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INSTYTUT ARCHEOLOGII I ETNOLOGII POLSKIEJ AKADEMII NAUK

MAGDALENA NATUNIEWICZ-SEKUŁA
MAREK BACZEWSKI

WEKLICE

A CEMETERY OF THE WIELBARK CULTURE
ON THE EASTERN MARGIN OF THE VISTULA DELTA
(EXCAVATIONS 2005–2018)



Warszawa 2023



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A Germanic head with a Suebian hair-knot on bronze kettle mount
form Czarnówko, Lębork district

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Yew stave bucket with brass fittings from grave 579(462)
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Weklice 1991. Łucja and Jerzy Okulicz-Kozaryn (centre) exploring grave 210.
Photo: Grzegorz Stasielowicz



Weklice 1997. Jerzy and Łucja Okulicz-Kozaryn (centre) with the tombstone from grave 360.
Photo: Przemysław Wielowiejski

Łucja Okulicz-Kozaryn and Jerzy Okulicz-Kozaryn in memoriam

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I. FOREWORD (M. NATUNIEWICZ-SEKUŁA)

The Wielbark Culture cemetery in Weklice, site 7, in Elbląg commune, Elbląg district, Warmian-Masurian Voivodeship, is located in the Elbląg Heights, at 19°34'44" longitude and 54°06'60" latitude. It is listed in the AZP archaeological site registration system as Site 1 within Area 17-53 (Fig. 1, 2). This listed site (72/A/85) is firmly established as a canonical site in academic literature and popular science writing on the Roman Period¹, primarily owing to the richness and diversity of the finds.

Prior to the publication of the present volume, the site had been described in the first part of a monograph on the cemetery, which presented discoveries made before World War II and included a catalogue of graves found during excavations in 1984–1985, 1987–1989, 1991–1992, 1994–1995, and 1997–1998 (made under the supervision of Prof. Jerzy Okulicz-Kozaryn, then working at the Institute of Archaeology of the University of Warsaw) and in 2003–2004 (under the direction of Dr Magdalena Natuniewicz-Sekuła from the Institute of Archaeology and Ethnology of the Polish Academy of Sciences, hereafter IAE PAS)². That volume also contains chapters on the reconstruction of the local geographical environment of the necropolis in the first centuries AD, the geological and stratigraphic situation of the site, as well as selected issues related to the funeral rites. That publication also includes specialist analyses looking at anthropological and botanical aspects as well as textile remains. It also clarifies the internal (local) chronology of the cemetery, which differs in a number of aspects from the dating used in the interregional chronological system of the Wielbark Culture and the Central European *Barbaricum* more generally³.

That monograph also presented an extensive history of the village, complete with a discussion of the origin of the name Weklice and a history of research at the cemetery, including archival sources starting with the earliest accidental finds made in the 1820s up until modern-day research, which began in 1984⁴.

However, a new archival source has since come to light and is duly presented in the present volume. This is a card placed in an envelope from the personal archive of Carl Engel, currently held in the *Lehrstuhl für Vor- und Frühgeschichte* at the Georg August University of Göttingen⁵. The card contains an anonymous photograph with a note depicting a view of the cemetery from the south-west, now destroyed by an existing gravel pit. The photo (of which two prints survive) was taken in the spring of 1934 from a spot on the road from Bogaczewo, Elbląg district (former *Guldenboden, Kreis Elbing*) to Weklice (former *Wöklitz or Woeklitz/Woecklitz, Kreis Elbing*) (Fig. 3). This is the oldest known source predating World War II to contain information on the activity of Prussian archaeologists at the cemetery⁶.

⁴ M. Natuniewicz-Sekuła, J. Okulicz-Kozaryn 2011, 9–10, 15–22.

⁵ I owe information about this source to Prof. Adam Cieśliński (Associate Professor at the Faculty of Archaeology, Warsaw University). I am also grateful to Mr. Horst Junker (*Museum für Vor- und Frühgeschichte*) in Berlin for his assistance in obtaining rights for its publication in this volume.

⁶ Information obtained from Mr. Horst Junker suggests that the envelope was used as a sleeve for storing negatives and photographic prints. However, the fact that it is addressed to Prof. Wolfgang La Baume suggests that he re-used it to send such photographs to another individual. The post stamp is dated 12 June 1950, a time when W. La Baume had just become head of the *Vorgeschichtliche Abteilung* at the Herder-Institut in Marburg. His new position would have brought him into contact with many various documents relating to the archaeology of East Prussia. Presumably, Prof. La Baume would have reused the envelope to forward the negative and two prints from Weklice to somebody

¹ See literature on the site in subsection I.1.

² M. Natuniewicz-Sekuła, J. Okulicz-Kozaryn 2011.

³ H. J. Eggers 1951; R. Wołągiewicz 1968; K. Godłowski 1970.

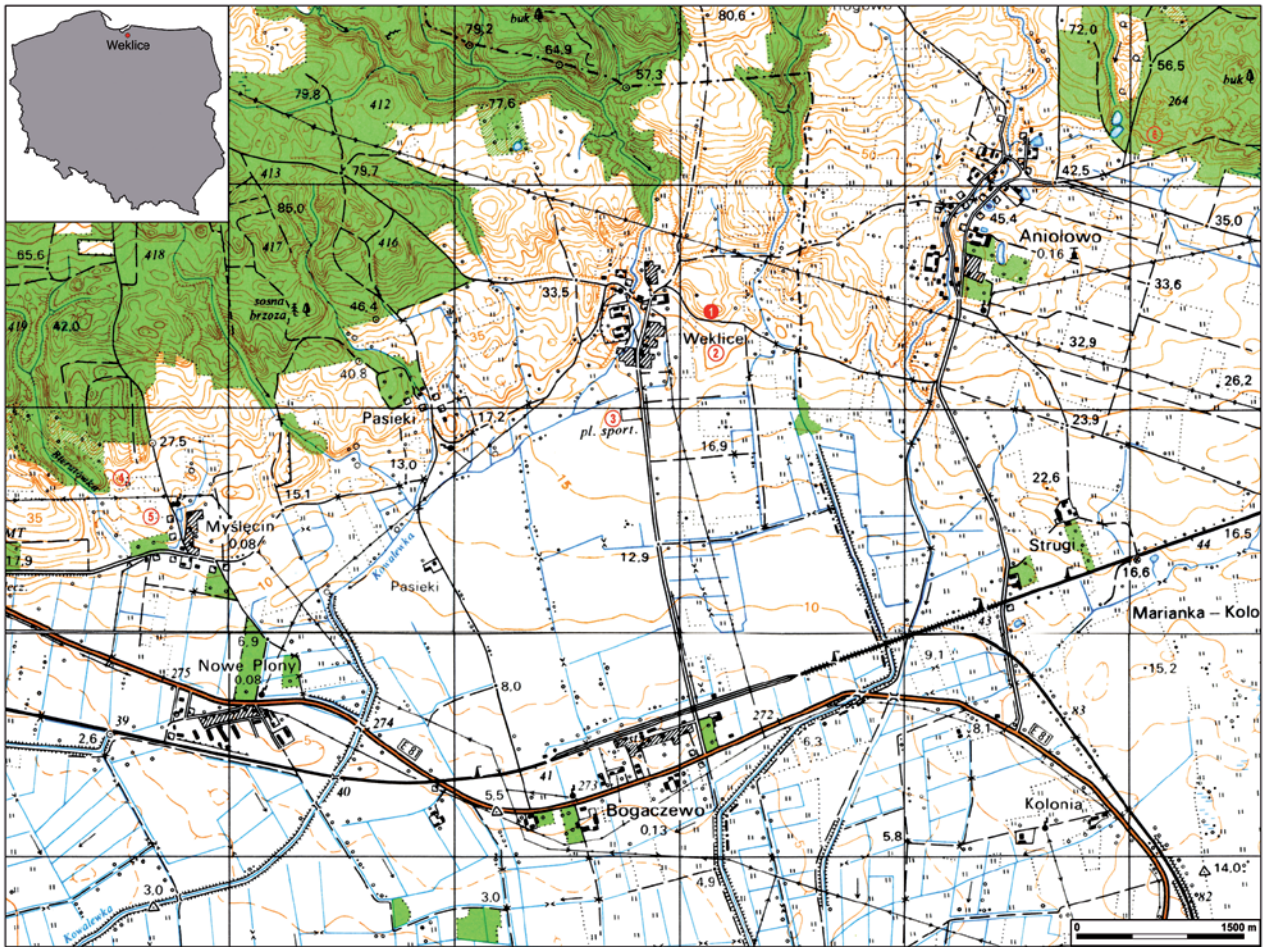


Fig. 1. Weklice. Location of the cemetery and local Roman Period sites of the Wielbark Culture at the south-western edge of Elbląg Heights. 1 – cemetery in Weklice, site 7 (AZP 17-53/1); 2 – settlement (?) in Weklice, site 10 (AZP 17-53/71); 3 – settlement (?), site 11 (AZP 17-52/38); 4 – cemetery in Myślęcín (AZP 17-52/27); 5 – settlement in Myślęcín (AZP 17-52/14); 6 – cemetery in Aniołowo (AZP 17-53/7). Graphics: M. Natuniewicz-Sekuła

The present study includes Wielbark Culture material from graves and associated features discovered during excavations in 2005–2009, 2011–2016, 2018⁷,

else, possibly Herbert Jankuhn from Kiel, who became a professor (since 1956) and later head of the *Lehrstuhl für Vor- und Frühgeschichte* at the Georg August University of Göttingen. However, other possibilities exist. What we do know is that not all of the photographs and drawings in the Carl Engel archive were originally his. Some material was added to the archive at later dates. The Weklice source may have been such a later addition, particularly given that the negative is not at Göttingen anymore. The negative may have been lost, or it might be held in the photography collections of the Herder-Institut in Marburg. The negative and prints from Weklice continue to hold secrets, and those explanations remain conjectural, but it is highly likely that Wolfgang La Baume had played a role in keeping those photographs in Göttingen.

⁷ Excavations at Weklice were resumed in 2022 following interruption caused by the COVID-19 pandemic.

which were conducted by M. Natuniewicz-Sekuła on behalf of the IAE PAS (Fig. 4) as well as those stray finds from the years 1984–1998, 2003–2004 which were not included in the first part of the monograph, and stray finds from seasons 2005–2018. Analyses of the sources are kept to a reasonable length, limited to the specific elements of the funeral rite or selected categories of items. In this respect, the publication moves away from the principle of formal analysis applied to all categories of monuments, as used in the other volumes of the *Monumenta Archaeologica Barbarica* series. This choice is guided by the fact that research at the cemetery has not been completed. The book also contains a longer chapter by Marek Baczewski discussing the horizontal stratigraphy of the cemetery.

The need to continue archaeological work in Weklice is not limited to research considerations, but also relates

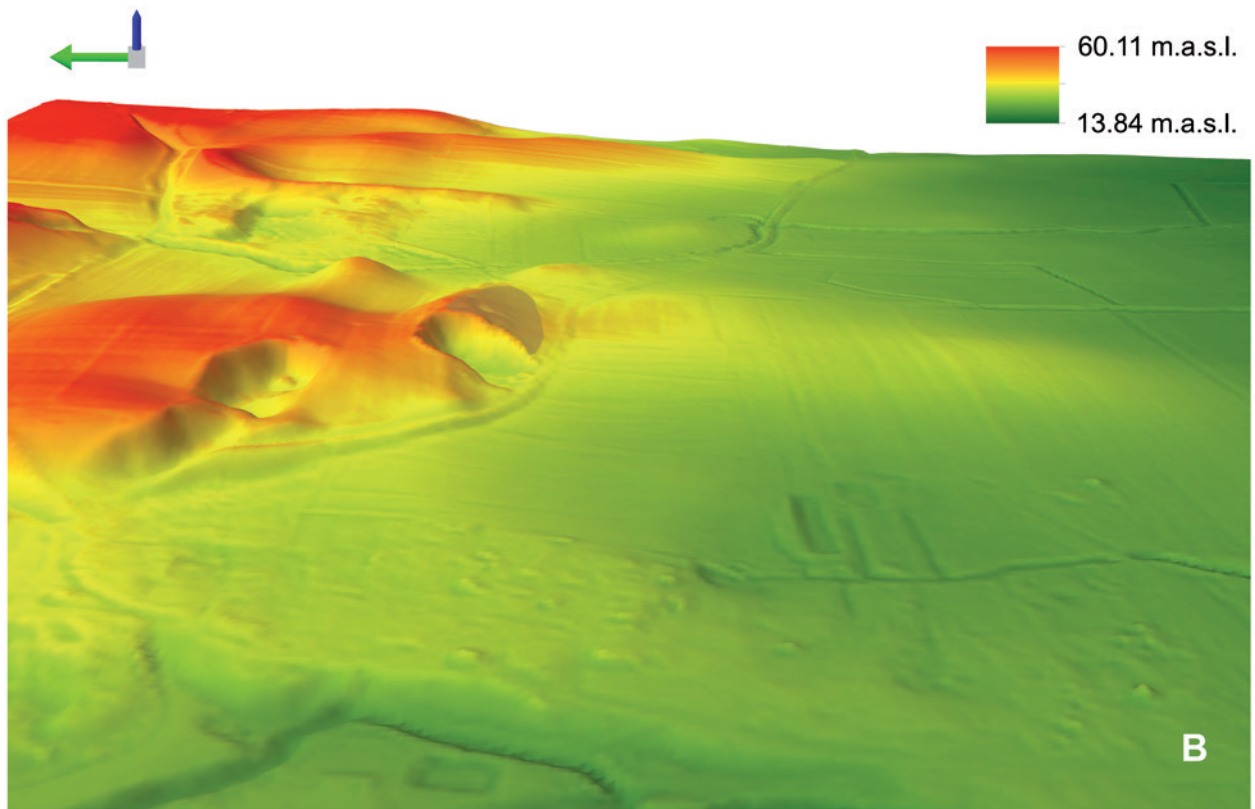
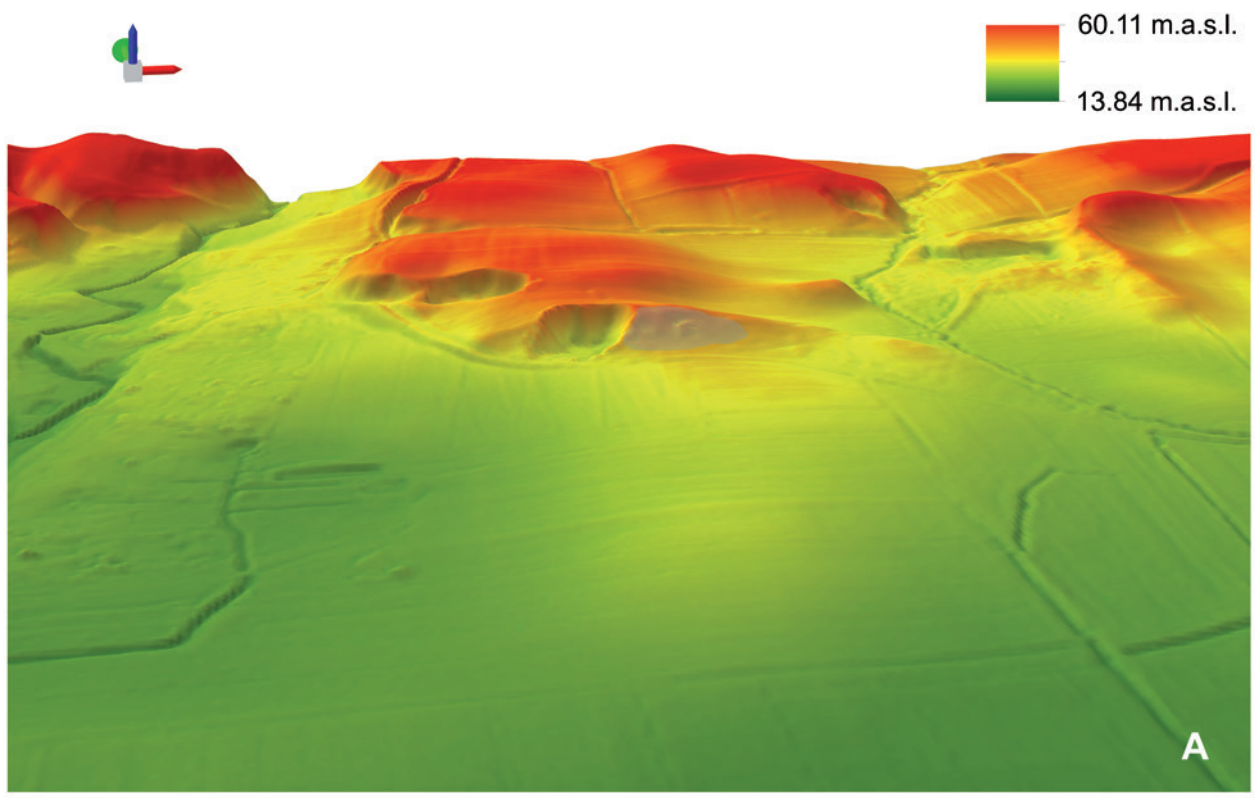
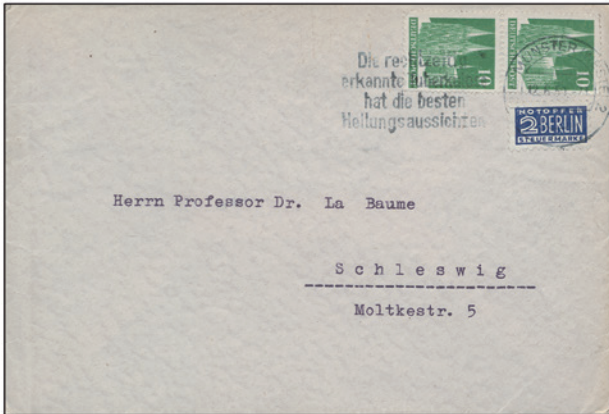
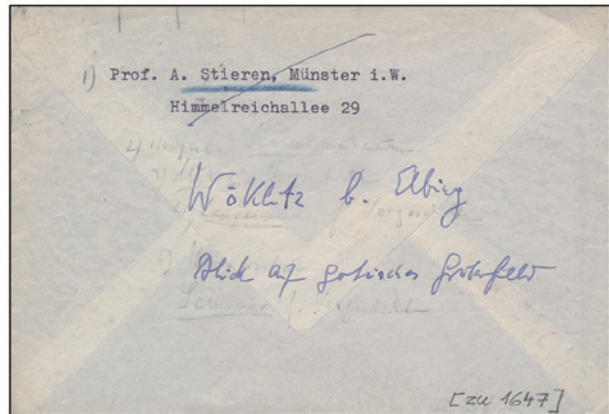


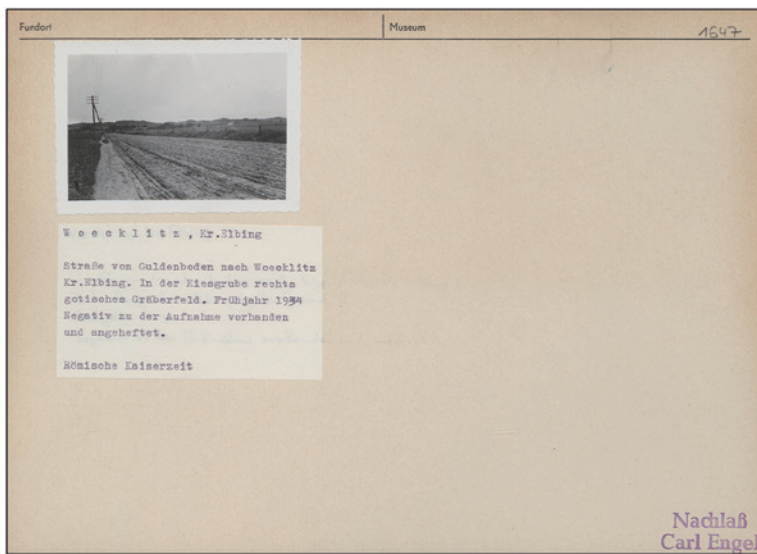
Fig. 2. Weklice. Digital terrain model of the cemetery area, with the explored extent marked. A – view from the south;
 B – view from the west. Graphics: M. Baczewski



A



B



C



D

Fig. 3. Archival material from the file of Carl Engel related to Weklice. The photograph shows the cemetery (marked with an arrow) as seen from the south west. A – pressmark SUFG, CEnA 1-1647A/1; B – pressmark SUFG, CEnA 1-1647A/2; C – pressmark SUFG, CEnA 1-1647/1; D – pressmark SUFG, CEnA 1-1647B/1. © Seminar für Ur- und Frühgeschichte, Georg August-Universität Göttingen.

Graphics: M. Baczewski, M. Natuniewicz-Sekula

to conservation concerns⁸. In 2005–2008, work was done in the north-eastern part of the site, previously made unavailable for excavation by the presence of a dense stand of pine trees. In 2008, verifying excavations were additionally done in sections formerly studied in the 1990s. As a result, further Wielbark Culture graves were discovered under the backfill. Therefore, verification work on late twentieth century excavations had also been done by 2018. The scope was extended to include a previously unexplored area in the eastern and southern parts, which was now explored in order to identify the boundaries of the cemetery (Fig. 5). Despite those research efforts, the goals have not been achieved. The boundaries of the cemetery have not been identified, and excavations are still in progress, with no obvious end date in sight.

Close to twenty years of field research at Weklice have been made possible by financial support provided by a number of institutions. These have included: 2005 – Centre for the Protection of Archaeological Heritage (Ośrodek Ochrony Dziedzictwa Archeologicznego),

⁸ Although the site is listed as a protected historical monument, it remains vulnerable as traces of gravel pit use and illegal detectorist activity have been found in the area.

Museum in Elbląg, Warmian-Masurian Voivodeship Conservator for the Protection of Historical Monuments (Warmińsko-Mazurski Wojewódzki Konserwator Zabytków); 2006 – Archaeology and History Museum in Elbląg (Muzeum Archeologiczno-Historyczne w Elblągu, hereafter MAH), Polish Archaeological Association, Warsaw Branch (Stowarzyszenie Naukowe Archeologów Polskich, oddział w Warszawie), IAE PAS; 2007 – MAH and IAE PAS; 2008 – Monumenta Archaeologica Barbarica Foundation (further FMAB), Polish Ministry of Culture and National Heritage (as part of the Cultural Heritage Programme for the Protection of Archaeological Monuments); 2009 – Regional Branch of the Office for the Protection of Historical Monuments in Olsztyn (Wojewódzki Oddział Służby Ochrony Zabytków w Olsztynie), IAE PAS; 2011 – local government of the Warmian-Masurian Voivodeship, FMAB; 2012 – IAE PAS; 2013 – FMAB; 2014–2016, 2018 – FMAB, private sponsor, IAE PAS.

Invaluable financial support has also been generously provided on several occasions by the Faculty of Archaeology, University of Warsaw as well as the Institute of Archaeology and Ethnology, University of Gdańsk, when the two institutions used their teaching funds to

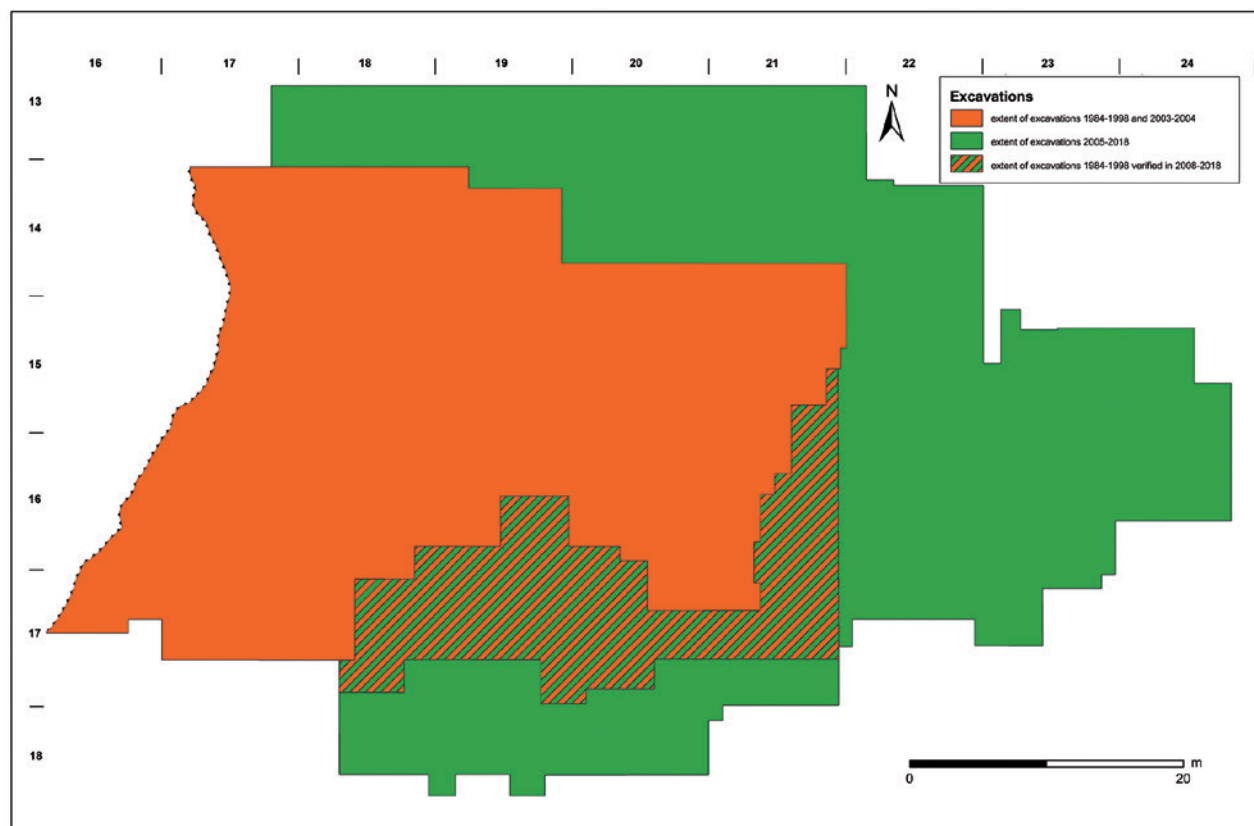


Fig. 5. Weklice. Extent of the area explored in 1984–2018. Graphics: M. Baczewski, M. Natuniewicz-Sekuła

cover the cost of student excavation internships. Our expeditions have repeatedly received unstinting support from the Archaeology and History Museum in Elbląg. The Museum has generously shared its staff and resources free of charge on many occasions. I am particularly grateful to Grzegorz Stasielowicz from the Museum as well as to residents of Weklice: Jan Puzio, Michał Rękas and the late Waldemar Rękas.

I am very grateful to all my colleagues who have made this work possible in ways great and small by helping over many years in organising and coordinating the logistics of excavations in Weklice. To name them all would be an impossible task. However, I particularly want to thank Paulina Auch and Dr Michał Auch, Agnieszka Bocheńska, Prof. Bartosz Kontny, Dariusz Nachyła, Michał Sekuła, Dr Anna Strobin. Research at the Weklice cemetery would not have been possible without the participation of archaeology students, to whom I remain forever indebted. They have offered their much-needed help with good cheer and unflagging commitment over a period of many years, happily providing tremendous amounts of hard work in all weathers and living conditions. Thank you from the very bottom of my heart!

Given the variety of research perspectives presented in the following chapters, this publication could not have been written without the collaboration of a number of people. Jarosław Strobin and Dariusz Nachyła did the labour-intensive conservation work. Ewa Pazyna took great pains to expertly prepare the magnificent drawings of items found in the graves. The ceramic vessels were reconstructed and put back together by Marta Dec. The photographs of the items are by Michał Dąbski, Dariusz Nachyła and Grzegorz Stasielowicz. Over the years, the photographic documentation of the excavation work has been done by the author herself as well as students and other collaborators.

This volume also contains some specialist analyses⁹. Brief notes summarising¹⁰ those findings are also to be found in the relevant catalogue entries. Osteological description and analysis was carried out by Prof. Iwona Teul. This is supplemented by a chapter by Dr Beata Cienkosz-Stepańczak, Dr Aleksandra Lisowska-Gaczorek, Dr Jacek Pawlyta and Prof. Krzysztof Szostek, who use isotope studies to discuss the nutrition strategies of the Weklice population. Identifications of raw materials and types of preserved fabric fragments were done by Dr Maria Cybulska and Prof. Jerzy Maik. Identifications of residues of botanical organic samples are by Maria Michniewicz. The findings

of radiocarbon dating were done by Dr M. Natuniewicz-Sekuła and Prof. Jerzy Sikora. Comments on the structure and technology of selected items made of copper, silver and gold alloys and decorated with enamel were summarized by Dr Paweł Gan. Grzegorz Czopowicz presented findings relating to the chemical composition of ceramics and discussed selected vessel forms.

The items published in this volume currently form a museum collection, most of which is part of the permanent exhibition at the MAH entitled “Goths. From the Baltic Sea to Rome”. The research documentation is stored at the IAE PAS. A copy is held in the Voivodship Office for the Protection of Monuments in Olsztyn, Elbląg Branch (Wojewódzki Urząd Ochrony Zabytków w Olsztynie, delegatura w Elblągu).



This publication is the result of two research projects:

1. *Weklice, site 7, Elbląg district. Cemetery of a Roman Period elites in the heart of the amber coast* – realised by the IAE PAS in 2014–2016, financed by the National Science Centre (agreement no. UMO-2013/11/D/HS3/02473) and
2. *Weklice. Cemetery of Germanic elites in the heart of the amber coast* – realised by the FMAB in 2022–2023, co-funded by the Minister of Culture and National Heritage from the Culture Promotion Fund – under the program “Protection of Archaeological Monuments” (agreement No. 03109/22/FPK/NID).

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⁹ See section IV.

¹⁰ See subsection II.2.

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II. CATALOGUE (MAGDALENA NATUNIEWICZ-SEKUŁA, MAREK BACZEWSKI)

II.1. INTRODUCTION

The catalogue comprises descriptions and inventories of 161 features (nos 493–640). This includes 140 Wielbark Culture graves and 14 related features as well as two graves (607, 632) and five features (494A, 515, 531, 583, 584) with different chronologies and origins (see descriptions in subsection II.2.). The graves and features discussed here were discovered during excavations in 2005–2018. The catalogue also comprises stray finds (605 items or fragments) discovered in 1984–1998 (by Prof. Jerzy Okulicz-Kozaryn, then Institute of Archaeology, University of Warsaw) and 2003–2018 (by Dr Magdalena Natuniewicz-Sekuła, Institute of Archaeology and Ethnology, Polish Academy of Sciences)¹¹. Descriptions of features and finds follow the conventions used in the series *Monumenta Archaeologica Barbarica*.

The cemetery is partially destroyed by human activity, a process that began in ancient times and continued until the present. This includes the remains of a medieval layer (presumably the outskirts of a settlement)¹²,

¹¹ This publication does not discuss stray finds of several hundred fragments of Wielbark Culture vessels or medieval ceramic materials, which will be discussed separately.

¹² The layer in question consists of compacted, greasy, mid- and coarse-grained dark brown sand, black in places. The layer is rich in organic material and contains numerous charcoals. It is located in a depression which was originally at the foot of the hill where the cemetery is situated. The layers become thicker towards the S, with a maximum thickness of ca. 70–80 cm. The layer contains numerous items of archaeological interest including Wielbark Culture finds from destroyed graves as well as some medieval objects. In terms of medieval material, the earliest items (fragments of ceramic vessels) date back to the turn of the ninth and tenth centuries, and the most recent date back to the fifteenth century. At this stage of exploration, this layer cannot be interpreted in full. Presumably, it comprises the remains of the northernmost outskirts of a medieval settlement, which

several centuries' worth of farming involving deep ploughing¹³, and modern sand and gravel extraction. As a result, a high proportion of graves had been destroyed or disturbed prior to the start of archaeological exploration. The descriptions in this catalogue include notes on the form and state of preservation of the graves, the treatment of the buried individuals and other funerary activities, and the specifics of ceremonial garments. This information suggests similarities and differences between the local community and the neighbouring populations, as well as probable intercultural relations.

The complicated stratigraphy of the site poses considerable challenges in terms of identifying the relationships between the different layers, graves and other features. Identifying the horizontal stratigraphy of the graves was similarly problematic (see more in Section III). The outlines of the grave pits were often not immediately apparent, either because the graves were disturbed and destroyed by secondary trenches or other forms of human activity (primarily farming), or because of the natural properties of the location. Because the cemetery was situated on a geological formation known as an esker, characterised by irregular layers of sand, gravel and clay permeated with iron oxides, cavities from old tree branches, animal burrows or secondary trenches would create conditions for hardpan precipitations. Those plentiful copper-coloured

extends further S of the cemetery, taking up a sizable promontory on a flood terrace of Lake Družno (cf. M. Natuniewicz-Sekuła, J. Okulicz-Kozaryn 2011, 13–15, fig. 2).

¹³ Two ploughed layers have been identified at the cemetery: a modern layer situated above the medieval layer (finds from that layer date back to the sixteenth to the nineteenth centuries) and a contemporary ploughed layer containing twentieth century material (for more information about the geological and stratigraphic character of the site, see M. Natuniewicz-Sekuła, J. Okulicz-Kozaryn 2011, 13–15, fig. 2).

inclusions, often forming at the edges of graves, were often very helpful in piecing together the complicated stratigraphy and layouts of the grave pits¹⁴. All those aspects are taken into consideration in descriptions of graves provided in this catalogue.

All features found on the site were mapped onto a coordinate grid squares (10×10 m). The grid coordinates were marked with Arabic numerals: first stripes E to W, then columns N to S¹⁵; the individual plots within the grid were marked with letters: A, B, C, D. When discussing individual features, locations are identified by plot letter.

The features were numbered in the order in which they were explored. In more than a dozen cases, particularly where the stratigraphy was unclear, the same numbers were given to two or more features, appended with extra letters (A, B, C...). Each description starts with the grave number, followed by the identification of the burial ritual: inhumation or cremation. The following burial descriptors were used: 'inhumation' and 'cremation': 'pit' or 'urn' and in warranted cases 'cremation-inhumation'. In many cases, additional information on grave structure or burial placement was also included, such as 'log coffin', 'cobbled surface', 'with a layer of decomposed organics' etc.

To describe the state of preservation, the following expressions were used for graves and burials:

- 'destroyed': the burial and the equipment are displaced or incomplete, the outline of the grave pit or some other element is only partially visible, the cremation urn and the burnt bones obviously scattered in one or more locations;
- 'disturbed': the burial and the equipment are partially displaced within the grave pit, the cremation urn may be damaged, however the bottom remains in its original location;
- 'opened': the grave pit or the burial had been disturbed by a secondary trench, in most cases in ancient times, and some or all of the equipment had been removed.

The current state of preservation of the graves was influenced by a variety of factors: damage caused by human activity, ancient and modern (with graves having been disturbed by pits made for later burials, secondary

trenches, medieval settlements, farming or modern and present-day damage), as well as other forms of destruction caused by factors such as plant roots or small burrowing animals. Not all damage could be explained with certainty, so probable interpretations were included in the descriptions of individual graves where possible. Additionally, the descriptions identify the dimensions of the pit, its alignment relative to the cardinal directions, the fill material, the presence of human or animal bones¹⁶, wooden burial structures or charcoals, and the locations of grave equipment items. The basic findings of anthropological, botanical and textile analysis were also included¹⁷. Where available, anthropological data concerning the age, sex and body height of the buried individuals were provided at the end of the description.

Plans of graves and features are presented in the scale of 1:20. Unless stated otherwise, the drawings of finds and miniature vessels are done in the scale of 3:4, and the drawings of urns and larger metal or wooden vessels are done in scales 1:3 and 1:2. The grave fills were very varied in terms of colour and consistency, making it impossible to come up with a consistent system for presenting such information in graphic form. Instead, grave descriptions in the catalogue contain detailed information about the respective fill layer or layers. For the sake of clarity, symbols were used to mark the extent of trenches related to post-funerary interventions from the Roman and migration periods, as well as the damage caused in the Middle Ages, modern times and in the present day. Where a scale other than 1:20 is used to illustrate the arrangement of necklaces or clusters of items, such information is marked on a separate linear scale. The drawings and photographs included in the plates are identified by catalogue numbers.

The order of description for grave inventories is as follows: basic garments and decorative elements – brooches, bracelets, buckles, belt strap ends, belt mounts and other fittings; elements of necklaces and ornamental arrangements, S-shaped clasps, capsule pendants, pear-shaped pendants, spherical pendants, bucket pendants, axe pendants, metal, glass and amber beads (including amber pendants), springs, necklace spacers, rings. Spurs were treated as elements of riding gear. This was followed by everyday items and utensils such as combs, needles, pins, distaffs and spindle whorls; then,

¹⁴ Cf. M. Natuniewicz-Sekuła, J. Okulicz-Kozaryn 2011, 13–15.

¹⁵ In 1984, when the archaeological exploration of the site began, the full extent of the cemetery was not known. Field observations suggested that it was completely destroyed by a gravel extraction pit more than a dozen meters across situated W of the site (cf. Fig. 4). Hence, the coordinate grid was created for the gravel pit and the W-most edge of the hill (square 1-1). As a result, the plan of the cemetery in this publication starts with high numbers (squares 14-16).

¹⁶ Analyses of animal bones are not discussed separately, however the relevant findings are included in subsections II.2., IV.2. Unless stated otherwise, the taxonomic identifications of animal species are by Dr Anna Gręzak (Faculty of Archaeology, University of Warsaw).

¹⁷ See subsections IV.1., IV.3., IV.4. in the present volume.

respectively, ceramic vessels (including accessory vessels and urns), glass, metal and wooden vessels, and tools – knives. Finally, the descriptions list metal casket fittings: lock fittings, keys, springs, braces and others. Caskets or organic containers¹⁸ are mentioned in descriptions where the preserved outline made it possible to capture the size and construction of the item. Where applicable, the descriptions end with finds of unclear function or non-characteristic fragments of ceramic vessels. A large number of catalogued items made from precious metals and copper alloys was analysed in terms of chemical composition. Where the copper alloy could be identified, the exact type was included in the catalogue (e.g. brass, tin-lead brass)¹⁹.

The catalogue descriptions of equipment items include classifications according to relevant typologies. Where the items in question deviated from the standard typological model in terms of shape or technology, such deviations were discussed in detail. Where such items represented forms that were unknown or unclassified, a more detailed description was likewise provided. Owing to the very fragmentary preservation of some of the ceramic vessels from cremation graves (caused by poor quality of the ceramics), no reconstructions or typological classifications were possible in those cases.

The following typological classifications were used to describe the finds: for brooches, O. Almgren (1923; A.)²⁰, J. Andrzejowski (2017); K. Exner (1941);

¹⁸ Containers are defined here as items without metal fittings, preserved *in situ* in the form of decomposed organic substances (wood or bark). The term casket was used for findings visible *in situ* as clear outlines of decomposed wood containing elements of metal fittings (lock fittings, springs, keys, internal and external braces).

¹⁹ Cf. M. Natuniewicz-Sekuła 2013, 2017; 2020 and subsection IV.6. in the present volume.

²⁰ The system for describing spring-cover brooches, group II, East series, types A. 40 and 41 as well as crossbow brooches with a tendril foot, group VI, series 1, types A. 161 and 162 needs to be discussed separately. In the case of the former, given the multiplicity of forms, often including shared workshop characteristics (including secondary ones) and given that O. Almgren did not propose unequivocal distinguishing features between them, both types were treated jointly as A.II.40-41. Despite the attempts to come up with an alternative typological classification for such brooches in the literature (cf. M. Olędzki 2002; J. Schuster 2006), such typological refinements equally did not prove unequivocally applicable to the material found at Wekllice. In this category of brooches there are also forms with stylistic features of types A. 38 and A. 40-41. In those cases, the form A.II.38/40-41 was used (see also M. Natuniewicz-Sekuła; J. Okulicz-Kozaryn 2007, 66–70). As far as crossbow brooches with a tendril foot are concerned, the items found at Wekllice proved similarly impossible to unequivocally identify as O. Almgren's types A. 161 or 162. Generally speaking, those are two varieties of the same type, which, depending on the variant, have a more arched or knee-shaped bow

R. Jamka (1963), J. Garbsch (1965), W. Jobst (1975), E. Riha (1979), T. Dąbrowska (1995), A. Kokowski (1995), U. Lund Hansen and M. Przybyła (2010), A. Chilińska-Früboes (2020); for rod bracelets, M. Natuniewicz (2000); for shield-headed bracelets, T. Wójcik (1982); for buckles, R. Madyda-Legutko (1987; ML); for belt strap ends, K. Raddatz (1957), R. Madyda-Legutko (1992; 2011; ML); A. Ciesliński (2021); for belt fittings, R. Madyda-Legutko (2016; ML); for S-shaped clasps, A. von Müller (1957), K. Patalan (2022); for bucket pendants, I. Beilke-Voigt (1998); for axe-pendants, A. Kokowski (1998); for glass, amber and metal beads as well as amber pendants, M. Tempelmann-Mączyńska (1985; TM); for rings, Chr. Beckmann (1969); for spurs, K. Godłowski (1970), J. Ginalski (1991); for combs, S. Thomas (1960; Thomas); for metal pins, B. Beckmann (1966), A. Juga-Szymańska (2014); for needles, T. Dąbrowska (1997); for ceramic vessels, R. Wołagiewicz (1993; RW); for glass vessels, H.J. Eggers (1951) and U. Lund Hansen (1987); for metal vessels, H.J. Eggers (1951); for fittings of wooden vessels (buckets), A. Becker (2006); for casket fittings, locks, braces and keys, A. Kokowski (1997).

The following abbreviations were used to describe dimensions: L – length, Thk – thickness, W – width, Dm – diameter, H – height. Also, weight (Wt) was included for some measurements, and volume (Vol) was measured for Roman glass and metal vessels. The weight was measured only for items made from amber and precious metals (gold and silver), and, in some warranted cases, from copper alloys or clay.

The inventory lists conclude with dating information. The same chronological system was used as in the first volume of this monograph, with later modifications²¹.

II.2. GRAVES AND OTHER FEATURES

(MAGDALENA NATUNIEWICZ-SEKUŁA)

Grave 493 (inhumation, destroyed) **SQ 15-22 D, 16-22 B**
Grave pit captured at the depth from ca. 0.52 to 0.60 m²², right underneath the topsoil. Aligned NNW-SSE,

with a triangular, hemispherical, trapezoid or faceted cross-section. For that reason, all brooches of that type are described here as A.VI.161-162. Within those specimens some items were decorated with single incised or smooth wire rings, since a detailed analysis of some specimens (including on decorated ones), including secondary characteristics, demonstrated that the bows were forged using the same forging dies (cf. M. Natuniewicz-Sekuła 2013).

²¹ Cf. M. Natuniewicz-Sekuła, J. Okulicz-Kozaryn 2011, 123–133; M. Natuniewicz-Sekuła 2020, 15–31.

²² Unless stated in relative terms, all depths of graves and objects are stated below ground level.

roughly rectangular with rounded corners, sized 2.96×1.00 m with a maximum thickness of 0.80 m (Pl. I). The N section of the pit contains an animal burrow, probably ancient, with badger bones and a fragment of animal long bone (unspecified species), which destroyed the grave pit all the way to the bottom. Individual bones²³ were scattered at various depths throughout the grave fill. Those were found in a layer of dark-yellow compacted sand, which clearly differed from the surrounding compacted bright-yellow sand. Also found in the pit were several stones and pieces of marl with diameters of up to ca. 0.10 m. In the S section of the top of the pit, a calvaria pointing left, displaced downward from its original location by ca. 0.15 m; in the central part of the pit, spine bones, long bones of upper and lower limbs and ribs; in the N section – at the bottom of the pit – a jawbone with teeth. Also at the bottom in the S section, bones from a right foot – this is the only part of the skeleton that retained its anatomical arrangement, suggesting that the individual was originally placed on the left side of his body with the head pointing N. At the same level, a needle (1) was found in the N section. Man, *adultus* (30–40 years old).

Inventory (Pl. I): 1. Brass needle made of round wire, eye forged and punched through. Dąbrowska type II. L: 4.8 cm.

Dating: Roman Period.

Grave 494 (inhumation, disturbed) SQ 15-22 C, D

Grave pit captured at the depth of 0.30 to 0.35 m, right underneath the topsoil. Aligned NNW-SSE, roughly rectangular with rounded corners, sized 3.00×0.90 m, with a maximum thickness of 0.50 m (Pl. II). The N section of the grave was damaged by an animal burrow (feature 494A – see description below) containing remains of animal bones (cat) and objects displaced from grave 494. At the bottom of the N section of the grave pit, a calvaria (with the jawbone and the facial part of the cranium missing) and scattered teeth. In the centre of the pit, upper limb long bones and both femurs in an anatomical arrangement, suggesting that the individual was placed on her right side with bent arms and probably slightly bent legs. Poorly preserved bones (crumbling and flaking). The pit is filled with loose, uniformly dark yellow, slightly grayish sand with hardpan precipitations and marl inclusions. Next to the E edge, just above the level at which the grave pit became apparent, at the bottom of the topsoil, two S-shaped clasps (6–7) were found, presumably part of the grave equipment. A buckle (1) was located near the teeth;

a bead (8), W of the calvaria; two shield-headed bracelets: one – on the bones of the right arm (2) the other – on the bones of the left arm (3); fragment of a buckle prong (?) (5) near the right humerus; a buckle (4) at the level of the unpreserved pelvis; fragments of the fittings from a casket lock (9a–d), E of the arm bones, and a casket brace or the fitting of a belt mount (10) between the femurs. The outline of the casket not captured. Woman, *adultus* (30–35 years old).

Inventory (Pl. III, CCVI:1): 1. Forged iron brooch decorated with silver foil embossed with geometric patterns. Decorated with horizontal bars of dots and oblique lines (brooch head) and a hash pattern with a row of dots (foot). Bow decorated with vertical lines with dots in between. Pin and bowstring missing, damaged spring. Group A.V, series 11, type *Leonów*. L: 3.2 cm, W: 3.1 cm. 2. Shield-headed bracelet made from a copper alloy, cast, with a forged finish, slightly narrower in the mid-bow section, the cross-section is flat to convex, turning close to triangular near the base. Bow decorated with fine vertical engraved lines. The lower parts of the bases are decorated with a triple protuberance with an ornament consisting of vertical engraved lines. Type Wójcik II A. Dm: 7.4 cm, base W: ca. 1.4 cm. 3. Brass shield-headed bracelet, cast, with a forged finish, slightly narrower in the mid-bow section, flat-to-convex in cross-section, close to triangular near the base. Bow decorated with engraved fine vertical dashes. The lower parts of the bases are decorated with a double thicker section with an ornament consisting of engraved vertical dashes. Type Wójcik II A. Dm: 6.1 cm, W of the bases: 1.2 cm. 4. Unipartite, semi-circular forged iron buckle. Decorative protuberance at the base of the prong. Type ML D 1. L: 4.5 cm, W: 5.5 cm. 5. Iron fragment of a buckle prong (?), forged, broken off at the end. L: 2.3 cm. 6. Silver S-shaped clasp, made of smooth round wire. At the ends, small profiled knobs decorated at the base with a ring of incised wire. In the mid-section, a cylindrical, forged protuberance decorated with incisions. Type von Müller C, Patalan variant C5b. L: 1.5 cm, Wt: 1.25 g. 7. Silver S-shaped clasp made of smooth round wire. Small profiled knobs at the ends, decorated with a wire ring welded to the base. In the mid-section, a forged double profiled protuberance. Type von Müller D, Patalan type C8. L: 1.6 cm, Wt: 0.82 g. 8. Glass bead, flattened spherical shape, black, matte. Type TM 40. Dm: 0.8 cm, H: 0.3 cm. 9a–d. Brass casket fitting forged from a flat piece of metal. Damaged. Surviving as two fragments: one containing an oval opening and three fastening rivets, the other deformed and bent out of shape. Two rivets preserved separately. Type Kokowski 2. Preserved fragments L: 2.8 cm, 1.8 cm, W: 1.8 cm, 1.7 cm.

²³ Unless stated otherwise, 'bones' in the catalogue refer to human bones.

Separately preserved rivets L: 1.1 cm, 1.2 cm. **10.** Casket brace or fitting (?) or a belt mount (?) made from a copper alloy, bent into an irregular quadrangle, made out of forged narrow band, rectangular in cross-section, ends damaged. Preserved L: 1.5 cm.

Dating: *stadium* IIB/IIC.

Feature 494A (burrow with animal remains, disturbing grave 494) SQ 15-22 C, D

Feature revealed at the depth of 0.30 m, right underneath the topsoil. It intersected the N section of the pit of grave 494 almost down to the bottom but remained within the grave's outline (Pl. II). An irregular oval outline sized 1.10×0.90 m. Filled with loose, fine-grained light yellow sand with hardpan precipitations, clearly different in colour from the fill of grave 494. The feature contained animal bones (fragments of a cat skeleton: two scapula fragments, first thoracic vertebra, two humerus fragments, two skull fragments and a fang). The feature was modern (?), perhaps even contemporary, created before the cemetery area had been ploughed (pre-1960s). The fill contained teeth of a female *adultus* (30–35 years old) and some of the original equipment from grave 494, including the remains of a casket: a fragment of a lock fitting with preserved wood (oak) (4); a lock spring, containing preserved wood (ash) (5); more casket fittings with wood (birch) and rivets (6a–c, 7a–d, 8, 9); also a needle (3), a belt strap end (1) and a belt suspension mounting – a belt attachment (2).

Inventory (Pl. IV): **1.** Forged iron belt strap end ending in a shield. Massive shank, flat-convex in cross-section, flaring out towards the attachment. Type Raddatz JI, ML type 4. L: 8.9 cm, maximum attachment W: 2.1 cm, shield Dm: 2.2 cm. **2.** Forged iron belt hanger, roughly square in cross-section, ending in irregularly quadrangular plates; the attachments contain preserved rivets with washers. The bases of the hanger are decorated with horizontal engraved lines at the ends. ML variety 3. L: 2.9 cm, maximum distance between attachments: 4.0 cm, plate W: 1.4 cm. Distance between attachments and rivet washers: 0.3 cm and 0.2 cm. **3.** Thick needle made from round copper alloy wire. Forged eye, punched through. Dąbrowska type II. L: 8.5 cm. **4.** Hourglass-shaped forged iron lock fitting of a casket, preserved partly with a single rivet. The metal contains two holes along the vertical line: one rectangular, the other one round. At the bottom, preserved remains of wood (oak). Type Kokowski 5. Preserved L: 4.6 cm, preserved W: 1.8 cm. **5.** Forged iron casket spring ending in a round cross-section. Shank made from a flat forged metal band, rectangular in cross-section, with a curved and tapering ending sunk into a preserved

piece of wood (ash). Total L (including wood): 10.5 cm, spring L: 9.2 cm. **6a–c.** Casket fitting shaped like a fragment of a rectangular iron sheet with preserved mineralised wood at the bottom (birch). Perpendicular to the metal and the wood, a tape-shaped rectangular brass brace or fitting decorated with horizontal engraved lines. At the ends, two holes, originally containing brass rivets, round-headed rivets with ends bent at a right angle. Preserved L of flat iron piece: 2.5 cm, W: 1.8 cm, brass fitting L: 4.4 cm, W: 0.7 cm, brass rivets L: 1.9 cm, 1.4 cm. **7a–b.** Two fragments of a wooden slat (birch) from a casket with partly preserved rivets; one with a semi-spherical head. Preserved W: 1.6 cm, 1.9 cm, L of rivet including head: 1.2 cm. **7c.** Forged fragment of an iron rod (part of casket fittings). Preserved L: 1.1 cm. **7d.** Forged fragment of an iron rivet with a square cross-section and a flat head, forged, broken off at the end (part of casket fittings). Preserved L: 1.0 cm. **8.** Forged fragment of an iron rivet (part of casket fittings) with a square cross-section and a flat head, forged, the end bent at a right angle, broken off. Preserved L: 1.9 cm. **9.** Forged iron fragment of a rod bent into an arched shape, rhomboid cross-section (part of casket fittings). Preserved L: 3.1 cm.

Dating of finds: *stadium* IIB/IIC (see description of grave 494).

Dating of feature: modern, contemporary (?).

Grave 495 (cremation-inhumation, disturbed) SQ 13-20 D, 14-20 B

A clear outline of the grave pit was captured at the depth of 0.47 m, right underneath the topsoil. The top was damaged by ploughing. The pit is aligned N-S, roughly rectangular with rounded corners, sized 3.70×1.50 m. At NW and SE ends of the pit, two irregular burrows (features 495B and 495A, sized 0.93×0.53 and 0.85×0.56 m, respectively), penetrating right down to the bottom of the pit of grave 495 (Pl. V, CXCIV:1–2). Filled with loose light brown sand, clearly distinct from the layer that filled the grave pit, which was reddish-brown with a high clay and hardpan content. Both burrows contain stones (ca. 0.25–0.30 m in diameter) bearing no marks of intentional processing other than ploughing damage; the stones may have served as surface grave markers. The top of the grave pit contains one more feature (495C): an animal burrow which destroys that part of the grave right down to the level of the skeleton. In the upper section of grave 495, down to the depth of ca. 0.05–0.06 m from the level of capture, the whole pit contains very small individual burnt bones, three unburnt fragments of long bones, individual charcoals (not analysed) and ten highly burnt shards of ceramic vessels (17–26). At the same level, in the SW section of

the pit, a bead (3) and broken fragments of another one (2) were found as a secondary deposit (ploughing [?]). The inhumation burial and the elements of equipment at the depth of ca. 0.15 m below the level of capture – in a layer of compacted reddish-brown sand with high clay and hardpan content. Found at this level was the rim of a vessel (5) and small charcoals (not analysed); no burnt bones. A calvaria preserved in three fragments, partly in the W section of feature 495C, displaced from its original location. Under the S-most fragment of the calvaria, individual ribs and pelvic bones were found. Among the pelvic bones, a needle or a brooch pin fragments (4). A jaw bone and some teeth were found directly E of this cluster of bones. The remaining parts of the skeleton were not preserved. Original arrangement unknown. At the level of the bones, at the edge of feature 495C, a brooch (1), placed bow down; next to it, small fragments of fabric (flax [?]). The remaining equipment outside the grave pit, displaced by a burrowing animal; the burrow was at the chest level of the buried individual. In the N section of the grave pit, a set of five vessels imported from the Roman Empire; the vessels were arranged around a wooden casket (oak, alder and willow [?]) (11) with a poorly visible outline, with a lock fitting (12a–e, 13–15) and, in the middle of the outline, a lock spring from a two-bit lock (16). The open lid of the casket was damaged by the weight of a saucepan placed on top (10); the wood in that spot preserved thanks to contact with the copper alloy. In the N section of grave pit, in order, from W: a strainer (9), on its side with the handle pointing SW, a ladle (8), likewise on its side, with the handle pointing SE, and slightly SW of those, two glass cups (6–7): one on its side (6), one upright (7). Woman, *adultus* (30–35 years old); burnt bones: unidentified sex, unidentified age.

Inventory (Pl. VI–XI, CCV:1–2): 1. Spring-cover brooch, East series with a relatively high catchplate, made from a copper alloy. Cast bow with a forged finish. Spring covers decorated at the edges with double engraved lines, the bow decorated with three ornamental lines in imitation of incised wire, between which there are triangles topped with little circles. Massive, prominent crest decorated with three rows of imitation incised wire. Next to the brooch, three preserved fragments of a fabric (flax [?]). Type A.II.40–41. L: 3.4 cm, W: 3.8 cm. 2. Fragment of a glass bead, yellowish, transparent. Preserved L: 1.2 cm. 3. Amber bead, disc-shaped, hand-cut, dark honey-coloured, transparent. Type TM 389. Dm: 1.9 cm, maximum H: 0.5 cm, Wt: 1.21 g. 4. Two fragments of a needle or brooch pin made from a copper alloy. Preserved L: 3.3 cm. 5. Fragment of the rim of a miniature ceramic vessel, dark brown, with a loosely smoothed external surface, bearing signs of burning.

Rim Dm: 6.3 cm. 6–7. Two tulip-shaped glass cups with widely flared rims, slightly thicker edges and clearly emphasised feet. The bodies are decorated with two threads forming a repeating pattern of horizontal figures of eight. Transparent, slightly greenish glass with visible technological traces in the form of ellipsoid air bubbles, streaks and sand spots. Both cups were mould-blown, the threads were wound around the vessel while hot at the finishing stage. Type Eggers 188a. H: 9.7 cm, 10.2 cm, rims Dm: 10.3 cm, 10.1 cm, feet Dm: 4.3 cm, 4.0 cm, walls Thk: 0.15–0.2 cm, vessels Vol: (to rim edge): 327 and 330 ml. 8. Ladle made from a copper alloy. The bottom part slightly cracked and crumbling. Handle made of thin metal sheet, profiled at the half-way point with two extrusions, fractured in places, fan-like flared handle end. Spun bowl. At the bottom, an ornament in the form of circular lines engraved on a lathe, similar engraved lines under the rim. Type Eggers 161. Total L: 27.0 cm, bowl H: 7.5 cm, bowl Dm: 12.2 cm, bowl wall Thk: 0.1–0.15 cm, metal handle Thk: 0.2 cm. 9. Strainer made from a copper alloy. Handle fractured in places, made out of flat metal sheet, profiled at the half-way point with two extrusions, fan-like flared end. Bowl spun and embossed. The bottom is perforated with holes sized ca. 0.1 cm in diameter to form a rosette pattern, the body is similarly perforated with holes forming horizontal and zig-zagging lines. On the body and on the rim edge, tin fillings remaining from technological or manufacturing processes (casting, rounding, embossing), or possibly from later repairs (?). Type Eggers 161. Total L: 27.0 cm, bowl H: 6.5 cm, bowl Dm: 12.2 cm, bowl wall Thk: 0.05–0.1 cm, metal handle Thk: 0.2 cm. 10. Saucepan made from a copper alloy with a maker's stamp at the end of the handle (TALIO.F: *Talio fecit*). The profiled handle is flat, pinched in the middle, with rounded ends and a hole for hanging, slightly bent out of shape and partially broken. The face is decorated with concentric punched dots forming a triangle, with engraved lines incised crosswise, radiating towards the body. The circular end of the handle circumscribed with engraved lines, incised crosswise. The body on the inside and the upper section including the outer rim are both tin plated. On the inside and on the outside the vessel shows traces of spinning. On the body of the vessel, coaxial with the handle, a round seal (made from a different copper alloy), 0.8 cm across, hammered flat with the body. This is probably a mark left from stopping or concealing a hole from a bolt that used to hold the model in place when the body of the half-finished vessel was cast, or else a repair made after the vessel was damaged in the spinning process. Inside the body, along the circumference, three rows of engraved lines marking Vol measurements: 250 ml (first line from bottom),

600 ml (second line from bottom), 1500 ml (third line from bottom); total Vol up to the rim edge: 2100 ml. Type Eggers 142. Total L: 33.0 cm. Body H: 11.5 cm, body Dm at rim: 19.0 cm, body Dm at bottom: 13.0 cm, bottom Thk: 0.2–0.6 cm, wall Thk: 0.1–0.3 cm, handle Thk: 0.3–0.5 cm. 11. Wooden casket. Traces of two damaged vertical walls have been preserved, sized ca. 0.20×0.20 m (one of those contains traces of corroded rivets made from a copper alloy – not pictured) and two fragments of wood from the lid located outside the outline of the walls. One lid fragment (oak and alder have been identified) lay directly under the saucapan (10); affixed with four rivets (12b–e) to the other fragment (willow (?)) and solid fragment with a fitting (11) – oak; on the bottom side, a lock fitting (12a). Slid under the fitting there was a thin flat piece of metal (13). Along the edges of the second lid fragment, small nails were driven in (14–15). Located in the central section of the casket, a brass lock spring from a two-bit lock (16), likewise preserved with wood fragments (alder). 12a–e. Rectangular casket lock fitting made from a thin copper alloy sheet containing three holes (one roughly oval-shaped and two circular ones), fastened to the wood with four bronze rivets with damaged ends (three contain preserved flat-rounded heads). Type Kokowski 2. L: 8.6 cm, maximum W: 2.8 cm, Thk: 0.1 cm, preserved rivets L: 1.0 cm, 1.1 cm, 1.1 cm, 1.2 cm. 13. Thin rectangular piece of a copper alloy with the shorter edges bent outwards. Originally placed under the lock fitting to mask one of the keyholes. Distance between the bent sections corresponds to the width of the fitting, which made it possible to slide the thin piece of metal under the holes. This probably marks the site of a repair made after a key bit broke off or as a way to prevent unauthorised unlocking. L: 3.6 cm, maximum W: 1.0 cm, Thk: 0.05 cm. 14–15. Two rivets made from a copper alloy with the ends bent at a right angle and broken off; one preserved with a flat-rounded head, one damaged. Preserved L: 1.2 cm, 1.3 cm. 16. Brass casket lock spring from a two-bit lock, made from two separate rods with massive bits, roughly square in cross-section, and middle sections shaped like flat bands, rectangular in cross-section and clearly narrower hooked ends, square and rectangular in cross-section; the end of the shorter rod is bent less. The end of the shorter rod rests on the end of the longer rod; at two-thirds of its length, the longer rod has a hole for fastening the spring to the wood by means of a rivet. Preserved L: 11.4 cm, rod L: 10.9 cm, 11.2 cm. 17–26. Ten fragments of bodies of various ceramic vessels, including a rim, burnt, brown and greyish-brown. Preserved H: 4.3 cm, 1.9 cm, 2.0 cm, 1.7 cm, 1.7 cm, 1.0 cm, 1.2 cm, 1.5 cm, 2.1 cm, 2.4 cm. **Dating:** *stadium* IIIA/IIIB.

Feature 495A (pit for a stone) SQ 14-20 B

In the S section of grave 495, a roughly oval-shaped depression sized 0.85×0.56 m with a maximum thickness of 0.22 m, intersecting the grave down to its bottom (Pl. V). Filled with loose, mid- and fine-grained light brown sand. In the central section of the depression, at the top, a stone (ca. 0.40 m in diameter) sunk to the depth of ca. 0.06 m as the marker of grave 495. **Inventory:** none.

Dating: *stadium* IIIA/IIIB (see description of grave 495).

Feature 495B (pit for a stone) SQ 13-20 D

In the N section of grave 495, a roughly oval-shaped cavity sized 0.93×0.53 m with a maximum thickness of 0.13 m, intersecting the grave all the way down to the bottom (Pl. V). The pit is filled with loose, mid- and fine-grained light brown sand. In the N section of the feature, a stone ca. 0.4 m in diameter at the top had been placed to mark grave 495.

Inventory: none.

Dating: *stadium* IIIA/IIIB (see description of grave 495).

Feature 495C (animal burrow) SQ 14-20 B

An irregularly shaped animal burrow located in the central section of grave 495, causing damage all the way down to the burial level (Pl. V). In the feature, three fragments of a calvaria displaced from grave 495. Filled with a mixture of loose, fine-grained sand, light grey and yellow. No animal bones were found, but the burrow layout with a central nest and two tunnels appears to have been a fox hole or a badger sett.

Inventory: none.

Dating: *stadium* IIIA/IIIB or later (see description of grave 495).

Grave 496 (cremation-inhumation, disturbed) SQ 14-20 A, C

The outline of the bottom part of the pit was captured at the depth of 0.44 m (at 0.33 m in the N section, right underneath the topsoil in the S section). Roughly oval-shaped with the longer axis aligned N-S, slightly inclined to NNW-SSE, sized 3.2×1.2 m. Maximum Thk: 0.30–0.35 m (Pl. XII). The top section of the grave was damaged by ploughing. A circular feature (497) was once situated in the N section, probably a depression caused by the grave marker (see description of feature 497). The stone was revealed in a secondary deposit ca. 0.50 m E of the grave's edge. The pit is filled with coarse- and mid-grained sand with clay turned into hardpan, dark copper in colour, mixed with loose, light yellow sand and individual charcoals (not analysed). In the grave, *in situ*, fragments of lower

limbs (tibiae, left fibula and foot bones) and fragments of an ilium and small shards of hip bones. The femurs were captured as a streak of compacted sand turned into hardpan. The individual was buried on the right side of the body with slightly bent legs. In the central section of the pit, at chest level and N of the hip bone fragments, there was a circular, compacted cluster of burnt bones. Identifiable bones included upper skeleton bones (fragments of long bones, the lower jaw, molars, occipital bone). This was found in a layer of compacted coarse-grained, dark copper-coloured sand with high clay content. The individual was probably buried in a biritual rite since no traces of a pit were detected where the cremated remains would have been placed. With the exception of an S-shaped clasp (1), located among the burnt bones and bearing traces of partial melting, the remaining elements of equipment show no traces of fire. The arrangement of the items had been disturbed by ploughing. At the top layer, right above the grave pit, two beads were found (5–6). Directly S of the edge of feature 497, a spindle whorl (7) – at the level of the un-preserved skull, and three more beads in the pelvic area (2–4). Woman (?), *adultus*; burnt bones: unidentified sex, *adultus/maturus* (35–40 years old).

Inventory (Pl. XII): 1. Silver S-shaped clasp made from smooth, round wire. At the ends, small profiled and forged knobs, with rings of smooth wire applied and welded in place at the base. In the middle, a smooth wire ring applied and welded in place. Type von Müller D, Patalan variant D2a. L: 1.3 cm, Wt: 0.79 g. 2. Barrel-shaped glass bead, matte, red, with visibly darker vertical threads. Type TM 12. Dm: 1.2 cm, H: 1.0 cm. 3. Barrel-shaped glass bead, matte, dark red. Type TM 12. Dm: 1.1 cm, H: 1.0 cm. 4. Glass bead shaped like a flattened sphere, colourless, transparent, with a metal foil insert. Type TM 387a. Dm: 1.1 cm, H: 0.7 cm. 5. Chipped glass bead, spherical, mosaic pattern, matte, red. Partially preserved ornamental yellow and black stripes. Type TM 286b. Dm: 1.3 cm, H: 1.0 cm. 6. Fragment of an amber disc-shaped bead, hand-cut, dark honey-coloured, transparent. Type TM 388. Reconstructed Dm: 1.0 cm, H: 0.6 cm, Wt: 0.24 g. 7. Biconical ceramic spindle whorl, dark brown, with flat ends. Dm: 3.6 cm, H: 2.6 cm.

Dating: *stadium* IIB.

Feature 497 (pit for a stone) SQ 14-20 A

A circular depression with a diameter of ca. 0.50 m and with a maximum thickness of 0.07 m, located in the N section of feature 496 (Pl. XII). The fill contained loose fine-grained light yellow sand and three burnt fragments of long bones, probably from the original fill of grave 496. Some 0.50 m E of the edge of the pit

of grave 496, a stone (diameter: ca. 0.40 m) serving as the surface marker of grave 496; displaced by modern ploughing. Unidentified sex, *adultus/maturus* (35–40 years old).

Inventory: none.

Dating: *stadium* IIB (see description of grave 496).

Grave 498 (inhumation, destroyed) SQ 14-20 B, D

At the depth of 0.19 to 0.25 m, right underneath the topsoil, an irregular outline of the pit became apparent, rounded in the N section, clearly tapering in the S section (Pl. XIII). The bottom part of the grave was captured, whose S end was destroyed by the collapsed slope of a disused gravel and sand extraction pit. The pit is aligned N-S, slightly deflected to NNW-SSE, sized 2.5×1.0 m in the N section and 0.50 m – in the S section. Maximum thickness 0.30 m. The pit is filled with slightly compacted mid- and fine-grained, dark grey-brown sand turned into humus with intrusions of light and copper-coloured sand. In the layer, individual large charcoals (not analysed), many sloe bush roots and two trunks of young pines. Found in an anatomical arrangement, a calvaria in the N section and tibiae and fibulae in the S section, which suggests the individual was originally in a supine position with the head pointing N. The remaining bones of the skeleton were displaced: by the skull, there were long bones from the upper right limb, and further S, scattered ribs, spine bones, pelvis and left femur. The individual was buried with the body lying straight and with the head pointing N. The fill of the grave contained several burnt bones, a secondary deposit. The nature of the fill indicates that the grave was destroyed in modern times prior to the start of systematic excavations in 1984. Analysis of archival data suggests that the grave may have been found in an accidental discovery followed by amateur explorations in the 1920s by Wilhelm Klink, the local teacher, and Feliks Jakobson, a Latvian archaeologist. Characteristically, in those excavations the grave equipment would be removed while the bones would have been left in the grave²⁴. Man, late *maturus* (50–55 years old); burnt bones: unidentified sex, unidentified age.

Inventory: none.

Dating: Roman Period.

Grave 498A (inhumation, destroyed) SQ 14-20 B, D

Directly E (ca. 0.50 m) from grave 498, at the depth of 0.20 m, right underneath the topsoil, a grave pit was captured aligned N-S, slightly inclined to NNW-SSE, roughly rectangular with rounded edges (Pl. XIII). The pit was 2.50 m long and 1.10 m wide in the N

²⁴ Cf. M. Natuniewicz-Sekuła, J. Okulicz-Kozaryn 2011, 15–22.

section, and 0.60 m wide in the S section. Thickness: down to the maximum depth of 0.40 m. The fill of the grave pit layer was identical in nature as that of grave 498 above, and the destruction of the grave should be interpreted similarly. At the bottom of the pit, in its N section, small fragments of a calvaria, then scattered fragments of long bones and individual shards of bone shafts; the original location of the body could not be established. At the bottom, there were several burnt bones in a secondary deposit. In the NE section of the grave, a lunula-shaped bucket fitting (1), and, in the N section of the pit, a vessel rim (2), preserved in fragments. Also fragments of modern wires and modern bottle glass. Unidentified sex, *infans* II/*iuvenis* (14–16 years old); burnt bones: unidentified sex, unidentified age.

Inventory (Pl. XIII):

1. Lunula-shaped bucket fitting (?) made of tin-lead bronze, partially damaged. The item was cut from a thin sheet of metal, with two holes in the arms (with a single rivet attachment preserved). In the upper section, a hole with a surviving attachment, with a rhomboid ring attached, presumably the handle. Reconstructed arm span of the lunula: 3.5 cm, ring Dm: 2.7 cm. 2. Four fragments of the rim of a thin-walled, bowl-shaped ceramic vessel. External surface carefully smoothed, dark brown in colour, internal surface roughly smoothed, dark brown. Low temper content consisting of fine-grained crushed ceramics and mica. Medium-fired to produce a crumbling and flaking ceramic mass. Rim Dm: 8.0 cm, H: 2.8 cm.

Dating: *stadium* IVB.

Grave 499 (cremation urn, destroyed) SQ 16-22 D

At the depth of 1.37 m, right underneath the medieval layer and ca. 0.20 m above the level at which the pit of inhumation grave 509 was captured, a concentration of burnt bones, small ceramic fragments and a spindle whorl (1) were found in a layer of loose light yellow sand with some hardpan precipitations (Pl. XIV). Indistinct pit outline. Beside, to the E and ca. 0.02 m below, ca. 1/3 of an urn was revealed in preserved fragments (2), with burnt bones and a fragment of a burnt metal vessel (?) (3–3a) stuck to the bottom. The urn had been displaced from its original location. Unidentified sex, *adultus* (20–30 years old).

Inventory (Pl. XIV): 1. Ceramic spindle whorl, barrel-shaped, dark brown, decorated with circumferential and vertical irregular engraved lines, with concave ends. Dm: 3.2 cm, H: 2.5 cm. 2. Reconstructed ceramic vessel with one or several handles (?). Band handle stuck onto the vessel. Above the widest part of the body, a decoration in the form of alternating triangles, decorated inside with alternating grooved oblique lines. The motif

is framed with broad grooved horizontal lines. External surface black, glossy, smoothed; internal surface – smoothed, dark brown, with temper content consisting of fine-grained crushed ceramics and sand. Poorly fired, laminating and flaking ceramic mass. Group RW IV. Rim Dm: 25.5 cm, body Dm: 30.5 cm, bottom Dm: 13.2 cm, H: 18.0 cm. 3–3a. Brass item with a very high copper content and a small zinc content, with a hole at the upper edge (fragment of the upper part of the vessel (?)), partially melted, decorated with lines of oblique short marks in parallel bands. Item revealed at the bottom of a ceramic urn, under a layer of burnt bones. Reconstructed L: 6.6 cm, reconstructed H: 5.2 cm.

Dating: *stadium* IIIA (?).

Grave 500 (cremation pit (?), disturbed) SQ 15-22 C, D

At the depth of 0.53 m, under a modern ploughed layer, a grave pit oriented E-W along the longer axis, roughly oval-shaped, sized 2.40×1.20 m and with a maximum thickness of 0.25 m (Pl. XV). Filled with firmly compacted medium-grained, copper-coloured sand turned into hardpan and mixed with gravel and small stones. In the W section of the pit, a burnt bone, and in the E section, at the depth of ca. 0.02 m below the level at which the grave was captured, two unburnt beads (1–2). On the NE side the grave was slightly damaged by the pit of grave 494. We are highly likely dealing with a cremation pit burial, similar in size and shape to the inhumation graves. Unidentified sex, adult.

Inventory (Pl. XV): 1. Amber bead, disc-shaped, hand-cut, dark honey-coloured, transparent. Type TM 388. Dm: 0.9 cm, H: 0.3 cm, Wt: 0.17 g. 2. Amber eight-shaped pendant, hand-cut, collarless, dark honey-coloured, transparent. Type close to TM 465. H: 1.5 cm, Wt: 0.65 g.

Dating: *stadium* IVA.

Grave 501 (inhumation, destroyed) SQ 14-19 C, 14-20 D

The bottom section of the grave pit, which is aligned E-W, was captured at the depth of 0.19 to 0.38 m, right underneath the topsoil, damaging the top section of the feature (Pl. XVI). The pit is roughly rectangular (with rounded edges at the W end, and oval-shaped at the E end) and sized 2.80×1.10 m. The pit was filled with two layers: one of loose, light yellow sand in the central section of the pit, and compacted coarse-grained, dark copper-coloured sand largely turned into hardpan occurring only alongside the edges of the pit and at the bottom. The bottom was found at ca. 0.20–0.25 m below the level at which the grave was captured. At this depth, on the W side, preserved fragments of a calvaria were found, and further off and directly SW

of the calvaria, a brooch with a separately preserved pin (1). The brooch was displaced from its original location by ploughing. The layout of the calvaria indicates that the individual may have been placed in a supine position with the head pointing W. Man, late *maturus* (ca. 50 years old).

Inventory (Pl. XVI): 1. Brass eye brooch, Prussian series. Cast bow with a forged finish; traces of forging filed down and polished. On the brooch head, a decoration in the form of a pair of punched eyelets, with two pairs of analogous eyelets on the foot. Forged spring, pin preserved separately. Type A.III.57. L: 8.0 cm, W: 3.3 cm.

Dating: *stadium* IA.

Grave 502 (inhumation, disturbed) SQ 16-22 B

At the depth of 0.38 m, underneath the ploughed layer, the grave pit is aligned N-S, roughly oval-shaped, sized 2.40×0.75 m and with a maximum thickness of 0.25 m (Pl. XVI). Filled with loose light fine-grained yellow sand with some hardpan precipitations, numerous along the E, W and S edges of the grave. In the N section, at the bottom of the pit, fragments of a calvaria, and ca. 0.20 m S, a cluster of vertebrae. The position of the skull indicates that the individual may have been placed on the right side of the body with the head pointing N. Next to the calvaria, a needle (2). Some 0.15 m W of the vertebrae, a brooch (1) with its head pointing W. Unidentified sex, adult.

Inventory (Pl. XVI, CCVI:2): 1. Brass spring-cover brooch, East series, cast with clear traces of a die-forged finish preserved at the bottom side of the bow. Faceted foot. Crest inlaid with fine silver wires hammered into grooves on the crest. The wires are badly worn. Type A.II.38/40-41. L: 3.2 cm, W: 2.4 cm. 2. Needle made from round copper alloy wire. Forged eye, punched through. Dąbrowska type II. L: 6.5 cm.

Dating: *stadium* IIC.

Grave 503 (inhumation, destroyed) SQ 14-20 C, D

At the depth of 0.18–0.27 m, under a modern ploughed layer, a grave pit was captured along the E-W line, roughly rectangular with rounded corners, sized 2.65×0.85 m and with a maximum thickness of 0.16 m (Pl. XV). The S section of the feature was completely destroyed by a modern collapsed slope in a disused gravel and sand pit. The grave was filled with highly compacted mid- and coarse-grained, dark copper-coloured sand turned into hardpan. In the E section of the pit, lower limb bones (tibia, femur, toe phalanges) were found in a non-anatomical arrangement. The original position of the body could not be established, but the head was probably pointing W. Male (?), adult, body height 172–174 cm.

Inventory: none.

Dating: *stadium* IA.

Grave 504 (inhumation) SQ 16-22 B, D

The grave pit was captured at the depth of 1.19 m, under a medieval layer. It was roughly rectangular with rounded corners, sized 2.25×0.80 m and with a maximum thickness of 0.37 m. Aligned N-S slightly deflected to NNW-SSE (Pl. XVII). Filled with two layers. In the centre of the feature there was loose, fine-grained, yellow-grey sand with some hardpan precipitations, 0.23 m thick. At the bottom of that layer, in the central section of the feature, a spindle whorl (1) and fragments of casket fittings including a lock were preserved, along with wood remains (oak) (2–8). The outline of the casket was not captured. Under that layer and along the edge of the feature, all the way up to the top, a layer of firmly compacted dark copper-coloured sand turned into hardpan, and mid- and coarse-grained gravel, with small spots of loose, yellow sand. No bones were preserved.

Inventory (Pl. XVII): 1. Biconical ceramic spindle whorl, brown, sharply curved and with concave ends. Dm: 3.3 cm, H: 2.1 cm. 2. Rectangular forged iron casket lock fitting with two round holes and four rivets in the corners. On the bottom side, the rivets are bent outwards, with preserved fragments of highly mineralised wood (oak). Type Kokowski 2. L: 3.9 cm, maximum W: 2.0 cm, bent rivet W: ca. 0.5 cm. 3. Fragment of a forged iron casket brace or fitting made from a thin metal band, rectangular in cross-section. Preserved L: 1.2 cm. 4. Fragment of a forged iron casket brace or fitting made from a thin metal band, rectangular in cross-section. One end bent at a right angle. Preserved L: 1.3 cm. 5. Fragment of a forged iron casket brace or fitting made from a thin metal band, rectangular in cross-section. Ends bent, damaged. Preserved L: 2.0 cm. 6. Three forged iron fragments of a casket brace or fitting made out of a flat metal band, rectangular in cross-section. Ends bent. Reconstructed L: 1.5 cm. 7. Fragment of a forged iron casket brace or fitting made from a thin metal band, rectangular in cross-section. Ends damaged. Preserved L: 1.6 cm. 8. Fragment of a forged iron casket brace made from a thin metal band, rectangular in cross-section. Ends damaged. Preserved L: 1.4 cm.

Dating: *stadium* IIB (?).

Grave 505 (inhumation, cobbled with stones) SQ 16-22 B, D

At the depth of ca. 1.30 m, right under the medieval layer, a grave pit aligned N-S, roughly rectangular with rounded corners, sized 2.05×0.75 m and with a maximum thickness of 0.15 m (Pl. XVIII). Filled with firmly

compacted thick- and medium-sized, dark reddish-brown sand turned into hardpan, with small inclusions of loose yellow sand. In the N part of the feature, at the level of capture, numerous stones with a diameter of ca. 0.05–0.2 m, forming a kind of cobbled surface. Under the cobbles, a crushed calvaria, crushed teeth, clavicles and a left humerus. More stones among the bones. E of the calvaria, a pin (23), formerly a head-gear element (?), with an S-shaped clasp right underneath it (6). On the clavicles, two brooches (1–2) with heads pointing upwards. A third brooch, likewise with the head pointing upwards (3), at the level of the un-preserved chest, and next to it a necklace made from 15 beads and a necklace spacer (7–22). S of the necklace, forearm bones of the right and left arms – with a bracelet on each (4–5). In the central section of the burial, a fragment of a lower limb long bone. In the SE section of the grave pit, a clear outline of a casket (26) with a lock fitting and preserved wood (oak) (25–25a); inside the outline – a spindle whorl (24). The arrangement of the skeletal bones indicates that the individual was buried on the right side of the body with bent arms legs and the head pointing N. Woman (?), *adultus*.

Inventory (Pl. XVIII–XIX): 1. Brass spring-cover brooch, East series. Cast bow with a forged finish. In the upper section a decoration in the form of three vertical lines and a single horizontal line, incised obliquely. Massive, broad crest decorated with horizontal lines scored at an angle in imitation of filigree and a central zig-zag line motif. Damaged pin. Spring axis made out of iron. Type A.II.40–41. L: 3.2 cm, W: 3 cm. 2. Brass spring-cover brooch, East series. Cast bow with a forged finish. Decorated in the upper section with three vertical lines and a single horizontal line scored at an angle. Massive, wide crest decorated with horizontal lines with oblique incisions in imitation of filigree and a central zig-zag motif. Iron spring bar. Typ. A.II.40–41. L: 3.1 cm, W: 3.2 cm. 3. Brass brooch shaped like a flat band with a wide forged bow, a flared rectangular head and a massive crest on the bow. Upper bow-string resting on the head. Profiled, thicker at the base of the catchplate, soldered on separately (solder composition not analysed). On the head and the crest, traces of a tin coating are preserved; this is either an imitation of silver foil or remains from solder used to affix silver foil. Type similar to A.V.118. L: 2.6 cm, W: 2.4 cm. 4–5. Two identical shield-headed brass bracelets. Both specimens are massive, with cast bows and a die-forged finish (traces of forging are clearly apparent on the bottom surfaces), triangular in cross-section, slightly narrower in the mid-section, semi-circular in cross-section. Decorated on the edges with punched imitation incised wire. The heads are

also finished by forging, with visible traces preserved on the bottom sides. Heads and rims decorated with punched imitation incised wire. Type similar to Wójcik III A. Dm: 6.4 cm, 6.2 cm, heads W: 2.0 cm each. 6. Fragment of a silver S-shaped clasp, with one end preserved. Made of two fine incised wires, firmly welded together during soldering. Ending decorated with a cluster of granulation set on a double ring of incised wire. Type von Müller B, Patalan type B5 (?). Preserved L: 1.4 cm, Wt: 0.62 g. 7–10. Four glass beads, barrel-shaped, red, matte. Type TM 12. Dm: 1.3 cm, 1.3 cm, 1.2 cm, 1.0 cm, H: 1.0 cm, 0.9 cm, 0.9 cm, 0.8 cm. 11. Cylindrical glass bead, matte, red, decorated with an applied black glass thread. Type similar to TM 298. Dm: 1.1 cm, H: 1.1 cm. 12. Barrel-shaped glass bead, matte, red, mosaic pattern (yellow-green floral stripe). Type similar to TM 356. Dm: 1.2 cm, H: 0.9 cm. 13. Barrel-shaped glass bead, black to dark grey, matte, with visibly darker vertical stripes. Type TM 11. Dm: 0.8 cm, H: 0.5 cm. 14–18. Five disc-shaped amber beads, hand-cut, with traces of a turned finish, dark honey-coloured, transparent. Type TM 389. Dm: 1.6 cm, 1.8 cm, 1.5 cm, 1.1 cm, 1.2 cm, H: 0.7 cm, 1.0 cm, 0.9 cm, 0.5 cm, 0.5 cm, Wt: 1.47 g, 1.67 g, 1.04 g, 0.47 g, 0.50 g. 19–21. Three amber disc-shaped beads, made with a lathe, dark honey-coloured, transparent. Type similar to TM 429–430. Dm: 1.9 cm, 1.8 cm, 1.8 cm, H: 1.1 cm, 1.0 cm, 0.7 cm, Wt: 2.80 g, 2.20 g, 2.01 g. 22. Forged iron ring with a round cross-section, a necklace spacer. Dm: 0.7 cm. 23. Thick needle made from round copper alloy wire, ending damaged. Eye forged and punched through. Dąbrowska type II. Preserved L: 8.0 cm. 24. Biconical ceramic spindle whorl, dark brown, with flat ends. Dm: 3.0 cm, H: 2.2 cm. 25–25a. Rectangular iron casket lock fitting with two holes (one roughly rectangular, one round) and two vestigially preserved rivets in the vertical axis bar of the fitting. On the bottom side, preserved traces of mineralised wood (oak). Separately preserved, a damaged rivet shank (25a). Type Kowowski 2. L: 6.4 cm, maximum W: 2.1 cm, preserved L of the rivet shank: 0.9 cm. 26. Decomposed oak wood. *In situ*, the remains of a casket with a square outline. Given the state of preservation, it was not possible to reconstruct the exact structure of the item. Dimensions: ca. 35.0×35.0 cm.

Dating: *stadium* IIIA.

Grave 506 (cremation urn, destroyed) SQ 15-22 C

At the depth of 0.37 m, right underneath the topsoil, a grave pit with its longer axis aligned N-S, with an irregular outline, sized ca. 0.86×0.64 m (Pl. XVII). The maximum pit depth was 0.54 m. Filled with loose, light grey to dark grey sand with spots of compacted

copper-coloured sand turned into hardpan. In the pit, several burnt bones and, in the E section, three fragments of an urn (1). Also in the fill, small stones with diameters of ca. 0.03–0.05 m. Unidentified sex, *adultus* (?).

Inventory (Pl. XVII): 1. Reconstructed fragment of the upper part of a ceramic vessel. External surface on the neck smoothed, the body was roughened with visible grains of temper (crushed ceramics, granite and mica). Dark brown, darker in places, internal surface carelessly smoothed, light brown. Medium-fired ceramic mass, crumbling and flaking. Type RW IB (?). Rim Dm: 15.6 cm, body Dm: 29.0 cm, preserved H: 12.5 cm.

Dating: *stadium* IIIA (?).

Grave 507 (cremation-inhumation, double) SQ 16-22 A, C

At the depth of 1.32 m, under a medieval layer, a grave pit aligned N-S, roughly rectangular with rounded corners, sized 2.16×0.74 m, with a maximum thickness of 0.40 m (Pl. XX). Filled with two layers: loose, fine-grained, light grey to yellow sand with some hardpan precipitations, clustered at the E and W edges and in the middle section of the feature, with a thickness of 0.33 m. In that layer, in the N section of the grave pit, a fragment of highly corroded glass (2) and individual burnt bones. At the bottom of the pit, a layer of compacted dark copper-coloured sand largely turned into hardpan, with a thickness of ca. 0.07 m. In it, in the N section of the pit, a brooch (1), as well as unburnt fragments of teeth, broken fragments of a calvaria and a fragment of a clavicle bone. Unidentified sex, *adultus/maturus*; burnt bones: unidentified sex, *infans* I (2–4 years old).

Inventory (Pl. XX): 1. Spring-cover brooch, East series, made of tin bronze. Wide bow at the head, cast with a forged finish, decorated in the upper section with 'suspended' triangles topped with little circles and engraved vertical double lines. Crest massive, not prominent. Type A.II.40–41. L: 3.5 cm, W: 3.6 cm. 2. Fragment of a corroded, thin-walled glass vessel (?). Preserved L: 2.4 cm, preserved W: 2.2 cm.

Dating: *stadium* IIIA.

Grave 508 (inhumation [?]) SQ 16-22 B

A clear outline of the grave pit became apparent at the depth of 0.52 m in the N section and 0.70 m in the S section, right under a modern ploughed layer. Aligned NW-SE. At the level of capture, the outline was close to oval-shaped, much wider in the N section, sized 1.78×0.80 m. In the N section, a stone ca. 0.25 m across (Pl. XX). The edge of the pit clearly visible thanks to hardpan concentrations. Filled with coarse-grained, dark copper-coloured clay, mixed with dark copper-coloured sand largely turned into

hardpan. Pit thickness ca. 0.40 m. No bones were preserved.

Inventory: none.

Dating: Roman Period.

Grave 509 (inhumation containing a plank structure shoring up the sides of the pit, disturbed) SQ 16-22 D

The grave pit was captured at the depth of 1.20 m in the N section to 1.60 m in the S section, right under a medieval layer. Aligned NW-SE, sized ca. 2.95×0.55 m, with a maximum thickness of ca. 0.30 m (Pl. XXI). At the level of capture, in the S section of the feature, a ceramic fragment and a burnt bone, probably from cremation urn grave 499 located right above grave 509. In the S section of the pit, at the bottom, only a fragment of a tibia aligned NW-SE, which suggests that the individual was placed on the right side of the body, with the head probably pointing N. Right above the bone by the W edge, in a cluster of decomposed organics (leather [?]), a belt strap end (1). Also along the SW and S edges of the pit, a strip of decomposed wood (unidentified) and small charcoals (unidentified) ca. 0.50 m in length. Given that no remains of decomposed wood were found at the bottom of the grave pit, those were presumably the remains of planks stabilising the sides of the pit sides. Unidentified sex, *adultus* (?).

Inventory (Pl. XXI): 1. Belt strap end made from a copper alloy, ending in a small ring. Shank slightly faceted in cross-section, decorated close to the attachment with a motif of an oblique cross framed with horizontal engraved lines. In the middle of the shank and at its base, a decoration in the form of engraved double horizontal lines. Attachment with a fragmentarily preserved rivet. In the attachment, a fragment of mineralised leather (not analysed). Type Raddatz JIII, ML type 5, form 1. L: 4.5 cm, maximum attachment W: 1.1 cm, ring Dm: 0.9 cm.

Dating: *stadium* IIIB.

Grave 510 (inhumation in the coffin (?), destroyed) SQ 15-22 D, 16-22 B

The grave pit became apparent ca. 0.26 m below ground level, right underneath the topsoil. Aligned N-S. Roughly rectangular, with rounded edges in the N section, and oval-shaped in the S section, sized 2.37×0.72 m and with a maximum thickness of ca. 0.25 m (Pl. XXI). Filled with fine-grained, dark yellow-grey sand containing some stones (mainly marl). The top of the pit completely destroyed by modern ploughing. Underneath the ploughed layer, scattered and partially preserved bones from the upper part of the skeleton were found in the N section

of the feature. Some 0.20 m below the level of capture of the pit, the rest of the skeleton was revealed in an anatomical arrangement, with concentrations of decomposed wood (not analysed) around it – the remains of a coffin (?). In the S section, a right leg tibia and a fibula were found in an anatomical arrangement along with foot bones, indicating that the individual was originally placed on the right side of the body with bent legs. In the N section there were scattered fragments of arm bones, a calvaria, small fragments of teeth, and fragments of ribs. The state of preservation was poor (bones crumbling and laminating). Discovered in the S section, a spindle whorl (1), found S of the right leg, and in the N section, a fragment of a corroded iron object (2). Unidentified sex, late *adultus* (30–35 years old).

Inventory (Pl. XXI): 1. Biconical ceramic spindle whorl, dark brown, with concave ends. Dm: 3.5 cm, H: 1.8 cm. 2. Small fragments of a highly corroded iron object.

Dating: Roman Period.

Grave 511 (inhumation, double, destroyed) SQ 15-23 C, 16-23 A

The feature was discovered at the depth of ca. 0.16 m, right underneath the topsoil. At this level, clear traces of ploughing became visible aligned E-W, disturbing the skeleton. A cluster of pelvic fragments and lower limb bones from a single individual (a fibula, a tibia and fragments of foot bones) were found in clean, yellow sand. S of those, a needle was discovered (1). Further S of those, fragments of more lower limb long bones from the same individual, and among those a fragment of the body of a ceramic vessel (2). Some 0.12 m below, a clear outline of a grave pit became apparent, aligned NNW-SSE, roughly rectangular with rounded edges and sized 2.68×0.77 m, with a maximum thickness of 0.23 m (Pl. XXII). Filled with dark yellow sand and gravel turned into hardpan. At the bottom of the pit, the remains of another skeleton were discovered. Other than the skull, which was found in an anatomical arrangement (turned right in the N section of the pit), the remaining bones, which took the form of badly preserved fragments of ribs and lower limb long bones, were found scattered in the S section of the grave. Also found, within the pit as well as outside it, were four stones with diameters ranging from 0.10 to 0.20 m located at various levels. Woman, *adultus* (20–25 years old) – the skeleton above; man, *iuvenis* (18–20 years old) – the skeleton below.

Inventory (Pl. XXII): 1. Needle made from a copper alloy. Damaged in the upper section (eye missing) and broken, made from round wire. Preserved L: 4.4 cm. 2. A Fragment of the body of a large ceramic vessel. External surface smoothed, dark brown, internal surface

carelessly smoothed, brown, low temper content consisting of fine-grained crushed ceramics and sand. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 8.9 cm.

Dating: Roman Period.

Grave 512(513) (inhumation with a layer of decomposed organics, destroyed) SQ 15-23 C, 16-23 A

At depths ranging from ca. 0.25 m in the N section to 0.35 m in the S section, right underneath the topsoil, two irregular pits were present, one destroyed by a ploughed strip (down to the depth of 0.15 m), additionally both were destroyed all the way down to the bottom by a modern trench. In the first stage of exploration, those were numbered separately, 512 and 513, however given the identical nature of their respective fills they were eventually concluded to be the remains of a single destroyed grave 512(513). Irregular grave pit, roughly oval-shaped with the longer axis aligned NNW-SSE and presumed dimensions of 2.40×0.80 m. Maximum thickness ca. 0.20 m (Pl. XXIII). Filled with a layer of firmly compacted reddish-brown coloured sand with a high clay content turned into hardpan, mixed with gravel, stones and marl, clearly clustered in the S section of the feature. At the bottom of the grave, overlapping with the sides of the pit, a layer of decomposed, dark brown organics mixed with charcoals (alder). In the top part of the pit, in the N section, a fragment of a long bone was discovered, and, at the bottom, a ceramic fragment (1). Unidentified sex, *adultus* (?).

Inventory (Pl. XXIII): 1. Fragment of the body of a ceramic vessel with dark brown, carelessly smoothed external and internal surfaces. Low temper content consisting of coarse-grained granite and crushed ceramics. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.6 cm.

Dating: Roman Period.

Grave 514 (cremation pit, disturbed) SQ 14-21 A

The pit of the grave was roughly oval-shaped, captured at the depth of ca. 0.20–0.25 m, right underneath the topsoil. The top had been damaged by ploughing. At the level of capture, the pit is aligned N-S, with an oval outline, sized 2.45×0.95 m and with a maximum thickness of 0.23 m (Pl. XXIV). Filled with loose, light yellow sand with streaks of precipitations of compacted mid-grained, dark copper-coloured sand turned into hardpan. In the fill, very small individual charcoals were found (not analysed). In the central section of the feature, a cluster of three stones with diameters ranging from 0.10 to 0.23 m, with a miniature bead (1) found next to it. The remaining beads (2–4) were found in sifted soil from the fill of the grave pit. In the S section,

two burnt bone fragments. Unidentified sex, unidentified age.

Inventory (Pl. XXIV): 1–4. Four miniature beads made from glass paste, orange-coloured, matte. Type TM 53. Dm: from 0.4 to 0.5 cm, H: ca. 0.13 cm each.

Dating: *stadium* IIIB (?).

Feature 515 (fire pit [?]) SQ 16-22 D

An outline of the feature was discovered ca. 0.55 m below ground level, in the top of the medieval layer. Oval-shaped with the longer axis aligned E-W, sized 0.45×0.44 m. In cross-section, the pit is semi-circular, with a maximum thickness of 0.30 m (Pl. XXIII). The NW section of the feature contains a compact cluster of charcoals (pedunculate oak) in the form of large clumps situated at 0.10 m from the top. The fill consisted of highly compacted dark brown sand with clear, orange-coloured clay precipitations bearing signs of annealing from heating. In this layer, two small burnt fragments of medieval ceramics were found (1–2).

Inventory: 1–2. Two fragments of bodies of ceramic vessels, dark grey, with porous surfaces, burnt.

Dating: Medieval Period²⁵.

Grave 516 (inhumation, destroyed) SQ 13-21 D, 14-21 B
Some 0.20 m below ground level, right underneath the topsoil, a part of a grave pit was discovered containing fragments of a calvaria and a lower jaw with teeth. The feature formed the W section of a grave pit, whose E section at that level was not captured because it had been destroyed by burrowing animals and ploughing. At the depth of 0.30 m, the bottom of the whole grave pit was captured aligned E-W, with a rectangular outline with rounded corners, sized 1.6×0.7 m and with a maximum depth of 0.10 m (Pl. XXIII). Filled with compacted dark reddish-coloured sand largely turned into hardpan. The arrangement of the preserved skull fragments indicates that the individual was placed with the head pointing W. Woman (?), *adultus/maturus* (30–40 years old).

Inventory: none.

Dating: *stadium* IA.

Grave 517 (inhumation, destroyed) SQ 16-23 A

The feature was captured after finding bones at ca. 0.65 m in the N section and 0.70 m in the S section, under a modern ploughed layer (Pl. XXIV, CXCIV:3). An uninterrupted outline of the grave pit was only captured in the N section (0.70×0.70 m). In that section, a calvaria with the upper jaw was found in an

anatomical arrangement, lying on the right side. Under the skull, metacarpal bones and phalanges were found. The individual was buried on the right side of the body with the hand placed under the head, which pointed N. The pit was most likely oval-shaped, aligned NNW-SSE. Filled with dark yellow sand with a small admixture of light grey sand. In a layer of yellow sand mixed with humus, the remaining parts of the skeleton (spine, upper and lower limb bones) were found in a non-anatomical arrangement, directly S of the skull. Found among bones were burnt fragments of two ceramic vessels (1–2), one crumbled. The thickness of the preserved section of the pit was ca. 0.35 m. Woman, early *maturus* (35–40 years old).

Inventory (Pl. XXIV): 1–1a. Two fragments of a ceramic vessel, burnt; the bottom section and a fragment of the body. External surface dark brown-grey, made porous by burning. Preserved fragments H: 4.2 cm, 2.2 cm. 2. Crushed fragment of a burned ceramic vessel, dark grey-brown.

Dating: Roman Period.

Grave 518 (inhumation, disturbed) SQ 13-21 C, 14-21 A

The outline of the bottom section of the grave pit was captured at depths of 0.26 to 0.36 m, right underneath the topsoil. The top part of the feature was disturbed by ploughing and a tree growing in that location. The grave pit's longer axis was aligned WWS-EEN. It was roughly rectangular with rounded corners and sized 2.05×0.70 m, with a maximum thickness of 0.20 m (Pl. XXV, CXCIV:4). Filled with compacted coarse-grained, copper-to-red sand largely turned into hardpan and well mixed with individual or clustered lumps of clay. In the pit, fragments of a calvaria, a lower jaw and clavicle bones. The arrangement indicates that the individual was buried with the head pointing W, probably in a supine position. Next to it, two brooches, one by the right clavicle (1) with its head pointing E. The other (2) near the left clavicle, by the lower jaw, was on its side with its head likewise pointing E; next to it, a preserved fabric fragment (flax) and a fragment of decompose wood (oak) – possibly the remains of a small wooden container. Some 0.20 m SE from the skull, a small vessel was on its side (3); inside, the remains of decomposed organics and crushed bone. Woman, *adultus* (25–30 years old).

Inventory (Pl. XXV, CCVI:3): 1. Brass Noric-Pannonian brooch. Bow with an oval cross-section, cast with a filed finish, decorated with two crests with profiled bases, the foot terminating in a slightly profiled knob. Forged catchplate perforated with irregular round holes. The working part, the spring and the pin, drawn and forged. The upper bow-string held by a hook on

²⁵ The ¹⁴C dating obtained for feature 515 – cf. Tab. 26, subsection IV.5.

the head. Type Garbsch 237b. L: 7.2 cm, W: 2.3 cm. 2. Noric-Pannonian brooch made from a copper alloy. Bow with an oval cross-section, cast with a filed finish, decorated with two crests with clearly profiled bases, the foot terminating in a doubly profiled knob. Forged catchplate with an excised triangular hole. The working part, the spring and the pin, drawn and forged. The upper bow-string held by a hook on the head. On the bottom side of the spring, at the base of the pin, a preserved fabric fragment (flax). Type Garbsch 236c. L: 6.8 cm, W: 2.3 cm. 3. Small ceramic vessel, rotund, irregularly shaped, fractured, with a low curve of the body. External surface carelessly smoothed, light brown, internal surface dark brown. Medium-fired ceramic mass, crumbling and flaking. Type RW XVIIIA. Rim Dm: 4.6 cm, bottom Dm: 3.6 cm, H: 5.9 cm.

Dating: *stadium* IA.

Grave 519 (inhumation, destroyed) SQ 13-21 D, 14-21 B The pit became apparent at the depth of ca. 0.20–0.25 m, right underneath the topsoil. The outline was irregular, with the longer axis aligned NW-SE, sized ca. 1.85×1.30 m (Pl. XXVI). Filled with compacted dark copper-coloured sand, dark brown in places, with a high clay content, apparently a modern fill. Additionally, the feature was almost completely burrowed through by animals. The thickness ranged from 0.05 to 0.15 m. Right above the level of capture, in the ploughed layer, a buckle (1) and a belt strap end (2) were discovered; both items were part of the original grave equipment. The rivet from the attachment of the latter (2a) was at the bottom of the grave pit, as well as a pendant (3). Also in the fill of the feature, 30 miniature beads (4–33) and a ceramic fragment (34) were discovered in several clusters. The feature may be the remains of a grave revealed and explored before World War II²⁶. No bones were preserved.

Inventory (Pl. XXVI, CCVI:4): 1. Bipartite belt buckle with a plate made from a copper alloy. D-shaped buckle frame, cast, with a forged and filed finish, rectangular plate, forged, with two preserved rivets. Type ML D 17. Total L: 3.5 cm, plate W: 1.8 cm, plate L: 2.0 cm, frame W: 2.6 cm, frame L: 1.5 cm. 2–2a. Belt strap end with a ring with a protrusion made from a copper alloy, both ends damaged. Cast, with a forged and filed finish. Attachment rivet preserved separately, with a damaged end. Massive shank with a faceted cross-section, decorated close to the attachment with two horizontal engraved lines. Type Raddatz JII3, ML type 6, form 1. Preserved L: 5.7 cm, ring Dm: 1.6 cm, rivet head Dm: 0.8 cm, preserved rivet

L: 0.7 cm. 3. Brass hemispherical pendant, the cast half has a clear concavity at the bottom where wax was removed to reduce the weight of the cast object. End decorated with a cast imitation of a granulation cluster. H: 2.2 cm. 4–33. Thirty miniature beads, orange, made from glass paste. Type TM 53. Dm: 0.4 to 0.6 cm, H: 0.13 to 0.14 cm. 34. Fragment of a ceramic vessel, thin-walled, external surface dark brown and smoothed, internal surface carelessly smoothed, with a surviving decoration in the form of horizontal grooved lines. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 1.7 cm.

Dating: *stadium* IIIB/IVA.

Grave 520 (inhumation, destroyed) SQ 14-21 A, C Feature captured at the depth of ca. 0.20 m, right underneath the topsoil. The pit with the longer axis aligned NW-SE, with an irregular outline, roughly rectangular in the N section and with maximum dimensions of 1.80×0.90 m (Pl. XXVII). At the level of capture, several highly deteriorated bones. In the fill of the pit, broken and crumbled bones found in several clusters and at various depths (fragments of lower and upper limb long bones, pelvic bones, spine bones, phalanges), in a non-anatomical arrangement. The feature was filled with highly mixed sandy soil, dark grey to brown (turned into humus), with a high clay content precipitations and sand turned into hardpan. The fill was modern, with crisply delineated edges relative to the undisturbed soil around it. The discussed feature is probably the remains of a grave explored before World War II, with bones left behind and rediscovered presently²⁷. Man, early *maturus* (35–40 years old).

Inventory: none.

Dating: Roman Period.

Grave 521 (inhumation, double, opened) SQ 16-23 A, C The feature was roughly rectangular in the S section, rounded in the N section, captured at the depth of ca. 1.00 m in the N section and 1.20 m – in the S section, under a medieval layer. The pit is aligned NNW-SSE, sized 2.10×0.80 m and with a maximum thickness of ca. 0.80 m (Pl. XXVII, CXCV:1). In the fill of the grave, in its N section, bones scattered at various depths, suggesting that the grave had been opened in antiquity; the outline of that secondary trench was not captured. Displaced skull bones and ribs were discovered in the upper section of the pit, directly on the pelvis, which was located close to the N edge of the grave. The leg bones were found in an anatomical arrangement at the bottom of the grave pit. This arrangement

²⁶ Cf. M. Natuniewicz-Sekuła, J. Okulicz-Kozaryn 2011, 15–21.

²⁷ Cf. M. Natuniewicz-Sekuła, J. Okulicz-Kozaryn 2011, 15–21.

suggests that the individual was seated leaning against the N side of the grave pit. The fill layer was made up of dark yellow-grey sand with individual hardpan streaks. Close to the heel bone, a spur (1), with another spur (2) on a fibula located in the N section of the grave close to a humerus. This is a third fibula, indicating that the grave contained two individuals. To the left of the lower vertebrae, a pin (3) was discovered. Man, *adultus* (25–35 years old) – the better preserved skeleton; unidentified sex, *infans* II (10–12 years old) – the single fibula bone.

Inventory (Pl. XXVII): 1. Brass bowed spur, cast, massive bow with a triangular cross-section, wider close to the base of the prick. Hemispherical terminals, relatively long, solid, roughly conical prick with a rhomboid cross-section. Ginalski type E5. Arm span: 4.4 cm, H: 3.1 cm, prick L: 1.7 cm. 2. Brass bowed spur, cast, massive bow with a roughly triangular cross-section, wider at the base of the prick, hemispherical terminals; short, massive conical prick, hollow inside (with a trace left by the casting shank), roughly rhomboid in cross-section. Ginalski type E2. Arm span: 4.5 cm, H: 2.4 cm, prick L: 1.0 cm. 3. Pin with a hemispherical head made from a copper alloy, cast, with a filed finish; an engraved cross motif on the head. Type similar to Beckmann 48; Juga type Wekllice. L: 4.7 cm.

Dating: *stadium* IVA/IVB.

Grave 522 (inhumation, double, opened) SQ 16-23 A, C
The grave pit became apparent at the depth of ca. 1.00 m in the N section and 1.30 m in the S section, under a medieval layer. Rectangular outline sized ca. 2.60×0.80 m with a maximum thickness of 0.20 m. The longer axis aligned NNW-SSE (Pl. XXVIII). The outline of the pit was clearly visible at the level at which the skeleton was found. Filled with dark yellow-grey sand with precipitated hardpan streaks. In the SE section, tibiae and fibulae of an adult woman were found in an anatomical arrangement. Foot bones missing. The arrangement indicates that the individual was buried on the right side of the body with bent legs and the head pointing N. The remaining bones (fragments of the lower jaw, calvaria, ribs, spine and upper limb long bones) were scattered in the N section of the grave. Among those, a child's left tibia was found. The equipment, in the form of a buckle (1) and a bead or a spindle whorl (?) (2) was displaced from its original location, presumably when the grave pit had been opened. The outline of that secondary trench (probably located in the N section of the grave) was not visible, which may indicate that it was made shortly after burial. Woman, early *adultus* (20–25 years old), body height 152–155 cm – the better preserved

skeleton; unidentified sex, *infans* I (1–4 years old) – the single tibia.

Inventory (Pl. XXVIII): 1. Unipartite forged iron buckle with a rectangular buckle frame. Prong decorated with three transverse incisions. Type ML G 1. L: 2.2 cm, W: 3.4 cm. 2. Amber bead or spindle whorl (?), conical, made with a lathe, dark honey-coloured, transparent. Type TM 443. Dm: 2.5 cm, maximum H: 1.7 cm, Wt: 6.55 g.

Dating: *stadium* IVA.

Grave 523 (inhumation, destroyed) SQ 14-20 D, 14-21 A, C

The feature became apparent at the depth of ca. 0.15–0.20 m, under a modern ploughed layer. At the level of capture, the outline was irregular, elongated, aligned N-S. Dimensions: 1.95 m N-S and 1.70 m E-W. Maximum thickness in the S section – 0.35 m, in the N section – 0.43 m (Pl. XXVI). The pit was filled with relatively loose, dark brown-copper-coloured sand with lumps of greenish clay. The fill (sand from the ploughed layer turned into humus) had been highly mixed in modern times (?). Throughout the pit, scattered individual bone fragments (a skull, teeth and long bones) with traces of mechanical damage. In the SW section of the feature, a fragment of a pin was found with the spring of a brooch (1), and a spindle whorl (2) in the SE section. The feature were probably the remains of a grave explored before World War II, in which bones and elements of equipment had been left behind²⁸. Woman (?), early *adultus* (20–25 years old).

Inventory (Pl. XXVI): 1. A pin made from a copper alloy along with a fragment of a forged eye brooch, Prussian series. Group A.III. L: 6.6 cm, preserved spring W: 1.3 cm. 2. Ceramic spindle whorl, biconical, dark brown, gently curved with concave ends. Dm: 2.8 cm, H: 1.6 cm.

Dating: *stadium* IB.

Grave 524 (inhumation, double, opened) SQ 16-22 B, 16-23 A

Grave pit with a rectangular outline with rounded edges, captured at the depth of 0.85 m in the N section and 1.10 m in the S section, under a medieval layer. Longer axis aligned N-S. The pit dimensions were ca. 2.80×1.00 m, with a maximum thickness of ca. 0.70–0.80 m (Pl. XXIX). The feature was filled with loose, light yellow sand with compacted grey precipitations and several stones with diameters of ca. 0.10–0.20 m. At the bottom of the grave pit and up to 0.20 m above the bottom, scattered bones in a non-anatomical

²⁸ Cf. M. Natuniewicz-Sekuła, J. Okulicz-Kozaryn 2011, 15–21.

arrangement. In the S section of the pit there was the skull of a single individual, aged *adultus*, and next to it a clear outline of a casket (13) in the form of decomposed wood (oak). In the casket, a needle (6), a spindle whorl (9), a hooked pin with a twisted shank (8), and a fragment of the bottom part of a vessel (10), a casket fitting with preserved wood (oak) and a fragment of an iron lock spring (11–12). Near the skull, an S-shaped clasp (2) and three beads (3–5). The remaining bones of the same individual were scattered on the E side of the S section of the pit. In the central section of the grave, fragments of a child's long bones were discovered, and next to those another needle (7) – an element of the child's grave equipment (?). The disturbed arrangement of the bones and equipment indicates that the grave had been opened in antiquity, although the outline of the secondary trench could not be captured. The opening of the grave and the possible removal of some of the equipment is suggested by the rich remainder, e.g. an S-shaped clasp decorated with filigree and granulation (2), which may have been left out. Original arrangement of the body unknown. Woman, *adultus*; unidentified sex, *infans* I (2–4 years old).

Inventory (Pl. XXIX, CCVII:1): 1. Unipartite buckle with a rectangular buckle frame made from a copper alloy. Frame die-forged from a rod with a rhomboid and round profile; forged prong with a tapered end. Type ML G 8. L: 2.3 cm, W: 2.8 cm. 2. Silver S-shaped clasp. Shank made from four fine wires soldered together, central wire is incised, the other three soldered on alongside it are smooth, with soldered granules running along the length of the smooth wires (some not preserved). Solder composition not identified. In the mid-section, a shield attached with a hook, made from spiral incised wire. In the central section of the shield, a large granule surrounded by smaller ones. The entire shield is enclosed by a soldered flat band with soldered granules. The bases of the clasp terminals are surrounded by rings made from smooth and incised wire, with granulation at the ends consisting of five larger granules and clusters of four smaller granules soldered on. Type von Müller B, Patalan subvariant B5c2 (subvariant *Wekllice*). Maximum L: 3.1 cm, shield Dm: 1.0 cm, Wt: 3.76 g. 3. Barrel-shaped glass bead, matte, red. Preserved locations of crumbled eyes. Type TM 223. Dm: 1.0 cm, H: 0.9 cm. 4. Barrel-shaped glass bead, matte, red, decorated with black eyelets within white circles. Type TM 223a. Dm: 1.0 cm, H: 0.9 cm. 5. Biconical amber bead, hand-cut, dark honey-coloured, transparent. Type TM 391. Dm: 1.6 cm, maximum H: 0.9 cm, Wt: 1.15 g. 6. Needle made from round copper alloy wire. Forged eye, punched through. Dąbrowska type II. L: 8.0 cm. 7. Needle made from round copper

alloy wire. Forged eye, punched through. Dąbrowska type II. L: 7.8 cm. 8. Hooked pin with a twisted shank made from a copper alloy. L: 5.6 cm. 9. Ceramic spindle whorl, cylinder-shaped, light brown, with concavities on the main body and on the flat ends. Dm: 2.4 cm, H: 2.0 cm. 10. Reconstructed bottom part of a ceramic vessel, dark brown, darker in places, External surface loosely smoothed. High temper content consisting of coarse-grained crushed ceramics and granite. Medium-fired ceramic mass, crumbling and flaking. Bottom Dm: 5.0 cm, preserved H: 1.8 cm. 11. Damaged rectangular iron casket brace or fitting with a single rivet and fragments of preserved mineralised wood (oak) on the bottom side. Preserved L: 3.5 cm, W: 2.1 cm. 12. Fragment of a forged iron band – a casket lock spring (?). Preserved L: 1.3 cm. 13. Found *in situ*, the remains of a casket (decomposed oak wood), rectangular outline with clearly visible corners. Given the state of preservation, it was not possible to reconstruct the exact structure of the item. Dimensions ca. 30.0×20.0 cm.

Dating: *stadium* IIIA/IIIB.

Grave 525 (inhumation, destroyed) SQ 14-21 A

Grave pit captured at the depth of ca. 0.25 m, right underneath the topsoil. At this level, the S section was clearly apparent. The N section was completely destroyed by ploughing. A complete outline of the pit was captured at its bottom. Aligned NW-SE, rectangular with rounded edges and sized 2.45×1.00 m, it had a maximum thickness of 0.40–0.42 m (Pl. XXVIII). Along the W edge of the feature, there were four stones with diameters ranging from 0.05 to 0.15 m, with another one in the N section and one placed on a tibia. By the SW edge of the pit, a small cluster of decomposed organics (not analysed). The fill in the upper part of the grave (to 0.27 m below the level of capture) consisted of a layer of loose, fine-grained, light yellow sand with streaks of compacted mid-grained, dark copper-coloured sand turned into hardpan. Underneath, a visibly different layer of compacted coarse-grained, copper-coloured sand with a high clay and hardpan content. Within that layer, in the S section of the feature, some very poorly preserved lower limb bones were located. The arrangement indicates that the individual was buried in a supine position with the head probably pointing N. Unidentified sex, adult.

Inventory: none.

Dating: Roman Period.

Grave 526 (inhumation, destroyed) SQ 13-20 C

The grave pit was discovered at the depth of ca. 0.40 m, right underneath the topsoil. The top was completely destroyed by ploughing. At the level of capture, the pit

was close to oval-shaped and aligned N-S. Dimensions: ca. 2.10×1.00 m, with a maximum thickness of 0.10 m (Pl. XXX). Filled with compacted mid- and fine-grained, dark copper-coloured sand, with a high clay content in places, mixed with the ploughed layer displaced to the location by plant roots and burrowing animals. In the central section, throughout of the length of the pit, a layer of sand largely turned into hardpan, containing grey sand with a high clay content – the remains of a fabric (shroud [?]). In the layer, several poorly preserved small fragments of long bones. Unidentified sex, unidentified age.

Inventory: none.

Dating: Roman Period.

Grave 527 (inhumation, opened) SQ 16-23 C, 17-23 A

The grave pit was captured at the depth of ca. 1.30 m, under a medieval layer. At the level of capture it was aligned NNW-SSE, with an oval-shaped outline. Dimensions: 2.90×0.80 m, with a thickness of 0.60 m (Pl. XXX, CXCIV:2–3). In the central section of the pit, an oval secondary trench (feature 527A) with its longer axis aligned N-S, running along the longer edges of the grave pit. At its top, fragments of lower limb bones and a fragment of a pelvis were discovered. The trench did not extend all the way down to the bottom of grave 527, but it partially disturbed the arrangement of the skeleton. The grave was filled with highly compacted dark copper-coloured sand turned into hardpan; in it, there were small stones, marl and precipitations of loose, light yellow sand. The bones were in a non-anatomical arrangement at the depth of ca. 0.40–0.50 m below the level of capture of the pit. *In situ*, there was a skull (outside of the trench) and a right femur. The individual was buried in a supine position, with the head pointing N. The remaining bones (lower jaw, ribs, fragments of the spine and limb long bones) were scattered throughout the pit, under secondary trench 527A, they were displaced by small burrowing animals. The chest bones were jumbled up the most. Around the skeleton, the grave fill was intensely copper-coloured; it contained concentrations of decomposed, grey-dark brown organics – remains of an unidentified material (mat, fabric, fur) lining the bottom of the pit. At this level, in the NW corner of the pit, an unworked stone with a diameter of ca. 0.30 m had been placed. Man, *adultus* (25–30 years old).

Inventory: none.

Dating: Roman Period.

Feature 527A (secondary trench into grave 527) SQ 16-23 C

This oval trench sized 1.20×0.80 m with a maximum thickness of 0.32 m destroyed the central section of

the pit of grave 527. Oriented along the longer axis of the grave, it was made right along the W and E edges of the pit (Pl. XXX). Filled with loose, light yellow sand with elongated hardpan precipitations. The trench disturbed part of the grave down to the level of the skeleton, but did not intersect with the bottom of the pit. At the top, a fragment of a lower limb bone and a fragment of the pelvis were discovered (bones from the individual buried in grave 527), as well as a broken piece of a ceramic vessel (1). Man, *adultus* (25–30 years old). **Inventory** (Pl. XXX): 1. Fragment of the body of a ceramic vessel. External surface roughened, dark brown, internal surface carelessly smoothed, light brown. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.6 cm.

Dating: Roman Period.

Grave 528 (inhumation, disturbed) SQ 16-23 C

The grave became apparent at the depth of ca. 0.90 m, under a medieval layer. The pit is aligned NNW-SSE, roughly rectangular with rounded edges in the N section, oval-shaped in the S section, sized 2.70×0.92 m (Pl. XXXI). Filled with medium-compacted fine-grained dark yellow sand, containing small stones and concentrations of compacted clay turned into hardpan. The edge of the feature had a dark copper-coloured, clay and gravel lining. In the top part of the grave, a rib fragment and a reed rhizome. The remains of a skeleton were found at the bottom, ca. 0.55 m below the level at which the pit was captured. The bones were damaged and jumbled up. Fragments of a calvaria, several teeth, the long bones from a lower limb and one humerus. The individual was buried on the side of the body with slightly bent legs (?) and the head pointing N. At the level of the skeleton, many burrows of small animals were noted, resulting in the displacement of some of the bones and equipment. On the right side of the buried individual, an amber bead was preserved in two parts (1), and next to it two fragments of a ring (1a–b). In the central section of the pit, fragments of a needle or a brooch pin were revealed (2) along with a ceramic fragment (4). In the N section of the pit, a clearly dark copper-coloured patch turned into hardpan, with a square outline, the remains of an organic container (5) – no remains of wood were present. In its SW corner, at the bottom, a fragment of a ceramic spindle whorl (3). Unidentified sex, *iuvenis* (16–18 years old). **Inventory** (Pl. XXX–XXXI): 1. Disc-shaped amber bead made with a lathe, with a turned groove around the circumference, dark honey-coloured, transparent. A copper alloy ring (1a–1b) was originally set onto the bead. Type similar to TM 430. Dm: 2.6 cm, H: 1.3 cm, Wt: 5.69 g. 1a–1b. Two fragments of a ring made from a copper alloy, originally set onto bead (1).

Type Beckmann 15 or 16 (?). Preserved L: 2.5 cm, 1.2 cm. 2. Two fragments of a needle or a brooch pin made from a copper alloy. Combined L: 1.5 cm. 3. Fragment of a biconical ceramic spindle whorl, dark brown with flat ends. Preserved Dm: 2.6 cm, H: 1.8 cm. 4. Fragment of the body of a ceramic vessel, dark brown, darker in places, with a roughened external surface and a carelessly smoothed internal surface. High temper content consisting of fine-grained granite and crushed ceramics. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.6 cm. 5. The remains of a container found *in situ* without fittings in the form of decomposed organics; a roughly square outline with rounded edges. Given the state of preservation, it was not possible to reconstruct the exact structure of the item. Dimensions ca. 40.0×40.0 cm.

Dating: *stadium* IIIB.

Grave 529 (cremation urn with a cluster of stones above the urn) **SQ 16-22 C**

The grave was discovered at the depth of ca. 1.40 m, under a medieval layer. Above the urn (2), a cluster of four stones was revealed (a surface grave marker), two of which were bigger 0.30×0.10 to 0.40×0.28 m (Pl. XXXII, CXCVI:1–2). A fifth stone, which topped the cluster, was displaced from its original location and revealed ca. 0.20 m S. The outline of the pit was not captured. The urn (2) was highly fractured and overgrown with roots. The upper part of the urn, down to the curve, was filled with a layer of loose, fine-grained, yellow sand. In it, individual burnt bones were found. In the bottom section of the vessel, in a layer of compacted fine- and mid-grained sand with a high clay content, numerous, well preserved fragments of bone were found, relatively large and clean. In the urn, no remains of the pyre (charcoals) were noted. Most of the bones were cream-coloured, and some (including skull fragments) were dark brown. At the bottom of the urn, a layer of poorly fired or annealed clay stuck to the sides, fused with the bones. The vessel was probably lined with clay and, after being filled with cremation remains, burned again. Some 0.08 m above the bottom of the urn, among the bone remains, a buckle with a damaged frame (1) was discovered, bearing no traces of fire. Woman, *adultus* (25–35 years old).

Inventory (Pl. XXXII, CCVII:2): 1. Bipartite brass buckle with a plate and a D-shaped frame, partially damaged. All the construction parts were forged, additionally a forged knob was applied on one of the ends of the frame axis bar. Type ML D 29. L: 3.2 cm, frame W: 2.0 cm, total W: 3.7 cm. 2. Reconstructed ceramic vase (urn). Highly fractured (under the weight of the stones placed on top). External surface smoothed,

internal surface loosely smoothed, dark brown, darker in places. Under the neck, at the base of the body, a wide ornamental stripe in the form of horizontal lines, between those vertical and oblique lines arranged in sets of four and five. Medium-fired ceramic mass, crumbling and flaking. Type RW IVA. Rim Dm: 25.1 cm, body Dm: 37.2 cm, bottom Dm: 14.8 cm, H: 26.6 cm.

Dating: *stadium* IVA.

Grave 530 (cremation-inhumation, disturbed) **SQ 16-22 A**

At the depth of ca. 0.60 m, under a modern ploughed layer, a small pit was captured, with a roughly rectangular outline with rounded edges, sized 1.60×1.00 m and with a thickness of ca. 0.50 m (Pl. XXXI). The grave was filled with a homogeneous layer of compacted copper-red to brown sand largely turned into hardpan, with marl concretions and small stones. In the N section of the grave pit, a cluster of clean burnt bones. In the S section, ca. 0.30 m from top of the pit, an unburnt lower limb long bone was revealed in several fragments as a secondary deposit caused by burrowing animals. The burnt and unburnt bones can be assumed to belong to the same individual (*adultus*), since the burnt bones are fragments of the upper part of the skeleton, none of which appears among the unburnt bones. In the central section of the grave, small fragments of a ceramic vessel (1) were found. The grave was located above the pit of inhumation graves 536 and 541. Man, *adultus*; burnt bones: unidentified sex, *adultus*.

Inventory (Pl. XXXI): 1. A reconstructed ceramic bowl, dark brown, darker in places, smoothed inside and outside. Low temper content consisting of fine-grained crushed ceramics, with visible large mica grains. Medium-fired ceramic mass, crumbling and flaking. Type RW XIV B. Body Dm: 16.9 cm, bottom Dm: 11.2 cm, preserved H: 13.0 cm.

Dating: *stadium* IIIB (?).

Feature 531 (World War II feature) **SQ 13-18 D** (see Fig. 4)

Grave 532 (inhumation, disturbed) **SQ 16-22 A**

The feature was discovered ca. 0.80 m below ground level, under a modern ploughed layer. In the top layer, damaged by ploughing, a cluster of bones including the skull, spine, ribs as well as a brooch (1). Some 0.15 m lower down, a poorly visible outline of an oval-shaped pit sized 2.00×0.80 m with a thickness of 0.15 m, aligned NNE-SSW (Pl. XXXIII). In the central section, at the W edge of the pit, another cluster of bones: fragments of a skull, vertebrae and long arm bones. Filled

with a layer of loose, fine-grained sand, light yellow to dark yellow, with precipitations of compacted hardpan streaks aligned E-W and aggregated close to the bone cluster. The disturbed arrangement of the bones made it impossible to recreate the position of the body, but the individual was buried with the head pointing N. Woman, late *adultus* (30–35 years old).

Inventory (Pl. XXXIII): 1. Brass crossbow brooch with a tendril foot, die-forged bow with a faceted profile, decorated with individual rings of incised wire: one in the middle, one above a wire wrapper and one at the foot terminal. The spring ends in small knobs – forged stoppers placed on the iron bar. Type A.VI.161-162. L: 5.3 cm, W: 1.7 cm.

Dating: *stadium* IIIB.

Grave 533 (inhumation, double, destroyed) SQ 15-23 A

The top of the grave pit became apparent at the depth of ca. 0.30 m, right underneath the topsoil. At the level of capture, the S edge was captured clearly. The N edge was captured ca. 0.10 m further below during further exploration. The pit was located within a large modern trench – presumably the sand pit covered up and ploughed after World War II and in operation in the early twentieth century (cf. Fig. 4). In the S section, the grave has an oval-shaped outline, in the N section – a roughly rectangular one with rounded edges. Aligned N-S, sized 2.20×1.00 m, with a maximum thickness of 0.25 m (Pl. XXXIII). The upper part was completely destroyed by a sand pit and ploughing. Filled with a layer of compacted copper-brown sand with a high clay content largely turned into hardpan, with a large admixture of fine, compacted gravel that made the feature difficult to excavate. At the bottom of the pit, scattered small fragments of crushed bones from two individuals in a non-anatomical arrangement (including, among others, metacarpal bones, fragment of a bone shank, the vertebral body of a cervical vertebra, fragment of a rib, small fragments of a long bone and cancellous bone). Unidentified sex, *maturus* (40–50 years old); unidentified sex, *infans* I (2–4 years old).

Inventory: none.

Dating: Roman Period.

Grave 534 (cremation urn (?), destroyed) SQ 16-22 C

At the depth of ca. 1.45 m, under a medieval layer, an oval outline of a pit aligned NW-SE was discovered, sized ca. 0.65×0.45 m and with a maximum thickness of 0.10 m (Pl. XXXIV). It was filled with light yellow sand mixed with loose, mid-grained, light grey sand. In the SE section of the grave, a vessel, with a damaged upper part (1), without burnt bones or equipment.

The pit has a bowl-like profile with gently sloped sides and a flat bottom. No bones were preserved.

Inventory (Pl. XXXIV): 1. Reconstructed ceramic bowl, dark brown, with a smoothed external surface and a carelessly smoothed internal surface. At the base of the body an ornament in the form of oblique, lightly scored grooves. Low temper content consisting of fine-grained crushed ceramics. Medium-fired ceramic mass, crumbling and flaking. Group RW XIV (?). Body Dm: 13.8 cm, bottom Dm: 6.9 cm, preserved H: 8.3 cm.

Dating: Roman Period.

Grave 535 (inhumation [?]) SQ 13-17 D, 13-18 A, C

At the depth of ca. 0.50 m, right underneath the topsoil, a grave pit was captured with a regular rectangular outline sized ca. 2.85×0.75 m, and a maximum thickness of 0.30 m. Aligned NE-SW (Pl. XXXIV). The upper section was completely destroyed by ploughing. Filled with compacted coarse-grained, dark copper-coloured sand with a high clay content in the central section. The fill at the bottom of the pit was indicative of decomposed organic remains (human [?]). The grave pit was highly penetrated by plant roots and destroyed by numerous animal burrows. No bones were preserved.

Inventory: none.

Dating: *stadium* IA (?).

Grave 536 (inhumation, disturbed) SQ 16-22 A, C

The outline of the grave was captured at the depth of ca. 1.10 m in the N section and 1.50 m in the S section, under a medieval layer. The pit was sized 2.95×0.80 m with a maximum thickness of 0.25 m, roughly rectangular with rounded corners. Aligned N-S, slightly deflected to NNW-SSE (Pl. XXXV, CXCVI:3–4, CCIV:1). At the level of capture, the N and W edges were clearly visible and marked with streaks of hardpan. The edges of the pit in its S section were identified ca. 0.15 m deeper. The NE corner of the grave was damaged by grave 541. The pit was filled with fine-grained, light grey sand mixed with light yellow sand. Some long streaks of hardpan were clustered mainly in the N section of the pit next to the grave equipment items. Also found in the fill were some small stones, mostly marl. In the middle section of the pit, a distinct outline was captured of the remains of a rectangular organic container (41), with traces of decomposed wood discovered at the bottom: elm (?) and alder (?). Filled with light yellow sand edged with hardpan. Right by the NE corner of the container, a brooch (1) was located with the bow pointing downwards and the head pointing N. The remaining grave equipment was found in the container: a bead necklace with spacers (5–40), with the end located outside of the container outline. It also

included an S-shaped clasp (4). Placed on the necklace was a brooch (2) with its head pointing SW, presumably pinned into some fabric (?). Presumably, the container was wrapped in the piece of fabric in question. Under the necklace, at the bottom of the container, a buckle was located (3). No bones were preserved.

Inventory (Pl. XXXV–XXXVII, CCVII:3): **1.** Brass spring-cover brooch, East series, decorated with incised silver wires. Cast bow with a forged finish, massive, with a prominently flared foot. In the upper section of the bow, a decoration in the form of engraved vertical lines with imitation incised wire, with hanging triangles topped with circles between the lines. On the cylinder covering the spring, an ornament in the form of a row of short lines, the spring covers are decorated with vertical engraved lines. Massive, prominent crest decorated with incised silver wires, analogous wires above and below the crest and along the terminal of the foot and catchplate. Type A.II.40-41. L: 4.0 cm, W: 4.0 cm. **2.** Silver crest-headed brooch. Cast bow with a die-forged finish made using a faceted profile. The crest and the narrower section between the bow and the foot and the foot terminal were decorated with punched imitation incised wire. Type similar to A.V.127. L: 2.8 cm, W: 2.6 cm, Wt: 9.32 g. **3.** Brass rectangular unipartite buckle. Cast buckle frame with a forged finish. On the bottom side, traces of filing are visible. Type ML G 1. L: 2.1 cm, W: 1.7 cm. **4.** Massive brass S-shaped clasp made of round wire, with forged ends twisted into a spiral. Type von Müller A, Patalan type A3. L: 2.5 cm. **5.** Brass bead made from two embossed, domed pieces of thick metal sheet. Both domes contain a pressed ornament made with a matrix of alternating engraved and smooth triangles (two ornamental stripes per dome). The domes are hollow inside and fitted tightly together. Perpendicular to where the domes are fastened together, a brass pipe is inserted in the holes, with edges hammered close to the holes to add stability to the construction. Type similar to TM 521. Dm: 3.3 cm, H: 2.8 cm, pipe L: 3.1 cm, pipe Dm: 0.5 cm. **6.** Brass bead made from two domed pieces of thick metal sheet by embossing. Both domes contain a pressed ornament made with a matrix of alternating engraved triangles (one ornamental stripe per dome). The domes are hollow inside and fitted tightly together. Perpendicular to where the domes are fastened together, a brass pipe was inserted into the holes, with edges hammered close to the holes to add stability to the construction. Type similar to TM 521. Dm: 3.3 cm, H: 2.8 cm, pipe L: 3.0 cm, pipe Dm: 0.5 cm. **7.** Brass bead made by embossing from two domed pieces of thick metal sheet. Both domes contain a pressed ornament made with a matrix of alternating engraved and

smooth triangles (two ornamental stripes per dome). The domes are fitted tightly together on a wooden ball (linden) with clear traces of chiselling. The wooden ball is drilled through, with a brass pipe inserted in the hole. The edges of the pipe were hammered flat close to the dome holes to add stability to the construction. Type similar to TM 521. Bead Dm: 3.2 cm, H: 2.8 cm, pipe L: 3.0 cm, pipe Dm: 0.5 cm, the wooden ball Dm: 2.6 cm, the wooden ball H: 2.6 cm. **8.** Barrel-shaped glass bead, light green, transparent. Type TM 4b. Dm: 1.0 cm, H: 0.8 cm. **9.** Barrel-shaped glass bead, dark blue, transparent, with white eyes within navy blue circles. Type similar to TM 225a. Dm: 1.0 cm, H: 0.6 cm. **10.** Barrel-shaped glass bead, matte, red, with black eyes within white circles. Type TM 223a. Dm: 1.6 cm, H: 1.2 cm. **11.** Barrel-shaped glass bead, matte, red, with a wavy yellow-green thread. Type similar to TM 257. Dm: 1.6 cm, H: 1.2 cm. **12.** Barrel-shaped glass bead, matte, red, with black eyes within white circles. Type TM 223a. Dm: 1.6 cm, H: 1.2 cm. **13.** Barrel-shaped glass bead, matte, red, with a wavy yellow-green thread. Type similar to TM 257. Dm: 1.6 cm, H: 1.2 cm. **14.** Barrel-shaped glass bead, matte, red, with a wavy yellow-green thread. Type similar to TM 257. Dm: 1.6 cm, H: 1.3 cm. **15.** Barrel-shaped glass bead, matte, red, with a wavy yellow-green thread. Type similar to TM 257. Dm: 1.6 cm, H: 1.2 cm. **16.** Barrel-shaped glass bead, matte, red with black eyes within yellow circles. Type TM 211D. Dm: 1.4 cm, H: 1.3 cm. **17.** Barrel-shaped glass bead, irregularly shaped, red, matte. Type similar to TM 10. Dm: 0.9 cm, H: 1.1 cm. **18.** Barrel-shaped glass bead, matte, red. Type TM 10. Dm: 1.1 cm, H: 0.8 cm. **19.** Barrel-shaped glass bead, light green, transparent. Type TM 4b. Dm: 0.9 cm, H: 0.9 cm. **20.** Barrel-shaped glass bead, white, matte. Type TM 6. Dm: 0.9 cm, H: 0.9 cm. **21.** Spherical glass bead, green, transparent. Type TM 24. Dm: 0.6 cm, H: 0.6 cm. **22.** Glass bead black, matte, lentil-shaped. Type similar to TM 88–90. Dm: 0.7 cm, H: 0.7 cm. **23.** Fragment of a glass bead, red, matte, with black eyes within yellow circles. Type similar to TM 211. Preserved H: 1.1 cm. **24–28.** Five completely crushed glass beads, white, light blue, green, matte and transparent. **29–34.** Six disc-shaped turned amber beads, dark honey-coloured, transparent. Type TM 430. Dm: 3.7 cm, 3.3 cm, 3.1 cm, 3.2 cm, 2.8 cm, 3.3 cm, H: 1.6 cm, 1.5 cm, 1.2 cm, 1.5 cm, 1.6 cm, 1.3 cm, Wt: 10.82 g, 7.75 g, 7.18 g, 9.43 g, 7.24 g, 9.49 g. **35.** Hand-cut, disc-shaped amber bead, dark honey-coloured, transparent. Type TM 388. Dm: 0.9 cm, H: 0.5 cm, Wt: 0.23 g. **36.** Cast ring-like spacer profiled out of a copper alloy band. Dm: 1.6 cm, band W: 0.5 cm. **37.** Cast ring-like spacer profiled out of a copper alloy band. Dm: 1.4 cm, band W: 0.4 cm.

38. Cast, profiled brass ring-like spacer. Dm: 1.3 cm, band W: 0.4 cm. 39. Cast, profiled brass ring-like spacer. Dm: 1.3 cm, band W: 0.5 cm. 40. Cast ring-like spacer profiled out of a copper alloy band. Dm: 1.4 cm, band W: 0.5 cm. 41. Decomposed elm wood (?), the smaller part made of alder wood (?). The remains of a container without metal fittings found *in situ*, rectangular outline with rounded edges. The poor state of preservation made it impossible to recreate the exact structure of the item. Dimensions: ca. 18.0×12.0 cm.

Dating: *stadium* IIIA/IIIB.

Grave 537 (cremation pit, disturbed) SQ 16-22 C

The burial was captured at the depth of ca. 1.65 m, under a medieval layer. An oval grave pit, slightly rectangular in the N section. The S edge was distinct at this depth, however the N edge was found ca. 0.20 m below. Pit size: ca. 2.40×1.00 m, with a maximum thickness of 0.75 m. The grave was aligned N-S, slightly inclined to NNE-SSW (Pl. XXXVIII, CCIV:1). The pit was filled with two layers, disturbed in many places by burrowing animals. The first layer in the upper section of the grave contained fine-grained, light grey and yellow sand with hardpan spots. In that layer, a cluster of burnt bones was discovered in the N section of grave; NE of the cluster there was a stone with a diameter of ca. 0.20 m and, at the N edge, a fragment of a burnt casket spring (3). In the S section of grave, individual charcoals were found (alder). In the layer below (firmly compacted copper-brown sand with a high clay content and an admixture of grey-yellow sand with small stones), two fragments of burnt bones, charcoals (alder), partially melted beads (1–2) and a fragment of a burnt casket fitting (4) were discovered. The equipment items were mainly clustered in the N section of the grave above the cluster of burnt bones. The elastic, clay-like consistency of the layer at the bottom of the grave indicates that remains of organic matter that had once lined (?) the pit. Unidentified sex, unidentified age.

