiu popularitu.

Nižšie uvedené príklady zdôrazňujú význam série prípadových štúdií výskumu mohýl z archeologického komplexu Poštela pri Maribore v severovýchodnom Slovinsku. Tieto mohyly majú niekoľko spoločných charakteristík, ale zároveň odhaľujú značnú rozmanitosť súvisiacu s ich základným tvarom, prírodným prostredím a stavom ich zachovania. Uvedené príklady sú preto viac než vhodné nato, aby pomohli načrtnúť širokú škálu výziev, s ktorými sa pri výskume mohýl týmito metódami stretávame, hoci nie sú reprezentatívne pre všetky možné scenáre.

Archeologický komplex Poštela

Archeologický komplex Poštela sa sústreďuje okolo opevneného hradiska Poštela, ktoré má strategickú polohu a kontroluje celú Drávsko-ptujskú rovinu, ako aj okraje okolitých kopcov (obr. 1; 2). Na planine Habakuk, tesne pod sídliskom, sa pochovávalo v plochých žiarových (urnových) hroboch, ako aj v mohylách. Najväčšia skupina mohýl sa nachádza v Pivole (poloha Botanická záhrada). Je podobne ako skupiny mohýl z Habakuku spojená s urnovým pohrebiskom (Črešnar/Vinazza/Mušič 2019, 439–448).

V posledných rokoch sa naše výskumy na planine Habakuk primárne zameriavali predovšetkým na neinvazívny a nízkoinvazívny výskum (obr. 1–13). Využívali sme ALS, vykonávali intenzívny geofyzikálny prieskum s následným overovaním výsledkov v teréne a len ojedinele aj cielené výkopy malého rozsahu (Črešnar/Vinazza/Mušič 2019, 443–446, obr. 3; 5–7). Napriek málo invazívnemu prístupu sa podarilo získať dôležité nové dáta.

Skupina mohýl z Pivoly sa nachádza v nižšinej polohe vo vzdušnej vzdialenosti viac ako 2 km od sídliska. Je to najväčšia skupina mohýl v tesnej blízkosti hradiska Poštela (obr. 1; 2; 14–20).

V tomto článku sa zameriavame na vybrané výsledky geofyzikálnych výskumov viacerých mohýl na nekropolách z Habakuku a Pivoly, ktoré spresňujú aj niektoré naše už publikované výskumy (napr. Teržan/Črešnar/Mušič 2015, 61–82). Predkladanú štúdiu treba chápať ako pokračovanie nášho výskumu a prehĺbenie témy.

V rámci nekropoly v Pivole bol vybraný testovací polygón na overenie spoľahlivosti výsledkov s využitím údajov zo záchranného výskumu mohyly 13, realizovaného v roku 2006 (pozri Teržan/Črešnar/Mušič 2007, 159, 160; 2012, 17–58; 2015, 61–82). Medzitým (2006–2022) bolo preskúmaných viac ako 3,5 ha v rámci nekropoly v Pivole a približne 4 ha vo vybraných priestoroch sídliska Poštela, ako aj viac ako 2,5 ha na mohylovom pohrebisku na planine Habakuk. Stále sa vyvíjajúci multimetodický prístup zahŕňal magnetické, georadarové a nízko-frekvenčné elektromagnetické metódy, odporové mapovanie a mapovanie magnetickej susceptibility, ako aj 2D odporové tomografické profilovanie mohýl, opevnení a pod. (obr. 2; 3; pozri Medarič/Mušič/Črešnar 2016, 67–93; Mušič/Črešnar/Medarič 2014, 19–47; Mušič et al. 2013; 2015, 37–64; 2018, 317–334; Teržan/Črešnar/Mušič 2015, 61–82).

Pohrebisko na planine Habakuk

Geofyzikálne výskumy sa realizovali v širšom okolí archeologického komplexu Poštela na mnohých samostatných plochách spôsobom, ktorý diktovali špecifické okolnosti súvisiace s definovanými cieľmi, a s obmedzeniami vyplývajúcimi z rôznorodých a často sa meniacich podmienok prostredia. Spôsob prieskumu závisí od rozsahu, najmä s ohľadom na náročné podmienky terénnych prác a rozsah použitých techník. Na ilustráciu sme vybrali príklad severnej skupiny mohýl habakuckej nekropoly (obr. 3; 4).

Magnetická metóda

Magnetické vlastnosti kruhových priekop mohýl, ktoré sa z hľadiska minerálneho zloženia len málo líšia od prírodného prostredia, do ktorého boli vykopané, možno vizualizovať pomocou moderných magnetometrov. Magnetickou metódou často rozpoznáme výplne kruhových priekop mohyly, ktoré vznikli pri ťažbe zeminy využitej na stavbu mohyly. Hoci veľký pomer medzi objemom plášťa a kamenných hrobových komôr často sťažuje identifikáciu ich magnetického pôsobenia, v niektorých prípadoch je predsa len možné pozorovať anomálie, ktoré by mohli naznačovať obsah mohýl.

Kruhové priekopy sú zreteľne viditeľné už v „surových“ dátach gradientových meraní (obr. 6: B; 7: B) a v spracovaní pomocou algoritmov *upward continuation* (obr. 7: B, 9: C, D). V súvislosti s identifikáciou možných kamenných pohrebných komôr v centrálnych častiach mohýl musíme porovnať výsledky rôznych krokov spracovania, využívajúc napr. *calculation of vertical derivatives*, ktorý mierne zvýrazňuje laterálne zmeny magnetických anomálií (obr. 9: B), a transformáciu *reduction to the pole*, ktorá znižuje bipolaritu magnetických anomálií (obr. 9: E).

Georadarová metóda (Ground penetrating radar/GPR)

Výsledky GPR metódy s využitím vysokofrekvenčnej 400 MHz antény (obr. 10) boli podobné výsledkom získaným geoelektrickým meraním (obr. 12). Najsilnejšie georadarové ozveny boli namerané na špecifických miestach mohyly, čo interpretujeme ako vplyv horninového zloženia plášťov mohyly, prípadne kamenných hrobových komôr. Objavujú sa i v priestoroch medzi mohylami ako dôsledok vplyvu pevného skalného podložia v hĺbke menšej ako 1 m (obr. 10).

Odporové meranie

Metódu geoelektrického odporu na geoelektrické mapovanie (Geoscan RM15) sme použili predovšetkým na určenie efektu vysokého odporu horninového materiálu v mohylách a plytko uloženom podloží technikou *twin probes array* (pozri napr. Mušič/Horvat 2007, 219–283). Najvyššie hodnoty odporu boli namerané na mierne vyvýšenej časti terénu so skupinou mohýl (obr. 12: A, B). Vysokoodporové anomálie do hĺbky 1 m s najväčšou pravdepodobnosťou predstavujú vplyv vysokoodporového zloženia plášťa mohýl s kamennými komorami, ako aj pevného geologického podložia v priestoroch medzi mohylami.

Elektrická odporová tomografia (Electrical resistivity tomography/ERT)

Na 2D odporových modeloch (pozri Mušič et al. 2015, 37–64) bolo definované amfibolitové podložie planiny s mohylami s vyšším elektrickým odporom a gravitačne transportovaný materiál s lepšou elektrickou vodivosťou (najmä naplaveniny a piesky) v nižšej, relatívne rovinatej oblasti na juhu. Tieto modely profilu ERT 1 nad stredne vysokou mohylou 31 (obr. 13) boli vytvorené na základe meraní z troch rôznych sústav elektród (pozri Mušič et al. 2015, 37–64). Následne bola metódou ERT skúmaná aj nízka mohyla 33 (obr. 13).

Keďže sa ako najvhodnejšia ukázala dipólovo-dipólová elektródová sústava, pri ERT meraní mohýl sme využívali najmä túto techniku. V modeli odporovej tomografie sú vysokoodporové anomálie predstavujúce zvyšky kamennej

hrobovej komory (obr. 13: k) dobre oddelené od zvetraného amfibolitového materiálu s nižším odporom (obr. 13: b, c) nad pevným amfibolitovým podloží s vyšším odporom (obr. 13: d). Profily ERT naprieč mohylou 33, merané v dvoch na seba kolmých smeroch (obr. 13: ERT 2, ERT 2_1), jasne definovali zvyšky kamennej hrobovej komory v centrálnej časti mohyly (obr. 13: C, D).

Pohrebisko v Pivole

Magnetická metóda

Očakávali sme, že zachytíme magnetické anomálie z možných kruhových priekop, ale nie anomálie naznačujúce existenciu hrobových komôr (obr. 16). Týmto spôsobom sme doplnili výsledky georadarovej metódy, ktoré samy o sebe jednoznačne nepotvrdili prítomnosť obvodových priekop, ako aj výsledky výkopov, ktoré boli väčšinou zamerané len na skúmanie centrálnych hrobových komôr. V prípade mohyly 13, kde boli vytýčené tri zisťovacie sondy na detekciu kruhovej priekopy, sa podarilo identifikovať len zvyšky plášťa mohyly.

Georadarová metóda (Ground penetrating radar/GPR)

GPR metóda, využívajúca 400 MHz anténu, bola uprednostnená pri riešení výskumných otázok týkajúcich sa presnej polohy a veľkosti hrobových komôr vybudovaných z kameňa kladeného na sucho vnútri mohýl, ako aj ich zachovanej výšky (obr. 17–20). Na dôkladnejšie štúdium zloženia mohýl bola aplikovaná pokročilá metóda spracovania s topografickou korekciou (obr. 18; pozri *Goodman et al. 2006*, 157–161). Po aplikovaní prístupu zohľadňujúceho špecifiká jednotlivých prípadov sa výrazne znížil šum a drobné nepravidelnosti v zložení mohyly sa prejavili ako slabo viditeľná variabilita pozadia s ojedinělými zvyškami kamenných komôr z nasucho kladeného kameňa. Kvalitné georadarové dáta umožnili presnú 3D vizualizáciu, ako aj analýzy výsledkov meraní v 3D prostredí (obr. 20).

Po terénnych výskumoch sme sa často vracali k základným údajom, prehodnocovali sme ich a opätovne analyzovali, aby sme z nich vyťažili ešte viac poznatkov, pretože počas terénneho archeologického výskumu sme rozpoznali len niektoré objekty, ktoré neboli viditeľné alebo zrozumiteľné v primárnych výsledkoch geofyzikálnych meraní, alebo naopak. To je i prípad mohyly 13, kde až terénny archeologický výskum ukázal rozdiel medzi jednotlivými časťami kamenných zvyškov konštrukcie hrobovej komory a rozlíšil sutinu od konštrukcie z nasucho kladeného kameňa a jej drevené prvky (obr. 21).

Obr. 1. Najvýznamnejšie lokality staršej doby železnej medzi masívom Pohorje a riekou Dráva.

Obr. 2. Poloha archeologického komplexu Poštela (pri Maribore), s pohrebiskami v polohách Pivola a Habakuk na podklade DTM vytvoreného na základe LiDAR-ových dát (autor DTM D. Mlekuž)

Obr. 3. Hradisko Poštela a pohrebisko v polohe Habakuk. Plochy skúmané rôznymi geofyzikálnymi metódami, plytkými vrtmi a zisťovacími sondami (pozri obr. 2; autor DTM D. Mlekuž; podľa *Mušič/Črešnar/Međarić 2014*, obr. 2; *Mušič et al. 2015*, obr. 8).

Obr. 4. Hradisko Poštela a pohrebisko v polohe Habakuk (A). Severná časť pohrebiska (B), skúmaná magnetickou metódou, metódou GPR, odporovou metódou a vybrané profily na 2D odporovú tomografiu (podľa *Mušič et al. 2018*, obr. 1; 4).

Obr. 5. Habakuk. Severná časť pohrebiska. A – tieňovaný DTM; B – analýza miestneho reliéfu (D. Mlekuž); C – výsledky magnetických meraní; D – „horizontálna stratigrafia“ skupiny mohýl s konštrukčnými relatívno-chronologickými fázami (následnosť: žltá – oranžová – červená – purpurová – modrá; čiernou vyznačené mohyly nie sú spoľahlivo datované; podľa *Črešnar 2017*, obr. 3; *Črešnar/Vinazza/Mušič 2019*, obr. 6).

Obr. 6. Habakuk. Severná časť pohrebiska, skúmaná metódou magnetického gradientu na DTM (A) a magnetogram gradientu celkového magnetického poľa (B). Magneticky „tiché“ miesta (a), plochy s rozličnou magnetickou susceptibilitou povrchovej vrstvy pôdy (b), centrálna časť mohylového pohrebiska s kruhovými priekopami okolo mohýl a niektoré približne štvorcové tvary možných centrálnych hrobových komôr (c), široký pás magnetických anomálií prírodného pôvodu (d; podľa *Mušič et al. 2018*, obr. 2).

Obr. 7. Habakuk, severná skupina mohýl. LiDAR-ová mapa s polohami plytkých pôdnych vrtov (A), výsledky magnetického merania po aplikovaní *low-pass* filtra (B), a výsledky meraní magnetickej susceptibility v ornici ($\times 10^{-3}$ SI) do hĺbky približne 5 cm, realizovaných v pravidelnej sieti 10×10 m (C). Najvyššie hodnoty magnetickej susceptibility boli namerané na relatívne rovnej ploche južne od skupiny mohýl (podľa *Mušič et al. 2015*, obr. 16).

Obr. 8. Habakuk, severná skupina mohýl. Priemerné hodnoty magnetickej susceptibility nameranej prístrojom *Kappa-meter KT-5* na povrchu (A) a v dvoch hĺbkových intervaloch plytkých vrtov (B – 0–30 cm; C – 30 cm až pevné podložie v hĺbke približne 50–60 cm). Hodnoty susceptibility sa líšia, najnižšie sú na povrchu a najvyššie v niektorých polohách v poslednom hĺbkovom intervale. Domnievame sa, že to nie je vplyvom podložia, pretože susceptibilita amfibolitu (okolo $0,2–0,25 \times 10^{-3}$ SI) je nižšia než namerané hodnoty. Predpokladáme, že všetky hodnoty nad $2,5–3 \times 10^{-3}$ SI by mohli byť archeologického pôvodu. Ich hlavným zdrojom sú obyčajne aktivity súvisiace s vysokými teplotami. Napríklad v južnej časti nekropoly bola na základe merania magnetickej susceptibility (ako doplnok k magnetickému meraniu a nízkofrekvenčnej elektromagnetickej metóde) objavená rituálna uloženina zo staršej doby železnej, obsahujúca veľké množstvo fragmentárnej keramiky a zvieracích kostí (podľa *Mušič et al. 2015*, obr. 17).

Obr. 9. Habakuk, severná skupina mohýl. Mapa magnetických meraní na DTM odvodenom z LiDAR-ovej mapy pre náhodne zvolený 3D pohľad magnetickej odpovede mohýl po aplikovaní *upward continuation* algoritmu (A). Pokro-

- čilé metódy spracovania magnetických meraní: *vertical derivatives* (B), *upward continuation* s prepočítanými magnetickými anomáliami na úrovni 0,75 m (C) a 1,5 m nad skutočnou výškou magnetického profilu (D), *reduction to the pole* a *upward continuation* 0,3 m nad skutočnou výškou magnetického profilu (E). Centrálne časti mohýl, obkolesené kruhovými priekopami s priemerom korelujúcim s mohylou (a), širokým pásom relatívne silných magnetických anomálií geologického pôvodu popri východnom okraji topografickej vyvýšeniny s mohylami (b), magneticky „tichá“ plocha (c), a plocha s rozličnou magnetickou susceptibilitou pravdepodobne archeologického pôvodu (d; podľa Mušič *et al.* 2018, obr. 3; 10).
- Obr. 10. Habakuk, severná skupina mohýl. 3D zobrazenie GPR signálov zaznamenaných 400 MHz anténou na topografickej mape odvodennej z LiDAR-ových snímok v troch hĺbkových intervaloch. a – 0–0,5 m; b – 0,5–1 m; c – 1–1,5 m. Relatívne silné GPR odrazy boli namerané nad aj medzi mohylami (pohľad zo severozápadu; podľa Mušič *et al.* 2015, obr. 11).
- Obr. 11. Habakuk, severná skupina mohýl. Zdvihnutý amfibolitový blok pevného podložia (A), elektricky vysoko vodivý materiál (gravitáciou transportovaný materiál/kolúvium/masívny zosuv [D]), strmá vertikálna hranica (zlom?) medzi pevným podložíom a jemnozrnným, gravitáciou transportovaným sedimentom (piesok/naplavenina [F]; podľa Mušič *et al.* 2015, obr. 13; 14; 20).
- Obr. 12. Habakuk, severná skupina mohýl. Plocha preverená odporovým meraním (A). Celkovo boli najvyššie hodnoty odporu namerané na mierne vyvýšenej plošine s mohylami (B: a), čo je najlepšie viditeľné na 3D zobrazení (C: a). Možné kamenné komory sa nedajú zreteľne identifikovať v dôsledku heterogénneho zloženia plášťov mohýl s vysokým obsahom kamennej sutiny. O niečo vyššie hodnoty odporu, než má miestne podložie, sú zachytené na južnej strane na relatívne plochom teréne, ktorý mohol byť zmenený činnosťou človeka, hoci prírodný pôvod sa nedá úplne vylúčiť (B: b; C: b; podľa Mušič *et al.* 2015, obr. 10).
- Obr. 13. Habakuk, severná skupina mohýl. Mohyla 31 (B): 2D ERT model profilu ERT 1. k – zvyšky kamennej komory s vysokým odporom (300–750 Ω m); p – veľmi vysoký odpor plášťa mohyly (vyššie 1500 Ω m) blízko povrchu a nízky odpor vnútra mohyly pod úrovňou 0,5 m pod povrchom (60–150 Ω m); j – pravdepodobne kruhová priekopa mohyly vyplnená materiálom s vysokým odporom; b – jemnozrnný materiál s vysokým obsahom vlhkosti (do 100 Ω m); c – vodou nasýtený amfibolitový substrát (100–200 Ω m); d – vysoký odpor naznačuje čiastočne zvetrané amfibolitové podložie. Mohyla 33: 2D ERT model profilov ERT 2 (C) a ERT 2_1 (D), meraných v navzájom kolmých smeroch (A). k – zvyšky kamennej komory s veľmi vysokým odporom (700–8000 Ω m), pravdepodobne sa strop komory stlačil, čo sa dá usudzovať k konkávnej strednej časti mohyly nad komorou; p – plášť mohyly s vysokým odporom (vyššie 1000 Ω m) siaha do hĺbky 0,5 m pod povrchom, oveľa nižšie hodnoty odporu (150–400 Ω m) sú vo vnútornej časti mohyly; j – obvodová priekopa okolo mohyly, ktorá bola neskôr vyplnená materiálom s vyšším odporom, transportovaným gravitáciou z mohyly, polohovo korešponduje s kruhovou magnetickou anomáliou; x – kamenné štruktúry s vysokým odporom, 0,7 m široké a 0,3 m vysoké, zostávajú bez interpretácie; b – zvetrané zvyšky amfibolitového podložia (200–700 Ω m; podľa Mušič *et al.* 2018, obr. 4–6).
- Obr. 14. Pohrebisko Pivola (plochy A, B a C) s plochami preskúvanými rôznymi geofyzikálnymi metódami, plytkými vrtmi a malými výkopmi (pozri obr. 2). A – bývalý les, nikdy nekultivovaný, s dobre zachovanými mohylami; B – bývalá vojenská základňa, pretvarované mohyly; C – poľnohospodárska oblasť, mohyly takmer zničené (LiDAR-ová mapa D. Mlekuž).
- Obr. 15. Pohrebisko Pivola. Plochy v severnej časti pohrebiska na poľnohospodárskej pôde s takmer zničenými mohylami v Pivole (A), skúmanými magnetometriou, GPR a odporovou metódou (B; LiDAR-ová mapa D. Mlekuž).
- Obr. 16. Pohrebisko Pivola, severná skupina mohýl. Magnetická mapa na digitálnom výškovom modeli. Silné bodové magnetické anomálie sú spôsobené mnohými železnými predmetmi roztrúsenými v poľnohospodársky obrábanej pôde (A). Priekopy okolo mohýl, identifikované na magnetograme, sú označené bielymi šípkami (B; podľa Teržan/Črešnar/Mušič 2015, obr. 8).
- Obr. 17. Pohrebisko Pivola, severná skupina mohýl. A – plochy preskúvané GPR na DTM odvodenom z LiDAR-ovej mapy so žltými kruhmi indikujúcimi polohu a veľkosť mohýl; B – výsledky GPR meraní v hĺbkovom intervale 70–80 cm (LiDAR-ová mapa D. Mlekuž).
- Obr. 18. Pohrebisko Pivola, severná skupina mohýl. Topografická korekcia výsledkov GPR metódy so 400 MHz anténou (A a B). Obrázok ukazuje excentrickú polohu hrobových komôr a zreteľné rozdiely v stave zachovania. Komora mohyly 13 (A – Kv_3) je dobre zachovaná (pozri obr. 17; 19; 20), zatiaľ čo komora mohyly 17 (B – Kv_6) je takmer úplne zničená hlbokou orbou (pozri obr. 17). Po topografickej korekcii je plášť mohyly so silným zvýraznením GPR signálov (tmavomodré plochy) tiež v pôvodnej polohe (podľa Mušič/Črešnar/Medarič 2014, obr. 4).
- Obr. 19. Pohrebisko Pivola, severná skupina mohýl, mohyla 13. GPR časové rezy v hĺbkovom intervale od 0,5 m do 0,9 m (a–d) a odporové meranie (e). Výrazné georadarové odrazy z kamennej hrobovej komory a vysoké hodnoty odporu v centrálnej časti mohyly sú jasne viditeľné (A). Veľkosť takmer úplne zničenej mohyly bola určená na základe zoslabenia GPR signálov a významne nižšieho odporu v priestore plášťa mohyly (B, naznačené kruhmi).
- Obr. 20. Pohrebisko Pivola, severná skupina mohýl, mohyla 13. GPR časové rezy v hĺbkovom intervale 60–70 cm (1) reprezentujú výrazné odrazy z hrobovej komory z nasucho kladeného kameňa v centre mohyly (A), zoslabenie GPR signálu vo vodou nasýtenom plášti mohyly vybudovanom z piesočnatej hliny (B) a chaotické odrazy zo štrkopiesku na modernom poli v blízkom okolí (C). Zobrazenie GPR amplitúdy (2) a 3D zobrazenie (3; podľa Mušič/Črešnar/Medarič 2014, obr. 6; Teržan/Črešnar/Mušič 2015, obr. 13; 16).

Obr. 21. Pivola, mohyla 13. Zobrazenie troch následných fáz výskumu hrovej komory na georeferencovaných kolmých fotografiách a na počítačovej grafike vyhotovenej na základe týchto fotografií. Pri objavení bola hrobová komora zakrytá a vyplnená kamennou sutinou (A), po ktorej odstránení sa objavili dve väčšie koncentrácie spálenej zemi-ny a spálených ľudských ostatkov (B). Po odstránení výplne sa odhalili detaily dôležité pre pochopenie konštrukcie komory – dve jamy na zvislé drevené stĺpy vo východnej a západnej stene. Popri vnútorných stenách komory a na jej dne boli odkryté zvyšky zvetranej vrstvy, ktoré indikujú existenciu drevenej konštrukcie (C).

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VESSELS WITH CONICAL NECK ('KEGELHALSGEFÄSSE') IN THE NORTHEASTERN TRANSDANUBIAN HALLSTATT GROUP¹

Interpreting the Vessels Based on Grave Contexts

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The Northeastern Transdanubian Hallstatt group refers to the cultural unit within the Eastern Hallstatt circle in the Early Iron Age (Ha C–Ha D1 period) that covers the Danube Bend and the eastern part of Western Slovakia, more specifically the land between the rivers Váh and Hron. The present study focuses on this area, where the number of flat cremation cemeteries is high, while burial tumuli are less characteristic. Vessels with conical neck ('Kegelhalsgefässe') are among the most common vessel shapes in the entire Eastern Hallstatt circle. One, two or sometimes even more fragments of them per grave in the research area of the recent survey provide a good basis for analysing their role in the burials. The study of the excavated graves, where sufficient data of the context were also available, suggests three potential functions of the vessels: they either served as urns, were part of a drinking vessel set or were used for cooking or serving some kind of meat dish. The different functions also shed light on the complex network system of the NE-Transdanubian Hallstatt group.

THE RESEARCH HISTORY OF THE NORTHEASTERN TRANSDANUBIAN HALLSTATT GROUP AND THE ASSORTMENT OF THEIR BURIAL PLACES

Although the tumuli are not among the most typical forms of burial in the NE-Transdanubian Hallstatt group, these visually remarkable remains of the Early Iron Age drew the attention first to the separate cultural unit within the Eastern Hallstatt circle that existed on its north-eastern borderland, along the river Danube (Százhalombatta [Czajlik *et al.* 2016, 57] and Süttő [Czajlik/Novinszki-Groma/Horváth 2015, 59, 60]). The first flat cremation cemeteries in Northern Transdanubia were excavated and published in the 1930s and 1950s (Középrépáspuszta [Nagy 1939] and Halimba-Cseres [Lengyel 1959]).

In the first half of the 20th century, Slovak archaeologists concluded that the few Early Iron Age archaeological remains of Southwest Slovakia belong to the Eastern Alpine Hallstatt circle (Budinský-Krička 1947, 15; Eisner 1933, 148–154, 160, 161). The article by Jozef Paulík in 1958 on the two small burial mounds (number 1/57 and number 2/57) and the two cremation graves in Hurbanovo, as well as on the cremation burials of Bajč, Malé Kosihy and Malá nad Hronom drew the attention first to the Early Iron Age material discovered in the southern, lower flow of the tributaries Váh and Hron of the river Danube. These archaeological finds show many similarities with the forms and styles of the NE-Transdanubian material but not with that of the Kalenderberg-group (Paulík 1958, 374, 375).

The similarity between both the burials and the material culture on the northern and southern side of the river Danube implies that they both date back to the first half of the Hallstatt period, to the Ha C–Ha D1 phase. During the excavation of the graves at Chotín in the 1950s, material of the Vekerzug culture from the Late Hallstatt period appeared as well (Dušek M. 1966). The same happened in the cemetery of Modrany, excavated in 1970–1971 (Dušek S. 1976).

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Tibor Kemenczei published his work on the lifespan of the flat cremation cemeteries and the appearance of Vekezug culture material on the right side of the river Danube in 1977 (Kemenczei 1977). In contrast to the northern part of the research area, here the use of flat cremation cemeteries stopped in the Ha D1 period and material of the Vekezug culture was discovered only sporadically in the area around today's Budapest (Pomáz, Szigetszentmárton; Kemenczei 1977, 85).

Jozef Paulík discussed the subject of the graves between the rivers Váh and Hron again in 1975. He named it the 'Középrépáspusztá-group' after the flat cremation cemetery published first from the research area. He came to the conclusion that a large number of flat cremation graves and cemeteries, the strong traditions of the Urnfield period in the material culture as well as the Thraco-Cimmerian (Mezőcsát group) influence from the East were the main characteristics of this particular cultural unit (Paulík 1975, 49–51).

Thanks to the rising number of archaeological sites from the Hallstatt period in the Transdanubian region, it became possible to identify a new cultural division in the second half of the 20th century. Based on the location of the Early Iron Age cemeteries and settlements, Erzsébet Patek divided the Transdanubian region into four units (Patek 1982/1983, 59, 60). She identified three units to the north of Lake Balaton, among them one at the Danube Bend, in the north-eastern part of Transdanubia. It is important to highlight that from a geographical point of view, the two key cemeteries of the earlier research, Középrépáspusztá and Halimba, are not part of the NE-Transdanubian Hallstatt group.

Biba Teržan also split the northern part of Transdanubia into three cultural units in her monograph from 1990. Based on the analysis of the materials from a social viewpoint (Teržan 1990, 159–183) she distinguished a separate group ('Porabje – Rába [Raab] River region'), situated between the Sopron group in the west ('The Neusiedler See region with Burgenland Gradišće and the Danube Plain') and the NE-Transdanubian Hallstatt group in the east ('The Danube Bend').

Archaeological work in the second half of the 20th century confirmed that the flat cremation cemeteries were the most common within the NE-Transdanubian Hallstatt group. Tibor Kemenczei led the rescue excavation of 16 graves at the Tatabánya-Alsó, Vasútállomás site, in 1970 (Groma 2015, 137–139). Although both the modern building constructions and the medieval village disturbed the archaeological site, Éva Vadász and Gábor Vékony managed to excavate 45 flat cremation graves at Tatabánya, Dózsakert (Kisné-Vékony 2002, 7–9; Vékony 1978, 27).² There is also a flat cremation cemetery with 82 excavated graves near the tumuli field in Süttő (Czajlik/Novinszki-Groma/Horváth 2015, 70).³ Out of the 38 cremation graves excavated by Mikuláš Dušek at Nové Zámky in 1957–1958, 29 date back to the Hallstatt period. Susanne Stegmann-Rajtár split the Early Iron Age life of the cemetery into five phases in her work from 2009 (Stegmann-Rajtár 2009, 114).

In contrast, the number of the excavated and published burial mounds in the research area is significantly lower. Jozef Paulík studied two little tumuli at the Hurbanovo site (Paulík 1958, 362–366). Thanks to Éva Vadász, we know the archaeological context and the material of the second largest tumulus in the southern group at Süttő (Vadász 1983) and the data on the single burial mound near Tata (Vadász 2003). Unfortunately, we only have a few studies on the tumuli from the huge Százhalombatta cemetery and

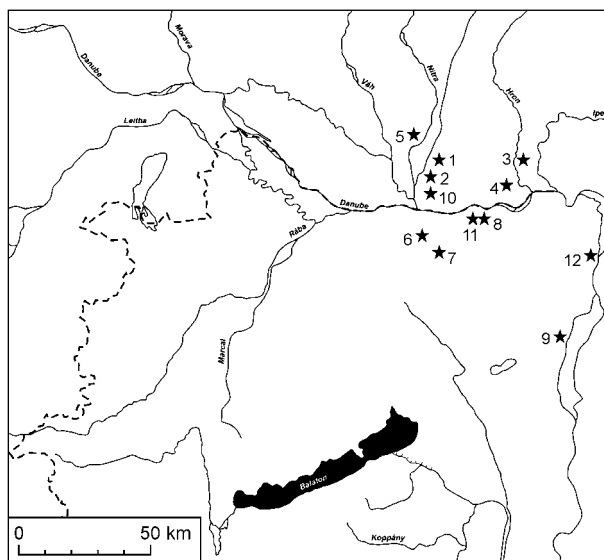


Fig. 1. Map of the cemeteries of the research area. 1 – Bajč; 2 – Hurbanovo; 3 – Malé Kosihy; 4 – Malá nad Hronom; 5 – Nové Zámky; 6 – Tata; 7 – Tatabánya-Alsó, Vasútállomás, and Tatabánya, Dózsakert; 8 – Süttő; 9 – Százhalombatta; 10 – Chotín; 11 – Neszmély; 12 – Budapest-Békásmegyér. Map K. Novinszki-Groma.

² The Tatabánya, Dózsakert cemetery, was the topic of author's final thesis. I would like to thank the Kuny Domokos Museum of Tata for permitting me to use the analysis of a recent paper.

³ The flat cremation cemetery of Süttő was featured in author's PhD. thesis. I am grateful to the Balassa Bálint Museum of Esztergom for helping me with analysing the material.

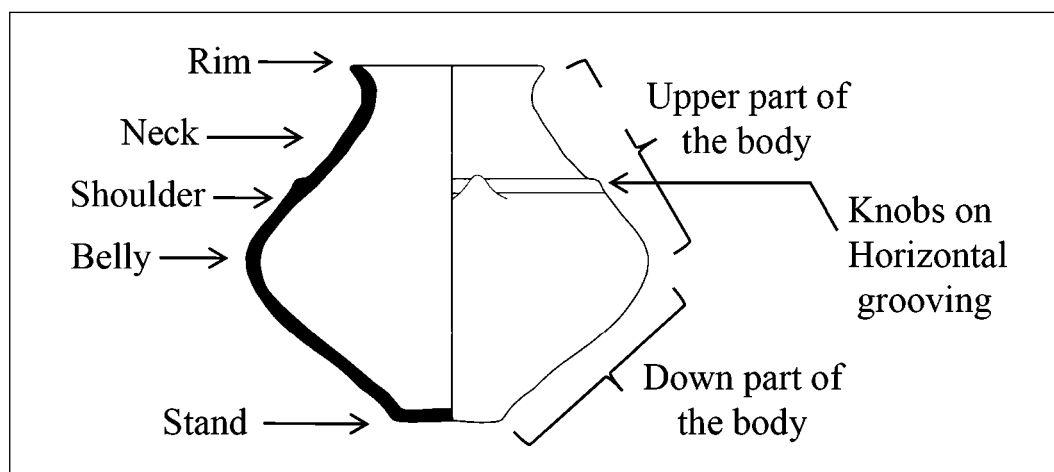


Fig. 2. The typical shape of the big vessels with conical neck. Drawing K. Novinszki-Groma based on Dobiat 1980, 66, fig. 7.

with the inventory of archaeological materials unpublished, it is impossible to include them in my analysis (Holport 1986; 1993).

Seven archaeological sites listed here provide the basis for the analysis in this paper (Fig. 1: 1–5, 7, 8). The graves usually contained vessels with conical neck, and analysing their shape in conjunction with the archaeological context is enough to determine their potential functions.

THE VARYING SHAPES AND DECORATIONS OF THE VESSELS WITH CONICAL NECK OF THE NORTHEASTERN TRANSDANUBIAN HALLSTATT GROUP

'Kegelhalsgefäß' or the vessel with conical neck is a common vessel type in the Eastern Hallstatt circle. These huge pots appear in the materials of both cemeteries and settlements. The most prominent characteristic of this vessel type is the biconical body, where the body is the widest below the shoulder, at the belly. It has an everted rim with a narrow neck, from where the upper part of the body starts widening. The second sharp break in the shape of the pot is at the shoulder, between the upper and lower part of the body. From here, the vessel starts narrowing towards the base. It can be difficult to distinguish between the neck and the shoulder, but a horizontal grooving often helps, as it gives extra emphasis to this part (Fig. 2; Dobiat 1980, 66, fig. 7).

Although a typological classification is not the main aim of this paper, I will discuss the various shapes of the vessels with conical neck of the NE-Transdanubian Hallstatt group briefly in the following. The collection of ceramic materials from the huge tumulus cemetery in Sulm Valley, Austria, is an important source regarding the Eastern Hallstatt circle. In case of the vessels with conical neck, Claus Dobiat had already described the bellied forms with shorter neck earlier, and stated that the vessels from the younger graves are slimmer and their necks are outstandingly long (Dobiat 1980, 68, 69, fig. 9).

The vessels with longer conical neck help only a little in categorising the cemeteries of NE-Transdanubia. Almost the only exceptions are the huge vessels from grave Nos. 50 and 59 of Süttő, as their necks are notably longer than the body of the pots. This might suggest that these graves date from the later phase of the Ha C–Ha D1 period (Fig. 3).

The five chronological units of the Nové Zámky cemetery, starting from the beginning of the Early Hallstatt period to the beginning of the Late Hallstatt period, provide the best basis for analysing the typological development of the vessels with conical neck within the NE-Transdanubian Hallstatt group. The first three phases (grave No. 18 from the first; graves Nos. 2, 17, 19, 24 and 25 from the second, and graves Nos. 5, 14, 23, 34 from the third phase) represent the classical Ha C–Ha D1 period (Stegmann-Rajtár 2009, 85, 86). The vessels with conical neck have notable bellies during this period, also meaning that the pots are not twice as high as or even bigger than the width of the break between the shoulder and the belly. Vertical channelling are typical decorative elements on them, since they emphasise the breaks

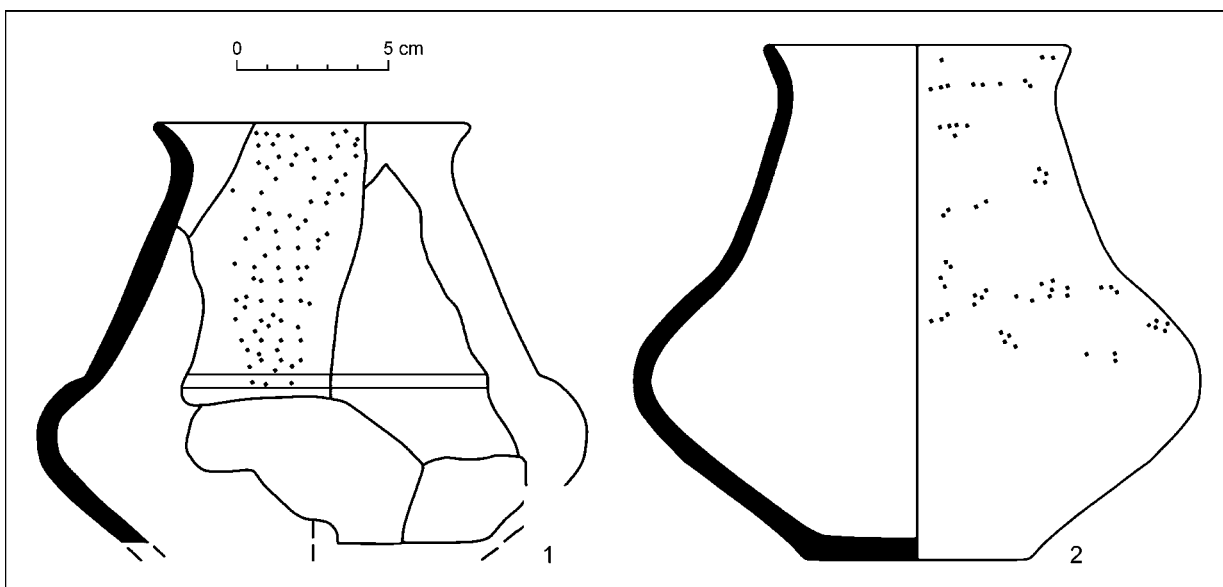


Fig. 3. Big vessels with longer conical neck from the research area. 1 – Süttő, grave No. 50; 2 – Süttő, grave No. 59. Drawing K. Novinszki-Groma.

between each part of the pot, for example between the rim and the neck or between the shoulder and the belly (Fig. 4: 1–3).

Phase IV with graves No. 26 and 29 at Nové Zámky represents the end of the Early Hallstatt period (Ha C2–Ha D1), while graves Nos. 7, 8 and 9 of Phase V date back to the Late Hallstatt period (Ha D; *Stegmann-Rajtár* 2009, 86, 87). The vessels with conical neck started to get taller and thinner in that period, thus the terms ‘amphora’ or ‘vase’ describe their shapes that had come into fashion. The sharp breaks disappeared from the body of the vessels (Fig. 4: 4, 5). As the cemeteries south of the Danube do not cover the Late Hallstatt period, these types of vessels rarely appear in the graves. Only a few of them were discovered in the burials of Süttő and Tatabánya, Dózsakert site, while the big vessels of grave Nos. 2, 8, 10 and 15 in Tatabánya-Alsó, Vasútállomás site (*Groma* 2015, 140–153, fig. 3: 12; 5: 8; 6: 1; 7: 10), resemble the later variants. This suggests that the cemetery was still in use during the later phase, which is a very important piece of information as the only metal object of this site, a harp-shaped fibula in grave No. 1 dates back to the early Ha C1–Ha C2 periods.

Four decoration techniques were used typically on the vessels with conical neck, discovered in the flat cremation cemeteries of the research area. Horizontal channelling – sometimes even several of them, like in case of the huge vessel from grave No. 35 at Nové Zámky (*Stegmann-Rajtár* 2009, 72. pl. XVII: 9) – often emphasise the break between the rim and the neck, or the neck and the shoulder (Fig. 5: 1). The above-mentioned pot has a different channelling on it as well: parallel vertical or crosswise lines run around the shoulder. While horizontal channelling is very typical among the archaeological material of both the flat cremation cemeteries and the burial mounds (see *Appendix*), we only have a few examples for vertical or crosswise channelling decorating the shoulder of the pots from the research area. The examples are from the flat graves Nos. 41, 51 in Süttő (Fig. 5: 2) and one is from the tumulus of Tata (*Vadász* 2003, 90. pl. II: 2).

Knobs are also common decorative elements, usually on the shoulder of the pots. The number of knobs on the vessels from the research area varied from three to six, but mostly they were four, at equal distance from each other. Sometimes they interrupt the horizontal channellings, as we can see on the vessel with a conical neck from grave No. 65 in Süttő, but they also stand alone on the shoulder (Fig. 5: 3). The knobs decorating the lower part of the pots are less common among the finds from the research area. Examples of this are the two vessels from graves Nos. 24 and No. 25 of Nové Zámky, since, as opposed to the pointed variants on the upper part of the pots, their knobs are more like vertical handles (Fig. 5: 5; *Stegmann-Rajtár* 2009, 69–71, pl. XIII: 7; XIV: 7, 8).

The decorations referred to as ‘repeating motifs’, appear quite often and in various forms on the shoulder of the vessels from the flat cremation cemeteries. Channelled line bundles and impressed lines

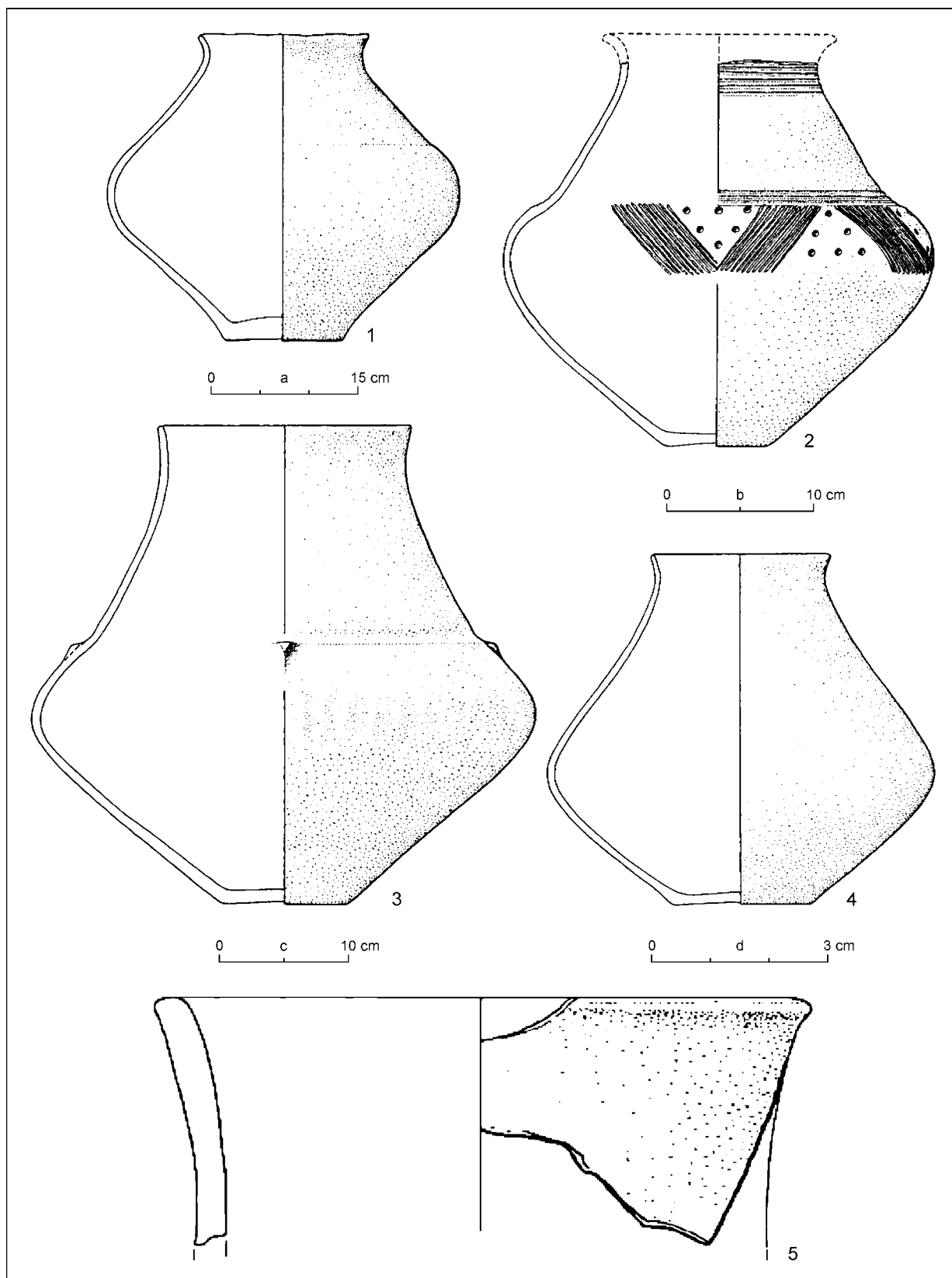


Fig. 4. Formal development of the big vessels with conical neck from the Nové Zámky cemetery. 1 – grave No. 18 (Stegmann-Rajtár 2009, 67, pl. X: 1); 2 – grave No. 2 (Stegmann-Rajtár 2009, 61, pl. I: 11); 3 – grave No. 34 (Stegmann-Rajtár 2009, 71, 72, pl. XVII: 1); 4 – grave No. 26 (Stegmann-Rajtár 2009, 71, pl. XV: 4); 5 – grave No. 9 (Stegmann-Rajtár 2009, 63, pl. II: 10). Scale: a – 1, 2;; b – 3; c – 4; d – 5.

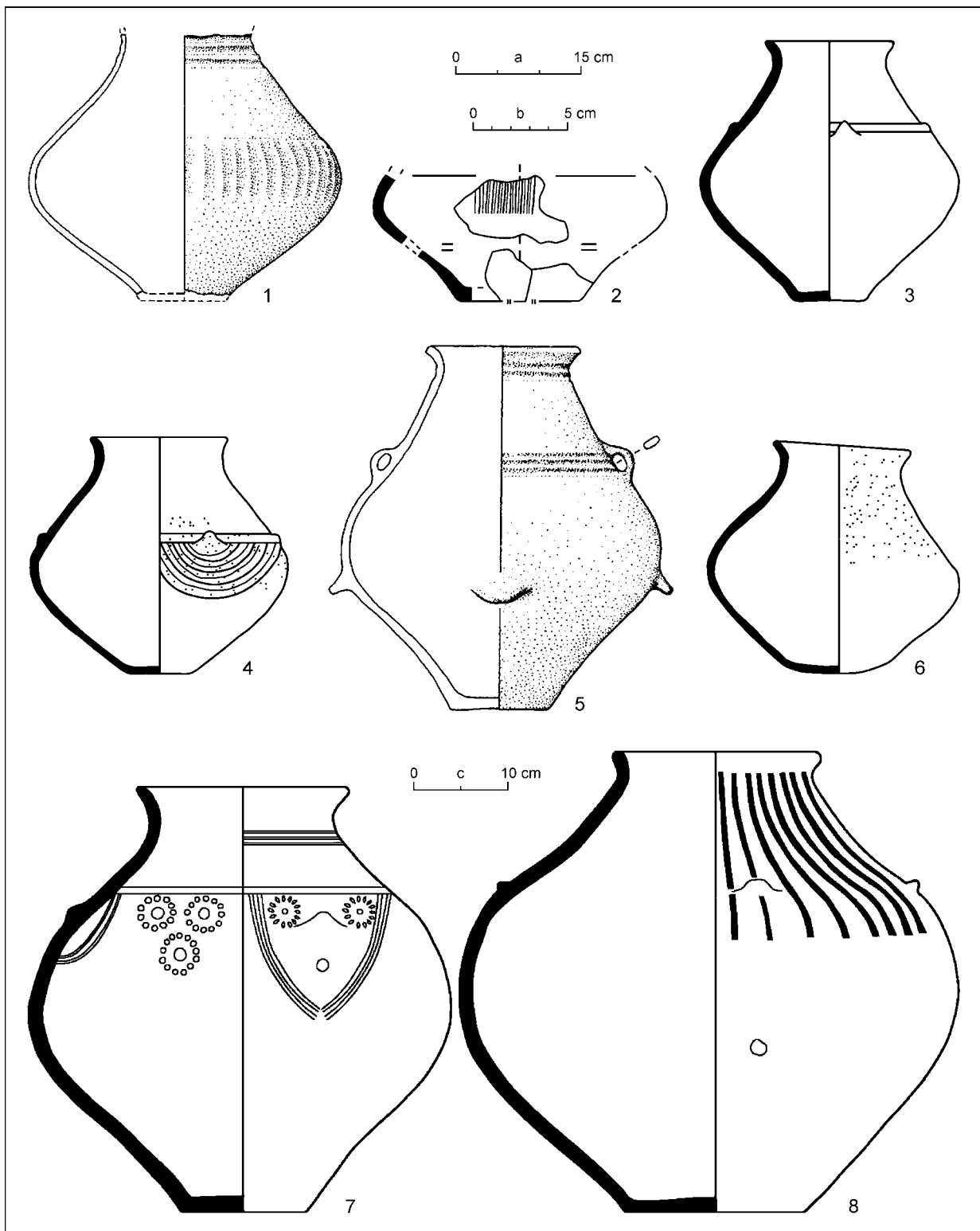


Fig. 5. The various decorations of the big vessels with conical neck. 1 – horizontal channelling, Nové Zámky, grave No. 35 (*Stegmann-Rajtár 2009*, 72, pl. XVII: 9); 2 – vertical or crosswise channelling/ribs on the shoulder, Süttő, grave No. 51 (drawing K. Novinszki-Groma); 3 – knobs on the shoulder, Süttő, grave No. 65 (drawing K. Novinszki-Groma); 4 – simple 'repeating motifs', Süttő, grave No. 12 (drawing K. Novinszki-Groma); 5 – knobs on the lower part of the pot, Nové Zámky, grave No. 24 (*Stegmann-Rajtár 2009*, 69, pl. XIII: 7); 6 – graphite-painted/gleaming surface on the upper part of the vessel, Süttő, grave No. 24 (drawing K. Novinszki-Groma); 7 – complex 'repeating motifs', Tatabánya, Dózsakert, grave 'X' (drawing K. Novinszki-Groma); 8 – graphite-painted motifs, Tatabánya, Dózsakert, grave No. 37 (drawing K. Novinszki-Groma). Scale: a – 1, 5; b – 2; c – 3, 4, 6–8.

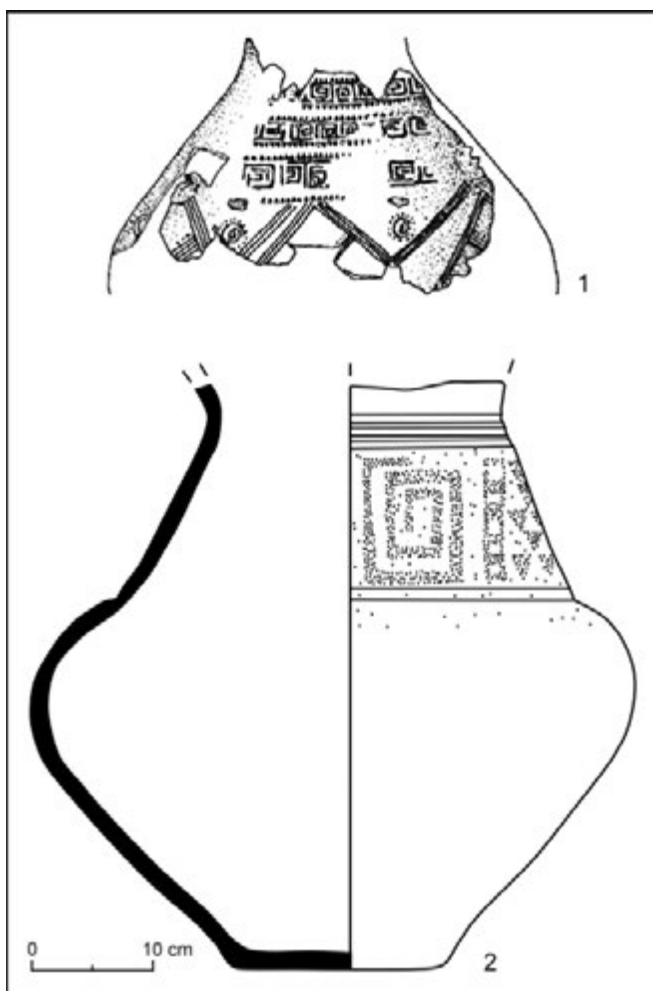


Fig. 6. Examples of graphite-painted geometric motifs in the research area. 1 – Süttő, old tumulus excavations (Vadász 1986, 252, pl. 2: 1); 2 – Süttő, grave No. 2 (drawing K. Novinszki-Groma).

danubian Hallstatt group had a few complex geometric patterns, such as meander motifs and volutes painted with graphite. These variants were discovered mostly in the burial mounds, for example in the old tumulus in Süttő that was excavated in the 1920s and 1930s (Fig. 6: 1; Vadász 1986, 252, pl. 2: 1), but similar decorative elements can be found in the material from burial mound No. 109 of Százhalombatta as well (Holport 1993, 26, 27, fig. 4: 2, 4; 5: 2).⁴ Meanwhile, from the flat cremation cemeteries only one vessel with conical neck has a graphite-painted, complex geometric motif. Meander motifs alternate with chessboard-like square and triangle motifs on the neck of the vessel from grave No. 2 of the Süttő flat cemetery (Fig. 6: 2).

While the above-mentioned decorative elements can be found on vessels with conical neck from both the tumuli and the flat cremation cemeteries, one type of protuberant decoration is exclusive among the finds of the burial mound. Animal protomes – bulls and birds – decorate the shoulder of the big vessels from the tumuli. They are often placed at the same distance from each other, just like the knobs on the vessels from the flat, cremation burials. Our examples include the finds of the old excavations in Süttő (Vadász 1986, 252, pl. 2: 1; 3), as well as the material of tumuli No. 117 and No. 109 in Százhalombatta (Fig. 7; Holport 1993, 26, 27, fig. 6–9).

It is clear from the material of both the tumuli and the flat cremation graves that the size of the vessels with conical necks varied (see *Appendix*). The smallest vessels are no higher than 20 centimetres. They were often discovered together with larger biconical vessels, for example at the Tata tumulus, where

of dots make up one section, and they often have knobs on the shoulder. The pattern is repeated around the upper part of the vessel. We can find a wide variety of motifs, from the simpler ones, such as three grooves around the knob (found in the flat cremation grave No. 12 of Süttő; Fig. 5: 4) to the more complex and artistic variants, like on the finds of grave 'X' of Tatabánya, Dózsakert site (Fig. 5: 7) and grave No. 3 at the Tatabánya-Alsó, Vasútállomás site (Groma 2015, 144, fig. 4: 4). The same decoration technique appears in the tumuli materials, for example on two vessels with conical neck from the Süttő burial mound, as they have knobs with channelled lines under them and graphite-painted zigzags and triangles decorating them (Vadász 1983, 27, fig. 13).

It is important to discuss the fourth type of decorations, the graphite painting. This decorative element is more common among the vessels from the burial mounds, with the exception of the pot from grave No. 37 of Tatabánya, Dózsakert, where vertical lines cover the neck and the shoulder (Fig. 5: 8). It is more common among the finds of the flat, cremation cemeteries that the upper part or even the whole surface of the vessel is graphite-painted for a gleaming appearance (Fig. 5: 6). This technique maybe interpreted as an imitation of metal vessels, found exclusively in the rich tumuli, for example in Fehérvárcsurgó in Northern Transdanubia (Vágó 2015, 189).

It is worth mentioning that sometimes the vessels with conical neck of the NE-Trans-

⁴ The material of the Százhalombatta burial mound revealed traces of red-black painting over the graphite painting.

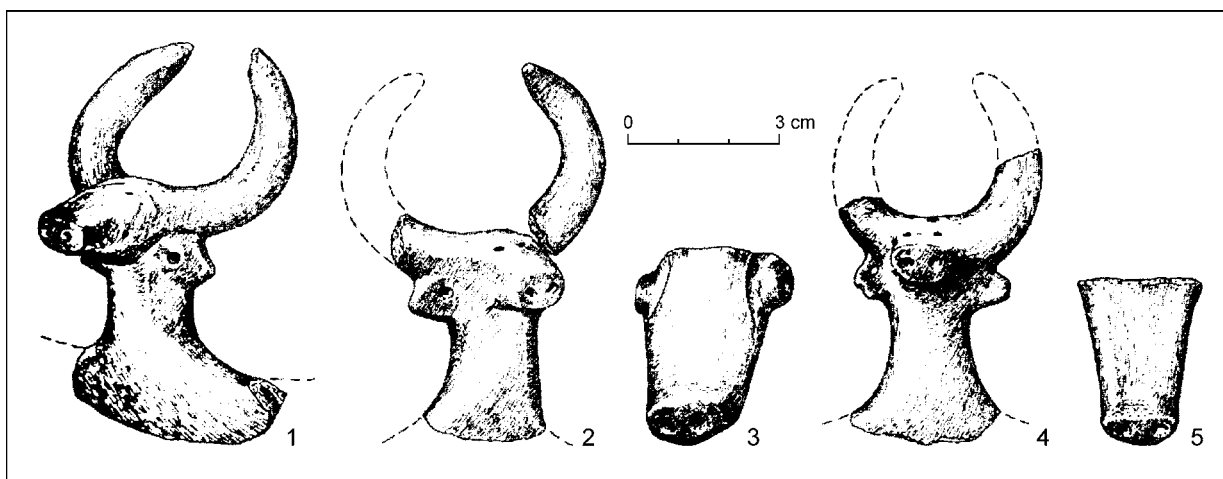


Fig. 7. Animal protomes from tumulus No. 117 in Százhalombatta (Holport 1993, 26, 27, fig. 6).

a little, 17.3 cm pot was excavated along two 31.8 cm pieces (Vadász 2003, 90, pl. II: 1, 2; III: 3). Most of the big pots with conical neck are middle-sized, their heights varying between 20 and 40 centimetres. The largest vessels are over 40 cm. Two pots from the Süttő tumulus are the tallest, with 54.4 and 53 cm respectively (Vadász 1983, 27, fig. 13), but there were 48.1 cm (grave No. 1 of Süttő), 47.8 cm (grave No. 2 of Süttő) and 46 cm (grave No. 17 of Nové Zámky; Stegmann-Rajtár 2009, 65–67, pl. IX: 1) tall vessels in the flat cremation graves.

THE ORIGIN OF THE VESSELS WITH CONICAL NECK IN THE EARLY IRON AGE ARCHAEOLOGICAL MATERIAL

In the research area, the Vál group of the Late Bronze Age Urnfield culture preceded the Early Iron Age Hallstatt culture. The most recent publication is on the Békásmegyer cemetery, which provides an excellent summary of the state of research in the area. It provides further confirmation that Northeastern Transdanubia, as well as the eastern part of Western Slovakia is rich in excavated and published cemeteries of the Urnfield culture. Besides the smaller and disturbed burial place, the 326 graves in Chotín uncovered by Mikuláš Dušek in 1957, Neszmély with its 200 graves published by Erzsébet Patek in 1961 and the 329 graves in Békásmegyer provide a good basis for analysing the main vessel shapes of the Late Bronze Age in the research area and studying their role in burial context (Fig. 1: 10–12; Kalicz-Schreiber/Kalicz/Váczi 2010, 13, 14).

The analysis indicates two main types of vessels. One has a cylindrical or conical neck, separated from the protruding shoulder by a sharp break, while the lower part of the pot has a rounded biconical shape (Fig. 8: 1, 2). The other falls under the category of 'amphora'. It has a cylindrical or conical neck, but the body is rounder. A small foot serves often as the base of the pot and it usually has two little handles on the shoulder (Fig. 8: 3, 4). Vertical channelling lines often decorate the shoulders of both types (Kalicz-Schreiber/Kalicz/Váczi 2010, 248–251; Patek 1961, 65–72).

Even though the big pots of the Urnfield culture share many similarities with the vessels with conical neck of the Early Iron Age, there are also a few differences between the main types. The earlier variants discovered in the burials of the Hallstatt culture are more similar to the big pots of the Mezőcsát group of the Great Hungarian Plain, from the transitional period from the Late Bronze to the Early Iron Age (Ha B3/Ha C1 phase; Fig. 8: 5). Erzsébet Patek conceived that the origin of the vessels with conical neck of this cultural unit goes all the way back to the local Late Bronze Age (Gáva and Kyjatice cultures), with the additional Southeastern Alpine and Italian influences (Patek 1993, 19, fig. 10; 11).

Cremation is predominant in the Urnfield culture with almost no exceptions, however there are no strict rules regarding the treatment of the human remains in the pit. We have examples for both the urns containing the cremated remains and the remains being scattered on the bottom of a pit (Kalicz-Schreiber/

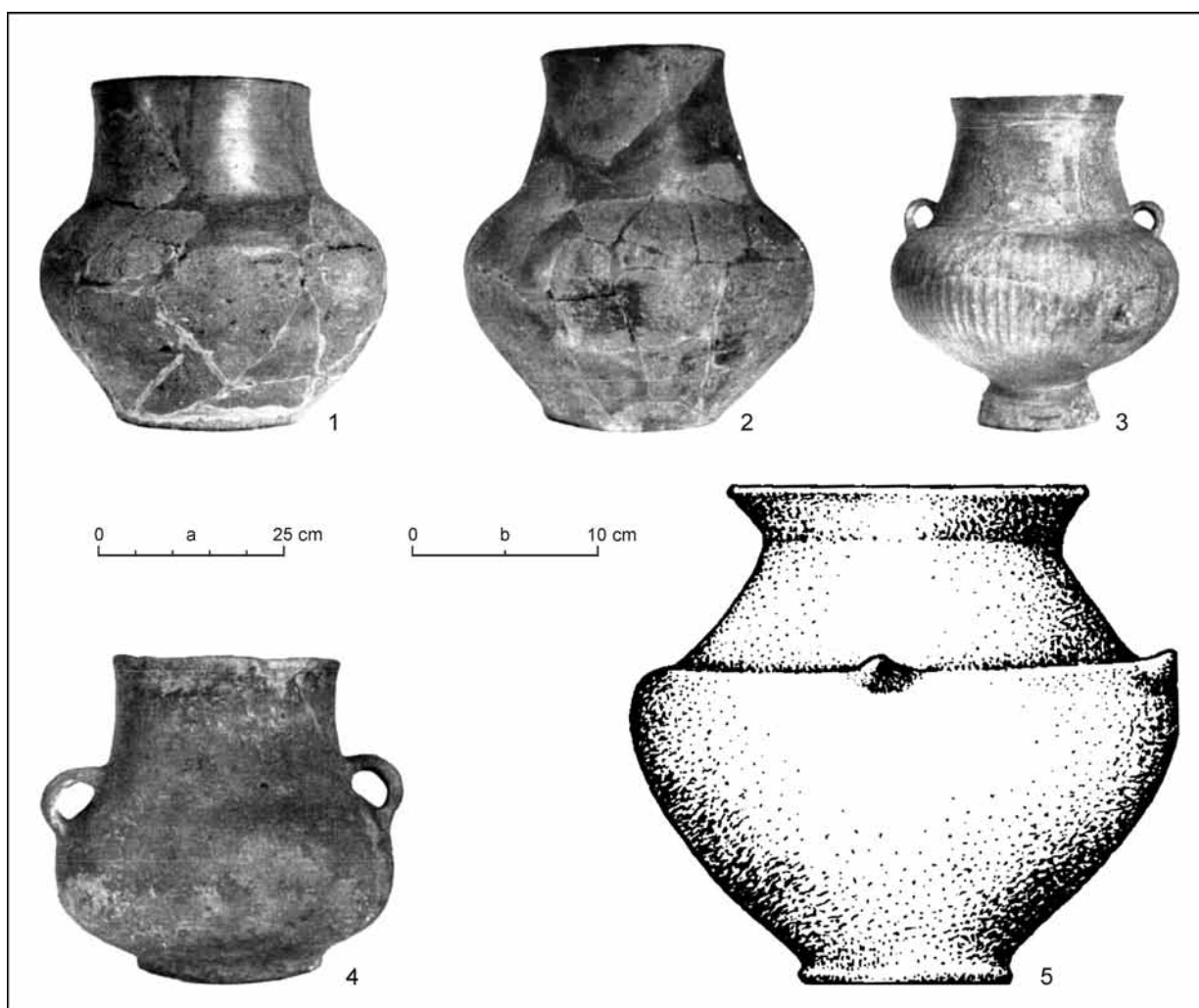


Fig. 8. The most common shapes of the big vessels of the Urnfield culture. 1, 2 – big vessel with conical or cylindrical neck, Neszmély, grave No. 51 (*Patek 1993, 46, pl. VIII: 4, 5*); 3, 4 – ‘amphora’, Neszmély, grave No. 53 (*Patek 1993, 46, pl. VIII: 7, 8*); 5 – big vessel with conical neck of the Mezőcsát group, grave of Boconád, Gosztonyi-tanya (*Patek 1993, 69, pl. 2: 5*). Scale: a – 1–4; b – 5.

Kalicz/Váczi 2010, 17). The most common types of urns are the vessels with conical or cylindrical neck and the amphorae (*Kalicz-Schreiber/Kalicz/Váczi 2010, 248, 249*). As grave No. 103 at the Békásmegyer site shows, the urns contained not only the cremated human remains but also the burnt personal belongings of the deceased. Buttons, a belt buckle, rings, hair rings and pieces of bronze wires were found next to the cremated remains in the two-handled amphora from the grave (*Kalicz-Schreiber/Kalicz/Váczi 2010, 70, 71, fig. 146; 147; pl. 49: 2, 6–11*).

Besides their role as urns during the Urnfield culture, grave contexts suggest that the vessels were part of other burial practices as well in the Late Bronze Age. Nevertheless, the amphora from grave No. 119 of Békásmegyer is an urn. It was found together with three cups and fragments of a bowl around it, as well as a little amphora and two small bowls in it (*Kalicz-Schreiber/Kalicz/Váczi 2010, 83, fig. 178; 180; pl. 57: 1–7*). The fragmented bigger bowl probably served as a cover, and the other vessels suggest that the bigger amphora had a part in eating and drinking practices.

A unique burial practice of the Mezőcsát group in the Ha B phase of the Late Bronze Age was inhumation of the body. This means that in these cases the vessels with conical neck did not serve as urns. The graves often contained bones of animals – mostly that of sheep in the north-eastern part of the Great Hungarian Plain –, placed around or inside these big vessels (*Patek 1990, 70*).

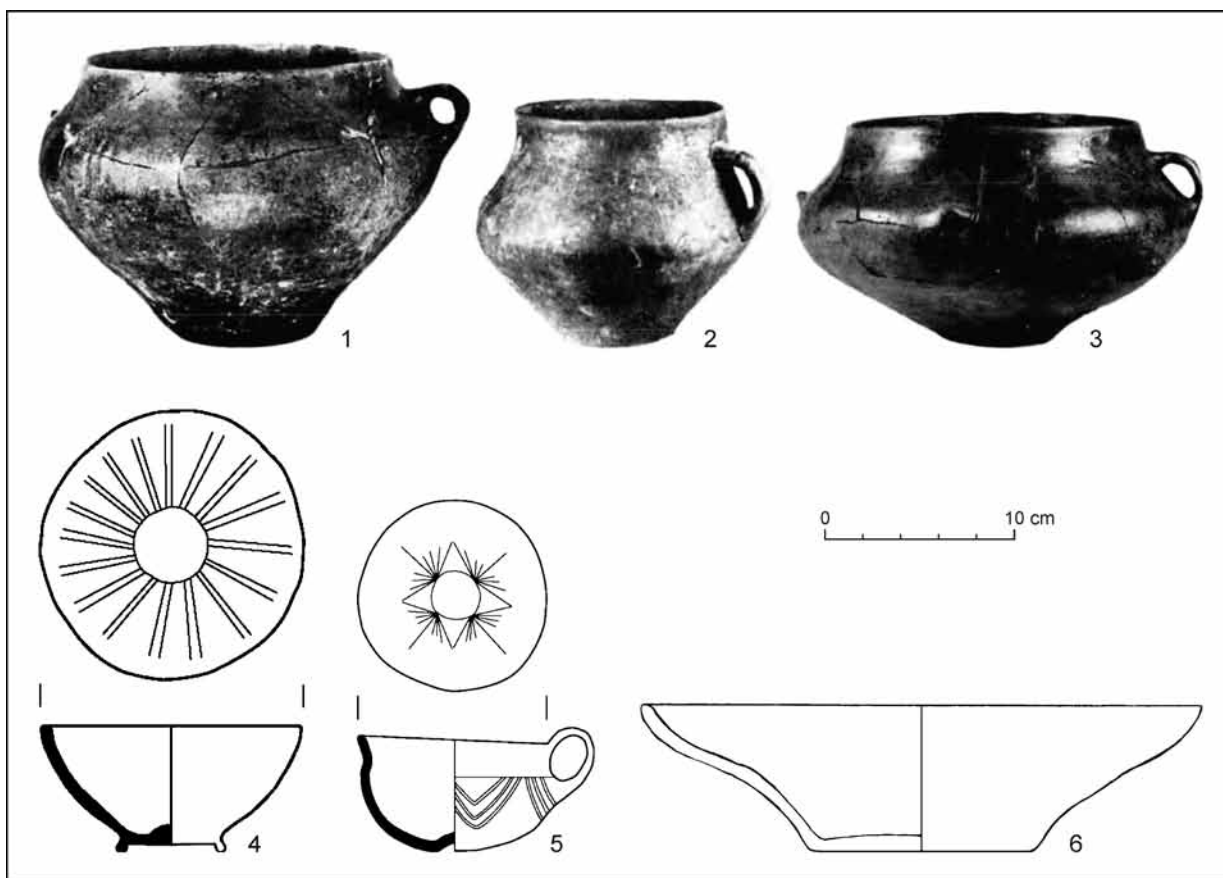


Fig. 9. Vessel types serving as urns in the Early Iron Age graves of the research area. 1–3 – deep biconical bowls: 1 – Hurbanovo, tumulus No. 1/57 (Paulík 1958, 363, pl. III: 7), 2 – Hurbanovo, tumulus No. 2/57 (Paulík 1958, 365, pl. IV: 1), 3 – Bajč, cremation grave (Paulík 1958, 366, fig. 4: 1); 4 – footed cup, Tatabánya-Alsó, Vasútállomás, grave No. 3 (Groma 2015, 144, fig. 4: 6); 5 – handled cup, Tatabánya, Dózsakert, grave No. 16 (Novinszki-Groma 2018, 123, pl. III: 4); 6 – conical bowl, Süttő, grave No. 20 (drawing K. Novinszki-Groma). Without scale – 1–3.

THE ROLE OF THE VESSELS WITH CONICAL NECK IN THE GRAVES OF THE NORTHEASTERN TRANSDANUBIAN HALLSTATT GROUP

Thanks to the careful excavation and precise publication of numerous burials, we can work out the potential role of the vessels with conical neck discovered in the Early Iron Age graves of the research area. At least three definable main functions will be discussed in the following.

The graves of the Northeastern Transdanubian Hallstatt group contained only a small amount of cremated human remains. Therefore, it is very difficult to decide at times whether the remains were placed in one or sometimes even multiple urns (see *Appendix*), or were simply scattered in the bottom of the pits. However, the vessels with conical neck in all the larger cemeteries served as urns. The Nové Zámky burial place is perhaps the most important, since out of the total 37 vessels, the function of 12 as urns is verifiable. Among these burials, grave No. 16 is special, because despite the vessels being highly fragmented, the place of the human remains suggests that the two additional pots and four bowls on top of the vessel with conical neck also contained cremated human remains (Stegmann-Rajtár 2009, 65, 66). It is unlikely that the seven vessels were all used as urns, but it suggests the possibility of a burial custom, in which the objects were placed in the pit first, and only then were the human remains scattered in it.

There are many examples from the research area where the cremated human remains were placed into an urn, but into a different vessel type instead of the vessel with conical neck. Usually, these were deep, biconical bowls with or without a handle. The burial context of the old excavations, conducted in the area of today's Slovakia, proves that these huge bowls served as urns, as the small burial mound No. 1/57 in Hurbanovo also suggests. The deep bowl found there contains not only a larger amount of cremated human bones, but two

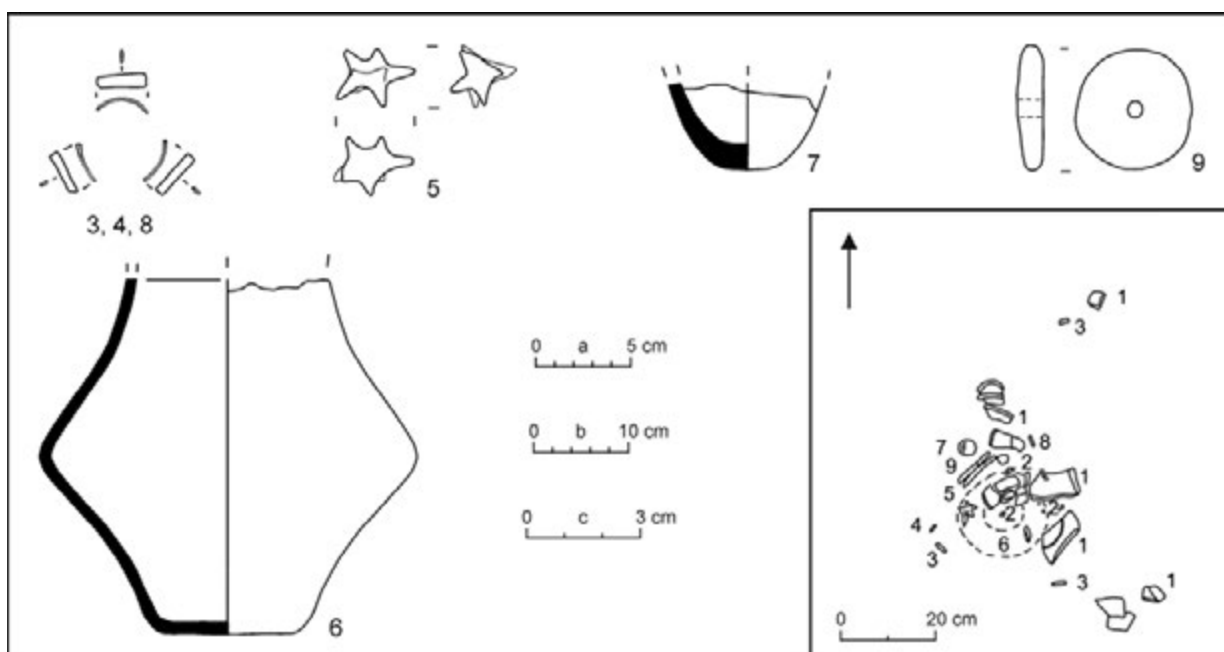


Fig. 10. Early Iron Age big vessel with conical neck serving as an urn, containing the personal belongings of the deceased. Süttő, grave No. 44. Drawing K. Novinszki-Groma, based on the documentation of É. Vadász. Scale: a – 3–5, 8, 9; b – 6; c – 7.

bronze beads as well (Fig. 9: 1; *Paulík 1958*, 362–364, fig. 1; 2: 1, 2). It is worth mentioning that fragments of a vessel with conical neck were also found in the burial. The context was very similar in the small tumulus No. 2/57 in Hurbanovo: the deep, biconical bowl contained human remains and the fragments of a harp-shaped iron fibula, while the vessel with conical neck was empty (Fig. 9: 2; *Paulík 1958*, 364–366, fig. 2: 3–6; 3). A different bowl covered the urn, both discovered inside the bigger vessel.⁵ Our third example is the flat, cremation grave at Bajč. The human remains were again placed into a deep, biconical bowl, while the vessel with conical neck was found empty during the excavation (Fig. 9: 3; *Paulík 1958*, 366, 367, fig. 4).

In the flat cremation graves of the research area, only a few other vessel types were used as urns. Sometimes the vessels are unique in some way, like the pedestal cup with rich inner decoration from grave No. 3 of the Tatabánya-Alsó, Vasútállomás site (Fig. 9: 4; *Groma 2015*, 144, fig. 4: 6) or a uniquely shaped handled cup that is similar to the Early Iron Age material of Silesia from grave No. 16 of Tatabánya, Dózsakert (Fig. 9: 5; *Novinszki-Groma 2018*, 123, pl. III: 4). Sometimes the urns are simpler vessels, such as the bowls with inverted rim in grave 'B' or No. 8 at Tatabánya, Dózsakert, or a conical bowl in grave No. 20 of Süttő (Fig. 9: 6).

Just like in the case of several graves from the Late Bronze Age Urnfield culture the burnt or unburnt objects and the human remains were placed into urns during the Hallstatt period as well. Grave No. 44 of Süttő is quite special, since a star-shaped clay figure, a clay spindle whorl, pieces of jewellery made of bronze sheets and a miniature vessel were found between the fragments of a vessel with conical neck (Fig. 10).

The presence of animal bones in the graves of the Hallstatt culture in NE-Transdanubia and in the eastern part of Western Slovakia varies from cemetery to cemetery (*Novinszki-Groma 2017*, 166, fig. 8). Most of the time they are part of the material, but we can find them only in a few graves. Tatabánya, Dózsakert, is the richest cemetery in that regard (see *Appendix*). There, the animal bones are often placed inside or around the vessels with conical neck. Sometimes a cup or a little bowl is inside the big vessel as well. The context suggests that the vessels with conical neck stored some kind of meat dish, implying the influence of the Mezőcsát group.

Graves in the western areas of the Eastern Hallstatt circle often contain drinking sets. These sets consist of a larger mixing pot, from which the drink was transferred into another, similarly large serving

⁵ It has to be mentioned that covering the urn with another bowl is not as common in the Hallstatt period as it is in the Urnfield culture, but we know about the practice from cases where a deep bowl or a big pot with conical neck served as an urn.

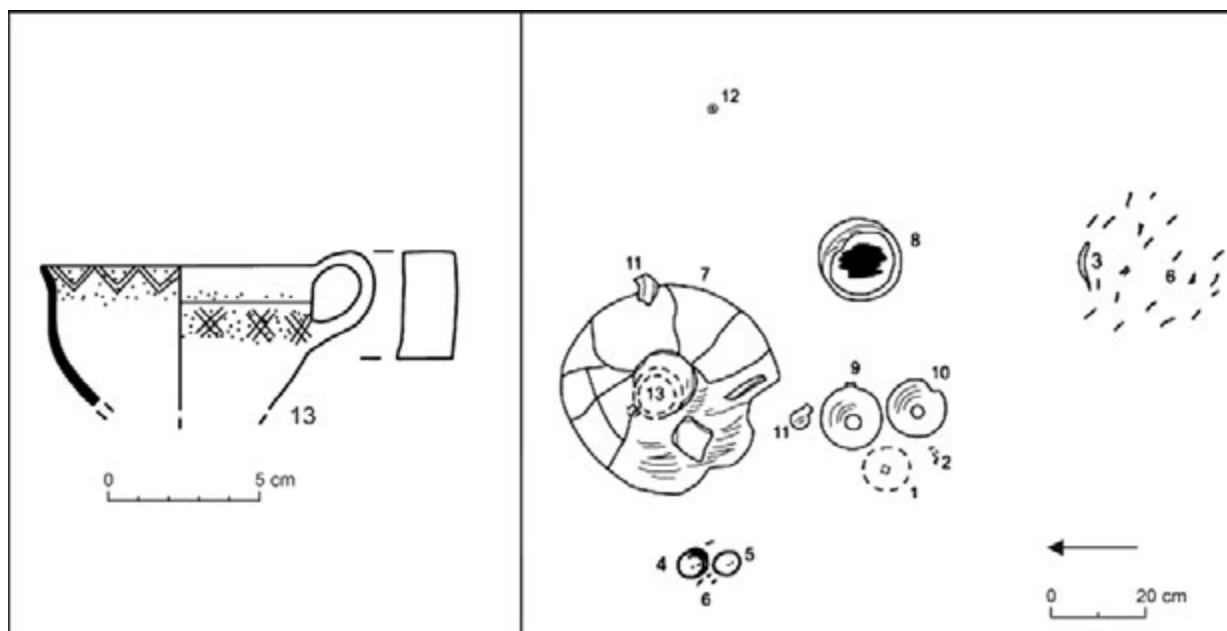


Fig. 11. Big vessel with conical neck with a handled cup inside, Süttő, grave No. 19. Drawing K. Novinszki-Groma.

vessel by using a handled cup. During this process, the drink passed through a sieve, thus the drink was already filtered when it was poured from the serving pot into the little bowls or cups, which were used for consumption. It seems that the big vessels with conical neck were often used as the mixing pots in this system (Kaus 1980, 37). The beverage consumed from these drinking sets was most likely some kind of wine – probably served with herbs and spices. The wine was probably produced in the part of the Eastern Hallstatt circle that is now Austria and Transdanubia, as evidenced by the grape stone find from burial mound No. 1 in Zagersdorf (Kaus 1980, 37, 38; Rebay 2002, 57, fig. 4).

In the flat cremation grave No. 17 of Süttő (Fig. 11) or grave No. 25 of Nové Zámky (Stegmann-Rajtár 2009, 69–71, fig. 7), cups with a handle or little bowls laid in the vessels with conical neck, which did not contain human remains. This suggests that the smaller vessels were probably used for scooping or drinking. The material of the Süttő tumulus supports the idea that here the vessels with conical neck were part of a drinking set, often found in the male graves of the Hallstatt culture. The big pots served as a container of the beverage, while the eight bowls with inverted rim were used for drinking (Nebelsick 2016, 25, 26, fig. 1: 1,6; 1: 1,8).

To complete the list of potential functions of the big vessels with conical neck in the NE-Transdanubian Hallstatt group, it is important to mention that the grave contexts suggest a complex burial ceremony in case of both the tumuli and the flat, cremation graves (Kaus 1980, 37). This means that the big vessels with conical neck had different functions, e.g. they contained originally some kind of beverage, but during the burial ritual, the cremated human remains were placed into them, turning the pots into urns.

CONCLUSION

During the Late Bronze and Early Iron Ages, cremation was the dominant burial practice in the western part of the Carpathian Basin. The human remains were often placed into vessels with cylindrical or conical neck discovered in the material of several cultural units (Patek 1961, 65). Based on the recent observations, this is the case for the graves of the NE-Transdanubian Hallstatt group extending over the eastern part of Western Slovakia, specifically the area between the rivers Hron and Váh.

Vessels with conical or cylindrical neck already appear in the material of the Late Bronze Age Urn-field culture, which preceded the Hallstatt group in the research area. Most of these vessels, however, have a different shape than the Early Iron Age variants. Similar pots were found in the graves of the Mezőcsát group on the Great Hungarian Plain, meaning that they were most likely the direct antecedents of the basic vessel types of the Hallstatt culture.

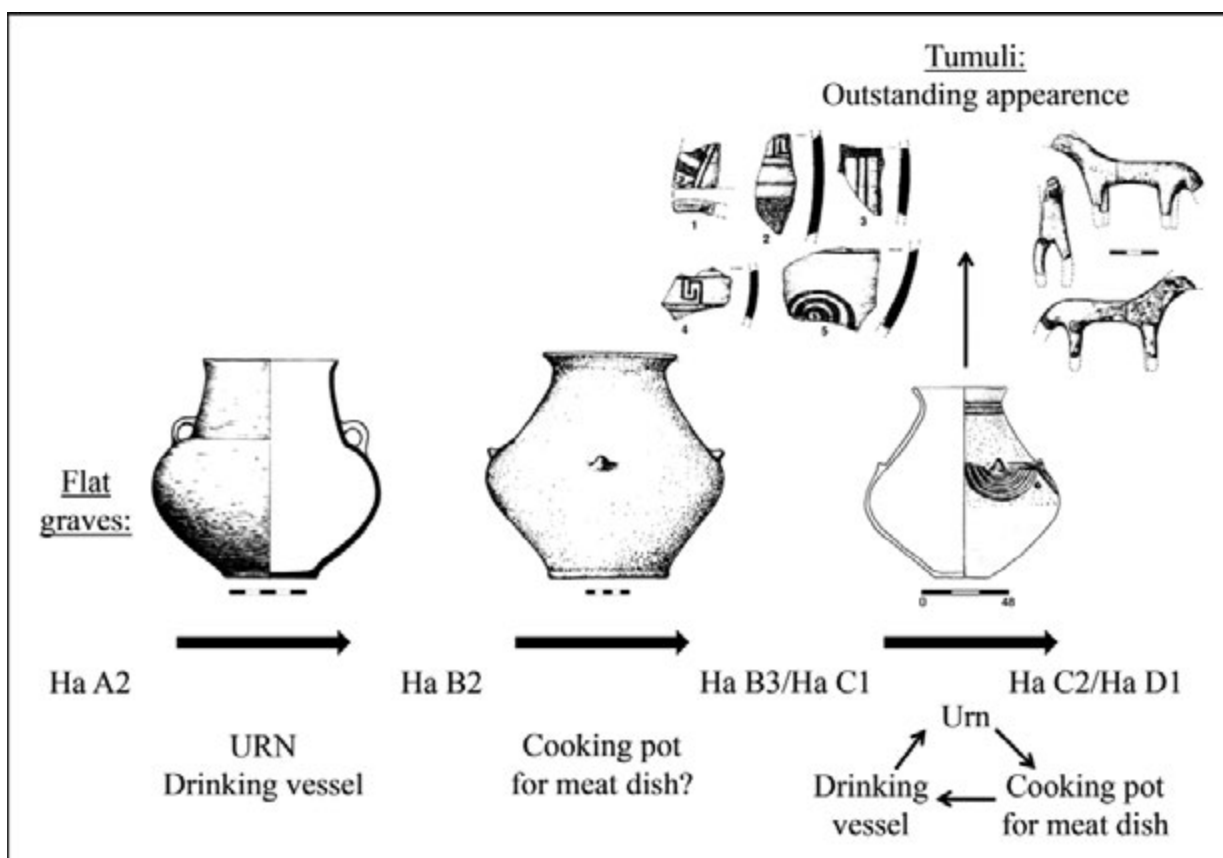


Fig. 12. Development of the big vessels with conical neck and the change in their functions in the graves of NE-Transdanubia from the Late Bronze Age to the Early Iron Age. The 'amphora' of the Urnfield culture is from grave No. 287 in Békásmegyer (Kalicz-Schreiber/Kalicz/Vácz 2010, 166, fig. 420; pl. 124: 6), the big vessel with conical neck of the Mezőcsát group is from grave No. 22 in Füzesabony, Kettőshalom (Patek 1993, 63, pl. 6: 6), the big vessel with conical neck of the Hallstatt culture is from grave No. 33 in Süttő (drawing K. Novinszki-Groma), the painted geometric motifs are from the fragments discovered in tumulus No. 109 in Százhalombatta (Holport 1993, 26, 27, fig. 4: 1–5), the animal protomes are from tumulus No. 109 in Százhalombatta (Holport 1993, 26, 27, fig. 9).

The only tumulus field where both the archaeological contexts and the inventory are public is Süttő, but unfortunately this is not the case for Százhalombatta. The other two sites – Tata and Hurbanovo – have one or two smaller burial mounds. These circumstances make it difficult to compare the vessels with conical neck from the tumuli and the flat cremation graves, thus we can only make some observations. There are no clear differences between the main forms, the variants of the Ha C–Ha D1 period occur in both burial types. The sizes and the main decoration techniques are also similar, but we have to highlight the use of complex painted geometric motifs – like meanders or volutes – and protomes, as they were part of the archaeological material only from the tumuli.

The main aim of the recent research was to discover the functions of the vessel types from the graves. Sometimes the big pots were found empty, without any other object around them, suggesting that they only had a one-time role. However, different contexts indicate three functions, which are the following:

1. urn: contained the cremated human remains and sometimes parts of personal accessories;
2. liquid container: cups or small bowls inside the big vessels suggest that they were filled with some kind of drink when placed into the grave;
3. cooking or serving pot for some meat dish: animal bones inside or around the vessels suggest this function.

It is also possible that one vessel had a mixed role, changing its function in the course of the burial ceremony.

The vessels with conical neck from the flat cremation graves fulfilled all three identified functions, but in the case of the tumuli, they either served as urns or seemed to be part of a drinking set. The animal

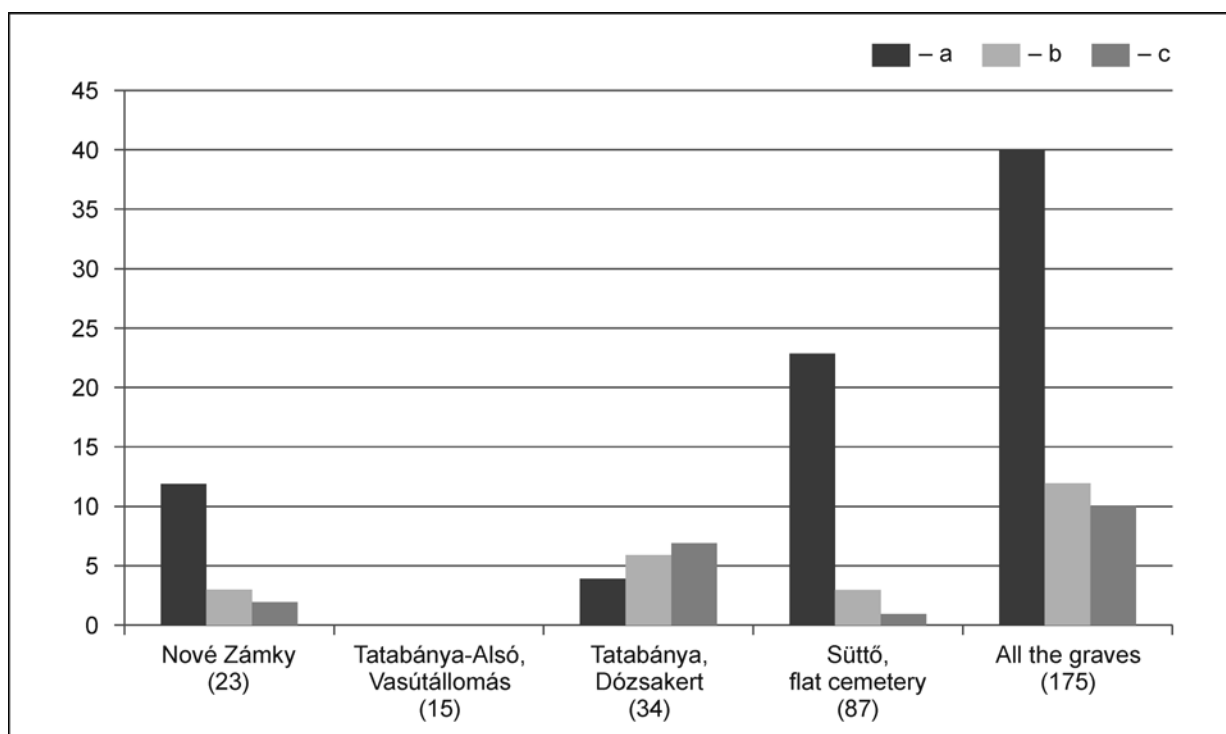


Fig. 13. The diagrams show the different functions of the big vessels with conical neck in the cemeteries of the research area. The numbers sign all the vessels per cemetery and total number of the big vessels with conical neck in the cemeteries of the research area. Legend: a – urn; b – part of a drinking vessel set; c – container of a meat dish.

bones were often placed inside or around the big pots in the inhumation graves of the Mezőcsát group, suggesting that the influences from the east are either missing or less defining in the burials of the elite. However, we have to be careful with this statement because of the small number of burial mounds in the research area (Fig. 12).

At the same time, the analysis of the vessels with conical neck in the grave contexts revealed that there are noticeable differences between each flat cremation cemetery. In some places the vessels functioned usually as urns (Nové Zámky), while in others (Tatabánya, Dózsakert) they were rather used for cooking or as a serving pot of a meat dish. This means that each community had their own distinct burial practices, even though, based on the other aspects, they all belonged to the same cultural unit of the NE-Transdanubian Hallstatt group.

APPENDIX

The following report sheets present the most important data on the big vessels with conical neck from the research area. If *the height is written in italics*, it means that the pot could not be fully restored. In these cases, the real heights have to be more than the reported number. The following codes indicate the different decorations: 0 – no decoration; 1 – horizontal channelling; 2 – vertical or crosswise channelling; 3 – knobs; 4 – ‘repeating motifs’ made up of channelled lines, impressed dots and graphite-painted motifs; 5 – graphite painting on the surface; 6 – geometric motifs painted with graphite; 7 – animal protomes. I also specified the functions of the big vessels with conical neck. I indicated if it was used as an urn in the grave or another type of ceramics played this role. I documented the existence of small cups or bowls inside the big vessels with conical neck that were most likely part of a drinking set. I also determined the presence of animal bones inside or around the big vessel, suggesting that it probably served as a container of a meat dish (Fig. 13).

The sources of data are the following: Bajč, Hurbanovo, Malé Kosiň, Malá nad Hronom (Paulík 1958, 361–368); Nové Zámky (Stegmann-Rajtár 2009, 60–73); Tata tumulus (Vadász 2003, 90); Tatabánya-Alsó, Vasútállomás (Groma 2015, 140–153); Tatabánya, Dózsakert (unpublished research of the author); Süttő flat cremation cemetery (unpublished research of the author); Süttő tumulus (Vadász 1986, 27).

Appendix. Data on the big vessels with conical neck from the research area.

Grave/big vessel	Height [cm]	Decoration	Urn	Type of the Urn	Vessel inside	Animal bones
Name of the site: Bajč						
No. 1/1	25.5	3	X	deep bowl	X	X
Name of the site: Hurbanovo						
Flat grave 68/56/1	35	3	X	X	X	X
Flat grave 68/56/2	17	3, 4	X	X	X	X
Flat grave 68/56/3	6	0	X	X	X	X
Flat grave 68/56/4	7.5	0	X	X	X	X
Flat grave 74/56/1	28.5	0	X	X	X	X
Tumulus 57/1/1	–	5	X	deep biconical bowl	X	X
Tumulus 57/1/2	–	0	X	deep biconical bowl	X	X
Tumulus 57/2/1	36.5	0	X	deep biconical bowl	X	X
Name of the site: Malé Kosihy						
No. 1/1	28.5	1, 4	X	X	X	X
Name of the site: Malá nad Hronom						
No. 1/1		0	X	X	X	X
Name of the site: Nové Zámky						
No. 2/1	39	1, 4	X	X	X	X
No. 5/1	18.8	4, 5	✓	pot	X	X
No. 6/1	–	0	X	X	X	X
No. 9/1	–	0	X	X	X	X
No. 11/1	24	3	X	X	X	X
No. 13/1	15	0	X	X	X	X
No. 14/1	35.2	1	✓	deep biconical bowl	X	X
No. 16/1	–	0	✓	2 pots, 4 bowls	X	X
No. 17/1	46	3	✓		X	X
No. 18/1	31.5	1	X	deep biconical bowl, pot	X	X
No. 19/1	33.6	1, 4	X	X	✓	X
No. 21/1	18.4	0	✓	–	X	X
No. 22/1	16	0	X	X	X	X
No. 23/1	18	1, 3, 4, 5	✓	–	X	X
No. 24/1	45.6	1, 3, 5	✓	–	X	✓
No. 25/1	40	1, 3, 4	X	big vessel with conical neck	✓	X
No. 25/2	–	3, 4	✓	–	X	X
No. 26/1	27.2	0	✓	–	X	✓?
No. 29/1	29.2	0	✓	–	X	X
No. 34/1	32.6	1, 3	✓	–	✓	X
No. 35/1	33	1, 2	✓	–	X	X
No. 37/1	15	0	X	X	X	X
No. 37/2	12.3	0	X	X	X	X
Name of the site: Tata						
Tumulus/1	31.8	1, 2, 4	✓	–	X	X
Tumulus/2	31.8	1, 2	X	big vessel with conical neck	X	X
Tumulus/3	17.3	5	X	big vessel with conical neck	X	X
Name of the site: Tatabánya-Alsó, Vasútállomás						
No. 2/1	7.8	3	X	deep biconical bowl	X	X
No. 2/2	21	0	X	deep biconical bowl	X	X

Appendix. Continuation.

Grave/big vessel	Height [cm]	Decoration	Urn	Type of the Urn	Vessel inside	Animal bones
No. 3/1	–	1, 3	X	cup	X	X
No. 5/1	28	0	X	X	X	X
No. 6/1	–	3, 4	X	X	X	X
No. 7/1	14.2	3, 4	X	X	X	X
No. 8/1	34.2	3	X	X	X	X
No. 8/2	21	0	X	X	X	X
No. 9/1	37.2	1, 3	X	X	X	X
No. 10/1	36.2	0	X	little bowl	X	X
No. 11/1	–	0	X	X	X	X
No. 12/1	–	0	X	X	X	X
No. 13/1	–	0	X	X	X	X
No. 15/1	25.5	0	X	X	X	X
No. 15/2	15.4	5	X	X	X	X
Name of the site: Tatabánya, Dózsakert						
'A'/1	36	5	✓	2 more deep biconical bowls	X	X
'A'/2	–	4	X	big vessel with conical neck, 2 more deep biconical bowls	X	X
'B'/1	2.8	1, 3	X	bowl with inverted rim	✓	✓
'X'/1	34	1, 3, 4	X	X	X	X
No. 1/1	–	0	✓	deep biconical bowl	X	X
No. 3/1	–	1, 3	X	X	X	X
No. 5/1	32	1	X	X	✓	✓
No. 6/1	20.6	1, 4, 5	X	X	X	X
No. 8/1	47	1,3	✓	bowl with inverted rim	X	✓
No. 9/1	30.4	1,3,4	✓		X	X
No. 11/1	29.1	0	X	X	X	X
No. 11/2	–	1,3,5	X	X	X	X
No. 12/1	–	1, 3	X	X	X	X
No. 13/1	35	1, 3	X	deep biconical bowl	X	X
No. 14/1	29.3	1, 3	X	X	X	X
No. 15/1	40	1, 3, 4, 5	X	X	X	X
No. 16/1	41	3, 5	X	handled cup	X	X
No. 17/1	53.5	1, 2, 3	X	X	✓	✓
No. 17/2	15.9	0	X	X	X	X
No. 19/1	42.2	1, 3	X	X	X	X
No. 21/1	41.5	1, 3, 4, 5	X	X	X	X
No. 23/1	41	5	X	X	X	X
No. 24/1	37.7	0	X	X	X	X
No. 24/2	–	1, 4, 5	X	X	X	✓
No. 25/1	44.2	1	X	pot, bowl, little pot	✓	X
No. 26/1	41.8	1, 3, 5	X	deep biconical bowl	X	✓
No. 28/1	39.5	1, 3, 5	X	X	X	X
No. 28/2	8.9	5	X	X	X	X
No. 34/1	–	0	X	deep biconical bowl	X	X
No. 36/1	26.3	5	X	deep biconical bowl	X	X
No. 37/1	36.8	3, 4, 5	X	deep biconical bowl	X	X
No. 38/1	30.5	5	X	X	X	X

Appendix. Continuation.

Grave/big vessel	Height [cm]	Decoration	Urn	Type of the Urn	Vessel inside	Animal bones
No. 39/1	37.5	5	X	X	✓	X
No. 40/1	24.5	0	X	deep biconical bowl	✓	✓
Name of the site: Süttő (tumulus)						
Tumulus/1	53	1, 3, 4, 5	X	X	X	X
Tumulus/2	54.5	1, 3, 4, 5	X	X	X	X
Name of the site: Süttő, Sáncfődek (flat cremation cemetery)						
No. 1/1	48.1	1, 3	✓	big vessel with conical neck, bowl with omphalos	X	X
No. 1/2	–	1, 2	✓	big vessel with conical neck, bowl with omphalos	X	X
No. 1/3	–	1	X	2 big vessels with conical neck, bowl with omphalos	X	X
No. 2/1	47.8	1, 6	X	X	X	X
No. 2/2	–	0	X	X	X	X
No. 2/3	–	1, 3, 4	X	X	X	X
No. 4/1	41.8	1, 4	✓	deep biconical bowl	X	X
No. 5/1	13.5	1	X	X	X	X
No. 7/1	25	1, 4	X	X	X	X
No. 8/1	32.2	0	X	skeletal	X	X
No. 10/1	37.6	1	X	X	X	X
No. 11/1	39.2	1, 3, 5	X	deep biconical bowl	X	X
No. 11/2	44.2	3, 4, 5	X	deep biconical bowl	X	X
No. 12/1	26.4	1, 3, 4	X	skeletal	X	X
No. 13/1	34	3	X	skeletal	X	X
No. 14/1	–	0	✓	–	X	X
No. 15/1	–	0	X	X	X	X
No. 15/2	–	0	X	X	X	X
No. 16/1	39.8	1, 3, 4, 5	✓	big vessel with conical neck	X	X
No. 16/2	–	1, 3, 4, 5	✓	big vessel with conical neck	X	X
No. 17/1	–	0	X	X	✓	X
No. 17/2	12.5	1, 3, 4, 5	X	X	X	X
No. 17/3	5.5	4	X	X	X	X
No. 19/1	38	3, 4	X	deep biconical bowl, bowl with inverted rim	X	X
No. 20/1	17.4	1, 4	X	bowl	X	X
No. 21/1	16	0	✓		X	X
No. 22/1	11.8	3	X	X	X	X
No. 23/1	38.1	3	X	X	X	X
No. 24/1	25.2	5	X	skeletal	X	X
No. 25/1	–	0	✓	–	X	X
No. 26/1	–	0	X	X	X	X
No. 27/1	33.5	1, 3	X	X	X	X
No. 28/1	17	2, 5	X	X	X	X
No. 29/1	31.4	0	X	skeletal	X	X
No. 30/1	–	1	✓	–	X	X
No. 31/1	–	1, 4	X	X	X	X
No. 31/2	19	5	X	X	X	X
No. 32/1	31	3, 5	X	deep biconical bowl	X	X
No. 33/1	40.5	1, 3, 4, 5	X	deep biconical bowl	X	✓
No. 34/1	–	0	X	X	X	X

Appendix. Continuation.