Inventory (Pl. XXXVIII): 1. Partially melted glass barrel-shaped bead, green, transparent, with white eyes within red circles. Type TM 221b. Dm: 1.2 cm, H: 1.0 cm. 2. Completely crushed and burnt glass bead, white, matte. 3. Fragment of a forged iron casket spring in the form of flat metal band from the shank. Preserved L: 1.3 cm, band W: 0.7 cm. 4. Fragment of a forged iron casket brace made out of a flat metal band. Preserved L: 3.0 cm, band W: 0.7 cm.

Dating: *stadium* IIIA (?).

Grave 538 (inhumation, disturbed) SQ 16-22 C

Grave captured at the depth of ca. 2.00 m, under a medieval layer. Roughly rectangular in shape, the pit is

aligned N-S and sized ca. 2.40×0.75 m with a maximum thickness of 0.50 m (Pl. XXXIX, CCIV:1). The upper part of the fill contained a layer of loose, light grey and yellow sand mixed with hardpan precipitations, ca. 0.10 m thick. In that layer, a pottery fragment was found in the central section of the grave (25). The consistency of the layer below (compacted sand with a high clay and hardpan content, copper-coloured to copper-brown) indicates that this was the remains of a decomposed skeleton and organic matter. The equipment consisted of beads (3–20) and an S-shaped clasp (2), located in the N part of the feature. Among the beads, a fragment of a vessel with a broken handle (22) and a fitting (21) were discovered. At this depth, individual crushed teeth were found, indicating that the individual had been placed in the grave with the head pointing N. At the level of the unpreserved pelvis, a belt strap end (1) was found with remains of decomposed wood (oak), and E of the belt strap end there were two fragments from different vessels (23–24). Also present in this layer were individual small charcoals (not analysed). The bottom of the grave was filled with yellow-grey, coarse-grained sand with hardpan precipitations and a high clay content, forming the remains of organic matter once lining the bottom of the pit (?). Unidentified sex, adult.

Inventory (Pl. XXXIX, CCVIII:1): 1. Belt strap end made from a copper alloy, made from a cast rod with an oval cross-section, with a forged finish. In the belt strap end attachment, remains of leather were preserved (not analysed). Type Raddatz O18, ML type 3. L: 6.1 cm. 2. Silver S-shaped clasp made out of smooth wire, with ends terminating conical forged knobs. Type von Müller D, Patalan type D1. L: 1.6 cm, Wt: 0.63 g. 3. Colourless glass bead, segmented, with metal foil. Dm: 0.6 cm, H: 0.9 cm. 4–10. Seven lentil-shaped glass beads, black, matte. Type similar to TM 88–90. Dm: 0.6 to 0.7 cm, H: 0.6 to 0.9 cm. 11–20. Ten spherical glass beads, orange, matte. Type TM 26. Dm: 0.4 cm to 0.5 cm, H: 0.3 cm to 0.4 cm. 21. Non-distinctive iron item (fitting or brace), forged from a metal band, slightly wider in the upper section, and tapering towards the end. A hole punched at 1/3 of the height, presumably for a rivet. L: 3.7 cm. 22. Fragment of the body of a thin-walled ceramic vessel with a broken handle, dark brown, external surface smoothed. High temper content consisting of mid-grained crushed ceramics, visible large mica grains. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 4.9 cm. 23. Fragment of the body of a thick-walled ceramic vessel, light brown, external surface roughened. High temper content consisting of coarse-grained crushed ceramics and granite. Medium-fired ceramic mass, crumbling and

flaking. Preserved H: 5.3 cm. 24. Fragment of the body of a thin-walled ceramic vessel with a broken handle, dark brown, External surface smoothed. Low temper content consisting of fine-grained crushed ceramics, visible mica grains. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.6 cm. 25. Fragment of the body of a thin-walled clay vessel, dark brown, external surface smoothed. Low temper content consisting of fine-grained crushed ceramics, visible mica grains. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.3 cm.

Dating: *stadium IVA*.

Grave 539 (inhumation, disturbed) SQ 16-22 C

The pit was revealed at the depth of ca. 2.20 m, under a medieval layer. Irregular outline (narrower in the N section, wider in the S section) aligned N-S. Dimensions: 2.95×1.10 m, with a maximum thickness of 0.40 m (Pl. XL, CCIV:1). The pit was disturbed by many burrows made by small animals. Filled with loose, fine-grained light grey and yellow sand with streaks of hardpan precipitations. Within the fill layer, about a dozen small stones were found (not arranged into a particular pattern) and many small charcoals (alder and birch). Also, decomposed streaks of organic precipitations were found, concentrating around equipment items (primarily the beads). Those organic relics were probably the remains of some fabric (?) placed in the pit. The equipment comprised beads (3–17), located in the central section, most of which were heavily crushed. The arrangement indicates that they were once sewn onto a piece of clothing (fabric [?]) to form a decorative appliqué placed in the grave. Also, a belt strap end found in the middle section of the pit (1), and a belt mount found in the S section (2). A spindle whorl was located in the N section of the grave (18). The fill contained large fragments of a vase-like vessel (19), predominantly from its upper part; the widest parts were heavily worn, indicating that the vessel bore ancient damage. No bones were preserved.

Inventory (Pl. XL): 1. A massive belt strap end made of tin-lead bronze with an oval protuberance at the base of the shank and a massive terminal, with a round cross-section. The attachment was made from a single sheet of metal, forged out of the shank, decorated with fine incisions along the edges, preserving the remains of two rivets with washers. Type Raddatz similar to O16, ML type 2, form 6. L: 4.8 cm. 2. Rectangular, forged belt mount made from a copper alloy, with three rivets with short shanks, preserved in fragments. L: 3.1 cm, maximum W: 1.6 cm. 3. Barrel-shaped glass bead, matte, red, with fine darker vertical lines. Type similar to TM 10. Dm: 0.9 cm, H: 0.9 cm. 4. Barrel-shaped glass bead,

matte, red. Type TM 10. Dm: 0.7 cm, H: 0.7 cm. 5. Barrel-shaped glass bead, dark green, transparent. Type TM 4a. Dm: 0.9 cm, H: 0.9 cm. 6. Barrel-shaped glass bead, light green, transparent. Type TM 4b. Dm: 0.6 cm, H: 0.6 cm. 7. Fragment of a polyhedral glass bead, purple, transparent. Type TM 119. W: 0.7 cm, preserved H: 0.8 cm. 8–17. Ten completely crushed glass beads, white, blue, matte. 18. Ceramic spindle whorl, dark brown, biconical with concave ends. Dm: 4.0 cm, H: 1.9 cm. 19. Reconstructed upper part of a ceramic vase, with three handles stuck onto the edge of the rim. Inside and outside surfaces loosely smoothed, dark brown, black in places. Low temper content consisting of finely crushed ceramics and granite with visible mica grains. Medium-fired ceramic mass, crumbling and flaking. Type RW IVA. Rim Dm: 20.0 cm, preserved H: 13.3 cm.

Dating: *stadium IVB/V (?)*.

Grave 540 (cremation-inhumation) SQ 16-22 A

Grave pit revealed at the depth of ca. 1.30 m, under a medieval layer, and, in the W section, under the fill of an archaeological trench made in 1995. Aligned N-S, roughly rectangular in shape, with relatively distinct edges, sized 3.10×1.10 m and with a maximum depth of 0.90 m (Pl. XLI, CXCVI:5, CCIV:1). Filled with fine-grained light grey sand mixed with yellow sand containing streaks of hardpan. At the bottom of the feature the fill was more compacted with a higher hardpan content and a more copper-red colouration. Individual burnt bones were found scattered at various depths of the pit along with many small charcoals (birch) and non-distinctive fragments of vessels, of which seven were not burnt (3–9), and ten were badly burnt (10). At the bottom, in the N section of the grave, unburnt fragments of a lower jaw with teeth were revealed. Also found at this depth were a fragment of a needle or a brooch pin (1), and, in the S section of the pit, a natural lump of amber (11) and a damaged vessel (2) filled with charcoals (hornbeam). Unidentified sex, *adultus*; burnt bones: unidentified sex, *adultus*.

Inventory (Pl. XLI): 1. Two fragments of a needle or a brooch pin made from round copper alloy wire. Combined L of the fragments: 1.2 cm. 2. Reconstructed upper part of a ceramic goblet with a single handle stuck onto the edge, foot not preserved. The lower part of the body has an ornamental decorative band decorated with a series of incised teardrops. Underneath, a broad ornamental stripe of oblique incised lines forming a cross-hatch pattern. External and internal surfaces are dark brown, well smoothed. Low temper content consisting of fine-grained crushed ceramics with visible mica grains. Well-fired to produce a hard

and strong ceramic mass. The significant wear and tear at the widest part of the vessel indicates that it was already damaged when placed in the grave. Group RW VIII. Rim Dm: 12.7 cm, body Dm: 17.8 cm, preserved H: 14.8 cm. 3. Fragment of the body of a ceramic vessel, brick-red, with a roughened surface. High temper content consisting of coarse-grained crushed ceramics and granite. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.8 cm. 4. Fragment of the body of a ceramic vessel, dark brown, with a roughened surface. High temper content consisting of mid-grained crushed ceramics and granite. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.1 cm. 5. Fragment of the body of a ceramic vessel, dark grey, with a lightly smoothed surface. Low temper content consisting of fine-grained crushed ceramics. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.0 cm. 6. Fragment of the body of a ceramic vessel, dark brown, with a lightly smoothed surface. Low temper content consisting of fine-grained crushed ceramics. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 1.9 cm. 7. Fragment of the body of a ceramic vessel, dark brown, with a lightly roughened surface. Low temper content consisting of coarse-grained crushed ceramics. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.1 cm. 8. Fragment of the body of a ceramic vessel, dark brown, with a finely roughened surface. High temper content consisting of mid-grained crushed ceramics and granite. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 1.7 cm. 9. Fragment of the body of a ceramic vessel, dark brown, with a lightly roughened surface. Low temper content consisting of coarse-grained crushed ceramics. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 0.9 cm. 10. Ten small, non-distinctive fragments of crushed or burnt ceramics, dark brown and dark grey-brown. 11. Natural lump of amber with preserved bark, dark honey-coloured, transparent. Preserved H: 0.9 cm, Wt: 0.10 g.

Dating: *stadium* IIIB (?).

Grave 541 (inhumation, double) SQ 16-22 A

Grave discovered at the depth of ca. 1.20 m under a medieval layer. Pit aligned N-S, with a roughly rectangular outline, sized 3.10×0.90 m and with a maximum thickness of 0.30 m (Pl. XLII, CCIV:1). Filled with fine- and mid-grained light grey sand with numerous hardpan precipitations clustered near the bones and equipment items. The fill layer also contained decomposed organic material clustered around equipment items, probably the remains of a fabric or some other organic matter originally lining the bottom of the pit. At the bottom of the pit, fragments of the calvaria, the lower jaw and

the clavicles of an adult individual (woman), among those a child's bones were identified (fragments of the skull and of the long bones). The positioning of the woman's skull may suggest that she had been placed on the right side of the body with the head pointing N. On the woman's clavicles, two brooches were found with their heads pointing SW (1–2): one lying on its side, and another brooch discovered at chest level directly S (3). Under the jaw bone, an S-shaped clasp was found (5). At the level of the unpreserved hip bones, a buckle was located (4). The spring from a casket lock (7) and a spindle whorl (6) were found above the woman's head, inside an oval outline (probably that of a casket) saturated with hardpan and decomposed organics. Woman, *adultus* (20–30 years old); newborn/*infans* I (0–1 year old).

Inventory (Pl. XLII, CCVIII:2): 1. Brass spring-cover brooch, East series, cast bow with a die-forged finish. On the bow, an ornament in the form of three vertical stripes of engraved double lines, a similar horizontal stripe at the base. On the spring covers, vertical engraved lines. Massive, prominent crest decorated with a zig-zag motif. Foot terminal with a double engraved line forming a horizontal stripe. Type A.II.40-41. L: 3.3 cm, W: 3.4 cm. 2. Brass spring-cover brooch, East series, cast bow with a die-forged finish. On the bow, an ornament in the form of three vertical stripes of engraved double lines, a similar horizontal stripe at the base. Vertical engraved lines on the spring covers. The cylinder covering the spring was decorated with a double zig-zag motif, as was the massive, prominent crest. At the foot terminal, a horizontal stripe of double engraved lines. Type A.II.40-41. L: 3.0 cm, W: 3.3 cm. 3. Iron brooch with a spring cylinder and a crest on the head, die-forged. Silver foil applied onto the cylinder and the bow, with matrix-pressed filigree motifs, braided, pearled and twisted in imitation of incised wire and horizontal lines. Type shares characteristics of A.V.126 and A.V.130. L: 3.0 cm, W: 2.8 cm. 4. Unipartite rectangular forged iron buckle. Type ML G 8. L: 3.6 cm, W: 3.3 cm. 5. Silver S-shaped clasp made of slightly incised wire, with a thicker profiled middle section. Knobs decorated at the bases by applied smooth wire rings. Type von Müller C, Patalan variant C5a. L: 1.8 cm, Wt: 1.92 g. 6. Ceramic spindle whorl, dark brown, cylindrical with a slightly concave top and bottom. Dm: 3.3 cm, H: 2.0 cm. 7. Fragment of an iron casket lock spring, forged from a flat metal band, with a preserved transverse fragment of iron tape (part of the lock mechanism [?]). Preserved L: 4.9 cm. 8. Decomposed organics, wood (?). The remains of a casket found *in situ*, with an oval outline. Given the state of preservation, it was not possible to reconstruct the exact structure of the item. Dimensions: ca. 30.0×22.0 cm. **Dating:** *stadium* IIIA.

Grave 542 (inhumation containing wooden structure [?])
SQ 16-22 C, 17-22 A

The grave was revealed at the depth of 2.20 m, under a medieval layer. The grave pit, aligned N-S, had a clearly visible, roughly rectangular outline with rounded edges. Dimensions: 2.20×0.70 m, maximum depth: 0.40 m (Pl. XLIII, CXCIV:5, CCIV:1). Directly above the level at which the N section of the grave was revealed, at the bottom of a medieval layer, a spindle whorl (22) included in the equipment was found. The pit was filled with loose, fine-grained, light yellow sand with circular hardpan precipitations with a high clay content (diameter ca. 0.15 m). Inside, individual, small stones (granites and marl) and charcoals (oak), as well as decomposed organics, mainly close to equipment items. In the N section of the pit proper, at the bottom, the remains of a skeleton were found, including a badly preserved calvaria with the lower jaw, resting on its right side, suggesting a similar placement of the body. In the S section of the grave pit, fragments of broken shafts of lower limb long bones and metacarpal bones. Under the skull, a necklace was found consisting of nine amber beads (10–18), two of which (13.16) were set in massive rings (19–20). In the N section, above the skull, a needle (21). A biconical bead and a damaged S-shaped clasp (8–9) were placed right next to the lower jaw, presumably parts of a separate neck-worn ornament. At the level of the clavicles, two brooches were lying on their sides (1–2), both with heads pointing downwards, a third brooch (3) with its head pointing upwards was located at the level of the unpreserved chest bones. Two shield-headed bracelets (4–5) were found among the metacarpal bones of both arms. Around them there were fragments of decomposed wood (oak) – the remains of a wooden structure (?). In the S section of the pit, at the level of unpreserved limb and pelvic bones, a buckle (6) and a belt strap end (7) were found, along with a fragment of decomposed wood (oak [?]). Woman (?), adult.

Inventory (Pl. XLIII–XLIV, CCVIII:3): 1. Brass spring-cover brooch, East series. Wide cast bow with a die-forged finish decorated with three transversely incised vertical lines and, in the bottom section, a single horizontal transversely incised line (imitation of pearled wire) and between those, suspended triangles topped with little circles. A relatively narrow crest with a low profile, decorated with a transversely incised line. Underneath the crest, a series of punched circles. Foot terminal decorated with transversely incised lines. Iron spring bar. Type A.II.40-41. L: 3.6 cm, W: 4.1 cm. 2. Brass spring-cover brooch, East series. Wide bow, cast with a die-forged finish. Bow decorated with three transversely incised vertical lines and, in the bottom

section, a single horizontal transversely incised line (imitation of pearled wire), between those, suspended triangles. A relatively narrow crest with a low profile, decorated with a transversely incised line. Foot terminal decorated with a transversely incised line. Iron spring bar. Type A.II.40-41. L: 3.7 cm, W: 4.1 cm. 3. Silver crossbow brooch with a high catchplate, cast, with a die-forged finish, decorated with individual rings of incised wire applied onto the head, the narrow section between the bow and the foot, and the foot terminal. Spring ends decorated with forged knobs with incised wire rings applied at the base. Group A.VII, series 1, similar to type 203. L: 3.5 cm, W: 2.4 cm, Wt: 5.05 g. 4. Silver shield-headed bracelet, fully forged on a profiled die from a cast prefabricate. Very clear traces of forging on the bottom side. Bow with a narrower mid-section. Base and bows decorated with transverse punched incisions to imitate pearled wire. Next to the bracelet, a surviving fabric fragment (unspecified) and a wood fragment (oak). Type Wójcik IV B. Dm: 6.1 cm, bow W: 1.0 cm to 1.6 cm, bases W: 2.1 cm, Wt: 41.44 g. 5. Silver shield-headed bracelet, fully forged on a profiled die from a cast prefabricate. Very clear traces of forging on the bottom side. Bow with a narrower mid-section. Base and bows decorated with transverse punched incisions to imitate pearled wire. Next to the bracelet, a wood fragment (oak). Type Wójcik IV B. Dm: 6.1 cm, bow W: 1.2 cm to 1.7 cm, bases W: 2.1 cm, Wt: 45.80 g. 6. Bipartite buckle with a rectangular plate, made from a copper alloy. Plate forged out of a metal sheet, the edge close to the rivet decorated with a double engraved line, a cast frame (now partially damaged) with a forged finish. A wood fragment (oak [?]) preserved close to the buckle. Type ML D 17. L: 1.8 cm, total W: 3.3 cm, plate W: 1.6 cm. 7. Brass belt strap end, cast from a rod, with a forged finish, shank with a rectangular cross-section, flared in the upper section, tapering towards the bottom, decorated at the edges with engraved lines. Damaged attachment with a preserved leather fragment (not analysed). Type similar to Raddatz O18, ML type 3. L: 6.2 cm. 8. Two fragments of one (or two [?]) silver S-shaped clasps. The first fragment made out of three fine incised wires soldered together, in the middle section a preserved double ring of incised wire. At the ending, an extensive cluster of granulation in the form of four larger granules with a composition of smaller granules soldered on in clusters of four. The whole is set on a double ring of incised wire. The second fragment is made out of six fine wires (three incised ones and three smooth ones in between), a separately preserved double ring of smooth and incised wire, presumably the base of the terminal, onto which a decorative cluster of granules was originally

soldered (solder composition not analysed). Both fragments bear traces of partial melting. Type von Müller B, Patalan subvariant B5c2. L: 1.6 cm and 2.5 cm, separately preserved ring Dm: 0.4 cm, Wt: 0.54 g, 1.68 g. **9.** Biconical silver bead made out of two conical domes soldered together at the base (solder composition not analysed). The domes were made by winding smooth wire onto a conical form. The item bears traces of significant wear and tear (friction). Dm: 1.0 cm, H: 1.3 cm, Wt: 0.84 g. **10.** Barrel-shaped amber bead, irregularly shaped, hand-cut, dark honey-coloured, transparent. Type similar to TM 393. Dm: 2.4 cm, H: 1.6 cm, Wt: 5.18 g. **11.** Barrel-shaped amber bead, irregularly shaped, hand-cut, dark honey-coloured, transparent. Type similar to TM 393. Dm: 2.1 cm, H: 1.3 cm, Wt: 3.20 g. **12.** Disc-shaped amber bead, irregularly shaped, hand-cut, dark honey-coloured, transparent. Type similar to TM 389. Dm: 1.8 cm, H: 0.9 cm, Wt: 1.57 g. **13.** Disc-shaped amber bead, irregularly shaped, hand-cut, dark honey-coloured, transparent. Originally set within a ring-like spacer (19). Type similar to TM 389. Dm: 1.6 cm, H: 0.8 cm, Wt: 1.07 g. **14.** Barrel-shaped amber bead, irregularly shaped, hand-cut, dark honey-coloured, transparent. Type similar to TM 392. Dm: 1.3 cm, H: 1.3 cm, Wt: 1.31 g. **15.** Disc-shaped amber bead, irregularly shaped, hand-cut, dark honey-coloured, transparent. Type similar to TM 389. Dm: 1.3 cm, H: 0.8 cm, Wt: 0.70 g. **16.** Disc-shaped amber bead, irregularly shaped, hand-cut, dark honey-coloured, transparent. Originally set within a ring-like spacer (20). Type similar to TM 388. Dm: 1.0 cm, H: 0.6 cm, Wt: 0.36 g. **17.** Disc-shaped amber bead, irregularly shaped, hand-cut, dark honey-coloured, transparent. Type similar to TM 388. Dm: 0.9 cm, H: 0.5 cm, Wt: 0.26 g. **18.** Disc-shaped amber bead, irregularly shaped, hand-cut, dark honey-coloured, transparent. Type similar to TM 388. Dm: 0.8 cm, H: 0.5 cm, Wt: 0.16 g. **19.** Cast ring-like spacer profiled out of a copper alloy band. Original setting of amber bead (13). Dm: 2.5 cm. **20.** Cast ring-like spacer profiled out of a copper alloy band. Original setting of amber bead (16). Dm: 2.1 cm. **21.** Fragment of a needle shank made from round copper alloy wire. Preserved L: 2.4 cm. **22.** Biconical ceramic spindle whorl, dark brown, with flat ends. Dm: 2.8 cm, H: 2.5 cm.

Dating: *stadium* IIIIB.

Grave 543 (inhumation containing a wooden structure shoring up the sides of the pit, opened) **SQ 15-22 C**

Grave revealed at the depth of ca. 0.80 m, under a modern ploughed layer. Irregular pit, oval outline in the S section, damaged in the N by a secondary dig (feature 543A – see description below), aligned N-S. Preserved dimensions:

ca. 2.00×1.30 m (Pl. XLV, CXCVII:1–2). The undisturbed S section of the grave was filled with compacted coarse-grained copper-to-brown coloured sand with a high clay content. Some 0.15 m below the level at which the grave was revealed, a very well preserved humerus, pelvic and lower limb bones were found. The arrangement of the latter suggests that the individual was placed on his left side, with legs curled up high (possibly tied [?]). The foot bones, the vertebrae and the lower ribs are missing. In the undisturbed section of the pit, a clearly preserved, partially burnt wooden structure was revealed. The sides contained charcoals (oak) clustered along the longer sides of the grave. This was probably a wooden structure made of planks or laths (slats of split wood) intended to shore up the sides of the pit as no wood remains were found under the preserved part of the skeleton or at the bottom of the grave. The total dimensions at the bottom were ca. 3.00×1.00 m. The remains of the construction were also revealed within the secondary trench (cf. description of 543A). In the N section of the grave pit, a needle (1) was found at knee level. Man, *adultus* (25–30 years old).

Inventory (Pl. XLV): **1.** Needle made from round copper alloy wire. Forged eye, punched through. Dąbrowska type II. L: 5.3 cm.

Dating: *stadium* IIIA/IIIB.

Feature 543A (secondary trench into grave 543) **SQ 15-22 C**

The irregular, roughly oval trench (1.40×1.20 m) was discovered at the depth of 0.80 m, under a modern ploughed layer. It was located in the N section of grave 543, but it did not extend to the bottom of the grave pit. Within it, significantly scattered fragments of casket fittings (2–13) were found with preserved wood (hornbeam) and lower jaw teeth, suggesting that the individual from grave 543 was placed with the head pointing N. Filled with loose, fine-grained, light yellow sand with hardpan precipitations. Also captured were the remains of decomposed wood from the wooden structure of the grave 543, particularly visible along the W side of described feature. In the S section, at the bottom of the trench, a darker circular area with a diameter of ca. 0.20 m and a depth of 0.20 m, filled with decayed wood. This is the trace of a (pointed) wooden stake, possibly related to the wooden structure on the sides of grave 543. Man, *adultus* (25–30 years old).

Inventory (Pl. XLV): **1.** Iron unipartite buckle, forged, roughly oval frame. Type similar to ML G 51. L: 4.6 cm, W: 3.3 cm. **2.** Iron casket brace forged out of a metal band, with wood fragments (hornbeam). L: 3.0 cm, band W: 0.6 cm. **3.** Iron casket brace forged out of a metal

band, with wood fragments (hornbeam). L: 3.2 cm, band W: 0.6 cm. 4. Fragment of a convex external iron casket brace or fitting. L: 2.8 cm, W: 2.1 cm. 5. Fragment of a convex external iron casket brace or fitting with fragments of a wooden slat (oak). On the sides, a fragment of a mineralised bone was found (unidentified), possibly from the casket finish. L: 1.7 cm, maximum W: 0.9 cm. 6. Fragment of an iron casket brace. Preserved L: 1.4 cm, band W: 0.6 cm. 7. Forged iron rivet with a fragment of a wooden casket slat (oak). Wood L: 2.4 cm, W: 2.2 cm, iron rivet Dm: 0.9 cm, shank L: 0.5 cm. 8. Fragment of a bar-shaped forged iron external casket brace or fitting with a wooden slat (oak). L: 2.5 cm, W: 1.6 cm. 9. Fragment of a wooden slat (oak), probably an element of a casket. Preserved L: 3.00 cm. 10. Iron rivet with two shanks with a fragment of mineralised wood (unidentified). L: 2.1 cm, W: 1.4 cm. 11. Fragment of a forged iron external casket brace or fitting. L: 2.0 cm, W: 2.0 cm. 12. Fragment of a forged iron external casket brace or fitting with a fragment of a wooden slat (oak). L: 4.0 cm, W: from 1.6 cm to 2.7 cm. 13. Fragment of a forged iron band with a small rivet – part of casket fittings (?). L: 1.4 cm, band W: 0.6 cm.

Dating of finds: *stadium* IIIA/IIIB.

Dating of feature: *stadium* IIIA/IIIB or later (see description of grave 543).

Grave 544 (cremation urn, destroyed) SQ 16-22 A

The remains of the grave were captured at the depth of ca. 1.00 m, under a medieval layer, in the form of clusters of fragments of a single vessel (2), scattered in a ca. 1.50 m radius in a layer of loose, fine-grained, light yellow sand with hardpan precipitations. Among the vessel fragments there was a pear-shaped pendant (1) and several small burnt bones. The outline of the pit was not captured. Unidentified sex, unidentified age.

Inventory (Pl. XLIV, CCIX:1): 1. Pear-shaped pendant made of electrum (a gold and silver alloy), partially melted in the heat of the pyre (pendant suspension loop not preserved), made by soldering together elements embossed with a repoussé technique; hollow inside, with a narrow elongated neck and a soldered-on horizontal rim. In the upper section of the body, a soldered-on decoration of fine wires shaped like an inverted festoon. At the bottom, decorated with two fine wires twisted to form springs and bordered by smooth fine wires. The endings are decorated with clusters of granules. On the upper surface of the pendant, near the wires, a red precipitate survives – probably the remains of a chemical solder based on copper compounds. H: 2.3 cm, maximum W: 1.3 cm, Wt: 2.24 g. 2. Reconstructed ceramic bowl (urn), dark brown, with smoothed inside and outside surfaces. High temper

content consisting of crushed ceramics and granite, with visible mica grains. Medium-fired ceramic mass, crumbling and flaking. Type RW VIB. Rim Dm: 12.4 cm, body Dm: 33.6 cm, bottom Dm: 13.6 cm, H: 7.8 cm.

Dating: *stadium* IIB/IIC.

Grave 545 (inhumation, quadruple (?), destroyed) SQ 15-23 D

Revealed at the depth of ca. 0.50 m, under a modern ploughed layer. The pit is aligned NNE-SSW, roughly rectangular in shape, sized ca. 3.30×1.20 m and with a maximum depth of 0.55 m (Pl. XLVI, CXCVIII:1). The upper section of the pit was destroyed by ploughing. Above the N section of the grave, several items were discovered, probably grave equipment: a brooch (1), a belt strap end (7), a brass belt fitting with a pendant ring (8) and a casket spring (15). The remaining part of the grave was disturbed by a large trench filled with highly compacted mid- and coarse-grained, copper-brown sand. This was the remains of a sand pit exploited in the early of the twentieth century and filled and ploughed after World War II, which destroyed the NE section of the explored part of the cemetery (cf. Fig. 4). The W section of the grave pit from the level at which it was identified was disturbed by animal burrows; burrow remains were found all the way down to the bottom. The pit was filled with compacted coarse-grained, dark copper-coloured sand largely turned into hardpan, with an admixture of loose, light yellow sand. Also found in the fill were many clusters and deposits of clay, gravel and small charcoals (oak [?]). As a result of the damage, the fill of the feature contained scattered fragments of bones from four individuals, in a non-anatomical arrangement. Bones with the most anatomical arrangement were found in the NW section of the pit (child, *infans* II). In that location, next to the bones, elements of equipment were found: brooches (2–3), bracelets (4–5), an S-shaped clasp (10) and a fragment of a band of a capsule pendant (12). Located due E of the skeleton of *infans* II there was a fragment of the jaw bone of a *iuvenis* (with discolorations caused by copper oxides suggesting it was originally adjacent to an item made from a copper alloy). A male skull (*maturus*) was found in the SW section of the pit with its face turned downwards, inside an animal burrow. Various bones from other individuals were scattered throughout the pit. The other elements of equipment were scattered and could not be attributed to specific individuals. In the NE section, an S-shaped clasp (9) and, slightly below, a small fragment of a rivet from a casket brace or fitting (16). In the middle section of the pit, a destroyed capsule pendant (11) and a modern glass fragment (18). In the S section, a non-distinctive

ceramic fragment (17), at the SE edge of the pit, a buckle (6). The grave was located in a cluster of the features (with bones from several individuals) all bearing similar damage. Possibly, some of the bones found in the pit formed a secondary deposit. Unidentified sex, *infans* II (10–12 years old); woman (?), *iuvenis* (18–20 years old); woman, *adultus* (25–35 years old); man, *maturus* (45–50 years old).

Inventory (Pl. XLVI–XLVII, CCX:7): **1.** Iron brooch with a wide, flat bow and a flared rectangular head. On the head, an engraved groove for the upper bowstring. Decorated over its entire surface with silver foil with geometric patterns embossed with a filigree and granulation matrix in the form of a series of circles and diagonal cross-hatches. Group A.V, series 11, type *Leonów*. L: 2.8 cm, W: 2.1 cm. **2–3.** Two identical brass brooches with crested heads and a spring inside a cylinder. On the cylinders, traces of fragments of embossed silver foil. Type A.V.130. L: 3.0 cm; 3.1 cm, W: 2.9 cm; 2.8 cm. **4–5.** Two identical brass shield-headed bracelets. The middle sections of the bow are flat-to-convex in cross-section, more triangular at the bases. Type Wójcik II B. Dm: 6.7 cm; 6.5 cm, maximum base W: ca. 1.5 cm each. **6.** Unipartite iron belt buckle with a plate preserved in fragments; two fragments preserved separately; one bearing a visible imprint of a fabric (unidentified) with a canvas weave (?). Prong missing. Type ML D 7 (?). L: 4.2 cm, W: 3.6 cm. **7.** Brass belt strap end with a single rivet on the attachment, rectangular shaft cross-section and a trapezoid, slightly flared ending of a ring-shaped terminal. Type similar to Raddatz JII3, ML type 6, form 1. L: 7.2 cm. **8.** Brass belt fitting with a pendant ring. Massive ring with a rhomboid cross-section. Flared fitting ending in a rivet, decorated in the upper and lower parts with a geometric pattern of engraved lines. ML variety 7. Fitting L: 1.8 cm, ring Dm: 1.2 cm. **9.** Silver S-shaped clasp made from a single smooth wire with an oval cross-section, more square in the middle section, and wrapped in a double braid of smooth wire. One end of the shaft is damaged, the other – at the base of the terminal – contains two soldered-on rings made from smooth wire with a cluster of five larger granules and a soldered-on application (originally on each – only three are preserved) made out of an arrangement of smaller-sized granulation (four smaller granules). Type von Müller B, Patalan variant B3b. Preserved L: 2.6 cm, Wt: 2.59 g. **10.** Brass S-shaped clasp made of smooth round wire. In the middle section of the shank, a thicker forged part imitating applied wire rings. Shank terminals decorated with double rings of incised wire. Type von Müller C, Patalan variant C5a. Maximum L: 1.4 cm. **11.** Damaged brass capsule pendant. On the front shield, preserved traces of a tin-lead

solder to affix silver (?), gilt silver (?) or gold (?) foil. Preserved H: 1.4 cm, Dm: 1.3 cm. **12.** Brass fragment of a tin-coated middle band (remains of solder on foil (?)), probably from the capsule pendant. Dm: 1.5 cm. **13.** Melon-shaped glass bead, dark blue, transparent. Type TM 163. Dm: 1.8 cm, H: 1.2 cm. **14.** Fragment of an iron hooked pin with a twisted shank. Preserved L: 2.3 cm. **15.** Iron casket lock spring with one end broken off, with a flat shank, rectangular cross-section and an almost square ending. Preserved L: 9.0 cm. **16.** Fragment of an iron item – element of a rivet from a casket brace or fitting (?). Preserved H: 1.0 cm. **17.** Fragment of the body of a ceramic vessel, dark brown, with a lightly smoothed surface. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 1.2 cm. **18.** Fragment of a modern glass vessel, dark green, transparent. Preserved H: 1.6 cm.

Dating: *stadium* IIB/IIC.

Grave 546 (inhumation in a log coffin, double, opened) **SQ 16-23 B, D**

Revealed at the depth of 1.00–1.10 m, under a medieval layer. At this level, an incomplete female skeleton was captured in a non-anatomical arrangement (fragments of the skull, lower jaw, spine, pelvis and long limb bones). Situated in a pit aligned NNW-SSE, roughly rectangular with rounded edges (dimensions 3.00×1.00 m) and with a maximum depth of 0.60 m (Pl. XLVIII, CXC VII:3). The upper part of the feature was filled with compacted copper-brown gravel with a high clay content, largely turned into hardpan, with stones with diameters of ca. 0.04–0.15 m and one larger stone with a diameter of ca. 0.25 m, located in the N section of the pit. The bottom section of the feature was filled with loose, coarse-grained, dark yellow gravel mixed with fine-grained, dark grey sand and copper-brown hardpan precipitations. The top of the grave was damaged by a secondary trench whose outline was not captured clearly. Green discolourations on some of the bones indicate the original presence of copper alloy items in the grave equipment. Some 0.35–0.40 m below the level at which the feature was captured, a clear outline was captured of a log coffin (unidentified wood) sized 2.60×0.60 m. In the sides of the coffin, small charcoals (silver birch) were found suggesting that the coffin was made by burning. A male skeleton was found in the log. The upper section was destroyed (probably by the same secondary trench). Only small fragments of ribs, pelvis, upper limb long bones and spine were preserved. Among the bones, undisturbed equipment items were found. At the level of the clavicle bone, there was a brooch (1) with its head pointing W, another brooch with its head pointing S (2) was located lower

down, above the pelvic bones. The arrangement indicates that the body was wrapped in a cloak or shroud. In the N section of the coffin, where the unpreserved skull would have been, a spindle whorl (6) was found as well as the bottom part of a vessel (7) with clearly worn widest parts (it had been originally placed in the grave in a worn condition). Further S, a fragment of a needle (5). The lower part of the skeleton was preserved in an anatomical arrangement: the individual was placed on the right side, with the right arm outstretched, and the left arm bent in the elbow or placed on the pelvis, with the head pointing N. On the left femur, a buckle (3), and next to the right tibia – a belt strap end (4). Woman, early *adultus* (25–30 years old), body height 160–166 cm – the skeleton in the top part of the pit; man, late *adultus* (35–40 years old), body height 170–172 cm – skeleton at the bottom of the pit.

Inventory (Pl. XLIX): 1. Brass crossbow brooch with a high catchplate. Die-forged bow. The narrower section of the bow and the foot terminal decorated with individual rings of incised wire. Group A.VII, series 1, type similar to 203. L: 3.3 cm, W: 2.0 cm. 2. Silver crossbow brooch with a tendril foot. Die-forged bow with a faceted profile, decorated with triple rings of incised wire at the head, in the mid-section and at the transition section next to the foot. Head decorated with a forged knob with a triple ring of incised wire applied at the base. Iron spring bar. Type similar to A.VI.167. L: 4.9 cm, W: 1.7 cm, Wt: 5.77 g. 3. Semi-circular (D-shaped) bipartite brass buckle with plate. The plate and the buckle frame were die-forged, frame and prong with a faceted cross-section, bar endings decorated with forged knobs. Type similar to ML D 18. L: 2.6 cm, total W: 3.2 cm, plate W: 1.4 cm, buckle frame W: 1.8 cm. 4. Brass belt strap end ending in a profiled ring, cast shank with a die-forged finish with a faceted profile, fan-shaped, flared attachment with two rivets. Type Raddatz JII3, ML type 6, form 1. L: 6.4 cm. 5. Fragment of an iron needle or brooch pin forged from round wire. L: 3.2 cm. 6. Biconical ceramic spindle whorl, dark brown, with flat ends. Dm: 2.9 cm, H: 2.8 cm. 7. Lower part of a small ceramic vase, brown, dark brown in places, roughened in the lower part of the body curve. High temper content consisting of coarse-grained crushed ceramics and granite. Medium-fired ceramic mass, crumbling and flaking. Type RW XIVA. Body Dm: 13.0 cm, bottom Dm: 7.6 cm, preserved H: 6.0 cm.

Dating: *stadium IVA*.

Grave 547 (inhumation in a log coffin, double, disturbed) **SQ 16-23 B, D**

Revealed at the depth of ca. 0.80 m, under a medieval layer. The top of the pit was visibly disturbed

by medieval ploughing. The pit is aligned NNW-SSE, roughly oval-shaped, sized ca. 3.20×1.30 m and with a maximum depth of 0.20 m (Pl. L). Grave filled with copper-yellow sand largely turned into hardpan with a high clay content, with concretions of loose, sandy gravel. At the bottom of the grave pit, a log coffin was placed (wood not analysed), supported on the S side with a large stone sized ca. 0.30×0.30 m. The coffin was filled with medium-compacted dark yellow to copper-coloured sand with concretions of clay and gravel turned into hardpan. The coffin was sized 2.10×0.42 m, shaped like an elongated trapezoid with rectangular corners, narrower in the N section (0.24 m) and wider in the S section (0.48 m). The coffin was laid diagonally relative to the grave axis, roughly aligned with the NW-SE line. In the N section, a wooden container was placed in the coffin (5), containing several items found inside, including a comb (3), a spindle whorl (4) and a smoothed stone – a game token (?) (6). In the remaining section of the coffin, a skeleton was found with the upper section incomplete and clearly disturbed by small burrowing animals. Identified bones included fragments of a calvaria, spine and ribs, as well as three clavicles (two left ones) suggesting that two individuals were buried in the grave. Also discovered were a buckle (1) and a belt strap end (2). Some bones had an anatomical arrangement, including some leg bones (tibiae, fibulae and foot bones), suggesting that the better preserved skeleton was placed on the left side of the body with the head pointing N. Unidentified sex, *adultus* (25–35 years old) – the better preserved skeleton; unidentified sex, *adultus* (?) – second left clavicle.

Inventory (Pl. L, CCX:1): 1. Bipartite brass buckle with a plate. The plate and the buckle frame were die-forged, the frame and prong had a faceted cross-section. The plate was decorated with a motif of concentric eyes (four forming a rhomboid pattern) and engraved lines along the shorter edges. Type ML E 12. L: 2.5 cm, total W: 2.9 cm, plate W: 1.7 cm, frame W: 1.2 cm. 2. Brass belt strap end, with a roughly rectangular profiled ending containing a hole in the middle and a short tongue decorated with horizontal engraved lines. The shank was cast, with a die-forged finish with a faceted profile, attachment with a single rivet. Type similar to Raddatz JII3, ML type 6, form 1, variant 2. L: 6.2 cm. 3. Incomplete three-layer comb with an arched handle made of bone (antler [?]). Handle material held together by seven rivets made from a copper alloy. Type Thomas I. W: 10.6 cm, maximum H: 6.0 cm. 4. Biconical ceramic spindle whorl, dark brown, with concave ends. Dm: 4.0 cm, H: 3.2 cm. 5. Decomposed wood (unidentified). Remains of a wooden container without metal fittings found *in situ*. Rectangular outline with

clearly visible corners, most likely made by burning (unidentified charcoals were obtained from a side). Given the state of preservation, it was not possible to reconstruct the exact structure of the item. A fragment of mineralised bone (unidentified) was also found near the sides, possibly from external bone lining on the container. Dimensions ca. 45.0×24.0 cm. 6. Smoothed stone with a flat bottom side. Game token (?). L: 2.1 cm, W: 2.0 cm.

Dating: *stadium* IVA/IVB.

Grave 548 (inhumation, destroyed) SQ 15-23 D, 16-23 B

Revealed at the depth of 0.75 m, under a modern ploughed layer. The top clearly destroyed by ploughing. The pit is aligned N-S, close to oval-shaped, sized ca. 2.80×1.20 m and with a maximum depth of 0.50 m (Pl. LI). The W section of the feature was filled with highly compacted coarse-grained, copper to brown-coloured sand mixed with gravel, the E section – with loose, mid-grained, light yellow sand. The pit also contained inclusions of clay ca. 0.10 m in diameter and individual stones with a diameter of ca. 0.20 m. The N section of the grave was disturbed by the pit of inhumation grave 545. The skeleton was incomplete. Fragments of a skull, long limb bones, ribs and vertebrae were scattered throughout the pit as a result of ploughing and animal burrowing, making it impossible to identify the original location of the buried individual. A damaged buckle (1) was preserved, located in the E section of the grave, in a cluster of large stones. Its shape and state of preservation indicate that we are possibly dealing with a modern item that ended up in the disturbed feature. Grave 548 intersected the SE corner of inhumation grave 557. Man, early *maturus* (40–45 years old), body height 164–170 cm.

Inventory (Pl. LI): 1. Damaged iron buckle with a plate untypically bent upwards. Maximum frame L: 3.3 cm, plate L: 3.0 cm, preserved W: 3.0 cm.

Dating: earlier than *stadium* IIB/IIC (see description of grave 545).

Grave 549 (cremation pit) SQ 16-22 D, 17-22 B

Revealed at the depth of ca. 1.60 m, under a medieval layer. The pit was roughly oval-shaped, aligned N-S, with dimensions of 2.90×1.00 m and a maximum depth of ca. 0.80 m (Pl. LIII). The grave was filled with loose, fine-grained, light yellow sand (copper-coloured in places) with numerous precipitations of light copper-coloured clay turned into hardpan and numerous small stones with a diameter of ca. 0.02–0.06 m and marl 0.03–0.07 m in diameter. Within the layer, throughout its depth, many greyish discolourations were found,

remaining from decomposed organics, as well as individual small charcoals (not analysed). At the NW edge of the pit, at its bottom, a dark brown stain of decomposed wood (oak) was found – possibly the remains of a wooden coffin or casket (?), and a buckle (1). Next to the buckle, several burnt tooth fragments and a burnt bone from a single individual were found. In the SE corner, at the same level, a casket spring lock (2) was found. Unidentified sex, unidentified age.

Inventory (Pl. LII): 1. Bipartite buckle with a plate and a rectangular buckle frame made from a copper alloy. The plate was forged from a metal sheet, the frame was cast, with a forged finish. At the buckle plate, a wood fragment (oak). Type similar to ML G 28. L: 3.0 cm, frame L: 4.0 cm, frame W: 2.5 cm, total W: 4.0 cm. 2. Iron spring from a casket lock, forged from a rod with a rhomboid cross-section, clearly thicker at the end, rhomboid in cross-section. L: 7.4 cm.

Dating: *stadium* IIIA/IIIB.

Grave 550 (inhumation, disturbed) SQ 16-21 D, 17-21 B

Revealed at the depth of ca. 2.40 m, under a medieval layer. The top of the grave had clearly been damaged by more recent layers. The pit is aligned N-S, roughly oval-shaped, sized ca. 2.40×1.00 m and with a maximum depth of ca. 0.50 m (Pl. LI). Filled with fine-grained, light yellow-grey sand with numerous precipitations of copper-coloured, compacted hardpan. The equipment, including belt fittings (2–3) found at the presumed level of the hips and legs, and a brooch (1) located at chest level (not preserved), were found directly at the level at which the pit was captured. Beside one belt fitting (3), fragments of decomposed organics were found (leather and thread). A soil sample taken close to the belt fitting showed the presence of small charcoals (oak) and strongly decomposed wood (oak). The remains of a skeleton were discovered at the bottom of the pit, in the NE section, in the form of fragmentarily preserved teeth, which suggests that the buried individual was placed with the head pointing N. W of the teeth, fragments of a vessel (4) were discovered. A fragment of the rim of another vessel (5) was found ca. 0.60 m further S. Unidentified sex, *maturus* (?).

Inventory (Pl. LII, CCX:3): 1. Brass knee-shaped brooch, cast bow with a forged finish, decorated on the head with imitation incised wire. Foot decorated with an engraved ornament in the form of the letter X and lines of punched dots. Type similar to A.V.137. L: 3.0 cm, W: 2.0 cm. 2. Belt strap end made from a copper alloy, cast, terminating in a ball and tongue with a round cross-section. Shank with a forged finish, with a rectangular cross-section. On the shank, a decoration in the form of engraved lines running along the edge.

Damaged attachment with a single rivet. Type similar to Raddatz O16, ML type 2, form 6. L: 6.4 cm. 3. Belt fitting made from a copper alloy, cast from a triangular mould, ring-like, containing three protrusions with rivet holes (only one rivet was preserved). At the bottom, a single separate flat sheet of metal was added as a support or a pad. Inside the fitting, remains of leather (not analysed) and fragment of a double thread (unidentified). L: 2.8 cm, W: 2.4 cm. 4. Reconstructed small ceramic vase, dark brown, with a lightly smoothed, glossy surface. High temper content consisting of fine-grained crushed ceramics and granite, visible mica grains. At the base of the body, a decoration in the form of two horizontal scored lines, underneath an ornament consisting of scored triangles. Medium-fired ceramic mass, crumbling and flaking. Type RW XVIA. Reconstructed rim Dm: 13.8 cm, body Dm: 15.2 cm, bottom Dm: 7.7 cm, reconstructed H: 10.6 cm. 5. Fragment of the rim of a ceramic vessel, strongly flared outward, dark brown, with a smoothed surface. High temper content consisting of mid- and coarse-grained crushed ceramics. Medium-fired ceramic mass, crumbling and flaking. H: 4.4 cm.

Dating: *stadium* IIB.

Grave 551 (inhumation, disturbed) SQ 16-22 D, 17-22 B Revealed at the depth of ca. 1.60 m, under a medieval layer. The top of the grave had clearly been damaged by the overlying layer and animal burrows. The pit is aligned NNW-SSE, almost oval-shaped in outline, sized 2.40×0.90 m and with a maximum depth of 0.20 m, (Pl. LIII). At the level at which the pit was captured (close to its middle section), a buckle (1) was discovered, presumably part of the grave equipment. Filled with loose, fine-grained, light yellow sand with hardpan veins and many small stones with 0.02–0.04 m in diameter. In the N section of the feature, bone remains from a single individual were found, namely the skull facing down. N of the skull, a round flat piece of thin metal was discovered – the shield of a capsule pendant or of a bucket pendant (3). Beside, E of the shield, a belt strap end (2). Directly E of the skull, the outline of a wooden container (oak) was revealed (5) with non-metal fittings, filled with compacted mid-grained, dark copper-coloured sand largely turned into hardpan with a high clay content, containing dark brown precipitations of decomposed wood. Inside the container there was a crushed comb (4). Man, *senilis* (over 55 years old). **Inventory** (Pl. LIII, CCX:4): 1. D-shaped unipartite buckle with a thicker frame made of tin-lead bronze. The frame was cast, with a forged finish, triangular in cross-section. Unspecified type. L: 3.0 cm, W: 1.6 cm. 2. Damaged belt strap end made of tin-lead bronze,

made out of sheet metal flared at the bottom end. On it, along the longer edges, a punched ornament of semi-circles surrounded by triangular leaves. This fragment is connected to another, partially preserved one with a hook-like catch mounted on an axis. Type ML (1992) *Wrocław-Zakrzów*. Preserved L: 6.9 cm, maximum fitting W: 1.6 cm. 3. Round silver shield from a capsule pendant or the bottom of a bucket pendant. Dm: 1.3 cm, Wt: 0.22 g. 4. Fragments of a three-layer comb in the form of external lining made from bone (antler [?]) and rivets made from a copper alloy. An arched handle preserved *in situ*. Type Thomas I. Preserved lining L: 1.3 cm, preserved rivets L: 0.8 cm, 0.6 cm. 5. Decomposed wood (oak). *In situ*, remains of a wooden container without metal fittings, rectangular outline with clearly visible corners. Given the state of preservation, it was not possible to reconstruct the exact structure of the item. Dimensions ca. 34.0×27.0 cm.

Dating: *stadium* VI.

Grave 552 (inhumation, disturbed) SQ 16-22 C, 17-22 A Revealed at the depth of ca. 1.80 m, under a medieval layer. Pit outline close to oval-shaped, sized ca. 2.60×1.20 m and with a maximum thickness of 0.50 m. Aligned NNW-SSE (Pl. LIV). Filled with loose, fine-grained, light yellow sand with hardpan veins concentrated close to the items, the layer also contains numerous lumps of marl. The grave pit clearly contained numerous small animal burrows. In the N section of the pit, a large fragment of a wooden plank (oak) was revealed, supporting a belt strap end (1) with leather remains. The remaining equipment items were deposited in a wooden casket (oak) (8), preserved along with metal fittings (6) and situated in the central section of the pit. Those included three vessels (3–5) and a spindle whorl (2). Outside the outline of the casket, SW of it, a fragment of the spring from a casket lock (?) was found (7). No bones were preserved.

Inventory (Pl. LIV–LV, CCIX:3): 1. Damaged belt strap end made of tin bronze ending in a ring, cast, with a forged finish. Attachment decorated with engraved horizontal lines, with a single rivet, inside preserved fragments of leather (not analysed). Type similar to Raddatz JIII, ML type 5, form 1. Preserved L: 7.3 cm. 2. Biconical ceramic spindle whorl, dark brown, with concave ends. Dm: 3.3 cm, H: 1.6 cm. 3. Miniature ceramic vessel, light brown, with a smoothed surface. High temper content consisting of mid-grained crushed ceramics, visible mica grains. Well-fired to produce a hard and strong ceramic mass. Type RW XVIIIIE. Rim Dm: 7.0 cm, body Dm: 9.3 cm, bottom Dm: 4.5 cm, H: 7.7 cm. 4. Ceramic bowl crushed under the weight of the soil, brown, with a smoothed surface. High temper

content consisting of fine-grained crushed ceramics. The vessel is strongly deformed and very poorly fired (or the vessel may have been only slightly heated before being placed in the grave). Crumbling and flaking ceramic mass. Type RW VIB. Rim Dm: 14.6 cm, body Dm: 20.6 cm, bottom Dm: 5.3 cm, H: 7.7 cm. 5. Glass drinking bowl, bowl-shaped with a low-set body curve, light green glass, transparent, many air bubbles and streaks, rim slightly thicker, thick concave bottom. Type similar to Eggers 202, Lund-Hansen type *Møllegårdsmarken*. Rim Dm: 8.0 cm, bottom Dm: 4.0 cm, H: 6.0 cm. 6. Rectangular casket brace or fitting made from a copper alloy, decorated with lines engraved along the longer edges, preserved with two rivets, one damaged. L: 3.3 cm, band W: 1.2 cm, rivet shank L: 1.3 cm. 7. Fragment of a forged iron spring from a casket lock (?). L: 4.0 cm, maximum band W: 0.8 cm. 8. Decomposed wood (oak). The remains of a casket found *in situ*. Rectangular outline with rounded edges. Given the state of preservation, it was not possible to reconstruct the exact structure of the item. Dimensions: ca. 54.0×40.0 cm.

Dating: *stadium* IVB.

Grave 553 (inhumation, disturbed) SQ 16-22 C, 17-22 A Revealed at the depth of ca. 2.00 m, under a medieval layer and clearly damaged by the same in the topmost section. The pit is aligned NNW-SSE, roughly rectangular with rounded edges, sized 2.65×0.80 m and with a maximum depth of 0.30 m (Pl. LV). Filled with a mixture of loose, fine-grained, light yellow and dark yellow sand. Also found in the same layer were some grey discolourations related to the decomposition of unspecified organics, lacking any clear or continuous concentrations to indicate the presence of a coffin or some other wooden structure. Those were probably the remains of a decomposing body and the organic matter (fabric [?]) that once covered the individual. At the bottom of the pit there were four stones 0.15–0.20 m in diameter. The grave contained a single individual with nothing but crushed fragments of a tooth preserved in the N section of the pit. Beside, a brooch (1) facing upwards was found. The brooch may have once pinned together the fabric covering the body. At the brooch, small charcoals (not analysed) and a decomposed wood fragment (oak) were found – possibly the remains of a container. Closer to the S end of the pit, fragments of melted glass (2) were discovered. Unidentified sex, *maturus* (?).

Inventory (Pl. LV): 1. Crossbow brooch with a high catchplate, made from a copper alloy. Bow decorated with transverse incisions to imitate incised wire; a similar ornament at the transition area between the bow and

the foot. Group A.VII, series 2. L: 3.2 cm, W: 1.3 cm. 2. Four fragments of a melted glass bead (?), light green, transparent. L of preserved fragments: 1.0 cm, 0.4 cm, 0.4 cm, 0.8 cm.

Dating: *stadium* IIIB.

Grave 554 (cremation-inhumation) SQ 17-22 A

Revealed at the depth of ca. 1.85 m, under a medieval layer. The pit is aligned NNW-SSE, outline close to oval-shaped, sized 2.10×0.90 m and with a maximum depth of ca. 0.20 m (Pl. LVI). Filled with loose and medium-compacted fine- and mid-grained, light yellow sand with numerous hardpan precipitations and copper-brown clay with a high sand content, mainly concentrated in the S section of the pit, and with numerous small charcoals (oak and maple). At the level of capture, a non-distinctive fragment of a vessel (10). Fragments of teeth found at the bottom of the N section of the pit, several burnt bones found in the middle section. Given the state of preservation, it was not possible to determine whether those came from a single individual, but if not, then the bones came from similarly aged individuals (*adultus*). In the S section, E of the feature, three vessels (7–9) were found, including one (8) placed inside another (9), a decomposed comb (3), a needle (4) and a spindle whorl (6). Also located at chest level (not preserved) was a hooked pin with a twisted shank (5) and two beads (1–2). Unidentified sex, *adultus*; burnt bones: unidentified sex, *adultus*.

Inventory (Pl. LVI–LVII, CCIX:4): 1. Light green, transparent disc-shaped glass bead. Type TM 42b. Dm: 1.6 cm, H: 0.9 cm. 2. Disc-shaped amber bead, hand-cut, dark honey-coloured, transparent. Type TM 389. Dm: 1.6 cm, H: 0.4 cm, Wt: 0.84 g. 3. Fragments of a three-layer comb in the form of handle lining made of bone (antler [?]) and rivets made from a copper alloy. An arched handle preserved *in situ*. Type Thomas I. Preserved fragments L: 1.0 cm, 0.9 cm, 0.7 cm, 1.0 cm, 1.0 cm, 0.6 cm, 0.3 cm. 4. Needle made from round copper alloy wire. Forged eye, punched through. Dąbrowska type II. L: 6.6 cm. 5. Hooked pin with a twisted shank made from a copper alloy. L: 5.6 cm. 6. Biconical ceramic spindle whorl, dark brown, with flat ends. Dm: 4.2 cm, H: 2.4 cm. 7. Miniature ceramic vessel, light brown, dark brown in places, with a smoothed surface. High temper content consisting of fine-grained crushed ceramics. Well-fired to produce a hard and strong ceramic mass. Type RW XVIIIC. Rim Dm: 8.2 cm, body Dm: 8.6 cm, bottom Dm: 4.6 cm, H: 5.8 cm. 8. Miniature ceramic vessel, light brown, dark brown in places, with a smoothed surface. High temper content consisting of fine-grained crushed ceramics. In the middle section, a broad ornamental stripe

in the form of oblique scored lines forming triangles, between which rows of circles are found in the lower section. The composition is delineated by scored horizontal lines (one in the upper section, two in the lower section). Well-fired to produce a hard and strong ceramic mass. Type RW XVIII B. Rim Dm: 7.4 cm, body Dm: 8.9 cm, bottom Dm: 4.4 cm, H: 6.6 cm. 9. Small ceramic vase, dark brown, with a smoothed surface. High temper content consisting of fine-grained crushed ceramics and granite, visible mica grains. Under the neck, down to mid-height of the vessel, a wide ornamental stripe in the form of alternating triangles, scored obliquely to form a cross-hatch pattern; each stripe is delineated by a horizontal groove. Well-fired to produce a hard and strong ceramic mass. Type RW XVII A. Rim Dm: 12.4 cm, body Dm: 18.8 cm, bottom Dm: 6.9 cm, H: 13.6 cm. 10. Fragment of the body of a ceramic vessel, dark brown, with a carelessly smoothed external surface. High temper content consisting of fine-grained crushed ceramics. Medium-fired ceramic mass, crumbling and flaking. H: 2.0 cm.

Dating: *stadium* IIIA/IIIB.

Grave 555 (inhumation, destroyed) **SQ 16-23 B, 16-24 A** Revealed under a modern ploughed layer at the depth of ca. 0.80 m (N section) and 1.20 m (S section), under a medieval layer which had caused visible damage. The N section of the grave was completely destroyed by ploughing. The pit is aligned NNW-SSE, close to oval-shaped, sized ca. 3.20×1.30 m and with a maximum depth of ca. 1.00 m (Pl. LVII). It was filled with compacted dark copper-coloured sand mixed with clay and gravel. In the pit, the remains of a single individual were discovered. The upper part of the skeleton was incomplete. Fragments of a calvaria, lower jaw, ribs and clavicle bones were found jumbled up in the top part of the N section of the pit, which had been disturbed by ploughing. In that section, at the bottom of the pit, there were equipment items, aligned N-S, possibly indicating that the body was wrapped in a shroud (?). The items included brooches with some adhering wood (oak) (2–3), a needle (4) and fragments of two vessels (5–6). At the bottom of the S section of the pit, lower limb bones and a pelvis with the bones of a hand resting on top of it were found in an anatomical arrangement. The pelvis and the hand bones bore traces of copper oxides remaining from a metal object (bracelet or buckle), which was missing from the equipment as a result of the damage caused by ploughing. Beside, to the W near the ribs area, another brooch was found (1), along with a wood fragment (oak). The arrangement of the skeletal bones indicates that the individual was laid in the grave on the right side of the body with

bent legs and the head pointing N. Woman, *maturus* (35–40 years old).

Inventory (Pl. LVII–LVIII, CCX:5): 1. Knee-shaped brooch made of tin bronze. Cast bow with a forged finish. Profiled head decorated with oblique lines, catchplate decorated with an engraved letter-of-X motif. Type similar to A.V.137. L: 4.1 cm, W: 1.8 cm. 2. Spring-cover brooch, East series, made from a copper alloy. Cast bow with a forged finish. In the upper section, a decoration in the form of three vertical lines and a single horizontal line, incised obliquely, with triangle motifs topped with circles in between, and triangles in the lower part. Massive wide crest. Additional decoration in the form of incised oblique lines on the cylinder covering the bow string. Iron spring bar. Type A.II.40-41. L: 4.0 cm, W: 3.3 cm. 3. Brass spring-cover brooch, East series. Cast bow with a forged finish. In the upper section, a decoration in the form of three vertical lines and a single horizontal line incised obliquely, with triangle motifs topped with circles in between, and triangles in the lower part. Wide, massive crest. Additional decoration in the form of incised oblique lines on the cylinder covering the bow string. Catchplate had been repaired with a separate thin piece of metal attached with two rivets. Iron spring bar. Type A.II.40-41. L: 4.0 cm, W: 3.3 cm. 4. Needle made from round copper alloy wire. Forged eye, punched through. Dąbrowska type II. L: 4.8 cm. 5. Reconstructed ceramic pot, dark brown, darker in places, with a roughened surface, carelessly smoothed in the bottom section. High temper content consisting of coarse-grained crushed ceramics and granite. Medium-fired ceramic mass, crumbling and flaking. Type RW IB. Body Dm: 14.1 cm, bottom Dm: 10.0 cm, reconstructed H: 12.6 cm. 6. Fragment of the body of a ceramic vessel with a broken handle and partially preserved ornamentation in the form of grooved lines. Smoothed dark brown surface. Medium-fired ceramic mass, crumbling and flaking. Group RW IV (?). H: 8.8 cm.

Dating: *stadium* IIB/IIC.

Grave 556 (inhumation, double, disturbed, opened) **SQ 16-23 B, D**

Revealed at the depth of ca. 1.00 m, under a medieval layer. The pit at the level of capture was roughly rectangular and aligned NNW-SSE, sized ca. 3.00×1.00 m and with a maximum thickness of 0.50 m (Pl. LIX, CXCVIII:2–3). The NE section was damaged by inhumation grave 546. The upper part of the pit was filled with compacted coarse-grained, light copper-coloured clay mixed with loose, yellowish sand with some gravel concretions. At this level, in the S section of the pit, the skull of the first individual (a man) was found with the lower jaw missing. No equipment items were found.

Some 0.40 m lower down, the pit was clearly smaller (2.60×0.80 m) and oval-shaped. It was filled with compacted coarse-grained, dark copper-coloured sand largely turned into hardpan and mixed with gravel; also found were numerous stones 0.04 to 0.10 m in diameter (marl, granites). At the bottom of the feature, scattered remains of another individual were found (a woman). Near the destroyed skull bones in the N section of the pit, a cluster of charcoals (oak [?]) and a stone ca. 0.15 m in diameter were found. The skeleton was fully preserved. The bones were completely jumbled up as a result of a post-funerary intervention that post-dated the skeletonisation of the body. The outline of the secondary trench was not captured. It may have reached the top part of the fill, where the man's skull was located. The damage may also have been caused by the digging of grave 546 at a later date. The original locations of the equipment items are shown by numerous green discolourations (products of copper corrosion) preserved on some of the bones. Among the bones, a fragment of a ring (1) and a piece of broken metal sheet (2) were discovered. Despite the jumbled arrangement of the bones it was possible to determine that the second individual was laid in the grave on the right side of the body with bent legs and the head pointing N. Man, *maturus* (40–45 years old) – the skeleton located above (skull); woman, *adultus* (20–25 years old), body height 156–160 cm – the skeleton located below.

Inventory (Pl. LIX): 1. Fragment of a ring made from a copper alloy. Type Beckmann 15. Dm: 1.4 cm. 2. Fragment of a thin piece of metal made from a copper alloy, embossed with decorative filigree imitation. L: 0.8 cm, W: 0.4 cm.

Dating: earlier than *stadium* IVA (see description of grave 546).

Grave 557 (inhumation, destroyed) SQ 15-23 D

Revealed at the depth of ca. 0.50 m, under a modern ploughed layer. The pit is aligned NNE-SSW, outline close to oval-shaped, sized 2.70×0.90 m and with a maximum depth of 0.70 m (Pl. LX). The upper part was destroyed by ploughing. The pit was filled with highly compacted, saturated copper-brown gravel turned into hardpan and coarse-grained sand with a high clay content containing numerous stones 0.02–0.10 m in diameter (granites, marl), fossils and belemnites, as well as small charcoals (oak and hornbeam). Throughout the fill, starting from the top, the scattered remains of a single individual were found: fragments of a calvaria, lower jaw, ribs, spine and femoral bones. Those were highly fragmented and displaced by burrowing animals. The original position of the body could not be determined. The SW corner of the grave was additionally

intersected by the pit of inhumation grave 548. The original equipment items were clustered in the NE section of the pit and included a brooch (1), a belt strap end (2) and a bead (3). Also, two fragments of a modern ceramic vessel were found in the fill. Woman, adult.

Inventory (Pl. LX, CCX:6): 1. Crossbow brooch with a tendril foot, made from a copper alloy. Die-forged bow, roughly triangular in profile, a metope ornament at the transition between the bow and the foot. Type A.VI.161-162. L: 4.0 cm, W: 1.6 cm. 2. Brass belt strap end, cast, ending in a terminal with a double ring. Die-forged finish, shank with a faceted cross-section. Attachment with a single rivet decorated along the edge with an engraved line, the bottom part of the attachment made from a separate thin piece of metal, probably as a result of production damage or a later repair. Type Raddatz JII7, ML type 7. L: 6.2 cm, rings Dm: 1.2 cm, 0.8 cm. 3. Damaged shield-shaped amber bead, made on a lathe, dark honey-coloured, transparent. Type TM 430. Dm: 2.0 cm, H: 0.8 cm, Wt: 1.40 g.

Dating: *stadium* IVB.

Grave 558 (inhumation, destroyed) SQ 15-24 C, 16-24 A

Revealed at the depth of ca. 0.80 m, under a modern ploughed layer. The grave pit is aligned NE-SW, outline close to oval-shaped, sized ca. 3.20×1.20 m and with a maximum depth of ca. 0.80 m (Pl. LXI). The upper part of the feature was destroyed by ploughing. The pit was filled with highly compacted, saturated copper-brown gravel turned into hardpan, as well as coarse-grained sand with a high clay content containing numerous stones (granites and marl) 0.02–0.10 m in diameter, fossils and belemnites and small charcoals (wild rose). Some highly fragmented bones (mainly fragments of long bone shanks) from a single individual were discovered in the fill, displaced by burrowing animals and the damage describe above. The original position of the body could not be determined. A fragment of a shoulder bone bore green discolourations caused by the presence of an object made from a copper alloy. At the bottom of the N section of the pit, there was a cluster of four stones (0.10–0.20 m in diameter). The equipment was scattered within the grave pit: a buckle (1), a bead (2), three fragments of nails – possibly parts of a casket (3–5) and two non-distinctive ceramic fragments (6–7). Woman, *maturus* (?).

Inventory (Pl. LXI): 1. Bipartite buckle made from a copper alloy, with a plate and a damaged frame. Plate forged from a metal sheet, with two rivets, frame decorated at the base with a metope ornament. Bar with two forged knobs. Type ML D 17 (?). Plate L: 2.2 cm, bar L: 2.9 cm, W: 3.4 cm. 2. Miniature bead made from glass paste, orange, matte. Type TM 53. Dm: 0.4 cm,

H: 0.1 cm. 3. Damaged shank of a small iron nail, forged, rectangular in cross-section. Preserved L: 1.0 cm. 4. Iron nail, forged, shank with a rhomboid cross-section, rectangular head. L: 5.0 cm, head L: 1.3 cm, head W: 1.2 cm. 5. Damaged shank of an iron nail, forged, rhomboid in cross-section. Preserved L: 4.9 cm. 6. Fragment of the body of a thin-walled ceramic vessel, dark brown, with a smoothed surface. High temper content consisting of fine-grained granite. Medium-fired ceramic mass, crumbling and flaking. H: 3.3 cm. 7. Fragment of the body of a thick-walled ceramic vessel, dark brown, with a lightly smoothed surface. High temper content consisting of fine-grained granite. Medium-fired ceramic mass, crumbling and flaking. H: 2.8 cm.

Dating: *stadium* IIIA/IIIB (?).

Grave 559 (inhumation in a log coffin, double, opened) SQ 16-24 A

Revealed at the depth of ca. 1.00 m, under a medieval layer. The pit is aligned N-S, outline close to oval-shaped, wider in the S section. Dimensions: ca. 2.50×1.00–1.50 m, maximum depth: 0.75 m (Pl. LXII). Filled with compacted coarse-grained, copper-brown gravelly sand with a high clay content, containing numerous stones 0.03–0.10 m in diameter. At the bottom of the grave pit, a narrow log coffin (oak) sized 1.80×0.25 m, placed diagonally relative to grave axis, aligned with NW-SE. The NW corner of the coffin had clearly been damaged, presumably by a secondary trench, although the outline of the trench was not captured. Other signs of post-funerary interference may include the considerable width of the pit in the top section compared to the bottom section. The anatomical arrangement of the upper part of the skeleton in the coffin was disturbed. Identified bones included a calvaria, ribs, long arm bones (including three humerus bones, suggesting two buried individuals) and vertebrae. Among the bones, some equipment items: a comb (2) and a bead (1). Also in the N section of the coffin, a wooden container (oak) without metal fittings (3) was found. In the S section of the coffin, leg bones were preserved in an anatomical arrangement. The position indicates that one of the individuals was buried in a supine position with the head pointing N. Woman, *maturus* (40–45 years old); unidentified sex, *iuvenis* (16–18 years old) – only a humerus was preserved. **Inventory** (Pl. LXII, CCX:2): 1. Spherical glass bead, colourless, transparent, with an ornament consisting of vertical red matte threads. Type similar to TM 17. Dm: 0.5 cm, H: 0.5 cm. 2. One-layer comb made of bone (antler [?]), with an ornament consisting of incised circles with dots inside along the edge of the handle and at the base. Type Thomas AII. W: 5.2 cm, H: 4.0 cm.

3. Decomposed oak wood. The remains of a wooden container without metal fittings found *in situ*, placed in the N section of the coffin, with a crisp rectangular outline. At one side, a fragment of mineralised bone (unidentified) was also found, possibly part of container lining. Given the state of preservation, it was not possible to reconstruct the exact structure of the item. Dimensions: ca. 20.0×15.0 cm.

Dating: *stadium* IIIB (?).

Grave 560 (inhumation, disturbed) SQ 17-22 A

Revealed at the depth of ca. 2.20 m, under a medieval layer. The pit is aligned N-S, roughly rectangular with rounded corners, sized 2.20×0.80 m and with a maximum depth of ca. 0.35 m (Pl. LXI). The N section of the pit was damaged by an inhumation grave (grave 542). As a result, the feature could not be captured except in the bottom part. The grave was filled with loose, light yellow sand with numerous irregularly shaped hardpan precipitations, primarily clustered in the S section of the feature. Also found were many small stones, 0.03–0.06 m in diameter, mainly granites and marl. At the bottom of the pit, a completely decomposed comb (2) was found in the middle section of the pit, as well as a bead (1) – in the S section, and fragments of a vessel (3) in the SE corner. No bones were preserved. **Inventory** (Pl. LXII): 1. Disc-shaped amber bead, hand-cut, milk-white-yellow, matte. Type TM 389. Dm: 1.2 cm, H: 0.3 cm, Wt: 0.28 g. 2. Four partially preserved rivets made from a copper alloy from a three-layer comb made of bone (antler [?]). Preserved *in situ*, with an arched handle. Type Thomas I. Preserved rivets L: 0.8 cm, 0.5 cm, 0.6 cm, 0.5 cm. 3. Reconstructed upper part of a ceramic pot, light brown, with a roughened external surface and a carelessly smoothed internal surface. High temper content consisting of coarse-grained granite. Medium-fired ceramic mass, crumbling and flaking. Type RW IB (?). Rim Dm: 13.7 cm, preserved H: 8.1 cm.

Dating: *stadium* IIIA/IIIB (?).

Grave 561 (cremation urn, destroyed) SQ 17-21 B

Revealed at the depth of ca. 1.60 m, under a medieval layer. The feature was identified based on fragments of the bottom of a vessel (2) and burnt bones present in clean, light yellow sand over an area of ca. 0.30×0.30 m (Pl. LXIII). Next to the bones there were several charcoals (birch). Some 0.20 m above and 1.00 m NE from the urn, a cluster of fragments of the same vessel was discovered along with burned fragments of a comb (1) and a casket brace or fitting (3), probably part of the grave equipment. Unidentified sex, *infans* I/II (6–8 years old).

Inventory (Pl. LXIII): 1. Two considerably burnt fragments of bone (antler [?]) forming the lining of a three-layer comb decorated with a motif of punched triangles, along the edge and inside the lining (in this case probably in a triangular pattern). Type Thomas I, decorative motif A. Preserved fragments L: 1.8 cm, 3.0 cm, preserved fragments H: 1.6 cm. 2. Reconstructed miniature ceramic vessel, dark brown, with a carefully smoothed surface. Medium-fired, producing a poorly fired ceramic mass, crumbling and flaking. Type RW XVIIIIE. Rim Dm: 8.8 cm, body Dm: 11.7 cm, bottom Dm: 5.7 cm, H: 10.4 cm. 3. Partially melted casket brace or fitting made from a flat forged copper alloy band, rectangular in cross-section. L: 2.4 cm, band W: 0.7 cm.

Dating: *stadium* IIIA/IIIB (?).

Grave 562 (inhumation in a log coffin, disturbed) SQ 17-21 B, D

Revealed at the depth of ca. 2.40 m, under a medieval layer. The pit is aligned N-S, roughly rectangular outline with rounded edges, sized 3.00×1.00 m and with a maximum depth of 0.35 m (Pl. LXIV). Above the N edge of the pit, outside of the outline, a stone with traces of processing was revealed (clear traces of surface chipping on the sides), H: 0.60 m, W: 0.40–0.50 m. The stone was most likely a grave marker at the then-surface level. The pit was filled with loose, fine- and mid-grained, light yellow sand with numerous charcoals (elm and oak). Some 0.10 m below the level of capture, traces of decomposed wood pulp were revealed, remaining from a log coffin (oak [?]) sized 2.00×0.55 m. The coffin was placed in the grave closer to the W edge of the pit. Most of the equipment items were discovered in the N section of the coffin: several dozen beads (4–46) and fragments of a bucket pendant (1–3). The scattered arrangement of the beads indicates that they may have been sewn onto a piece of fabric headgear. In the NE corner of the coffin, a clear trace of a wooden container (oak [?]) was captured; inside, it contained a comb (47) and a needle (48) as well as a destroyed upper part of a vessel (50). At hip level, a miniature knife (51) was discovered, and, in the S section of the pit, a spindle whorl was located (49). The skeleton was not preserved – only tooth fragments were found in the N section of the coffin, indicating that the individual was buried with the head pointing N. Unidentified sex, adult.

Inventory (Pl. LXIV–LXV, CCXI:1): 1–3. Three fragments of a damaged bucket pendant made from a copper alloy: the bottom, the suspension loop and the body. Type AI (?). Bottom Dm: 1.2 cm, suspension loop L: 1.4 cm, suspension loop band W: 0.8 cm, body Dm: 1.6 cm, body band W: 0.8 cm. 4–27. Twenty-four

glass miniature beads, black, matte. Type TM 55. Dm: 0.3 to 0.6 cm, H: 0.1 to 0.3 cm. 28. Melon-shaped glass bead, light blue, transparent. Type similar to TM 171. Dm: 1.4 cm, H: 1.3 cm. 29–30. Two polyhedral glass beads, dark blue, transparent. Type TM 126. W: 0.5 cm each, H: 0.8 cm each. 31–46. Sixteen eight-shaped amber pendants, whole or fragmented, mostly flat, some with head rims close to the eye. Dark honey-coloured, transparent. Type TM 471a–471d. H: 1.6 cm, 1.6 cm, 1.5 cm, 1.5 cm, 1.3 cm, 1.5 cm, 1.5 cm, 1.2 cm, 1.6 cm, 1.3 cm, 1.5 cm, 0.9 cm, 0.7 cm, 0.9 cm, 0.9 cm, 0.5 cm, Wt: 0.44 g, 0.38 g, 0.24 g, 0.61 g, 0.35 g, 0.33 g, 0.30 g, 0.54 g, 0.73 g, 0.36 g, 0.28 g, 0.26 g, 0.15 g, 0.25 g, 0.18 g, 0.09 g. 47. Fragments of bone (antler [?]) lining and copper alloy rivets of a three-layer comb, decorated with a motif of multi-centre eyes and a strip of punched triangles along the bottom edge of the bone lining. An arched handle preserved *in situ*. Type Thomas I, decorative motif A. Preserved fragments L: 2.8 cm, 4.4 cm, 1.5 cm, 1.6 cm, H of the fragment containing the rivets: 2.9 cm, H of the rivets preserved separately: 0.5 cm, 0.4 cm. 48. Needle made from a copper alloy with an end bent at a right angle and broken off, made from round wire. Forged eye, punched through. Dąbrowska type II. Preserved L: 4.5 cm. 49. Biconical ceramic spindle whorl, dark brown, with concave ends. Dm: 2.8 cm, H: 2.0 cm. 50. Reconstructed upper part of a ceramic vessel, dark brown, with a carefully smoothed surface. Well-fired, producing a hard ceramic mass. Type RW XVIIIA (?) Rim Dm: 12.0 cm, preserved H: 8.0 cm. 51. Miniature knife made from a copper alloy with a narrower tang, blade decorated on both sides with a ‘wolf-teeth’ ornament consisting of zig-zag lines. On the tang, darker signs of corrosion indicate a handle made of an organic material, not preserved. L: 7.2 cm, blade base W: 0.8 cm, maximum blade W: 1.3 cm, Wt: 3.05 g. 52. Decomposed wood (oak [?]). *In situ*, the remains of a container without metal fittings, roughly rectangular, with rounded edges. The container was placed in the NE corner of the coffin. The state of preservation made it impossible to recreate exact structure of the item. Dimensions ca. 32.0×24.0 cm.

Dating: *stadium* IVB.

Grave 563 (inhumation in a log coffin, disturbed) SQ 17-21 B

Grave revealed at the depth of ca. 2.10 m, under a medieval layer that damaged the top of the grave. The pit is aligned N-S, oval-shaped, narrower in the S section, sized 2.80×0.90 m and with a thickness of 0.35 m (Pl. LXVI). Filled with loose, fine-grained, light yellow sand with hardpan precipitations. In the grave, the remains

of a decomposed log coffin, sized 2.20×0.60 m, in the form of decomposed wood pulp (not analysed). Also found, a destroyed vessel (2) located in the N section of the grave pit and a drinking cup (1), located closer to the S section of the feature. No bones were preserved.

Inventory (Pl. LXXVII): 1. Ceramic drinking cup with a single handle attached with plugs, decorated at the base of the body with a double line of grooved triangles. Dark brown, surface loosely smoothed. High temper content consisting of coarse-grained crushed ceramics, granite and mica. Well-fired to produce a hard and strong ceramic mass. Type RW XVA. Rim Dm: 10.1 cm, body Dm: 11.7 cm, bottom Dm: 5.8 cm, H: 7.3 cm. 2. Reconstructed ceramic vessel, decorated with cross-hatched triangles enclosed with two stripes of double grooves, carelessly smoothed surface, dark brown. Medium-fired ceramic mass, crumbling and flaking. Type RW XVIA. Reconstructed rim Dm: 14.4 cm, body Dm: 16.8 cm, reconstructed bottom Dm: 8.8 cm, reconstructed H: 12.6 cm.

Dating: *stadium* IIIA/IIIB (?).

Grave 564 (inhumation, disturbed, opened [?]) SQ 16-21 D

A clear outline of the pit was captured at the depth of 1.75 m, oval-shaped in the N section, rectangular with rounded edges in the S section (Pl. LXVIII–LXIX). Top damaged by an archaeological trench made in 1998. Aligned N-S, slightly declined to NNW-SSE, with maximum dimensions of 3.50×1.30 m. In the central section the feature was intersected by an ancient secondary trench (feature 564A – see description below). The trench had been sunk into grave 564 to a maximum depth of 0.20 m. At the level of capture of the trench (ca. 1.90 m), in the N section of the grave (a layer of compacted sand turned into hardpan), a cluster of charcoals (alder) was revealed, and 0.50 m further S, a ceramic fragment (8). In the S section of the pit, only a single burnt bone was found, probably a secondary deposit. The grave was filled with a series of irregularly alternating layers: firmly compacted copper-coloured sand turned into hardpan (layer thickness 0.03 to 0.10 m) with an admixture of loose, yellow sand mixed with grey sand (layer thickness 0.10–0.30 m) and very small charcoals (not analysed). Arguably, the layers of sand turned into hardpan are the remains of decomposed organic matter (mats (?) or a fabrics [?]) used to cover the body, and those were covered with layers of loose sand – this would account for the uneven arrangement of the layers. At the depth of 2.30 m, a damaged bow brooch (1) was discovered in a layer of loose sand in the S section of the pit, presumably displaced from its original location as a result of post-deposit processes.

The remaining equipment was located at the bottom of the pit (ca. 2.90 m below ground level), in a layer of sand turned into hardpan and mixed with charcoals (alder and poplar). In the central section of the pit, at chest level (not preserved), a spherical pendant was found (3–3a). Some 0.60 m to the SW, a clear outline of a small casket (9) was captured, with a preserved fragment of a wooden slat (hornbeam) with braces or fittings (6). In the S section of the pit, a cluster of objects was revealed including a pair of spurs (4–5), a buckle (2) and two fragments of an iron nail (7) surrounded by decomposed organics (hornbeam). The arrangement indicates a single burial (probably a male – judging from the equipment). The grave intersected with two inhumation graves: the S section of grave 566 and the N section of grave 565, destroying the fill of each to the bottom. Unburnt bones were not preserved; a burnt bone: unidentified sex, unidentified age.

Inventory (Pl. LXIX–LXX, CCX:8): 1. Two fragments of a knee-shaped brooch made from a copper alloy, including a fragment of the middle part of a bow and a separately preserved foot terminal with a catchplate fragment. Type A.V.132 (?). Preserved fragments L: 2.2 cm, 0.9 cm. 2. Bipartite buckle made from a copper alloy with a rectangular buckle frame and a plate forged from a metal sheet; die-forged frame. Along the edge of the plate, an ornament in the form of imitation incised wire. At the plate, a fabric fragment (unidentified) with a canvas weave, under the plate a hornbeam wood fragment was found. Type similar to ML G 3. L: 3.5 cm, W: 4.4 cm. 3–3a. Gold spherical pendant, hollow inside. Made out of two repoussé hemispheres soldered together. Three fine wires were soldered onto a suspension loop made from a metal band; the external wires are smooth, and the middle wire is incised. In the upper section of the base, right below the neck, an ornament made from a soldered ring of incised wire with a row of granulation. In the middle section, two horizontal rows of soldered granulations, and three lines of granulation spreading in a radial pattern down to the bottom section of the base. H: 1.8 cm, suspension loop H: 0.5 cm, Dm: 1.5 cm, Wt: 3.50 g. 4. Bow spur made of tin-lead bronze with a massive hollow spur prick with a rhomboid cross-section, flared in the bottom section. The yoke arms, which are triangular in cross-section, end in two accentuated terminals with shield-shaped knobs. On those, a cross motif is engraved, decorated with transverse incisions in imitation of pearled wire. Cast (the hollow in the prick is a remnant of a casting shank) and finished by filing. Under the spur, a wood remnant (hornbeam) was found. Type similar to Godłowski I, Ginalski E3. Arms span: 6.0 cm, H: 5.2 cm, prick L: 3.2 cm. 5. Bow spur

made of tin-lead bronze with a massive hollow spur prick with a rhomboid cross-section, flared in the bottom section. The yoke arms, which are triangular in cross-section, end in two accentuated terminals with shield-shaped knobs. On those, a cross motif is engraved, decorated with transverse incisions in imitation of pearled wire. Cast (the hollow in the prick is a remnant of a casting shank) and finished by filing. Under the spur, a wood remnant (hornbeam) was found. Type similar to Godłowski I, Ginalski E3. Arms span: 5.6 cm, H: 4.7 cm, prick L: 3.0 cm. **6.** Fragments of casket braces or fittings made from a copper alloy preserved along with a fragment of a wooden slat made from hornbeam (casket lid [?]). Preserved L: 3.4 cm, preserved W: 2.7 cm. **7.** Fragment of a forged iron nail with a square cross-section, with a round head. Under the nail, preserved fragments of hornbeam wood. Preserved L: 3.7 cm. **8.** Fragment of the body of a ceramic vessel, light brown, with a lightly smoothed surface. High temper content consisting of mid-grained crushed ceramics and mica. Medium-fired ceramic mass, crumbling and flaking. H: 4.9 cm. **9.** Decomposed hornbeam wood. Preserved *in situ* the remains of a small square-bottomed casket. Given the state of preservation, it was not possible to reconstruct the exact structure of the item. Dimensions: ca. 15.0×15.0 cm. **Dating:** *stadium* IIC.

Feature 564A (secondary trench into grave 564) **SQ 16-21D**

The pit is roughly round, sized 1.25×1.20 m, with the longer axis aligned N-S, sunk into the central section of grave 564, causing damage to the depth of 0.20 m (Pl. LXVIII–LXIX). Filled with loose, fine-grained, light yellow sand with precipitations of compacted coarse-grained, copper-coloured sand with a high clay content turned into hardpan and many small charcoals (not analysed). In the pit, two non-distinctive ceramic fragments (1–2) were found. The profile of the feature tapers in a funnel-like fashion. The fill was similar to the fill layers of grave 564, indicating a similar origin and chronology for the features, although the exact function is difficult to identify. Possibly connected to funerary rituals. **Inventory** (Pl. LXVIII): **1.** Fragment of the body of a ceramic vessel, light brown and grey, with a lightly smoothed surface. High temper content consisting of coarse-grained crushed ceramics and mica. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.5 cm. **2.** Fragment of the body of a ceramic vessel, light to dark brown, external surface smoothed, internal surface roughened. High temper content consisting of mid-grained crushed ceramics and mica. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.7 cm.

Dating: *stadium* IIC (see description of grave 564).

Grave 565 (inhumation, destroyed) **SQ 16-21 D, 17-21 B**

The grave pit was captured at the depth of 2.20 m, with the top disturbed by an archaeological trench made in 1998. The N section was similarly destroyed down to the bottom by an inhumation grave (grave 564). Aligned NNW-SSE, close to oval-shaped, with maximum dimensions of 1.25×0.75 m and a thickness of 0.40 m (Pl. LXIII). Filled with fine-grained, yellow-grey sand, containing in places precipitations of rust-brown hardpan and coarse-grained sand with a high clay content, presumably the remains of organic matter. Also noted were some small charcoals (pedunculate oak). The only equipment item was a band bracelet (1), revealed at the outer limit of the cut through grave 564. At the bottom of the pit, along the W and S edges, an arrangement of stones was found, 0.20 to 0.50 m in diameter. Those stones were presumably not visible at ground level at the time of interment, but were placed instead at the bottom of the pit. No bones were preserved.

Inventory (Pl. LXIII, CCIX:2): **1.** Band bracelet made from a copper alloy with slightly flared ends. Die-forged bow, decorated along the edge and in the middle with double stripes of punched dots. Dm: 5.6 cm, bow W: 0.9 cm to 1.1 cm.

Dating: earlier than *stadium* IIC (see description of grave 564).

Grave 566 (inhumation, destroyed) **SQ 16-21 B, D**

The grave pit became apparent at the depth of 1.70 m, under the fill of an archaeological trench made in 1998, intersected in the S section by inhumation grave 564. Aligned N-S, oval-shaped, sized 2.00×0.80 m and with a maximum thickness of ca. 0.25 m (Pl. LXVI). Filled with loose, fine-grained, yellow-grey sand with precipitations of compacted coarse-grained, copper-coloured sand with a high clay content turned into hardpan; contained some small charcoals (not analysed). At chest level (not preserved), a needle was found (1), possibly used to pin the individual's clothes or shroud (?). No bones were preserved.

Inventory (Pl. LXVI): **1.** Needle made from a copper alloy with a damaged eye and point, made of round wire. Forged eye, punched through. Dąbrowska type II. L: 5.7 cm.

Dating: earlier than *stadium* IIC (see description of grave 564).

Grave 567 (cremation pit (?), destroyed) **SQ 17-21 B**

The grave was captured at the depth of 2.25 m. Found directly under the fill of an archaeological trench made in 1998, which probably destroyed the grave (Pl. LXV).

The outline of the pit was not captured. The feature contained a cluster of partially melted objects in a layer of loose, fine- and medium-grained yellow-grey sand with hardpan veins. The items included a buckle (1), a fragment of melted glass (2) and burnt bones. Although small non-distinctive fragments of vessels in various forms were present in the direct vicinity of the equipment, there are no reasons to consider this to be part of the equipment (urn [?]) of this burial. Unidentified sex, adult.

Inventory (Pl. LXV): 1. Partially melted buckle made of tin-lead bronze, with a thicker frame and a small rectangular plate. Type ML H 16 (?). L: 3.0 cm, W: 2.4 cm. 2. Fragment of a melted glass item (vessel [?]), light green, transparent. Preserved H: 1.7 cm.

Dating: *stadium* VI.

Grave 568 (inhumation, disturbed) SQ 16-21 C, D; 17-21 A, B

The grave pit is aligned N-S, roughly rectangular in shape, rounded in the S section, rectangular in the N section, sized 2.45×0.50–1.00 m. The top of the pit was captured at the depth of 2.20 m and had been damaged by an archaeological trench made in 1998 (Pl. LXXI). At the level of capture, two ceramic fragments were found (10–11). At the bottom of the S section of the pit, fragments of casket fittings were found, including a lock (2) and internal and external fittings (3–9) with preserved wood (birch). The outline of the casket was not captured, but the fittings enclosed the bottom of the casket and a stone, presumably used to stabilise the casket within the grave. Filled with lightly compacted fine-grained, yellow-grey sand with individual hardpan streaks. The bottom of the pit was found at the maximum depth of 0.25 m below the level of capture. No bones were preserved.

Inventory (Pl. LXXI–LXXII): 1. Reconstructed fragment of the lower part of a ceramic vessel, dark brown, with rough vertical stripes on the external surface. Medium-fired ceramic mass, crumbling and flaking. Group RW I (?). Bottom Dm: 7.0 cm, preserved H: 5.8 cm. 2. Damaged iron casket lock fitting with mineralised wood preserved on the bottom side (birch). Forged out of a rectangular metal sheet with two preserved rivets with damaged shanks and, fragmentarily, an oblong keyhole. Type Kokowski 2. Preserved L: 4.9 cm, maximum W: 3.7 cm, longest rivets L: 2.1 cm. 3. Iron casket fitting with mineralised wood preserved on the bottom side (birch). Forged out of a rectangular metal sheet with three preserved rivets, two damaged, one preserved whole, with the shank bent at a right angle. L: 5.5 cm, maximum W: 3.5 cm, rivet L: 1.2 cm, 2.1 cm. 4. Fragment of a forged iron casket brace or fitting, metal band, rectangular in cross-section. L: 1.2 cm,

band W: 0.4 cm. 5. Fragment of a forged iron casket brace or fitting, metal band, rectangular in cross-section. L: 2.1 cm, band W: 0.7 cm. 6. Fragment of a forged iron casket brace or fitting, metal band, rectangular in cross-section. L: 2.1 cm, band W: 0.7 cm. 7. Fragment of a forged iron casket brace or fitting, metal band, rectangular in cross-section. L: 1.6 cm, band W: 0.6 cm. 8. Fragment of an iron rivet shank with a round cross-section (part of a casket fitting). L: 1.8 cm. 9. Fragment of an iron rivet shank with a round cross-section (part of a casket fitting). L: 1.5 cm. 10. Fragment of the body of a thin-walled ceramic vessel, dark brown, with a smoothed surface. High temper content consisting of fine-grained mica. Medium-fired ceramic mass, crumbling and flaking. H: 4.5 cm. 11. Fragment of the body of a thick-walled ceramic vessel, light brown, with a lightly roughened surface. High temper content consisting of coarse-grained crushed ceramics and granite. Medium-fired, producing a poorly fired ceramic mass, crumbling and flaking. H: 8.0 cm.

Dating: *stadium* IIIA (?).

Grave 569 (cremation-inhumation (?) in a log coffin, disturbed) SQ 17-21 A-D

Pit revealed at the depth of 2.20 m, aligned N-S, roughly rectangular with rounded corners, sized 2.90×0.95 m and with a maximum depth of 0.45 m (Pl. LXXIV). The top had been destroyed by an archaeological trench made in 1998. Heterogeneous fill, in the upper part predominantly made up of loose, yellow-grey sand with precipitations of rust-brown hardpan. At the burial level and in the coffin there was compacted coarse-grained, reddish-grey sand with high clay content mixed with decomposed organic material. Throughout the fill of the grave pit, individual small charcoals (unidentified) and burnt bones were found. The remains of a skeleton and coffin were discovered at the depth of ca. 0.20 m below the level of capture. Log coffin (oak) sized 2.60×0.55 m, badly decomposed, clearly delineated, rectangular, with clear corners. Revealed in its N section were fragments of teeth from the lower jaw, in the S section – close to the spurs (1–2), poorly preserved heel bones and traces of tibiae. The remaining grave equipment consisted of a fragment of a pin or brooch pin (4), revealed in the N section of the pit and at chest level (not preserved), and, in the E section of the pit – the remains of a comb (3). The layout of the finds indicates that the individual may have been in a supine position with the head pointing N. At this level, a fragment of a vessel rim (5) was discovered in an animal burrow. The presence of burnt bones throughout the fill is difficult to interpret. It may indicate a biritual burial, however the state of preservation of the bones, both burnt

and unburnt, makes it impossible to ascertain whether they belonged to a single individual. Anthropological analysis findings may indicate a single individual. Male (?), adult; the burnt bones: male (?), adult.

Inventory (Pl. LXXIV): 1. Bow spur made of tin bronze, with asymmetric arms forged out of a metal sheet ending in terminals shaped like slightly accentuated knobs. Bow flaring into a trapezoid shape, in the middle section a hole for an additional terminal (not preserved). Prick riveted to the bow, strongly profiled in the bottom section, conical in the upper section. Type similar to Godłowski VII, Ginalski G1/H. Arms span: 8.1 cm, H: 4.4 cm, prick L: 1.8 cm. 2. Bow spur made of tin bronze, with asymmetrical arms forged out of a metal sheet ending in terminals shaped like slightly accentuated knobs. Bow flaring into a trapezoid shape, in the middle section a hole for an additional terminal (not preserved). Prick riveted to the bow, strongly profiled in the bottom section, conical in the upper section. Type similar to Godłowski VII, Ginalski G1/H. Arms span: 9.0 cm, H: 4.0 cm, prick L: 1.4 cm. 3. Fragment of a three-layer comb made of bone (antler [?]) with remains of four poorly preserved rivets made from a copper alloy. The external layers of the handle and the teeth are both incomplete. One of the handle layers is decorated with a motif of triple eyes, with lines of points running along the edge. An arched handle was preserved *in situ*. Type Thomas I, decorative motif B. Preserved L: 4.3 cm, preserved H: 1.7 cm. 4. Fragment of a needle or a brooch pin made from a copper alloy. Preserved L: 1.2 cm. 5. Fragment of the rim of a ceramic vessel, dark brown, with a loosely smoothed surface. Low temper content consisting of mid-grained crushed ceramics. Medium-fired ceramic mass, crumbling and flaking. Rim Dm: 10.0 cm.

Dating: *stadium* VI.

Grave 570 (inhumation containing a wooden structure (?), disturbed) **SQ 16-21 B, D**

Revealed at the depth of 2.20 m, damaged by an archaeological trench made in 1998. The grave pit is aligned NNW-SSE, roughly oval in shape, sized 1.9×0.80 m and with a maximum thickness of 0.7 m (Pl. LXXII). Filled with loose, fine-grained, yellow sand along with compacted coarse-grained sand turned into hardpan. The equipment, discovered at the bottom of the pit, included two brooches (1–2) with their heads turned slightly down, located near the clavicle bones. Slightly below, at chest level (not preserved), another brooch (3), also with its head down. At the level of the hands there were two rod bracelets (4–5). Next to the item worn on the right wrist there was a buckle (6) and, right next to it, a belt mount (7) with leather preserved inside. Around

the items, a large cluster of decomposed wood (oak [?]), probably a kind of platform made from planks (?) on which the individual was laid in the grave. The arrangement of the equipment items suggests that the individual was placed on the back with one arm straight and one bent. The inventory indicates a female burial. No bones were preserved.

Inventory (Pl. LXXII–LXXIII, CCXI:3): 1. Brass spring-cover brooch, East series, cast, with a forged and filed finish. Spring covers and catchplate decorated with vertical engraved lines, cylinder covering the bow-string decorated with a zig-zagging line. A highly prominent crest with two silver incised wires, hammered in. Iron spring bar. Type A.II.38. L: 5.0 cm, W: 4.1 cm. 2. Brass spring-cover brooch, East series, cast, with a forged and filed finish. The spring covers and the catchplate decorated with engraved vertical lines, the cylinder covering the bow-string decorated with a zig-zagging line. A highly prominent crest with two silver incised wires hammered in. Iron spring bar. Type A.II.38. L: 5.0 cm, W: 4.0 cm. 3. Brass brooch derivative of strongly profiled brooches with a wide bow forged from a metal sheet. At the transition to the foot, a decoration in the form of imitation incised wire. Type A.V.148. L: 3.3 cm, W: 1.7 cm. 4. Brass rod bracelet, cast from a rod, with a forged and filed finish. The bow was oval in cross-section in the middle part, and lenticular in cross-section at the ends. Type Natuniewicz 1. Dm: 6.4 cm, bow W: 0.7 cm. 5. Rod bracelet made from a copper alloy, cast from a rod, with a forged and filed finish. The bow has an oval cross-section in the middle part, and lenticular cross-section at the ends. Type Natuniewicz 1. Dm: 6.4 cm, bow W: 0.7 cm. 6. Unipartite iron buckle with a forged oval frame, square cross-section. Type ML C 13. L: 4.4 cm, W: 3.7 cm. 7. Belt mount made from a copper alloy, made of two forged sheets of metal riveted together, with some leather preserved inside (not analysed). L: 2.1 cm, band W: 0.7 cm.

Dating: *stadium* IIB.

Grave 571 (cremation urn, destroyed) **SQ 16-24 A**

Grave revealed at the depth of 0.70 m, under a modern ploughed layer. The pit is roughly circular, sized 0.65×0.60 m and with a maximum thickness of 0.30 m. Located in N section of inhumation grave 572 – which it destroyed down to the level at which the skeleton was captured (Pl. LXXV). Within the pit of graves 571 and 572, clusters of fragments of a single urn (1) and burnt bones. The bottom of the vessel was revealed in the NW section of the pit of grave 572, where the urn was originally placed. The grave was destroyed by ploughing. Filled with dark compacted coarse-grained, copper-coloured sand mixed with loose gravel and stones, as well

as some precipitations of lumps of copper-coloured clay turned into hardpan. Unidentified sex, adult.

Inventory (Pl. LXXVI): 1. Reconstructed ceramic pot, dark brown; the rim, neck and bottom parts carelessly smoothed, the middle part highly roughened. High temper content consisting of coarse-grained crushed ceramics and granite. Medium-fired ceramic mass, crumbling and flaking. Type RW IB. Rim Dm: 17.8 cm, reconstructed body Dm: 31.2 cm, bottom Dm: 13.6 cm, reconstructed H: 26.6 cm.

Dating: *stadium* IIIA.

Grave 572 (inhumation in a log coffin, containing a burnt layer, destroyed) **SQ 16-24 A**

The grave pit became apparent at the depth of ca. 0.70 m in the N section and 0.90 m in the S section, under a modern ploughed layer, aligned NNW-SSE, sized 2.50×1.00 m (Pl. LXXV, CXC VIII:4). At the level of capture the N section was completely destroyed by a cremation urn burial (grave 571) down to the level where the skeleton bones were present. Many charcoals and burnt pieces of wood (hornbeam) were revealed at various levels, possibly connected with funerary rituals. Some 0.70 m below the level at which the grave was revealed the pit was oval-shaped and larger, with dimensions of 2.65×1.30 m. At its bottom it contained the upper section of the skeleton – not anatomically arranged (destroyed by the pit of grave 571). Preserved bones included fragments of a humerus, a lower jaw, ribs and broken shanks of long arm bones. Near the bones, traces of a destroyed log coffin (wood and hornbeam charcoals) sized 0.50×0.35 m. In the S section of the pit, lower limb bones and a pelvis in an anatomical arrangement, suggesting that the individual was in a supine position with the head pointing N. Also noted in the pit were large and medium-sized stones (including one on the pelvis) – presumably originally used to stabilise the coffin. Man, *maturus* (45–50 years old).

Inventory: none.

Dating: earlier than *stadium* IIIA (see description of grave 571).

Grave 573 (cremation urn, destroyed) **SQ 16-24 B**

The pit was revealed at the depth of 1.10 m, under a modern ploughed layer. Roughly circular in shape, sized 0.60×0.55 m and with a maximum thickness of 0.30 m (Pl. LXXV). Filled with compacted coarse-grained, copper-coloured gravel turned into hardpan and compacted copper-coloured clay. In the pit itself and at its top, fragments of an urn (1) were revealed along with numerous burnt bones. Fragments of that vessel appeared already ca. 0.10 m below the level at which the pit was captured, and the grave itself had

presumably been destroyed by ploughing. Unidentified sex, *adultus* (?).

Inventory (Pl. LXXVI): 1. Reconstructed ceramic vase with a single damaged handle. Glossy, dark brown, black in places. At the base of the body, a decoration in the form of a decorative band with oblique dashes. The middle part of the body contains a broad ornamental belt made out of vertical stripes of alternately scored diagonal lines, the bottom part was roughened. The neck and the part adjacent to the bottom were smoothed. Low temper content consisting of fine-grained crushed ceramics, with individual grains of mica visible. Medium-fired ceramic mass, crumbling and flaking. Type RW IVA. Body Dm: 31.2 cm, preserved H: 25.1 cm.

Dating: *stadium* IIIA.

Grave 574 (inhumation in a log coffin, destroyed) **SQ 15-24 C, 16-24 A**

The grave pit was located at the depth of 0.95 m (N section) to 1.15 m (S section) under a modern ploughed layer. Its upper part, down to the level at which the skeleton was found, had clearly been destroyed by ploughing. Roughly rectangular with rounded edges, aligned NNW-SSE. At the level of capture it was sized 2.30×0.75 m, with a maximum thickness of 0.35 m (Pl. LXXVII, CXCIX:1). Filled with coarse-grained, compacted clay sand turned into hardpan, thoroughly mixed with small stones and clay. At the bottom, the remains of a log coffin were revealed. The N edge was not preserved, however the S section had clear rectangular corners. The coffin was triangular in profile. The wood type was not identified; the charcoals in the walls (pedunculate oak) indicate that it was hollowed out with fire from an oak log. Preserved dimensions of the coffin: 1.90×0.50 m. Inside the coffin, a single individual was buried. In the N section of the log, bones from the upper part of the skeleton were found in a non-anatomical arrangement. Near the lower jaw and the calvaria, a bead necklace was found (3–16). At the level of ribs, a brooch was found (1). Near the pelvis, a belt strap end (2) was located. In the S section of the coffin, the skeleton had an anatomical arrangement, with foot bones, tibiae and fibulae from both legs. The arrangement indicates that the body was originally placed on the right side, with legs slightly bent and the head pointing N. Woman, *adultus* (25–30 years old).

Inventory (Pl. LXXVII, CCXI:2): 1. Brass crossbow brooch with a high catchplate. Cast bow with a die-forged finish, polyhedral in profile. Foot terminating in a profiled knob. Catchplate decorated with an X sign motif. Iron spring bar. Group A.VII, series 1, type similar to 203. L: 4.4 cm, W: 1.7 cm. 2. Belt strap end made

from a copper alloy, ending in a ring with a profiled tongue. The shank was die-forged with a faceted profile. A fan-shaped flared attachment, ending in two rivets and decorated with a double X motif. As a result of a repair (?), a separate piece of flat metal was riveted to the bottom side to form a second support for the attachment. Type Raddatz JII3, ML type 6, form 1. L: 6.5 cm, ring Dm: 0.9 cm. 3–11. Nine miniature glass beads, light green, transparent. Type TM 49. Dm: 0.3 cm to 0.4 cm, H: 0.1 cm each. 12. Barrel-shaped amber bead, dark honey-coloured, transparent. Type similar to TM 392. Dm: 1.2 cm, H: 1.0 cm, Wt: 0.72 g. 13–16. Four disc-shaped amber beads, irregularly shaped, dark honey-coloured, transparent. Type TM 388. Dm: 0.9 cm, 1.0 cm, 0.9 cm, 0.9 cm, H: 0.5 cm, 0.7 cm, 0.7 cm, 0.6 cm, Wt: 0.26 g, 0.46 g, 0.42 g, 0.45 g.

Dating: *stadium* IVA.

Grave 575 (inhumation, destroyed) SQ 15-24 D

At the depth of ca. 0.60 m, within the sand pit exploited at the beginning of the twentieth century, and filled and ploughed after World War II, a cluster of bones was revealed in a concentration of compacted gravel and clay. Identifiable bones included fragments of a calvaria, a scapula, ribs, vertebrae, humerus bones, radial and elbow bones as well as metacarpal bones and phalanges, along with a ceramic fragment (2). Some 0.20 m below, two femurs were found in a non-anatomical arrangement, with the bases of the sockets reversed relative to each other (Pl. LXXIII, CXCVIII:5), and a buckle (1) between them. The buckle was found in a compacted layer of copper-red clay and gravel, presumably the bottom of the pit, whose N and S section were completely destroyed by the trench. Based on the arrangement of the bones and the outline of the pit we can conclude that the grave was aligned NNE-SSW and contained the remains of a single individual. Man, adult.

Inventory (Pl. LXXIII): 1. Unipartite buckle made from a copper alloy with a flat, D-shaped, forged frame, rectangular in diameter. Type ML D 11. L: 2.5 cm, W: 2.3 cm. 2. Two fragments of the body of a ceramic vessel, light brown, with a roughened surface. High temper content consisting of fine-grained crushed ceramics. Visible traces of a delicate ornament in the form of vertical scored lines. Medium-fired ceramic mass, crumbling and flaking. H: 4.6 cm.

Dating: *stadium* IIIA (?).

Grave 576 (cremation pit containing a burnt layer) SQ 16-21 B, D

Revealed at the depth of 1.60 m in the N section to 1.80 m in the S section, under a filled archaeological trench made in 1998. The grave pit is aligned

N-S, roughly rectangular with rounded edges, sized 2.50×0.80–0.95 m with a maximum thickness of ca. 0.50 m (Pl. LXXVIII, CXCIX:2). Filled with loose, fine-grained, yellow-grey sand with precipitations of compacted copper-coloured sand turned into hardpan with a high clay content. Numerous large and small charcoals, fragments of burnt logs and branches (hornbeam) as well as individual burnt bones, not forming any clusters, were also found throughout the fill. This kind of fill indicates that the remains of a pyre were placed in the pit; notably, the burnt bones were clean. In the pit, a belt strap end (1) and a spindle whorl (2) not marked by fire were found, as well as small ceramic fragments from several vessels (3–8). Unidentified sex, adult.

Inventory (Pl. LXXVIII): 1. Belt strap end made from a copper alloy ending in a square terminal, with a hole in the middle and a long rectangular tongue. Fan-shaped flared attachment, damaged in the upper section, with a single rivet. The item was cast and finished by die-forging with a faceted profile. Type Raddatz JII3, ML type 6, form 1, variant 2. L: 4.9 cm. 2. Biconical ceramic spindle whorl, dark brown, with flat ends. Dm: 3.5 cm, H: 2.3 cm. 3–7. Four fragments from the body and one from the rim of a ceramic vessel, bearing traces of secondary burning, dark brown, grey-dark brown in places. Surface slightly roughened. Low temper content consisting of coarse-grained crushed ceramics. H: 3.4 cm, 4.0 cm, 2.9 cm, 3.0 cm, 1.6 cm. 8. Fragment of the body of a thin-walled ceramic vessel, black, glossy, with a carefully smoothed surface. High temper content consisting of fine-grained sand. Medium-fired ceramic mass, crumbling and flaking. H: 4.6 cm.

Dating: *stadium* IVA/IVB.

Grave 577 (cremation urn, destroyed) SQ 17-21 C

The grave was revealed at the depth of ca. 1.40 m, under a medieval layer. The longer axis of the pit is aligned N-S, oval-shaped and sized ca. 1.15×0.95 m (Pl. LXXVII). Filled with compacted mid-grained, dark copper-coloured sand turned into hardpan. In the central section, a highly damaged bottom of an urn (1) and a cluster of charcoals (not analysed) were found *in situ*, as well as several small burnt bones. The profile of the pit was irregularly shaped, with a maximum thickness of ca. 0.10 m. The feature constituted the remains of a cremation urn grave, presumably destroyed when the pit of grave 582 was made. Unidentified sex, unidentified age.

Inventory (Pl. LXXVII): 1. Reconstructed bottom of a ceramic vessel, dark brown, external surface smoothed. Fine-grained temper consisting of crushed ceramics and granite. Medium-fired ceramic mass, crumbling and flaking. Bottom Dm: 7.0 cm.

Dating: earlier than *stadium* IVB (see description of grave 582).

Grave 578 (inhumation, opened) SQ 16-23 C, D

The grave pit became apparent at the depth of ca. 1.35 m, under a medieval layer (Pl. LXXIX); close to oval-shaped, sized ca. 2.85×0.80 m. In its central section, a secondary trench was located (see the description of feature 578A), which destroyed the pit of the present grave to the depth of 0.70 m. Within it, fragments of a humerus were found. At the bottom of grave 578, skeleton bones were found in a non-anatomical arrangement. In the N section of the grave, skull bones and upper limb long bones were found, among which an S-shaped clasp was discovered (1). Fragments of ribs and flat bones were highly scattered further to the S. Some of those bore green discolourations suggesting that copper alloy items were originally present in their vicinity. A right femur, tibiae and fibulae from both legs and toe phalanges were found in an anatomical arrangement, indicating that the individual was in a supine position with the head pointing N. W of the femur, a fragment of a needle or brooch pin was found (2), and, at the same depth in the E section of the pit, a cluster of long bones was present, likewise discoloured by copper compounds. Filled with loose, fine-grained, light yellow sand mixed with copper-coloured hardpan precipitations with a high clay content. In the S section, concentrations of fatty clay and small stones were present, and small charcoals (not analysed) were concentrated in the N section of the pit, near the skull bones. The profile of the pit was trough-shaped, with a maximum thickness of 0.90 m. Woman, *senilis* (55–60 years old).

Inventory (Pl. LXXIX): 1. Damaged silver S-shaped clasp. Shank made out of three incised wires, between which three smooth wires were inserted and soldered together. In the middle section of the shank, a triple ring of incised wire was applied. The damaged end is decorated by an elaborate cluster of granulation in the form of four larger granules with an arrangement of four smaller soldered granules on each (only one survives). The whole is set on a double ring of incised wire. The other end is not preserved. Type von Müller B, Patalan variant B5b. L: 2.6 cm, Wt: 4.69 g. 2. Damaged fragment of a needle or brooch pin made from round copper alloy wire. L: 3.3 cm.

Dating: *stadium* IIIA/IIIB.

Feature 578A (secondary trench into grave 578) SQ 16-23 D

The roughly round pit sized 0.80×0.90 m became clearly apparent in the central section of inhumation grave 578, destroying it to the depth of 0.70 m (Pl. LXXIX).

Filled with mid-grained, dark copper-coloured sand mixed with fine gravel and clay. At the top of the feature, ca. 0.10 m below the level of capture, a fragment of a humerus from the individual buried in grave 578 was found. The remaining part of the skeleton was at the bottom of the grave 578. Woman, *senilis* (55–60 years old).

Inventory: none.

Dating: *stadium* IIIA/IIIB or later (see description of grave 578).

Grave 579(462) (inhumation, disturbed) SQ 17-21 A, C

The S section of the pit became apparent at the depth of ca. 2.00 m right under a medieval layer, and the N section was revealed under a filled archaeological trench made in 1998 which had visibly disturbed that section of the grave. At the level of capture, the grave appeared as a rather irregular, dark grey outline. Only the W edge was relatively clearly visible. Directly in the top part, as well as scattered widely N and S of its outline, fragments of a destroyed urn were found originating from cremation grave 581, along with a small number of burnt bones. Also found at that level was an axe pendant (1), displaced from its original location, presumably as a result of post-deposition processes. After exploring grave 581, a clear outline of the pit of 579(462) was captured (Pl. LXXX). It was aligned N-S, sized ca. 3.50×1.00 m. Roughly rectangular with rounded edges in the N section, irregular but wider in the S section. In the N section of the grave pit, at the depth of ca. 0.10 m below the level of capture, a relatively regular structure became apparent in the form of hardpan precipitations and decomposed wood (not analysed) – the remains of a wooden container or platform (27). On top of those, three vessels were found containing several fragments of burnt bones (a secondary deposit), most likely from the aforementioned destroyed cremation urn grave 581. The set of vessels included two bowls made on a potter's wheel (21–22) and a bucket made from yew slats held together by metal hoops (25) (Pl. CC:1–2). Inside the bucket, a turned wooden vessel (alder) (26.26a–m) was preserved in fragments with the trace of a metal fitting at the rim in the form of green copper oxide patina (26b) and a glass drinking cup, also preserved in fragments (24). Some 0.40 m S of the set of vessels (in the E section of the grave), there was a drinking cup placed upside down (23). The remaining equipment items were found in the S part of the N section of the grave. Those included: two axe pendants (2–3), including one preserved in fragments, one bead (6) and ten amber beads (7–16), two glass beads, one melon-shaped (4) and one barrel-shaped (5), and a ring

(17). The items were scattered. The layout indicates that the items were not parts of a necklace, but rather an appliqué sewn onto a garment or fabric. Among those, small individual fragments of teeth and individual burnt bones were found, most likely from the destroyed cremation urn grave (grave 581). Closer to the E edge of the grave, a set of spinning tools was found, including a spindle hook (19), fragment of a needle (18) and an amber spindle whorl (20), deposited within a greyish layer of organic origin. The items were most likely placed in the grave in a container or perhaps a pouch. Some 0.50 m SE of the items, a cluster of wood shavings and flint chips was found (27–30), presumably deliberately placed in the grave. Those were discovered in a layer of coarse-grained, dark copper-brown sand with numerous small charcoal fragments (not analysed) and small stones. The maximum thickness was 0.30 m. Underneath, separated by iron precipitate, a layer of dark copper-coloured sand without charcoals was found (thickness ca. 0.20 m). The bottom of the grave pit was covered by a layer of grey-dark brown sand with a high clay content whose greasy, fatty structure may indicate organic origins. The bottom of the grave may have been lined with textiles, hides or furs (?), as suggested by the irregular, wavy structure of the layer formed from sediment. The depth of the grave pit below the level of capture was ca. 1.00 m., the skeletal bones were fully decomposed. The only available evidence for identifying the sex of the buried individual is the equipment, indicating a woman. The layout of the cemetery shows that feature 579 overlaps with feature 462, identified during exploration in 1998. Not explored at the time, only the top part of the feature had been documented with drawings – at the time it was interpreted as a pit with an unidentified function that destroyed the S section of inhumation grave 456. It was noted at the time that pit 462 contained streaks of black soil, presumably the remains of wood pulp from the destroyed S part of the coffin from grave 456²⁹; it is now clear that those were connected with the fill (organic container) revealed in the N section of the feature 579. Accordingly, the grave was catalogued as 579(462), explaining the function of feature 462. Unidentified sex, unidentified age; burnt bones: unidentified sex, unidentified age.

Inventory (Pl. LXXXI–LXXXIX, CCXII:1–2): 1. Silver axe pendant, forged from a thin metal sheet, with two holes in the suspension loop. Type Kokowski 2. L: 1.6 cm, blade W: 1.0 cm, Wt: 0.43 g. 2. Silver axe pendant, forged from a thin metal sheet, with a single

hole in the suspension loop, fitted with a ring for hanging the ornament, made from thin wire, with entwined ends. The base of the suspension loop was decorated with two engraved lines and an X-shaped ornament. Type Kokowski 2. L: 1.3 cm, blade W: 1.2 cm, ring Dm: 0.8 cm, Wt: 0.52 g. 3. Silver fragment of the blade from an axe pendant. Type Kokowski 2 (?). Preserved L: 0.4 cm, Wt: 0.01 g. 4. Melon-shaped glass bead, with pronounced ribs, green, transparent. Type TM 379b. Dm: 1.8 cm, H: 1.4 cm. 5. Barrel-shaped glass bead, orange, matte. Type TM 9. Dm: 0.8 cm, H: 0.7 cm. 6. Shield-shaped amber bead, made with a lathe, dark honey-coloured, transparent. Type similar to TM 430. Dm: 2.8 cm, H: 0.9 cm, Wt: 5.43 g. 7–14. Eight amber eight-shaped pendants, with a rim in the narrow section, hand-cut with traces of lathe finishing, dark honey-coloured, transparent. Type similar to TM 471e. H: 2.5 cm, 2.3 cm, 2.3 cm, 2.3 cm, 2.2 cm, 2.5 cm, 2.3 cm, Wt: 2.48 g, 2.71 g, 2.67 g, 2.56 g, 1.96 g, 2.80 g, 2.69 g, 2.52 g. 15. Hand-cut amber pendant, the lower part with a polyhedral cross-section, the top part with a suspension loop. The lower part was decorated along the vertical edge with a relief in the form of double rows of oblique incisions. Dark honey-coloured, transparent. Type similar to TM 458b. H: 1.7 cm, maximum base W: 1.3 cm, Wt: 1.43 g. 16. Hand-cut amber pendant, the lower part with a polyhedral cross-section, the top part with a suspension loop. Dark honey-coloured, transparent. Type similar to TM 458b. H: 2.0 cm, maximum base W: 1.4 cm, Wt: 2.04 g. 17. Silver ring made of round wire, with a second wire wrapped around it in a spiral on both sides, forming a spiral eye in the middle. Type Beckmann 16. Dm: 2.5 cm, Wt: 2.54 g. 18. Fragment of a silver needle forged from round wire, with the eye broken off. L: 4.8 cm, Wt: 0.54 g. 19. Silver hooked pin with a twisted shank. L: 2.5 cm, Wt: 0.13 g. 20. Disc-shaped amber spindle whorl made with a lathe, dark honey-coloured, transparent. Type similar to TM 443. Dm: 3.0 cm, H: 1.6 cm, Wt: 9.84 g. 21. Ceramic bowl made on a potter's wheel, burned after firing (external surface discoloured by reduction processes). Brick-red and grey inside and outside. The external surface and the bottom show clear marks of fast wheel use. High temper content consisting of fine-grained sand. Well-fired to produce a hard and strong ceramic mass. Rim Dm: 18.8 cm, body Dm: 18.2 cm, bottom Dm: 7.0 cm, H: 7.3 cm. 22. Ceramic vase made on a potter's wheel with a high cylindrical neck, with a low-set body curve. Black, smoothed and glossy inside and outside, brick-coloured in the widest part. The external surface and the bottom show clear marks of fast wheel use. High temper content consisting of fine-grained sand,

²⁹ Cf. M. Natuniewicz-Sekuła, J. Okulicz-Kozaryn 2011, 114–115, Pl. CCII.

including mid-sized grains of granite. Well-fired to produce a hard and strong ceramic mass. Rim Dm: 19.0 cm, body Dm: 20.9 cm, bottom Dm: 10.0 cm, H: 16.0 cm. 23. Ceramic drinking cup with a handle stuck onto the side. Light brown, surface loosely smoothed. High temper content consisting of coarse-grained crushed ceramics, granite and mica. Well-fired to produce a hard and strong ceramic mass. Type RW XVA. Rim Dm: 8.6 cm, body Dm: 11.0 cm, bottom Dm: 4.1 cm, H: 6.6 cm. 24. Glass drinking bowl, preserved in fragments (reconstructed in a drawing), highly corroded, with a slightly convex bottom. Made in a mould from layered glass (?). The surface is decorated with horizontal ornamental stripes engraved with circles and semi-circles separated by the motif of an inverted letter T and separated with horizontal lines. On two fragments, two small handles were noted (there may have been more originally), placed at the maximum width of the body. The vessel was preserved as a crumbling item with a crystalline structure. Because it was originally deposited inside a bucket made of yew, the alkali compounds in the glass were probably leached off and replaced with silica, resulting in devitrification³⁰. Originally made of transparent glass, the item now only contains fragments of colourless, transparent glass. Unspecified type. Reconstructed dimensions: rim Dm: 13.0 cm, body Dm: 12.7 cm, bottom Dm: 3.0 cm, H: 6.4 cm. 25. Reconstructed wooden bucket (yew) with three brass hoops and a brass handle. The vessel consists of ten staves joined with tongue and groove joints and a groove for the bottom. The staves were set into the bottom fastened in the groove (the bottom is preserved very fragmentarily). The hoops around the vessel were decorated with thin engraved lines making an oblique check pattern. The top hoop is additionally decorated in the bottom section with punched dots, and the upper part is hammered onto a rim formed from the connected staves. The hoop ends overlap and are connected by means of two copper alloy rivets (not analysed) with long shanks and hemispherical heads hammered into the staves. The hoops survived as a mineralised layer of small, crumbling sheets of metal. The decorated attachment plates were made from a thick trapezoid metal sheet and riveted to the staves with four rivets; in the bottom section, those were decorated with punched dots. The bucket handle forms a flat band, rectangular in cross-section, narrowing at the ends to individual knobs connected to the decorated attachment plates.

On the inside, the connections are masked by round washers. The handle was decorated with punched circles. Bucket type Becker form 1b, decorated attachment plate: similar to Becker IIIA, handle type: Becker, similar to form C. Rim Dm: 19.6 cm, bottom Dm: 20.0 cm, bucket H: 19.6 cm, total H (including handle): 29.8 cm, hoops W (from the top): 3.0 cm, 3.8 cm, 3.8 cm. 26.26a–m. Fourteen fragments of a turned wooden vessel (alder); one contains two turned rib pieces (26), another bears traces left by a copper alloy fitting (26b), in the form of green patina. The state of preservation made it impossible to reconstruct the shape of the item. Preserved fragments L: 9.6 cm, 6.4 cm, 8.0 cm, 3.8 cm, 2.7 cm, 4.0 cm, 3.3 cm, 2.3 cm, 2.0 cm, 1.4 cm, 2.3 cm, 2.5 cm, 1.8 cm, 2.0 cm, preserved fragments H: 2.2 cm, 1.8 cm, 2.5 cm, 1.3 cm, 2.3 cm, 1.4 cm, 1.3 cm, 0.9 cm, 1.1 cm, 1.3 cm, 0.7 cm, 1.0 cm, 1.3 cm. 27. Preserved in fragments *in situ* in the form of decomposed wood (unidentified), a wooden container or platform on which a set of vessels (21, 22, 25) was placed. Dimensions: 50.0×40.0 cm. 28. Two fragments of the body of a ceramic vessel from grave 581 (see description of grave 581). 29. Baltic flint. Flake with negative flake scars on the dorsal surface, prepared butt – single strike. L: 3.0 cm, W: 2.6 cm, Thk: 0.9 cm. 30. Baltic flint. Fragment of a negative flake with a broken butt part. L: 2.7 cm, W: 1.1 cm, Thk: 0.3 cm. 31. Pomeranian flint. Blade with scars on the entire dorsal surface, punctuated butt. L: 2.2 cm, W: 0.6 cm, Thk: 0.2 cm. 32. Pomeranian flint. Flake with negative flake scars on the dorsal surface, prepared butt – single strike. L: 1.6 cm, W: 1.1 cm, Thk: 0.1 cm.

Dating: *stadium* IVB.

Grave 580 (cremation pit, destroyed) SQ 17-21 A

The remains of a destroyed grave were discovered at the depth of ca. 1.60 m, under a medieval layer. At this level, burnt bones and several fragments of a single vessel were found (1.1a–m), scattered over an area of ca. 3.80×2.20 m (Pl. XC). The material was deposited in a layer of compacted dark copper-coloured sand turned into hardpan, with numerous charcoals (hornbeam). Some 0.10 m below, the grave pit became apparent. Roughly circular in shape, sized ca. 1.80×1.80 m and with a maximum thickness of 0.40 m (Pl. XCI). The fill contained numerous concentrations of burnt bones and ceramics; including more fragments of the same vessel (1.1a–m) and three others (2–4). At the bottom of the pit, there was a layer of charcoals (hornbeam). Grave 580 was sunk into the N section of inhumation grave 582. At the level at which grave 582 was captured, burnt teeth were discovered, presumably from burial 580. At the bottom of the pit of grave 580, containing

³⁰ We are grateful to Prof. Tomasz Purowski (Institute of Archaeology and Ethnology, Polish Academy of Sciences) for that observation.

numerous animal burrows, as well as at the level of capture of the N section of grave 582, two small fragments of a vessel made on a potter's wheel were found, originally part of the equipment of grave 582 – where more fragments of the same vessel were found. Man, *maturus* (over 45 years old).

Inventory (Pl. XCI–XCII): **1.1a–1m.** Fourteen fragments of the body of a single ceramic vessel. Light brown external surface, grayish in places, roughened. Dark brown internal surface, carelessly smoothed. High temper content consisting of coarse-grained crushed ceramics and granite. The widest part of the body is badly worn with use, suggesting that the vessel had already been well-worn in the antiquity. Medium-fired ceramic mass, crumbling and flaking. Group RW I (?). H: 6.2 cm, 3.0 cm, 2.3 cm, 5.7 cm, 7.0 cm, 7.1 cm, 4.9 cm, 5.6 cm, 4.4 cm, 2.9 cm, 2.9 cm, 3.0 cm, 3.3 cm, 4.1 cm, 3.2 cm. **2.** Fragment of the body of a thin-walled ceramic vessel, dark brown, with a lightly smoothed surface. Low temper content consisting of mid-grained crushed ceramics and granite. Medium-fired ceramic mass, crumbling and flaking. H: 2.8 cm. **3.** Fragment of the body of a thin-walled ceramic vessel, dark brown, with a smoothed surface. Low temper content consisting of fine-grained crushed ceramics and granite, visible mica grains. Medium-fired, producing a poorly fired ceramic mass, crumbling and flaking. H: 2.5 cm. **4.** Fragment of the bottom and the lower section of a ceramic vessel, light brown, with a smoothed surface. Low temper content consisting of fine-grained granite. Medium-fired ceramic mass, crumbling and flaking. H: 2.3 cm.

Dating: later than *stadium* IVB (see description of grave 582).

Grave 581 (cremation urn, destroyed) SQ 17-21 A, C At the depth of ca. 1.95 m, the feature was made apparent from clusters of fragments of vessels located in the SE section of inhumation grave 579(462) and ca. 1.5 m S of its pit (Pl. LXXXIX). Those were fragments of an urn; presumably destroyed when digging the pit of grave 579(462). None of the clusters were original deposit locations. The outline of the pit was not captured. No bones were preserved.

Inventory (Pl. LXXXIX): **1.** Reconstructed fragment of the lower part of a ceramic vessel with an accentuated bottom. Dark brown, smoothed internal and external surfaces. Low temper content consisting of fine-grained granite, visible mica grains. Medium-fired ceramic mass, crumbling and flaking. Type RW VIB (?). Bottom Dm: 6.9 cm, preserved H: 5.3 cm.

Dating: earlier than *stadium* IVB; see description of grave 579(462).

Grave 582 (inhumation on a platform made from split boards (?), disturbed) SQ 17-21 A, C

The grave pit became apparent at the depth of 1.90 m, under a medieval layer. Aligned N-S, roughly rectangular with rounded edges, sized ca. 3.40×1.00 m and with a maximum thickness of 0.40 m (Pl. XCIII). Slightly wider in the N section, where it was disturbed by cremation grave 580. In the N section of the grave, at the level of capture, small burnt bones were revealed (a secondary deposit, probably from grave 580), as well as unburnt teeth and charcoals (unidentified). In that section of the pit there were scattered fragments of a vessel made with a potter's wheel (4), destroyed by the pit of grave 580, with more fragments of the same vessel at the bottom. Slightly below, a spindle whorl (3) was found, located in the middle part of the N section of the grave. At the E edge, streaks of decomposed organics were preserved – presumably a wooden structure (not analysed), likewise destroyed by grave 580. Such traces were preserved in the N section over ca. 0.80 m. In the S section, at the bottom of the pit, a well preserved fragment of a split board was revealed *in situ* (not analysed) (5) with maximum dimensions of 0.80×0.40 m. The wood was found in a wet fill layer with a high clay content, with the wood grain clearly visible (Pl. CXCIX:4). The split board was ca. 0.03–0.05 m thick. It appears to be the remains of a platform. On the split board there was an amber pendant (2), and at the SE corner, a brooch (1) with its head pointing NE. Other than fragments of teeth, no skeleton bones were preserved. The arrangement of the items indicates that the body was probably wrapped in a piece of fabric fastened at the bottom with a brooch before it was placed on the wooden structure. The remains of the fabric are responsible for the high clay content in the fill, which is otherwise made up of coarse-grained, dark yellow sand mixed with hardpan precipitations. Unidentified sex, adult.

Inventory (Pl. XCIII–XCIV, CCXI:6): **1.** Crossbow brooch with a tendril foot made of tin bronze. Wide die-forged bow decorated with a metope ornament at the head, the base and in the upper section of the foot. Type A.VI.161-162. Pattern Kokowski ZM-103. L: 5.0 cm, W: 3.0 cm. **2.** Amber pendant shaped like a stylised horse's head, dark honey-coloured, transparent, decorated at the edges with a relief of oblique dashes, and, along the longer edge, with an engraved line. The suspension loop for hanging drilled in the upper section imitates the horse's eye. H: 3.3 cm, maximum W: 1.3 cm, Wt: 1.88 g. **3.** Biconical ceramic spindle whorl, dark brown, with flat ends. Dm: 3.1 cm, H: 1.3 cm. **4.** Reconstructed ceramic vase made on a potter's wheel. Dark brown inside and outside, in

places polished, smoothed, brick-red in the widest part. Strongly flared rim, a decorative band on the upper part of the vessel's body. The external surface and the bottom show clear marks of fast wheel use. High temper content consisting of fine-grained sand. Well-fired to produce a hard and strong ceramic mass. Rim Dm: 20.0 cm, reconstructed body Dm: 21.6 cm, bottom Dm: 10.0 cm, reconstructed H: 13.6 cm. 5. A split board (fragment of a platform [?]), preserved *in situ* in small fragments, in the form of decomposed wood (not analysed). Dimensions: ca. 80.0×40.0 cm.

Dating: *stadium* IVB.

Feature 583 (modern trench – within a filled and ploughed sand pit) SQ 15-22 B

Oval-shaped trench located at the depth of 0.24 m. The outline was visible right under the turf, in a modern ploughed layer (Fig. 4). The longer axis, sized 1.60×1.35 m, is aligned E-W. Filled with a homogenous layer of fine-grained, dark brown sand with some clay content mixed with humus. The fill contained small pieces of modern rubbish such as fragments of cans, wires, bottle caps, fragments of vessels (flower pots), fine-grained brick rubble, etc. The maximum depth was 1.30 m. In the E section of the feature, at the bottom, two wooden pegs were located (very well preserved), and in the W section – a fragment of a Roman vessel (1) in a secondary context.

Inventory (Pl. XCIV): 1. Fragment of the body of a brass vessel made out of a thin sheet decorated with vertical engraved lines, probably a jug of Roman provenance³¹. Preserved L: 2.4 cm, W: 0.6 cm.

Dating of finds: Roman Period.

Dating of feature: modern.

Feature 584 (modern trench – within a filled and ploughed sand pit) SQ 14-22 D, 15-22 B, D

The top of the feature was captured at the depth of 0.23 m in the N section and at 0.41 m in the S section, right underneath the topsoil (Fig. 4). The pit had a semi-circular outline with a max. L: ca. 7.00 m and a max. W: ca. 3.50 m, up to 1.50 m thick. The E part was outside the archaeological trench. The feature was filled with multiple layers consisting of highly mixed, brown-yellow loose sand with a lot of small stones, as well as loose, fine-grained, dark brown-yellow sand with a lot of gravel and small charcoals (not analysed). At various levels in the fill, several dozen unburnt bones were discovered along with Wielbark Culture items from different periods (1–11). The bones came from

³¹ Cf. M. Natuniewicz-Sekuła 2010 and subsection II.3., cat. no. 502–550 in the present volume.

at least three individuals (*infans* II, a female *adultus* and a male *maturus*). A capsule pendant (9) found in the feature is probably attributable to the child burial since it was revealed in one of the clusters of child bones. The feature was sunk into a large sand pit, presumably one exploited before World War II and subsequently filled and ploughed. Presumably this was one of the three sand pits explored by Prussian archaeologists – the feature under discussion may be the remains of one of those³². Based on the number of bones and equipment items we can conclude that the feature destroyed at least several graves. Unidentified sex, *infans* II (8–9 years old); woman, *adultus* (25–35 years old); man, *maturus* (45–50 years old).

Inventory (Pl. XCIV): 1. Brass crest-headed brooch. Cast bow with a forged and filed finish. Prominent crest on the head, decorated with three hammered silver incised wires. The foot terminal was decorated with two silver, incised wires. Type similar to A.V.120. L: 4.3 cm, W: 3.8 cm. 2. Damaged bipartite belt buckle made from a copper alloy with preserved crumbled fragments of the buckle plate. Frame forged, with a faceted cross-section. Type ML D 17 (?). L: 2.7 cm, W: 2.7 cm. 3. A massive belt strap end made from a copper alloy, with a lenticular shank at the base and a massive terminal with an oval cross-section. Flared, fan-shaped attachment made of individual metal sheets, forged from a shank, containing one preserved rivet with a small head with the remains of a mounting pad. Type similar to Raddatz O16, ML type 2, form 6. L: 4.2 cm. 4–7. Four hemispherical, forged rivet heads made from a copper alloy, part of an appliqué on a decorative belt. On the inside, three of the heads contain trace remains of solder left from the connection with the shanks. Dm: 0.8 to 1.0 cm. 8. Silver S-shaped clasp. Shank made out of individual incised wire. At mid-length, a triple ring made from incised wire was applied. The shank ends at the base are decorated with individual incised rings each set with clusters of four granulation granules. Type von Müller B, Patalan variant B3b. L: 1.8 cm, Wt: 1.28 g. 9. Silver capsule pendant, suspension loop damaged. Front shield decorated with spirally applied smooth wire, with a granule soldered on in the middle. Back shield not preserved. Dm: 1.0 cm, W: 0.5 cm, Wt: 0.80 g. 10. Hooked pin with a twisted shank, made from a copper alloy. L: 4.7 cm. 11. Rivet from a casket (?) made from a copper alloy, with a round head hammered flat and a long shank bent at the end. L: 2.7 cm, rivet head Dm: 0.6 cm.

Dating of finds: *stadium* IIC to *stadium* IIIA/IIIB.

Dating of feature: modern.

³² Cf. F. Jacobson 1927, 123–135.

Grave 585(290A) (cremation urn, destroyed) SQ 17-19 D; 17-20 A, B

The grave pit became apparent at ca. 1.75 m, under a medieval layer and partially under the fill of an archaeological trench made in 1998. Roughly circular, sized 0.48×0.45 m, with a thickness of 0.14 m (Pl. XCV). Filled with fine-grained, dark copper-coloured sand turned into hardpan and containing small charcoals (not analysed). In the middle section of the pit there was an urn (1) with its upper part destroyed, containing a burnt long bone. Fragments of the vessel come from the urn from grave 290A, explored in 1994, as corroborated by the vessel's technique, shape, decoration, colour and dimensions. At the time, the grave was interpreted as a cremation urn, destroyed, and was labelled as 290A. Unidentified sex, unidentified age.

Inventory (Pl. XCV): 1–1a³³. Reconstructed part of a ceramic vase. Black, surface carefully smoothed, glossy. Vessel decorated at the base of the body with a decorative stripe in the form of three horizontal decorative bands and short vertical band in between. The middle band is also decorated with oblique scores. In the central section of the body, an ornament of scored oblique lines forming triangles. The lower part of the body decorated with a broad decorative stripe of chaotically scored horizontal, vertical and oblique lines. High temper content consisting of fine-grained sand and small grains of granite, visible mica grains. Medium-fired ceramic mass, crumbling and flaking. Type RW IVA. Reconstructed rim Dm: 19.6 cm, body Dm: 24.5 cm, bottom Dm: 8.5 cm, reconstructed H: 16.9 cm.

Dating: *stadium* IIIA.