Grave/big vessel	Height [cm]	Decoration	Urn	Type of the Urn	Vessel inside	Animal bones
No. 35/1	—	1	X	X	X	X
No. 36/1	17	0	X	2 bowls	X	X
No. 41/1	—	2, 5	X	X	X	X
No. 43/1	—	0	✓	—	X	X
No. 44/1	18.8	0	✓	—	X	X
No. 46/1	—	1, 4	X	X	X	X
No. 48/1	20	3, 4, 5	X	X	X	X
No. 48/2	—	4, 5	X	X	X	X
No. 50/1	—	0	X	X	X	X
No. 50/2	13.5	1, 5	X	X	X	X
No. 51/1	—	2, 5	✓	—	X	X
No. 53/1	—	1, 3, 5	✓	—	X	X
No. 54/1	36.5	1, 3, 4, 5	X	little bowl	X	X
No. 55/1	37.4	0	✓	pot	X	X
No. 56/1	5	3	X	X	X	X
No. 57/1	16	5	✓	big vessel with conical neck	X	X
No. 57/2	—	1, 4	✓	big vessel with conical neck	X	X
No. 58/1	34	5	X	X	X	X
No. 58/2	—	1, 4	X	X	X	X
No. 59/1	16.8	5	X	X	X	X
No. 59/2	—	1, 3, 4, 5	X	X	X	X
No. 60/1	6.7	1, 4	X	partly skeletal (skull)	X	X
No. 60/2	17.5	5	X	partly skeletal (skull)	X	X
No. 61/1	7.5	0	X	X	X	X
No. 62/1	—	3, 5	✓	fragments	X	X
No. 63/1	17.5	1	X	fragments	X	X
No. 63/2	7.3	1, 3	X	fragments	X	X
No. 64/1	—	1, 3, 4, 5	✓	—	X	X
No. 65/1	29.2	1, 3	X	fragments	X	X
No. 66/1	10.9	0	X	X	✓	X
No. 67/1	15.5	0	X	little bowl	X	X
No. 68/1	28.6	1, 3	✓	bowl, mug	X	X
No. 68/2	12.3	1, 3, 4, 5	X	big vessel with conical neck, bowl, mug	X	X
No. 69/1	38.2	1, 3, 5	✓	big vessel with conical neck, pot	X	X
No. 69/2	30	1, 3, 4, 5	✓	big vessel with conical neck, pot	X	X
No. 74/1	3.4	1, 2, 5	X	deep biconical bowl	X	X
No. 74/2	13	2, 4, 5	X	deep biconical bowl	X	X
No. 76/1	31.5	0	X	X	X	X
No. 76/2	6.5–6.7	5	X	X	X	X
No. 77/1	—	0	X	X	X	X
No. 78/1	26	0	X	bowl with inverted rim	X	X
No. 79/1	—	3	✓	fragments	X	X
No. 80/1	29.2	5	✓	deep biconical bowl, 2 bowls with inverted rim	✓	X
No. 81/1	—	1, 4, 5	X	partly skeletal (pieces of skull)	X	X
No. 82/1	28.8	1, 3, 4	X	deep biconical bowl	X	X
No. 82/2	10	0	X	deep biconical bowl	X	X
No. 82/2	6.5–7	0	X	deep biconical bowl	X	X

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Nádoby s kónickým hrdlom (“Kegelhalsgefäße”) v halštatskej skupine severovýchodného Zadunajska

Interpretácia nádob na základe hrobových kontextov

Katalin Novinszki-Groma

Súhrn

Veľké nádoby s kónickým hrdlom patria medzi najtypickejšie formy nádob vo východnom halštatskom okruhu. Analýza materiálu nájdeného na väčších pohrebiskách, ktoré sa využívali dlhšie obdobie – ako napríklad Kleinklein v údolí Sulmu v Rakúsku (*Dobiat 1980*, 66–73) alebo Nové Zámky na Slovensku (*Stegmann-Rajtár 2009*, 73–76) – nám umožňuje načrtnúť celkový typ-chronologický vývoj týchto veľkých nádob. Kým formy s výrazným vydutím sú charakteristické pre staršiu časť doby halštatskej (HC–HD1), veľké nádoby s vyšším hrdlom a hrnce bez ostrých zlomov profilu prišli do módy na začiatku stupňa HD.

Tento príspevok sa zameriava na veľké nádoby s kónickým hrdlom z hrobov halštatskej skupiny SV Zadunajska, osídľujúcej územie ohybu Dunaja v Maďarsku a oblasť medzi južnými časťami údolí Hrona a Váhu (prítok Dunaja) na Slovensku. V tejto oblasti už bolo vykopané a publikované množstvo pohrebísk popolnicových polí, datovaných do neskej doby bronzovej, a pohrebísk halštatskej kultúry staršej doby železnej (obr. 1). Zároveň sa tu objavuje v porovnaní s plochými žiarovými pohrebiskami nachádza len málo mohylových hrobov.

Pohrebiská nachádzajúce sa severne od rieky Dunaj na skúmanom území sa používali až do konca stupňa HD, na rozdiel od pohrebísk v južných oblastiach, kde sa používali do fázy HD1. Preto sa do prezentovanej analýzy dostal

len hrobový materiál z obdobia HC–HD1. V súlade s vyššie uvedenou typo-chronológiou v analyzovanom materiáli prevládali varianty veľkých nádob s kónickým hrdlom s výraznejším vydutím. Podobné tvary boli objavené už v hrobách popolnicových polí z neskorej doby bronzovej, ktorá v tejto oblasti predchádzala halštatskú kultúru. Formy nádob zo staršej doby železnej sa ešte viac podobajú nádobám mezočsátskej skupiny fázy HB3 z Veľkej maďarskej nížiny, čo ukazuje na vplyvy z východu.

Analýza odhalila štyri typické techniky výzdoby veľkých nádob s kónickým hrdlom v skúmanej oblasti: horizontálne žliabkovanie, pozostávajúce z jednej alebo viacerých línií, ktoré zvýrazňujú hrdlo alebo plecia nádob; tri až šesť výčnelkov v rovnakej vzdialenosti od seba väčšinou na pleciach; „opakujúce sa motívy“ tvorené zväzkami žliabkovaných línií a vtlačenými jamkami, ktoré často zdobia hrdlá alebo plecia; a tuhovanie v hornej časti nádob, ktoré im dodáva lesklý vzhľad. Zatiaľ čo uvedené techniky sú charakteristické pre materiál z plochých žiarových pohrebísk, zložité geometrické motívy (ako meandre alebo volúty) maľované grafitom alebo vystupujúce zvieracie protómy boli takmer bez výnimky objavené v mohylách.

Hlavnou výskumnou otázkou bola funkcia veľkých nádob s kónickým hrdlom z hrobov zo staršej doby železnej v skúmanej oblasti. Hrobové kontexty umožnili rozlíšiť tri potenciálne funkcie nádob, ktoré mohli slúžiť ako:

1. urny, ktoré obsahovali spoločné ľudské pozostatky, niekedy spolu s osobnými predmetmi zosnulého;
2. nádoby na tekutiny – v takom prípade sa vnútri alebo neďaleko veľkej nádoby našla malá šálka alebo miska;
3. nádoby na varenie alebo servírovanie mäsového pokrmu – vtedy boli v blízkosti veľkých nádob objavené zvieracie kosti.

Prvú a druhú funkciu možno pozorovať už v materiáli hrobov popolnicových polí, zatiaľ čo tretiu možno pripísať vplyvu skupiny Mezőcsát, kde veľké hrnce v kostrových hrobách mohli tiež plniť rovnakú úlohu. Ďalším dôležitým zistením je, že účel veľkých nádob s kónickým hrdlom sa na jednotlivých pohrebiskách v rámci halštatskej skupiny severovýchodného Zadunajska líšil.

Obr. 1. Mapa pohrebísk v skúmanej oblasti. 1 – Bajč; 2 – Hurbanovo; 3 – Malé Kosihy; 4 – Malá nad Hronom; 5 – Nové Zámky; 6 – Tata, 7 – Tatabánya-Alsó, Vasútállomás, a Tatabánya, Dózsakert; 8 – Süttő; 9 – Százhalombatta; 10 – Chotín; 11 – Neszmély; 12 – Budapest-Békásmegyer. Mapa K. Novinszki-Groma.

Obr. 2. Typický tvar veľkej nádoby s kónickým hrdlom. Kresba K. Novinszki-Groma podľa *Dobiat* 1980, 66, obr. 7.

Obr. 3. Veľké nádoby s kónickým hrdlom v skúmanej oblasti. 1 – Süttő, hrob 50; 2 – Süttő, hrob 59. Kresba K. Novinszki-Groma.

Obr. 4. Vývoj veľkých nádob s kónickým hrdlom na pohrebisku v Nových Zámkoch. 1 – hrob 18 (*Stegmann-Rajtár* 2009, 67, tab. X: 1); 2 – hrob 2 (*Stegmann-Rajtár* 2009, 61, tab. I: 11); 3 – hrob 34 (*Stegmann-Rajtár* 2009, 71, 72, tab. XVII: 1); 4 – hrob 26 (*Stegmann-Rajtár* 2009, 71, tab. XV: 4); 5 – hrob 9 (*Stegmann-Rajtár* 2009, 63, tab. II: 10). Mierka: a – 1, 2; b – 3; c – 4; d – 5.

Obr. 5. Rôzna výzdoba veľkých nádob s kónickým hrdlom. 1 – horizontálne žliabkovanie, Nové Zámky, hrob 35 (*Stegmann-Rajtár* 2009, 72, tab. XVII: 9); 2 – vertikálne alebo šikmé žliabkovanie/lišty na pleciach, Süttő, hrob 51 (kresba K. Novinszki-Groma); 3 – výčnelky na pleciach, Süttő, hrob 65 (kresba K. Novinszki-Groma); 4 – jednoduché „opakujúce sa motívy“, Süttő, hrob 12 (kresba K. Novinszki-Groma); 5 – výčnelky v dolnej časti nádoby, Nové Zámky, hrob 24 (*Stegmann-Rajtár* 2009, 69, tab. XIII: 7); 6 – tuhovaný/lesklý povrch v hornej časti nádoby, Süttő, hrob 24 (kresba K. Novinszki-Groma); 7 – zložité „opakujúce sa motívy“, Tatabánya, Dózsakert, hrob „X“ (kresba K. Novinszki-Groma); 8 – tuhované motívy, Tatabánya, Dózsakert, hrob 37 (kresba K. Novinszki-Groma). Mierka: a – 1, 5; b – 2; c – 3, 4, 6–8.

Obr. 6. Príklady tuhovaných geometrických motívov v skúmanej oblasti. 1 – Süttő, starší výskum mohýl (*Vadász* 1986, 252, tab. 2: 1), 2 – Süttő, hrob 2 (kresba K. Novinszki-Groma).

Obr. 7. Zvieracie protómy z mohyly 117 v Százhalombatte (*Holport* 1993, 26, 27, obr. 6).

Obr. 8. Najbežnejšie formy veľkých nádob s kónickým hrdlom v kultúre popolnicových polí. 1, 2 – veľká nádoba s kónickým alebo valcovitým hrdlom, Neszmély, hrob 51 (*Patek* 1993, 46, tab. VIII: 4, 5); 3, 4 – „amfora“, Neszmély, hrob 53 (*Patek* 1993, 46, tab. VIII: 7, 8); 5 – veľká nádoba s kónickým hrdlom skupiny Mezőcsát, hrob z lokality Bóconád, Gosztonyi-tanya (*Patek* 1993, 69, tab. 2: 5). Mierka: a – 1–4; b – 5.

Obr. 9. Typy nádob slúžiacich ako urny v hrobách staršej doby železnej v skúmanej oblasti. 1–3 – hlboké dvojkonické misy: 1 – Hurbanovo, mohyla 1/57 (*Paulík* 1958, 363, tab. III: 7), 2 – Hurbanovo, mohyla 2/57 (*Paulík* 1958, 365, tab. IV: 1), 3 – Bajč, žiarový hrob (*Paulík* 1958, 366, obr. 4: 1); 4 – šálka na nôžke, Tatabánya-Alsó, Vasútállomás, hrob 3 (*Groma* 2015, 144, obr. 4: 6); 5 – šálka s uchom, Tatabánya, Dózsakert, hrob 16 (*Novinszki-Groma* 2018, 123, tab. III: 4); 6 – kónická misa, Süttő, hrob 20 (kresba K. Novinszki-Groma). Bez mierky – 1–3.

Obr. 10. Veľká nádoba s kónickým hrdlom zo staršej doby železnej, slúžiaca ako urna a obsahujúca osobnú výbavu zosnulého. Süttő, hrob 44. Kresba K. Novinszki-Groma, podľa dokumentácie É. Vadászovej. Mierka: a – 3–5, 8, 9; b – 6; c – 7.

Obr. 11. Veľká nádoba s kónickým hrdlom so šálkou s uchom vnútri, Süttő, hrob 19. Kresba K. Novinszki-Groma.

Obr. 12. Vývoj veľkých nádob s kónickým hrdlom a zmena ich funkcie v hrobách v SV Zadunajsku od neskorej doby bronzovej do staršej doby železnej. „Amfora“ kultúry popolnicových polí z hrobu 287 v Békásmegyeri (*Kalicz-Schreiber/Kalicz/Váczi* 2010, 166, obr. 420; tab. 124: 6), veľká nádoba s kónickým hrdlom skupiny Mezőcsát z hrobu 22

vo Füzesabony, Kettőshalom (Patek 1993, 63, tab. 6: 6), veľká nádoba s kónickým hrdlom halštatskej kultúry z hrobu 33 v Süttő (kresba K. Novinszki-Groma), maľované geometrické motívy sa našli na fragmentoch objavených v mohyle 109 v Százhalombatte (Holport 1993, 26, 27, obr. 4: 1–5), zvieracie protómy z mohyly 109 v Százhalombatte (Holport 1993, 26, 27, obr. 9).

Obr. 13. Diagramy ukazujú rozličnú funkciu veľkých nádob s kónickým hrdlom na pohrebiskách v skúmanej oblasti. Čísla označujú počet nádob na jednotlivých pohrebiskách a celkový počet veľkých nádob s kónickým hrdlom na pohrebiskách v skúmanej oblasti. Legenda: a – urna; b – časť picieho servisu; c – nádoba na mäsový pokrm.

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CREMATION BURIAL GROUND FROM HURBANOVO IN THE CONTEXT OF THE DEVELOPMENT OF THE EASTERN HALLSTATT CULTURE¹

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In 1956–1959, six burials from the Hallstatt period (Ha C–Ha D1) were excavated by Jozef Paulík in Hurbanovo, Komárno district, Pieskovisko (‘Sandpit’) site, Western Slovakia. They were flat cremation burials; one of them might have been originally located under a tumulus mound. Most of them contained only pottery, some also yielded bronze or iron items and ornaments from garment. The burials can be assigned to the Eastern Hallstatt culture (Hallstatt culture of the Central and Northeastern Transdanubia). Finds of pottery and miniature artefacts from the burials in Hurbanovo are comparable with the inventory of the burials from the burial grounds in Nové Zámky, Malá nad Hronom, Svodín, Bajč and Modrany.

INTRODUCTION

At the end of the Bronze Age (Ha B2–3) and at the beginning of the Early Iron Age (Ha C1, Ha C2, Ha D1), significant cultural changes occurred in the East Alpine-Transdanubian territory; the changes are documented not only at settlements but mainly at burial grounds. Although certain traditions of the Urnfield culture survived there also in the Hallstatt period (e.g. occurrence of cremation burials), we observe numerous differences mainly in the form of grave pits and grave goods of the buried men, women and children associated with different burial customs (Egg/Kramer 2005; Stegmann-Rajtár 2006; 2009, 59–73; 2013). Grave inventories present typical find contexts at selected burial grounds of the Northeastern Hallstatt cultural territory within its regional groups (Fig. 1; 2). Significant differences have been detected in the form of grave pits and arrangement of offerings in tumuli and flat burials between these regional cultural groups – the Kalenderberg Hallstatt culture (e.g. in Reca, Dunajská Lužná-Nové Košariská or Janíky-Dolné Janíky; Stegmann-Rajtár 2002a, fig. 1), and the Hallstatt culture of the Central and Northeastern Transdanubia (e.g. in Nové Zámky, Malá nad Hronom or Hurbanovo; Stegmann-Rajtár 2002a, fig. 2). Both analysed groups of the Northeastern Hallstatt culture reflect local customs as well as considerable influences from the neighbouring, mainly southern territories (Egg/Kramer 2005; Studeníková 2012; Teržan 1986; 1990).

ON THE EXCAVATION OF THE BURIAL GROUNDS OF THE HALLSTATT PERIOD IN SOUTHWESTERN SLOVAKIA

The commonly used name of the Kalenderberg Hallstatt culture is a broad term for the large part of the Northeastern Hallstatt cultural territory, which – apart from the Kalenderberg culture – includes the territory of the Hallstatt culture of Central and Northeastern Transdanubia (Fig. 1; 2). Obvious differences not only in the burial rite but also in the material content of tumuli as well as flat burials document existence of two equal groups of the Eastern Hallstatt culture which were immediate neighbours. Their contact and mutual influence are evidenced also in the material content of some settlements north of

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Fig. 1. The East Hallstatt culture in the East Alpine-Pannonian territory (after Egg/Kramer 2005, fig. 2).

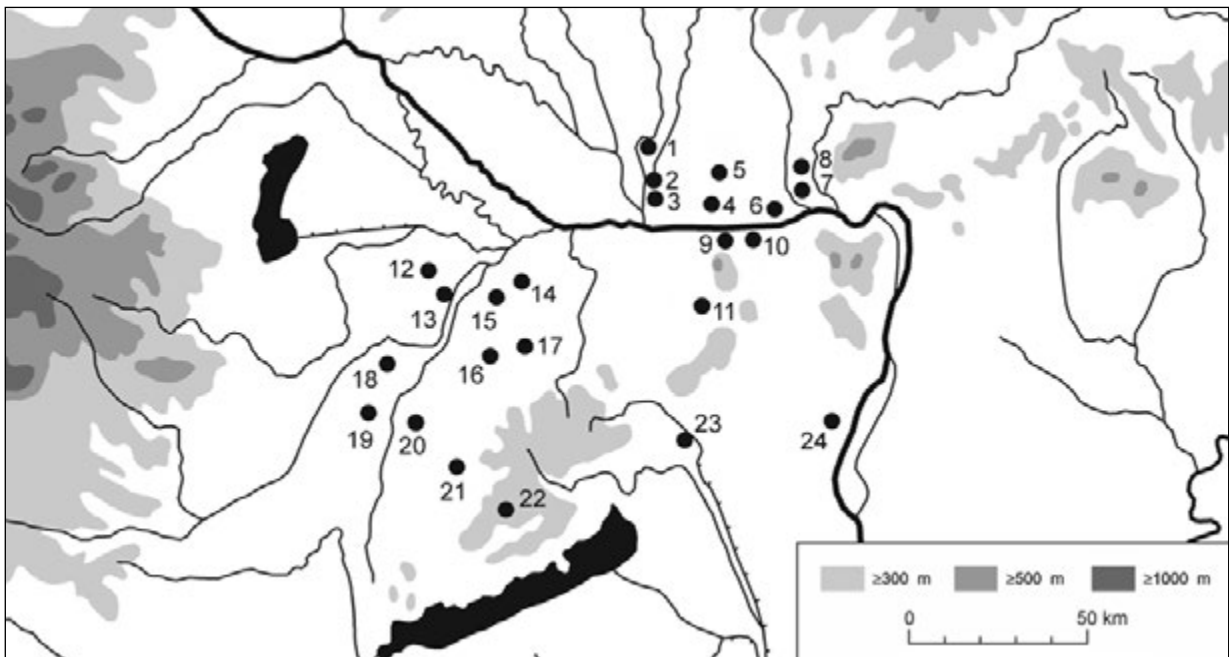


Fig. 2. Map of burial grounds and burials of the East Hallstatt culture. 1 - Nové Zámky; 2 - Bajč; 3 - Hurbanovo; 4 - Modrany; 5 - Svodín; 6 - Mužla; 7 - Malá nad Hronom; 8 - Malé Kosihy; 9 - Süttö; 10 - Lábatlan; 11 - Tatabánya; 12 - Csorna; 13 - Árpás; 14 - Nagybarát; 15 - Mezőöros-Alsótág; 16 - Vaszar; 17 - Középrépauszta; 18 - Mesteri; 19 - Csöngé; 20 - Kismező; 21 - Somlóvásárhely; 22 - Halimba; 23 - Fehérvárcsurgó; 24 - Százhalombatta (after Stegmann-Rajtár 2009, fig. 13).



Fig. 3. Location of the Hurbanovo, Pieskovisko site (after Veliačik/Romsauer 1994, fig. 14).

the Danube which are characterized by culturally mixed character of finds. Jozef Paulík pointed to the different character of the material culture from smaller tumuli (e.g. Malá nad Hronom, Hurbanovo) and flat burials (e.g. Nové Zámky, Modrany, Svodín) in the north-eastern part of the Kalenderberg culture in 1964 and introduced the name of the 'Középrépás type of the Kalenderberg culture' after the eponymous burial ground in Transdanubia (Paulík 1964). At present it is clear – based on the partly published older as well as more recent find assemblages mainly from the richly equipped tumuli (e.g. Vaszar, Somlóvásárhely, Süttő, Százhalombatta) and flat burial grounds (e.g. Középrépáspuszta, Halimba-Cseres) – that the territory of Central and Northeastern Transdanubia and the adjacent territory north of the Danube with most burial grounds between the Váh and Ipel' rivers had an independent development, which was different from the development in Northwestern Transdanubia (Kalenderberg Hallstatt culture) and the neighbouring areas of Southwestern Slovakia between the Little Carpathians and the Váh River.

Considerable attention was paid in the past to the evaluation of the structure of settlements and burial grounds of the Early Iron Age in Southwestern Slovakia (Ha C–Ha D). Several large and small burial grounds were investigated, but often only their parts were studied and documented (Müller 2012; Stegmann-Rajtár 1992; 1994; Veliačik/Romsauer 1994). The excavation then focused mainly on large tumuli of the Kalenderberg Hallstatt culture, e.g. in Reca, Dunajská Lužná-Nové Košariská, Janíky-Dolné Janíky, Nová Dedinka, Pusté Úľany and Biely Kostol (Stegmann-Rajtár 2017, 390; Studeníková 2012). Smaller tumuli of the Hallstatt culture of the Central and Northeastern Transdanubia are known from Hurbanovo (tumulus 1/57; Paulík 1958) and Malá nad Hronom (Paulík 1959; Stegmann-Rajtár 1992, fig. 39). This type of burial monument is preserved only exceptionally until now and is very badly recognizable in the field – most of the tumuli had been disturbed by ploughing for years, and so there were destroyed (Stegmann-Rajtár 2017, 394). Systematic documentation of tumuli by means of aerial archaeology (Kuzma/Bartík 2013; Kuzma/Bartík/Rajtár 2006) and recently mostly by aerial laser scanning (LIDAR) helped to map the places of their occurrence in detail. Therefore, today we have recorded many more of them than we were able to detect in the past by means of traditional surface survey (Felcan/Felcanová 2018, 7; Felcan/Paštka/Stegmann-Rajtár 2020, fig. 1). It is very likely that other burials belonging to the socially lower and poorer class of population were located in the spaces between individual tumuli which were poorly visible in the terrain in the course of the excavation. A comparable situation was discovered in the central areas with the Eastern Hallstatt culture, e.g. in Steiermark (tumuli in Kleinklein) and Northern Transdanubia (tumuli in Százhalombatta). Larger flat burial grounds within Southwestern Slovakia were previously investigated

in Modrany (Dušek S. 1976), Svodín (Němejcová-Pavůková 1986) and Nové Zámky (Dušek M. 1971; Stegmann-Rajtár 2009; 2013). Tumuli as well as flat graves contained exclusively cremation burials.

EXCAVATION OF THE BURIAL GROUND IN HURBANOVO IN 1956–1959

In 1956–1959, six burials from the Hallstatt period (Ha C–Ha D1) were investigated by Jozef Paulík on the site Pieskovisko ('Sandpit') in Hurbanovo, Komárno district (Fig. 3).² They were flat cremation burials and one of them might have originally been placed under a tumulus mound (Fig. 4). Most of them contained only pottery, some of them also yielded parts of garment and its bronze or iron items (Paulík 1958; Veliačik/Romsauer 1994, 63, 64). The burials can be assigned to the Hallstatt culture of Central and North-eastern Transdanubia (Stegmann-Rajtár 2002a; 2009, 85, 86; 2017, 394, 395).

The burials from 1956 were uncovered during the excavation of a Slavic in-

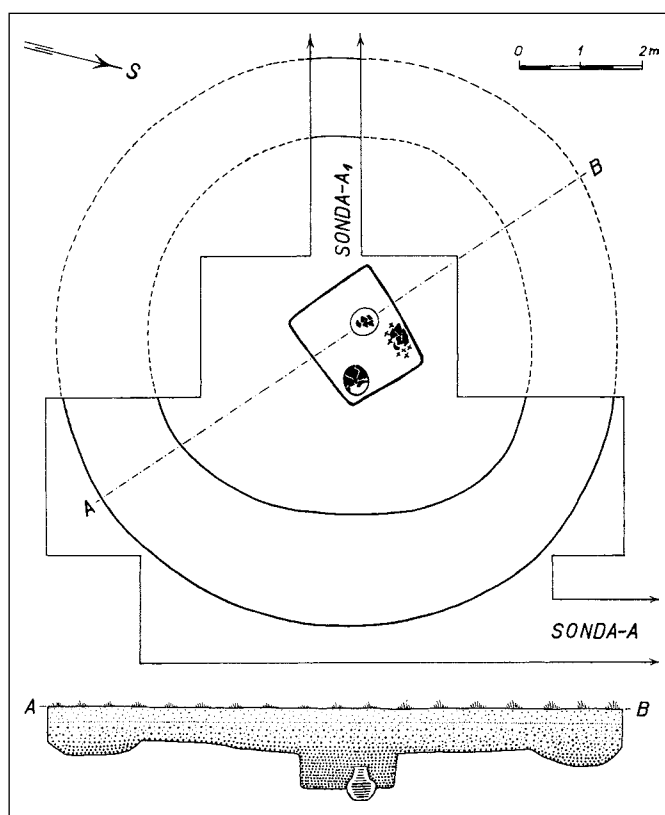


Fig. 4. Hurbanovo, ground plan of tumulus 1/57 (after Paulík 1958, fig. 1).

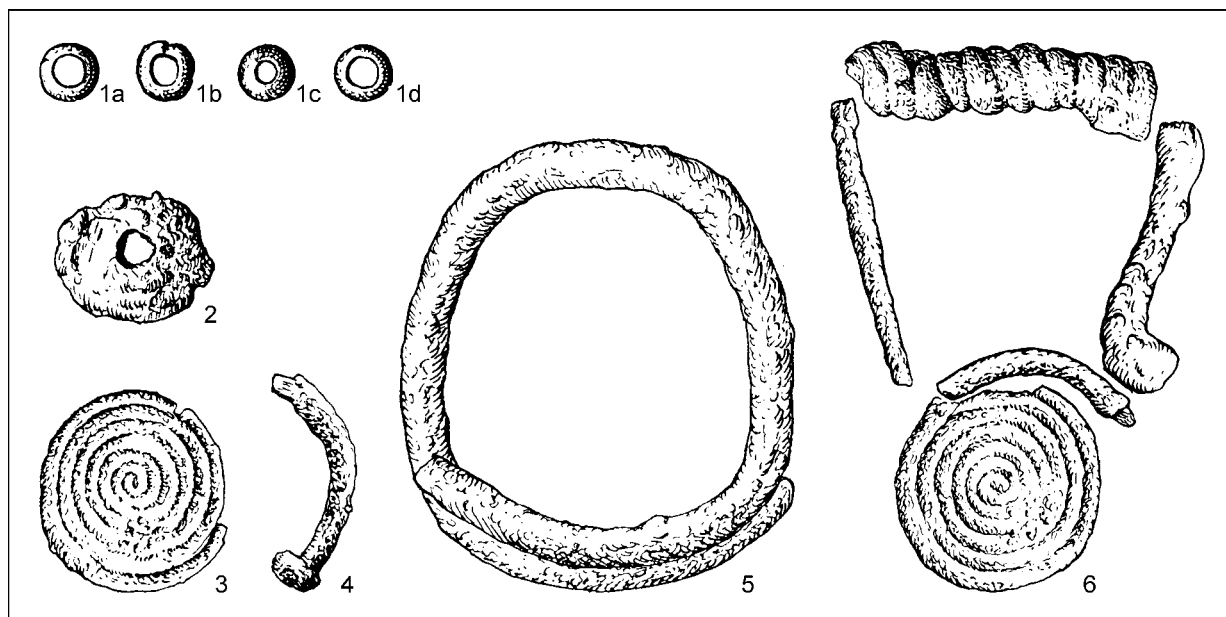


Fig. 5. Hurbanovo. Iron and bronze artifacts from tumulus 1/57 (1, 2) and burial 2/57 (3–6; after Paulík 1958, fig. 2). Whithout scale.

² In the cadastre of Hurbanovo, besides the described six burials from Hurbanovo, Pieskovisko, the considerably large burial grounds at the sites of Hurbanovo, Konkoľ (Rajtár/Ratimorská 1990), and Hurbanovo, Štrkovisko (Rajtár 2004), are known.

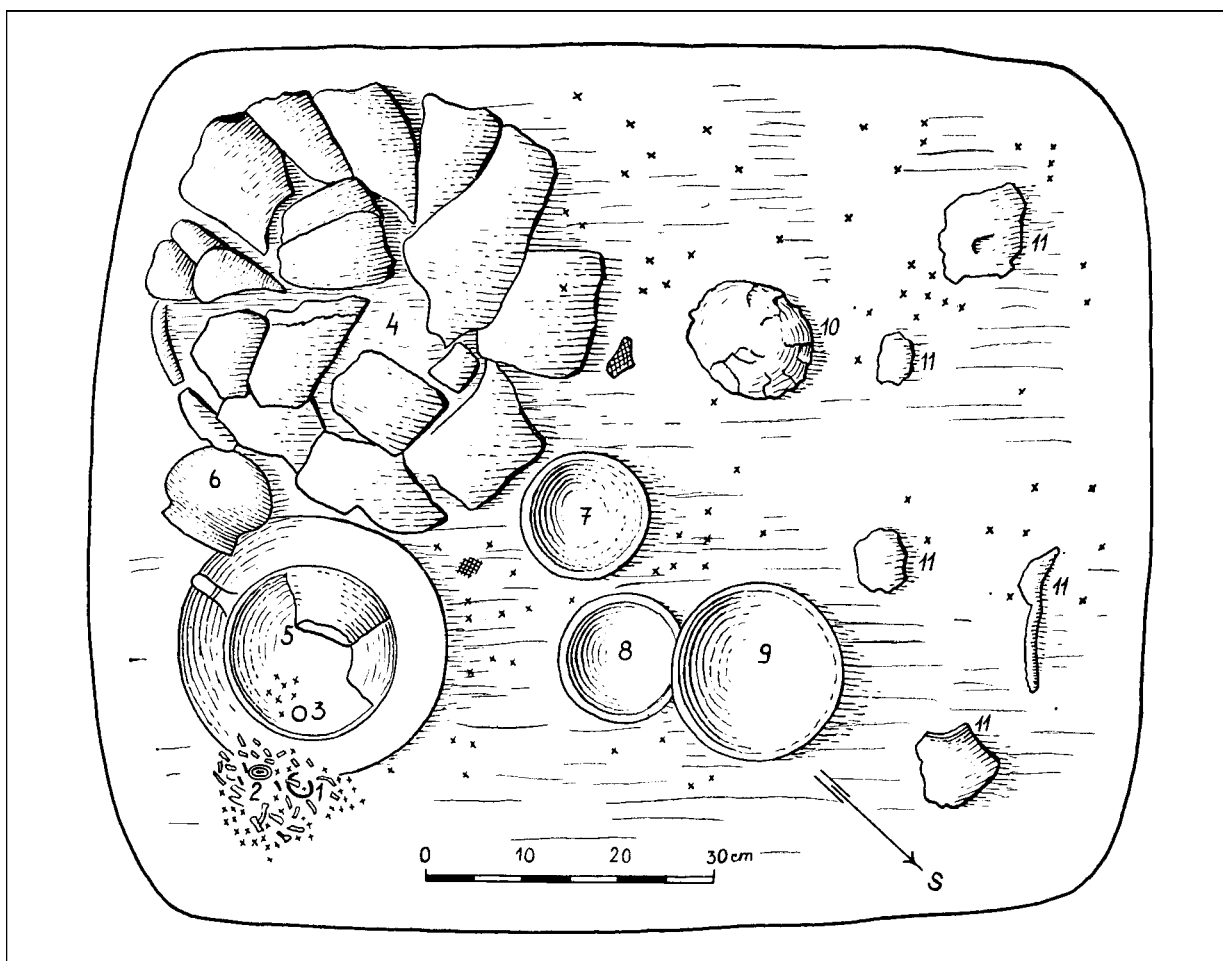


Fig. 6. Hurbanovo, ground plan of tumulus 2/57 (after Paulík 1958, fig. 3).

humation burial ground. They included cremation burials 68/56 and 74/56. Both inventories contained only pottery. In the course of the excavation in 1957, cremation burials 1/57 (tumulus; Fig. 4; 5: 1, 2) and 2/57 (flat burial; Fig. 5: 3–6; 6) were investigated. Both inventories contained pottery as well as a few bronze and iron artefacts belonging to ornaments and parts of garment of the buried. The excavation at this site continued in 1959, when cremation burials 1/59 and 2/59 were uncovered during earthworks (Paulík 1958; 1964). They were considerably damaged by a bulldozer and their content was incompletely preserved. Burial 1/59 had rich grave goods (Fig. 7). It contained bronze ornaments and parts of garment – various types of smooth and profiled bracelets and rings (Fig. 7: 6, 7, 9, 10, 14, 15), four boat-shaped fibulae with lateral knobs (Fig. 7: 1–3, 5), a fragment of probably a disc (?) fibula (Fig. 7: 8) and one iron ring (Fig. 7: 4; Studeníková 2001, 93–95, note 6). However, only two vessels have been saved from this burial. Burial 2/59 contained seven or eight vessels, an iron knife, an iron ring and probably a fragment of a harp-shaped iron fibula, like the one found in burial 2/57 (Fig. 5: 6). The finds of pottery and miniature artefacts from the burials in Hurbanovo, Pieskovisko site, are comparable with the inventory from the burial grounds in Nové Zámky, Malá nad Hronom, Svodín (Fig. 8), Bajč, Malé Kosičky and Modrány (Němejcová-Pavůvková 1986; Paulík 1958; Romsauer 1996; Stegmann-Rajtár 2009; 2013; 2017, 394, 395). Although the burial ground in Hurbanovo was considerably damaged by the exploitation of sand and some burials – mainly from the Hallstatt period (Ha D2–Ha D3) – have been very poorly preserved, we were able to analyse the material mostly from the Early and Late Hallstatt period (Ha C–Ha D1). Based on pottery and miniature finds of bronze and iron, the six saved burials from Hurbanovo (68/56, 74/56, 1/57, 2/57, 1/59 and 2/59) point to the expansion of the Hallstatt culture of Central and Northeastern Transdanubia also to the territory north of the Danube. Its main territory was located east of the Váh River (Stegmann-Rajtár 2002a; 2009; 2017). The most numerous parallels to the typical finds from flat

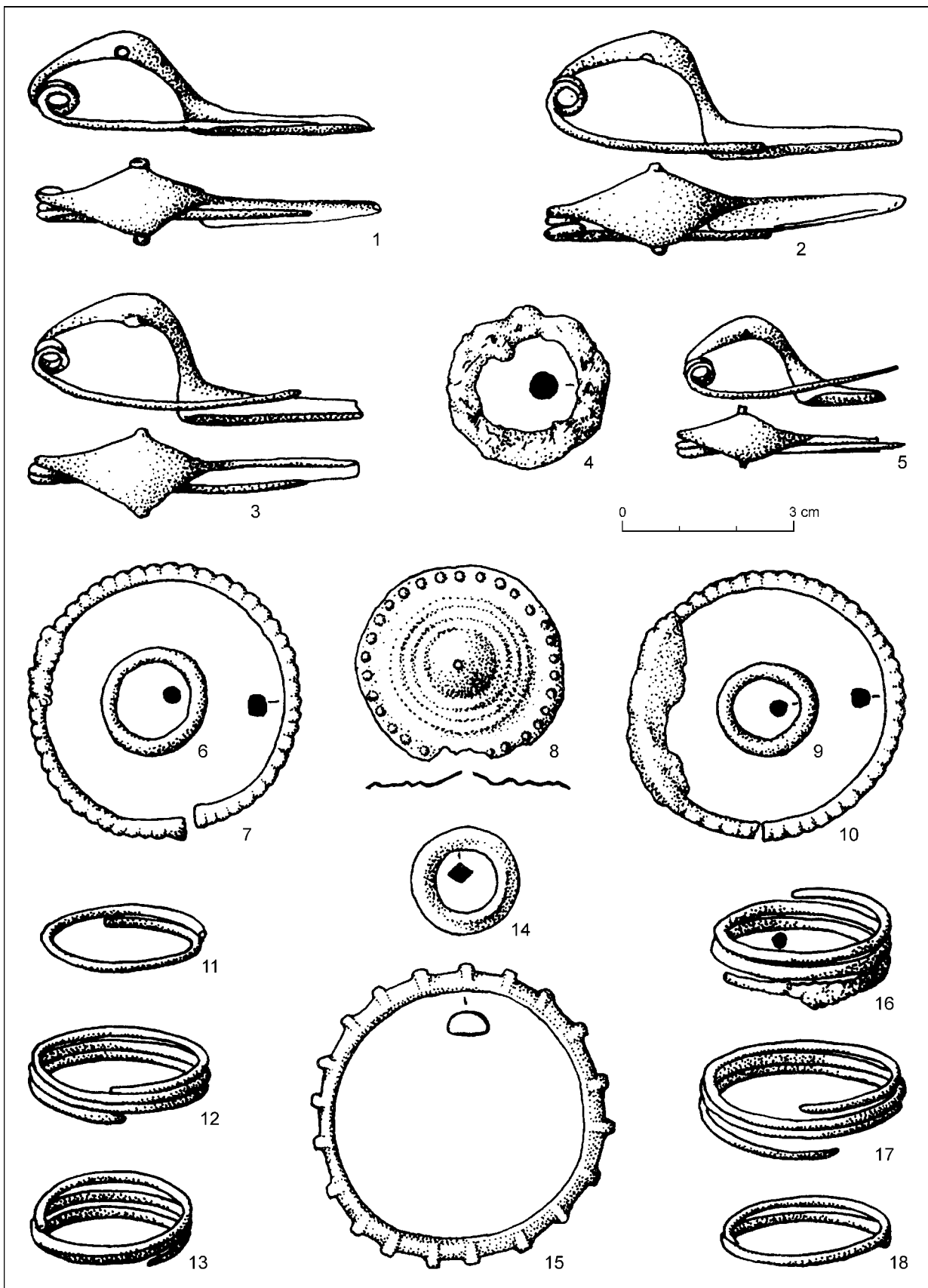


Fig. 7. Hurbanovo. Finds from burial 1/59. 1-3, 5-18 – bronze; 4 – iron (after *Studeníková* 2001, fig. 4).

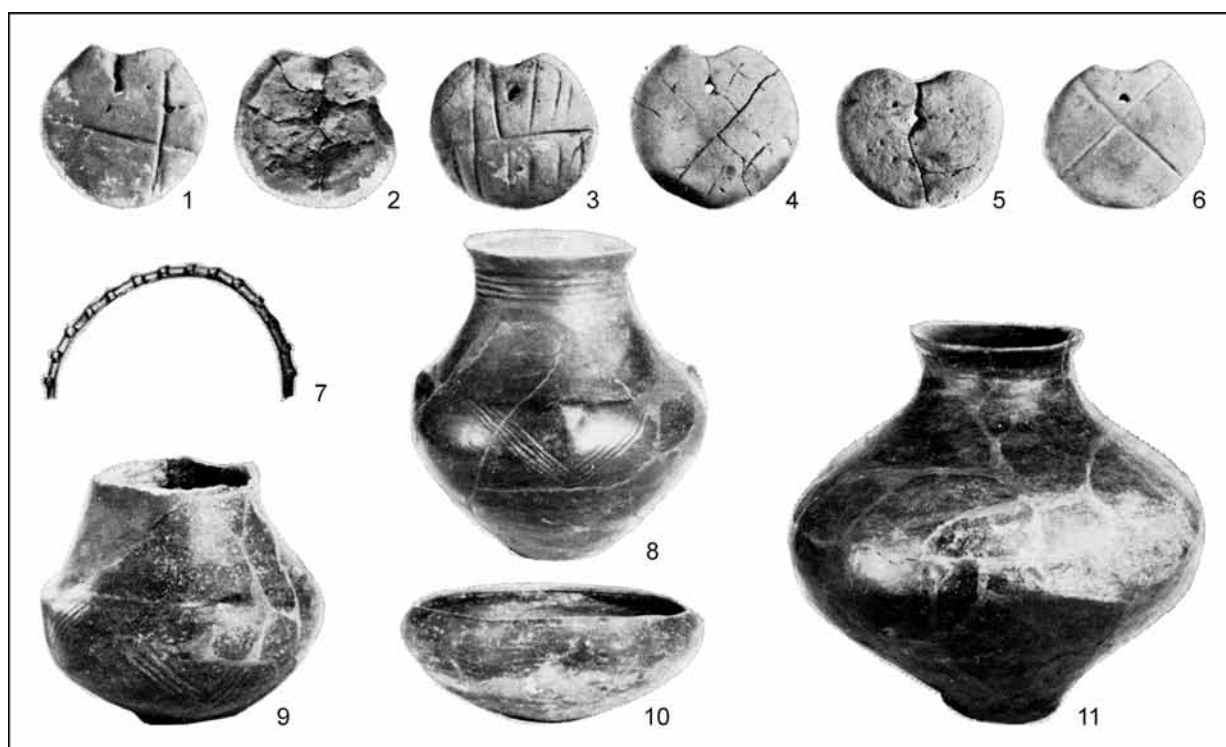


Fig. 8. Svodín. Finds from burial 46/77. 1–6, 8–11 – clay; 7 – bronze (after Němejcová-Pavúková 1986, fig. 19). Without scale.

burials come from the burial grounds in Modrany (Dušek S. 1976), Svodín (Němejcová-Pavúková 1986, fig. 19) and Nové Zámky (Stegmann-Rajtár 2009; 2013). The assumed tumuli 1/57 from Hurbanovo (Fig. 4) has the closest parallels within Southwestern Slovakia in the tumulus from Malá nad Hronom (Paulík 1959; Stegmann-Rajtár 1992, fig. 39). The above-mentioned burial grounds as well as individual burials, e.g. from Bajč, Malé Kosihy (Paulík 1958, fig. 4; 5) and Mužla (Kuzma 2001), belonged to the period of the biggest boom of the Eastern Hallstatt culture in the Eastern Alpine-Transdanubian territory belonging to the 7th century BC (Stegmann-Rajtár 2017, 383–386).

THE BURIAL GROUND FROM HURBANOVO IN THE CONTEXT OF DEVELOPMENT OF THE HALLSTATT PERIOD IN THE NORTHERN PART OF THE CARPATHIAN BASIN

In Southwestern Slovakia, apart from large tumuli, mainly larger or smaller cremation burial grounds belonging to the Hallstatt culture of Central and Northeastern Transdanubia are common in the territory east of the Váh River and southwards in Northern Transdanubia (east of the Rába River as far as the Danube Bend). The largest concentration of flat burial grounds in the territory of Southwestern Slovakia existed between the rivers of Nitra, Hron and Ipel'. As already mentioned, the burial grounds of Nové Zámky, Modrany and Svodín were situated on the northern periphery of territory of this culture (Stegmann-Rajtár 2009; 2013). The burial grounds in Bajč, Malé Kosihy (Paulík 1959, fig. 4; 5) and Mužla (Kuzma 2001) were smaller. The discovered material documents the overlap with the Lusatian culture as well as with the equestrian nomadic cultural entity, which is clearly reflected in the composition of finds. They connect the traditions of the Middle Danube Urnfields with a considerable share of the Mezőcsát culture (Stegmann-Rajtár 2005, fig. 20; 2011; 2022). Burying at the burial grounds north of the Danube usually did not end with the extinction of the Eastern Hallstatt culture. Most of the burial grounds were also used in the Final Hallstatt period (stage Ha D2–3), i.e. in the period of the Vekerzug culture (Stegmann-Rajtár 2009, 87; 2013; 2017). Fibulae characterizing regional as well as supra-regional contacts are the most typical items of clothing in the Early and Late Hallstatt period (Romsauer 1996; Studeníková 2001). First, there is the harp-shaped fibula, which was common in Central Europe as early as the Late

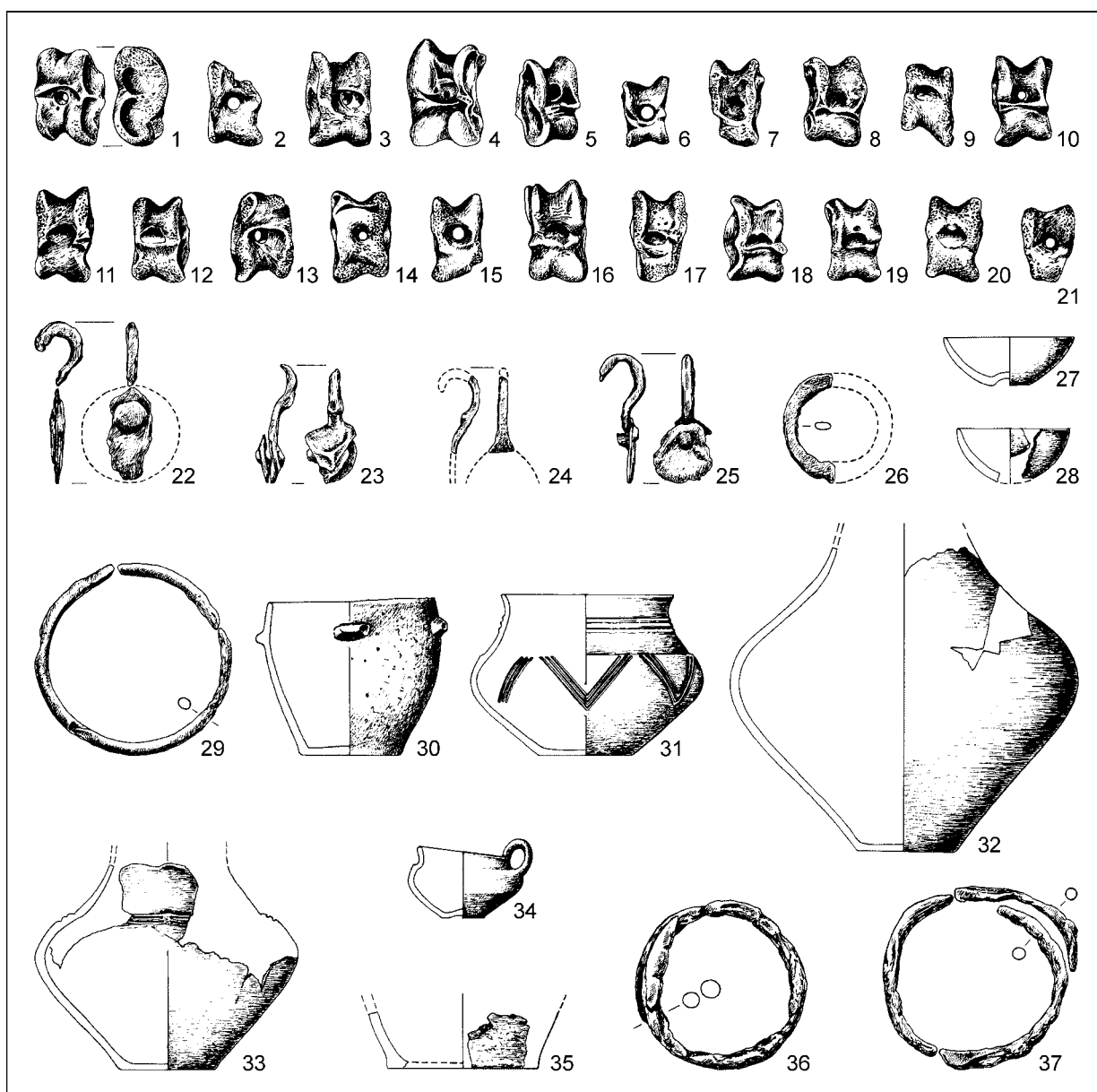


Fig. 9. Halimba-Cseres. Finds from burials 1 (1–32) and 6 (33–37). 1–21 – bone; 22–26, 29, 36, 37 – iron; others – clay (after Patek 1993, fig. 68). Without scale.

Bronze Age and survived also in the Early Hallstatt period. Besides burial 2/57 in Hurbanovo (Fig. 5: 6), a harp-shaped fibula was discovered in burial 50/76 in Svodín, in combination with a boat-shaped fibula (Němejcová-Pavůvková 1986, 169). In the Late Hallstatt period (Ha C2–HD 1), the harp type of fibulae was gradually replaced by the boat type, which spread from the territory of Southwestern Slovakia further to the north (Felcan/Stegmann-Rajtár/Tirpák 2019, fig. 6; Stegmann-Rajtár 2009, fig. 14). Boat-shaped fibulae were typically present e.g. at the burial ground in Nové Zámky. The burial ground in Nové Zámky with first burials from the Early Hallstatt period was in use until the Final Hallstatt period (Ha C1a, Ha C1b, Ha C2, Ha D1, Ha D2–3). It seems very likely, regarding the typical grave goods, that the Eastern Hallstatt culture in the region did not disappear suddenly but was gradually over-layered by the Vekerzug culture, which became dominant in the Final Hallstatt period (HD 2–3; Stegmann-Rajtár 2009; 2013; 2017).

Tumuli were rarely built over cremation burials in the territory east of the Váh River – they were used only for important individuals of the local community; their grave goods were richer in comparison with flat burials in this area (Stegmann-Rajtár 2017, 392). The tumuli were mainly small, unlike the large tumuli of the Kalenderberg Hallstatt culture (Stegmann-Rajtár 2002b, fig. 1). Besides pottery (up to 5–10 vessels),

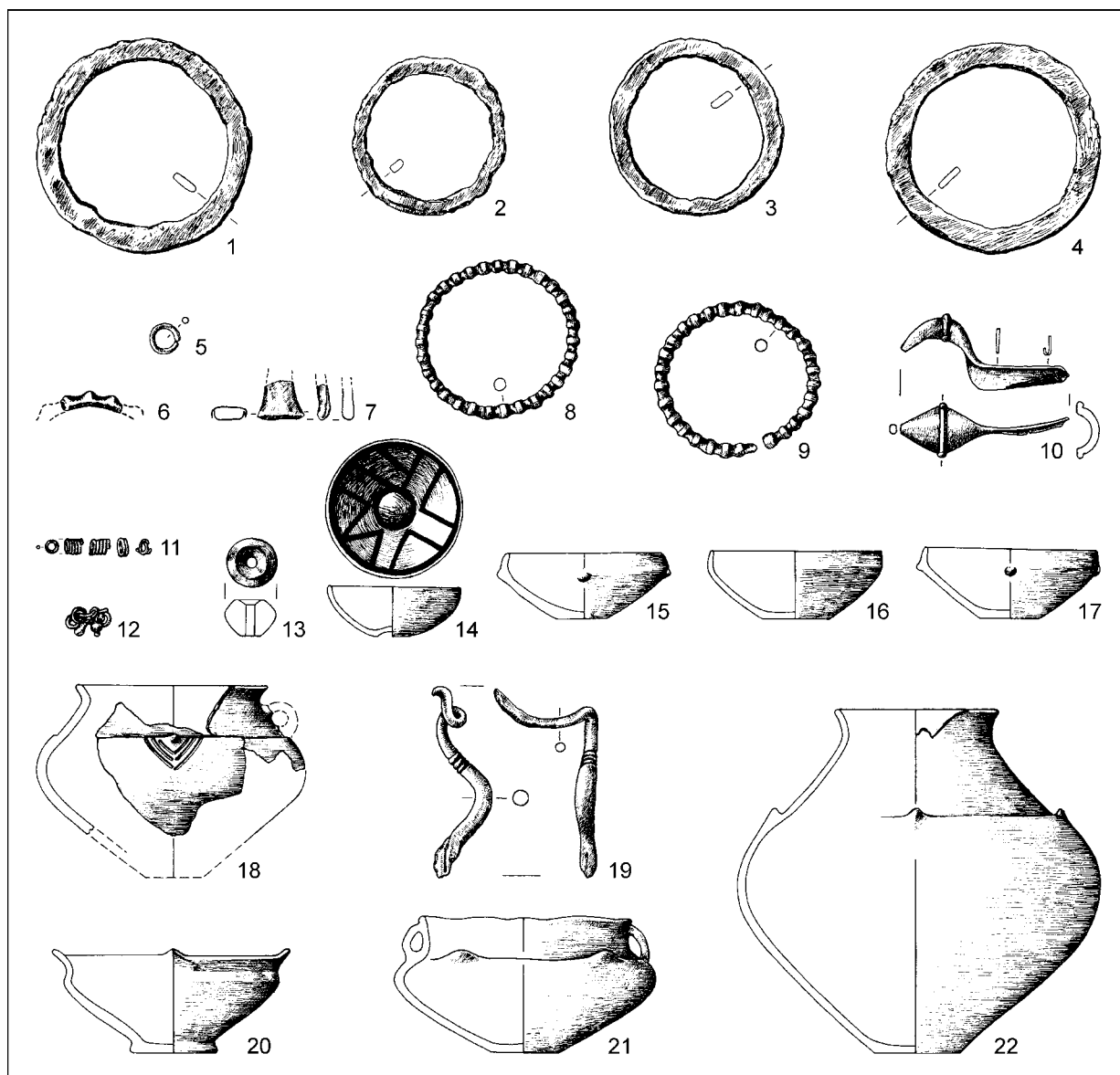


Fig. 10. Halimba-Cseres. Finds from burials 6 (1–9), 9 (10–13, 16) and 12 (14, 15, 17–22). 1–4 – iron; 13–18, 20–22 – clay; others – bronze (after Patek 1993, fig. 69). Without scale.

the associated material included mostly bronze or iron items of garment and jewellery. Typical tumuli include Malá nad Hronom (*Stegmann-Rajtár* 1992, fig. 39) and Hurbanovo (tumulus 1/57; *Paulík* 1958), where the most frequently occurring metal finds contained parts of garment and jewellery – fibulae and bracelets. They were probably female burials and were built without chambers with finds on the bottom of rectangular grave pits.

Burials of elite men with weapons are absent in the area of Southwestern Slovakia; they are more frequent only south of the Danube, e.g. in the tumuli of Süttő, Vaszar or Somlóvásárhely (*Novinszki-Groma* 2017; *Patek* 1993, 62–131; *Stegmann-Rajtár* 1992, 92–107; *Teržan* 1990). The men were riders and warriors buried with weapons, various tools and horse harness or its parts (*Kmeťová* 2014; *Novinszki-Groma* 2017; *Patek* 1993; *Paulík* 1959; 1975; *Stegmann-Rajtár* 2002a; 2017).

In the rich graves also multiple individuals (a man and a woman, sometimes with a child) were buried.

Apart from rare small tumuli with rich goods (Malá nad Hronom, Hurbanovo), flat cremation burials with rather poor goods (e.g. Nové Zámky, Svodín, Halimba-Cseres [Fig. 9; 10], Középrépuszta), belonging to larger burial grounds, were more frequent in Southwestern Slovakia in the Early and Late Hallstatt period, during existence of the Hallstatt culture of the Central and Northeastern Transdanubia (Fig. 2).

The typical assemblage of regularly repeating types of vessels in the investigated burials is an important evidence of regional differences in the territory of the Eastern Hallstatt culture (Stegmann-Rajtár 2002a, fig. 1; 2). A bowl with the handle raised above the rim occurring exclusively in burials of the Kalenderberg Hallstatt culture is a good example. It does not occur in burials of the Hallstatt culture of Central and Northeastern Transdanubia. On the other hand, bowls with handles terminated in the middle of the necks were typical of the Hallstatt culture of Central and Northeastern Transdanubia and are absent in the Kalenderberg Hallstatt culture.

As described above, Southwestern Slovakia belonged – together with Southern Moravia, Lower Austria, Burgenland and Hungarian Transdanubia – to the northern part of the Eastern Hallstatt cultural sphere. The Hallstatt culture (Eastern Hallstatt culture) was formed there; it had various forms and uneven dynamics of evolution in individual regions, although it followed from traditions of the Late and Final Bronze Age (Late and Final Middle Danube Urnfield culture) in several aspects – e.g. continuous usage of the cremation burial rite can be mentioned as one of them. On the other hand, the settlements and burials are mainly detected at new sites which had not been settled in the Final Bronze Age. This applies mainly to the unfortified settlements and adjacent burial grounds in the lowland part of Southwestern Slovakia. The situation was different at hilltop sites, where fortified settlements were built as early as the Late and Final Bronze Age; the settlement there survived to the following period of the Early Iron Age (Barta *et al.* 2017; Felcan/Stegmann-Rajtár 2018; Stegmann-Rajtár 2017).

CONCLUSION

The territory of Southwestern Slovakia was densely settled during the Hallstatt period (8th–5th century BC; Stegmann-Rajtár 2009, 84; 2002b; 2017; Studeníková 2012). In its early stage, i.e. during the phases Ha C–Ha D1, it belonged to the northern part of the Eastern Hallstatt culture. After its demise, it became an area with intense expansion of the Vekerzug culture with its peak in phase Ha D2–3.

The Eastern Hallstatt culture expanded mainly in the lowland areas of Southwestern Slovakia, where it was influenced during the whole course of its existence by the contact with the Lusatian culture, forming specific mixed cultural zone in this region. The Eastern Hallstatt culture was represented by the Kalenderberg Hallstatt culture with most sites west of the Váh River and by the Hallstatt culture of Central and Northeastern Transdanubia with most sites east of the Váh. Both cultures overlapped and differences between them are documented mainly in different burial customs.

At the end of the Bronze Age and in the Early Iron Age, Southwestern Slovakia was part of the Central European as well as the Adriatic-Carpathian cultural sphere (Hänsel A./Hänsel B. 1997; Patek 1993; Stegmann-Rajtár 1992; Teržan 1990). Their mutual contact took place mostly in the north-western part of the Carpathian Basin, where considerable concentration of finds of southern as well as south-eastern origin is recorded. Most of the finds reached the territory under consideration from the Danubian-Carpathian and Southeastern Alpine region as well as from the Central Balkans (Studeníková 2012). The settlements and burial grounds from studied region often reflect various cultural influences and contacts with neighbouring as well as more distant territories (Stegmann-Rajtár 2002a; Stegmann-Rajtár 2002b; Stegmann-Rajtár 2017).

Recently, opinions on the development of cultural relations and contacts between the Central Danube region and Southern and Southeastern Europe in the Late and Final Urnfield and in the Hallstatt period have changed. Publication of finds from previously as well as newly discovered sites in the northern part of the Carpathian Basin has contributed to it. This source base currently offers numerous stimuli for revision analysis and for a new evaluation of the subject of the development of the Late and Final Bronze Age and the Early Iron Age.

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Žiarové pohrebisko v Hurbanove v kontexte vývoja východohalštatskej kultúry

Susanne Stegmann-Rajtár

Súhrn

V rokoch 1956 až 1959 sa v polohe Pieskovisko v Hurbanove, okr. Komárno (obr. 1), podarilo pod vedením J. Paulíka preskúmať šesť hrobov z doby halštatskej (HC–HDI). Išlo o ploché žiarové hroby, z ktorých jeden mohol byť pôvodne pod mohylovým násypom. Väčšina z nich obsahovala iba keramický riad, v niektorých sa nachádzali aj súčasti a ozdoby odevu vyhotovené z bronzu alebo zo železa. Hroby môžeme zaradiť do východohalštatskej kultúry (halštatská kultúra stredného a severovýchodného Zadunajska; obr. 2). Hroby z roku 1956 boli odkryté v rámci výskumu slovanského kostrového pohrebiska (obr. 3). Išlo o žiarové hroby 68/56 a 74/56. Obidva inventáre obsahovali iba keramický riad. Počas výskumu v roku 1957 sa preskúmali žiarové hroby 1/57 (mohyla; obr. 4; 5: 1, 2) a 2/57 (plochý hrob; obr. 5: 3–6; 6). Inventáre obsahovali keramiku, ako aj menší počet bronzových a železných artefaktov, ktoré patrili k ozdobám a súčasti odevu pochovaných. Výskum tejto polohy pokračoval aj v roku 1959, keď sa v priebehu zemných prác objavili žiarové hroby 1/59 a 2/59. Boli značne zničené buldozérmi a ich obsah sa zachoval iba neúplne. Hrob 1/59 mal bohatú výbavu, obsahoval bronzové ozdoby a súčasti odevu – rôzne typy hladkých a profilovaných náramkov a krúžkov, štyri ločkovité spony s bočnými gombíkmi, fragment terčovitej (?) spony a jeden železný krúžok (obr. 7). Z tohto hrobu sa však podarilo zachrániť iba dve nádoby. V hrobe 2/59 sa nachádzalo sedem alebo osem nádob, železný nôž, železný krúžok a pravdepodobne fragment železnej harfovitej spony, aká sa našla aj v hrobe 2/57. Nálezy keramiky a drobných predmetov z hrobov v Hurbanove, Pieskovisku, sú porovnateľné s inventárom hrobov z pohrebísk v Nových Zámkoch, Malej nad Hronom, Svodíne (obr. 8), Bajči a Modranoch.

V literatúre často používaný názov „kalenderberská halštatská kultúra“ je veľmi širokým pojmom pre rozsiahlu časť severovýchodohalštatského kultúrneho okruhu, ktorý okrem územia kalenderberskej kultúry zahŕňa aj územie halštatskej kultúry stredného a severovýchodného Zadunajska. Jednoznačné rozdiely nielen v pohrebných zvyklostiach, ale aj v materiálnej náplni mohýl, ako aj plochých hrobov však dokladajú existenciu dvoch rovnocenných skupín, ktoré bezprostredne susedili. Ich kontakt a vzájomný vplyv je doložený najmä v materiálnej náplni niektorých sídlisk severne od Dunaja, pre ktorý je typický kultúrne zmiešaný charakter nálezov. Na odlišný charakter materiálnej kultúry z menších mohýl (napr. Malá nad Hronom, Hurbanovo), ako i plochých hrobov (napr. Nové Zámky, Modrany, Svodín) v „severovýchodnej časti kalenderberskej kultúry“ upozornil už v roku 1964 Jozef Paulík, ktorý do literatúry zaviedol názov „középrépású typ kalenderberskej kultúry“ podľa rovnomenného pohrebiska v Zadunajske. Dnes na základe čiastočne publikovaných starších i novších hrobových celkov, predovšetkým z bohato vybavených mohýl (napr. Vaszar, Somlóvásárhely, Süttő, Százhalombatta), ale aj plochých pohrebísk (napr. Középrépásuszta, Halimba-Cseres; obr. 9; 10), vieme, že oblasť stredného a severovýchodného Zadunajska a k nej prilehlé územie severne od Dunaja, s ťažiskom pohrebísk medzi Váhom a Ipľom malo samostatný vývoj, odlišný od vývoja v severozápadnom Zadunajske (kalenderberská halštatská kultúra) a v susedných oblastiach juhozápadného Slovenska medzi Malými Karpatami a Váhom.

Obr. 1. Východohalštatská kultúra v priestore východoalpско-panónskej oblasti (podľa Egg/Kramer 2005, obr. 2).

Obr. 2. Mapa pohrebísk a hrobov východohalštatskej kultúry. 1 – Nové Zámky; 2 – Bajč; 3 – Hurbanovo; 4 – Modrany; 5 – Svodín; 6 – Mužla; 7 – Malá nad Hronom; 8 – Malé Kosihy; 9 – Süttő; 10 – Lábatlan; 11 – Tatabánya; 12 – Csorna; 13 – Arpás; 14 – Nagybarát; 15 – Mezőőros-Alsótag; 16 – Vaszar; 17 – Középrépásuszta; 18 – Mesteri; 19 – Csöngö; 20 – Kismező; 21 – Somlóvásárhely; 22 – Halimba; 23 – Fehérvárcsurgó; 24 – Százhalombatta (podľa Stegmann-Rajtár 2009, obr. 13).

Obr. 3. Poloha náleziska Hurbanovo, Pieskovisko (podľa Veliačik/Romsauer 1994, obr. 14).

Obr. 4. Hurbanovo, pôdorys mohyly 1/57 (podľa Paulík 1958, obr. 1).

Obr. 5. Hurbanovo. Železné a bronzové predmety z mohyly 1/57 (1, 2) a z hrobu 2/57 (3–6) (podľa Paulík 1958, obr. 2). Bez mierky.

Obr. 6. Hurbanovo, pôdorys hrobu 2/57 (podľa Paulík 1958, obr. 3).

Obr. 7. Hurbanovo. Nálezy z hrobu 1/59. 1–3, 5–18 – bronz; 4 – železo (podľa Studeníková 2001, obr. 4).

Obr. 8. Svodín. Nálezy z hrobu 46/77. 1–6, 8–11 – hlina; 7 – bronz (podľa Němejcová-Pavíková 1986, obr. 19). Bez mierky.

Obr. 9. Halimba-Cseres. Nálezy z hrobov 1 (1–32) a 6 (33–37). 1–21 – kosť; 22–26, 29, 36, 37 – železo; ostatné hlina (podľa Patek 1993, obr. 68). Bez mierky.

Obr. 10. Halimba-Ceres. Nálezy z hrobov 6 (1–9), 9 (10–13, 16) a 12 (14, 15, 17–22). 1–4 – železo; 13–18, 20–22 – hlina; ostatné bronz (podľa Patek 1993, obr. 69). Bez mierky.

‘DEVIANT’ BURIALS AS MARKERS OF PARTICULAR SOCIAL IDENTITIES¹

Some Examples from the ‘Scythian’ Cemetery at Sâncrai-Darvas (Transylvania)

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The article analyses three recently unearthed burials from the ‘Scythian’ cemetery at Sâncrai-Darvas in Transylvania that broke the common funerary norms of this chronological and cultural horizon. In the first case, a double re-inhumation illustrates the practice of prolonged funerals which is also attested in a few other cases from the same cemetery. The second grave, belonging to a female shaman, is another case of a post-burial intervention, this time determined by communal fear. The last grave belongs to another person whose social status and function determined the community to choose less common funerary rituals. In all of these cases, the funerary rituals were part of either the liminal or the post-liminal stage of the funerary ceremonies, being connected either with the physical and symbolic treatment of the corpse or with the integration of the deceased into the otherworld, concomitantly with the restoration of the social and spiritual equilibrium of the family or the community.

INTRODUCTION

As a rite of passage, the funerary ceremony has three main stages, each with its own ritualized gestures and meanings. The first (pre-liminal) stage comprises rituals that are meant to help separate the deceased from the world of the living, while also defending the community against the threatening impact of death. The second (liminal) stage mainly deals with the physical and ontological transformation of the corpse. The third (post-liminal) stage comprises the rituals which allow the integration of the deceased into the otherworld and the restoration of the social equilibrium of the respective community (Fowler 2004, 44, 45; van Gennep 1998, 131–146). A significant part of the rituals practised during each of these three stages, particularly those concerning the last two, when the deceased is laid into the burial pit and then reaches the otherworld, while the mourners are gradually reintegrated into the local social body, could be reconstructed based on archaeological evidence, often with the support of other interdisciplinary analyses.

On the other hand, the burials were also public social events in which at least some, if not all, of the community usually participated. The performed rituals and the ways in which grave-goods were assembled were part of an entire social strategy through which the mourners attempted to preserve the memory of the deceased while also perpetuating certain elements which defined their own real or desired social status and identity (Wells 2007, 472–474; Williams 2003, 10). That is why the funerary discoveries play such an important role in the identification of individual or collective identities from the past.

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From the funerary perspective, collective identities are characterized by a certain degree of ritual repetitiveness across an entire cemetery belonging to a single community. Therefore, when the common funerary pattern is broken by some unusual practices, the burials in question are interpreted as ‘deviant’. The term generally designates unusual burials which do not conform to the ritual norms of a community and are often associated with marginal social groups, outcasts or people who suffered unusual deaths (Fig. 1). They could be criminals, women who died in childbirth, infants, disabled or sick individuals, and generally, people who were perceived as a threat to the community even after death (Murphy 2008). As a consequence, in the symbolic topography of a communal cemetery, which could mirror or not the real topography of the burial ground, their burials occupied a marginal position.

Based on these observations, the main scope of this article is to analyse a few burials from the ‘Scythian’ cemetery at Sâncrai-Darvas (Alba County) in Transylvania,² whose particular ritual features are different from those commonly encountered in this cemetery, so they could be potentially interpreted as ‘deviant’. The analysis will seek to understand the reasons for the different ritual treatment of these people and whether the chosen funerary practices are related to some particular social identities.

THE ‘SCYTHIAN’ CEMETERY AT SÂNCRAI-DARVAS (ALBA COUNTY), IN TRANSYLVANIA (ROMANIA)

Rescue excavations conducted in 2016 on the new Sebeş-Turda motorway contributed to the identification of a new cemetery belonging to the ‘Scythian’ horizon in the vicinity of Sâncrai village, close to Aiud (Alba County). Further systematic excavations have been conducted since 2020 also outside the area affected by the motorway, in order to investigate the entire cemetery (Fig. 2). So far, 114 archaeological features have been unearthed (Rustoiu 2019, 54–70; Rustoiu *et al.* 2017; 2021; 2022).

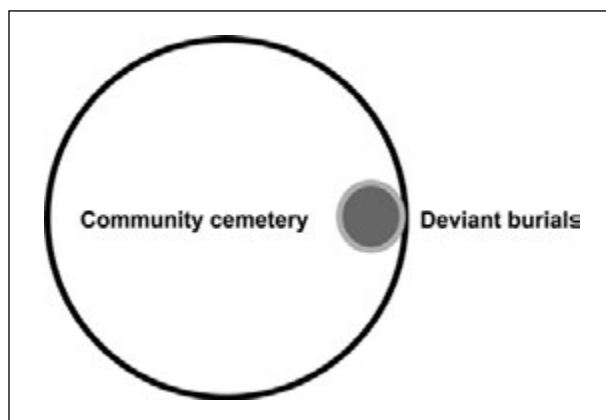


Fig. 1. Theoretical positioning of the ‘deviant’ burials in the symbolic topography of a cemetery (drawing A. Rustoiu).

² Chronologically, the last stage of the Early Iron Age and the Late Iron Age in Transylvania cover three distinct cultural horizons: 1. the ‘Scythian’ horizon (ca. 700–450/350 BC); 2. the ‘Celtic’ horizon (ca. 350–200/175 BC); 3. the ‘Dacian’ horizon (ca. 200/175 BC–106 AD). The term ‘horizon’ is preferred instead of the traditional archaeological periodization, because it is more clearly defining the gradual and often diffuse changes experienced by various communities from the perspective of cultural identities. At the same time, the term ‘horizon’ is more appropriate for the interpretation of certain archaeological contexts in which older and newer elements or those having different origins are intermingled (see Rustoiu 2021). The ‘Scythian’ horizon was marked by a cultural orientation towards the Northern Pontic region. This situation was largely determined by the arrival of some groups coming from the steppe and silvo-steppe of the Northern Pontic regions. They came through the passes of the Northern Carpathians in successive stages, bringing over new cultural and identity models. On the Great Hungarian Plain, archaeological discoveries are pointing to a mixture of locals and newcomers living together (Chochorowski 1985; Kemenczei 2009; Párducz 1973, etc.). This cultural mixture is mostly visible in the funerary rites and rituals. Contemporaneous settlements from the Great Hungarian Plain have a rural character, occupying a limited area, while the dwellings consist mainly of sunken huts having a rectangular or oval shape (Scholtz 2010). Some flat inhumation cemeteries have been discovered in Transylvania, many graves containing weaponry typical of the Northern Pontic region. Until recently, no settlements have been found in this region, their absence being connected to the transhumant way of life (Vasiliev 1980). However, one potentially belonging to this horizon was identified not far from the fortified settlement at Teleac (Uhnér *et al.* 2018a, 302; 2018b, 380–383, fig. 13–17), while another was identified through field surveys in the surroundings of the cemetery at Sâncrai-Darvas (Egri *et al.* 2023, 167, 168). In general, the so-called ‘Scythian age’ included a diversity of cultural aspects reflecting the amalgamation of the local communities with the warlike groups which came from various parts of the Northern Pontic region starting with the first half of the 7th century BC. The evolution of these mixed groups, having connections mostly with the eastern regions and/or the Northern Balkans, was interrupted after the middle of the 4th century BC by the arrival from the west of the Celtic communities.

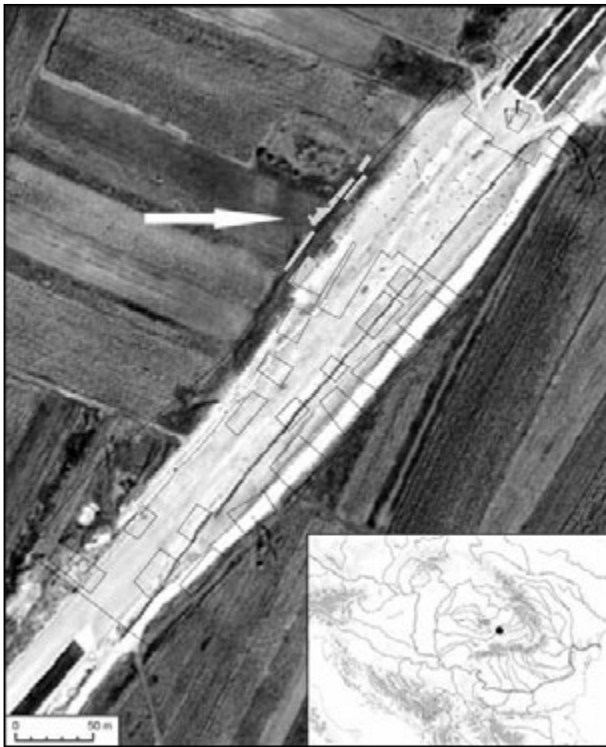


Fig. 2. Sâncrai-Darvas. Topographic plan of the 2016 rescue (black squares) and 2020 systematic archaeological excavations (white arrow pointing on grey areas; drawing A. Drăgan).

The majority of the unearthed graves are inhumations (Fig. 3: 1). The deceased were usually laid in the extended supine position, though some were also laid in a one-side flexed or crouched position. There are only a few cremation burials (Fig. 3: 3). Previously, these were usually ascribed to the indigenous population (Vasiliev 1980). One horse burial was also identified (Fig. 3: 2).

The deceased were usually buried with meat offerings (El Susi 2021a) frequently associated with iron knives and sets of ceramic vessels. Most of the graves contain jewellery and costume accessories made of gold, bronze or iron (Fig. 4: 1–4, 6, 7). The finds have analogies in other cemeteries from Transylvania dated to the 7th and 6th centuries, and at the beginning or in the first half of the 5th century BC.

Regarding the weaponry, most of the graves contain arrowheads (Fig. 4: 8). In a few cases, these were accompanied by quiver appliques with zoomorphic decoration (Fig. 4: 5). Other graves contain spearheads, hammer-axes and daggers of the akinakes type (Fig. 4: 9). Regarding the harness fittings, one iron horse-bit was found in the pit containing the horse skeleton. This belongs to the type with

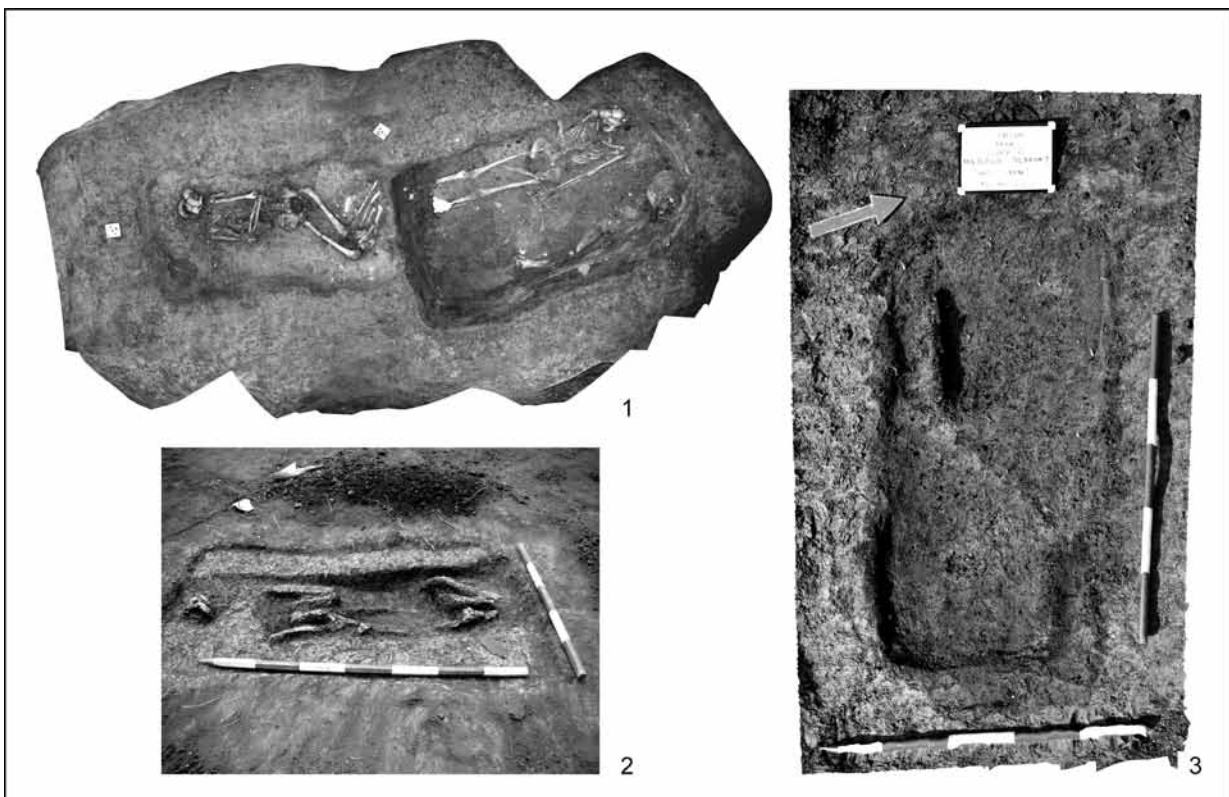


Fig. 3. Sâncrai-Darvas. 1 – photogrammetry of the inhumation graves Nos. 3/2020 and 4/2020 (photo A. Drăgan); 2 – horse burial (photo G. Baltes); 3 – cremation grave No. 6/2020 (photo M. Egri).

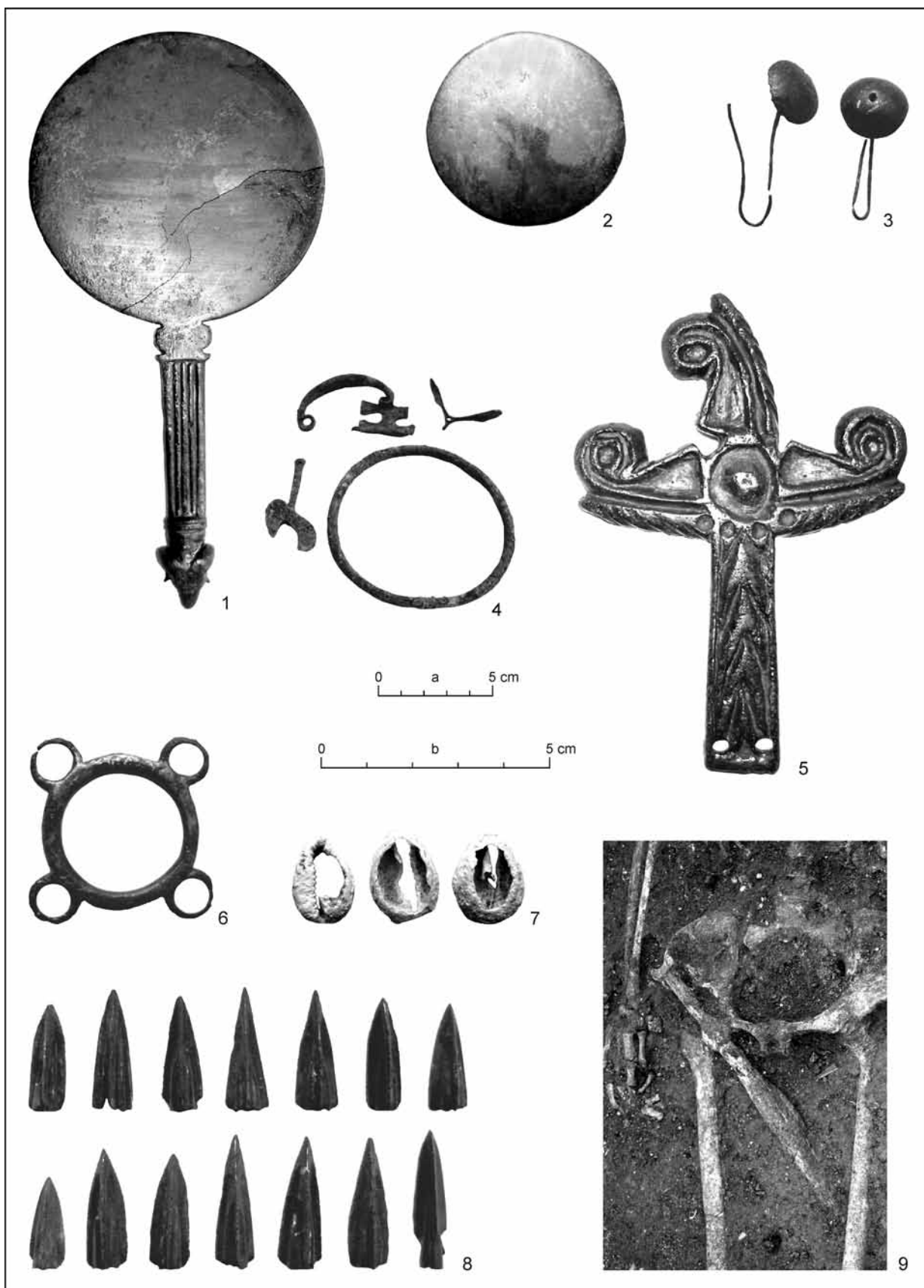


Fig. 4. Sâncrai-Darvas grave-goods. 1–6, 8 – bronze; 7 – shells; 9 – iron akinakes *in situ* (photos A. Rustoiu and M. Egri). Scale: a – 1–3; b – 5–8; without scale – 4, 9.

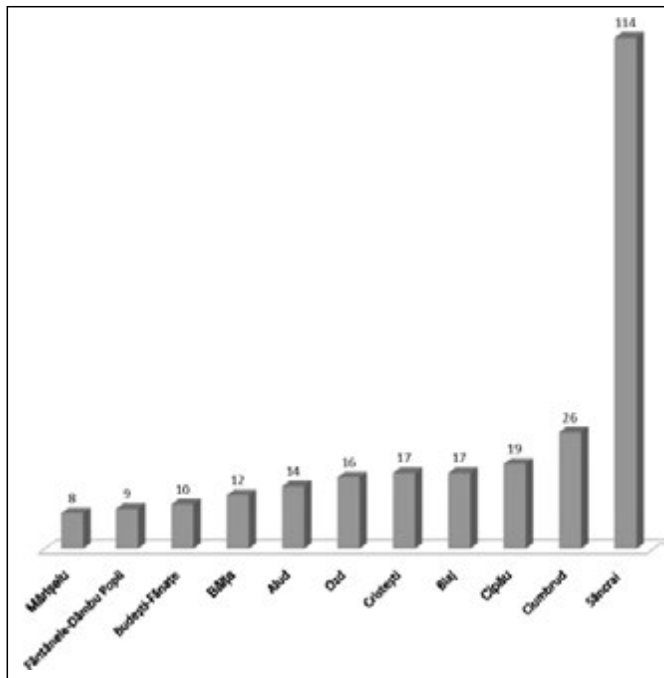


Fig. 5. Size of the 'Scythian' cemeteries in Transylvania based on the number of graves (graph A. Rustoiu).

S-shaped cheek pieces. Similar horse-bits are common in the Northern Pontic region and also in the Northern Balkans in the 5th–4th centuries BC (Werner 1988, type IV).

The 'Scythian' cemetery at Sâncraia-Darvas can be dated to the period between the 8th/7th and the 5th/4th centuries BC.³ The funerary inventories have analogies both in the earlier cemeteries of this horizon and in the later ones, some even exceeding the chronological limits presumed until now in the specialist literature. It is also worth noting that all other 'Scythian' cemeteries from Transylvania usually consist of a small number of graves. However, the Sâncraia cemetery, where 114 features have been unearthed until now, is by far the largest in Transylvania and one of the larger ones in the entire Carpathian Basin (Fig. 5).

Some of the graves from the cemetery at Sâncraia-Darvas are not conforming to the usual ritual norms, and can be included in the category of the so-called 'deviant' burials.

For example, seven graves display traces of post-burial interventions in which the funerary pit was reopened and the skeleton was manipulated, the bones being displaced or grouped in a non-anatomical position. These traces indicate an intentional, targeted intervention of the community, or of some members, who wanted to change the way in which the deceased were perceived upon death. The graves were surely not robbed, because the funerary inventories were intact.⁴ Some of the most relevant cases are graves Nos. 7/2020, 9/2020 and 91/2016.

Grave No. 9/2020

Grave No. 9/2020 was identified during the systematic archaeological excavations conducted in area E. The funerary pit has an almost rectangular shape with rounded corners, oriented W – E, and the dimensions of 2.20 × 1.20 m and a depth of 0.70 m (Fig. 6; 7).

On the bottom of the pit, three ceramic vessels were deposited in a row along the western edge – a large bitronconical vessel, for which a niche was dug into the wall of the pit, later filled with sandy soil, and two cups (the broken handle of one of these cups was found towards the middle of the pit). A human skull, with the detached mandible found nearby, and some smaller bones were also recovered from the western side. Some kaolin beads were discovered next to the skull.

The bottom of the pit was covered with a layer of greyish-yellow soil which was 0.22 m thick. Two groups of dismembered human and animal bones were found on top of this layer in the northern and, respectively, southern side of the pit, together with one ceramic cup which was recovered from the middle of the pit. During the anthropological analysis, a bracelet with unattached ends which was made of bronze wire was identified among the human bones.

³ For other cemeteries discovered in the same area, at Aiud, Gâmbaș and Ciombrud, and for their chronology see Vulpe 1984. For other early 'Scythian' discoveries (8th–7th centuries BC) in Transylvania see also Boroffka 1998.

⁴ The reopening of graves and the treatment of human remains in ways which are different from the initial burials are attested in all historical periods. The reasons for these interventions are very diverse: later accidental disturbances, robbery, post-mortem 'punishment' of the deceased carried out by enemies (a kind of *damnatio memoriae*), magical practices against malevolent spirits, reuse of graves (by the families or for secondary burials within older funerary complexes), commemorative rituals for the ancestors, etc. (see Brent 2017; Dobos 2014; Fahlander 2010; Weiss-Krejci/Becker/Schwyzler 2022, with several contributions to this topic; Wendling 2020).

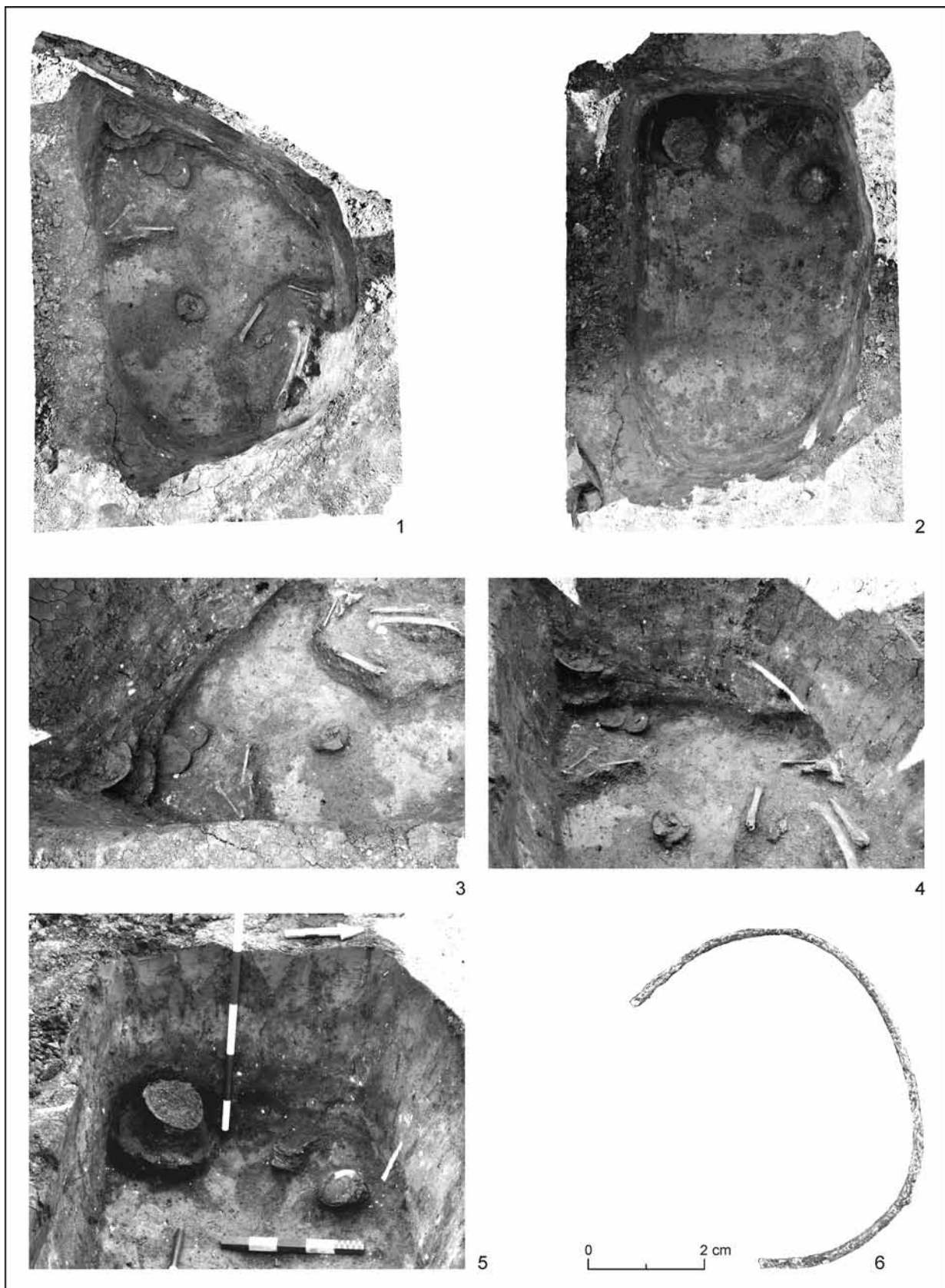


Fig. 6. Sâncrai-Darvas grave No. 9/2020. 1, 3, 4 – details of the upper part of the burial; 2, 5 – bottom of the funerary pit; 6 – bracelet discovered among the human bones in the southern part of the grave (1, 2 – photogrammetry A. Drăgan; 3–5 – photos M. Egri; 6 – photo Sz. S. Gál).

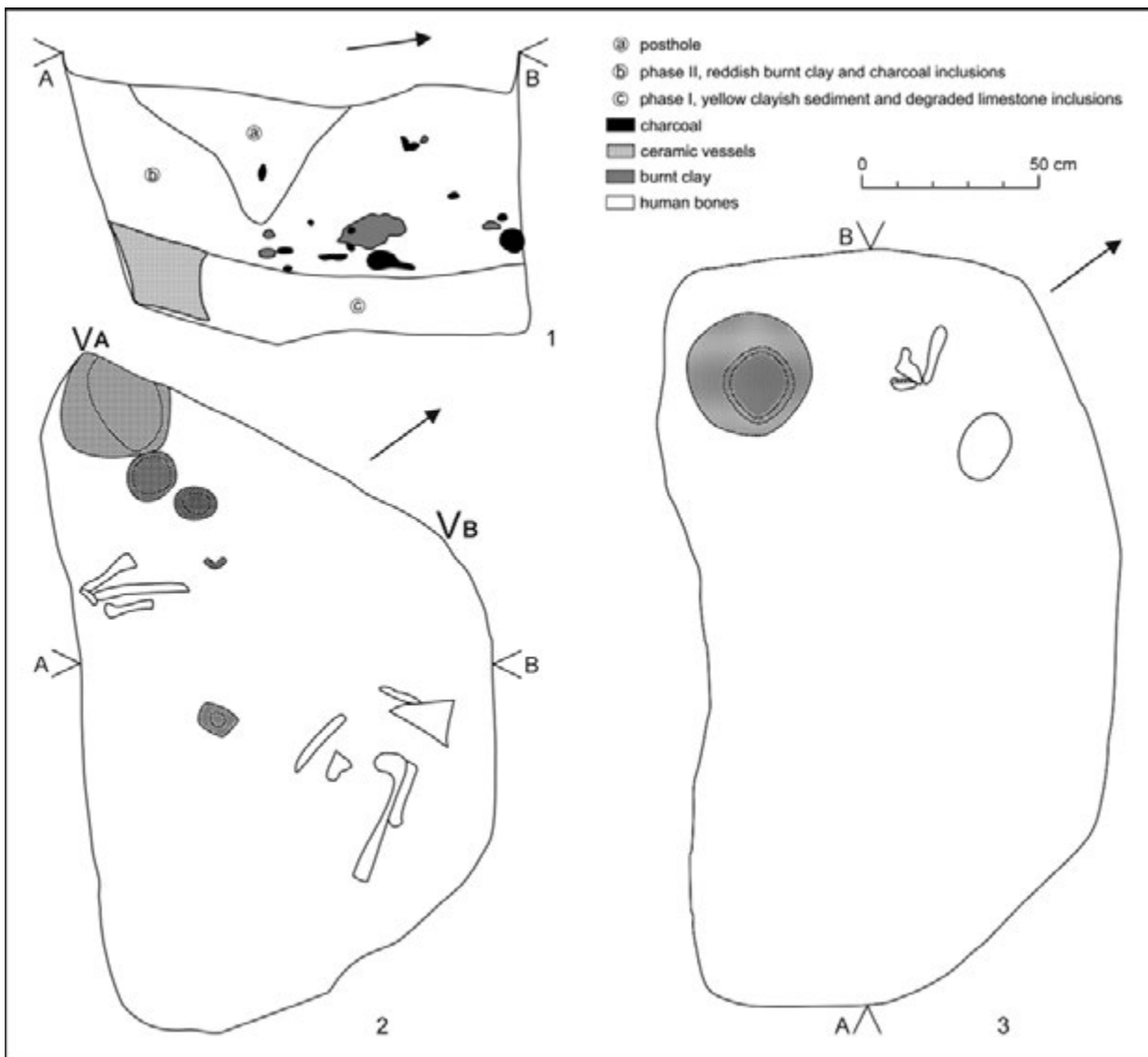


Fig. 7. Sâncrai-Darvas grave No. 9/2020. 1 – cross-section of the funerary pit; 2, 3 – plan of the grave and deposits of bone and vessels on the upper (2) and lower (3) part of the pit (drawings M. Musteață).

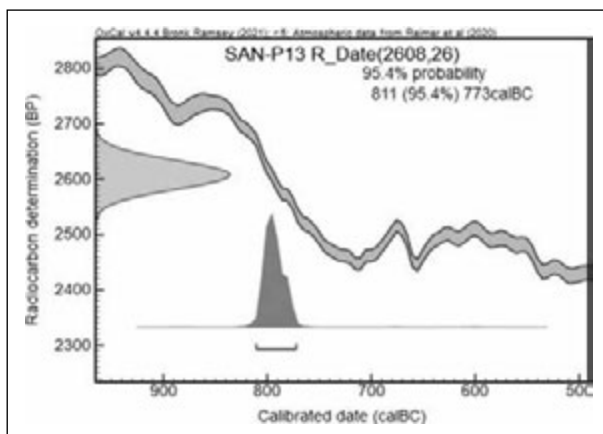


Fig. 8. Radiocarbon dating (BP) of the charcoal samples from grave No. 9/2020.

On top of this layer, the pit was filled with a 0.45 m thick layer of compact yellowish-black soil containing numerous fragments of burned clay and charcoal. Some of the upper part of the pit was then covered by alternating layers of burned soil and yellow clay.

On the western side, the intermediate profile cutting across the pit on the line of the grave goods revealed a posthole with a tapered lower end penetrating the grave fill of the second phase. The posthole had a top diameter of 0.55 m and a depth of 0.43 m.

The radiocarbon analysis of the charcoal samples recovered from the grave fill of the second phase indicates that the grave can be dated with a probability of 95.4% to 810–774 BC (Fig. 8; HEKAL Report I/2924 cf. Molnár et al. 2013).

The anthropological analysis concluded that the human bones belong to two individuals.⁵ The skull found on the bottom of the pit belongs to a woman. The frontal, parietal, temporal and occipital bones, as well as fragments of the facial bones, could be identified (maxillary and mandible bones with strongly eroded teeth – dentition schema 2-1-2-3). The group of remains from the southern side above the greyish-yellow layer contained human long bones (left femur without the lower part) and fragments from the diaphysis of the upper limbs (radius, humerus and ulna), as well as animal bones (possibly ovicaprids).⁶ The bronze bracelet mentioned above was found with this group of human bones.

The characteristics of the skull found on the bottom of the pit, as well as the postcranial bones from the group found on the southern side of the pit above the greyish-yellow layer, signal the presence of a woman, though the size of the left femur shows male characteristics. Except for this one bone, the rest of the human remains belonged to a woman. The presence of the kaolin beads next to the skull and the bronze bracelet next to the upper limbs seems to confirm this identification. There is insufficient data to determine the height of the person, but the teeth erosion and the bones of the arm indicate an elderly person over 60 years old.

The group of bones from the northern side of the pit above the greyish-yellow layer probably belonged to a male. The skull fragments come from the frontal (the metopic suture is visible) and parietal bones. The postcranial fragments include parts of the upper limbs (left humerus without epiphyses, with enthesopathy on the diaphysis), parts of the diaphysis of the left femur and the right tibia. The left femur found together with the group of bones from the southern part of the pit surely belongs to this individual. His age cannot be determined at this point.

It is important to note that none of the two human skeletons is complete. The contexts of discovery, including the stratigraphy of the funerary pit and the state of human remains, suggest that the grave was reopened sometime after the initial burial, the skeletons were manipulated in one way or another, and only some of the bones were then reburied. The time between their death and inhumation and their subsequent re-inhumation was long enough for the bodies to decompose.

The palynological analysis of the soil samples retrieved from the ceramic vessels found on the bottom of the pit is equally relevant (*Grindean et al. 2023*). The soil from the two cups found next to the large bitronconical vessel contained pollen of different species of herbs and pasture plants: meadow grass, flowering grass, fireweed, groundsel, alfalfa, yarrow and sorrel. Soil samples collected from the bottom of the pit, next to the human skull on the western side, revealed pollen of hazel and black alder. The analysis of the soil from the large bitronconical vessel only detected spores of mushrooms that grow on cow dung (dung fungi), and freshwater algae, most likely from the floodplain of the Mureş River which on that time was located a few hundred meters to the west. Finally, the cup found towards the middle of the pit, above the greyish-yellow layer, only contained spruce pollen. The presence of spruce is rather unusual, given that Sâncrai is located relatively far from the mountainous area where spruce normally grows. Some possible explanations are explored below.

The results of the palynological analysis are relevant for the landscape around the cemetery. The area was apparently dominated by pastures for grazing cattle. The presence of hazel pollen (as well as dog-rose and birch, detected in other graves) indicates that the area was quite recently deforested. Nearby, the marshy, humid environment of the Mureş River's floodplain was favourable for the growth of algae and black alder. The palynological samples also show that the majority of the identified plants bloom at the beginning of summer. This is also when the re-inhumation probably took place. The hazel pollen, which blooms already in February, probably reached the bottom of the pit with the soil used for the initial filling of the grave, unless it was introduced with the human remains.

The exclusive presence of dung fungi and algae spores in the large bitronconical vessel suggests that it may have contained water or another type of liquid contaminated by these spores. In the case of the cup from the middle of the pit, the identification of only spruce pollen and nothing else could be explained by a content made from young spruce cones, which could have been (wild) bee honey – although in this case it should have been associated with other types of pollen (*Rösch 1999, 111*) – or a liquid obtained from steeping or macerating young spruce cones. Ethnographic studies are attesting the use of this kind of traditional medicine in different European contexts, so its presence in grave can potentially be related

⁵ The anthropological analysis was done by Szilárd Sándor Gál (Mureş County Museum, Târgu Mureş) and will be published in a separate study.

⁶ A detailed archaeozoological analysis by Georgeta El Susi (Institute of Archaeology and Art History Cluj-Napoca) is in progress.

to the deceased male whose bones indicate that he suffered from painful joint disease (enthesopathy or arthritis),⁷ though another ritual function cannot be excluded.

Based on the above data, the possible scenario of the re-inhumation can be outlined. Sometime after the initial burial, when the corpses already reached a sufficiently advanced decomposition phase,⁸ the two deceased were exhumed. One possibility is that both originated from a double burial, although it is equally possible that each of them came from a separate grave. It is also possible that both of the deceased or at least one of them were exhumed from grave No. 9/2020, which was later reused for re-inhumation, as its irregular shape seems to suggest.

The presence of burned soil and charcoal fragments suggests that fire was used during the exhumation and/or re-inhumation, though the recovered bones show no traces of burning and the pit itself or the grave goods were also not burned. Likewise, no hearths or other fire installations, nor any traces of open fire were identified in the surroundings of this grave. The initial use of the funerary pit for a cremation burial can be excluded since no burned bones were found. One possible explanation could be the setting of a fire on top of the initial burial before it was opened, perhaps as a kind of purification, though the precise scope and meaning of this ritual will likely remain unknown. The soil containing burned fragments was later used to fill up the funerary pit.

The re-inhumation involved the deposition of three ceramic vessels on the western margin of the pit (the large bitronconical vessel probably contained water from the Mureş River, contaminated with algae and dung fungi; the cups were apparently empty), while the skull, maxillary and other bones of the female deceased were placed on the bottom of the pit,⁹ near the vessels. Everything was then covered by a 22 cm thick layer of loose greyish-yellow soil. Subsequently, other parts of the female postcranial skeleton and some of the male skeleton were thrown inside the pit in two distinct groups. Because only parts of the skeletons were included and the bones were partially mixed, one of the femurs of the male deceased ended up with the remains of the woman, which were also mixed with some animal bones probably resulting from a meat offering. One ceramic cup containing spruce honey or a liquid obtained from processed young spruce cones was placed between the two groups of bones. The pit was then filled up with a compact soil mixed with fragments of burnt clay and charcoal. Finally, a wooden post was inserted into the ground in the western part of the pit, above the line of ceramic grave-goods and the female skull, to serve as a grave-marker. According to the palynological results, the re-inhumation ceremony most likely happened around the beginning of the summer.