Grave 586 (inhumation, disturbed) SQ 17-20 B, D

The grave pit was identified at the depth of 2.20 m under an archaeological trench made in 1998. The upper section had clearly been disturbed by the trench. Some 0.05 m above the level of capture of the feature, glass and amber beads were discovered (3–4, 20–21), probably part of the original equipment of the grave in question. The grave pit is aligned N-S, roughly rectangular with rounded corners, sized 3.10×1.15 m and with a maximum thickness of 0.40 m (Pl. XCVII, CCIV:2). Filled with compacted dark copper-coloured sand largely turned into hardpan. In the central section the fill was clearly heterogeneous, mixed with streaks of dark copper-coloured hardpan, marl and fine-grained, greyish sand (characteristic of decomposed organics – fabrics [?]) and small charcoals (sessile oak). The equipment items were scattered at various depths in the S section of the feature: fragments of brooches (1–2)

and 15 glass beads, some of them crushed (5–19). The arrangement of the items indicates that they were not part of a necklace, but rather an appliqué sewn onto a garment or fabric covering the buried individual. Also, a ceramic fragment was discovered (26). In the N section of the grave, a clear outline of a wooden container (oak) without metal fittings (25) was present (Pl. CXCIX:3). Within the outline, a ring (22), a needle (23) and a fragment of the shank of a hooked pin (24) were found. In the N section of the pit, fragments of teeth and two fragments of a calvaria were preserved, along with two fragments of long bones found in the S section of the pit. Unidentified sex, adult.

Inventory (Pl. XCVI): 1. Two fragments of a silver brooch spring with remains of an iron axis bar. Preserved fragments L: 0.9 cm, 0.7 cm, combined Wt: 0.75 g. 2. Four small fragments of a brooch spring (?) made from a copper alloy. Preserved fragments L: 0.3 cm, 0.5 cm, 0.4 cm, 0.5 cm. 3. Glass cylinder-shaped bead, matte, red, with alternating white wavy lines and a horizontal white thread applied on the surface. Type similar to TM 325a. Dm: 1.2 cm, H: 1.6 cm. 4. Barrel-shaped glass bead, black, matte. Type TM 11. Dm: 1.2 cm, H: 0.8 cm. 5. Lenticular glass bead, black, matte. Type similar to TM 40. Dm: 0.6 cm, H: 0.4 cm. 6–15. Ten polyhedral glass beads, dark blue, transparent, whole and surviving in fragments. Type TM 126. Dm: 0.6 cm, preserved H: from 0.5 to 1.0 cm. 16–19. Four completely crushed polyhedral glass beads, dark blue, transparent. Type TM 126. 20. Disc-shaped amber bead, hand-cut, dark honey-coloured, transparent. Type TM 389. Dm: 2.0 cm, H: 1.2 cm, Wt: 2.49 g. 21. Amber eight-shaped pendant with a small rim at the narrow section near the eye, dark honey-coloured, transparent. Type similar to TM 471e. H: 1.8 cm, Wt: 0.83 g. 22. Silver ring with an eye made from spiral wire. Type Beckmann 16. Dm: 3.2 cm, Wt: 3.10 g. 23. Thick needle made from round copper alloy wire. Forged eye, punched through. Dąbrowska type II. L: 6.8 cm. 24. Silver fragment of a hooked pin with a twisted shank. Preserved L: 2.0 cm, Wt: 0.15 g. 25. Decomposed wood (oak). The remains of a container without metal fittings found *in situ*, roughly rectangular, with rounded edges. Given the state of preservation, it was not possible to reconstruct the exact structure of the item. Dimensions ca. 55.0×55.0 cm. 26. Fragment of the body of a thin-walled ceramic vessel, dark brown, with a carelessly smoothed surface. Medium-fired ceramic mass, crumbling and flaking. H: 1.6 cm.

Dating: *stadium* IVA.

Grave 587 (inhumation on a platform made from split boards (?), disturbed) SQ 17-20 C, D

Grave revealed at the depth of 2.20 m, in the N section – under an archaeological trench made in 1998, in the S

³³ Cf. M. Natuniewicz-Sekuła, J. Okulicz-Kozaryn 2011, 84, Pl. CXXVII/290A:1.

section – under a medieval layer. The pit is aligned N-S, roughly oval in shape, sized 2.30×1.20 m, with a maximum depth of 0.35 m. The grave intersected with the SE corner of grave 588 (Pl. XCIX–C, CCIV:2). The fill was heterogeneous. The upper layer consisted of light grey to dark brown sand with a high clay content, compacted in places (particularly in the S section, indicating decomposed organics – oak was identified) with a large number of charcoals (oak) and small stones. The bottom of the pit was filled with a layer of compacted dark copper-coloured sand turned into hardpan with numerous charcoals (oak), decomposed organics and small stones. The layer of organics was concentrated in the S section of the grave. The layout indicates that a structure, such as a partially burnt platform made from split boards (?), was located at the bottom of the pit. Along with those traces, equipment items were discovered, including a fragment of a brooch pin or needle (1) and a ceramic fragment (2). No bones were preserved.

Inventory (Pl. C): 1. Fragment of a brooch pin or a needle made from a copper alloy. Preserved L: 2.3 cm. 2. Fragment of the body of a thin-walled ceramic vessel, light brown. High temper content consisting of mid-grained crushed ceramics and granite. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 1.3 cm.

Dating: Roman Period.

Grave 588 (inhumation in a log coffin, disturbed) SQ 17-20 A, C

The grave pit was captured at the depth of ca. 2.30 m, in the N section – under an archaeological trench made in 1998, in the S section – under a medieval layer. The top part was clearly disturbed. Aligned N-S, roughly rectangular, oval-shaped in the N section, with rounded edges in the S section. The SE corner of the pit was intersected by grave 587. Pit size: 3.10×0.85 m, with a maximum thickness of 0.30 m (Pl. XCIX, CC:4, CCIV:2). In the middle, clear traces of a log coffin sized ca. 2.85×0.50 m were captured in the form of dark brown discolourations of decomposed organics (oak), with the sides containing small charcoals (linden), filled with fine-grained, light grey and yellow sand. The grave pit was likewise filled with fine-grained light yellow sand. In the S section of the coffin, a retouched flint blade was located (3), ca. 0.10 m below, at the bottom of its central section, a buckle (1) and an amber pendant (2). In the NW corner, a fragment of the body of a vessel was found (4). No bones were preserved.

Inventory (Pl. C, CCXI:4): 1. Bipartite omega-shaped buckle made from a copper alloy. Without a plate or plate missing. Buckle frame cast, with a forged finish. Type similar to ML E 2. Axis L: 3.3 cm, frame L: 4.9 cm,

W: 3.7 cm. 2. Eight-shaped amber pendant with a rim in the narrow section of the eye, dark honey-coloured, transparent. Type similar to TM 471e. H: 1.8 cm, Wt: 1.25 g. 3. Cretaceous flint (Volhynian flint [?]), re-touched blade, prepared striking platform, pressure technique. L: 11.8 cm, W: 1.7 cm, Thk: 0.9 cm. 4. Fragment of the body of a thin-walled ceramic vessel, dark brown-grey. Medium-fired ceramic mass, crumbling and flaking. H: 2.3 cm.

Dating: *stadium* IIIB.

Grave 589 (inhumation, disturbed) SQ 17-20 B, D

The grave pit was located at the depth of 2.30 m. The N section was captured under an archaeological trench made in 1998, the S section – under a medieval layer. The top of the grave was damaged by the overlying layers. The pit is aligned N-S, close to oval-shaped, wider in the N section, sized 2.20×0.45–0.70 m and with a maximum thickness of 0.45 m (Pl. XCVII, CCIV:2). Filled with light yellow, fine-grained sand, with small charcoals (not analysed). In the N section, a streak of decomposed organics was discovered (not analysed), possibly the remains of a container, and directly E of it there were two vessels placed side by side (4–5), a spindle whorl (3), an amber pendant (1) and a decomposed comb (2) (Pl. CCI:5). In the S section of the pit, a fragment of the body of a vessel was discovered (6). No bones were preserved.

Inventory (Pl. XCVII–XCVIII):

1. Roughly triangular amber pendant, hand-cut. Dark honey-coloured, transparent. Type similar to TM 468. H: 2.5 cm, Wt: 2.14 g. 2. Small fragments of crushed lining from a three-layer comb made of bone (antler [?]) along with rivets made from a copper alloy. The arched comb handle was preserved *in situ*. Preserved fragments L: lining 0.7 cm, rivet 0.5 cm. 3. Biconical ceramic spindle whorl, dark brown, with flat ends. Dm: 2.6 cm, H: 2.4 cm. 4. Ceramic bowl, dark brown, with smoothed inside and outside surfaces. High temper content consisting of fine-grained crushed ceramics and granite, visible mica grains. Medium-fired, producing a poorly fired ceramic mass, crumbling and flaking. Type RW VIB. Rim Dm: 12.4 cm, body Dm: 18.1 cm, bottom Dm: 8.5 cm, H: 11.8 cm. 5. Miniature ceramic vessel, light brown, dark brown in places, with a smoothed surface. High temper content consisting of fine-grained crushed ceramics. Well-fired to produce a hard and strong ceramic mass. Type RW XVIIIC. Rim Dm: 6.4 cm, body Dm: 8.6 cm, bottom Dm: 3.7 cm, H: 6.2 cm. 6. Fragment of the body of a thin-walled ceramic vessel, dark brown, with a slightly roughened surface. Medium-fired ceramic mass, crumbling and flaking. H: 1.0 cm.

Dating: *stadium* IIIA/IIIB (?).

Grave 590 (inhumation with traces of a wooden structure, opened) SQ 17-20 D

The feature was located at the depth of ca. 2.35 m below ground level, under a medieval layer. In the N section, a secondary trench was present (see description of the feature 590A) which did not extend to the bottom of the grave pit. The grave is aligned NNW-SSE. The dimensions in the undisturbed S section were 0.70×0.85 m, with a maximum thickness of 0.45 m (Pl. XCVIII, CCIV:2). Filled with compacted fine-grained, copper-brown sand mixed with numerous small charcoals (not analysed) and a slight number of small stones. The bottom of the pit was filled with a layer of slightly compacted fine-grained, grey to dark brown sand with traces of decomposed wood (oak) – probably a wooden structure of some kind – and numerous charcoals (not analysed) and large stones. No bones were preserved.

Inventory: none.

Dating: Roman Period.

Feature 590A (secondary trench into grave 590) SQ 17-20 D

The trench, roughly rectangular with rounded edges, destroyed the N part of grave 590 down to the depth of 0.38 m. The dimensions were 1.40×0.80 m (Pl. XCVIII). Filled with loose, fine-grained, grey sand. Within the trench, two flint flakes were found (1–2).

Inventory (Pl. XCVIII): 1. First flake from Pomeranian flint. L: 1.6 cm, W: 2.6 cm, Thk: 0.6 cm. 2. Flake fragment of Baltic flint. L: 2.0 cm, W: 3.8 cm, Thk: 0.9 cm.

Dating: Roman Period or later (see description of grave 590).

Grave 591 (cremation pit, disturbed) SQ 16-21 B

Revealed at the depth of 0.60 m, under an archaeological trench made in 1995. Oval-shaped pit aligned NNW-SSE, sized 1.95×0.80 m, with a maximum depth of 0.40 m (Pl. XCV). Filled with fine-grained, light yellow sand with numerous streaks of hardpan precipitations. Throughout the depth of the pit, many burnt bones and unburnt equipment items were found: three beads (1–3), a spindle whorl (4), a fragment of a corroded iron object (5) and a broken fragment of a ceramic vessel (6). Unidentified sex, adult.

Inventory (Pl. XCV): 1. Barrel-shaped glass bead, black, matte. Type TM 11. Dm: 0.9 cm, H: 0.8 cm. 2. Fragment of a glass bead, matte, red, with remains of applied green thread. Type similar to TM 257b. Dm: 0.9 cm, H: 0.8 cm. 3. Crushed glass bead, matte, red. 4. Biconical ceramic spindle whorl, dark brown, with flat ends. Dm: 2.8 cm, H: 2.5 cm. 5. Fragment of a corroded and crushed iron object. 6. Fragment of the body of a thin-walled

ceramic vessel, light brown, with a roughened surface. Medium-fired, producing a poorly fired ceramic mass, crumbling and flaking. Preserved H: 2.3 cm.

Dating: Roman Period.

Feature 592AB (funeral pyre, pyre site [?]) SQ 17-19 C, D

The outline of the pit was revealed at the depth of 1.55 to 1.63 m, under a medieval layer – at that level it was damaged by streaks of ploughed soil from this period. In the first stage of exploration, two features were identified, 592A and 592B, which, following the removal of an animal burrow that intersected them, proved to be the remains of a single feature (592AB). Also present at this level were the N and S sections of the pit of inhumation grave 592C, in the top part of which there were finds including ceramic fragments, a burnt stone and small burnt bones forming a secondary deposit displaced from feature 592AB by burrowing animals (cf. description of grave 592C). The pit of feature 592AB was aligned E-W. It was close to oval-shaped, wider in the W section (1.30 m), narrower in the E section (0.75 m), and 3.00 m long (Pl. CI, CC:3). At the level of capture, burnt stones were discovered along the length of the pit. Filled with fine-grained, loose dark brown sand mixed with precipitations of yellow, undisturbed sand. This contained streaks of decomposed organics, including wood (oak), the remains of burnt material, many charcoals (unidentified, oak and ash tree). Scattered throughout the fill, there were fragments of various ceramic vessels (2–15), in the NE section a fragment of fossilised sponge (1). Some 0.20 m below, in the W section and 0.30 m below in the E part, at the bottom of the pit, the arrangement of the burnt stones was more regular, forming a kind of cobbled surface (Pl. CII). Also found at that length were small charcoals (unidentified), individual burnt bones and a ceramic fragment (3). The feature under discussion intersected grave 592C extending to the depth of ca. 0.35 m. Unidentified sex, adult.

Inventory (Pl. CIII): 1. Fragment of a fossilised sponge, probably from the Cretaceous, family *Craticularia*, genus *Laocoetis*³⁴. L: 3.7 cm, H: 2.7 cm. 2. Fragment of the rim of a ceramic vessel, light brown, with a rough surface. High temper content consisting of fine-grained granite. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 1.3 cm. 3. Fragment of the handle of a ceramic vessel, brick-red, rough external surface. High temper content consisting of mid-grained granite and crushed ceramics. Well-fired to produce

³⁴ Identified by Prof. Andrzej Pisera from the Institute of Paleobiology, Polish Academy of Sciences in Warsaw.

a hard and strong ceramic mass. Preserved H: 3.5 cm, W: 3.0 cm. 4–15. Twelve fragments from bodies of ceramic vessels, light brown, grey and dark brown, with rough external surfaces and carelessly smoothed internal surfaces. No. 10 is decorated with a double stripe of oblique scores. High temper content consisting of mid-grained granite and crushed ceramics. Well-fired to produce a hard and strong ceramic mass. Preserved H: 0.9 cm, 1.7 cm, 1.4 cm, 1.5 cm, 1.1 cm, 1.4 cm, 2.7 cm, 2.6 cm, 2.6 cm, 1.8 cm, 2.2 cm, 3.6 cm.

Dating: later than *stadium* IVB (see description of grave 592C).

Grave 592C (inhumation, destroyed) SQ 17-19 C, D

The pit of the grave was captured at the depth of 1.66 m in the N section and at 1.47 m in the S section, under a medieval layer. Feature 592AB was sunk into the central section. At the level of capture, the grave was additionally damaged by medieval ploughed streaks and animal burrows, containing the fill layer of feature 592AB. Finds at this level included fragments of vessels (5–11), a burnt stone and individual burnt bones and charcoals (ash), forming a secondary deposit displaced from feature 592AB (Pl. CI). Some 0.25 m below, in the N section of the pit, fragments of a calvaria were revealed. At this level, animal burrows were visible throughout the pit with the displaced fill layer from feature 592AB (Pl. CII). The full outline of the pit was revealed after exploring feature 592AB, at the depth of 2.00 to 2.12 m. The pit is aligned NNW-SSE, oval-shaped, sized 2.80×0.95 m and with a maximum depth of 0.80 m (Pl. CIV). Filled with compacted mid-grained sand, dark yellow mixed with grey. The equipment was in the N section, disturbed by the overlaying feature 592AB. In the NW section, crushed fragments of a skull, with a large fragment of a calvaria and individual teeth ca. 0.30 m S. A ceramic vessel (3), filled with soil and small charcoals (alder) was placed E of the skull, with a glass vessel (4) S of the ceramic vessel. Both vessels were placed in a layer of decomposed organics (not analysed), possibly the remains of an organic container. S of the calvaria, a bucket pendant was found (1), with another bucket pendant (2) in the S section of the grave pit. Woman, *adultus* (30–40 years old); burnt bones: unidentified sex, adult.

Inventory (Pl. CIII–CV, CCXI:5): 1. Bucket pendant made of tin bronze. The body of the pendant was made from thin tape, bearing the remains of tin solder left from silver, gold or gilt foil. Band suspension loop soldered in the inside part of the body. Type AII. Dm: 0.9 cm, H: 1.2 cm. 2. Bucket pendant made from a copper alloy. The body was made out of thin tape, bearing the remains of tin solder left from silver, gold

or gilt foil. Band suspension loop soldered in the inside part of the body. Type AII. Dm: 0.9 cm, H: 1.2 cm. 3. Reconstructed ceramic bowl, dark brown, with a smoothed surface. High temper content consisting of fine-grained crushed ceramics and granite. Medium-fired ceramic mass, crumbling and flaking. Type RW VIB. Rim Dm: 18.0 cm, body Dm: 19.7 cm, bottom Dm: 8.9 cm, H: 13.5 cm. 4. Glass drinking bowl. Rim flared out, with a thicker rounded edge, cylindrical body. The glass mass is wavy, light green, transparent, with many streaks and air bubbles. A massive, slightly concave bottom. Mould-blown. Type similar to Eggers 201. Rim Dm: 10.9 cm, bottom Dm: 5.2 cm, H: 7.3 cm, Vol: 430 ml. 5. Fragment of the rim of a ceramic vessel, light brown, with a rough surface. High temper content consisting of mid- and fine-grained granite. Well-fired to produce a hard and strong ceramic mass. Preserved H: 3.9 cm. 6. Fragment of the rim of a ceramic vessel, dark brown, with a lightly smoothed surface. High temper content consisting of fine-grained granite and mica. Medium-fired, producing a poorly fired ceramic mass, crumbling and flaking. Preserved H: 1.9 cm. 7–11. Five fragments from bodies of ceramic vessels, light brown and dark brown, with rough and carelessly smoothed surfaces. Well- and medium-fired. Preserved H: 2.9 cm, 2.9 cm, 2.6 cm, 2.9 cm, 3.1 cm.

Dating: *stadium* IVB.

Grave 593 (inhumation, destroyed) SQ 15-23 B, D

The bottom part of the grave pit became apparent at the depth of ca. 0.80 m. It was located within a large trench – presumably a sand pit exploited in the early twentieth century and filled and ploughed after World War II, which destroyed the NE section of the explored part of the cemetery (cf. Fig. 4). The pit is aligned NNW-SSE, irregular but close to oval-shaped, and sized 2.10×1.20 m, with a maximum depth of ca. 0.15 m (Pl. CV). At the level of capture, in the NW section, two burnt bones were found (not analysed), a secondary deposit. Filled with a layer of compacted copper-brown sand with a high content of clay and fine gravel (individual stones of up to ca. 0.10 m in diameter), largely turned into hardpan, and with some small charcoals (not analysed). At the bottom of the pit (ca. 0.03 to 0.10 m below the level of capture) there were small fragments of crushed bones in a non-anatomical arrangement (including calvaria bones and fragments of long bones), in the SW section of the grave a damaged needle (1). Woman, *adultus* (30–40 years old).

Inventory (Pl. CV): 1. Needle made from round copper alloy wire, eye forged and punched through. Bent in two places. Dąbrowska type II. L: 4.8 cm.

Dating: Roman Period.

Grave 594 (cremation-inhumation in a log coffin) SQ 17-19 A

The grave pit was located ca. 1.50 m below the level of cremation urn graves 217, 224, 225 and 226. The top was damaged by an archaeological trench made in 1992. The grave under discussion also intersected with the E part of inhumation grave 608. The pit was revealed at the depth of 2.10 to 2.15 m, at the level of capture it contained a coffin aligned NW-SE, with an oval-shaped outline and sized 2.70×1.20 m with a maximum depth of 0.30 m (Pl. CVI). Filled with dark yellow, mid-grained sand with gravel and precipitations of hardpan with clay content. At the bottom of the grave pit, a log coffin (oak) was placed, filled with slightly compacted mid-grained, dark yellow sand with inclusions of coarse-grained sand and hardpan with clay content. The log was 1.60 m long and irregularly shaped: narrower in the N section, with rectangular corners and the maximum width of 0.35 m, wider in the S section, with a width of 0.60 m (the S side has not yet been captured). Relative to the grave axis, the coffin was located in the E section of the pit. In the central section of the coffin, at the bottom, a compact cluster of burnt bones was discovered, with decomposed organic material around it (possibly the remains of an additional organic container in which the bones were laid in the grave); a small fragment of a ceramic vessel (5) was found beside it. The remaining equipment was located in the SE section of the coffin, next to two stones. Two brooches (1–2) were found in a concentration of decomposed organics (fabric [?]). Next to brooch (2), two fragments of mineralised thread were preserved (unidentified). Directly N of the brooches, a large fragment of a ceramic vessel (3) and a glass cup (4) were discovered (Pl. CCI:4). Outside the coffin, in the E section of the pit, a fragment of a femur was found with a stone placed next to it. Woman (?), adult; burnt bones: unidentified sex, adult.

Inventory (Pl. CVI–CVII, CCXII:3): 1. Crossbow brooch with a tendril foot made from a copper alloy. Evenly arched bow, die-forged, with a faceted cross-section. A metope ornament at the base of the bow and foot. Pin damaged. Type A.VI.161-162. L: 5.4 cm, W: 1.9 cm. 2. Crossbow brooch with a high catchplate made from a copper alloy. Bow forged, faceted, evenly arched, oval in cross-section. A small protrusion at the end of the head. Next to the brooch, two fragments of mineralised thread were preserved (unidentified). Group A.VII, series 2. L: 3.6 cm, W: 1.6 cm. 3. Reconstructed upper part of a ceramic pot, light brown, dark brown in places, with a highly roughened external surface and a carelessly smoothed internal surface. High temper content consisting of coarse-grained granite

and crushed ceramics. Well-fired to produce a hard and strong ceramic mass. Type RW IC. Rim Dm: 17.0 cm, body Dm: 20.8 cm. Preserved H: 13.1 cm. 4. Glass tulip-shaped cup with a slightly flared rim and a slightly thicker, rounded edge. Foot clearly accentuated, originally chipped on one side, with a rounded widest part. Underneath the rim, a decorative spiral thread along the circumference. Body decorated with two wavy lines forming a horizontal figure-of-eight motif. The glass mass is slightly greenish and transparent, with visible technological traces in the form of ellipsoid air bubbles, streaks and sand spots. Mould-blown, with threads applied hot in the finishing stage. Type Eggers 188c. Rim Dm: 6.4 cm, bottom Dm: 4.2 cm, H: 12.5 cm, Vol: 165 ml. 5. Fragment of the body of a ceramic vessel, dark brown, with a lightly smoothed surface. High temper content consisting of mid-grained mica. Medium-fired, producing a poorly fired ceramic mass, crumbling and flaking. Preserved H: 1.4 cm.

Dating: *stadium* IIIB.

Grave 595 (inhumation in a log coffin, disturbed) SQ 17-19 A, B

Poorly visible, damaged by an archaeological trench made in 1992, the outline of the grave pit became apparent at the depth of 1.90 m. The grave intersected the S section of inhumation grave 605. The pit was roughly rectangular with rounded edges in the N section, and oval-shaped in the S section, sized 2.80×0.90 (N) – 0.70 (S). Aligned N-S, slightly deflected to NNW-SSE. The maximum depth was 0.55–0.60 m (Pl. CVIII). The pit was filled with loose, fine-grained, light yellow sand with compacted coarse-grained sand turned into hardpan with lumps of clay. At the bottom of the pit (at the depth of 2.45 to 2.50 m), in its N section, the outline of a log coffin was captured in the form of decomposed wood pulp (wood not analysed), sized 1.25 m (preserved length) by 0.50 m (maximum width in the N section). The coffin contained the skeleton of a single individual, laid on the right side of the body with the head pointing N and the facial part of the cranium turned W, with arms bent at the elbows and placed on the chest (carpal bones missing) and slightly bent legs (foot bones not preserved). On the chest, two brooches were found: (1) one on its side, with its head pointing W, with a fabric fragment by the spring cover (unidentified) and (2) another one likewise on its side, with its head pointing E. The arrangement of the brooches indicates that they may have pinned together some fabric (shroud, cloak). In that location, a necklace consisting of 26 glass beads and two amber beads (5–32) was discovered, scattered in a chaotic arrangement. Some of the beads were found in sifted soil. A buckle (3) was found between the femurs.

The remaining equipment was in the S section of the pit, near the E edge: a spindle whorl (33), a miniature vessel (34) and a belt strap end (4) with a preserved fabric fragment (flax). Man, *maturus* (40–50 years old).

Inventory (Pl. CVII–CVIII, CCXII:4): 1. Silver spring-cover brooch, East series. Bow decorated with vertical lines with imitation filigree, between those an ornament of suspended triangles topped with eyelets, with pairs of eyelets punched above and below the crest. Crest decorated with horizontal lines with imitation incised wire, bowstring cover decorated with short oblique lines. On the cover, a fabric fragment was preserved (unidentified). High catchplate, mounted obliquely. Clear traces of die-forging at the bottom side of the bow. Iron spring bar. Type A.II.40-41. L: 3.7 cm, W: 3.5 cm, Wt: 14.50 g. 2. Crossbow brooch with a tendrill foot, made from a copper alloy. Bow evenly arched, with a semi-circular cross-section. Foot decorated in the middle section with transverse engraved lines. Decorative profiled knobs at the ends of the axis bar and on the head. Type A.VI.161-162. L: 7.5 cm, W: 2.5 cm. 3. Bipartite belt buckle with a plate, made from a copper alloy. D-shaped buckle frame, cast, with a forged and filed finish. Rectangular plate, forged, with two preserved rivets. Prong originally bent. Type ML D 17. Total L: 3.7 cm, plate W: 2.6 cm, plate L: 2.1 cm, frame W: 2.6 cm, frame L: 2.0 cm. 4. Massive brass belt strap end with a thicker oval mid-section and a long, slightly flared tongue, round in cross-section. A fan-shaped attachment with a rivet shank (head not preserved). At the attachment, a fabric fragment (flax). Type similar to Raddatz O15, ML type 2, form 6. L: 5.0 cm, attachment W: 2.3 cm. 5. Fragment of a barrel-shaped glass bead, red, matte, with a chequered ornament of black-yellow-white squares. Type similar to TM 366. Reconstructed Dm: 1.1 cm, H: 1.0 cm. 6. Barrel-shaped glass bead, matte, red. Type TM 12. Dm: 1.3 cm, H: 0.9 cm. 7. Barrel-shaped glass bead, matte, red, with black eyes circled in yellow. Type TM 223b. Dm: 1.1 cm, H: 0.9 cm. 8. Barrel-shaped glass bead, light green, matte. Type TM 8. Dm: 1.1 cm, H: 1.0 cm. 9–10. Two polyhedral glass beads, purple, transparent. Type TM 128. W: 0.6 cm each, H: 1.1 cm, 1.2 cm. 11. Crushed glass bead, yellowish, transparent. 12–29. Eighteen miniature beads made from glass paste, orange, matte. Type TM 53. Dm: 0.4–0.6 cm, H: 0.1–0.15 cm. 30. Miniature barrel-shaped bead made from glass paste, orange, matte. Type TM 26. Dm: 0.4 cm, H: 0.4 cm. 31. Amber bead, flat-convex, made with a lathe, dark honey-coloured, transparent. Type similar to TM 436. Dm: 2.2 cm, H: 1.2 cm, Wt: 2.91 g. 32. Amber bead, disc-shaped, made with a lathe, dark honey-coloured, transparent. Type TM 439. Dm: 1.9 cm, H: 1.0 cm, Wt: 2.03 g.

33. Biconical ceramic spindle whorl, dark brown, with concave ends. Dm: 4.2 cm, H: 1.8 cm. 34. Miniature ceramic vessel, dark brown, external surface carelessly smoothed, internal surface dark brown. High temper content consisting of fine-grained crushed ceramics, granite and mica. Well-fired to produce a hard and strong ceramic mass. Type RW XVIIIA. Rim Dm: 3.8 cm, bottom Dm: 2.6 cm, H: 4.6 cm.

Dating: *stadium* IIIB/IVA.

Grave 596 (cremation-inhumation) SQ 17-19 B, D

Feature discovered at the depth of 1.65 m. The grave pit is aligned N-S, close to oval-shaped, sized 2.50×0.8–1.10 m, with a maximum depth of 0.75 m (Pl. CIX). Filled with light yellow (dark yellow in places) fine-grained sand with hardpan streaks and numerous very small charcoals (not analysed) as well as individual stones, 0.10 to 0.15 m in diameter. Equipment items were found below the level of capture, scattered throughout the length of the pit, down to the depth of 0.45 m. Those included eight silver rivet heads in the central section of the grave (2–9) – from a belt attachment (?), a fragment of a bucket pendant (10), three miniature glass beads (11–13), two fragments of a vessel (17–18) and a crumbled piece of an object made from a copper alloy (16). Some of those items were found by sifting the grave fill. Close to the W edge of the pit, a miniature spoon (15) was found, and 0.80 m S of the spoon, a ring with beaded hazelnut shells (14.14a–b). Several burnt bones (fragments of a skull and a tooth) were discovered in the fill. In the SW section, at the bottom of the pit, ca. 0.70 m below the level of capture, a belt strap end (1) was found with leather preserved inside the fitting, adhering to a femur fragment. Close to the fitting (1), a wood fragment (alder). Unidentified sex, adult; burnt bones: Woman (?), adult.

Inventory (Pl. CIX, CCXII:5): 1. A massive belt strap end made from tin-lead bronze with a brass rivet on the attachment. Shank cast, modelled by forging. The attachment is roughly fan-shaped, ending in a triangular shape, with two thicker conical sections at the base. The tongue is decorated in the upper section with an oval, doubly profiled protuberance. The tongue is round in cross-section. In the attachment, a fragment of mineralised leather was preserved (not analysed). Type similar to Raddatz O16, ML type similar to 2, form 6. L: 5.8 cm, maximum attachment W: 2.2 cm. 2–9. Eight round silver rivet heads (decorative belt appliqué or fittings), made from a thin metal sheet formed with a die. In two of those (nr 7–8), preserved traces of tin solder used to mount the shanks. Dm: 0.7–0.8 cm, H: 0.3–0.4 cm, Wt: 0.10 g, 0.12 g, 0.10 g, 0.11 g, 0.12 g, 0.09 g, 0.11 g, 0.07 g. 10. Fragment of the cylinder of a silver bucket pendant

made from forged profiled metal sheet. Dm: 0.7 cm, preserved H: 0.6 cm, Wt: 0.17 g. 11–13. Three miniature glass beads, black, matte. Type TM 55. Dm: 0.5 cm each, H: 0.2 cm each. 14. 14a–b. Silver ring made from round wire, with a second wire wrapped around it in a spiral on both sides, forming two spiral eyes in the middle. On the ring, a hazelnut shell is suspended (common hazel – 14b). Another shell (common hazel) fractured (14a), likewise drilled through, was found right next to the ring under discussion. Type Beckmann 22d. Dm: 2.6 cm, combined Wt including shell: 3.02 g, shell H: 1.0 cm and 0.8 cm. 15. Miniature spoon made of tin bronze with a small admixture of lead, with a suspension loop for hanging. Cast shank with a forged finish. End hammered into a bowl-like shape. L: 6.4 cm. 16. Non-distinctive fragment of an object made from a copper alloy. Preserved W: 0.4 cm. 17–18. Two fragments of bodies of ceramic vessels, dark brown and light brown, with a rough surface. Low temper content consisting of mid-grained granite. Medium-fired, producing a poorly fired ceramic mass, crumbling and flaking. Preserved H: 1.8 cm, 1.4 cm.

Dating: *stadium* V.

Grave 597 (inhumation, destroyed) SQ 17-19 B, D; 17-20 A, C

Feature revealed at the depth of 1.94 m, ca. 1.20 m below the level at which inhumation grave 280 was captured and explored in 1994. The grave pit is aligned N-S, roughly rectangular with rounded corners, sized 1.90×0.90 m, with a maximum depth of 0.55 m (Pl. CX). Filled with loose, fine-grained, light yellow sand, greyish in places (remains of decomposed organic matter [?]), with precipitated hardpan streaks. Equipment found ca. 0.10–0.15 m below the level of capture, scattered in the S section of the pit: two fragments of an object made from a copper alloy (1–1a), fragment of the internal lining of a comb (2) and the rim of a ceramic vessel (3). Among those, three teeth and broken fragments of the shanks of long bones. The original position of the body could not be established. Unidentified sex, adult.

Inventory (Pl. CX): 1–1a. Damaged, round metal sheet made from a copper alloy and a fragment of another piece of metal sheet, bent into an arch. Probably the remains of a bucket pendant or a capsule pendant. Dm: 1.5 cm, preserved metal sheet H: 0.5 cm. 2. Fragment of the internal lining of a three-layer comb made of bone (antler [?]) with a preserved rivet hole. Type Thomas I (?). Preserved W: 0.6 cm. 3. Fragment of the rim of a ceramic vessel, bowl-shaped (?), thin-walled, black, with a smoothed surface. High temper content consisting of fine-grained mica. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 1.6 cm.

Dating: earlier than *stadium* IVA (see description of grave 280³⁵).

Grave 598 (inhumation, destroyed) SQ 17-20 A, C

The grave pit was discovered at the depth of 1.95 m, ca. 1.20 m below the level of capture of inhumation grave 279 explored in 1994. Aligned N-S, slightly deflected to NNW-SSE, roughly rectangular with rounded edges, sized 1.80×0.70 m and with a maximum depth of 0.40 m (Pl. CX). Filled with loose, fine-grained, light yellow sand with some small charcoals (not analysed) and a single larger charcoal (alder) and with precipitated hardpan streaks. In the S section of the pit, ca. 0.15 m below the level of capture, a vessel fragment was discovered. No bones were preserved.

Inventory (Pl. CX): 1. Fragment of the body of a ceramic vessel, thick-walled, brown, with a roughened external surface. High temper content consisting of mid-grained granite. Medium-fired, producing a poorly fired ceramic mass, crumbling and flaking. Preserved H: 3.2 cm.

Dating: Roman Period.

Feature 599 (secondary trench into grave 600) SQ 17-19 C

At the depth of 2.00 m, in the central section of inhumation grave 600, an oval feature was observed sized 1.60×1.30 (Pl. CXI, CCI:3) and with a maximum depth of ca. 0.40 m. Filled with compacted coarse-grained sand turned into hardpan, mixed with fine gravel and clay concretions. At the level of capture, a burnt bone (not analysed), small charcoals (unidentified) and fragments of a ceramic vessel and daub (1–2) were discovered. From ca. 0.10 to 0.35 m below the level of capture, there were bones scattered along the W side of the remains of the coffin (wood not analysed) in a non-anatomical arrangement (lower jaw, fragments of the long bones from the upper limbs, ribs, pelvic bones) from the individual buried in grave 600. Man, *adultus* (30–35 years old), body height 167–170 cm.

Inventory (Pl. CXII): 1. Fragment of the body of a thin-walled ceramic vessel, dark brown, with a carefully smoothed surface. High temper content consisting of fine mica grains. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 1.3 cm. 2. Fragment of daub. Preserved H: 3.0 cm.

Dating: *stadium* IVB or later (see description of grave 600).

Grave 600 (inhumation in a log coffin, opened) SQ 17-19 A, C

Grave pit revealed at the depth of 2.00 m, aligned N-S, close to oval-shaped in the N section and roughly

³⁵ M. Natuniewicz-Sekuła, J. Okulicz-Kozaryn 2011, 81–82.

rectangular with rounded edges in the S section, ca. 3.70 m long, 0.90 m wide in the N section and 1.05 m wide in the S section, with a maximum depth of 0.65 m (Pl. CXI). At this level, individual charcoals were found in the S section (not analysed). The grave was filled with loose, fine-grained, dark yellow sand, compacted in places and with a high clay content, as well as many precipitated hardpan streaks. In the central section of the pit, a secondary trench was found (see the description of feature 599). When explored, bones and equipment items were found at the bottom of the pit, ca. 0.40 m below the level at which the feature was captured: in the N section, fragments of a calvaria and a clavicle bone, beside those a glass vessel (4), ca. 0.10 m S of which there was a wooden bucket (yew) with metal hoops (Pl. CCI:1–2); the two bottom hoops were broken and came loose from the bucket staves (5.5a–c). The bucket was originally placed on a platform or a split board (oak). A piece of fabric (flax) was found preserved on the bottom hoop, and another one (not analysed) next to a stave fragment (5d). The bucket may have been covered with some fabric, some of which was also inside the bucket. In the S section of the grave, a clear outline of a coffin was captured, sized 1.20×0.40 m. The coffin was filled with compacted coarse-grained sand largely turned into hardpan. In the coffin, there were lower limb bones and left foot bones in an anatomical arrangement, and ca. 0.20 m S of those, a comb (3) was placed. The remaining equipment, including a belt attachment (1) and an amber bead (2) was discovered right under the bottom of the secondary trench (feature 599) in the central section of the pit. To the side of the coffin there was a stone, probably used to stabilise it, with two smaller stones found under the coffin. The preserved anatomical arrangement of the bones indicates that the individual was placed with straight legs and the head pointing N. Man, *adultus* (30–35 years old), body height 167–170 cm.

Inventory (Pl. CXII–CXVI, CCXIII:1): 1. Belt strap end made of tin-lead bronze, made out of thin metal sheet. The sides are slightly concave at $\frac{1}{3}$ of the length. Part of the attachment up to the mounting of two rivets was made from a separate metal sheet, with remains of tin solder on the inside. Type Raddatz JIV1, ML type 9, form 3. L: 6.0 cm, attachment W: 2.2 cm. 2. Cylindrical amber bead made with a lathe, dark honey-coloured, transparent. Type similar to TM 440. Dm: 2.6 cm, H: 3.1 cm, Wt: 8.01 g. 3. Three-layer comb made from bone (antler [?]), richly decorated, with a triangular handle. Type Thomas II, decorative motif C. W: 15.0 cm, H: 7.9 cm. 4. Glass drinking bowl, asymmetrical. A slightly flared rim with a thicker rounded edge, low bowl-like body. Under the rim, three rows of hot glass thread had been applied along

the circumference. Thick, concave bottom. Wavy glass mass, colourless, slightly yellowish, transparent, with many air bubbles and streaks. Mould-blown. Type similar to Eggers 213. Rim Dm: 10.3 cm, bottom Dm: 5.0 cm, maximum H: 6.6 cm, Vol: 280 ml. 5. Reconstructed wooden bucket (yew) with three hoops and a handle made from tin bronze. *In situ*, the vessel consisted of ten decomposed yew staves connected with tongue and groove joints and a bottom set into a groove (not preserved). Traces of the wood from the staves survived close to the upper hoop and the decorated attachment plates. The two bottom hoops were made from plain smooth metal bands with overlapping ends, originally connected with two rivets, as suggested by hoop holes. On the bottom hoop, a small fragment of mineralised fabric (flax). The top hoop is richly decorated with an embossed ornament: the middle hoop has a row of punched motifs (fish or bird [?]), the hoops above and below have rows of dots. The decorated attachment plates of the handle were made from a thick metal sheet, roughly trapezoid, topped with a round prominence. Attached to the staves with four rivets and decorated with two rows of embossed fish or bird motifs (?) with dots. The bucket handle is shaped like a flat band with tapered ends and a rectangular cross-section, ending in a knob. Decorated with engraved letter-of-X motifs separated by vertical lines. On the inside, the connection is masked by a round washer. Bucket type: form 1b, decorated attachment plate similar to type IIIA, handle type: similar to form C according to A. Becker. Rim Dm: 20.0 cm, bottom Dm: 20.6 cm, bucket H: 19.8 cm, H including handle: 30.0 cm, hoops W (from the top): 3.0 cm, 3.2 cm, 3.4 cm. 5a–c. Two fragments of rivet shanks bent at a right angle (one preserved with some wood) and a semi-circular rivet head made from a copper alloy. Rivet L: 1.2 cm, 1.0 cm, head Dm: 0.8 cm. 5d. Fragment of a wooden staff (yew) with a preserved scrap of mineralised fabric (not analysed) with a canvas weave.

Dating: *stadium* IVB.

Grave 601 (inhumation, disturbed) SQ 17-19 B, D

The poorly visible outline of the pit was revealed at the depth of 2.35–2.40 m. Also revealed at this level were the remains of an archaeological dig from 1992 in the form of two separate trenches sunk into the pit to the depth of ca. 0.10–0.15 m (Pl. CXVII). In the trench located in the central-E section of the pit, a stone sized 0.60×0.25 m was found. A clear outline of the pit was captured at the depth of 2.56 m. Aligned N-S, slightly deflected to NNW-SSE, close to oval-shaped, sized 2.80×0.85 m in the N section and 0.55 m in the S section, with a maximum thickness of 0.30–0.35 m (Pl. CXVII).

Filled with loose, fine-grained, light yellow sand with numerous small charcoals (not analysed) and precipitations of compacted hardpan. Some 0.30 m below, at the bottom of the pit, bones and equipment items were found. Fragments of a calvaria and teeth were located in the S section of the pit, S of those: a spindle whorl (6) and a pin (5). Directly N of the skull, two brooches (1–2) facing NE. In the central section of the pit, at the level of the unpreserved pelvis, a belt strap end (4) with the attachment pointing S, and 0.10 m further N – a buckle (3). The arrangement of the skeletal remains and items indicates that the individual was placed on the right side of the body with the head pointing S. Woman, *adultus* (30–35 years old).

Inventory (Pl. CXVIII): 1–2. Two almost identical spring-cover brooches, East series, made from a copper alloy. Spring covers decorated with vertical engraved lines. Bows cast, with a die-forged finish. On the bows, a decoration in the form of three vertical lines and one horizontal line (above the crest), incised transversally (imitation pearled wire), between those engraved triangles topped with punched dots. Relatively wide and prominent crests, decorated with a line with transverse incisions. Foot terminals decorated with a horizontal engraved line. Iron spring axes. Type A.II.40–41. L: 3.8 cm, 4.0 cm. W: 3.2 cm each. 3. Forged iron bipartite buckle with a rectangular buckle frame. Prong broken off. Type similar to ML G 46. L: 2.9 cm, W: 4.3 cm. 4. Forged iron belt strap end terminating in a ring, with a small hole and a damaged prominence. Type similar to Raddatz JII3, ML type 6, form 1. L: 10.8 cm, ring Dm: 1.6 cm. 5. Pin made from a copper alloy with a round head clearly differentiated from the shank (made from a forged sheet of metal), with a central hole. Shank bent in the middle, end broken off. Type Beckmann 133. Preserved L: 7.0 cm, head Dm: 0.9 cm. 6. Ceramic spindle whorl, dark brown, biconical, with slightly concave ends. Dm: 3.8 cm, H: 2.3 cm.

Dating: *stadium* IIIA.

Grave 602 (inhumation in a log coffin, destroyed) SQ 17-19 B

The outline of the central section of the pit was captured at the depth of 1.79 m. Clearly visible within it, there were streaks of decomposed wood (not analysed) remaining from the coffin. The N and S sections of the pit were destroyed by an archaeological trench made in 1992, sunk into the feature down to the depth of 0.05 m in the N section and 0.25 m in the S section. The complete outline of the grave's bottom was discovered at the depth of 1.85 to 2.18 m. The irregularly shaped pit is aligned NNW-SSE, tapering to an oval end in the N section, roughly rectangular with rounded edges

in the S section. The dimensions were 2.30×0.80 m, and the total depth of the pit below the level of capture ranged from 0.10 to 0.15 m (Pl. CXIX, CCII:4). Filled with loose, fine-grained light yellow sand with hardpan streaks. At this level, the edges of the coffin were discovered in the form of streaks of decomposed wood (not analysed). The coffin was filled with light yellow sand mixed with grey remains of decomposed wood. The coffin was roughly rectangular with rounded edges, sized 2.00×0.50 m. No bones were preserved.

Inventory: none.

Dating: Roman Period.

Grave 603 (inhumation, destroyed) SQ 17-20 A

The outline of the pit was captured at the depth of 1.79 m, ca. 1.00 below the level at which inhumation grave 252 was revealed, explored in 1992. The top of the pit was destroyed as part of an earlier dig. Some 0.10–0.25 m below, the pit, sized 1.90×0.80 m and with a maximum thickness ranging from ca. 0.10 to 0.15 m, took on a roughly oval shape aligned NNW-SSE (Pl. CXIX, CCII:4). It was filled with loose, fine-grained light yellow and grey sand. Some very small charcoals were noted (not analysed) as well as precipitated and compacted hardpan streaks. At this level, equipment items were found clustered along the E edge of the pit: in the NE section, the remains of a comb (6) and a glass bead (1) and an amber bead (5) were discovered. S of those there was an amber bead (4) and two glass beads (2–3). No bones were preserved.

Inventory (Pl. CXIX): 1. Barrel-shaped glass bead, dark blue, transparent, with dark blue eyes circled in white. Type similar to TM 225a. Dm: 1.3 cm, H: 1.0 cm. 2. Crushed glass bead, light blue, transparent. 3. Lenticular glass bead, dark purple, transparent. Type similar to TM 88. W: 1.1 cm, H: 1.0 cm. 4–5. Two amber beads, disc-shaped, slightly asymmetrical, hand-cut, dark honey-coloured, transparent. Type TM 389. Dm: 2.1 cm, 1.8 cm, H: 0.7 cm, 0.6 cm, Wt: 1.69 g, 0.85 g. 6. Fragments of the lining of a three-layer comb made of bone (antler [?]) with rivets made from a copper alloy, one rivet fragment found separately. An arched handle preserved *in situ*. Type Thomas I. Preserved lining H: 1.3 cm, 1.2 cm, 1.2 cm, preserved rivet L: 0.4 cm.

Dating: earlier than *stadium* IIIB (see description of grave 252³⁶).

Grave 604 (inhumation, disturbed and partially destroyed) SQ 16-20 C, 17-20 A

The grave pit became apparent at the depth of 1.97 m. Disturbed in the N section and completely destroyed in the S section by an archaeological trench made in 1992.

³⁶ M. Natuniewicz-Sekuła, J. Okulicz-Kozaryn 2011, 74–75.

Also, the grave intersected the W edge of inhumation grave 606. Some 0.17 m below the level of capture the pit had a regular, roughly rectangular shape with rounded corners in the N section. The pit is aligned N-S, slightly deflected to NNW-SSE. The preserved dimensions were 1.80×0.70 m, with a maximum depth of 0.20 m (Pl. CXX). Filled with loose, fine-grained light yellow sand with hardpan streaks. Also noted in the layer were some greyish discolourations remaining from decomposed organics. At this level, some bones and grave equipment were found undisturbed in the N section of the grave. In the NW section of the pit, a cluster of teeth from the lower jaw was found. Just S of those there was a necklace made up of 21 glass beads (4–24) along with a certain number of completely crushed glass beads (25). E of the necklace, two brooches were found lying on their sides (1–2), with the heads turned upwards, along with a fabric fragment (unidentified) beside (1). Close to the W edge of the pit, a buckle (3), with its frame turned S. The arrangement of the equipment items indicates that the individual was placed on her right side with bent legs and with the head pointing N. Woman, *adultus/maturus* (30–40 years old).

Inventory (Pl. CXX): 1–2. Two almost identical crest-headed brooches made from a copper alloy. Cast bows with a die-forged finish. Item no. 1 has a damaged bow-string and a fabric fragment (unidentified) preserved close to the spring. Iron spring axes. Type A.V.124. L: 3.2 cm, 3.0 cm, W: 2.5 cm each. 3. Unipartite iron buckle with a semi-circular frame, rectangular in cross-section. Type ML D 11. L: 2.9 cm, W: 2.2 cm. 4–12. Nine miniature glass beads, black, matte. Type TM 55. Dm: 0.3–0.5 cm. H: 0.2–0.4 cm. 13–22. Ten barrel-shaped glass beads, dark purple, transparent. Type TM 19. Dm: 0.4–0.5 cm, H: 0.4–0.5 cm. 23–24. Two glass beads, colourless, transparent, with metal foil. Type TM 387a. Dm: 0.5 cm, 0.4 cm, H: 0.6 cm, 0.4 cm. 25. About a dozen fragments of completely crushed glass beads, colourless, transparent, with metal foil.

Dating: *stadium* IIC.

Grave 605 (inhumation with a partially burnt wooden structure, disturbed) **SQ 16-19 C, 17- 19 A**

The outline of the grave, aligned NNW-SSE, was captured at the depth of ca. 2.35 m. The top of the pit was damaged by an archaeological trench made in 1992, the S section damaged by inhumation grave 595. Along the E edge, a clear oblong streak of partially burnt wood was discovered (split boards [?]). S of that, another fragment of partially burnt wood, roughly triangular and sunk into the pit by ca. 0.20 m. Probably the trace of a stake marking the location of the burial. The burnt layer contained large charcoals (alder). Additionally

in the S section of the pit, a tibia and broken fragments of a long bone shank were revealed, probably from the skeleton located at the bottom of the pit. At this level the pit had a roughly oval shape and preserved dimensions of length 2.45 m, width 1.00 m. Some 0.35 m below, the preserved part of the pit was sized 2.55×1.1 m, with a maximum depth of ca. 0.40 m (Pl. CXXI, CCII:1–3). At this level, the remains of a skeleton and equipment were found. The grave was filled with compacted coarse-grained dark copper-coloured sand with gravel and a high clay content. In the W section of the pit, there were still visible traces of burnt wood, which suggests that the E side of the pit had been lined with a wooden structure that was later partially burnt inside the pit. The individual was placed on the right side of the body, with the head pointing N and the facial cranium turned W. The right arm was bent in the elbow, the left arm was straight (the carpal bones of both hands were missing). The arrangement of the femurs indicates that the legs were slightly bent, and the lack of tibiae, fibulae or foot bones is probably due to the fact that they were removed when the pit of grave 595 was made. In the N section of the pit, a cluster of iron nails was found (66–68) with adhering wood fragments (hornbeam). Those were possibly elements of a casket or some other wooden item. N of the skull there was a layer of decomposed organics, within which a wood fragment (oak) was identified with preserved traces of gold (69–69a). Those are probably the remains of a container, supported on the W side by a small stone. Given the poor state of preservation, the item could not be reconstructed. Within it, two perfectly preserved metal utensils were found: a strainer (65) nested within a ladle (64). Inside the strainer there was a wooden (poplar) hoop (70). E of the utensils, there was a needle (62), and W of the items, a hooked pin (63) was found in a layer of decomposed wood (oak). Under the lower jaw, a pear-shaped pendant was found (9–9a), and, right next to it, three miniature glass beads (20–22) and an S-shaped clasp. On the clavicles, two brooches: one (1) with the bow turned upwards and its head pointing NE, the other (2) on its side with its head pointing W. A third brooch (3) was located at the level of the upper ribs, with its bow turned upward and its head pointing SW. S of that, on the chest, there was an elaborate necklace made up of 13 glass beads (10–19.23–25) and 36 amber beads (26–61). The central element of that necklace was an enamelled shield brooch (4). At the level of the pelvis there was a buckle (5), and E of that, a belt attachment (7). The belt strap end (6) was under the left femur. Woman, *adultus* (25–35 years old).

Inventory (Pl. CXXII–CXXVIII, CCXIII:2): 1–2. Two almost identical brooches with prominent crests and

spring cylinders. The bows were made from brass (item no. 2 was analysed), cast, with a forged finish. The cylinders, springs and the spring axes, and the pin (the pin of brooch (1) is not preserved) were forged from iron. Both items were completely covered in silver gilt foil with embossed geometric motifs (short vertical lines and semicircles) and filigree (pearled, braided and wavy motifs). Tin solder was used to affix the foil to the bow. The two specimens were preserved with fabric fragments (unidentified). On the spring of brooch (1), a fragment of a textile tape (unidentified) made on a tablet loom. Type A.II.43. L: 3.7 cm, 3.5 cm, W: 3.2 cm, 3.3 cm, Wt: 16.60 g, 20.17 g. 3. Silver knee-shaped brooch. Cast bow with a die-forged finish, triangular in profile, ending in a knob, decorated at the edge with short vertical lines. On the head, a decorative profiled knob. Semi-circular decorative knobs mounted on the spring ends. Group A.V, series 9. L: 3.6 cm, W: 2.6 cm, Wt: 7.71 g. 4. Brooch made of tin-lead bronze, round with a central opening. The external edge is decorated with notches, with eight small, regularly spaced projections. The remaining surface is filled with a stripe of alternating fields of red and yellow enamel. In the opening, a cross of notched wire, with a profiled knob in the centre, riveted at the bottom side. A hinged construction of the pin. Close to group III.48 according to K. Exner. Dimensions: 3.3×3.2 cm, knob H: 1.0 cm, total H: 2.2 cm. 5. Bipartite buckle with a rectangular buckle frame and a plate made of tin bronze. The frame and the prong are cast, with a die-forged finish, with a trapezoid profile, decorated with a metope motif. The plate is decorated at the edges with engraved lines, contains the remains of mineralised leather (not analysed). The frame axis bar ending in semi-circular knobs. Type ML G 16. Total L: 3.6 cm, plate W: 2.8 cm, frame W: 2.8 cm. 6. Belt strap end made of tin bronze, ending in a round terminal. The shank is cast, with a forged finish. Type similar to Raddatz JIII1, ML type 5, similar to form 1. L: 7.3 cm, ring Dm: 1.7 cm, attachment W: 1.9 cm. 7. Belt mount made from a copper alloy, made in the form of a belt loop from a piece of bent sheet metal, whose ends are riveted to a rectangular attachment made from two separate metal sheets. L: 2.5 cm, band W: 0.7 cm. 8. Silver S-shaped clasp made from smooth round wire. At the ends, small profiled knobs decorated with incisions. In the mid-section, an incised, profiled prominence. Type von Müller C, Patalan variant C5b. L: 1.9 cm, Wt: 1.60 g. 9–9a. Gold pear-shaped pendant embossed with a repoussé technique, hollow inside, cylindrical neck decorated with filigree and granulation, soldered suspension loop wrapped in a spring made from smooth wire. The upper part of the pendant decorated with filigree in

the form of herringbone wire; the lower part is decorated with filigree festoons (smooth and herringbone wire), edged with granules; between the festoons, soldered rings with granulation clusters. At the bottom decorated with two wires shaped like springs. The end is topped with a composition of large and small granules. The item shows signs of wear, with ornamentation worn down in places. H: 4.4 cm, maximum W: 1.8 cm, Wt: 8.22 g. 10. Biconical glass bead, light green, transparent; oblique glass structure with numerous air bubbles. Type similar to TM 65. Dm: 3.3 cm, H: 2.9 cm. 11–12. Two barrel-shaped glass beads, red, matte. Type TM 12. Dm: 1.9 cm, 1.7 cm, H: 1.5 cm, 1.3 cm. 13. Glass bead with a flattened spherical shape, dark blue, transparent. Type TM 30a. Dm: 1.2 cm, H: 0.6 cm. 14. Barrel-shaped glass bead, light blue, matte. Type TM 2b. Dm: 0.8 cm, H: 0.7 cm. 15–16. Two flattened-spherical, slightly asymmetrical glass beads, black, matte. Type TM 40. Dm: 1.5 cm, 1.3 cm, H: 0.8 cm, 1.0 cm. 17. Barrel-shaped glass bead, black, matte, impressions from crumbled eyes. Type similar to TM 224. Dm: 1.2 cm, H: 0.9 cm. 18. Barrel-shaped glass bead, matte, red, with impressions from crumbled eyes with particles of yellowish, matte glass. Type similar to TM 223. Dm: 1.3 cm. H: 1.0 cm. 19. Damaged, barrel-shaped glass bead, matte, red, with impressions from crumbled eyes with particles of white matt glass. Type similar to TM 223. Dm: 1.1 cm, H: 0.8 cm. 20–22. Three miniature beads made from glass paste, orange-coloured, matte. Type TM 53. Dm: 0.4–0.5 cm, H: 0.15 cm. 23–24. Fragments two completely crushed glass beads, yellowish, transparent. Measured *in situ* Dm: 3.0 cm each. 25. Completely crushed glass bead, light blue, matte. 26. Amber bead, barrel-shaped, hand-cut, dark honey-coloured, transparent. Type TM 394. Dm: 0.8 cm, H: 0.9 cm, Wt: 0.40 g. 27. Amber bead, biconical, hand-cut, dark honey-coloured, transparent. Type TM 395a. Dm: 1.2 cm. H: 0.9 cm, Wt: 0.76 g. 28–49. Twenty-two amber beads, asymmetrical, roughly disc-shaped and barrel-shaped, finished with a lathe (visible preserved traces of turning). Dark honey-coloured, transparent. Types similar to TM 430 and 431. Dm: 1.2 cm, 1.4 cm, 1.2 cm, 1.3 cm, 1.1 cm, 1.2 cm, 1.4 cm, 1.3 cm, 1.4 cm, 1.0 cm, 1.3 cm, 1.4 cm, 1.6 cm, 1.3 cm, 2.0 cm, 1.8 cm, 1.8 cm, 1.6 cm, 1.5 cm, 1.7 cm, 1.7 cm, 1.4 cm, H: 0.8 cm, 1.0 cm, 0.8 cm, 0.8 cm, 0.9 cm, 0.8 cm, 0.8 cm, 0.6 cm, 0.6 cm, 0.6 cm, 0.7 cm, 0.7 cm, 0.6 cm, 0.8 cm, 1.0 cm, 1.0 cm, 0.8 cm, 0.9 cm, 1.2 cm, 1.1 cm, 1.3 cm, 1.0 cm, Wt: 0.76 g, 1.31 g, 0.75 g, 0.80 g, 0.74 g, 0.80 g, 0.84 g, 0.56 g, 0.57 g, 0.33 g, 0.54 g, 0.59 g, 0.88 g, 0.70 g, 2.42 g, 1.92 g, 1.38 g, 1.27 g, 1.48 g, 1.61 g, 1.95 g, 1.06 g. 50. Barrel-shaped amber bead made with a lathe, dark honey-coloured, transparent. At the end visible traces of

a failed attempt to drill a hole. Type TM 432. Dm: 3.6 cm, H: 2.4 cm, Wt: 19.66 g. 51–57. Seven amber beads, disc-shaped, made with a lathe, dark honey-coloured, transparent. Items nos. 53 and 54 bear visible traces of a failed attempt to drill a hole. Type TM 439. Dm: 3.2 cm, 3.2 cm, 3.1 cm, 3.0 cm, 3.0 cm, 2.6 cm, 2.3 cm, H: 1.3 cm, 1.4 cm, 1.3 cm, 1.4 cm, 1.4 cm, 1.2 cm, 1.1 cm, Wt: 8.81 g, 8.58 g, 7.75 g, 7.39 g, 7.56 g, 4.51 g, 3.80 g. 58–61. Four amber beads, cylindrical, made with a lathe, dark honey-coloured, transparent. Items 58, 59, 60 bear visible traces of a failed attempt to drill a hole. Type similar to TM 440. Dm: 2.8 cm, 2.9 cm, 2.3 cm, 2.2 cm, H: 2.1 cm, 1.9 cm, 1.3 cm, 1.5 cm, Wt: 8.87 g, 7.61 g, 3.78 g, 4.24 g. 62. Needle made from a copper alloy, preserved in two fragments. Made of round wire. Eye and end broken off. Preserved L: 3.3 cm. 63. Hooked pin with a twisted shank, made from a copper alloy. Preserved in three fragments. Hook and end broken off. Preserved L: 3.1 cm. 64. Ladle made from a copper alloy. Handle made from a flat metal sheet, profiled in mid-section with two protrusions and a flared fan-like end. Spun bowl. At the bottom, an ornament in the form of four circular lines engraved on a lathe, similar engraved lines under the rim. Type Eggers 161. Total L: 24.6 cm, bowl H: 5.6 cm, bowl sides Thk: 0.1–0.15 cm, handle Thk: 0.2 cm. 65. Strainer made from a copper alloy. Handle made from a flat metal sheet, profiled in mid-section with two protrusions and a flared fan-like end. Spun bowl and embossed. Bottom perforated with holes with ca. 0.1 cm in diameter forming a rosette pattern, bowl similarly perforated in horizontal and oblique patterns. Type Eggers 161. Total L: 24.5 cm, bowl H: 4.7 cm, bowl sides Thk: 0.1–0.15 cm, handle Thk: 0.2 cm. 66. Iron nail, round-headed, with mineralised wood on the shank (hornbeam). Element of a casket or some other item. Total L: 2.9 cm, head Dm: 1.0 cm. 67. Iron nail with a rectangular head and mineralised wood on the shank (hornbeam). Element of a casket or other wooden item. Total L: 3.6 cm, head dimensions: 1.1×1.2 cm. 68. Head of an iron fitting with a preserved hole for a bolt or shank at the bottom. Remains of mineralised wood (hornbeam) at the bottom. Element of a casket or some other item. W: 2.2 cm, L: 1.5 cm. 69–69a. Wood fragment (oak) from the side of a casket (?) with preserved remains of gold (gilding [?]). Preserved fragment L: 1.3 cm, W: 0.9 cm. Dimensions measured *in situ*: maximum L: 4.8 cm, maximum W: 2.4 cm. 70. Wooden hoop (poplar) cut and turned from a thick log with very wide growth rings. External Dm: 6.5×5.7 cm, internal Dm: 4.5×5.0 cm, Thk: 0.6–1.0 cm, W: 2.5–2.7 cm. **Dating:** *stadium* IIIA/IIIB.

Grave 606 (inhumation, disturbed and partially destroyed) SQ 16-20 C, 17-20 A

The outline of the bottom section of the grave pit became apparent at the depth of 2.17 m. It was disturbed by an archaeological trench made in 1992, and, at the W edge, by inhumation grave 604, and at the S edge, by inhumation grave 609. In the undisturbed N and E sections close to oval-shaped, aligned NNW-SSE, sized 1.30×0.60 in the S section to 0.80 m in the N section, with a maximum depth of 0.10 m (Pl. CXXVIII). Filled with loose, fine-grained light yellow sand mixed with precipitated hardpan streaks. The layer also contained greyish discolourations remaining from decomposed organics as well as individual charcoals (pine). In the E section of the pit, a compact cluster of large charcoals (linden) was discovered, probably the remains of a burnt wooden container (?). In the central section of the pit, closer to the W edge, there were the remains of a skeleton and grave equipment in an undisturbed arrangement: a fragment of the lower jaw including teeth, with an S-shaped clasp underneath (4), and E of that there were two brooches: one (1) with its bow pointing upward and its head pointing S, the other (2) placed on the right side with its head pointing N. Both had fabric and string remains preserved on the springs (unidentified). A third brooch (3), directly SW of the other two, was placed on the left side of the body with its head pointing upward. Around those items, a necklace was found consisting of 13 glass beads (5–17), as well as an unknown number of completely crushed beads (18). The arrangement of the items and the preserved bones indicates that the individual was placed on the right side of the body with the head pointing N. Unidentified sex, *infans* I.

Inventory (Pl. CXXVIII): 1–2. Two almost identical brooches with crested heads made from brass (item no. 1 was analysed). On the crests, preserved small remains of embossed silver foil affixed with tin solder. The bows were cast and finished by forging. On the bows, a tin-silver coating. Iron spring axis bars. The springs of both items contained preserved fragments of string and fabric (unidentified). Type similar to A.V.126. L: 3.3 cm, 3.2 cm, W: 2.8 cm, 3.0 cm. 3. Crest-headed brooch made from a copper alloy. Crest decorated with horizontal engraved lines, cast bow with a forged finish. Type similar to A.V.126. L: 2.7 cm, W: 2.1 cm. 4. Silver S-shaped clasp made from smooth round wire. At the ends, small profiled knobs decorated at the base with a ring made from smooth wire. A thicker, ring-like forged mid-section. Type von Müller D, Patalan variant C5b. L: 1.4 cm. 5–7. Three glass miniature beads, red, matte. Type similar to TM 54. Dm: 0.4–0.5 cm, H: 0.3–0.4 cm. 8–9. Two miniature glass beads, dark

green, transparent. Type similar to TM 49. Dm: 0.4 cm each, H: 0.2–0.4 cm. 10. Miniature glass bead, black, matte. Type TM 55. Dm: 0.4 cm, H: 0.2 cm. 11. Barrel-shaped glass bead, black, matte. Type TM 27. Dm: 0.4 cm, H: 0.2 cm. 12. Barrel-shaped glass bead, black, matte. Type TM 27. Dm: 0.7 cm, H: 0.4 cm. 13–14. Two barrel-shaped glass beads, dark green, transparent. Type TM 20. Dm: 0.7 cm each, H: 0.7 cm each. 15. Barrel-shaped glass bead, dark blue, transparent. Type TM 18. Dm: 0.8 cm, H: 0.6 cm. 16. Barrel-shaped glass bead, colourless, transparent, with metal foil. Type TM 387a. Dm: 0.5 cm, H: 0.7 cm. 17. Glass bead, segmented, colourless, transparent, with metal foil. Type TM 387b. Dm: 0.6 cm, H: 1.1 cm. 18. Around a dozen fragments of completely crushed glass beads, colourless, transparent, with metal foil.

Dating: *stadium* IIIA.

Grave 607 (inhumation, double) SQ 17-18 D

At the depth of ca. 0.80 m, at the bottom of a medieval layer, an irregular outline of a grave pit became apparent. Additionally, the grave under discussion slightly intersected with the SE corner of inhumation grave 613. The pit is aligned NNW-SSE, 1.50 m long, narrower in the N section (0.35 m) and wider (0.65 m) in the S section (Pl. CXX). The maximum depth was 0.30 m. Filled with compacted coarse-grained, dark copper-coloured sand with a high clay content and a large amount of stones ca. 0.08 m in diameter. Some 0.10 m below, the remains of two skeletons were found in a non-anatomical arrangement, with bones present at various depths in the pit. Above, the skull bones of the first individual were revealed (*maturus*) with a stone placed inside the jaw. The arms and legs are strongly bent towards the skull, suggesting that the individual was tied with the legs and arms close to the head. The bones of another individual (a calvaria, lower and upper limb bones, fragments of ribs) were found scattered below, to the N of the skeleton above and underneath it. Man, *maturus* (40–50 years old) – the skeleton found above; unidentified sex, *iuvenis* (16–18 years old) – the skeleton found below.

Inventory: none.

Dating: Medieval Period.

Grave 608 (inhumation containing organic structure, disturbed) SQ 17-19 A

The pit of the grave was discovered at the depth of 2.15 to 2.18 m. The top was damaged by an archaeological trench made in 1992, and the E edge was intersected by the cremation-inhumation grave 594. The pit is aligned N-S, irregularly shaped, sized 2.50×0.80 m, with a maximum thickness of 0.20 m (Pl. CXXX).

Filled with compacted coarse-grained, light yellow sand with numerous streaks of hardpan and lumps of clay. At this level, an irregular outline of a structure was captured in the central section of the pit closer to the S edge, (1.10×0.45 m), in the form of highly decomposed, greasy, dark brown organic substance (unidentified). The remains were also scattered in the N section of the grave. The structure was filled with compacted dark brown-grey sand mixed with gravel. Some 0.07–0.10 m below, the structure had a boat-like shape (0.80×0.35 m) surrounded by about a dozen darker circular spots (diameter from 0.02 to 0.03 m). Those were probably the remains of poles supporting the sides. The structure was probably a kind of woven basket used as a coffin. At the bottom, a spindle whorl (1) was discovered, with a small vessel right next to it (2). No bones were preserved.

Inventory (Pl. CXXX–CXXXI): 1. Biconical ceramic spindle whorl, dark brown, with concave ends. Dm: 2.5 cm, H: 1.3 cm. 2. Miniature ceramic vessel, biconical, decorated in the upper section of the body with grooves running along the circumference. Dark brown, with a smoothed surface, high temper content consisting of fine-grained crushed ceramics, granite and mica. Medium-fired ceramic mass, crumbling and flaking. Type similar to RW XIIC. Rim Dm: 3.2 cm, bottom Dm: 4.5 cm, H: 6.0 cm.

Dating: earlier than *stadium* IIIB (see description of grave 594).

Grave 609 (inhumation, disturbed) SQ 16-20 C, 17-20 A

The outline of the bottom section of the grave pit became apparent at the depth of 2.04 m. The grave was clearly disturbed by an archaeological trench made in 1992, at whose bottom, some 0.03 m above the level at which the N section of grave 609 was captured, two brooches were discovered (1–2). Those were situated next to each other with their bows turned upward and their heads turned N, presumably forming part of the grave equipment. Additionally, the pit was sunk into inhumation grave 606, destroying its S section. Aligned NNW-SSE, roughly rectangular with rounded edges, it was 1.60 m long, 0.60 m wide in the N section and 0.50 m wide in the S section, with a maximum thickness of 0.10 m (Pl. CXXVIII). Filled with compacted mid-grained, dark yellow sand with precipitated hardpan streaks. The fill layer contained greyish discolourations remaining from decomposed organics as well as individual charcoals (linden). The equipment was clustered in the N section of the pit, closer to the E edge. Here, elements of a casket in the form of a lock fitting (7) and braces (8–14) were discovered in a layer of decomposed wood (not analysed) including some

partially preserved wood (hornbeam). Nearby, probably inside a casket, there was a highly decomposed comb (3) placed on top of a vessel (6), next to it there were two fragments of another vessel (5) and a needle (4). Outside of the outline of the casket, in the W section of the pit, crushed teeth were found, suggesting that the individual was placed with the head pointing N. Unidentified sex, adult.

Inventory (Pl. CXXIX–CXXX): 1–2. Two almost identical spring-cover brooches, East series (item no. 1 without the pin and with a separately preserved spring fragment). Cast bows with a forged finish, triangular in cross-section, decorated with vertical engraved lines, horizontal at the base. Wide crests, not prominent. Type A.II.40–41. L: 3.7 cm, 3.6 cm, W: 2.8 cm, 2.9 cm. 3. Nine whole and fragmented rivets (including one with a fragment of the lining) made from a copper alloy from a three-layer comb made of bone (antler [?]). An arched handle preserved *in situ*. Type Thomas I. L: 0.9–1.3 cm. 4. Damaged needle made from round copper alloy wire, eye (preserved in fragments) forged and punched through. Dąbrowska type II. Preserved L: 4.9 cm. 5. Fragment of the upper part of a ceramic bowl-shaped vessel, dark brown, with a smoothed external surface, high temper content consisting of very fine-grained granite, crushed ceramics and mica. Medium-fired ceramic mass, crumbling and flaking. Type RW XIVB (?). Rim Dm: 12.5 cm, preserved H: 7.7 cm. 6. Fragment of the upper part of a ceramic vessel, dark brown to black, with a carefully smoothed and lightly glossed surface, high temper content consisting of fine granite and mica. Medium-fired ceramic mass, crumbling and flaking. Group RW VI (?). Rim Dm: 20.3 cm, preserved H: 8.4 cm. 7. Forged iron casket lock fitting, roughly rectangular, with two holes and two rivets at the corners. On the bottom side, the remains of highly mineralised wood (unidentified). Type Kokowski 2. L: 5.2 cm, maximum W: 3.5 cm. 8–8a–b. Three forged iron fragments from a casket brace or fitting (*in situ*, those were parts of a single object), preserved with highly mineralised wood (hornbeam). L: 4.5 cm, 1.5 cm, 1.6 cm. 9–14. Six fragments of forged iron casket braces. L: 1.3–3.0 cm.

Dating: *stadium* IIIB.

Grave 610 (inhumation, disturbed) SQ 17-18 B, 17-19 A
The grave pit was discovered at the depth of 1.54 m, located ca. 0.6 to 0.9 m below the level of capture of inhumation graves 236A and 253, with the top damaged by an archaeological trench made in 1992. The pit is aligned N-S, oval-shaped, sized 1.95×0.80 m and with a maximum thickness of 0.15 m (Pl. CXXXI). Filled with compacted coarse-grained, dark copper-coloured

sand, with a lot of small stones and gravel. Some 0.10 m below, the remains of a skeleton were revealed. The facial cranium pointed W. S of that there was a clavicle bone and a forearm bone, further off broken fragments of ribs, a femur and a tibia. The arrangement of the preserved parts of the skeleton indicates that the individual was placed on the right side of the body with the legs bent and the head pointing N. Under the lower jaw, next to the clavicle bone, there were two brooches (1–2) with some preserved fabric (flax) and a thread, facing S. Along the unpreserved spine there were glass beads (3–9) and amber beads (10–14). The arrangement indicates that they were not part of a necklace, but rather a kind of appliqué sewn onto a garment. Man, *maturus* (40–50 years old).

Inventory (Pl. CXXXI): 1–2. Two almost identical spring-cover brooches, East series, made from a copper alloy. Cast bows with a forged finish, decorated with transverse incised lines in imitation of pearled wire: three vertical ones and one horizontal one. Between those, suspended triangles topped with circles. Wide crests, not prominent, decorated with transverse incised lines, similar foot terminals. Under the crests, a row of small punched semicircles and semi-dots. Iron spring axes. By the springs and pin, the remains of thread (unidentified) and fabric (flax) were preserved. Type A.II.40–41. L: 4.4 cm, 4.0 cm, W: 3.3 cm each. 3–5. Three glass beads, barrel-shaped, dark green, transparent. Type TM 4a. Dm: 0.8–0.9 cm, H: 0.6–0.8 cm. 6. Barrel-shaped glass bead, light green, transparent. Type TM 4b. Dm: 0.8 cm, H: 0.6 cm. 7. Quadrilateral glass bead, dark purple, transparent, decorated with a yellow wavy thread. Type similar to TM 109. W: 0.5 cm, H: 0.8 cm. 8. Polyhedral glass bead, dark green, transparent. Type TM 129. W: 0.5 cm, H: 0.9 cm. 9. Crushed polyhedral glass bead, dark blue, transparent. 10–14. Five amber beads, disc-shaped, slightly asymmetrical, hand-cut, dark honey-coloured, transparent. Type TM 388 and 389. Dm: 2.0 cm, 1.3 cm, 1.0 cm, 1.2 cm, 0.8 cm, H: 0.5 cm, 0.8 cm, 0.5 cm, 0.7 cm, 0.4 cm, Wt: 1.14 g, 0.86 g, 0.35 g, 0.46 g, 0.15 g.

Dating: *stadium* IIIA.

Grave 611 (inhumation, disturbed) 17-20 A

The grave pit was captured at the depth of 1.82 m, ca. 1.10 m below the level at which inhumation grave 287 was revealed. The top was damaged by an archaeological trench made in 1992. The grave was also sunk into inhumation grave 612, destroying part of its pit down to the bottom. The pit is aligned N-S, roughly rectangular with rounded edges, sized 1.25×0.80 m and with a maximum thickness of 0.40 m (Pl. CXXXII). Filled with loose, fine-grained, dark yellow sand (greyish in

places) with hardpan streaks. Within the layer there were small and larger charcoals (alder) concentrated in the E section of the pit. From ca. 0.30 to 0.35 m below the level of capture, bones and equipment were found. In the N section of the grave, a tooth was found, and a casket brace or fitting (1) in the central section. Some 0.30 m SW of that, a streak of burnt wood (alder) was present, possibly the remains of the internal structure of the grave. Also discovered in the fill were two non-distinctive ceramic fragments (2–3). Unidentified sex, adult.

Inventory (Pl. CXXXII): 1. Forged iron casket brace. L: 2.6 cm, W: 1.7 cm. 2–3. Two fragments of bodies of ceramic vessels, brown and dark brown, with lightly smoothed and slightly roughened surfaces. High temper content consisting of fine-grained crushed ceramics. Medium-fired ceramic mass, crumbling and flaking. Both fragments preserved H: 2.6 cm.

Dating: earlier than *stadium* IVA (see description of grave 287³⁷).

Grave 612 (inhumation, destroyed) SQ 17-20 A

The outline of the grave pit captured at the depth of 1.95 m, ca. 1.25 m below the level of capture of inhumation grave 287 and 1.00 m below inhumation grave 256. The pit was disturbed by an archaeological trench made in 1992. Also, grave 611 was sunk into the central section of the pit, destroying it in part down to the bottom. The pit is aligned E-W, roughly rectangular with rounded edges, sized 2.55×0.80 m and with a maximum thickness of 0.35 m (Pl. CXXXII). Filled with loose, fine-grained dark, yellow sand (greyish in places) with small charcoals (linden) and precipitated hardpan streaks. No bones were preserved.

Inventory: none.

Dating: Roman Period.

Grave 613 (inhumation with a structure made from planks, disturbed, opened) SQ 17-18 B, D

The grave pit was discovered at the depth of 1.26 to 1.36 m. The SE corner was damaged by inhumation grave 607. Aligned N-S, close to oval-shaped, 2.40 m long, narrower in the N section (0.70 m) and wider in the S section (1.00 m), with a maximum thickness of 0.55 m (Pl. CXXXIII). Filled with compacted coarse-grained, dark copper-coloured sand with a high clay content and a large amount of stones ca. 0.05 m in diameter. Some 0.35 m below, the remains of a skeleton and equipment were found. In the N section there was a skull with the facial cranium turned W, supported on the E side with two stones. S of the skull there was a round metal sheet

– fragment of a capsule pendant (?) (5) – and three glass beads (6–7). As far as the remaining skeleton bones are concerned, only fragments of arm bones in a non-anatomical arrangement were preserved in the middle section of the pit. In that section, three scattered fragments of objects (1–3) were discovered, possibly the remains of one or several brooches. The fact that the remaining bones and equipment items were missing indicates that the grave had been opened, but no outline of the secondary trench was found. In the S section of the pit there were bones of bent lower limbs, the right leg preserved in the form of broken fragments of the shank of a tibia and a foot. The arrangement indicates that the individual was placed on the right side of the body with bent legs. By the left femur, in a layer of decomposed organics, a belt strap end (4–4a) with an (unidentified) fabric preserved on the attachment had been placed. At the level of the knees, fragments of a thin metal sheet (9), and in the foot area fragments of corroded objects made from a copper alloy (11–12) and iron (13). E of the left foot, a non-distinctive ceramic fragment was found (10). Also present in the E section of the pit were a streak of decomposed wood (oak) 0.75 m long and charcoal dust (unidentified), probably a fragment of a partially burnt plank shoring up a side of the pit. Man, *maturus* (40–50 years old).

Inventory (Pl. CXXXIII): 1. Fragment of the bow-spring (?) from the spring of a crossbow brooch made from round copper alloy wire. Group A.VI. Preserved L: 3.3 cm. 2. Fragment of a silver brooch spring made from round wire. Dm: 0.4 cm, Wt: 0.10 g. 3. Fragment of a brooch pin (?) made from a copper alloy. Preserved L: 0.5 cm. 4–4a. Belt strap end made from a copper alloy with a fabric impression preserved on the attachment (unidentified). A rectangular rivet washer preserved separately. Type similar to Raddatz O15, similar to ML type 2, form 6. L: 5.8 cm, washer L: 1.0 cm, washer W: 0.6 cm. 5. Round metal sheet made from a copper alloy – fragment of a capsule pendant (?). Dm: 1.6 cm. 6–8. Three polyhedral glass beads, dark blue, transparent. Type TM 126. W: 0.6–0.8 cm, H: 1.0–1.1 cm. 9. Two fragments, probably from a round piece of sheet metal made from a copper alloy. Preserved L: 0.7–0.9 cm. 10. Fragment of the body of a ceramic vessel, brown, with a roughened external surface. Well-fired to produce a hard and strong ceramic mass. Preserved H: 5.5 cm. 11–12. Corroded fragments of two objects made from a copper alloy. 13. Fragments of a corroded iron object.

Dating: *stadium* IVB/V.

Grave 614 (inhumation, disturbed) SQ 17-18 C, D

Revealed at the depth of 1.30 m, the outline of a grave pit damaged by an archaeological trench made in 1998.

³⁷ Cf. M. Natuniewicz-Sekuła, J. Okulicz-Kozaryn 2011, 83.

Some 0.10 m below the outline became oval-shaped, sized 2.00×1.00 m. Aligned N-S, with a maximum thickness of 0.20 m (Pl. CXXXIV). Filled with loose, fine-grained, yellow-grey sand with precipitations of compacted copper-coloured hardpan and several stones 0.05 m in diameter. In the fill layer, small individual charcoals were noted (not analysed). In the N section of the pit, organic remains were captured in the form of dark brown to grey discolourations with a greasy consistency. Those may have been the remains of textiles or fur lining the bottom of the grave (?). Within that layer, the remains of a skeleton and equipment were revealed. In the N section of the pit, there was a calvaria pointing W as well as some individual teeth. Around those, 17 glass beads (1–17) and two amber beads (18–19) were found (considerably scattered). This was a necklace displaced from its original location during archaeological work in 1998. Directly E of the skull, around a dozen fragments of a single vessel (21) were discovered, similarly displaced during exploration. At chest level, a spindle whorl (20) was found and, ca. 0.10 m S of the whorl, a wholly preserved vessel (22). Further E, a broken fragment of a femur. The arrangement of the skeleton indicates that the individual was placed on the right side of the body with the head pointing N. Woman, *maturus* (35–45 years old).

Inventory (Pl. CXXXIV–CXXXV): 1. Barrel-shaped glass bead, milky white, matte. Type TM 6. Dm: 1.2 cm, H: 0.9 cm. 2. Glass bead, disc-shaped, black, matte, with yellow eyes circled in red. Type similar to TM 212. Dm: 1.2 cm, H: 0.6 cm. 3. Glass bead, segmented, black, matte. Type TM 97b. Dm: 0.9 cm, H: 1.1 cm. 4. Glass bead, segmented, light green, transparent, with red, matte eyes. Type similar to TM 101. Dm: 1.0 cm, H: 1.1 cm. 5. Polyhedral glass bead, light blue, transparent. Type similar to TM 126. W: 0.5 cm, H: 1.0 cm. 6–7. Two damaged polyhedral glass beads, dark purple, transparent. Type TM 128. W: 0.3 cm, 0.5 cm, H: 1.0 cm each. 8–17. Ten fully and partly preserved polyhedral glass beads, dark purple, transparent. Type TM 128. W: 0.4–0.8 cm, H: 0.5–1.2 cm. 18. Fragment of the upper part of an amber eight-shaped pendant, dark honey-coloured, transparent. Preserved H: 1.2 cm, Wt: 0.69 g. 19. Amber pendant, irregularly shaped, made from an icicle-shaped piece, dark honey-coloured, transparent. H: 3.5 cm, maximum W: 2.0 cm. 20. Biconical ceramic spindle whorl, dark brown, with concave ends. Dm: 4.3 cm, H: 2.5 cm. 21. Reconstructed ceramic vessel, dark brown, darker in places, with a lightly smoothed surface. High temper content consisting of mid- and fine-grained granite and mica. Medium-fired ceramic mass, crumbling and flaking. Type RW VIB. Reconstructed rim Dm: 17.9 cm, bottom Dm: 9.2 cm,

reconstructed H: 9.9 cm. 22. Reconstructed ceramic vessel, bowl-shaped, light brown, darker in places, external surface carefully smoothed. High temper content consisting of very fine-grained granite, crushed ceramics and mica. Well-fired to produce a hard and strong ceramic mass. Type RW VIA. Rim Dm: 13.6 cm, bottom Dm: 6.6 cm, H: 8.3 cm.

Dating: *stadium* IVB/V.

Grave 615 (cremation pit with the remains of a pyre)
SQ 18-18 B

At the depth of ca. 1.06 m, an oval outline of a grave pit was revealed, with the longer axis aligned E-W, sized 0.85×0.60 m and with a maximum thickness of 0.35 m (Pl. CXXXV). Filled with dark brown sand with burnt material, mixed with compacted fine-grained light yellow sand with charcoals (not analysed) and small burnt bones scattered throughout the pit. Woman, *adultus*.

Inventory: none.

Dating: Roman Period.

Grave 616 (cremation pit burial with the remains of a pyre) **SQ 18-18 B, 18-19A**

The outline of the pit was captured at the depth of ca. 1.00 m, under a medieval layer. Aligned N-S, irregularly shaped, sized 2.10×1.10 m and 0.30 m deep (Pl. CXXXVI). Filled with dark brown sand with burnt material, mixed with compacted fine-grained, light yellow sand with small charcoals (not analysed). At the level of capture, in the central section of the pit, by its E edge, a stone was revealed (0.25×0.10 m), possibly a surface grave marker; smaller stones, ca. 0.15 m in diameter, were present throughout the fill without a regular arrangement. Next to the stone and ca. 0.10 m below, a fragment of a vessel (4) was found, along with about a dozen other fragments of vessels (2–5) scattered throughout the grave fill along with burnt bones; the biggest concentration was found in the N section of the pit. Man, *maturus*.

Inventory (Pl. CXXXVI): 1. Reconstructed fragment of the upper part of a ceramic vessel, vase-like with a handle, dark brown, with a highly smoothed surface. At the base of the handle, an ornament in the form of a band decorated with a herringbone pattern, in the upper section of the body a decorative band with short oblique lines, underneath a motif of alternating triangles decorated with oblique and horizontal hatching. High temper content consisting of fine- and mid-grained granite and mica. Medium-fired ceramic mass, crumbling and flaking. Group RW IV. Rim Dm: 24.5 cm, preserved H: 11.5 cm. 2. Fragment of the rim of a ceramic vessel, bowl-shaped, dark brown, with a lightly smoothed surface. High temper content

consisting of fine- and mid-grained granite and crushed ceramics. Medium-fired, producing a poorly fired ceramic mass, crumbling and flaking. Rim Dm: 15.0 cm, preserved H: 3.9 cm. 3. Reconstructed fragment of the upper part of a ceramic vessel, vase-like, dark brown, with a lightly smoothed surface. High temper content consisting of fine- and mid-grained granite and mica. Medium-fired ceramic mass, crumbling and flaking. Rim Dm: 19.4 cm, preserved H: 7.0 cm. 4. Reconstructed fragment of the upper part of a ceramic vessel, vase-like, dark brown, with a smoothed surface. High temper content consisting of fine- and mid-grained granite and mica. Medium-fired ceramic mass, crumbling and flaking. Rim Dm: 18.0 cm, preserved H: 5.2 cm. 5. Twelve fragments from bodies of ceramic vessels.

Dating: *stadium* IVB (?).

Grave 617 (cremation pit with the remains of a pyre)
SQ 18-18 B

At the depth of 1.15 m, a small round depression was revealed sized 0.40×0.35 m. The maximum thickness was 0.25 m (Pl. CXXXV). In its central section, in a layer of grey sand saturated with decomposed organics, probably the remains of a textile container, a hard, compacted cluster of burnt bones was revealed (thickness 0.10 m). The cluster of bones was within a layer of dark brown to grey sand with charcoals (unidentified), extending to the bottom of the pit. Woman, *adultus*.

Inventory: none.

Dating: Roman Period.

Feature 618 (funeral pyre, pyre site (?) with a collapsed daub dome) **SQ 18-19 B**

The feature was captured at the depth of ca. 1.20 m, under a medieval layer. The top had clearly been damaged by medieval ploughing. The longer axis of the pit was aligned E-W, roughly oval-shaped, sized 2.60×1.35 m and with a maximum thickness of 0.45 m (Pl. CXXXVII–CXXXVIII). The upper part of the fill formed a layer of daub rubble (7) mixed with dark brown burnt material and numerous small charcoals (birch). Some 0.05 m below, a significant area of daub was observed, with some fragments preserved in the form of large slabs (Pl. CCIII:1). On the daub, construction impressions were noted from poles and branches that were probably a construction element of a collapsed domed furnace. At this level, in a burnt layer, fragments of ceramic vessels (6), individual burnt bones, charcoals and the remains of decomposed and partially carbonised wood (oak) were discovered – probably remains of the construction (foundation) of a clay dome. Under the layer of daub, the pit was filled along the edge down to the bottom with a layer of compacted coarse-grained, dark brown sand saturated

with carbonised particles. The middle of the feature was filled with highly annealed, medium-compacted, fine-grained, orange-yellow sand. In the centre of the pit, grey, ashen sand was present. Within it, a brooch (1) was discovered along with a ceramic fragment (2) and several burnt bones. The remaining ceramic fragments, some with traces of burning (3–5) and some burnt bones, were found in the layer of annealed sand. In it, a burnt animal bone was also discovered (bird or mammal [?]). Unidentified sex, adult.

Inventory (Pl. CXXXVIII): 1. Crest-headed brooch, made from a copper alloy, slightly melted. Part of the spring damaged. Cast bow with a forged finish, with a faceted cross-section. Type A.V.120. L: 2.9 cm, preserved W: 2.0 cm

2. Reconstructed fragment of the upper part of a ceramic vessel, bowl-shaped, brick-red, with a rough surface. High temper content consisting of fine- and mid-grained granite and mica. Well-fired to produce a hard and strong ceramic mass. Rim Dm: 22.7 cm, preserved H: 4.2 cm.

3. Reconstructed fragment of the upper part of a ceramic vessel, bowl-shaped, dark brown, with a lightly smoothed surface. High temper content consisting of fine- and mid-grained granite and mica. Medium-fired ceramic mass, crumbling and flaking. Rim Dm: 19.7 cm, preserved H: 3.6 cm. 4. Reconstructed fragment of the upper part of a ceramic vessel, bowl-shaped (?), dark brown, with a lightly smoothed surface. High temper content consisting of fine- and mid-grained granite and mica. Medium-fired ceramic mass, crumbling and flaking. Rim Dm: 22.1 cm, preserved H: 7.3 cm. 5. Fragment of the rim of a ceramic vessel, dark brown, with a lightly smoothed surface. High temper content consisting of fine- and mid-grained granite and mica. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.4 cm. 6. Twenty fragments of bodies from ceramic vessels. 7. Several dozen fragments of daub with construction imprints from poles and branches. Combined Wt: 35 kg.

Dating: *stadium* IIA.

Grave 619 (cremation pit with the remains of a pyre)
SQ 18-19 A

The roughly circular pit sized 0.80×0.70 m was discovered at the depth of 1.17 m. The maximum thickness was 0.25 m (Pl. CXXXV). Filled with dark brown sand with burnt material mixed with compacted fine-grained, light yellow sand. In the fill layer, many precipitations of hardpan and small charcoals (not analysed). In the grave, at the level of capture, a stone sized 0.10×0.08 m, a small ceramic fragment (1) and small burnt bones scattered throughout the pit, extending down to the bottom. Unidentified sex, adult.

Inventory (Pl. CXXXV): 1. Fragment of the body of a ceramic vessel, dark brown, with a carelessly smoothed

surface. High temper content consisting of fine-grained crushed ceramics. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.0 cm.

Dating: Roman Period.

Grave 620 (inhumation, destroyed and opened) SQ 17-18 D

After exploring the secondary trench that destroyed the grave (feature 620A – see description below), the bottom section of the grave pit was revealed at the depth of 1.70 to 2.00 m. Aligned N-S, oval-shaped, sized 1.90×0.95 m and with a maximum thickness of 0.20 m (Pl. CXXXIX). Filled with loose, fine-grained, light yellow and grey sand with some precipitations of compacted copper-coloured hardpan. Individual small charcoals (not analysed) were noted in the layer. In the N section, there was a cluster of bones including ribs, a fragment of a lower jaw with teeth and upper limb bones. Those had been displaced from their original location as a result of the destruction caused by the secondary trench (feature 620A). Among those, there were remains of equipment in the form of fragments of objects made from a copper alloy (3–6, 8). W of that cluster, a vessel (2) was found, and E of the vessel, a ceramic fragment (9). In the central section, a broken piece of sheet metal was found (7), and slightly further S, an amber bead (1). By the E edge of the pit, found *in situ*, a fragment of a tibia along with foot bones. In the S section, another non-distinctive ceramic fragment (10). The disturbed arrangement of the skeleton made it impossible to identify the position of the body, but the individual was most likely placed with the head pointing N. Unidentified sex, adult.

Inventory (Pl. CXXXIX): 1. Disc-shaped amber bead, hand-cut, dark honey-coloured, transparent. Type TM 388. Dm: 0.9, H: 0.4 cm, Wt: 0.20 g. 2. Ceramic vessel, dark brown, darker in places, with a lightly smoothed surface. High temper content consisting of mid-grained crushed ceramics and granite, individual mica grains. Medium-fired ceramic mass, crumbling and flaking. Type RW XIVB. Rim Dm: 12.6 cm, bottom Dm: 5.5 cm, H: 8.9 cm. 3. Fragment of round wire made from a copper alloy. Preserved L: 0.9 cm. 4–5. Two fragments of bands made from a copper alloy with a rectangular cross-section. Preserved fragments L: 1.1 cm, 0.8 cm. 6–8. Three partially preserved metal sheets made from a copper alloy. Preserved fragments L: 1.4 cm, 1.1 cm, 1.2 cm. 9–10. Two fragments of bodies from ceramic vessels, thick-walled, brick-red and light brown, with a rough surface. High temper content consisting of mid-grained crushed ceramics and granite. Well-fired to produce a hard and strong ceramic mass. Preserved H: 3.8 cm, 4.4 cm.

Dating: *stadium* IVB/V (?).

Feature 620A (secondary trench into grave 620) SQ 17-18 D

The outline of the feature was revealed at the depth of ca. 1.60 m. Aligned N-S, roughly oval-shaped, sized 1.85×0.85 m (Pl. CXXXIX). The trench covered almost the whole extent of the pit of inhumation grave 620 (cf. description of grave 620), destroying it down to the depth of ca. 0.20 m. The only areas left intact were the NE, W and partially the S edges. The trench was filled with compacted mid-grained, light yellow sand with individual charcoals (not analysed) and hardpan precipitations along the edge. In the S section and by the W edge of the feature, there were small, greyish streaks of decomposed wood (not analysed) and a fragment of a tibia and a fibula, and E of those a cluster of teeth. Unidentified sex, adult.

Inventory: none.

Dating: *stadium* IVB/V or later (see description of grave 620).

Grave 621 (inhumation, destroyed, opened) SQ 17-18 D

The bottom part of the grave was discovered at the depth of 1.82 to 2.16 m. The pit was aligned N-S, with an oval outline, sized 2.25×0.75 m. The preserved thickness ranged from 0.15 to 0.20 m (Pl. CXL). The central and N sections were destroyed by a secondary trench (feature 621A – see description below), which did not extend to the bottom. Filled with loose fine-grained, light yellow sand mixed with compacted mid-grained, copper-coloured sand and numerous precipitations of hardpan streaks. Skeleton incomplete, with the skull, chest bones and vertebrae missing. Found in the pit, the radial bones from an upper limb, carpal bones, the pelvis and leg bones. The arrangement indicates that the individual was placed in a supine position with the head pointing N. The equipment was close to the pelvic bones, in a layer of decomposed organics, possibly the remains of fabrics: a brooch (1) laid on its side, with the head pointing SW (probably pinning in place a shroud or a cloak), and a buckle next to it (2). Under the carpal bones of the right hand, a vessel (4), and, on the right femur, a comb (3). Man, *maturus* (45–50 years old).

Inventory (Pl. CXL–CXLI): 1. Crossbow brooch with a tendril foot made of tin bronze, with a high-domed, almost knee-shaped bent bow, die-forged, with a faceted profile. Type A.VI.161-162. L: 6.6 cm, W: 3.2 cm. 2. Unipartite buckle with a plate. Prong and plate made of tin bronze, buckle frame made of tin-lead bronze. Cast frame with a die-forged finish, faceted profile. On the frame, a preserved fragment of mineralised leather (not analysed), onto which a separate plate from a copper alloy sheet was placed, triangular and decorated with a row of punched holes. Plate ends rolled

up on the bottom side. Type similar to ML G 1. Total L: 3.1 cm, plate W: 1.3 cm, plate L: 0.8 cm, frame W: 2.4 cm, frame L: 1.7 cm. 3. Damaged comb made of bone (antler [?]), three-layer, with a flared handle. Type Thomas III, variant 1. W: 10.3 cm, H: 5.6 cm. 4. Miniature ceramic vessel, light brown, dark brown in places, with a smoothed surface. High temper content consisting of fine-grained crushed ceramics, granite and mica. Well-fired to produce a hard and strong ceramic mass. Type RW XVIIIIC. Rim Dm: 8.5 cm, bottom Dm: 5.6 cm, H: 6.0 cm.

Dating: *stadium* V.

Feature 621A (secondary trench into grave 621) SQ 17-18 D

The oval-shaped pit was revealed at the depth of 1.69 m, located in the N and central sections of grave 621, destroying those sections almost completely. The trench did not extend to the bottom. Aligned N-S, sized 1.70×1.00 m. The maximum thickness of the trench was 0.45 m (Pl. CXL). Filled with compacted mid-grained, dark yellow sand with hardpan precipitations and lumps of clay and clay clusters. The fill layer contained small charcoals (not analysed), and traces of decomposed organics were noted in the S section of the pit, possibly the remains of textiles. Some 0.20 m N of that, a belt strap end (1), placed directly under the equipment items from grave 621 and certainly part of its original equipment.

Inventory (Pl. CXL): 1. Brass belt strap end with a damaged terminal, originally round. Type Raddatz JII (?), ML type 6, form (?). L: 6.5 cm, maximum attachment W: 2.1 cm.

Dating: *stadium* V or later (see description of grave 621).

Grave 622 (cremation pit with the remains of a pyre) SQ 17-19 C, 18-19 A

The outline of the pit was captured at the depth from ca. 1.15 to 1.20 m, under a medieval layer. The N section, which had been disturbed by a strip of medieval ploughing, contained around a dozen burnt bones and ceramic fragments, probably part of the grave equipment. The pit is aligned NNW-SSE, close to oval-shaped, sized 4.10×1.70 m and with a maximum depth of 0.80 m (Pl. CXLII–CXLIII, CCIII:5). The top section of the pit was filled with dark brown sand with burnt material, mixed with compacted fine-grained, light yellow sand and numerous charcoals (predominantly hornbeam with individual alder and birch charcoals). At the bottom of the pit, light yellow sand predominated, and the layer of burnt material was only present in trace amounts. At the level of capture, in the central

section of the grave, teeth from the lower jaw of a cow and a pig tooth were present – probably a secondary deposit from the medieval layer. Several centimetres below, there were a fragment of a melted glass bead (5), a casket brace (15–16), ceramic fragments and burnt bones. Some 0.20 m below the level of capture, in the central section of the grave, a cluster of large stones, with smaller stones also present in various sections of the fill. At this level, the number of burnt bones rose considerably, particularly in the N section of the pit. Burnt objects were also discovered: a partially melted brooch (1) and a buckle (4), a spindle whorl (8) with signs of burning, and, close by, a fragment of a urn (9). Presumably, grave 622 had destroyed a cremation urn burial (not numbered separately), and the burnt elements of equipment numbered (1.4–5.8) had been part of the original equipment. This seems to be corroborated by the presence of burnt bones from two individuals in grave 622. Also discovered at the same level were several hundred ceramic fragments from the Roman Period and the early Iron Age – the latter forming a secondary deposit (10–14.18). The rest of the equipment, without signs of fire, was found at the bottom of the grave pit, ca. 0.60–0.80 m below the level of capture. Those were present in the central and N sections of the pit: two brooches (2–3), an eight-shaped pendant (6), a ring (7) and a fragment of rod (17). Man, *adultus*; woman, *adultus*.

Inventory (Pl. CXLIV–CXLV): 1. Crest-headed brooch, melted, very massive, made of tin-lead bronze. Crest and foot terminal decorated with engraved horizontal lines. Cast bow, semi-oval in cross-section, die-forged finish. Short, trapezoid foot; spring and catchplate not preserved. Crest decorated with lines with imitation filigree. Type similar to A.V.127. L: 3.5 cm, crest W: 2.0 cm. 2. Crossbow brooch with a tendril foot made from a copper alloy, with an arched bow, die-forged with a faceted profile. Head and ends spring decorated with profiled knobs. Type A.VI.161-162. L: 4.0 cm, W: 2.8 cm. 3. Crossbow brooch with a tendril foot made from a copper alloy, highly arched, knee-shaped bow, die-forged with a faceted profile. Type A.VI.161-162. L: 6.5 cm, W: 2.9 cm. 4. Bipartite iron buckle with a rectangular buckle frame and a plate, forged item, bent prong, the object had been burnt. Type ML G 16. Total L: 3.3 cm, plate L: 1.8, plate W: 3.4 cm, frame L: 2.0 cm, frame W: 3.5 cm. 5. Fragment of a melted glass bead, light green, transparent. Dm: 1.7 cm, H: 0.8 cm. 6. Amber eight-shaped pendant with a rim close to the eye, dark honey-coloured, transparent. Type TM 471i. H: 2.1 cm, Wt: 0.72 g. 7. Ring made from round copper alloy wire. Dm: 1.5 cm. 8. Biconical ceramic spindle whorl, burned, dark grey

with concave ends. Dm: 4.1 cm, H: 3.1 cm. **9.** Upper part of a ceramic vessel, dark brown, darker in places, with a roughened surface, carelessly smoothed close to the rim. High temper content consisting of mid- and fine-grained crushed ceramics, granite, mica. Well-fired to produce a hard and strong ceramic mass. Type RW IC. Rim Dm: 21.8 cm, preserved H: 15.7 cm. **10.** Reconstructed fragment of the upper part of a ceramic vessel, bowl-shaped, dark brown, with a lightly smoothed surface. High temper content consisting of fine- and mid-grained granite and mica. Medium-fired ceramic mass, crumbling and flaking. Rim Dm: 19.7 cm, preserved H: 3.6 cm. **11.** Reconstructed fragment of the upper part of a ceramic vessel, bowl-shaped, dark brown, with a smoothed surface. High temper content consisting of fine-grained granite and mica. Medium-fired ceramic mass, crumbling and flaking. Rim Dm: 16.6 cm, preserved H: 2.7 cm. **12.** Reconstructed fragment of the upper part of a ceramic vessel, dark brown, darker in places, with a lightly smoothed surface. High temper content consisting of fine- and mid-grained granite, crushed ceramics and mica. Medium-fired ceramic mass, crumbling and flaking, visibly burnt. Group RW I (?). Rim Dm: 17.6 cm, preserved H: 8.2 cm. **13.** Reconstructed fragment of the upper part of a ceramic vessel, light brown, dark brown in places, with a lightly smoothed surface close to the rim, and a roughened lower part. High temper content consisting of mid-grained granite and crushed ceramics. Medium-fired ceramic mass, crumbling and flaking, visibly burnt. Group RW I (?). Rim Dm: 19.1 cm, preserved H: 7.3 cm. **14.** Reconstructed fragment of the upper part of an early Iron Age ceramic vessel, with a broken transverse handle. Light grey or brick-red in places, carelessly smoothed surface. High temper content consisting of mid-grained granite and crushed ceramics. Well-fired to produce a hard and strong ceramic mass. Rim Dm: 20.0 cm, preserved H: 5.5 cm. **15–16.** Two fragments of forged iron casket braces. Preserved circumference L: 3.7 cm, 3.6 cm. **17.** Fragment of a forged rod made from a copper alloy, polygonal in cross-section. Preserved L: 2.8 cm. **18.** One hundred seventeen fragments from ceramic vessel bodies from the early Iron Age (secondary deposit) and Roman Period.

Dating of finds: early Iron Age; from *stadium* IIB/IIC to *stadium* IVB.

Dating of grave: *stadium* IVB (?).

Grave 623 (cremation pit with the remains of a pyre) SQ 18-19 A, B

The outline of the pit was captured at the depth of 1.10 m in the N section to 1.42 m in the S section, under a medieval layer. The top was damaged by strips of medieval

ploughing. The pit is aligned NNW-SSE, close to oval-shaped, sized 2.40×1.50 m and with a maximum thickness of 0.80 m (Pl. CXLVI). Filled with dark brown sand with burnt material, mixed with compacted fine-grained, light yellow sand and numerous charcoals (hornbeam and unidentified). By the bottom of the pit, the layer of burnt material was present in trace amounts, with light yellow sand predominating. At the level of capture, in the NE section of the pit, a bracelet (2) was discovered, presumably from a medieval layer, and many ceramic fragments (18) and burnt bones. Some 0.20 m below, in the central section of the pit, closer to the W side, a cluster of five stones was found, and N of those, fragments of two early Iron Age vessels (5.10). Grave 623 had probably destroyed an early Iron Age cremation urn grave (not numbered separately), with the vessels probably forming its original equipment. At this level, a much larger amount of burnt bones was discovered. The remaining elements of equipment were scattered throughout the pit at various depths without a clear arrangement. A fragment of a brooch bowstring (1), a damaged buckle frame (3), a fragment of a hooked pin (4) and fragments of non-distinctive metal objects (13–16) were found. None showed traces of fire. Additionally, several hundred ceramic fragments from the Roman Period and the early Iron Age as well as the Neolithic were discovered, the latter as a secondary deposit (6–9.11–12.18). Woman, *adultus*.

Inventory (Pl. CXLVI–CXLVIII): **1.** Fragment of arched round wire made from a copper alloy, brooch bowstring (?). Preserved L: 2.9 cm. **2.** Iron rod bracelet, forged from a metal rod with a faceted cross-section. Dm: 6.9 cm. **3.** Fragment of a D-shaped buckle frame made from a copper alloy with a faceted cross-section. Preserved L: 3.8 cm. **4.** Hooked pin with a twisted shank made from a copper alloy. End damaged. Preserved L: 2.4 cm. **5.** Reconstructed early Iron Age bowl-shaped ceramic vessel, preserved without the bottom. By the rim, a transverse handle stuck on, protruding slightly above the upper edge. Brick-red, in places light brown, smoothed surface. High temper content consisting of fine-grained crushed ceramics. Well-fired to produce a hard and strong ceramic mass. Rim Dm: 26.4 cm, preserved H: 8.2 cm. **6.** Reconstructed lower part of a ceramic vessel, brown, dark brown in places, with a roughened surface, carelessly smoothed close to the bottom. High temper content consisting of coarse-grained granite and crushed ceramics. Medium-fired ceramic mass, crumbling and flaking. Type RW IB (?). Bottom Dm: 13, 6 cm, preserved H: 13.0 cm. **7.** Reconstructed ceramic vessel, dark brown, darker in places, with a roughened surface in the central part, and carelessly smoothed in the bottom and upper

parts. High temper content consisting of fine-grained crushed ceramics and granite. Medium-fired ceramic mass, crumbling and flaking. Type RW IC. Reconstructed rim Dm: 15.8 cm, bottom Dm: 13.6 cm, preserved H: 17.3 cm. **8.** Fragment of the upper part of a vase-like ceramic vessel, dark brown, black in places, with a smoothed surface. High temper content consisting of fine-grained mica and granite. Medium-fired ceramic mass, crumbling and flaking. Rim Dm: 22.1 cm, preserved H: 7.3 cm. **9.** Fragment of the upper part of a vase-like ceramic vessel, dark brown, black in places, with a smoothed surface. At the base of the neck, a slightly protruding decorative band. High temper content consisting of fine-grained mica and granite. Medium-fired ceramic mass, crumbling and flaking. Rim Dm: 21.2 cm, preserved H: 5.4 cm. **10.** Reconstructed upper part of an early Iron Age ceramic vessel with a broken handle, brick-red, in places light brown, with a carefully smoothed surface. High temper content consisting of fine-grained crushed ceramics, granite and mica. Well-fired to produce a hard and strong ceramic mass. Rim Dm: 13.6 cm, preserved H: 8.1 cm. **11.** Fragment of the rim of a Neolithic ceramic vessel, light brown, with a lightly smoothed surface, decorated with an impression of rope. High temper content consisting of fine-grained crushed ceramics. Well-fired to produce a hard and strong ceramic mass. Preserved H: 3.2 cm. **12.** Fragment of the rim of an early Iron Age ceramic vessel, dark brown, with a smeared coat on the surface, with numerous protruding mid-sized grains of granite. High temper content consisting of mid-grained granite and crushed ceramics. Well-fired to produce a hard and strong ceramic mass. Preserved H: 2.6 cm. **13.** Fragment of a round copper alloy rod. Preserved L: 2.4 cm. **14–15.** Two fragments of forged iron wire, arched, round and rectangular in cross-section. Preserved L: 4.5 cm, 3.4 cm. **16.** Fragment of a non-distinctive iron object with a rectangular cross-section. Preserved L: 1.3 cm. **17.** Fragments of a burnt and crumbled iron object. **18.** One hundred and twenty-six fragments from the bodies of ceramic vessels from the early Iron Age and the Roman Period.

Dating of finds: Neolithic; early Iron Age; *stadium* IVB (?).
Dating of grave: *stadium* IVB (?).

Grave 623A (cremation pit with the remains of a pyre)
SQ 18-19 B, D

The outline of the pit was captured at the depth of 1.18 m in the N section to 1.62 m in the S section, under a medieval layer. The top had clearly been damaged by strips of medieval ploughing. Aligned NNW-SSE, close to oval-shaped, sized 2.60×1.80 m and with a maximum thickness of 0.60 m (Pl. CXLIX). Filled with dark brown

sand with burnt material, mixed with compacted fine-grained, light yellow sand and numerous charcoals (not analysed). Near the bottom of the pit, the layer of burnt material was present in trace quantities, with light yellow sand predominating. At the level of capture there were also many ceramic fragments (4) as well as burnt bones and two stones; smaller stones were present in parts of the fill. Some 0.15 m below, a larger amount of burnt bones was observed down to the bottom of the pit. Throughout the fill, ceramic fragments from the Roman Period and early Iron Age were found – the latter a secondary deposit (1–4). Man, *maturus*.

Inventory (Pl. CXLVIII): **1.** Fragment of the rim of an early Iron Age ceramic vessel, thin-walled, dark brown, with a smoothed surface. Temper consisting of fine-grained crushed ceramics, granite and mica. Well-fired to produce a hard and strong ceramic mass. Preserved H: 4.6 cm. **2.** Fragment of the rim of an early Iron Age ceramic vessel, thin-walled, brick-red, in places light brown, with a carefully smoothed surface. High temper content consisting of fine-grained crushed ceramics, granite and mica. Well-fired to produce a hard and strong ceramic mass. Preserved H: 4.5 cm. **3.** Fragment of the rim of a ceramic vessel, thin-walled, grey-dark brown, with a smoothed surface. High temper content consisting of fine-grained crushed ceramics, granite and mica. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.1 cm. **4.** Fifty-eight fragments from the bodies of ceramic vessels from the early Iron Age and the Roman Period.

Dating of finds: early Iron Age; *stadium* IVB (?).

Dating of grave: *stadium* IVB (?).

Grave 624 (cremation pit with the remains of a pyre)
SQ 17-18 D

The pit was revealed at the depth of 1.70 m, under a medieval layer. Roughly circular, sized 0.55×0.50 m, with a maximum thickness of 0.20 m (Pl. CLIII). Filled with dark brown-grey sand with burnt material and charcoals (not analysed). Containing two ceramic fragments (1–2) and burnt bones. The grave was sunk into the N section of inhumation grave 627. Unidentified sex, adult.

Inventory (Pl. CXLVIII): **1.** Fragment of the body of a ceramic vessel, dark brown, with a roughened surface. High temper content consisting of coarse-grained crushed ceramics and granite. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 3.1 cm. **2.** Fragment of the body of a ceramic vessel, dark brown, with a rough surface. High temper content consisting of mid-grained crushed ceramics and granite. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 3.2 cm.

Dating: Roman Period.

Grave 625 (cremation-inhumation, disturbed) SQ 17-18 D, 17-19 C, 18-18 B, 18-19 A

The pit was revealed at the depth of 1.43 m in the N section and 1.52 m in the S section, under a medieval layer. The top had clearly been damaged by strips of medieval ploughing. Aligned NNW-SSE, close to oval-shaped, sized 2.80×1.40 m and with a maximum thickness of 0.80 m (Pl. CL-CLI). Filled with slightly compacted coarse-grained, light yellow sand. In it, many charcoals (unidentified), clay-like decomposed organics (remains of a fabric, fur [?]), as well as individual large and medium-sized stones. At the level of capture, a tooth was found. Some 0.15 m below, unburnt bones and equipment items. In the S section of the pit, a comb (3), a vessel (5) and a ring (2) with crushed broken fragments of lower limb bones. At chest level (not preserved), next to a humerus, a needle (4) and a triangular piece of thin metal (11). In the N section, a cluster of teeth, among those an amber pendant (1) and fragments of metal objects (12-14). N of those, the remains of a small organic container (not analysed) (10), placed on a stone. Additionally, throughout the pit fill down to the bottom, burnt bones and ceramic fragments (6-7.9.15), including one from the early Iron Age – the latter a secondary deposit (8). Woman, *adultus*; burnt bones: unidentified sex, *infans* I.

Inventory (Pl. CLI-CLII): 1. Amber eight-shaped pendant with a collar at the eye, dark honey-coloured, transparent. Type TM 471i. H: 1.7 cm, Wt: 0.81 g. 2. Ring made from round copper alloy wire. Dm: 1.6 cm. 3. Fragments of the lining from a three-layer comb made of bone (antler [?]) with rivet holes; one preserved with a rivet, and two rivets separately. Found *in situ*, an arched comb handle. Type Thomas I. Lining fragments L: 2.0 cm, 1.3 cm, 0.9 cm, 0.8 cm, rivets L: 1.2 cm, 0.9 cm. 4. Damaged needle made from round copper alloy wire, eye forged, punched through. Dąbrowska type II. Preserved L: 4.3 cm. 5. Reconstructed lower part of a ceramic vessel, dark brown, darker in places. High temper content consisting of mid- and coarse-grained crushed ceramics and granite. Medium-fired ceramic mass, crumbling and flaking. Group RW XIV (?). Bottom Dm: 6.5 cm, preserved H: 8.5 cm. 6-7. Two fragments of rims of ceramic vessels, dark brown, with smoothed surfaces. High temper content consisting of fine-grained granite and mica. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.3 cm, 1.7 cm. 8. Fragment of the rim of an early Iron Age bowl-shaped ceramic vessel, brick-red, light brown in places, with a smoothed surface. High temper content consisting of fine-grained crushed ceramics. Well-fired to produce a hard and strong ceramic mass. Rim Dm: 18.1 cm, preserved H: 3.3 cm. 9. Fragment of the bottom part of a ceramic

vessel, dark brown, with a lightly smoothed surface. High temper content consisting of mid-grained granite and mica. Group RW V (?). Bottom Dm: 10.1 cm, preserved H: 3.9 cm. 10. Preserved *in situ*, the remains of a small organic container (basket [?]), with a circular outline. Given the state of preservation, it was not possible to reconstruct the exact structure of the item. Dm: 14.0 cm, H: 10.0 cm. 11-12. Two partially preserved thin pieces of metal made from a copper alloy, originally triangular. Preserved L: 1.7 cm, 1.5 cm. 13. Fragment of thin metal sheet made from a copper alloy, decorated with engraved lines. L: 0.4 cm, W: 0.4 cm. 14. Fragment of an arched object made from a copper alloy, triangular in cross-section. Preserved L: 1.2 cm. 15. Eighteen fragments of bodies of ceramic vessels from the Roman Period.

Dating: *stadium* IVA/IVB (?).

Grave 626 (cremation urn with the remains of a pyre, destroyed) SQ 17-19 C

Revealed at the depth of 1.45 m, under a medieval layer and strips of medieval ploughing, was the bottom part of an urn (1) (Pl. CL). It was filled with dark grey sand mixed with burnt material, burnt bones and individual small charcoals (not analysed). Some of the fill was also present around the urn as a result of ploughing damage to the top part of the urn. Next to the urn, a fragment of the body of another vessel (2). Pit outline not captured. Unidentified sex, adult.

Inventory (Pl. CL): 1. Reconstructed fragment of the lower part of a ceramic vessel, black, with a carefully smoothed and slightly glossed surface. High temper content consisting of fine-grained mica and granite. Medium-fired ceramic mass, crumbling and flaking. Type RW VIA. Bottom Dm: 13.3 cm, preserved H: 4.8 cm. 2. Fragment of the body of a ceramic vessel, light brown, with a roughened surface. High temper content consisting of mid-grained granite and crushed ceramics. Medium-fired, producing a poorly fired ceramic mass, crumbling and flaking. Fragment bears traces of burning. Preserved H: 11.8 cm.

Dating: Roman Period.

Grave 627 (inhumation, destroyed) SQ 17-18 D, 18-18 B

After exploring cremation grave 624, at the depth of 1.80 m, the pit of an inhumation grave became apparent. Aligned N-S, roughly rectangular with rounded edges and sized 1.40×0.80 m. Maximum thickness 0.30 m (Pl. CLIII). Filled with loose fine-grained, light yellow and slightly grayish sand. At the level of capture, several charcoals (not analysed) and a burnt bone were noted – presumably a secondary deposit from cremation grave 624. In the S section of the pit, a large stone with traces

of processing, sized 0.35×0.22 m (originally a surface grave marker). At the bottom of the grave pit, a vessel fragment (1). No bones were preserved.

Inventory (Pl. CLIII): 1. Fragment of the body of a ceramic vessel, dark brown, with a rough surface. High temper content consisting of mid-grained crushed ceramics and granite. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 1.8 cm.

Dating: Roman Period.

Grave 628 (inhumation, disturbed) SQ 17-18 B

The grave pit, disturbed by an archaeological trench made in 1992, was revealed at the depth of 1.75 m. It was captured ca. 1.05 m below inhumation grave 239. Aligned N-S, roughly rectangular with rounded corners, sized 2.40×0.75 m and with a maximum thickness of 0.20 m (Pl. CLIII). Filled with compacted mid-grained, light yellow sand mixed with grey sand, with precipitations of compacted rust-brown hardpan and individual charcoals (unidentified), surrounded by remains of burnt material. Some 0.20 m below, at the bottom of the pit, equipment items were found. In the N section, at chest level (not preserved), a brooch (1) with its bow turned upward and its head pointing SE, found in a layer of decomposed organics – possibly remains of textiles. Some 0.50 m SE from the brooch, a buckle (2), and ca. 0.20 m SW of the buckle, a spindle whorl (3). No bones were preserved.

Inventory (Pl. CLIV): 1. Triple-crest brooch made from a copper alloy, cast bow with a forged finish, spring and pin preserved separately. Iron spring bar. Type A.V.96. L: 3.7 cm, head crest W: 2.1 cm, spring W: 1.9 cm. 2. Unipartite iron buckle with a rectangular frame, forged. Type ML G 1. L: 3.3 cm, W: 4.1 cm. 3. Biconical ceramic spindle whorl, dark brown, with slightly concave ends. Dm: 3.8 cm, H: 2.6 cm.

Dating: *stadium* IIB/IIC.

Grave 629 (inhumation, disturbed) SQ 17-18 B

The grave pit was discovered at the depth of 1.38 to 1.53 m. The central and E sections were disturbed to the depth of 0.05 m by an archaeological trench made in 1998. After exploration, an oval outline of a grave pit was captured, aligned NW-SE, sized 2.20×1.00 m and with a maximum thickness of 0.40 m (Pl. CLIV). Additionally, the grave intersected the N section of inhumation grave 631, not reaching its bottom. Grave 629 was filled with fine- and mid-grained loose sand, light yellow mixed with grey, with hardpan streaks. Present throughout the pit were individual charcoals (oak), some surrounded by dark grey discolourations remaining from decomposed organics (fabric [?]). The remains of a skeleton (fragments of a calvaria, upper limb long

bones), crushed teeth and elements of equipment were discovered ca. 0.10 m below, in the central section of the pit, right next to the E edge. Above the teeth, a brooch (1) was found on its side, with its head pointing N, next to it, to the W – a decomposed comb (4), and on the arm bones, a buckle (2) and a belt strap end (3) found in a layer of decomposed organics. In the S section of the pit, fragments of two vessels (5–6) and a burnt bone (unidentified) were found, presumably a secondary deposit. Unidentified sex, *infans* I/II.

Inventory (Pl. CLV): 1. Silver brooch with a tendril foot and an upper bow-string, cast bow with a forged finish, with a faceted cross-section. Spring ends decorated with knobs. Type similar to A.VI.161-162. Variant Puck according to Andrzejowski. L: 3.4 cm, W: 0.9 cm, Wt: 4.04 g. 2. Bipartite belt buckle with a plate made from a copper alloy. D-shaped buckle frame, cast, with a filed and forged finish, rectangular plate, forged with two preserved rivets. Prong originally bent. Type ML D 17. L: 2.1 cm, W: 2.3 cm. 3. Belt strap end made from a copper alloy ending in a lunular terminal, carefully finished by filing; presumably the effect of a failed casting or repairs. In the attachment, a preserved fragment of mineralised leather (not analysed). Type Raddatz JII (?), ML type 6, form (?). L: 3.2 cm. 4. Fragments of lining made from bone (antler [?]) and seven rivets made from a copper alloy from three-layer comb. A flared handle preserved *in situ*. Type Thomas III, variant 1. Preserved lining fragments L: 2.3 cm, 3.2 cm, 2.0 cm, 1.1 cm, 4.5 cm, rivets L: 0.6–1.2 cm. 5. Fragment of the rim of a ceramic vessel, vase-like, dark brown, with a smoothed surface. At the base of the body decorated with parallel grooves. High temper content consisting of fine-grained granite and mica. Medium-fired ceramic mass, crumbling and flaking. Dm: 21.5 cm, preserved H: 9.7 cm. 6. Fragment of the body of a ceramic vessel, light brown, with a carelessly roughened surface. High temper content consisting of mid-grained granite and crushed ceramics. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.9 cm.

Dating: *stadium* IVB.

Grave 630 (cremation urn with the remains of a pyre) SQ 18-19 A

The pit was revealed at the depth of 1.50 m, under a medieval layer. Close to oval-shaped, sized 0.80×0.70 m and with a maximum thickness of 0.20 m (Pl. CLVI). Filled with fine-grained, dark brown sand saturated with burnt material and small charcoals (not analysed). In the central section of the pit there was a fractured urn (1), with the upper part destroyed by medieval ploughing. In the urn, a cluster of burnt bones. Man, early *maturus* (40–45 years old).

Inventory (Pl. CLVI): 1. Reconstructed ceramic vessel, crushed by the weight of soil, dark brown, black in places, with a smooth glossed surface. At the base of the neck, a decoration in the form of irregular rows of slight punctures arranged into irregular teardrops. Low temper content consisting of mid- and coarse-grained granite. Medium-fired, producing a poorly fired ceramic mass, crumbling and flaking. Group RW IV. Reconstructed rim Dm: 24.6 cm, reconstructed bottom Dm: 16.6 cm, reconstructed H: 15.5 cm.

Dating: *stadium* IIIA.

Grave 631 (inhumation in a log coffin, disturbed, opened [?]) **SQ 17-18 B, D**

The S section of the grave pit was discovered at the depth of 1.63 m; the top was damaged by an archaeological trench made in 1998. Inhumation grave 629 had been sunk to the depth of 0.25 m into the N section. At the level of capture, in the S section, a tooth was found along with charcoal dust (unidentified) and a glass bead (8). Some 0.25–0.30 m below, a clear outline of the bottom section of the pit was captured. Aligned N-S, slightly deflected to NNW-SSE, oval-shaped, sized 2.50×1.20 m (Pl. CLVI). Filled with mid-grained, dark yellow sand with numerous streaks of hardpan and charcoals (mostly hornbeam and oak). In the centre of the pit, the outline of a log coffin (unidentified wood) became apparent, with traces of fire on the sides. The coffin was filled with compacted dark yellow sand mixed with grey sand. The log was 1.80 long and 0.60 m wide at the widest point. In the N part of the coffin, a casket (16) (unidentified wood) was placed, containing some of the equipment: a brooch lying on its side (1), a fragment of a brooch knob (4), an amber bead (9), fragment of a ring (11) and an iron brace or fitting (15). Some 0.30 m S of the casket, an amber pendant (10), and at the W side of the coffin, in its S section, a brooch with its head turned upward (3) and two ceramic fragments (14.17). The remaining equipment items were found outside of the coffin. In the NW section of the pit, a buckle (7), and ca. 0.70 m S of the buckle – a burnt small vessel (12). By the S end of the pit, a second buckle (6), and E of that a third brooch (2) and a fragment of a brooch spring with a preserved axis (5). Also found here were more fragments of vessels (13.18). Incomplete skeleton. Within the coffin, long lower limb bones (the femurs and a tibia), surrounded by individual teeth, and outside of the coffin, in the S section of the pit, a damaged lower jaw. The scattered arrangement of the objects and the incomplete skeleton suggest that the grave had been opened, but no outline of a secondary trench was identified. The bones and equipment may also have been disturbed and rearranged when inhumation grave 629 was made. Woman, *adultus* (35–40 years old).

Inventory (Pl. CLVII): 1. Silver crossbow brooch with a tendril foot, with an arched bow, die-forged with a faceted profile. Head decorated with a knob with a ring of incised wire at the base, another incised ring at the transition section between bow and the foot. Spring ends decorated with profiled knobs (only one preserved). Type A.VI.161-162. L: 4.1 cm, W: 2.3 cm, Wt: 3.44 g. 2. Silver crossbow brooch with a tendril foot, with a knee-shaped bow, die-forged with a triangular profile. Type A.VI.161-162. L: 4.3 cm, W: 1.6 cm, Wt: 5.00 g. 3. Crossbow brooch with a tendril foot made from a copper alloy, with an arched bow, die-forged with a round profile. Type A.VI.161-162. L: 4.5 cm, W: 2.0 cm. 4. Silver profiled knob decorated at the base with a ring of incised wire. Probably an element from a crossbow brooch with a tendril foot. Group A.VI. Dm: 0.5 cm, H: 0.5 cm, Wt: 0.28 g. 5. Fragment of a silver brooch spring with an iron axis. W: 1.3 cm, Wt: 0.56 g. 6. Bipartite belt buckle with a plate made from a copper alloy. D-shaped buckle frame, cast, with a forged and filed finish, rectangular plate, forged, with two preserved rivets. Frame originally bent. Type ML D 17. L: 2.5 cm, W: 1.7 cm. 7. Iron unipartite buckle with a forged plate and frame. A second part of the plate was made from a separate piece and attached with a rivet. Type similar to ML G 32. L: 4.6 cm, W: 2.5 cm. 8. Polyhedral glass bead, dark blue, transparent. Type TM 126. W: 0.7 cm, H: 0.9 cm. 9. Disc-shaped amber bead, hand-cut, dark honey-coloured, transparent. Type TM 391. Dm: 0.8 cm, H: 0.4 cm, Wt: 0.19 g. 10. Fragment of an amber eight-shaped pendant with a rim at the eye, dark honey-coloured, transparent. Type TM 471i. Preserved H: 1.2 cm, Wt: 0.35 g. 11. Two fragments of a ring made from a copper alloy Beckmann 15/16 (?). Preserved L: 2.8 cm. 12. Miniature ceramic vessel with an originally chipped rim, burnt, with visible signs of fire inside the vessel, particularly at the bottom. Smooth external surface, light grey, dark grey in places. High temper content consisting of fine-grained granite and mica. Type RW XIII C. Bottom Dm: 3.7 cm, body Dm: 9.1 cm, preserved H: 5.3 cm. 13. Fragment of the bottom part of a ceramic vessel, dark brown, with a lightly smoothed surface. High temper content consisting of mid- and fine-grained crushed ceramics and granite. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.6 cm. 14. Fragment of the rim of a bowl-shaped ceramic vessel, dark brown, with a lightly smoothed surface. High temper content consisting of fine-grained granite and mica. Medium-fired ceramic mass, crumbling and flaking. Rim Dm: 16.4 cm, preserved H: 4.5 cm. 15. Fragment of a forged iron band, a casket brace or fitting (?). L: 1.8 cm, W: 1.1 cm. 16. Preserved *in situ*, the remains of a casket, rectangular

outline. Given the state of preservation, it was not possible to reconstruct the exact structure of the item. Dimensions 26.0×22.0 cm. 17. Fragment of the body of a ceramic vessel, dark grey, with a rough surface. High temper content consisting of mid- and fine-grained crushed ceramics and granite. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.9 cm. 18. Fragment of the body of a ceramic vessel, brick-red, with a carelessly smoothed surface. High temper content consisting of fine-grained crushed ceramics and granite. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.8 cm.

Dating: *stadium* V.

Grave 632 (cremation urn with the remains of a pyre, disturbed) **SQ 18-19 B, 18-20 A**

The pit was revealed at the depth of 1.18 m, under a medieval layer. Close to oval-shaped, sized 0.60×0.55 m, with a maximum thickness of 0.20 m (Pl. CLVIII). Filled with fine-grained, dark brown sand saturated with burnt material and small charcoals (not analysed). In it, ceramic fragments and individual burnt bones. In the central section there were two fractured vessels, with upper parts destroyed by medieval ploughing. *In situ*, an urn (1) filled with burnt bones, and S of that a vessel (2) turned upside down (Pl. CCIII:4). Probably, the vessel originally covered the urn (1). Unidentified sex, adult.

Inventory (Pl. CLVIII): 1. Reconstructed, thin-walled ceramic vessel with a strongly curved body, brick-red, light brown in places, with a carefully smoothed surface. High temper content consisting of fine-grained crushed ceramics and sand. Well-fired to produce a hard and strong ceramic mass. Bottom Dm: 5.5 cm, preserved H: 11.2 cm. 2. Reconstructed bowl-shaped ceramic vessel, preserved without the bottom. By the rim, a transverse handle stuck on and protruding slightly above the upper edge. Brick-red, light brown in places, smoothed surface. High temper content consisting of fine-grained crushed ceramics and sand. Well-fired to produce a hard and strong ceramic mass. Rim Dm: 31.2 cm, preserved H: 9.4 cm.

Dating: early Iron Age.

Grave 633 (cremation pit with the remains of a pyre) **SQ 18-19 B**

The pit was discovered at the depth of 1.35 m, under a medieval layer. Aligned NNW-SSE, oval-shaped outline sized 1.55×1.10 m and with a maximum thickness of 0.50 m (Pl. CLVIII). Filled with compacted mid-grained sand (dark grey mixed with yellow) and the remains of dark brown burnt material. In it, many small charcoals (not analysed) were found. Some

0.15 m below, in the central section of the pit, a cluster of three stones; other, smaller stones were scattered throughout the pit. N of the cluster of stones, a casket fitting (1) with no signs of fire. At this level, down to the bottom of the pit, crumbled fragments of burnt bones and ceramic fragments (2–7) from the Roman Period and early Iron Age; the latter are a secondary deposit. Unidentified sex, unidentified age.

Inventory (Pl. CLVIII): 1. Fragment of a forged iron casket brace. Preserved L: 2.8 cm, band W: 0.5 cm. 2. Fragment of the body of a ceramic vessel, dark brown, with a smoothed surface. High temper content consisting of mid- and fine-grained granite and mica. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 6.7 cm. 3–6. Four fragments of bodies of early Iron Age ceramic vessels, brick-red and brown, with a smeared coat on the surface. High temper content consisting of mid- and coarse-grained crushed ceramics and granite. Well-fired to produce a hard and strong ceramic mass. Preserved H: 6.0 cm, 8.5 cm, 4.1 cm, 5.6 cm. 7. Thirty-five fragments from bodies of ceramic vessels from the early Iron Age and the Roman Period.

Dating of finds: early Iron Age; Roman Period.

Dating of grave: Roman Period.

Grave 634 (cremation pit with the remains of a pyre, disturbed) **SQ 18-19 B, 18-20 A**

The grave was discovered at the depth of 1.40 m, under a medieval layer. Feature 618 was sunk into its W section to the bottom. The pit of grave 634 intersected the W section of cremation grave 638. Roughly circular, sized 1.80×1.90 m and with a maximum thickness of 0.55 m (Pl. CLX). In the S section of the top there was a stone (0.40–0.45 m). Filled with compacted mid-grained sand (dark grey mixed with yellow) and the remains of burnt material. In it, numerous small charcoals (alder) were present. Some 0.20 m below the level of capture, in the central section of the pit, a cluster of stones was revealed, and throughout the grave pit, down to the bottom, crumbled fragments of burnt bones and ceramic fragments (1–18) from the Roman Period and early Iron Age; the latter were a secondary deposit. Unidentified sex, adult.

Inventory (Pl. CLX): 1–2. Two fragments of the body of a ceramic vessel, decorated with grooved lines, probably triangles shaded with short lines. Dark brown, carelessly smoothed surface. High temper content consisting of fine-grained granite and mica. Analogous to fragment (5) found in grave 638. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.6 cm, 2.5 cm. 3. Fragment of the body of a ceramic vessel, black, with a lightly smoothed surface. High temper content

consisting of fine-grained granite and mica. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 1.8 cm. 4–18. Fifteen fragments from bodies of early Iron Age ceramic vessels, brick-red, dark brown and black, with rough and with a smeared surfaces. High temper content consisting of mid- and fine-grained crushed ceramics and granite. Well-fired to produce a hard and strong ceramic mass. Preserved H: 3.3 cm, 2.8 cm, 1.5 cm, 2.8 cm, 1.7 cm, 1.6 cm, 1.9 cm, 2.0 cm, 1.4 cm, 2.4 cm, 2.6 cm, 1.6 cm, 1.3 cm, 2.3 cm, 2.0 cm. **Dating of finds:** early Iron Age; earlier than *stadium* IIA (see the description of the feature 618).

Dating of grave: earlier than *stadium* IIA (see the description of the feature 618).

Grave 635 (cremation-inhumation, disturbed) **SQ 17-19 D, 17-20 C, 18-19 B, 18-20 A**

The grave pit, which had been disturbed by an archaeological trench made in 1994, was revealed at the depth of 1.60 m. Some 0.30 m below, the outline became clearly apparent. The grave was aligned N-S, with an oval outline, sized 2.50×1.00 m, with a maximum thickness of 0.45 m (Pl. CLXI). Filled with loose mid-grained dark yellow sand with grey and dark brown greasy intrusions – remains from decomposed organics (fabric, fur [?]). In the fill layer, many hardpan streaks and a single stone. In the N section of the grave, at the bottom of the pit, broken fragments of arm long bone shanks and burnt bones scattered throughout the pit were discovered. In the SW section, a crushed amber bead (1), and fragments of ceramic vessels were present throughout the pit (2–4). Unidentified sex, adult; burnt bones: unidentified sex, unidentified age.

Inventory (Pl. CLXI): 1. Badly crushed amber bead, dark honey-coloured, transparent. Wt: 0.5 g. 2. Fragment of the rim of a ceramic vessel, bowl-shaped, black, with a smoothed surface. High temper content consisting of fine-grained granite and mica. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.1 cm. 3. Fragment of the body of a ceramic vessel, thick-walled, light brown, with a roughened surface. High temper content consisting of fine-grained granite and mica. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.9 cm. 4. Fifteen fragments from bodies of ceramic vessels from the Roman Period. **Dating:** Roman Period.

Grave 636 (inhumation, destroyed, opened) **SQ 18-18 B, D; 18-19 A, C**

The top of the grave became apparent at the depth of 1.00 m. At this level, three burnt bones (not analysed) were found, presumably a secondary deposit unrelated to this grave. Some 0.10–0.18 m below, a grave pit

was revealed aligned N-S, roughly rectangular with rounded edges and sized 2.35×1.00 m. The maximum thickness was ca. 0.20 m (Pl. CLXI). Filled with loose, fine-grained light yellow sand with numerous hardpan streaks. At the bottom of the pit, in the NW section, fragments of a calvaria, lower jaw with teeth and loose individual teeth were discovered, as well as three ceramic fragments (1–3). The arrangement of the calvaria indicates that the individual was placed on the right side of the body with the head pointing N. Man, *maturus* (40–50 years old).

Inventory (Pl. CLXI): 1–3. Three fragments of bodies from various ceramic vessels, black, dark brown and grey, with smoothed and rough surfaces. High temper content consisting of fine-grained granite and mica. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.9 cm, 1.8 cm, 1.4 cm.

Dating: Roman Period.

Grave 637 (cremation pit with the remains of a pyre) **SQ 18-20 A, B**

The pit was revealed at the depth of 1.75 m, under a medieval layer. Oval-shaped, sized 0.80×0.50 m and with a maximum thickness of 0.20 m (Pl. CXXI). Filled with dark yellow sand mixed with dark brown-grey sand with intrusions of burnt material and small charcoals (not analysed). In it, a ceramic fragment (1) and a single burnt bone. Unidentified sex, unidentified age.

Inventory (Pl. CXXI): 1. Fragment of the body of a ceramic vessel, dark grey, with a rough surface. High temper content consisting of mid- and fine-grained crushed ceramics and granite. Medium-fired, producing a poorly fired ceramic mass, crumbling and flaking. Preserved H: 1.8 cm.

Dating: Roman Period.

Grave 638 (cremation pit with the remains of a pyre, disturbed) **SQ 18-20 A**

Fragment of the E section of the pit was discovered at the depth of 1.63 m, under a medieval layer. Cremation grave 634 had been sunk into the W section, destroying it down to the bottom. The preserved part of the pit was oval-shaped, with dimensions of 1.00×1.00 m and a maximum thickness of 0.30 m (Pl. CLXII, CCIII:3). In the top part there was a stone (0.18×0.18 m) and a medieval ceramic fragment (a secondary deposit) (10). Filled with compacted mid-grained, dark grey and yellow sand and the remains of burnt material forming horizontal layers interspersed with the sand described above. Numerous small charcoals (not analysed) were noted, and ceramic fragments (1–9) from the Roman Period and early Iron

Age; the latter a secondary deposit, and fragments of burnt bones were scattered throughout the grave pit. Unidentified sex, adult.