Grave No. 91/2016

Grave No. 91/2016 was identified during the initial rescue excavations in 2016 (Fig. 9; 10). The NW – SE oriented funerary pit has a rectangular shape measuring 1.72 × 0.95 m and a depth of 1.24 m. The scattered bones of a female skeleton were found on the bottom of the pit. The skull was placed in the middle of the southern side of the pit (Fig. 9: 1, 2; 10: 1). The skeleton of a dog laid on the right side in anatomic connection was found on top of the human bones (Fig. 9: 3; 10: 1). One perforated knucklebone of a sheep or goat (L = 30 mm; W = 15 mm; Th = 14 mm) was found among the dog bones. This was most likely worn as a pendant by the dog (Fig. 10: 2). The right femur of the deceased was leaning upright against one large bitronconical jar which was found on the eastern side of the pit. Two one-handled cups were found under the human remains, in the middle of the pit. One was placed on the bottom of the pit and the other was found overturned on the side (see *Rustoiu 2019*, 54–68).

⁷ A recent ethno-medical study about the traditional pharmacological use of conifers in Transylvania determined that spruce needles and cones were used to treat numerous diseases. Some of the therapeutic substances were obtained from young spruce cones boiled in milk or from macerated young spruce cones mixed with honey. These were used to treat diseases such as coughs, dyspnoea, pneumonia, sore throat, kidney diseases, backache, cardiac problems, thyroid glands, cystitis or rheumatism (see *Papp et al. 2022*).

⁸ The decomposing/skeletonization period varies according to the environment in which the corpse is disposed off (open air, water, or underground), the temperature, humidity etc. For example, in Central and Southeastern Sweden, where the climate is colder and the decomposing of soft tissues is usually slower, the outdoor complete skeletonization occurs after two years (see *Alfsdotter/Petäros 2021*). However, based on the outdoor temperature to which the corpse is exposed, the decomposing process can last from a few weeks to a few years (*Brent 2017*, 46, with references).

⁹ The selective depositing of the female skull on the bottom of the pit, separate from the rest of the skeleton, could have had a ritual meaning. The woman could have been the important figure in this re-inhumation. An argument for this idea is that she is the only one buried with personal objects consisting of body ornaments. For similar situations from the cemeteries at Dürrenberg bei Hallein (Austria), in which the skulls were moved or treated in a particular ritual way, see *Wendling 2020*, 164.

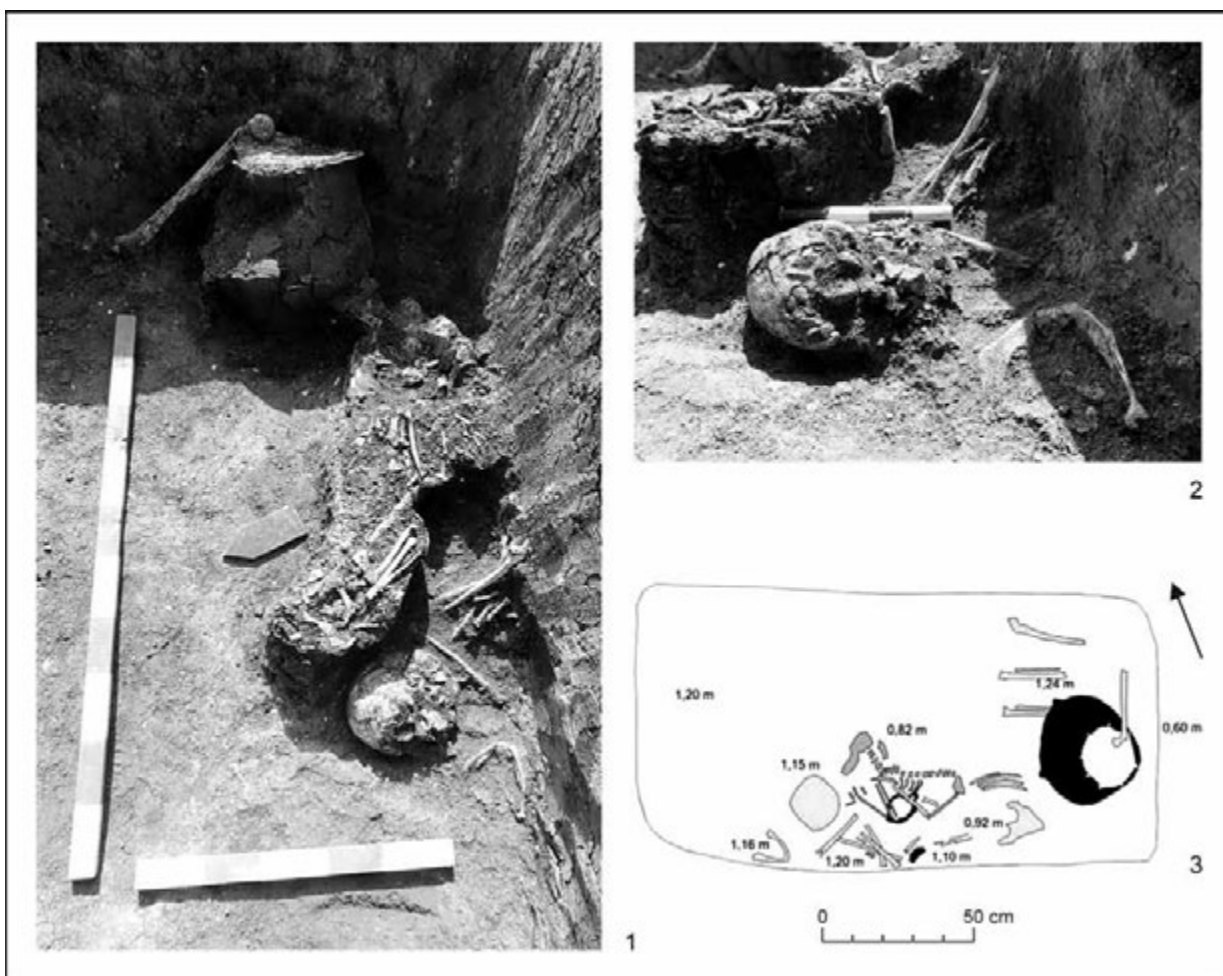


Fig. 9. Sâncrai-Darvas grave No. 91/2016 (after Rustoiu 2019).

Again, the archaeological context suggests that the grave was reopened and the human remains were manipulated before being reburied. Based on the aforementioned observations, the funerary ritual and the post-burial intervention can be reconstructed. Initially, the deceased was laid into the funerary pit in a position which cannot be properly identified. Sometime later, after the soft tissues of the corpse decomposed, maybe a few years later, the funerary pit was reopened and the skeleton was manipulated in an unknown manner, the bones being subsequently thrown back into the pit rather carelessly. Right before that, three ceramic vessels were placed into the pit – two one-handed cups and one large bitronconical jar.

Either during the reburial or sometime later, the corpse of a dog wearing a knucklebone pendant was placed on top of the human remains. According to the archaeozoological analysis, it was a small dog, unlike the more common dogs of the 'Scythian' horizon or of the Late Iron Age, who had an average height of 50–60 cm (*El Susi* 2021b).

The anthropological analysis of the human remains (*Gál/Vaida/Marinescu* 2021, 142, table 8; *Rustoiu* 2019, 60) is relevant in this case. The skeleton belonged to a woman with a height of 1.53 m, who was over 60 years old when she died. The biochemical analysis of the dental calculus indicates a diet rich in carbohydrates, which was based mainly on cereals and far less on meat and dairy, as it would have been expected for a member of a nomad-pastoralist population. Lastly, the detailed analysis of the skull has shown that the deceased suffered from epilepsy. This illness could explain, up to a point, the post-burial interventions.

The epilepsy was associated with shamanic trance among many past and present populations. It was often seen as a way of communicating with the spirits or other supernatural beings, as attested by written sources from Sumer to Classical Greece (*Collins* 2008, 33–41).

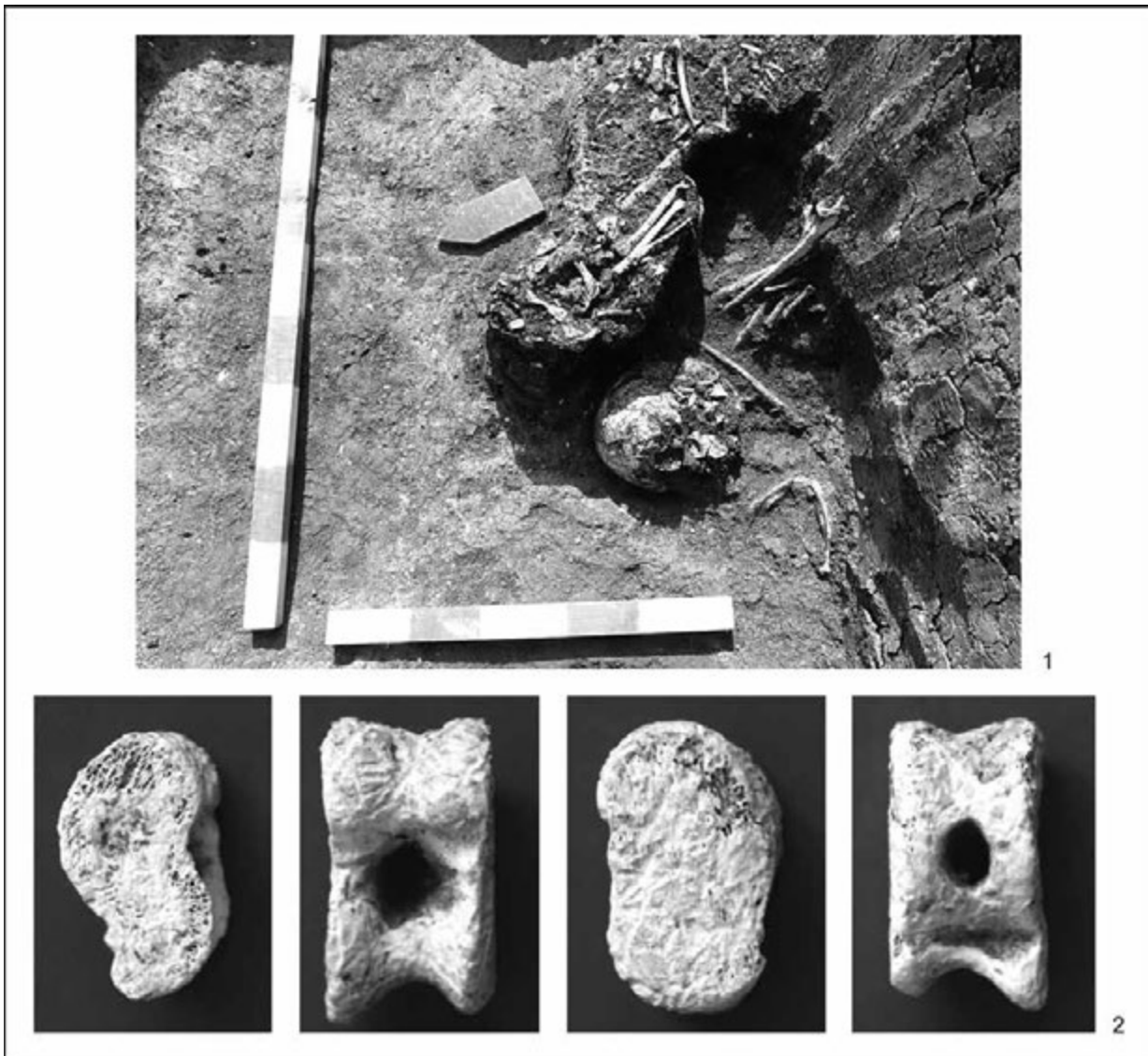


Fig. 10. Sâncrai-Darvas grave No. 91/2016. 1 – detail of the inhumed dog; 2 – sheep/goat knucklebone (after Rustoiu 2019).

The shaman enters a trance (self-induced, sometimes by ingesting psychotropic substances, or due to an illness¹⁰) and communicates with the supernatural beings in order to obtain information that can heal other members of the community or solve other life problems they may face. Despite their perceived ability to communicate with the otherworld, the epileptics often experienced difficulties in adapting to the societal norms due to widespread mistrust or medical ignorance. That is why the shamans whose trance is induced by epileptic seizures, as well as other people experiencing ecstatic episodes induced through other means, were feared by their communities even after death (Kaplan 2006, 5, 6; Rustoiu 2019, 61, 62).

The case of a young shaman from Central Yakutia is relevant. She died at the end of the 18th century and was buried in an isolated place. Fearing her return from death, the people from her community dug an unusually deep pit for her grave, while her hands were immobilised by sewing the cuffs of her garment and the body was tied up with a cord (Crubézy 2007; Crubézy et al. 2017).

¹⁰ Similarly to Sâncrai, anthropological analysis offered relevant data in other situations of the same kind. For example, the recent re-examination of a skeleton from a Mesolithic grave discovered in the interwar period at Bad Dürrenberg has shown that it belonged to a female shaman: '... this burial indeed has to be interpreted as a shaman's burial on the basis of the anatomical variations that can be observed in the cranio-vertebral junction of the adult skeleton. The consequent neurological distortions caused the experience of variations of altered states of consciousness in the woman, which were interpreted in terms of shamanistic abilities and ultimately led to the extraordinary social significance of her life and death' (Porr/Alt 2006, 404, 405).

Another similar situation was encountered far away, in Central America, in the Maya Mountains from Southern Belize. The grave of a shaman was discovered in a small cave up in the mountains, away from any prehistoric settlement. His occupation while alive was indicated by the unusual burial (in a cave, far from the world of the living), as well as by the grave-goods which were symbolically connected with the otherworld. Again, fearing his return from death, the people performing the funerals decapitated the corpse and bricked up the entrance to the grave (*Prüfer/Dunham 2009*).

Lastly, a post-burial intervention observed in a Late Iron Age grave from Dürrnberg consisted of an unusual rearrangement of the human bones after the decomposing of the corpse. *‘These manipulations together with the innominate bones which had been placed on top of the chest, and a wooden beam put across the remains may represent magic action against an undead revenant’* (*Wendling 2020, 165, fig. 8.6, with references*).

Returning to the aforementioned grave from Sâncrai, it can be presumed that the post-burial intervention reflects the fears of the living people, the family or the community facing the perceived powers of the deceased. Unlike the other graves in which post-burial interventions have been observed, this grave illustrates a singular type of ritual that has not been documented elsewhere. The corpse of a dog was placed on top of the re-deposited human remains. This gesture has a powerful ritual and symbolic meaning. Symbolically, the dog was often linked to the otherworld. In the Greek mythology, as well as in that of other Indo-European populations, the dogs played an important role in three main moments of the humans’ relation with death: the passage from life to death; the time spent by the soul in the otherworld; the return of the spirit into the world of the living (*De Grossi Mazzorin/Minniti 2006, 62; Menache 1997, 27, 28*).

Due to this perception, the dogs were invested with various practical and symbolic qualities (*De Grossi Mazzorin/Minniti 2006, 62–64; Gourevitch 1968; Luce 2008; Menache 1997, 27 etc; see also Ștefan 2021*). In the grave of the female shaman from Sâncrai, the psychopomp function of the dogs should be considered. The interring of the dog in the same grave sometime after the initial interring of the deceased woman was perhaps performed to guide her soul back to the otherworld, probably because she was haunting the living people.¹¹ The same ritual could have also had the scope to purify or exorcise. The magical

¹¹ In a local cemetery from Crimea, belonging to the Roman period (2nd–4th centuries AD), it was noted that a series of rituals involving the inhumation of dogs were later practised in some robbed graves. The dogs were laid over the pits excavated by the robbers. It has been considered that the practice was meant to appease the spirits of the deceased and to protect the robbers against their actions. On the other hand, the dogs interred after reopening the graves could have played the role of guardians of the border between the world of the living and the otherworld. Similar rituals have also been observed in Kazakhstan during the Early Iron Age (see further in *Polit 2019, 156–159*). Still, the meaning of these discoveries could also be interpreted in the way suggested for grave No. 91/2016 discovered at Sâncrai. In Transylvania, dog bones are also attested in two other graves belonging to the ‘Scythian’ horizon. One example is the cremation grave No. 9 from the cemetery at Băița, in which dog (or wolf?) metacarpal bones were discovered alongside bird bones and ceramic vessels (*Vasiliev 1976, 55*). In this case, the dog remains could have been part of the meat offering. The second example is grave No. II from Cipău-Gară, which contained one human skeleton and another one belonging to a dog. Unfortunately, the latter was removed from the funerary pit by workers before an archaeologist was able to examine the discovery. Thus it is impossible to say whether the dog was interred alongside the deceased or the bones were part of the meat offering, like in the case of the burial at Băița. The published description is also not mentioning whether the dog skeleton was complete or not, since no anthropological or archaeozoological analyses were performed (*Vlasa 1961*).

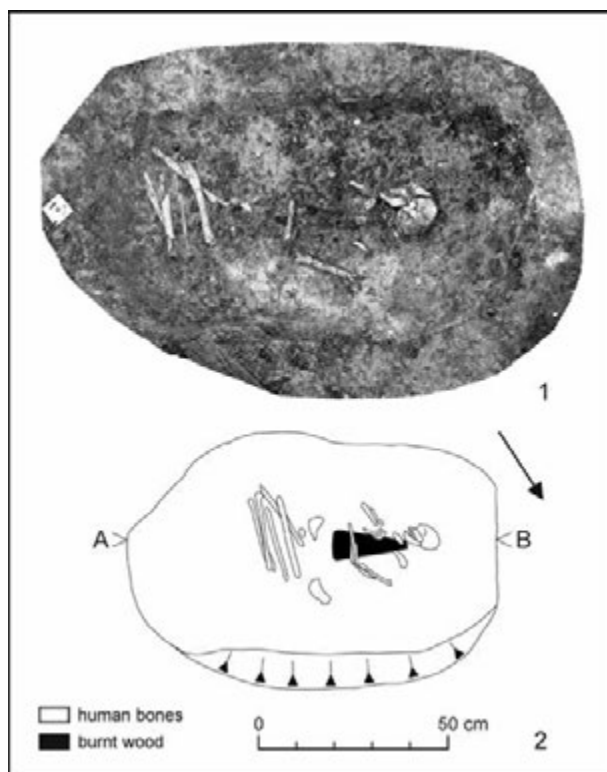


Fig. 11. Sâncrai-Darvas grave No. 7/2020. Female skeleton with tightly flexed legs and holding a carbonized object to the chest (1 – photogrammetry A. Drăgan; 2 – drawings M. Musteață).

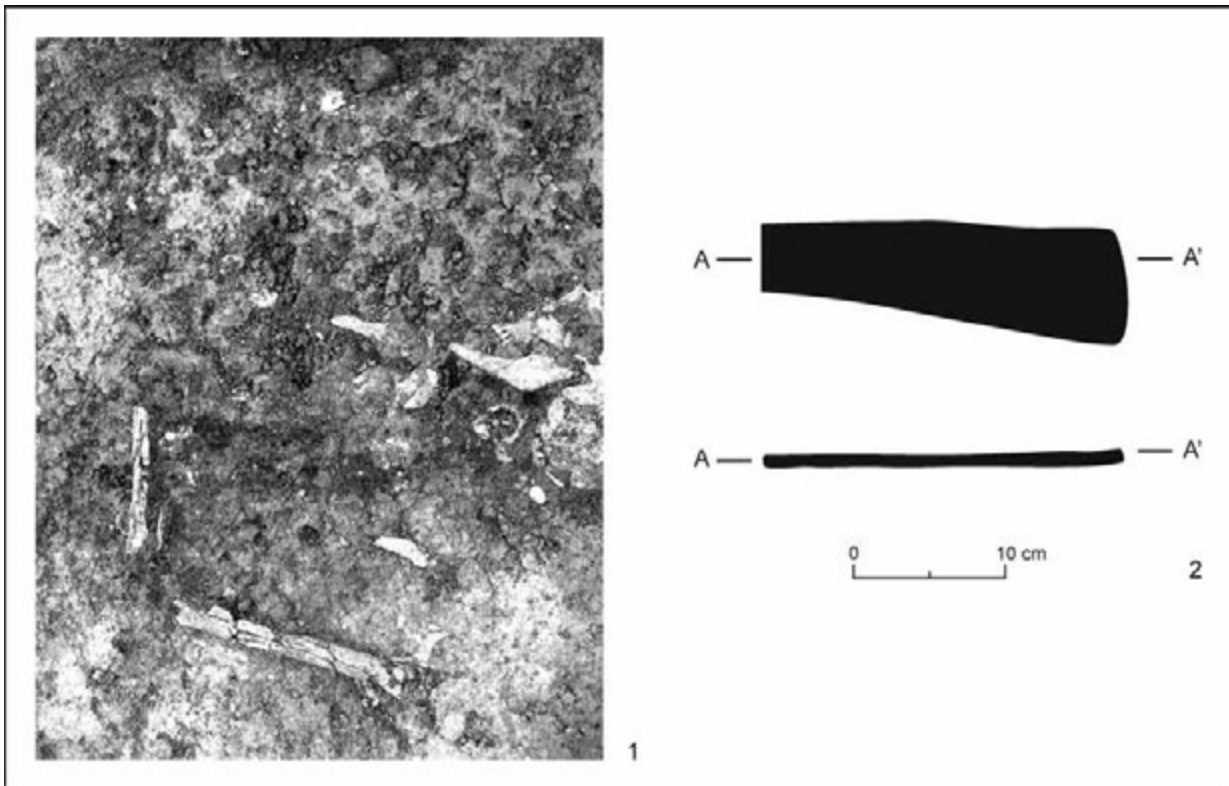


Fig. 12. Sâncrai-Darvas grave No. 7/2020. Details of the carbonized object (1 – photo M. Egri; 2 – drawing A. Rustoiu).

function of the dog from grave No. 91/2016 at Sâncrai-Darvas is also suggested by the sheep/goat knucklebone pendant which was probably hung around its neck (see *Rustoiu 2019*, 65–68, with references).

Grave No. 7/2020

Another grave from the same cemetery that can be classified among the 'deviant' ones has been unearthed in the 2020 archaeological campaign (Fig. 11; 12). This is an inhumation involving the skeleton of a woman.¹² The deceased was apparently laid crouched on the right side, but the tightly flexed position of the leg bones seems to suggest that actually she might have been buried in a right side-sitting position with her legs to the left side and the skeleton subsequently fell during the decomposing process (Fig. 11). One wooden object, which was set on fire right before the grave was closed, has been discovered carbonized, tightly held to her chest with the arms (Fig. 12). The fire was strong enough to cremate most of the chest and upper spine bones of the skeleton. The grave contained no other grave goods.

The carbonized wooden object, whose very friable remains could not be recovered in one piece, has a slender trapezoidal shape with the height of 24 cm, the slightly curved lower side being 8 cm wide and the top side being 4.5 cm wide. Its thickness varies between 1 cm at the top and 1.8 cm at the base, which is slightly raised (Fig. 12: 2). Samples of carbonized wood were retrieved for radiocarbon and anthracological analyses, though the results are not yet available.

The most likely function of this object is difficult to ascertain due to its very poor preservation, with basically just an imprint of it being clearly visible upon excavation. The almost complete cremation of the chest and upper spine bones suggests that the object most likely consisted of many other pieces made of highly combustible organic materials which were not preserved, besides the carbonized trapezoidal piece. In this context, it is worth noting that a number of older or more recent discoveries are attesting the frequent presence of many wooden objects (vessels, weaponry, tools, toiletry, body or costume ornaments etc.) in several Scythian burials from Central Asia or the Northern Pontic region (e.g. *Bokovenko 2006*, 873, 874; *Daragan et al. 2022*; *Fialko 2017*, 34).

¹² The anthropological analysis was done by Szilárd Sándor Gál (Mureş County Museum, Târgu Mureş).

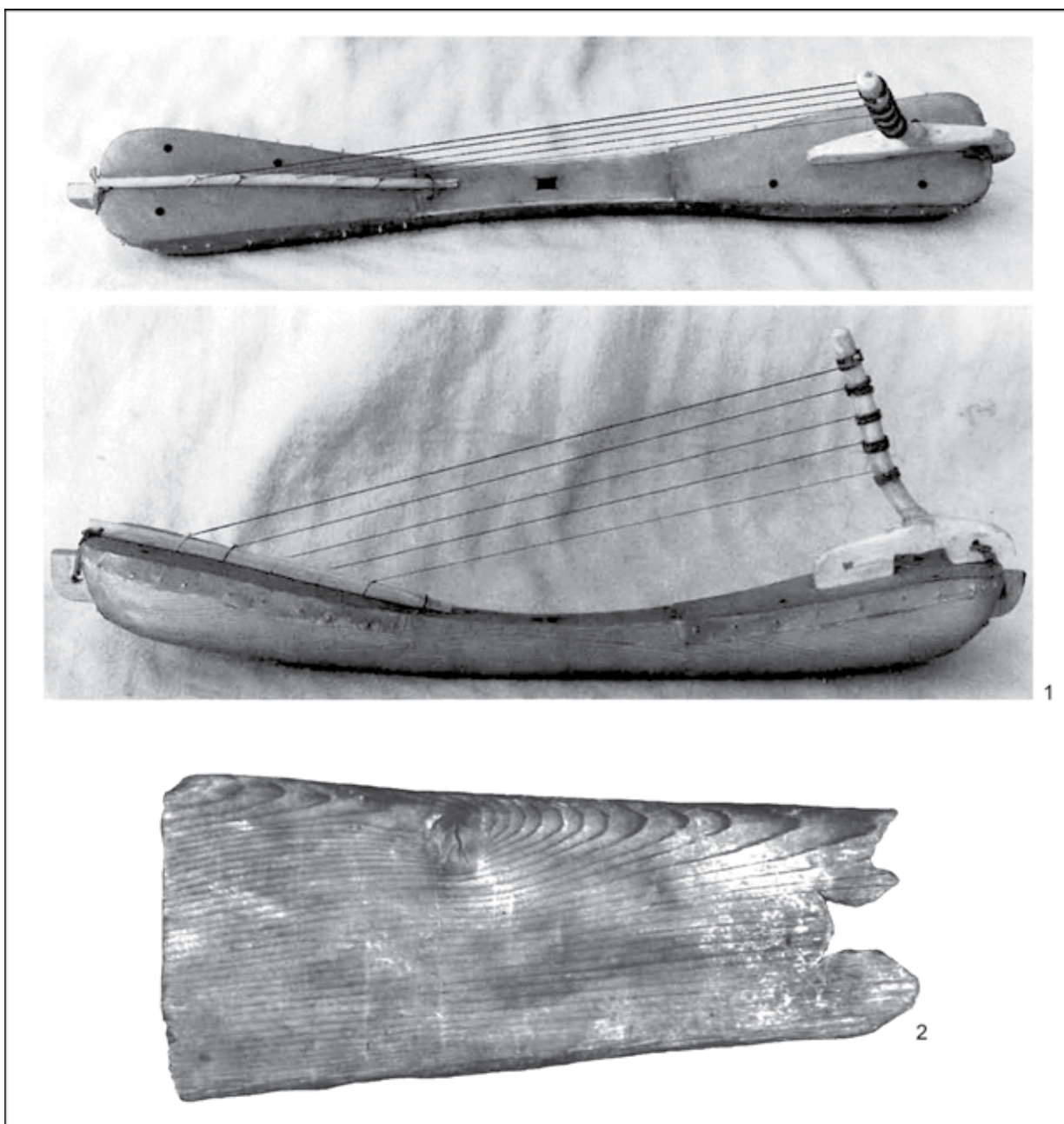


Fig. 13. Pazyryk. 1 – reconstructed harp; 2 – fragmentary wooden soundboard of the extant harp (after Lawergren 1990).

The slender trapezoidal shape seems to exclude its identification as a wooden tray or plate for food offerings, since these are always circular, oval or rectangular and often have thick, slightly raised rims (see Bokovenko 2006, fig. 12: 1–4). The same can be said about its potential identification as an element of a wooden box or chest (see the examples in Daragan *et al.* 2022, fig. 6; 7), which usually is rectangular. On the other hand, the shape may suggest its use as a strengthening piece of a dagger sheath, though the absence of the dagger, the width and mostly the upside down position in grave make this identification rather unlikely.

Based on the shape and the way in which the object was held by the deceased, the carbonized wooden plaque could potentially be associated with a particular type of soundboard of the so-called steppe harps of Central Asia.¹³ A fragmentary wooden plaque that is relatively similar was discovered together with

¹³ String instruments, harps or lyres, from the Eastern Hallstatt environment were inspired from similar instruments from the Mediterranean region and their form differed from the Asian harps (see Lochner 2011, 8–16; Pomberger 2020).

other wood and leather pieces of a harp in tumulus II at Pazyryk, being dated to the beginning of the 4th century BC (Fig. 13; *Lawergren 1990*, 114, pl. 59: 1). Together with a drum, the harp belonged to a tattooed man having Central Asian facial features. The man, who was buried alongside a woman, was considered to be a high-ranking individual or someone having important social and ritual functions in the community (*Fialko 2013*; *Lawergren 1990*; *Lisovoi/Alpatova 2016*, 27–30). Similar harps are also known from tumulus II at Bashadar in Kazakhstan, dated to the late 6th century BC, from some graves in Northwestern China, dated to the 5th–3rd centuries BC, and from one grave at Olbia, dated to the late 5th century BC (*Lawergren 2003a*; 2008). However, the soundboards of this kind normally have at least one sound hole, just like the harp from Pazyryk, but none is visible on the carbonized plaque from Sâncrai-Darvas.



Fig. 14. Statuette of a girl playing a guqin, Eastern Han Dynasty. Toulon Asian Art Museum (after *Rault 2000*).

On the other hand, its shape could also suggest another type of ancient musical instrument that is still present in modern forms among the traditional instruments from Central and Eastern Asia – a plucked zither consisting of a more-or-less curved board with several strings and moveable bridges made of wood or bone. Among the traditional instruments belonging to this category are the jetigen from Kazakhstan, the yatgha from Mongolia or the se, zheng and guqin from China; all of them emerged in the 6th–5th century BC and were influenced by the steppe harp (Fig. 14; *Lawergren 1993*; 2000; 2003a; 2003b; 2007). The only issue is that the few extant ancient instruments of this kind tend to be much larger than the object from Sâncrai, unless this is just one poorly preserved part of a larger instrument which was almost completely destroyed by fire.

Accordingly, the woman buried in a rather unusual way at Sâncrai could have been a musician. One has to note that music was often associated with various social practices and rituals in ancient societies. It was included

in shamanic rituals, or had an important mnemonic role in the oral transmission of traditions, or in punctuating the rhythm of ritual practices, and so on. Musicians were often respected, but they were sometimes also feared due to their abilities and supposed influence over someone's senses and feelings, which were associated with their techniques (see the ways in which the supposed supernatural powers of Orpheus' music were described by ancient authors; *Semenzato 2016*). Therefore, they often occupied a marginal social position in the community.

This could also explain the unusual funerary treatment of the deceased woman from Sâncrai-Darvas. The setting on fire of her instrument could have been related to a perceived symbolic power of its sound, which required its destruction upon the owner's death, a practice which is also encountered in the case of other objects associated with ritual or magical powers that have to be destroyed to prevent an illicit use by untrained individuals. For example among the indigenous people of Siberia, the drums used by shamans became part of their persona, so they had to be destroyed upon their owners' death (*Devlet 2001*, 47–50).

CONCLUSIONS

The three 'deviant' burials discussed above are illustrating three different ritual-related situations.

In the first case, a double re-inhumation illustrates the practice of prolonged funerals which is also attested in a few other cases from the same cemetery at Sâncrai-Darvas. The handling of the skeletonised human remains was careful, despite the apparently random disposal and mixing, most likely because

the people performing the ritual had to follow certain prescriptions. So, the skull of the female deceased was clearly deposited separately on the bottom of the funerary pit and was further physically separated not only from the male deceased but also from the rest of her own bones by a layer of soil. This distinct layer created a new surface, or maybe a separate funerary space, on which parts of the headless female skeleton and of the male skeleton were laid in two distinct groups, albeit the male femur accidentally landed in the wrong pile. The separation of the two groups of human remains was also marked by the depositing of a cup containing some substance obtained from processing young spruce cones. According to the anthropological analysis, the male deceased suffered from a painful disease of the joints, so the substance could have been deposited to help him in the otherworld, though other ritual reasons for this offering could also be possible. Lastly, a more common ritual – the depositing of three ceramic vessels probably containing offerings on the western side of the pit – was performed. After filling up the pit, the grave was marked with a wooden post, a practice that was important for maintaining the memory of the ancestors and their identity. Therefore, these post-burial interventions which implied the re-inhumation of some individuals most likely were important rituals for the descendants and the wider community.

Post-burial interventions are not unusual.¹⁴ They are encountered in many historical periods, but are not generally performed for all of the deceased buried in a cemetery. These rituals are only performed in those cases in which the relations between the living people and the deceased are perceived as disturbed. The aforementioned example underline the fact that the second inhumation required the repeating of many rituals performed during the first inhumation.

Grave No. 91/2016 of the female shaman was already extensively discussed (see *Rustoiu 2019*, 54–69). However, in the context of the present analysis, it is worth mentioning that it is another case of a post-burial intervention. Unlike in the case of grave 9/2020, the exhumation and re-inhumation were most likely carried out because the community was afraid of the haunting spirit of the female deceased and her perceived powers while alive. This fear made them to perform a number of protective rituals, the depositing of the dog during the re-inhumation of the shaman being a relevant argument for this hypothesis. Moreover, the analogies from different cultural environments and historical periods indicate that the shamans were frequently feared due to their ability to move between the world of the living and the otherworld. That is why their funerary treatment included numerous ritual precautions and restrictions. As a result, their burials often display ‘deviant’ features in comparison with those of the general funerary norms of the respective community, reflecting their particular social status and identity.

The third grave from Sâncrai-Darvas, which is also characterized by a number of particular rituals and means of treating the corpse, indicates, like in the case of the aforementioned grave of the shaman, a social identity and function that was markedly different from that of the regular members of the community. The most likely placing of the corpse in a side-seated position and holding the instrument like the deceased was still singing was not only meant to indicate her social function and identity while alive, but also the manner in which she was still perceived after death. The destruction by fire of the instrument right before closing the burial could indicate that it was perceived as an important part of her social persona and that its power, and the power of its owner, was perhaps also feared. Its destruction not only prevented an illicit use by untrained people, but also broke the powerful spiritual bond between the owner and its bewitching tool.

Lastly, it is important to note that in all of these cases the funerary rituals were part of either the liminal or the post-liminal stage of the funerary ceremonies, being connected either with the physical and symbolic treatment of the corpse or with the integration of the deceased into the otherworld, concomitantly with the restoration of the social and spiritual equilibrium of the family or the community.

¹⁴ Ethnographic accounts attest the existence of post-burial interventions among different Romanian communities up to the modern times. For example, Romulus Vulcănescu describes the following post-burial ritual: ‘... decapitation was carried out after seven years, during ritual exhumations mostly in the autumn... and only on Saturdays, after lunchtime, before the sunset. The exhumation was public, the deceased’s relatives and the village’s priests participated, and sometimes also the nosy villagers. The exhumation could be incomplete, when only the skull was dug out, or complete, when the entire skeleton was exhumed... The skull detached from the skeleton or together with the complete skeleton was cleaned of dirt and washed with red wine... It was then wrapped up in an ornate handkerchief and laid under the Virgin Mary icon in the church... Here, during the night between Saturday and Sunday, the relatives held a wake and mourned the deceased. The mass of the second burial was performed after the Sunday liturgy using the same ritual as in the case of the first burial. If the skull belonged to a man who was considered wicked while alive, it was buried with the face down, but if it belonged to a man seen as good, it was buried with the face up. In the latter case, the required offering rituals were performed over the grave: a living rooster, a living lamb etc. and on the grave a bowl with fruits, an offering tree with soul birds (a kind of cakes hung on branches), a bread roll, fruits and wine’ (Vulcănescu 1987, 306–308, with figures).

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„Deviantné” hroby ako ukazovatele zvláštnych sociálnych identít

Niekoľko príkladov zo „skýtskeho” pohrebiska v Sâncrai-Darvas (Transylvánia)

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Súhrn

Článok analyzuje tri nedávno objavené hroby zo „skýtskeho” pohrebiska na lokalite Sâncrai-Darvas v Sedmohradsku, ktoré sa z rôznych dôvodov vymykajú bežným pohrebným normám tohto chronologického a kultúrneho horizontu. V dôsledku toho ich možno interpretovať ako „deviantné” (neštandardné) pohreby. Týmto termínom sa vo všeobecnosti označujú neobvyklé pohreby, ktoré nezodpovedajú rituálnym normám spoločenstva a často sa spájajú s marginálnymi sociálnymi skupinami, s vyvrheli alebo s ľuďmi, ktorí zomreli za neobvyklých okolností.

V prvom prípade ide o dvojnásobnú reinhumáciu, ktorá ilustruje prax predĺžených pohrebov. Tá je doložená aj v niekoľkých ďalších prípadoch z toho istého pohrebiska. Antropologická analýza dospela k záveru, že ľudské pozostatky patria dvom osobám, mužovi a žene. Kontext nálezu vrátane stratigrafie pohrebnej jamy a stavu zachovania ľudských pozostatkov naznačujú, že hrob bol niekedy po prvom pohrebe znovu otvorený, s kostrami sa rôzne manipulovalo a len časť kostí bola potom znovu pochovaná. Palynologická analýza vzoriek zeminy získaných z hrobu a keramických nádob naznačuje, že obrad sa musel uskutočniť na začiatku leta. Do hrobu boli uložené aj nové prídavky vrátane liečivej látky z mladých smrekových šišíek.

Druhý hrob, patriaci žene šamanke, je ďalším prípadom zásahu po primárnom pohrebe, tentoraz podmieneného strachom komunity. Niekedy po prvom pohrebe bola pohrebná jama znovu otvorená a s kostrou sa manipulovalo neznámym spôsobom, pričom kosti boli následne pomerne nešetrne hodené späť do jamy. Tesne predtým boli do jamy vložené tri keramické nádoby. Buď počas opätovného pochovávania, alebo niekedy neskôr bola na ľudské pozostatky položená mŕtvola psa, ktorý mal na sebe závesok z kĺbovej kosti ovce/kozy. Toto gesto má silný rituálny a symbolický význam, pretože pes sa často spájal so záhrobím. Uloženie psa do toho istého hrobu niekedy po prvotnom uložení zosnulej ženy malo možno za cieľ odviesť jej dušu späť na onen svet, pravdepodobne preto, že prenasledovala živých ľudí.

Posledný hrob patril jedincovi, ktorého spoločenské postavenie a funkcia rozhodli o tom, že komunita zvolila menej obvyklé pohrebné rituály. Nachádza sa v ňom kostra ženy, ktorá bola zrejme pochovaná v polohe v sede otočená vpravo s nohami otočenými doľava a kostra sa následne počas procesu dekompozície prevalila na pravú stranu. Zuholnatý drevený predmet, ktorý bol zapálený tesne pred uzavretím hrobu, žena pevne zvierala rukami na hrudi. Oheň bol dostatočne silný nato, aby spálil väčšinu kostí hrudníka a hornej časti chrbtice kostry. Najpravdepodobnejšiu funkciu dreveného predmetu je ťažké určiť vzhľadom na jeho veľmi zlé zachovanie – pri výskume bol v podstate rozpoznateľný len jeho odtlačok. S najväčšou pravdepodobnosťou sa okrem zuholnatého lichobežníkového kusa skladal z mnohých ďalších častí vyrobených z vysoko horľavých organických materiálov, ktoré sa nezachovali. Na základe tvaru predmetu a spôsobu, akým ho držala zosnulá žena, by karbonizovaná drevená doska mohla byť súčasťou niektorého typu strunového hudobného nástroja špecifického pre Strednú Áziu – žena teda mohla byť hudobníčka. Zapálenie nástroja mohlo súvisieť s vnímanou symbolickou silou jeho zvuku, ktorá si vyžadovala zničenie nástroja po smrti majiteľa. S takýmto postupom sa stretávame aj v prípade iných predmetov, ktorým sa pripisovala rituálna alebo magická moc a ktoré sa museli zničiť, aby sa zabránilo ich nedovolenému/„neodbornému” používaniu nepoučenými osobami.

Vo všetkých týchto prípadoch boli pohrebné rituály súčasťou buď liminálnej, alebo postliminálnej fázy pohrebných obradov, pričom boli spojené buď s fyzickým a symbolickým zaobchádzaním s mŕtvolou, alebo so začlenením zosnulého do iného sveta a zároveň s obnovením sociálnej a duchovnej rovnováhy rodiny alebo komunity.

Obr. 1. Teoretické umiestnenie „deviantných” hrobov v symbolickej topografii pohrebiska (kresba A. Rustoiu).

Obr. 2. Sâncrai-Darvas. Plán záchranného archeologického výskumu z roku 2016 (čierne líniové obrisy) a systematického archeologického výskumu v roku 2020 (biela šípka označujúca sivé plochy; kresba A. Drăgan).

Obr. 3. Sâncrai-Darvas. 1 – fotogrametria kostrových hrobov 3 a 4 (foto A. Drăgan); 2 – hrob koňa (foto G. Baltes); 3 – žiarový hrob (foto M. Egri).

Obr. 4. Sâncrai-Darvas, hrobové prídavky. 1–6, 8 – bronz; 7 – mušle; 9 – železný akinakes *in situ* (foto A. Rustoiu a M. Egri). Mierka: a – 1–3; b – 5–8; bez mierky – 4, 9.

Obr. 5. Veľkosť „skýtskych” pohrebísk v Transylvánii na základe počtu hrobov (graf A. Rustoiu).

Obr. 6. Sâncrai-Darvas, hrob 9/2020. 1, 3, 4 – detail hornej úrovne hrobu; 2, 5 – dno hrovej jamy; 6 – náramok objavený medzi ľudskými kosťami v južnej časti hrobu (1, 2 – fotogrametria A. Drăgan; 3–5 – foto M. Egri; 6 – foto Sz. S. Gál).

- Obr. 7. Sâncrai-Darvas, hrob 9/2020. 1 – profil hrobovej jamy; 2, 3 – plán hrobu a uloženie kostí a nádob v hornej (2) a spodnej (3) úrovni jamy (kresba M. Musteață).
- Obr. 8. Rádiouhlíkové datovanie (BP) vzoriek uhlíkov z hrobu 9/2020.
- Obr. 9. Sâncrai-Darvas, hrob 91/2016 (podľa Rustoiu 2019).
- Obr. 10. Sâncrai-Darvas, hrob 91/2016. 1 – detail kostrového pohrebu psa; 2 – kľbová kosť ovce/kozy (podľa Rustoiu 2019).
- Obr. 11. Sâncrai-Darvas, hrob 7/2020. Kostra ženy so silno skrčenými nohami; pochovaná zviera na prsiach zuhoľnatený predmet (1 – fotogrametria A. Drăgan; 2 – kresba M. Musteață).
- Obr. 12. Sâncrai-Darvas, hrob 7/2020. Detail zuhoľnateného predmetu (1 – foto M. Egri; 2 – kresba A. Rustoiu).
- Obr. 13. Pazyryk. 1 – rekonštruovaná harfa; 2 – fragment drevenej rezonančnej dosky zo zachovanej harfy (podľa Lawergren 1990).
- Obr. 14. Plastika dievčaťa hrajúceho na *guqin*, východná dynastia Chan. Múzeum ázijského umenia v Toulon (podľa Rault 2000).

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A NEW CELTIC SCHNABELKANNE, CONFISCATED IN BAD DÜRKHEIM, NOW KEPT IN MAINZ

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Celtic beaked bronze jugs are among the most creative and sophisticated bronze products of the Early La Tène culture. A hitherto unknown example of this rare type of objects was offered in 2015 at a London auction house. The auction was stopped by the police and finally the object was confiscated in Bad Dürkheim in Palatinate. After legal disputes, the confiscation was confirmed by a final judgement and the object was handed over to the *Römisch-Germanisches Zentralmuseum* in Mainz (now *Leibniz-Zentrum für Archäologie*) for safekeeping.

The piece belongs to the small group of five Celtic beaked jugs so far. The beak and neck area are cast and also so attached to the body of sheet metal. The total of four masks on the handle represents a uniform pictorial program. The closest parallel of this jug is the one from the secondary grave at the Kleinaspergle tumulus in Württemberg.

The jug is an important trace of a 'princely grave' of phase Lt A, which was probably destroyed by looters in the area of Southern Hesse, Baden-Württemberg or Rhineland-Palatinate some years ago.

Here a new Celtic beaked bronze jug, a *Schnabelkanne* will be presented. This piece, however, bears the shadow of having been excavated by looters. Nevertheless, there is a ray of hope. The police confiscated the piece after it was offered at an English auction house and finally the jug was handed over to the *Römisch-Germanisches Zentralmuseum* in Mainz (since 1st of January 2023 *Leibniz-Zentrum für Archäologie*) for safekeeping in trust.

THE STORY

On the 24th of September 2015 the *Römisch-Germanisches Zentralmuseum* in Mainz was informed of an upcoming auction of a Celtic beaked jug, six days later, on the 30th of September 2015, at an auction house in London. The cryptic indications of provenance in the auction catalogue make one wonder: the jug is said to come from a 'German private collection', acquired in 2006, before that from another German private collection since the 1980s and before that in Luxembourg private collection, before the 1980s. Moreover, the sparse information published by the auction house that the jug had already been in private hands for several decades is hardly credible. It can be ruled out that such a spectacular find could have remained hidden from the professional world for such a long time.

The old aristocratic collection from which unprovenanced antiquities allegedly all originate, as suggested by dealers, is a fairy tale. Cabinets of curiosities, created at a time before the countries of origin had relevant antiquities laws, did indeed exist. But the objects kept there, have usually found some kind of documentary expression over the centuries, in old copperplate engravings, inheritance deeds or early publications.

Even before the auction begins, the *Landesamt für Denkmalpflege Baden-Württemberg* files a criminal complaint, because Baden-Württemberg, along with Rhineland-Palatinate and Hesse, each can be considered as the country of origin and thus the potential owner. The Federal Criminal Police Office investigates the consignor and the alleged previous owners, obtains the cancellation of the auction and the return of the jug to the consignor. At the consignor's house in Bad Dürkheim, in Palatinate, the jug is seized by the Neustadt an der Weinstraße Criminal Investigation Department, first handed over to



Fig. 1. Celtic *Schnabelkanne*, confiscated in Bad Dürkheim, now kept in Mainz. Photo S. Steidl, LEIZA.

the local branch of the *Generaldirektion Kulturelles Erbe Rheinland-Pfalz* in Speyer and then brought to the RGZM in Mainz for examination. Result: It is an authentic antique original, even though considerable missing parts were added. The public prosecutor's office, which in the meantime had initiated preliminary proceedings against the collector from Bad Dürkheim shortly thereafter terminates these proceedings and orders the return of the jug to the suspect. Reason: Regardless of the actual ownership situation, a criminal prosecution was ruled out because of the statute of limitations.

Up to this point, the case follows a familiar pattern: if antiquities of dubious origin are seized at all and investigative proceedings are initiated, sooner or later they are stopped and the seized antiquities are returned to the suspected dealer – despite overwhelming evidence of a criminal origin (Müller-Karpe 2010; 2011; 2012; 2014; 2017). In our case, however, the Ludwigshafen police headquarters and the police in Neustadt refuse to follow the public prosecutor's instruction to hand over the beaked jug. Instead they order a prolongation of the seizure under the risk prevention law on the basis of the Police and Regulatory Authorities Act: Considering the circumstances, there were serious doubts about the alleged acquisition of ownership by the man from Bad Dürkheim, who had also spread different versions about the provenance of the jug. The continued proceedings are aiming at averting the danger that the jug would finally be lost for the real owner, who had not yet been identified. Furthermore, the marketing of archaeological finds of suspicious origin, as in this case, is a financial incentive and driver for further lootings and illegal excavations. This therefore constitutes an immediate threat to the archaeological record which is manifested in the find context of those antiquities that are still preserved in the ground.

The collector from Bad Dürkheim sues the police for the return of the jug before the Administrative Court of Neustadt an der Weinstraße. However, on 5th June 2018, the court rejects the complaint and confirms the seizure (VG Neustadt 2018). This landmark judgment is now legally binding and



Fig. 2. Celtic *Schnabelkanne*, confiscated in Bad Dürkheim, now kept in Mainz, x-ray photo of the upper part. X-ray photo St. Patscher, LEIZA.

can be viewed on the internet. The successful action of the police in their own responsibility, even in the absence of support from the public prosecutor's office, is encouraging (Müller-Karpe 2021). The jug was handed over to the RGZM for safekeeping in trust. Now, based on further investigations and the evaluation of the available evidence, it is important to obtain clues that will identify the place where the jug was found and the circumstances of the find. This, hopefully, will enable us one day also to return the jug to the federal state, where it was found.

DESCRIPTION

The jug (Fig. 1), with a total height of 48.1 cm, consists of several parts: a separate base, the body made of sheet bronze, the area of the neck and beak with a cover plate, and the massive handle. Unlike Etruscan beaked jugs, it is not chased from one piece (Eiden 1995; Pabst 2018). The base plate was made separately and added later; it was turned over from the outside around the lower rim – like a modern tin can. No traces of turning the base on a lathe were visible. The conical body consists of a simple sheet of bronze. No traces of driving or evidence of a joint were observed, nor are there any visible patches of

reparation; the surface was probably once polished. The sharp bend at the shoulder (Fig. 1) is considered rather unusual for the shape of the vessel.

But the restoration report of a Dutch private company, which was hired for the restoration of the jug by the consignor, provided us of photos in the state of discovery. They confirm this bend and a largely straight course of the wall. During this restoration, the additions were generously treated with paint, thus concealing the fact that this is after all a highly fragmented, fresh ground find with some missing parts. X-rays in Mainz and 3D-CT in Esslingen reveal very well the numerous debris of corroded bronze sheet (Fig. 2), some of it quite small, which was more or less carefully collected by the looter(s).

The area of the shoulder/neck and the beak with the cover plate provide information about the complex manufacture of the jug: the cover plate and beak as well as the neck down to the middle of the shoulder are made of cast bronze, 2–3 mm thick and probably from one piece, as the X-ray show (Fig. 2). Inside the jug, the radiographs show casting residues that have not been cleaned and bubbles from the casting. In the area of the shoulder, the connection to the sheet metal body was made by casting, which means that this upper part was cast and connected to the body of the vessel.

The cover plate of the beak, with its distinctive angular undercuts on the inside, formed the base for the design of the wax mould. The groove on the underside still suggests the finger line of the person working. The actual beak was attached in wax to the top plate, the width of the spout was about a little finger. And then came the casting in lost mould, which at the same time made the connection to the sheet metal body.

The handle consists of a masked handle attachment with a five-leaf palmette, it runs up to another mask on the mouth, where the handle splits into two arms, which again end in masks. The handle is decorated with three beaded bands on the back, the central band developing into a sculpted back crest in the area of the mouth; on the arms, the profile is semicircular and undecorated. The handle was again made by casting in a lost mould; X-rays show numerous casting bubbles (Fig. 2). It is a lead-tin bronze with a high tin content, which was well suited for casting.



Fig. 3. Celtic *Schnabelkanne*, confiscated in Bad Dürkheim, now kept in Mainz, view of beak, cover plate and upper part of the handle. Photo S. Steidl, LEIZA.

The handle is attached to the body of the jug and to the lid employing rivets. There are carefully hidden rivets in the middle of the two arms on the mouth, behind the ends of the mask, as well as in the central head on the handle. Further rivets sit in the handle attachment: a central, well-sewn rivet at the top of the head and probably at least two more at the tips of the central palmette leaves, on each side. The rivet on the right has survived, while the corresponding one on the left is missing, but is plausible here and has been restored.

THE ARTWORK

Figural representations in the form of sculpted faces are found on both ends of the arms, the base of the handle and on the attachment. They are all characterised by oversized, round eyes with indicated pupils; the noses are pointed and triangular. These are typical faces of the Early La Tène period (Megaw R./Megaw J. V. S. 2001), almost composed of abstract ornaments. All the faces on the jug follow a uniform concept and they could represent or refer to the same person/figure. Of particular interest are the hair-styles and headdresses.

On the masks on the side arms (Fig. 3), the headgear is set off by a notched line, then a pointed, elongated and finely ribbed mop of hair develops, which may have been given the shape of a Berru-type helmet (Schönfelder 2005) and ends in a thickened teardrop. Slender S-shaped tendrils begin on both sides and end below the thickened end of the 'helmet knob' – thus creating the image of a triple palmette.

The face at the upper base of the handle (Fig. 3) is most strongly profiled, a mouth is barely visible between the nose and the chin, the cheeks are very sculptural. A headdress or coiffure of two teardrop-shaped tips, merging into the midrib of the handle, is not covered here by a straight band, but by two beaded arches above the eyes.

This motif of the divided headdress or hairstyle is found again in the figure on the handle attachment, where it merges into the three-row beaded handle above the rivet, and is separated from the rest of the

face by a beaded band. The eyes are accentuated by outwardly open parabolas, the mouth is only a fine line and the chin is narrower than the plastically rounded cheeks in each case – thus resembling the masks on the handle arms. A five-ribbed toggle beard seems to be striking, as well as side curls, set off by pearl ribbons.

Pointed silens or animal ears cannot be identified on the jug in Mainz – this motif, however, appears on all four faces of the jug from Kleinaspergle (Lkr. Ludwigsburg, Germany; *Kimmig 1988*); it is considered to have been adopted from the attachments of the stamnos.

On both sides of the beginning of the beak (Fig. 3), there is a mirror image of an animal emerging from a pelta ornament; the head, eye and ear are clearly visible. The pointed ear, the small head and the slender neck make us think of a hind. A double S-band develops from the open mouth, which then runs forward to the tip of the beak, where it merges into another ornament.

COMPARISONS

Until now, only five ‘Celtic beaked jugs’ were known in their full forms; they will be briefly presented and compared here in order to better classify the piece in Mainz.

A first small group consists of the specimens from grave 112 from the Dürrnberg (Bez. Hallein, Austria; *Hundt 1974; Moosleitner 1985*) as well as from grave 1 from tumulus 1 at the Glauberg (Wetteraukreis, Germany; *Bosinski 2018*). The jug from Dürrnberg, excavated in 1932, comes from an ancient robbed chariot grave. Characteristic features are the elegantly curving sides divided by ornate ribs and the richly varied figural decoration on the handle. These characteristics also apply to the second piece of this group from the rich main grave from the Glauberg, carefully uncovered in 1994 in a regular excavation (*Frey/Herrmann 1997*) and then in the laboratory. Both pieces seem like siblings – but not like twins. The two pieces are united by the complex figural decoration on the handles and the expansive shape of the attachment or an intermediate plate. For the jug from the Glauberg, the production of the body from a sheet of metal with a joint is considered certain. In both cases these are the only bronze vessels in the graves; at the Glauberg Etruscan bronze import is otherwise completely absent, at the Dürrnberg it is at least relatively rare, and regular ‘princely graves’ with several Etruscan pieces are also unknown.

A twin pair of beaked jugs came from a find at Basse-Yutz (départ. Moselle, France; *Haffner 1993; Megaw J. V. S./Megaw R. 1990*) in Lorraine. They were discovered by chance in 1927 together with two Etruscan stamnoi. Two years later, the pieces were purchased by the British Museum and have been in London ever since. What is striking here is the inlay work with what used to be red coral; this is a technique that occurs particularly frequently in the western Moselle region and Saarland, but also occasionally in the Palatinate, and which has been given the name ‘Weiskirchen workshop’ (*Echt 2007; Haffner 1979; Nortmann/Neuhäuser/Schönfelder 2004, 169–171*). In addition to red coral, mention should also be made of – technically very innovative – red enamel on the dog, which was used for decoration, when the lines became too fine to be inlaid with coral. Besides the dogs on the handle arms, the duck that sits on the beak and seems to swim away with the poured liquid is particularly striking.

The ‘Celtic beaked jug’ from the Kleinaspergle tumulus (Lkr. Ludwigsburg, Germany) has been completely preserved except for the lower part. The burial mound had been quite expertly examined in 1879, and the grave goods are in the *Landesmuseum Württemberg* in Stuttgart. Here, too, a rich grave is known. Among the grave goods were a large cauldron, a ribbed cist, an Etruscan stamnos, two Greek drinking bowls with Celtic gold repairs and gold fittings from two drinking horns. The beaked jug is also decorated only with human masks. The derivation of the jug’s masks from the silen heads of the stamnos is one of the prime examples of the transfer of Mediterranean figurativeness into early Celtic art.

The Kleinaspergle and the Mainz jug show quite similar faces, possibly something like a gag beard, a palmette underneath, perhaps hair on the side of the head, pointed silen ears on the Kleinaspergle, on the other jug ‘normal’ ears, the hair away from the forehead, still divided into two strands at the top. The top of the handle itself with a decoration reminiscent of the Etruscan model (see *Vorlauf 1997*). If we look at the faces at the end of the handle, a similar picture emerges. Considering the now known comparisons, the new piece and the jug from the Kleinaspergle belong closest together.

The fragment of a beaked jug’s spout and an animal-shaped handle from Borsch (Wartburgkreis, Germany; *Storch 1986*) in Thuringia are also often attributed to the Celtic beaked jugs. However, if we

look at the high attachment of the handle to a clearly rounded shoulder of the vessel, the attribution does not seem to be so simple. In Basse-Yutz, the zoomorphic parts of the handle develop out of the attachment; in Borsch, the entire handle is zoomorphically shaped. This seems to be a new creation of its own, using the beak of a jug, but with a different handle shape. Since a broader spectrum of Mediterranean imports was brought to Central Europe, reworking and new creations took place.

Recently, a curved animal from a handle arm of a Celtic beaked jug came to light during a detector survey at Pavlov-Děvín (Dist. Břeclav, Czech Republic; *Golářová 2021; Golářová/Navrátil 2017*). Its head is looking backwards, the mouth is open and the lips are curled outwards. The piece was formerly attached to the arm of a handle and was itself riveted to the mouth of the jug. The outside of the animal is decorated with interlocking S-spirals. This find in Southern Moravia shows, that this vessel form was also present in regions that do not know any 'princely tombs'. Southern Moravia thus also belongs to the Early La Tène core area with rich art. Another animal can be mentioned here, the beast from Droužkovice (Dist. Chomutov, Czech Republic; *Megaw J. V. S./Megaw R. 2002*) in Northwestern Bohemia. It is a hint that early La Tène *Röhrenkannen* could have existed in these areas. For the moment, the lids of these vessels are the only bronzes with riveted creatures.

CONCLUSIONS

Celtic beaked jugs are under the most elaborate object of early Celtic craft and art (*Jacobsthal 1944*, Nos. 381 a–b Basse-Yutz, 382 Dürrnberg, 383 Borsch, 385 Kleinaspergle) and they belong to the highest elite of the Early La Tène period. They were probably used to serve alcoholic drinks – traces of honey mead were found in the jug from the Glauberg (*Rösch 2002*). They are voluminous vessels, and they work for poring liquids (*Frey/Dobiat 2019*, 559–561). In addition to the practical aspects, the jugs, like other bronze vessels, served as a means of self-expression for the elite, in that they had their own history, meaningful art and provided an occasion for remembrance and conversation (*Stöllner 2019*, 596–602). A chronological classification beyond an assignment to the phase Lt A is difficult; the piece in Mainz certainly dates neither to the very early beginning of this phase nor to the transition to Lt B1a.

Currently, three variants of this vessel form can be identified, with very small numbers: Dürrnberg and Glauberg as well as the animal from Pavlov-Děvín form a particularly decorated group. They belong to the highly creative eastern early La Tène art. The pieces from Kleinaspergle and the specimen in Mainz are simpler in their decoration – nevertheless they do not have to be older. In each case, they are based on a uniform concept. The pair of jugs by Basse-Yutz is well integrated into the 'Weiskirchen workshop tradition' through the design of the coral inlays, and which can be dated to the Lt A–Lt B1a transition. These three groups represent not necessarily only three workshops, but nevertheless three concepts with which bronze smiths dealt with the challenge of the beaked jug.

Celtic beaked jugs come from rich graves, with gold jewellery, weapons, chariots and other bronze vessels. The jug presented here in detail was confiscated in Bad Dürkheim – we assume that it was also found in the surrounding area. We are not able to pretend, that it comes from Bad Dürkheim itself. It certainly comes from a grave, probably a burial mound. It was already badly corroded and splintered. So the burial mound must not have been preserved, but perhaps it was visible e.g. in aerial photography. The jug was certainly not a chance find. People had deliberately sought out burial mounds, searched there with a metal detector. Perhaps at dusk in the forest, perhaps hidden between vines.

In the same time horizon, where the beaked jug appears, other first-class Early La Tène objects appear on the art market. All of them could come from one princely grave. The potential origin of the other objects is harder to pin than the origin of the beaked jug. But for all, the northern part of the Upper Rhine Valley would perfectly fit. We hope in the future to shed more light on this case. The beaked jug confiscated in Bad Dürkheim was not found alone in a grave.

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Nová keltská zobákovitá kanvica, skonfiškovaná v Bad Dürkheime, v súčasnosti uložená v Mainzi

Martin Schönfelder

Súhrn

Článok predstavuje novú keltskú zobákovitú kanvicu, ktorú polícia zhabala, keď bola v roku 2015 ponúkaná na predaj v anglickom aukčnom dome. Po súdnych ťahaniciach bol džbán nakoniec v roku 2018 odovzdaný do úschovy *Römisch-Germanisches Zentralmuseum* v Mainzi (teraz *Leibniz-Zentrum für Archäologie*).

Bronzová kanvica (celková výška 48,1 cm), pozostáva z viacerých častí: samostatného dna, tela vyrobeného z bronzového plechu, oblasti hrdla a zobáka s pokrývkou a masívneho držadla. Kónické telo je z jednoduchého bronzového plechu. Oblasť pliec/hrdla a zobáka s pokrývkou poskytujú informácie o komplikovanom postupe výroby kanvice. Pokrývka a zobák, ako aj hrdlo až po stred pliec sú vyrobené z liateho bronzu. Vnútri džbánu sú na röntgenových snímkach viditeľné zvyšky po odlievaní a bubliny ako pozostatky procesu odlievania. Horná časť nádoby bola odliata a spojená s plechovým telom nádoby v oblasti pliec. Držadlo pozostáva z maskovitej atáše s päťlistou palmetou, vbieha do druhej masky na ústí a tam sa držadlo rozdeľuje do dvoch ramien, ktoré tiež končia maskou. Držadlo bolo vyrobené odlievaním do stratenej formy; k telu kanvice a k veku sa pripájalo pomocou starostlivo ukrytých nitov.

Na oboch koncoch ramien, na báze držadla i na atáši sa nachádzajú figurálne zobrazenia vo včasolátenskom štýle v podobe ľudských tvárí. Všetky sa vyznačujú nápadne veľkými okrúhlymi očami s naznačenými zrenicami; nosy sú špicaté a trojuholníkové. Všetky tváre na kanvici majú jednotnú koncepciu a mohli by predstavovať alebo odkazovať na tú istú osobu/postavu.

Doteraz bolo známych len päť exemplárov úplných „keltských zobákovitých kanvic“. V súčasnosti sa dajú rozlíšiť tri varianty tejto formy, pričom každý variant zastupuje len malý počet exemplárov. Prvú malú skupinu tvoria exempláre z antického vykradnutého hrobu s vozom z Dürrnbergu a z mohyly 1 v Glaubergu. Obidve kanvice spája zložitá figurálna výzdoba na držadlách a expanzívny tvar atáše alebo stredovej platne. Patria k vysoko kreatívnemu okruhu

východného včasnotaténskeho umenia. Dvojica zobákovitých kanvíc pochádza z náhodného nálezu v Basse-Yutz v Lotrinsku. Na základe dizajnu koralových inkrustácií sa dajú začleniť do „tradície weiskirchenskej dielne“ a datovať do prechodu LT A a LT B1a. „Zobákovitá kanvica“ z bohatej mohyly Kleinaspergle sa zachovala takmer kompletne, chýba jej však spodná časť. Zobákovitá kanvica je tiež zdobená len ľudskými maskami. Vzhľadom na dnes známe paralely stojí nový exemplár najbližšie práve ku kanvici z Kleinaspergle. Predstavené tri skupiny nereprezentujú nevyhnutne len tri dielenské okruhy, ale azda aj tri odlišné koncepty, akými výrobcovia bronzových predmetov pristupovali k náročnej výrobe zobákovitých kanvíc.

Keltské zobákovité kanvice pochádzajú z bohatých hrobov so zlatými šperkmi, zbraňami, vozmi a inými bronzovými nádobami. Tu podrobne prezentovaná kanvica bola skonfiškovaná v Bad Dürkheime – predpokladáme, že sa niekde v tejto oblasti aj našla. Určite pochádza z hrobu, pravdepodobne z mohyly. Bola značne skorodovaná a poškodená (rozlámaná). Mohyla sa teda nemusela zachovať, ale azda bola viditeľná napr. na leteckej fotografii. Kanvica určite nebola náhodným nálezom. Ľudia úmyselne prehľadávali mohyly detektormi kovov. Možno za súmraku v lese, možno ukrytí vo viníci.

Obr. 1. Keltská zobákovitá kanvica skonfiškovaná v Bad Dürkheime, v súčasnosti uložená v Mainzi. Foto S. Steidl, LEIZA.

Obr. 2. Keltská zobákovitá kanvica skonfiškovaná v Bad Dürkheime, v súčasnosti uložená v Mainzi, röntgenový snímok hornej časti. RTG snímok St. Patscher, LEIZA.

Obr. 3. Keltská zobákovitá kanvica skonfiškovaná v Bad Dürkheime, v súčasnosti uložená v Mainzi, pohľad na zobák, veko a hornú časť držiadla. Foto S. Steidl, LEIZA.

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NAGYBERKI-SZALACSKA – A HALLSTATT PERIOD CENTRE OF POWER IN TRANSDANUBIA

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The hilltop settlement at Nagyberki-Szalacska (Somogy County, Hungary) is usually regarded as one of the most important Early Iron Age (EIA) centres of power in Transdanubia. This perception is largely based on the evidence provided by the adjacent tumulus cemetery comprising more than a hundred burial mounds. Due to the outstanding grave assemblages, Nagyberki-Szalacska is a relatively well-known Early Iron Age site in Western Hungary, however, an assessment of the results of these excavations at the site is still missing. In addition, in the 1980s excavations were carried out at the hilltop settlement. These unearthed a large number of Early Iron Age features and finds that hold valuable, yet unpublished information about the Early Iron Age community at Szalacska. In this paper, my aim is to provide sort of an overview of the Early Iron Age site at Nagyberki-Szalacska.

INTRODUCTION

Recently, my attention was caught by fragments of a vessel made of thin bronze sheet held in the Prehistoric Collection of the Hungarian National Museum (HNM). Based on their structural and ornamental properties the find dates to the Early Iron Age (EIA). Although, nothing is sure about its provenience, former employees of the museum proposed the possibility of the find originating from Nagyberki-Szalacska. But, without any firm evidence, the remark ‘Szalacska (?)’ in the inventory book is nothing more than an educated guess (Soós/Lukács 2023). Despite the guess being unsubstantiated, it is worth discussing why Nagyberki-Szalacska seemed like an obvious candidate for the provenience of the bronze sheet fragments.

First of all, due to its exceptionally long research history and some remarkable discoveries, Nagyberki-Szalacska is one of the most well-known EIA sites in Western Hungary. Over the last one and a half century the three excavation campaigns carried out within the extensive tumulus cemetery north of the prehistoric hilltop settlement near Szalacska led to the accumulation of a considerable EIA assemblage in the Prehistoric Collection of the HNM which contains several fragments of different kinds of bronze vessels, though, the bronze sheet fragments of unknown provenience are in much better condition and are of a vessel type hitherto unknown among the finds recovered from the site (Soós/Lukács 2023).

In addition, the site complex near Szalacska resembles those settlements of the Hallstatt East which are commonly seen as centres of power insofar as the settlement near Szalacska occupies a prominent position on a small hill as well as overlooks an extensive tumulus cemetery (Egg 1996, 59; Metzner-Nebelsick 2017a, 444). Similar patterns can be seen at a number of sites in Western Hungary, Slovenia, Croatia, and Austria, with the Burgstallkogel and the Sulmtal cemetery as a paragon. Importantly, it is the separate tumulus group of the cemetery in the Sulm Valley near Kleinklein, the Pommerkogel and the Kröllkogel to be precise, that provided the best analogies of the vessel fragments kept in the HNM. It seems as if by writing the name Szalacska on the box containing the bronze vessel fragments, former colleagues at the museum were trying to show support for C. Dobiat’s opinion that Nagyberki-Szalacska is indeed the easternmost location of the Sulmtal group, a concept he put forward in his monograph on the tumulus cemetery in the Sulm Valley (Dobiat 1980, 176). Although a resurfaced looter’s find from Szalacska might serve as such a proof, today’s researchers tend to think of Kleinklein and Nagyberki-Szalacska as sites of different cultural groups of the Eastern Hallstatt zone (Egg 2021, fig. 3; Metzner-Nebelsick 2017b, fig. 1).

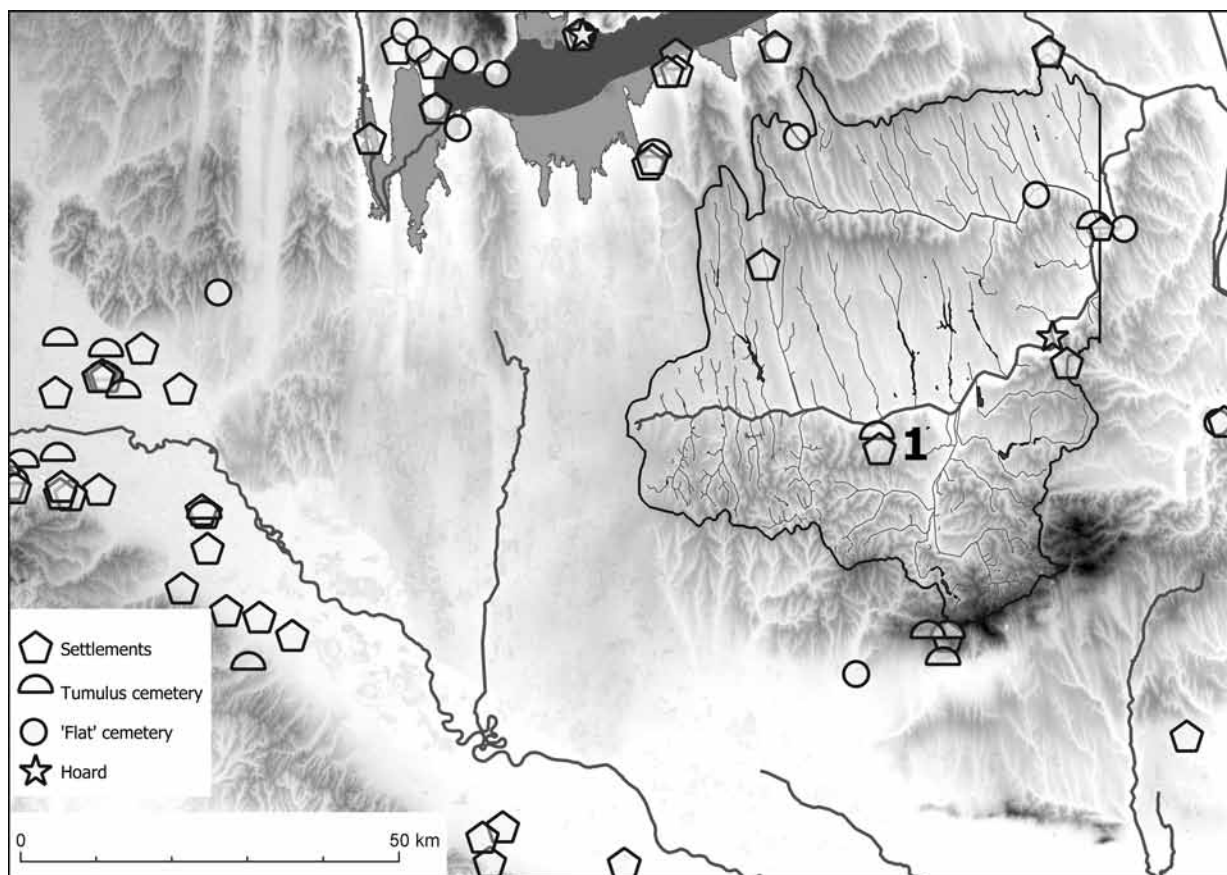


Fig. 1. Regional overview of the EIA sites in Southern Transdanubia and adjacent regions with the catchment of the Kapos River highlighted. 1. Nagyberki-Szalacska. Map by the author.

Despite the importance and long research history of the site, the tumulus cemetery and, even more so, the hilltop settlement are still somewhat obscure. In this paper I would like to shed some light on what there is to know about the EIA site near Szalacska.

CONTEXT AND TOPOGRAPHY

The prehistoric fortified settlement on the Szalacska hill is located in Southern Transdanubia, in the central part of the catchment area of the Kapos River (Fig. 1). In fact, the prehistoric site is situated along the south-eastern border of a small valley linked directly to the Kapos River. In terms of sheer numbers, the distance between the hilltop settlement and the Kapos River is 3 km. As a result, the hilltop settlement, reaching the height of 239 m a.s.l., has often been seen as central place exercising control over the Kapos Valley along the middle course of the river, at least during the later prehistoric periods (Patek 1968, 19; 1993, 132).

Owing to the works of Zoltán Czajlik and Balázs Holl, we now have a fairly clear picture of the extension and inner structure of the tumulus cemetery which due to agricultural cultivation endures continuous destruction (Holl/Czajlik 2013). The burial mounds form uncertainly distinguishable groups in the small valley running from south to north. Most of the mounds are situated north of the hilltop settlement marking a possible route connecting the hilltop and the Kapos River.

In fact, this possible route also takes shape if we look at how one could have been able to perceive the local landscape from the hilltop settlement. Based on the viewshed analysis of the landscape around the hilltop settlement conducted on the digital elevation model created by the South-Transdanubian Water Management Directorate, it becomes apparent that the mounds follow the line along which the hilltop settlement could have had visual contact with the Kapos Valley (Fig. 2: 1). Having mentioned that, the fact also has to be highlighted that based on the same analysis the settlement had strong visual contacts

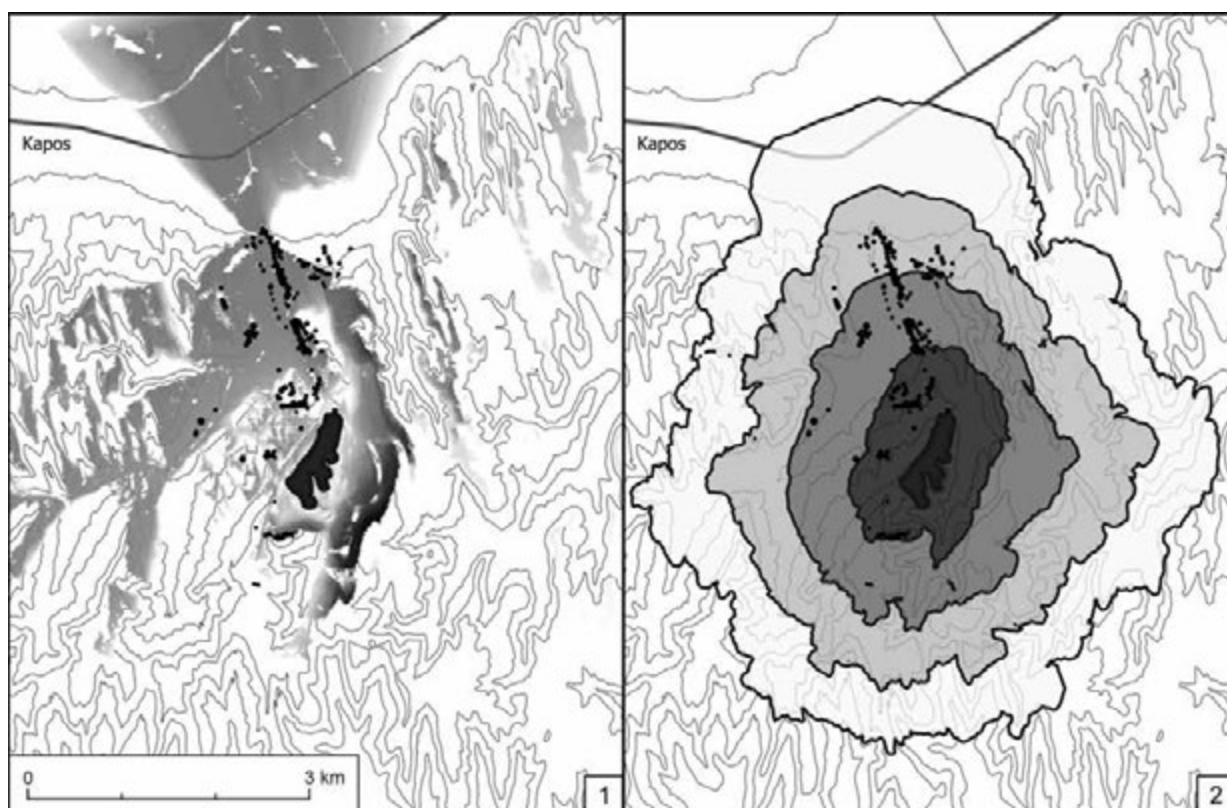


Fig. 2. Topographical map of the Szalacska site complex. 1 – viewshed analysis of the Szalacska hilltop settlement; 2 – 60-minute-walk least-cost site catchment of the Szalacska settlement. Map by the author.

towards the west and even more so to the east. However, as opposed to the landscape directly to the west, the current state of research does not have any firm evidence of prehistoric activities in the areas adjacent to the settlement to the east.

Having mentioned prehistoric activities outside the prehistoric hilltop settlement, it is worth looking at the topographical properties of the settlement and its possible catchment area. The prehistoric settlement on the Szalacska hill is supposed to have occupied an area of approximately 22 hectares covering large parts of the hilltop. In addition, archaeologists of the Rippl-Rónai Museum of Kaposvár suggest that there are prehistoric settlement traces in the western foreground of the hill (Fig. 4). Unfortunately, at this point we cannot be sure whether the EIA settlement on the hill occupied the entire hilltop. What seems to be sure is that the EIA settlement extended from the southern rampart to the chapel in the north, but more on this topic later. Given the uncertainties regarding the extent of the prehistoric settlement the catchment area shall be calculated around the extent of the polygon of the official heritage record. During the calculations, I applied the so-called ‘modified Tobler’ algorithm (Herzog 2020, table 18: 2; Márquez-Pérez/Vallejo-Villalta/Álvarez-Francoso 2017). Isochromes of multiples of 15 minutes and concentric zones between them were calculated around the hilltop settlement. Comparing the extent of the cemetery with the least-cost zones reveals that the layout of the cemetery extends beyond the areas conventionally thought to be theatres of everyday activities of the population of the hilltop settlement (Fig. 2: 2). As a result, it seems reasonable to suggest again that the mounds could have been built so that they follow the main route from the Kapos River to the settlement. Also, it would appear, that the community living on the hilltop could have used the surrounding areas for purposes other than funerary. Interestingly, the probably less known southern tumulus group of the cemetery, the so-called Csille mounds, outline both the southern part of the 15-minute isochrome and the southern horizon seen from the hilltop settlement.

Even though the tumulus cemetery seems to underline the strong contact of the hilltop settlement towards the Kapos River, and there is a recurrent opinion that the Szalacska hilltop served as a centre of power in the region, there are hilltop settlements along the river valley which have a more direct relationship to the Kapos. The best example is probably the prehistoric hilltop settlement near Regöly,

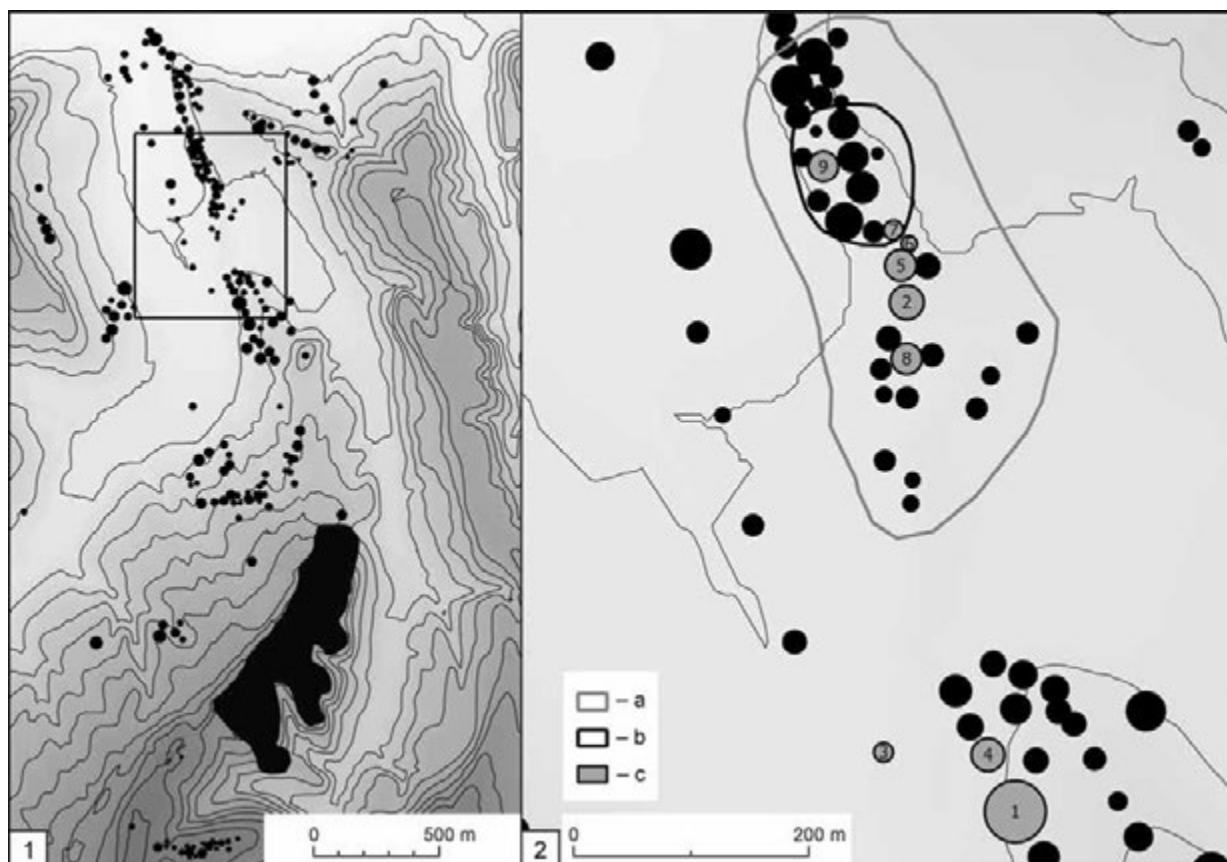


Fig. 3. Excavations in the Szalacska tumulus cemetery. 1 – overview of the Szalacska hilltop settlement and burial mounds identified in the surrounding landscape; 2 – part of the Szalacska cemetery marked on the left image. Legend: a – area where the excavation in 1876 took place; b – area where the excavation in 1943 took place; c – tumuli excavated in the 1970s (numbers after T. Kemenczei). Map by the author.

whose significance in the EIA is highlighted by the recently excavated tumulus (Szabó/Fekete 2014). The prehistoric settlement near Regöly is located on a loess plateau emerging adjacent to the confluence of the Kapos River and Koppány stream, as a result, the prehistoric occupants had a direct overlook on both waterways.

Interestingly, while there are at least three prehistoric hilltop settlements, with EIA occupation, which are commonly seen as important centres of power in the Kapos Valley (Patek 1968, 20), the EIA settlement network within the catchment area of the Kapos River is still mostly unknown (Fig. 1; Patek 1993, 132). Currently, there is only one EIA settlement in this region whose EIA occupation is confirmed by documented excavations. Hence, one of the main tasks of the research in the near future is to uncover further nodes of the EIA settlement network. For the time being, however, one has to rely on the settlement discovered near Mernye-Rézdomb when investigating settlements traditionally thought to lack central functions (Honti *et al.* 2016, 216).

Although there are other EIA hilltop settlements in the catchment area of the Kapos River, the largest tumulus cemetery in the region is, beyond dispute, the one near the Szalacska hilltop with well over a hundred burial mounds (Holl/Czajlik 2013).

FROM THE HEROIC PAST TO YESTERDAY

The history of research near Nagyberki-Szalacska begins with a survey and excavation initiated by Flóris Rómer. Since he was overwhelmed with the organisation of the 8th International Congress of Anthropology and Prehistoric Archaeology, he asked historian Ernő Kammerer and architect Antal Hencz to carry out investigations at the tumulus cemetery near Nagyberki-Szalacska. Hencz made the first detailed

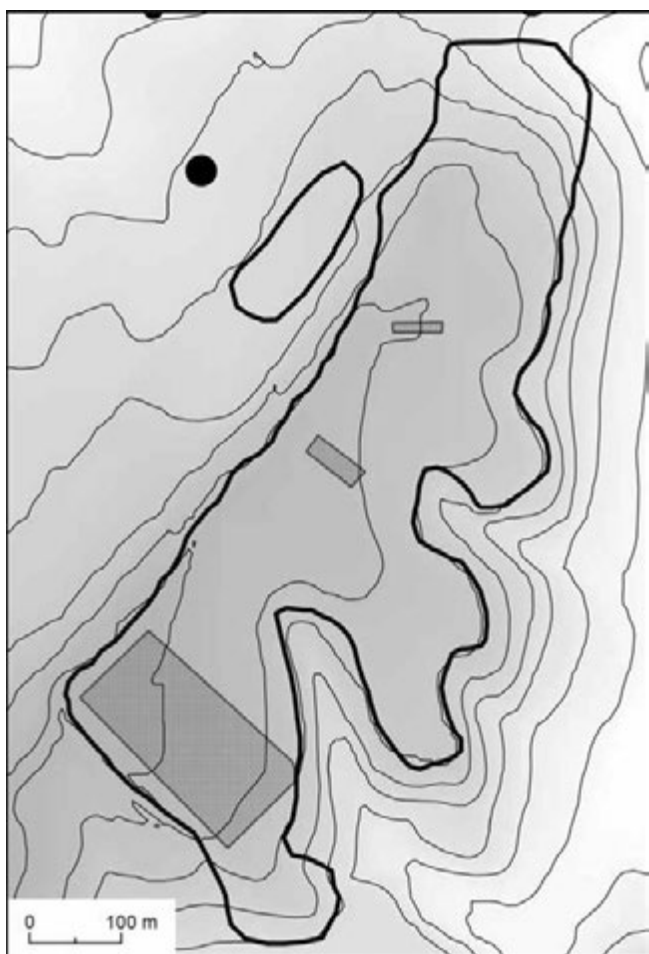


Fig. 4. Zones where the excavations on the hilltop in the 1980s took place. Map by the author.

map of the tumulus cemetery, although, his survey did not extend to the whole cemetery. However, the map clearly indicates where the subsequent excavations took place (Rómer 1878, fig. 32). According to Rómer's account as well as the inventory book of the HNM, Kammerer investigated nine mounds of the same tumulus group in the northernmost section of the cemetery just where the small valley below the Szalacska hilltop settlement reaches the Kapos Valley (Fig. 3).

Rómer briefly described the results of the excavations and some of the finds, also he dated the burials to the Late Roman period (4th–5th century; Rómer 1878, 115–121). However, it was Lajos Márton who correctly dated the burials to the EIA (Márton 1913, 147, 148). Although Rómer was mistaken about the correct chronological position of the discoveries, he, as it later turned out, was right when he put forward the idea that a pre-historic settlement should be located on the Szalacska hill (Rómer 1878, 120). In 1906 his assumption gained proof when Kálmán Darnay began his fieldworks and excavations on the hill. Although his most famous discovery is the Late La Tène minting workshop, he also collected important data about earlier periods of the occupation on the hill (Darnay 1906; 1909; 1910). Noteworthy are the EIA fibulae among which there is a half-finished boat-shaped fibula (Darnay 1910, 130), probable evidence for the metal production on the hilltop (Fekete 1985a, 87). Darnay proceeded

his investigations on the hilltop until 1910, published several articles about his discoveries, however, never provided a detailed summary of his works.

Between the two world wars the idea of the commencement of new excavations in the tumulus cemetery was constantly on the table in the Hungarian National Museum, however, due mostly to financial reasons, the works led by Sándor Gallus began only in 1943. Gallus investigated five mounds in the vicinity of the farmstead near Szalacska (Fig. 3). This means that he conducted his excavations near the tumuli which had been opened in the 1870s. Although, his drawings of the archaeological features and his notes survived, they are hardly of use for today's research because he never entered the finds of his excavation into the inventory of the museum and never prepared a detailed documentation of his investigation because he left Hungary in 1944 and never returned. To make matters worse, the majority of the finds he recovered went missing during the siege of Budapest in the winter of 1944/45. The surviving items were finally inventoried in 1951, however, there were several inconsistencies with Gallus' notes. Hence, when Éva Kabay published the finds from the Szalacska tumuli that were still locatable in the late 1950s, she had to face with many difficulties (Kabay 1960). Nevertheless, her article was the main source about the EIA of Szalacska for nearly 15 years and still remains exceedingly important.

The next stage of the research of the Szalacska necropolis began in 1971 when the local agricultural cooperative demolished two of the burial mounds (Kemenczei 1974). Because in one of them the workers came across a stone chamber, they informed the Hungarian National Museum. This is how Tibor Kemenczei's excavations in the cemetery began. In the following three years he investigated nine mounds in total (Fig. 3; Kemenczei 1975). His excavations are invaluable for several reasons. First, he was the first to excavate mounds south of the northernmost tumulus group. Secondly, the quality and detailedness

of his documentation far exceeds the ones made during previous excavations. Thirdly, he inventoried the archaeological material recovered during the excavations, and the grave assemblages are consistent.

While there has been a constant curiosity about the tumuli near Szalacska, the EIA settlement on the hilltop did not attract scholarly attention for several decades after Darnay's investigations in the 1900s. Apart from a small-scale excavation campaign led by Károly Sági in 1954, motivated by investigations for looted Roman period jewellery, there was no documented archaeological investigations on the hilltop until the 1980s. In 1982, however, Szilvia Honti began her excavations on the Szalacska hill. In five excavation campaigns during the 1980s she probed the prehistoric hillfort at several locations (Fig. 4). Unfortunately, however, the results of her excavations were never published.

Since then, research of the site complex near Szalacska has been limited to topographical investigations. Among these B. Holl and Z. Czajlik's work (Holl/Czajlik 2013) deserve special attention.

A CEMETERY OF SOME RENOWN

As for the EIA funeral customs in the Szalacska cemetery, the most important and reliable information comes from Kemenczei's excavations, however, previous discoveries provide additional but indispensable data. Every mound contained a cremation burial (Fig. 5). The calcined bones were mixed with remains of the funerary pyre and placed in most cases into a shallow grave pit of either rectangular or oval shape deepened into the soil (Kemenczei 1975; 1976, 203). There are, however, exceptional mounds. The burnt remains in Tumulus 1973/4 were scattered onto a layer of clay with which the builders plastered the soil. Tumulus 1971/1 is exceptional for several reasons.

During the excavation Kemenczei found a rectangular 6.25 by 5.75 m burial chamber made of stones (Fig. 5). The walls were 0.7 m high at the time of the excavation and their width was approximately 0.75 m. The builders had plastered the inner area of the chamber with stone blocks and subsequently remains of the funerary pyre were scattered onto the floor of the chamber at two places. So far, this is the only well-documented case of a burial chamber made of stone in the Szalacska necropolis. However, the so-called Tumulus 'A' excavated in the 1870s is supposed to have had a small burial chamber, too. Moreover, it has been suggested that locals had been exploiting Tumulus 'A' for stone blocks for some time before the excavation (Kabay 1960, 47). Reportedly, during the excavation in 1876 Kammerer and his colleagues found a small stone chamber. However, contrary to any other excavated tumulus in the Szalacska cemetery, this burial is supposed to have been located quite near to the top of this vast tumulus with 30 m in diameter and approximately 11 m in height. Also, the dimensions of this so-called burial chamber seem disproportionate to the dimensions of the mound (Kabay 1960, 47). Furthermore, based on the information available there were no pottery in this grave which is quite unusual for the funerary customs of the Szalacska cemetery. As a result, one might entertain the idea that Kammerer and his colleagues did not in fact dig to the bottom of the mound but they discovered a secondary burial near the top of one of the largest tumuli in the cemetery.

Among the five tumuli excavated by Sándor Gallus there is none which would have contained a burial chamber built of stone blocks similar to the one found in Tumulus 1971/1. The inner structure of Tumulus 1943/3, however, is not simple. Based on the drawings Gallus made, one can suggest that it contained a chamber made of wooden beams and posts. However, it would appear that at the corners this wooden chamber was supported by stone blocks (Kabay 1960, 51).

As mentioned above, the calcined human remains were usually scattered in the shallow grave pit. Usually, they were mixed in a layer comprising ashes, remains of the funerary pyre, and broken pottery (Kemenczei 1974, 11; 1976, 203). Importantly, Kemenczei's investigations found no evidence for using ceramic vessels as urns. By contrast, however, in Gallus' notes there are certain allusions to the possibility of a few cases where pottery vessels could have been used as containers of cremated human remains. This, however, is still an unlikely scenario because among the pottery vessels recovered from the tumuli opened in the 1970s intact specimens are definitely exceptional. This is also true for the ceramic material recovered from the Szalacska mounds in the 1870s, however, one has to bear in mind that these finds were subject of damage and loss during the historical events of the 20th century. Kemenczei claimed that the ceramic vessels whose fragments came to light from the graves could have been intentionally broken during or before the funeral and only fragments accompanied the remains of the deceased into the grave (Kemenczei 1974, 11; 1975, 165; 1976, 204). Importantly, contrary to metal finds in the graves, signs of secondary exposure to considerable heat or transformation due to secondary burning of the ceramic fragments are seldom in the pottery material of the Szalacska mounds.

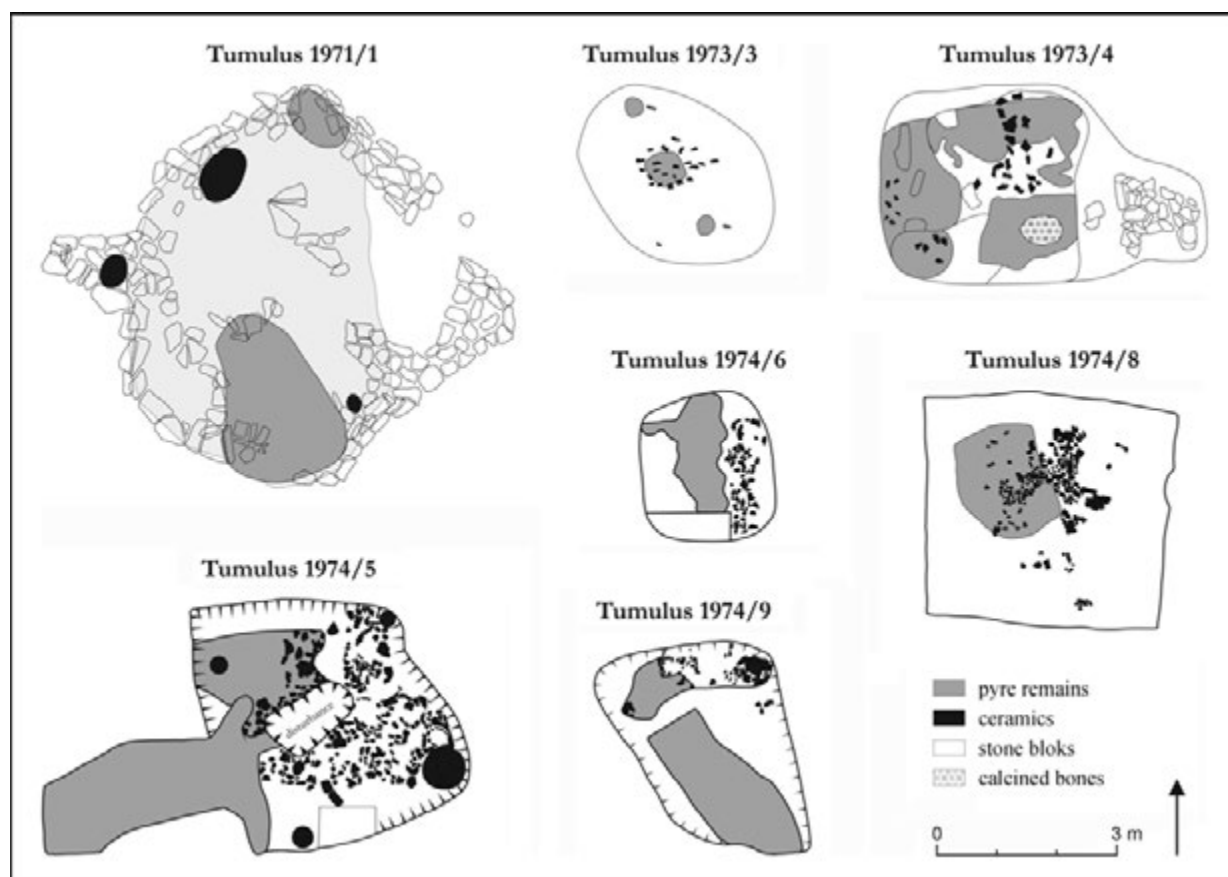


Fig. 5. The graves in the burial mounds excavated by Tibor Kemenczei in the 1970s. Figure by the author.

Considering their highly fragmented state, it is questionable whether it is reasonable to speak about ceramic sets when dealing with the composition of the ceramic material in the Szalacska graves. However, it is worth looking at the typological spectrum of the ceramic finds occurring in the graves. In the case of the tumuli excavated by Tibor Kemenczei, every grave contained large pots with conical neck (*Kegelhalsgefäße*), however, in terms of minimum number of distinguishable specimens their number varies greatly among the burials. It appears that the burial chamber of Tumulus 1971/1 yielded fragments of at least seven such pots. On the other end of the spectrum, we have graves containing fragments of only two such vessels. Tumulus 1974/9 yielded the fragments of a large, black, polished vessel with fluted decoration on its shoulder and below its rim and the fragments of a specimen decorated with black geometrical patterns painted over a brick-red background (Fig. 6). Importantly, every mound excavated by Kemenczei contained ceramic vessels with red-black painted decoration, although in greatly varying amounts (Kemenczei 1976, 206). Interestingly, in the burial chamber of Tumulus 1971/1 only a few fragments of red-black painted vessels were found, however, the adjacent but considerably smaller Tumulus 1973/3 contained the pieces of at least two nearly entirely restorable vessels with red-black painted decoration (Kemenczei 1976, 206). Noteworthy that red-black painted decoration is not limited to large pots with conical neck, but this kind of decoration appears on a variety of vessel types.

For instance, among the ceramic sherds found in Tumulus 1974/8 there are fragments of a vessel with short conical neck. According to C. Metzner-Nebelsick's recent assessment, these vessels can mainly be found in EIA graves in the region between the Lake Balaton and the river Sava (Metzner-Nebelsick 2017a, 433). Hence, it is hardly surprising that specimens of this vessel type frequently occur among the ceramic material of the Szalacska graves excavated by Kemenczei, although, their majority does not have red-black painted decoration but dark burnished surfaces and fluted decoration. Tumulus 1971/1 contained fragments of several vessels with short conical neck, although, they show considerable variability in shape (Kemenczei 1974, fig. 2: 3, 4; 3: 3; 4: 1).

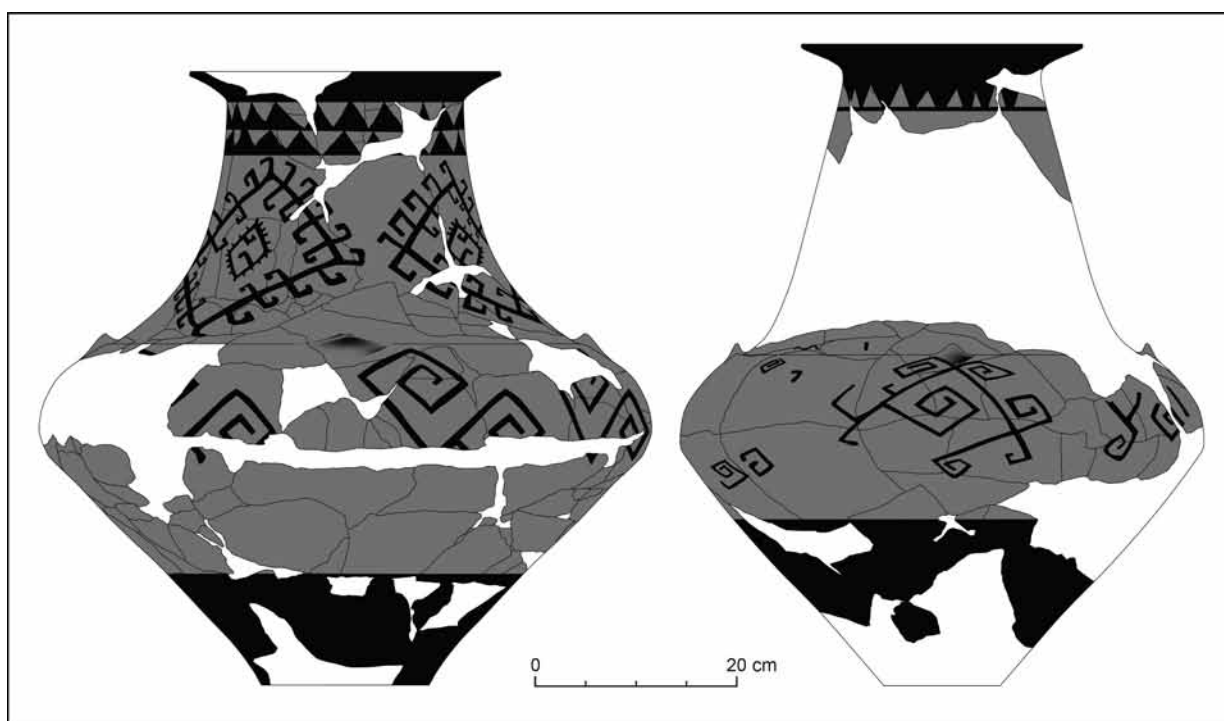


Fig. 6. Red-black painted vessels from Tumulus 1974/5. Figure by the author.