Inventory (Pl. CLXII): 1. Fragment of the rim of an early Iron Age ceramic vessel, brick-red, light brown in places, with a carefully smoothed surface. High temper content consisting of fine-grained crushed ceramics. Well-fired to produce a hard and strong ceramic mass. Preserved H: 2.3 cm. 2. Fragment of the rim of an early Iron Age bowl-shaped vessel, brick-red, light brown in places, with a smoothed surface, high temper content consisting of fine-grained crushed ceramics. Well-fired to produce a hard and strong ceramic mass. Preserved H: 3.3 cm. 3. Fragment of the bottom part of a ceramic vessel, dark brown, with a slightly roughened surface. High temper content consisting of mid-grained granite and crushed ceramics. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.4 cm. 4. Fragment of the body of a ceramic vessel, dark brown, with a lightly smoothed surface. High temper content consisting of fine-grained granite and mica. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.3 cm. 5. Fragment of the body of a ceramic vessel decorated with grooved lines, probably triangles filled with short lines. Dark brown, carelessly smoothed surface. High temper content consisting of fine-grained granite and mica. This is analogous to fragments (1–2) found in grave 634. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.3 cm. 6–9. Four fragments of bodies from ceramic vessels, light brown and dark brown, with rough and roughened surfaces. High temper content consisting of mid- and fine-grained granite and mica. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 2.2 cm, 1.7 cm, 1.7 cm, 1.7 cm. 10. Fragment of the body of a ceramic vessel decorated with two horizontal grooved lines, dark brown, with a rough surface. High temper content consisting of mid-grained crushed ceramics. Well-fired to produce a hard and strong ceramic mass. Preserved H: 2.3 cm.

Dating of finds: early Iron Age; earlier than *stadium* IIA (see the description of the feature 618 and grave 634).

Dating of grave: earlier than *stadium* IIA (see descriptions of the feature 618 and grave 634).

Grave 639 (cremation pit with the remains of a pyre, destroyed) **SQ 18-20 A**

At the depth of 1.53 m, under a medieval layer, the top of the grave pit was revealed, destroyed in the E section by an archaeological trench made in 2013. At the time, a thunderstorm caused the collapse of 1.5 m high profiles; the feature was damaged during the removal of mud and soil from the trench. The preserved part of

the pit, with an arched outline, was sized 1.20 m by 0.50 m with a thickness of 0.40 m (Pl. CLXII). Filled with compacted mid-grained, dark grey sand mixed with yellow and the remains of burnt material forming horizontal layers interspersed with the sand described above. In the fill, numerous small charcoals were noted (not analysed), and in the grave pit, four ceramic fragments were found scattered (1–4) along with fragments of burnt bones. Unidentified sex, unidentified age.

Inventory (Pl. CLXII): 1–4. Four fragments from bodies of ceramic vessels, light brown and dark brown, with carelessly smoothed surfaces. High temper content consisting of mid- and fine-grained granite and mica. Medium-fired, producing a poorly fired ceramic mass, crumbling and flaking. Preserved H: 2.7 cm, 1.6 cm, 1.8 cm, 1.1 cm.

Dating: Roman Period.

Grave 640 (cremation pit with the remains of a pyre, destroyed) **SQ 18-20 B**

The bottom part of the grave pit became apparent at the depth of 1.28 m. The N section was destroyed by an archaeological trench made in 2013. At the time, a thunderstorm caused the collapse of 1.5 m high profiles; the feature was damaged during the removal of mud and soil from the trench. The pit is aligned NNW-SSE, close to oval-shaped, with preserved dimensions of 0.75×0.35 and a maximum thickness of 0.08 m (Pl. CLXII). Filled with mid- and coarse-grained grey-yellow sand with a high clay content mixed with burnt material. In the S section, small clusters of charcoals (alder). In the grave, one burnt bone and two ceramic fragments were discovered (1–2). Unidentified sex, unidentified age.

Inventory (Pl. CLXII): 1–2. Two fragments of bodies from ceramic vessels, light brown, with rough surfaces. High temper content consisting of fine-grained granite and mica. Medium-fired ceramic mass, crumbling and flaking. Preserved H: 1.9 cm, 2.1 cm.

Dating: Roman Period.

II.3. STRAY FINDS (MAREK BACZEWSKI) (Pl. CLXIII–CXCIII; CCXIV–CCXVIII)

1. Bow of a brass spring-cover brooch, West series. Bent out of shape, cast with a forged finish, engraved ornamental lines. Profiled crest decorated with an imitation of incised wire. Group A.II. L: 2.5 cm, W: 1.1 cm. 2. Brass spring-cover brooch, West series. Cast bow with a forged finish. Decorated with a double row of punched dots. Prominent profiled crest. Spring covers decorated with crossed engraved lines. Type A.II.28. L: 6.8 cm,

W: 5.2 cm. 3. Spring-cover brooch, East series, made from a copper alloy. Cast bow with a forged finish. Decorated with three stripes of imitation incised wire. Spring covers and foot decorated with an engraved line ornament. Prominent crest. Type A.II.38. L: 4.3 cm, W: 3.2 cm. 4. Fragment of the bow of a spring-cover brooch, East series, made from a copper alloy. Cast, with a forged finish. Bow and foot decorated with engraved lines imitating incised wire. Type A.II.38 (?). Preserved L: 3.2 cm, W: 1.5 cm. 5. Fragment of the bow of a spring-cover brooch, East series, made from a copper alloy. Crest decorated with engraved lines. Type A.II.38 (?). Preserved L: 3.4 cm, W: 1.1 cm. 6. Fragment of the bow of a spring-cover brooch, East series, made from a copper alloy. Cast, with a forged finish. The decoration consists of a double engraved line at the edges and engraved lines converging to form a triangle in the middle section. Crest decorated with an imitation of incised wire. Type A.II.40-41. Preserved L: 2.5 cm, W: of the crest: 2.1 cm. 7. Spring-cover brooch, East series, made from a copper alloy. Cast bow with a forged finish, decorated with double engraved lines. Fragment of spring and pin preserved separately. Type A.II.40-41. L: 3.9 cm, crest W: 1.3 cm. 8. Partially melted spring-cover brooch, East series, made from a copper alloy. Cast bow. Ornamental engraved lines on bow and crest. Type A.II.40-41. L: 4.8 cm, crest W: 1.7 cm. 9. Spring-cover brooch, East series, made from a copper alloy. Cast bow with a forged finish. Bow decorated with double engraved lines. Crest decorated with engraved lines forming triangles. Type A.II.40-41. L: 3.5 cm, crest W: 1.9 cm. 10. Spring-cover brooch, East series, made from a copper alloy. Cast bow with a forged finish. Bow decorated with double engraved lines. Crest decorated with engraved lines forming triangles. Type A.II.40-41. L: 3.4 cm, W: 3.8 cm. 11. Bow of a spring-cover brooch, East series, made from a copper alloy. Cast, with a forged finish. Bow decorated with double engraved lines. Crest decorated with an imitation of incised wire. Type A.II.40-41. Preserved L: 3.0 cm, W: 1.6 cm. 12. Bow of a spring-cover brooch, East series, made from a copper alloy. Cast, with a forged finish. Decorated at the edges with a double engraved line. In the middle section of the bow, under the crest and on the foot engraved ornamental lines converging to form a triangle with a punched dot at an apex. Profiled crest. Type A.II.40-41. Preserved L: 3.8 cm, crest W: 1.6 cm. 13. Brass spring-cover brooch, East series. Cast bow with a forged finish, decorated with three stripes of imitation incised wire. On the crest, two stripes of imitation pearl wire and a double engraved line forming triangular shapes. Type A.II.40-41. L: 3.4 cm, W: 3.4 cm. 14. Spring-cover brooch, East series, made from a copper alloy. Cast

bow with a forged finish. Engraved line ornament on the bow, crest and foot. Type A.II.40-41. L: 3.3 cm, W: 3.4 cm. 15. Spring-cover brooch, East series, made from a copper alloy. Bow bent out of shape, cast, with a forged finish. Decorated with an ornament of double engraved lines. Profiled crest. Type A.II.40-41. Reconstructed dimensions: L: 3.8 cm, W: 2.8 cm. 16. Spring-cover brooch, East series, made from a copper alloy. Cast bow with a forged finish. Decorated with engraved lines on the bow and foot, and under the crest. Right cover damaged and fastened with a rivet. Type A.II.40-41. Preserved L: 2.7 cm, preserved W: 2.2 cm. 17. Fragment of the bow of a silver spring-cover brooch, East series. Cast, with a forged finish. Decorated with an engraved line on the bow and foot. Profiled crest. Type A.II.40-41. Preserved L: 2.8 cm, W: 1.8 cm, Wt: 5.71 g. 18. Bow of a spring-cover brooch, East series, made from a copper alloy. Cast, with a forged finish. Decorated with three stripes of punched dots. Profiled crest. Under the crest, an ornament made up of semi-circles. Type A.II.40-41. Preserved L: 3.8 cm, preserved W: 2.0 cm. 19. Fragment of the bow of a spring-cover brooch, East series, made from a copper alloy. Cast bow with a forged finish. Profiled crest. Type A.II.40-41 (?). Preserved L: 2.0 cm, W: 1.2 cm. 20. Bow of a spring-cover brooch, East series, made from a copper alloy. Cast, with a forged finish. Decorated with a double engraved line in the upper part of the bow and single line on the foot. Profiled crest. Type A.II.40-41. L: 3.1 cm, W: 2.5 cm. 21. Spring-cover brooch, East series, made from a copper alloy. Cast bow with a forged finish, decorated with three stripes of imitation incised wire and two engraved triangles ending in punched dots. Four punched dots over the crest. More stripes of imitation incised wire above the crest and on the crest itself. Type A.II.40-41. L: 4.2 cm, W: 4.4 cm. 22. Partially melted bow of a spring-cover brooch, East series, made from a copper alloy. Cast, with a forged finish. Faintly visible ornament made up of stripes of imitation incised wire and an engraved triangle ending in a punched circle. On the crest, single engraved line forming ornamental triangles. Type A.II.40-41. L: 5.5 cm, preserved W: 2.2 cm. 23. Spring-cover brooch, East series, made from a copper alloy. Cast bow with a forged finish. The bow is decorated with an engraved line and punched dots. Fragment of an engraved line on the crest. A piece of fabric (flax) is preserved on the brooch spring. Type A.II.40-41. L: 3.3 cm, W: 3.2 cm. 24. Bow of a spring-cover brooch, East series, made from a copper alloy. Cast, with a forged finish, decorated with stripes of imitation incised wire and engraved triangles ending in punched dots. Crest decorated with stripes imitating pearled wires. Type A.II.40-41.

L: 2.6 cm, W: 1.6 cm, Wt: 8.77 g. 25. Fragment of the bow of a spring-cover brooch, East series, made from a copper alloy. Type A.II.40-41. Preserved L: 2.5 cm, W: 1.5 cm. 26. Fragment of the bow of a silver spring-cover brooch, East series. Cast, with a forged finish. Ornamental imitation of incised wire faintly visible. Type A.II.40-41. Preserved L: 1.9 cm, preserved bow W: 1.0 cm, Wt: 2.92 g. 27. Fragment of the bow of a silver spring-cover brooch, East series. Crest and foot decorated with stripes of imitation incised wire. Type A.II.40-41. Preserved L: 2.6 cm, bow W: 1.6 cm, Wt: 4.68 g. 28. Bow of a spring-cover brooch, East series, made from a copper alloy. Type A.II.40-41 (?). Preserved L: 3.6 cm, W: 1.1 cm. 29. Partially melted brooch foot, made from a copper alloy. Type A.II.40-41 (?). Preserved L: 1.6 cm, crest W: 1.3 cm. 30. Fragment of the head of a spring-cover brooch, made from a copper alloy. Group A.II. L: 1.5 cm, W: 1.2 cm. 31. Fragment of a spring and cover of a spring-cover brooch, East series, made from a copper alloy. Group A.II. Preserved L: 0.8 cm, preserved W: 1.2 cm. 32. Fragment of the cover of a spring-cover brooch, East series, made from a copper alloy. Decorated with engraved lines. Type A.II.40-41 (?). Preserved L: 1.0 cm, preserved W: 2.2 cm. 33. Eye brooch, main series, made from a copper alloy. Cast bow with a forged finish. In the middle of the bow a stripe of imitation incised wire, ornamental engraved lines at the edges. Prominent crest. Type A.III.53. L: 6.3 cm, W: 2.3 cm. 34. Brass eye brooch, main series. Cast bow with a forged finish. Foot decorated with engraved lines. Prominent crest. Type A.III.53. L: 5.2 cm, W: 2.2 cm. 35. Fragment of the bow of an eye brooch Prussian series, made from a copper alloy. Cast, with a forged finish. On the bow, an ornamental strip of imitation incised wire. Two eyelets on the head. Type A.III.57. Preserved L: 2.3 cm, W: 1.9 cm. 36. Bow of an eye brooch, Prussian series, made from a copper alloy. Cast, with a forged finish. Foot decorated with engraved lines. Gentle crest. Type A.III.60. L: 6.2 cm, bow W: 1.0 cm. 37. Partially melted bow of an eye brooch, Prussian series, made from a copper alloy. Cast, with a forged finish. On the foot, two pairs of eyelets and decorative engraved lines. Type A.III.61. Preserved L: 4.6 cm, bow W: 1.5 cm. 38. Fragment of an eye brooch, made from a copper alloy. Cast bow with a forged finish, decorated with a stripe of imitation pearly wire. Type A.III.60-61. Preserved L: 2.5 cm, bow W: 1.3 cm. 39. Partially melted fragment of an eye brooch, Prussian series, made from a copper alloy. Cast bow with a forged finish. On the bow, an ornamental strip of imitation incised wire. Type A.III.60-61. Preserved L: 2.0 cm, W: 1.1 cm. 40. Fragment of an eye brooch made from a copper alloy. Cast bow with

a forged finish. Decorated with an engraved line at the end of the foot. Group A.III. Preserved L: 3.9 cm, W: 1.0 cm. 41. Fragment of an eye brooch made from a copper alloy. No visible eyelets on the foot. Group A.III. Preserved L: 4.5 cm, W: 0.9 cm. 42. Fragment of an eye brooch, Prussian series, made from a copper alloy. Cast bow with a forged finish. On the bow, a strip of imitation pearly wire. On the foot, a punched eyelet is visible. Group A.III. Preserved L: 3.0 cm, W: 1.2 cm. 43. Pin of an eye brooch made from a copper alloy. Group A.III. Preserved L: 6.4 cm, W: 0.3 cm. 44. Fragment of a spring and pin of an eye brooch made from a copper alloy. Group A.III. Preserved L: 2.6 cm, W: 1.0 cm. 45. Pin of an eye brooch, Prussian series, made from a copper alloy. Preserved fragment of the spring. Group A.III. L: 7.0 cm. W: 0.3 cm. 46. Fragment of the spring of an eye brooch made from a copper alloy. Group A.III. Preserved L: 0.9 cm, preserved W: 1.3 cm. 47. Fragment of the head and bow of an eye brooch made from a copper alloy. On the bow, an ornamental strip of imitation incised wire. Group A.III. Preserved L: 1.4 cm, bow W: 0.8 cm. 48. Fragment of the head and bow of an eye brooch made from a copper alloy. On the bow, a strip of imitation incised wire. Group A.III. Preserved L: 1.8 cm, bow W: 0.8 cm. 49. Broad-headed brooch with crest on the bow and foot, made from a copper alloy. Cast bow with a forged finish. Foot terminates in a profiled knob. Spring enclosed within a cylinder. Type A.IV.72, variant 2. L: 4.4 cm, W: 3.5 cm. 50. Fragment of a broad-headed brooch with a spring inside a cylinder, made from a copper alloy. Cast bow. Cylinder decorated with engraved lines. Type A.IV.72, variant 2. L: 2.6 cm, bow W: 0.8 cm. 51. Trumpet-headed brooch made from a copper alloy. Cast bow with a forged finish. Two crests, one on the bow and one on the foot. Foot terminates in a knob. Damaged spring. Type A.IV.77. L: 4.0 cm, head crest W: 0.9 cm. 52. Bow of a broad-headed brooch made from a copper alloy. Cast bow with a forged finish. Two profiled crests – on the bow and on the foot. Foot terminates in a profiled knob. Type similar to A.IV.78. L: 3.9 cm, W: 1.2 cm. 53. Partially melted fragment of a silver broad-headed brooch with two crests. Type A.IV.78 (?). Preserved L: 2.6 cm, W: 0.7 cm, Wt: 4.92 g. 54. Brass bow of a brooch derived from the strongly profiled variants. Cast bow with a forged finish. Foot terminates in a conical knob. Mazovian form, type 1A. L: 4.2 cm, crest W: 1.1 cm. 55. Triple-crest brooch made from a copper alloy. Cast bow with a forged finish. Foot terminates in a knob. Type A.V.95. L: 3.5 cm, W: 2.0 cm. 56. Triple-crest brooch made from a copper alloy. Cast bow with a forged finish. Traces of solder remaining from embossed silver, gilt or gold foil on the crests and

the cylinder. Spring contained inside a cylinder. Type A.V.95. L: 4.8 cm, W: 3.1 cm. 57. Fragment of the bow of a triple-crest brooch, made from a copper alloy. Cast, with a forged finish. Foot terminates in a knob. Type A.V.96. Preserved L: 2.4 cm, crest W: 2.2 cm. 58. Triple-crest brooch made from a copper alloy. Cast bow with a forged finish. Foot terminates in a knob. Traces of solder remaining from embossed silver, gilt or gold foil on the crests and the cylinder. Spring contained inside a cylinder. Type A.V.96. L: 3.8 cm, W: 2.6 cm. 59. Triple-crest brooch made from a copper alloy. Remains of silver foil on upper crest and cylinder. Cast bow with a forged finish. Foot terminates in a knob. Spring contained inside a cylinder. Remains of an unidentified fabric on the spring. Type A.V.96. L: 4.5 cm, W: 2.2 cm. 60. Partially melted bow of a triple-crest brooch made from a copper alloy. Cast, with a forged finish. Foot terminates in a small knob. Type A.V.96. L: 4.3 cm, W: 1.5 cm. 61. Bow of a triple-crest brooch made from a copper alloy. Cast bow with a forged finish. Foot terminates in a knob. Type A.V.96. Preserved L: 3.9 cm, W: 1.7 cm. 62. S-shaped brooch with crested head and foot, made from a copper alloy. Cast bow with a forged finish. Type A.V.109/110. L: 3.6 cm, preserved W: 2.1 cm. 63. S-shaped brooch with crested head and foot, made from a copper alloy. Cast bow with a forged finish. Remains of unidentified thread on the spring. Type A.V.109/110. L: 4.6 cm, bow W: 0.6 cm. 64. Crest-headed brooch made from a copper alloy. Cast bow with a forged finish. Type A.V.120. L: 3.1 cm, bow W: 0.7 cm. 65. Crest-headed brooch made from a copper alloy. Cast bow with a forged finish. Imitation incised wire at the transition point between bow and foot and at the end of the foot. Type similar to A.V.120. L: 3.3 cm, W: 2.1 cm. 66. Bow of a forged iron crest-headed brooch. Head and bow decorated with horizontal rows of engraved lines. Type similar to A.V.123. L: 2.8 cm, W: 0.7 cm. 67. Crest-headed brooch made from a copper alloy. Cast bow with a forged finish. Wider foot. Two fragments of flax thread at the spring. Type A.V.126. L: 3.2 cm, preserved W: 2.3 cm. 68. Fragment of a crest-headed brooch made from a copper alloy. Cast bow with a forged finish. Stripes of ornamental imitation incised wire at the transition point between bow and head and foot. Type A.V.128. L: 3.0 cm, crest W: 1.9 cm. 69. Crest-headed brooch with a wider foot, made from a copper alloy. Cast bow with a forged finish. Type A.V.128. L: 3.2 cm, bow W: 1.1 cm. 70. Bow of a crest-headed brooch with a wider foot, made from a copper alloy. Cast, with a forged finish. Bow and crest decorated with stripes of imitation incised wire. Crest additionally decorated with concentric circles. Type A.V.128. L: 3.0 cm, W: 1.2 cm. 71. Fragment of the bow

of a silver brooch. Wider foot. Group A.V, series 8 (?). Preserved L: 1.0 cm, W: 1.6 cm, Wt: 3.42 g. 72. Crest-headed brooch with a wider foot, made from a copper alloy. Cast bow with a forged finish. Type A.V.128. L: 3.2 cm, W: 3.1 cm. 73. Bow of a knee-shaped brooch made from a copper alloy. Cast, with a forged finish. Profiled head. Type similar to A.V.132. Preserved L: 3.5 cm, bow W: 0.5 cm. 74. Knee-shaped brooch made from a copper alloy. Cast bow with a forged finish. Head decorated with two rows of punched circles and stripes of imitation incised wire. Ornamental double engraved line at the transition point between bow and foot. Type A.V.132. L: 4.6 cm, W: 1.7 cm. 75. Brass crest-headed brooch with a round shield on the foot. Cast bow with a forged finish. On the crest, a fragment of gilt or gold foil and remains of tin solder. Base of crest decorated with incised wire made from a copper alloy. Type similar to A.V.132 and A.V.137. L: 2.8 cm, W: 2.1 cm, bow W: 0.4 cm. 76. Brooch with an arched bow, made from a copper alloy. Cast bow with a forged finish. Upper chord wound around the head. Decorated with engraved lines on head, foot and catchplate. Type similar to A.V.148. L: 3.4 cm, preserved W: 1.7 cm. 77. Arched bow of a brooch made from a copper alloy. Cast, with a forged finish. Smooth wire wound around head. Foot decorated with engraved lines. Type similar to A.V.148. L: 3.8 cm, W: 0.4 cm. 78. Brooch with an arched bow made from a copper alloy. Cast bow with a forged finish. Chord wound around the head. Decorated with a double engraved line at the transition point between bow and foot. Type similar to A.V.148. L: 3.9 cm, preserved W: 1.1 cm. 79. Bow of a brooch with a hooked head made from a copper alloy. Cast, with a forged finish. Type A.V.148. L: 2.8 cm, W: 0.8 cm. 80. Bow of a brooch made from a copper alloy. Cast, with a forged finish. Decorated with engraved lines at the edges. Wider foot. Type A.V.148. L: 2.8 cm, W: 0.8 cm. 81. Brooch with an upper chord, made from a copper alloy. Cast bow with a forged finish. Decorated with punched rosettes made up of triangles and a double row of triangles at the edges. Type similar to A.V.148. L: 4.1 cm, bow W: 0.8 cm. 82. Brooch made from a copper alloy. Cast bow with a forged finish. Type A.V.148. Preserved L: 3.2 cm, bow W: 0.8 cm. 83. Bow of a brooch made from a copper alloy. Cast, with a forged finish. Decorated with rosettes made up of triangles and dots at the edges. Type similar to A.V.148. Preserved L: 3.8 cm, W: 0.7 cm. 84. Bow of a crest-headed brooch made from a copper alloy. Cast with a forged finish. Traces of a tin coating on the entire bow. Group A.V, series 11, type *Leonów*. L: 3.1 cm, W: 2.5 cm. 85. Silver crossbow brooch with a tendril foot and a knee-shaped bow. Bow forged with a forging die.

Type A.VI.161-162. L: 3.6 cm, W: 1.6 cm, Wt: 3.68 g. **86.** Silver crossbow brooch with a tendril foot, knee-shaped bow. Bow forged with a forging die. Spring axis terminates in knobs. Type A.VI.161-162. L: 3.4 cm, W: 2.4 cm, Wt: 6.12 g. **87.** Bow of a crossbow brooch with a tendril foot, made from a copper alloy. Forged with a forging die. Type A.VI.161-162 or A.VI.168. L: 4.8 cm, W: 0.3 cm. **88.** Bow of a crossbow brooch with a tendril foot, made from a copper alloy. Forged with a forging die, bent out of shape. Type A.VI.161-162 or A.VI.168. L: 3.8 cm, W: 0.3 cm. **89.** Partially melted fragment of the bow of a crossbow brooch with a tendril foot, made from a copper alloy. Type A.VI.161-162 or A.VI.168. Preserved L: 2.9 cm, W: 0.3 cm. **90.** Crossbow brooch with a tendril foot, knee-shaped bow, made from a copper alloy. Bow forged with a forging die. Type A.VI.161-162. L: 4.7 cm, W: 2.3 cm. **91.** Silver crossbow brooch with a tendril foot, with an arch-shaped bow. Bow forged with a forging die. Axis of the spring made from a copper alloy. Spring and pin preserved separately. Type A.VI.161-162. L: 3.8 cm, bow W: 0.3 cm, Wt: 4.45 g. **92.** Crossbow brooch with a tendril foot, with an arch-shaped bow, made from a copper alloy. Bow forged with a forging die. Flat rectangular fields on the head, in the lower part of the bow and on the foot. Type A.VI.161-162. L: 4.0 cm, W: 1.4 cm. **93.** Bow of a crossbow brooch with a tendril foot, made from a copper alloy. Arch-shaped, forged with a forging die. Flat rectangular fields on the head, in the lower part of the bow and on the foot. Type A.VI.161-162 or A.VI.168. L: 4.1 cm, W: 0.3 cm. **94.** Silver crossbow brooch with a tendril foot, with an arch-shaped bow. Bow forged with a forging die. Metope fields on the head, bow and foot. Type A.VI.161-162. L: 3.0 cm, W: 1.2 cm, Wt: 3.01 g. **95.** Crossbow brooch with a tendril foot, with an arch-shaped bow, made from a copper alloy. Bow forged with a forging die. Metope field on the foot. Knobs at the ends of the spring axis. Type A.VI.161-162. L: 4.4 cm, W: 2.8 cm. **96.** Fragment of the bow of a silver crossbow brooch with a tendril foot. Forged with a forging die. Metope field on the bow and foot. Type A.VI.161-162 or A.VI.168. Preserved L: 3.7 cm, W: 0.3 cm, Wt: 1.12 g. **97.** Fragment of the bow of a silver crossbow brooch with a tendril foot. Arch-shaped, forged with a forging die. Metope field on the head, bow and foot. Type A.VI.161-162 or A.VI.168. Preserved L: 2.8 cm, W: 0.3 cm, Wt: 1.41 g. **98.** Bow of a silver crossbow brooch with a tendril foot. Arch-shaped, forged with a forging die. Pin preserved separately. Type A.VI.161-162 or A.VI.168. L: 4.1 cm, W: 0.3 cm, Wt: 4.10 g. **99.** Crossbow brooch with a tendril foot, made from a copper alloy. Bow forged with a forging die. Metope ornamentation on the bow and

foot. Knobs at the ends of the axis. Type A.VI.161-162. L: 3.7 cm, bow W: 0.3 cm. **100.** Crossbow brooch with a tendril foot, with an arched bow, made from a copper alloy. Bow forged with a forging die. Type A.VI.161-162. L: 4.0 cm, bow W: 0.4 cm. **101.** Crossbow brooch with a tendril foot, with an arch-shaped bow, made from a copper alloy. Bow forged with a forging die. Head terminates in a knob. Type A.VI.161-162. L: 4.9 cm, bow W: 0.4 cm. **102.** Silver crossbow brooch with a tendril foot, with a knee-shaped bow. Bow forged with a forging die. A high knob on the head decorated with wound wire and a ring of incised wire. Type A.VI.161-162. L: 6.1 cm, bow W: 0.4 cm, Wt: 8.38 g. **103.** Crossbow brooch with a tendril foot, with a knee-shaped bow, made from a copper alloy. Bow forged with a forging die. Type A.VI.161-162. L: 4.6 cm, bow W: 0.4 cm. **104.** Silver bow of a crossbow brooch with a tendril foot. Knee-shaped bow forged with a forging die. Type A.VI.161-162 or A.VI.168. L: 4.9 cm, W: 0.4 cm, Wt: 4.07 g. **105.** Fragment of the bow of a crossbow brooch with a tendril foot, made from a copper alloy. Forged with a forging die. Type A.VI.161-162. Preserved L: 3.4 cm, W: 3.1 cm. **106.** Crossbow brooch with a tendril foot, with a knee-shaped bow, made from a copper alloy. Bow forged with a forging die. Type A.VI.161-162. L: 6.7 cm, W: 2.8 cm. **107.** Fragment of a crossbow brooch with a tendril foot, made from a copper alloy. Bow forged with a forging die. Type A.VI.161-162. Preserved L: 5.6 cm, bow W: 0.4 cm. **108.** Bow of a crossbow brooch with a tendril foot, made from a copper alloy. Arch-shaped bow forged with a forging die. Type A.VI.161-162 or A.VI.168. L: 4.0 cm, W: 0.4 cm. **109.** Crossbow brooch with a tendril foot, with a knee-shaped bow, made from a copper alloy. Bow forged with a forging die. Type A.VI.161-162. L: 5.1 cm, bow W: 0.4 cm. **110.** Damaged bow of a crossbow brooch with a tendril foot, made from a copper alloy. Bow forged with a forging die. Type A.VI.161-162. L: 4.6 cm, W: 0.3 cm. **111.** Bow of a silver crossbow brooch with a tendril foot. Bow (bent out of shape), forged with a forging die. Decorated with gold foil and silver rings of incised wire. Knob on the head decorated with a ring of silver incised wire. Type similar to A.VI.161-162. L: 4.7 cm, W: 0.4 cm, Wt: 6.35 g. **112.** Fragment of a crossbow brooch with a tendril foot, with an arched bow, made from a copper alloy. Bow forged with a forging die, decorated with rings of incised wire. Knobs at the ends of the spring axis. Type similar to A.VI.161-162. Preserved L: 3.0 cm, W: 1.9 cm. **113.** Silver crossbow brooch with a tendril foot, slightly knee-shaped bow forged with a forging die, decorated with rings of smooth wire and gold foil in between. Type similar to A.VI.161-162.

L: 4.6 cm, bow W: 0.3 cm, Wt: 5.19 g. **114.** Silver crossbow brooch with a tendril foot, slightly knee-shaped bow, forged with a forging die, decorated with rings of smooth wire with gilt foil in between. Type similar to A.VI.161-162. L: 4.7 cm, bow W: 0.4 cm, Wt: 5.69 g. **115.** Bow of a crossbow brooch with a tendril foot, made from a copper alloy. Arched, forged with a forging die. Type A.VI.161-162 or A.VI.168. L: 5.0 cm, W: 0.3 cm. **116.** Bow of a crossbow brooch with a tendril foot, made from a copper alloy. Arched, forged with a forging die. On the head, a prominent knob decorated with smooth wire. Type A.VI.161-162 or A.VI.168. L: 4.0 cm, W: 0.4 cm. **117.** Bow of a silver crossbow brooch with a tendril foot. Knee-shaped bow, forged with a forging die. Metope fields on the head, bow and foot. Two holes for spring axes. Type similar to A.VI.165. L: 5.4 cm, W: 0.4 cm, Wt: 3.01 g. **118.** Bow of a silver crossbow brooch with a tendril foot. Knee-shaped, forged with a forging die. Metope fields on the head, bow and foot. Two holes for spring axes. Type similar to A.VI.165. L: 5.5 cm, W: 0.4 cm, Wt: 3.63 g. **119.** Bow of a silver crossbow brooch with a tendril foot. Arch-shaped, forged with a forging die. Decorated with rings of incised wire on the head, bow and foot. Head decorated with an ornamental knob. Type A.VI.167. L: 5.1 cm, W: 0.4 cm, Wt: 4.78 g. **120.** Bow of a crossbow brooch with a tendril foot, made from a copper alloy. Forged with a forging die, decorated with rings of incised wire. Type A.VI.167. L: 4.1 cm, W: 0.4 cm. **121.** Silver knob decorated with a ring of incised wire. Most likely from the spring of a brooch, group A.VI or A.VII. L: 0.6 cm, Wt: 0.29 g. **122.** Bow of a silver crossbow brooch with a tendril foot, forged with a forging die, decorated with rings of incised wire. Head terminates in a decorative knob. Foot terminates in a profile. Type A.VI.167. L: 5.8 cm, W: 0.5 cm, Wt: 8.01 g. **123.** Crossbow brooch with a tendril foot, with an arch-shaped bow, made from a copper alloy. Bow forged with a forging die, decorated with rings of incised wire. Head terminates in a decorative knob. Type A.VI.167. L: 5.8 cm, bow W: 0.4 cm. **124.** Fragment of the bow of a crossbow brooch with a tendril foot decorated with rings of incised wire, made from a copper alloy. Bow forged with a forging die. Type A.VI.167. Preserved L: 4.5 cm, bow W: 0.3 cm. **125.** Fragment of the bow of a silver crossbow brooch with a tendril foot decorated with rings of incised wire. Arch-shaped, forged with a forging die. Type A.VI.167. L: 4.4 cm, W: 0.3 cm, Wt: 4.65 g. **126.** Fragment of the bow of a silver crossbow brooch with a tendril foot, decorated with rings of incised wire. Arch-shaped, forged with a forging die. Head terminates in a decorative knob. Type A.VI.167. L: 4.5 cm, bow W: 0.5 cm, Wt: 5.31 g.

127. Crossbow brooch with a tendril foot and an extended 'false' spring, made from a copper alloy. Arch-shaped bow, forged with a forging die. Head terminates in a knob. Metope field in the upper part of the foot. Type A.VI.168. L: 4.6 cm, preserved W: 3.0 cm. **128.** Silver crossbow brooch with a tendril foot and an extended 'false' spring. Knee-shaped bow, forged with a forging die. Head terminates in a profiled knob. Type A.VI.168. L: 3.7 cm, preserved W: 2.1 cm, Wt: 4.98 g. **129.** Silver spring with the chord of a crossbow brooch with a tendril foot. Extended 'false' spring. Type A.VI.168. Preserved L: 1.0 cm, preserved W: 4.1 cm, Wt: 5.19 g. **130.** Fragment of a crossbow brooch with a tendril foot and an extended 'false' spring, made from a copper alloy. Knee-shaped bow, forged with a forging die. Type A.VI.168. Preserved L: 3.9 cm, bow W: 0.4 cm. **131.** Fragment of a crossbow brooch with a tendril foot and an extended 'false' spring, made from a copper alloy. Bow forged with a forging die. Type A.VI.168. Preserved L: 4.2 cm, bow W: 0.4 cm. **132.** Fragment of a silver catchplate of a crossbow brooch with a tendril foot. Group A.VI. Preserved L: 0.9 cm, Wt: 0.21 g. **133.** Fragment of the catchplate of a crossbow brooch with a tendril foot, made from a copper alloy. Group A.VI. Preserved L: 1.6 cm. **134.** Fragment of the silver catchplate of a brooch with a tendril foot. Group A.VI. Preserved L: 2.2 cm, Wt: 0.27 g. **135.** Fragment of a silver catchplate of a crossbow brooch with a tendril foot. Group A.VI. Preserved L: 1.5 cm, preserved W: 0.4 cm, Wt: 0.25 g. **136.** Crossbow brooch with a closed catchment plate, made from a copper alloy. Arch-shaped bow, forged with a forging die. Type A.VI.170. L: 3.6 cm, bow W: 0.4 cm. **137.** Crossbow brooch with a closed catchment plate, made from a copper alloy. Arch-shaped bow, forged with a forging die. Type A.VI.170. L: 4.7 cm, bow W: 0.4 cm. **138.** Crossbow brooch with a closed catchment plate, made from a copper alloy. Arch-shaped bow, forged with a forging die. Type A.VI.170. L: 4.7 cm, bow W: 0.4 cm. **139.** Brooch with a closed catchment plate, with a bow-shaped bow, made from a copper alloy, decorated with engraved lines. Bow forged with a forging die. Head terminates in a small knob. Type similar to A.VI.170. L: 4.1 cm, bow W: 0.5 cm. **140.** Fragment of a silver foot of a crossbow brooch with a closed catchment plate. Decorated with gold foil and incised silver wire rings. Foot terminates in a knob. Group A.VI. Preserved L: 2.5 cm, Wt: 2.39 g. **141.** Fragment of the foot of a crossbow brooch with a closed catchment plate, made from a copper alloy. Decorated with a ring of incised wire. Group A.VI. Preserved L: 2.1 cm, W: 0.6 cm. **142.** Fragment of the bow of a crossbow brooch, made from a copper alloy. Bow forged with a forging die, decorated with engraved lines. Group

A.VI. Preserved L: 2.8 cm, W: 0.6 cm. 143. Bow of a crossbow brooch with a high catchplate, made from a copper alloy. Cast, finished with a forging die. Foot decorated with rings of smooth wire. Group A.VII, series 1. Preserved L: 3.9 cm, bow W: 0.4 cm. 144. Bow of a crossbow brooch with a high catchplate, made from a copper alloy. Cast, finished with a forging die. Group A.VII, series 1. L: 3.1 cm, bow W: 0.4 cm. 145. Bow of a brooch with a high catchplate, made from a copper alloy. Cast, finished with a forging die. A smooth chord groove in the upper section of the head. Fragment of the pin preserved separately. Group A.VII, series 1. Preserved L: 3.0 cm, bow W: 0.4 cm. 146. Fragment of the silver catchplate of the foot of a crossbow brooch with a high catchplate. Group A.VII, series 1. Preserved L: 0.9 cm, preserved W: 1.8 cm, Wt: 0.26 g. 147. Bow of a silver crossbow brooch with a high catchplate. Cast, finished with a forging die. On the head there is a pin for fastening the knob. Group A.VII, series 1. L: 2.5 cm, bow W: 0.3 cm, Wt: 1.35 g. 148. Bow of a crossbow brooch with a high catchplate, made from a copper alloy. Cast bow finished with a forging die. A crest at the transition point between bow and foot. Group A.VII, series 1. Preserved L: 2.9 cm, bow W: 0.3 cm. 149. Brass crossbow brooch with a high catchplate. Cast bow finished with a forging die. A crest at the transition point between bow and foot. The foot is decorated with an engraved line at the end. Group A.VII, series 2. L: 2.8 cm, W: 1.6 cm. 150. Bow of a crossbow brooch with a high catchplate, made from a copper alloy. Cast bow with a forged finish. A slim crest at the transition point between bow and foot. Foot terminates in a profiled knob. Group A.VII, series 1. Preserved L: 4.3 cm, W: 0.4 cm. 151. Crossbow brooch with a high catchplate, made from a copper alloy. Cast bow with a forged finish. Head, bow and foot decorated with slim crests. Group A.VII, series 1. L: 3.4 cm, bow W: 0.4 cm. 152. Fragment of the silver catchplate of a *Rosettenfibel*, decorated with engraved lines forming triangular shapes. Type A.VII.216/217, group 6. Preserved L: 2.1 cm, Wt: 0.61 g. 153. Bow of a silver *Rosettenfibel* with a high catchplate. Cast, with a forged finish, decorated with two rosette knobs of gold foil placed on silver shields and rings of incised wire. Traces of tin solder on the tongue, probably remains of decorative foil. Catchment plate decorated with triangular engraved lines. Type A.VII.216/217, group 6. Preserved L: 5.9 cm, bow W: 0.4 cm, shield W: 1.4 cm, Wt: 11.36 g. 154. Brooch with a knee-shaped bow, made of tin-lead bronze. Cast bow with a forged finish. On the head, a crest decorated with a 'wolf teeth' ornament. Swallow tail foot decorated with an oblique cross. Type similar to Jobst 13C/D and Riha 3.12. L: 4.3 cm, crest W: 2.0 cm. 155. Fragment of a brooch spring with the axis inside, made from a copper alloy. Preserved L: 2.5 cm. 156. Fragment of a brooch foot, made from a copper alloy. Preserved L: 1.9 cm, W: 0.8 cm. 157. Fragment of a catchplate of a silver brooch. Preserved L: 0.7 cm, preserved W: 1.2 cm, Wt: 0.29 g. 158. Spring with chord and pin of a crossbow-shaped brooch made from a copper alloy. L: 3.4 cm, W: 3.0 cm. 159. Fragment of the spring of a brooch set on an axis, made from a copper alloy. Preserved L: 1.8 cm. 160. Fragment of a catchplate of a brooch, made from a copper alloy. Preserved L: 0.9 cm, preserved W: 2.0 cm. 161. Fragment of the spring and pin of a silver brooch. L: 4.2 cm, preserved W: 1.0 cm, Wt: 1.87 g. 162. Partially melted fragment of the bow of a brooch with a head, made from a copper alloy. A preserved fragment of the axis in the head hole. Preserved L: 1.9 cm, W: 0.5 cm. 163. Fragment of a brooch with a wider foot, made from a copper alloy. Preserved L: 2.2 cm, W: 1.0 cm. 164. Spring of a brooch preserved in two fragments, made from a copper alloy. Preserved L: of both fragments: 0.4 cm, preserved W: 1.2 cm, 1.4 cm. 165. Fragment of the spring of a brooch with a preserved pin, made from a copper alloy. L: 3.6 cm. 166. Fragment of the spring of a brooch set on an axis, with a preserved pin, made from a copper alloy. L: 2.3 cm, preserved W: 1.3 cm. 167. Fragment of the spring of a brooch set on an axis, with a preserved fragment of a pin, made from a copper alloy. Preserved L: 1.3 cm, preserved W: 1.6 cm. 168. Iron brooch pin, preserved in two fragments. Preserved L: 2.1 cm and 0.9 cm. 169. Silver knob of the head of a crossbow brooch, wound with smooth silver wire. Preserved L: 1.3 cm, Wt: 0.94 g. 170. Fragment of embossed gilt silver foil decorated with a geometric pattern. Originally it most likely coated a brooch crest. L: 3.3 cm, W: 1.1 cm, Wt: 0.26 g. 171. Fragment of a catchplate of a brooch, made from a copper alloy. Preserved L: 1.1 cm, preserved W: 1.0 cm. 172. Fragment of a brooch pin made from a copper alloy. Preserved L: 1.4 cm. 173. Brooch pin made from a copper alloy. Preserved L: 5.3 cm. 174. Fragment of a brooch pin made from a copper alloy. Preserved L: 2.2 cm. 175. Fragment of the spring of a brooch made from a copper alloy. Preserved L: 1.0 cm, preserved W: 0.8 cm. 176. Fragment of the spring of a brooch made from a copper alloy. Preserved L: 0.4 cm, preserved W: 0.8 cm. 177. Fragment of the spring of a brooch made from a copper alloy. Preserved L: 0.4 cm, preserved W: 1.2 cm. 178. Fragment of the bow of a brooch made from a copper alloy. Preserved L: 2.0 cm, W: 0.8 cm. 179. Fragment of a brooch foot made from a copper alloy. Preserved L: 1.7 cm, W: 1.0 cm. 180. Fragment of the spring of a silver brooch. Preserved L: 0.6 cm, preserved

W: 1.6 cm, Wt: 1.34 g. **181.** Silver shield with filigree. Probably part of a brooch. L: 0.7 cm, W: 0.8 cm, Wt: 0.45 g. **182.** Fragment of a flat piece of silver, probably part of a brooch catchplate. Preserved L: 0.2 cm, preserved W: 0.8 cm, Wt: 0.05 g. **183.** Melted lump of silver. Probably a brooch. L: 3.7 cm, W: 0.5 cm, Wt: 14.08 g. **184.** Fragment of a silver knob from the end of a brooch axis. W: 0.4 cm, H: 0.2 cm, Wt: 0.15 g. **185.** Partially melted fragment of a brooch foot and catchplate, made from a copper alloy. Preserved L: 1.1 cm, preserved W: 1.2 cm. **186.** Iron brooch spring contained in a cylinder. Preserved L: 2.8 cm, W: 0.8 cm. **187.** Fragment of a rod bracelet made from a copper alloy. Cast from a rod, forged and filed finish. Type Natuniewicz 1. Preserved L: 2.7 cm, W: 0.8 cm, Thk: 0.4 cm. **188.** Fragment of a rod bracelet made from a copper alloy. Cast from a rod, forged and filed finish. Partially preserved ornament consisting of a double engraved line. Type Natuniewicz 2. Preserved L: 6.6 cm, W: 0.6 cm, Thk: 0.4 cm. **189.** Fragment of a rod bracelet made from a copper alloy. Cast from a rod, forged and filed finish. Decorated with small dots. Type Natuniewicz 2. Preserved L: 3.1 cm, W: 0.4 cm, Thk: 0.3 cm. **190.** Fragment of a rod bracelet made from a copper alloy. Cast from a rod, forged and filed finish. Type Natuniewicz 1. Preserved L: 3.2 cm, W: 0.7 cm, Thk: 0.3 cm. **191.** Partially melted fragment of a rod bracelet made from a copper alloy. Cast from a rod. Type Natuniewicz 1. Preserved L: 1.7 cm, W: 0.7 cm, Thk: 0.4 cm. **192.** Fragment of a bracelet made from a flat piece of copper alloy. Cast, forged with a forging die. Type Natuniewicz 3. Preserved L: 1.6 cm, W: 1.3 cm, Thk: 0.2 cm. **193.** Fragment of a rod bracelet made from a copper alloy. Cast from a rod, forged and filed finish. Type Natuniewicz 1. Preserved L: 4.1 cm, W: 0.7 cm, Thk: 0.3 cm. **194.** Fragment of a rod bracelet made from a copper alloy. Cast from a rod, forged and filed finish. Type Natuniewicz 1. Preserved L: 3.6 cm, W: 0.6 cm, Thk: 0.3 cm. **195.** Fragment of a rod bracelet, semi-circular to roof-shaped in cross-section, made from a copper alloy. Cast from a rod, forged and filed finish. Upper part of bow decorated with small incisions. Type Natuniewicz 2. Preserved L: 2.1 cm, W: 0.8 cm, Thk: 0.2 cm. **196.** Fragment of a rod bracelet made from a copper alloy. Cast from a rod, forged and filed finish. Middle part of the bow decorated with a stripe of imitation pearly wire. Type Natuniewicz 2. Preserved L: 1.6 cm, W: 0.7 cm, Thk: 0.3 cm. **197.** Fragment of a rod bracelet made from a copper alloy. Cast from a rod, forged and filed finish. Type Natuniewicz 2. Preserved L: 1.9 cm, W: 0.5 cm, Thk: 0.4 cm. **198.** Fragment of a rod bracelet made from a copper alloy. Cast from a rod, forged and filed finish. On the bow, remains of decorative punched dots.

Type Natuniewicz 2. Preserved L: 2.0 cm, W: 0.6 cm, Thk: 0.3 cm. **199.** Fragment of a rod bracelet made from a copper alloy. Cast from a rod, forged and filed finish. On the bow, remains of decorative punched dots. Type Natuniewicz 2. Preserved L: 2.4 cm, W: 0.8 cm, Thk: 0.4 cm. **200.** Rod bracelet made from a copper alloy. Cast from a rod, forged and filed finish. Bow decorated with a line of punched dots. Dm: 5.1 cm, W: 0.5 cm, Thk: 0.4 cm. **201.** Fragment of a rod bracelet made from a copper alloy. Cast from a rod, forged and filed finish. Type Natuniewicz 1. Preserved L: 3.0 cm, W: 0.8 cm, Thk: 0.2 cm. **202.** Fragment of a rod bracelet made from a copper alloy. Cast from a rod, forged and filed finish. Type Natuniewicz 1. Preserved L: 2.0 cm, W: 0.5 cm, Thk: 0.2 cm. **203.** Fragment of a rod bracelet made from a copper alloy. Cast, with a forged and filed finish. Type Natuniewicz 2. Preserved L: 1.9 cm, W: 1.1 cm, Thk: 0.3 cm. **204.** Rod bracelet made from a copper alloy. Cast from a rod, forged and filed finish, bow decorated at the edges with lines of punched triangles. Type Natuniewicz 2. Dm: 6.2 cm, W: 0.6 cm, Thk: 0.4 cm. **205.** Fragment of a rod bracelet made from a copper alloy. Cast from a rod, forged and filed finish. Type Natuniewicz 1. Preserved L: 2.0 cm, W: 0.5 cm. **206.** Shield-headed bracelet, cast, forged finish, made from a copper alloy. Bow decorated with three rows of punched circles. Type Wójcik I. Dm: 6.8 cm, W: 0.5 cm, Thk: 0.6 cm. **207.** Fragment of a shield-headed bracelet made from a copper alloy. Cast, with a forged finish. Decorated at the edges with punched double dots. Slightly differentiated rim of the head. Type Wójcik I. Preserved L: 3.8 cm, bow W: 0.5 cm, shield W: 1.1 cm. **208.** Fragment of a shield-headed bracelet made from a copper alloy. Cast, with a forged finish. Prominent base, vase-like neck. Slightly differentiated rim of the head decorated with punched dots. Type Wójcik I. Preserved L: 2.6 cm, shield W: 1.2 cm. **209.** Fragment of a shield-headed bracelet made from a copper alloy. Cast, with a forged finish. Decorated with punched dots in the middle of the bow and on the head. Rim decorated with short, punched lines. Type Wójcik I. Preserved L: 4.2 cm, bow W: 0.8 cm. **210.** Head of a shield-headed bracelet made from a copper alloy. Cast, with a forged finish. Smooth base, prominent neck. Type Wójcik I. Preserved L: 2.2 cm, W: 1.5 cm. **211.** Head of a shield-headed bracelet made from a copper alloy. Cast, with a forged finish. Profiled base. Narrow rim decorated with a crimping motif. Type Wójcik II A. Preserved L: 2.4 cm, bow W: 1.8 cm, shield W: 1.2 cm. **212.** Fragment of the bow of a shield-headed bracelet made from a copper alloy. Cast, with a forged finish made using a forging die. Punched dots in the middle and at the edges

of the bow. Type Wójcik II C. Preserved L: 2.0 cm, W: 1.3 cm. 213. Fragment of the bow of a shield-headed bracelet made from a copper alloy. Cast, with a die-forged finish. Punched dots in the middle. Type Wójcik II C. Preserved L: 2.0 cm, W: 1.3 cm. 214. Fragment of a silver shield-headed bracelet forged using a forging die. Type Wójcik III. Preserved L: 8.8 cm, bow W: 1.6 cm, shield W: 2.6 cm, Wt: 23.98 g. 215. Fragment of the bow of a silver shield-headed bracelet with a visibly narrower section. Type Wójcik III. Preserved L: 3.9 cm, W: 0.9 cm, Thk: 0.2 cm, Wt: 4.92 g. 216. Head of a silver shield-headed bracelet forged using a forging die. Type Wójcik III (?). Preserved L: 2.8 cm, shield W: 2.6 cm, Thk: 0.2 cm, Wt: 6.65 g. 217. Head of a shield-headed bracelet made from a copper alloy. Cast, with a forged finish. Decorated with punched concentric circles and incisions imitating pearled wire. Type Wójcik III B. Preserved L: 2.9 cm, shield W: 2.8 cm. 218. Fragment of a silver shield-headed bracelet. Cast, with a forged finish made using a profiled forging die. Neck, head and rim decorated with incisions imitating pearled wire. Type Wójcik IV or V. Preserved L: 10.2 cm, bow W: 1.5 cm, shield W: 2.4 cm, Wt: 14.74 g. 219a–b. Two fragments of the silver bow of a single shield-headed bracelet. Cast, with a forged finish made using a profiled forging die. Upper and lower rib decorated with punched dots. Type Wójcik V. Fragment a – preserved L: 2.5 cm, fragment b – preserved L: 4.3 cm, bow W: 2.0 cm, Wt: 6.73 g. 220. Fragment of a silver shield-headed bracelet. Cast, with a forged finish made using a profiled forging die. Neck and shield decorated with incisions imitating pearled wire. Type Wójcik V. Preserved L: 6.2 cm, bow W: 2.5 cm, preserved shield W: 3.3 cm, Wt: 13.30 g. 221. Fragment of a silver shield of a shield-headed bracelet. Cast, with a forged finish made using a profiled forging die. Shield decorated with incisions imitating pearled wire. Type Wójcik V. Preserved L: 1.8 cm, W: 2.0 cm, Wt: 1.82 g. 222. Fragment of a silver shield of a shield-headed bracelet. Cast, with a forged finish made using a profiled forging die. Shield decorated with incisions imitating pearled wire. Type Wójcik V. Preserved L: 2.5 cm, shield W: 2.4 cm, Wt: 3.37 g. 223. Fragment of a silver shield of a shield-headed bracelet. Cast, with a forged finish made using a profiled forging die. Shield decorated with incisions imitating pearled wire. Type Wójcik V. Preserved L: 2.0 cm, W: 2.0 cm, Wt: 1.70 g. 224. Fragment of the silver bow of a shield-headed bracelet. Cast, with a forged finish made using a profiled forging die. Type Wójcik V. Preserved L: 3.7 cm, W: 1.8 cm, Wt: 5.88 g. 225. Fragment of the silver bow of a shield-headed bracelet. Cast, with a forged finish made using a profiled forging die. Type

Wójcik V. Preserved L: 1.1 cm, W: 0.6 cm, Wt: 0.31 g. 226. Fragment of a silver shield-headed bracelet. Cast, with a forged finish made using a profiled forging die. Incisions imitating pearled wire on the bow, base and head fragment. Type Wójcik V. Preserved L: 3.7 cm, bow W: 1.9 cm, Wt: 6.00 g. 227. Fragment of a silver shield-headed bracelet. Cast, with a forged finish made using a profiled forging die. Incisions imitating pearled wire on the bow, base and head fragment. Type Wójcik V. Preserved L: 5.2 cm, reconstructed shield W: 3.0 cm, Wt: 7.60 g. 228. Fragment of the bow of a silver shield-headed bracelet. Cast, with a forged finish made using a profiled forging die. Bow decorated with incisions imitating pearled wire. Type Wójcik V. Preserved L: 1.5 cm, W: 2.4 cm, Wt: 1.31 g. 229a–b. Two silver fragments of a single shield-headed bracelet. Cast, with a forged finish made using a profiled forging die. Bow decorated with transverse incisions imitating pearled wire. Shield decorated with incisions. Type Wójcik V. Fragment a – preserved L: 5.7 cm, fragment b – preserved L: 5.6 cm, bow W: 2.4 cm, reconstructed shield W: 3.8 cm, Wt: 20.17 g. 230. Fragment of the bow of a silver shield-headed bracelet, die-forged. Type Wójcik V. Preserved L: 4.2 cm, W: 2.4 cm, Wt: 6.84 g. 231. Fragment of the bow of a silver shield-headed bracelet, die-forged. Type Wójcik V. Preserved L: 3.8 cm, preserved W: 1.5 cm, Thk: 0.2 cm, Wt: 4.06 g. 232. Fragment of a head of a shield-headed bracelet made from a copper alloy. Cast, with a forged finish. Preserved L: 1.0 cm, W: 1.0 cm. 233. Fragment of a silver head including rim of a shield-headed bracelet. Cast, with die-forged finish. Shield decorated with incisions imitating pearled wire. Type Wójcik V. Preserved L: 1.5 cm, preserved W: 1.9 cm, Wt: 0.93 g. 234. Fragment of a shield-headed bracelet made from a copper alloy. Cast, with a forged finish. Preserved fragment of a neck and head. On the neck, transverse crests decorated with punched dots. Preserved L: 1.4 cm, W: 1.8 cm. 235. Fragment of the bow of a shield-headed bracelet made from a copper alloy. Cast, with a forged finish. Decorated with punched dots. Preserved L: 3.0 cm, W: 1.4 cm. 236. Fragment of the bow and head of a shield-headed bracelet made from a copper alloy. Preserved L: 2.2 cm, bow W: 0.9 cm. 237. Fragment of the bow of a silver shield-headed bracelet. Decorated with punched dots. Preserved L: 2.9 cm, preserved W: 0.7 cm, Wt: 0.99 g. 238. Fragment of the bow of a shield-headed bracelet made from a copper alloy. Preserved L: 2.3 cm, W: 1.3 cm. 239. Fragment of a silver wavy bracelet (*wellenförmiger Armring*) with a preserved shield and a hole for attaching a T-shaped fastening. Preserved L: 4.0 cm, shield Dm: 1.7 cm, Wt: 3.19 g. 240. Fragment of the bow of a silver wavy

bracelet (*wellenförmiger Armring*). Preserved L: 1.4 cm, Wt: 0.60 g. **241.** Fragment of the bow of a silver wavy bracelet (*wellenförmiger Armring*). Preserved L: 1.9 cm, Wt: 0.91 g. **242.** Fragment of the bow of a silver wavy bracelet (*wellenförmiger Armring*). Preserved L: 2.4 cm, Wt: 2.00 g. **243.** Fragment of the bow of a silver wavy bracelet (*wellenförmiger Armring*). Preserved L: 4.9 cm, Wt: 5.68 g. **244a–b.** Two fragments of the bow of a single silver wavy bracelet (*wellenförmiger Armring*). A sidebar for fastening at the shield preserved near one. Fragment a – preserved L: 1.3 cm, fragment b – preserved L: 0.8 cm, combined Wt: 1.02 g. **245.** Fragment of the bow of a silver wavy bracelet (*wellenförmiger Armring*). Preserved L: 2.6 cm, W: 1.6 cm, Thk: 0.2 cm, Wt: 1.68 g. **246.** Fragment of the bow of a silver wavy bracelet (*wellenförmiger Armring*). Preserved L: 2.7 cm, Wt: 2.47 g. **247a–d.** Silver capsule of a wavy bracelet (*wellenförmiger Armring*). Preserved in three fragments. Decorated with filigree and granulation. Fragment a – Dm: 1.2 cm, Wt: 3.14 g, fragment b – Dm: 1.5 cm, Wt: 1.46 g, fragment c – Dm: 0.6 cm, Wt: 0.38 g, d – reconstruction of the capsule. Combined Wt: 4.99 g. **248.** Fragment of silver tape from the capsule of a wavy bracelet (*wellenförmiger Armring*). Decorated with granulation. Preserved L: 0.8 cm, Wt: 0.19 g. **249.** Fragment of the silver capsule of a wavy bracelet (*wellenförmiger Armring*). Decorated with filigree and granulation. Dm: 1.8 cm, Wt: 3.74 g. **250.** Bipartite buckle with an omega-shaped frame (reconstruction) and plate, made from a copper alloy. Wide prong with hook-like protrusions. Buckle plate with two rivets, decorated with ‘wolf teeth’. Type ML B 9. Preserved L: 5.3 cm, W: 5.0 cm. **251.** Unipartite iron buckle with a circular frame. Straight prong. Type ML C 13. L: 3.2 cm, W: 2.9 cm. **252.** Damaged unipartite iron buckle with a round frame. Straight prong. Type ML C 13. L: 3.2 cm, W: 3.5 cm. **253.** Oval frame of a unipartite iron buckle. Type ML C 13. L: 3.6 cm, W: 4.8 cm. **254.** Semi-circular frame of an iron unipartite buckle. Type ML D 1. L: 3.1 cm, W: 5.7 cm. **255.** Unipartite buckle with a semi-circular frame made from a copper alloy. Straight prong. Type ML D 1. L: 2.4 cm, W: 2.4 cm. **256.** Fragment of a unipartite iron buckle with a semi-circular frame. Preserved base of the prong. Type similar to ML D 1. Preserved L: 2.6 cm, preserved W: 2.2 cm. **257.** Unipartite buckle with a semi-circular frame, made from a copper alloy. Straight prong. Type ML D 1. L: 2.8 cm, W: 2.9 cm. **258.** Semi-circular frame of a unipartite iron buckle. Type ML D 1. L: 2.4 cm, W: 3.4 cm. **259.** Unipartite iron buckle with a semi-circular frame. Straight prong. Type ML D 1. L: 3.9 cm, W: 4.5 cm. **260.** Fragment of a semi-circular iron frame of a unipartite buckle. Type ML D 1 (?). L: 4.0 cm, W: 5.2 cm. **261.** Fragment of unipartite iron buckle with a broad semi-circular frame. Type similar to ML D 11. L: 3.7 cm, W: 3.9 cm. **262.** Fragment of a bipartite buckle with a D-shaped frame and plate made from a copper alloy. Axis ends hammered flat. Preserved prong base and fragments of the plate. Type ML D 17. Frame L: 1.9 cm, W: 3.1 cm. **263.** Bipartite buckle with a D-shaped frame and plate, made from a copper alloy. Axis ends hammered flat. Buckle plate with two rivets, decorated with engraved lines at the edge. Straight prong decorated with engraved lines at the base. Type ML D 17. L: 3.9 cm, W: 3.5 cm. **264.** Fragment of a bipartite buckle with a D-shaped frame and plate, made from a copper alloy. The ends of the axis terminate in profiled knobs. The buckle plate and prong are partially preserved. Type ML D 17. Preserved L: 2.2 cm, axis W: 3.5 cm. **265.** Damaged bipartite buckle with a D-shaped frame and plate, made from a copper alloy. Type ML D 17. L: 2.8 cm, W: 3.2 cm. **266.** Damaged (partially melted) bipartite buckle with a D-shaped frame and plate, made from a copper alloy. Type ML D 17 (?). Preserved L: 2.4 cm, W: 3.6 cm. **267.** Bipartite buckle with a D-shaped frame and plate, made from a copper alloy. Buckle plate with two rivets. Straight prong. Type ML D 17. L: 2.4 cm, W: 3.4 cm. **268.** Damaged bipartite buckle with a D-shaped frame and plate, made from a copper alloy. Type ML D 17. Preserved L: 2.6 cm, W: 2.3 cm. **269.** Bipartite buckle with a D-shaped frame and plate, made from a copper alloy. Buckle plate with two rivets. Straight prong. Type ML D 17. L: 3.6 cm, W: 2.9 cm. **270.** Bipartite buckle with a D-shaped frame and plate, made from a copper alloy. Straight prong, damaged plate. Type ML D 17. Preserved L: 3.1 cm, W: 2.7 cm. **271.** D-shaped frame of a bipartite silver buckle. Bases decorated with a metope ornament. Type similar to ML D 17–20. Preserved L: 2.2 cm, W: 3.6 cm, Wt: 3.30 g. **272.** Bipartite buckle with a D-shaped frame and plate, made from a copper alloy. Axis ends terminate in profiled knobs. Rectangular buckle plate with slightly concave shorter sides, decorated with engraved lines at the edges and four punched eyelets in the middle. Straight prong. Type ML D 18. L: 3.5 cm, W: 3.3 cm. **273.** Bipartite buckle with a D-shaped frame and plate, made from a copper alloy. Trapezoid buckle plate ending in a damaged rivet hole. Straight prong. Type ML D 20. Preserved L: 3.8 cm, W: 2.4 cm. **274.** Fragment of a bipartite buckle with a D-shaped frame made from a copper alloy. Axis ends terminating in knobs. Fragment of a straight prong. Type similar to ML D 26. Preserved L: 1.3 cm, W: 2.7 cm. **275.** Bipartite buckle with a D-shaped frame made from a copper alloy. Axis ends hammered flat. Straight prong. Type ML D 26. L: 1.4 cm,

W: 1.9 cm. **276.** Fragment of a semi-circular buckle frame made from a copper alloy. Group ML D. Preserved L: 2.1 cm, W: 0.4 cm. **277.** Fragment of a semi-circular frame of an iron buckle. Group ML D. Preserved L: 2.5 cm, W: 3.2 cm. **278.** Bipartite buckle with a D-shaped frame, slightly concave, made from a copper alloy. Axis terminating in profiled knobs. Buckle plate with a single preserved rivet. Straight prong. Type ML E 12. L: 3.1 cm, W: 3.0 cm. **279.** Bipartite buckle with a D-shaped frame, slightly concave, made from a copper alloy. Buckle plate with two rivets. Straight prong. Type ML E 12. L: 3.6 cm, W: 3.2 cm. **280.** Bipartite buckle with a D-shaped frame, slightly concave, made from a copper alloy. Buckle plate with two rivets. Straight prong. Type ML E 12. L: 4.1 cm, W: 3.7 cm. **281.** Bipartite buckle with a D-shaped frame, concave, made from a copper alloy. Buckle plate with two rivets. Straight prong. Type similar to ML E 14. L: 3.1 cm, W: 4.1 cm. **282.** Unipartite iron buckle with a rectangular frame. Straight prong, bent out of shape. Type ML G 1. L: 3.5 cm, W: 4.1 cm. **283.** Unipartite iron buckle with a rectangular frame. Straight prong. Type ML G 1. L: 2.6 cm, W: 3.8 cm. **284.** Bipartite iron buckle with a rectangular frame. Axis ends hammered flat. Straight prong. Type similar to ML G 46. L: 2.0 cm, W: 3.5 cm. **285.** Bipartite iron buckle with a roughly rectangular frame. Type similar to ML G 46. L: 3.0 cm, W: 4.5 cm. **286.** Frame of a bipartite rectangular buckle, bent out of shape, made from a copper alloy. Group ML G. Preserved L: 2.1 cm, W: 3.4 cm. **287.** Unipartite buckle with a semi-circular, thicker frame made from a copper alloy. Straight prong. Type similar to ML H 25. L: 1.8 cm, W: 2.4 cm. **288.** Buckle plate with a partially preserved axis, made from a copper alloy. Axis terminates in a profiled knob. Preserved L: 2.2 cm, W: 3.5 cm. **289a–b.** Two fragments of a single buckle plate made from a copper alloy. Fragment a – L: 2.0 cm, W: 2.3 cm, fragment b – L: 1.8 cm, W: 2.3 cm. **290.** Fragment of the prong and base of a buckle frame made from a copper alloy. Axis fragment preserved in the base hole. Preserved L: 1.1 cm. **291.** Fragment of a buckle frame made from a copper alloy. Preserved L: 0.8 cm, W: 2.8 cm. **292.** Fragment of a buckle plate and prong made from a copper alloy. Buckle plate decorated with ‘wolf teeth’. Preserved L: 2.2 cm, W: 3.3 cm. **293.** Fragment of a buckle prong made from a copper alloy. Preserved L: 2.0 cm, W: 0.4 cm. **294.** Fragment of a buckle prong made from a copper alloy. Preserved L: 2.0 cm, W: 0.4 cm. **295.** Fragment of a buckle frame made from a copper alloy. Preserved L: 1.2 cm, W: 2.6 cm. **296.** Fragment of a buckle plate and prong, made from a copper alloy. Preserved L: 2.7 cm, W: 2.2 cm. **297.** Fragment of the prong of an iron buckle. Preserved L: 3.0 cm, W: 0.3 cm. **298.** Iron hoop, probably a buckle frame. L: 3.2 cm, Thk: 0.5 cm. **299.** Fragment of a belt strap end with a profiled shaft, made from a copper alloy. Type similar to Raddatz O3; ML type 1, form 3. Preserved L: 3.6 cm, shaft W: 0.4 cm. **300.** Fragment of a belt strap end with a profiled shaft, made from a copper alloy. Type similar to Raddatz O3; ML type 1, form 3. Preserved L: 2.3 cm, shaft W: 0.4 cm. **301.** Belt strap end with a profiled shaft, made from a copper alloy. Type similar to Raddatz O3; ML type 1, form 3. Preserved L: 3.8 cm, shaft W: 0.4 cm. **302.** Fragment of a belt strap end with a profiled shaft, made from a copper alloy. Type Raddatz O3; ML type 1, form 3. Preserved L: 3.6 cm, W: 0.7 cm. **303.** Fragment of a belt strap end terminating in a small profiled ball, made from a copper alloy. Type similar to Raddatz O17; ML type 2, form 2. Preserved L: 3.2 cm, W: 0.5 cm. **304.** Belt strap end of tin-lead bronze. Fan-shaped attachment with a rivet fragment. Decorated with a small ball in the midsection of the shaft. Shaft terminates in a double engraved line. Type similar to Raddatz O15; ML type 2, form 6. L: 5.3 cm, attachment W: 3.0 cm. **305.** Belt strap end ending in a roughly oval or rectangular widening and a straight terminal tongue, made from a copper alloy. Type similar to Raddatz O14; ML type 2, form 6. L: 3.7 cm, attachment W: 0.9 cm. **306.** Belt strap end terminating in an oval-shaped wider section and a straight terminal tongue, made from a copper alloy. The bottom section of the attachment decorated with four engraved lines. Type similar to Raddatz O10; ML type 2, form 6. L: 5.7 cm, attachment W: 1.1 cm. **307.** Belt strap end terminating in a thicker ball-shaped part and a straight terminal tongue, made of tin-lead bronze. Damaged attachment. One brass rivet preserved. Type similar to Raddatz O16; ML type 2, form 6. Preserved L: 4.2 cm, ball W: 0.9 cm. **308.** Fragment of a belt strap end terminating in a thicker ball-shaped part and a small terminal tongue, made from a copper alloy. Shaft decorated with a punched triple eyelet. Group Raddatz O; ML type 2, form 6. Preserved L: 3.0 cm, W: 0.6 cm. **309.** Belt strap end terminating in a thicker biconical part and a terminal tongue, made from a copper alloy. Three concentric eyelets on both sides of the attachment. On one side of the attachment, a preserved fabric fragment (not analysed). Type similar to Raddatz O15; ML type 2, form 6. L: 5.9 cm, attachment W: 2.0 cm. **310.** Belt strap end with a ball in the middle section and a terminal tongue, made from a copper alloy. Thicker sections on either side of the ball. Type similar to Raddatz O12; ML type 2, form 6. L: 4.6 cm, attachment W: 1.5 cm. **311.** Belt strap end terminating in a ring, made from a copper alloy. Ring not preserved.

Type Raddatz JII; ML type 5 or 6. Preserved L: 5.9 cm, attachment W: 1.4 cm. 312. Belt strap end terminating in a partially preserved ring, made from a copper alloy. Type Raddatz JII; ML type 5 or 6. Preserved L: 4.1 cm, shaft W: 0.6 cm. 313. Fragment of a belt strap end terminating in a partially preserved ring, made from a copper alloy. Decorated with a horizontal line between the attachment and the shaft. Type Raddatz JII; ML type 5 or 6. Preserved L: 3.7 cm, attachment W: 1.6 cm. 314. Belt strap end terminating in a ring, made from a copper alloy. Decorated with punched circles, triangles and engraved lines. Type Raddatz JIII1; ML type 5, form 1. L: 5.5 cm, preserved attachment W: 1.6 cm. 315. Fragment of a belt strap end (?) terminating in a ring with attachment, made from a copper alloy. Decorated with engraved lines. Type Raddatz JIII2; ML type 5, form 2, variant 1. Preserved L: 5.9 cm, ring W: 3.0 cm. 316. Silver belt strap end. Base of attachment decorated with a row of dots. Ring in the mid-section of the attachment. Below the ring, a broad widening terminal tongue. Type Raddatz JIII5; ML type 6. L: 4.4 cm, attachment W: 1.6 cm, Wt: 4.76 g. 317. Iron belt strap end ended with a ring with a damaged tongue. Type Raddatz JIII3; ML type 6, form 1. Preserved L: 5.3 cm, ring W: 1.8 cm. 318. Belt strap end with a ring and a terminal tongue, made from a copper alloy. Preserved in two fragments, broken at the ring. Below and above the ring decorated with an engraved line. Rectangular terminal tongue. Type similar to Raddatz JIII4; ML type 6, form 1. Preserved L: 4.2 cm, W: 1.3 cm. 319. Belt strap end terminating in a ring with a terminal tongue, made from a copper alloy. Type similar to Raddatz JIII3; ML type 6, form 1. L: 5.5 cm, attachment W: 0.7 cm. 320. Belt strap end terminating in a ring with a broken terminal tongue, made from a copper alloy. Shaft decorated with an engraved line. Type Raddatz JIII3; ML type 6, form 1. Preserved L: 3.9 cm, attachment W: 1.3 cm. 321. Belt strap end with a rectangular terminal with a central hole and a trapezoid terminal tongue, made from a copper alloy. Attachment with a single rivet, widening in the upper section. Type similar to Raddatz JIII4; ML type 6, form 1, variant 2. Preserved L: 4.4 cm, plate W: 0.9 cm. 322. Belt strap end with a rectangular terminal, with a small hole in the centre and a rectangular terminal tongue, made from a copper alloy. Terminal decorated with engraved lines. Type similar to Raddatz JIII4; ML type 6, form 1, variant 2. L: 5.8 cm, terminal W: 0.9 cm. 323. Belt strap end with a rectangular terminal, with a hole and trapezoid terminal tongue, made from a copper alloy. Decorated with horizontal lines. Type similar to Raddatz JIII4; ML type 6, form 1, variant 2. Preserved L: 5.4 cm, attachment W: 1.5 cm. 324. Belt strap end made from

a copper alloy. Lower part lenticular in shape, upper part slightly wider near the end. In the middle, a thicker element with a square cross-section, decorated with a metope ornament. Type Wólka. L: 5.6 cm, W: 1.3 cm. 325. Belt strap end shaped like an upside-down trapezoid, made from a copper alloy. Two flat rivets at the top. Preserved L: 3.0 cm, W: 2.1 cm. 326. Fragment of an iron belt strap end. Preserved L: 3.7 cm, attachment W: 1.7 cm. 327. Fragment of a belt strap end made from a copper alloy. Shaft decorated with engraved lines. Preserved L: 3.6 cm, attachment W: 1.6 cm. 328. Fragment of the attachment section of a belt strap end, made from a copper alloy. Preserved L: 1.8 cm, attachment W: 1.3 cm. 329. Fragment of the shaft of a belt strap end, made from a copper alloy. Shaft with engraved ornamental lines and punched dots. Preserved L: 3.6 cm, attachment W: 2.0 cm. 330. T-shaped belt application made from a copper alloy. Profiled ends. Rectangular overlay not preserved. L: 3.2 cm, H: 0.9 cm. 331. Belt loop decorated with engraved lines in the middle and at the edges of the mount, made from a copper alloy. Belt mount connected at the ends to a leather underlay. L: 3.2 cm, W: 1.0 cm. 332. Half-pipe belt mount made from a copper alloy. Partially damaged. L: 1.8 cm, W: 0.8 cm. 333. Iron, forged belt hanger. ML form 3. L: 2.9 cm. 334. Belt fitting made from a copper alloy. Originally probably contained a ring. No rivet. ML similar to form 2. L: 1.4 cm, W: 0.5 cm. 335. Belt mount or belt application, made of tin-lead bronze, roughly circular in shape. At the edge, three protrusions with preserved rivets. L: 2.4 cm, W: 2.8 cm. 336. Belt overlay, made from a copper alloy. L: 1.5 cm, W: 0.6 cm. 337. Belt overlay, made from a copper alloy. L: 2.0 cm, W: 0.5 cm. 338. Fragment of a buckle plate or belt application, made from a copper alloy. Decorated with punched dots. L: 1.2 cm, W: 1.0 cm. 339. Fragment of a silver S-shaped clasp made from smooth wire. Conical end. At centre, a thicker ring-shaped section. Type von Müller D, Patalan variant D2a. Preserved L: 2.0 cm, Wt: 0.73 g. 340. Silver S-shaped clasp made from smooth wire. Ends shaped like profiled cones. A cylindrical thicker part in the middle section. At centre, a round cross-section. Type similar to von Müller C, Patalan type C5. L: 2.0 cm, preserved W: 1.6 cm, Wt: 1.67 g. 341. Fragment of a silver S-shaped clasp made of three twisted wires. A triple filigree ring in the middle section. Granulation at the end. Type von Müller B, Patalan variant B5b. Preserved L: 1.3 cm, W: 1.4 cm, Wt: 1.11 g. 342. Gold S-shaped clasp made of six filigree wires. Ends decorated with small gold granules. At centre, three smooth rings and two incised rings. Type von Müller B, Patalan subvariant B5c2. L: 1.9 cm, W: 1.4 cm, Wt: 2.27 g. 343. Cylindrical body

of a silver bucket pendant. Type AII. Dm: 0.9 cm, H: 1.1 cm, Wt: 1.05 g. 344. Bucket pendant made from a copper alloy. Cylindrical body, damaged suspension loop. Fragments of silver foil preserved in places. Type AI. Dm: 1.4 cm, body H: 0.7 cm, preserved H: 1.2 cm. 345. Oblong flat piece of silver, probably part of a damaged bucket pendant. L: 3.9 cm, H: 0.9 cm, Wt: 1.75 g. 346. Partially melted and deformed fragment of a bucket pendant made from a copper alloy. W: 1.6 cm, H: 1.3 cm. 347. Damaged bottom of a bucket pendant or capsule pendant made from a copper alloy. Dm: 1.5 cm, Thk: 0.1 cm. 348. Round flat piece of metal, made from a copper alloy. Most likely the bottom of a bucket pendant or capsule pendant. Dm: 1.6 cm. 349. Front shield of a silver capsule pendant, punched into shape using a matrix with imitation spirally twisted pearled wire. Dm: 1.4 cm, Wt: 0.12 g. 350. Capsule pendant. Middle tape made from a copper alloy. Silver shields. L: 1.5 cm, Thk: 0.4 cm, Wt: 0.84 g. 351. Fragment of a silver biconical bead made of smooth wire. Preserved L: 0.6 cm, preserved W: 0.6 cm, Thk: 0.1 cm, Wt: 0.13 g. 352. Gold barrel-shaped bead, empty inside. Soldered together from two hemispheres formed from incised wire. Dm: 0.7 cm, H: 0.6 cm, Thk: 0.1 cm, Wt: 0.69 g. 353. Fragment of a silver biconical bead, made of smooth wire. Granulation visible on the body. Preserved H: 0.6 cm, W: 1.2 cm, Thk: 0.1 cm, Wt: 0.86 g. 354. Gold barrel-shaped bead, empty inside. Soldered together from two hemispheres formed from braided filigree wire. Dm: 0.6 cm, H: 0.6 cm, Wt: 0.77 g. 355. Barrel-shaped glass bead, light blue, transparent. Type TM 2b. Dm: 2.1 cm, H: 1.0 cm. 356–362. Seven barrel-shaped glass beads, green, transparent. Type TM 4. Dm: 1.3 cm, 1.3 cm, 1.5 cm, 1.3 cm, 1.3 cm, 1.4 cm, 1.4 cm, H: 1.0 cm, 1.1 cm, 1.0 cm, 1.1 cm, 1.1 cm, 1.1 cm, 1.2 cm. 363–364. Two barrel-shaped glass beads, orange, matte. Type TM 10. Dm: 1.0 cm each, H: 0.7 cm, 0.8 cm. 365. Barrel-shaped glass bead, black, matte. Type TM 11. Dm: 1.4 cm, H: 1.0 cm. 366–371. Six barrel-shaped glass beads, red, matte. Type TM 12. Dm: 1.8 cm, 1.2 cm, 1.0 cm, 1.4 cm, 1.0 cm, 1.1 cm, H: 1.3 cm, 0.9 cm, 1.1 cm, 1.0 cm, 0.9 cm, 0.9 cm. 372. Spherical glass bead, white, matte. Type TM 22. Dm: 0.9 cm, H: 0.7 cm. 373. Disk-shaped glass bead, black, matte. Type similar to TM 40. Dm: 1.6 cm, H: 0.7 cm. 374. Miniature glass bead, orange, matte. Type TM 53. Dm: 0.4 cm, H: 0.2 cm. 375. Miniature glass bead, red, matte. Type TM 54. Dm: 0.5 cm, H: 0.2 cm. 376. Lentil-shaped glass bead, blue, transparent. Type similar to TM 89. W: 0.9 cm, H: 0.9 cm. 377–378. Two hexagonal glass beads, blue, matte. Group TM XII (atypical). W: 0.4 cm each, H: 1.7 cm each. 379. Cylindrical glass bead, white, matte. Type TM 138. Dm: 0.9 cm, H: 2.0 cm. 380. Cylindrical glass bead, red, matte. Type TM 142. Dm: 1.2 cm, H: 2.1 cm. 381. Cylindrical glass bead, red, matte, partially melted. Group TM XV. Dm: 0.9 cm, H: 0.9 cm. 382. Ribbed-shaped glass bead, navy blue, transparent. Type similar to TM 181. Dm: 1.5 cm, H: 1.0 cm. 383–385. Three melon-shaped glass beads, navy blue, transparent. Type TM 162. Dm: 1.7 cm, 1.5 cm, 1.5 cm, H: 1.1 cm, 0.9 cm, 1.2 cm. 386. Melon-shaped glass bead, flattened, black, matte. Type TM 168. Dm: 0.8 cm, H: 0.5 cm. 387. Melon-shaped glass bead, violet, transparent. Type TM 171. Dm: 1.5 cm, H: 1.0 cm. 388–390. Three snail-shaped glass beads, willow green, transparent. Group TM XIX. Dm: 2.3 cm, 2.4 cm, 2.2 cm, H: 1.1 cm, 1.0 cm, 1.1 cm. 391–392. Two spherical glass beads, black, matte, with white-yellow flowers. Type similar to TM 198–199. Dm: 1.2 cm, 1.3 cm, H: 1.0 cm each. 393. Spherical glass bead, blue, matte, with yellow eyes. Type similar to TM 202. Dm: 1.3 cm, H: 1.0 cm. 394. Spherical glass bead, dark blue, matte with white eyes. Type similar to TM 205. Dm: 1.2 cm, H: 1.1 cm. 395. Spherical glass bead, white, matte, with blue eyes. Type similar to TM 216. Dm: 1.2 cm, H: 0.8 cm. 396. Spherical glass bead, light blue, transparent, with yellow-red-grey eyes. Type similar to TM 218. Dm: 1.4 cm, H: 1.3 cm. 397. Spherical glass bead, dark blue, transparent, with white-dark blue eyes. Type similar to TM 218–219. Dm: 1.4 cm, H: 1.2 cm. 398. Spherical glass bead, blue, transparent, with white-blue eyes. Type similar to TM 218–219. Dm: 1.3 cm, H: 1.0 cm. 399. Barrel-shaped glass bead, black, matte, with a white thread ornament along the circumference. Type similar to TM 263a. Dm: 1.7 cm, H: 1.5 cm. 400. Barrel-shaped glass bead, black, matte, with a white threads ornament. Type similar to TM 266a. Dm: 1.9 cm, H: 1.2 cm. 401. Spherical glass bead, red, matte, with yellow-black eyes. Type TM 223. Dm: 1.2 cm, H: 0.8 cm. 402. Barrel-shaped glass bead, dark green, transparent, with wavy white-red lines. Type similar to TM 267a. Dm: 3.0 cm, H: 2.0 cm. 403. Barrel-shaped glass bead, matte, decorated with red, green, yellow and blue stripes. Type similar to TM 290c. Dm: 1.6 cm, H: 1.3 cm. 404. Cylinder-shaped glass bead, green, transparent, with diagonal red and white stripes. Type TM 304. Dm: 1.0 cm, H: 3.0 cm. 405. Cylinder-shaped glass bead, mosaic, red, with a yellow central stripe and a black meander, matte. Type TM 361a. Dm: 0.9 cm, H: 1.5 cm. 406. Cylinder-shaped glass bead, mosaic, red, with a yellow central stripe and a black meander against a white background, matte. Type TM 361a. Dm: 1.2 cm, H: 2.0 cm. 407. Cylinder-shaped glass bead, mosaic, red, a yellow central stripe and black geometric patterns, matte. Type similar to TM 361a. Dm: 1.2 cm, H: 2.1 cm. 408. Fragment

of a red-green glass bead. W: 1.0 cm, H: 0.7 cm.

409. Melted glass bead, light green, transparent. W: 2.9 cm, H: 1.0 cm. **410.** Fragment of a melted glass bead, light green, transparent. W: 0.7 cm, H: 0.9 cm. **411.** Disk-shaped amber bead, hand-cut, dark honey-coloured, transparent. Type TM 388. Dm: 1.0 cm, H: 0.4 cm, Wt: 0.23 g. **412.** Disk-shaped amber bead, hand-cut, dark honey-coloured, transparent. Type similar to TM 389. Dm: 2.2 cm, H: 0.8 cm, Wt: 4.82 g. **413.** Barrel-shaped amber bead, hand-cut, dark honey-coloured, transparent. Hole positioned asymmetrically. Type similar to TM 393. Dm: 2.2 cm, H: 1.8 cm, Wt: 5.03 g. **414.** Amber bead, oblong, polygonal cross-section, hand-cut, dark honey-coloured, transparent. Type similar to TM 407. W: 1.3 cm, H: 2.0 cm, Wt: 0.98 g. **415.** Amber bead, biconical, hand-cut, dark honey-coloured, transparent. Type similar to TM 410. W: 2.1 cm, H: 2.8 cm, Wt: 2.9 g. **416.** Amber bead, biconical, hand-cut, dark honey-coloured, transparent. Type similar to TM 410. W: 1.4 cm, preserved H: 2.3 cm, Wt: 1.04 g. **417.** Amber bead, rectangular, hand-cut, dark honey-coloured, transparent. Sides decorated with concentric circles. Type similar to TM 411. Dm: 1.0 cm, H: 1.5 cm, Wt: 1.22 g. **418.** Amber trapezoid pendant, chipped, hand-cut, dark honey-coloured, transparent. Type TM 414a. H: 1.4 cm, Thk: 0.5 cm, Wt: 0.65 g. **419.** Amber disk-shaped bead, finished on a lathe (visible traces of turning), dark honey-coloured, transparent. Type similar to TM 430. Dm: 1.7 cm, H: 0.7 cm, Wt: 1.43 g. **420–423.** Four barrel-shaped amber beads, finished on a lathe (visible traces of turning), dark honey-coloured, transparent. Type TM 431. Dm: 1.2 cm, 1.7 cm, 1.8 cm, 1.5 cm, H: 0.9 cm, 0.8 cm, 0.9 cm, 0.7 cm, Wt: 1.25 g, 1.37 g, 1.88 g, 0.90 g. **424.** Barrel-shaped amber bead, finished on a lathe (visible traces of turning), dark honey-coloured, transparent. Similar to TM 432. Dm: 1.7 cm, H: 1.2 cm, Wt: 1.54 g. **425.** Barrel-shaped amber bead, finished on a lathe (visible traces of turning), dark honey-coloured, transparent. Decorated with a groove along the circumference, probably for setting a ring. Type similar to TM 432. Dm: 2.2 cm, H: 1.6 cm, Wt: 3.25 g. **426.** Barrel-shaped amber bead, finished on a lathe (visible traces of turning), dark honey-coloured, transparent. Type similar to TM 432. Dm: 2.1 cm, H: 1.2 cm, Wt: 2.33 g. **427.** Amber shield bead, finished on a lathe (visible traces of turning), dark honey-coloured, transparent. Body decorated with a double wavy line and dots along the circumference. Near the hole, an ornament of five concentric circles with dots in the middle. Damaged. Type similar to TM 438. Dm: 3.0 cm, H: 0.9 cm, Wt: 3.12 g. **428.** Damaged amber shield bead, finished on a lathe (visible traces of turning), dark honey-coloured, transparent. Type similar to TM 439. Dm: 2.9 cm, H: 1.1 cm, Wt: 4.95 g. **429.** Amber shield bead decorated with lines along the circumference, finished on a lathe (visible traces of turning), dark honey-coloured, transparent. Type similar to TM 439. Dm: 1.8 cm, H: 0.8 cm, Wt: 2.11 g. **430.** Amber shield bead, finished on a lathe (visible traces of turning), dark honey-coloured, transparent. Type similar to TM 439. Dm: 2.0 cm, H: 0.6 cm, Wt: 1.27 g. **431.** Profiled amber bead, finished on a lathe (visible traces of turning), dark honey-coloured, transparent. Type similar to TM 450. Dm: 2.8 cm, H: 1.6 cm, Wt: 4.98 g. **432.** Amber bucket pendant, dark honey-coloured, transparent. Type TM 456. Dm: 0.8 cm, H: 1.3 cm, Wt: 0.41 g. **433.** Fragment of an amber bead, dark honey-coloured, transparent. Group TM XLVI. Preserved L: 1.7 cm, Wt: 0.82 g. **434–435.** Two damaged eight-shaped amber pendants, dark honey-coloured, transparent. Type similar to TM 465. W: 1.2 cm, 0.7 cm, H: 1.5 cm, 1.3 cm, Wt: 1.06 g, 0.29 g. **436.** Damaged eight-shaped amber pendant, dark honey-coloured, transparent. Type TM 471f. W: 1.1 cm, H: 1.9 cm, Wt: 1.12 g. **437.** Damaged eight-shaped amber pendant, dark honey-coloured, transparent. Type TM 471i. W: 1.2 cm, preserved H: 1.8 cm, Wt: 0.88 g. **438–440.** Three eight-shaped amber pendants, dark honey-coloured, transparent. Type similar to TM 471k. W: 1.5 cm, 0.9 cm, 1.0 cm, H: 2.0 cm, 1.7 cm, 2.0 cm, Wt: 1.43 g, 0.55 g, 1.48 g. **441.** Fragment of an eight-shaped amber pendant, dark honey-coloured, transparent. W: 1.1 cm, preserved H: 1.3 cm, Wt: 0.92 g. **442.** Fragment of an amber bead, dark honey-coloured, transparent. Preserved W: 1.2 cm, preserved H: 1.2 cm, Wt: 0.45 g. **443.** Fragment of an amber bead, dark honey-coloured, transparent. Preserved W: 0.7 cm, preserved H: 0.7 cm, Wt: 0.25 g. **444.** Barrel-shaped stone bead. Type similar to TM 494–495. Dm: 1.5 cm, H: 1.1 cm. **445.** Fragment of a ring with wire wrapped around the bow, made from a copper alloy. Type Beckmann 15 or 16. L: 1.4 cm, W: 0.4 cm. **446.** Fragment of a ring with wire wrapped around the bow, made from a copper alloy. Type Beckmann 15 or 16. L: 2.2 cm, W: 0.4 cm. **447.** Fragment of a silver ring with wire wrapped around the bow. Type Beckmann 15 or 16. Dm: 2.9 cm, wire Thk: 0.2 cm, Wt: 1.77 g. **448.** Ring with ends forming a spiral shield, made from a copper alloy. Type Beckmann 16. Dm: 3.3 cm, wire Thk: 0.3 cm, shield W: 1.0 cm. **449.** Silver ring with ends forming a spiral shield. Type Beckmann 16. Dm: 2.4 cm, wire Thk: 0.2 cm, shield W: 0.6 cm, Wt: 2.89 g. **450.** Brass spur with a large asymmetrical bow with a bent longer arm. Hook in the middle section of the bow. High, faceted spur neck with a profiled base. Ginalski type G1. H: 6.6 cm, preserved W: 5.5 cm.

451. Brass spur with a large asymmetrical bow. Broken off fragment of a hook in the middle section of the bow. High, faceted spur neck with a profiled base. Ginals type G1. H: 6.1 cm, bow W: 6.9 cm. 452. Three-layer comb made of bone (antler [?]). Attached with at least four rivets made from a copper alloy. Unadorned. Incomplete. Type Thomas I. Preserved L: 8.1 cm, H: 5.0 cm, Thk: 0.5 cm. 453. Fragment of a three-layer comb made of bone (antler [?]). A single rivet made from a copper alloy is visible. Preserved L: 0.7 cm, H: 1.1 cm, Thk: 0.2 cm. 454. Fragment of the handle of a one-layer comb made of bone (antler [?]). Decorated with two rows of concentric circles. Preserved L: 5.2 cm, H: 1.4 cm. 455. Fragment of a three-layer comb made of bone (antler [?])³⁸. L: 1.0 cm, W: 1.6 cm, Thk: 0.2 cm. 456. Fragment of a one-layer comb made of bone (antler [?]). Type Thomas AI. Preserved L: 3.5 cm, preserved W: 2.9 cm, Thk: 0.5 cm. 457. Fragment of a three-layer comb made of bone (antler [?]) with a preserved rivet made from a copper alloy. L: 1.8 cm, W: 2.1 cm. 458. Fragment of a three-layer comb made of bone (antler [?]). L: 1.4 cm, W: 3.5 cm, Thk: 0.2 cm. 459. Fragment of a three-layer comb made of bone (antler [?]). L: 1.5 cm, W: 2.0 cm, Thk: 0.2 cm. 460. Needle made from a copper alloy, eye forged and punched through. Type Dąbrowska II. L: 6.8 cm. 461. Needle made from a copper alloy, eye forged and punched through. Shaft bent in half. Type Dąbrowska II. L: 4.7 cm. 462. Needle made from a copper alloy, eye forged and punched through. Shaft bent below the eye. Type Dąbrowska II. L: 5.3 cm. 463. Needle made from a copper alloy, eye forged and punched through. Type Dąbrowska II. Preserved L: 5.0 cm. 464. Needle made from a copper alloy, eye forged and punched through. Type Dąbrowska II (?). Preserved L: 4.2 cm. 465. Needle made from a copper alloy, eye forged and punched through. Type Dąbrowska II. L: 5.6 cm. 466. Fragments of a needle made from a copper alloy. Preserved fragments L: 2.7 cm, 2.0 cm. 467. Fragment of a hooked pin with a twisted shaft, made from a copper alloy. Preserved L: 2.4 cm. 468. Silver pin with an oval head and an asymmetrically positioned hole. Below the head, a cross-shaped ornament on three sides. Broken shaft. Similar to group Beckmann X. Preserved L: 3.4 cm, head Dm: 0.5 cm, Wt: 1.97 g. 469. Fragment of the shaft of a needle or pin, made from a copper alloy. Preserved L: 2.4 cm. 470. Round, semi-circular item with a hole in the upper section, made from a copper alloy. Probably fragment of a distaff. Dm: 2.5 cm, H: 0.8 cm. 471. Ceramic spindle whorl, biconical, gently curved, slightly concave top and bottom. Dm: 2.8 cm, H: 2.3 cm. 472. Ceramic spindle whorl, biconical, gently curved, concave top and bottom. Dm: 3.9 cm, H: 2.8 cm. 473. Ceramic spindle whorl, biconical, gently curved, flat top and bottom. Dm: 4.2 cm, H: 2.8 cm. 474. Ceramic spindle whorl, biconical, asymmetrical, gently curved, slightly concave top and bottom. Dm: 3.4 cm, H: 2.2 cm. 475. Ceramic spindle whorl, biconical, gently curved, concave top and bottom. Dm: 3.3 cm, H: 2.2 cm. 476. Ceramic spindle whorl, biconical, gently curved, flat top and bottom. Dm: 3.6 cm, H: 1.7 cm. 477. Ceramic spindle whorl, biconical with ornamental engraved lines, flat top and bottom. Dm: 3.0 cm, H: 1.5 cm. 478. Ceramic spindle whorl, biconical, flat top and bottom. Dm: 3.6 cm, H: 2.2 cm. 479. Ceramic spindle whorl, biconical, gently curved, flat top and bottom. Dm: 3.6 cm, H: 2.4 cm. 480. Damaged ceramic spindle whorl, biconical, sharply curved. Dm: 4.1 cm, H: 2.7 cm. 481. Fragment of a ceramic spindle whorl, biconical, gently curved, flat top and bottom. Dm: 4.3 cm, H: 2.8 cm. 482. Ceramic spindle whorl, biconical, gently curved, concave top and bottom. Dm: 4.4 cm, H: 2.3 cm. 483. Ceramic spindle whorl, biconical, gently curved, flat top and bottom. Dm: 4.2 cm, H: 2.0 cm. 484. Ceramic spindle whorl, barrel-shaped, concave top and bottom. Dm: 3.4 cm, H: 2.0 cm. 485. Ceramic spindle whorl, biconical, gently curved, concave top and bottom. Dm: 3.6 cm, H: 1.6 cm. 486. Ceramic spindle whorl, biconical, gently curved, slightly concave top and bottom. Decorated with triangles along two engraved lines and four lines along the circumference. Dm: 3.8 cm, H: 2.1 cm. 487. Fragment of a ceramic spindle whorl, biconical, profiled top and bottom. Dm: 2.1 cm, H: 2.2 cm. 488. Ceramic spindle whorl, biconical, sharply curved, concave top and bottom. Dm: 4.2 cm, H: 2.0 cm. 489. Ceramic spindle whorl, biconical, slightly concave sides, flat top and bottom. Dm: 3.3 cm, H: 2.4 cm. 490. Fragment of a ceramic spindle whorl, barrel-shaped, flat top and bottom. Dm: 2.9 cm, H: 2.5 cm. 491. Ceramic spindle whorl, biconical, sharply curved, concave top and bottom. Dm: 3.2 cm, H: 1.4 cm. 492. Ceramic spindle whorl, spherical. Slightly asymmetrical. Flat top and bottom. Dm: 4.0 cm, H: 2.6 cm. 493. Ceramic spindle whorl, biconical, gently curved, flat top and bottom. Dm: 3.2 cm, H: 2.6 cm. 494. Awl-shaped iron fire striker. L: 6.9 cm, W: 1.0 cm. 495. Fragment of a glass vessel (goblet [?]) decorated with an applied thread. Transparent, yellowish glass. Type Eggers 189 (?). L: 1.8 cm, W: 1.5 cm. 496. Bottom of a glass vessel (bowl [?]), with a distinct foot. Transparent, yellowish glass. L: 5.4 cm, W: 4.1 cm, Thk: 1.0 cm. 497. Fragment of a glass vessel. Transparent, yellowish glass. L: 1.5 cm, W: 1.6 cm, Thk: 0.4 cm. 498. Fragment of the rim of a glass vessel. Transparent,

³⁸ Fragment of a comb found with four rivets (cat. no. 560–563).

yellowish glass. L: 1.1 cm, W: 1.7 cm, Thk: 0.4 cm. 499. Fragment of the bottom part of the body a tin bronze strainer. Type Eggers 160 or 161. Body Dm: 8.5 cm, handle L: 7.2 cm. 500. Fragment of the handle of a tin bronze strainer. Type Eggers 160 or 161. L: 7.2 cm, W: 2.1 cm. 501. Fragment of the body a tin bronze strainer. Type Eggers 160 or 161. L: 1.2 cm, W: 1.4 cm. 502–550³⁹. Forty nine fragments of the body of a brass jug. W: 4.6 cm, 3.9 cm, 2.1 cm, 1.6 cm, 3.3 cm, 2.0 cm, 2.1 cm, 1.6 cm, 2.6 cm, 2.9 cm, 2.1 cm, 1.8 cm, 1.4 cm, 1.8 cm, 1.3 cm, 1.6 cm, 0.9 cm, 0.9 cm, 1.3 cm, 1.2 cm, 1.0 cm, 3.3 cm, 1.7 cm, 2.6 cm, 1.8 cm, 7.1 cm, 3.9 cm, 2.5 cm, 1.5 cm, 2.0 cm, 0.7 cm, 1.4 cm, 0.9 cm, 1.6 cm, 2.0 cm, 1.3 cm, 1.0 cm, 0.8 cm, 1.8 cm, 1.1 cm, 1.2 cm, 1.0 cm, 1.0 cm, 2.1 cm, 0.6 cm, 1.9 cm, 1.2 cm, 1.3 cm, 4.7 cm, H: 4.0 cm, 5.6 cm, 1.4 cm, 1.8 cm, 3.4 cm, 4.4 cm, 2.0 cm, 1.5 cm, 2.3 cm, 2.0 cm, 2.2 cm, 2.0 cm, 1.5 cm, 3.0 cm, 1.8 cm, 2.0 cm, 1.2 cm, 1.4 cm, 1.6 cm, 1.9 cm, 2.2 cm, 2.0 cm, 1.7 cm, 3.1 cm, 2.0 cm, 5.0 cm, 3.8 cm, 2.6 cm, 1.6 cm, 1.7 cm, 0.6 cm, 0.7 cm, 0.9 cm, 2.1 cm, 1.9 cm, 1.1 cm, 0.6 cm, 1.0 cm, 1.4 cm, 1.0 cm, 1.0 cm, 0.6 cm, 1.0 cm, 1.6 cm, 0.6 cm, 1.5 cm, 0.7 cm, 1.4 cm, 2.6 cm, Thk: 0.3 cm, 0.3 cm, 0.3 cm, 0.2 cm, 0.3 cm, 0.2 cm, 0.2 cm, 0.2 cm, 0.2 cm, 0.2 cm, 0.2 cm, 0.2 cm, 0.2 cm, 0.2 cm, 0.2 cm, 0.2 cm, 0.2 cm, 0.3 cm, 0.3 cm, 0.2 cm, 0.2 cm, 0.1 cm, 0.2 cm, 0.2 cm, 0.3 cm, 0.4 cm, 0.2 cm, 0.4 cm, 0.4 cm, 0.3 cm, 0.2 cm, 0.4 cm, 0.1 cm, 0.3 cm, 0.1 cm, 0.2 cm, 0.3 cm, 0.1 cm, 0.1 cm, 0.1 cm, 0.2 cm, 0.1 cm, 0.1 cm, 0.2 cm, 0.3 cm, 0.2 cm, 0.1 cm, 0.3 cm, 0.1 cm, 0.2 cm, 0.3 cm. 551. Round-headed rivet, made from a copper alloy. H: 0.4 cm, head Dm: 1.2 cm. 552. Flat-headed rivet, made from a copper alloy. H: 0.8 cm, head Dm: 1.0 cm. 553. Round-headed rivet, made from a copper alloy. H: 0.4 cm, head Dm: 1.1 cm. 554. Flat-headed rivet, made from a copper alloy. End of the rivet mandrel is bent. H: 0.7 cm, head Dm: 0.7 cm. 555. Round-headed rivet, made from a copper alloy. H: 0.4 cm, head Dm: 1.0 cm. 556. Fragment of a headless rivet, made from a copper alloy. L: 1.3 cm. 557. Fragment of a headless rivet, made from a copper alloy. L: 1.0 cm. 558. Round-headed rivet, made from a copper alloy. H: 0.4 cm, head Dm: 1.1 cm. 559. Rivet head made from a copper alloy. Dm: 0.8 cm, H: 0.3 cm. 560–563. Four rivets, made from a copper alloy from three-layer comb⁴⁰. L: 0.7 cm, 0.7 cm, 0.7 cm, 0.4 cm, Thk: 0.2 cm each. 564. Rivet, made from a copper alloy. L: 0.8 cm, Thk: 0.2 cm. 565. Fragment of an item made of bone (antler [?]), saturated with copper oxides. L: 0.7 cm, W: 0.6 cm. 566. Fragment of an amber item. L: 0.8 cm, W: 0.5 cm, Wt: 0.08 g. 567a–i. Nine lumps of amber. Found as part of a cluster. Dimensions: a – L: 2.2 cm,

W: 1.5 cm, b – L: 1.7 cm, W: 1.4 cm, c – L: 1.3 cm, W: 1.1 cm, d – L: 1.2 cm, W: 1.3 cm, e – L: 1.5 cm, W: 1.2 cm, f – L: 1.1 cm, W: 1.3 cm, g – L: 0.6 cm, W: 1.1 cm, h – L: 0.8 cm, W: 0.8 cm, i – L: 0.7 cm, W: 0.6 cm, combined Wt: 7.26 g. 568. Fragment of a flat piece of silver item. Preserved L: 0.8 cm, preserved W: 0.9 cm, Wt: 0.19 g. 569. Silver object melted to a lump. Preserved L: 1.4 cm, W: 0.6 cm, Wt: 1.56 g. 570. Fragment of a silver item, smooth wire. Preserved L: 2.6 cm, W: 0.3 cm, Wt: 1.80 g. 571. Silver object melted to a lump. L: 0.5 cm, W: 0.6 cm, Wt: 0.75 g. 572. Silver object melted to a lump. L: 1.6 cm, H: 1.0 cm, Wt: 2.90 g. 573. Forged silver circle of smooth wire. Dm: 2.3 cm, Thk: 0.3 cm, Wt: 2.28 g. 574. Silver circle of incised wire. Dm: 1.7 cm, Thk: 0.2 cm. 575. Fragment of a flat piece of metal, made from a copper alloy. Remains of solder on the surface (not analysed). Preserved L: 1.9 cm, W: 0.5 cm. 576. Fragment of a flat piece of metal, made from a copper alloy. Remains of solder on the surface (not analysed). Preserved L: 3.3 cm, W: 0.6 cm. 577. Fragment of a bent flat piece of metal, made from a copper alloy. One end hooked. L: 5.4 cm, W: 1.0 cm. 578a–c. Three small balls made from a copper alloy. Dm: 0.4 cm each. 579a–c. Three wire circles made from a copper alloy, of which two are bent out of shape. Dm: 1.1 cm, wire Thk: 0.2 cm. 580. Fragment of a flat piece of metal with a partially preserved hole, made from a copper alloy. Preserved L: 1.5 cm, preserved W: 0.7 cm. 581. Circle made from a copper alloy. Dm: 1.1 cm. 582. Fragment of an object made from a copper alloy. Bent out of shape. Oval cross section. L: 2.0 cm, W: 0.2 cm. 583. Fragment of a flat semi-circular piece of metal, made from a copper alloy. Preserved L: 2.1 cm, W: 2.5 cm. 584. Flat piece of metal with a rectangular central hole, made from a copper alloy. L: 1.7 cm, W: 1.3 cm. 585. Fragment of an object made from a copper alloy, with punched concentric circles connected with an ornamental engraved line. Preserved L: 2.7 cm, W: 2.5 cm. 586. Chain link, made from a copper alloy. L: 0.8 cm, Thk: 0.2 cm. 587. Fragment of a wide-ended iron object. Preserved L: 2.8 cm, bow W: 0.6 cm. 588. Fragment of an object made from a copper alloy. Preserved L: 0.5 cm, Thk: 0.2 cm. 589. Fragment of a little shield made from a copper alloy. Preserved L: 4.6 cm, preserved W: 3.1 cm, Thk: 1.8 cm. 590. Fragment of wound up wire made from a copper alloy. Preserved L: 1.1 cm, W: 0.5 cm. 591. Fragment of wound up wire made from a copper alloy. Preserved L: 0.7 cm, W: 0.4 cm. 592. Fragment of a metal attachment made from a copper alloy. Preserved L: 2.8 cm, W: 1.3 cm. 593. Tape made from a copper alloy. L: 3.2 cm, bow W: 0.4 cm. 594. Partially melted fragment of an object made from a copper alloy. Preserved L: 2.4 cm, W: 0.5 cm. 595. Fragment of an object made from

³⁹ The reconstruction of the jug based on the fragments described under numbers 502–550 is illustrated on plate CXCI.

⁴⁰ Cf. footnote 38.

a copper alloy. Preserved L: 1.5 cm, W: 1.1 cm. **596.** Flat rectangular piece of metal, made from a copper alloy. Decorated at the edges with punched dots. L: 4.1 cm, W: 1.5 cm. **597.** Fragment of an object made from a copper alloy. Preserved L: 1.0 cm, W: 1.1 cm, Thk: 0.2 cm. **598.** Fragment of an object made from a copper alloy. Dm: 0.5 cm, H: 0.6 cm. **599.** Fragment of an iron item terminating in a profiled knob. Preserved L: 1.4 cm, W: 0.3 cm.

600. Fragment of an iron item. Preserved L: 0.7 cm, W: 0.2 cm. **601.** Fragment of an iron item. Preserved L: 1.6 cm, W: 0.7 cm, Thk: 0.2 cm. **602.** Fragment of an iron item. Preserved L: 4.5 cm, W: 0.6 cm. **603.** Fragment of an iron item. Preserved L: 1.8 cm, W: 1.8 cm, Thk: 0.6 cm. **604.** Fragment of an iron item. Preserved L: 2.0 cm, preserved W: 1.8 cm, Thk: 0.4 cm. **605.** Iron fitting. L: 2.6 cm, preserved W: 8.1 cm.

III. ANALYSIS OF HORIZONTAL STRATIGRAPHY OF THE CEMETERY IN WEKLICE (MAREK BACZEWSKI)

INTRODUCTION

Given the large number of graves precisely dated within the internal chronology of the site in Wekllice (cf. Tab. 1), it was possible to come up with a detailed analysis of horizontal stratigraphy using geospatial tools. A GIS (Geographic Information System) database was compiled for the site using ArcMap version 10.8. The database contains information on graves discovered during excavations in 1984–2018. The chronology of individual items was established based on data contained in the first part of the monograph on the Wekllice cemetery⁴¹ as well as the new information found in the present volume. The total number of graves and other features included in the analysis (Fig. 6, 7) is 588, 439 of which have been assigned to specific *stadia*. The layouts illustrating the spatial development of the cemetery over time do not include 52 objects dated less accurately using stratigraphic data or 97 others whose chronology remained undetermined.

Stray finds are included in the analysis of the horizontal stratigraphy of the cemetery. The high number of stray finds results from surface damage of the site. The area contains garbage pits, utility pits, sand excavation pits and fortifications made by German soldiers in 1945⁴². The location was also used for forestry (tree plantations) and agriculture (ploughing). Surveying data indicate that the top of the hill on which the cemetery is located was almost two meters higher before World War II than it is today⁴³. Also, some burials were damaged even while the cemetery remained in use – this is apparent from damage to older graves caused by later burials.

Only stray finds with precise location data within the site grid are included in the map. The database

comprises 203 dated and 123 undated items (Fig. 8). Because those are not part of burial assemblages, an interregional chronology system developed for the Wielbark Culture was used to date them⁴⁴. Stray finds were considered as a source of useful information about the spatial development of the cemetery if it was possible to date them to within three adjacent *stadia*. In total, the GIS database contains 914 records (Fig. 9).

ANALYSIS

The cemetery began operation at a time associated with *stadium* IA within the internal chronology of the cemetery, corresponding to the interregional sub-phase B_{1b}. The earliest inhumation burials, which are related to the phase in which the necropolis was established, took place in pits oriented along the east-west axis⁴⁵. So far, nine burials have been discovered that can be reliably dated to this phase⁴⁶. The graves from *stadium* IA were mainly concentrated in the northern part of the examined area of the cemetery (Fig. 10). A linear arrangement for the location of burials is apparent, with three rows of two to five graves. Presumably, more objects would have existed in the initial phase. This is suggested by brooches found as stray finds, A.III.53, which are also present in the equipment of graves from *stadium* IA. Notably, this part of the hill has sustained heavy damage, as shown by the numerous stray finds discovered in this part of the necropolis.

In *stadium* IB (interregional sub-phase B_{2a}), the orientation of inhumation graves changes to N-S, with some declination along the NNW-SSE axis or, less frequently,

⁴¹ M. Natuniewicz-Sekuła, J. Okulicz-Kozaryn 2011.

⁴² M. Natuniewicz-Sekuła 2010, 409.

⁴³ M. Natuniewicz-Sekuła 2010, 409, footnote 15.

⁴⁴ R. Wołagiewicz 1968; 1981; 1993, 24–25, fig. 1, 2; K. Godłowski 1970.

⁴⁵ M. Natuniewicz-Sekuła 2007, 485–487.

⁴⁶ The precise location of grave VIII is unknown (cf. M. Natuniewicz-Sekuła, J. Okulicz-Kozaryn 2011, 26–27).

Tab. 1. Weklice. Chronology of the graves and other features. Phases acc. to A. Bursche, J. Okulicz-Kozaryn 1999; J. Okulicz-Kozaryn 1992; *stadia* acc. M. Natuniewicz-Sekuła, J. Okulicz-Kozaryn 2011; M. Natuniewicz-Sekuła 2020; interregional chronology acc. to H. J. Eggers 1951; R. Wołagiewicz 1968; K. Godłowski 1970; absolute dating acc. to the authors. Compiled by: M. Baczewski, M. Natuniewicz-Sekuła

Phase	<i>Stadium</i>	Inhumation graves	Cremation-inhumation graves	Cremation urn graves	Cremation pit graves	Funeral pyre (pyre sites [?])	Other features	Total	Interregional chronology	Absolute dating (approximately)
I	IA	VIII, 474, 489, 491, 492, 501, 503, 516, 518, 535 (?)	-	-	-	-	-	10	B ₁ ; B _{1b} (?)-B _{1c}	ca. 40-70 AD
	IA/IB	89	-	-	-	-	-	1	-	ca. 60-90 AD
	IB	III, 14, 66, 72, 136, 258, 271, 339, 471, 482, 523	64	-	-	-	-	12	B _{2a}	ca. 80-100AD
I/II	IB/IIA	21, 90, 144	-	-	-	-	-	3	-	ca. 80-110 AD
II	IIA	137, 282, 340, 360, 376, 401, 406, 481/484 (?)	-	-	-	618	-	9	B _{2b}	ca. 100-120 AD
	IIA/IIB	40, 46, 52, 97, 138, 254, 301, 349	-	-	-	-	-	8	-	ca. 110-130 AD
	IIB	20, 35, 38, 44, 45, 48, 58, 83, 96, 158, 161, 240, 277, 299 (?), 332, 344, 346, 348, 350, 361, 362, 396, 451, 468, 504 (?), 550, 570	496	223, 374	-	-	36	31	B _{2b} /B _{2c}	ca. 120-140 AD
	IIB/IIC	V, 22, 25, 26A-D, 27, 60, 74, 84, 88, 196, 218, 219, 238, 251, 259, 267, 278, 303, 318, 330, 334, 364, 386, 398, 404, 413, 480, 485, 494, 545, 555, 628	-	77, 117, 244, 544	-	-	-	36	-	ca. 130-140 AD
	IIC	18, 39, 107, 205, 228, 234, 373, 390, 405, 466, 475, 502, 564, 604	-	135, 139, 179A/190/190A, 291/294/295	473	-	-	19	B _{2c}	ca. 140-150 AD
III	IIIA	I, II, 17, 34A, 191, 221, 227, 265, 286, 432, 456, 488, 505, 541, 568 (?), 575 (?), 601, 606, 610	16, 507	29/30, 41 (?), 67, 68 (?), 73, 78, 85, 98 (?), 108 (?), 109, 115, 116, 120 (?), 129, 140, 145, 146/149, 148, 151, 157/180, 166 (?), 169, 176, 181/182, 188, 195 (?), 206, 209, 211, 212/213, 214 (?), 215, 217, 226, 232, 242, 263, 276, 281, 284, 585 (290A), 296 (?), 297 (?), 300A-D, 310 (?), 319 (?), 320, 322, 351/352/355/356, 375 (?), 375A (?), 381, 385 (?), 421/444, 431, 435, 442, 444A-D, 449/458, 450 (?), 457, 499 (?), 506 (?), 571, 573, 630	537 (?)	-	-	88	B ₂ /C ₁ ; B ₂ /C _{1.A}	ca. 150-170 AD
	IIIA/IIIB	33, 163 (?), 172 (?), 177 (?), 208, 250, 257, 279 (?), 289/436, 302, 338, 366, 397, 402, 429, 434, 453, 455, 467, 524, 536, 543, 558 (?), 560 (?), 563 (?), 578, 589, 605	495, 554	65/65A (?), 198/199, 286AB, 286C, 341, 561 (?)	154 (?), 549	-	-	38	-	ca. 160-180 AD

Phase	Stadium	Inhumation graves	Cremation-inhumation graves	Cremation urn graves	Cremation pit graves	Funeral pyre (pyre sites [?])	Other features	Total	Interregional chronology	Absolute dating (approximately)
III	IIIB	11, 24, 28, 43, 62, 80, 92, 102, 125, 127, 192, 200, 210, 252, 256, 261, 306, 314, 316, 326, 342, 353, 382, 383, 393, 445, 447, 448 (?), 452, 465, 469, 509, 528, 532, 542, 553, 559 (?), 588, 609	530 (?), 540 (?), 594	160/175, 305	490, 514 (?)	–	63	47	B ₂ /C ₁ –C _{1a} ; B ₂ /C _{1B} and C _{1a}	ca. 170–200 AD
III/IV	IIIB/IVA	400, 519, 595	–	–	–	–	388	4	–	ca. 190–200 AD
IV	IVA	VI, 15, 23, 59, 65B, 75, 76, 82, 101 (?), 124, 155, 179, 204, 229, 231, 246, 268, 280, 287, 298, 312, 315, 433, 438, 463, 522, 538, 546, 574, 586	–	143, 233 (?), 235, 237 (?), 359, 412, 418, 437, 464, 529	500	–	271A	42	C _{1b}	ca. 200–220 AD
	IVA/IVB	55, 150, 153, 239, 301A, 307, 309, 324, 403, 416, 521, 547	118, 625	147 (?)	576	–	–	16	–	ca. 210–230 AD
	IVB	128, 133, 168, 184, 308, 372, 389, 423, 498A, 552, 557, 562, 579, 582, 592C, 600, 629	–	279A	616, 622, 623, 623A	–	–	22	C ₂ (C _{2a})	ca. 220–240 AD
IV/V	IVB/V	478, 539 (?), 613, 614, 620	–	–	–	–	–	5	–	ca. 230–250 AD
V	V	IV, 34, 86, 95, 119, 131, 132, 141, 173, 174, 185 (?), 194, 202, 220, 248, 274, 275, 288, 323, 327, 328 (?), 331, 333, 336, 379, 380, 411, 426, 440, 441, 446, 621, 631	596	87 (?), 105 (?), 142 (?), 178 (?), 292, 337 (?), 354, 410 (?), 443 (?)	170 (?), 363	–	–	45	C ₂ (C _{2b})	ca. 250–300 AD
VI	VI	551	569	357	567	–	–	4	C ₃ –D ₁	ca. 300–375 AD
(?)	(?)	VII, 9, 10, 12, 13, 31, 32, 37, 42, 53, 69, 183, 224, 225, 335, 345, 369, 371, 387, 454, 461, 493, 498, 508, 510, 511, 512, 513, 517, 520, 525, 526, 527, 533, 587, 590, 593, 598, 602, 612, 615, 627, 636	201, 635	49, 57, 71, 99, 104, 130, 159, 189, 222, 262, 264, 270, 272, 293, 329, 358, 377, 384, 392, 415, 419/422, 424, 461A, 534, 626	19, 61, 165, 167, 266, 591, 617, 619, 624, 633, 637	–	527A, 590A	83	(?)	(?)
Graves and features dated on the basis of stratigraphy (cf. subsection II.2.)		47, 51, 54, 81, 91, 94, 126, 164&164A, 207, 216/247, 236A, 241, 243, 245, 249, 253, 260, 283, 290, 311, 313, 321, 378, 394, 395, 548, 556, 565, 566, 572, 597, 603, 608, 611	–	56, 60A, 100, 103, 110, 111/123AB, 113, 114, 121/122/134, 152A–F, 162, 186/187, 197, 230, 236, 255, 285, 391, 399, 407/414/420, 408/417/439, 430, 577, 581	93, 103A, 580, 634, 638, 639, 640	592AB	543A, 564A, 578A, 599, 620A, 621A	72	–	–

the NNE-SSW axis. Some new burials were located in a previously used area of the cemetery; in those cases, a linear arrangement relative to the older graves was retained (Fig. 11). Otherwise, new graves were located to the south and southwest of existing ones, i.e. within the upper part of the slope. This represented a significant development of the cemetery. In those cases, no linear pattern is apparent. In *stadium* IB, we encounter the earliest instance of what we interpret as a cremation-inhumation grave (grave 64⁴⁷).

In *stadium* IIA, nine objects can be distinguished, with eight more from the intermediate *stadium*, i.e. *stadium* IIA/IIB. *Stadium* IIA corresponds to the early interregional B_{2b} sub-phase. The new area being put to use in the cemetery is mainly located south of all the older burials, comprising large sections of the hillside (Fig. 12). At that time, the graves were located at considerable distances from one other, resulting in a more scattered pattern relative to earlier *stadia*. This can be explained in two ways. One is that the cemetery may have become designated as a burial area for locating future interments. Alternatively, perhaps certain areas were designated or created as burial areas for specific families. Only in some instances are the graves located closer together, as in the central-western part of the studied area. Grave pits dug between older burials, mainly those dated to *stadium* IA, did not follow the original linear pattern. The distribution of stray finds dating to sub-phase B_{2b} may suggest that other graves from that *stadium* might also have been located at the top of the hill and on its slope.

In the next *stadium* (IIB), which largely corresponds to interregional sub-phases B_{2b}/B_{2c}, a significant increase in the number of graves becomes apparent. Inhumation graves predominate, with the earliest cremation urn graves making an appearance along with another instance of a cremation-inhumation burial. The area used for burials remained unchanged at this time (Fig. 13). However, it is possible to identify areas where new burials predominated. Most were located in the eastern part of the area in use at the time (the hillside). Grave pits located in the northern part of that cluster are noticeably distributed along a linear pattern.

In terms of funeral rites and grave inventories, the beginning of *stadium* IIC remains similar to that at the end of *stadium* IIB (*stadium* IIB/IIC)⁴⁸. The Weklice community continued to use inhumation burials. However, cremation was beginning to have a growing importance. Besides urn burials, the earliest cremation pit

graves make an appearance. In contrast to the previous *stadium*, burials were usually located in the central and western part of the cemetery, mostly in empty spaces between older burial pits (Fig. 14). In the empty zone to the southwest of the oldest objects, a new cluster of burials appeared. At this point the cemetery is expanding considerably in the eastern direction. Two new burials are made at a distance of approximately 10 m from older graves. The border between the newly established burial area in the east and the rest of the cemetery will be retained over several successive *stadia*.

Stadium IIC corresponds to the end of interregional phase B₂ (sub-phase B_{2c}). Inhumation continues to be the most prevalent funeral rite. Cremation urn graves and cremation pit burials also appear (the former being predominant). New graves were located in empty spaces between older burials, mainly in the central part of the hill slope (Fig. 15). A few graves are also located near the hilltop. One grave was located a short distance from the older burials – on the south-western edge of the cemetery. In that case it should be borne in mind that the western part of the cemetery may have been completely destroyed by the open-pit gravel mine. The aggregate plan for phase II of the cemetery (Fig. 16) has been supplemented with stray finds dated generally to interregional phase B₂. The complete set of stray finds loosely indicates that the area of the cemetery in use by the end of phase II may have been larger. It should be noted that most of the stray finds were discovered in modern and present-day layers. Only a single rod bracelet (Pl. CLXXIII:195) was found in a layer dated to the Roman Period.

In *stadium* IIIA, which corresponds to the older period of interregional phases B₂/C₁-C_{1a}⁴⁹, urn graves come to predominate in the cemetery. However, inhumation graves still account for a significant percentage of burials. A single instance of a cremation pit grave and a cremation-inhumation grave was recorded. In this *stadium*, the central and south-central part of the area under discussion was in heavy use (Fig. 17). The southern part of the cemetery comes into more frequent use. New burial pits were set up outside of the line of graves formed by the older burials, approaching feature 618 – a funeral pyre (pyre site [?]) from *stadium* IIA. The site had also expanded to the east. Subsequent burials were located in the eastern zone of the cemetery, separated by a clear, twelve-metre empty strip. This may have been an area

⁴⁷ M. Natuniewicz-Sekuła, J. Okulicz-Kozaryn 2011, 38–39, Pl. XXVIII.

⁴⁸ M. Natuniewicz-Sekuła 2020, 21–22.

⁴⁹ Based on materials from the cemetery in Weklice, one publication on goldsmithing practices in the Wielbark Culture (M. Natuniewicz-Sekuła 2020, 25–26, footnote 21) proposes subdividing interregional phase B₂/C₁-C_{1a} into two sub-phases – B₂/C_{1.A} (older stage) and B₂/C_{1.B} (younger stage).

designated for burials of people from a single family or gens. Starting in *stadium* IIB, through to *stadium* IVB, a small number of graves (from one to three) will be systematically located in this specific area.

The transitional *stadium* IIIA/IIIB continues to be characterised by a high rate of inhumation burials. There are significantly fewer urn graves at this point compared to the previous *stadium*. Occasional cremation pit burials and cremation-inhumation burials are also present. New burial pits appear almost across the entire area of the cemetery, placed between older features (Fig. 18). However, the number of burials in the central part of the cemetery, which in the previous *stadium* was in heaviest use, now drops noticeably.

Stadium IIIB of the cemetery in Wekllice is synchronous with the younger stage of interregional phase B₂/C₁-C_{1a}⁵⁰. Inhumation predominates over cremation. The proportion of cremation urn graves, pit graves and cremation-inhumation graves is small. At this point in time the size of the cemetery is not expanding (Fig. 19). Grave pits are located in empty spaces between older features. Subsequent burials were located in the central part of the cemetery, where almost no free space was available; as a result, older burials were disturbed in the making of new ones. The aggregate map of phase III of the cemetery (Fig. 20) presents all features dated to this phase and additionally includes dispersion data on items found outside of graves, which can be dated to within phase B₂/C₁-C_{1a}. Though mainly found in modern or present-day layers, those items may indicate the existence of at least several graves, now completely destroyed, in the northern part of the cemetery, at the top of the hill. Concentrations of items from the central and south-eastern periphery of the site may be caused by violations of graves in antiquity, as well as by modern activity, mainly agricultural.

The next *stadium*, i.e. IVA, is correlated with interregional sub-phase C_{1b}. Compared to the earlier *stadium*, the number of graves decreases slightly. However, the number remains high, indicating a stable population and mortality rate. Inhumation graves predominate over cremation graves, mainly urn graves. In that *stadium* grave pits were located almost throughout the cemetery, with a particularly dense concentration in its central part (Fig. 21). The only place where no burials were found is the northern part, where no stray finds were likewise recorded. In the eastern part, new graves were located (three features in *stadium* IVA). The empty strip shrinks slightly.

Similar patterns in terms of frequency and location of burials are discernible where it comes to the

transitional *stadium* IVA/IVB, which is also associated with sub-phase C_{1b}. New burials make an appearance in the empty strip that separates the eastern cluster (Fig. 22). A new grave is also laid outside of the previously respected southern boundary of the cemetery.

Stadium IVB is synchronised with the oldest stage of interregional phase C₂. A drop in the number of graves is noticeable. Inhumation burials predominate. The proportion of cremations is small. Most cremation burials take place in pit graves. Most of the burials were made in the southern part of the cemetery – this represents an expansion relative to the earlier boundaries of the cemetery (Fig. 23). The remaining graves from *stadium* IVB were placed between older graves. At this time, the last burial was made in the eastern zone of the cemetery. That zone would not be used afterwards. The largest number of stray finds dated to phases C_{1b}-C₂ were found in the north-western part of the cemetery. Among others, those included silver brooches⁵¹, silver bracelets⁵², silver belt elements⁵³ and Roman imports⁵⁴. The collection of those prestigious objects may indicate that graves of people with a higher social status, now destroyed, were once located in that zone. The location itself would seem to have a certain relevance in that respect, the top of the hill being the most prominent place in the locality.

The aggregate layout map for phase IV (Fig. 24) of the cemetery also includes burials from the transitional *stadium* IVB/V as well as stray finds that can be dated to within interregional phase C_{1b}. Similar to the previous *stadium*, most burials took place in the northern part of the cemetery, beyond the line of burials maintained until *stadium* IIIA.

Stadium V is correlated with the late C₂ phase. Compared to *stadium* IVB, the number of graves increases. Inhumation predominates. Also found are some cremation urn graves and pit graves as well as a single cremation-inhumation burial. The extent of the cemetery remains unchanged. Graves are concentrated in the western and central parts of the cemetery (Fig. 25). The eastern zone is not in use. The distribution of stray finds datable to within phase C₂ may indicate that graves existed at that time in the northern eastern parts of the cemetery. However, it should be noted that all of those finds were located on a secondary deposit in modern or contemporary layers.

⁵¹ Cf. subsection II.3., cat. nos. 91, 111, 117, 118, 140, 147, 152, 153, 161.

⁵² Fragments of shield-headed bracelets, cat. nos. 219, 221, 222, 223, 224, 225, 226, 227 and wavy bracelets (*wellenförmiger Arming*), cat. nos. 239, 240, 243, 246, 247, 248, 249.

⁵³ Buckle, cat. no. 271 and belt strap end cat. no. 316.

⁵⁴ Fragments of the body of a brass jug, cat. nos. 502–550.

⁵⁰ Cf. footnote 49.

Stadium VI, which is synchronous with phase C₃-D₁, is the final *stadium* of operation for the Wekllice cemetery. Only four graves can be included in this *stadium*, each of which uses a different funeral rite (inhumation, cremation-inhumation, cremation urn burial and cremation pit burial). The graves were located at a short distance from one another, in the south-eastern part of the cemetery (Fig. 26), between older burials, however outside of the zone in use in *stadium* V.

CONCLUSION

The analysis of the horizontal stratigraphy of the Wekllice cemetery remains in line with earlier findings, however it offers a significantly more detailed picture. Observations on the cemetery's spatial development⁵⁵ relied on a framework which distinguished between three different zones within the cemetery. The first included the top of the hill and the southwestern part of the slope. That zone was used from the beginning of the cemetery's operation until the beginning of *stadium* V, with the exception of the northern part, i.e. hill-top, which was out of use in the period from *stadium* IB to IIIB. Later, burials would take place at the top of the hill. Those were distinguished by rich grave goods, possibly suggesting burials of local elites. The second zone, which comprised the centre of the slope and the foot of the hill, was separated from the first zone by a strip of empty space. That area was in use from *stadium* IIA until *stadium* VI. This zone is characterised by an archaeologically complex system of overlapping inhumation and cremation graves. The third zone is located east of the second zone. It remained in use from *stadium* IIC until IIIB. The precise demarcation of the first and second zones can now be challenged. It would seem that the south-western arrangement of graves located on the hill is not as clear as suggested previously⁵⁶, and can be only identified until *stadium* IB at the latest. In its final stages, it becomes blurred. Some burial pits appear which are located directly to the south of the oldest objects. This tendency becomes even more apparent in the next *stadium*. The layout maps (Fig. 10–19) show no interruption in the pattern of use of the top of the hill between *stadium* IB and IIIB. Throughout this period, individual burials were made in this area. The presence of several stray finds in this location

might indicate that features dating to within the two *stadia* mentioned above were subsequently destroyed. The frequency and quality of items actually increase in *stadium* IIIB. The new data corroborate the separation of zones two and three, divided by a small empty strip. However, it should be noted that the use of the eastern zone of the cemetery may have started earlier, as some stray finds seem to confirm. Burials located in this part of the cemetery continued to take place until *stadium* IVB; afterwards, the area was no longer in use.

By developing and creating plans of specific *stadia* we have been able to keep a detailed track of chronological and spatial change in the cemetery used by the Wielbark Culture population in Wekllice. Although the site has not yet been excavated fully, we have been able to identify changes to the boundaries over time and to determine which zones remained in the most intensive use in subsequent *stadia* of the cemetery's use. The necropolis was first created at the end of sub-phase B_{1b} at the top of the hill before expanding to the south-west and later to the south, including the hill slope. The cemetery reached its main extent in sub-phase B_{2b}. Subsequent burial pits were mainly located in free spaces between older graves; they were rarely located outside of the area occupied in the earlier *stadia*. It also seems that the top of the hill remained in use throughout the cemetery's existence; this is indicated by stray finds from that area. However, beginning in phase B₂/C₁-C_{1a} until C₂, more objects in that area are found outside of burial pits. Those items are prestigious in nature, made from silver or, less frequently, gold and decorated using advanced goldsmithing techniques. Roman imports are also present among them (mostly fragments of metal vessels). With this in mind, we can assume that several burials of high status individuals took place at the top of the hill in phases B₂/C₁-C_{1a} until C₂. Also notable are graves from the eastern part of the cemetery, which were separated from the main cluster by a zone (several meters wide) kept free of burials. The earliest graves in the eastern part of the cemetery date back to transitional *stadium* IIB/IIC within the cemetery's internal chronology, corresponding to interregional sub-phases. In each successive *stadium* until IVB (interregional phase C₂), at least one grave is established in this zone. Perhaps the individual clusters of graves are family or gens quarters.

⁵⁵ Cf. M. Natuniewicz-Sekuła, J. Okulicz Kozaryn 2011, 134–136, fig. 7; M. Natuniewicz-Sekuła 2020, 113–114.

⁵⁶ Cf. M. Natuniewicz-Sekuła, J. Okulicz Kozaryn 2011, 134–136, fig. 7.