Having excavated nine mounds of the Szalacska cemetery, Kemenczei assumes that there is a notable proportionality between the size of the tumuli and the amount of metal objects among the pyre goods (Kemenczei 1975, 165). As opposed to the observation of the proportionality between the tumulus sizes and the amount of metal objects in the graves, such clear proportionality cannot be seen between the tumulus sizes and the amount of pottery finds in them (Kemenczei 1976, 204).

Although Kemenczei's observation about the amount of metal finds is worth emphasising, one has to draw attention to the fact that excavations of the Szalacska tumuli tend to unearth only a handful of (and mostly badly damaged) metal items. Noteworthy among these are the iron skewers unearthed in Tumulus 1971/1. Fragments of at least two skewers lay among most of the finds in the southern corner of the burial chamber (Kemenczei 1974, 4). Importantly, skewers, evidence of the influence of the Mediterranean cultures on the Hallstatt communities had, are usually associated with the most ostentatious graves of the Eastern Hallstatt zone and could have served as status symbols (Egg/Munir 2013, 272). Similar to Tumulus 1971/1, Tumulus 1943/3 also ranks among the largest tumuli of the cemetery. As Gallus's notes suggest, this is another tumulus that contained iron skewers (Kabay 1960, 51).

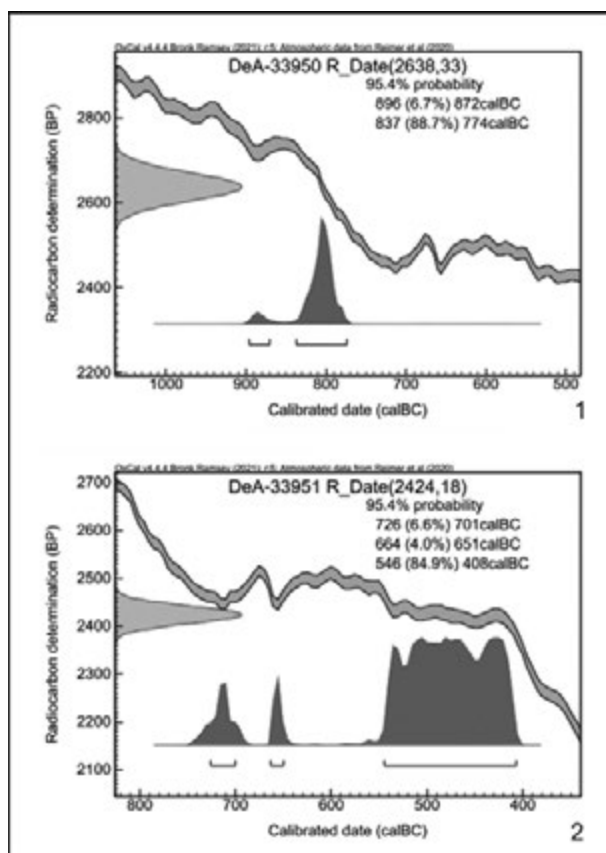


Fig. 7. Probability distribution of the results of the radiocarbon measurement conducted on the samples taken from Tumulus 1973/3 (1) and 1973/4 (2) of the Szalacska cemetery.

Besides skewers, bronze vessels, in general, are thought to have served as feasting equipment in burial contexts. In the Szalacska cemetery, remains of bronze vessels are scarce but certainly not unprecedented. Probably, the most recognizable evidence originates from Tumulus 1943/2. Gallus's excavation brought to light a broken angular handle of presumably a broad-rimmed bowl (*Kabay 1960*, fig. 15; *Patay 1990*, 83). According to Gallus' notes the grave goods and calcined remains of the deceased laid in a simple shallow grave pit with no signs of any grave architecture (*Kabay 1960*, 50, 51). In addition, Tumulus 1971/1 also yielded several bronze sheet fragments held together by bronze pegs. They are, in all likelihood, fragments of a situla-like bronze vessel (*Soós/Lukács 2023*).

Interestingly, both weapons and parts of horse harnesses are rare among the finds recovered by the excavations of the Szalacska cemetery. In the 1970s only two pieces of iron spears came to light. On the one hand, in the assemblage found in Tumulus 1973/3 there was a spearhead in the small shallow oval grave pit. The other iron spearhead was part of the assemblage of Tumulus 1971/1 (*Kemenczei 1974*, 4). In addition, this is the only grave that so far yielded items easily recognizable as parts of horse harnesses. Also, Tumulus 1943/3 and Tumulus 1943/5 contained several bronze buttons which probably served as decoration of the harness (*Kabay 1960*, 52, 53).

As for the chronology of the burial mounds at Szalacska, Kabay agrees with Gallus's opinion that the burial mounds he excavated date to the Ha C period (*Kabay 1960*, 58). Based on the tumuli investigated in the 1970s, Kemenczei argues that, in fact, none of the hitherto excavated burials date before the Ha C2 phase (*Kemenczei 1974*, 14). In her seminal monograph, B. Teržan argued that the so far excavated tumuli of the Szalacska cemetery belong to Phase III of the relative chronological system she outlined for the Drava region and the region of Slovenian Styria (*Teržan 1990*, 158).

Recently, animal bones from two tumuli have been submitted to AMS radiocarbon analysis. Samples were taken from a wild boar scapula (Tumulus 1973/3) and from a horse metatarsus (Tumulus 1973/4). Both measurements resulted relatively early dates. The radiocarbon date was calibrated with the IntCal 20 atmospheric calibration curve in the OxCal v4.4.4 software (*Reimer et al. 2020*). While the sample from Tumulus 1973/4 dates either to the period from the second half of the 6th century to the end of the 5th century BC or, which is in our view more likely, to the late 8th century and the first half and middle of the 7th century BC, the sample from Tumulus 1973/3 resulted a surprisingly early date, i.e. the 9th and early 8th century (Fig. 7). Since the sample contained very small amount of collagen, one has to be cautious with the result of the latter measurement.

THE EARLY IRON AGE SETTLEMENT

Apart from the few metal finds recovered by Darnay's excavation, the archaeological material of the EIA settlement on the hilltop used to be nearly completely unknown before Szilvia Honti carried out her excavations. Moreover, even today the excavations conducted in the 1980s provide the single most valuable source of information about the EIA occupation on Szalacska hill.

The excavations began in the summer of 1982 and until the end of 1989 five excavation campaigns were carried out. Honti and her colleagues opened seventeen trenches in total, at six different locations on the hilltop. Most trenches were located in the south, namely, near the rampart. However, they investigated the settlement remains at a few locations to the north, too. The latter along with the EIA finds found during Darnay's excavation strongly suggest that the Hallstatt period settlement extended to large parts of the hilltop, i.e. it could have covered an area of some 15 hectares, however, since Honti and her colleagues only excavated some 550 m² with an average dimension of 35 m² per trench, it is nearly impossible to say anything about its inner structure and density of the occupation.

The majority of the EIA archaeological features unearthed by Honti and her colleagues are pits of various dimensions and shape. Due to later activities on the hilltop disturbing the EIA features, the evaluation of their function is somewhat complicated. Among the features there are beehive-shaped pits of different sizes (Fig. 8). Similar beehive-shaped pits came to light from the EIA settlements near Balatonboglár (*Jáky 2016*, 150) and Alsópáhok (*Horváth 2015*, 233) along the shores of the Lake Balaton, and near Letenye (*Horváth 2012*, 123) some 16 km from the confluence of the Mura and Drava rivers. Since these lowland settlements were excavated to a large extent, the observation that beehive-shaped pits are the most frequent among the EIA features seems worth highlighting.

Although the excavation unearthed some postholes, without reliable evidence their chronological position cannot be accurately determined. While the existence of LBA and La Tène post constructions

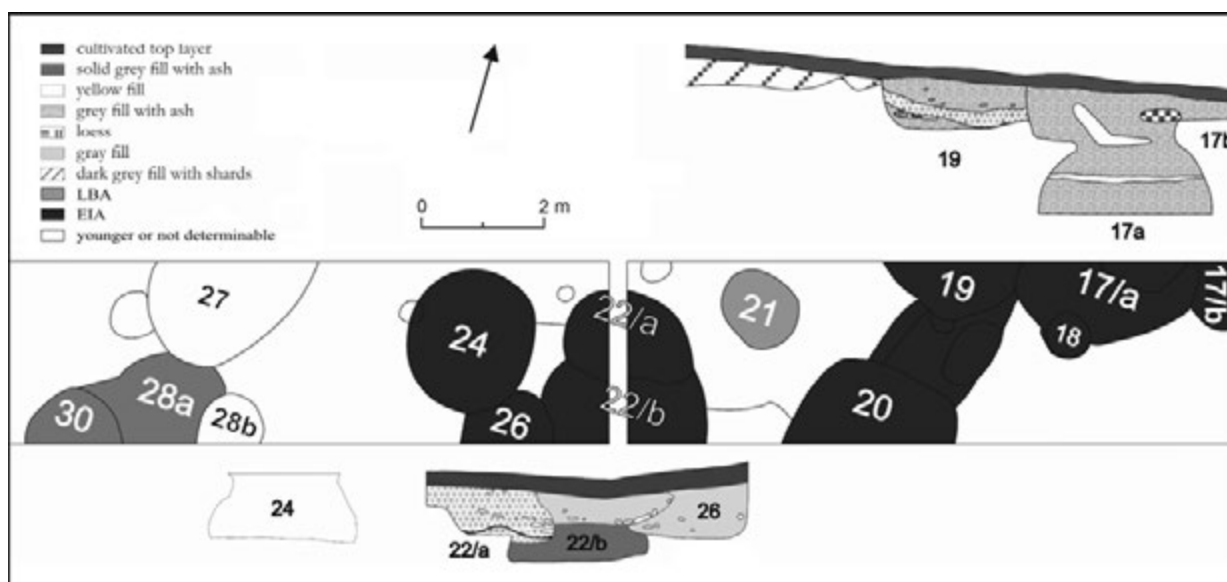


Fig. 8. Trenches VI and VII of the excavation in 1982. Figure by the author.

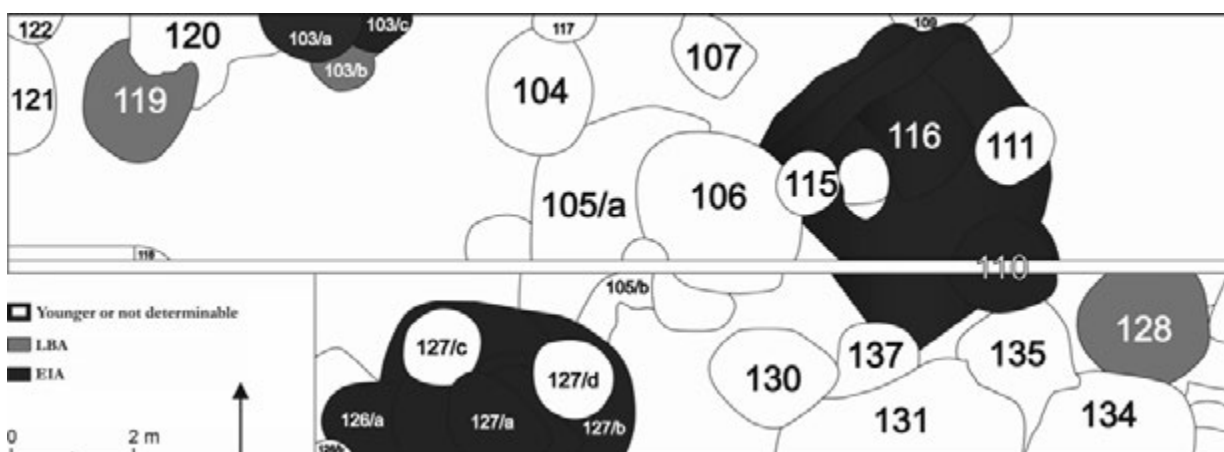


Fig. 9. Trenches XVI and XVII of the excavation in 1989. Figure by the author.

seem substantiated by the discoveries, due to several Late Iron Age pits and the limited horizontal extent of the trench, Honti's assumption of an EIA post construction cannot be verified.

In the last year Honti and her colleagues found two pits with rectangular ground plan with 4.1 to 4.5 m length along their edges (Features 116 and 127; Fig. 9). Similar features are often interpreted as sunken houses. As for the similar rectangular pits of the EIA settlement near Balatonboglár, András Jáky distinguished two types based on their size (Jáky 2016, 151). Considering this, the sunken houses of Szalacska belong to the larger type of houses. Similarly, based on their size, the two houses from the Szalacska settlement rank among the larger buildings found near Vát (Molnár/Farkas 2010, 123). Both rectangular pits had nearly flat floors and relatively steep walls, however, the northern building (Feature 116) had a somewhat stepped structure along its walls and a shallow pit-like depression in the central part of the floor. Feature 127 to the south had been considerably damaged through Late Iron Age pits and was not entirely excavated, thus its inner structure is somewhat obscure. In Feature 116, however, in its western corner the excavation revealed a posthole, but this is the only structural element indicative of a superstructure.

Hardly surprisingly, the most common finds recovered from the EIA archaeological features are ceramic fragments. They show considerable typological variability (Fig. 10). Common vessel types include

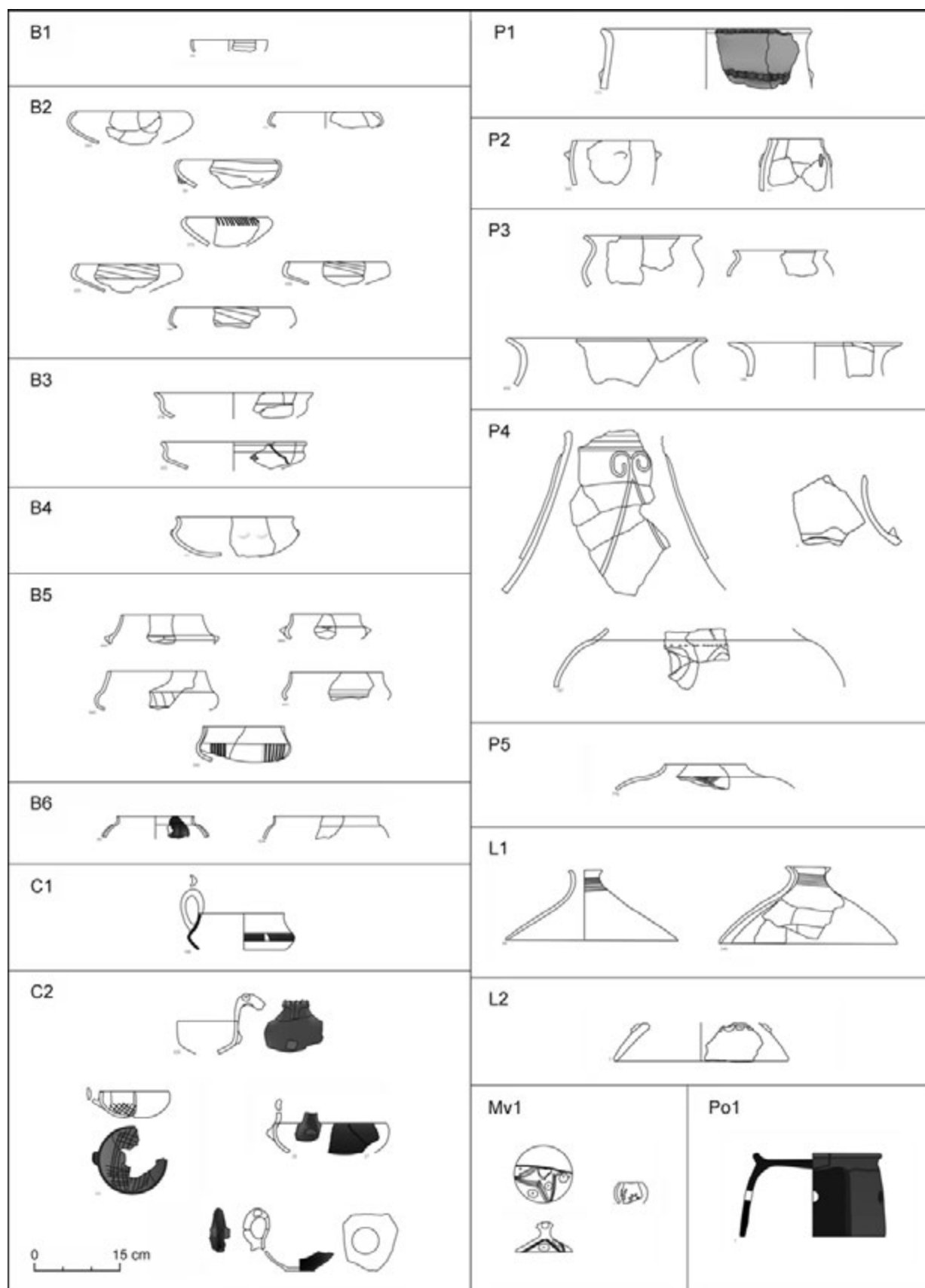


Fig. 10. Typological overview of the pottery discovered on the Szalacska hilltop site. Figure by the author.

bowls with inverted rim (B2) and bowls with conical neck (B5). The former type includes specimens with and without decoration. The decoration of bowls with inverted rims show a large variability as far as the method of decoration is concerned. Bowls with inverted rims decorated with horizontal or oblique faceting are nearly as frequent as the ones decorated with oblique fluting.

Bowls with conical neck seem to represent the finest products of EIA potters at the Szalacska settlement. All fragments show a polished and burnished surface with occasional graphite-coating. They are also characterized by thin walls. Usually the potters decorated the belly of the bowls. There are two main type of decoration of the bowls with conical necks. On the one hand, the belly of the bowls is decorated with densely spaced vertical or oblique fluted lines. On the other hand, fragments of bowls with horizontal faceting on the belly also frequently occur in the ceramic material recovered from the Szalacska hilltop.

Among the bowls with conical neck, Honti's excavation brought to light several fragments of bowls with S-shaped profile. This type is closely related to the former, however, the specimens of the latter have less accentuated profile. They are frequently decorated on their belly with vertical fluted lines, and similarly to the bowl with conical neck, usually their outer surface is carefully burnished. Importantly, there are bowls with S-shaped profile have a variant which comprise bowls with strongly everted rim (B3). These are also of exceptionally fine quality and, in some cases, they bear red-black painted decoration.

As opposed to bowls, cups are somewhat seldom. Based on their shape, distinguishing two groups among them seems reasonable. On the one hand, there are cups with conical neck (C1). In terms of typological characteristics, these vessels are hardly distinguishable from bowls with conical neck, the main difference is the handle. However, in the case of small fragments, this distinction cannot be made.

The second type of cups are of globular body (C2). Some specimens of this very heterogeneous type are worth considering in detail. The pit-complex excavated in Trench X yielded a particularly characteristic set of Hallstatt period ceramics. One of them shows the straight rim, slightly bulging body and decorated handle of a fine-quality cup. The handle of the vessel is raised above the rim and could have been decorated with knobs or horn-like extensions. Near the top of the handle it has a rectangular cross-section but downwards it transforms into a circular cross-section and just at the lower joint of the handle the potter shaped a support for the grip. Although such supports are not unprecedented on cups in the EIA material from Western Hungary (Horváth 2012, fig. 2: 2; 12: 137), they are rather characteristic of the cups recovered from the Sulmtal necropolis (Dobiat 1980, pl. 38: 6; 42: 10; 67: 5; 92: 7). These cups appear in the Phase 2 of the cemetery but their proliferation is seen in the latest stage of the cemetery. Being the youngest grave within the cemetery, the ceramic material recovered from the Kröllkogel underlines this observation (Kramer 2013, 374). In terms of the decoration of the handle and the overall shape of the vessel, the best comparisons of the cup found in the Szalacska settlement are the ones found in the Kröllkogel (Kramer 2013, 337–339).

Already in the first year of Honti's excavations in Trenches VI and VII a large number of EIA features were found. From a relatively shallow layer two fragments of a globular cup with zoomorphic handle came to light. Closest analogies of this cup came to light from the Gamulica tumulus near Martijanec in Northwestern Croatia (Vinski-Gasparini 1961, pl. VII: 1). In addition, there are fragments of comparable cups among the pottery finds of Tumulus 2 near Vaskeresztes near today's border between Austria and Hungary (Fekete 1985b, fig. 20: 7, 8).

A third type of cups can only be assumed to have been used in the Szalacska hilltop settlement. Feature 10/b–c yielded the fragment of a band-like handle with a central rib. Although further fragments of the vessel did not turn up, based on its fine quality and red-black painted geometric decoration it could have been part of a cup similar to those recovered from Tumulus 2 near Vaskeresztes, although, instead of black painting the geometric motives on this specimen were created with tin foils (Fekete 1985b, 48).

The ceramic material recovered from the EIA settlement on the hilltop contain fragments of vessels with conical neck (P4). Some of them are elaborately decorated, and one of them is a reminiscent of the large vessel recovered from Tumulus 1971/1 (Kemenczei 1974, fig. 8). In contrast to the ceramic assemblages in the tumuli, fragments of vessels with short conical neck are not frequent in the ceramic material of the EIA settlement (P5). More common elements of the ceramic material are the fragments of pots of various shapes. Similar to other EIA settlements in Western Hungary and the adjacent regions, barrel-shaped pots seem predominant among them (P2; Horváth 2012, 126). In addition, there are several fragments of coarse baking lids (L2), but fragments of elaborate lids of fine quality are also common in the ceramic material (L1). Pyraunoi (Pol), loom weights and spindle whorls are less frequent.

It is worth briefly describing the relationship between the settlement and the tumuli based on their respective ceramic materials. There are several dissimilarities between them. First, while the typological spectrums of the vessels included in the burial assemblages and of those found in the settlement are largely overlapping, pyraunoi, baking lids and miniature vessels are only attested in the settlement material. By contrast, vessels decorated with red-black decoration are considerably less frequent on the hilltop than in the burial assemblages. Furthermore, while there are two tumuli which yielded ceramic bull protomes (*Kemenczei 1974*, fig. 5: 6), such finds are absent among the ceramic fragments hitherto found on the hilltop.

Since the excavations in the 1980s found only a few metal finds and they are hardly of any help in evaluating the chronological aspects of the settlement, we have to rely on the ceramic material. In this regard, the cups are of significance. However, before dealing with their chronological position, I have to touch upon the evidence Darnay brought to light in the early 1900s. In the northern part of the settlement, near to the chapel his excavations brought to light a few EIA fibulae. Presumably, these fibulae were already in a secondary context when unearthed. However, their presence on the hilltop is hardly independent of the EIA settlement. One of them is worth highlighting (*Darnay 1910*, fig. 3) because based on M. Fekete's assessment, this fibula suggests activities on the hilltop in the latter phases of the Ha D period (*Fekete 1985a*, 83). Unfortunately, the evidence suggesting a similar conclusion is thin as far as the results of the excavations in the 1980s are concerned. However, bowls with embossed decoration and the elaborate drinking vessels strongly suggest that the EIA settlement flourished in the Ha C2–Ha D1 phases.

THE QUESTION OF CENTRALITY

It is a recurrent notion in the literature that Szalacska should have played some sort of central role among the EIA communities in the Kapos region. Yet, this claim has been largely based on the evidence gathered from the tumuli, and little attention has been paid to whether the EIA settlement on the hill would corroborate this notion.

Unfortunately, the excavations on the hilltop have not yet provided evidence for the concentration of power or wealth in terms of architecture. The houses so far documented are both in terms of shape and dimension comparable to those found during the excavations of the Balatonboglár (*Jáky 2016*, 151) and Letenye settlements (*Horváth 2012*, 123). Another aspect worth considering is how the ceramic materials recovered from the Szalacska hilltop and other settlements in the region compare to each other. Possibly, the most illuminating example is the EIA settlement near Balatonboglár. This settlement lies near the southern shore of the Balaton. In Iron Age times it could probably have been located just at the shore (*Jáky 2016*, 149). Owing to the works of A. Jáky (2016), research now has a broad scale understanding of this settlement. As far as the archaeological features excavated at both sites are concerned, no striking difference appears. A similar situation takes shape when looking at the spectra of vessel types used by the communities of the settlements. Hence, at first glance there are no fundamental dissimilarities between the two sites, of course, apart from the fact that one of Western Hungary's largest EIA tumulus cemeteries is located just below the Szalacska hilltop. By contrast, current research does not know about EIA tumulus burials near the Balatonboglár settlement. However, a more thorough survey of the ceramic materials reveals several minor differences. But first, it has to be mentioned that due to the large-scale excavation of the Balatonboglár settlement we have a more complete and clearer understanding of it than of the Szalacska settlement. One of the dissimilarities is the nearly complete absence of fragments of red-black coated vessels in the material unearthed at the Balatonboglár site (*Jáky 2016*, 155). In addition, while the Szalacska settlement yielded several elaborately decorated lids, at the Balatonboglár site lids and baking lids of rather coarse quality are hardly distinguishable. Another visible difference between the ceramic materials of these sites is that there are some elaborate cups among the vessels recovered from the Szalacska hilltop which do not find counterparts among the potteries found at the Balatonboglár settlement.

These cups bear significance. Their size and elaborate decoration suggest that they could have been personal belongings used for personal consumption of beverages, possibly, in context of feasts or libation rituals. Based on their analogies found in ostentatious graves (e.g. Tumulus II near Vaskeresztes, the Gamulica tumulus near Martijanec) they might be seen as an evidence for the existence of an elite at the Szalacska settlement.

However, the existence of an elite does not necessarily translate to the settlement being a central place. Instead, based on D. Knitter and O. Nakoinz's recent assessment of the approaches to the concept of centrality in archaeological contexts the following aspects of the cemetery and settlement near Szalacska are worth considering (Knitter/Nakoinz 2018).

One of the central functions is security. Although, there are ramparts on the hilltop, little is known about their chronology. As a result, we cannot be sure about whether the EIA settlement on the hilltop had artificial fortifications. However, given its elevated location, one could argue that the settlement on the hilltop was naturally fortified. As for administrative functions, arguably, the large number of tumuli and their sizes suggest that their construction required both vast energy investment and considerable organizational power (Soós 2017). Some of the hitherto excavated tumuli yielded compelling evidence for the existence of elite burials, however, as the recently investigated tumulus near Regöly shows (Szabó/Fekete 2014), the accumulated wealth and prestige items in the tumuli near Szalacska is certainly not unrivalled. Hence, assuming that the elite associated with Szalacska had exclusive administrative functions, if any, over a large area is not reasonable. Also, as the above cited authors emphasise, without written sources administrative functions can hardly be assessed (Knitter/Nakoinz 2018, 13).

Similarly, the direct evidence for trading activities at Szalacska is exceedingly thin. Although, some researcher pointed out the proximity of Szalacska to the Kapos River, which is supposed to have been a major trade route (Patek 1968, 19, 1993, 139), wares directly associated with this route are not abundant. One notable example of imports at Szalacska, however, is a so-called Arnoaldi type fibula recovered by Gallus's excavations (Fekete 1982, 133). Fragments of the fibula was found in Tumulus 1943/3, i.e. the burial mound with the wooden chamber (Kabay 1960, 53). The centre of the production of such fibulae could have been in Verucchio, but specimens occur in various regions of Central Europe (Bentini et al. 2020, 391).

Another aspect worth considering is craft. As already mentioned, the half-finished boat-shaped fibula is seen as a proof of local metalwork production, however, the excavations in the 1980s did not find further similarly or more compelling evidence. Assuming that ceramic production could have taken place in the settlement is fairly reasonable. The more so, if the characteristic red-black painted ceramics are taken into consideration. Importantly, in the catchment of the Kapos River, such red-black painted pottery seems to have been closely associated with the Szalacska cemetery and the settlement on the hilltop, although, one must bear in mind how limited the knowledge of EIA settlements and cemeteries in the region under consideration is.

As for cult, there is hardly any direct evidence for it on the Szalacska hilltop. However, given the outstanding size of the tumulus cemetery in the valley, one might propose the idea that, similar to the proposition for the Sulmtal cemetery (Hellmuth Kramberger et al. 2019, 47), it could have served as a central cemetery of a community well beyond the occupants of the hilltop settlement.

CONCLUSIONS

Despite its long research history and the remarkable finds that surfaced there, Nagyberki-Szalacska is both a well-known and, at the same time, an obscure site of the Early Iron Age of Western Hungary. One of the largest tumulus cemeteries in the region and the hilltop settlement overlooking the burial mounds have always been a perfect candidate for locating a central place of the EIA. The assessment of the currently available evidence, however, only reveals how limited our understanding of the period in Southern Transdanubia is, how limited our knowledge about the life of the settlements and the network of settlements in the region is. Nagyberki-Szalacska certainly seems to be a special site within the context of the EIA in Transdanubia, but there is still a huge amount of work to be done before its contextual evaluation becomes possible.

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Nagyberki-Szalacska – mocenské centrum z doby halštatskej v Zadunajsku

Bence Soós

Súhrn

Napriek dlhej histórii výskumu a pozoruhodným objaveným nálezom je Nagyberki-Szalacska známou a zároveň neznámou lokalitou zo staršej doby železnej v západnom Maďarsku. Jedno z najväčších mohylových pohrebísk v regióne a osada na vrchole kopca s výhľadom na mohyly boli vždy ideálnym kandidátom na lokalizáciu centrálného miesta staršej doby železnej. Zhodnotenie v súčasnosti dostupných dokladov však ukazuje, aké obmedzené je naše poznanie tohto obdobia v južnom Zadunajsku, aké obmedzené sú naše poznatky o živote na sídliskách o osieti osád v regióne. Nagyberki-Szalacska je unikátnou lokalitou v kontexte staršej doby železnej v Zadunajsku, ale ešte je potrebné vykonať obrovské množstvo práce, kým bude možné jej kontextuálne zhodnotenie.

- Obr. 1. Prehľad lokalít zo staršej doby železnej v južnom Zadunajsku a v priľahlých regiónoch v povodí rieky Kapos (vyznačené). 1 – Nagyberki-Szalacska. Mapa autor.
- Obr. 2. Topografická mapa sídliskového areálu Szalacska. 1 – analýza viditeľnosti z výšinného sídliska Szalacska; 2 – oblasť dosiahnuteľná v rámci 60 minút pešej chôdze zo sídliska Szalacska. Mapa autor.
- Obr. 3. Výskum na mohylovom pohrebisku Szalacska. 1 – výšinné sídlisko Szalacska a mohyly v jeho okolí; 2 – časť pohrebiska Szalacska, vyznačená na obrázku vľavo. Legenda: a – oblasť výskumu v roku 1876; b – oblasť výskumu v roku 1943; c – mohyly skúmané v 70. rokoch 20. stor. (číslovanie podľa T. Kemenceiho). Mapa autor.
- Obr. 4. Miesta preskúvané na výšinnom sídlisku v 80. rokoch 20. stor. Mapa autor.
- Obr. 5. Hroby v mohylách, ktoré skúmal Tibor Kemenczei v 70. rokoch 20. stor. Obrázok autor.
- Obr. 6. Nádobý s červeno-čiernou maľovanou výzdobou z mohyly 1974/5. Obrázok autor.
- Obr. 7. Rozptyl pravdepodobnosti výsledkov rádiouhlíkových meraní vzoriek z mohýl 1973/3 (1) a 1973/4 (2) na pohrebisku Szalacska.
- Obr. 8. Sondy VI a VII z výskumu v roku 1982. Obrázok autor.
- Obr. 9. Sondy XVI a XVII z výskumu v roku 1989. Obrázok autor.
- Obr. 10. Typologický prehľad keramiky objavenej na výšinnom sídlisku Szalacska. Obrázok autor.

Text translated by the author

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NEW EVIDENCE OF LATE HALLSTATT/EARLY LA TÈNE SOCIAL ELITE FROM NORTHWESTERN BOHEMIA

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Keywords: Northwestern Bohemia, Ha D/Lt A, settlement, social elite, valuable artefacts, Attic pottery, painted imitation

A rescue archaeological excavation at the site of Holedeč near Žatec in Northwestern Bohemia uncovered two features of unusual dimensions, representing the Late Hallstatt/Early La Tène manor house. The fillings of these features including one other settlement pit included three bronze fibulae, three fragments of domestic painted imitation of the Attic ware, local Early La Tène stamped pottery, pieces of daub, animal bones, antler finds, shells, spindle whorls, glass bead, two sherds of the Attic pottery and other finds.

The excavated inventory together with the unusual settlement features define without any doubt the researched site as the Late Hallstatt/Early La Tène settlement connected with the local social elite. The present paper brings the classification of the most significant finds from these features as well as the evaluation of unusual residential structures from the point of view of the archaeology of Central European Late Hallstatt/Early La Tène period.



Fig. 1. Location of the site on the map (map source: www.cuzk.cz).

INTRODUCTION

A rescue archaeological excavation in the site of Holedeč near Žatec (Fig. 1) has started during February 2020. This excavation was first supervised by Vojtěch Peksa, then the excavation continued until spring 2022 under supervision of Daniela Franková (both excavators from the Institute for the Preservation of the Archaeological Heritage of Northwestern Bohemia in Most). Rescue archaeological action followed the building activities in the south-western periphery of the village (construction of the road and family houses).

The excavation (Fig. 2) has brought very promising results. It uncovered large sunken house with postholes (feature 1a/21), indicating the presence of massive wooden posts or rather columns

(Fig. 3; 7: 1). The interior finds of the house included three bronze fibulae (Fig. 8: 8–10), three fragments of domestic painted imitation of the Attic ware (Fig. 8: 5–7), local Early La Tène stamped pottery (Fig. 9: 1–5), pieces of daub, animal bones, antler finds, shells, spindle whorls and other finds. The feature 6/22, also representing the sunken house (Fig. 5; 6; 7: 2), contained many sherds of local stamped pottery, pieces of daub, animal bones, antler finds, spindle whorls, one glass bead with the eyelets (Fig. 9: 6) and other finds. Feature 1b/21 (Fig. 4; 7: 3) included Early La Tène stamped pottery, pieces of daub, animal bones and other finds. This feature contained furthermore two fragments of the Attic red-figured pottery (Fig. 8: 1–4). Remaining features contained only a few atypical finds and could not be precisely dated.



Fig. 4. Photo of the feature 1b/21.

The excavated inventory together with the unusual settlement features defines without any doubt the researched site as the Late Hallstatt/Early La Tène settlement connected with the local social elite. The present paper brings the classification of the most significant finds from features 1a–b/21 (see ultra) as well as the evaluation of unusual residential structures from the point of the view of the archaeology of Central European Late Hallstatt/Early La Tène period.

FINDING CONTEXT AND THE INVENTORY OF THE RESEARCHED FEATURES

The excavated site is located in the south-western margin of the village Holedeč (Dist. Louny) in the altitude of 234 m a.s.l. The principal feature is represented by the sunken house (1a/21) of the rectangular plan. Its dimensions are 912 × 814 cm. The maximum depth of the house was 122 cm. The area extent of the house reached 74,2 m². The plan of the house featured several-tenths of the post holes. Some of them had only a few centimeters, the largest one reached up to 60 cm in diameter. They were positioned mostly inside of the house around the perimeter or inside the ground plan. Three post holes were placed outside of the sunken part of the house. The second sunken house was the feature 6/22. Its dimensions were slightly smaller, 730 × 610 cm, with maximal depth 86 cm. Finally, the feature 1b/21 represented a settlement pit with a diameter of 148 cm and maximal depth 40 cm.

Feature 1b/21

1. Sherd of Attic red-figured pottery. Clay: orange/ochre very soft, fine; glaze: deep black somewhat dull. Bottom part of the cup of the B type. Interior: rounded band filled up with a meander. Exterior: almost fully preserved palmette composed originally of seven leaflets. Next to the palmette standing figure in the cloak from which the right hand is visible. Dimensions: 9.5 × 5.9 cm. Fig. 8: 1, 2.
2. Sherd of Attic red-figured pottery. Clay: orange/ochre very soft, fine; glaze: deep black somewhat dull. Body part probably from a cup. Interior: central part of frontally standing human figure in cloak (drapery preserved). Exterior: unclear (perhaps floral?) motive. Dimensions: 2.1 × 2.2 cm. Fig. 8: 3, 4.



Fig. 5. Photo of the western part of the feature 6/22.



Fig. 6. Photo of the eastern part of the feature 6/22.

Feature 1a/21

3. Body sherd from the bowl-shaped vessel. Clay: black-greyish with an orange slip. Interior: round band filled up with the meander in carmine red colour. The remaining parts of the interior in black-greyish colour. Exterior: black greyish colour. Dimensions: 5.4 × 2.6 cm. Fig. 8: 5.
4. Body sherd from the bowl-shaped vessel. Clay: black-greyish with an orange slip. Interior: round band filled up with the S-shaped motive in carmine red colour. Unclear painted decoration also in the medallion of the vessel. The remaining parts of the interior in black-greyish colour. Exterior: black greyish colour. Dimensions: 4.7 × 4.6 cm. Fig. 8: 6.

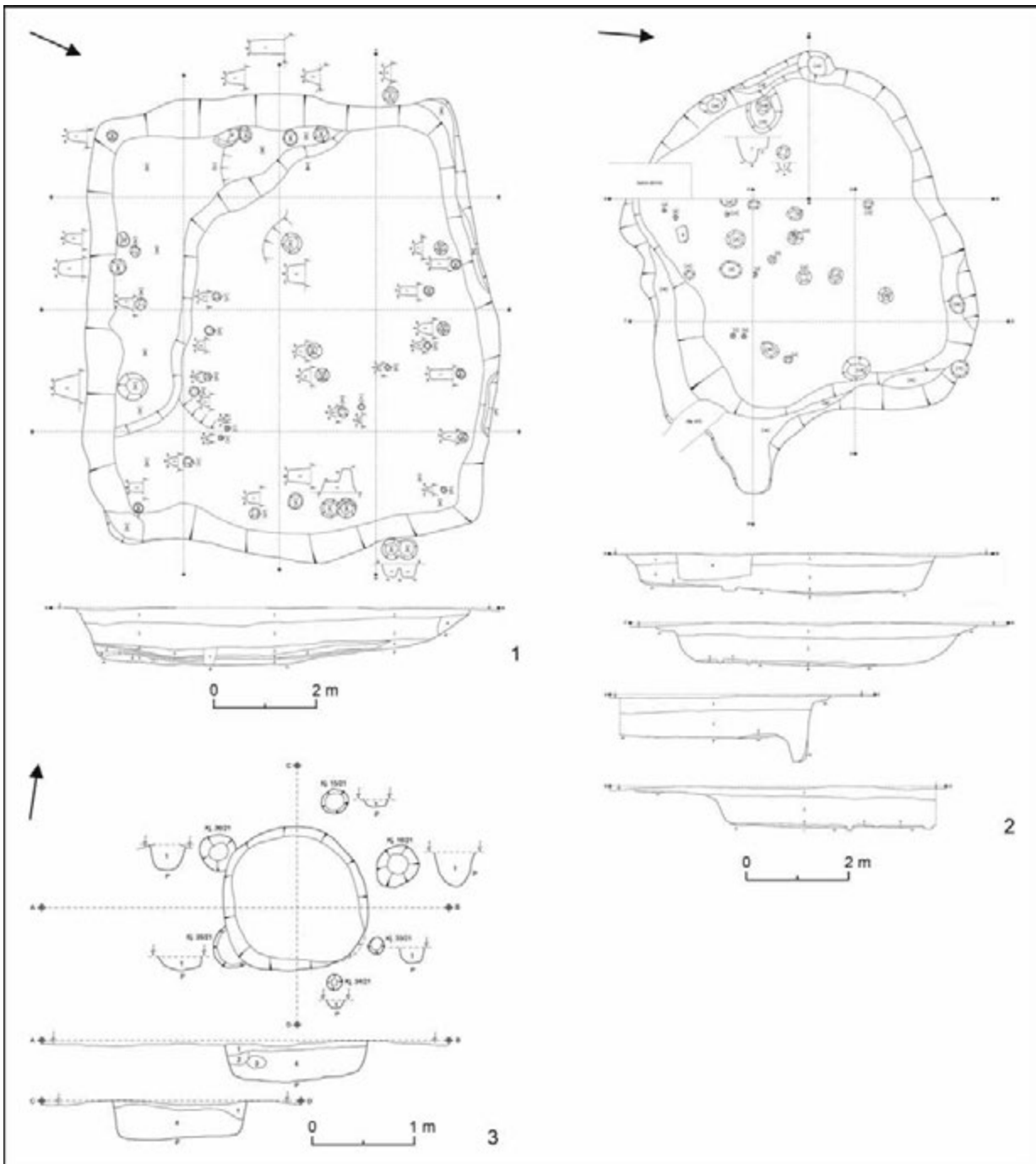


Fig. 7. Plans and sections of the features 1a–b/21 (1, 3) and 6/22 (2).

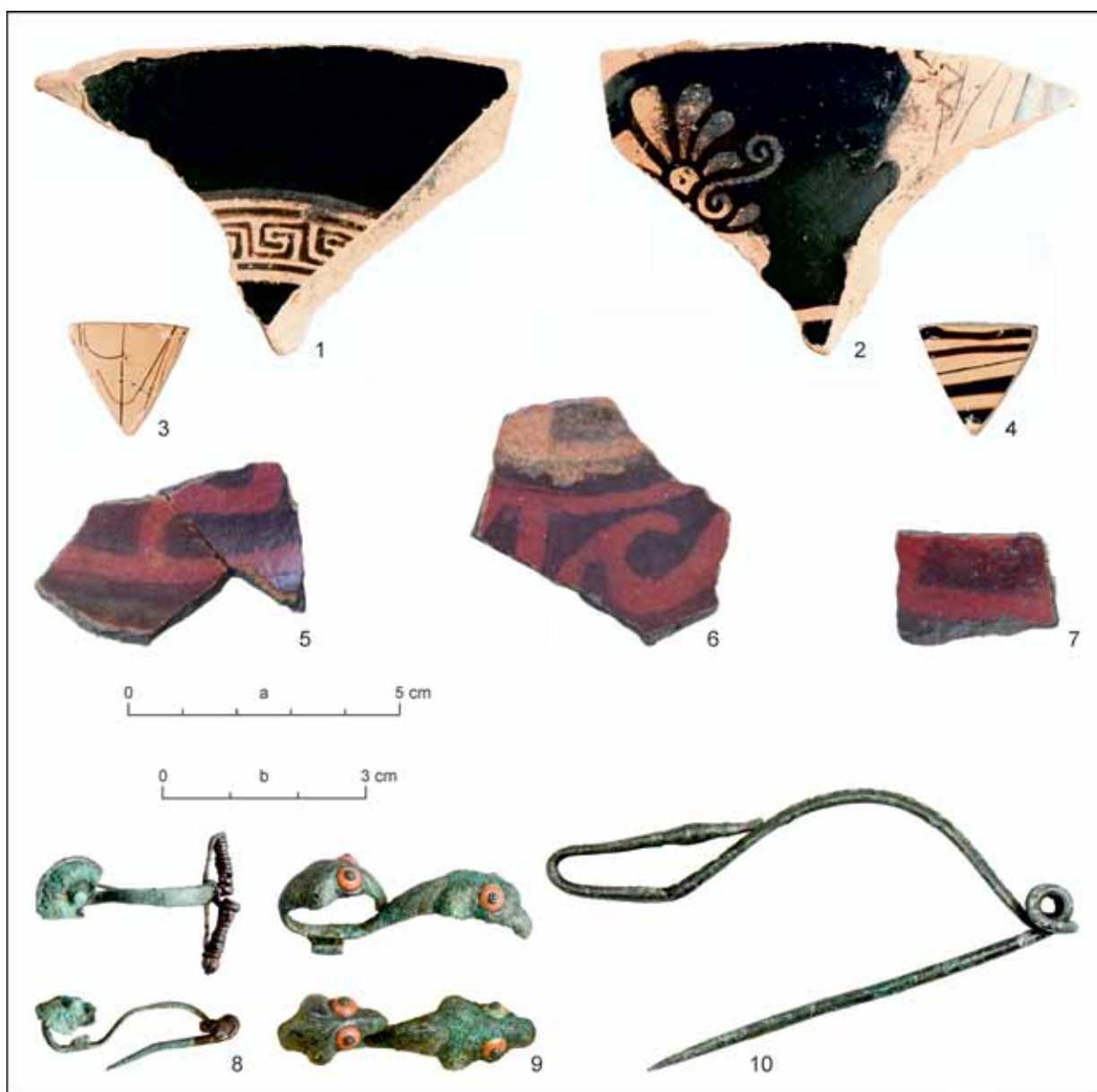


Fig. 8. 1–4 – Attic pottery from the feature 1b/21; 5–7 imitations of the Attic pottery from the feature 1a/21; 8–10 fibulae from the feature 1a/21. Scale: a – 1–7; b – 8–10.

5. Body sherd from the bowl-shaped vessel. Clay: black-greyish with an orange slip. Interior: round band filled up with the meander in carmine red colour. The remaining parts of the interior in black-greyish colour. Exterior: black greyish colour. Dimensions: 2.8 × 2.1 cm. Fig. 8: 7.
6. Almost fully preserved bronze fibula of *Fusszierfibel* type. The bow is flat, band-shaped with the backwards turned foot. The decoration element of the foot is made of a flat disc with central knob. The spring is bilateral with an iron axis. Length: 3.0 cm. Fig. 8: 8.
7. Bronze mask fibula. Spring and needle not preserved. The backwards turned foot decorated by a stylized zoomorphic depiction. The bow bears a stylized anthropomorphic depiction. The eyes of both figures are made of a red sea coral inlay. Length: 3.8 cm. Fig. 8: 9.
8. Fully preserved bronze fibula with a parabolic-shaped bow. The backwards turned foot is decorated by a small extension with transverse and diagonal incisions. The spring is bilateral. Length: 7.7 cm. Fig. 8: 10.



Fig. 9. 1–5 – examples of the Early La Tène stamped pottery from the feature 1a/21; 6 – glass bead with eyelets from the feature 6/22.

CLASSIFICATION OF THE FINDS

Attic pottery from the feature 1b/21

First piece of the Attic red-figured pottery (No. 1) belongs to the flat wide-opened cup of the type B (cf. Bloesch 1940). It is obviously demonstrated by the curved band filled up with the meander, which represents the borders of the cup's medallion – the central part of the internal side of the vessel. On the contrary, the external side bearing the painted decoration of a palmette and a part of the standing human figure (body in the draped himation and a hand) represents a typical depiction of the groups of debating figures in various roles or scenes with standing and sitting people that are frequently present on the external sides of the red-figured kylikes. An appropriate imagination of the original composition of external side decoration provides one red-figured kylix attributed to the Painter of the Louvre G 456, dated to the period of 460–450 BC and found in Vulci (Bermond Montanari 1960, pl. 118; 119). Based on the presence of the palmette next to the standing figure on our sherd and compared to the mentioned kylix of the Painter of Louvre G 456, it is even evident that our piece comes from near the handle zone of the kylix. One cups of Lyandros painter show a concordance with our piece in positioning the palmettes in 'low positions' near of the line representing the 'standing level'. Furthermore, the meanders delimiting the tondo of this cup have very similar form including such features as the accent on particular elements of the meander (cf. e.g. Beazley 1963, 835, No. 2).

The mentioned features and types of the scenes are frequently depicted on the kylikes of other painters characteristic for the second quarter of the 5th century BC and the period around the mid-5th century BC, such as Curtius painter, Splachnopt painter, Painter of Bologna 417, Veii painter, Penthesilea painter and others. This time corresponds also to the period of the manufacture of our kylix.

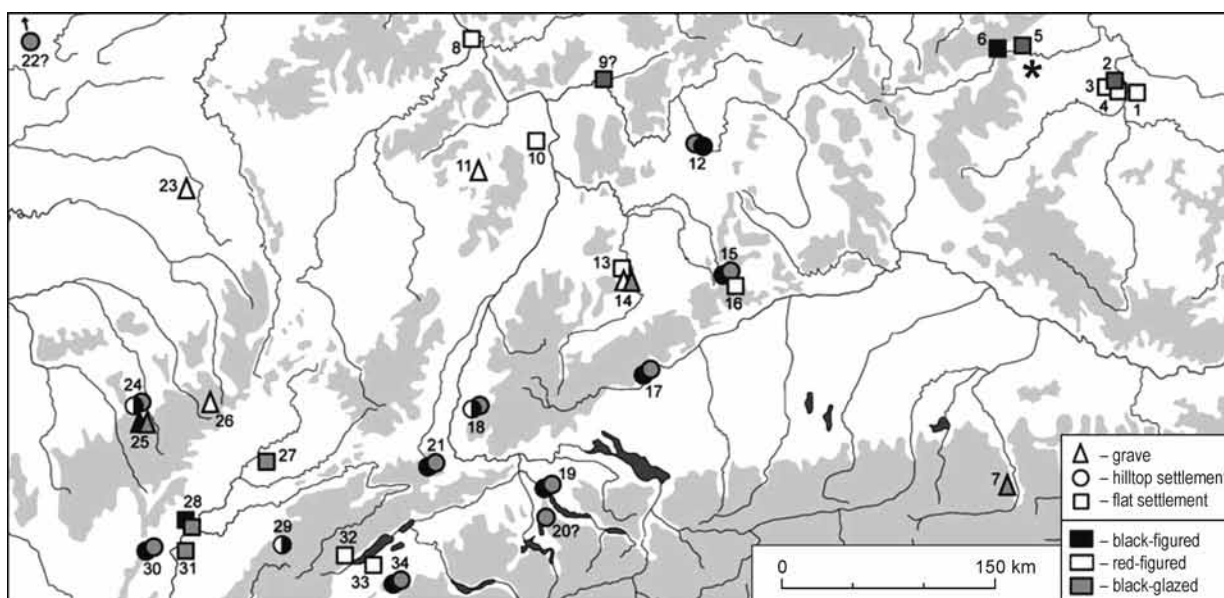


Fig. 10. Distribution of the Attic pottery north of the Alps. Asterisk – site of Holedeč. 1 – Praha-Pitkovice; 2 – Tuchoměřice; 3 – Dobrovíz; 4 – Praha-Ruzyně; 5 – Droužkovice; 6 – Kadaň; 7 – Bad Dürrenberg; 8 – Mühlheim-Kärlich; 9 – Hanau; 10 – Westhofen; 11 – Rodenbach; 12 – Marienberg; 13 – Eberdingen, Hochdorf; 14 – Asperg; 15 – Ipf; 16 – Kirchheim-Osterholz; 17 – Heuneburg; 18 – Breisach; 19 – Üetliberg; 20 – Baarburg; 21 – Britzgyberg; 22 – Kimmelberg; 23 – Somme-Bionne; 24 – Mont Lassois; 25 – Vix; 26 – Courcelles-en-Montagne; 27 – Beaujeu-Quitteur; 28 – Bragny-sur-Saône; 29 – Salins-les-Bains; 30 – Chassey-le-Camp; 31 – Damerey; 32 – Yverdon-les-Bains; 33 – Sévaz; 34 – Châtillon-sur-Clône (after Hansen/Böhr 2011, amended).