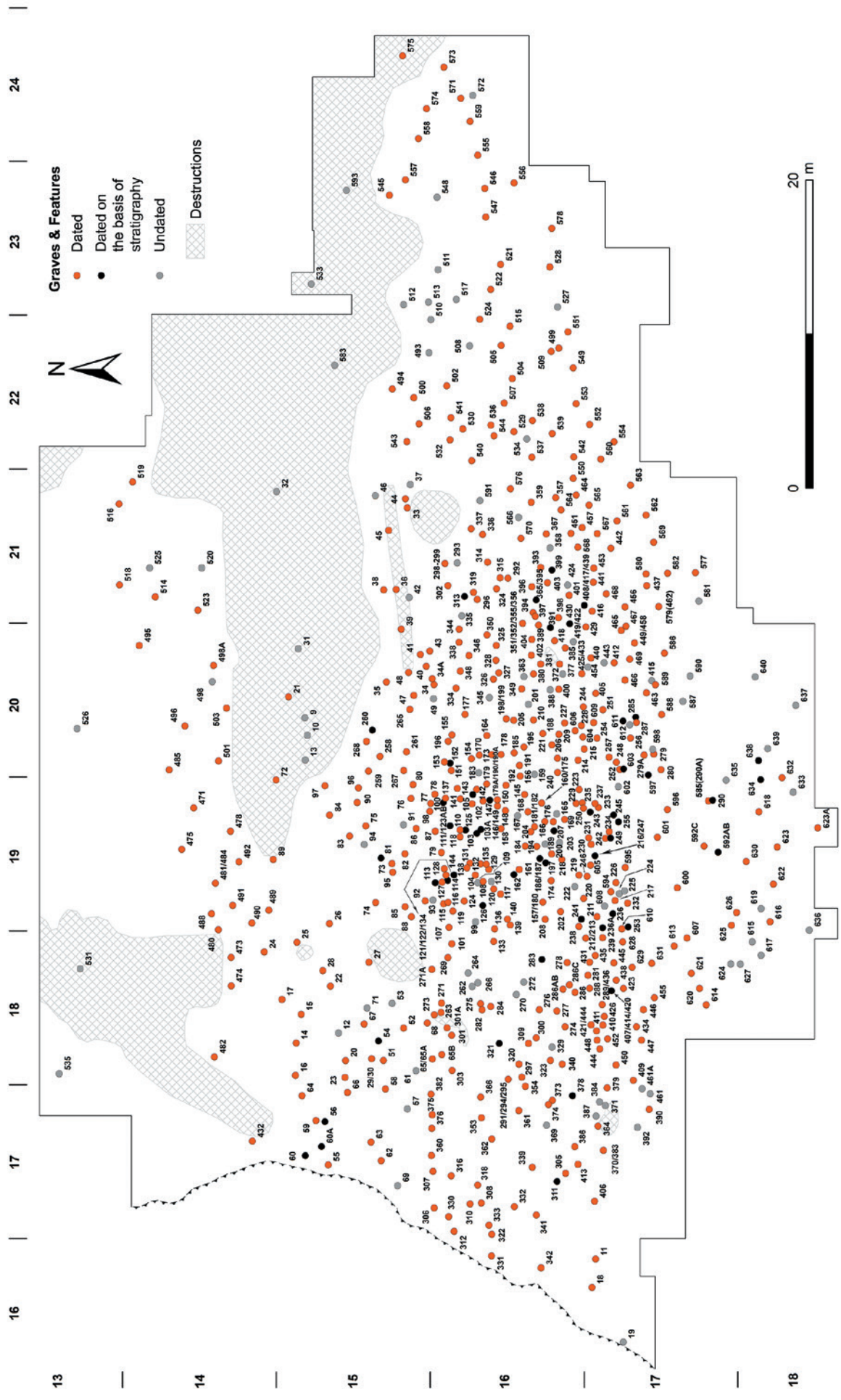


Fig. 6. Graves and other features contained in the GIS database. Graphics: M. Baczewski

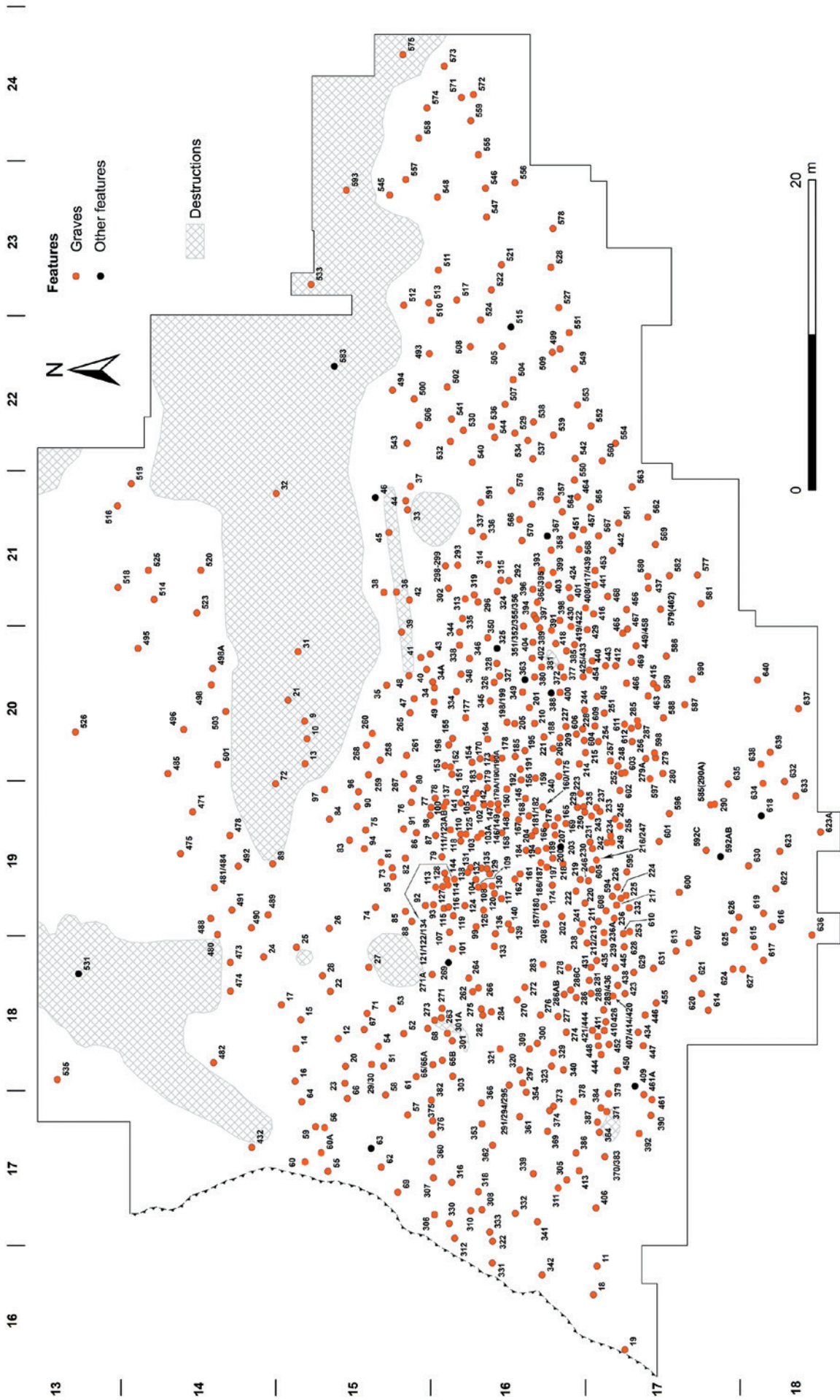


Fig. 7. Distribution of graves and other features included in the GIS database. Graphics: M. Baczewski

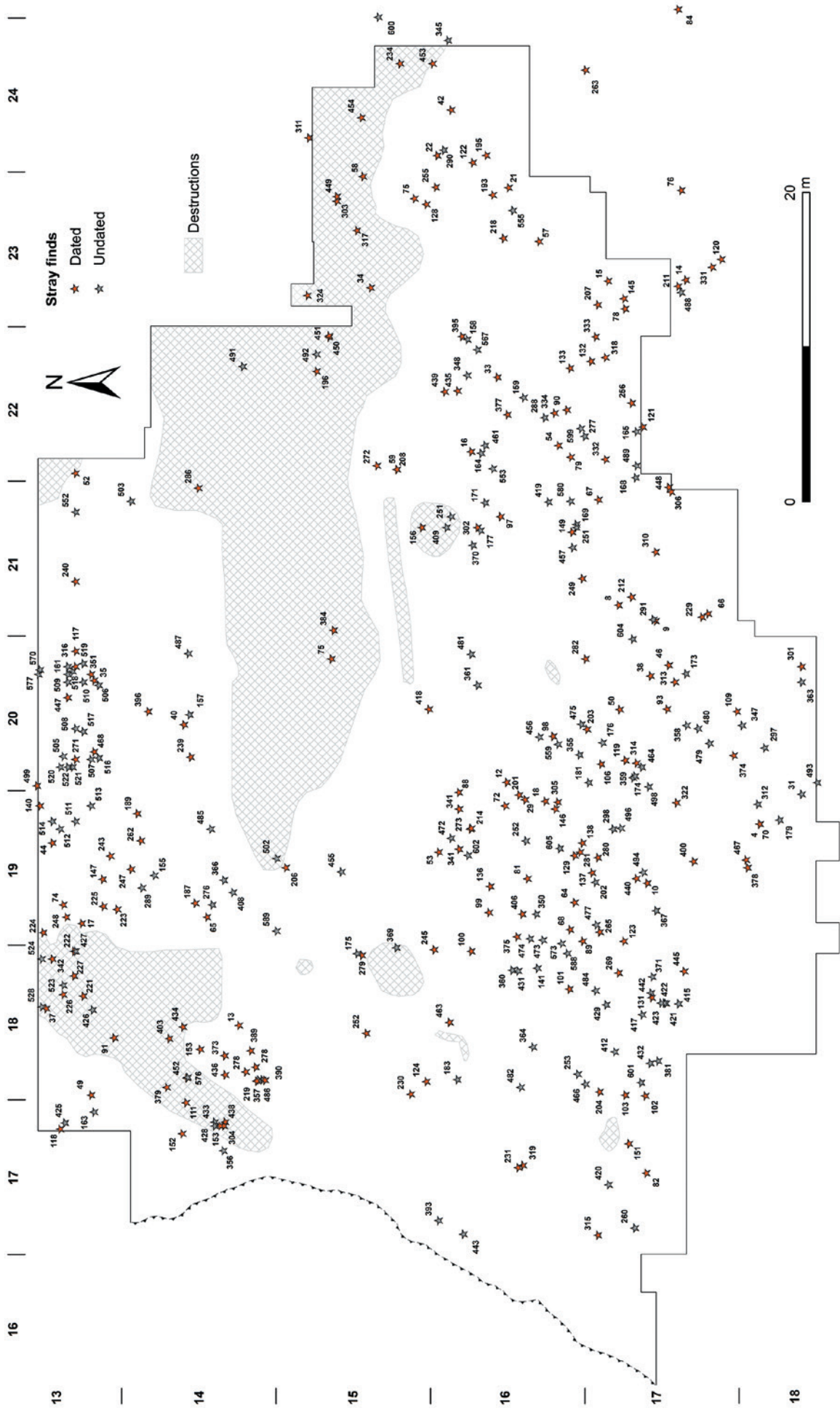


Fig. 8. Stray finds included in the GIS database. The numbers next to symbols correspond to item numbers in the catalogue. Graphics: M. Baczewski

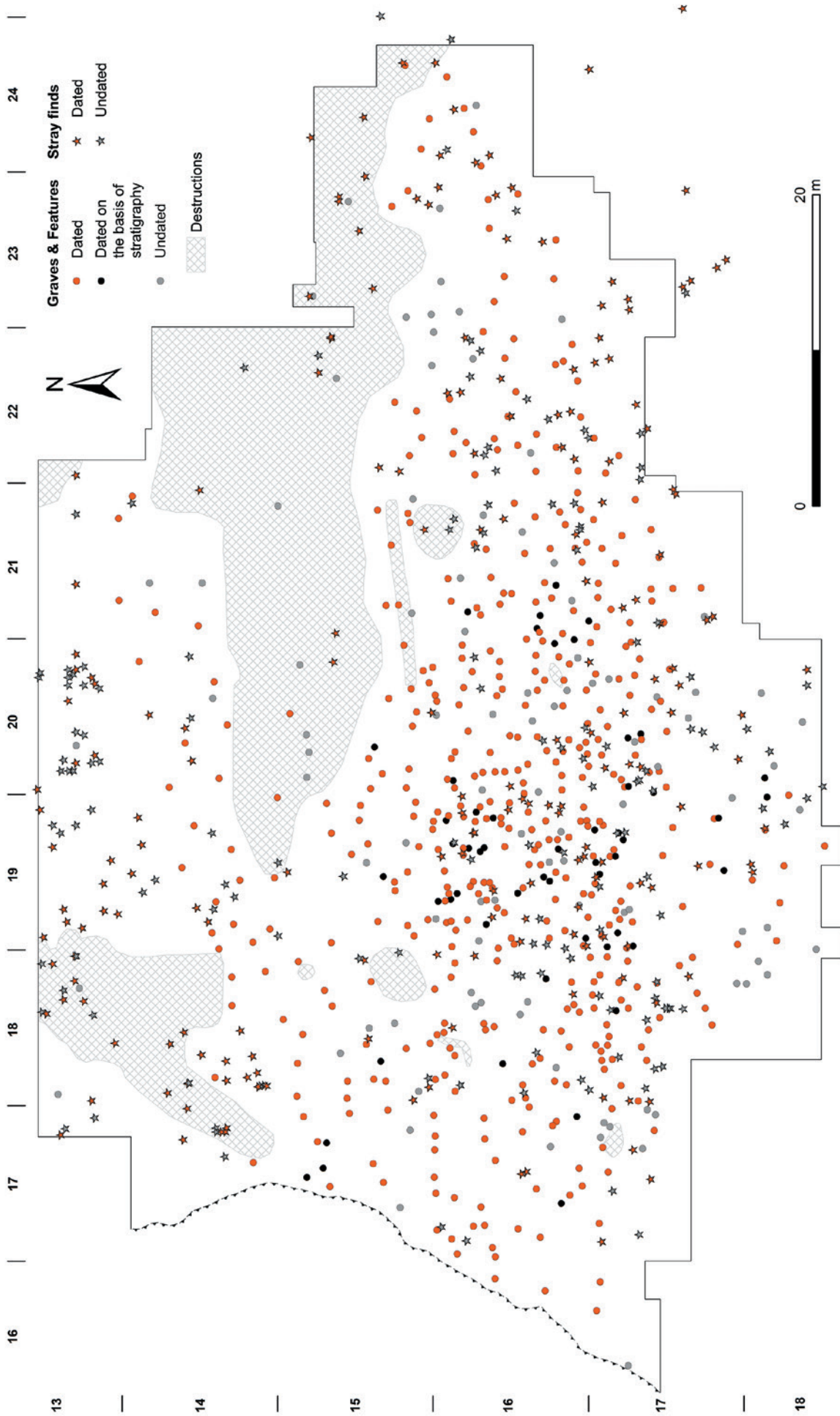


Fig. 9. Distribution of graves, other features and stray finds (dated and lacking specific dating). Graphics: M. Baczewski

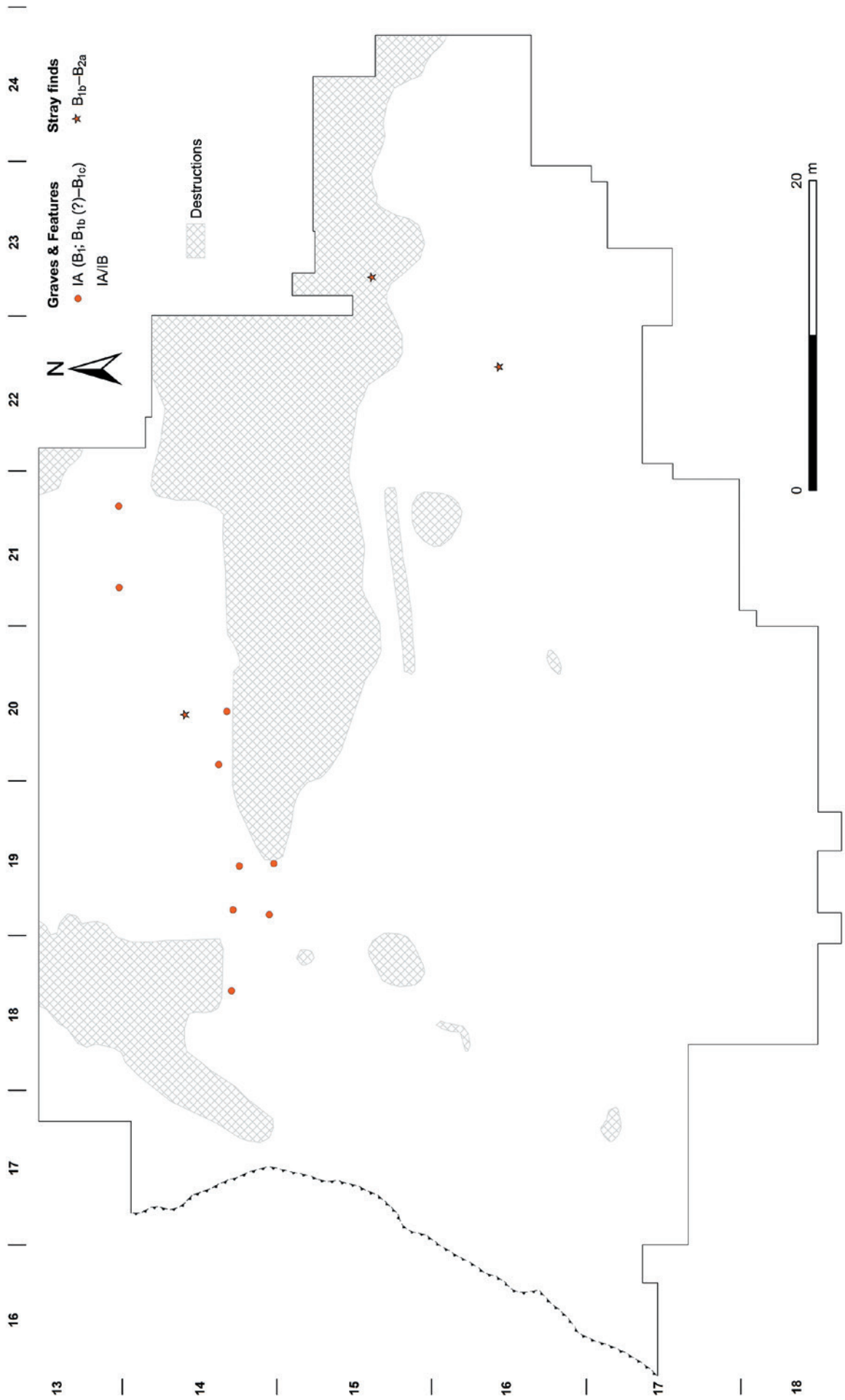


Fig. 10. Distribution of graves, other features in *stadia* IA (B₁, B_{1b} (?)-B_{1c}) and IA/IB and stray finds (interregional chronology B_{1b}-B_{2a}). Graphics: M. Baczewski

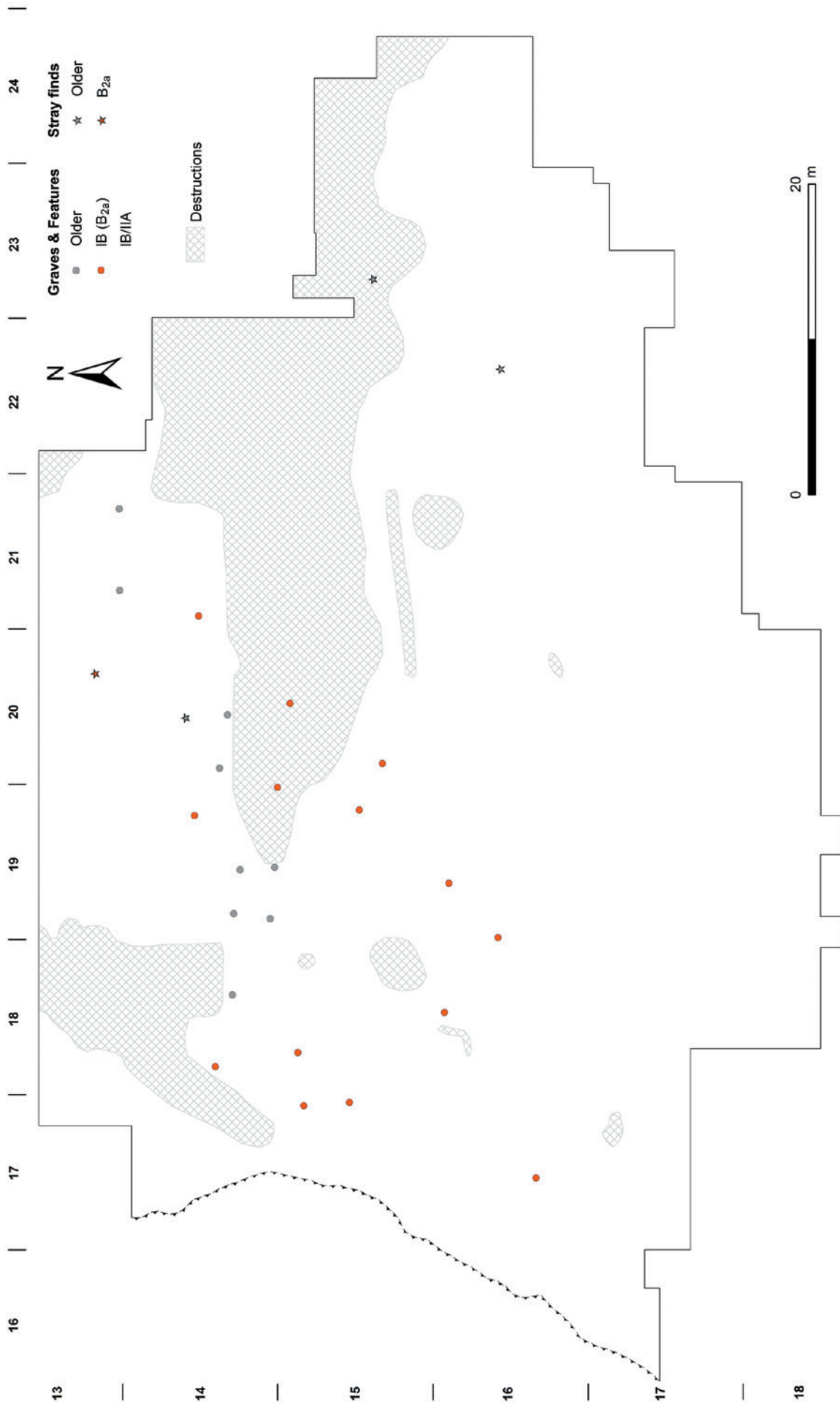


Fig. 11. Distribution of graves, other features in *stadii* IB (B_{2a}) and IB/IIA and stray finds (interregional chronology B_{2a}). Graphics: M. Baczewski

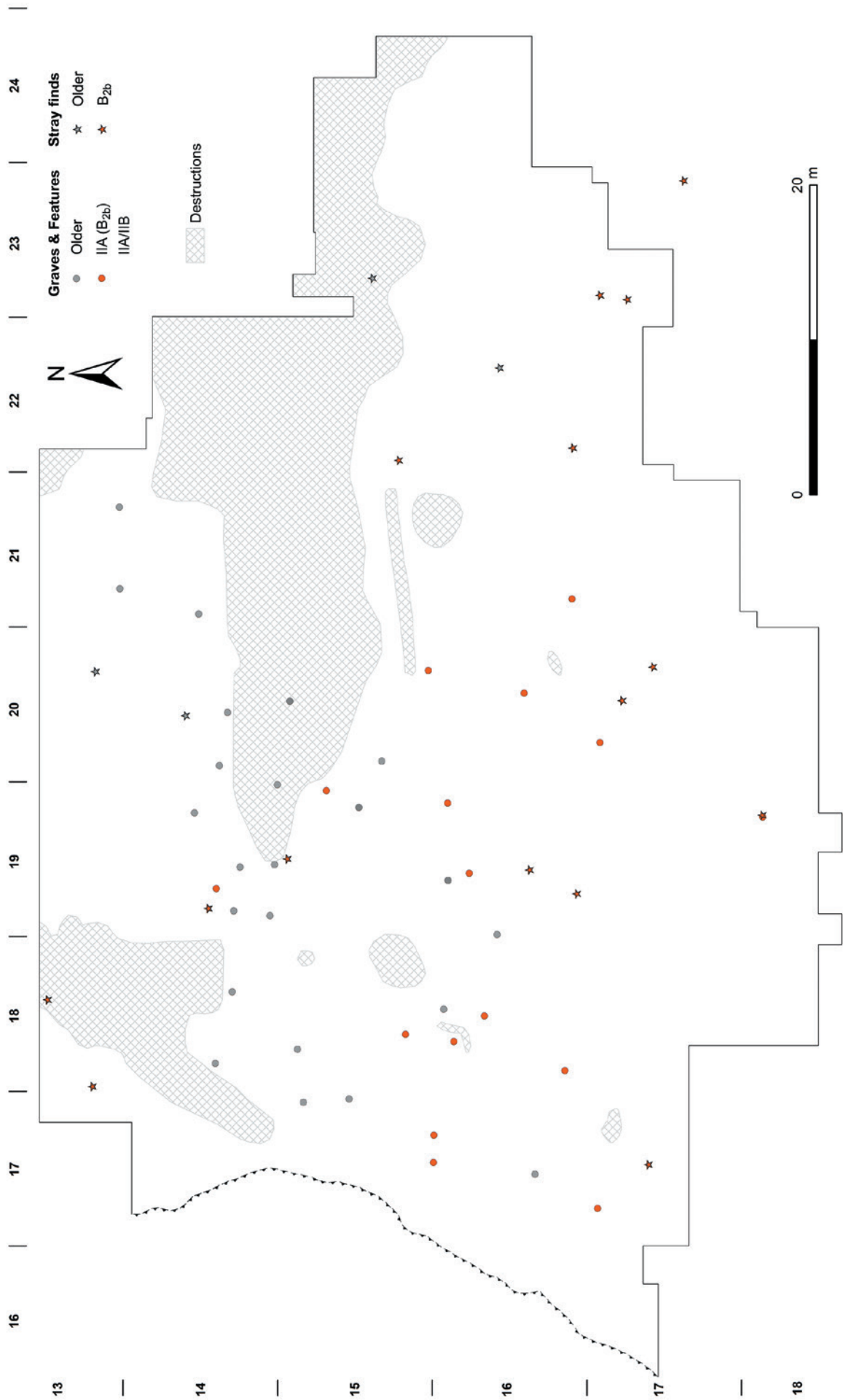


Fig. 12. Distribution of graves, other features in *stadia* IIA (B_{2b}) and IIA/IIB and stray finds (interregional chronology B_{2b}). Graphics: M. Baczewski

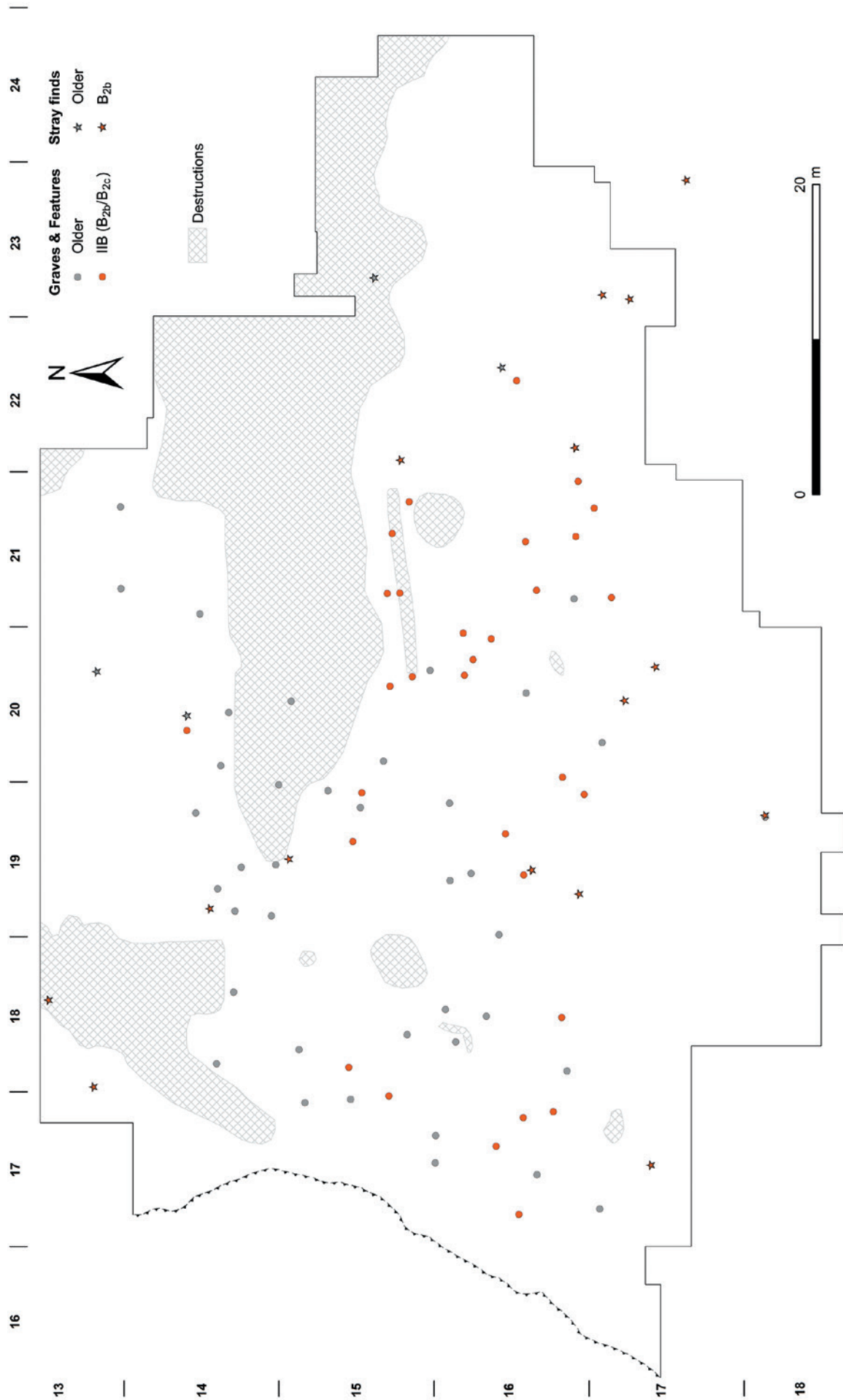


Fig. 13. Distribution of graves, other features in *stadium* IIB (B_{2b}/B_{2c}) and stray finds (interregional chronology B_{2b}). Graphics: M. Baczewski

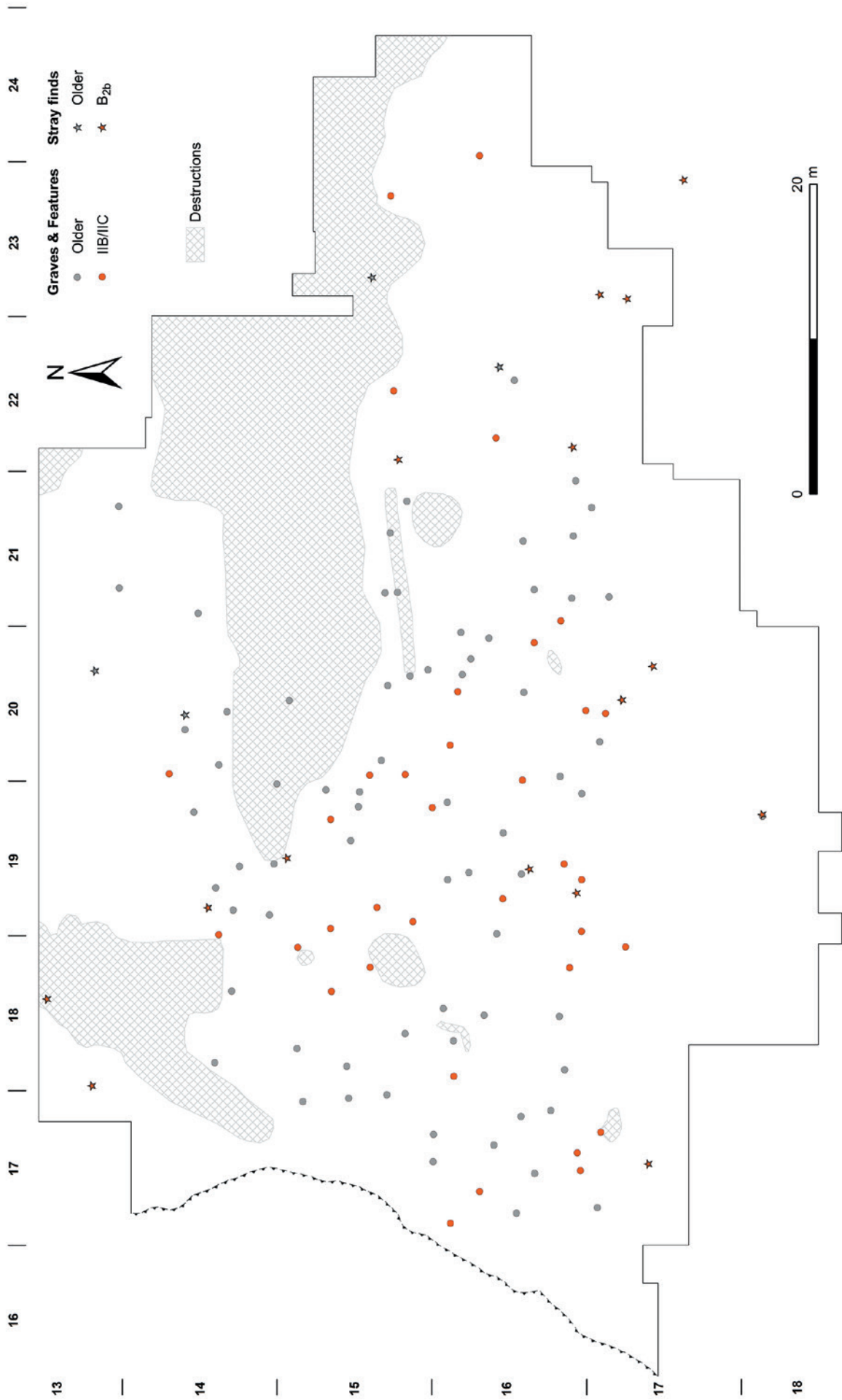


Fig. 14. Distribution of graves, other features in *stadium* IIB/IIC (B_{2b}/B_{2c}) and stray finds (interregional chronology B_{2b}) Graphics: M. Baczewski

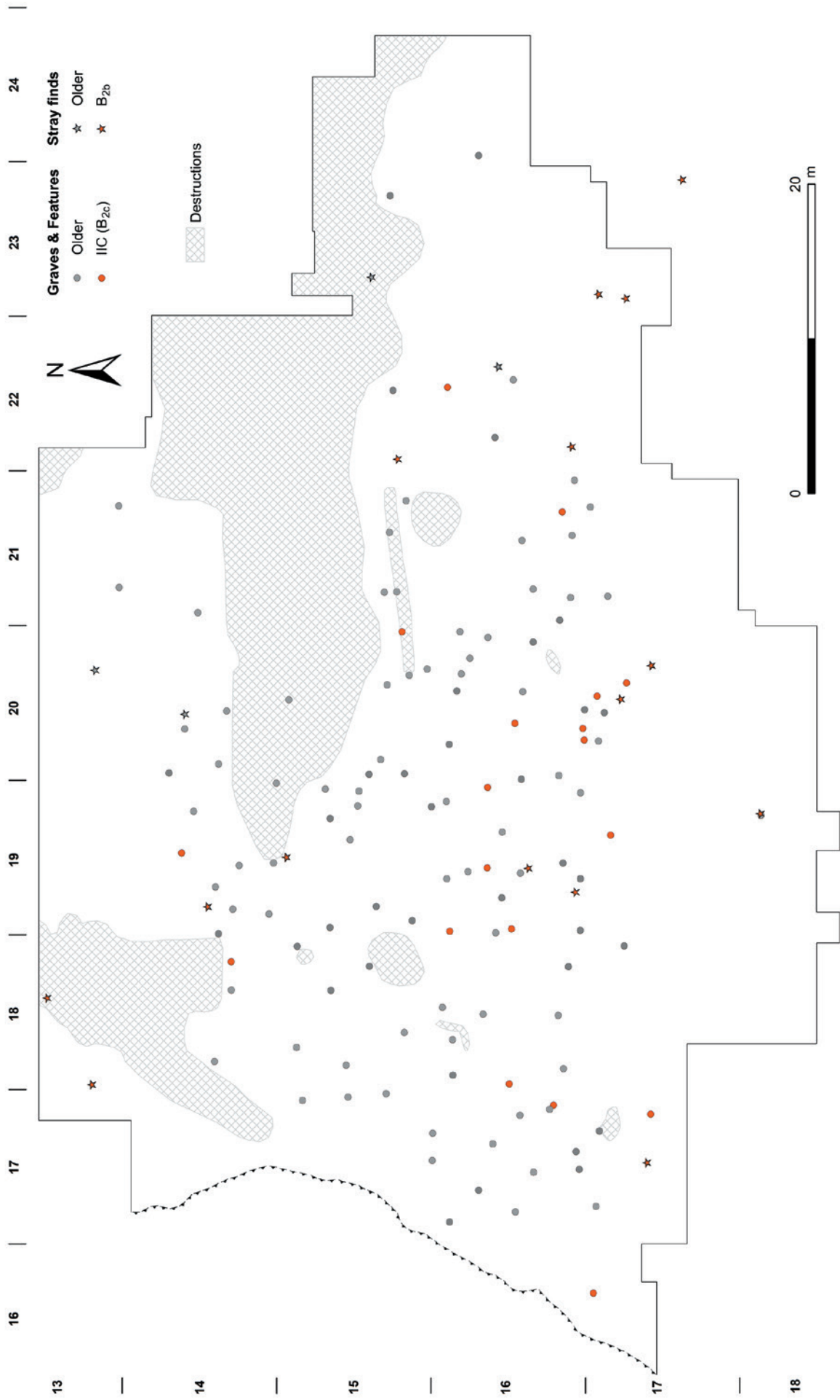


Fig. 15. Distribution of graves, other features in *stadium* IIC (B_{2c}) and stray finds (interregional chronology B_{2b}). Graphics: M. Baczewski

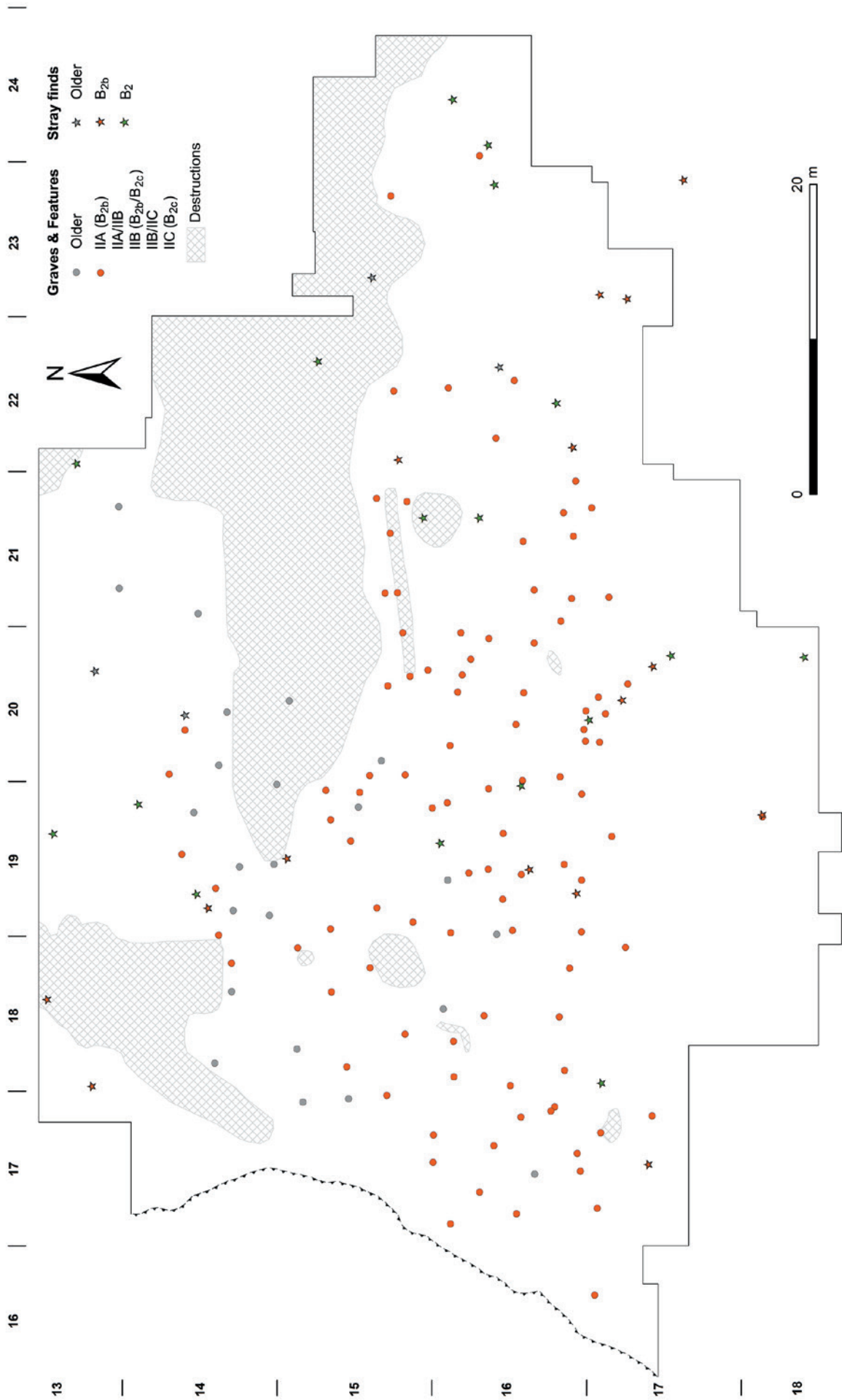


Fig. 16. Aggregate plan of graves, other features from phase II – *stadia* IIA–IIIC (B_{2b}–B_{2c}) and stray finds (interregional chronology B_{2b}). By green stars are marked stray finds with wider chronology, including the end of phase II. Graphics: M. Baczewski

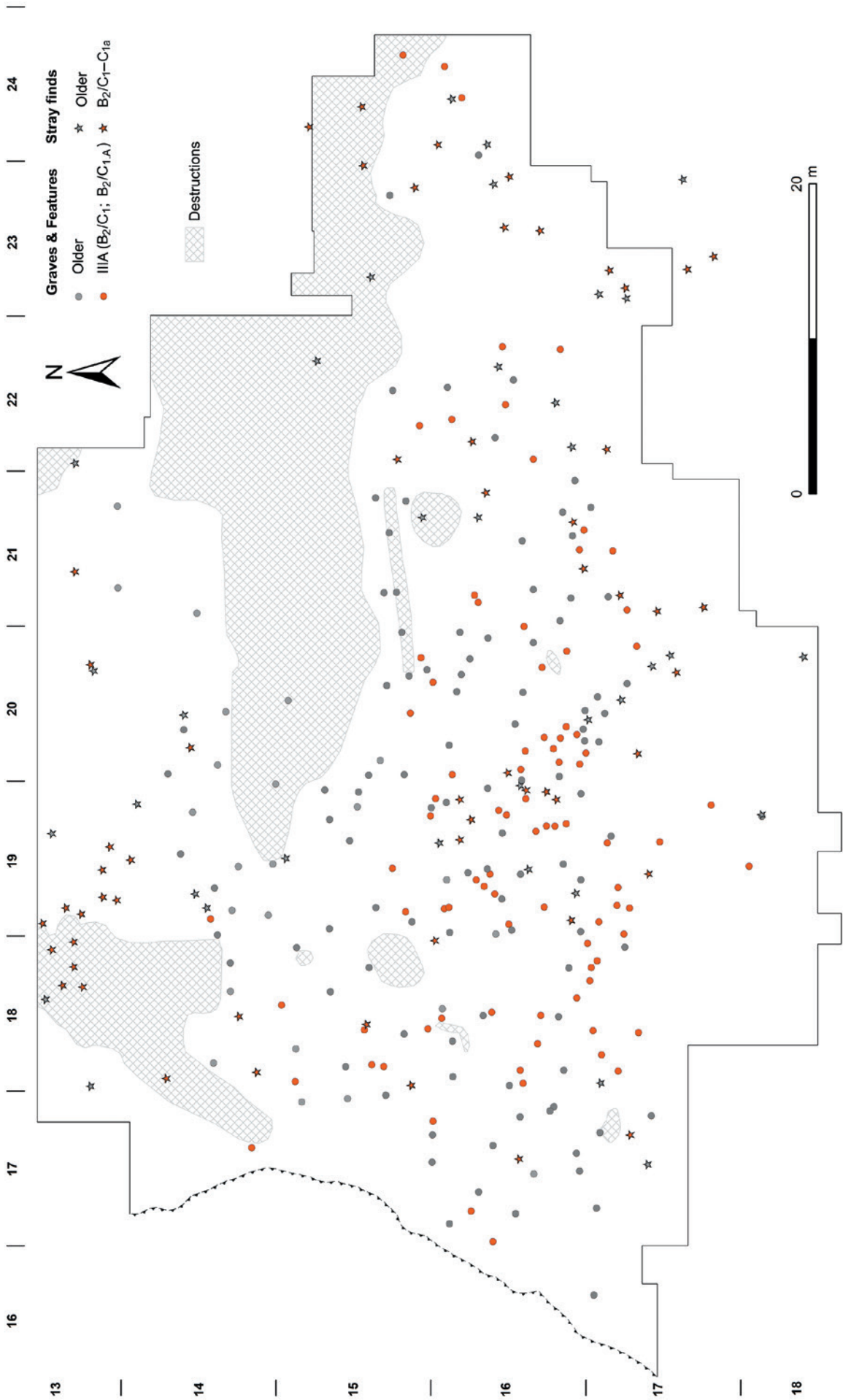


Fig. 17. Distribution of graves, other features in *stadium* IIIA (B₂/C₁; B₂/C_{1,A}) and stray finds (interregional chronology B₂/C₁-C_{1a}). Graphics: M. Baczewski

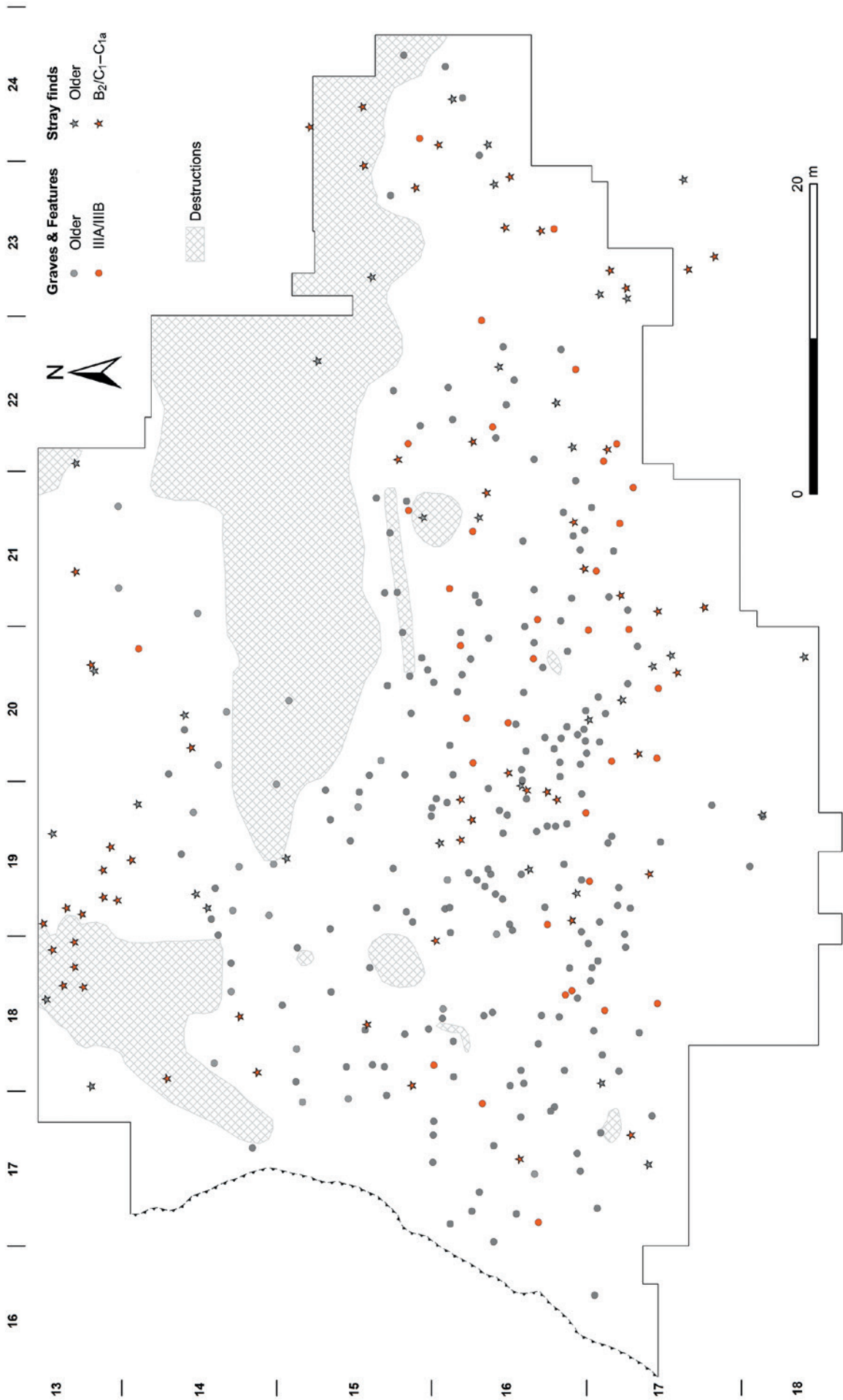


Fig. 18. Distribution of graves, other features in *stadium* IIIA/IIIB and stray finds (interregional chronology B₂/C₁-C_{1a}). Graphics: M. Baczewski

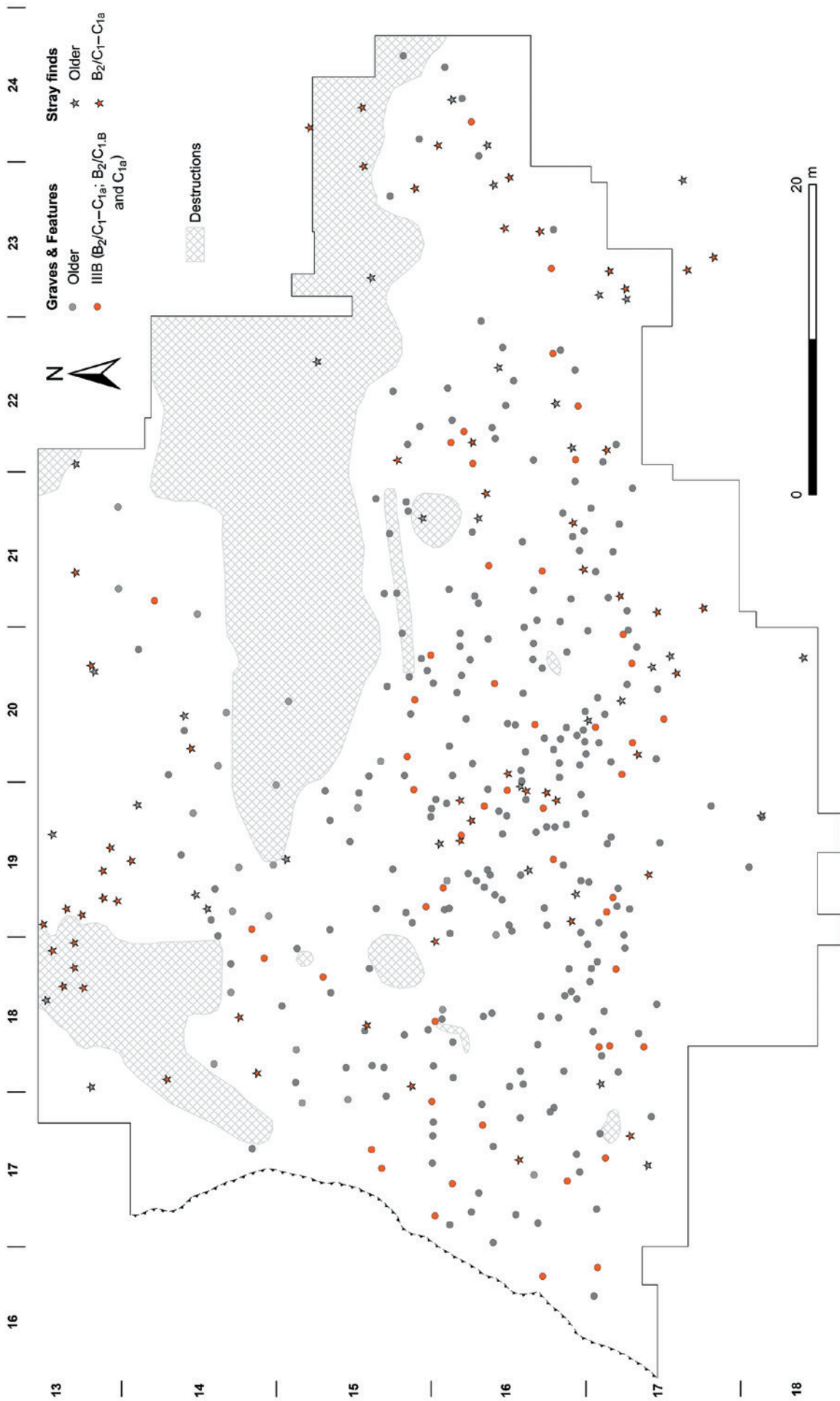


Fig. 19. Distribution of graves, other features in *stadium* III B ($B_2/C_1 - C_{1a}$, B_2/C_{1B} and C_{1a}) and stray finds (interregional chronology B_2/C_1-C_{1a}). Graphics: M. Baczewski

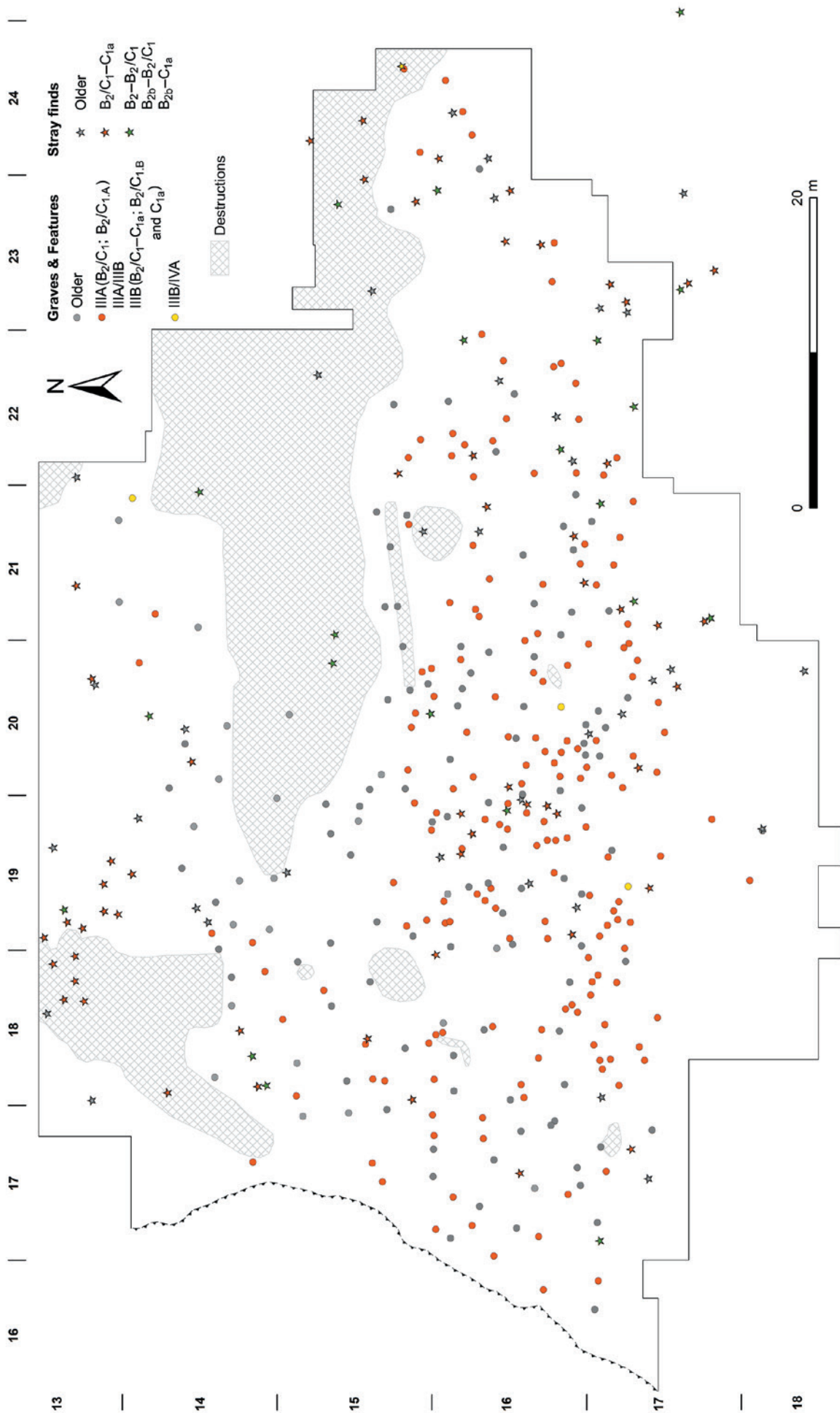


Fig. 20. Aggregate layout map of graves, other features from phase III – *stadia* IIIA–IIIB (B₂/C₁, B₂/C₁ – C_{1a}, C_{1a}) and *stadium* IIIB/IVA and stray finds (interregional chronology B₂/C₁–C_{1a}). By green stars are marked stray finds with wider chronology, including the phases II and III. Graphics: M. Baczewski

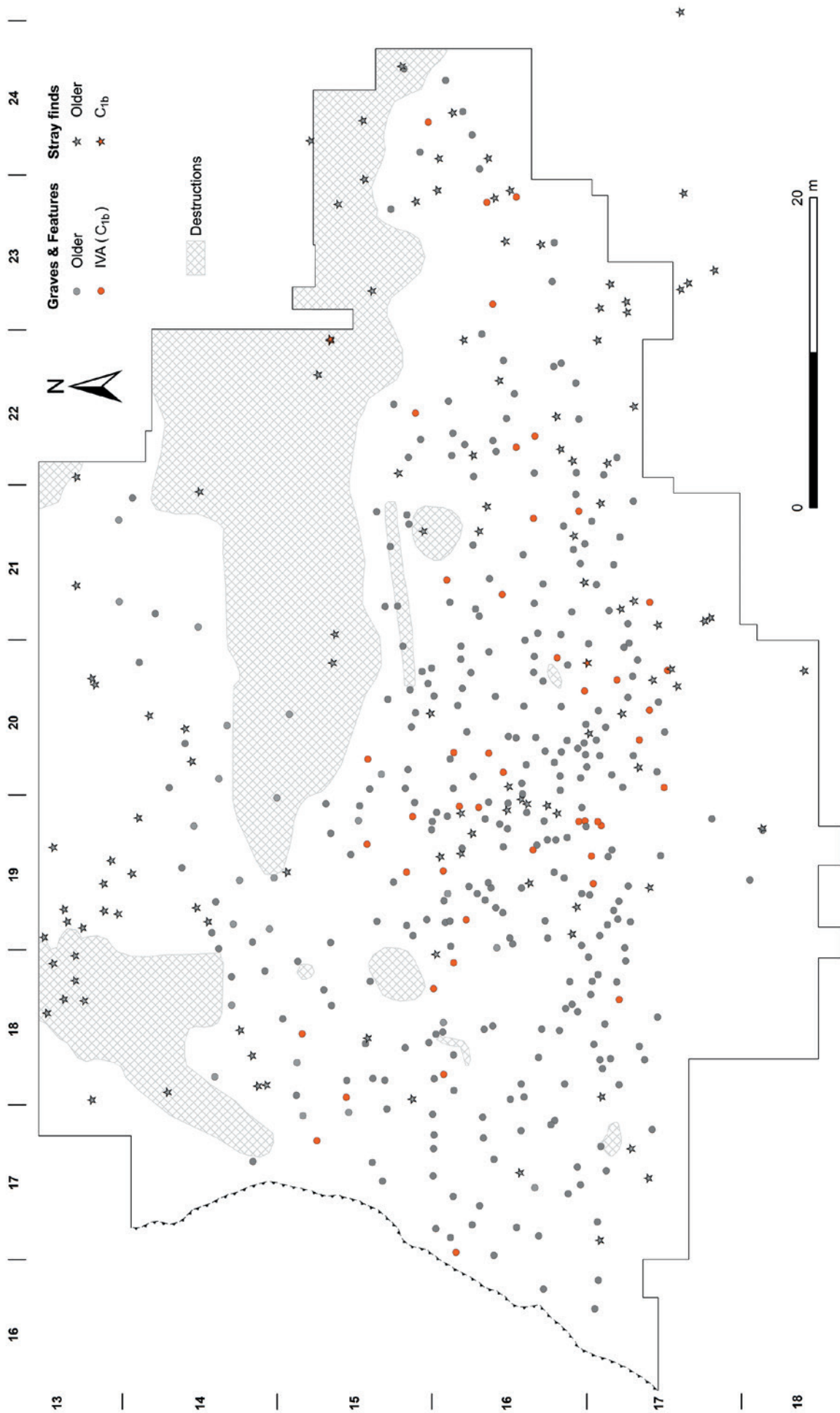


Fig. 21. Distribution of graves, other features in *stadium* IVA (C_{1b}) and stray finds (interregional chronology C_{1b}). Graphics: M. Baczewski

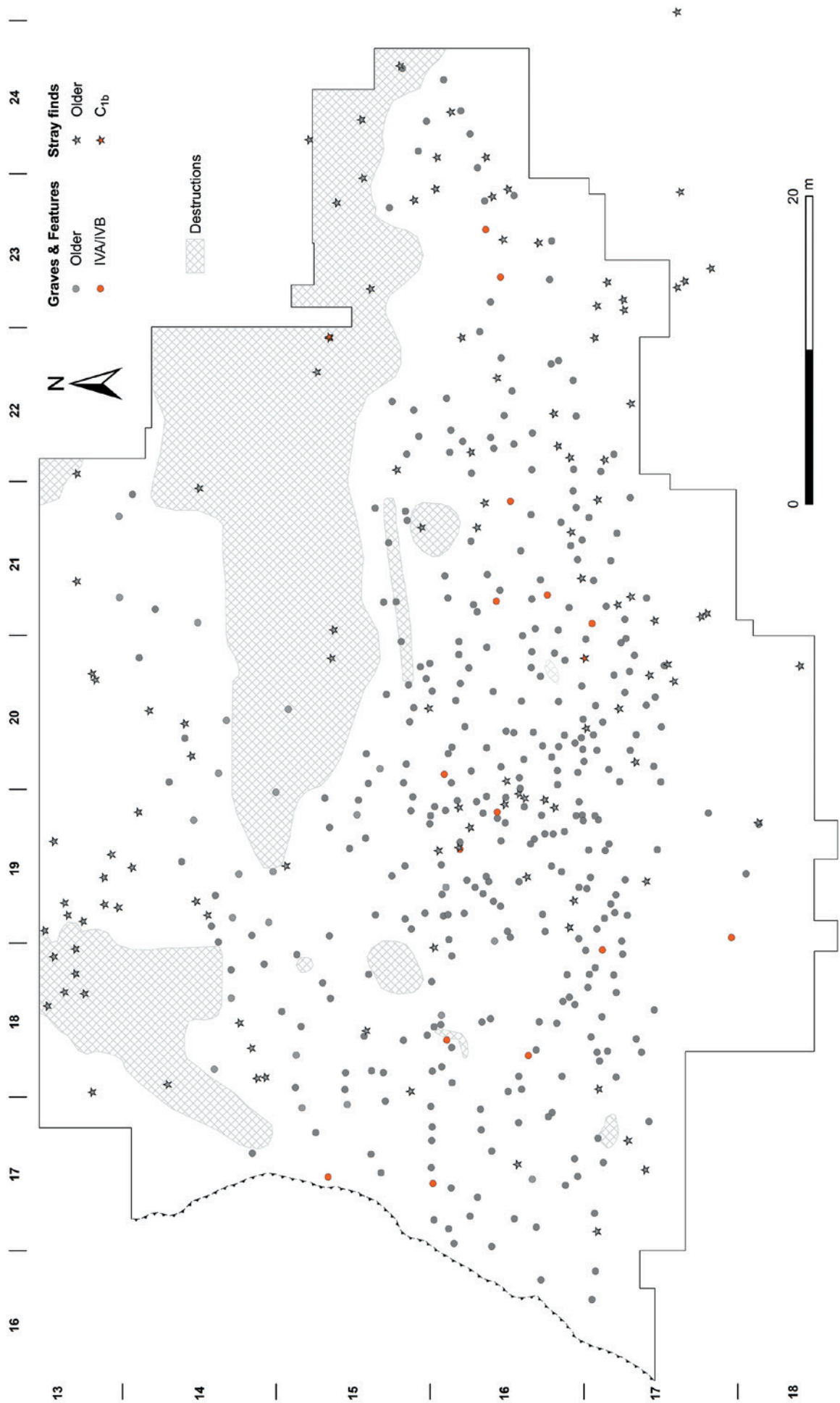


Fig. 22. Distribution of graves, other features in *stadium* IVA/IVB and stray finds (interregional chronology C_{1b}). Graphics: M. Baczewski

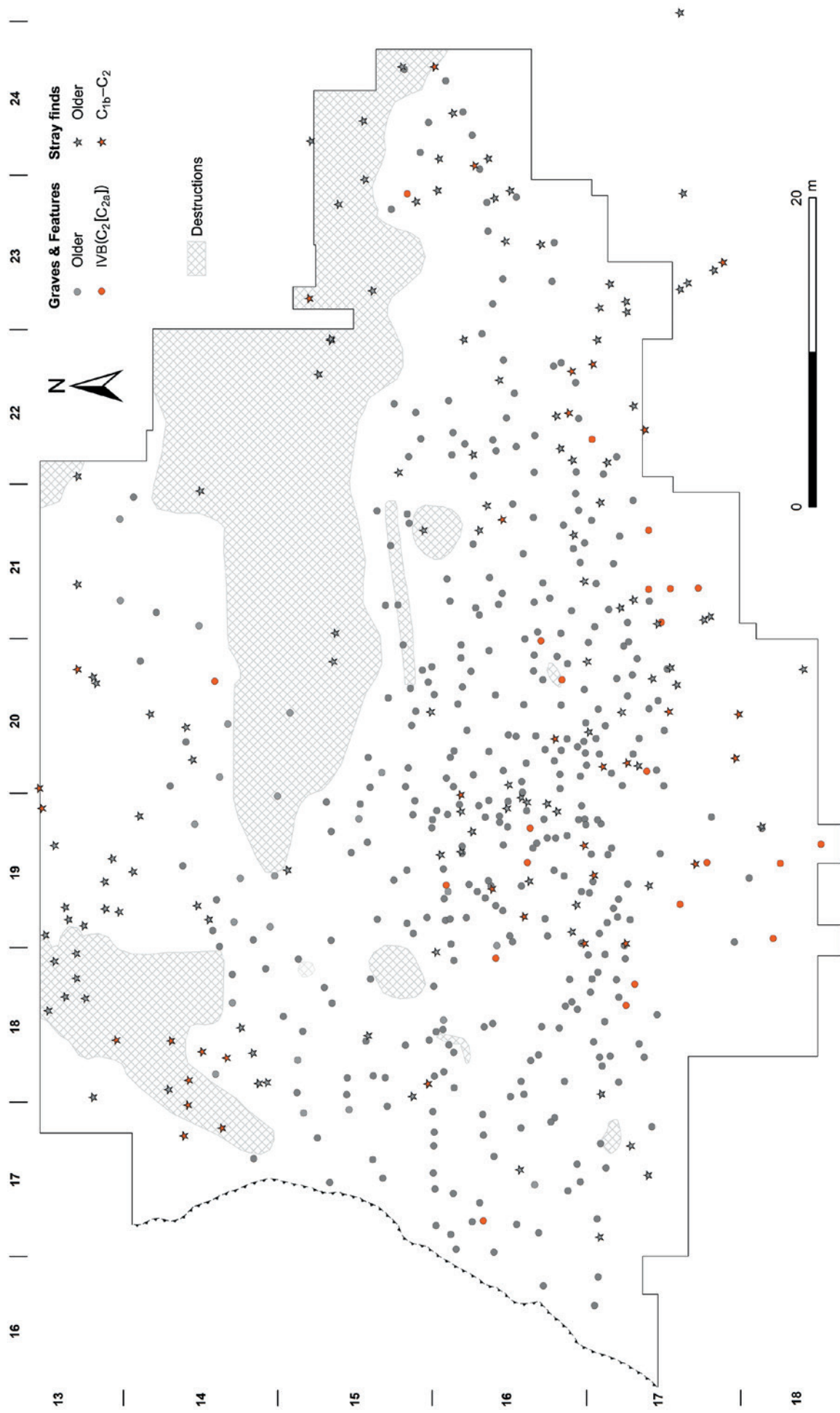


Fig. 23. Distribution of graves, other features in *stadium* IVB (C₂ [C_{2a}]) and stray finds (interregional chronology C_{1b}-C₂). Graphics: M. Baczewski

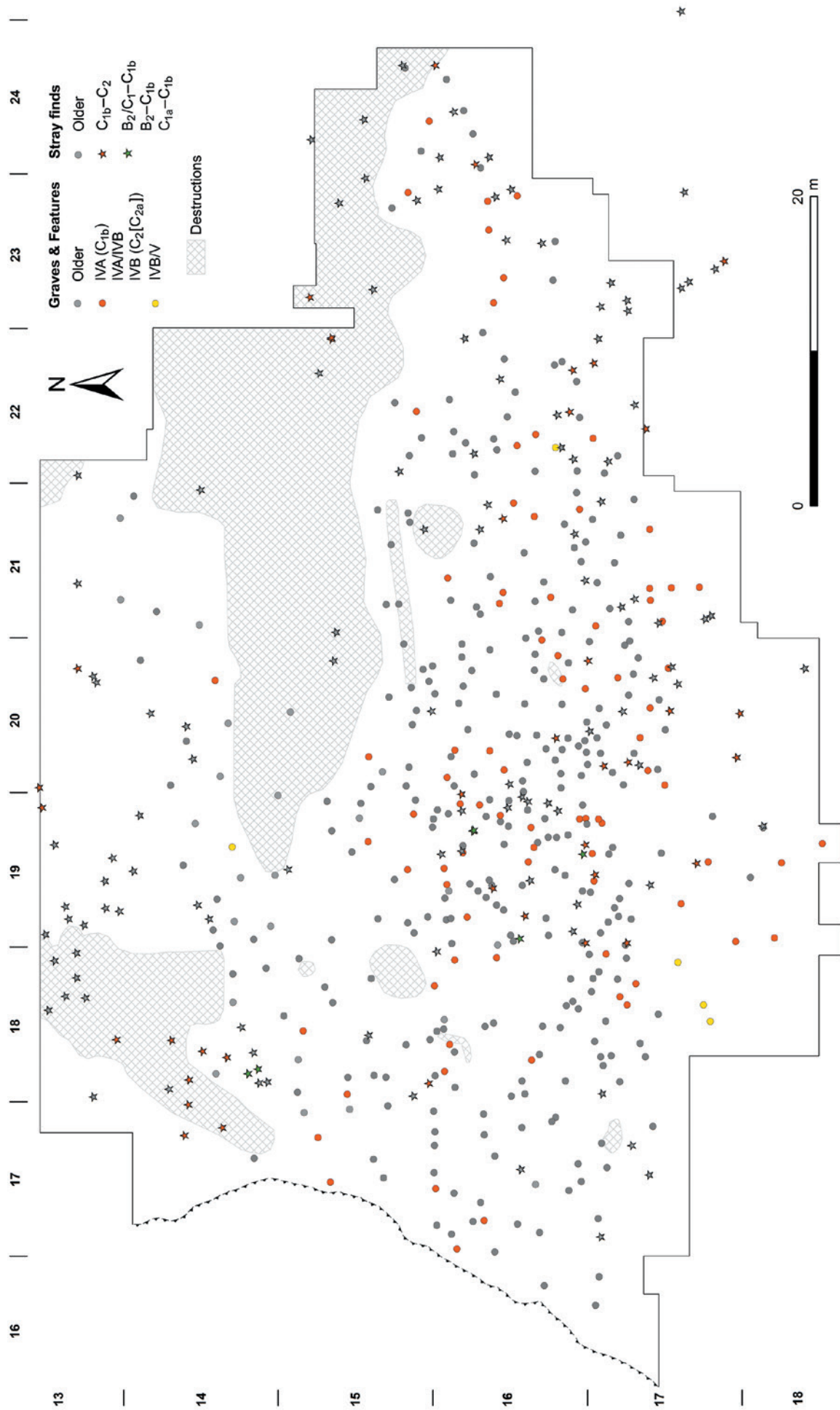


Fig. 24. Aggregate layout map of graves, other features from phase IV – *stadia* IVA–IVB (C_{1b} and C₂ [C_{2a}]) and *stadium* IVB/V and stray finds (interregional chronology C_{1b}–C₂). By green stars are marked stray finds with wider chronology, including the phases III and IV. Graphics: M. Baczewski

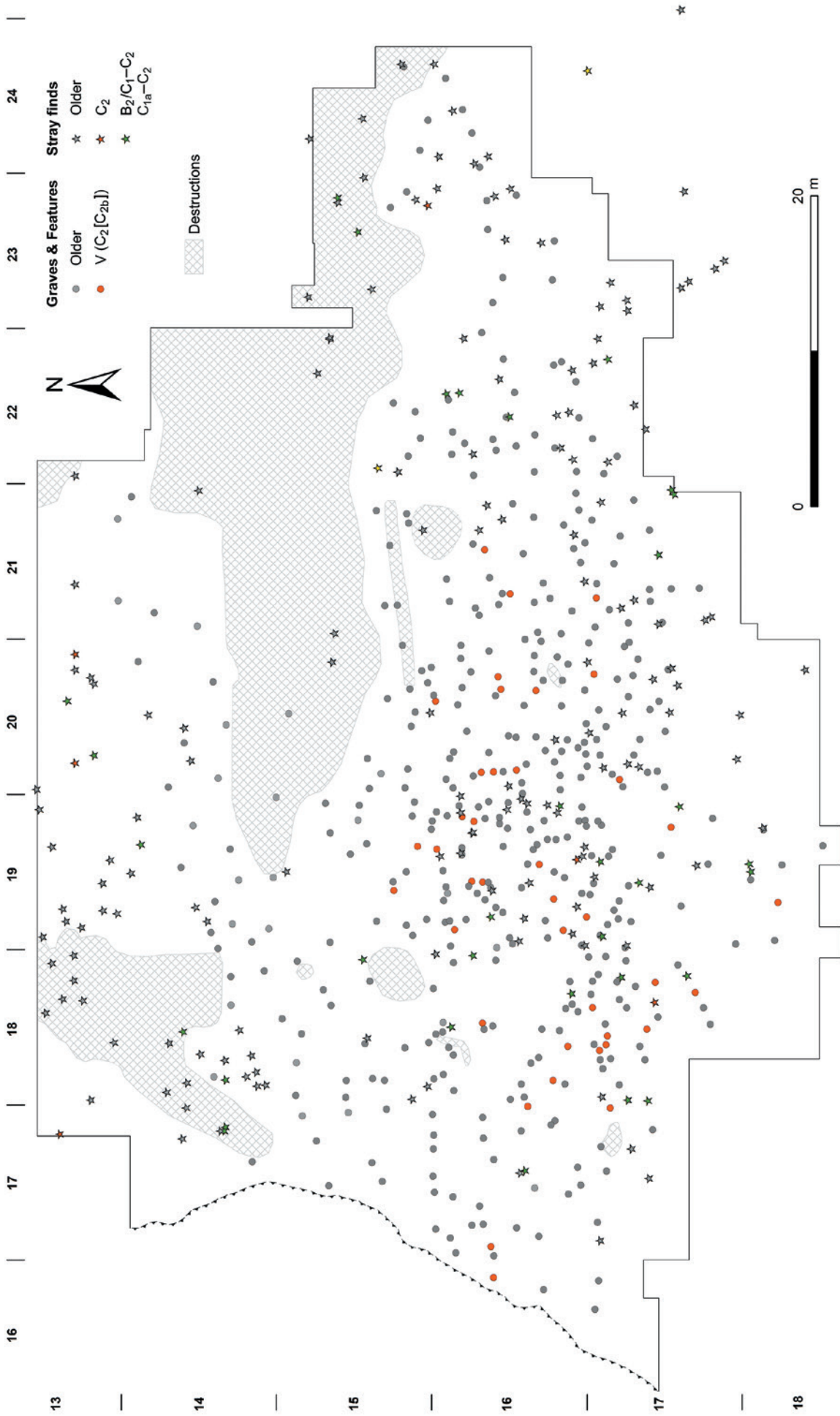


Fig. 25. Distribution of graves, other features in *stadium* V (C₂ [C_{2b}]) and stray finds (interregional chronology C₂). By green stars are marked stray finds with wider chronology, including the phases III, IV and V. Graphics: M. Baczewski

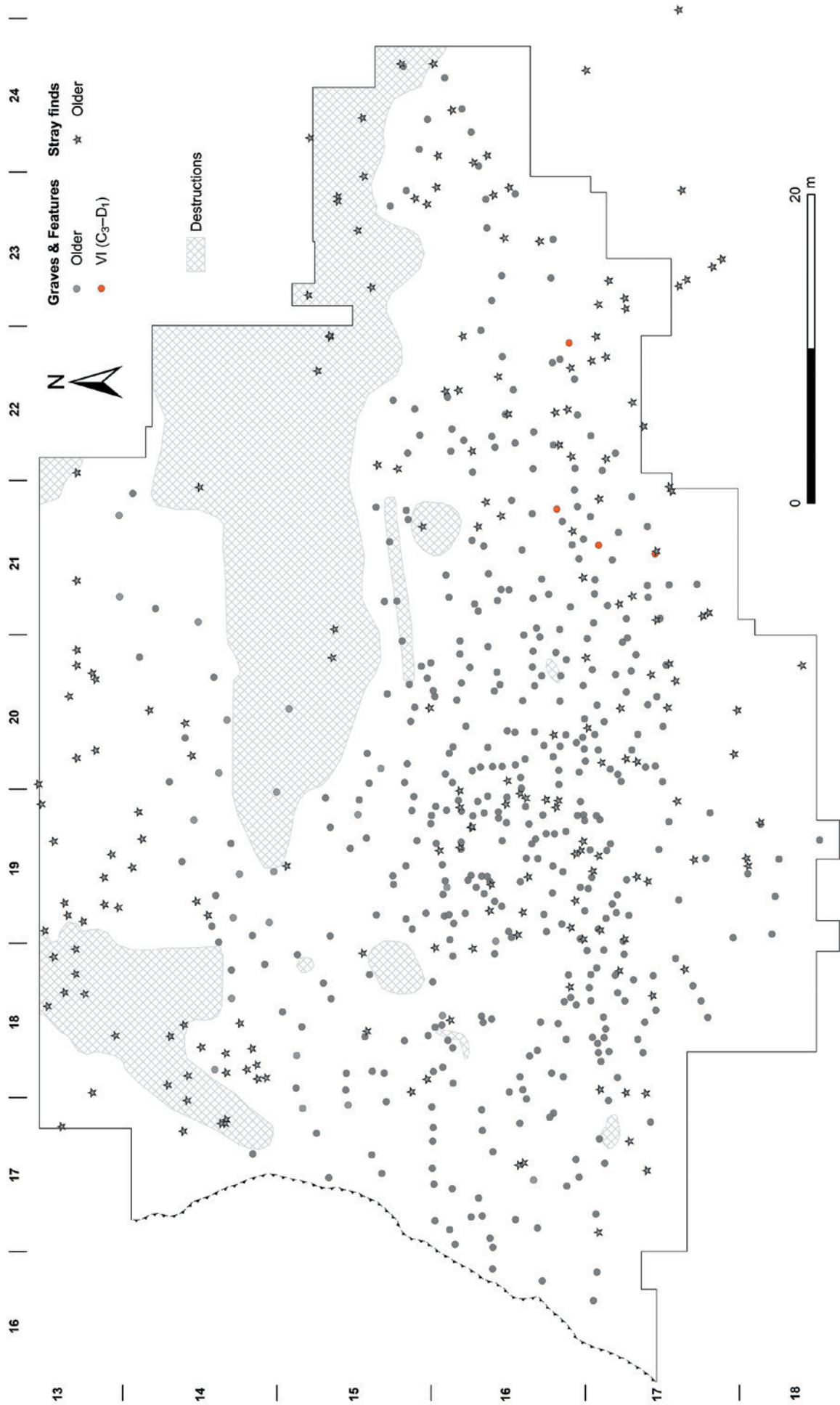


Fig. 26. Distribution of graves, other features and stray finds in stadium VI (C₃-D₁). Graphics: M. Baczewski

IV. SPECIALIST ANALYSES

IV.1. ANTHROPOLOGICAL ANALYSIS OF OSTEOLOGICAL MATERIAL FROM THE CEMETERY IN WEKLICE (IWONA TEUL)

1. INTRODUCTION

This analysis of osteological material from Wekllice covers the anatomical and anthropological characteristics of bone remains from graves discovered in 2005–2018. It was possible to determine the number of buried individuals, their age and sex, often also including their living stature (body height). In addition, the general biological status of the individuals has been determined, including the environmental and anthropogenic factors that influenced it. The population's dynamics and biological conditions have been similarly explored.

It has been established that the 139 graves (94 inhumation, 11 cremation-inhumation⁵⁷ and 34 cremation burials, including pit graves and urn graves) and the ten other features⁵⁸ contained bones belonging to 121 individuals for whom it was possible to determine both their age and sex, or only either their age or their sex. In 41 instances, bone remains are poorly preserved or missing altogether, making it impossible to determine the age, sex or number of buried individuals (Tab. 2).

⁵⁷ Only in two cases of cremation-inhumation graves (507 and 625), two individuals could be distinguished (cf. Tab. 2). The remaining cases were assumed to be single burials given that all the bones shared age and sex determinations, and burned or unburned bones were apparently part of the same skeleton (cf. detailed descriptions of the graves in question in subsection II.2).

⁵⁸ Cf. description in subsection II.2.

2. DESCRIPTION OF THE STATE OF PRESERVATION OF SKELETONS

SKELETON SERIES

In the first stage of the examination, the bone material was reconstructed and analysed macroscopically. In general, the condition of postcranial skeletons and skulls and mandibles is poor (Tab. 3, 4). Bone remains found in inhumation graves from the cemetery in Wekllice are preserved to varying degrees. We have divided the skeletons into three groups: complete skeletons (90–100% of skeletal bones preserved), almost complete skeletons (70–90% of skeletal bones preserved), and incomplete skeletons (10–50% of skeletal bones preserved).

In total, the material contained only six complete or almost complete skeletons. Skulls were discovered with more than 50% of individuals. Only five were complete; most skulls were either incomplete or fragmentary. The preservation patterns for mandibles were similar – lower jaws were missing in more than 56% of the skulls. Axial skeleton bones (spine, ribs, sternum) were found in 16% of individuals (mostly incomplete at over 80%, with the sternum missing in more than 90% of individuals). Shoulder girdle bones were found in more than 52% of individuals, however most (over 50%) were eroded, and only 2% were complete. Upper limb bones survived in over 60% of individuals, mostly in an incomplete condition; over 54% of the skeletons showed signs of epiphysis erosion. Hand and arm bones were the least well preserved – no complete sets have been recorded. Pelvic bones were preserved in fewer than 10% of the skeletons, with only one complete set;

70% of surviving pelvic girdle bones were in a poor state of preservation. Lower limb bones were the best preserved. Those were found in over 80% of the skeletons (over 53% were incomplete, 15% – almost complete). Foot bones were better preserved than hand bones (50% preserved in an incomplete state).

The varied state of preservation in the skeletons from the cemetery in Weklice is caused by a number of factors. One is the fact that the cemetery was in intensive use, meaning that later burials would cause damage or destruction to earlier ones. Other factors include environmental and soil conditions. The soil of the cemetery is mostly sandy⁵⁹, and therefore highly permeable, affecting the state of preservation of human remains to a significant degree. Notably, the human factor also played a role: graves would be opened some time after burial, which explains the high percentage of incomplete axial skeleton bones. Skeletons of children, which are more susceptible to decomposition or scattering, are in a poor state of preservation. As a result, the incidence of children's burials could only be determined on the basis of several incomplete skeletons or individual bone fragments that allow for estimating the approximate age at the time of death. The results of our analysis show that parts of children's skeletons are the least common among the findings, respectively represented by such categories as *infans* II, *infans* I (owing to the characteristics of young children's bones) and juveniles (*iuvenis*). It should be noted that the cemetery should contain relatively more bones of individuals in the *infans* II and *iuvenis* groups given the higher mass and degree of mineralization of such material. The best preserved skeletons are of individuals aged *adultus* and *maturus*. Individuals in the *senilis* group are the fewest. A considerable number of skeletons of adults in the categories *adultus* and *maturus* are either fragmentarily preserved or damaged, making it impossible to identify their sex. Therefore, a group of adult individuals of indeterminate sex was created (cf. Tab. 5, 6).

CREMATION SERIES

In the case of cremation graves (pit and urn burials) and non-grave features, bones belonging to 24 individuals were identified. The colour of the burnt bone fragments varies, ranging from pale through grey to brown. Most of the bone fragments are grey. The weight of bones deposited in urns ranges from 45 to 1975 grams, averaging 767 g.

⁵⁹ Cf. M. Natuniewicz-Sekuła, J. Okulicz-Kozaryn 2011, 13–15.

3. RESEARCH METHODS

Anthropological analysis was done following the usual methodologies and best practices. Determinations of sex and age at death were done by macroscopic methods. Age at death was determined according to anatomical and morphological criteria commonly accepted in anthropology⁶⁰. The age of adults was determined based on the degree of molar wear and obliteration of cranial sutures as well as on assessing morphological change to the surface of the interpubic joint (pubic symphysis). Where estimating the exact age at death was problematic, individuals were only classified as adults if a sufficient number of diagnostic fragments was preserved⁶¹. For children's skeletons, the stage of dental development and the degree of ossification and size of long bones were taken into account⁶².

Skeletons were classified by age using the following criteria: *infans* I: 0–6.9 years old, *infans* II: 7–13.9, *iuvenis*: 14–19.9, *adultus*: 20–29.9, *adultus/maturus*: 30–39.9, *maturus*: 40–49.9, *maturus/senilis*: 50–59.9, *senilis*: over 60 years old, and lastly – adult in those cases where bone fragments were preserved but a precise estimation of age was not possible. The sex of adult specimens was determined based on the development of diagnostic features on skull and pelvis bones. Those features provide the highest diagnostic accuracy, exceeding 90% in cases where comprehensive analytical methods are used⁶³.

4. PALAEODEMOGRAPHIC ANALYSIS

Paleodemographic studies based on anthropological findings provide important information on the biological conditions, dynamics, sizes and structures of populations. The condition and biological dynamics of the population from Weklice is described by means of mortality tables. This study examines bone remains of 121 individuals (adults and children). The sex ratio (proportion of women to men) in this series of skeletons is equal to 1:0.9.

The analysed structure of mortality (Fig. 27, Tab. 7) shows that this series is dominated by women (N= 39, equivalent to 29%), mostly dying at a young *adultus* age (36%). The frequency of death in older women (*maturus* and *senilis*) was lower (8% in the *maturus* category). Thirty-five male skeletons have been identified of individuals who died mainly at the age of *adultus/maturus*

⁶⁰ D.H. Ubelaker 1989; J. Buikstra 2006.

⁶¹ J. Piontek 1985; A. Malinowski, W. Bożiłow 1997.

⁶² J. Buikstra, D.H. Ubelaker 1994; L. Scheuer, S. Black 2000.

⁶³ T. White, P. Folkens 2005.

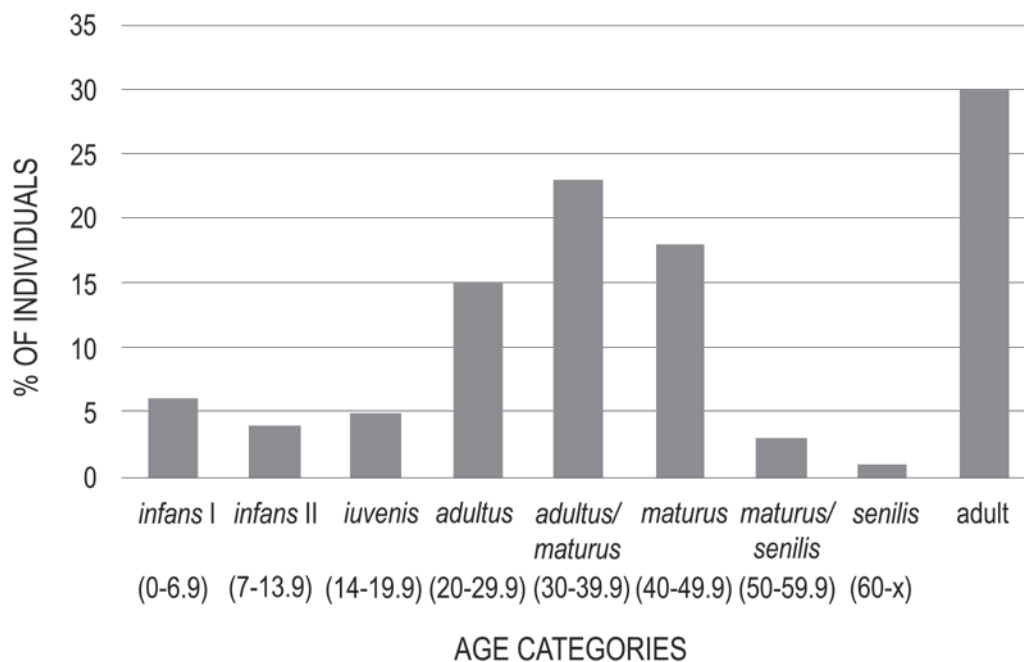


Fig. 27. Weklice. Population age structure. Compiled by: I. Teul. Graphics: M. Natuniewicz-Sekuła

or *maturus* (34%). The incidence of men in the earlier *adultus* category (14%) was lower than the equivalent rate for women. In older age categories, it amounted to 10% for *maturus/senilis* and *senilis*. In the group made up of children (10% of the population), the majority died in early childhood (*infans* I: N= 8, 61%), slightly fewer – in late childhood (*infans* II: N= 5, 38%). The incidence of juvenile deaths (*iuvenis*) was also low at only 4.5%. As can be seen from the proportion of identified skeletons of young and juvenile individuals in relation to adults, it is clear that the former are poorly represented in the studied skeletal series. Sex could not be identified in four juveniles and 46 adult individuals.

The lower proportion of men's graves is typical of Wielbark Culture cemeteries⁶⁴. Analytical results and earlier studies of bone material from Weklice⁶⁵ confirm this disproportion in the number of remains of women and men. This could have had a number of causes, as some men may have been buried using methods not available to archaeologists, possibly in connection with their social status, their function within the group or the cause of death, e.g. in combat, during a hunt or an expedition, etc.

The results also show differences between men and women in terms of mortality depending on age category. Female mortality was the highest in the 25–35

age range, which can be explained by increased risk of mortality in pregnancy, childbirth and the postpartum period. A significant share of male skeletons in the *maturus* group and a proportion of *adultus* and *senilis* individuals is perhaps associated with lifestyle and a higher sensitivity of male bodies to environmental conditions⁶⁶. Data on the ratios and distributions of the sexes in terms of age for the skeletal material from Weklice is also influenced by the state of preservation of the material and the effectiveness of analytical methods.

A mortality table for the population from Weklice has been created according to the stationary model⁶⁷ (Tab. 8). Because it was not possible to determine the age of a large proportion of adults, data for this group were estimated by assuming the same ratio for the adults of undetermined sex as for identified individuals and to the *iuvenis* (reproductive age), *adultus*, *maturus* and *senilis* age ranges. Estimated in this manner, the age structure of the studied population became the basis for calculating the parameters of the mortality table created on the assumption of a stationary population model. The probability of death was estimated for a stationary population ($r=0$) and for a population with a natural increase slightly higher than the replacement rate ($r=0.0025$). Additionally,

⁶⁴ K. Skóra 2019.

⁶⁵ I. Teul 2011, 151–172.

⁶⁶ N. Wolański 2006.

⁶⁷ M. Henneberg, J. Strzałko 1975; M. Henneberg 1976.

child mortality rates for children under the age of five was estimated using the Halley method⁶⁸. In order to compare the results with the mortality tables, life expectancy was calculated for individuals at birth and at the age of 20 based on the estimated mortality rate (q_x) for a stationary population ($r=0$).

In the Weklice population, the estimated average life expectancy of a newborn was $e^0_0=31.45$ years. For individuals who lived to adulthood and reached the age of 20, $e^0_{20}=21.89$ years. Using parameters from the mortality table, a gross potential reproduction rate (R_{pot}) was calculated, amounting to 0.588 (Tab. 9). This means that 59% of adults had the chance to produce a full number of offspring. I assume that the mortality of children in the 0–14 age category was high, despite the small representation in the analysed material (taking into account M. Henneberg's amendment⁶⁹), where the ratio of children increases to approx. 60% and the most elderly account for about 6%; this is a model with a progressive population: 40% of children, 10% of the oldest individuals). The biological status index (I_{bs}) for the Weklice population is 0.520 (Tab. 10). This table shows that 52% of individuals, i.e. a majority of adults, would live until the end of their reproductive period, and thus participate in creating the next generation.

$$R_{pot}=1-0.412= 0.588; I_{bs}=1-0.480 = 0.520$$

5. ANTHROPOMETRY

Standard measurements of skulls and bones of the postcranial skeleton were done according to R. Martin's methodology, and cranial indices were calculated⁷⁰ (Tab. 11, 12, 13). Because the state of preservation for skulls was poor to average, it was not possible to make many accurate measurements. Analysing the measurement value (*g-op*), i.e. the largest dimension of the skull, a greater range of variability of absolute measurement values was observed in women than in men. Such dimorphic differences in the skulls from the currently studied series, similar to the previous one⁷¹, indicate that male skulls differed significantly from female ones in terms of length, height of the upper face, facial width and nose height. Differences in skull height and forehead width are smaller. Comparisons of different rates shows that women's skulls were typically long-headed, medium wide-nosed and high-orbital.

⁶⁸ Cf. J. Piontek 1985.

⁶⁹ M. Henneberg 1976.

⁷⁰ R. Martin, R. Knussman 1988.

⁷¹ I. Teul 2011, 160–161.

The values of those rates indicates that male skulls are varied, especially in terms of the values of the main cranial index. Most individuals have skulls classified as long or medium-high.

6. LIVING BODY HEIGHT AND BODY BUILD

Living body height is one of the characteristics that clearly differentiate populations. It represents a genetically determined optimal value further mediated and influenced by bio-cultural factors in the environment. Because it is heavily conditioned by the environment, this value is currently being studied extensively to come up with a comprehensive assessment of variability in living conditions. Body height is highly sensitive to environmental impacts (health, availability of food, environmental and economic conditions) and may vary widely in a population.

In the analysed material, measurements were taken of bone lengths (M1), physiological lengths (M2) and circumference (M3). For individual bones, bone mass indices were calculated using the calculation methods for individual bones (humeral: $M7/M1 \times 10$, radial: $M3/M2 \times 100$, ulnar: $M3/M1 \times 100$, femoral: $M8/M2 \times 100$, tibial: $M11b/M1 \times 100$). Given the poor state of preservation, the analysis only incorporates selected long bones (Tab. 13, 14). Measured bone length values were lower in women. The greatest differences between women and men characterise average values of bone length indices (M1 according to Martin) for ulnar and radial bones as well as the humerus and the femur. The smallest differences were found in tibial lengths (Tab. 14). The highest disproportions in terms of bone mass were found in humerus, radius and femur bones. Analysis of measurements and indices relating to post-cranial skeleton bones suggest that the bone mass in Weklice skeletons is high to medium.

Measurements of long bones in adults made it possible to estimate the average living body height (Tab. 15). For comparison purposes, the calculation methods of Pearson, Trotter & Gleser, Breiting, Bach as well as Manouvrier were used⁷². Different calculation methods yielded clearly different values. The Pearson method yields lower body height parameters; the Bach & Manouvrier method yielded the highest values. To compare body height values for the population from Weklice, data was compiled using the average body height for a series of skeletons from the Roman Period and from the Middle Ages found in modern-day Poland (Tab. 16).

⁷² J. Piontek 1985; V. Vancata 2000.

Regardless of the estimation method used, the Weklice community was slightly taller compared to other populations. The average body height of men buried in the cemetery in Weklice was higher than the comparative sets of skeletons from the Roman Period and the early Middle Ages in modern-day Poland. The average body height for men was 172 cm. A similar value was obtained for average body height values in a series from Pruszcz Gdański, site 5, Gdańsk district. Women from the site in Weklice are not much taller (average 162 cm) than women from Pruszcz Gdański (sites 5 and 10), Gdańsk district, but clearly taller than women from other skeleton series of the Wielbark Culture⁷³.

The methods consistently show a clear sexual dimorphism, the men being more than 10 cm taller than the women. The bones of male skeletons have much higher average values. Based on the given values of the sexual dimorphism index and the significant differences in terms of length (Tab. 14) and limb mass (Tab. 17), as well as estimated body height between women and men (Tab. 15), taking into account the greater reactivity of males to environmental conditions, we can conclude that the biological condition of the population from Weklice was good and the group lived under optimal environmental conditions.

⁷³ J. Gładkowska-Rzeczycka 1981; 1982; M. Pietrzak, L. Cymek, F. Rożnowski 2015, 88–95.

7. LIVING CONDITIONS OF THE WEKLICE POPULATION FROM THE PERSPECTIVE OF PHYSICAL ANTHROPOLOGY

The morphological response of individuals to environmental conditions, inferred from factors that affect the community's dynamics and biological status, deserves to be analysed separately. For that purpose, the clearest marker of stress was used, namely the body's reaction to environmental conditions. We used the descriptions of pathological changes in the skeleton, indicators of morphological reactions to living conditions, i.e. *cribra orbitalia*⁷⁴ as well as markers of musculoskeletal stress markers⁷⁵. The assessment of pathological changes in bones is equally significant⁷⁶ (Fig. 28).

The population buried in the cemetery in Weklice was checked for incidence and frequency of *cribra orbitalia* (porotic hyperostosis in the orbital cavity), treated as a consequence of a diet deficient in nutrients necessary for erythropoiesis, such as iron, vitamins C and B₁₂, folic acid, manganese, zinc and copper⁷⁷, but also as a result of physiological stress. It should be added that

⁷⁴ O.P. Hengen 1971; A.H. Goodman 1989; F. Facchini, E. Rastelli, P. Brasili 2004.

⁷⁵ T. White, P. Folkens 2005.

⁷⁶ D.H. Ubelaker 1989; J. Buikstra, D.H. Ubelaker 1994.

⁷⁷ A. Pudło 2016.

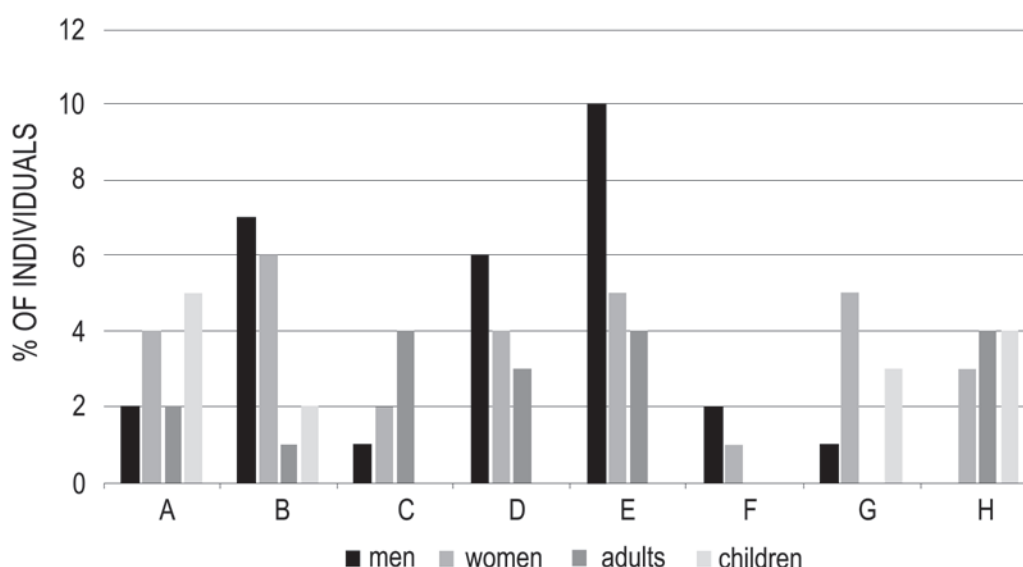


Fig. 28. Weklice. Lesions, musculoskeletal stress indicators and morphological reactions to living conditions: A – *cribra orbitalia* (CO), B – hypoplasia; C – caries (tooth decay); D – calculus (tartar); E – musculoskeletal stress markers, F – bone fractures; G – otitis media; H – maxillary sinusitis

Compiled by: I. Teul. Graphics: M. Natuniewicz-Sekuła

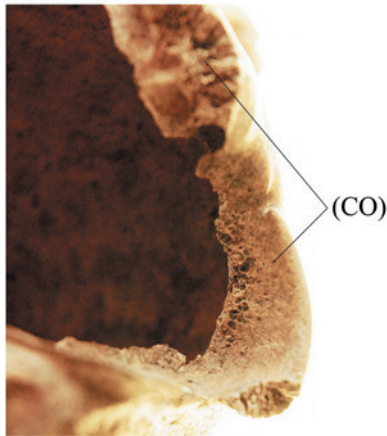


Fig. 29. Weklice. *Cribra orbitalia* (CO) on a fragment of the left orbit wall in the skull from grave 522.
Photo: I. Teul. Graphics: M. Baczewski



Fig. 30. Weklice. Grave 545 – enamel hypoplasia.
Photo: I. Teul. Graphics: M. Baczewski

such stress in early childhood may result from a lower content of those ingredients in breast milk. Porosity of the anterior part of the orbital cavity was noted and diagnosed in the skulls of 2% of men, 4% of women, 2% of adults and 5% of children (cf. Fig. 29). This is a low rate, possibly suggesting that such adverse conditions were not sufficiently strong to be impactful. This means that the levels of hygiene and the living conditions in the Weklice population were quite good, and the diet was varied (thanks to the proximity to the Vistula lagoon at the time).

Enamel hypoplasia and caries (tooth decay) can serve as sensitive indicators of ill health (Fig. 30). Caries was only observed on the teeth of five individuals (12%) out of 42 graves in which teeth were preserved, including three women and two men. Incidence of tooth loss or bone fistulas caused by perideontal inflammatory processes was similarly not high. Enamel hypoplasia was found in five women and three men. Calculus (tartar)

was not common – it was found on the teeth of three men and one woman. In the oldest people buried in the cemetery in Weklice, lesions were also found in the alveolar processes of maxillary bones and mandibular alveolar arches. Those findings indicate that the low incidence of enamel hypoplasia is owed to the absence of adverse factors affecting people early in their development. Good living conditions increased the chances of survival in childhood. We found strong levels of wear in molar surfaces, possibly caused by chewing on hard or uncleaned foods (found in a rich seaside and inland diet).

Some indication of musculoskeletal stress were found in the examined bone material. This mostly included degeneration and deformation of the spine and joints. Such changes were present in all sections of the spine: cervical, thoracic, lumbar and sacral. Evidence of Schmorl nodes was visible on the bodies of thoracic and lumbar vertebrae on the upper (Th6, 7, L1, 2, 4, 5) and lower surfaces (Th5–12, L1–4) (Fig. 31:1), caused by sudden and excessive loads, especially in the lumbar region. Osteophytes were also found on vertebral bodies: on cervical vertebrae (especially on the lower surface of the C4–6 vertebrae), thoracic vertebrae (this was particularly pronounced on the lower surfaces of the Th7–9 vertebrae, slightly wedge-shaped) and on lumbar vertebrae (on the lower surfaces of vertebral bodies) (Fig. 31:2). Other changes included those caused by excessive loads, apparent in flattened bodies and on clavicle bones; several individuals showed typical signs of enthesopathy or rhomboid impression (*impressio ligamenti costoclavicularis*). Also, evidence of biomechanical musculoskeletal stress were found on the shoulder blades (dorsal surface of the lateral margin, mostly on humeral bones (*crista tuberculi majoris* and *tuberositas deltoidea*), radial (radial tuberosity), femoral (gluteal tuberosity and *crespa aspera*) and tibial (tibial tuberosity, *linea muscoli solei*). The level of observed musculoskeletal stress indicators can be explained by the pulling and flexing of muscle tissues at muscle attachment sites (biomechanical stress). As noted earlier, evidence of musculoskeletal stress was more pronounced on the bones of right upper limbs (Fig. 32, 33).

Most degenerative changes were noted in the spine, ribs and sacroiliac joints. In the spine, sharp raised edges were visible on the small surfaces of the articular vertebrae (articular processes – *processus articularis*, costal facets – *fovea costalis*), on the anterior arches C1, and on the occipital condyles of the skull. It can be concluded that such changes would have corresponded to biomechanical stress, in particular to the kinetic chain of the upper limbs (shoulder girdle and upper limbs) and



Fig. 31. Weklice. 1 – Schmorl nodes on vertebrae; 2 – osteophytes on vertebrae. Photo: I. Teul. Graphics: M. Baczewski



Fig. 32. Weklice. 1 – degenerative changes in the right sternocostal joint; 2 – degenerative changes to the left sternoclavicular joint. Photo: I. Teul. Graphics: M. Baczewski

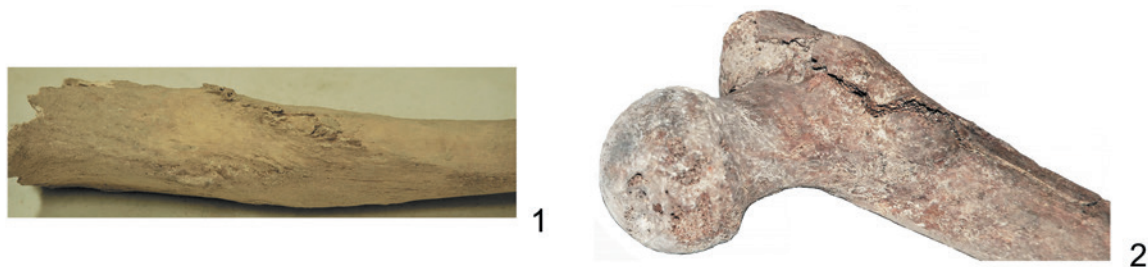


Fig. 33. Weklice. Enthesopathy: 1 – overload-deformation changes on the shaft of the tibia; 2 – overload-deformation changes on the greater trochanter of the femur. Photo: I. Teul. Graphics: M. Baczewski

to the spine and to sacroiliac joints. Pronounced skeletal wear of this kind, which was also noted in young individuals (20–25 years), is caused by strenuous work performed from an early age. Such degenerative changes and indicators of musculoskeletal stress provide evidence of strong loads impacting the spine and the right side of the body in particular (Fig. 34, 35).

8. NON-SPECIFIC DISEASES: UPPER RESPIRATORY TRACT INFECTIONS

Bone changes were noted within the maxillary sinus of preserved maxillary bones indicative of past maxillary sinusitis. The results show that the incidence of maxillary sinusitis in the complete sample amounts to 37%. The exposure of the tested skeletal series to infectious respiratory factors (independent of dental infections) could lead to upper respiratory dysfunction and disease – this was found in almost half (48%) of the subjects. The bone changes noted in maxillary sinuses may have resulted primarily from poor hygiene, poor living conditions and adverse factors in the immediate habitat

or in the natural environment. In addition, it is also highly likely that the population's lifestyle and activities may have depressed immunity and contributed to an increase in respiratory diseases.

The evidence suggests that the incidence of maxillary sinusitis (rhinogenous/respiratory) was higher in women than in men (14%). Women were more frequently exposed to adverse factors leading to health problems as a result of working in poorly ventilated indoor areas. Also, it is highly likely that women's immune systems would have been routinely exposed to more adverse factors as a result of pregnancies. In women, the virulence of upper respiratory tract infections may have been expansive enough for maxillary sinusitis to lead to lower respiratory tract infections such as bronchitis or pneumonia, or to sinus complications⁷⁸.

In two women (grave 522 and 532), evidence of bone lesions was found in petrous parts of the temporal bone (Fig. 36), possibly caused by otitis media (infections of the middle ear).

⁷⁸ I. Teul 2015.



Fig. 34. Weklice. 1 – degeneration-deformation changes in the costal facet of T11; 2 – degeneration changes in the hip socket; 3 – degeneration changes to *fovea capitis femoris*. Photo: I. Teul. Graphics: M. Baczewski



Fig. 35. Weklice. Healed open fracture of the fibula. Photo: I. Teul. Graphics: M. Baczewski

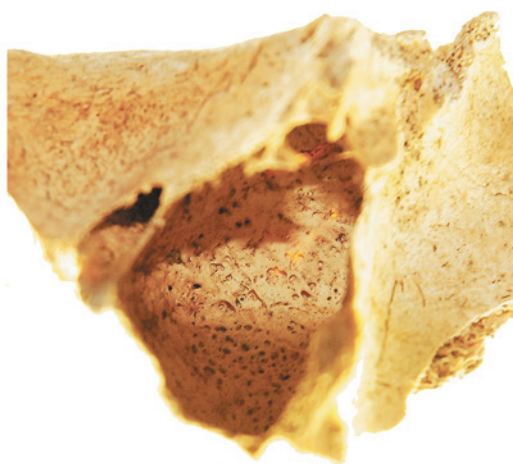


Fig. 36. Weklice. Grave 522: 1 – bone lesions in the maxillary sinus of a woman. Grave 532: 2 – lesions caused by inflammation (abscess caused by otitis media) on the frontal surface of the petrous pyramid of a woman's temporal bone. Photo: I. Teul. Graphics: M. Baczewski

Tab. 2. Weklice. List of human remains. Note: data relating to burnt bones from non-grave features, cremation-inhumation graves or inhumation graves deposited in secondary contexts have been marked in **bold type**. Compiled by M. Natuniewicz-Sekuła, I. Teul

No.	Grave or feature no.	Skull	Teeth	Pelvis	Long bones	Sex	Age (in years)	No. of individuals	Type of grave or feature, comments
1	493	+	+	+	+	♂	<i>adultus</i> (30–40)	1	inhumation grave
2	494	+	+	-	+	♀	<i>adultus</i> (30–35)	1	inhumation grave
3	494A	-	+	-	-	♀	<i>adultus</i> (30–35)	1	pit containing animal remains causing damage to grave 494. Teeth most likely of individual from grave 494
4	495	+	+	+	+	♀	<i>adultus</i> (30–35)	1	cremation-inhumation grave
		-	-	-	+	(?)	(?)	1	
5	496	-	-	+	+	♀(?)	<i>adultus</i>	1	cremation-inhumation grave
		+	+	-	+	(?)	<i>adultus/maturus</i> (35–40)	1	
6	497	-	-	-	+	(?)	<i>adultus/maturus</i> (35–40)	1	stone pit; burnt bones probably from the original backfill of grave 496
7	498	+	+	+	+	♂	late <i>maturus</i> (50–55)	1	inhumation grave;
		-	-	-	+	(?)	(?)		burnt bones in secondary context
8	498A	+	-	-	+	(?)	<i>infans II/iuvenis</i> (14–16)	1	inhumation grave;
		-	-	-	+	(?)	(?)		burnt bones in secondary context
9	499	-	-	-	+	(?)	<i>adultus</i> (20–30)	1	cremation urn grave
10	500	-	-	-	+	(?)	adult	1	cremation pit grave (?)
11	501	+	-	-	-	♂	late <i>maturus</i> (ca. 50)	1	inhumation grave
12	502	+	-	-	-	(?)	adult	1	inhumation grave
13	503	-	-	-	+	♂(?)	adult	1	inhumation grave; body height 172–174 cm
14	504	-	-	-	-	(?)	(?)	(?)	inhumation grave; bones not preserved
15	505	+	+	-	+	♀(?)	<i>adultus</i>	1	inhumation grave
16	506	+	+	-	+	(?)	<i>adultus</i> (?)	1	cremation urn grave
17	507	+	+	-	-	(?)	<i>adultus/maturus</i>	1	cremation-inhumation grave
		+	+	-	+	(?)	<i>infans I</i> (2–4)	1	
18	508	-	-	-	-	(?)	(?)	(?)	inhumation grave (?); bones not preserved
19	509	-	-	-	+	(?)	<i>adultus</i> (?)	1	inhumation grave
20	510	+	+	-	+	(?)	late <i>adultus</i> (30–35)	1	inhumation grave
21	511	-	-	+	+	♀	<i>adultus</i> (20–25)	1	inhumation grave, double
		+	+	+	+	♂	<i>iuvenis</i> (18–20)	1	
22	512(513)	-	-	-	+	(?)	<i>adultus</i>	1	inhumation grave
23	514	+	-	-	+	(?)	(?)	1	cremation pit grave
24	516	+	-	-	-	♀(?)	<i>adultus/maturus</i> (30–40)	1	inhumation grave
25	517	+	+	-	+	♀	early <i>maturus</i> (35–40)	1	inhumation grave
26	518	+	+	-	-	♀	<i>adultus</i> (25–30)	1	inhumation grave
27	519	-	-	-	-	(?)	(?)	(?)	inhumation grave; bones not preserved
28	520	-	+	+	+	♂	early <i>maturus</i> (35–40)	1	inhumation grave

No.	Grave or feature no.	Skull	Teeth	Pelvis	Long bones	Sex	Age (in years)	No. of individuals	Type of grave or feature, comments
29	521	+	+	+	+	♂	<i>adultus</i> (25–35)	1	inhumation grave, double
		–	–	–	+	(?)	<i>infans</i> II (10–12)	1	
30	522	+	–	+	+	♀	<i>early adultus</i> (20–25)	1	inhumation grave, double; woman's body height 152–155 cm
		–	–	–	+	(?)	<i>infans</i> I (1–4)	1	
31	523	+	+	–	+	♀	<i>early adultus</i> (20–25)	1	inhumation grave
32	524	+	+	+	+	♀	<i>adultus</i>	1	inhumation grave, double
		–	–	–	+	(?)	<i>infans</i> I (2–4)	1	
33	525	–	–	–	+	(?)	<i>adult</i>	1	inhumation grave
34	526	–	–	–	+	(?)	(?)	(?)	inhumation grave
35	527	+	+	+	+	♂	<i>adultus</i> (25–30)	1	inhumation grave
36	527A	–	–	+	+	♂	<i>adultus</i> (25–30)	1	secondary trench into grave 527; bones of individual buried in grave 527
37	528	+	+	–	+	(?)	<i>iuvenis</i> (16–18)	1	inhumation grave
38	529	+	+	–	+	♀	<i>adultus</i> (25–35)	1	cremation urn grave
39	530	–	–	–	+	♂	<i>adultus</i>	1	cremation-inhumation grave
		+	+	–	+	(?)	<i>adultus</i>	1	
40	532	+	+	–	+	♀	<i>late adultus</i> (30–35)	1	inhumation grave
41	533	–	–	–	+	(?)	<i>maturus</i> (40–50)	1	inhumation grave, double
		–	–	–	+	(?)	<i>infans</i> I (2–4)	1	
42	534	–	–	–	–	(?)	(?)	(?)	cremation urn grave (?); bones not preserved
43	535	–	–	–	–	(?)	(?)	(?)	inhumation grave (?); bones not preserved
44	536	–	–	–	–	(?)	(?)	(?)	inhumation grave; bones not preserved
45	537	–	–	–	+	(?)	(?)	(?)	cremation pit grave
46	538	+	–	–	–	(?)	<i>adult</i>	(?)	inhumation grave
47	539	–	–	–	–	(?)	(?)	(?)	inhumation grave; bones not preserved
48	540	+	+	–	–	(?)	<i>adultus</i>	1	cremation-inhumation grave
		–	–	–	+	(?)	<i>adultus</i>	1	
49	541	+	+	–	+	♀	<i>adultus</i> (20–30)	1	inhumation grave, double
		+	–	–	+	(?)	<i>newborn/infans</i> I (0–1)	1	
50	542	+	–	–	+	♀(?)	<i>adult</i>	1	inhumation grave
51	543	–	–	+	+	♂	<i>adultus</i> (25–30)	1	inhumation grave
52	543A	+	+	–	–	♂	<i>adultus</i> (25–30)	1	secondary trench in grave 543; bones of individual buried in grave 543
53	544	–	–	–	+	(?)	(?)	(?)	cremation urn grave
54	545	+	+	+	+	♂	<i>maturus</i> (45–50)	1	inhumation grave, containing four individuals
		+	+	+	+	♀	<i>adultus</i> (25–35)	1	
		+	+	+	+	♀(?)	<i>iuvenis</i> (18–20)	1	
		+	+	+	+	(?)	<i>infans</i> II (10–12)	1	

No.	Grave or feature no.	Skull	Teeth	Pelvis	Long bones	Sex	Age (in years)	No. of individuals	Type of grave or feature, comments
55	546	-	-	+	+	♂	late <i>adultus</i> (35–40)	1	inhumation grave, double; man's body height 170–172 cm;
		+	+	+	+	♀	early <i>adultus</i> (25–30)	1	woman's body height 160–166 cm
56	547	+	-	-	+	(?)	<i>adultus</i> (25–35)	1	inhumation grave, double
		-	-	-	+	(?)	<i>adultus</i> (?)	1	
57	548	+	+	+	+	♂	early <i>maturus</i> (40–45)	1	inhumation grave; body height 164–170 cm
58	549	-	+	-	-	(?)	(?)	(?)	cremation pit grave
59	550	-	+	-	-	(?)	<i>maturus</i> (?)	1	inhumation grave
60	551	+	-	-	-	♂	<i>senilis</i> (over 55)	1	inhumation grave
61	552	-	-	-	-	(?)	(?)	(?)	inhumation grave; bones not preserved
62	553	-	+	-	-	(?)	<i>maturus</i> (?)	1	inhumation grave
63	554	-	+	-	-	(?)	<i>adultus</i>	1	cremation-inhumation grave
		-	-	-	+	(?)	<i>adultus</i>	1	
64	555	+	+	+	+	♀	<i>maturus</i> (35–40)	1	inhumation grave
65	556	+	+	+	+	♀	<i>adultus</i> (20–25)	1	inhumation grave, double;
		+	-	-	-	♂	<i>maturus</i> (40–45)	1	woman's body height 156–160 cm
66	557	+	-	-	+	♀	<i>adult</i>	1	inhumation grave
67	558	+	-	+	+	♀	<i>maturus</i> (?)	1	inhumation grave
68	559	+	+	-	+	♀	<i>maturus</i> (40–45)	1	inhumation grave, double
		-	-	-	+	(?)	<i>iuvenis</i> (16–18)	1	
69	560	-	-	-	-	(?)	(?)	(?)	inhumation grave; bones not preserved
70	561	+	-	-	+	(?)	<i>infans</i> I/II (6–8)	1	cremation urn grave
71	562	-	+	-	-	(?)	<i>adult</i>	1	inhumation grave
72	563	-	-	-	-	(?)	(?)	(?)	inhumation grave; bones not preserved
73	564	-	-	-	-	(?)	(?)	(?)	inhumation grave; bones not preserved;
		-	-	-	+	(?)	(?)	(?)	burnt bone in secondary context
74	565	-	-	-	-	(?)	(?)	(?)	inhumation grave; bones not preserved
75	566	-	-	-	-	(?)	(?)	(?)	inhumation grave; bones not preserved
76	567	+	-	-	+	(?)	<i>adult</i>	1	cremation pit grave (?)
77	568	-	-	-	-	(?)	(?)	(?)	inhumation grave; bones not preserved
78	569	-	+	-	+	♂(?)	<i>adult</i>	1	cremation-inhumation grave (?)
		+	-	-	+	♂(?)	<i>adult</i>	1	
79	570	-	-	-	-	(?)	(?)	(?)	inhumation grave; bones not preserved
80	571	+	-	-	+	(?)	<i>adult</i>	1	cremation urn grave
81	572	+	+	+	+	♂	<i>maturus</i> (45–50)	1	inhumation grave
82	573	+	-	-	+	(?)	<i>adultus</i> (?)	1	cremation urn grave
83	574	+	+	+	+	♀	<i>adultus</i> (25–30)	1	inhumation grave
84	575	-	-	-	+	♂	<i>adult</i>	1	inhumation grave
85	576	+	+	-	+	(?)	<i>adult</i>	1	cremation pit grave

No.	Grave or feature no.	Skull	Teeth	Pelvis	Long bones	Sex	Age (in years)	No. of individuals	Type of grave or feature, comments
86	577	-	-	-	-	(?)	(?)	(?)	cremation urn grave
87	578	+	+	+	+	♂	<i>senilis</i> (55-60)	1	inhumation grave
88	578A	-	-	-	+	♂	<i>senilis</i> (55-60)	1	secondary trench in grave 578; humerus of individual from grave 578
89	579(462)	- +	+ +	- -	- +	(?) (?)	(?) (?)	1 1	inhumation grave; burnt bones in secondary context
90	580	+	+	+	+	♂	<i>maturus</i> (over 45)	1	cremation pit grave
91	581	-	-	-	-	(?)	(?)	(?)	cremation urn grave; bones not preserved
92	582	-	+	-	-	(?)	adult	1	inhumation grave
93	584	+ + +	+ + +	+ + +	+ + +	♂ ♀ (?)	<i>maturus</i> (45-50) <i>adultus</i> (25-35) <i>infans</i> II (8-9)	1 1 1	Modern trench which destroyed at least several graves
94	585(290A)	-	-	-	+	(?)	(?)	(?)	cremation urn grave
95	586	+	+	-	+	(?)	adult	1	inhumation grave
96	587	-	-	-	-	(?)	(?)	(?)	inhumation grave; bones not preserved
97	588	-	-	-	-	(?)	(?)	(?)	inhumation grave; bones not preserved
98	589	-	-	-	-	(?)	(?)	(?)	inhumation grave; bones not preserved
99	590	-	-	-	-	(?)	(?)	(?)	inhumation grave; bones not preserved
100	591	+	-	+	+	(?)	adult	1	cremation pit grave
101	592AB	-	-	-	+	(?)	adult	1	funeral pyre, pyre site (?)
102	592C	+ -	+ -	- -	- +	♀ (?)	<i>adultus</i> (30-40) adult	1	inhumation grave; burnt bones in secondary context
103	593	+	-	-	+	♀	<i>adultus</i> (30-40)	1	inhumation grave
104	594	- +	- -	- -	+ +	♀(?) (?)	adult adult	1 1	cremation-inhumation grave
105	595	+	+	+	+	♂	<i>maturus</i> (40-50)	1	inhumation grave
106	596	- +	- +	- -	+ +	(?) ♂(?)	adult adult	1 1	cremation-inhumation grave
107	597	-	+	-	+	(?)	adult	1	inhumation grave
108	598	-	-	-	-	(?)	(?)	(?)	inhumation grave; bones not preserved
109	599	+	+	+	+	♂	<i>adultus</i> (30-35)	1	secondary trench in grave 600; bones of individual buried in grave 600; body height 167-170 cm.
110	600	+	-	-	+	♂	<i>adultus</i> (30-35)	1	inhumation grave; body height 167-170 cm
111	601	+	+	-	-	♀	<i>adultus</i> (30-35)	1	inhumation grave
112	602	-	-	-	-	(?)	(?)	(?)	inhumation grave; bones not preserved
113	603	-	-	-	-	(?)	(?)	(?)	inhumation grave; bones not preserved
114	604	+	+	-	+	♀	<i>adultus/maturus</i> (30-40)	1	inhumation grave

No.	Grave or feature no.	Skull	Teeth	Pelvis	Long bones	Sex	Age (in years)	No. of individuals	Type of grave or feature, comments
115	605	+	+	+	+	♀	<i>adultus</i> (25–35)	1	inhumation grave
116	606	+	+	–	–	(?)	<i>infans</i> I	1	inhumation grave
117	607	+	+	–	+	♂	<i>maturus</i> (40–50)	1	inhumation grave, double
		+	+	–	+	(?)	<i>iuvenis</i> (16–18)	1	
118	608	–	–	–	–	(?)	(?)	(?)	inhumation grave; bones not preserved
119	609	–	+	–	–	(?)	adult	1	inhumation grave
120	610	+	+	–	+	♂	<i>maturus</i> (40–50)	1	inhumation grave
121	611	–	+	–	–	(?)	adult	1	inhumation grave
122	612	–	–	–	–	(?)	(?)	(?)	inhumation grave; bones not preserved
123	613	+	–	–	+	♂	<i>maturus</i> (40–50)	1	inhumation grave
124	614	+	+	–	+	♀	<i>maturus</i> (35–45)	1	inhumation grave
125	615	+	–	–	+	♀	<i>adultus</i>	1	cremation pit grave
126	616	+	–	–	+	♂	<i>maturus</i>	1	cremation pit grave
127	617	+	–	–	+	♀	<i>adultus</i>	1	cremation pit grave
128	618	–	+	–	+	(?)	adult	1	funeral pyre with collapsed daub dome, pyre site (?)
129	619	–	–	–	+	(?)	adult	1	cremation pit grave
130	620	+	+	–	+	(?)	adult	1	inhumation grave
131	620A	–	+	–	+	(?)	adult	1	secondary trench in grave 620; bones of individual buried in grave 620
132	621	–	–	+	+	♂	<i>maturus</i> (45–50)	1	inhumation grave
133	622	+	+	+	+	♂	<i>adultus</i>	1	cremation pit grave, double
		+	+	+	+	♀	<i>adultus</i>	1	
134	623	+	+	–	+	♀	<i>adultus</i>	1	cremation pit grave
135	623A	+	–	–	+	♂	<i>maturus</i>	1	cremation pit grave
136	624	+	–	–	+	(?)	adult	1	cremation pit grave
137	625	+	+	–	+	♀	<i>adultus</i>	1	cremation-inhumation grave
		+	+	–	+	(?)	<i>infans</i> I	1	
138	626	–	+	–	+	(?)	adult	1	cremation urn grave
139	627	–	–	–	–	(?)	(?)	(?)	inhumation grave; bones not preserved
140	628	–	–	–	–	(?)	(?)	(?)	inhumation grave; bones not preserved
141	629	+	+	–	+	(?)	<i>infans</i> I/II	1	inhumation grave
142	630	+	–	–	+	♂	early <i>maturus</i> (40–45)	1	cremation urn grave
143	631	+	+	–	+	♀	<i>adultus</i> (35–40)	1	inhumation grave
144	632	–	–	–	+	(?)	adult	1	cremation urn grave
145	633	–	–	–	+	(?)	(?)	1	cremation pit grave
146	634	–	–	–	+	(?)	adult	1	cremation pit grave
147	635	–	–	–	+	(?)	adult	1	cremation-inhumation grave
		+	–	–	+	(?)	(?)	1	
148	636	+	+	–	–	♂	<i>maturus</i> (40–50)	1	inhumation grave
149	637	–	–	–	+	(?)	(?)	1	cremation pit grave
150	638	+	–	–	+	(?)	adult	1	cremation pit grave
151	639	–	–	–	+	(?)	(?)	1	cremation pit grave
152	640	–	–	–	+	(?)	(?)	1	cremation pit grave

Tab. 3. Weklice. Preservation of the skull and the lower jaw in inhumation graves. Compiled by: I. Teul

State of preservation	% of bone preservation	Skull		Mandible	
		N	%	N	%
complete	(90.0–100.0)	5	8.1	5	8.6
almost complete	70.0–90.0	4	6.4	12	20.6
incomplete	10.0–60.0	53	85.5	41	70.8
total	–	62	100.0	58	100.0

Tab. 4. Weklice. State of preservation of postcranial skeletons in inhumation graves. Compiled by: I. Teul

State of preservation	% of preserved bones	Axial skeleton (vertebrae, ribs, sternum)		Bones of the upper limb girdle		Upper limb bones		Hand bones		Pelvis		Lower limb bones		Foot bones	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
complete	90.0–100.0	6	6.5	5	5.5	4	4.6	–	–	1	1.6	2	2.4	–	–
almost complete	70.0–90.0	15	16.3	18	20.0	12	13.6	4	8.2	3	4.8	10	12.0	5	10.4
incomplete	10.0–60.0	71	77.2	67	74.5	72	81.8	45	91.8	59	93.6	71	85.6	43	89.6
total	–	92	100.0	90	100.0	88	100.0	49	100.0	63	100.0	83	100.0	48	100.0

Tab. 5. Weklice. State of preservation of skeletons of individuals in all age categories. Compiled by: I. Teul

State of skeleton preservation (%)	<i>infans I</i>		<i>infans II</i>		<i>iuvenis</i>		<i>adultus</i>		<i>maturus</i>		<i>senilis</i>		<i>adults</i>		<i>(?)</i>	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
complete (90.0–100.0)	0	0.0	0	0.0	0	0.0	2	1.5	4	3.0	0	0.0	0	0.0	0	0.0
nearly complete (70.0–90.0)	0	0.0	0	0.0	0	0.0	2	1.5	5	3.7	0	0.0	0	0.0	0	0.0
incomplete (10.0–60.0)	8	6.0	5	3.7	6	4.5	46	34.6	19	14.3	4	3.0	34	25.2	9	6.6
total	8	6.0	5	3.7	6	4.5	50	37.6	27	21.0	4	3.0	24	25.2	9	6.6

Tab. 6. Weklice. State of skeleton preservation relative to age and sex. Compiled by: I. Teul
Adults + (?) – adults and individuals of undetermined sex

Skeleton preservation	F		M		Children and adolescents		Adults + (?)	
	N	%	N	%	N	%	N	%
complete (90.0–100.0)	2	1.5	4	3.0	0	0.0	0	0.0
almost complete (70.0–90.0)	4	3.0	3	2.3	0	0.0	0	0.0
incomplete (10.0–60.0)	33	24.8	29	21.8	15	10.5	43	32.3
total	39	29.3	36	27.1	15	10.5	43	32.3

Tab. 7. Weklice. Structure of mortality in different age categories. Compiled by: I. Teul

Age	Children		Women		Men		Unspecified		Total	
	N	%	N	%	N	%	N	%	N	%
<i>infans</i> I (0–6.9)	9	69.2	–	–	–	–	–	–	9	7.4
<i>infans</i> II (7–13.9)	4	30.8	–	–	–	–	–	–	4	3.3
<i>iuvenis</i> (14–19.9)	–	–	2	5.5	–	–	4	9.7	6	5.0
<i>adultus</i> (20–29.9)	–	–	14	39.0	4	12.9	2	4.9	20	16.5
<i>adultus/maturus</i> (30–39.9)	–	–	13	36.2	9	29.0	3	7.3	25	20.7
<i>maturus</i> (40–49.9)	–	–	3	8.3	9	29.0	5	12.2	17	14.1
<i>maturus/senilis</i> (50–59.9)	–	–	1	2.7	3	9.7	–	–	4	3.3
<i>senilis</i> (60–x)	–	–	–	–	1	3.2	–	–	1	0.8
adult	–	–	3	8.3	5	16.2	27	65.9	35	28.9
total	13	100.0	36	100.0	31	100.0	41	100.0	121	100.0
%	10.8	–	29.7	–	25.6	–	33.9	–	–	100.0

Tab. 8. Weklice. Structure of population mortality based on a stationary model. Compiled by: I. Teul

d_x – number of deceased persons in a given period; % – ratio of the age category in the studied population; l_x – number of people living to the beginning of a given age category; q_x – probability of death of an individual in a given age class; p_x – probability of survival of an individual in a given age class; L_x – number of years lived by all representatives of the age category; T_x – number of years left to live by all representatives of the age category; e^0_x – expected life expectancy of an individual at the age equal to the beginning of the category

Age category	d_x	%	l_x	q_x	p_x	L_x	T_x	e^0_x
0–6.9	8	6.01	100.00	0.231	0.9318	5.324	19.244	31.45
7–14.9	5	3.75	93.99	0.198	0.9112	3.811	13.021	29.43
15–19.9	6	4.51	90.24	0.234	0.9083	1.821	10.112	27.84
20–29.9	34	25.56	85.73	0.241	0.6654	3.128	8.219	21.89
30–39.9	28	21.05	60.17	0.219	0.5781	2.358	5.279	18.78
40–49.9	48	36.09	39.12	0.523	0.3155	1.490	2.672	12.73
50–59.9	3	2.25	3.03	0.383	0.2937	0.821	1.014	11.12
60–x	1	0.75	2.28	0.966	0.000	0.214	0.214	5.00

Tab. 9. Weklice. Potential Reproduction Rate (R_{pot}). Compiled by: I. Teul

D_x – number of individuals deceased at the age of x years; d_x – extinction rate in a given age class; s_x – reproductive loss rate; ω – indicates the age at the time of death of the oldest individual in the study group

Age	D_x	d_x	s_x	$d_x s_x$
15–19 years	8	0.066	0.95	0.063
20–29 years	39	0.325	0.65	0.211
30–39 years	51	0.425	0.30	0.127
40–49 years	17	0.141	0.08	0.011
50– ω	5	0.041	0	0
total	120	1.000	0	0.412

Tab. 10. Weklice. Biological status index (I_{bs}). Compiled by: I. Teul
 D_x – number of individuals deceased at age x ; d_x – incidence of mortality in age group;
 s_x – reproductive loss index; ω – age at death of oldest individual in studied group

Age	D_x	d_x	s_x	$d_x s_x$
0–14	13	0.098	1.00	0.098
15–19	6	0.060	0.95	0.057
20–29	20	0.293	0.65	0.190
30–39	60	0.383	0.30	0.114
40–49	17	0.128	0.08	0.011
50– ω	5	0.037	0	0.010
total	121	1.000	0	0.480

Tab. 11. Weklice. Descriptive statistics of the metric features of the postcranial skeleton of women (F) and men (M) in millimetres.
 Compiled by: I. Teul

No. according to Martin	Feature	F				M				
		N	min	max	x	N	min	max	x	p
M1	g-op	5	166	193	180.5	5	183	198	189.4	<0.001
M8	eu-eu	3	120	149	130.5	5	140	154	145.6	0.008
M13	ms-ms	2	88	130	102.3	3	95	127	115	0.021
M17	ba-b	2	127	141	137.2	3	133	146	140	<0.001
M12	ast-ast	2	100	123	111.5	3	103	134	120	0.001
M11	au-au	2	102	129	115.5	3	107	132	122.7	<0.001
M51	mf-ek	6	37	42	38.7	8	39	47	43.7	0.374
M52	sba-spk	6	34	36	32.7	6	29	37	34.7	0.889
M44	ek-ek	6	86	104	93.6	4	84	107	94.3	0.431
M50	mf-mf	6	19	26	23.6	8	19	31	21.7	0.042
M45	ft-ft	6	90	101	95.3	5	95	105	99.6	0.141
M46	z-zy	6	114	132	124.2	8	122	141	132.7	<0.001
M66	go-go	2	78	104	94.1	3	93	112	102.5	0.001
M48	n-pr	4	59	74	65.2	5	65	82	71.2	0.023
M55	n-ns	4	46	52	48.2	5	47	59	52.4	0.211
M69	gn-id	2	17	32	24.5	2	19	38	28.5	0.123
M68	go-gn	2	69	89	79	3	71	97	84.3	<0.001
M70	kdl-wys	4	27	44	35.5	5	28	42	35.5	0.691
M54	apt-apt	3	24	27	24.6	4	21	28	24.5	0.121

Tab. 12. Weklice. Metric characteristics of five selected cranial indices of men and women. Compiled by: I. Teul
1 – width-length index; 2 – upper face index; 3 – nasal index; 4 – orbit index; 5 – height-average index

Sex	Men					Women				
index	1	2	3	4	5	1	2	3	4	5
N	5	5	5	8	5	3	5	3	5	2
min	76.5	53.3	44.7	69.6	80.1	72.3	51.7	50.2	80.9	81.7
max	81.7	59.2	47.4	97.7	90.6	84.3	56.3	52.9	85.7	100.9
X	78.8	51.6	41.6	82.5	85.1	74.1	53.6	49.6	83.5	87.6
mean	3.76	3.62	4.66	8.66	4.10	4.67	3.42	4.27	7.3	5.66
median	78.6	55.3	45.2	78.6	84.6	71.5	54.6	50.1	82.9	85.6

Tab. 13. Weklice. Descriptive statistics of the metric features of the postcranial skeleton of women (F) and men (M) in millimetres.
Compiled by: I. Teul

No. according to Martin	Feature	F				M			
		N	min	max	X	N	min	max	X
M1	<i>humerus</i> : maximum length	5	312.1	322	314	4	346.7	333	348
M4	<i>humerus epicron</i> : width	5	38	65	52.6	3	–	–	–
M7	<i>humerus</i> : circumference	5	49	75	60.1	4	–	–	–
M9	<i>humerus</i> : head, width	3	34.1	56.2	42.7	4	44	51	49.4
M1	<i>radius</i> : maximum length	3	195	248	235	4	267	271	270.1
M3	<i>radius</i> : circumference	2	34	49	42	2	–	–	–
M1	<i>ulnaris</i> : maximum length	2	231.3	259.4	256.4	2	285	301	291.5
M3	<i>ulnaris</i> : circumference	3	32	51	38.1	2	–	–	–
M1	<i>femur</i> : maximum length	4	389	489	440.1	4	472	494	481.3
M8	<i>femur</i> : circumference	4	73	99	86.4	4	–	–	–
M13	<i>femur</i> : width of boproximal epiphysis	4	74	103	84.5	4	–	–	–
M18	<i>femur</i> : head height	4	42	53	44.8	2	–	–	–
M19	<i>femur</i> : head width	4	38	49	42.7	3	–	–	–
M20	<i>femur</i> : head circumference	4	118	157	134.3	3	–	–	–
M1	<i>tibia</i> : maximum length	4	298	374	351.3	7	376	386	380.5
M6	<i>tibia</i> : distal tibia epiphysis	3	39	51	44.4	5	–	–	–
M10b	<i>tibia</i> : circumference	4	58	95	73.8	7	–	–	–

Tab. 14. Weklice. Comparison of sex differences in measurements of long skeleton bones in men (M) and women (F),
in millimetres. Compiled by: I. Teul

Bone	No. according to Martin	M					F					Dimorphism index X_M/X_K
		N	X	min	max	mean	N	X	min	max	mean	
<i>femur</i>	M1	6	481.5	472	494	22.6	6	439.5	394	441	22.6	1.09
	M6	6	31.2	28	34	2.8	6	26.5	24	27	2.7	1.17
	M7	6	30.8	28	31	2.4	6	28.2	27	31	2.1	1.09
<i>tibia</i>	M1	11	380.5	–	–	17.4	7	351.5	348	354	14.8	1.08
<i>fibula</i>	M1	5	376.1	371	379	17.8	4	338.5	335	340	17.2	1.11

Tab. 15. Wekllice. Reconstruction of living body height in men (M) and women (F) in centimetres. Compiled By: I. Teul

Method	M			F			X _m -X _k
	N	X	min-max	N	X	min-max	
Pearson	7	171.2	155.4-179.1	7	158.9	152.1-168.3	12.5
Trotter and Glaser	7	176.5	163.4-187.1	7	164.8	155.5-172.0	10.7
Breitinger (M) and Bach (F)	7	172.4	161.5-183.3	7	162.4	156.5-168.4	10.7
Manouvrier	7	173.7	159.0-186.4	7	161.3	153.8-171.2	11.4

Tab. 16. Comparative list of mean male (M) and female (F) body height (in centimetres). Data from selected Wielbark Culture, Masłomęcz group and early medieval cemeteries. Compiled by: I. Teul

Site	M	F	X _m -X _k	Authors
Wekllice, site 7, Elbląg district	170.8	158.9	11.9	I. Teul 2011
Wekllice, site 7, Elbląg district	171.2	158.7	12.5	Own data (excavations 2005-2018)
Pruszcz Gdański, site 5, Gdańsk district	169.4	158.0	11.4	M. Pietrzak, L. Cymek, F. Rożnowski 2015
Pruszcz Gdański, site 10, Gdańsk district	169.0	158.3	10.7	J. Gładkowska-Rzeczycka 1981
Pruszcz Gdański, site 7, Gdańsk district	165.0	156.0	11.9	J. Gładkowska-Rzeczycka, A. Pudło 2003
Gródek nad Bugiem, site 1C, Hrubieszów district	169.0	152.7	16.3	W. Kozak-Zychman 1996
Masłomęcz, Hrubieszów district	165.8	154.3	11.5	W. Kozak-Zychman 1996
Gostkowo, Toruń district	167.1	154.7	12.4	A. Florkowski 1970
Gruczno, Świecie district (12 th -14 th c.)	166.5	154.8	11.7	G. Kriesel 1992
Wolin-Młynówka, Kamień Pomorski district (10 th -12 th c.)	166.2	151.4	14.8	E. Wokroj 1967
Ostrów Lednicki, Gniezno district (10 th -14 th c.)	166.6	155.8	10.8	M. Godycki 1956

Tab. 17. Wekllice. Long bone mass index of men (M) and women (F). Compiled by: I. Teul

No.	Bone	M			F			M/F
		N	X	mean	N	X	mean	
1	<i>humerus</i>	4	19.8	1.21	4	18.1	1.56	1.09
2	<i>radius</i>	4	19.4	2.61	3	17.4	1.21	1.11
3	<i>ulnaris</i>	3	15.7	1.02	2	14.5	1.23	1.08
4	<i>femur</i>	7	20.7	1.11	4	18.2	1.31	1.13
5	<i>tibia</i>	4	21.3	1.22	4	19.8	1.51	1.07

IV.2. THE ORIGIN AND NUTRITIONAL STRATEGIES OF THE HUMAN POPULATION FROM THE CEMETERY IN WEKLICE (BEATA CIENKOSZ-STEPAŃCZAK, ALEKSANDRA LISOWSKA-GACZOREK, JACEK PAWLYTA, KRZYSZTOF SZOSTEK)

1. INTRODUCTION

For several decades, scientists interested in the analytical aspects of isotopic research have been developing methods for exploring prehistoric and historical populations⁷⁹. This methodology is becoming the standard in archaeological, bio-archaeological and anthropological research. Applications of isotopic research in these areas mainly relate to past dietary habits (carbon and nitrogen isotopes⁸⁰) and migration⁸¹ (analysis of oxygen isotopic proportions⁸²). Besides genetic methods involving the analysis of fossil DNA, isotopic methods are the main tool for studying the origins of human groups and

their operation in geographic space⁸³. Isotopic values in tissues of organisms are obtained by determining the ratios of heavier to lighter isotopes, with the final value being calculated in relation to a standard and presented in permilles (‰) marked with the delta symbol (δ)⁸⁴. In human tissues, C and N isotopes are present, among others, in hair, nails, and, most importantly for anthropologists, in the organic part of bone tissue⁸⁵. The organic fraction of the skeleton is largely built from collagen (over 90%), other non-collagen proteins (e.g. glycoproteins, osteocalcin, osteonectin), and lipids. During bone formation, collagen forms fibrils, within which bioapatite crystals become deposited. The amount of organic matter depends on the type of material. Bones have the highest organic content, accounting for some 30% of the bone's dry weight. In dentin, the value oscillates in the range of 26–28%, and in enamel it is 2–3%⁸⁶.

NITROGEN ISOTOPES

In living organisms, nitrogen isotopes (¹⁴N and ¹⁵N) are present in organic compounds. In the case of human tissues, the isotopic composition of collagen reflects the

⁷⁹ M.J. Schoeninger, K. Moore 1992.

⁸⁰ M.J. Schoeninger, M.J. DeNiro 1984; K. Choy, M.P. Richards 2009; D.A. Byers *et alii* 2011; B. Cienkosz-Stepańczak *et alii* 2017; B. Mnich *et alii* 2020; J. Tomczyk *et alii* 2020a.

⁸¹ In migration studies, ⁸⁷Sr/⁸⁶Sr isotopes in the local geological formations are also used. These become incorporated into human or animal skeletons, mainly from food and water, providing supplementary data for identifying geographical origin. Isotope proportions in bone tissue reflect the isotope signatures of the location or region in which a given person was present at a certain point of time, e.g. while the enamel was becoming mineralised. An individual born and raised in a given area will have isotope values of strontium closely reflecting the local isotope values. If those values differ, the individual may be assumed to be of non-local origin (K. Szostek, K. Mądrzyk, B. Cienkosz-Stepańczak 2015).

⁸² A. Lisowska-Gaczorek *et alii* 2016; Ł. Oleszczak *et alii* 2018; S. Pederzani, K. Britton 2019.

⁸³ H.P. Schwarcz, L. Gibbs, M. Knyf 1993.

⁸⁴ C. White, F.J. Longstaffe, K.R. Law 2004. Isotope levels are determined using the general formula: $\delta R(\text{‰}) = [R_{\text{sample}} - R_{\text{standard}}] / R_{\text{standard}} \times 1000$. The standards are PDB (the Pee Dee Belemnite) for carbon, and AIR (Atmospheric Nitrogen) for Nitrogen.

⁸⁵ B.T. Fuller *et alii* 2006.

⁸⁶ S. Maziarski, Z. Nowicki 1954; F.D. Pate 1994; K.A. Hoppe, P.L. Koch, T.T. Furutani 2003.

isotopic composition of proteins in food, with air being its primary source in ecosystems⁸⁷. When ingested nutrients become metabolised and transformed as part of the biochemical processes occurring in the human body, the isotopic ratio gradually increases by about 3‰. This so-called trophic effect is caused directly by the phenomenon of isotopic fractionation. For nitrogen, the trophic effect is 3–5‰⁸⁸. In anthropological studies, $\delta^{15}\text{N}$ isotopes are used to determine diet components, allowing researchers to distinguish sea-based diets from land-based ones, or even between diets sourced from the littoral zone and the open waters⁸⁹. The trophic effect is also observed in the tissue ratios between nursing women → nursed children, with differences ranging from 2‰ to 3‰⁹⁰.

CARBON ISOTOPES

Similar to nitrogen, carbon isotopes (^{12}C , ^{13}C) are present in the organic fraction (carbon being the building block of virtually all organic matter compounds) as well as in inorganic apatite carbonates. Carbon is present in amino acids, sugars and fats ingested by humans and animals. Plants capture carbon from the atmosphere through the process of photosynthesis⁹¹. Because C isotopes are present in carbohydrates, they are used for identifying diets based on plants that use C3 and C4 photosynthetic pathways. Plants with different photosynthesis types will have different isotope ratios. The mean value for C3 photosynthesis plants is -28‰, with values ranging from -22‰ to -33‰; for C4 photosynthesis plants, the values range from 16‰ to -7‰⁹². Also, the trophic effect makes it possible to identify the proportion of marine foods in the diet as well as the diet's general composition. When interpreting $\delta^{13}\text{C}$ results obtained from protein and apatite it must be borne in mind that for plant tissues, the value of $\delta^{13}\text{C}$ of human collagen increases by about 4‰⁹³. This is caused by the fact that the carbon in collagen is directly connected to proteins in the food⁹⁴.

⁸⁷ R.P. Mauldin *et alii* 2013.

⁸⁸ T.L. Dupras, M.W. Tocheri 2007; K. Choy, M.P. Richards 2009.

⁸⁹ M.J. Schoeninger, M.J. DeNiro 1984; K. Choy, M.P. Richards 2009; D.A. Byers *et alii* 2011.

⁹⁰ T.L. Dupras, M.W. Tocheri 2007; J. Tomczyk *et alii* 2020a.

⁹¹ R.P. Mauldin *et alii* 2013.

⁹² B.N. Smith, S. Epstein 1971; N.J. van der Merwe, J.A. Lee Thorp, R.H.V. Bell 1988; F.D. Pate, M.J. Schoeninger 1993; K. Choy, M.P. Richards 2009.

⁹³ B.N. Smith, S. Epstein 1971; S.H. Ambrose, L. Norr 1993; B.H. Passey *et alii* 2005.

⁹⁴ R.P. Mauldin *et alii* 2013.

OXYGEN ISOTOPES

Currently, the most prevalent methods for determining the origins and migration patterns of human groups involve analysing stable oxygen isotopes. This is thanks to technological advancements and a relatively low costs of analysing light isotopes compared to strontium isotopic determinations or analysis of fossil DNA⁹⁵.

Oxygen isotopic tests consist in finding a common denominator between an organism's natural environment, its biology and functioning, and the strategies and choices over its lifetime. The methodology is based on the strong positive correlation between the isotopic composition of oxygen ($\delta^{18}\text{O}$) in the mineral fraction of mammalian bone tissue and the concentration of the same isotopes in water in the environment⁹⁶. The isotopic composition of water in the environment depends primarily on the climatic and geographical factors in a given macro-region. Water is continually subject to isotopic fractionation processes. This produces a ratio of oxygen isotopes ($^{18}\text{O}/^{16}\text{O}$) that is specific to a given region. Animals and humans in a given micro-region drink water with an isotopic ratio characteristic of that location, which then becomes incorporated into the tissues, including the chemical structure of the bone tissue.

In research practice, determining the isotopic concentration of oxygen in samples of animal bone material makes it possible to determine the range of local isotopic composition, which then can be compared with the δ value of ^{18}O in fragments of human skeletons. This in turn makes it possible to identify individuals of auto- or allochthonous origin⁹⁷.

BONE REMODELING AND DIAGENESIS

Biochemical analysis of bones must take into account the process whereby trace elements and isotopes are removed from, and incorporated into, living tissue because the isotopes from bone tissue are gradually replaced by new isotopes in ingested food⁹⁸. This slow but continual turnover process occurs in all animal organisms. The process only occurs in bones; teeth, once they have formed, do not change their composition

⁹⁵ B. Stepańczyk, K. Szostek, J. Pawlyta 2014; E. Lightfoot, T.C. O'Connell 2016; A. Lisowska-Gaczorek *et alii* 2016.

⁹⁶ A. Longinelli 1984; B. Cienkosz-Stepańczyk, K. Szostek, A. Lisowska-Gaczorek 2021.

⁹⁷ C. Lécuyer *et alii* 2007.

⁹⁸ T.L. Dupras, M.W. Tocheri 2007; K. Szostek, K. Mądrzyk, B. Cienkosz-Stepańczyk 2015.

over an individual's lifetime⁹⁹. The turnover and remodeling depends on the individual's age, metabolism, biological sex and physiological condition, and it affects different parts of the skeleton in different ways. It is assumed that bones retain information from the last 10–30 years of an individual's life¹⁰⁰. Because physical development is faster in children, the turnover is accelerated in juvenile individuals, taking place every 3–4 years¹⁰¹. Importantly, the first step in any isotopic analysis of bone tissue should involve excluding potential *post mortem* contamination that would make the data ineligible for analysis. Depending on hydrological, thermal, oxido-reductive and microbiological conditions, material deposited in the soil may be subject to processes of ion exchange between the bone tissue and the soil. Also, the organic components may become degraded over time. The degree of preservation of the organic fraction determines the ratio of carbon to nitrogen (C/N), and, in the case of oxygen isotope analyses, the CI index¹⁰².

ENVIRONMENTAL BACKGROUND IN ISOTOPIC STUDIES

In diet reconstruction studies, one popular method for identifying regional variability of isotopic ratios involves analysing animal remains from areas where the cemeteries are located¹⁰³. The basic technique for determining local isotopic levels involving animal material consists in determining the range of isotopic variation in the animal tissue or in determining the mean value for the complete set of measurements. The range of variability in an area is assumed to be contained within two standard deviations of the mean. Either modern animals or animals that were contemporaneous with the studied human population are used in this kind of analysis¹⁰⁴. Local fauna is an excellent indicator for bioavailable nitrogen and carbon because many animal species live in close proximity to humans and their tissues reflect the natural complexity of the environment,

especially if they come from the same period as the studied human population¹⁰⁵.

2. RESEARCH AIMS AND METHODS

The aim of this study is to recreate the nutritional strategies of the population from Weklice by analysing carbon ($\delta^{13}\text{C}$) and nitrogen ($\delta^{15}\text{N}$) isotopes. Based on this data, it will be possible to determine the origin of individuals using oxygen isotopes ($\delta^{18}\text{O}$).

DIAGENESIS

Diagenesis is a complex chemical process that leads to a partial or complete fossilisation of the organic fraction and inorganic bone tissue in the soil environment¹⁰⁶. Depending on the purpose of analysis, the degree of *post mortem* changes to bone material is analysed separately for the collagen (which forms the organic part of bones) and for bone apatite (which constitutes the mineral component). In the latter case, the process of diagenesis is associated with more or less dynamic recrystallisation of hydroxyapatite and the adsorption and ion exchange occurring between biogenic matter and waterborne dissolved ions in the grave environment¹⁰⁷.

With regard to nitrogen and carbon isotopes, the analysis involved measuring the parameters that characterise the state of preservation of analysed material (the C:N ratio). Unless it has been contaminated *post mortem* to a degree that might interfere with the correct interpretation of test results, collagen is characterised by a C:N ratio of 2.9 to 3.6¹⁰⁸. The laboratory standards (established reference material) used in the analyses were atmospheric nitrogen (AIR) and PeeDeeBelemnite (PDB).

In the case of oxygen isotopes, FTIR spectroscopy was used to assess diagenetic changes that reflect the state of preservation of the inorganic fraction in the samples. The spectroscopy was performed using a Nicolet iS20 spectrometer, a Fourier-transform infrared spectrometer from Thermo Scientific. All spectra were recorded in the IR range of 4000–400 cm^{-1} . A spectral resolution of 4 cm^{-1} and 32 scans were used. For each sample, spectrometry results were used to calculate the values of the most commonly used diagenetic parameters, the carbonate-phosphate ratio ($\text{CO}_3 / \text{PO}_4$) and the crystallinity

⁹⁹ J. Beaumont, J. Montgomery 2015.

¹⁰⁰ R.P. Mauldin *et alii* 2013.

¹⁰¹ K. Szostek, K. Mądrzyk, B. Cienkosz-Stepańczak 2015.

¹⁰² L.E. Wright, H.P. Schwarcz 1996; R.E.M. Hedges 2002; M. Lebon *et alii* 2010.

¹⁰³ T.D. Price, J.H. Burton, R.A. Bentley 2002; P. Budd *et alii* 2004; C. White, F.J. Longstaffe, K.R. Law 2004; R.A. Bentley 2006; K. Szostek 2009; B. Shaw *et alii* 2011; K.J. Knudson, K.R. Gardella, J. Yaeger 2012.

¹⁰⁴ G. Grupe *et alii* 1997; J.A. Evans, S. Tatham 2004; T.D. Price *et alii* 2010; L.A. Gregoricka 2013.

¹⁰⁵ B. Shaw *et alii* 2011; K.J. Knudson, K.R. Gardella, J. Yaeger 2012.

¹⁰⁶ M. Lebon *et alii* 2010; M.M. Beasley *et alii* 2014.

¹⁰⁷ L.E. Wright, H.P. Schwarcz 1996; F. Berna, A. Matthews, S. Weiner 2004.

¹⁰⁸ M.L. Jørkov, J. Heinemeier, N. Lynnerup 2007.

index (CI). The following threshold values were assumed for eligible samples: CI of 3.3 and a $\text{CO}_3 / \text{PO}_4$ ratio of -0.15 to 0.7^{109} .

ISOTOPIC ANALYSES

Nitrogen and carbon isotopes

To isolate collagen from the samples, the procedure proposed by H. Bocherens *et alii* was used¹¹⁰. The collagen was isolated from bones and dentin. The material was cleaned mechanically using an ultrasonic cleaner before skeleton fragments were dried and ground up using a Testchem vibratory grinder. The powdered material was weighed and portioned into samples about 0.3 g each. Each sample was immersed in 1M HCl for 20 minutes. The undissolved fraction of each sample was then incubated for 24 hours in 0.125 M NaOH at room temperature to purify the sample. Then, a 0.001M HCl reagent was added and the samples were incubated in a water bath at 90°C for 17 hours to completely dissolve the bone and dentin powder. Approximately 1–2 ml of the dissolved sample solution was transferred to Amicon filtering tubes. The filtering process made it possible to capture any non-collagen proteins and to obtain pure collagen which was then freeze-dried. The isotopic composition of $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ was determined using a Costech ECS 4010 elemental analyser coupled with a Thermo Scientific Conflo IV and a Thermo Scientific Delta V Advantage continuous flow mass spectrometer at the Scottish Universities Environmental Research Centre in Glasgow.

Oxygen isotopes

Stable oxygen isotopes were analysed within isolated phosphate groups derived from the phosphates present in bone hydroxyapatite. Phosphates were isolated using a procedure developed by J.R. O'Neil *et alii*¹¹¹. Fragments of compact bone were first cleaned with ultrasound, then ground up and purified of organic matter and other potential chemical impurities using sodium hypochlorite (NaOCl) followed by sodium hydroxide (NaOH). In order to isolate phosphate ions from bone apatite, the samples were incubated in hydrofluoric acid (HF). Silver nitrate (AgNO_3) was then added and the samples were incubated at 70°C. As a result, crystals of silver phosphate (Ag_3PO_4) precipitated from the

solution and were used for measuring the isotopic ratios using a method proposed by C. Lécuyer *et alii*¹¹². This was done in an isotope mass spectrometer operating in a continuous flow mode coupled with an elemental microanalyser and a gas chromatograph. The laboratory standard used for this analysis was NIST 120c. Measurements of oxygen isotopes in the bone samples were carried out by the Department of Radioisotope Applications at the Silesian University of Technology in Gliwice.

The results of the spectrometric analysis were expressed in the form of the so-called delta notation. The oxygen isotopic ratio ($\delta^{18}\text{O}$) was measured against a standardised sample of VSMOW (Vienna Standard Mean Ocean Water) and was expressed by the following equation:

$$\delta^{18}\text{O} = \frac{R_{\text{sample}} - R_{\text{standard}}}{R_{\text{standard}}} \cdot 1000\text{‰}$$

where R is the ratio of the isotope concentration of the heavier (^{18}O) to the lighter (^{16}O) isotope.

RECONSTRUCTION OF THE PALAEODIET: THE MODELS

Step 1: a linear mixed model based on isotopic carbon values was used to determine the average proportion of foods made from plants that use the C3 photosynthetic pathway¹¹³. Typically, the proportion of C3 in a diet is calculated using the minimum value of stable carbon isotopes characteristic of the collagen in the bones of the tested animals at the given archaeological site on the one hand, and the value of -7‰ , which is the typical value of a land-based diet that is 100% based on foods from plants using the C4 photosynthetic pathway (modern data)¹¹⁴. Because the model assumes modern isotope data (-7‰ – modern C4 plants data)¹¹⁵, an adjustment of 1.5‰ is required for data obtained from prehistoric skeleton studies. This is because past CO_2 levels were significantly lower than current values¹¹⁶. The adjustment makes it possible to compare historical samples

¹⁰⁹ L.E. Wright, H.P. Schwarcz 1996; R.E.M. Hedges 2002; B. Cienkosz-Stepańczyk, K. Szostek, A. Lisowska-Gaczorek 2021.

¹¹⁰ H. Bocherens *et alii* 1997; H. Bocherens, D. Drucker 2003.

¹¹¹ J.R. O'Neil, E. Reinhard, R.E. Blake 1994.

¹¹² C. Lécuyer *et alii* 2007.

¹¹³ G. Dewar, S. Pfeiffer 2010; F.D. Pate, R.J. Henneberg, M. Henneberg 2016.

¹¹⁴ N.J. van der Merwe, J.A. Lee Thorp, R.H.V. Bell 1988; F.D. Pate 1994.

¹¹⁵ After: N.J. van der Merwe *et alii* 1988; F.D. Pate, M.J. Schoeniger 1993.

¹¹⁶ J.L. Bada *et alii* 1990; B.D. Marino, M.B. McElroy 1991.

to present-day isotopic levels¹¹⁷. In this study, however, the decision was made that experimental values would be used instead, sourced from the most recent research findings on a Neolithic group from Miechów, Miechów district¹¹⁸, rendering isotopic adjustment unnecessary. The reference point in the model presented here are the isotopic results obtained from bones of animals that were contemporaneous with the studied human population, which consumed food sourced fully from the specific natural environment, i.e.: a. starting point – organisms eating only plants using the C3 photosynthetic pathway; b. end point – organisms eating only food from marine ecosystems or organisms eating only plants using the C4 pathway.

In the case of these analyses, the lowest value recorded for herbivores feeding on C3 pathway plants from Weklice (-22.9 ‰ $\delta^{13}\text{C}$) was used as the starting point. The values of the C4 photosynthetic pathway based on research by B. Mnich *et alii* were used as the end point¹¹⁹. Given the high variability of isotopic levels within vegetation of the C4 photosynthetic pathway, it seems that the best way to determine the isotopic carbon levels in a given palaeoenvironment is to rely on experimental results from the studied archaeological site¹²⁰. Therefore, in order to determine the isotopic values of carbon in C4 plants, data from experimental studies of C4 plant remains were used¹²¹ in which the level of carbon isotopes was measured in found millet grains (-9.8‰). This value was used in the present study to recreate the isotopic levels characteristic of C4 plants, taking into account the isotopic fractionation between herbivores and plants. The level of fractionation in the studied environment was determined on the basis of the difference between the concentrations of carbon isotopes in plants and in herbivores, which was 2.4‰ (Δ plants less herbivores = 2.4‰) (mean value for plants: -23.5, mean value for cattle: -21.1)¹²². Therefore, it was assumed that organisms potentially consuming only C4 plants in the analysed ecosystem should have isotopic values at -7.4‰ (-9.8‰ - millet +2.4 = -7.4‰). In the proposed model, this value is theoretical – it imitates the isotopic level of organisms feeding exclusively on C4 pathway vegetation available in this area. Because the value is not based on the research of modern organisms, it requires no

adjustment as described above. This made the model significantly simpler.

Step 2: in order to verify the proportion of animal protein in the diet, a mixed model was used¹²³ using animal and human $\delta^{15}\text{N}$ values to estimate the proportion of animal protein in human diet. This takes into account the expected isotopic levels of plants consumed by herbivores¹²⁴. In the standard model, the starting point is the predicted isotopic value of the vegetation calculated on the basis of isotopic data from herbivores, adjusted for isotopic fractionation. Isotopic enrichment between individual trophic levels as described by modern models remains within the 3‰–5‰ range¹²⁵. In this study, it was assumed that the differences between individual trophic levels are equal to 4‰. This is based on the aggregated data known to us from published studies.

It should be emphasised that neither model requires normal distributions from the sample and can be successfully used both for population analyses and for individual analyses.

LOCAL ISOTOPE LEVEL MODEL – ENVIRONMENTAL BACKGROUND

The methodology of oxygen isotopic analyses is based on the strong correlation between the isotopic delta of oxygen in (drinking) water in the environment and the isotopic delta of oxygen in bone apatite¹²⁶. Currently, oxygen and hydrogen isotopic data can be obtained for the locations of dozens of research stations around the world which submit their data to the Global Network of Isotopes in Precipitation¹²⁷. Because such data is not available in many locations around the world, the OIPC tool (Online Isotopes in Precipitation Calculator) is used instead to obtain the missing environmental data.

The microregional value of isotopic ratios in migration studies (not only for oxygen, but also for strontium, carbon and nitrogen isotopes, etc.) is determined on the basis of analyses of animal remains from the vicinity of the cemetery¹²⁸. The basic technique for determining

¹¹⁷ G. Dewar, S. Pfeiffer 2010; F.D. Pate, T.D. Owen 2014.

¹¹⁸ B. Mnich *et alii* 2020.

¹¹⁹ B. Mnich *et alii* 2020.

¹²⁰ S. Caemmerer *et alii* 2014.

¹²¹ On the method, see B. Mnich *et alii* 2020.

¹²² Data from the publication: B. Mnich *et alii* 2020.

¹²³ Proposed by R.E.M. Hedges, L.M. Reynard 2007 and R.A. Fraser *et alii* 2013.

¹²⁴ R.E.M. Hedges, L.M. Reynard 2007.

¹²⁵ M.J. DeNiro, S. Epstein 1981; M. Sponheimer *et alii* 2003; C.T. Robbins, L.A. Felicetti, M. Sponheimer 2005.

¹²⁶ A. Longinelli 1984.

¹²⁷ IAEA/WMO 2015.

¹²⁸ In most cases those are remains of animals from the studied cemetery, which are situated in close proximity to the studied skeletons. Animal archeological finds are usually not dated. It is assumed that the isotopic background is the same as

the local isotopic level involving animal material is to determine the range of isotopic variability of animal tissues. The local fauna is an excellent indicator of bioavailable oxygen because many animal species live in close proximity to humans and their tissues reflect the natural complexity of the environment, especially if they come from the same period as the studied human population¹²⁹.

STATISTICAL METHODS

Statistical analysis was done using the Statgraphics Centurion 18 software. In isotopic studies, the analytical methods included: cluster analysis using the Euclidean distance squares model, linear models reconstructing the percentage of animal protein in the diet and the share of foodstuffs from the C3 vs C4 photosynthetic pathway and the non-parametric Kruskal-Wallis test. All tests were conducted at a 95% confidence level.

3. MATERIAL, RESULTS AND DISCUSSION

The study involved 26 individuals of different ages and sexes (11 women, 12 men, 2 children and 1 adult of unknown sex) (Tab. 18). In addition, seven samples of various species of animals were analysed (Tab. 19).

TEST OF SAMPLE PURITY – DIAGENESIS

Checking whether the samples have been affected by diagenesis has a significant impact on the overall analysis. In the event of changes to the mineral or organic fractions, the results will not correspond to the true composition of isotopes incorporated into an individual's bone and tooth structures in their lifetime. Therefore, isotopic levels in samples that changed *post mortem* reflect the environment in which the skeleton was found, and must be discarded.

Organic part – collagen

Because the bone material was poorly preserved, collagen was only isolated from 18 samples of human material and four samples of animal material (Tab. 20, 21).

the isotopic level of animals living in the immediate vicinity of the studied human skeletons. Those are mostly non-migratory farm animals. Cf. T.D. Price, J.H. Burton, R.A. Bentley 2002; P. Budd *et alii* 2004; C. White, F.J. Longstaffe, K.R. Law 2004; R.A. Bentley 2006; K. Szostek 2009; K.J. Knudson *et alii* 2012; B. Shaw *et alii* 2011.

¹²⁹ B. Shaw *et alii* 2011; K.J. Knudson, K.R. Gardella, J. Yaeger 2012.

The C/N ratios in the samples ranged from 3.6 to 4.4. The results of the analysed C/N ratio indicate degradation of collagen in a large part of the tested samples (in nine samples of human bones and in one animal bone the C/N ratio is >3.6). Nine human samples and three animal samples had a C/N ratio of 3.6 (maximum eligibility limit). Those samples were included in the interpretation of results for carbon and nitrogen isotope analysis, however the results should be treated with caution (Fig. 37).

Inorganic part – phosphates

With reference to the diagenetic indices of the inorganic component, namely the crystallinity index CI (Fig. 38) and the CO₃/PO₄ ratio (Fig. 39) it was found that 10 samples of human bones and three samples of animal bones are ineligible for use in the interpretation of results of the oxygen isotope analysis. The remaining samples are within the range that makes them eligible for analysis, with CI values not exceeding 3.3 and the carbonate-phosphate ratio within the 0.15–0.7 range¹³⁰. Phosphates could not be obtained from one animal sample.

After analysing the diagenetic changes to the mineral component of bone material, 16 human bone samples and three animal bone samples were included in the interpretation of oxygen isotope results.

Reconstruction of origin and mobility

Analysis of oxygen isotopic ratios in skeletal remains is based on the assumption that the chemistry of the human body is correlated with the level of δ¹⁸O in the water present in the environment, which makes it an effective method for identifying migrants and determining their origin¹³¹.

For this purpose, the values of the isotopic delta of individuals were compared to the environmental background in the form of two sets of data. The first set included the isotopic ratios in local rainwater – a range of values between the minimum and maximum ¹⁸O/¹⁶O ratios estimated for the Weklice area throughout the year¹³². For this geographical area, δ¹⁸O_{standard} ranges from -13.5‰ to -5.4‰ over

¹³⁰ L.E. Wright, H.P. Schwarcz 1996; R.E.M. Hedges 2002; B. Cienkosz-Stepańczak, K. Szostek, A. Lisowska-Gaczorek 2021.

¹³¹ E. Lightfoot, T.C. O'Connell 2016.

¹³² OIPC, version 03.1, accessed on 3/12/2021 (https://wateriso.utah.edu/waterisotopes/pages/data_access/oipc_citation.html); G.J. Bowen 2021.

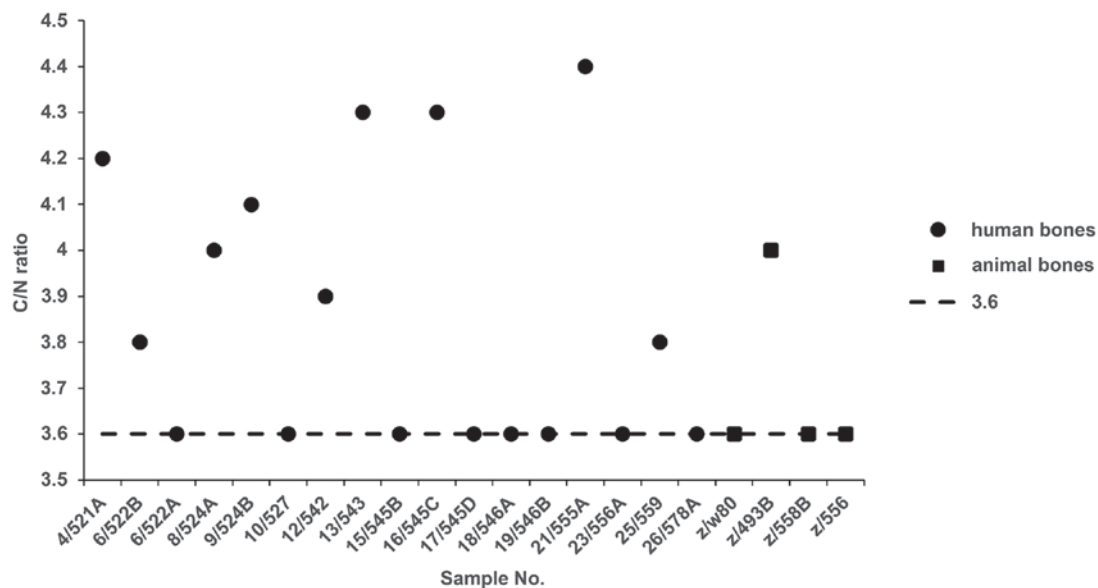


Fig. 37. Values of the C/N diagenetic ratio. The black dashed line marks the boundary for samples unchanged *post mortem* (C/N=3.6). Compiled by: B. Cienkosz-Stepańczyk, A. Lisowska-Gaczorek, K. Szostek. Graphics: M. Natuniewicz-Sekuła

the course of the year (with an annual mean value of -9.4‰).

In the next step of the analysis, the results obtained for water in the environment were converted into isotopic values for phosphates according to a formula developed by B. Luz and Y. Kolodny¹³³: $\delta^{18}\text{O}_{\text{sample}} = (\delta^{18}\text{O}_{\text{standard}} \times 0.78) + 22.7$. The converted $\delta^{18}\text{O}_{\text{sample}}$ values were 12.17–18.49‰ (mean: 15.37‰).

The second set of data included the values of $\delta^{18}\text{O}_{\text{sample}}$ in a set of animal bones discovered locally at the cemetery in Weklice. Owing to diagenetic changes to the animal bones, only three of the animals were included in the interpretation of results, with oxygen isotopic values of 15.04, 15.09 and 16.20. Those values are broadly within the same range as the water in the environment, scattered around the mean value. A comparison of human isotope group data with ranges of the local environmental background is presented in the next figure (Fig. 40).

The graph shows a relatively narrow variability range in the value of $\delta^{18}\text{O}_{\text{sample}}$ in the bones of local animals. Only three human bone samples were within that range. In the studied area, a relatively wide range of variability in the isotopic data for local water was observed, with a spread of 6.32‰, which also includes all the animal samples. All the human samples are contained within this broader environmental range.

¹³³ B. Luz, Y. Kolodny 1985.

Additionally, in order to identify individuals unconnected to the local water sources, normal probability distributions for $\delta^{18}\text{O}$ measurements were added up, and the number of modes of the total distribution and their characteristics were then identified. The sum of probability distributions of all the measurement results for the human bones is shown in the next figure (Fig. 41). The modes were identified by finding the minimum number of Gaussian distributions to give a good description of the total probability distribution for the $\delta^{18}\text{O}$ measurements in phosphates from human bones. The analysis of the number of modes shows that the studied individuals constituted no more than four population groups, three of which were most likely local. Group 4 is one male (*adultus*) from grave 543, with values that are higher but still within the broad range of isotopic levels in the local environment.

Taking into account that a small number of animal samples were included in the analysis, to indicate the origin of the test subjects it is necessary to integrate data provided by the OIPC calculator with the data obtained for the animals. This comparison suggests that all the analysed individuals were members of the indigenous population.

Reconstruction of nutritional strategy

In the first part of the analysis, isotopic values of carbon and nitrogen obtained for human and animal

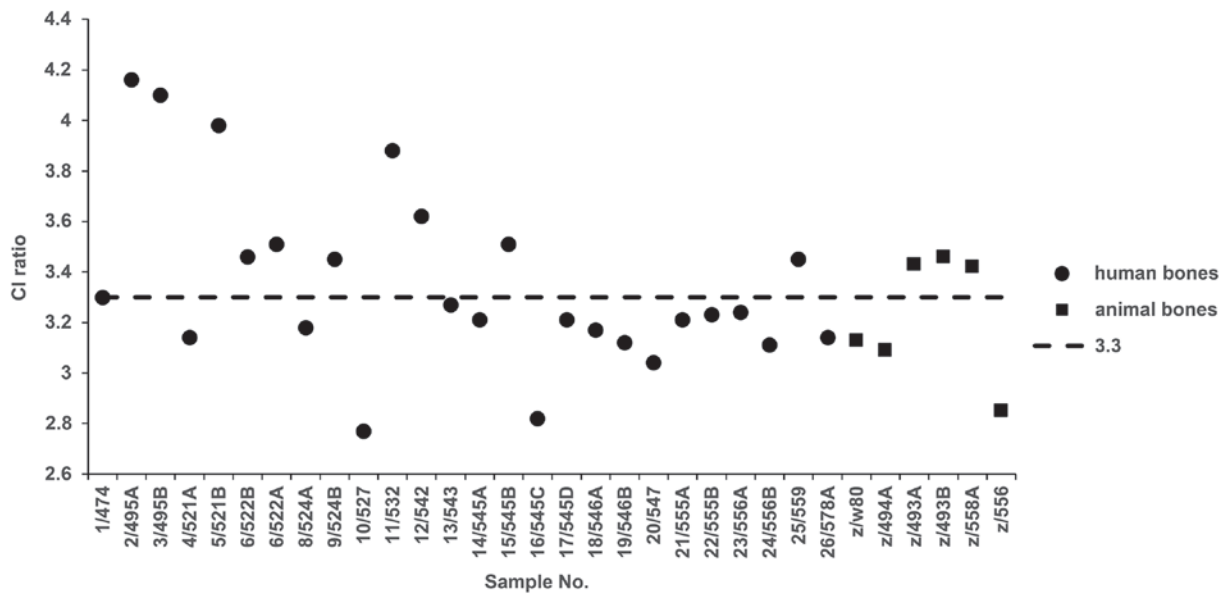


Fig. 38. CI values for human and animal tissues. The boundary for uncontaminated samples (CI<3.3) is marked with a black dashed line. Compiled by: B. Cienkosz-Stepańczak, A. Lisowska-Gaczorek, K. Szostek. Graphics: M. Natuniewicz-Sekuła

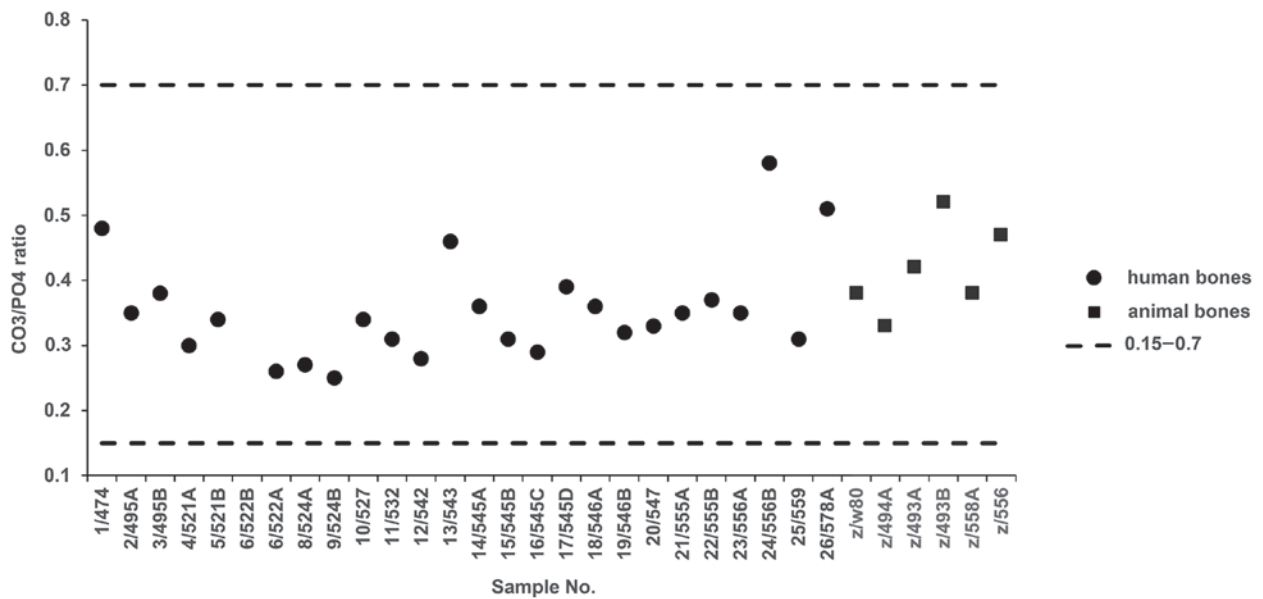


Fig. 39. Carbonate-phosphate ratios in analysed samples. Black dashed lines indicate the range of samples unaffected by diagenesis (CO₃/PO₄ = 0.15–0.7). Compiled by: B. Cienkosz-Stepańczak, A. Lisowska-Gaczorek, K. Szostek. Graphics: M. Natuniewicz-Sekuła

samples were compared. The mean value of ¹⁵N for the humans was 11.23‰, with a standard deviation of 0.51. For the animals, the mean value was 6.03‰, SD 0.06. It should be noted that the value for the human samples (4.58%) had a higher degree of variation

than the highly homogeneous result for the studied animals (0.96%) (Fig. 42). As for carbon isotopes, the mean value of δ¹³C for human samples was -21.57 ‰ (SD 0.36). In animal samples, the mean value was -22.8 ‰, SD 0.1 (Fig. 43).

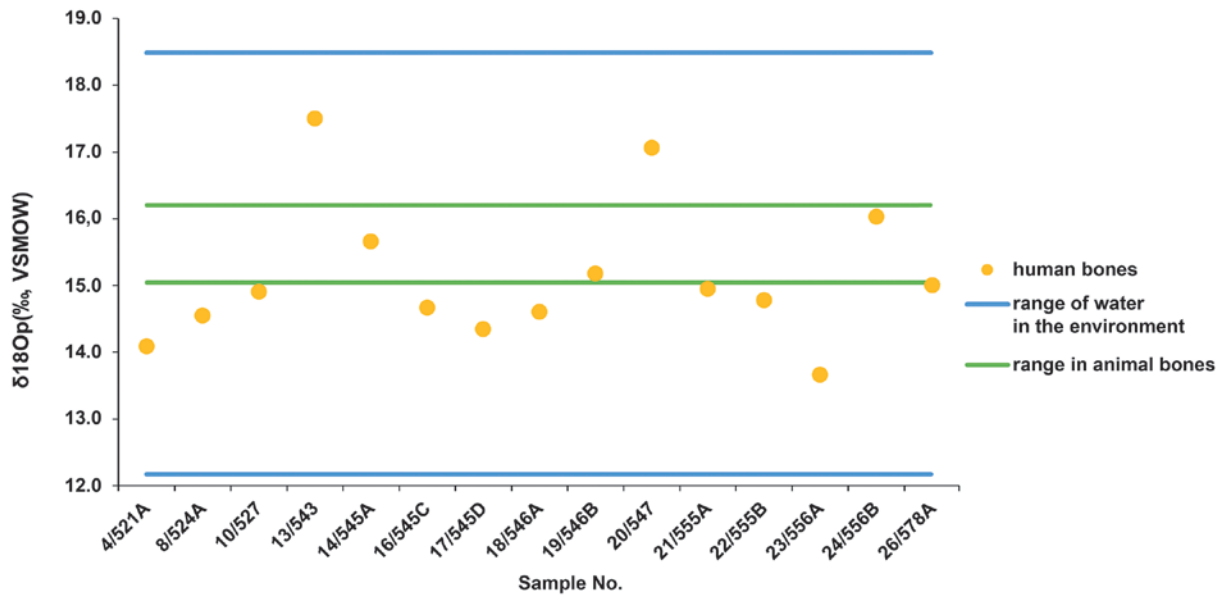


Fig. 40. $\delta^{18}\text{O}_{\text{sample}}$ values for individuals from the site in Wekllice relative to local environmental background. Compiled by: B. Cienkosz-Stepańczyk, A. Lisowska-Gaczorek, K. Szostek. Graphics: M. Natuniewicz-Sekuła

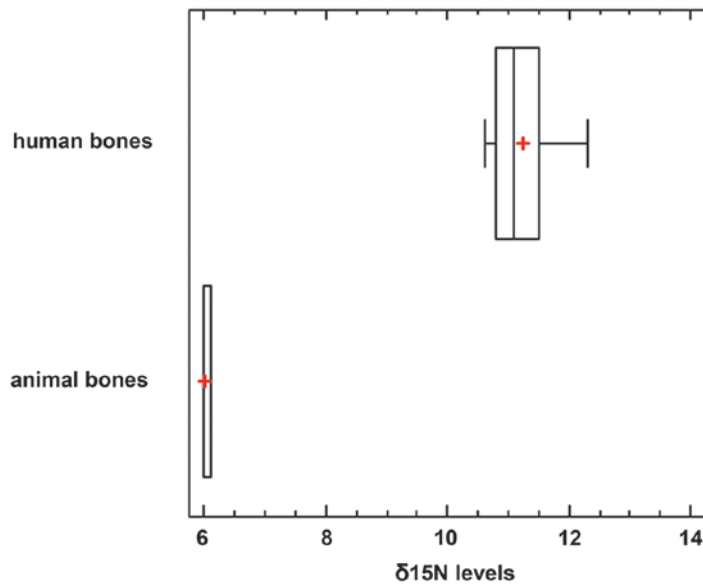


Fig. 41. The sum of probability distributions of all measurements for the human bones with four identified modes. Compiled by: B. Cienkosz-Stepańczyk, A. Lisowska-Gaczorek, K. Szostek. Graphics: M. Natuniewicz-Sekuła

By comparing those results with isotopic fractionation in separate trophic chains, it was observed that the samples taken from the humans were significantly different than those from the studied set of animals. For nitrogen as well as carbon isotopes, the Kruskal-Wallis test showed that the human samples

had significantly higher values: nitrogen, $H=6.31915$; $p=0.0119419$, and carbon, $H=6.27465$; $p=0.0122456$ (Fig. 42, 43).

The trophic networks were differentiated using cluster analysis based on the nearest-neighbour model (squared Euclidean distances) (Fig. 44).

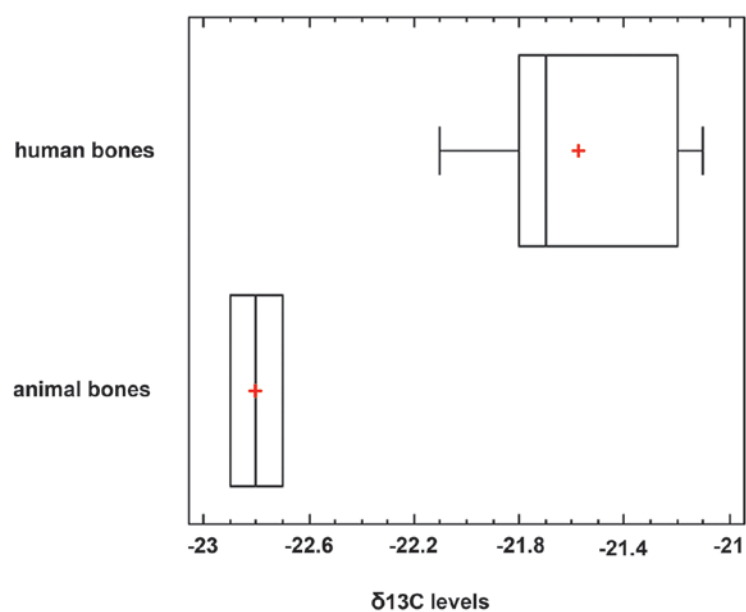


Fig. 42. Stable nitrogen isotopes in humans and animals in Weklice. Compiled by: B. Cienkosz-Stepańczyk, A. Lisowska-Gaczorek, K. Szostek. Graphics: M. Natuniewicz-Sekuła

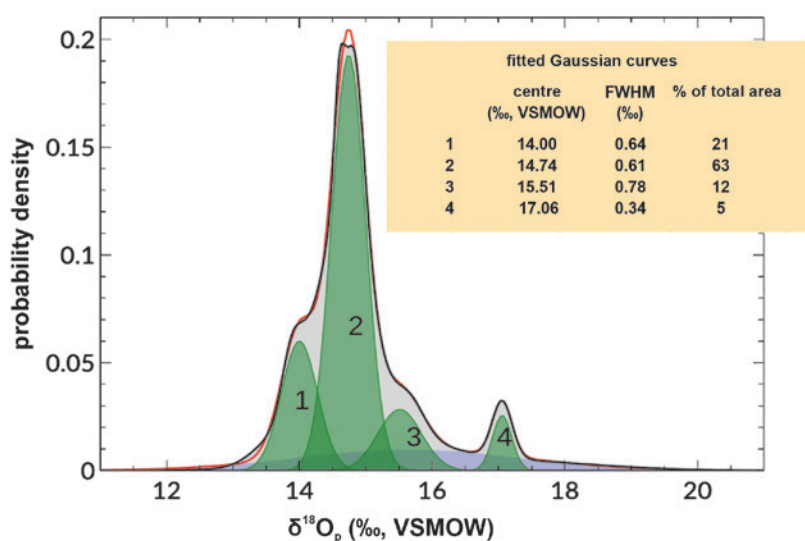


Fig. 43. Stable carbon isotopes in humans and animals in Weklice. Compiled by: B. Cienkosz-Stepańczyk, A. Lisowska-Gaczorek, K. Szostek. Graphics: M. Natuniewicz-Sekuła

The isotopic data obtained from animal collagen samples does not differ from the known isotope levels in medieval land animals from Poland¹³⁴. Carbon

and nitrogen isotopic values in the animal samples are typical of herbivores feeding on C3 plants¹³⁵. The graph shows a cluster represented by the women and the child, and a separate cluster composed of the men.

¹³⁴ L.J. Reitsema, T. Kozłowski 2013; M. Krajewska 2015; L.J. Reitsema *et alii* 2017.

¹³⁵ C. Polet, M.A. Katzenberg 2003.

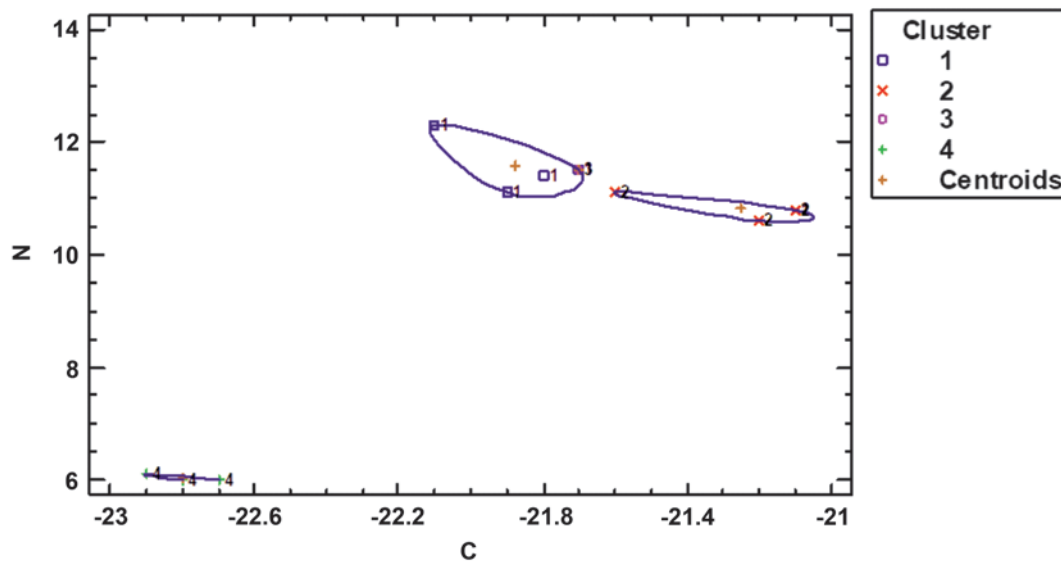


Fig. 44. Isotopic differentiation in analysed human and animal samples: 1 – females; 2 – males; 3 – children (*infans II*); 4 – animals. Compiled by: B. Cienkosz-Stepańczyk, A. Lisowska-Gaczorek, K. Szostek. Graphics: M. Natuniewicz-Sekuła

Although the clusters are distinct, no statistically significant differences in carbon and nitrogen levels were observed between the sexes, although the values of carbon isotopes within the male group are higher (less negative): in females, the mean $\delta^{13}\text{C}$ was -21.72‰ (SD 0.376829); in males, the mean $\delta^{13}\text{C}$ was -21.3‰ (SD 0.264575).

Diet based on the C3 photosynthetic pathway compared to C4 diet

In order to estimate the proportion of nutrients in the diet that are typical of the C3 photosynthetic pathway compared to foodstuffs of C4 origin, a detailed analysis of isotopic differences was used, based on the model used previously¹³⁶. Details of the model are provided in chapter 2.

The probability of consuming products of C4 origin by the analysed human group in the historical period under analysis is potentially high¹³⁷, so the model was applied to food products from C3 vs. C4 photosynthetic pathways. To determine the isotopic values of carbon in C4 plants, available research data was used¹³⁸. In the proposed model, this value is em-

pirical. It imitates the isotopic level of organisms that only feed on C4 vegetation (Tab. 22).

The results shows that the mean value of the share of C3 foods in the studied group is 92.2%. A very high proportion of the food came from the C3 pathway. Differences between the sexes are virtually unnoticeable. Additionally, the low level of variability between individuals probably indicates that almost the whole group ate foods with similar carbon isotopes. The *infans II* individual (grave 545) shows no difference in terms of the proportion of C3 diet compared to the others, particularly the women. Therefore, it can be concluded with a high degree of probability that the studied human group was homogeneous in this respect; mainly foods from the C3 photosynthetic pathway were consumed. It is also unlikely that meat of animals that were fed plants such as millet was a component in the diet, since the isotopic composition of the tested fauna rules out the possibility that the animals were fed C4 products. The variation in the proportional share of C3 food suggests similar nutritional strategies in men and women.

The animal protein component in the diet in the light of model studies

A mixed model based on the ratio of nitrogen isotopes was used to establish the percentage of animal protein

¹³⁶ Among others, G. Dewar, S. Pfeiffer 2010; F.D. Pate, R.J. Henneberg, M. Henneberg 2016; J. Tomczyk *et alii* 2020a.

¹³⁷ B. Mnich *et alii* 2020; Ł. Pospieszny *et alii* 2021.

¹³⁸ Cf. B. Mnich *et alii* 2020.

in the diet of the studied individuals¹³⁹. Two scenarios were proposed, both of which rely on the fact that, on average, the value of $\delta^{15}\text{N}$ increases by 4‰ with each trophic level¹⁴⁰. In the first model, a purely plant-based diet was represented by the mean value obtained for the herbivores. In this study, the starting point is the average ratio of nitrogen isotopes measured for all the animals under analysis (in this case, 6.0‰). Due to fractionation between trophic levels (Δ plant fraction – herbivorous fraction \approx 4‰ fractionation), the predicted level of nitrogen in vegetation consumed by herbivorous animals was reconstructed at 2.0‰ (isotopic value of vegetation = 2.0‰) (Fig. 45).

The enrichment value of +4‰ was also added to the animal-specific value of $\delta^{15}\text{N}$ to determine the endpoint value of $\delta^{15}\text{N}$ in the linear model. This point represents the isotopic value of nitrogen in the diet of organisms where all of the protein is animal in origin (Δ herbivorous-human diet -100% animal protein = +4‰). The end point of the model ($\delta^{15}\text{N}=10‰$) is indicated in the figure 45. The mean value of $\delta^{15}\text{N}$ isotopes in the studied group of humans was 11.23‰.

Using the first standard scenario, the fraction of animal protein in the diet of the studied group exceeds 100%. The observed levels of $\delta^{15}\text{N}$ in the studied humans exceed the assumed isotopic variability of herbivores originating from the studied site (taking into account isotope fractionation at 4‰) (cf. Fig. 44). These results suggest that the animal protein in the diet of the studied population came mostly from sources other than the meat of herbivores. However, it is known that the standard model exaggerates the proportion of consumed animal protein because it does not take into account the impact of crop consumption (e.g. cereals)¹⁴¹. Therefore, a second scenario was proposed. This scenario uses the differences in nitrogen isotope levels between plants consumed by herbivores and plants consumed by humans.

In isotopic research, plant remains are rarely analysed, mainly because they decay rapidly in soil. Nevertheless, it is assumed that the values of $\delta^{15}\text{N}$ in plants consumed by herbivores and humans are the same. However, it should be borne in mind that plants in the diet of these two groups may come from different habitats. Besides, the menu of herbivores consists of different parts of plants, i.e. seeds, leaves or stems,

which may have different isotopic ratios¹⁴². For example, nitrogen isotope deltas of cereal grains (wheat) are 1–1.5‰ higher than those of whole leaves¹⁴³, and the value of $\delta^{15}\text{N}$ in millet grain is higher than that in millet stems and leaves (by 0.8‰ and 2.6‰, respectively)¹⁴⁴. An increase of about 2.5‰ was also observed in the level of $\delta^{15}\text{N}$ in cereal grain relative to chaff¹⁴⁵. Higher values of nitrogen isotopes in grains potentially consumed by humans compared to the expected values for animal feed ranged from 1.8‰¹⁴⁶ to 3‰¹⁴⁷. In view of this data, it can be expected that people, who are natural consumers of cereal seeds and edible parts of legumes such as chickpeas, lentils and beans, will have higher nitrogen isotope values than herbivores that consume grass, bran or chaff. This must be taken into account to avoid overestimating the intake of animal protein by humans¹⁴⁸.

Therefore, the second scenario uses the differences in nitrogen isotope levels between plants consumed by herbivores and plants consumed by humans. In order to reinterpret the results obtained in this scenario, the isotopic value of plants estimated on the basis of data obtained for herbivores was increased by 2.5‰ (this being the mean value of the studies referenced above) for a total value of 4.5‰ (Fig. 46). It should be emphasised that in this case the level of nitrogen isotopes observed in organisms that feed exclusively on vegetation typical of our species, and taking into account isotopic fractionation at 4‰, amounted to 8.5‰. The adjustment resulted from the observation of differences between plant products eaten by humans/omnivores and herbivores. Due to the fact that in the first scenario the observed levels of ^{15}N in the studied humans exceed the assumed isotopic variability of herbivores, an additional analysis was carried out based on data from studies of prehistoric freshwater fish, primarily predatory fish such as *Esox lucius* and *Sander lucioperca*¹⁴⁹. Accordingly, research data from J. Tomczyk *et alii* was adopted as the end point¹⁵⁰.

After the adjustment it turned out that the mean predicted value of nitrogen isotopes for people consuming only freshwater fish meat and/or omnivorous animals feeding on similar plants as those consumed by humans

¹³⁹ Proposed by R.E.M. Hedges, L.M. Reynard 2007 and R.A. Fraser *et alii* 2013.

¹⁴⁰ M.J. Schoeninger, M.J. DeNiro 1984; J.C. Sealy *et alii* 1987; R.A. Fraser *et alii* 2013.

¹⁴¹ R.A. Fraser *et alii* 2013; B. Mnich *et alii* 2020.

¹⁴² R.A. Fraser *et alii* 2013.

¹⁴³ T. Yoneyama *et alii* 1997.

¹⁴⁴ R.E.M. Hedges, L.M. Reynard 2007.

¹⁴⁵ A. Bogaard *et alii* 2007; R.A. Fraser *et alii* 2013.

¹⁴⁶ R.A. Fraser *et alii* 2013.

¹⁴⁷ B. Mnich *et alii* 2020.

¹⁴⁸ R.A. Fraser *et alii* 2013.

¹⁴⁹ H.K. Robson *et alii* 2016.

¹⁵⁰ J. Tomczyk *et alii* 2020b.

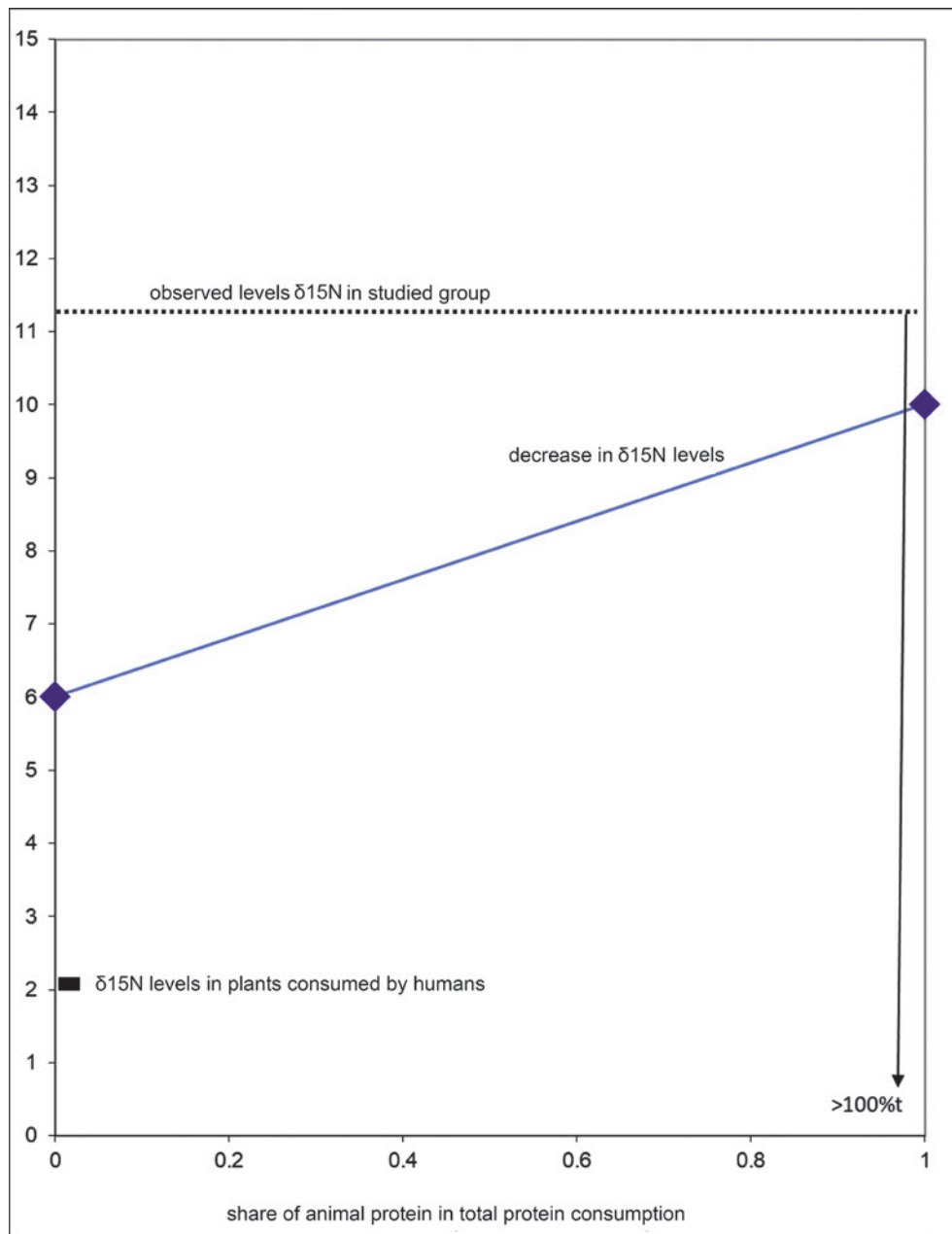


Fig. 45. Standard scenario for estimating the animal protein fraction (%) in the Weklice diet.
 Compiled by: B. Cienkosz-Stepańczyk, A. Lisowska-Gaczorek, K. Szostek. Graphics: M. Natuniewicz-Sekuła

(e.g. pigs) could be equal to 68.25% (Fig. 46). The animal protein fraction estimated in the second scenario seems more likely.

This scenario was used to estimate the percentage of protein in the diet of men and women. It turned out that a higher proportion of protein is apparent in the females (73%) compared to the males (58.2%). Because of the small sample size, this result should be treated with considerable caution. Nonetheless, this shows a clear absolute difference between the sexes in terms of the percentage of protein, possibly indicating different strategies for obtaining food.

COMPARATIVE POPULATION ANALYSES

To verify the sex differences in the share of animal protein in the diet, comparative population analyses were used. It may be interesting to map the studied group of male and female individuals from Weklice onto the broader background of data available in the literature from the Mesolithic to the Hallstatt Period (Fig. 47). This analysis takes into account the Mesolithic population due to its close geographical proximity to Weklice. It should be noted that an analysis of a group of individuals from areas in northern and

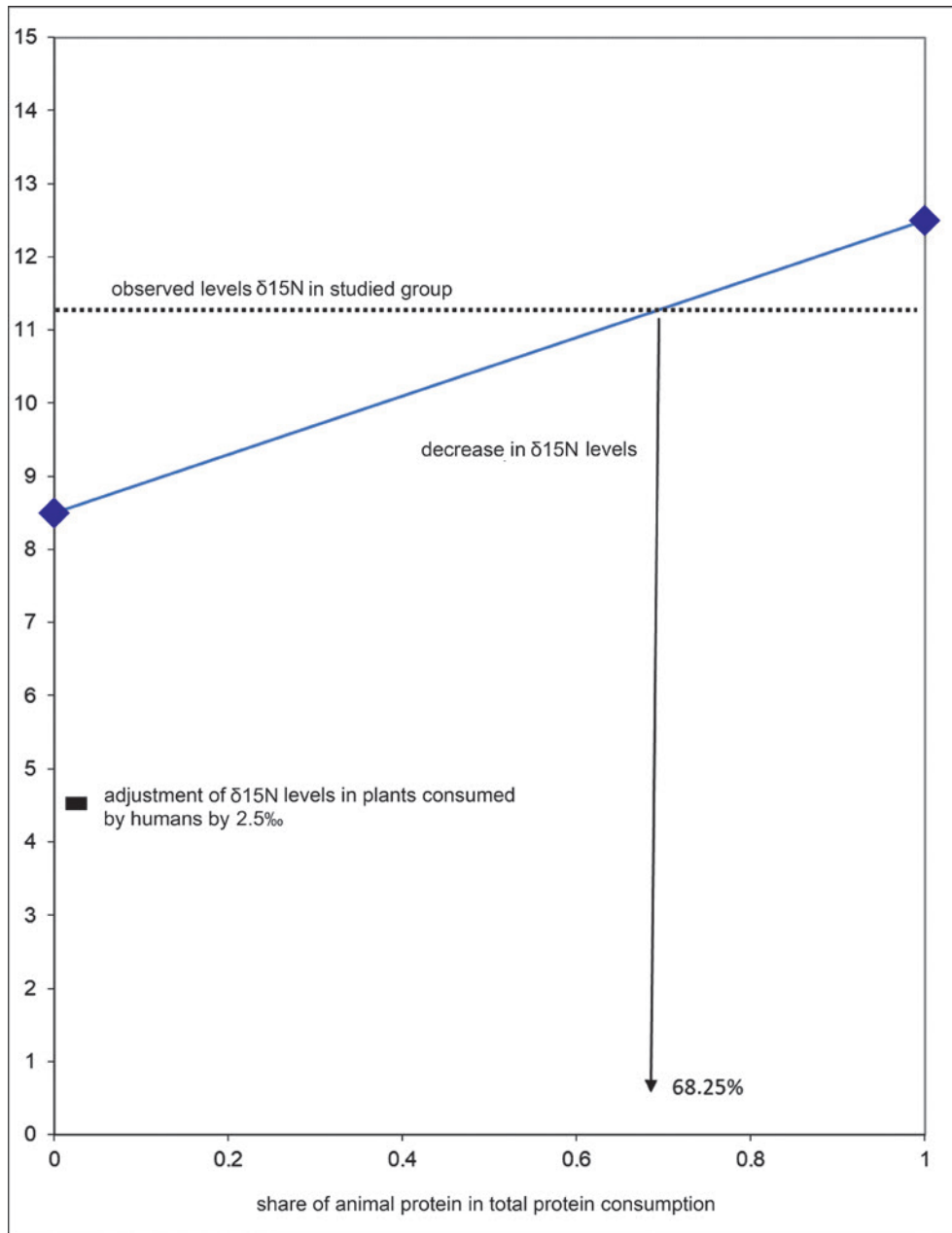


Fig. 46. The scenario involving an estimation of the animal protein fraction (%) in the diet of Weklice individuals, assuming an isotopic adjustment of 2.5‰ resulting from the differences between grass vegetation and cereals. Compiled by: B. Cienkosz-Stepańczak, A. Lisowska-Gaczorek, K. Szostek. Graphics: M. Natuniewicz-Sekuła

north-eastern Poland published by J. Tomczyk *et alii*¹⁵¹ is the only available study of this kind. Therefore, it was assumed that despite the chronological differences, the nutritional strategies in this specific boreal environment could be similar.

A comparative analysis showed that the studied group of female individuals from Weklice probably used protein resources originating in inland waters, and that predatory fish (pike, zander, etc.) accounted for a large

share of animal protein in their diet. The male diet was richer in proteins from land animals. It is worth emphasising that the juvenile individual from grave 545 represents a nutritional strategy similar to that of the group of women from Weklice.

The individuals studied in this analysis certainly fall outside the range noted for those groups that consumed products from the C4 pathway (including millet). The average ratio of $\delta^{13}\text{C}$ isotopes that is characteristic of the studied group is about 2.0‰ lower than that of the Hallstatt Culture communities, who

¹⁵¹ J. Tomczyk *et alii* 2020a.

are believed to have consumed a diet containing C4 plant components¹⁵². The same applies to the Iron Age population from the territory of Slovenia¹⁵³.

4. SUMMARY AND CONCLUSIONS

In conclusion, the analysis of stable oxygen isotopes in individuals buried at the Weklice cemetery relative to the level of isotopic oxygen in the environment and in animal bones made it possible to assess their origins reliably. The results shows that all the individuals had spent the last 10 years of their lives (approx. 2–3 years in the case of children)¹⁵⁴ in the Weklice region, and that the diet of women was based on protein from inland waters.

Those results are also highly valuable in terms of understanding nutritional strategies. The analysis of stable carbon and nitrogen isotopes showed variation in the type of diet within the studied group: in women, a higher share of freshwater fish in the diet was recorded, whereas men tended to eat more meat from land animals.

Notably, isotopic analyses of populations of the Roman Period are few¹⁵⁵. This makes the present research all the more valuable, the small sample size notwithstanding. These results fill a gap between the Neolithic and the Middle Ages on Polish lands, and make it possible to track the change in nutritional strategies at key points in the biocultural changes that involved a modernisation of methods for plant cultivation and animal breeding.

¹⁵² J.D. Le Huray, H. Schutkowski 2005.

¹⁵³ M. Murray, M.J. Schoeniger 1988.

¹⁵⁴ R.E.M. Hedges *et alii* 2007.

¹⁵⁵ Cf. P. Łuczkiwicz *et alii* 2022.

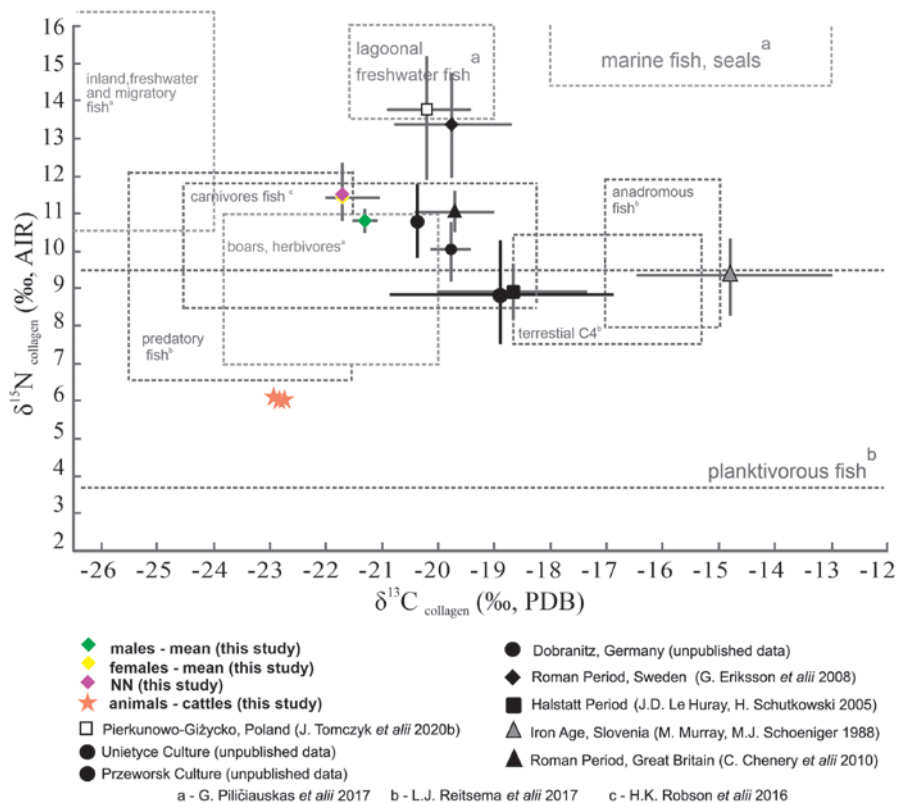


Fig. 47. Results of $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ from bone collagen obtained for the group of people and animals from the site in Magnice, Wrocław district, compared to the isotopic data of other populations from different periods in Europe and in the Weklice site.

Compiled by: B. Cienkosz-Stepańczak, A. Lisowska-Gaczorek, K. Szostek. Graphics: M. Natuniewicz-Sekuła

Tab. 18. Samples of analysed human bone material. Compiled by: B. Cienkosz-Stepańczak, A. Lisowska-Gaczorek, K. Szostek

Grave number	Sample number	Dating	Sex	Age	Sampling location
474	1/474	<i>stadium</i> IA	male	<i>maturus</i>	tibia
495	2/495A	<i>stadium</i> IIIA/IIIB	female	<i>adultus</i>	rib
495	3/495B	<i>stadium</i> IIIA/IIIB	female	<i>adultus</i>	long bone
521	4/521A	<i>stadium</i> IVA/IVB	male	<i>adultus</i>	femur
521	5/521B	<i>stadium</i> IVA/IVB	male	<i>adultus</i>	femur
522	6/522A	<i>stadium</i> IVA	female	early <i>adultus</i>	tibia
522	6/522B	<i>stadium</i> IVA	(?)	<i>infans</i> I	tibia
524	8/524A	<i>stadium</i> IIIA/IIIB	female	<i>adultus</i> (?)	humerus
524	9/524B	<i>stadium</i> IIIA/IIIB	female	<i>adultus</i> (?)	femur
527	10/527	Roman Period	male	<i>adultus</i>	humerus
532	11/532	<i>stadium</i> IIIB	male	late <i>adultus</i>	humerus
542	12/542	<i>stadium</i> IIIB	female	<i>adultus</i>	femur
543	13/543	<i>stadium</i> IIIA/IIIB	male	<i>adultus</i>	femur
545	14/545A	<i>stadium</i> IIB/IIC	male	<i>maturus</i>	femur
545	15/545B	<i>stadium</i> IIB/IIC	female	early <i>adultus</i>	humerus
545	16/545C	<i>stadium</i> IIB/IIC	male	<i>maturus</i>	tibia
545	17/545D	<i>stadium</i> IIB/IIC	(?)	<i>infans</i> II	radius
546	18/546A	<i>stadium</i> IVA	female	early <i>adultus</i>	humerus
546	19/546B	<i>stadium</i> IVA	male	late <i>adultus</i>	tibia
547	20/547	<i>stadium</i> IVA/IVB	(?)	<i>adultus</i>	tibia
555	21/555A	<i>stadium</i> IIB/IIC	female	<i>maturus</i>	tibia
555	22/555B	<i>stadium</i> IIB/IIC	female	<i>maturus</i>	clavicle
556	23/556A	earlier than <i>stadium</i> IVA	female	early <i>maturus</i>	ulna
556	24/556B	earlier than <i>stadium</i> IVA	male	<i>maturus</i>	femur
559	25/559	<i>stadium</i> IIIB (?)	female	early <i>maturus</i>	humerus
578	26/578A	<i>stadium</i> IIIA/IIIB	female	<i>senilis</i>	tibia

Tab. 19. Samples of analysed animal bone material. Compiled by: B. Cienkosz-Stepańczak, A. Lisowska-Gaczorek, K. Szostek

Number of grave, object, layer	Sample number	Species	Sampling location
layer [80]	z/w80	cattle	long bone fragment
494A	z/494A	cat (<i>Felis sp.</i>)	long bone fragment
493	z/493A	badger (<i>Meles meles</i>)	long bone fragment
493	z/493B	(?)	long bone fragment
558	z/558A	horse (<i>Equus sp.</i>)	M3 tooth
558	z/558B	cattle	skull fragment
556	z/556	cattle	phalanx bone

Tab. 20. Results of isotopic tests of bone material from the Weklisce site (samples affected by diagenetic change are marked in **bold type**). Compiled by: B. Cienkosz-Stepańczak, A. Lisowska-Gaczorek, K. Szostek

Grave number	Sample number	Sex	Age	C/N	$\delta^{13}\text{C}$	$\delta^{15}\text{N}$	$\delta^{18}\text{O}$	$\delta^{18}\text{O}$ sd	CI Index	CO_3/PO_4 ratio
474	1/474	male	<i>maturus</i>	no collagen			14.85	0.15	3.3	0.48
495	2/495A	female	<i>adultus</i>	no collagen			–	–	4.16	0.35
495	3/495B	female	<i>adultus</i>	no collagen			–	–	4.1	0.38
521	4/521A	male	<i>adultus</i>	4.2	-22.3	12.2	14.09	0.02	3.14	0.3
521	5/521B	male	<i>adultus</i>	no collagen			–	–	3.98	0.34
522	6/522B	(?)	<i>infans I</i>	3.8	-21.4	11	14.63	0.18	3.46	0.27
522	6/522A	female	<i>adultus</i>	3.6	-21.9	11.1	14.47	0.25	3.51	0.26
524	8/524A	female	(?)	4	-22.7	12.4	14.55	0.23	3.18	0.27
524	9/524B	female	(?)	4.1	-22.8	12.5	15.65	0.59	3.45	0.25
527	10/527	male	<i>adultus</i>	3.6	-21.6	11.1	14.90	0.12	2.77	0.34
532	11/532	male	<i>adultus</i>	no collagen			14.88	0.23	3.88	0.31
542	12/542	female	<i>adultus</i>	3.9	-21.7	10	14.78	0.10	3.62	0.28
543	13/543	male	<i>adultus</i>	4.3	-21.5	9.7	17.50	1.25	3.27	0.46
545	14/545A	male	<i>maturus</i>	no collagen			15.66	0.23	3.21	0.36
545	15/545B	female	<i>adultus</i>	3.6	-22.1	12.3	14.30	0.27	3.51	0.31
545	16/545C	male	<i>maturus</i>	4.3	-22.5	10.6	14.66	1.10	2.82	0.29
545	17/545D	(?)	<i>infans II</i>	3.6	-21.7	11.5	14.35	0.41	3.21	0.39
546	18/546A	female	<i>adultus</i>	3.6	-21.8	11.4	14.60	0.08	3.17	0.36
546	19/546B	male	<i>adultus</i>	3.6	-21.2	10.6	15.17	0.28	3.12	0.32
547	20/547	(?)	<i>adultus</i>	no collagen			17.06	0.15	3.04	0.33
555	21/555A	female	<i>maturus</i>	4.4	-22.7	10.5	14.94	0.35	3.21	0.35
555	22/555B	female	<i>maturus</i>	no collagen			14.77	0.37	3.23	0.37
556	23/556A	female	early <i>maturus</i>	3.6	-21.7	11.5	13.66	0.34	3.24	0.35
556	24/556B	male	<i>maturus</i>	no collagen			16.02	1.09	3.11	0.58
559	25/559	female	early <i>maturus</i>	3.8	-22.5	8.6	14.55	0.22	3.45	0.31
578	26/578A	female	<i>senilis</i>	3.6	-21.1	10.8	15.00	0.19	3.14	0.51

Tab. 21. Values of C/N, $\delta^{13}\text{C}$, $\delta^{15}\text{N}$ and $\delta^{18}\text{O}$, CI and CO_3/PO_4 obtained from animal tissue (samples affected by diagenetic change are marked in **bold type**). Compiled by: B. Cienkosz-Stepańczak, A. Lisowska-Gaczorek, K. Szostek

Grave / feature, layer number	Species	Sample number	C/N	$\delta^{13}\text{C}$	$\delta^{15}\text{N}$	$\delta^{18}\text{O}$	$\delta^{18}\text{O}$ SD	CI Index	CO_3/PO_4 ratio
layer [80]	cattle	z/w80	3.6	-22.8	6	15.04	0.05	3.13	0.38
494A	cat (<i>Felis sp.</i>)	z/494A	no collagen			15.09	0.59	3.09	0.33
493	badger (<i>Meles meles</i>)	z/493A	no collagen			14.25	0.15	3.43	0.42
493	(?)	z/493B	4	-21.4	8.9	13.98	0.20	3.46	0.52
558	horse (<i>Equus sp.</i>)	z/558A	no collagen			14.73	0.31	3.42	0.38
558	cattle	z/558B	3.6	-22.7	6	–	–	–	–
556	cattle	z/556	3.6	-22.9	6.1	16.20	0.24	2.85	0.47

Tab. 22. Estimated share of C3 food in the diet of the studied individuals of the Wielbark Culture from the site in Weklice based on stable carbon isotope data. Compiled by: B. Cienkosz-Stepańczak, A. Lisowska-Gaczorek, K. Szostek

Isotopic data				Lower limit -22.8‰ (C3 – based land plant diet, experimental data for cattle) Upper limit -7.4‰ (C4 – based land plant diet, experimental data lead out from millet, B. Mních <i>et alii</i> 2020)	
Sample category	N	Mean $\delta^{13}\text{C}$ (‰)	Range (‰)	Mean C3 vs. C4 – based plant and animal component (%)	Range C3 (%)
All individuals	9	-21.6	-22.1; -21.1	92.2 C3 vs. 7.8 C4	95.5–89.0
Females	5	-21.7	-22.1; -21.1	92.9 C3 vs. 7.1 C4	95.5–89.0
Males	2	-21.3	-21.6; -21.1	90.3 C3 vs. 9.7 C4	92.2–89.0
Children (<i>infans</i> II)	1	-21.7	-21.7	92.9 C3 vs. 7.1 C4	–

IV.3. TEXTILES FROM THE CEMETERY IN WEKLICE (MARIA CYBULSKA, JERZY MAIK)

INTRODUCTION

The present discussion of textile items found in Weklice looks at finds from the years 2005–2018¹⁵⁶ that originate from 14 graves as well as four stray finds associated with the Wielbark Culture. Where possible, research methods and description formats have been kept consistent with those in the first part of the Weklice publication¹⁵⁷. It is important to note that most of the textiles under discussion are in a poor or very poor state of preservation. Generally speaking, the surviving material mostly consists of tiny fragments saturated with metal oxides from adherent items. Consequently, analysing fibre origins or technological characteristics (such as fabric density) are a challenge (in some cases an impossible one). Also, conservation treatments¹⁵⁸ have been applied to the metal finds, along with the surviving textiles, posing an added analytical problem. As the final step in the conservation process, the finds were coated with a protective chemical agent. This had the side

effect of partly or fully obscuring the structure of most of the textiles. As a result, routine tests were not run on all of the fabrics discovered in Weklice. In a large proportion of cases this made analysis impossible, and the finds could only be described as 'likely remnants of textiles coated with a protective agent'¹⁵⁹. Without judging this approach we wish to note that textiles, too, are items of archaeological significance and should be protected by archaeologists and conservators to the same degree as other finds.

In all, this analysis includes 18 textile fragments, one fragment of an item made on a tablet loom, eight fragments of thread or twine, a fragment of unravelled yarn, and one badly damaged fragment of an unidentified textile product.

THE FABRICS

The surviving fabrics were mostly preserved where they were either directly adjacent, or actually adhered, to metal items. In some cases it was possible to analyse and identify the raw materials used in their production. This applies to seven fragments of fabrics. Each turned out to be made of flax, though in some cases the identification could not be made with full confidence. Those instances are identified with question marks in the catalogue of textile finds. No other plant material, such as hemp, has been identified. All the flax (or likely flax) fabrics were made using the plain weave technique (Fig. 49) with ZZ-twist yarn (where the warp and the weft are both spun clockwise) (Fig. 50:1, 51, 56, 62). Thread density was not always possible to

¹⁵⁶ Most of the analytical work presented here was done as part of NCN (National Center of Sciences) grant no. 2013/11/D/HS3/02473 and has been discussed in an unpublished grant report (M. Cybulska, J. Maik 2015). In addition to finds attributed to the Wielbark Culture, that report also includes analyses of early medieval textiles. The latter will be presented in a separate publication.

¹⁵⁷ The first part examines material found during archaeological excavations conducted in 1984–2004. This includes textiles marked in the catalogue as nos. 1–36 (J. Maik 2011, 173–180). In this publication, the numbering system of textile finds is continued, with catalogue numbers 37–65.

¹⁵⁸ The authors of this publication have faced a similar situation in several other instances, especially in the case of finds from Mazovia and the Lublin region, i.e. areas where textiles are generally in a poor state of preservation.

¹⁵⁹ M. Cybulska, A. Drążkowska 2021, 389–390.

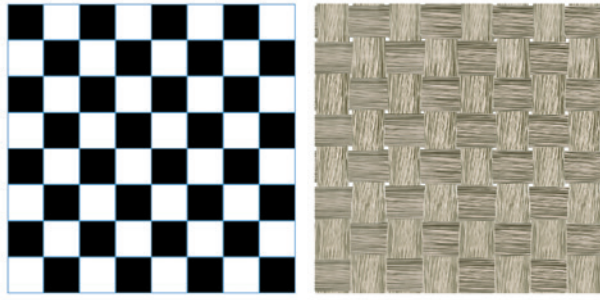


Fig. 48. Drawing and visualization of the tabby weave.
Graphics: M. Cybulska

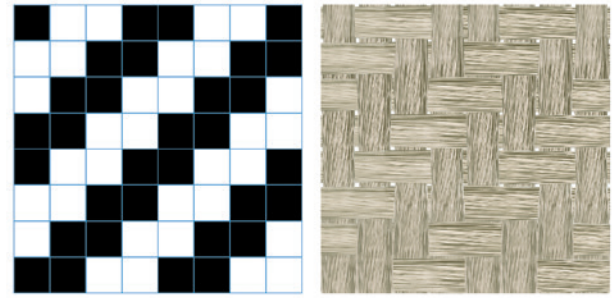


Fig. 49. Drawing and visualization of a 2/2 twill weave.
Graphics: M. Cybulska

measure but it generally ranged from 7 to 22 threads per one centimetre (warp) and from 7 to 14 threads per one centimetre (weft).

The studied fabrics had no distinctive qualities, such as edges, possibly because of the poor state of preservation in the analysed material. Among those fabrics where the fibre origin was not identified, most items (six) were of the plain weave type made with ZZ-twist yarn (Fig. 53, 57, 59, 60), with a warp density of 10 to 20 threads per centimetre and a weft density of 10 to 16 threads per centimetre. Those items similarly had no distinctive features such as edging.

In conclusion, the two sets of textile items indicate that we are dealing with typical flax fabrics¹⁶⁰, possibly remains of shirts or other parts of clothing worn by the buried individuals.

In terms of the textiles made of unidentified materials, one distinctive item stands out, namely item 57 (grave 606), made of 2/2 twill weave (Fig. 49, 60), and item 54 (grave 605), woven on a tablet loom (Fig. 58). Because no 2/2 twill weave fabrics made of plant fibres had ever been identified among Wielbark Culture textiles (all known items of this kind were made of wool), we believe that this is likewise a woollen product¹⁶¹. The weave is made of ZZ-twist yarn (Fig. 60), corresponding to Type 7 in the typology proposed by J. Maik¹⁶². The density of the warp and weft is ca. 20 and ca. 16 threads per centimetre, respectively, making this a typical woollen fabric of the Wielbark Culture¹⁶³.

¹⁶⁰ J. Maik 2012, 65–92.

¹⁶¹ A similar situation was described in the first part of the publication; in that case all the fabrics with a 2/2 twill weave were assumed to have been made of wool (J. Maik 2011, 173).

¹⁶² J. Maik 1988, 29; 1997, 13–14, Table 1.

¹⁶³ J. Maik 2012, 95–96.

TAPE WOVEN ON A TABLET LOOM

The textile find from grave 605 (catalogue no. 54) is one of the more interesting examples of Weklisce fabrics (Fig. 58). Although the yarn is quite heavily mineralised, each visible thread consists of several thinner threads twisted together. The item appears to be a fragment of string neatly wrapped around a brooch. However, macroscopic analysis at high magnification showed that the individual strings are interconnected with threads running through them. This means the item is not so much a thicker piece of string as a product made of sets of four doubled threads in the warp and thin threads in the weft of a textile product woven on four hole tablets. This is presumably a piece of tape of unknown width used in a piece of clothing, for instance as a dress strap. Unfortunately, it was not possible to determine the type of material used. However, the find is clearly a fragment of an item of clothing, possibly one more complex than a simple linen shirt¹⁶⁴.

THREADS AND TWINE

In addition to woven items, the Weklisce cemetery has also yielded a number of pieces of thread. Those include single S or Z threads as well as thread made of at least two strands twisted together (Fig. 54, 55). Two of those have been identified as pieces of string (Fig. 60). In the remaining cases, the poor state of preservation makes any assessment impossible.

Some of the single threads may in fact be remnants of fabrics, however this cannot be verified. The single threads (Fig. 61) with a Z-twist (1 item) or an S-twist (1 item) have a thickness of 0.38 to 1.20 mm, confirming that those may be remnants of fabrics¹⁶⁵.

¹⁶⁴ J. Maik 2010, 25–30.

¹⁶⁵ J. Maik 2012, 72–74.

CONCLUSIONS

Any discussion of the full set of textiles from the cemetery must also reference finds discussed in the first part of the publication.

All the fabrics made with identifiable raw materials were made of plant fibres (12 items); all those items are made of flax fibres, presumably meaning that all the fabrics are pieces of linen tabby. This is also corroborated by the results of the analysis of the weave – in each instance we are dealing with a plain weave pattern characteristic of linen fabrics from the Roman Period. Therefore, we believe that the other plain weave fabrics (nine items) may also have been made of flax. It is also interesting to compare the two sets of textiles, as illustrated by the following two graphs of fabric density (Fig. 63, 64). Analysis shows that fabrics in both sets have very similar thread densities. Both sets of textiles appear quite clearly to consist of three levels of quality. This aspect requires further research, particularly when more finds of textiles have come to light in the future.

As mentioned before, the finds also include 2/2 twill weave fabrics, most likely made of wool. Those constitute a minority of textile finds in the Weklice cemetery.

In general, woollen items clearly outnumber flax fabrics found in cemeteries of the Wielbark Culture¹⁶⁶. After analysing the material presented here we have come to revise our views on the frequency of flax fabrics. As it turns out, graves from several cemeteries in Mazovia and the Lublin Region have yielded a higher proportion of flax fabrics than other locations¹⁶⁷. This problem requires further detailed research, which will obviously depend on the extent

of surviving material. It seems possible that burials in some regions of the Wielbark Culture involved people being buried in their usual everyday clothes (possibly with slight modifications), whereas in others they were buried only wearing shirts. Another possibility is that the preserved fragments of flax tabby are in fact remains of shrouds. It is obviously possible that the outer layers of clothing may have also been made of flax, and not just wool. Such flax fabrics may have been worn in the warmer seasons. However, it should be borne in mind that Germanic communities in Roman times are known to have been wearing layered woollen clothing. Women wore long shirts with sleeves worn underneath dresses with straps and – in some cases – decorative cloaks on their shoulders (a type of garment known as the *Prachtmantel*). Male clothing consisted of a shirt, a tunic, a cloak worn over the shoulders and – most likely – trousers. Examples of such garments include remains preserved in a woman's grave 127 in the village of Odry, Chojnice district (Poland) or in a man's grave 1, mound 4 in Gronowo, Drawsko Pomorskie district (Poland)¹⁶⁸. This is corroborated by many fragments of clothing found in the marshes¹⁶⁹ of northern Germany and by the depictions of German men and women on the columns of Trajan and Marcus Aurelius (2nd century AD) in Rome, but also on the Column of Victory (109 AD) in Adamclisi, Constanța region in Dobruja, Romania¹⁷⁰.

At this point, we do not have a sufficient amount of material to resolve whether or not flax fabrics were used in inner or outer layers of clothing or as grave clothes, or indeed as shrouds.

¹⁶⁶ J. Maik 2012, 65–92.

¹⁶⁷ R. Wołagiewicz 1981; J. Maik 2012, 217–227.

¹⁶⁸ J. Maik 2010, 26–29; M. Cybulska, T. Florczak 2013, 123–134; M. Cybulska 2020, 124–129.

¹⁶⁹ K. Schlabow 1976, 49–98.

¹⁷⁰ K. Schlabow 1976, 48–49, fig. 55–62.

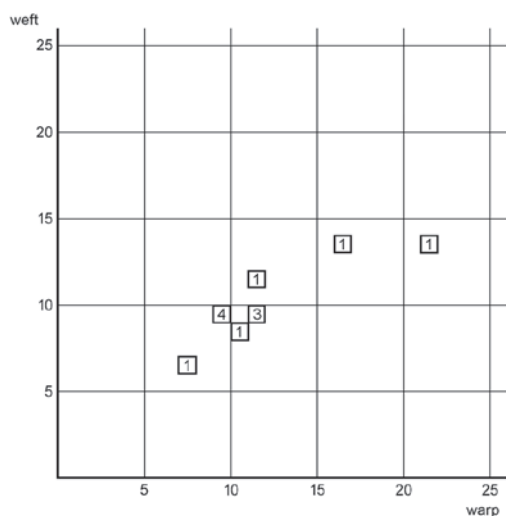


Fig. 63. Weklice. Graph of the density of tabby weave flax fabrics. Graphics: E. Wtorkiewicz-Marosik

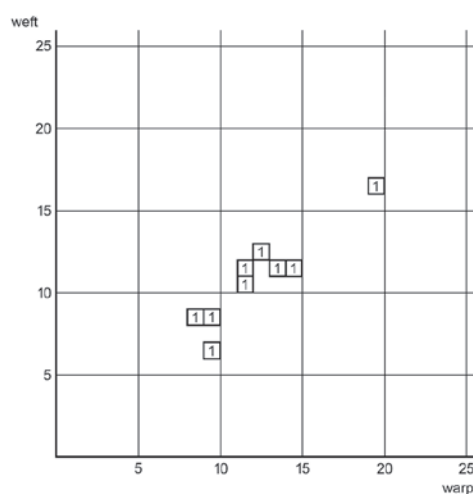


Fig. 64. Weklice. Graph of the density of tabby weave fabrics of unspecified material. Graphics: E. Wtorkiewicz-Marosik

CATALOGUE OF TEXTILE FINDS

Grave 495

Dating: *stadium* IIIA/IIIB.

37¹⁷¹. Fragment of fabric made from plant fibres (flax [?]) found in the vicinity of a brooch (Fig. 50:1; Pl. VI:1). Size: approx. 1.00×0.80 cm.

38. Fragments of unravelled yarn from an area close to a brooch (Fig. 50:2). The find is in a badly damaged condition, making it impossible to analyse.

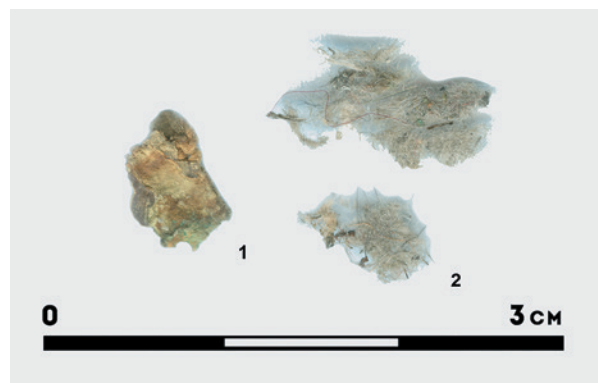


Fig. 50. Weklice, grave 495. 1 – flax fabric (catalogue no. 37); 2 – unravelled yarn (catalogue no. 38). Photo: M. Cybulska. Graphics: J. Słomska-Bolonek

No.	Weave	Number of threads per 1 cm		Yarn twist	Thickness of yarn (mm)				Notes
		warp	weft		warp		weft		
					range	mean	range	mean	
37	tabby	17	14	ZZ	–	0.55	–	0.66	the density was measured for a section with a length of 0.50 cm
38	–	–	–	–	–	–	–	–	–

Grave 518

Dating: *stadium* IA.

39. Fragment of damaged flax fabric at the point between the bow and the spring of a brooch (Fig. 51; Pl. XXV:2). The fibula was pinned through the fabric.

40. Fragments of a double Z/2Z thread, 0.74 mm thick.

41. Two S-twist strands, 0.38 mm thick.

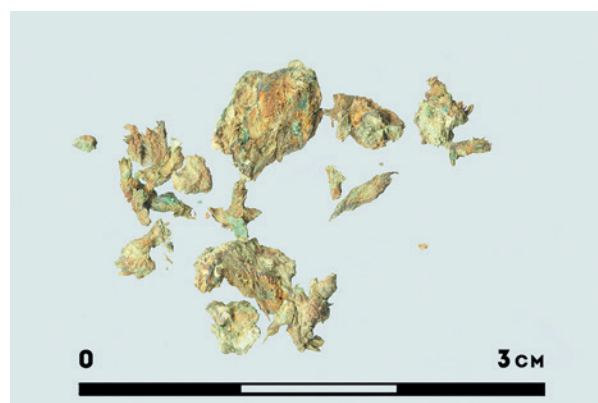


Fig. 51. Weklice, grave 518. Flax fabric (catalogue no. 39). Photo: M. Cybulska. Graphics: J. Słomska-Bolonek

No.	Weave	Number of threads per 1 cm		Yarn twist	Thickness of yarn (mm)				Notes
		warp	weft		warp		weft		
					range	mean	range	mean	
39	tabby	22	14	ZZ	–	0.40	–	0.50	–
40	–	–	–	Z/2Z	–	0.74	–	–	–
41	–	–	–	S	–	0.38	–	–	–

¹⁷¹ See footnote 157.

Grave 542

Dating: *stadium* IIIB.

42. Fragment of damaged fabric found close to a bracelet (Fig. 52; Pl. XLIII:4). The find is badly damaged, making analysis impossible.

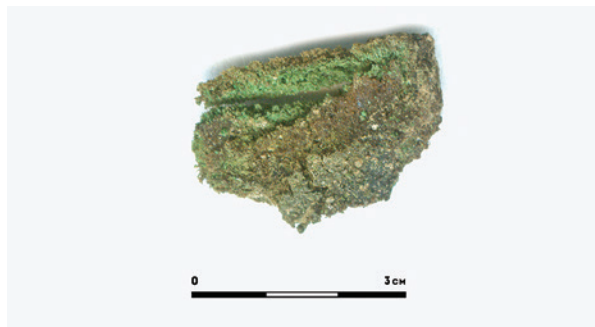


Fig. 52. Weklice, grave 542. Fragment of fabric (catalogue no. 42).
Photo: M. Cybulska. Graphics: J. Słomska-Bolonek

Grave 545

Dating: *stadium* IIB/IIC.

43. Fragments of mineralised fabric on fragments of a buckle plate (Fig. 53; Pl. XLVI:6). Size: approx. 2.00×1.00 cm. The find is coated with a preservative agent that makes analysis impossible.

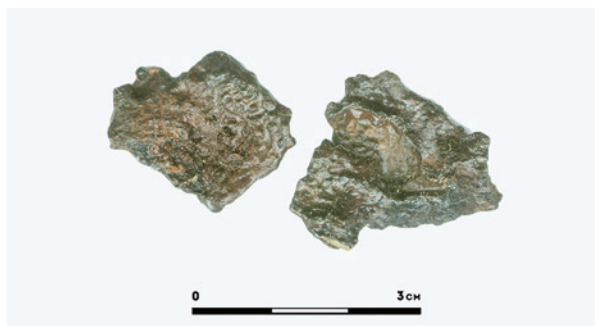


Fig. 53. Weklice, grave 545. Fabric made of unspecified material (catalogue no. 43). Photo: M. Cybulska.
Graphics: J. Słomska-Bolonek

No.	Weave	Number of threads per 1 cm		Yarn twist	Thickness of yarn (mm)				Notes
		warp	weft		warp		weft		
					range	mean	range	mean	
43	tabby (?)	-	-	ZZ	-	-	-	-	-

Grave 550

Dating: *stadium* IIB.

44. A small remnant of a double Z/2Z thread (Fig. 54; Pl. LII:3). This fragment has been preserved next to a copper alloy belt fitting.

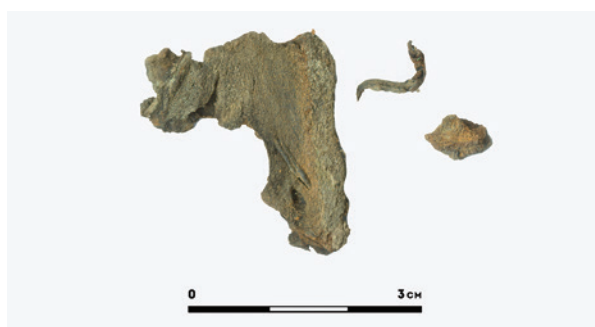


Fig. 54. Weklice, grave 550. Doubled thread (catalogue no. 44).
Photo: M. Cybulska. Graphics: J. Słomska-Bolonek

No.	Weave	Number of threads per 1 cm		Yarn twist	Thickness of yarn (mm)				Notes
		warp	weft		warp		weft		
					range	mean	range	mean	
44	-	-	-	Z/2Z	-	-	-	-	-

Grave 564

Dating: *stadium* IIC.

45. A small fragment of mineralized fabric on a copper alloy buckle (Pl. LXIX:2). Size: approx. 0.04×0.04 cm.

The find is coated with a preservative agent, making analysis impossible.

No.	Weave	Number of threads per 1 cm		Yarn twist	Thickness of yarn (mm)				Notes
		warp	weft		warp		weft		
					range	mean	range	mean	
45	tabby	-	-	-	-	-	-	-	-

Grave 594

Dating: *stadium* IIIB.

46. Two small fragments (length up to 6.00 mm, thickness approx. 1.50 mm) of a mineralised Z/2S twist thread, preserved close to a brooch made of a copper alloy (Fig. 55; Pl. CVI:2).



Fig. 55. Weklice, grave 594. Doubled thread (catalogue no. 46).

Photo: J. Maik. Graphics: J. Słomska-Bolonek

No.	Weave	Number of threads per 1 cm		Yarn twist	Thickness of yarn (mm)				Notes
		warp	weft		warp		weft		
					range	mean	range	mean	
46	-	-	-	Z/2S	-	1.50	-	-	-

Grave 595

Dating: *stadium* IIIB.

47. Fragment of weakly mineralised flax fabric sized approx. 0.10×0.08 cm, preserved close to a strap end attachment (Pl. CVII:4).

48. Fragment of damaged fabric close to a brooch. The find is badly damaged and could not be analysed (Pl. CVII:1).

No.	Weave	Number of threads per 1 cm		Yarn twist	Thickness of yarn (mm)				Notes
		warp	weft		warp		weft		
					range	mean	range	mean	
47	tabby	12	10	ZZ	0.60–0.80	0.58	0.60–0.90	0.79	-
48	-	-	-	-	-	-	-	-	damaged

Grave 600

Dating: *stadium* IVA.

49. Fragment of flax fabric sized approx. 0.03×0.03 cm (3 threads×2 threads) on a partially decomposed wooden bucket (Pl. CXV:5d).

50. Small piece of flax fabric sized approx. 0.60×0.40 cm, found at the outer surface of the lowest bucket band (Fig. 56; Pl. CXV:5).

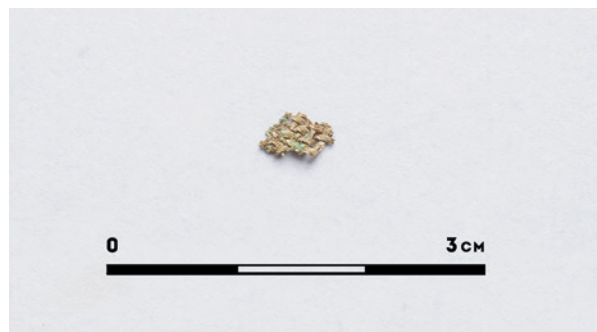


Fig. 56. Weklice, grave 600. Flax fabric (catalogue no. 50).

Photo: J. Maik. Graphics: J. Słomska-Bolonek

No.	Weave	Number of threads per 1 cm		Yarn twist	Thickness of yarn (mm)				Notes
		warp	weft		warp		weft		
					range	mean	range	mean	
49	tabby	–	–	ZZ	0.30–0.35	–	0.30–0.35	–	–
50	tabby	7–8	7–8	ZZ	0.30–0.50	–	0.30–0.50	–	fabric density was measured at sections measuring 0.40 and 0.50 cm

Grave 604

Dating: *stadium* IIC.

51. Fragment of a damaged textile item close to the spring of a brooch (Pl. CXX:1).

Grave 605

Dating: *stadium* IIIA/IIIB.

52. Fragments of fabrics preserved close to the spring of a brooch (Pl. CXXII:1), coated with a preservative agent that makes analysis impossible.

53. Fragment of a piece of fabric mineralised with iron oxides, sized approx. 1.00×1.00 cm, preserved close to a brooch (Fig. 57; Pl. CXXII:1).

54. Fragments of a tape woven on a tablet loom, mineralised with iron oxides, preserved next to the spring of a brooch (Fig. 58; Pl. CXXII:1).



Fig. 57. Weklice, grave 605. Fabric made of unspecified material (catalogue no. 53). Photo: J. Maik. Graphics: J. Słomska-Bolonek

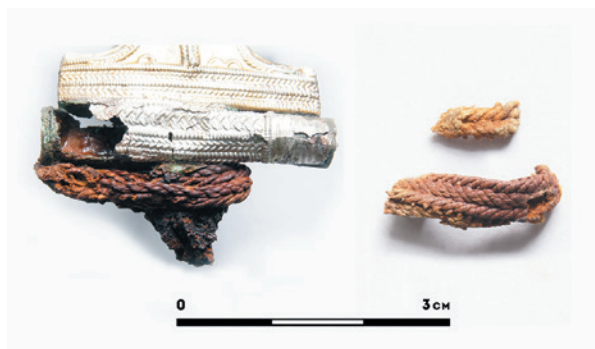


Fig. 58. Weklice, grave 605. Fragments of tape (?) made on a tablet loom (catalogue no. 54). Photo: J. Maik. Graphics: J. Słomska-Bolonek

No.	Weave	Number of threads per 1 cm		Yarn twist	Thickness of yarn (mm)				Notes
		warp	weft		warp		weft		
					range	mean	range	mean	
52	-	-	-	-	-	-	-	-	-
53	tabby	20	16	ZZ	approx. 0.50	-	approx. 0.60	-	the density was measured for a section with a length of 0.50 cm
54	four-hole tablets	-	-	Warp: S Weft: ?	0.50-0.70	-	-	-	-

Grave 606

Dating: *stadium* IIIA.

Pieces of fabric preserved close to brooches, mineralised with iron oxides from the fibula springs, additionally coated with a preservative agent that makes analysis impossible.

55. Fragment of fabric from the spring of a brooch sized about 2.00×1.00 cm (Fig. 59; Pl. CXXVIII:1).

56-58. Two fragments of fabric and a piece of string preserved on the spring of a brooch (Fig. 60; Pl. CXXVIII:2).

Size: approx. 1.00×1.00 cm (56) and approx. 0.50×5.00 cm (57), length: over 2.00 cm (58).



Fig. 59. Weklice, grave 606. Fabric made of unspecified material (catalogue no. 55). Photo: J. Maik. Graphics: J. Słomska-Bolonek

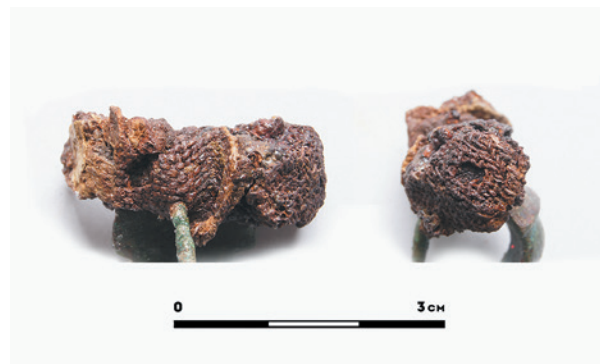


Fig. 60. Weklice, grave 606. Two fabrics and string made of unspecified material (catalogue no. 56-58). Photo: J. Maik. Graphics: J. Słomska-Bolonek

No.	Weave	Number of threads per 1 cm		Yarn twist	Thickness of yarn (mm)				Notes
		warp	weft		warp		weft		
					range	mean	range	mean	
55	tabby	10-12	10-12	ZZ	0.50-0.70	-	0.50-0.70	-	-
56	tabby	12-14	12-14	ZZ	0.50-0.60	-	0.50-0.60	-	-
57	twill 2/2	approx. 20	approx. 16	ZS	0.20-0.30	-	0.30-0.40	-	the density was measured for a section with a length of 0.50 cm
58	string	-	-	-	-	-	-	-	coated with a preservative agent

Grave 610

Dating: *stadium* IIIA.

59. Fragment of a fully mineralised thread preserved on the spring of a brooch (Fig. 61; Pl. CXXXI:1).

60. Fragment of mineralised flax fabric preserved close to the spring of a brooch. Size: approx. 1.00×0.50 cm (Fig. 62; Pl. CXXXI:2).



Fig. 61. Wekllice, grave 610. Single thread (catalogue no. 59).
Photo: J. Maik, Graphics: J. Słomska-Bolonek



Fig. 62. Wekllice, grave 610. Flax fabric (catalogue no. 60).
Photo: J. Maik. Graphics: J. Słomska-Bolonek

No.	Weave	Number of threads per 1 cm		Yarn twist	Thickness of yarn (mm)				Notes
		warp	weft		warp		weft		
					range	mean	range	mean	
59	-	-	-	Z	approx. 1.00-1.20	-	-	-	-
60	tabby	-	-	ZZ	approx. 0.50	-	approx. 0.50	-	-

Grave 613

Dating: *stadium* IVB/V.

61. On a strap end attachment, very poorly visible fabric coated with a preservative agent making analysis impossible (Pl. CXXXIII:4).

STRAY FINDS

Layer [80], bottom of the layer; SQ 17-21 B

Dating: *stadium* IIIA.

62. Two minuscule fragments of flax threads next to the spring of a brooch made from a copper alloy, length: 1.93-3.75 mm, doubled, Z twist (Z/2?) (Pl. CLXVII:67).

No.	Weave	Number of threads per 1 cm		Yarn twist	Thickness of yarn (mm)				Notes
		warp	weft		warp		weft		
					range	mean	range	mean	
62	-	-	-	?	0.68-0.69	-	-	-	-

Layer [72], top soil, from the surface; SQ 15-22 C

Dating: *stadium* IIB/IIC.

63. On the spring of a brooch made from a copper alloy there is a small remnant of fabric covered with a preservative agent that precludes analysis. Size: approx. 0.03×0.02 cm (Pl. CLXVII:59).

No.	Weave	Number of threads per 1 cm		Yarn twist	Thickness of yarn (mm)				Notes
		warp	weft		warp		weft		
					range	mean	range	mean	
63	tabby	-	-	-	-	-	-	-	-

Layer [72], top soil, from the surface; SQ 16-16 B/D

Dating: *stadium* IIB/IIC.

64. Fragment of flax fabric on the spring of a brooch made from a copper alloy. Size: approx. 1.20×1.00 cm (Pl. CLXIV:23).

No.	Weave	Number of threads per 1 cm		Yarn twist	Thickness of yarn (mm)				Notes
		warp	weft		warp		weft		
					range	mean	range	mean	
64	tabby	10.5	8.5	ZZ	-	0.72	-	0.81	-

Layer [255], backfill of an archaeological trench from 1998; SQ 17-18 B

Dating: *stadium* IIB.

65. On the spring of a brooch, traces of a thread coated with a preservative agent precluding analysis (Pl. CLXVII:63).

IV.4. RESULTS OF BOTANICAL ANALYSIS OF ORGANIC SAMPLES FROM THE CEMETERY IN WEKLICE (MARIA MICHNIEWICZ)

INTRODUCTION

This analysis looks at the fragments of trees and shrubs found at the cemetery in Weklice. The excavations yielded a total of 200 samples with a combined volume of over 85 litres. Those samples predominantly contain minerals with an admixture of organic substances, organic substances with an admixture of mineral components, as well as purely organic substances and purely mineral material. Diagnostic organic residue was recorded in 168 samples (cf. Tab. 23)¹⁷², including the following: 1) charcoal or charcoal dust; 2) wood tissue; 3) *detritus granosus*; *detritus lignosus*; *substantia humosa*; 4) bark tissue; 5) charred bark; 6) seed coat and seed; 7) bone tissue; 8) skin tissues; 9) hard coal; 10) a chitin insect carapace.

Wood tissues predominate in the analysed and identified samples. Those include charred tissue (charcoals). Bark is encountered sporadically. Products of tissue decomposition, i.e. *detritus granosus*, *detritus lignosus* and *substantia humosa*, may be of plant or animal origin. Remains of root systems of herbaceous plants are a secondary element found in most samples. Those finds most likely come from modern or near-modern plants that used the excavated areas as a source of nutrients, and as such have not been included in the table 23 that follows.

TISSUES OF LIGNEOUS PLANTS

Under natural conditions, organic tissue decomposes until it fully breaks down into mineral substances. In archaeological sites, tissue breakdown occurs in soil environments where the material is located below loosely structured mineral layers exposed to water, with access to air and variations in temperature and humidity. As is the case in Weklice, such conditions cause wood to become heavily or very heavily decomposed. One example is the log coffin from grave 546 (Pl. XLVIII; Tab. 23:58), which only survives as *detritus granosus* and *substantia humosa*. Humic acids leave dark brown stains in places that contain decomposed plant tissues, which sometimes makes it possible to measure the size of a log coffin. The end products of decomposing wood tissues are readily soluble in water and get leached away by groundwater or precipitation. As a result, such material is mostly washed away without a trace, with only a small proportion remaining within the burial pits. One exception are those places where wood tissue is in direct contact with metal items. In such cases, products of corrosion become deposited inside plant cells. This provides some mechanical reinforcement to tissue structures and makes tissue preservation more likely. However, carbonised wood tissues (charcoals) remain unaffected by decomposition processes. This is because charred tissue is chemically close to carbon (C), and therefore is not attractive to microorganisms.

¹⁷² In the Tab. 23, sample no. 25 – Feature 515 and samples nos. 158–168 – layer [80] contain medieval material that has not been included in the analysis.

TAXONOMIC IDENTIFICATIONS OF LIGNEOUS PLANT TISSUES

METHODS

After separating the mineral component, fragments of wood tissue and charcoals were studied in terms of anatomical characteristics. This analysis focused on identifying typical features characteristic of a given structure, such as tracheids, fibre tracheids, vessel elements or parenchyma cells. Various types of medullary rays were analysed and identified (simple, complex, narrow, broad, homogeneous, heterogeneous; this included measurements of width in terms of cell counts). For purposes of identification, it was also sometimes necessary to identify secondary anatomical features, such as various types of pit structures, shapes of pits in tracheid walls or vessel elements, types of perforation in side walls or longitudinal thickening. Such identification markers were studied in reflected light on cross-sections and at least one of the two longitudinal sections. The observations were done using a stereoscopic microscope at magnifications of 20–70 times and transmitted light illumination at magnifications of 100–400 times. Images of cross-section longitudinal sections and radial longitudinal sections were analysed. Prior to microscopic preparation, dyes were applied to non-carbonised tissues; charcoals and charred bark were bleached with hydrogen peroxide.

In terms of taxonomy, genera and species (sometimes families) were identified in the samples. Taxonomic identification was done with the help of botanical keys and a collection of comparative preparations. Usually, the state of tissue preservation was sufficient for purposes of identification. In those cases where decomposition makes unequivocal identification impossible, tentative taxonomic identifications are marked with the character “?”.

As regards specimens from the *Quercus* genus, it was possible to establish that the charred remains came from two different species – when carbonised, the ligneous tissues identifiably came from tree trunks and were well preserved.

In the case of vessels of summer wood, which form radial, often oblique, bifurcating strips in cross-section, especially at the end of the annual growth period, as well as in the case of spring wood vessels with oval outlines, where the radial diameter is clearly longer than the cross diameter, as well as in the case of a discernible ring of spring vessels consisting of two to four rows, it was concluded that such tissues most likely came from *Quercus* cf. *robur* specimens, a species also known as *pedunculata* oak.

Conversely, where the cross-section mostly showed a sudden and cleanly delineated change in the size of spring or summer wood vessels, with roughly round summer wood vessels forming more or less distinct triangular patterns, and spring wood vessels forming groups without a solid ring, (the ring being interrupted in one or two rows), such tissues were assumed to most likely come from the sessile oak, *Quercus* cf. *petraea*.

In the case of bark from the trunk of alder trees, where the cells were pentagonal and hexagonal and sized 20–28 microns in length and 11–12 microns in width, the tissues were assumed to come from the black alder, *Alnus* cf. *glutinosa*. Similarly, cell sizes and shapes in cross-section made it possible to identify bark from the trunk of the warty birch (*Betula pendula*).

In addition to general taxonomic identification, we tried to identify, inasmuch as possible, the exact part of the plant that the sample came from (trunk, limb, root collar, branch or root). In rare instances it was possible to estimate the diameter of the trunk or limb that the sampled tissues came from.

In the case of charcoal fragments, their shape was noted. More rounded shapes suggest movement and wear caused by water currents or waves, or possibly wind transport. Crisper, more angular shapes suggest the absence of such processes, suggesting that the charcoals were produced by charring *in situ*.

The taxonomic findings were collected (see Tab. 24). Each tissue fragment found in the sample material was treated as a single find. Where a sample contained several or more fragments from a single taxon (and where anatomically warranted), such fragments were collectively treated as a single find originating from one larger piece. Where charcoal dust or very fine charcoal fragments from a single taxon were found in the sample, this was likewise treated as a single find. In the same way, all the collected fragments of a single trunk, branch or wooden product were also treated as a single find.

The composition of the plant remains obtained from the archaeological finds is relatively homogeneous (Tab. 24). Fourteen taxa were identified (this does not take into account the subdivisions within the genera *Quercus*, *Alnus* or *Betula*). A great majority of the material consists of carbonised tissues. Non-carbonised tissues were only found in 2.3% of the analysed collection. It is also worth noting that in 94% of the set is made up of remains of tree trunks (including fragments that may be either trunks or limbs). Presumably, this part of the tree was of particular interest to the people who exploited the local forests.

CHARACTERISTICS OF THE LOCAL WOODLAND LANDSCAPE WHEN THE CEMETERY WAS IN USE

The cemetery itself (or its outskirts) was overgrown with clusters of trees. This conclusion comes from the clear preponderance of trunk wood in the samples. Analysis of plant remains offers some information about the local forest landscape (as opposed to pollen analysis). However, the trunks may also have been transported to this area from more remote habitats.

Among the tree remains, the most common identifications include the oak, *Quercus*, including both *Q. robur* and *Q. petraea*.

The pedunculate oak grows in various assemblies or forms single-species oak forests. These trees tend to grow on level or slightly undulating habitats in watershed areas or river valleys. Their occurrence indicates fresh soils rich in mineral and organic compounds. Clusters of oak trees also indicate the presence of loamy sands or sandy clays, occasionally with a limestone under-layer. The sessile oak is slightly more tolerant of less favourable soil or moisture conditions. The identification of both species of oak may indicate the existence of stretches of mixed oak or single-species oak woodland near the Weklice site.

In addition to the two species of oak, the local woodland would also have contained the common hornbeam, *Carpinus betulus*. Also present in the ecosystem, though to a much smaller extent, were trees such as lindens (*Tilia*), maples (*Acer*) or elms (*Ulmus*). This mix usually grows in flat or gently sloping areas, often adjoined by alder trees, which prefer conditions with more moisture. This type of woodland has no particular requirements in terms of soil quality or water availability. To this day, mixed woodland is the most common and widespread type of natural tree community.

The alder (*Alnus*) (almost always including the water-loving black alder, *A. glutinosa*) is also notable in local woodland of this kind. The alder is the principal component of alder forests, which may or may not also contain trees of other species.

Pure alder woodland usually develops on peat soils in river valleys. In natural conditions, alder woodland is the final stage in forest succession occurring on fenland¹⁷³. The floor of an alder forest is varied, featuring clumps of vegetation at the feet of trees but also areas which remain underwater for most of the year. The thickness of such waterlogged locations may exceed 60 cm. Those characteristics make alder forests extremely unsuitable as burial grounds. Unlike alder forests, riparian forests do not grow on peatland. Mineral

matter predominates over organic components in the soil of riparian forests. This kind of woodland grows on wet and very fertile soil. Unlike alder forests, it could well have been used for burials.

The presence of remains of the black alder in the cemetery may suggest that a small section of the cemetery may have been a flood meadow. The local woodland probably also contained birches (*Betula*), willows (*Salix*), poplars (*Populus*), and possibly also elms (*Ulmus*), maples (*Acer*), ash trees (*Fraxinus excelsior*), oaks (*Quercus*) and hornbeams (*Carpinus betulus*).

The material from Weklice clearly indicates the presence of birch trees, *Betula*, including the warty or silver birch (*Betula pendula*), which typically grows in dry and sandy areas. In the location under discussion, birches may have been a component in acidophilic oak woodland or mixed conifer forests.

The silver or warty birch is the most light-loving of deciduous tree species. Birches are a pioneer species that are the first to colonise open areas, where they form thick groves. Presumably, open spaces devoid of tree vegetation must have existed in the vicinity of the cemetery.

The existence of extensive open areas at the time when the cemetery was in use is evidenced by pollen data in sediments from the nearby Družno lake. Pollen analysis offers a general picture of ancient woodland landscapes, including the ratio of tree vegetation relative to herbaceous, aquatic or spore plants¹⁷⁴. The reconstruction of the local environment in Weklice based on the present findings partially reflects this general picture. It is worth noting that the composition of pollen grains from trees indicates the presence of wet forests containing alder and oak-hornbeam forests.

The vegetation in the cemetery and in its immediate vicinity is in agreement with the general picture based on pollen data from the sediments in lake Družno, which is several times the size.

REMAINS OF WOOD FROM COFFINS, GRAVE STRUCTURES AND GRAVE EQUIPMENT (UTILITY AND DECORATIVE ITEMS)

Wooden caskets and containers

Very little remains of wooden caskets and containers with no metal fittings¹⁷⁵. Surviving remains of this kind are usually strongly mineralised as a result

¹⁷³ W. Matuszkiewicz 1984.

¹⁷⁴ J. Zachowicz, W. Przybyłowska-Lange, J. Nagler 1982; J. Nitychoruk 1998; M. Kasprzycka 1999, 104–137.

¹⁷⁵ Cf. footnote 18 in subsection II.1. in this volume.

of contact with metal elements, such as fittings, locks or lock springs (cf. Tab. 23).

Most items of this kind were made of oak. The oak specimen from grave 495 also contains evidence of the use of willow wood and black alder bark (Tab. 23:5–15). Willow wood survives in samples from various parts of the item. Presumably, the black alder bark found near the lid was placed on the lid as an extra covering layer.

In the case of specimens from feature 543A and grave 605 (Tab. 23:54, 56, 129), where remains of hornbeam wood were found close to metal fittings besides oak wood, we are presumably dealing with the remains of a side of a coffin (or some other wooden structure), and not the wooden casket itself. This assumption is based on the unattractiveness of alder wood in woodworking terms: the wood is grey and matte in appearance, it shrinks easily and warps as it dries. The wood shrinks easily and warps as it dries. It also tends to chip while being planed. The wavy grain makes the wood resistant to splitting and difficult to work with. Oak wood is clearly superior visually (colour, patterning) and mechanically (strength, durability and flexibility). It splits easily, especially along the grain, making it easy to produce flat boards.

We have very limited data on the thickness of the boards used in the making of such wooden caskets. In the case of an oak specimen from grave 552 (Pl. LIV; Tab. 23:65), a 2 mm thick wood panel survives. This may be the original thickness, or possibly the minimum thickness if a thicker material had been worn down by processes of decomposition.

Common ash wood was identified close to the metal fittings of a casket found in feature 494A (secondary trench of grave 494). In addition to wood of the common ash, smaller amounts of oak and birch wood were also found (Tab. 23:1–3). It is difficult to say whether those were also parts of the same item, or perhaps the remains of some other structure within which the casket had been placed.

The wood of the common ash is visually more attractive than oak. Its physical and mechanical properties are similar to oak, but ash is more flexible and easier to work with. It dries without much cracking, however it is less durable than oak. Those characteristics may have guided the selection of this particular wood.

The casket from grave 568 was made of birch wood (Tab. 23:86–87). Birch wood is white with a yellowish tinge. It often contains so-called ‘pith flecks’. In the cross-section of the trunk, those form regularly distributed dark brown or almost black dots 1 mm in diameter. In the longitudinal sections, the flecks appear as regularly distributed parallel lines some 1 cm long and about 1 mm wide. Birch wood is also relatively easily splittable. It dries well with almost no warping, can be

turned with a wood lathe and reacts well to polishing. Lack of durability is the only drawback of birch wood.

This analysis of the types and species of wood used as raw material for caskets and containers only considers the wood’s mechanical suitability and appearance. However, the original choice at the time may also have been influenced by non-physical considerations, such as the symbolism of particular trees within the given belief system.

In the case of material identified as structural elements of caskets and containers in features and graves 494A, 504, 543A, 547, 552 and 559 (Tab. 23:4, 16, 55, 60, 65, 74), severely degraded and mineralised bone tissue of unidentified type was found. The state of preservation of such bone tissue – completely different in colour and structure from human bones discovered in the cemetery – suggests that those may be the remains of animal bones that formed decorative elements on the walls of the caskets.

Buckets

Well-preserved buckets with brass and tin-bronze fittings were discovered in graves 579(462) and 600 (Pl. LXXXIV–LXXXVII, CXIV–CXVI). The analysed fragments of bucket slats were made from the common yew (Tab. 23:97, 123). In the case of the best-preserved slat from grave 579(462) (Tab. 23:97), a mean size of growth rings was assumed for the whole trunk based on the slat’s dimensions. Based on this assumption, the tree that furnished the raw material for the bucket must have been more than 1300 years old. At present, the oldest yew trees in Poland are slightly over 1000 years old. However, some specimens in places like England are estimated to be 2000–4000 years old. In the early centuries of the common era, this particular specimen would presumably have been considered as relatively old, but not remarkably so.

Its excellent resistance to fungal and insect damage makes yew wood an ideal, almost imperishable raw material. This is a reddish-brown wood that is very hard and has excellent mechanical characteristics. The wood is dense and resistant to splitting. It has a low shrinkage rate, meaning that the dimensions change only very slightly when dry. The wood is also highly flexible and almost completely resistant to warping or cracking.

Yew trees grow very slowly, especially in girth. The slat from the bucket found in grave 579(462) is 9 mm thick and contains 67 annual growth rings with a thickness of 0.15–0.50 mm each. Suitable trees with a large trunk diameter would have been very ancient, and therefore presumably not easy to find. A bucket made of yew slats and decorated with copper alloy fittings may

have been a valuable item. It is questionable whether it was used as an everyday utility vessel. The common yew is a poisonous plant. Almost all of its organs and tissues, including the wood, contain an alkaloid called taxine which interferes with the nervous system and causes heart failure in humans and animals. However, given that buckets found in the settlements are likewise made of yew wood, this particular property was probably not known at the time. This observation is true of early Middle Ages, but it probably also applies to the Roman Period. The tree's longevity and near-imperviousness to decay may have played a symbolic role in funeral rituals.

Fragments of a turned wooden vessel

The bucket from grave 579(462) contained more than a dozen fragments of alder wood, tentatively identified as the remains of a vessel (Pl. LXXXVIII; Tab. 23:98), probably a bowl with around 1 cm thick walls. This item would have been turned into shape and polished. Such production methods would have required suitable raw materials. Alder wood is lightweight, soft and very easily splittable. As such, it has excellent characteristics for turning. This particular object was most likely made of black alder, an orange-coloured wood. This indicates that the visual aspects were likewise important to the individual who chose the raw material. Similar to birches, alder wood often contains shiny brown pith flecks that form visually attractive patterns.

The inside of a bead

Inside a large brass bead discovered in grave 536 (Pl. XXXVI:7a), a small, slightly flattened sphere was found (sized 2.5×2.6 cm). This was made of wood sourced from a linden trunk (Tab. 23:31). The wood's softness, excellent working and polishing characteristics, high splittability and low susceptibility to desorption cracks or warping all make linden wood a forgiving raw material that makes it possible to obtain objects of intended size.

Remains of wood tissues from coffins and other grave structures

Remains of coffins and wooden tomb structures whose exact function often remains unclear (cf. subchapter II.2.), have been mostly preserved in places of direct contact with metal objects. These are usually low-volume samples containing heavily decomposed wood tissues. In addition, negligible amounts of remains from tree trunks used as raw material for the construction of

coffins and grave structures were found. Most of such wood tissue has completely decomposed into basic minerals, its presence only evidenced by humic acids producing a dark brown coloration on mineral deposits. Such stains are most likely caused by completely decomposed wood tissues that have not been completely washed away by groundwater or rainwater.

Oak was most commonly used for making coffins and grave structures (cf. Tab. 23). Oak may have been chosen owing to its availability in the area. Given the characteristics of the local woodland discussed above it seems unlikely, if not impossible, that suitably sized raw material was brought in from other locations. Oak was an attractive material owing to its excellent mechanical characteristics including high splittability and durability as well as its attractive appearance.

The common hornbeam was also identified in the samples. The material was found as wood remains in features and graves 543A, 564 and 572 (Tab. 23:54, 83, 94). Hornbeam was probably as readily available as oak in the local area. Similar to oak, the wood is hard, heavy and resistant to mechanical wear and tear. However, it is not very durable, shrinks considerably and cracks as a result of changes in temperature and humidity. In the case of log coffins, old tree trunks were needed in order to obtain hornbeam material of sufficient size. The diameter of oldest specimens of the common hornbeam does not usually exceed 0.5 m. Notably, in the case of graves 564 and 572, the lowest section of trunks was used, including the root collar, presumably to ensure suitably large width.

Hornbeam wood is extremely difficult to split and very difficult to work with. The most likely technique used for the production process probably involved removing any unwanted timber by means of fire. This technique was probably in use in the community that used the cemetery in Weklice.

Root wood found under a necklace from grave 536 (Tab. 23:32) was tentatively identified as probably elm and probably alder. This may be the remains of some kind of wooden container because both elm and alder have so-called buttress roots, whose shape makes them suitable for carving.

Charcoal fragments obtained from graves and other features

The taxonomic composition of charcoal in Weklice material is analogous to the composition of unburnt wood remains (cf. Tab. 23, 24).

Charcoal is formed when wood tissue is heated to 170–430° C in conditions where the air supply is limited. This process is known as so-called dry distillation

(pyrolysis). It may occur naturally when wood tissue is ignited by a lightning strike or a fire resulting from the self-ignition of peat. However, such natural phenomena are uncommon. At archaeological sites, charcoals are usually present as a result of human activity, intentional (where wood is used as fuel) or unintended (as by-products of human activity). Pyrolysis is probably the earliest chemical process induced, and in many cases also managed, by humans. The hydrocarbons that form the bulk of wood tissue burn (oxidise) to form two main products, water vapour and carbon dioxide. Under anaerobic conditions, the reverse process (reduction) occurs in wood tissues heated by fire, whereby oxygen is removed from organic compounds. As a result, dry distillation occurs without oxygen.

Notably, the most frequent species identified in charcoals from Weklice were often the most energy-rich ones, with a high mean calorific value of 4500 kcal/kg (oak, hornbeam, birch). In this respect, alder wood is the only exception. Those frequently carbonised species are an excellent substrate in combustion or charring processes, especially when trunks are used for the purpose. Besides such finds, well-preserved wood sourced from healthy, freshly felled trees was the main source of fuel in the local area. This indicates that the material (tree trunks) was readily available in the vicinity of the cemetery.

In cases where charcoals were found in graves in very small quantities (cf. Tab. 23), those may have been part of funerary practices, but may also have been unrelated additions.

One noteworthy find is a charred piece of birch bark found with birch charcoals in grave 546 (Tab. 23:59). Those fragments appear to have originated from a single trunk slab that contained those two adjacent types of wood tissue. Presumably, the slab was used as part of the coffin.

Charcoals found in the fill of burial pits can be divided into two sets. The first set (features and graves 542, 543, 545 (?), 550, 554, 556 (?), 557, 562, 565, 574, 586, 587, 592AB, 629, 631) are oak charcoals, usually originating from trunks or limbs. Those charcoals were the product of freshly felled trees being charred to undergo a process of dry distillation. This is suggested by the absence of any traces of decomposition caused by microbes or insects. Such charcoals have angular shapes, indicating that the charring occurred *in situ*, probably inside the grave pit or similar structure.

Wood from oak trunks (possibly also from limbs), which was used to make coffins (e.g. graves 543 and 574; Tab. 23:52–53, 95) was exposed to suitably hot flames inside the burial pit before being cut off from oxygen. The process switched from combustion to dry

distillation when burning wood was covered with sand (or sand with an admixture of clay). Such mineral ingredients are found with oak charcoals in each of the aforementioned graves.

The second set (graves 540, 557, 572, 576, 580, 622, 623, 631) are charcoals originating from hornbeam trunks. Similar to the first set, the charring process most likely occurred inside the grave pit, and the charred material was always freshly felled. Unlike the charred oak coffins, heavy clay with sand was used in this set to cut off oxygen. As a result, most of the charcoals were crushed to form finer grained culm or dust. Charred oak and hornbeam wood was also found in the grave pits of the Weklice cemetery excavated in earlier seasons¹⁷⁶. The presence of charcoals in the pits of the cremation graves is associated with the remains of the cremation pyre, especially where such fragments co-occur with incinerated bone fragments. Charcoals occurring in connection with inhumation or symbolic burials should be associated with the ritual burning of fires inside the grave pit.

Wood charcoals found with wood remains

Wood charcoals found with remains of wooden items are the result of the carbonisation of very well-preserved tree tissues (Tab. 25). In the case of the casket from grave 495 and coffins/wooden constructions from graves 572 and 587 (Tab. 23:9, 91–94, 104–105), the wood remains and the charcoals came from same species. The anatomical characteristics of the tissues and the width of annual growth rings suggest that the wood tissues and the charcoals were originally parts of the same items. Such items were partially exposed to fire. This would have involved generating enough heat for dry distillation to occur followed by a cutting off of oxygen supply. As a result, such wood tissues presumably became partly charred before being extinguished, leaving the remaining fragments unaffected.

In two instances, charcoals and wood remains come from different species (cf. Tab. 25). This includes oak charcoals from the coffin in grave 543 along with hornbeam wood preserved close to the fittings of a casket (Tab. 23:52–53), which was found in the secondary excavation (feature 543A), and birch charcoals from the backfill at feature 618 (Tab. 23:140–141), where charred oak wood was also discovered. In those instances, this may have been the result of the practice of lighting fires during a funeral ceremony.

¹⁷⁶ M. Michniewicz 2011, 181–184.

Tab. 23. Wekllice. Diagnostic organic residue. Compiled by: M. Natuniewicz-Sekuła

No.	No. of grave/ feature/ layers	Sampling location	Sample volume	Comments
1	494A	fragment of the fitting of a casket lock and rivets (Pl. IV:4)	ca. 1 cm ³	Many small fragments of heavily decomposed and mineralised <i>Quercus</i> wood from a trunk.
2	494A	close to a casket fitting and rivets (Pl. IV:6a, 7a–b)	ca. 1 cm ³	Numerous fine partially decomposed and mineralised fragments of wood tissue; <i>Quercus</i> accounts for some two thirds of sample volume, and <i>Betula</i> for the remaining third.
3	494A	at the spring of the casket lock (Pl. IV:5)	ca. 2 cm ³	8 fragments of highly mineralised <i>Fraxinus excelsior</i> trunk wood with wide growth rings.
4	494A	fragment of casket fittings (Pl. IV:6a)	ca. 2 cm ³	2 fragments of heavily decomposed and mineralised bone (unidentified).
5	495	fragment of casket lid covered by a saucepan	ca. 234 cm ³	A slab of heavily decomposed <i>Alnus glutinosa</i> (?) bark with an admixture of fine sand and clay.
6	495	wood from a casket lid	ca. 117 cm ³	About 80% of sample volume is made up of sand with various grain sizes, clay and <i>detritus granosus</i> , mixed in with small fragments of heavily decomposed <i>Salix</i> wood.
7	495	wood from a casket lid	ca. 5 cm ³	Many small fragments of highly decomposed <i>Salix</i> wood, 6 <i>Quercus</i> charcoals, with an admixture of sand with various grain sizes.
8	495	near the spring of a casket lock	ca. 29 cm ³	The sample consists in roughly equal parts of sand with various grain sizes and fragments of heavily decomposed <i>Salix</i> wood, including a single seed of <i>Melandrium album</i> .
9	495	casket lid	ca. 4 cm ³	The sample comprises sand with a varied grain size with an admixture of small fragments of heavily decomposed <i>Quercus</i> charcoals and 16 <i>Quercus</i> charcoals from a trunk; the wood tissues were well preserved at the time of carbonisation.
10	495	spring of a casket lock	ca. 1 cm ³	Sample contains sand with various grain sizes with an admixture of small fragments of heavily decomposed <i>Quercus</i> wood.
11	495	casket lid	ca. 62 cm ³	Sample contains sand with varying grain sizes with an admixture of small fragments of decomposed <i>Quercus</i> wood.
12	495	fragment of a casket lid under a saucepan	ca. 276 cm ³	Sample contains sand with varying grain sizes mixed in with small fragments of relatively decomposed <i>Quercus</i> wood from a trunk.
13	495	near the fitting of a casket lock (Pl. VI:11)	ca. 4 cm ³	28 fragments of heavily decomposed <i>Quercus</i> wood.
14	495	near the fitting of a casket lock (Pl. VI:11)	ca. 29 cm ³	1 fragment of <i>Quercus</i> wood from a trunk 40–50 cm in diameter, relatively well-preserved tissues.
15	495	fragment of a casket lid	ca. 2 cm ³	Many small fragments of decomposed and mineralised <i>Quercus</i> wood.
16	504	fragments of a casket lock fittings (Pl. XVII:2)	ca. 1 cm ³	Small fragments of a decomposed and mineralised bone (unidentified) and <i>Quercus</i> wood.
17	505	casket lock fitting (Pl. XIX:25)	ca. 1 cm ³	Small fragments of decomposed and mineralised <i>Quercus</i> wood.
18	509	near a strap end (Pl. XXI/509:1)	ca. 36 cm ³	Sample contains sand of varying grain size with an admixture of fragments of a corroded copper alloy and <i>detritus granosus</i> .
19	509	preserved coffin fragment	ca. 189 cm ³	Sample contains loamy sand, mainly fine-grained, with a small admixture of dust from unidentifiable charcoals, and <i>substantia humosa</i> .
20	509	preserved coffin fragment	ca. 147 cm ³	Sample contains loamy sand, mainly fine-grained with a small admixture of dust from unidentifiable charcoals, and chips of decomposed human bones.
21	512(513)	decomposed organic layer	ca. 25 cm ³	Sample contains fine- and medium-grained sand with an admixture of 32 <i>Alnus</i> charcoals from a trunk; the tissues were very well preserved at the time of carbonisation.
22	512(513)	decomposed organic layer	ca. 408 cm ³	Sample contains burnt (?) clay mixed with organic matter (no charcoals) containing lumps of calcium carbonate, lumps of burnt ceramics (?).
23	512(513)	decomposed organic layer	ca. 356 cm ³	Sample contains a mixture of mostly fine-grained sand and <i>substantia humosa</i> , with an admixture of lumps of clay, calcium carbonate and gravel.