The second piece of the Attic pottery (No. 2) is substantially thinner. The external side is decorated by a standing figure in the frontal position of which we see the draped cloak on the body. The second side of the sherd seems to feature an unclear motive, perhaps of a floral nature. An interesting element is the draped cloak. Identically rendered drapery is depicted on one fragment of the kylix from the Late Hallstatt settlement in Dobrovíz in Central Bohemia (Trefný 2011, fig. 1a: 1), on one piece from Attic red-figured cup attributed to the painter Makron, found in Forcello/Bagnolo San Vito in Padan Etruria dated to around 480 BC (De Marinis 2005, fig. 54: 1; Paribeni 1986, fig. 127) or on one Attic red-figured fragment from Veio (D'Alessio 2001, 20). Identical draperies are characteristic also for some figures of already mentioned Painter of Bologna 417, for example on one red-figured cup from the collections in Orvieto, dated to 450 BC (Becatti 1940, pl. 16: 2) or one from the Ashmolean museum from the same period (Beazley/Payne/Price 1931, pl. 54: 3, 4). These comparisons allow us to consider the same chronology for the smaller sherd from Holedeč, namely the second quarter of the 5th century BC, or perhaps the period around the mid-5th century BC.

A somewhat problematic question is whether both pieces belong to one kylix. It seems that the substantially thinner piece with the central part of the frontally positioned figure could belong (according to its width) to such parts of the cup that are located a little bit closer to the rim. However, we have to consider that the 'interior part' of the cup would have in this case a painted decoration out of the medallion, which is not a typical feature of these cups. So the variant that both sherds belong to one vessel seems rather improbable. They come more likely from two different vessels. Considering that both sides of the smaller sherd are painted, it was originally perhaps also a part of a red-figured cup.

Imports of the Attic pottery represent in the group of finds of exogenous character in Bohemia one of the most significant class (Fig. 10). They are concurrently known from seven sites in the Bohemian Basin, being first identified here at the end of 1960s. However, their contemporary number has increased since this period. This increase was caused especially by various building activities and following rescue archaeological excavations around Prague during several last years (cf. Trefný 2011, 271, 272).

The first Bohemian find of the imported Attic ware was the fragment of the black-figured cup with palmette decoration from the Late Hallstatt settlement in Kadaň-Jezerka (Kruta 1972, 317). The fragment was found during the excavations of J. Bubeník and V. Kruta in 1968–1970. It was identified during

the work with finds in the laboratory and then published by D. Koutecký (*Koutecký 1975*) and later by D. Koutecký and J. Bouzek (*Bouzek/Koutecký 1975*). The latter work included the information that the find represented (at that time) the easternmost find of a kind in Central Europe and corrected its original chronology, according to which the fragment was dated to the early 5th century BC (*Bouzek/Koutecký 1975*, 157). As for the transfer of this Greek product to Central Europe, the role of the Greek colony of Massilia was stressed as the most probable site, where it came from (*Bouzek/Koutecký 1975*, 158; *Villard 1969*). It was also supposed, that the fragment had reached its final destination from the west, via river Ohře Valley, which connected Northwestern Bohemia and Upper Palatinate. The role of the South German area for the transfer of the fragment was stressed by J. Waldhauser (*Waldhauser 1974*). On the contrary, B. Shefton noted the analogous finds in Central and Northern Italy (Numana, Cesena, Este, Spina, Forcello; cf. *De Marinis 1988*, 54, fig. 10; *Fabrini 1984*, 32; *Favaretto 1976*, 60) and expressed an idea, according to which the fragment came to Northwestern Bohemia from Italy (*Shefton 2000*, 35, note 70). Furthermore, the Northern Italy is also the area of frequent occurrence of the Attic vessels with characteristic decoration by a band of palmettes, in a light stripe under the dark rim, frequently ascribed to Haimon painter or similar works (Chiusi, Rugge; cf. *Beazley 1956*, 565, 566).

The second find of Attic pottery in the Bohemian Basin is the group of small fragments found in August 1982 in Prague-Ruzyně during the excavation of Early La Tène settlement in the site of Jiviny by J. Kovařík (*Trefný 2008*). All fragments have belonged most likely to one red-figured stemless cup.

The third group of finds is represented by three fragments of the pottery with a black glaze, found during the excavations of the fortified Celtic 'princely' court in Droužkovice in Northwestern Bohemia, carried out by Z. Smrž during 1982–1986 (*Smrž 1996*). Except of the typological classification of the fragments, as well as the basic chronology, the authors of their publication expressed also the opinion, that these fragments came to Bohemia from the west, via South Germany (*Smrž/Bouzek 1994*, 586).

The fourth group consists again of the fragments with the black glaze. They have been found during an excavation of the Late Hallstatt/Early La Tène settlement in Tuchoměřice in Central Bohemia, organized during 1997–1998 by P. Sankot and A. Veselá (*Sankot 2002*, 93; 2006, fig. 2).

The fifth find of the Attic figured pottery was made in the Late Hallstatt/Early La Tène settlement of Prague-Pitkovice. The fragments of the red-figured kylix were found in the summer 2006 during an excavation organized by J. Polišenský (*Trefný/Polišenský 2008*). During the laboratory treatment of the archaeological finds, one other piece of the red-figured pottery was found, coming from the stemmed cup (*Trefný 2011*, 272).

The last registered finds of the Attic pottery from the Bohemian territory before the discovery of Holedeč pieces were two fragments of the red-figured cup from the Late Hallstatt/Early La Tène settlement of Dobrovíz in Central Bohemia. The excavation was organized by J. Řídký in 2007 (*Trefný 2011*, fig. 1a: 1).

All finds from the Bohemian territory may be classified as Attic. All of them come from the cups, with the exception of one fragment from Droužkovice. It comes more likely from a jar or an oinochoe (*Smrž/Bouzek 1994*, 581). The cups are represented by several types. The fragment from Kadaň-Jezerka was first interpreted as belonging to a cup-skyphos and compared by some exemplars from the Boeotian cemetery of Rhitsona (*Bouzek/Koutecký 1975*, 157; *Ure 1927*, pl. 21; 22), where mainly the analogies of the decoration may be observed (cf. *Rotroff/Oakley 1992*, pl. 1: 3, 4). This classification was doubted by B. Shefton (*Shefton 2000*, 35, note 68), who presented analogies from Corinth and Lechaion from the second quarter of the 5th century BC. He also considered the possible connection between the Kadaň fragment and the black glazed 'Castulo cup' from the grave No. 44/2 in Dürrnberg (*Penninger 1972*, 80, pl. 46: 33; *Shefton 1995*, 19; 2000, 35, note 68). It is worth noting that the profile of the sharp belly of the Dürrnberg piece is different enough from the Kadaň find and thus cannot fully serve as an analogy of the shape. On the contrary, the well-comparable exemplars, characteristic also by the profile of the belly, are represented for example by the 'Rheneia cups' (*Rotroff/Oakley 1992*, fig. 159; 161; 162; *Sparkes/Talcott 1970*, fig. 5: 456; *Trefný 2008*, 119). However, these analogies correspond only in shape, not in decoration, since they belong to the group of the black-glazed pottery.

The piece from Prague-Ruzyně may be reconstructed as a stemless cup (*Trefný 2008*, fig. 9). Such reconstruction is possible thanks to one fragment with the preserved part of the foot ring and one other fragment from the bottom (*Trefný 2008*, fig. 7: 3, 4). One rim fragment from Dorůžkovice comes from a cup, perhaps of the variant B or C (*Smrž/Bouzek 1994*, 581, fig. 3: 1; *Sparkes/Talcott 1970*, 92, fig. 4: 432, 433; pl. 20: 419, 420; *Trefný 2008*, 119). The same may be said also for the fragments from Prague-Pitkovice (cf. *Trefný/Polišenský 2008*, photo pl. 4: 2, 3). They may be easily classified due to round

meander defining the medallion on the cup's inner side. As already mentioned, also the third fragment from Pitkovice was originally a part of a cup. However, this was a stemmed cup (*Trefný 2011*, fig. 1a: 2). Also the fragments from Dobrovíz may be classified as belonging to a cup, however, on the contrary to the mentioned types, of slightly deeper form (*Trefný 2011*, fig. 1a: 1). Finally, one fragment from Droužkovice is ascribed to the jug-like vessel or an oinochoe (*Smrž/Bouzek 1994*, 581; *Sparkes/Talcott 1970*, fig. 3: 201–203). The last shape is a particular exception within the uniform typological spectre of the Bohemian finds. It may be also noted, that other types of vessels of the Greek provenance, known as imports from Southern or Western Europe, for example, the craters, are in Bohemia completely missing.

All Bohemian finds of the Attic pottery may be dated to 5th century BC. The black-figured fragment from Kadaň-Jezerka belongs to its first half (cf. *Bouzek/Koutecký 1975*, 157). Also the fragments from Droužkovice may be dated to the early or the first half of the 5th century BC (*Smrž/Bouzek 1994*, 581). Red-figured fragments from Prague-Pitkovice unfortunately do not feature any specific elements, usable for finer chronology. They may be thus chronologically defined only in connection with the finding circumstances and with the knowledge of the evolution and culmination of the influx of the Attic red-figured ware to Northern Italy, from where they were transported further north. Based on these indices, Prague-Pitkovice fragments may be dated perhaps to the second quarter of the 5th century BC (*Pape 2002*, 424; *Trefný/Polišenský 2008*, 480, 481). Also the red-figured fragments from Dobrovíz may be dated, based on the comparison with analogies from Forcello/Bagnolo S. Vito in Northern Italy and from Etruscan Veio, to the second quarter of the 5th century BC (*Trefný 2011*, 272, 273, obr. 1b). The set of the fragments from Prague-Ruzyně included also one depiction with a human face. This fragment was unfortunately preserved only in a drawing, nevertheless it provided several important indices for its dating approximately to the period of 460–420 BC (*Trefný 2008*, 118). It is at present still the only 'Bohemian' fragment with a depiction of the human face. The depiction finds particular analogies in the works of, e.g., Aischines painter, Penthesilea painter, Curtius painter, Achilles painter or Hasselmann painter (*Trefný 2008*, 118). However, it must be stressed, that these comparisons are made only using the mentioned drawing and have only a relative value.

Considering the attribution of Prague-Ruzyně cup, it is useful to point out the finds of the Attic pottery from the princely court in Osterholz in Baden-Württemberg near the princely hillfort of Ipf (*Böhr 2005*, 209–221). These finds are also ascribed to the circle of Penthesilea painter, namely to the Splachnoptes painter, Bologna 417 painter or Veii painter and their chronology is generally similar to the chronology of the Bohemian finds of the Attic pottery.

The way of the transfer of the Attic pottery to the Bohemian Basin reflects the tendencies of the Greek pottery import in the 5th century BC (*Pape 2002*, 419–424). The ratio of the Attic pottery decreased during the 1st quarter of the 5th century BC in the area of Massilia and in the north of the Alps while the black-figured pottery prevailed over the red-figured pottery during this period (*Pape 2002*, fig. 29). Similar is the situation in the region of Bologna, where the ratio is a bit favourable for the red-figured pottery. The decrease of the Attic imports during the 2nd quarter of the 5th century BC continues, but the import of the Attic red-figured pottery reaches in the area of Bologna and Spina its maximum, but in Massilia the black-figured ware still dominates. After the highest decrease of the import of the Attic pottery to Massilia during the mid-5th century BC follows again an increase, however, Attic pottery has not been distributed in greater amounts to the north of the Alps. The Bohemian finds of the Attic figured pottery are thus connected most likely with the influx of imports coming from North Italy (*Pape 2002*, 424; *Shefton 2000*, 35). Of great significance in this process are the Etruscan trade points in the Po plain such as Forcello/Bagnolo S. Vito (cf. *Reusser 2002*, fig. 1).

Domestic painted pottery from the feature 1a/21

Three pieces of local pottery come from the flat opened bowl-like vessel. They bear an ornament in red colour. This ornament on two of them (Nos. 3 and 4) clearly resembles the meander set in a circular band. The largest sherd (No. 5) seems to be also decorated by the circular band. However, it is not in this case filled with the meander-like pattern but with an S-shaped motive that is known as so-called Celtic lyre. The overall look of the fragments, including the colour paint as well as used motives, indicate that they belong without any doubt to the group of pottery, that is in the Late Hallstatt/Early La Tène Bohemia classified as so-called imitations of the Attic ware.

The presence of Attic pottery in the region north of the Alps (Fig. 10) instigated the manufacture of imitations that were in their shape and iconography reminiscent of the Greek originals. For example, the finds from Heuneburg (Kimmig 1983, fig. 59: 1, 2; Pape 2000, 97, 98) prove there were imitations of specific pottery shapes, such as the Little-master cups. Especially the meander motive, which is frequently found on various types of Greek black-figure and red-figure ceramics, is considered the connecting link between local production and the Greek models. Fragments of cups with meander-painted decoration from Late Hallstatt to Early La Tène settlements in Plzeň-Roudná (Bašta/Baštová/Bouzek 1989) and Chržín (Chytráček 2007; 2008) are believed to represent imitations, even though meander or other related motives are generally not unknown in the Central European material culture of Late Hallstatt or Early La Tène period (cf. e.g. Megaw J. V. S./Megaw M. R. 2007, 799; Pauli 1980, 202; Sankot 1994, 46, fig. 1; Venclová [ed.] 2008a, fig. 76: 6, 7).

The find from Plzeň-Roudná was originally considered to originate from the north-western foothills of the Alps, particularly because of the fact that Late Hallstatt ceramics from this region often feature painted decoration using similar techniques (Bašta/Baštová/Bouzek 1989, 471–473). This is also the case of the use of red or white colours on ceramics from the Late Hallstatt period, e.g. from Želenice, Radovesice, Třebenice, Kadaň-Jezerka or Plzeň-Litice (Chytráček/Metlička 2004, 35; Kruta 1972, 321; Waldhauser 1974; 1977; Zápotocký 1963, 163). The inspiration for this phenomenon is sought mostly in the region of Southern Germany, or around Salzburg. The presence of this type of ceramics there is then believed to reflect the knowledge of painted pottery from Etruscan or Greek context (Kimmig/Gersbach 1971, 29, 30; Kimmig/Vacano 1973, 79; Waldhauser 1974, 100). Apart from that, two fragments of hollow stems from Závist are considered imports (Drda/Rybová 2008, 56, fig. 70), with remains of pastose red and white paint, probably from the region of Slovenia.

The later find of a similar ceramic fragment in Chržín allowed us to consider the possibility of the local provenance of both finds (Chytráček 2002, 126; 2007, 484, fig. 17; 2008, 61; Megaw J. V. S./Megaw M. R. 2007). This presumption was then confirmed based on chemical and technological provenance analyses (cf. Trefný et al. 2011). These showed that the ceramic material of the studied samples with painted decoration from Late Hallstatt or Early La Tène settlement in Plzeň-Roudná and Chržín is very similar to the ceramic material of analysed fine pottery from the objects where local origin is attested (cf. Kloužková/Hanykýř 2010). Thus, the imitations of Greek painted figure pottery from Plzeň-Roudná and Chržín can be considered locally made. Also, the vessel from Plzeň-Roudná is most probably not a ceramic import from north-western foothills of the Alps, as it was thought at the time of its discovery (Bašta/Baštová/Bouzek 1989).

The evaluation of other details of the painting on the vessel with meander decoration from Chržín, recorded during visual inspection under the microscope and analysis of microscopic sections of the sample, has had a profound impact on the reconstruction of the technological process of the used decoration painting. Originally, the option was considered that the meander decoration in carmine red was painted directly on a dark background. Partial details of the painting and microscopic sections imply, however, that the circular band on the inside of the vessel filled in with meander was created gradually or by a composite application of several layers, resulting in the optical effect of a meander. From the technological perspective, it is a similar approach that was used frequently in painting of this decorative element on Greek ceramics with figure decoration or on some Hallstatt or Early La Tène metal artefacts (Frey 2002, fig. 161: 4; 171; 176: 5; Venclová [ed.] 2008a, fig. 76: 6, 7). This way of construction of the decorative element is also easier compared to direct painting, as for maintaining the proportions of all parts of the circular meander (cf. Trefný et al. 2011, fig. 8).

Following this hypothesis (Fig. 11), a finished undecorated pottery product had an orange colour of the surface engobe. In the second phase this was altered, and as a result most of the inner surface of the vessel was of dark colour, probably with the exception of the centre, that retained the colour of the engobe. Although there is a thin layer of dark colour under the layer of red, it cannot be estimated if it is present in all parts of the vessel, or whether it is just a patch colouring. Furthermore, this layer in terms of its thickness significantly differs from the dark layer on the outer surface of the vessel. In the third phase, red colour was applied to the central part of the inner surface. The shade of this colour is identical with that of the meander itself. In the following phase, two concentric circles were drawn in dark colour on the inside of the central part of the vessel. These circles also served as a guide for the delimitation of the sides for the future meander. In the last phase, the band between these two circles was complemented with small right-angled legs. The result was a meander motive in red arranged in the circular curved band.

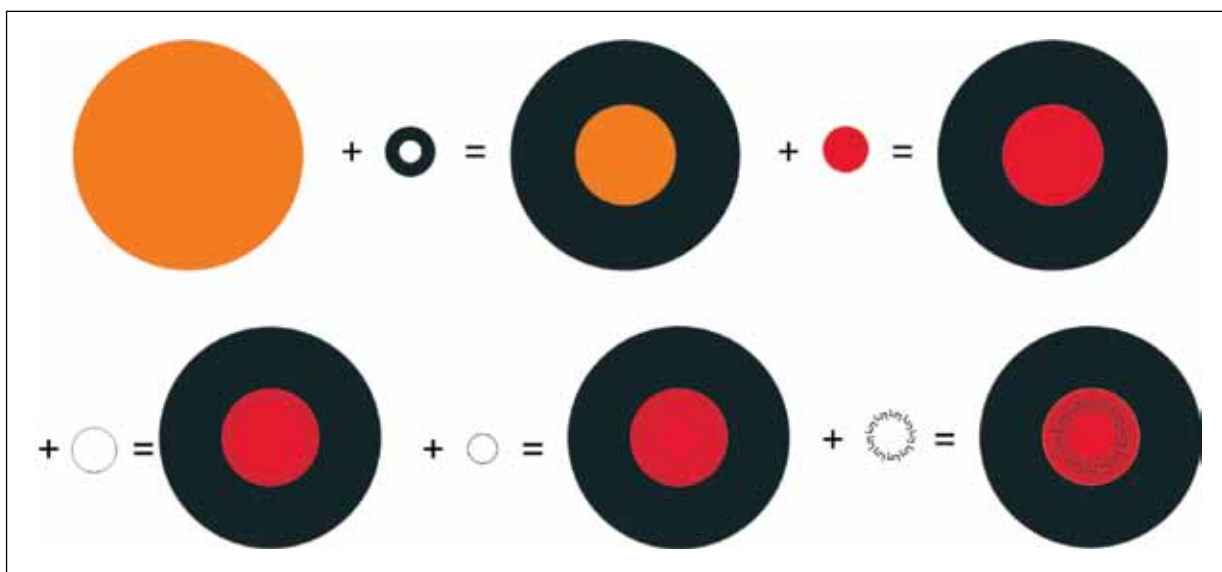


Fig. 11. System of the composition of the painted decoration on the domestic painted pottery.

We had no opportunity to study the Holedeč pieces under the microscope. However similar features, such as in case of the Chržín sherd, can be observed only by an eye. Several places of the painted decoration indicate, that the red paint is not placed on the dark background. This finding is confirmed by the fact, that the red colour is visible in some places under the dark slip. On the contrary, it seems that the dark colour is painted on the carmine red surface, so that the resulting effect is the carmine red meander or S-shaped motives. So, the system of the construction of the resulting decorative motif is the same as in case of Chržín vessel.

The entire execution and the individual decorative features on ceramic vessels from Plzeň-Roudná, Chržín and Holedeč display local producers' knowledge of Greek models. This corresponds with the current state of knowledge of the finds of imported Greek figured ceramics in Bohemia (Trefný 2011). The knowledge of southern ceramic originals is further indicated by a similar mode of painting of the circular band infilled by the meander. During the production of these pottery imitations, a similar approach could have been applied that we presuppose e.g. for the find of a ceramic object in the shape of a shoe with an upward drawn end from Early La Tène settlement in Prague-Pitkovice (Trefný et al. 2009). Based on local provenance and verification by methods of chemical and technological survey, we suppose that the maker of this artefact knew the formal shape of the original, which is the real footwear of this type that spread from Etruria to Bohemia. Although on the basis of the above-described argument, it is most likely that the local producers were familiar with southern models, it cannot be excluded that the producers got familiar with the given motives or technological approaches directly in the south and brought this knowledge to Central Europe. The importance of long-distance contact routes between the South and Central Europe cannot be overstated in the described process. Without their existence the transfer of individual artefacts of southern provenance would have been difficult to imagine, as well as important technological and decorative innovations.

The verification of a local provenance of the above-described finds from Chržín and Plzeň-Roudná, as well as the supposed local provenance of the pieces from Holedeč, casts a somewhat different light on some specific aspects of the study of Attic pottery imports, for example, on the value of this pottery in Central Europe. In recent years, there was uncovered an increased number of Attic pottery in Bohemia, and with these, theories emerged that the value of this class of pottery was lower, i.e. they were more accessible to a wider part of the society than it has been previously thought (cf. e.g. Bouzek 2007, 37, 38; Trefný/Polišenský 2008, 488). Other recent revelations turn these speculations in the original direction towards them as non-standard goods (cf. Trefný 2011, 283–290). The manufacture of the imitations in the region of Late Hallstatt and Early La Tène Bohemia could be seen as indirect evidence.

When we speak about the most important imitations of Attic pottery in Bohemia, another find needs to be mentioned – a bowl with red painted decoration in the shape of swans and S-shaped motives from an Early La Tène settlement in Radovesice (Kruta/Lička et al. 2004, 48; Waldhauser 1977, pl. 1: 1). Although the decoration of this vessel is not related to Attic ceramics, its decorative figure motive is entirely excep-

tional in this region and allows us to consider a link with regions with advanced techniques of figure painting on pottery, i.e. most probably from contemporary Italy or other surrounding areas. On the other hand, some features of the decoration, such as the S-shaped motive, are quite common in the transalpine Celtic region. This is also attested by its presence on the imitation of a red-figure kylix from Plzeň-Roudná (see above). In Central Europe there is known a similarly arranged decoration into a circle with the use of various S-shaped motives, which generally resembles the decoration of the Radovesice bowl. It is present for example on a bowl with S-shaped stamp decoration from a barrow burial in Thalmässing in Bavaria (Schussmann 2007, fig. 4: 2). It cannot be excluded that the origin of the bowl of Radovesice, i.e. its decoration, represented a mixture of influences from all the mentioned regions and the bowl could be a palimpsest of decorative motives or techniques of varied origin.

Fibulae from the feature 1a/21

The earliest fibula (No. 6; Fig. 8: 8) from the set of three pieces found in the sunken house in Holedeč is the bronze fibula of the *Fusszierfibel* type. One similar fibula is known from the settlement in Prague-Křeslice (Polišenský/Trefný 2011, fig. 17: 18). It is the example of the Mansfeld's F 3 type – the fibula with backwards turned foot and with the riveted decorative knob (Mansfeld 1973, 37). One fragment of the similarly turned foot end, including the decorative knob, is known from Heuneburg (Mansfeld 1973, pl. 11: 92; Sievers 1984, fig. 12: 6; 13: 1). One other fibula from this site with the bilateral spring, band-shaped bow and back turned foot end corresponds with the Prague-Křeslice fibula in lateral profile (Mansfeld 1973, pl. 11: 93; Sievers 1984, pl. 227: 2369). Another fibula from Heuneburg shows a similar lateral profile, however, with a different section of the bow, which is not band-shaped but circular (Mansfeld 1973, pl. 11: 91). Except for the last one, all mentioned Heuneburg parallels have been found in non-stratified finding contexts, so they cannot be used for the chronological classification. The last fibula (Mansfeld 1973, pl. 11: 91) is attributed to the local phase Ia, corresponding with Ha D3 (Mansfeld 1973, 72, table 26).

Other comparable finds are known from South German sites of Erlangen (Hoppe 1986, pl. 8: 12), St. Johann-Würtingen (Zürn 1987, pl. 283: 7) or Zwiefalten-Mörsingen (Zürn 1987, pl. 325: 11). As for the Bohemian parallels, one fibula from the hillfort Rubín has a very similar lateral profile (Sankot 2009, fig. 1: 11). This piece has, however, differently shaped decorative knob in the foot end (cf. Preidel 1937, fig. 4: 31). The same profile of the bow and of the turning of the foot end may be observed also at one iron fibula from the feature No. 62 in Radovesice in Northwestern Bohemia (Waldhauser et al. 1993, fig. 48: 3).

Based on the comparisons, the fibula from Holedeč may be classified according to the Mansfeld's typology (Mansfeld 1973) as a *Fusszierfibel* of the type F 3/B1 and dated to the period of Ha D2–Ha D3.

The second fibula (No. 7; Fig. 8: 9) belongs to so-called mask fibulae. The mask fibulae represent one of the most characteristic phenomena of the material culture of the Early La Tène period in Central Europe (Lt A). They constitute a type, which requires a substantial skillfulness of the maker. The majority of their bows were cast using the method of the lost-wax (Filip 1956, 81). It is therefore relatively complicated to classify these fibulae stylistically since each individual fibula in fact represents a peculiar original product. Their existence in the Bohemian territory is concurrently a particular indicator of the dissemination of the Early La Tène style eastwards, also to the Bohemian Basin. The focal point of their distribution area is located west of Bohemia, especially in Eastern France, Southwestern Germany – between Rhine and Danube rivers, individually also in Switzerland and Austria (Baitinger/Pinsker [Red.] 2002, fig. 149). This distribution pattern also indicates, that the origin of the Bohemian mask fibulae, or at least of some of them, in the mentioned zones cannot be completely excluded.

Our fibula from Holedeč (No. 7; Fig. 8: 9) finds almost exact analogies in the finds from unknown site in Germany (Binding 1993, pl. 6: 1; Kruta 1975, 15; Neumann 1973, 46), or from two other German sites, Altmannsdorf (Binding 1993, pl. 17: 12) and Gross Dechsendorf (Binding 1993, pl. 19: 1; Kersten 1933, 130). It is according to the classification of U. Binding (1993) close to the type 5 (*Maskenfibel mit anthropomorpher Kopfmaske und zoomorpher Fusszier*).

The Holedeč fibula is very important also in one other aspect. It features four decorative knobs made of the red sea coral. These knobs represent the important case (the fourth one in total) of the occurrence of the red sea coral during the Bohemian Early Iron Age (Ha C–Lt A). The Bohemian finds are in this category represented by four worked up (polished) branches of the red sea coral (*Coralium rubrum*) with the lengthwise openings found in the hillfort Minice near Kralupy nad Vltavou in Central Bohemia. These branches have been perhaps originally the components of the necklace (cf. Kruta/Lička et al. 2004, 41;

Slabina 1981, 81; *Trefný* 2012, fig. 12; *Trefný/Slabina* 2015, fig. 8). They were found in the erosion layers in the trench V, located across the fortification in the south side of the acropolis. These finds, together with the finds of the raw red sea coral from Poříčany in Central Bohemia represented up to recently the only one finds of a kind in the Bohemian territory during the Hallstatt and Early La Tène period (*Čtverák* 1986, 112, 113; *Venclová [ed.]* 2008a, fig. 95). The branch of the red sea coral found in the settlement pit in Zvoleněves near Slaný in Central Bohemia is dated already to the Middle La Tène period.

The branches of the red sea coral from Minice and Poříčany come probably from the area of Mediterranean (Tyrrhenian?) sea and represent very important evidence of the transfer of valuable ecofacts from the Mediterranean to Bohemian Basin. As for the determination of the long-distance routes, used for their transport to the Transalpine area, practically only two possibilities are supposed. One could have run via Alpine passes from Northern Italy, the second one runs via South France, along the valley of Rhône to the north (cf. *Benoît* 1956, 26; *Champion* 1976, 30, 31; *De Navarro* 1925, 483; *Jacobsthal* 1944, 133; *Jankuhn* 1969, 96; *Joffroy* 1962, 143; *Kimmig/Gersbach* 1971, 57–59; *Reinach* 1899, 12, 117; *Sievers* 1984, 18).

The presence of the find of the red sea coral in Heuneburg (*Kimmig/Gersbach* 1971, pl. 8: 5; *Sievers* 1984, 18, pl. 29: 363) is of great significance also for the Bohemian finds. This location could indirectly imply, where the finds from Minice and Poříčany came to Bohemian Basin from. The Heuneburg coral means also a certain chronological indication for Bohemian ones. It is dated to the local horizon IV, equal to Ha D1 (*Mansfeld* 1973, pl. 26) and is characterised as one of the earliest finds of a kind in the Transalpine area (*Kimmig/Gersbach* 1971, 58). The fibulae or the pins using the red sea coral inlays appear in the Transalpine zone just since Ha D1 (*Sievers* 1984, 18). The manufacture of the red sea-coral necklaces is documented here for example by a find from the tumulus in Kaltbrunn in Southern Germany (cf. *Kimmig/Gersbach* 1971, 57) or two beads from Heuneburg (*Sievers* 1984, 18).

The working up or polishing of the Minice finds is attested by the absence of any superficial structure or pattern, which is typical for the raw corals, as seen for example on the surface of Zvoleněves or Heuneburg finds (*Moucha* 1980, 516, fig. 2).

The third find of the red sea-coral in Bohemian milieu is of a recent date. It was made during the research of the rich Late Hallstatt period tumulus grave in Rovná in Southern Bohemia. The red sea-coral was a part (inlay) of two fibulae with decorated foot (*Fusszierfibel*) and also of the toilet set (*Chytráček et al.* 2015, 79). The use of the red sea-coral is in this case slightly later, than in the case of Minice hillfort, since the grave falls into Ha D2–Ha D3. Despite that it must be pointed out, that the example of preservation of the inlays of the red sea coral in both fibulae represents the first documented case of such use of the coral during the Early Iron Age in Bohemian milieu.

The fact, that the red sea coral had except of decoration also the function of an amulet is registered in the reports of the antiquity authors. Pliny the Elder emphasizes its protective and medicinal effects (*Plinius Secundus*, 32, 21). The significant exporters of the products of the red sea-coral were according to him Drepanum (Trapani) in Sicily, Aeolian islands, the regions of Naples, Gravisca in Etruria or islands near the Cote d'Azur in Southern France (*Kimmig/Gersbach* 1971, 58; *Plinius Secundus* 1963, 32, 21;).

Since the red sea-coral could have had a substantial value in the Late Hallstatt/Early La Tène Central Europe, it may be in Minice, Poříčany, Rovná and also Holedeč regarded also as indirect evidence for the presence of the high situated social elite in these sites.

The last fibula from Holedeč (No. 8; Fig. 8: 10) belongs to the type with a parabolic-shaped bow, that is typical for Pre-Dux horizon (Lt B1a). Analogous finds in the Bohemian milieu may be found for example in Prague, Závist (*Motýková/Drda/Rybová* 1984, fig. 44: 3), Lahoš (Holodňák/Waldhauser 1984, fig. 2: 10, 11) or Prague-Řeporyje (*Waldhauser* 2001, 402). The Závist fibula is dated to the period of around 380 BC (*Motýková/Drda/Rybová* 1984, 397), to the turn of Lt A and Lt B. However, the fibulae with parabolic-shaped bow are typical mainly for the Pre-Dux horizon corresponding to Lt B1a (*Venclová [ed.]* 2008b, 88). Based on the mentioned chronology, it is possible to date the fibula from Holedeč to the period defined by the turn of the phases Lt A and Lt B and the end of Lt B1a. It would correspond approximately to the period of ca 390/380–350 BC.

ARCHITECTURE OF THE TWO-STOREYED POST HOUSE (FEATURE 1a/21)

Domestic imitations of Attic pottery as well as three pieces of the fibulae were found in the great sunken house. Nearby settlement pit 1b/21 contained two sherds of Attic pottery. The dimensions of feature 1a/21, including the diameter of the postholes, indicating the presence of really massive wooden posts, or

rather columns, suggest, that the house must have been really large and perhaps also two-storeyed. Such houses would not appear for the first time in the architecture of the Bohemian Early Iron Age. The princely house, excavated during the research of the Late Hallstatt/Early La Tène settlement is known from Dolní Břežany near the significant central point – hillfort of Závist in the southern suburb of Prague. The plan of this house reached 13,6–14,8 × 9 m. Its internal structure as well as other observations brought the excavators to the idea of the reconstruction of this house as two-storeyed building, made of oak and beech logs, with hipped roof (Drdal/Rybová 1998, 73, 74; Motyková 1986). Since this structure was largest in the settlement, it was (considering also unusual building technique and specific finds) interpreted as the local chieftain's house.

Two-storeyed houses with unusually large dimensions and with finds of Attic pottery in close vicinity, playing here a role of luxurious items, suggest very clearly that this house belongs to a similar type as that one from Dolní Břežany. It is also most likely that this house was inhabited by the ruler or chieftain of this settlement unit, that could display also particular dominance over other neighbouring settlements.

It is very tempting to interpret the whole finding context in Holedeč as a princely court (*Herrenhof*). This idea could be supported by the fact, that we know the situations from Bohemia (Droužkovice, Prague-Pitkovice) as well as from Southwestern Germany (Osterholz), when the Attic pottery and other relevant items of non-standard value are found in similar princely courts. Also, the linear ditch located in the vicinity of the great house (feature 8/21; cf. Fig. 2) could represent the palisade fencing of such compound. However, although such a variant does not seem impossible, the connection between the house and ditch with a hypothetical palisade could not be proved. Thus, the variant of the existence of the Late Hallstatt/Early La Tène princely court in this site has only a hypothetical value.

INTERPRETATION OF THE SITE

As for the interpretation of the site, the aerial photograph (Fig. 12) showing the crop marks of other sunken features confirms that all three significant features are a part of a more extensive settlement (however, without knowing safely that all the features belong to the same timespan as these two sunken houses and a settlement pit). The dominant great house (feature 1a/21) together with another sunken house (feature 6/22) may be without any doubt ascribed to the local social elite and interpreted as a manor house, as indicated by the imports of non-standard value found nearby and their imitations including the bronze items.

Considering the social elite, we usually suppose its members to be the part of local 'aristocracy'. However, other mighty individuals, with particular potential to gain the expensive luxurious items may be also the members with a high social status. Attic pottery from Sevaz-Tudingez in Switzerland was found in a hut that belonged probably to a local blacksmith (Kaenel 2005, 54). Similarly, in Prague-Pitkovice and adjacent sites representing an Early Iron Age settlement agglomeration, the presence of finds such as imported Greek red-figure pottery or transport amphora that was probably used to transport wine, i.e. commodity with presupposed above-average value, suggests a presence of local elites at the site. Nevertheless, the social elite from Prague-Pitkovice could have been represented by the rich craftsman, focussed on a specialized craft. Evidence for these crafts is recorded here for example by the finds of the files or iron slag in Prague-Křeslice (Polišenský/Trefný 2011, 850), Prague-Pitkovice as well as Prague-Benice. In the feature No. 30 at the settlement of Prague-Křeslice, an iron cylindrical object was found enclosed from one side by a semi-spherical part (Polišenský/Trefný 2011, fig. 16: 2). Around the perimeter of this object, there were several holes resembling holes for the fastening of the object with nails to its wooden central axis. Approximately in the middle of the cylindrical part, there were four larger openings which are situated in opposition on two different levels. Because of the smaller holes on the perimeter of the cylindrical part of the object, it appears that it could be interpreted as an axle bearing around a wheel's central shaft. Four larger opposing holes could represent holes for the placement of two linchpins. Two very similarly shaped bronze cylindrical objects from Švihov were interpreted in the same way, as were their closest parallels from Tholey in Saarland (Filip 1956, pl. 7: 9, 10; Haffner 1989; Schönfelder 2002, 328, fig. 6). Of course, different function of this artefact cannot be ruled out. This is attested by analogies from Heuneburg, whose shape is identical to the described object, but those have not been unequivocally interpreted (Sievers 1984, pl. 106: 1428, 1429).

Regardless of the function of the described object, its importance lies in the way it was made. The object consisted of two parts: a semi-circular lock that was produced by beating over a wooden mould, and a cylindrical body with holes. These two parts were then welded together, and the material used



Fig. 12. Site of Holedeč with the crop marks of sunken features in the close vicinity of the researched site (map source: www.mapy.cz).

for joining them was either a bronze or copper wire or strip. The iron cylindrical object hence represents very interesting evidence for the use of this technology in Late Hallstatt Central Bohemia.

When processing the finds from the last, yet unpublished, Early Iron Age settlement in the vicinity of Pitkovice stream in Prague-Benice, an iron artefact was recorded in feature No. 254. This object has a conical shape with spout-like ending. In terms of shape, suitable analogies may be found among the bronze objects from Hradenín (*Dvořák 1938*, fig. 26: 25; 38: 1; 45; *Venclová [ed.] 2008a*, fig. 19: 8–11), Rubín hilltop site (*Sankot 2009*, fig. 2: 1), Mírkovice (*Chytráček 1990*, fig. 16: 8) or at other sites, and they are usually interpreted as decorative endings, i.e. parts of a wagon (*Chytráček 1990*, 123). This object is interesting for the process used in its manufacture. Its conical and spout parts are connected with a protrusion and in the join, there are remains of bronze or a similar alloy, as in the case of the Prague-Křeslice cylindrical artefact. Thus, also in this case there is evidence of joining two iron objects by bronze or copper strip. When the Prague-Křeslice artefact was published, including the initial consideration of its manufacturing process (*Polišenský/Trefný 2011*, fig. 25), there was some doubt about this interpretation. After the discovery of the second artefact in the same region, made using the same technology, it can be accepted that in this region there might have been a smithy (smithies?) that was able to produce welded artefacts, apart from other products. The discovered artefacts then significantly contribute to the knowledge of specific metalworking technologies that were known and used in this microregion. They also confirmed the significant role of the local producers that might be the local powerful sort of rulers, surrounded by Attic pottery and Greek wine.

Turning our attention back to the site of Holedeč, it is necessary to stress one topographic aspect. The Late Hallstatt/Early La Tène settlement in Holedeč is located 8.8 km of the direct distance from the significant hillfort of Rubín near Podbořany (*Preidel 1930*; *Sankot 2009*; *Trefný 2010*). This hillfort belongs to the most significant Bohemian central places of the Early Iron Age (*Chytráček et al. 2010*), together with the known hillforts such as Minice near Kralupy nad Vltavou (*Trefný/Slabina 2015*) in Central Bohemia, Závist near Prague (*Drda/Rybová 2008*) or Vladař in Northwestern Bohemia (*Chytráček/Šmejda 2005*). The hilltop site of Rubín in Podbořany region is in the concentration of exogenous artefacts quite exceptional. At this site, which used to have an elite court in its centre, there is a marked concentration of objects, which are characteristic for North Italian or Southeastern Alpine region, i.e. for the Golasecca culture area. There are for example sanguisuga fibulae, navicella fibula or several types of pendants that can be ascribed to this culture. It is very tempting to interpret this concentration, which has no parallels in Bohemia, in association to the hypothetical movement of individuals from the given region, although it is only a speculation. In any case, the composition of finds at this hilltop site fully confirms its function, which is also accentuated by its position in the vicinity of important communication corridors.

As for the Early Iron Age in Rubín, the settlement concentrates here in Ha C and Ha D. Thus, sites of Rubín and Holedeč could have been co-existing in Ha D. Although the distance of nearly 9 km is not negligible it is also not too much. In this perspective, some mutual relationships of these two sites in the contemporary settlement network may be considered. The Holedeč settlement could have had some subordinate role to the Rubín central point. Nevertheless, it cannot be fully excluded that both settlements have existed at the end of Ha D with equal status.

It is not by a chance, that many imports of southern provenance are concentrated in Rubín hillfort and its surroundings, including the Attic pottery from Holedeč. Northwestern Bohemia is located on the course of important contact route heading towards the south-west, which played a crucial role for the influx of the exogenous artefacts to this area (cf. *Trefný* 2017, fig. 6: 2). The course of long-distance routeways is not only suggested by the distribution of exogenous artefacts but also by other phenomena, such as the position of central places like significant hillforts or settlements, where these imports could have found their purchasers. Focusing on so-called central places, the most important hillforts of the Bohemian Early Iron Age – Závist in the southern periphery of Prague, Minice near Kralupy nad Vltavou in Central Bohemia, Rubín in Northwestern Bohemia and Vladař in Western Bohemia –, all these sites (*Chytráček et al.* 2010) are situated directly on or in the vicinity of the courses of long-distance routes. Also, other significant settlement forms, such as the princely courts, demonstrate a certain relationship to long-distance routes. The best known example, the court in Droužkovice (*Smrž* 1996), is situated near the route along the river Ohře. The position of the court in the settlement at Prague-Pitkovice (*Trefný/Polišenský* 2014, 280, 281) could correspond with the course of the route running around Závist and then going further to the north-east. The court in the hillfort of Hradiště near Němčice in Southern Bohemia (*Michálek/Lutovský* 2000), on the bank of the river Volyňka, is situated near the course of the Otava River and thus near (or practically on) the course of a very important long-distance route. The same may be said for the court in Štítary nad Radbuzou Hostětice in Western Bohemia (*Chytráček/Metlička* 2004, 257–271). As regards the significant unfortified lowland settlements, many examples in this category also lie in the vicinity of long-distance routes. This is for instance the case of Dolní Břežany in the southern periphery of Prague in close vicinity of the hillfort of Závist (*Motyková* 1986), Radovesice near Teplice in Northwestern Bohemia (*Waldhauser et al.* 1993), Plzeň-Roudná in Western Bohemia (*Bašta/Baštová/Bouzek* 1989), Chržín (*Chytráček* 2007; 2008), Poříčany (*Čtverák* 1986) in Central Bohemia or Tuchoměřice in the north-western periphery of Prague (*Sankot* 2006).

CONCLUSION

The site of Holedeč represents an important settlement with a particular relevance for the study of the social elite during the Ha D/Lt A period in Northwestern Bohemia and related issues. This site represents the seventh locality with Attic pottery in Bohemia and the first site in the Northwestern Bohemia, where the Attic red-figured pottery was identified. The finds of the Attic pottery in Holedeč also indicate the intensity of the greatest influx of the Attic pottery in Bohemia that is typical for the second quarter of the 5th century BC. The presence of kylikes between the imported pottery contribute to the widespread imagination of the consumption of the southern wine by the Early Iron Age mighty Celtic individuals, including the use of the appropriate ‘symposiastic vessels’. Nevertheless, we know that the Central European Celts were able to use the Attic pottery also for totally ‘non-symposiastic’ beverages (cf. *Rageot et al.* 2019).

Finds from Holedeč are very significant also in one other aspect. Three sherds of the local painted pottery that imitate the Attic imported models suggest that this phenomenon could have been in the Late Hallstatt/Early La Tène Bohemia more frequent. This frequency may be explained in two levels. Firstly, it may be the artistic inspiration by the attractive look of the Attic pottery, compared to the local wares. Secondly, particular frequency of the imitation may be influenced by the higher price of the original or non-standard accessibility of Attic pottery in the local milieu.

The site of Holedeč gains a particular relevance also thanks to the discovery of unusual type of a building. The imagination of the great house together with other features existing here during the period of Ha D2–Lt A/Lt B1, thus c. for 170 years, is very tempting. However, we cannot ignore the possibility that it could also have originated anytime during this period. The combination of the unusual architecture and the exogenous costly imports well contribute to the thesis that the contemporary rulers inhabited not only significant hillforts, but also flat settlements, as after all attested by many mentioned courts and other relevant settlement forms.

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Nové doklady pozdně halštatské/časně laténské společenské elity ze severozápadních Čech

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Souhrn

Záchranný archeologický výzkum v Holedči u Žatce v severozápadních Čechách odkryl pozůstatky dvou sídlištních objektů neobvyklé velikosti, představující relikt pozdně halštatského/časně laténského panského domu. Výplně těchto objektů, včetně jedné další sídlištní jámy, obsahovaly tři bronzové spony, tři zlomky domácích imitací attické keramiky, zlomky lokální časně laténské kolkované keramiky, zlomky mazanice, zvířecí kosti, nálezy parohoviny, mušle, přesleny, skleněný korálek, dva střepy attické keramiky a další nálezy.

Bronzové spony byly zastoupeny jedním exemplářem spony se zdobnou patkou (*Fusszierfibel*) typu F 3/B1, jednou maskovitou sponou a jednou sponou s parabolicky tvarovaným lučíkem a volnou patkou. Sponu se zdobnou patkou lze datovat do rozmezí HD2–HD3. Maskovitá spona náleží do fáze LTA. Konečně spona s parabolickým lučíkem je typickou náplní předdouchcovského horizontu (LTB1a), nicméně může se objevit i v období přechodu fází LTA a LTB1a. Maskovitá spona obsahuje čtyři ozdobné knoflíky, které jsou vykládány červeným mořským korálem. Tyto knoflíky představují čtvrtý doklad výskytu importu červeného mořského korálu na území Čech během starší doby železné (HC–LTA). Doposud byly nálezy tohoto ekofaktu známy z knížecího dvorce v Poříčanech, z pozdně halštatského hradiště v Minicích u Kralup nad Vltavou a z pozdně halštatského knížecího hrobu v Rovné u Strakonice, kdy byly součástí toaletního předmětu a jedné spony.

Velmi významným nálezem jsou tři zlomky malované keramiky, které lze interpretovat jako domácí napodobeniny řecké figurové keramiky. Po nálezech obdobného charakteru z pozdně halštatských sídlišť v Plzni-Roudné a Chržína na Slánsku jde o třetí skupinu nálezů daného druhu. Fakt, že attická keramika byla v pozdně halštatských a časně laténských Čechách napodobována svědčí o skutečnosti, že tvůrcům těchto imitací byly známy předlohy napodobenin, tedy skutečná attická keramika. To je ostatně v Holedči doloženo i nálezy tohoto typu. Skutečnost, že attická keramika byla imitována je zároveň nepřímou indicií vysoké hodnoty těchto luxusních importů, resp. jejich nikoliv běžné dostupnosti.

Vlastní zlomky attické keramiky pochází z číši, tedy nádob určených ke konzumaci vína. Díky jejich nálezům se Holedč stává sedmou lokalitou na území ČR s výskytem tohoto typu keramiky. Oba zlomky náležící k červenofigurové keramice lze datovat do průběhu druhé čtvrtiny 5. století př. Kr., přesněji snad do období 460–450 př. Kr. Náleží do období, kdy do zaalpské střední Evropy směřovalo největší množství řecké červenofigurové keramiky. Společně s ní do střední Evropy doputovalo i řecké víno, jak dokládají nálezy transportních vinných amfor, v jednom případě (Praha–Pitkovice) i z oblasti Čech.

Velmi významným objevem je i obytný areál reprezentovaný zejména zahloubeným domem s kůlovou konstrukcí s neobvyklými rozměry. Ty dosahovaly hodnot 912 × 814 cm, s největším zahloubením činicím 122 cm. Plošný rozsah domu činil 74,2 m². Zahloubené objekty na českých pozdně halštatských nebo časně laténských sídlišťích bývají obvykle výrazně menší. Podobný zahloubený dům, s ještě většími rozměry, byl objeven na pozdně halštatském až časně laténském sídlišti v Dolních Břežanech u Prahy. Byl rekonstruován jako dvojpatrový a přisouzen místní společenské elitě. Stejnou interpretaci předpokládáme i v případě panského domu z holedečského sídliště.

Nálezy luxusního charakteru, které na území Čech doputovaly prostřednictvím sítě dálkových kontaktních tras, společně se sídlištními objekty neobvyklé velikosti interpretované jako panské sídlo jednoznačně danou lokalitu identifikují jako pozdně halštatské/časně laténské sídliště spojené se soudobou společenskou elitou. Ačkoliv prozatím nelze dokázat, zdali se jedná o knížecí dvorec (*Herrenhof*) či nikoliv, význam tohoto sídliště v současné sídelní síti je danými nálezy v kombinaci s neobvyklou architekturou jednoznačně potvrzen.

Význam zdejšího nálezového kontextu tkví ještě v jedné skutečnosti. Obvykle bývají v prostředí pozdně halštatských či časně laténských Čech za tzv. centrální místa, tedy regionální centra moci, obchodu, řemesel apod. považovány významné výšinné opevněné lokality. Nicméně rozhojnění specifických nálezů či archeologických situací, které bývají chápány jako indikátory centrality, během posledních zhruba dvaceti let, naznačují, že velmi významná sídliště nalézáme nejen na výšinných lokalitách, ale i v rovinách. Je tedy pravděpodobné, že centrální místa nemohou být již více spojována pouze s hradišti, resp. výšinnými lokalitami. Naopak, tuto funkci mohou mít kromě výšinných center i některé rovinné aglomerace či sídliště. Příkladem takové situace je např. několik pozdně halštatských či časně laténských sídlišť podél Pitkovického potoka na jihovýchodním okraji Prahy, stejně jako sídliště v Holedči nedaleko Žatce.

Obr. 1. Poloha lokality na mapě (mapový zdroj: www.cuzk.cz).

Obr. 2. Plán lokality s prozkoumanými objekty 1a–b/21 a 6/22.

Obr. 3. Fotografie objektu 1a/21.

Obr. 4. Fotografie objektu 1b/21.

Obr. 5. Fotografie západní části objektu 6/22.

Obr. 6. Fotografie východní části objektu 6/22.

Obr. 7. Plány a řezy objekty 1a–b/21 (1, 3) a 6/22 (2).

Obr. 8. 1–4 – attická keramika z objektu 1b/21; 5–7 napodobeniny attické keramiky z objektu 1a/21; 8–10 spony z objektu 1a/21. Měřítka: a – 1–7; b – 8–10.

Obr. 9. 1–5 – příklady časně laténské kolkované keramiky z objektu 1a/21; 6 – skleněný korálek s očky z objektu 6/22.

Obr. 10. Rozšíření attické keramiky severně od Alp. Hvězdička – lokalita Holedeč. 1 – Praha-Pitkovice; 2 – Tuchoměřice; 3 – Dobruška; 4 – Praha-Ruzyně; 5 – Droužkovice; 6 – Kadaň; 7 – Bad Dürrenberg; 8 – Mühlheim-Kärlich; 9 – Hanau; 10 – Westhofen; 11 – Rodenbach; 12 – Marienberg; 13 – Eberdingen, Hochdorf; 14 – Asperg; 15 – Ipfl; 16 – Kirchheim-Osterholz; 17 – Heuneburg; 18 – Breisach; 19 – Üetliberg; 20 – Baarburg; 21 – Britzgyberg; 22 – Kemmelberg; 23 – Somme-Bionne; 24 – Mont Lassois; 25 – Vix; 26 – Courcelles-en-Montagne; 27 – Beaujeu-Quitteur; 28 – Bragny-sur-Saône; 29 – Salins-les-Bains; 30 – Chassey-le-Camp; 31 – Damerey; 32 – Yverdon-les-Bains; 33 – Sévaz; 34 – Châtillon-sur-Glâne (podle Hansen/Böhr 2011, doplněno).

Obr. 11. Systém skládání malované dekorace na domácí keramice.

Obr. 12. Lokalita Holedeč s patrnými porostovými příznaky v místech zahloubených objektů v těsném sousedství zkoumaného místa (mapový zdroj: www.mapy.cz).

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