No.	No. of grave/ feature/ layers	Sampling location	Sample volume	Comments
24	515	grave fill	ca. 1989 cm ³	207 <i>Quercus</i> charcoals from the core of a tree trunk or limb with an admixture of clay and fine sand.
25	515	grave fill	ca. 812 cm ³	176 charcoals of <i>Quercus</i> cf. <i>robur</i> from a trunk, 57 <i>Quercus</i> charcoals from the core of a trunk or limb, with an admixture of clay and fine sand.
26	518	near a brooch (Pl. XXV:2)	ca. 11 cm ³	Sample contains sand with varying grain sizes and 16 fragments of <i>Quercus</i> wood from a trunk with wide growth rings.
27	518	inside a miniature clay vessel (Pl. XXV:3)	ca. 52 cm ³	Sample contains medium sand with an admixture of fragments of crumbled human bone and remains of lignified plant roots.
28	524	fittings on a wooden casket (Pl. XXIX:11)	ca. 0.1 cm ³	Decomposed and mineralised <i>Quercus</i> wood.
29	528	from the upper layer of the grave fill	ca. 1 cm ³	Fragment of rhizodermis from a <i>Phragmites communis</i> rhizome.
30	529	sand with clay at the bottom of the body of a clay vessel (urn); (Pl. XXXII:2)	ca. 30 cm ³	Sample contains roughly equal parts of small charred human bones and sand with clay.
31	536	inside of a bead (Pl. XXXVI:7a)	ca. 10 cm ³	Processed fragment of <i>Tilia</i> trunk wood, with well-preserved tissues, wide growth rings; a spherically shaped product sized 2.5×2.6 cm, with a copper pipe in the axis.
32	536	wood fragments under a necklace (Pl. XXXV:41)	ca. 127 cm ³	Many small fragments of heavily decomposed root wood from an <i>Alnus</i> (?) or <i>Ulmus</i> (?) tree, with an admixture of clay and fine sand.
33	536	near a necklace	1. ca. 6 cm ³ 2. ca. 2 cm ³ 3. ca. 6 cm ³	1. Many small fragments of very heavily decomposed <i>Ulmus</i> (?) wood with an admixture of fine sand. 2. Small fragments very heavily decomposed root wood from an <i>Ulmus</i> (?) specimen and chips of bone (unidentified) with products of copper corrosion and an admixture of sand of varying grain sizes. 3. Sample contains sand of varying grain sizes with an admixture of granules of a metal corrosion product with some fragments of heavily degraded <i>Ulmus</i> (?) wood.
34	537	grave fill	ca. 48 cm ³	69 <i>Alnus</i> charcoals mainly from the core zone of a trunk or limb, admixture of fine sand.
35	537	grave fill	ca. 50 cm ³	63 <i>Alnus</i> charcoals from a trunk (the tissues were quite degraded at the time of carbonisation), with an admixture of clay and fine sand.
36	537	grave fill	ca. 3 cm ³	26 <i>Alnus</i> charcoals from a trunk, admixture of clay, fine sand and charcoal dust from unidentifiable charcoals.
37	538	near a belt strap end (Pl. XXXIX:1)	1. ca. 25 cm ³ 2. ca. 5 cm ³	1. 37 fragments of decomposed <i>Quercus</i> wood from a trunk, admixture of clay and fine sand. 2. 25 fragments of decomposed <i>Quercus</i> wood, from a trunk, admixture of clay and fine sand.
38	539	grave fill	ca. 16 cm ³	31 <i>Alnus</i> charcoals from a trunk, the tissues were very well-preserved at the time of carbonisation, admixture of clay and fine sand.
39	539	grave fill	ca. 5 cm ³	21 <i>Betula</i> charcoals from the core zone of a trunk or limb, 3 fragments of heavily degraded bone, admixture of fine sand and clay.
40	540	grave fill	ca. 20 cm ³	2 <i>Betula</i> charcoals from a trunk, the tissues were very well-preserved at the time of carbonisation, admixture of clay and fine sand.
41	540	grave fill	ca. 7 cm ³	2 fragments of partially carbonised <i>Betula</i> cf. <i>pendula</i> bark, admixture of sand of varying grain sizes.
42	540	inside a vessel (Pl. XLI:2)	ca. 71 cm ³	187 <i>Carpinus betulus</i> charcoals, from a trunk, the tissues were very well-preserved at the time of carbonisation, admixture of clay and fine sand.
43	540	grave fill	ca. 25 cm ³	49 charcoals, <i>Betula</i> from a trunk, admixture of fine- and medium-grained sand.
44	542	near a brooch (Pl. XLIII:1)	ca. 48 cm ³	Sample contains a mixture of clay, fine- and medium-grained sand and charcoal dust from unidentifiable charcoals, including several small <i>Quercus</i> charcoals.
45	542	near bracelets (Pl. XLIII:4-5)	ca. 151 cm ³	Sample contains clay with fine sand, an admixture of <i>detritus granosus</i> and <i>substantia humosa</i> .

No.	No. of grave/ feature/ layers	Sampling location	Sample volume	Comments
46	542	near bracelets (Pl. XLIII:4-5)	ca. 58 cm ³	Sample contains a mixture of fine sand, clay and fragments of decomposed <i>Quercus</i> wood.
47	542	near a bracelet (Pl. XLIII:4)	ca. 1 cm ³	Sample contains fragment of fabric and fragment of a chitinous insect carapace (imago stage) with an admixture of clay.
48	542	near a buckle (Pl. XLIV:6)	ca. 15 cm ³	Sample contains fine sand with clay with an admixture of fragments of extremely decomposed <i>Quercus</i> wood (?), <i>detritus granosus</i> , <i>substantia humosa</i> .
49	542	grave fill	ca. 111 cm ³	Sample contains sand of varying grain sizes with an admixture of fragments of heavily degraded <i>Quercus</i> wood, <i>detritus granosus</i> , <i>substantia humosa</i> .
50	542	near a belt strap end (Pl. XLIV:7)	ca. 24 cm ³	Sample contains clay with fine sand with an admixture of larger-grained sand and fragments of leather and <i>substantia humosa</i> .
51	543	E side of a coffin	ca. 51 cm ³	Sample contains a mixture of fine- and medium-grained sand with an admixture of <i>substantia humosa</i> , charcoal dust from unidentifiable charcoals, and gravel.
52	543	E side of a coffin	ca. 11 cm ³	Sample contains a mixture of fine- and medium-grained sand and charcoal dust from unidentifiable charcoals, several larger <i>Quercus</i> charcoals.
53	543	W side of a coffin	ca. 1280 cm ³	Sample contains a mixture of fine sand with <i>substantia humosa</i> and dust from unidentifiable charcoals, and several very small <i>Quercus</i> charcoals.
54	543A	wood at the fittings of a casket (Pl. XLV:2-3)	ca. 5 cm ³	9 fragments of relatively well-preserved <i>Carpinus betulus</i> wood (as a result of mineralisation).
55	543A	from fragment of casket fittings (Pl. XLV:7)	ca. 1 cm ³	1 fragment of degraded and mineralised bone (unidentified).
56	543A	from fragment of casket fittings (Pl. XLV:5, 7-9, 12)	ca. 1 cm ³	Fragment degraded and mineralised <i>Quercus</i> wood.
57	545	grave fill	ca. 6 cm ³	1 fragment of a chip of human bone, admixture of sand of varying grain sizes, <i>detritus granosus</i> , fine <i>Quercus</i> (?) charcoals.
58	546	N part of a log coffin	ca. 1577 cm ³	Sample contains a mixture of clay and fine sand with <i>detritus granosus</i> , <i>substantia humosa</i> .
59	546	S part of a log coffin	ca. 139 cm ³	Sample contains burnt clay with a small admixture of charcoal dust from <i>Betula</i> charcoals and very small fragments of carbonised bark of <i>Betula</i> cf. <i>pendula</i> .
60	547	SW corner of a casket	ca. 106 cm ³	Sample contains loamy fine sand with an admixture of medium sand and unidentifiable charcoal dust, and 1 fragment of degraded bone (unidentified).
61	549	near a buckle (Pl. LII/549:1)	ca. 447 cm ³	Sample contains 20 fragments of heavily degraded <i>Quercus</i> wood from a trunk and an admixture of metal corrosion products containing copper.
62	550	near a belt fitting (Pl. LII/550:3)	ca. 140 cm ³	Sample contains a mixture of fine- and medium-grained sand with clay, with an admixture of bone chips (unidentified), fine charcoals, <i>Quercus</i> , fragments of metal corrosion products containing copper and fragments of heavily degraded <i>Quercus</i> wood.
63	551	wood from a container	ca. 13 cm ³	Sample contains fine sand with an admixture of small fragments of heavily degraded <i>Quercus</i> wood.
64	552	wood from a casket fitting	ca. 576 cm ³	Sample contains a mixture of clay, fine sand, fragments of decomposed <i>Quercus</i> wood with an admixture of coarser sand and fragments of metal corrosion products containing copper.
65	552	wood from a casket	ca. 990 cm ³	Sample contains sand of varying grain sizes with gravel, with many bone chips (unidentified), with <i>detritus granosus</i> and fragments of very heavily degraded <i>Quercus</i> wood shaped into boards some 2 mm thick (sides of a wooden casket ?).
66	552	wood near a strap end (Pl. LIV:1)	ca. 3 cm ³	Small fragments of decomposed and mineralised <i>Quercus</i> wood.
67	553	near a brooch (Pl. LV/553:1)	ca. 38 cm ³	Sample contains sandy clay with an admixture of fragments of decomposed <i>Quercus</i> wood.
68	554	grave fill	ca. 10 cm ³	Sample contains a mixture of fine sand with charcoals: 17 <i>Acer</i> charcoals from a trunk, 4 <i>Quercus</i> charcoals from a trunk. The tissues in all the charcoals were very well-preserved at the time of carbonisation.

No.	No. of grave/ feature/ layers	Sampling location	Sample volume	Comments
69	555	near a brooch (Pl. LVII/555:1)	ca. 140 cm ³	Sample contains sand of varying grain size with an admixture of 3 fragments of heavily decomposed <i>Quercus</i> wood, degraded human bone and metal corrosion products containing copper.
70	556	near a skull	ca. 5 cm ³	Sample contains sand of varying grain sizes with an admixture of small fragments of human bones, dust from unidentifiable charcoals, and few small <i>Quercus</i> (?) charcoals.
71	557	grave fill	ca. 7 cm ³	16 <i>Quercus</i> charcoals from a trunk, 3 <i>Carpinus betulus</i> charcoals from a trunk with an admixture of fine sand. All the tissues were very well preserved at the time of carbonisation.
72	558	grave fill	ca. 2 cm ³	4 <i>Rosaceae</i> charcoals.
73	559	log coffin	ca. 2259 cm ³	Sample contains a mixture of sand of varying grain sizes with clay, gravel, small fragments of human bone, <i>detritus granosus</i> and fragments of extremely decomposed <i>Quercus</i> wood (?).
74	559	wooden container	ca. 896 cm ³	Sample contains a mixture of sand of varying grain sizes with clay, gravel, and an admixture of fragments of mineralised bone (unidentified), <i>detritus granosus</i> and fragments of degraded <i>Quercus</i> wood.
75	561	grave fill	ca. 1 cm ³	12 charcoals, <i>Betula</i> with an admixture of fine sand.
76	562	grave fill	ca. 7 cm ³	Sample contains fine sand with clay, with a small admixture of dust from unidentifiable charcoals.
77	562	grave fill	ca. 87 cm ³	17 <i>Ulmus</i> charcoals from a trunk with an admixture of fine sand.
78	562	grave fill	ca. 29 cm ³	16 <i>Quercus</i> charcoals from a trunk with wide growth rings, the tissues were very well preserved at the time of carbonisation; an admixture of fine sand and clay.
79	562	near a casket	ca. 87 cm ³	Sample contains sandy clay with a small admixture of extremely decomposed <i>Quercus</i> (?) wood.
80	562	log coffin	ca. 13 cm ³	Sample contains clay with a small admixture of extremely decomposed <i>Quercus</i> (?) wood.
81	564	grave fill	ca. 4332 cm ³	45 <i>Alnus</i> charcoals from a trunk, the tissues were very well or relatively well preserved at the time of carbonisation; admixture of fine- and medium-grained sand.
82	564	grave fill	ca. 21 cm ³	38 <i>Salix populus</i> charcoals, 3 <i>Alnus</i> charcoals, with an admixture of fine sand and clay.
83	564	near spurs (Pl. LXX:4-5)	ca. 53 cm ³	Heavily decomposed <i>Carpinus betulus</i> trunk wood from a root collar or limb zone, with a large admixture of clay and fine sand.
84	564	fragments of a fitting (Pl. LXIX:6)	ca. 10 cm ³	Many small fragments of decomposed and mineralised <i>Carpinus betulus</i> wood.
85	565	grave fill	ca. 31 cm ³	Sample contains fine sand with a considerable admixture of small <i>Quercus</i> cf. <i>robur</i> charcoals from a trunk, the tissues were well preserved at the time of carbonisation.
86	568	fragments of a casket fitting (Pl. LXXI:3)	ca. 0.2 cm ³	Small amounts of heavily mineralised <i>Betula</i> wood.
87	568	fragments of a casket lock fittings (Pl. LXXI:2)	ca. 1 cm ³	Heavily decomposed and mineralised <i>Betula</i> wood.
88	569	coffin	ca. 72 cm ³	Sample contains burnt clay with an admixture of charcoal dust from unidentifiable charcoals, small fragments of burnt bone and heavily decomposed <i>Quercus</i> wood.
89	570	near a bracelet (Pl. LXXIII/570:4)	ca. 23 cm ³	Sample contains loamy fine sand with a large admixture of heavily degraded <i>Quercus</i> (?) wood.
90	570	near a belt mount (Pl. LXXIII/570:7)	ca. 2 cm ³	2 fragments of mineralised leather.
91	572	carbonised layer	ca. 420 cm ³	Some ⅓ of sample volume is made up of burnt clay with an admixture of medium-grained sand and coarse gravel, the remaining ⅔ of sample volume is dust from unidentifiable charcoals with a few small charcoals from a <i>Carpinus betulus</i> trunk.

No.	No. of grave/ feature/ layers	Sampling location	Sample volume	Comments
92	572	carbonised layer	ca. 304 cm ³	Some 2/3 of sample volume is made up of burnt clay with an admixture of medium-grained sand and coarse gravel, the remaining 1/3 of sample volume is dust from unidentifiable charcoals with a few small <i>Carpinus betulus</i> charcoals. The tissues were well preserved at the time of carbonisation.
93	572	log coffin	ca. 2063 cm ³	Sample contains burnt, sandy clay with a large admixture of dust from unidentifiable charcoals, small <i>Carpinus betulus</i> charcoals most likely from a trunk. The tissues were well preserved at the time of carbonisation.
94	572	log coffin	1. ca. 18 252 cm ³ 2. ca. 19 110 cm ³	1. Many fragments of weathered rock. 2. Fragments of heavily decomposed <i>Carpinus betulus</i> wood from a trunk (at the root collar or limb zone), with a large admixture of fine sand, clay.
95	574	log coffin	ca. 26 cm ³	Sample contains fine- and medium-grained sand, dust from unidentifiable charcoals, and small (48 fragments) of <i>Quercus</i> cf. <i>robur</i> charcoals from a trunk with wide growth rings, the tissues were very well preserved at the time of carbonisation.
96	576	carbonised grave fill	ca. 304 cm ³	Sample contains fine loamy sand and sandy clay with a large admixture of dust from unidentifiable charcoals, with a few small <i>Carpinus betulus</i> charcoals from a trunk; the tissues were very well preserved at the time of carbonisation.
97	579(462)	fragment of the second stave below the croze of a stave bucket (Pl. LXXXIV-LXXXVII)	ca. 23 cm ³	Fragment of a rectangular/trapezoidal stave; stave length: 5.0-5.5 cm, outside and inside width: 4.3 cm, thickness: 0.9 cm; assuming that the inside stave width is a section of bucket circumference, the sagittal (based on the chord of the arc it forms) is equal to 1.5 mm; this is <i>Taxus baccata</i> wood from a trunk with a diameter of over 20.0 cm, the tissues are quite heavily degraded by processes of decomposition, mainly caused by microorganisms; the changes mainly involve loss of characteristic mechanical properties, diminished hardness and changes to specific gravity (the wood is abnormally lightweight); the surfaces of the stave correspond to longitudinal cross-sections of a trunk, and the stave thickness is within the radial cross-section of a trunk; the width of the stave consists of 67 consecutive annual growth rings, ranging from 0.15-0.50 mm in thickness.
98	579(462)	fragments of a turned vessel inside a stave bucket (Pl. LXXXVIII)	ca. 165 cm ³	Fragments of relatively well-preserved <i>Alnus</i> wood from a trunk. Side of a vessel ca. 1.0 cm thick, the vessel was made by turning and polishing.
99	580	grave fill	ca. 308 cm ³	Sample contains sandy clay and loamy fine sand with an admixture of charcoal dust from unidentifiable charcoals, with a small amount of <i>Carpinus betulus</i> charcoals created by carbonising heavily degraded tissues.
100	582	grave fill	ca. 4332 cm ³	Sample contains clay with an admixture of <i>substantia humosa</i> and charcoal dust from unidentifiable charcoals.
101	586	side of a casket	ca. 627 cm ³	Sample contains loamy sand with an admixture of a small amount of <i>de-tritus granosus</i> and <i>substantia humosa</i> .
102	586	bottom of a casket	ca. 864 cm ³	Sample contains loamy sand with an admixture of small, very heavily degraded fragments of <i>Quercus</i> wood tissue, no evidence of tissue mineralisation.
103	586	grave fill	ca. 1 cm ³	1 <i>Quercus</i> cf. <i>petraea</i> charcoal from a trunk, the tissues were very well preserved at the time of carbonisation.
104	587	grave fill near a wooden construction	ca. 106 cm ³	Sample contains loamy sand and 4 <i>Quercus</i> cf. <i>petraea</i> charcoals from a trunk, the tissues were very well preserved at the time of carbonisation.
105	587	grave fill near a wooden construction	ca. 90 cm ³	Sample contains loamy sand with an admixture of <i>Quercus</i> wood fragments, the tissues are well preserved.
106	588	grave fill	ca. 20 cm ³	Sample contains loamy sand and 1 <i>Tilia</i> charcoal, the wood tissues come from a trunk and were very well preserved at the time of carbonisation; carbon amounts for about one third of sample volume.
107	588	log coffin	ca. 90 cm ³	Sample contains roughly equal proportions of loamy sand and fragments of heavily degraded <i>Quercus</i> wood.
108	590	grave fill	ca. 30 cm ³	Sample contains loamy sand (about 3/4 of sample volume) with an admixture of fragments of <i>Quercus</i> cf. <i>petraea</i> wood from a trunk, well preserved (about 1/4 of sample volume).

No.	No. of grave/ feature/ layers	Sampling location	Sample volume	Comments
109	592AB	fill	ca. 50 cm ³	Many small fragments of <i>Fraxinus excelsior</i> charcoals from a trunk, the tissues were well-preserved at the time of carbonisation, admixture of fine sand and lumps of burnt clay.
110	592AB	fill	ca. 20 cm ³	Sample contains sandy clay mixed with dust from unidentifiable charcoals, and 2 small fragments of very heavily degraded <i>Quercus</i> wood.
111	592AB	fill	ca. 1 cm ³	2 <i>Fraxinus excelsior</i> charcoals from a trunk, the tissues were very well preserved at the time of carbonisation.
112	592AB	fill	ca. 4 cm ³	Sample contains a mixture of medium-grained sand with a large admixture of <i>detritus granosus</i> and <i>substantia humosa</i> and 1 fragment of very heavily degraded <i>Quercus</i> (?) wood and 1 <i>Quercus</i> charcoal.
113	592AB	fill	ca. 2 cm ³	Sample contains loamy, medium-grained sand with a large admixture of dust from unidentifiable charcoals.
114	592C	grave fill	ca. 60 cm ³	Sample contains many <i>Fraxinus excelsior</i> charcoals from a trunk, the tissues were well preserved at the time of carbonisation, an admixture of loamy, medium-grained sand mixed with dust from unidentifiable charcoals.
115	592C	inside a clay vessel (Pl. CV:3)	ca. 0.5 cm ³	Very small <i>Alnus</i> charcoals.
116	594	log coffin	ca. 109 cm ³	Sample contains loamy sand mixed with <i>substantia humosa</i> , <i>detritus granosus</i> , <i>detritus lignosus</i> and one small fragment of extremely heavily decomposed <i>Quercus</i> wood.
117	594	bottom of log coffin	ca. 80 cm ³	Sample contains a mixture of loamy sand, <i>substantia humosa</i> , <i>detritus granosus</i> .
118	596	near belt strap end (Pl. CIX:1)	ca. 26 cm ³	Fragments of degraded leather, with an admixture of fine sand.
119	596	near a tibia	ca. 24 cm ³	1 fragment of extremely degraded <i>Alnus</i> wood.
120	596	silver ring with threaded hazelnuts (Pl. CIX:14, 14a-b)	-	2 seed husks of <i>Corylus avellana</i> (one whole, one broken into two) with holes for threading onto a ring.
121	598	grave fill	ca. 2 cm ³	1 <i>Alnus</i> charcoal from a trunk or a thick limb, the tissue was very well preserved at the time of carbonisation, admixture of fine sand.
122	600	fragments of wood found near a bucket with traces of copper corrosion	ca. 4 cm ³	Many very small fragments of heavily decomposed wood tissue from a deciduous tree (<i>Dicotyledones</i>), likely <i>Quercus</i> (?).
123	600	fragments of wood sampled from six different bucket staves (Pl. CXIV-CXV)	ca. 27 cm ³	Many small fragments of wood tissue at an exceptionally advanced stage of decomposition; spring wood (?) without any preserved tissue structures, some structures survive in a very rudimentary fashion in summer wood. All structural fragments belong to <i>Taxus baccata</i> .
124	600	near a belt strap end (Pl. CXII:1)	ca. 7 cm ³	Sample contains sand of varying grain sizes with an admixture of <i>detritus granosus</i> , fragments of degraded leather and copper corrosion products.
125	605	carbonised layer inside grave pit	ca. 920 cm ³	Sample contains loamy sand and sandy clay with a high admixture of charcoals from <i>Alnus</i> root wood.
126	605	inside of strainer (Pl. CXXIII:70).	ca. 16 cm ³	6 fragments of <i>Populus</i> wood from a thick trunk with very wide growth rings, well preserved, which are part of a single turned or cut ring. Dry dimensions: outside diameter ca. 6.0 cm, inside diameter ca. 4.5-5.0 cm, thickness 0.6-1.0 cm, width 2.5-2.7 cm and 2 fragments of degraded <i>Quercus</i> root wood.
127	605	near a brooch, close to a jawbone (Pl. CXXII:1)	ca. 96 cm ³	Sample contains loamy sand with calcium concretions with an admixture of <i>detritus granosus</i> , <i>substantia humosa</i> and fragments of heavily decomposed human bone.
128	605	fragment of wood (Pl. CXXIII:69-69a)	ca. 1 cm ³	Sample contains fine- and medium-grained sand, <i>detritus lignosus</i> , an admixture of calcium carbonate concretions (reacts with 10% HCl), small fragments of <i>Quercus</i> wood.
129	605	tissues adjacent to nails forming structural elements of a casket or some other wooden construct (Pl. CXXIII:66-68)	ca. 0.8 cm ³	Very heavily decomposed and highly mineralised <i>Carpinus</i> wood.
130	606	grave fill	ca. 288 cm ³	Many charcoals from a <i>Tilia</i> trunk, some originating from a trunk with a diameter of over 6.0 cm and over 15.0 cm, all the charcoals were produced as a result of carbonisation of well-preserved tissues. 1 charcoal from <i>Pinus silvestris</i> , the carbonised tissue was quite heavily degraded.

No.	No. of grave/ feature/ layers	Sampling location	Sample volume	Comments
131	608	fill of an organic construct	ca. 345 cm ³	Sample contains loamy sand (mostly medium-grained, some fine-grained), with a small admixture of <i>substantia humosa</i> .
132	609	grave fill	ca. 2 cm ³	2 charcoals from a thick <i>Tilia</i> trunk, the carbonised tissues were very well preserved, with an admixture of fine sand.
133	609	tissues adjacent to a clasp fitting of a casket (Pl. CXXIX/609:8, 8a-b).	ca. 0.5 cm ³	Heavily degraded and highly mineralised <i>Carpinus</i> wood.
134	611	grave fill	ca. 10 cm ³	8 <i>Alnus</i> charcoals from a trunk, the tissues were very well preserved at the time of carbonisation.
135	611	burnt wood fragment	ca. 6 cm ³	12 small <i>Alnus</i> charcoals from a trunk, the tissues were very well preserved at the time of carbonisation
136	612	grave fill	ca. 16 cm ³	10 charcoals, <i>Tilia</i> from a trunk, well- or moderately well-preserved, admixture of fine- and medium-grained sand.
137	613	structure made of planks	ca. 20.5 cm ³	Sample contains fine and coarse loamy sand with a small admixture of <i>detritus granosus</i> , <i>detritus lignosus</i> and small fragments of extremely decomposed wood tissues from a <i>Quercus</i> specimen.
138	613	structure made of planks	ca. 30 cm ³	Sample contains loamy fine and coarse sand with an admixture of chips of human bone, <i>detritus granosus</i> , <i>substantia humosa</i> , and charcoal dust from unidentifiable charcoals.
139	617	grave fill	ca. 308 cm ³	Sample contains fine sand, mixed in with fragments of calcium rock, with a small admixture of chips of burnt human bones. The admixture contains <i>detritus granosus</i> , <i>substantia humosa</i> and unidentifiable charcoal dust.
140	618	from a daub layer	ca. 2 cm ³	1 charcoal from a <i>Betula</i> trunk, the tissues were very well preserved at the time of carbonisation.
141	618	from a daub layer	ca. 59 cm ³	Many fragments of heavily decomposed and partially carbonised <i>Quercus</i> cf. <i>petraea</i> trunk wood, an admixture of loamy fine sand.
142	618	from fill	ca. 2310 cm ³	Sample contains sandy clay with a small admixture of <i>detritus granosus</i> and <i>substantia humosa</i> .
143	621	near a brooch and buckle (Pl. CXL/621:1-2)	ca. 120 cm ³	Sample contains loamy medium- and fine-grained sand mixed with chips of human bones covered in corrosion products of copper and humus acids, the admixture contains <i>detritus granosus</i> and <i>substantia humosa</i> .
144	622	grave fill	ca. 3 cm ³	1 <i>Alnus</i> charcoal from the transitional zone between the trunk and the roots (root collar).
145	622	grave fill	ca. 8 cm ³	1 <i>Betula</i> charcoal from a trunk, the tissues were very well preserved at the time of carbonisation.
146	622	grave fill	ca. 113 cm ³	Sample contains fine sand with 45 fragments of <i>Carpinus betulus</i> trunk charcoals, the tissues were very well preserved at the time of carbonisation.
147	623	grave fill	ca. 11 cm ³	A lump of burnt clay mixed with dust from unidentifiable charcoals.
148	623	grave fill	ca. 2 cm ³	1 <i>Carpinus betulus</i> charcoal from a trunk, the tissues were very well preserved at the time of carbonisation.
149	625	grave fill	ca. 21 cm ³	Sample contains fine sand with a small admixture of lumps of clay with dust from unidentifiable charcoals.
150	629	grave fill	ca. 126 cm ³	Sample contains sandy clay with a small admixture of <i>substantia humosa</i> .
151	629	grave fill	ca. 2 cm ³	5 charcoals of <i>Quercus</i> cf. <i>petraea</i> , the tissues were well preserved at the time of carbonisation.
152	631	wood from log coffin and casket	ca. 8398 cm ³	Sample contains sandy clay and loamy sand with a small admixture of <i>detritus lignosus</i> , <i>detritus granosus</i> and <i>substantia humosa</i> .
153	631	grave fill	ca. 26 cm ³	A lump of burnt clay with a small admixture of dust from unidentifiable charcoals.
154	631	grave fill	ca. 14 cm ³	Burnt clay with 3 charcoals from a <i>Quercus</i> cf. <i>petraea</i> trunk, the carbonised tissues were quite well preserved.
155	631	grave fill	ca. 18 cm ³	44 charcoals from a <i>Carpinus betulus</i> trunk, the carbonised tissues were well preserved, an admixture of fine sand.
156	634	grave fill	ca. 18 cm ³	About two thirds of sample volume contains burnt clay, the remaining third is made up of 15 <i>Alnus</i> charcoals.

No.	No. of grave/ feature/ layers	Sampling location	Sample volume	Comments
157	640	grave fill	ca. 8 cm ³	About half of sample volume is clay; the other half is charcoals: 9 <i>Alnus</i> charcoals.
158	Layer [80]	from layer	ca. 288 cm ³	148 <i>Quercus</i> cf. <i>petraea</i> charcoals from a trunk and presumably also from a limb, the growth rings vary between 0.8-3.6 mm, the tissues were very well preserved at the time of carbonisation, an admixture of sand with varying grain sizes.
159	Layer [80]	from layer	ca. 71 cm ³	241 <i>Quercus</i> charcoals from a trunk, growth rings of up to 4.9 mm, admixture of sand with varying grain sizes.
160	Layer [80]	from the top of layer	ca. 3 cm ³	10 <i>Quercus</i> charcoals from the core zone of a trunk or a limb, with an admixture of fine- and medium-grained sand.
161	Layer [80]	from the top of layer	ca. 1 cm ³	2 <i>Alnus</i> charcoals from the core zone of a trunk or a limb, with an admixture of fine- and medium-grained sand.
162	Layer [80]	from layer	ca. 1 cm ³	2 <i>Salix</i> charcoals from a thin shoot.
163	Layer [80]	from layer	ca. 1 cm ³	1 <i>Quercus</i> cf. <i>robur</i> charcoal from the core zone of a trunk or a limb, the tissues were very well preserved at the time of carbonisation.
164	Layer [80]	from layer	ca. 1 cm ³	1 <i>Quercus</i> charcoal from a trunk with very wide growth rings, the tissues were very well preserved at the time of carbonisation.
165	Layer [80]	from layer	ca. 11 cm ³	12 <i>Pinus silvestris</i> charcoals from a trunk or a limb, with growth rings of 0.6-1.9 mm, the tissues were very well preserved at the time of carbonisation; admixture of clay and fine sand.
166	Layer [80]	from layer	ca. 38 cm ³	78 <i>Quercus</i> charcoals from the trunk's root collar, with very wide growth rings; admixture of clay and fine sand.
167	Layer [80]	from layer	ca. 6 cm ³	6 fragments of coal with an admixture of fine sand.
168	Layer [80]	from layer	ca. 1 cm ³	1 fragment of coal.

Tab. 24. Weklice. Taxonomic identifications of plant remains in samples. Abbreviations: a – wood fragment of unclear origin, b – wood fragment from a trunk, c – wood fragment from a root, d – fragment of bark from a trunk, e – fragment of a husk, f – fragment of charcoal of unclear origin, g – fragment of charcoal from a tree trunk, h – fragment of charcoal from a trunk or branch, i – fragment of charcoal from a twig, j – fragment of charcoal from the root collar of a trunk, k – fragment of charred bark from a trunk. Compiled by: M. Michniewicz

Genus/species/ family	a	b	c	d	e	f	g	h	i	j	k	Total	%
<i>Quercus</i>	23	8	2	–	–	15	292	551	–	1	1	1237	61.26
<i>Quercus</i> cf. <i>petraea</i>	–	2	–	–	–	5	159	–	–	–	–	–	
<i>Quercus</i> cf. <i>robur</i>	–	–	–	–	–	–	178	–	–	–	–	–	
<i>Alnus</i>	1	1	1	–	–	31	159	72	–	1	–	267	13.22
<i>Alnus</i> cf. <i>glutinosa</i>	–	–	–	1	–	–	–	–	–	–	–	–	
<i>Carpinus betulus</i>	5	3	–	–	–	–	250	1	–	–	–	259	12.82
<i>Betula</i>	1	1	–	–	–	12	70	21	–	–	–	109	5.39
<i>Betula</i> cf. <i>pendula</i>	–	–	–	1	–	–	–	–	–	–	3	–	
<i>Populus</i>	3	6	–	–	–	38	–	–	–	–	–	47	2.32
<i>Ulmus</i>	–	–	2	–	–	1	17	–	–	–	–	20	0.99
<i>Fraxinus excelsior</i>	1	–	–	–	–	–	19	–	–	–	–	20	0.99
<i>Acer</i>	–	–	–	–	–	–	17	–	–	–	–	17	0.84
<i>Tilia</i>	1	1	–	–	–	–	14	–	–	–	–	16	0.79
<i>Pinus silvestris</i>	1	–	–	–	–	–	13	–	–	–	1	15	0.74
<i>Roseaceae</i>	–	–	–	–	–	5	–	–	–	–	–	5	0.24
<i>Salix</i>	–	1	–	–	–	–	–	–	2	–	–	3	0.15
<i>Corylus avallena</i>	1	–	–	–	3	–	–	–	–	–	–	3	0.15
<i>Taxus baccata</i>	2	–	–	–	–	–	–	–	–	–	–	2	0.10
Total	37	23	5	2	3	107	1188	645	2	2	5	2020	100

Tab. 25. Weklice. Taxonomic identification of charcoals found near wooden items. Compiled by: M. Michniewicz

No. of grave/feature	Sampling location	Type or species of wood	Type or species of charcoal
495	casket lid	<i>Salix, Quercus</i>	<i>Quercus</i>
543, 543A	wood at the fittings of a casket and charcoals from the E side of the coffin	<i>Carpinus betulus</i>	<i>Quercus</i> and unidentifiable dust
572	coffin	<i>Carpinus betulus</i>	<i>Carpinus betulus</i>
587	grave fill and wooden construction	<i>Quercus</i>	<i>Quercus</i> cf. <i>petraea</i>
618	from a daub layer and carbonised wood	<i>Quercus</i> cf. <i>petraea</i>	<i>Betula</i>

IV.5. RESULTS OF RADIOCARBON DATING OF CHARCOAL AND WOOD SAMPLES FROM THE CEMETERY IN WEKLICE (MAGDALENA NATUNIEWICZ-SEKUŁA, JERZY SIKORA)

Radiocarbon dating analysis was done for selected samples from graves and related features at Wekllice. Twenty-six samples were collected from 20 cremation and inhumation graves and other features (cf. Tab. 26)¹⁷⁷. Given that no bone material had been preserved with sufficient collagen content to date individuals, fragments of wooden objects and charcoals were dated instead. For that purpose, features with certain or relatively certain archaeological dates were selected¹⁷⁸. Sample preservation was also taken into account. In ten instances (graves 495, 536, 549, 551, 552, 564, 569, 572, 582 and feature 543A) samples included fragments of wooden objects, primarily caskets or containers without metal fittings or, less frequently, log coffins or other burial-related structures. In addition, samples from medieval layer that covered Roman Period items were analysed. The analysis was done at Poznan Radiocarbon Laboratory in Poznań, Poland. The AMS (Accelerator Mass Spectrometry) technique was used. The measurements were calibrated using the OxCal software package (v. 4.4.4)¹⁷⁹ and the most current calibration curve available, IntCal 20¹⁸⁰.

¹⁷⁷ The research was done as part of the grant NCN (National Center of Sciences) 2013/11/D/HS3/02473. The analysed samples were collected from graves discovered in 2005–2013.

¹⁷⁸ Other than graves from phase I (*stadia* IA and IB), in which no charcoals or remains of wooden items have been preserved, samples were analysed for all the other *stadia* of the cemetery's operation (cf. M. Natuniewicz-Sekuła, J. Okulicz-Kozaryn 2011, 123–133; M. Natuniewicz-Sekuła 2020, 15–31 and Tab. 1 in section III).

¹⁷⁹ Ch. Bronk Ramsey 2021.

¹⁸⁰ P. Reimer *et alii* 2020.

The findings (Fig. 65) immediately show that the results cluster within several chronological periods, and that some of the dates based on radiocarbon analysis deviate from the chronologies obtained with traditional archaeological analysis.

In general, the radiocarbon findings were in agreement with archaeological chronology for graves 537, 539 (sample Poz-69487, the other data point from that grave was not in agreement), 540 (sample Poz-69582, the other data points from that grave were not in agreement), 543, 552, 562, 564 (two dates from that grave are in agreement with the archaeology), 569, 572, 574, and 576. In addition, radiocarbon dating was in relative agreement with archaeological dating for three samples collected from medieval layer and feature. In terms of grave material, it should be noted that radiocarbon dating provides much broader time spans (particularly in the 95.4% confidence interval) compared to dating based on the typological and chronological analysis of archaeological findings.

The chronology of grave 572, in which no equipment was found, was based on stratigraphy, and the grave was dated to a period earlier than *stadium* IIIA (before 150–170 AD). In that case, radiocarbon dating was used to analyse hornbeam wood from the log coffin and hornbeam charcoals preserved in the sides of the coffin¹⁸¹. The radiocarbon data obtained for that material at 95.4% confidence intervals (1895±30 and 1860±30) correspond to periods of 69–226 AD and 87–244 AD.

¹⁸¹ Remains of charcoals are often found in sides of coffins from Wekllice and suggests that coffins were made by burning (see subsection IV.4.).

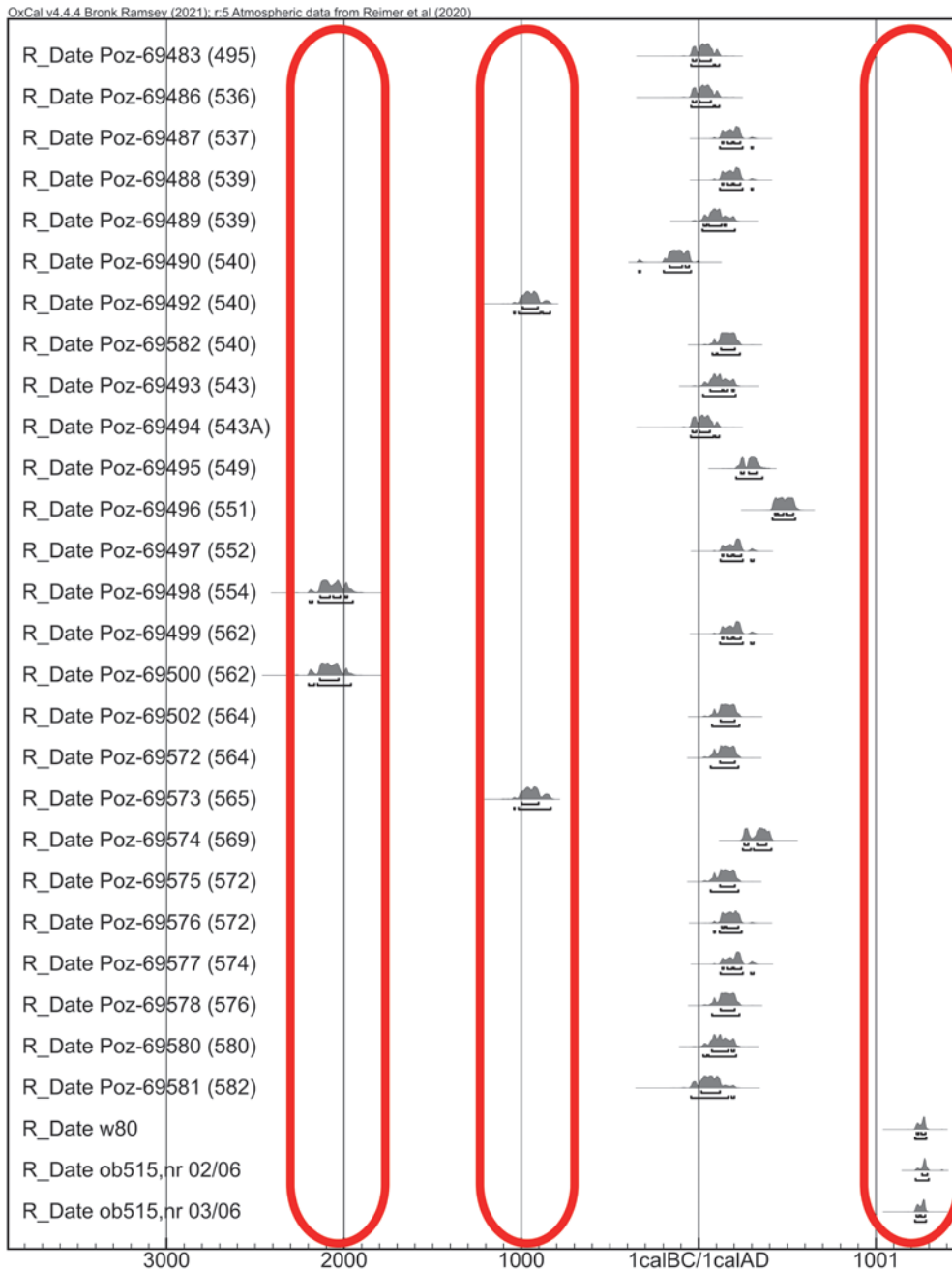


Fig. 65. Weklice. Calibrated dates (calBC/calAD). Graphics: J. Sikora

This dates the grave within the period between ca. 69 and 150–170 AD

Samples from graves 495, 536, 539, 540 (sample Poz-69490), 543A and 582 diverge from archaeological dating by relatively little, with differences ranging from several decades to ca. 200 years. Presumably, the so-called old wood effect could be involved in this case¹⁸²:

¹⁸² M.B. Schiffer 1986.

the analysed wood samples or charcoal fragments might contain heartwood (the innermost growth rings) from tree trunks, which would obviously have been decades or even, in extreme cases, centuries older than the outermost growth rings at the time the tree was actually felled. Another possibility is that the items placed in the graves (such as caskets or coffins) could have been produced long before the actual burial, or alternatively were made using properly seasoned old wood.

Situations where radiocarbon analysis suggests slightly older dates than the supposed chronology of the burials in question are relatively frequent in those cases where dating is based on organic material, particularly wood and charcoal fragments, rather than collagen collected from the bones of buried individuals.

In two instances, the findings of radiocarbon analysis pointed to dates more recent than the typological and chronological analysis of the grave items would otherwise suggest. This was the case in samples from graves 549 and 551. Grave 549 was dated to the period 160–180 AD, however the radiocarbon analysis of a wood sample preserved close to a buckle found in the grave suggested 213–361 AD (95.4% confidence interval), a more recent dating by several decades. Grave 551 was archaeologically dated to 300–375 AD, corresponding to stadium VI, or the closing stage in the cemetery's operation (interregional phase C₃–D₁). That dating is based on a belt strap end found in the equipment, morphologically related to the type Wrocław-Zakrzów, and on fragments of a comb, type Thomas I (Pl. LIII:1–2, 4). However, the radiocarbon analysis of a sample taken from the wood of a container placed in the grave indicates a date in the period 417–546 AD (95.4% confidence interval). Again, this is a date that is at least several decades more recent than the archaeological record would suggest. In both cases we might be dealing with more recent intrusions, caused by factors such as bioturbation or other faults in the exploration or sampling procedures, or (highly unlikely) laboratory errors. However, it is also not impossible that the radiocarbon dating actually reflects the time of burial more accurately. Hypothetically speaking, some of the items placed in graves might have been old, outmoded items kept and treasured as ancestor memorabilia over extended periods of time. In some cases, such 'ancient' items might have been placed in graves decades after the items in question had fallen out of fashion. In such instances, ancient memorabilia would offer misleading insights into grave chronology.

In four samples the discrepancy between the dates based on archaeological analysis and radiocarbon dating is significant. Those are samples taken from graves 540 (sample Poz-69490), 554, 562 (sample Poz-69500) and 565. Notably, the dates thus obtained are not random, but rather they can be confidently placed within two chronological horizons. Calibrated dates of the samples from graves 554 (3675BP±35) and 562 (3690BP±35) indicate the turn of the third and second millennia BC. The samples from graves 540 (2794BP±30) and 565 (2790BP±35) indicate the turn of the second and first millennia BC. In those cases we are surely dealing with residual material placed in a secondary context in the fills of Wielbark Culture grave pits. It should also be emphasised that the

explored section of the archaeological site also contained a small number of flint objects from a much older settlement, with some of those items being discovered in Wielbark Culture graves or directly below them. The general typological characteristics and the raw materials in this set of items indicate that the flint material from Weklice dates back to a period ranging from the late Paleolithic to the early Bronze Age¹⁸³. Those early dates obtained by radiocarbon analysis of charcoals might indicate human activity dating back to that period, or perhaps other human-induced or natural activities that could have produced charcoals, such as fires. In that sense, the radiocarbon findings make it possible to identify two horizons that had predated the operation of the cemetery and potentially involved human activity.

Given this set of radiocarbon findings, we used the OxCal software package to prepare a chronological model based on Bayesian statistics¹⁸⁴. The model uses four dates for samples from graves 540, 554, 562 and 565, and indicates two chronological horizons that predate the operation of the cemetery in the Roman Period. Those horizons are referred to here as Horizon A (turn of the third and second millennia BC) and Horizon B (turn of the second and first millennia BC). A series of dates that were slightly earlier than expected were eliminated from the model on the assumption that they were caused either by the old wood effect or by the use of items made from wood felled at much earlier dates. This is because those dates are unlikely to be evidence of a specific horizon of activity on the site. The dates obtained from graves 549 and 551, which turned out to be more recent than the dates suggested by typological and chronological analysis, were similarly eliminated from the model. Although such radiocarbon findings might possibly indicate that the dating obtained by traditional methods should be revised, they may just as well result from deficiencies in exploration. Dates related to the medieval stratigraphic structures were also included in the model and identified as Horizon C. For the sake of simplicity, dates of items from the Roman Period were roughly attributed to phases II, III, IV and VI, ignoring the chronological granularity at *stadium* level. (Tab. 27, Fig. 66). Item attributions to those various phases were based on the analysis of archaeological material.

Thus, the dates used in the model indicate the following chronological periods: Horizon A (turn of the third and second millennia BC), Horizon B (turn of the second and first millennia BC), phases II, III, IV and VI, and Horizon C (medieval settlement phase). Between

¹⁸³ Cf. more information in M. Natuniewicz-Sekuła, D.H. Werra 2014; 2016.

¹⁸⁴ Ch. Bronk Ramsey 2009.

those horizons there were discontinuation periods as well as periods of continuous transition between phases. Accordingly, the *Sequential* function was used in the OxCal software for those periods where there were either discontinuations to settlement between the phases or the transition dates could not be obtained (e.g. between phases IV and VI, where no data from phase V is available), and the *Contiguous* function for dates missing in phases that occurred one after another. Also,

the *R_Combine* function was used in the model for series of dates from graves 564 and 572, making it possible to obtain combined mean chronological periods – in the case of doubled dates.

The model made it possible to narrow down the chronological periods for each sample. In the case of grave 572, which contained no archaeological material and could not be dated with precision by traditional means, the modelled chronology suggests the period

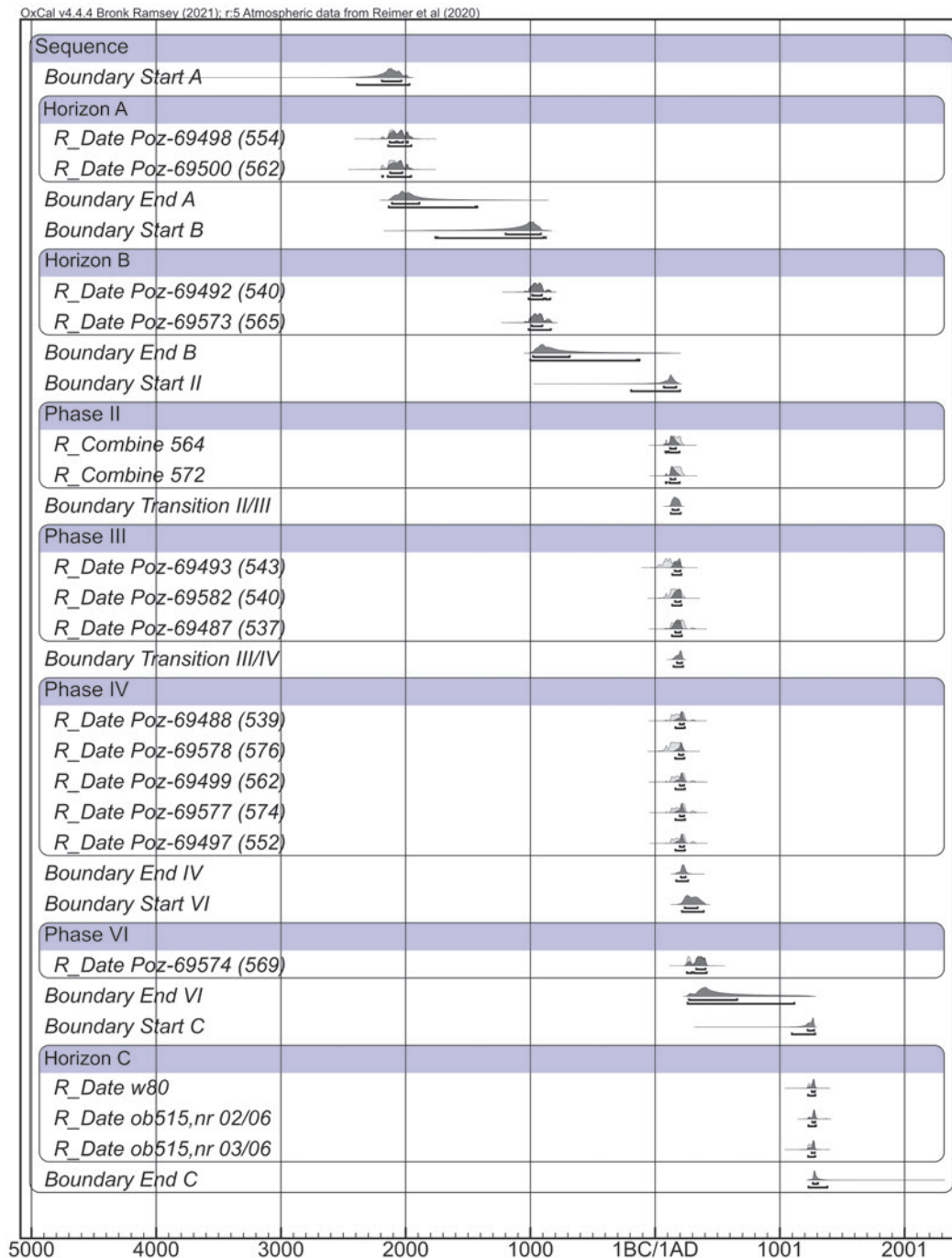


Fig. 66. Weklice. Bayesian modeling of the chronology of the cemetery in Weklice (BC/AD). Graphics: J. Sikora

86–198 AD (confidence interval 95.4%). Within a confidence interval of 68.2%, the period can be revised to 124–164 AD. Given the relative chronology of the grave and the fact that grave 572 should be more recent than grave 571 (150–170 AD), the grave can be highly likely dated roughly to the second quarter of the second century. The model-based dates for graves from phases III and IV can be narrowed down to periods of about 70 years (95.4% confidence interval) or about 40 years (68.2% confidence interval). Those are relatively narrow chronological periods for radiocarbon dating, but they are still significantly less precise than the chronologies based on archaeological material.

Despite the lower precision of radiocarbon dating (including the statistical modelling variant), this

analysis should be deemed useful nonetheless. Not only were new data obtained relating to the chronological horizons which predated and post-dated the operation of the Wielbark Culture cemetery (the medieval settlement in the latter case), but the radiocarbon analysis also made it possible to provide a more precise dating of grave 572 despite the fact that it contained no archaeological material. Lastly, radiocarbon analysis potentially points to the possibility that some of the individuals may have been buried with ‘ancient’ equipment items. Though highly conjectural, this possibility opens up the possibility of new interpretations of burials, or even revisions of burial chronologies, pushing them further into the Migration Period.

Tab. 26. Samples and radiocarbon dating including calibration. Compiled by: M. Natuniewicz-Sekuła, J. Sikora

Name	Date BP	Sample	Calibrated dates (BC/AD)						Archaeological dating	Absolute dating (approx.)
			from	to	%	from	to	%		
Poz-69483 (grave 495)	1985±30	wood, oak, from a casket lid	-36	70	68.2	-44	117	95.4	<i>stadium</i> IIIA/IIIB	ca. 160–180 AD
Poz-69486 (grave 536)	1985±30	wood, elm (?), under necklace bottom	-36	70	68.2	-44	117	95.4	<i>stadium</i> IIIA/IIIB	ca. 160–180 AD
Poz-69487 (grave 537)	1850±30	charcoal, alder, from the fill	132	236	68.2	120	306	95.4	<i>stadium</i> IIIA (?)	ca. 150–170 AD
Poz-69488 (grave 539)	1850±30	charcoal, alder, from the fill	132	236	68.2	120	306	95.4	<i>stadium</i> IVB/V (?)	ca. 230–250 AD
Poz-69489 (grave 539)	1930±30	charcoal, birch, from the fill	28	154	68.2	22	206	95.4	<i>stadium</i> IVB/V (?)	ca. 230–250 AD
Poz-69490 (grave 540)	2105±30	charcoal, birch, from the fill	-165	-55	68.2	-337	-44	95.4	<i>stadium</i> IIIB (?)	ca. 170–200 AD
Poz-69492 (grave 540)	2795±30	charred bark, silver birch, from the fill	-991	-907	68.2	-1043	-837	95.4	<i>stadium</i> IIIB (?)	ca. 170–200 AD
Poz-69582 (grave 540)	1885±30	charcoal, hornbeam, inside a vessel	127	206	68.2	78	234	95.4	<i>stadium</i> IIIB (?)	ca. 170–200 AD
Poz-69493 (grave 543)	1920±30	charcoal, oak, E side of coffin	66	201	68.2	26	210	95.4	<i>stadium</i> IIIA/IIIB	ca. 160–180 AD
Poz-69494 (feature 543A, secondary trench)	1990±30	wood, hornbeam, close to casket fittings	-37	64	68.2	-46	117	95.4	stratigraphically <i>stadium</i> IIIA/IIIB or later	ca. 160–180 AD
Poz-69495 (grave 549)	1780±30	wood, oak, close to a buckle	239	327	68.2	213	361	95.4	<i>stadium</i> IIIA/IIIB	ca. 160–180 AD
Poz-69496 (grave 551)	1595±30	wood, oak, from a container	430	535	68.2	417	546	95.4	<i>stadium</i> VI	ca. 300–375 AD
Poz-69497 (grave 552)	1840±30	wood, oak, from a casket	133	242	68.2	124	311	95.4	<i>stadium</i> IVB	ca. 220–240 AD
Poz-69498 (grave 554)	3675±35	charcoal, maple, from the fill	-2135	-1981	68.2	-2193	-1950	95.4	<i>stadium</i> IIIA/IIIB	ca. 160–180 AD
Poz-69499 (grave 562)	1845±30	charcoal, elm, from the fill	132	239	68.2	121	311	95.4	<i>stadium</i> IVB	ca. 220–240 AD
Poz-69500 (grave 562)	3690±35	charcoal, oak, from the fill	-2136	-2031	68.2	-2198	-1961	95.4	<i>stadium</i> IVB	ca. 220–240 AD
Poz-69502 (grave 564)	1890±30	charcoal, alder, from the fill	124	205	68.2	76	231	95.4	<i>stadium</i> IIC	ca. 130–150 AD

Name	Date BP	Sample	Calibrated dates (BC/AD)						Archaeological dating	Absolute dating (approx.)
			from	to	%	from	to	%		
Poz-69572 (grave 564)	1895±30	wood, hornbeam, close to spurs	121	206	68.2	69	226	95.4	<i>stadium</i> IIC	ca. 130–150 AD
Poz-69573 (grave 565)	2790±35	charcoal, pedunculate oak, from the fill	-999	-903	68.2	-1042	-833	95.4	earlier than <i>stadium</i> IIC (see description of grave 564)	before 130–150 AD
Poz-69574 (grave 569)	1720±30	wood, oak, from a log coffin	258	383	68.2	250	411	95.4	<i>stadium</i> VI	ca. 300–375 AD
Poz-69575 (grave 572)	1895±30	wood, hornbeam, from a log coffin	121	206	68.2	69	226	95.4	earlier than <i>stadium</i> IIIA (see description of grave 571)	before 150–170 AD
Poz-69576 (grave 572)	1860±30	charcoals, hornbeam, from a log coffin	130	225	68.2	87	244	95.4	earlier than <i>stadium</i> IIIA (see description of grave 571)	before 150–170 AD
Poz-69577 (grave 574)	1840±30	charcoals, oak, from a log coffin	133	242	68.2	124	311	95.4	<i>stadium</i> IVA	ca. 200–220 AD
Poz-69578 (grave 576)	1890±30	charcoals, hornbeam, burnt material from the fill	124	205	68.2	76	231	95.4	<i>stadium</i> IVA/IVB	ca. 210–230 AD
Poz-69580 (grave 580)	1915±30	charcoals, hornbeam, from the fill	75	202	68.2	27	213	95.4	later than <i>stadium</i> IVB (see description of grave 582)	after 220–240 AD
Poz-69581 (grave 582)	1960±40	wood, unidentified, split plank from pit bottom	16	121	68.2	-44	203	95.4	<i>stadium</i> IVB	ca. 220–240 AD
layer 80	760±30	charcoals, oak, from the fill	1231	1281	68.2	1222	1285	95.4	medieval	
Ob. 515, nr 02/06	740±30	charcoals, oak, from the fill	1261	1291	68.2	1225	1299	95.4	medieval	
Ob. 515, nr 03/06	765±30	charcoals, oak, from the fill	1229	1279	68.2	1222	1284	95.4	medieval	

Tab. 27. Chronological model made using Bayesian statistics in OxCal software. Compiled by: J. Sikora

Name	Unmodelled (BC/AD)						Modelled (BC/AD)					
	from	to	%	from	to	%	from	to	%	from	to	%
Boundary Start A	-	-	-	-	-	-	-2191	-2035	68.2	-2391	-1970	95.4
Horizon A	-	-	-	-	-	-	-	-	-	-	-	-
R_Date Poz-69498 (554)	-2135	-1981	68.2	-2193	-1950	95.4	-2129	-1982	68.2	-2141	-1955	95.4
R_Date Poz-69500 (562)	-2136	-2031	68.2	-2198	-1961	95.4	-2125	-2027	68.2	-2189	-1957	95.4
Boundary End A	-	-	-	-	-	-	-2111	-1891	68.2	-2136	-1426	95.4
Interval Break 1	-	-	-	-	-	-	612	1117	68.2	112	1160	95.4
Boundary Start B	-	-	-	-	-	-	-1199	-916	68.2	-1762	-876	95.4
Horizon B	-	-	-	-	-	-	-	-	-	-	-	-
R_Date Poz-69492 (540)	-991	-907	68.2	-1043	-837	95.4	-985	-909	68.2	-1015	-841	95.4
R_Date Poz-69573 (565)	-999	-903	68.2	-1042	-833	95.4	-988	-905	68.2	-1015	-837	95.4
Boundary End B	-	-	-	-	-	-	-979	-685	68.2	-1001	-126	95.4
Interval Break 2	-	-	-	-	-	-	718	1107	68.2	159	1134	95.4
Boundary Start II	-	-	-	-	-	-	70	170	68.2	-193	201	95.4
Phase II	-	-	-	-	-	-	-	-	-	-	-	-
R_Combine 564	124	203	68.2	80	218	95.4	121	168	68.2	83	196	95.4
R_Combine 572	130	206	68.2	120	229	95.4	124	164	68.2	86	198	95.4
Boundary Transition II/III	-	-	-	-	-	-	140	189	68.2	126	206	95.4
Phase III	-	-	-	-	-	-	-	-	-	-	-	-
R_Date Poz-69493 (543)	66	201	68.2	26	210	95.4	159	205	68.2	139	211	95.4
R_Date Poz-69582 (540)	127	206	68.2	78	234	95.4	160	205	68.2	138	213	95.4
R_Date Poz-69487 (537)	132	236	68.2	120	306	95.4	162	206	68.2	135	215	95.4
Boundary Transition III/IV	-	-	-	-	-	-	176	217	68.2	149	225	95.4
Phase IV	-	-	-	-	-	-	-	-	-	-	-	-
R_Date Poz-69488 (539)	132	236	68.2	120	306	95.4	197	232	68.2	164	239	95.4
R_Date Poz-69578 (576)	124	205	68.2	76	231	95.4	191	226	68.2	162	235	95.4
R_Date Poz-69499 (562)	132	239	68.2	121	311	95.4	198	233	68.2	163	240	95.4
R_Date Poz-69577 (574)	133	242	68.2	124	311	95.4	198	234	68.2	163	240	95.4
R_Date Poz-69497 (552)	133	242	68.2	124	311	95.4	198	234	68.2	164	240	95.4
Boundary End IV	-	-	-	-	-	-	208	245	68.2	170	265	95.4
Interval Break 3 (virtual break, resulting from the lack of dates from phase V)	-	-	-	-	-	-	0	99	68.2	0	160	95.4
Boundary Start VI	-	-	-	-	-	-	239	342	68.2	216	391	95.4
Phase VI	-	-	-	-	-	-	-	-	-	-	-	-
R_Date Poz-69574 (569)	258	383	68.2	250	411	95.4	330	405	68.2	255	414	95.4
Boundary End VI	-	-	-	-	-	-	271	659	68.2	260	1117	95.4
Interval Break 4	-	-	-	-	-	-	530	948	68.2	81	991	95.4
Boundary Start C	-	-	-	-	-	-	1224	1276	68.2	1097	1284	95.4
Horizon C	-	-	-	-	-	-	-	-	-	-	-	-
R_Date w80	1231	1281	68.2	1222	1285	95.4	1257	1282	68.2	1227	1285	95.4
R_Date ob515, nr 02/06	1261	1291	68.2	1225	1299	95.4	1261	1285	68.2	1230	1290	95.4
R_Date ob515, nr 03/06	1229	1279	68.2	1222	1284	95.4	1256	1281	68.2	1227	1284	95.4
Boundary End C	-	-	-	-	-	-	1265	1307	68.2	1230	1382	95.4

IV.6. STRUCTURAL AND TECHNOLOGICAL OBSERVATIONS OF SELECTED COPPER, SILVER, GOLD ALLOY AND ENAMEL-DECORATED ITEMS FROM THE CEMETERY IN WEKLICE (PAWEŁ GAN)

Tests of the chemical composition of this new group of items from the Wekllice cemetery were carried out in the Bio- and Archaeometry Laboratory of the Institute of Archaeology and Ethnology, Polish Academy of Sciences. Unlike other Wielbark Culture necropolises, this provides us with an extensive database of results for Wekllice¹⁸⁵. Non-destructive analytical methods were used, using scanning microscopes of the Vega 1 and Vega 4 series with a tungsten electron source. Thanks to the built-in attachment with an energy-dispersive X-ray detector (EDS), the content of different elements was determined using spectrum intensity analysis adjusted for ZAF correction¹⁸⁶. In addition, an Artax X-ray fluorescence spectrometer was used, characterised by a high measurement precision, in which a rhodium lamp is used as the radiation source (the μ Xrf method)¹⁸⁷. The measurements were carried out on item surfaces after removing corrosion products and protective layers. Given the heterogeneous nature of metals, each area was sampled several times to average out the results. To evaluate the results, Aztec and Spectra software packages were used together with the calibration curve of antique bronze patterns developed in the laboratory.

¹⁸⁵ M. Natuniewicz-Sekuła 2017, 185–233; 2020.

¹⁸⁶ A 100-second measurement time was used at accelerating voltage of 20keV. The measurements were made in a vacuum.

¹⁸⁷ The configuration of the Artax device at the resolution of the Si (SSD) detector is 150eV for Mn α . A 100-second measurement time in the oxygen atmosphere was used, voltages ranging from 12–50keV. Transverse resolution of tested areas ranged from 0.20 to 0.65 mm.

A total of 20 items were examined. The results are presented in the form of a table (Tab. 28).

In terms of chemical composition, the results are similar to those obtained previously. For the purposes of describing the goldsmithing production of the Wielbark Culture, the examined items from the Wekllice cemetery were divided into three material groups. Those comprised gold alloys (25 items), silver alloys (93 items) and copper alloys (118 items), including tin and tin-lead bronzes as well as brasses. In addition, a separate group was identified consisting of solder binders¹⁸⁸. This classification has been used in the present analysis. No additional metallurgical groups have been created.

The pear-shaped pendant from grave 605 was made of fine gold with the addition of silver (4%) and copper (2%) (chemical analysis CL21080; Fig. 67). Those additives were added deliberately in order to improve the item's utility. An embossing technique was used to create the stem and the capsule, which were then soldered together and richly decorated with filigree and granulation. Microscopic observation identified the methods of attaching the point granules to the base layer, as well as likely traces of missing granules. The points of contact contain visible corrugations in the metal surface, indicating the effects of elevated temperatures, possibly achieved by means of a blowpipe that directed heat to a specific location. Also, some of the granules appear to be placed on characteristic bridges which form when chemical solders are used (chemical solders are those consisting in most cases of mineral copper

¹⁸⁸ M. Natuniewicz-Sekuła 2020, 143.

compounds combined with organic adhesives). Adhesion is achieved as a result of a chemical reaction¹⁸⁹.

Another find from grave 605 is a brooch type A.II.43, with a bow made of brass (chemical analysis CL21078). The whole brooch is covered with applications, probably made using a stamping block, and containing a filigree composition¹⁹⁰. Because the colour of the foil is not uniform (ranging from silvery to pale yellow), measurements were taken in several places on the application, as well as at defects that suggest the presence of traces of solder binder. Based on macroscopic observation it was not possible to determine whether we are dealing with *electrum*¹⁹¹ or gold-plated silver foil, and, if the latter is the case, how the gold layer would have been applied. The overall research picture indicates that widespread use of the most impressive mercury amalgams and fire gilding methods in the European *Barbaricum* date back to the turn of the fourth and fifth centuries CE, a much later date than that for Roman workshops¹⁹². Presumably, in earlier centuries, craftsmen from the Wielbark Culture (among others) would have achieved gilding by means of plating or the diffusion method, in which gold foil was applied onto purified silver foil and stamped together. In the next step, both elements were heated at a controlled temperature to fuse them into a flat metal plate¹⁹³. However, another type of amalgam may have been used, made of tin and lead. Such formulations have already been found in the so-called Leiden Papyrus X dated to the third century CE¹⁹⁴. The binder was prepared by melding powdered metals with mercury in appropriate ratios. Owing to its low melting point, the resulting substance was easy to apply and safe to the ornament while providing excellent bonding characteristics. Similar to a gold amalgam¹⁹⁵, the mercury would evaporate when heated, leaving a metal layer behind. One of the analysed areas on the tested brooch was the foot with an adhering foil layer. The position of the samples make it possible to obtain the chemical profile throughout the preserved coating layer (Fig. 68, 69). The first layer covering the brass is an organic substance visible as carbon peaks. Presumably, this was a kind of tar or rosin intended to stiffen the silver foil and to hold in place. On the surface of the silver layer, an under-layer of tin

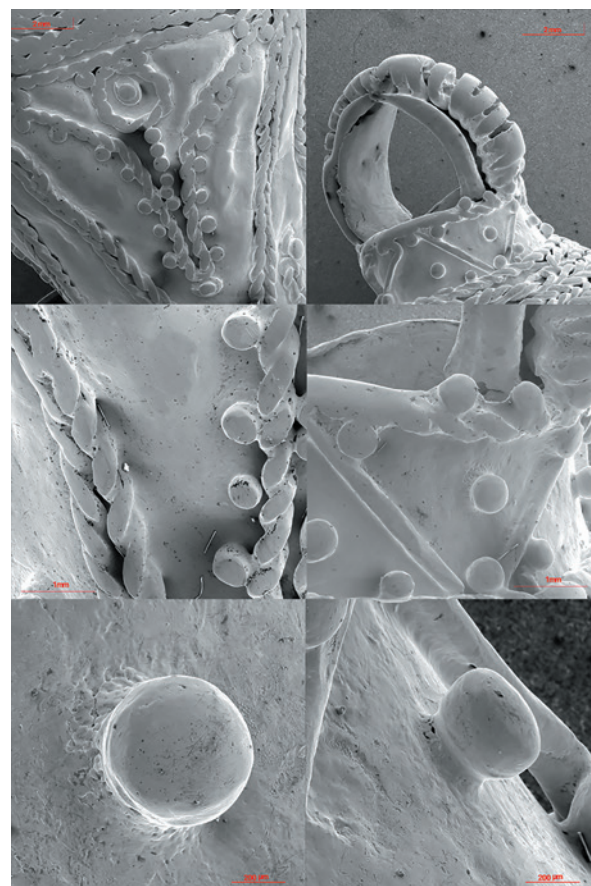


Fig. 67. Weklice, grave 605. Gold pear-shaped pendant.
Photo: P. Gan

was identified, most likely a remnant of the amalgam in question. This functioned as a kind of solder used to apply the surface layer of gold foil. Both coatings in the sampled area has a very similar thickness of about 0.20 mm, with a total thickness of about 0.55 mm including the binders. This offers evidence of the use of amalgams as described above¹⁹⁶.

A brooch bow crest with damaged foil was analysed next. The analysis revealed a uniform layer of tin underneath the fractures. Surface tests of the foil primarily showed variability in gold and silver content, depending mainly on the pattern created on the application, with convexities showing increased silver content (Fig. 70). A similar pattern was detected in the third analysed area, i.e. in the upper part of the brooch bow (Fig. 71). Surface analyses showed a variable Ag to Au ratio caused largely by the uneven surface structure of the application, reflecting the filigree model and the gradual

¹⁸⁹ J. Strobin 1998, 127–128.

¹⁹⁰ J. Strobin 2015, 181–182.

¹⁹¹ Gold and silver alloy (silver content: 8% to 30%), cf. M. Natuniewicz-Sekuła 2020, 42.

¹⁹² J. Strobin 2015, 183, 186.

¹⁹³ J. Strobin 2007, 678; A. Oddy 1993, 176.

¹⁹⁴ J. Jensen 2008, 19–23, 44.

¹⁹⁵ For more information about the fire gilding technique, see S. Safarzyński 2011, 263–264.

¹⁹⁶ For more information about other finds of possible amalgams of tin and lead in the Wielbark Culture, see Ł. Kowalski *et alii* 2017, 376; J. Strobin 2015.

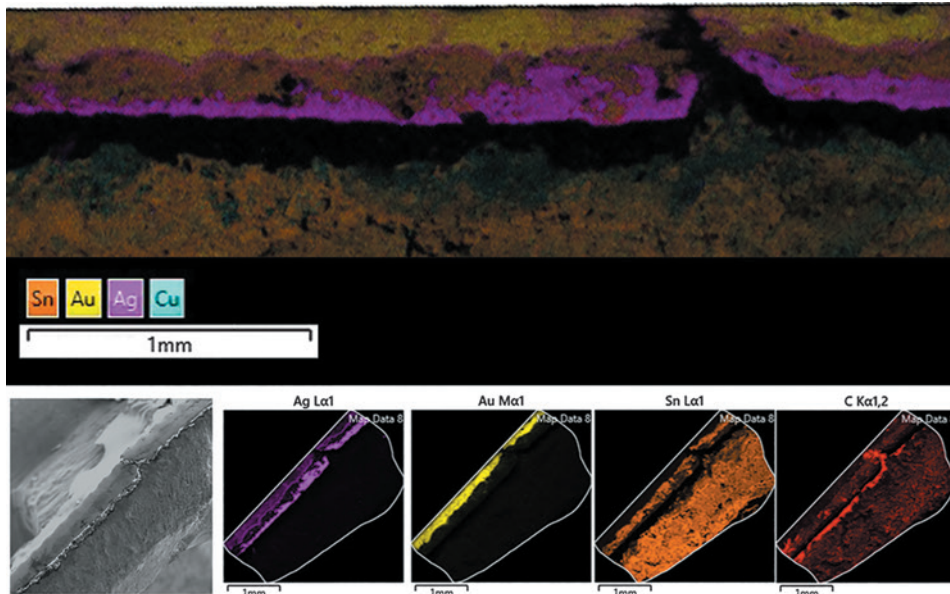


Fig. 68. Wekllice, grave 605. Brooch A.II.43. First analytical area: distribution of gold, silver and tin content on the foil. Photo: P. Gan

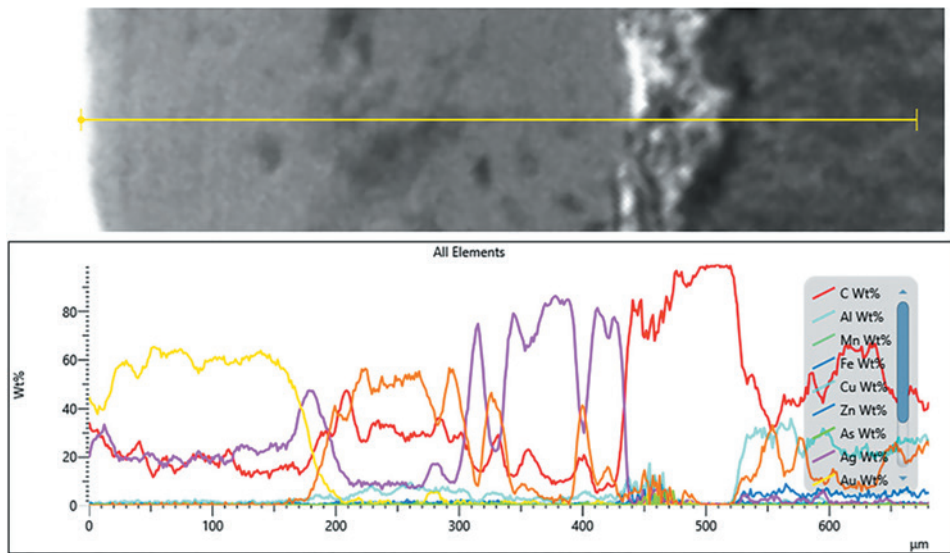


Fig. 69. Wekllice, grave 605. Brooch A.II.43. First analytical area: variability of gold, silver, tin and coal content identified in the cross-section of the foil. Photo: P. Gan

wear of the coating layers. Mapping and analysis showed that the foil had a corrugated distribution.

A type A.VI.161-162 crossbow brooch is another instance of the use of gold. This is a stray find (chemical analysis CL 21074; Fig. 72) made of fine silver with the addition of tin. The brooch was finished with gold foil applied onto where wire was wrapped around the bow. Analyses have shown that fine gold was used, with silver as the only additive in the alloy. However, the coat is thin, and because electrons penetrate deep into the item, the actual reading (15% silver) is probably a strong

overestimation. Linear analysis indicated that the gold coating has a varying thickness. This depends on the shape of the ornament and the extent of wear and tear.

Two more brooches were made of a silver alloy, a spring-cover brooch type A.II.40-41 from grave 595 (chemical analysis CL21071) and a knee-shaped brooch group A.V, series 9 from the richly equipped grave 605 (chemical analysis CL21082). Fine silver was used in both (94–96%), with copper and lead additives designed to increase the mechanical strength of the product. The resulting highly malleable alloy

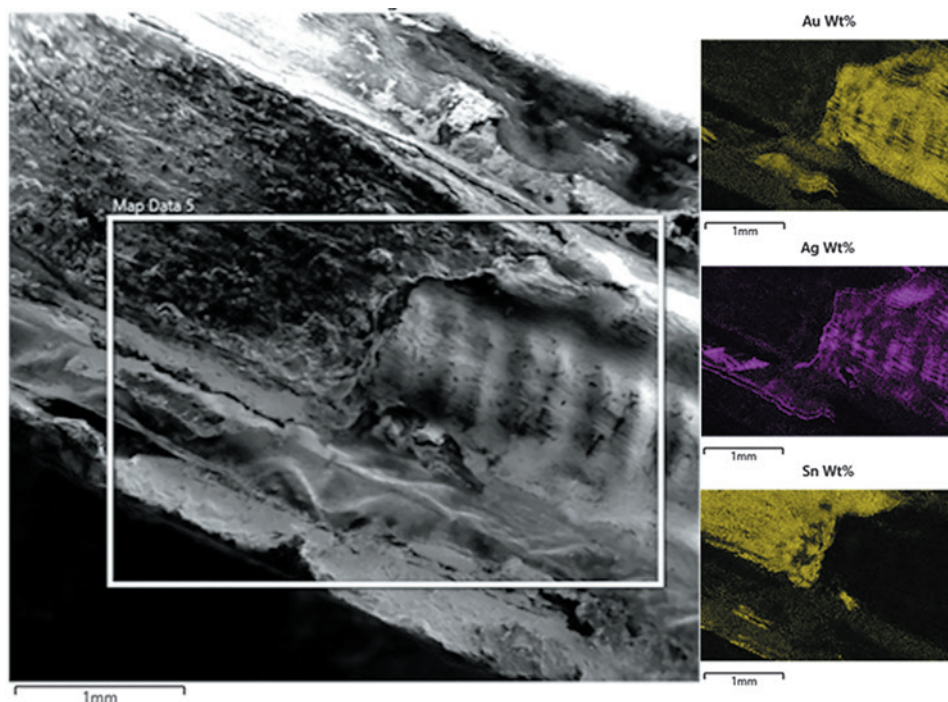


Fig. 70. Weklice, grave 605. Brooch A.II.43. Second analytical area on the crest. Mapping of tin solder binder and foil residue. Photo: P. Gan

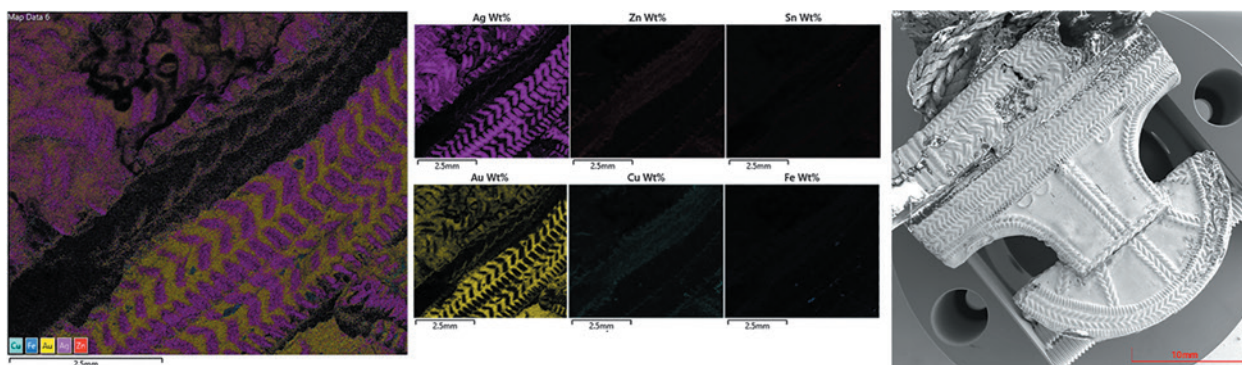


Fig. 71. Weklice, grave 605. Brooch A.II.43. Third analytical area. Photo: P. Gan

was ideally suited for making brooches. Such shapes were usually die-forged from pre-cast bars and surface-finished.

The last silver item in the set is a rivet from grave 596 (chemical analysis CL21072). Both the rivet head and the substance that fills the rivet were analysed. Additionally, analysis was done on the likely fragments of solder binder from an analogous rivet found in the same grave and separated during conservation (chemical analysis CL21073). The rivet was made of fine silver (92%) with the addition of copper, aluminium and lead. However, analysis of the solder binder shows highly consistent results, with alloys containing about 40%

of tin and silver with the addition of copper, sulphur, lead and aluminium.

The analysed items made of copper alloys (five brooches, four belt fittings, fittings from two wooden buckets, two buckles and a bucket-shaped pendant) showed no patterns in terms of different types of materials being selected for different types of items. However, the sample size is small and more research will be needed to compare the results with previously studied items from Weklice. Based on the current state of research, brass and tin bronzes were used to make items throughout the operation of the necropolis. This supports the idea of distinctive practices being involved

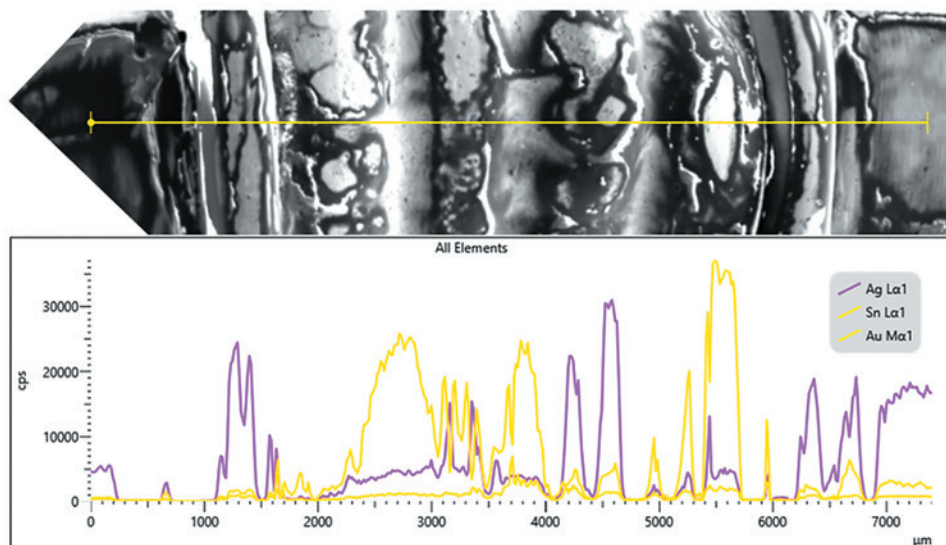


Fig. 72. Wekllice, stray find (catalogue no. 113). Crossbow brooch A.VI.161-162. Linear analysis of the gold foil located on the bow. Photo: P. Gan

in the selection of alloys suited for metalworking and casting. This set includes five brass items, four tin-lead bronze items and six tin bronze items. Within the set of brass items we can additionally distinguish two items made of two-component brass, with an average proportion of zinc (about 8%). The whole set of brasses supplemented with tin and lead additives is characterised by good running quality and malleability. The colour is bright yellow-red, which is not as decorative (golden-coloured) as alloys with about 15% zinc content, which are present in the historic material, as confirmed by the analyses of Wekllice items studied previously¹⁹⁷.

The admixture of tin in tin bronzes ranges from 3.33–21.26%. The lowest tin content was found in a bucket-shaped pendant (about 95% copper). The cylinder, formed out of a thin metal plate with low strength parameters, was made by means of metal forming. The remaining parts of the outfit, containing more than 7.84% tin, are characterised by lower levels of malleability, and become more brittle as tin content increases. Presumably, with the exception of the single brooch type A.VI.161-162 from grave 621 (chemical analysis CL21085), the remaining items were cast. Originally grey-brown in colour, this alloy quickly becomes patinated under natural conditions.

Items made of tin-lead bronze have similar mechanical properties. In addition, the increased lead content (in excess of 4%) has a positive effect primarily on the casting properties. The lower melting point of the alloy makes it possible to achieve more precise forms and to supplement material lost in repeated melting.

The skills and metallurgical expertise of the craftsmen is apparent, among others, in the bipartite rectangular buckle from grave 621 (chemical analysis CL21087). In three measurement areas, a similar percentage of tin content was found, with an increased lead content on the frame; the prong and the attachment were forged out of thin strips of tin bronze.

Notably, lead is almost insoluble in copper and crystallises at the edges of its grains. Because lead solidifies at a lower temperature than copper does, the exact distribution of lead within the alloy's internal structure also depends on the casting method and casting quality. As a result, the layer close to the surface may be particularly saturated with lead.

Another item worth mentioning is the brooch from grave 606 described as being similar to type A.V.126 (chemical analysis CL21084). An analogous part of the equipment from grave 386¹⁹⁸ was described as a brass item with a crest decorated with silver foil and a tin coat preserved on the bow. Both brooches have the same construction but differ in terms of the thickness of the tin coat on the brass bow. As it relates to the crest, remains of silver foil have been identified, surviving as a thin scratch (Fig. 73). The presence of silver is also visible in the composition of the tin solder binder, which is visible on a majority of the crest. Unfortunately, it is difficult to say whether we are dealing with the remains of silver foil fused with the binder, or perhaps the remains of the binder formulation¹⁹⁹.

¹⁹⁸ M. Natuniewicz-Sekuła 2020, 64.

¹⁹⁹ J. Strobin 2007, 674; M. Natuniewicz-Sekuła 2020, 63.

¹⁹⁷ M. Natuniewicz-Sekuła 2020, 50.

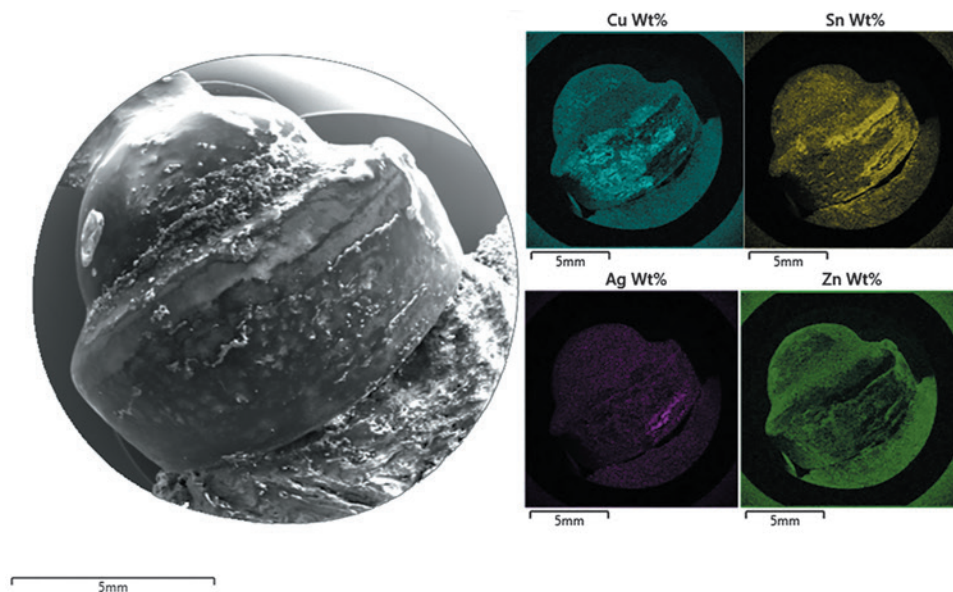


Fig. 73. Wekllice, grave 606. Brooch similar to type A.VI.126. Mapping of the main elements preserved on the crest.
Photo: P. Gan

Another notable item is a Roman provincial brooch with enamel made of tin-lead bronze with a large addition of zinc, similar to group III.48 according to Kurt Exner²⁰⁰ (chemical analysis CL21079, Fig. 74). The circular ring of the brooch is decorated with 20 alternating fields of yellow and red enamel. The individual fields have different sizes and clear boundaries (Tab. 29). The thickness of the bow ring slightly exceeds 1 mm. The enamel was obtained from a sodium-calcium-silicon (red) and sodium-lead-silicon (yellow) ash glass. The main colouring agents were iron and copper oxides, and, for the yellow colour – antimony and lead. Lead and tin were also responsible for adding opacity to the glass mass. The lead content could also facilitate the application of enamel by serving as a kind of solder, thus eliminating tensions between the enamel and the base and by lowering the melting point.



The analyses of items from the Wekllice cemetery were aimed at expanding available information on goldsmithing in the Wielbark Culture. Without a doubt, the rich variety of decorative items, instances of different techniques, especially filigree and granulation, as well as different methods for attaching applications confirm that the community's goldsmiths had considerable talents and practical skills.

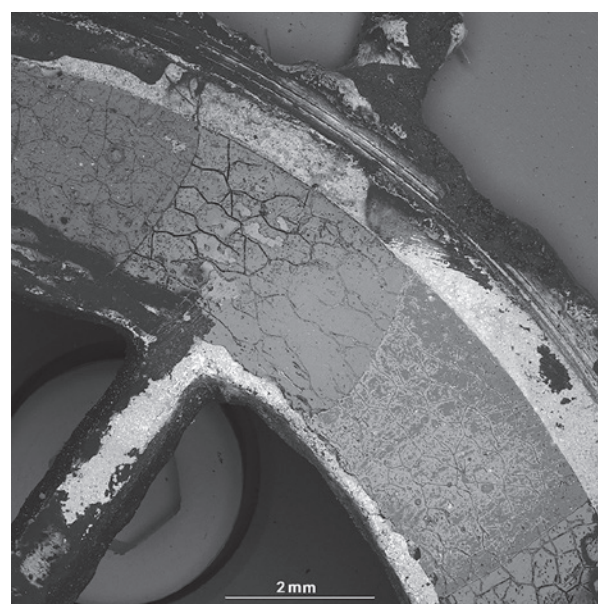


Fig. 74. Wekllice, grave 605. Roman provincial brooch with enamel. Areas of chemical analysis and visible boundaries between enamel fields. Photo: P. Gan

²⁰⁰ K. Exner 1941.

Tab. 28. Weklíce. Results of chemical composition tests of items made of gold, silver, copper alloy along with analyses of solder binders. Results are stated in % by weight; 0.00 – means that the content of that element was below the method's threshold of detectability. Compiled by: P. Gan

Chemical analysis number CL	Grave/Cat. no.	Item	Cu	Al	Si	Ti	Cr	Mn	Fe	Ni	Zn	As	Ag	Sn	Sb	Pb	Au	S	P	Dating	Metal type
21068	579(462)/25	bucket fitting	77.61	0.21	0.09	-	-	0.00	0.20	0.00	10.10	0.16	0.10	8.77	0.39	2.13	0.00	0.02	0.21	stadium IVB	brass
21069	592C/1	bucket shaped pendant	95.12	0.18	-	-	-	0.00	0.29	0.00	0.00	0.28	0.03	3.33	0.34	0.25	0.00	0.19	-	stadium IVB	tin bronze
21070	595/4	belt strap end, type similar to Raddatz O15, ML type 2, form 6	85.74	0.03	0.06	0.00	0.05	0.06	0.45	0.02	5.63	0.00	0.15	3.85	0.32	3.64	0.00	-	-	stadium IIIB/IVA	brass
21071	595/1	spring-cover brooch A.II.40-41	1.67	-	0.22	-	-	-	0.26	-	-	-	96.21	-	-	1.25	-	0.39	stadium IIIB/IVA	silver	
21072	596/7-8	rivet, head	3.31	1.79	0.26	-	-	0.00	0.03	-	-	-	92.67	-	-	1.50	0.00	-	stadium V	silver	
21072		rivet, inside	4.03	7.20	0.86	-	-	0.00	0.70	-	-	-	43.26	39.37	-	2.31	2.28	-	stadium V	solder binder	
21073		rivet, binder	4.91	5.49	1.14	-	-	0.00	1.23	-	-	-	-	46.87	35.36	-	2.29	2.81	-	stadium V	solder binder
21074	stray find/113	crossbow brooch A.VI.161-162, bow	2.50	0.00	0.00	-	-	0.00	0.56	0.00	0.00	0.00	90.59	6.35	0.00	0.00	0.00	0.00	0.00	stadium V	silver
21074		crossbow brooch A.VI.161-162, foil	-	-	-	-	-	-	-	-	-	-	15.28	-	-	-	84.70	-	-	stadium V	gold
21075	600/5	bucket fitting	90.44	-	-	-	-	0.00	0.06	0.15	0.00	0.00	0.00	7.84	0.12	1.40	0.00	-	-	stadium IVB	tin bronze
21076	600/1	belt strap end, type Raddatz JIV1, ML type 9, form 3	83.80	0.09	0.20	0.00	0.00	0.00	0.04	0.00	0.00	0.30	0.00	10.46	0.13	4.65	0.00	0.33	0.00	stadium IVB	tin-lead bronze
21076		belt strap end, type Raddatz JIV1, ML type 9, form 3, binder on the attachment	13.24	0.39	1.62	0.00	0.00	0.00	0.79	0.00	0.00	0.00	0.00	78.08	0.00	3.97	0.00	1.92	0.00	stadium IVB	solder binder/coat
21077*	605/69-69a	Au coat on fragment of wooden item	2.89	14.70	12.80	-	-	0.03	3.50	-	0.00	0.00	6.38	0.54	1.98	6.23	44.90	-	-	stadium IIIA/IIIB	gold

Chemical analysis number CL	Grave/Cat. no.	Item	Cu	Al	Si	Ti	Cr	Mn	Fe	Ni	Zn	As	Ag	Sn	Sb	Pb	Au	S	P	Dating	Metal type
21078	605/2	brooch A.II.43, bow	90.14	0.13	0.11	-	-	0.00	0.23	0.00	8.09	0.04	0.00	0.72	0.16	0.39	0.00	-	-	<i>stadium</i> IIIA/IIIB	brass
21078	605/2	brooch A.II.43, foil Au, analytical area 1	1.51	0.19	0.00	-	-	0.21	0.32	-	0.34	0.04	34.32	0.98	0.00	0.00	62.10	0.00	0.00	<i>stadium</i> IIIA/IIIB	gold
21078	605/2	brooch A.II.43 foil Ag, analytical area 1	4.51	0.58	0.00	-	-	0.01	0.62	-	0.74	0.11	69.84	23.58	0.00	0.00	0.00	0.00	0.00	<i>stadium</i> IIIA/IIIB	silver
21078	605/2	brooch A.II.43, foil Ag and Au, analytical area 1	5.30	0.00	0.00	-	-	0.00	0.82	-	1.04	0.41	33.93	43.94	0.00	0.00	14.55	0.00	0.00	<i>stadium</i> IIIA/IIIB	solder binder/ coat
21078	605/2	brooch A.II.43, foil from the surface, analytical area 2	7.74	0.06	0.35	-	-	0.00	0.38	0.00	0.69	0.00	23.34	2.55	0.00	0.00	63.39	0.00	1.50	<i>stadium</i> IIIA/IIIB	gold
21078	605/2	brooch A.II.43, foil edge, analytical area 2	4.74	1.47	2.64	-	-	0.07	1.11	0.00	0.00	0.00	88.39	0.40	0.00	0.46	0.00	0.73	<i>stadium</i> IIIA/IIIB	silver	
21078	605/2	brooch A.II.43, binder, bow edge, analytical area 2	24.80	1.93	3.18	-	-	0.12	2.09	0.00	1.64	0.49	3.02	51.76	0.00	0.00	2.28	0.94	7.75	<i>stadium</i> IIIA/IIIB	solder binder
21078	605/2	brooch A.II.43, binder, analytical area 2	8.17	0.69	2.32	-	-	0.00	0.89	0.00	0.83	0.37	6.29	76.04	0.00	0.00	1.39	0.00	3.00	<i>stadium</i> IIIA/IIIB	solder binder
21079	605/4	Provincial Roman brooch, similar to group III.48 acc. to K. Exner	74.52	0.00	0.00	0.00	0.00	0.01	0.61	0.08	6.61	0.00	0.00	9.11	0.29	8.77	0.00	-	-	<i>stadium</i> IIIA/IIIB	tin-lead bronze
21080	605/9	pear-shaped pendant	1.87	-	-	-	-	0.00	0.29	-	0.00	0.00	4.60	0.00	0.00	-	93.20	-	-	<i>stadium</i> IIIA/IIIB	gold

Chemical analysis number CL	Grave/ Cat. no.	Item	Cu	Al	Si	Ti	Cr	Mn	Fe	Ni	Zn	As	Ag	Sn	Sb	Pb	Au	S	P	Dating	Metal type
21081	605/5	buckle ML G16	70.95	0.42	0.15	0.10	0.00	0.08	0.42	0.11	0.05	2.40	0.24	21.26	1.66	1.72	0.00	0.44	0.00	<i>stadium</i> IIIA/IIIB	tin bronze
21082	605/3	knee-shaped brooch, group A.V, series 9	4.77	0.23	-	-	-	-	0.00	0.00	0.00	0.00	94.09	0.00	0.00	0.90	0.01	-	-	<i>stadium</i> IIIA/IIIB	silver
21083	605/6	belt strap end, type similar to Raddatz III, ML type 5, similar to form 1	82.13	0.07	0.19	0.15	0.00	0.00	0.21	0.01	0.00	0.00	0.20	16.33	0.36	0.35	0.00	-	-	<i>stadium</i> IIIA/IIIB	tin bronze
21084		brooch, type similar to A.V.126, crest, uncleaned metal surface	70.02	1.00	2.47	0.00	0.00	0.00	2.55	0.00	-	0.00	1.62	16.6	0.00	1.96	0.00	2.86	0.93	<i>stadium</i> IIIA	solder binder
21084	606/1	brooch, type similar to A.V.126, crest, binder	30.87	0.49	2.24	0.00	0.00	0.00	2.77	0.00	0.17	0.00	12.70	46.75	0.00	0.55	0.00	0.62	2.86	<i>stadium</i> IIIA	solder binder/ coat
21084		brooch, type similar to A.V.126, bottom part of the bow	89.54	0.00	0.00	0.00	0.00	0.00	0.72	0.00	6.03	0.00	0.00	2.37	0.00	1.32	0.00	0.04	0.00	<i>stadium</i> IIIA	brass
21085	621/1	brooch A.VI.161-162	87.34	0.24	0.05	0.04	0.09	0.00	0.16	0.00	0.00	0.14	0.21	9.40	0.38	1.98	0.00	-	-	<i>stadium</i> V	tin bronze
21087		buckle, type similar to ML G 1, prong	89.45	0.00	0.09	0.00	0.00	0.00	0.12	0.30	0.00	0.00	0.00	9.75	0.00	0.22	0.06	-	-	<i>stadium</i> V	tin bronze
21087	621/2	buckle, type similar to ML G 1, frame	80.50	0.06	0.00	0.17	0.04	0.00	0.30	0.10	0.01	1.17	0.37	11.32	0.06	6.27	0.00	-	-	<i>stadium</i> V	tin-lead bronze
21087		buckle, type similar to ML G 1, attachment	88.02	0.02	0.05	0.16	0.01	0.00	0.12	0.15	0.00	0.16	0.16	10.77	0.26	0.11	0.03	-	-	<i>stadium</i> V	tin bronze

Chemical analysis number CL	Grave/Cat. no.	Item	Cu	Al	Si	Ti	Cr	Mn	Fe	Ni	Zn	As	Ag	Sn	Sb	Pb	Au	S	P	Dating	Metal type
21086	621A/1	belt strap end, type Raddatz III(?), ML type 6, form (?)	89.00	0.06	0.00	0.00	0.06	0.17	0.62	0.00	8.64	0.57	0.21	0.11	0.00	0.57	0.00	-	-	later than <i>stadium</i> V (see dating of grave 621)	brass
21088	622/1	brooch, type similar to A.V.127	84.28	-	-	-	-	0.00	0.41	0.00	1.23	0.17	0.09	6.43	0.18	7.21	0.00	-	-	brooch from <i>stadium</i> IIB/IIC on secondary context; grave from <i>stadium</i> IVB	tin-lead bronze

* Analysis CL21077 (605/69–69a) also determined the following values: Ca 3.87; K 1.06; Mg 1.22.

Tab. 29. Wekllice, grave 605. Results of the chemical composition of the enamel from the brooch. Results are stated in % by weight; 0.00 – means that the oxide content was below the method's threshold of detectability. Compiled by: P. Gan

Enamel colour	Na ₂ O	MgO	Al ₂ O ₃	SiO ₂	P ₂ O ₅	SO ₃	Cl	K ₂ O	CaO	TiO ₂	MnO	Fe ₂ O ₃	CuO	ZnO	As ₂ O ₅	SnO	Sb ₂ O ₃	PbO	CoO
red	15.39	2.95	3.50	49.41	1.89	0.00	0.00	1.22	4.77	0.26	0.33	0.79	1.10	0.08	0.03	0.81	0.27	11.19	0.00
yellow	5.02	0.67	4.62	62.20	0.82	0.25	0.00	0.45	2.80	0.11	0.02	0.41	0.24	0.07	0.11	0.33	1.54	19.74	0.04

IV.7. ANALYSIS OF THE CHEMICAL COMPOSITION OF CERAMIC MASS IN BOWL-SHAPED AND VASE-SHAPED VESSELS FROM THE CEMETERY IN WEKLICE (GRZEGORZ CZOPOWICZ)

INTRODUCTION

The following section discusses the analysis of the chemical composition of clay mass used to produce the bowl-shaped and vase-shaped vessels found in 1984–2018. A total of 51 vessels were sampled²⁰¹. The samples were taken from upper bodies or rims, and were analysed using a Prince Gamma Tech X-ray spectrometer and a Tescan Vega scanning microscope²⁰².

The state of preservation of ceramics from the site in Weklice is unsatisfactory. In most instances, only fragments of vessels have been preserved. This is caused by three factors. The first is the poor quality of the ceramics, which were fired at low temperatures. As a result, the ceramic items are very fragile and prone to lamination. Another cause is the long history of agricultural activity at the cemetery site. As a result of deep ploughing²⁰³ (a practice abandoned in the 1960s), many graves were damaged or destroyed, and grave equipment was damaged. The last reason is the geological structure of the location. Glacial clays are only

present in the south-eastern section of the cemetery, where they provided protection from the erosive influence of atmospheric conditions (mainly leaching of material caused by precipitation and water flow in the Elbląg Heights²⁰⁴). Such phenomena had a much greater impact on cremation graves, which were shallower than inhumation graves.

MORPHOLOGICAL ANALYSIS AND CHEMICAL COMPOSITION OF BOWL-SHAPED AND VASE-SHAPED VESSELS

The largest group of vessels from the Weklice cemetery is represented by bowl-shaped forms (groups RW VI, Xa, Xb, XIV, XVIII) and vase-shaped forms (RW IV, XVI). In total, they account for 58% (111 vessels) of all typologically identified specimens²⁰⁵. They are present in phases II–VI of the use of the cemetery, with the exception of phase I (*stadium* IA and IB), which is synchronised with interregional phase B₁ and sub-phase B_{2a} of the Roman Period²⁰⁶. Due to high incidence and long duration of use, the analysis could be assumed to yield reliable results.

²⁰¹ The analyses of chemical composition were funded by an NCN (National Center of Sciences) grant (2013/11/D/HS3/02473). Fragments of vessels obtained during excavations in the years 1984–2013 were analysed.

²⁰² The analyses were carried out in the Laboratory of Bio- and Archaeometry of the Institute of Archaeology and Ethnology of the Polish Academy of Sciences.

²⁰³ The earliest traces of ploughing in the cemetery area were captured at the bottom of layer [80], which is dated back to the Middle Ages. The oldest materials from this (bottom) layer come from the ninth century.

²⁰⁴ More on the geomorphology of the cemetery, cf. M. Natuniewicz-Sekuła, J. Okulicz-Kozaryn 2011, 13–15.

²⁰⁵ Cf. Tab. 36 in subsection IV.8. in this volume.

²⁰⁶ The dating follows the internal chronology system of the cemetery (cf. M. Natuniewicz-Sekuła, J. Okulicz-Kozaryn 2011, 125–133; M. Natuniewicz-Sekuła 2020, 15–31 and Tab. 1 in section III of this volume).

GROUPS OF ANALYSED VESSELS

Vases (RW IV)

Vessels of this group are present mainly in cremation graves (616/1)²⁰⁷, mostly urn burials graves, where such vessels were used as urns (41/1, 68/1, 78/1, 85/4, 98/1, 103/1, 109/3, 111/123AB/[1], 146/149/[2], 169/1, 179A/190/190A/[2], 194/3, 226/1, 232/1, 235/1, 242/1, 244/2, 281/1, 284/1, 291/294/295/[1], 296/1, 357/5, 374/10, 444D/1, 449/458/[1], 450/1, 499/2, 529/2, 573/1, 585(290A)/1, 630/1). In three instances (23/2, 539/19, 555/6), we are dealing with inhumation graves. The colour of outer surfaces in vessels from this group ranges from brown to black; inner surfaces range in colour from brown to black. Fractures are brighter, mostly grey-brown. Only the vessel from grave 357/5 has a vertically formed rim.

Most vessels have a smooth outer surface; two have polished surfaces (585(290A)/1 and 444D/1). Other forms have a variety of unique surface treatments (smoothing, roughening and a combination of both surface finishing methods). The most common decorative motif involves scored lines along the circumference (nine vessels), usually placed near the transition between the rim and the body. The second method of decoration involved strips pasted onto the surface (six specimens), which were either smooth (284/1) or decorated with oblique incisions (296/1). The strips were placed mainly in the upper part of the vessel's body. A notable decorative pattern is found on the vessel from grave 242/1, where the three ears are connected to the rim at the upper points of attachment, and the lower points of attachment are mounted on a surrounding strip. Eleven vessels lack are undecorated.

Small vases (RW XVI)

Seven vessels (121/122/134/[1]²⁰⁸, 135/2, 145/1, 197/1, 198/199/[1], 286AB/1, 435/1) come from cremation graves, in which they were used as urns. The specimens from the inhumation graves (550/4, 562/50, 563/2) and the vessel from the cremation-inhumation grave 554/9

²⁰⁷ In the system of catalogue references adopted here, the grave number is given first, followed by a slash character and the inventory number. Graves with numbers I–VIII and 9–492 were published in the first volume of the monograph on the cemetery (cf. M. Natuniewicz-Sekuła, J. Okulicz-Kozaryn 2011). Graves with numbers 493 and up are presented in this volume.

²⁰⁸ The numbers of some graves consist of two or three numbers, which are separated by one or two slash characters. In those cases, the reference to the inventory in catalogue number follows the last slash, and additionally it appears in square brackets.

served as additional vessels. The outer surface of the discussed items is always smoothed, usually brown, while the inner surfaces as well as the fractures are lighter, i.e. grey-brown. All specimens from this group are distinguished by an out-turned rim. Four vessels (135/2, 145/1, 197/1, 435/1) have X-shaped ears with an upper attachment point connected to or just below the rim (distance to the edge of the rim is between 0.5 and 2.5 cm).

Bowl-shaped vessels (RW VI)

Vessels classified in this group come mostly from cremation graves (29/30/[6], 56/1, 98/1, 108/1, 120/2, 151/1, 166/1, 186/187/[1], 211/2, 214/1, 215/4, 237/1, 263/1, 300B/1, 300C/1, 310/1, 341/1, 359/3, 408/417/439/[1], 412/2, 418/1, 437/1, 464/1, 544/2, 581/1, 626/1), in which they serve as urns. Thirteen items were found in inhumation graves (VI/6, 34/39, 40/5, 200/4, 256/39, 275/86, 302/7, 552/4, 589/4, 592C/3, 609/6, 614/21, 614/22). As a rule, the vessels are brown-grey and brown in colour on the inner and outer surfaces, with dark brown fractures. Individual items are brick red and light grey (263/1 and 302/7). Vessel rims are mostly flared out; in some fewer cases they are nearly vertical and slightly flared out. Those forms have a smoothed outer surface, with the exception of three specimens (237/1, 256/1 and 341/1) which have a smooth rim and a roughened body. In this group, only 10 vessels are ornamented. Ornamental motifs include scored lines along the circumference, varied zigzag patterns or arrangements of triangles and engraved lines. The motifs are diverse and unique, with each vessel having a different decorative pattern.

Bowls (RW Xa and Xb)

RW Xa and Xb vessels were found in inhumation graves (five specimens: I/1, 45/22, 101/4, 257/3, 306/8) and in cremation urn graves (two specimens: 140/1 and 143/2). Their colour is identical on both the outer and the inner surfaces and in the fractures. It is mostly light brown or dark brown. The vessel rims are flared out; no information is available about the shape of the rim of the vessel from grave I, which is only known from a description provided in a publication²⁰⁹. Only the vessel from grave 101/4 is decorated – the ornament consists of three lines of ellipsoidal depressions along the circumference. With the exception of the vessel from grave 257/3, which has a roughened surface, the other specimens have smoothed surfaces.

²⁰⁹ Cf. M. Natuniewicz-Sekuła, J. Okulicz-Kozaryn 2011, 25.

Bowls (RW XIV)

Seven vessels in this group come from inhumation graves (VI/7, 204/2, 530/1, 534/1, 546/7, 609/5, 620/2), and one from a cremation-inhumation grave (625/5). All have flared rims and are dark brown in colour. Seven specimens have smooth surfaces and one (546/7) has a roughened surface. With the exception of one specimen (534/1) with a fragmentarily preserved ornament consisting of engraved lines, those vessels have no ornaments.

Little bowls (RW XVIII)

Vessels belonging to this group were found in inhumation graves (82/8, 383/18, 400/9, 404/3, 423/18, 552/3, 589/5, 621/4), cremation graves (442/1 and 561/2) and cremation-inhumation graves (two vessels from grave 554/7–8). Only in one instance the bowl was used as an urn (561/2). In this group, outer and inner surfaces are predominantly brown and dark brown; fractures are mostly brown.

Two specimens (404/3, 423/18) have straight (vertical) rims. All the bowls have smoothed surfaces. Two vessels are decorated. The specimen from grave 383/18 is characterized by knobs located on the curve of the vessel's body. In its middle section, the second vessel (554/8) has a wide ornamental stripe in the form of obliquely scored lines arranged in triangles, with rows of circles in the middle of the lower part. The whole composition is delineated with horizontal scored lines (one at the top, two at the bottom).

INTERPRETATION OF CHEMICAL COMPOSITION RESULTS

Fragments of upper bodies or rims were tested for chemical composition. The ceramic mass from the vessel curves was also analysed. Each sample was measured three times to obtain reliable results. The analysis took into account the co-occurrence relationships of the following chemical compounds in ceramic mass: Na₂O, MgO, Al₂O₃, SiO₂, K₂O, CaO, TiO₂, Cr₂O₃, MnO, Fe₂O₃, SO₃, P₂O₅, NiO₂, CuO, ZnO, As₂O₃, Cl. The results made it possible to distinguish five technological groups (Tab. 30). One shared feature of groups I, II, III and V is the aluminium to silicon ratio of 1:2.5. Group IV is distinguished by a 1:2 aluminium to silicon ratio and a high concentration of potassium (3.9%) and phosphorus (4.4%).

Technological group I

This group is represented by fragments of a vase (RW IV) from grave 529/2, *stadium* IVA, and a small

vase (RW XVI) from grave 563/2, probably dated to *stadium* IIIA/IIIB. The sample is characterised by a very low iron content in the ceramic mass, i.e. between 1.57% and 4.93%, and a high magnesium content of 2.66–3.92% (Tab. 31).

Technological Group II

This is the largest group. It includes practically all of the analysed vessels (46 out of 51). With the exception of *stadium* I, those are present in all the *stadia* of the cemetery's operation. One characteristic of this group is the high proportion of iron in the ceramic mass, ranging from 10.87% to 17.11% (Tab. 32).

Technological group III

This group was identified on the basis of a single bowl, RW XVIIIIB, from grave 554/8, *stadium* IIIA/IIIB. The chemical composition of the clay mass is similar to group II, however the iron content is lower (9.95%), and the silicon content is higher (57.9%). It is also the only vessel without any copper or zinc content in the mass and with a phosphorus content below 1.1%. This indicates that no plant admixture was used to thin out the clay²¹⁰ (Tab. 33).

Technological group IV

Group IV includes a single bowl-shaped vessel (RW VIB) from grave 418/1 dated to *stadium* IVA. The main distinguishing characteristic of the sample is a higher aluminium to silicon ratio of 1:2. In vessels this ratio amounts to 1:2.5. Secondly, this vessel is characterised by a high concentration of potassium (3.9%) and phosphorus (4.4%) (Tab. 34).

Technological group V

This is represented by a single vessel: a bowl (RW XIV) from grave 204/2, *stadium* IVA. A mass with a very high concentration of phosphorus (6.66–6.77%) and copper (5.17–6.11%) was used to produce this bowl. For phosphorus, this value is more than twice that of the other groups (other than group IV). In groups I–IV, copper content does not exceed 0.87%. The specimen was additionally tested to show that the phosphorus and copper are evenly distributed in the vessel (outer and inner surfaces, body curve). This even distribution of elements is natural and rules out the possibility that the high

²¹⁰ Ł. Kowalski 2014, 277.

concentration of phosphorus and copper was caused by any deliberate patterns of use (Tab. 35).

CONCLUSIONS

The analyses did not reveal any relationship between the shape of the vessel and the composition of the ceramic mass. Most forms (technological group II) were most likely made from clay originating from the same source and involved the use of similar admixtures. Individual vessels (technological groups I, III, IV and V) differ in terms of the chemical composition of the ceramic mass. Owing to an insufficient number of analyses, it is not possible to show unequivocally why this is the case.

Possible causes include using an alternative clay source, using different admixtures or perhaps the vessels being made outside the area inhabited by the population that used the cemetery. One characteristic of the vessels from Wekllice is their high aluminium content, which affects the high plasticity and flexibility of the ceramic mass²¹¹.

The fact that the chemical composition of most of the tested vessels is virtually identical indicates that the same clay deposit and the same admixtures, most likely of local origin, were used for bowl-shaped and vase-shaped forms. New light can only be shed on this issue by studying the chemical composition of the remaining vessels, as well as other, yet undiscovered vessels from the area of the Wekllice settlement.

²¹¹ H. Stoksik 2007; D. Riegert, K. Konopka, U. Kobylińska 2012, 105.

Tab. 30. Wekllice. Range of content values for different oxides in groups of ceramic mass samples (percentages); 0.00 indicates oxide content below the method's detectability threshold. Compiled by: G. Czopowicz

Groups	Na ₂ O	MgO	Al ₂ O ₃	SiO ₂	K ₂ O	CaO	TiO ₂	Cr ₂ O ₃	MnO	Fe ₂ O ₃	SO ₃	P ₂ O ₅	NiO ₂	CuO	ZnO	As ₂ O ₃	Cl
I	0.58-1.10	2.66-3.92	22.62-26.08	56.25-59.69	2.04-3.53	0.87-1.51	0.00-1.57	0.00-0.17	0.00-0.56	1.57-4.93	0.00-0.21	0.51-2.34	0.24-2.39	0.06-0.87	0.00-1.81	0.00-2.84	0.00-0.08
II	0.80-1.76	1.05-3.30	18.64-25.00	48.10-56.09	2.47-5.34	1.04-2.65	0.77-1.92	0.00-0.37	0.00-0.75	10.87-17.11	0.00-0.43	0.31-3.83	0.00-0.41	0.00-0.57	0.00-0.58	0.00-2.58	0.00-0.13
III	0.46	1.56-1.71	23.33-23.39	57.89-58.03	1.99-2.03	1.25-1.38	0.90-1.07	0.06-0.08	0.00-0.21	9.95-10.00	0.00-0.06	0.73-1.10	0.00-0.19	0.00	0.00	0.92-1.05	0.01-0.12
IV	0.33-0.61	2.43-2.44	23.18-23.50	46.70-47.01	3.81-3.96	2.15-2.69	1.25-1.33	0.00-0.07	0.02-0.07	13.38-14.46	0.00	4.39-4.47	0.00-0.20	0.00-0.15	0.00-0.14	0.48-0.70	0.02-0.08
V	0.03-0.77	1.66-1.68	19.30-19.98	47.43-48.73	3.66-4.08	1.70-1.84	0.71-1.07	0.00	0.00-0.09	10.6-10.61	0.04-0.59	6.33-6.77	0.00-0.05	5.17-6.11	0.23-0.32	0.00-0.40	0.00-0.06

Tab. 31. Wekllice. Technological group I – chemical composition; 0.00 indicates oxide content below the method's detectability threshold. Compiled by: G. Czopowicz

Sample no.	Grave no.	Na ₂ O	MgO	Al ₂ O ₃	SiO ₂	K ₂ O	CaO	TiO ₂	Cr ₂ O ₃	MnO	Fe ₂ O ₃	SO ₃	P ₂ O ₅	NiO ₂	CuO	ZnO	As ₂ O ₃	Cl
18848.01	529	1.10	3.92	23.50	59.03	3.17	0.85	0.00	0.00	0.00	3.34	0.21	0.51	2.39	0.87	0.45	0.62	0.04
18848.02	529	0.78	3.40	22.62	59.50	2.99	1.33	0.00	0.09	0.00	4.93	0.00	1.65	0.25	0.06	0.88	1.43	0.08
18848.03	529	0.58	3.46	23.89	56.25	3.53	0.87	1.57	0.17	0.00	1.57	0.00	2.34	0.78	0.34	1.81	2.84	0.00
18849.01	563	1.10	2.96	26.08	58.75	2.19	1.51	0.73	0.00	0.56	2.48	0.00	2.41	0.24	0.55	0.00	0.44	0.00
18849.02	563	1.10	2.66	25.07	59.69	2.04	0.90	0.56	0.00	0.00	3.73	0.00	1.90	1.44	0.68	0.18	0.00	0.06

Tab. 32. Wekllice. Technological Group II – chemical composition; 0.00 indicates oxide content below the method's detectability threshold. Compiled by: G. Czopowicz

Sample no.	Grave no.	Na ₂ O	MgO	Al ₂ O ₃	SiO ₂	K ₂ O	CaO	TiO ₂	Cr ₂ O ₃	MnO	Fe ₂ O ₃	SO ₃	P ₂ O ₅	NiO ₂	CuO	ZnO	As ₂ O ₃	Cl
18850.01	166	0.90	2.63	19.39	50.06	3.84	1.74	1.62	0.00	0.15	17.11	0.00	0.91	0.19	0.23	0.00	1.23	0.00
18850.02	166	0.68	2.67	20.41	51.77	3.59	1.77	1.27	0.20	0.15	16.28	0.00	0.66	0.00	0.09	0.24	0.23	0.00
18851.01	186/188	0.53	1.71	22.39	56.09	2.64	1.46	1.52	0.05	0.00	11.47	0.00	1.41	0.10	0.00	0.16	0.46	0.01
18851.02	186/188	1.12	2.08	22.01	54.60	2.72	1.63	1.24	0.00	0.14	11.90	0.00	1.37	0.00	0.15	0.00	1.01	0.03
18852.01	200	0.62	2.45	21.15	54.98	3.24	1.49	1.00	0.00	0.00	12.94	0.25	0.80	0.00	0.17	0.28	0.60	0.04
18852.02	200	0.23	2.47	21.37	54.70	3.38	1.49	0.98	0.00	0.08	14.29	0.02	0.58	0.00	0.14	0.21	0.00	0.05
18853.01	211	0.62	2.75	21.02	54.61	3.46	1.81	0.90	0.00	0.00	13.09	0.00	0.96	0.35	0.09	0.33	0.00	0.01

Sample no.	Grave no.	Na ₂ O	MgO	Al ₂ O ₃	SiO ₂	K ₂ O	CaO	TiO ₂	Cr ₂ O ₃	MnO	Fe ₂ O ₃	SO ₃	P ₂ O ₅	NiO ₂	CuO	ZnO	As ₂ O ₃	Cl
18853.02	211	0.54	2.59	21.41	53.10	3.45	1.53	1.04	0.04	0.05	14.20	0.00	0.83	0.13	0.25	0.35	0.42	0.07
18854.01	214	0.80	1.93	21.54	51.48	3.90	1.26	1.29	0.00	0.08	15.17	0.11	2.00	0.05	0.01	0.38	0.00	0.00
18854.02	214	0.52	2.06	22.38	53.18	3.93	1.12	1.14	0.04	0.00	12.85	0.00	2.42	0.31	0.00	0.00	0.00	0.06
18854.03	214	0.57	2.02	22.14	53.28	4.00	1.15	1.30	0.00	0.00	13.17	0.00	1.86	0.22	0.28	0.00	0.00	0.00
18855.01	215	0.25	2.41	23.05	49.09	4.02	1.41	1.13	0.00	0.08	15.11	0.00	1.54	0.08	0.00	0.31	1.46	0.05
18855.02	215	0.30	2.52	24.44	49.32	4.05	1.27	1.30	0.06	0.04	14.46	0.00	1.39	0.00	0.00	0.29	0.54	0.00
18856.01	237	0.61	2.79	21.59	52.44	3.24	1.38	1.16	0.00	0.10	15.16	0.00	0.84	0.00	0.16	0.49	0.00	0.03
18856.02	237	0.70	2.62	21.66	51.79	3.43	1.49	1.38	0.00	0.09	15.94	0.00	0.68	0.00	0.18	0.00	0.00	0.05
18857.01	256	0.75	2.48	18.64	51.15	3.16	2.30	1.20	0.11	0.00	15.48	0.43	3.18	0.00	0.00	0.00	1.00	0.11
18857.02	256	1.04	2.36	19.01	52.15	3.39	2.07	1.31	0.02	0.09	15.06	0.00	3.22	0.00	0.13	0.05	0.00	0.11
18858.01	263	1.16	1.05	22.77	53.67	3.18	1.68	1.52	0.10	0.00	13.98	0.00	0.89	0.00	0.00	0.00	0.00	0.00
18858.02	263	0.73	1.38	22.40	53.54	3.41	1.18	1.24	0.00	0.07	15.04	0.00	0.59	0.09	0.00	0.09	0.27	0.00
18859.01	278	0.59	2.23	22.58	49.38	4.04	1.66	1.29	0.02	0.34	15.18	0.00	1.36	0.00	0.00	0.33	1.01	0.00
18859.02	278	0.18	2.20	21.93	50.32	4.19	1.58	1.08	0.12	0.20	15.54	0.00	1.48	0.10	0.00	0.00	1.08	0.00
18860.01	300B	0.85	2.84	21.56	50.79	3.99	1.83	1.29	0.00	0.00	14.71	0.00	1.03	0.00	0.13	0.00	0.93	0.04
18860.02	300B	0.64	2.64	21.06	51.04	3.60	2.09	1.32	0.00	0.03	14.05	0.19	1.13	0.00	0.43	0.27	1.52	0.01
18861.01	300C	0.53	2.14	22.61	50.55	3.98	1.30	1.32	0.03	0.00	14.81	0.00	1.65	0.16	0.08	0.46	0.37	0.00
18861.02	300C	0.48	2.05	21.87	50.62	3.77	1.47	1.40	0.03	0.07	15.87	0.00	1.52	0.10	0.02	0.28	0.46	0.01
18862.01	302	0.64	2.34	21.61	54.68	2.65	2.38	1.03	0.23	0.56	12.57	0.10	0.75	0.00	0.27	0.19	0.00	0.00
18862.02	302	0.48	2.11	20.91	54.48	2.47	2.65	1.19	0.05	0.75	13.53	0.02	0.96	0.00	0.00	0.35	0.00	0.07
18863.01	310	1.00	2.81	20.86	54.17	3.80	1.95	1.17	0.11	0.00	12.64	0.00	1.03	0.27	0.19	0.00	0.00	0.00
18863.02	310	1.76	2.50	19.69	54.25	3.15	2.18	0.82	0.00	0.29	13.56	0.00	1.38	0.00	0.06	0.23	0.00	0.13
18864.01	341	0.68	2.73	19.46	51.68	3.74	1.34	1.92	0.01	0.17	15.26	0.00	0.69	0.00	0.25	0.15	1.88	0.03
18864.02	341	1.15	2.68	20.33	51.56	5.34	1.20	1.19	0.09	0.00	15.55	0.00	0.88	0.00	0.00	0.00	0.00	0.04
18865.01	359	0.23	2.44	21.05	52.76	3.87	1.82	1.33	0.00	0.05	13.60	0.00	1.06	0.19	0.42	0.23	0.93	0.02
18865.02	359	0.57	2.62	22.27	52.77	3.82	1.87	1.20	0.12	0.16	13.28	0.00	0.82	0.00	0.14	0.37	0.00	0.00

Sample no.	Grave no.	Na ₂ O	MgO	Al ₂ O ₃	SiO ₂	K ₂ O	CaO	TiO ₂	Cr ₂ O ₃	MnO	Fe ₂ O ₃	SO ₃	P ₂ O ₅	NiO ₂	CuO	ZnO	As ₂ O ₃	Cl
18866.01	408/417/439	1.00	2.49	21.20	52.63	3.27	1.98	1.17	0.00	0.05	14.45	0.03	1.30	0.35	0.08	0.00	0.00	0.00
18866.02	408/417/439	0.38	2.25	21.14	52.29	3.85	1.79	1.18	0.05	0.06	14.14	0.00	2.28	0.19	0.13	0.00	0.25	0.00
18867.01	419	0.75	2.63	19.57	53.44	3.24	1.65	1.01	0.21	0.04	15.22	0.14	1.90	0.00	0.20	0.00	0.00	0.00
18867.02	419	0.59	2.73	20.65	54.11	3.14	1.67	0.97	0.20	0.00	14.63	0.00	1.31	0.00	0.00	0.00	0.00	0.00
18869.01	437	0.44	2.78	21.33	51.74	3.30	1.60	0.95	0.09	0.27	14.64	0.00	2.26	0.36	0.00	0.11	0.14	0.00
18869.02	437	0.62	2.59	21.42	52.15	3.40	1.58	1.12	0.00	0.03	14.68	0.00	2.33	0.00	0.07	0.00	0.00	0.01
18870.01	464	0.45	2.59	22.21	51.31	3.29	1.48	1.15	0.00	0.22	14.51	0.00	2.29	0.03	0.25	0.16	0.06	0.01
18870.02	464	0.55	2.49	21.85	50.28	3.28	1.86	0.84	0.12	0.02	14.68	0.04	3.83	0.00	0.01	0.09	0.00	0.05
18871.01	499	0.42	2.66	20.48	54.60	3.49	1.68	1.02	0.16	0.00	14.43	0.00	0.86	0.05	0.12	0.00	0.00	0.02
18871.02	499	0.64	2.49	20.61	54.21	3.40	1.96	0.98	0.00	0.00	13.81	0.00	1.13	0.00	0.28	0.17	0.32	0.00
18872.01	544	0.29	2.38	20.53	55.64	3.29	1.41	1.11	0.00	0.21	14.17	0.00	0.72	0.00	0.00	0.00	0.24	0.02
18872.02	544	0.57	2.29	20.53	54.22	3.55	1.62	1.13	0.00	0.00	14.36	0.00	0.71	0.03	0.00	0.00	0.97	0.02
18873.01	552	0.50	2.25	20.67	51.09	4.20	1.69	0.96	0.00	0.13	15.46	0.00	0.69	0.41	0.43	0.01	1.50	0.00
18873.02	552	0.34	2.86	21.75	53.28	4.62	1.53	1.21	0.12	0.05	13	0.00	0.71	0.00	0.09	0.46	0.00	0.00
18873.03	552	0.41	2.74	22.15	52.76	4.56	1.46	1.03	0.00	0.00	13.30	0.14	0.68	0.26	0.52	0.00	0.00	0.00
18874.01	554	0.77	1.63	20.79	53.59	3.06	1.55	1.23	0.03	0.00	12.90	0.00	3.78	0.00	0.35	0.00	0.27	0.05
18874.02	554	0.49	1.69	23.10	53.35	2.79	1.63	1.44	0.18	0.10	13.16	0.00	2.02	0.00	0.00	0.00	0.00	0.03
18874.03	554	0.71	1.62	24.66	52.94	2.96	1.64	1.22	0.00	0.15	11.94	0.11	1.94	0.10	0.00	0.00	0.00	0.01
18875.01	560	0.34	2.71	23.90	53.11	4.27	1.35	1.22	0.08	0.00	10.99	0.00	1.27	0.00	0.37	0.31	0.00	0.08
18875.02	560	0.59	2.53	23.21	51.95	4.57	1.61	1.44	0.08	0.00	11.83	0.00	1.89	0.20	0.10	0.00	0.00	0.00
18876.01	562	0.76	2.92	21.27	51.81	3.80	1.52	0.98	0.00	0.15	14.35	0.00	1.31	0.00	0.15	0.00	0.88	0.10
18876.02	562	0.83	3.30	21.20	52.75	3.83	1.98	1.55	0.20	0.00	13.08	0.00	1.16	0.00	0.00	0.00	0.02	0.10
18877.01	101	0.59	2.51	20.38	55.14	3.38	1.60	1.08	0.12	0.14	13.92	0.00	0.76	0.00	0.00	0.00	0.00	0.02
18877.02	101	0.34	3.07	20.47	54.40	2.98	1.66	1.23	0.14	0.00	14.04	0.00	1.12	0.00	0.21	0.30	0.02	0.03
18878.01	143	0.51	2.62	21.64	51.98	3.40	1.67	1.19	0.00	0.00	14.68	0.00	1.19	0.18	0.00	0.00	0.91	0.02
18878.02	143	0.55	2.73	21.76	52.18	3.21	1.63	0.97	0.28	0.12	14.32	0.00	1.08	0.25	0.00	0.05	0.78	0.03

Sample no.	Grave no.	Na ₂ O	MgO	Al ₂ O ₃	SiO ₂	K ₂ O	CaO	TiO ₂	Cr ₂ O ₃	MnO	Fe ₂ O ₃	SO ₃	P ₂ O ₅	NiO ₂	CuO	ZnO	As ₂ O ₃	Cl
18879.01	257	0.77	2.70	21.07	52.73	3.51	1.58	1.04	0.07	0.00	14.48	0.00	1.22	0.30	0.44	0.04	0.00	0.03
18879.02	257	0.96	2.78	22.42	52.85	3.47	1.61	1.03	0.19	0.15	12.79	0.00	1.68	0.00	0.00	0.00	0.00	0.06
18880.01	306	0.66	2.49	20.54	54.03	2.86	1.91	0.91	0.15	0.00	15.11	0.00	0.96	0.00	0.00	0.37	0.00	0.01
18880.02	306	0.46	2.48	20.57	54.09	2.90	1.72	0.89	0.23	0.07	13.87	0.20	0.98	0.02	0.14	0.17	1.11	0.08
18881.01	589	0.55	2.72	19.79	53.70	3.43	1.37	1.11	0.20	0.00	14.15	0.00	1.19	0.22	0.01	0.00	1.53	0.03
18881.02	589	0.55	2.51	19.45	54.07	3.59	1.52	1.27	0.08	0.22	13.93	0.00	1.21	0.00	0.00	0.00	1.49	0.10
18882.01	45	1.15	2.41	21.60	54.62	3.10	1.76	1.17	0.00	0.00	13.37	0.00	0.82	0.00	0.00	0.00	0.00	0.00
18882.02	45	0.48	2.56	21.15	55.15	3.41	1.60	1.05	0.00	0.00	13.05	0.00	0.98	0.00	0.00	0.16	0.41	0.00
18883.01	140	0.63	2.31	23.29	51.65	3.77	1.46	0.99	0.00	0.00	14.01	0.00	1.03	0.29	0.00	0.22	0.25	0.10
18883.02	140	0.80	2.69	23.86	50.05	3.89	1.65	1.55	0.00	0.00	13.95	0.00	1.10	0.03	0.32	0.00	0.00	0.10
18885.01	546	0.74	2.52	20.02	54.21	3.27	2.57	1.08	0.03	0.00	14.96	0.00	0.46	0.00	0.00	0.14	0.00	0.00
18885.02	546	0.74	2.68	20.20	54.19	3.13	2.34	1.25	0.37	0.00	14.29	0.00	0.31	0.00	0.24	0.25	0.00	0.02
18886.01	82	0.37	2.70	20.25	54.67	3.53	2.03	1.38	0.00	0.00	13.45	0.01	1.01	0.00	0.17	0.33	0.12	0.00
18886.02	82	0.32	2.87	20.32	55.02	3.42	1.70	1.07	0.00	0.19	14.10	0.11	0.82	0.00	0.03	0.00	0.00	0.02
18887.01	383	0.48	2.77	23.48	49.33	3.83	1.56	1.30	0.08	0.07	14.24	0.00	0.96	0.03	0.06	0.00	1.80	0.00
18887.02	383	0.59	2.62	23.78	50.45	3.75	1.57	1.14	0.06	0.07	14.29	0.00	0.98	0.11	0.00	0.17	0.41	0.00
18888.01	400	0.57	2.95	23.40	52.53	3.40	1.91	0.81	0.13	0.41	12.88	0.00	0.63	0.02	0.11	0.00	0.24	0.00
18888.02	400	0.52	2.39	23.98	49.79	3.46	1.69	0.90	0.01	0.22	14.07	0.00	0.88	0.00	0.40	0.00	1.65	0.05
18888.03	400	0.36	2.40	25	51.16	3.30	1.63	0.83	0.03	0.02	13.60	0.00	0.66	0.00	0.54	0.43	0.00	0.05
18889.01	404	0.29	1.82	23.15	51.21	3.59	1.38	0.77	0.11	0.14	13.96	0.00	1.51	0.18	0.34	0.00	1.46	0.09
18889.02	404	0.81	1.80	24.39	50.63	3.72	1.44	1.15	0.13	0.00	13.62	0.21	1.88	0.00	0.10	0.00	0.00	0.11
18890.01	443	0.65	1.77	22.97	48.10	3.38	1.33	1.32	0.00	0.00	15.37	0.00	1.97	0.30	0.00	0.28	2.58	0.00
18890.02	443	0.36	1.43	23.05	50.32	3.29	1.24	1.23	0.00	0.00	16.17	0.00	2.39	0.09	0.40	0.05	0.00	0.00
18890.03	443	0.43	1.70	22.70	50.40	3.39	1.04	1.06	0.09	0.20	16.89	0.00	1.82	0.00	0.02	0.08	0.14	0.03
18891.01	442	0.50	2.44	21.34	51.66	3.33	1.60	1.09	0.15	0.09	13.79	0.00	1.58	0.30	0.15	0.00	1.96	0.02
18891.02	442	0.63	2.59	21.52	52.48	3.49	1.88	1.22	0.08	0.14	13.96	0.00	1.17	0.00	0.15	0.10	0.58	0.00

Sample no.	Grave no.	Na ₂ O	MgO	Al ₂ O ₃	SiO ₂	K ₂ O	CaO	TiO ₂	Cr ₂ O ₃	MnO	Fe ₂ O ₃	SO ₃	P ₂ O ₅	NiO ₂	CuO	ZnO	As ₂ O ₃	Cl
18892.01	534	0.81	2.71	23.30	51.58	3.92	1.80	1.33	0.27	0.00	13.05	0.00	0.93	0.00	0.08	0.08	0.12	0.02
18892.02	534	0.57	2.59	22.71	51.24	3.89	1.64	1.19	0.03	0.25	13.49	0.00	0.71	0.00	0.57	0.12	0.99	0.00
18893.01	552	0.54	2.56	20.70	54.47	3.88	1.76	1.30	0.00	0.00	13.21	0.00	0.78	0.25	0.13	0.42	0.00	0.00
18893.02	552	0.70	2.35	20.37	54.10	3.75	1.52	1.29	0.01	0.06	13.55	0.00	0.87	0.29	0.00	0.00	1.14	0.00
18894.01	554	0.68	2.12	20.10	51.83	3.63	1.84	1.27	0.13	0.23	13.63	0.00	3.69	0.00	0.43	0.00	0.41	0.00
18896.01	561	0.63	3.09	21.01	51.61	4.16	1.85	1.24	0.00	0.20	14.49	0.00	2.09	0.00	0.00	0.05	0.00	0.02
18896.02	561	0.42	3.17	20.84	50.27	4.17	1.70	1.20	0.11	0.00	15.57	0.00	2.03	0.15	0.38	0.00	0.00	0.00
18897.01	589	0.81	2.48	23.88	53.86	3.28	1.41	1.18	0.00	0.26	10.87	0.00	0.89	0.18	0.29	0.58	0.00	0.03
18897.02	589	0.51	2.25	23.41	53.76	3.65	1.60	1.15	0.17	0.11	12.08	0.00	0.65	0.17	0.18	0.32	0.00	0.00

Tab. 33. Wekllice. Technological group III – chemical composition; 0.00 indicates oxide content below the method's detectability threshold. Compiled by: G. Czopowicz

Sample no.	Grave no.	Na ₂ O	MgO	Al ₂ O ₃	SiO ₂	K ₂ O	CaO	TiO ₂	Cr ₂ O ₃	MnO	Fe ₂ O ₃	SO ₃	P ₂ O ₅	NiO ₂	CuO	ZnO	As ₂ O ₃	Cl
18895.01	554	0.46	1.71	23.33	57.89	2.07	1.38	0.9	0.06	0.21	9.95	0.06	0.73	0.19	0.00	0.00	0.92	0.12
18895.02	554	0.46	1.56	23.39	58.03	1.99	1.25	1.07	0.08	0.00	10.00	0.00	1.10	0.00	0.00	0.00	1.05	0.01

Tab. 34. Wekllice. Technological group IV – chemical composition; 0.00 indicates oxide content below the method's detectability threshold. Compiled by: G. Czopowicz

Sample no.	Grave no.	Na ₂ O	MgO	Al ₂ O ₃	SiO ₂	K ₂ O	CaO	TiO ₂	Cr ₂ O ₃	MnO	Fe ₂ O ₃	SO ₃	P ₂ O ₅	NiO ₂	CuO	ZnO	As ₂ O ₃	Cl
18868.01	418	0.33	2.44	23.50	46.70	3.81	2.15	1.25	0.00	0.02	14.46	0.00	4.47	0.00	0.00	0.14	0.70	0.02
18868.02	418	0.61	2.43	23.18	47.01	3.96	2.69	1.33	0.07	0.07	13.38	0.00	4.39	0.20	0.15	0.00	0.48	0.08

Tab. 35. Wekllice. Technological group V – chemical composition; 0.00 indicates oxide content below the method's detectability threshold. Compiled by: G. Czopowicz

Sample no.	Grave no.	Na ₂ O	MgO	Al ₂ O ₃	SiO ₂	K ₂ O	CaO	TiO ₂	Cr ₂ O ₃	MnO	Fe ₂ O ₃	SO ₃	P ₂ O ₅	NiO ₂	CuO	ZnO	As ₂ O ₃	Cl
18884.01	204	0.77	1.68	19.98	47.43	4.08	1.84	0.71	0.00	0.09	10.61	0.59	6.33	0.05	5.17	0.23	0.40	0.06
18884.02	204	0.03	1.66	19.30	48.73	3.66	1.70	1.07	0.00	0.00	10.60	0.04	6.77	0.00	6.11	0.32	0.00	0.00

IV.8. COMMENTS ON POTTERY MADE USING A POTTER'S WHEEL FROM THE CEMETERY IN WEKLICE (GRZEGORZ CZOPOWICZ)

During archaeological research in Wekllice in 1984–2018, numerous vessels or pottery fragments were discovered in the graves. Based on those finds, 192 forms were identified reflecting the typology of Ryszard Wołagiewicz²¹² (Tab. 36). Particularly noteworthy, however, are specimens produced with the aid of a potter's wheel, which can be divided into two groups.

The first group is local ceramics of the Wekllice type, represented by seven vessels. They are all dated to *stadium* IIIA (six specimens from features: 67/1²¹³, 116/4, 209/4, 212/213/[1], 217/2, 421/444/[1]) and *stadium* IIIB (one specimen from grave 115). Vessel height ranges from 17.0–26.0 cm, rim diameter – 20.0–28.0 cm, maximum body diameter – 23.5–32.0 cm, bottom diameter – 9.7–13.0 cm. One characteristic of this group of ceramic items is the identical chemical composition of the ceramic mass, indicating that the clay used to make the vessels came from a single source, presumably a local one²¹⁴. The Wekllice vessels were formed by hand and shaped on a wheel.

The second group contains imported vessels. Those are represented by three specimens: two from grave 579(462)/21–22 and one from grave 582/4 – all dated to *stadium* IVB. Those specimens are much harder and more well-fired compared to vessels of the Wekllice type.

The vase from grave 579(462)/22 is distinguished by a sharp curve in its body at $\frac{1}{3}$ of the vessel's height. Above the curve, the vessel's body has a cylindrical shape

with slightly tapering walls and is decorated with four grooves. The vessel also has a well-defined neck and a slightly flared rim. The wall thickness ranges from 0.4 cm at the lip and above the body curve to 0.6 cm below the body curve. The vase has a clearly well-defined annular bottom. The vessel is black to brown, has a glossy outer surface, there is also a glossy surface on the inner side between the rim and the first groove. At the curve the vessel is brick-coloured, with a high admixture of very fine sand and medium-sized granite grains.

The closest morphological analogues can be found in sites from the vicinity of the city of Teltow, Potsdam-Mittelmark county in Brandenburg and in Lower Lusatia (Germany). Typologically, it occupies an intermediate position between the Speichrow type and Breslack type (the number and size of grooves suggests the Breslack type, but the vessel morphology above the body curve is closer to the Speichrow type)²¹⁵.

A second vessel from this grave is a bowl with a wide opening (579(462)/21) with a height of 7.3 cm, rim diameter of 18.8 cm, maximum body diameter at the curve of 18.2 cm, and bottom diameter of 7.0 cm. The body curves gently and at a relatively high point, at about $\frac{2}{3}$ of the height of the vessel. Above the curve, the body has a cylindrical shape with a slightly flared rim. Wall thickness ranges from 0.6 cm above the curve to 0.8 cm below the curve. The bowl has a well-delineated annular bottom. The colour is brick-greyish on the outside and inside. The outer surface and the bottom shows traces of the use of a high-speed wheel. The admixture is small and large, mainly consisting of sand. The firing is good,

²¹² R. Wołagiewicz 1993, 12–19.

²¹³ Cf. footnotes 206 and 207 in subsection IV.7. of this volume.

²¹⁴ For more information see: M. Natuniewicz-Sekuła 2005; M. Natuniewicz-Sekuła 2008.

²¹⁵ J. Schuster 2008, 134–135, 142, fig. 6:1–4.

the clay mass is well-fired and hard. The surface of the vessel is rough. The curve of the bowl is grey with visible grains of a fine-grained admixture. The vessel is undecorated. The closest morphological analogues can be found at the sites of the Chernyakhov Culture in Danube areas, including Furmanivka (Фурманівка) in the Odessa region, Ukraine²¹⁶.

The fragmentarily preserved and reconstructed vessel from grave 582/4 is vase-shaped. The colour ranges from dark brown to black (both on the inside and outside), in places it is smoothed and glazed. The curve is brick-coloured. The rim is strongly flared out, there is a strip at the upper base of the body. The diameter of the rim is 20.0 cm, the diameter of the body is 21.6 cm, the diameter of the bottom is 10.0 cm, and the height is 13.6 cm. The stated

height and diameter of the body is based on a reconstruction of the vessel. Given the state of preservation, no unambiguous analogues could be found. However, the remaining grave equipment, which includes, among other things, a brooch similar to type A.VI.161-162, model ZM-103 according to A. Kokowski²¹⁷ (cf. Pl. XCIII:1) indicates that the vessel has a provenance connected to the areas of the Masłomęcz Group or the Chernyakhov Culture.

The presence of vessels made with a wheel in this area of Wielbark Culture settlement testifies to the far-reaching contacts of the population that used the cemetery. On the one hand, vessel shapes found here are made using a local pottery wheel, which is unusual within this culture, but on the other hand, finds include vessels imported from areas of other cultures.

²¹⁶ È.A. Symonovič 1988, 143–163.

²¹⁷ A. Kokowski 1995.

Tab. 36. Differentiation of the forms of ceramic vessels from the Weklisce cemetery discovered in the years 1984–2018.

Compiled by: G. Czopowicz, M. Natuniewicz-Sekuła

RW Group	N	Grave numbers	Height (cm)	Rim diameter (cm)	Max. body curve diameter (cm)	Bottom diameter (cm)	Dating ²¹⁸
I	33	49/1, 77/2, 87/2, 110/1, 129/5, 139/5, 157/180/[1], 160/175/[4], 176/1, 195/1, 206/1, 276/1, 285/1, 286C/1, 320/1, 346/1, 381/1, 391/1, 400/10, 407/414/420/[1], 431/5, 457/1, 506/1, 560/3, 568/1, 571/1, 580/1, 594/3, 622/9, 622/12, 622/13, 623/6, 623/7	18.0–25.0	12.0–20.0	19.0–26.5	9.0–13.0	<i>stadia</i> IIB–V
II	6	65/65A/[2], 73/1, 105/2, 148/1, 297/1, 351/352/355/356/[2]	22.4–24.0	14.8–19.0	20.0–24.2	8.8–9.7	<i>stadium</i> IIIA
III	2	23/2, 179A/190/190A/[2]	20.5–24.5	18.0–20.0	29.0–31.5	12.0–13.0	<i>stadia</i> IIC, IVA
IV	35	23/2, 41/1, 68/1, 78/1, 85/4, 98/1, 103/1, 109/3, 111/123AB/[1], 146/149/[2], 169/1, 179A/190/190A/[2], 194/3, 226/1, 232/1, 235/1, 242/1, 244/2, 281/1, 284/1, 291/294/295/[1], 296/1, 357/5, 374/10, 444D/1, 449/458/[1], 450/1, 499/2, 529/2, 539/19, 555/6, 573/1, 585(290A)/1, 616/1, 630/1	13.6–29.0	14.0–25.0	17.5–32.5	7.3–14.0	phases III–VI
V	4	181/182/[1], 188/1, 474/5, 625/9	24.0–31.0	20.0–21.0	28.0–33.0	11.5–15.0	<i>stadia</i> IA–IIIA
VI	38	VI/6, 29/30/[6], 34/39, 40/5, 56/1, 108/1, 120/2, 151/1, 166/1, 186/187/[1], 200/4, 211/2, 214/1, 215/4, 237/1, 256/39, 263/1, 275/86, 300B/1, 300C/1, 302/7, 310/1, 341/1, 359/3, 408/417/439/[1], 412/2, 418/1, 437/1, 464/1, 544/2, 552/4, 581/1, 589/4, 592C/3, 609/6, 614/21, 614/22, 626/1	7.4–17.0	14.3–24.0	16.4–23.5	7.7–11.5	phases II–V
VII	0	–	–	–	–	–	–
VIII	1	540/2	14.8	12.7	17.8	–	<i>stadium</i> IIIB
IX	0	–	–	–	–	–	–
Xa	4	101/4, 143/2, 257/3, 306/8	6.5–15.5	13–23.5	6.0–25.0	6.0–13.5	<i>stadia</i> IIIA/IIIB–IVA
Xb	3	I/1, 45/21, 140/1	7.5–16.5	16.0–19.4	15.5–24.3	7.8–9.4	<i>stadia</i> IIB, IIIA
XI	0	–	–	–	–	–	–
XII	5	118/18, 331/24, 380/5, 455/45, 608/2	3.5–7.2	3.0–5.0	5.7–6.6	3.2–4.3	<i>stadia</i> IIIA/IIIB, V
XIII	7	45/22, 88/8, 228/8, 261/9, 314/2, 492/9, 631/12	6.3–10.0	6.6–9.0	7.6–9.55	3.3–5.0	<i>stadia</i> IA–IIIB
XIV	8	VI/7, 204/2, 530/1, 534/1, 546/7, 609/5, 620/2, 625/5	8.2–10.0	7.2–8.5	9.3–11.0	9.3–11.0	<i>stadia</i> IIIB–IVB/V
XV	6	100/1, 220/53, 268/7, 466/3, 563/1 579(462)/23	6.0–8.0	5.0–9.0	8.0–11.0	3.0–6.5	<i>stadia</i> IIA–IIC, IVB–V
XVI	11	121/122/134/[1], 135/2, 145/1, 197/1, 198/199/[1], 286AB/1, 435/1, 550/4, 554/9, 562/50, 563/2	9.0–14.5	10.5–14.5	12.5–16.7	7.6–9.4	<i>stadia</i> IIC–IIIB
XVII	9	43/3, 86/21, 174/34, 251/5, 254/8, 287/2, 455/46, 518/3, 595/34	3.5–10.0	4.0–9.3	5.7–10.5	3.5–6.5	<i>stadia</i> IA–V
XVIII	12	82/8, 383/18, 400/9, 404/3, 423/18, 442/1, 552/3, 554/7, 554/8, 589/5, 561/2, 621/4	5.4–7.6	5.0–9.0	7.4–11.8	4.0–4.8	<i>stadia</i> IIIA–V
XIX	0	–	–	–	–	–	–

²¹⁸ Cf. footnote 206 in subsection IV.7. in this volume.

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VI. PLATES

Legend:

different colours and compositions of grave and feature fills

- different patterns of dots and lines representing various fill compositions.

decomposed organics mixed with sand or clay

- patterns of irregular shapes and dots representing decomposed organics.

burnt material mixed with sand or clay

- patterns of irregular shapes and dots representing burnt material.

annealed sand or clay

- uniform dot pattern representing annealed sand or clay.

sand with ash content

- cross-hatch pattern representing sand with ash content.

human bones

- Illustrations of human skull, long bone, and rib.

burnt human bones

- Symbol: three 'x' marks.

small ceramic fragments

- Symbol: three triangles.

large ceramic fragments

- Symbol: irregular shapes representing large ceramic pieces.

charcoals

- Symbol: three diamond shapes.

green discolouration on bones (produced by copper compounds)

- Symbol: three square shapes.

tree trunks

- Symbol: concentric circles representing tree trunk cross-sections.

stones

- Symbol: irregular shapes representing stones.

burnt stones

- Symbol: irregular shapes with diagonal hatching representing burnt stones.

daub

- Symbol: irregular shapes with a stippled texture representing daub.

decomposed wood

- Illustrations of various wood fragments, including a large plank and smaller pieces.

burnt or partially burnt wood

- Illustrations of charred wood fragments.

intersecting graves and features

- Symbol: a solid line with a semi-circular end.

secondary trenches

- Symbol: a dashed line with a semi-circular end.

medieval, modern and contemporary destructions

- Symbol: a line with a series of small triangles along its length.

scale of graves and features

- Scale bar from 0 to 50 cm.

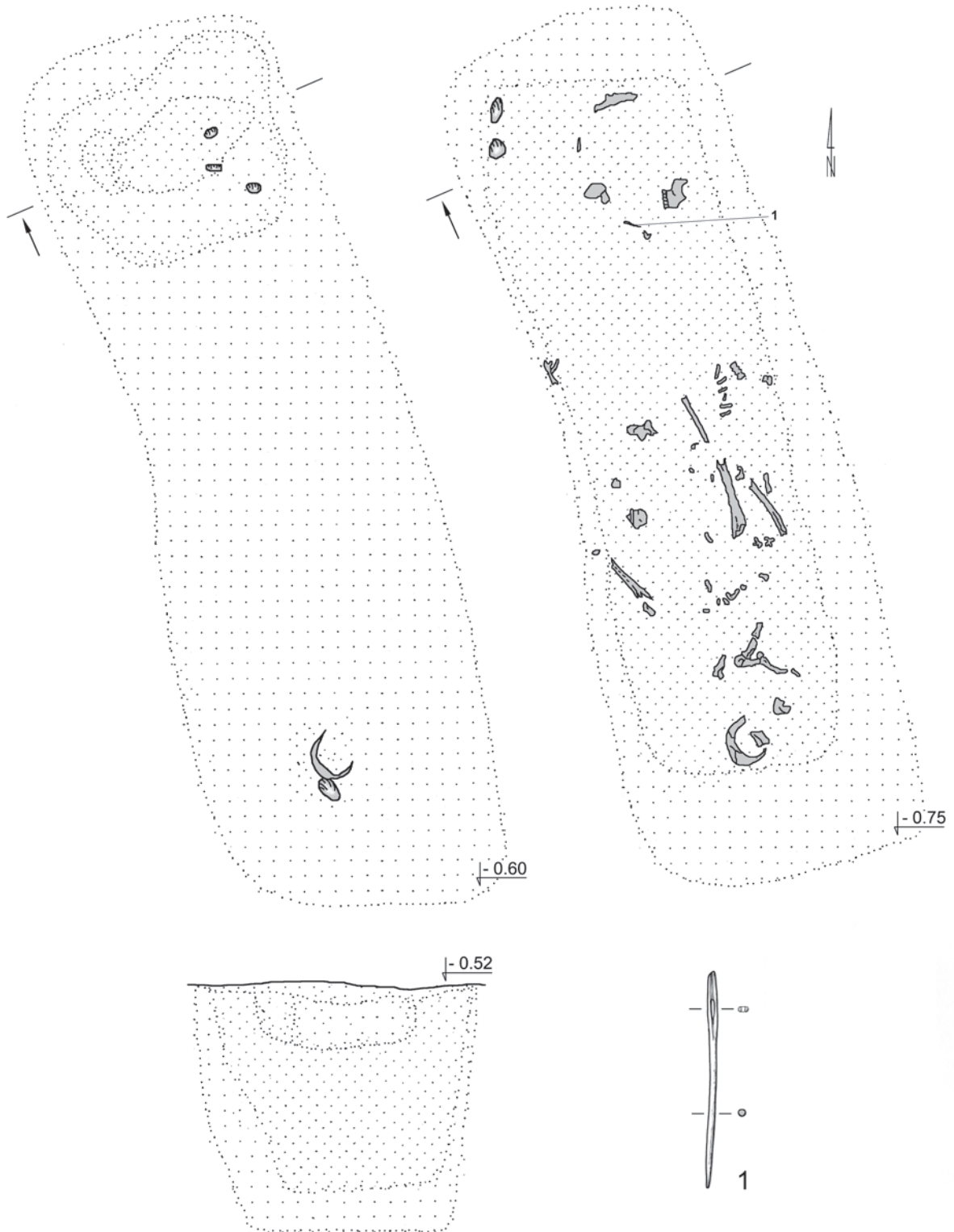
direction of exploration

- Symbol: an arrow pointing upwards.

location spot

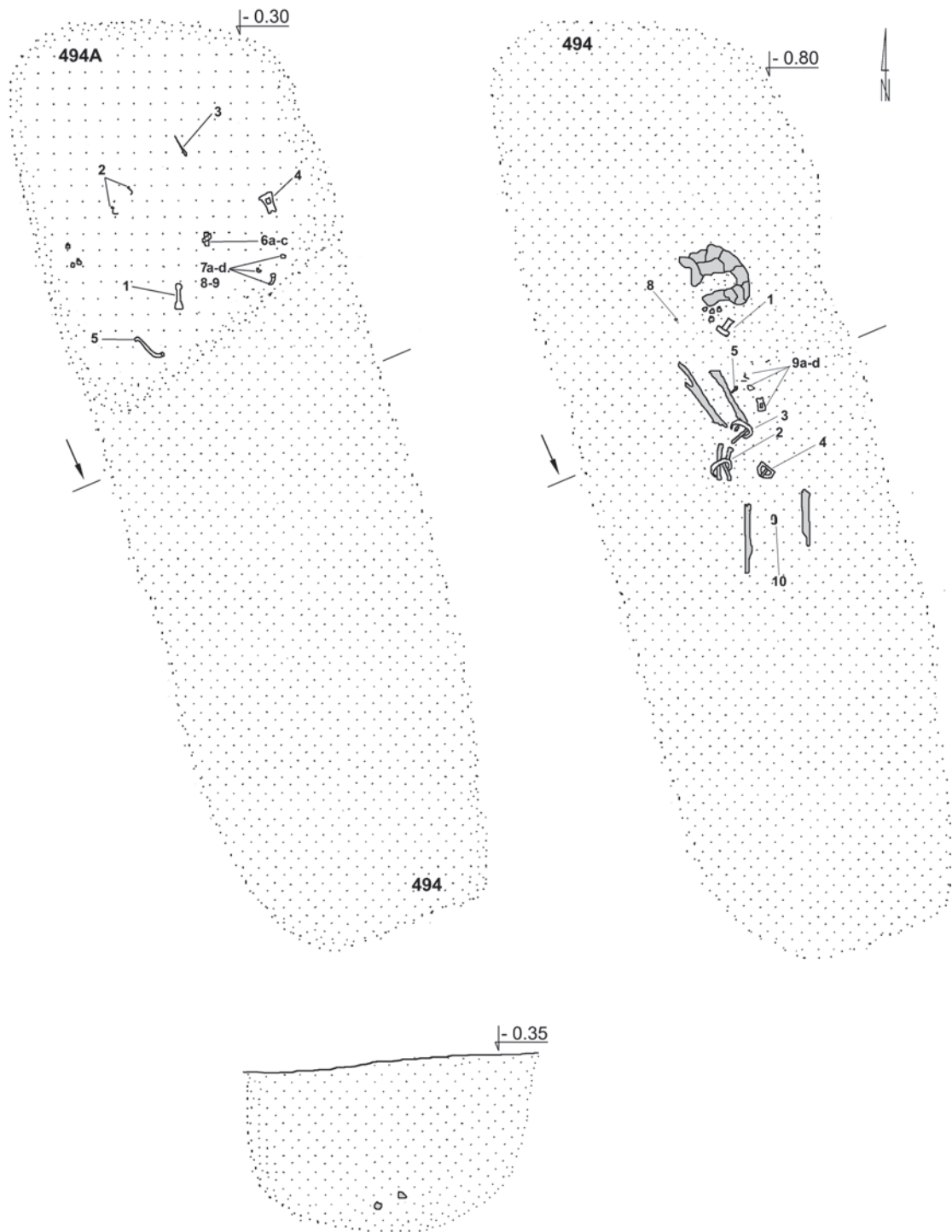
- Symbol: a small square with a dot inside.

Grave 493



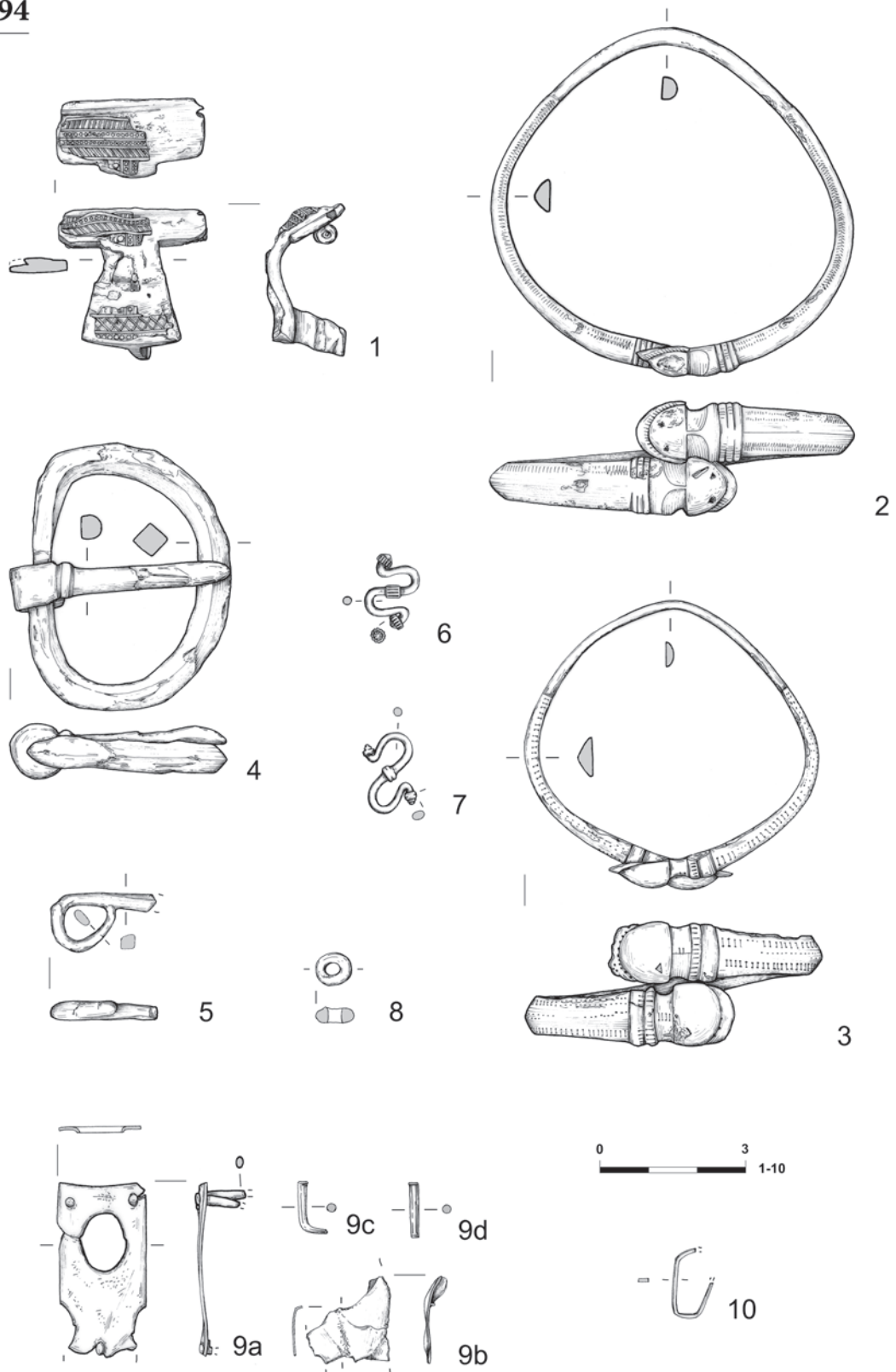
Pl. I. Grave 493: 1 – brass

Grave 494 & Feature 494A



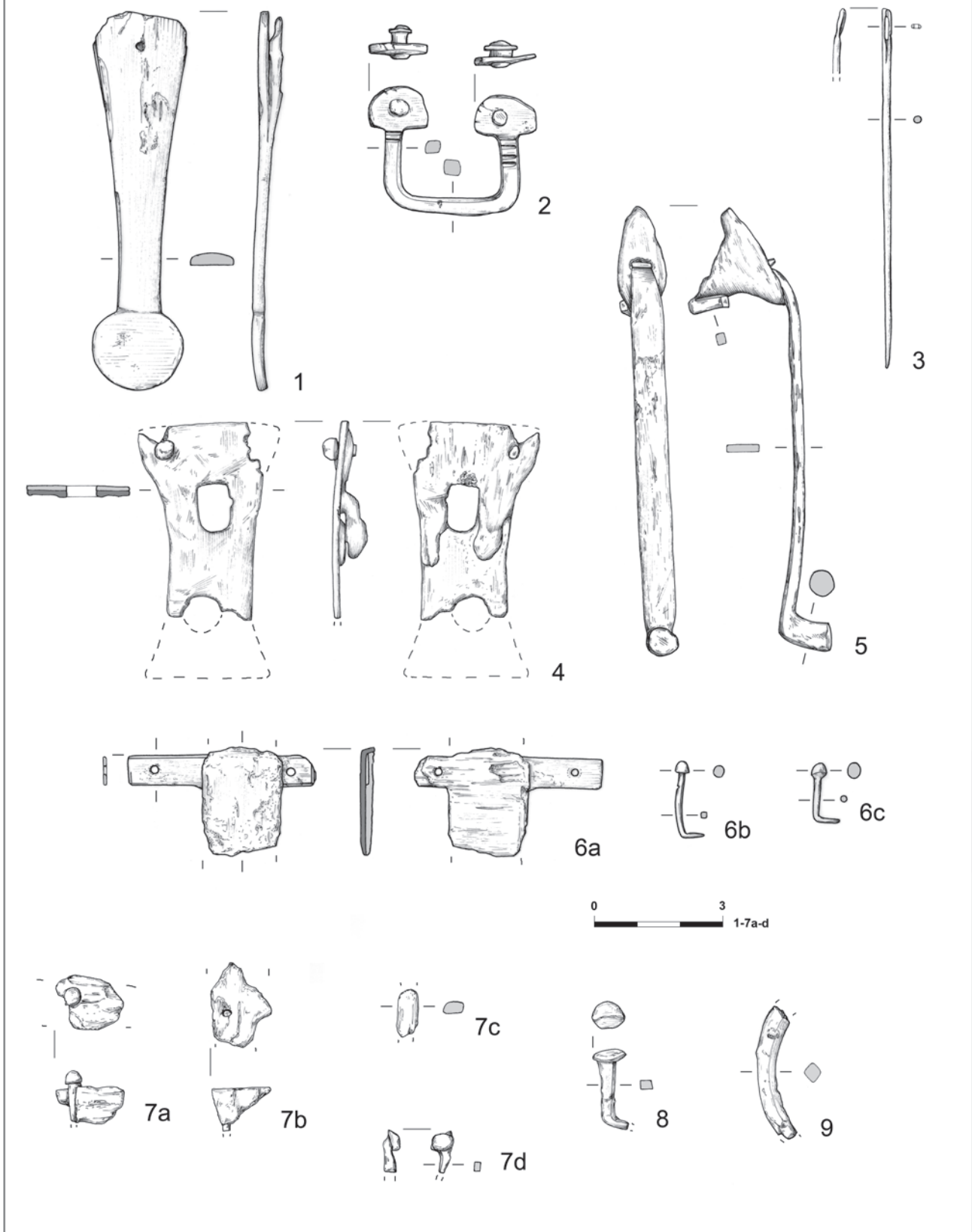
Pl. II. Grave 494 & Feature 494A

Grave 494



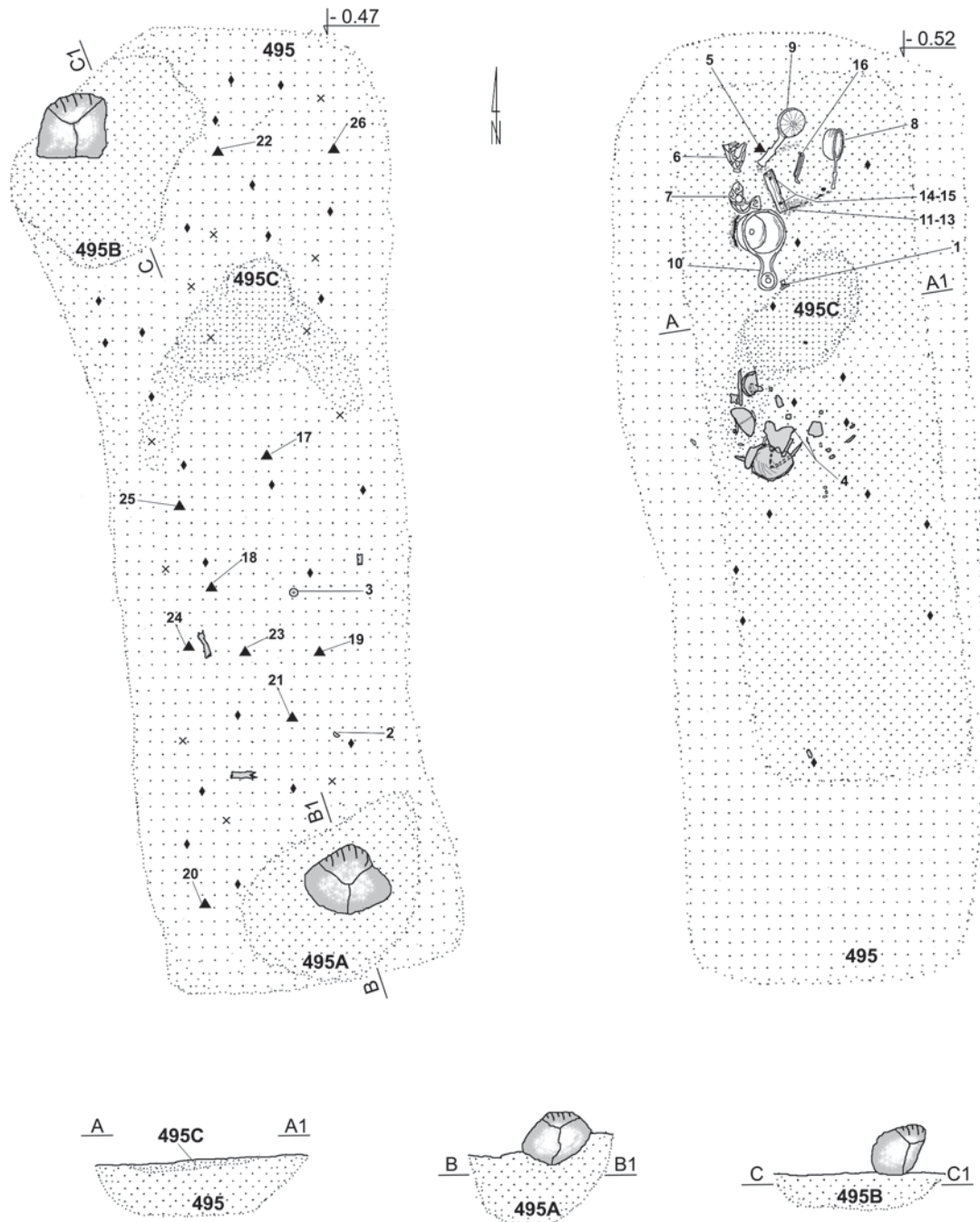
Pl. III. Grave 494: 1 – iron and silver foil; 2,10 – copper alloy; 3,9a–d – brass; 4–5 – iron; 6–7 – silver; 8 – glass

Feature 494A



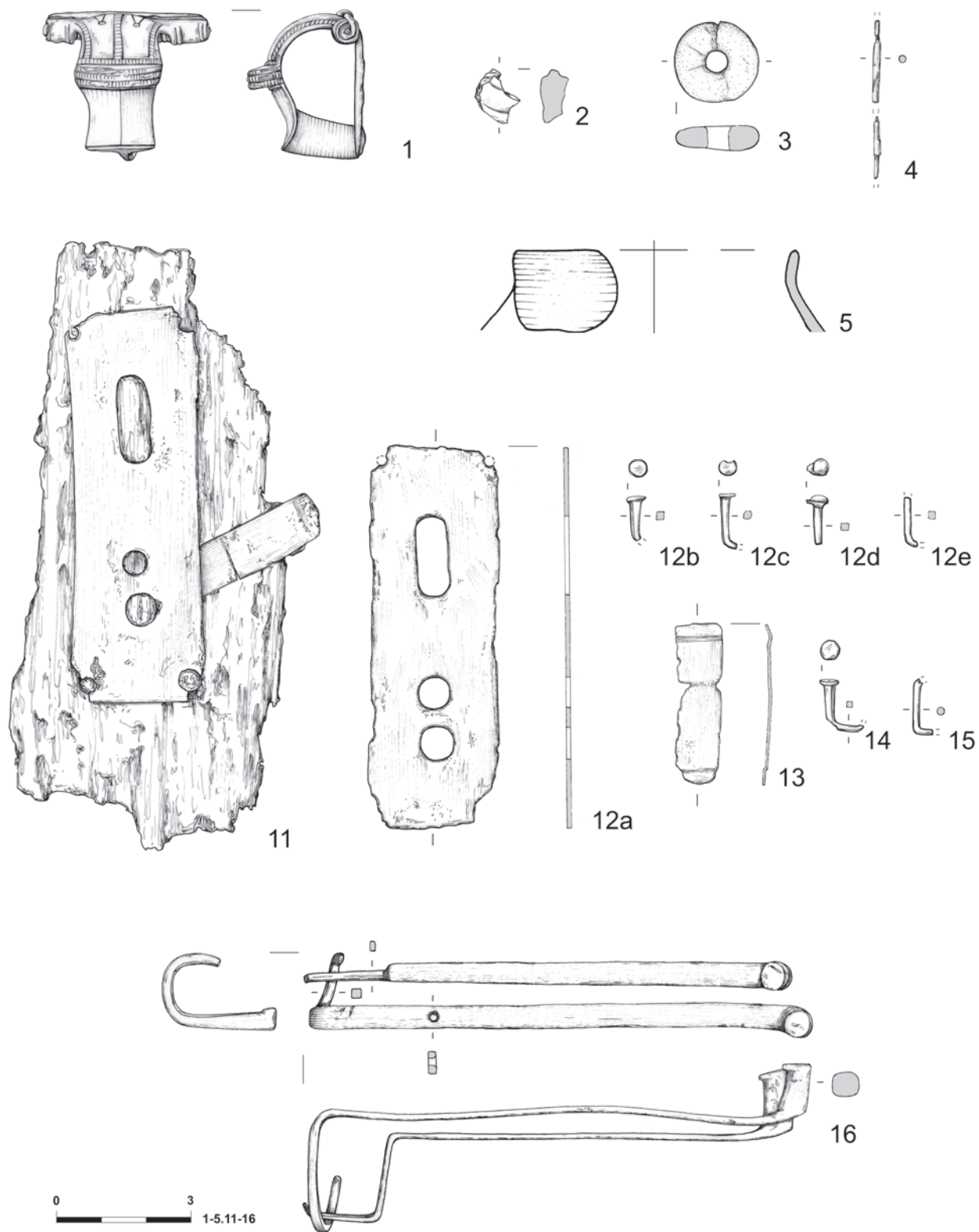
Pl. IV. Feature 494A: 1-2.4-5.7c-d.8-9 - iron; 7a-b - iron and wood; 6a-c - iron, wood and brass; 3 - copper alloy

Grave 495 & Features 495A, 495B, 495C

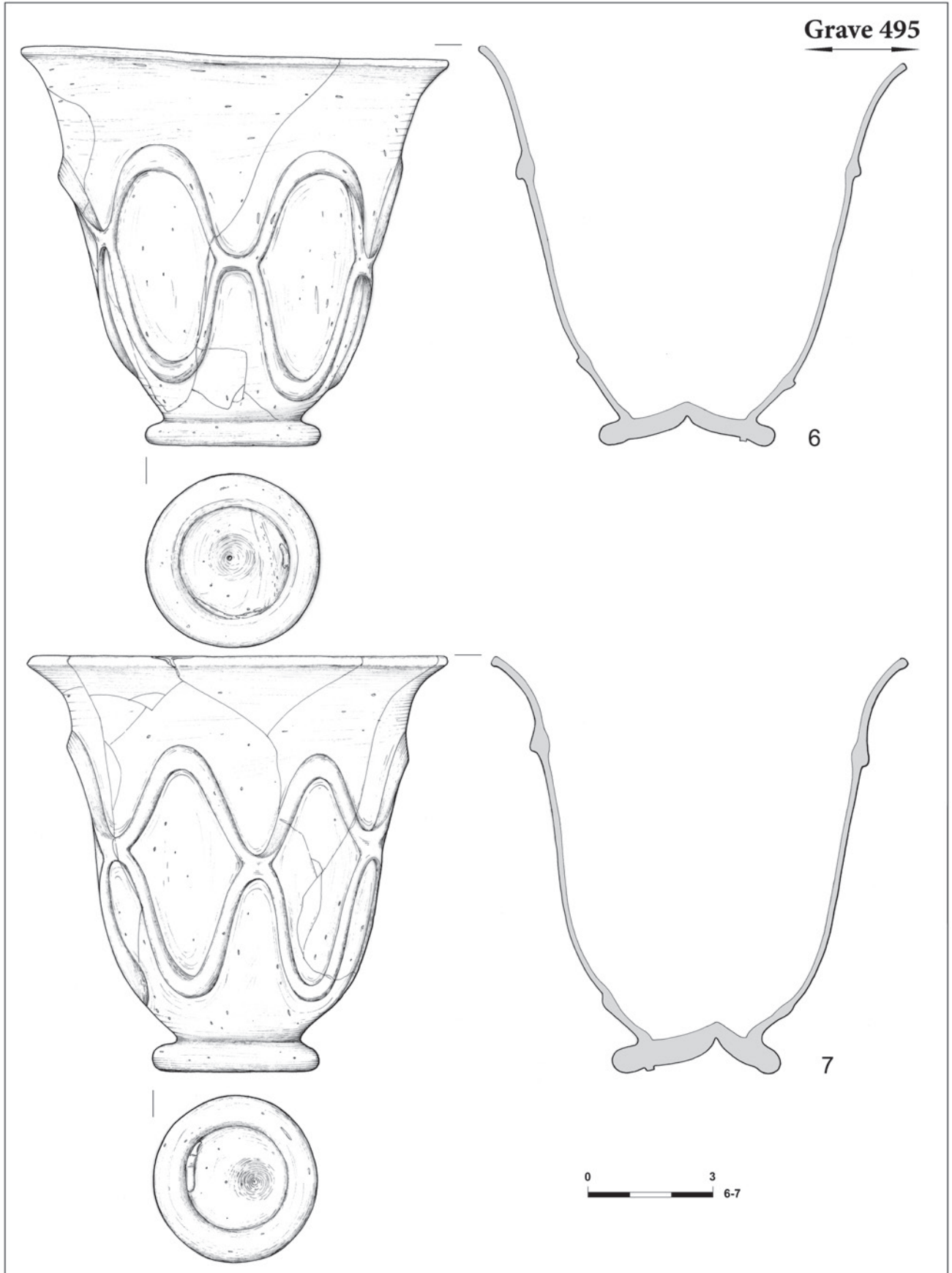


Pl. V. Grave 495 & Features 495A, 495B, 495C

Grave 495

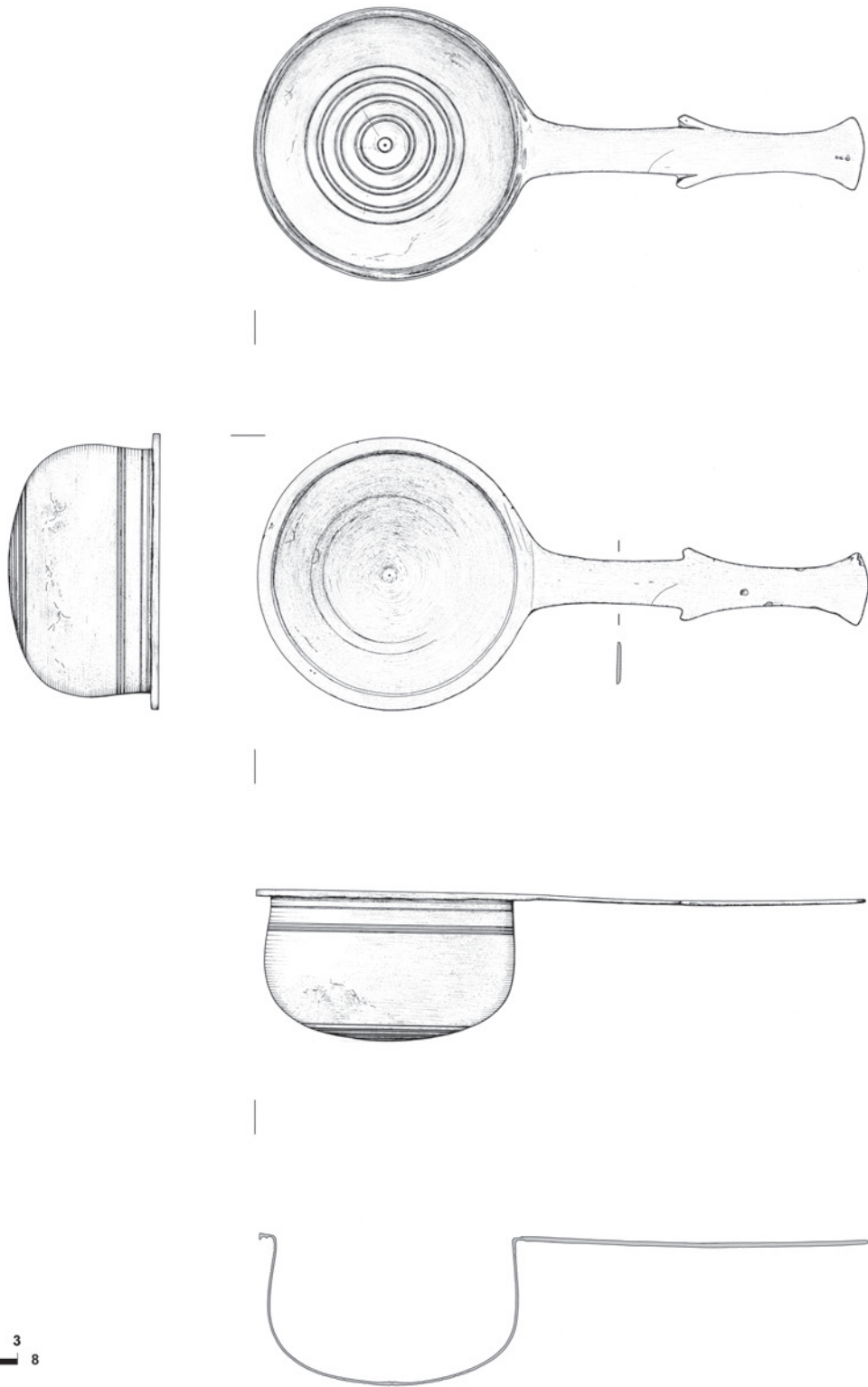


Pl. VI. Grave 495: 1.4.12a–e.13–15 – copper alloy; 11 – copper alloy and wood; 2 – glass; 3 – amber; 5 – ceramic; 16 – brass



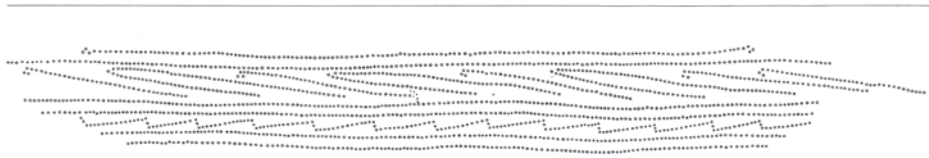
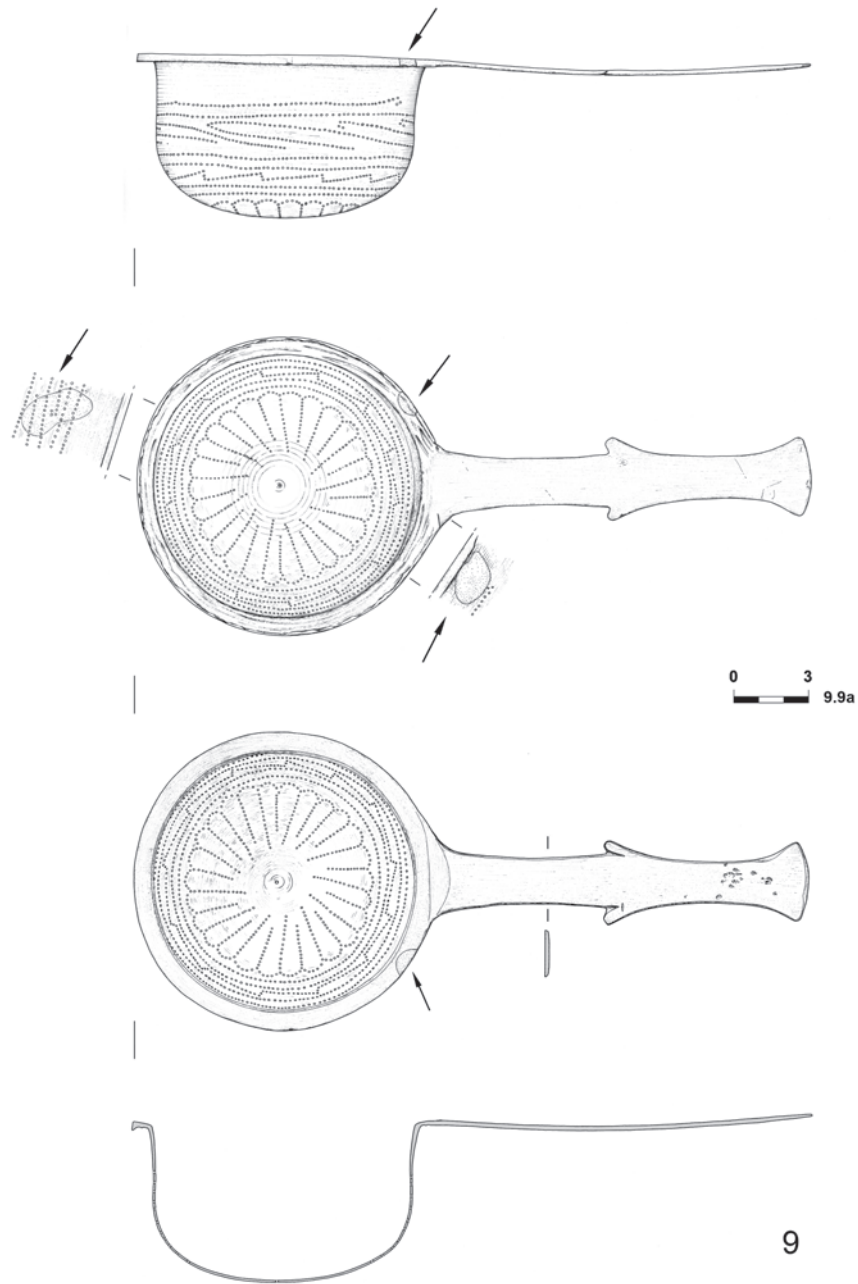
Pl. VII. Grave 495: 6-7 – glass

Grave 495



Pl. VIII. Grave 495: 8 - copper alloy

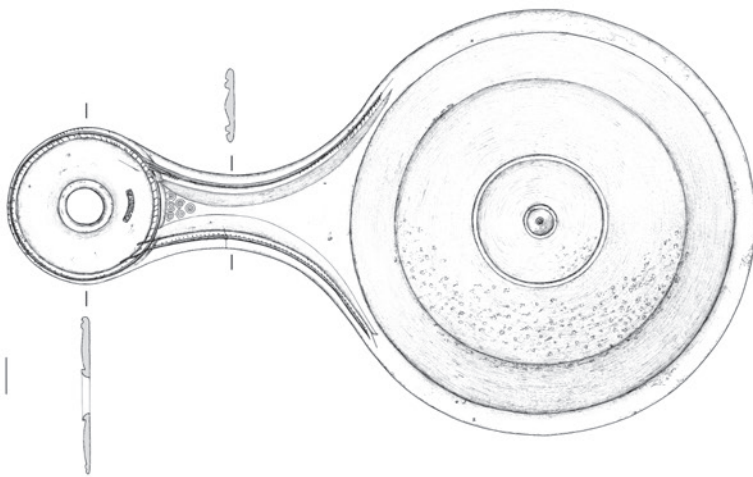
Grave 495



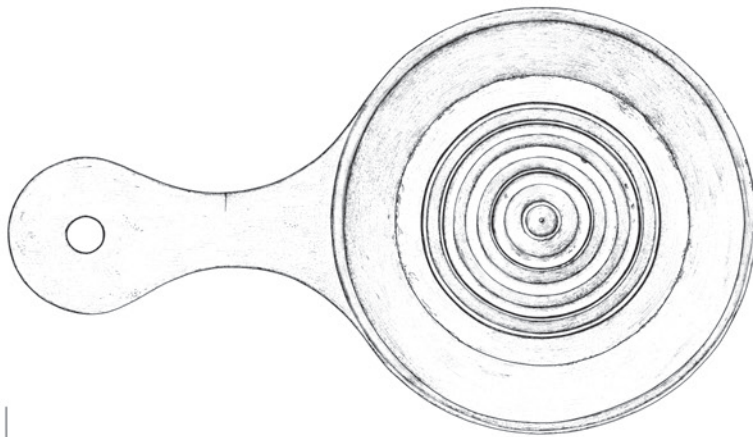
9a

Pl. IX. Grave 495: 9 – copper alloy. Tin fillings are marked by an arrows

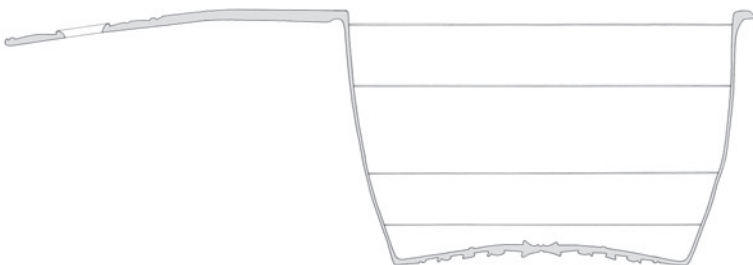
Grave 495



10a



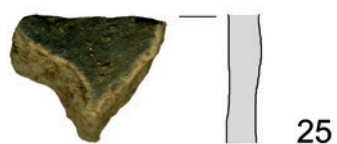
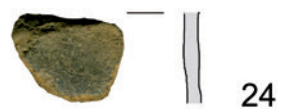
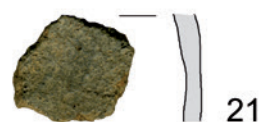
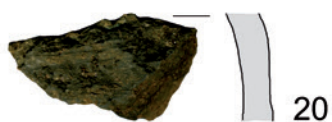
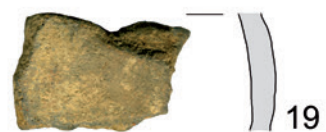
0 3 10
0 2 10a



10

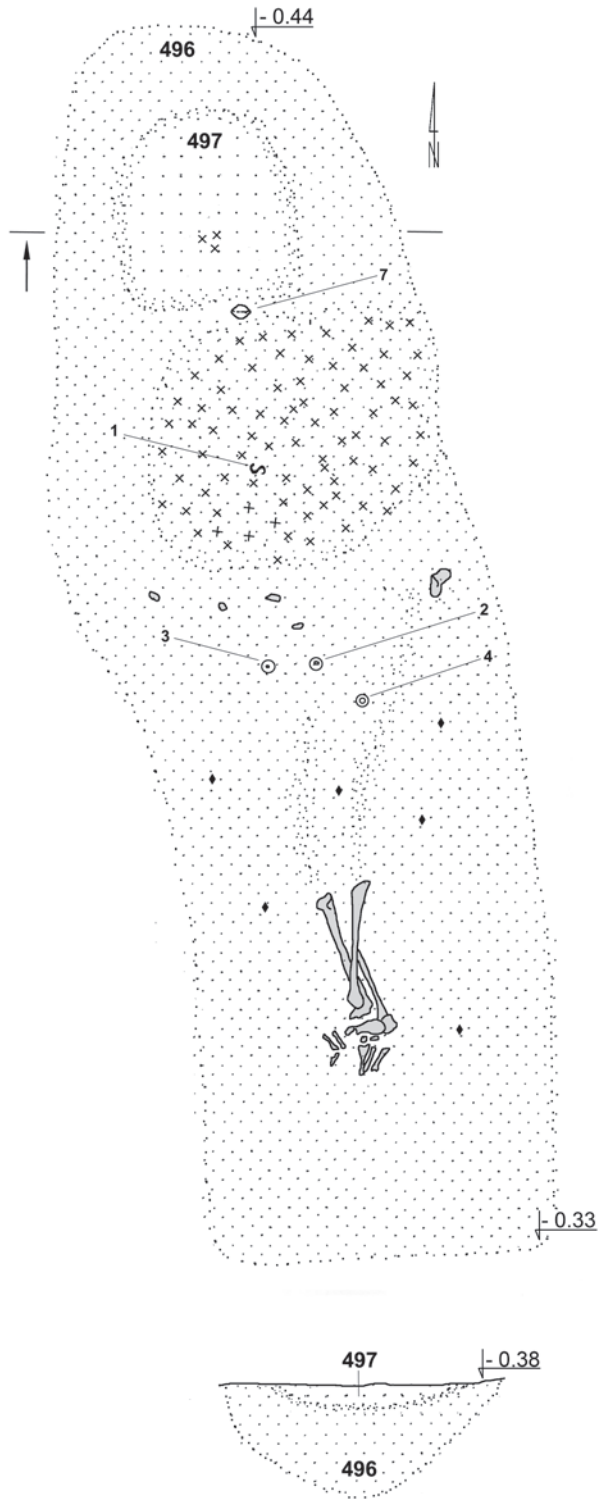
Pl. X. Grave 495: 10 – copper alloy. Locking mandrel (repair (?), trace of cast [?]) is marked by an arrow

Grave 495

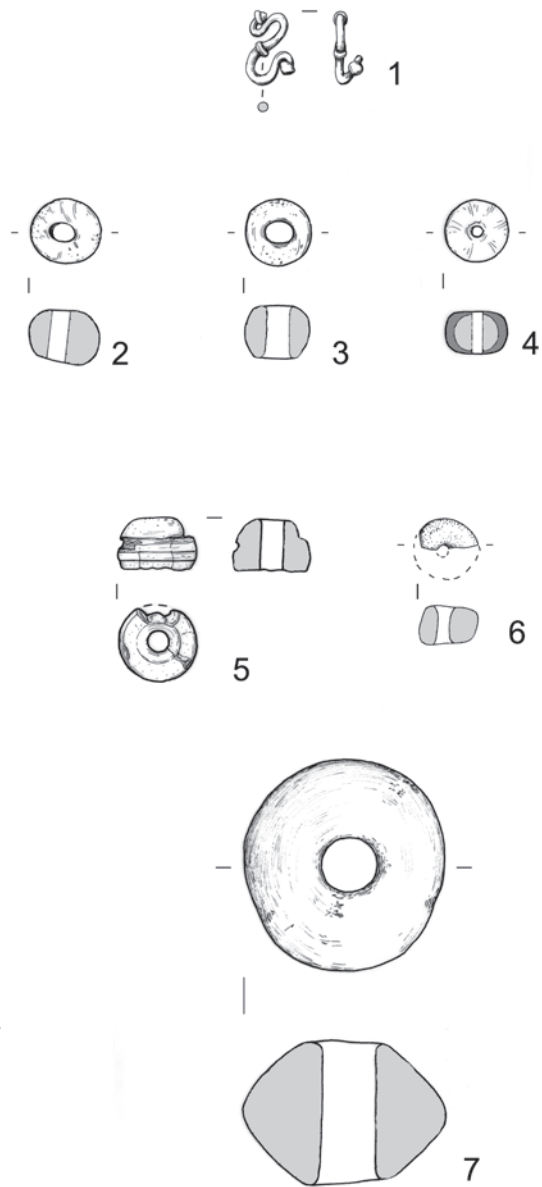


Pl. XI. Grave 495: 17-26 - ceramic

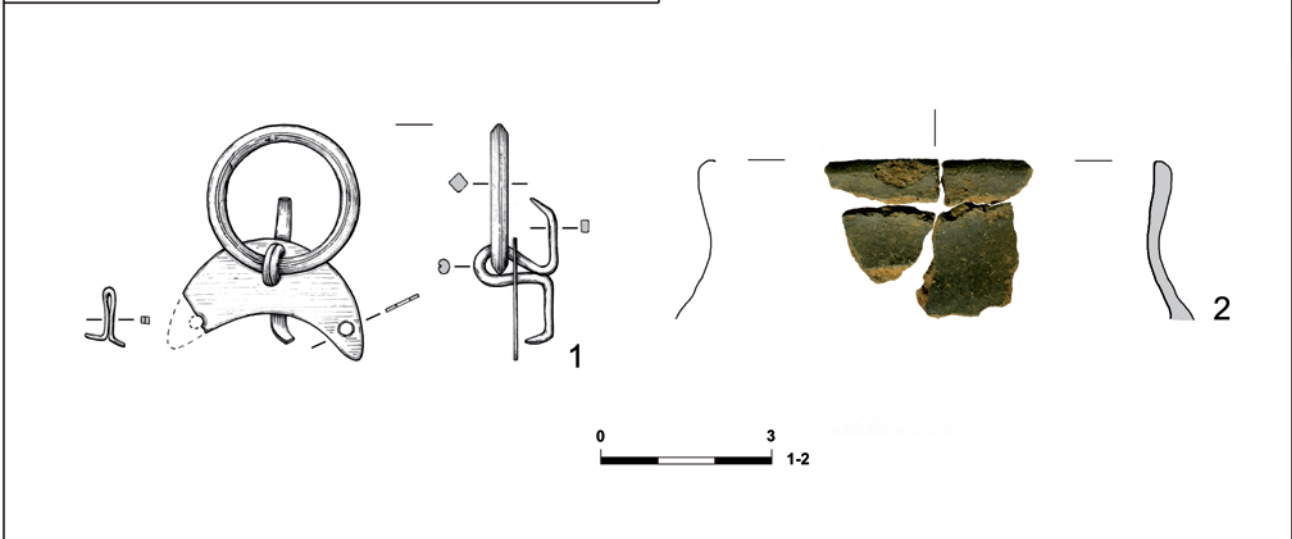
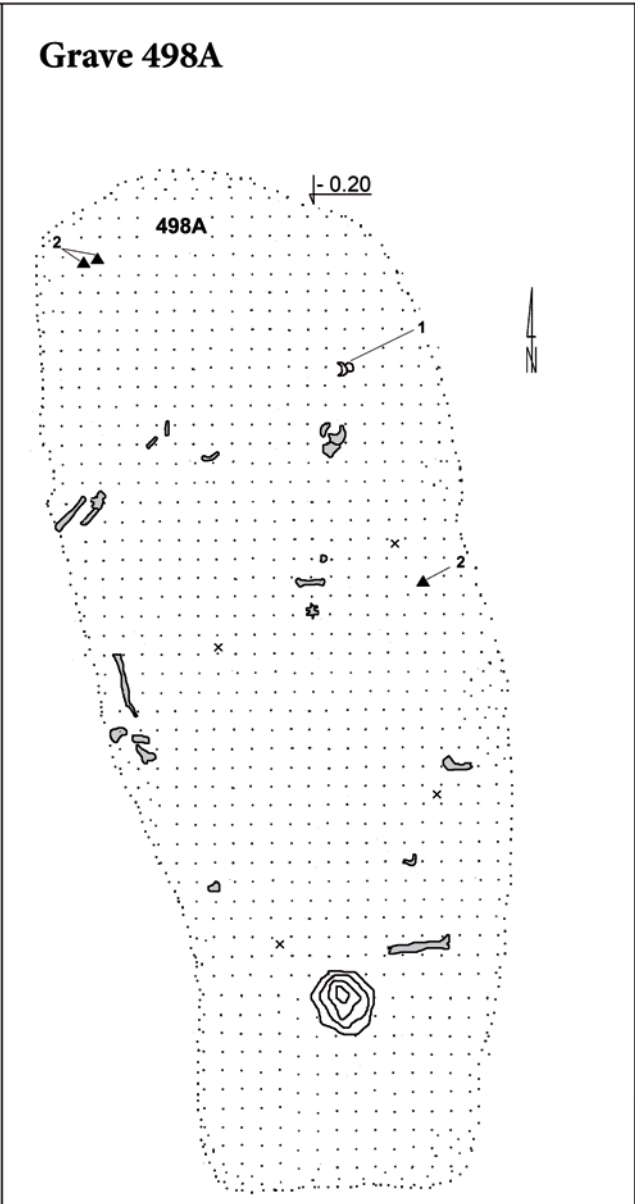
Grave 496 & Feature 497



Grave 496

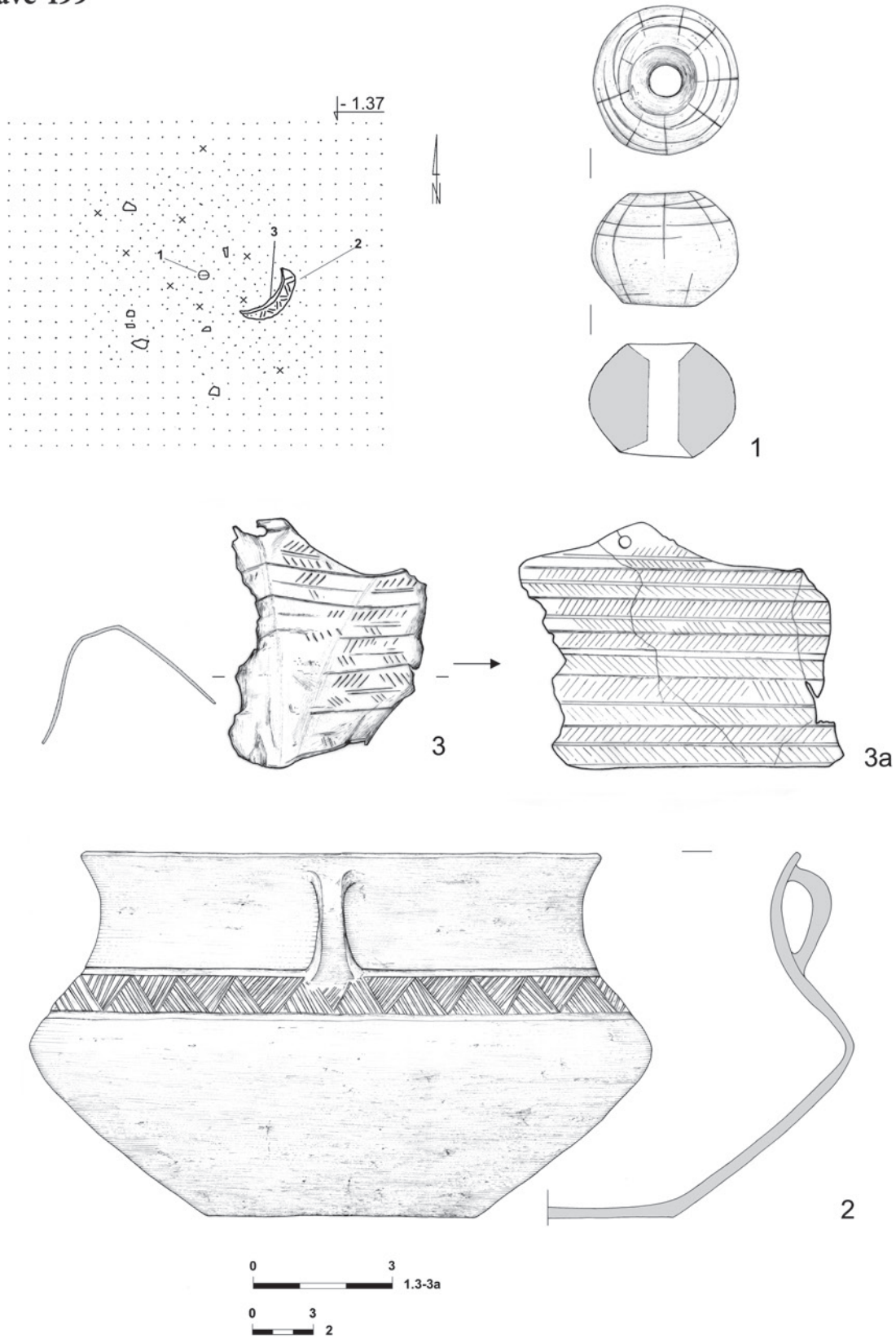


Pl. XII. Grave 496 & Feature 497. Grave 496: 1 – silver; 2–5 – glass; 6 – amber; 7 – ceramic



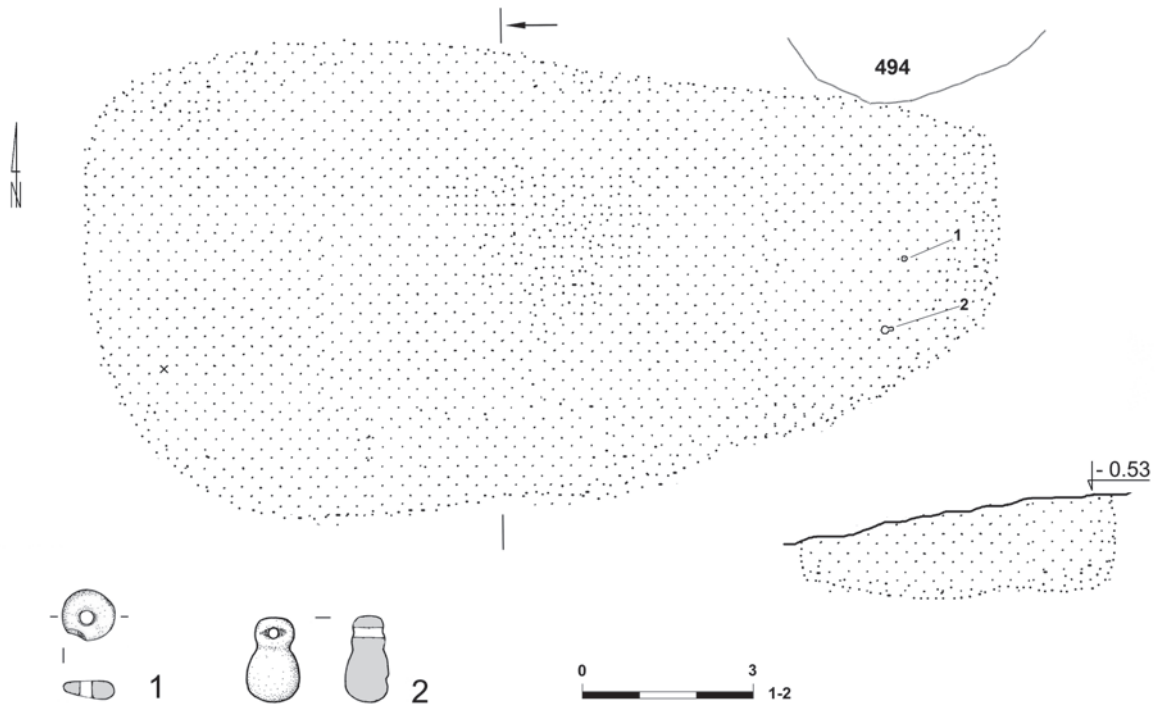
Pl. XIII. Grave 498. Grave 498A: 1 – tin-lead bronze; 2 – ceramic

Grave 499

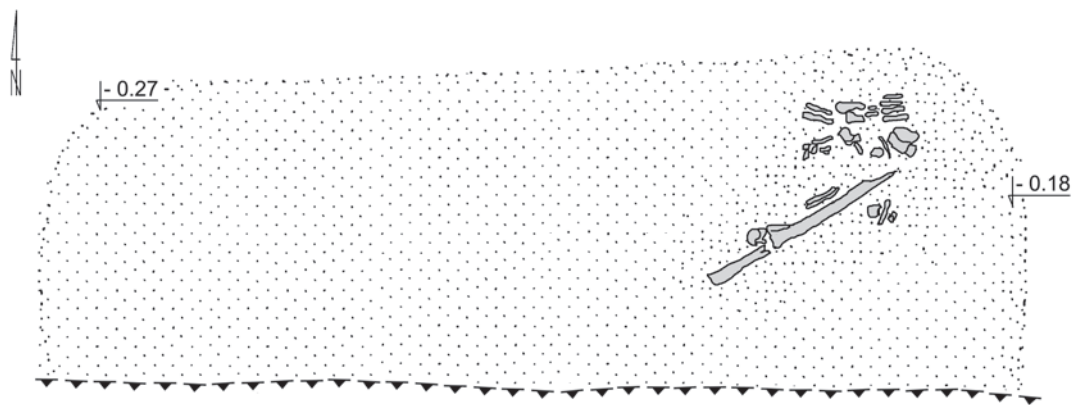


Pl. XIV. Grave 499: 1-2 – ceramic; 3-3a – brass

Grave 500

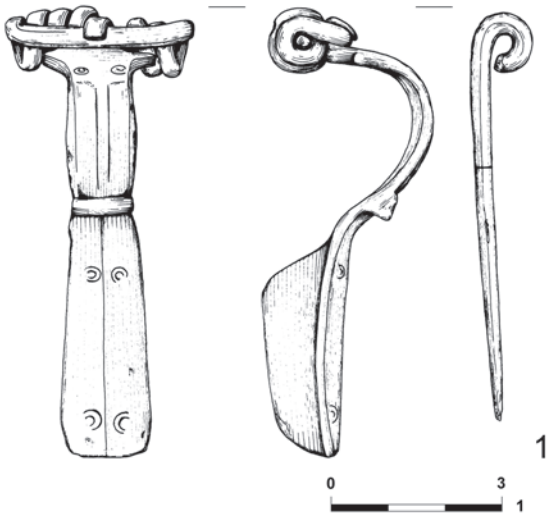
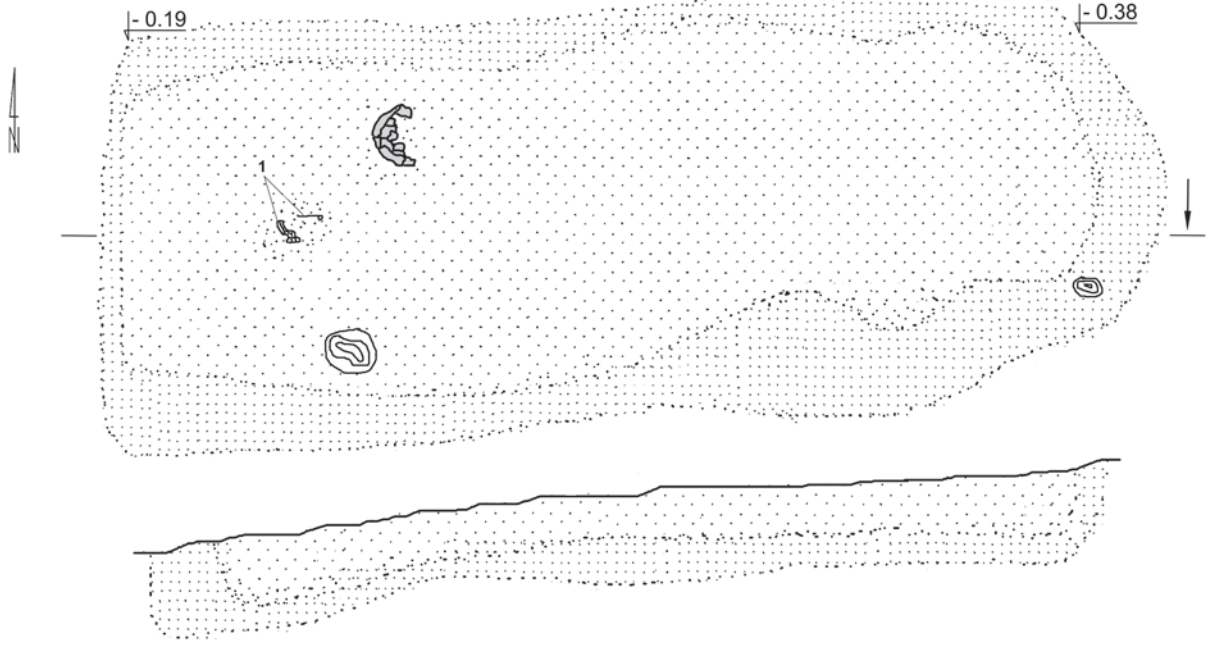


Grave 503

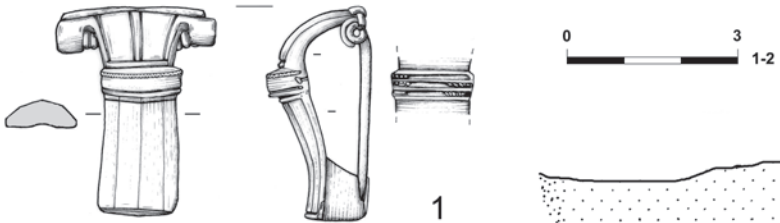
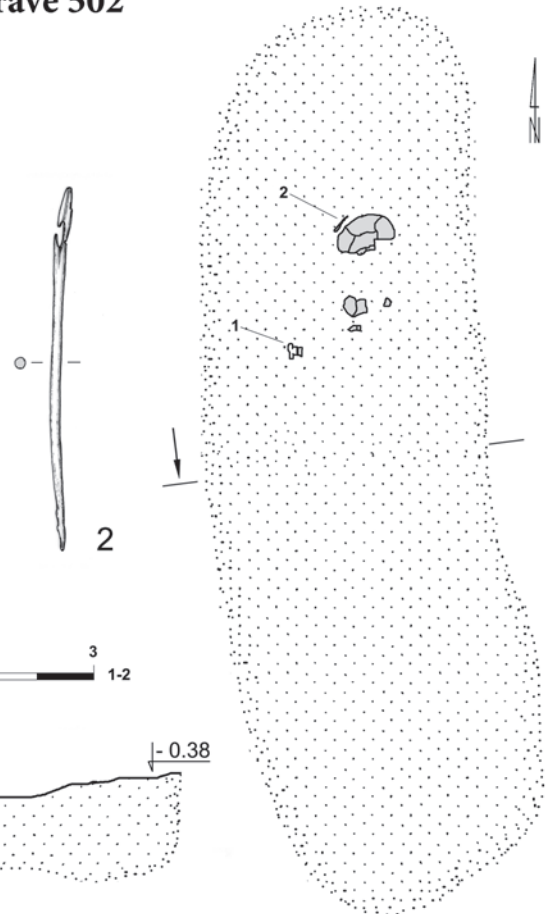


Pl. XV. Grave 500: 1-2 – amber. Grave 503

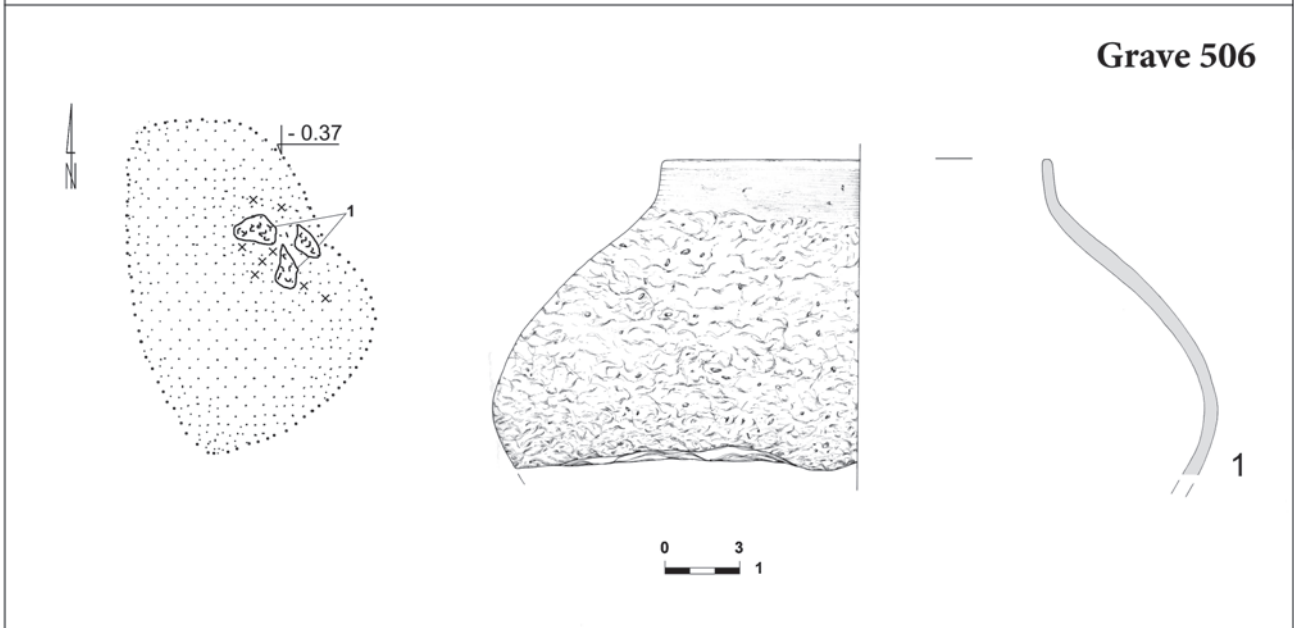
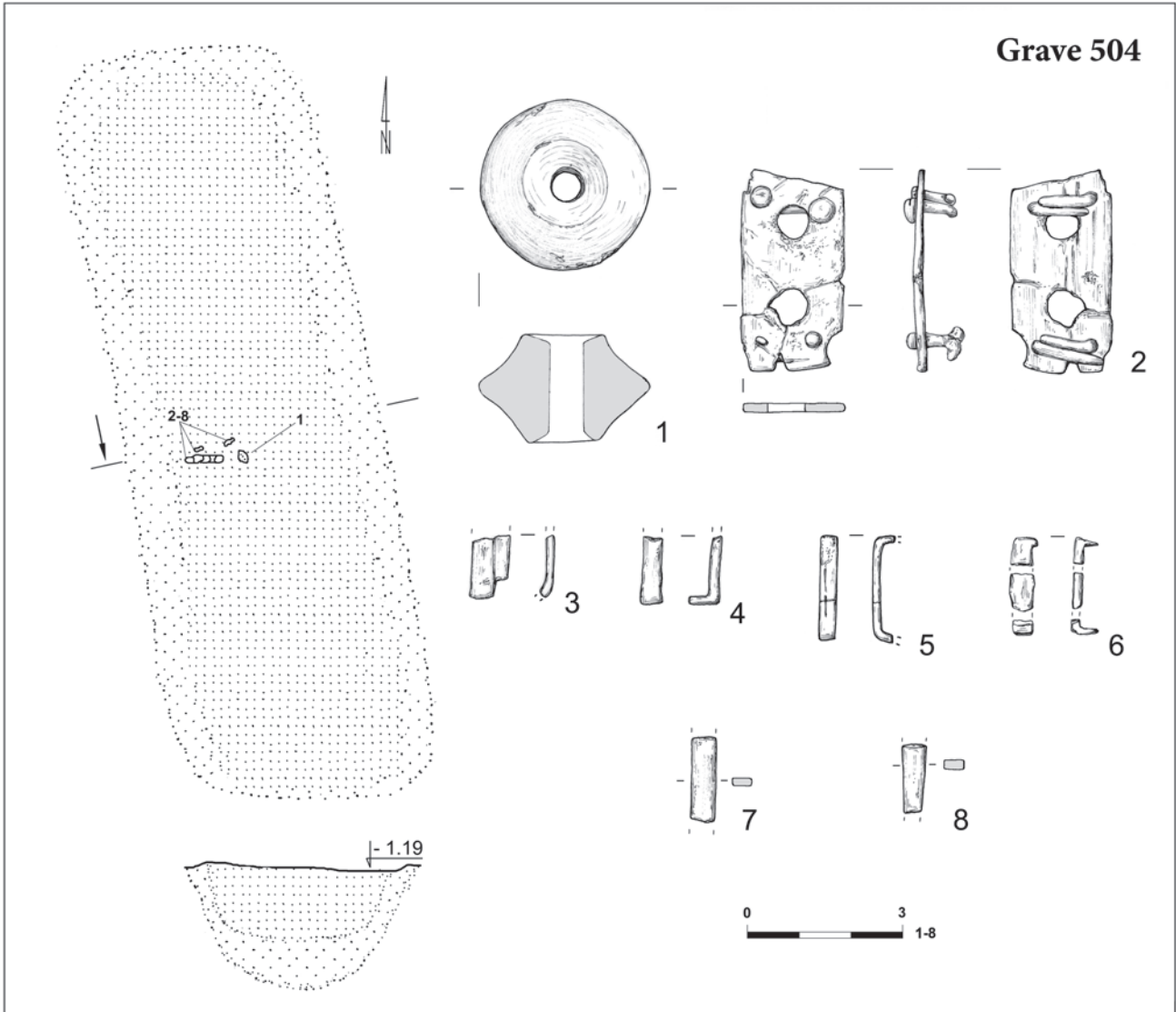
Grave 501



Grave 502

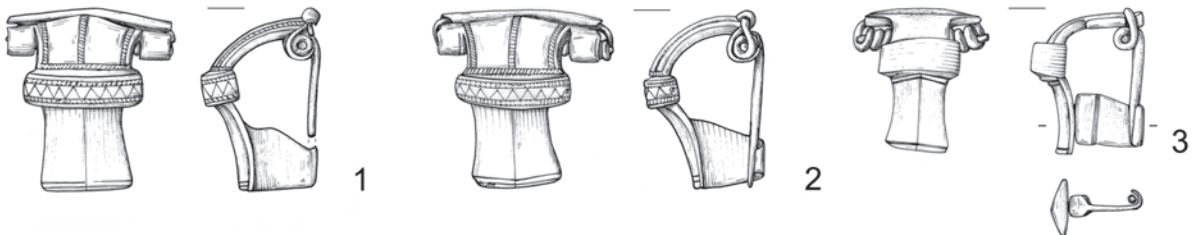
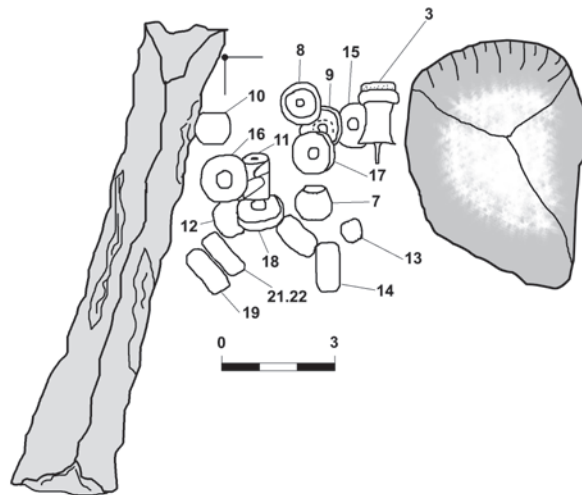
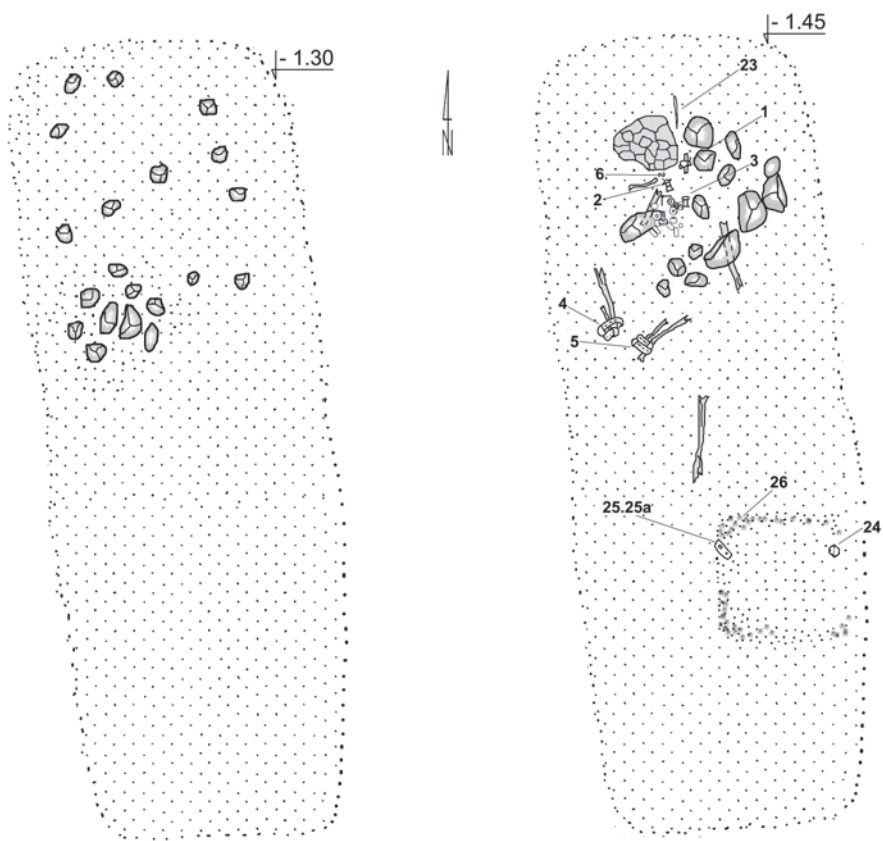


Pl. XVI. Grave 501: 1 – brass. Grave 502: 1 – brass; 2 – copper alloy



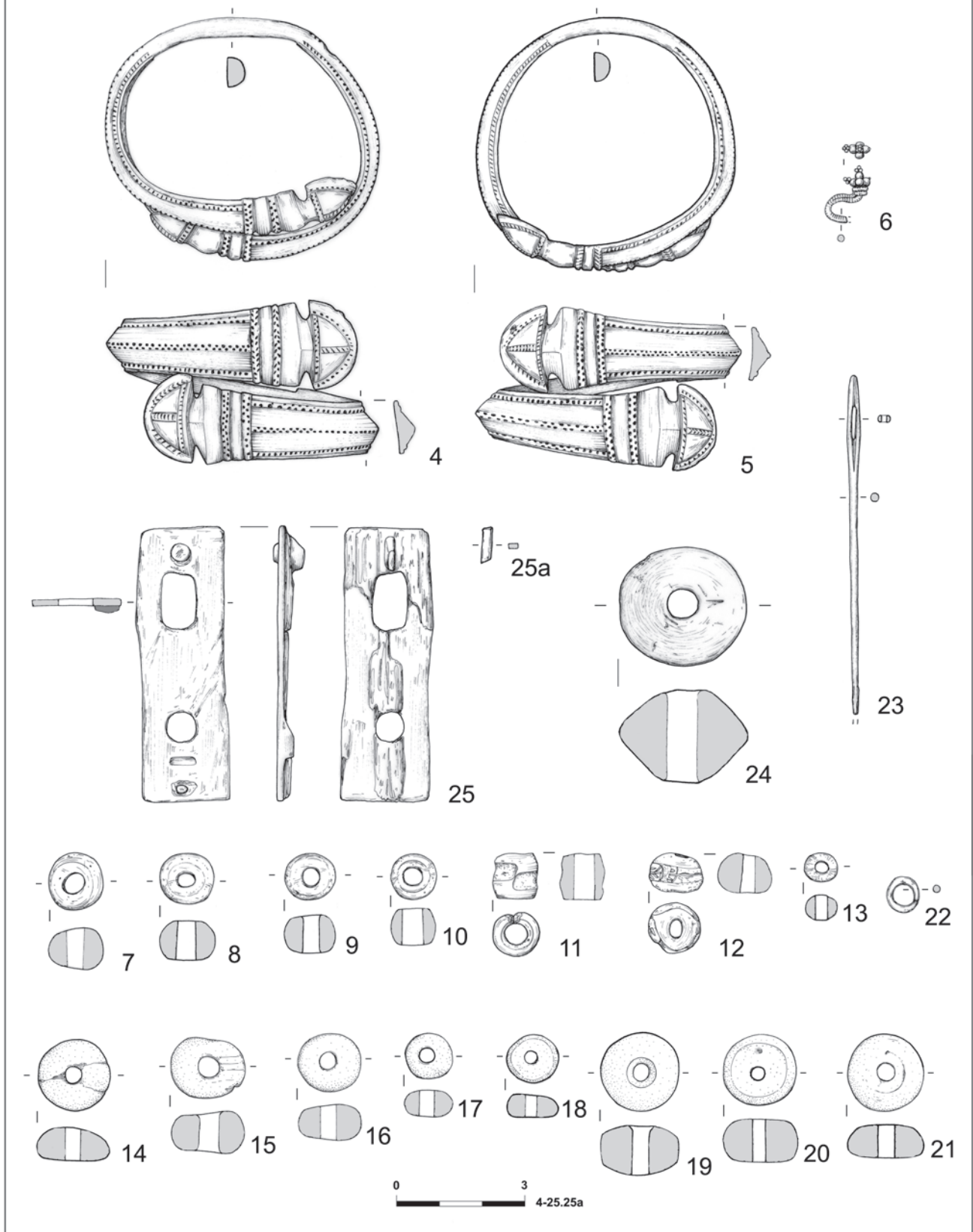
Pl. XVII. Grave 504: 1 – ceramic; 2–8 – iron. Grave 506: 1 – ceramic

Grave 505

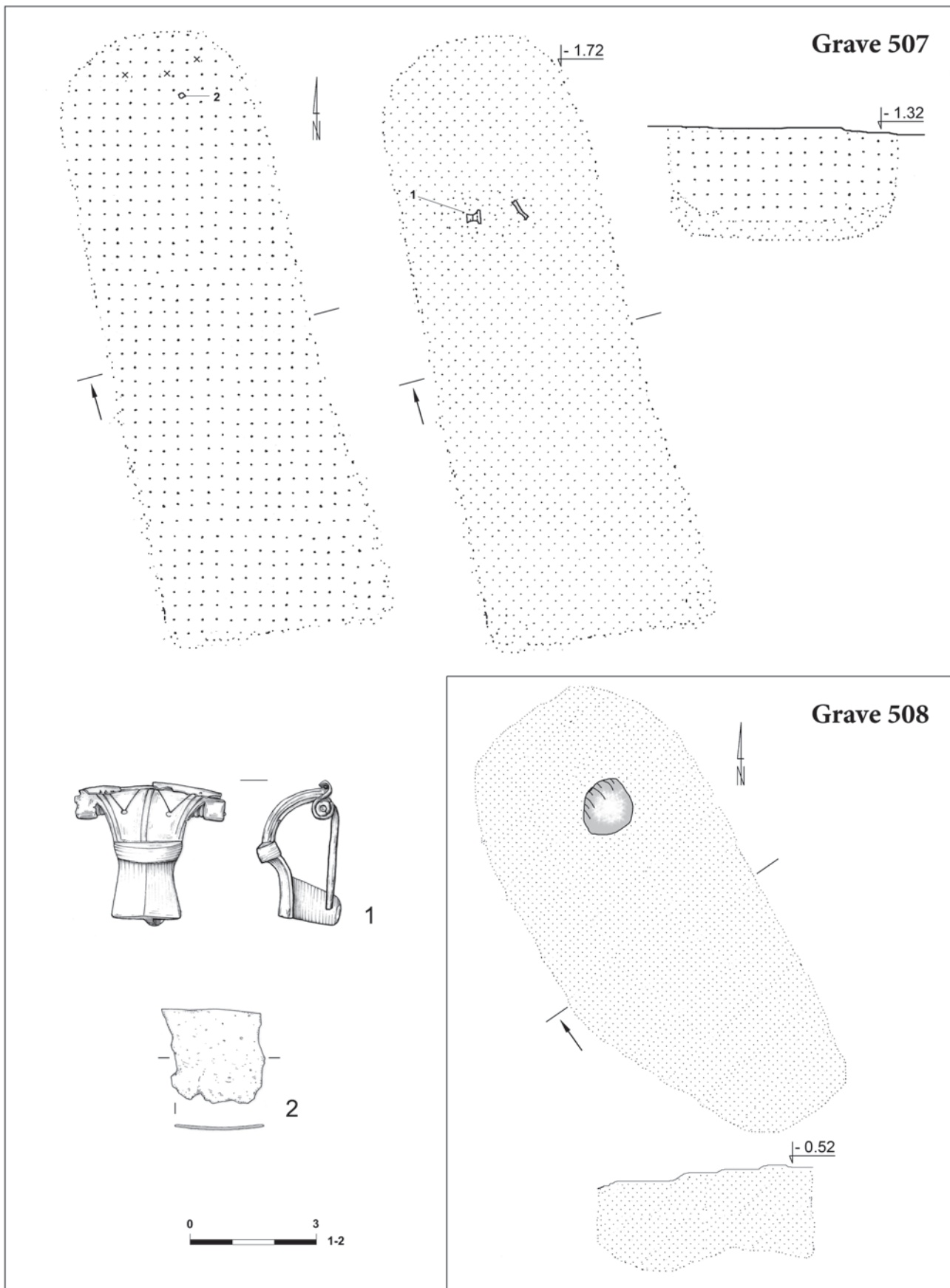


Pl. XVIII. Grave 505: 1-3 – brass; 26 (on plan) – wood

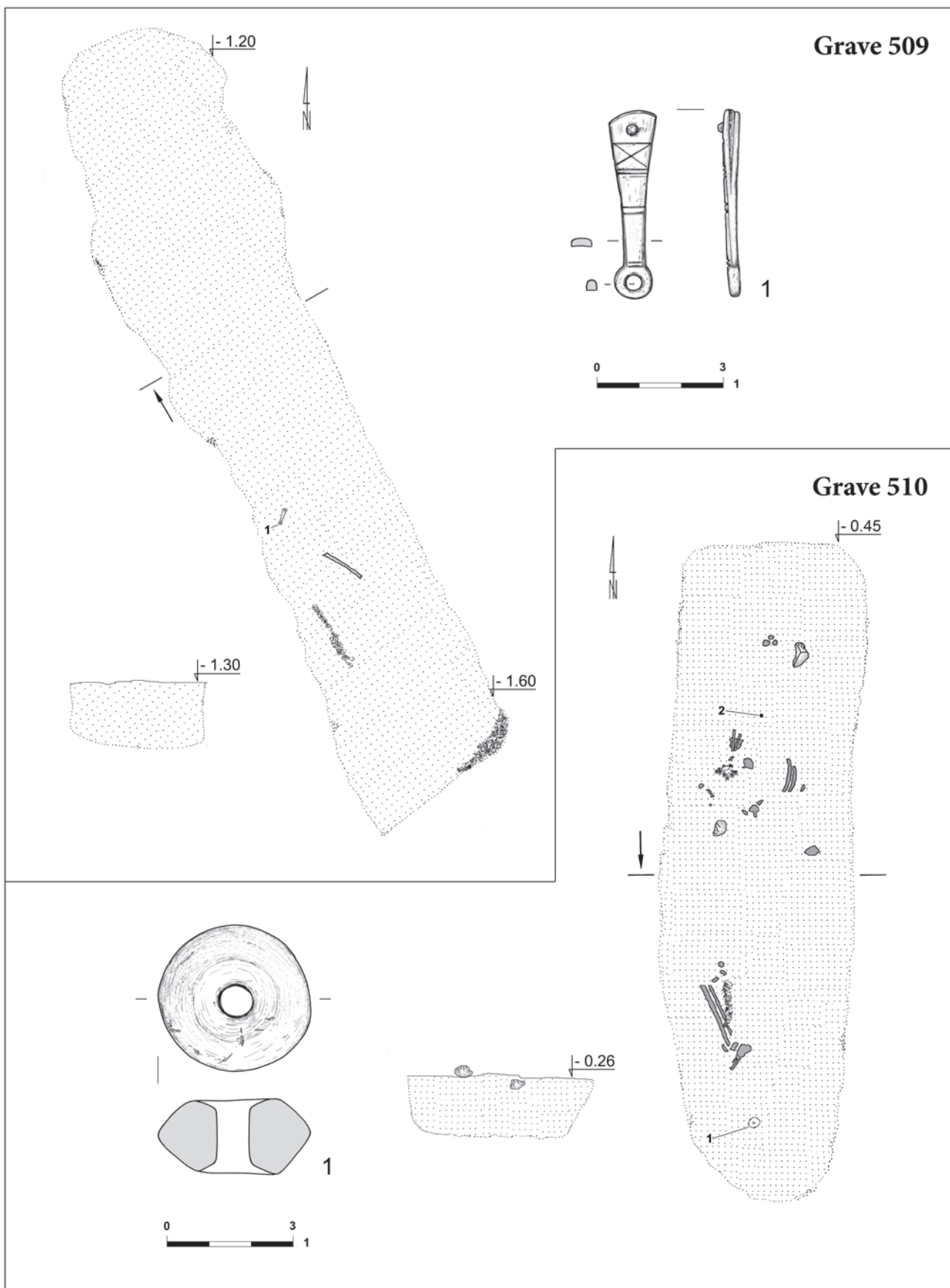
Grave 505



Pl. XIX. Grave 505: 4-5 – brass; 6 – silver; 7-13 – glass; 14-21 – amber; 22,25a – iron; 25 – iron and wood; 23 – copper alloy; 24 – ceramic

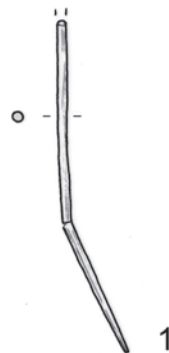
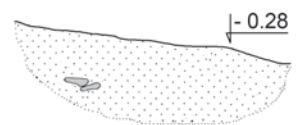
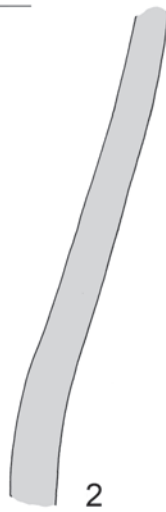
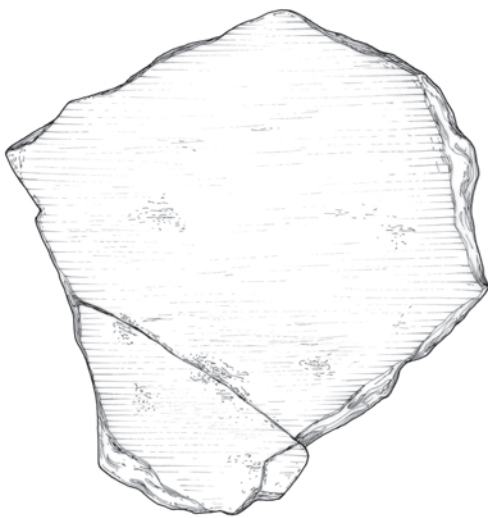
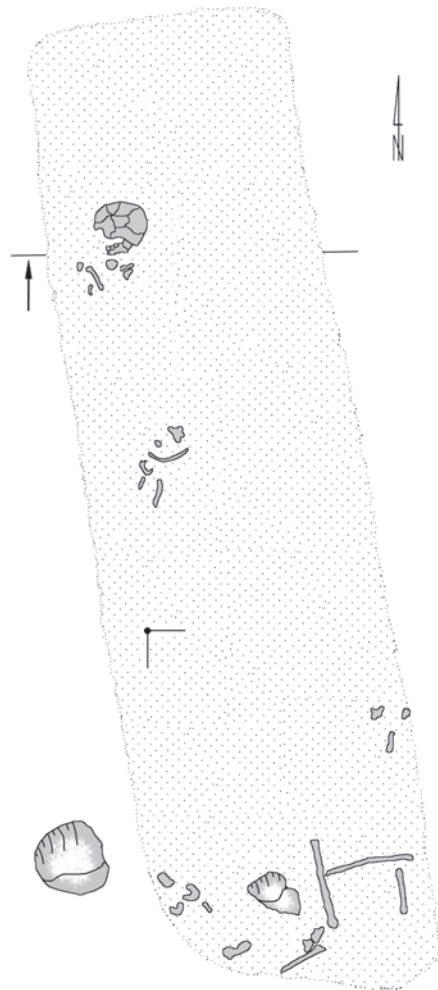
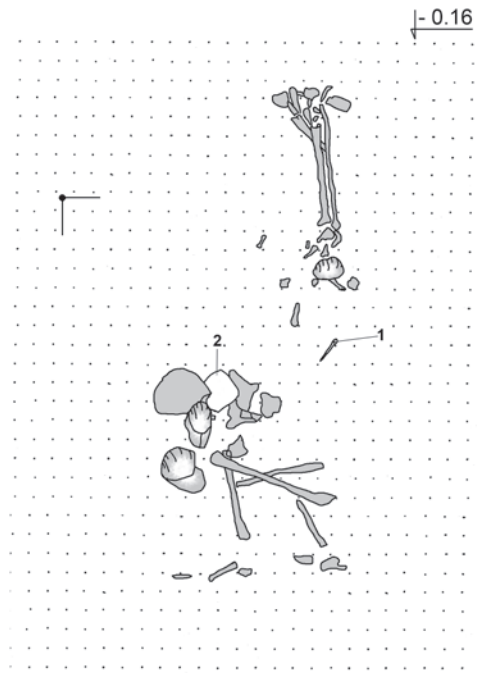


Pl. XX. Grave 507: 1 – tin bronze; 2 – glass. Grave 508



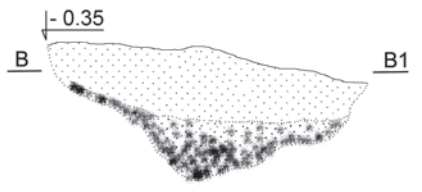
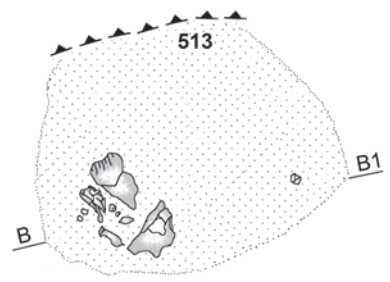
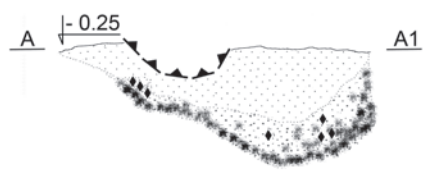
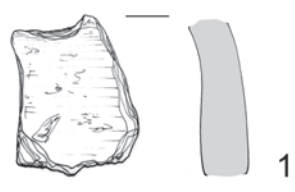
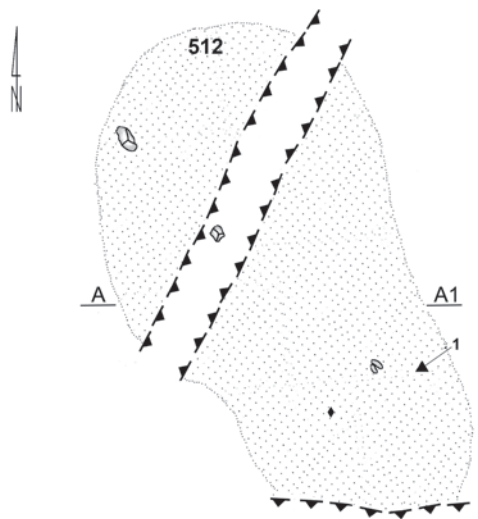
Pl. XXI. Grave 509: 1 – copper alloy. Grave 510: 1 – ceramic

Grave 511

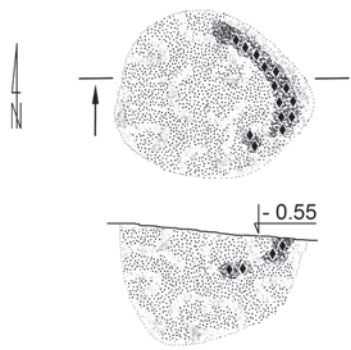


Pl. XXII. Grave 511: 1 – copper alloy; 2 – ceramic

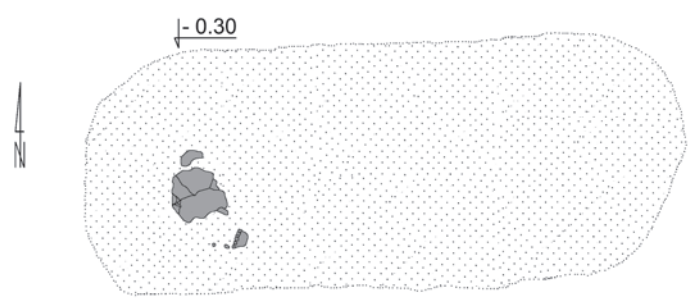
Grave 512(513)



Feature 515

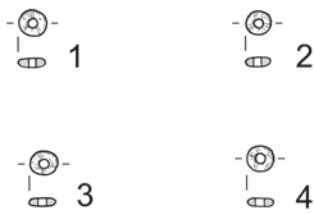
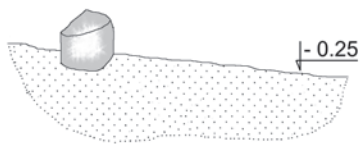
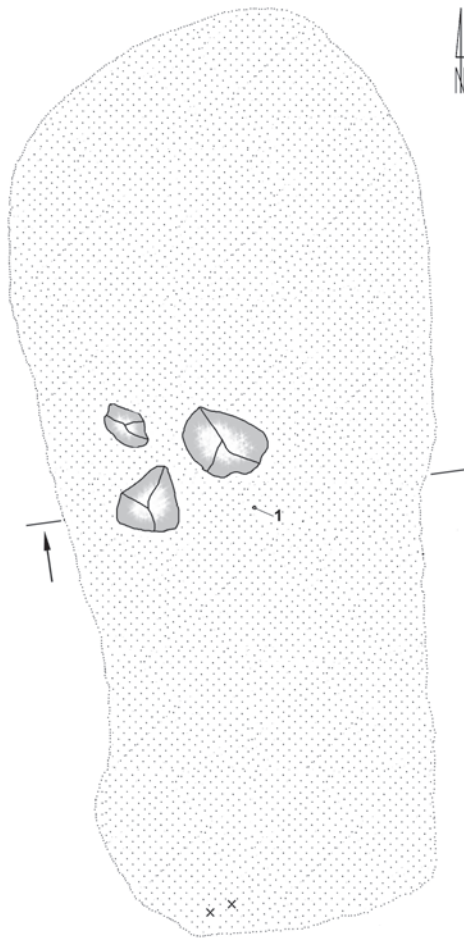


Grave 516

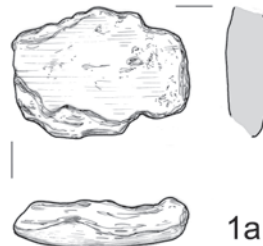
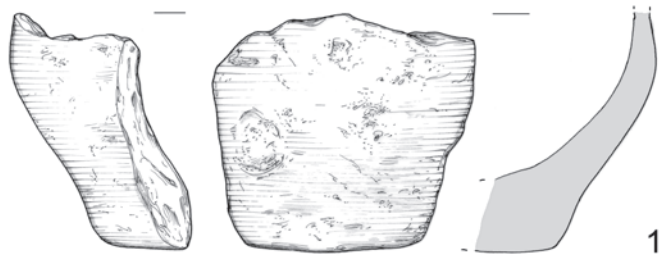


Pl. XXIII. Grave 512(513): 1 – ceramic. Feature 515. Grave 516

Grave 514

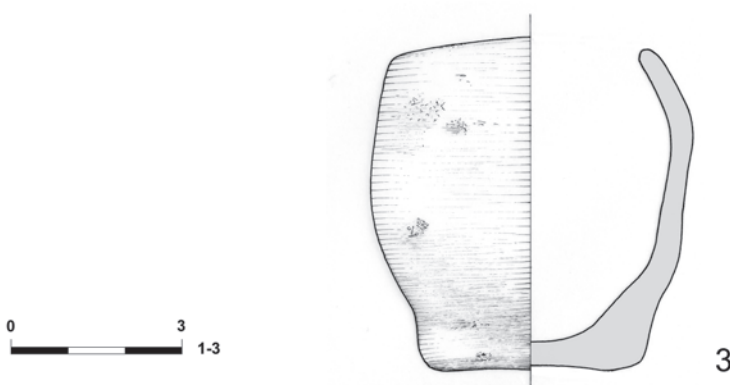
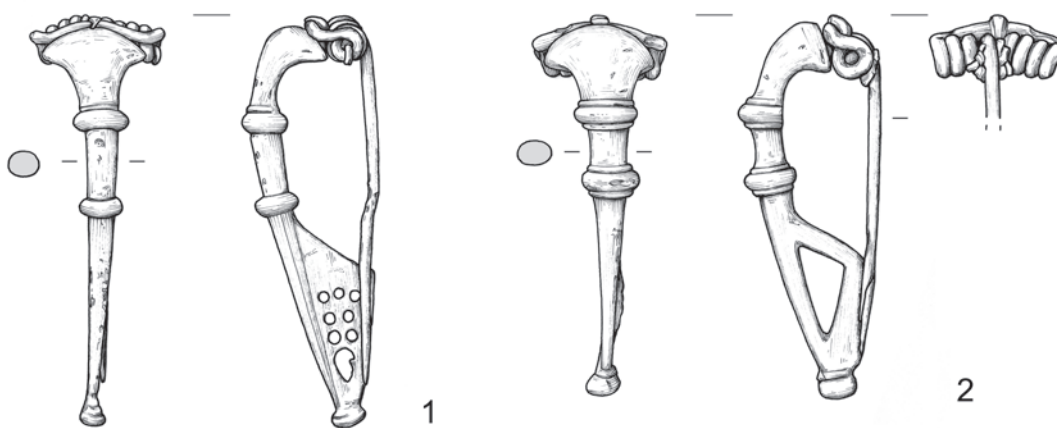
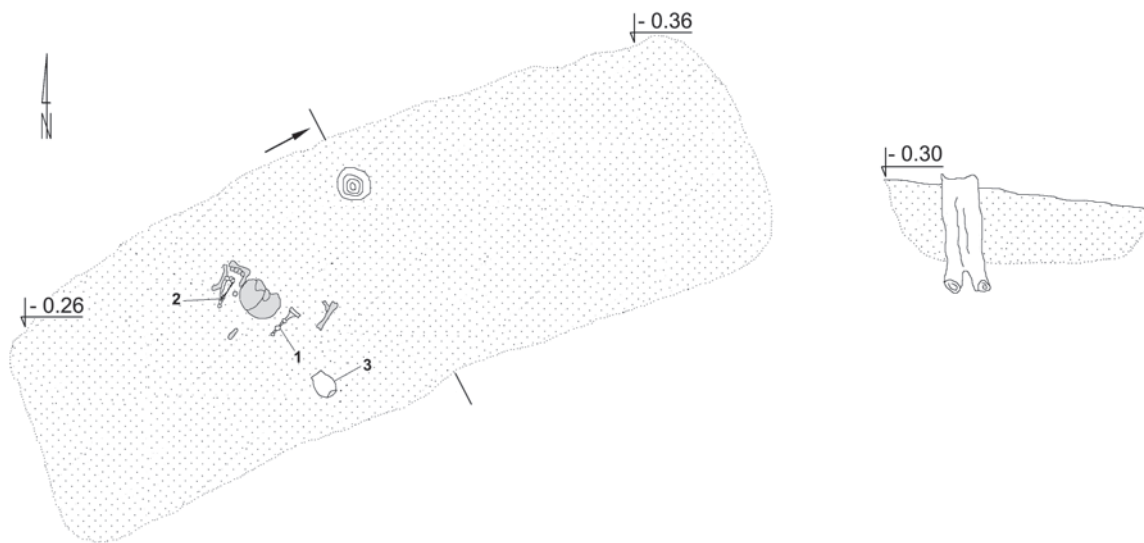


Grave 517



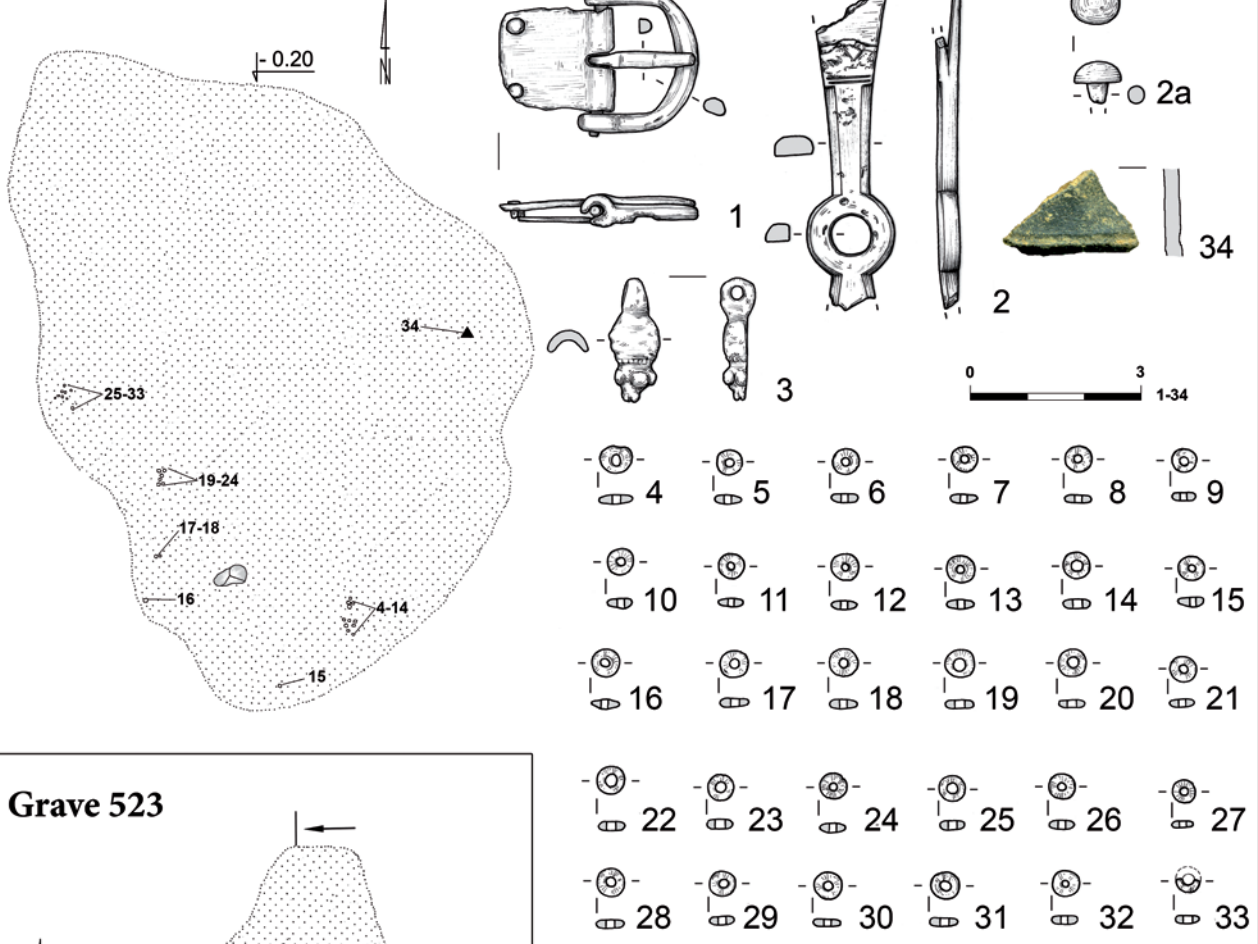
Pl. XXIV. Grave 514: 1-4 – glass. Grave 517: 1-1a – ceramic

Grave 518

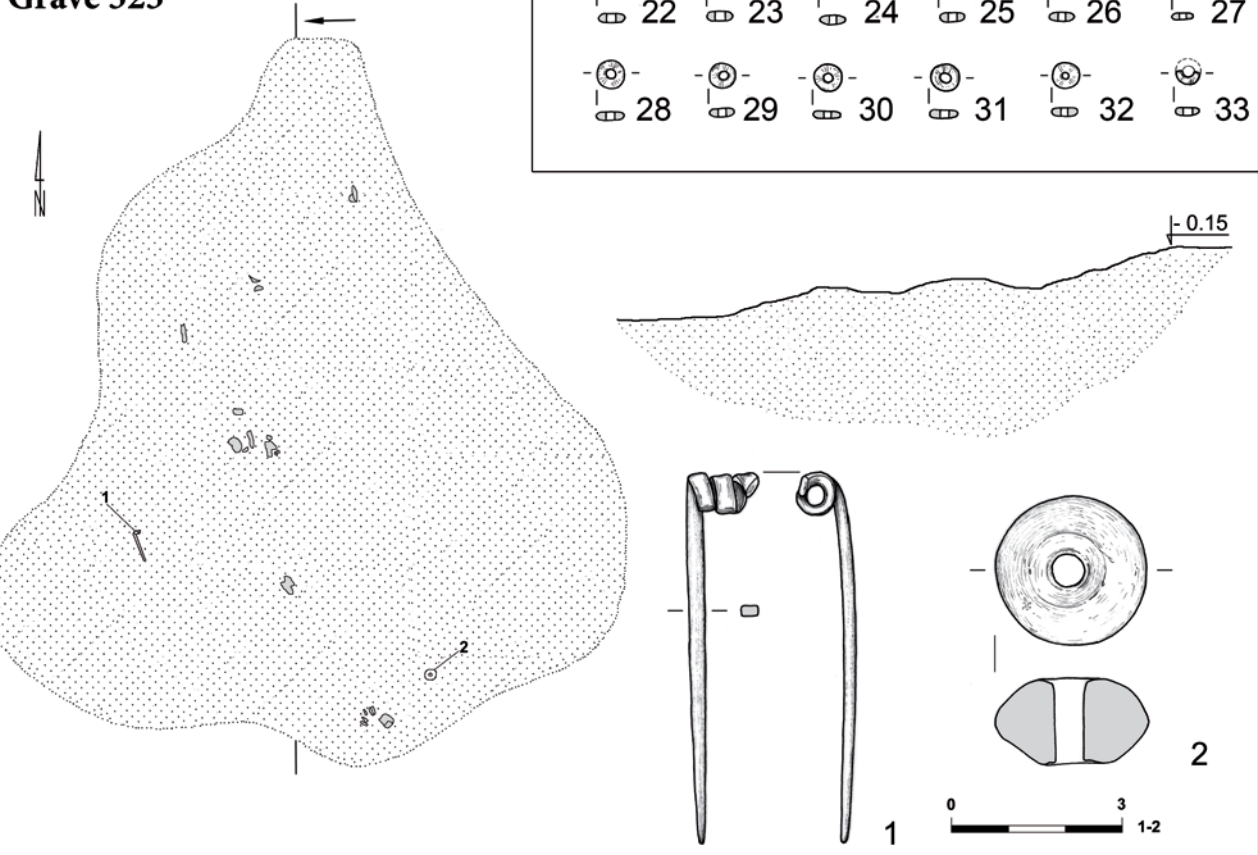


Pl. XXV. Grave 518: 1 – brass; 2 – copper alloy; 3 – ceramic

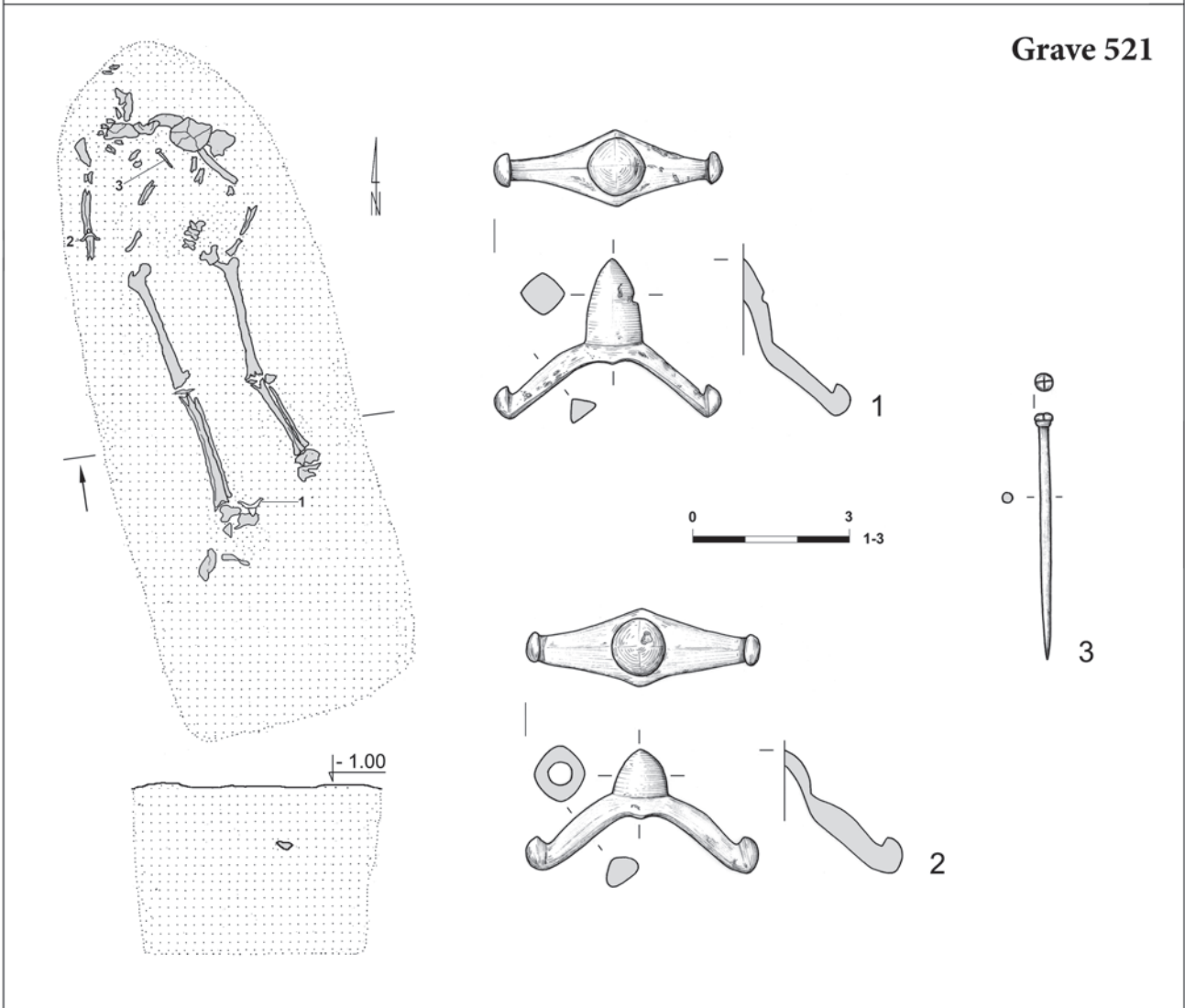
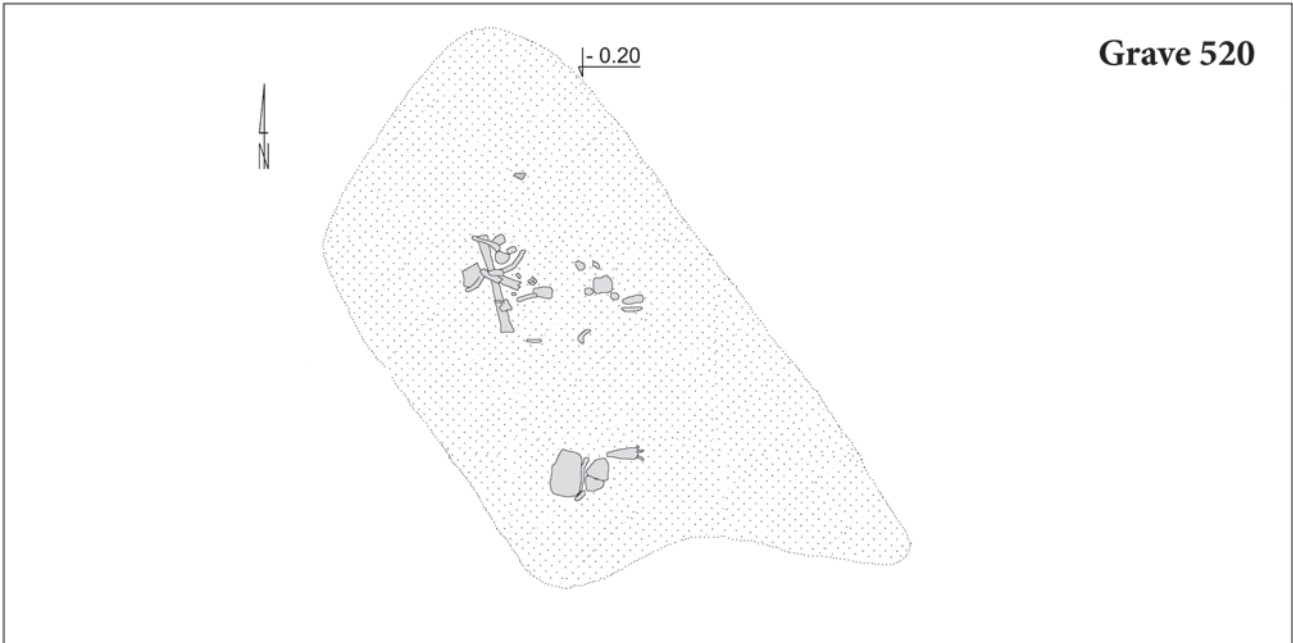
Grave 519



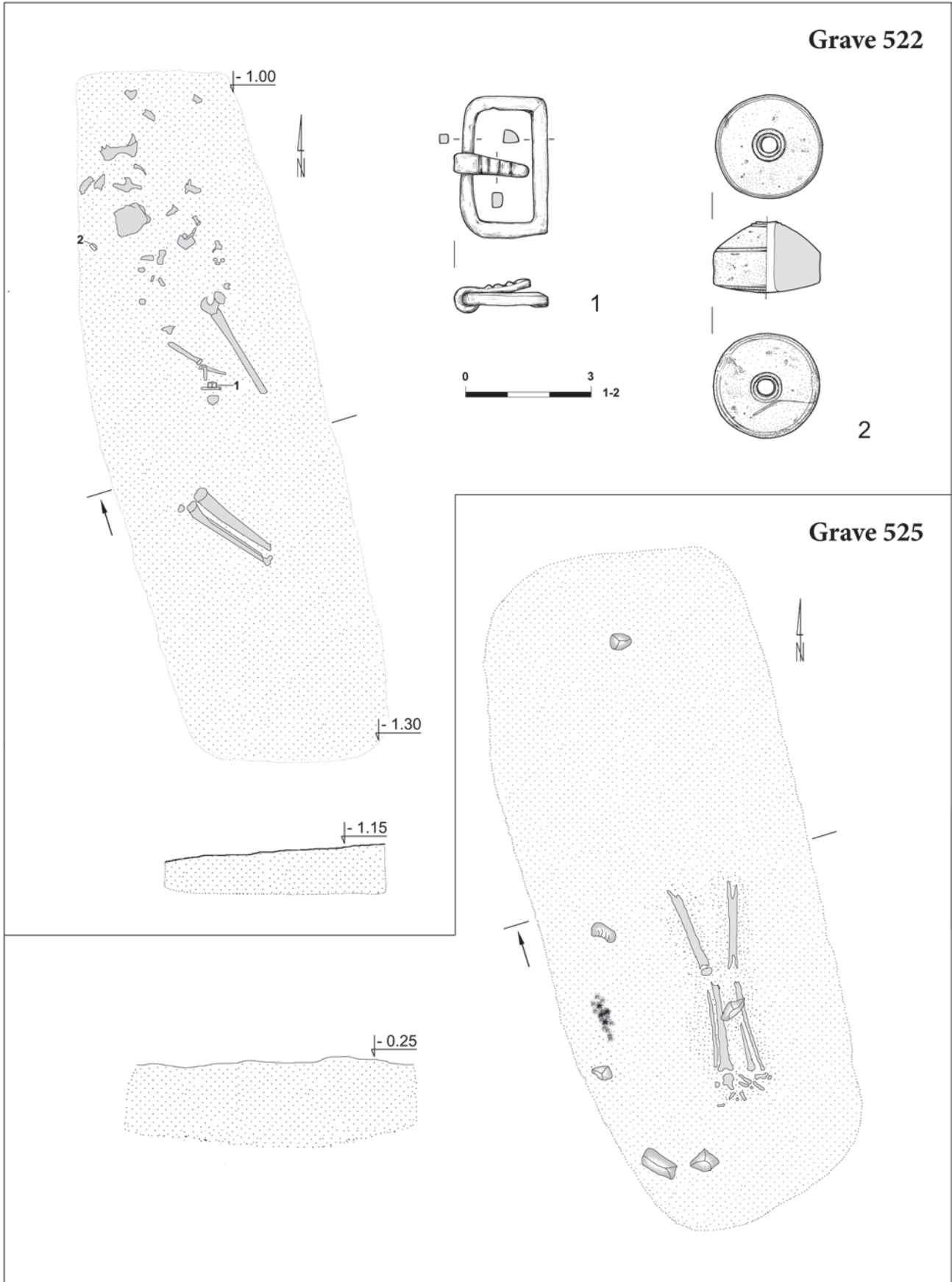
Grave 523



Pl. XXVI. Grave 519: 1-2-2a – copper alloy; 3 – brass; 4-33 – glass; 34 – ceramic. Grave 523: 1 – copper alloy; 2 – ceramic

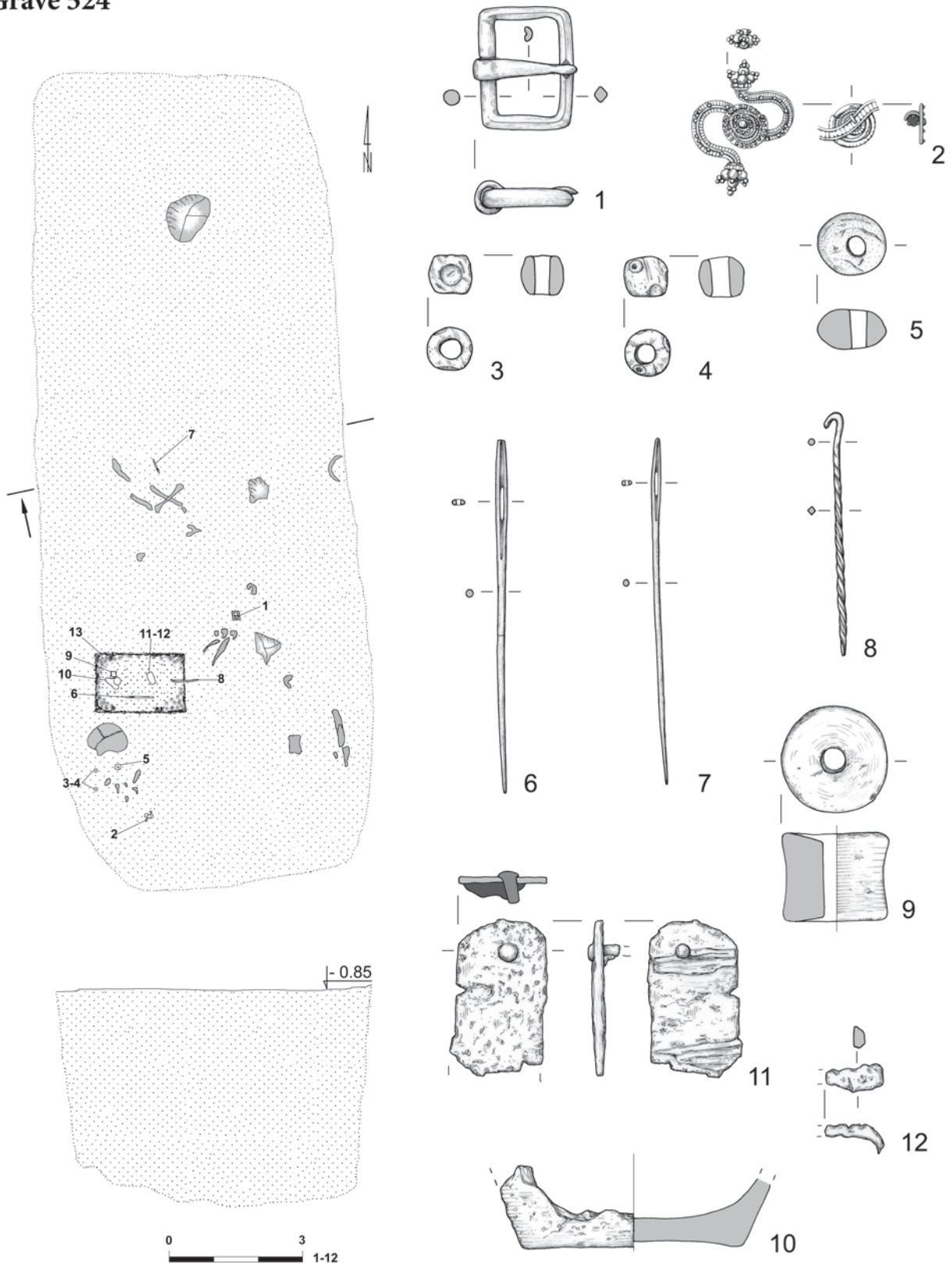


Pl. XXVII. Grave 520. Grave 521: 1-2 – brass; 3 – copper alloy



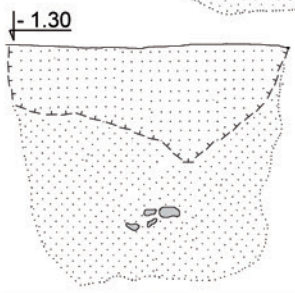
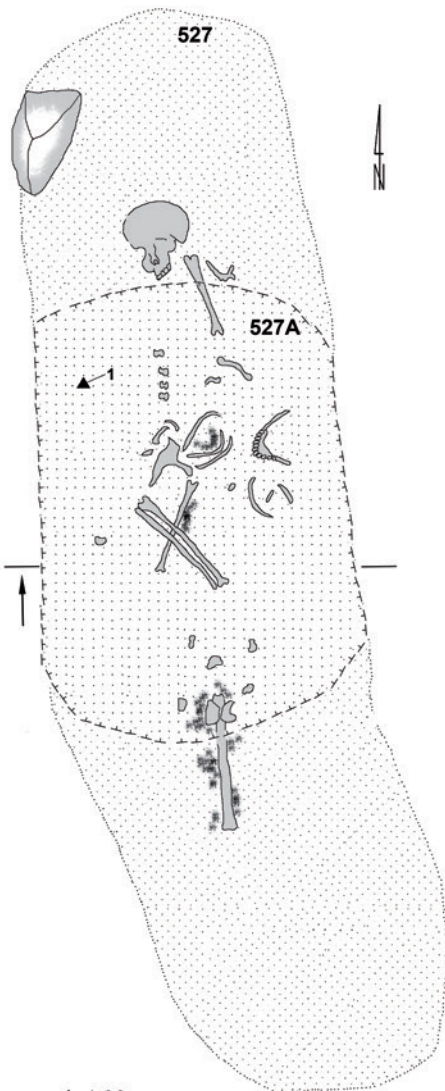
Pl. XXVIII. Grave 522: 1 – iron; 2 – amber. Grave 525

Grave 524

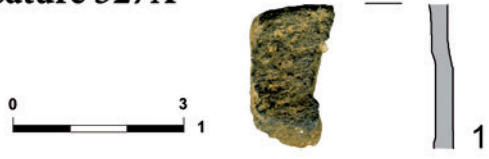


Pl. XXIX. Grave 524: 1.6-8 – copper alloy; 2 – silver; 3-4 – glass; 5 – amber; 9-10 – ceramic; 11 – iron and wood; 12 – iron; 13 (on plan) – wood

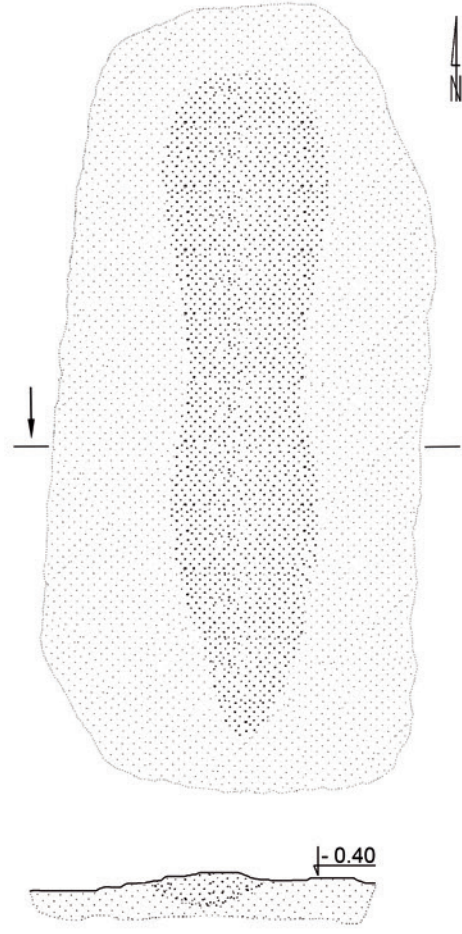
Grave 527 & Feature 527A



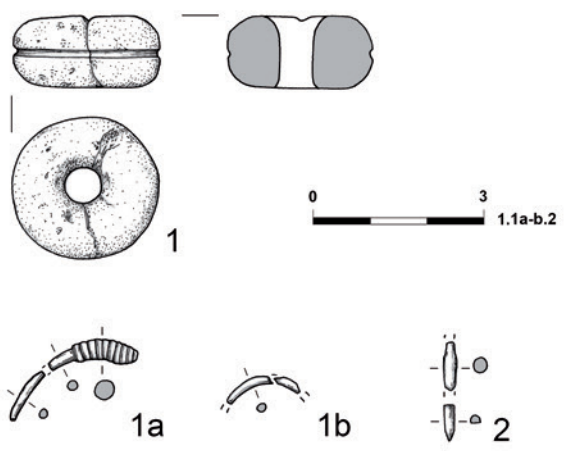
Feature 527A



Grave 526

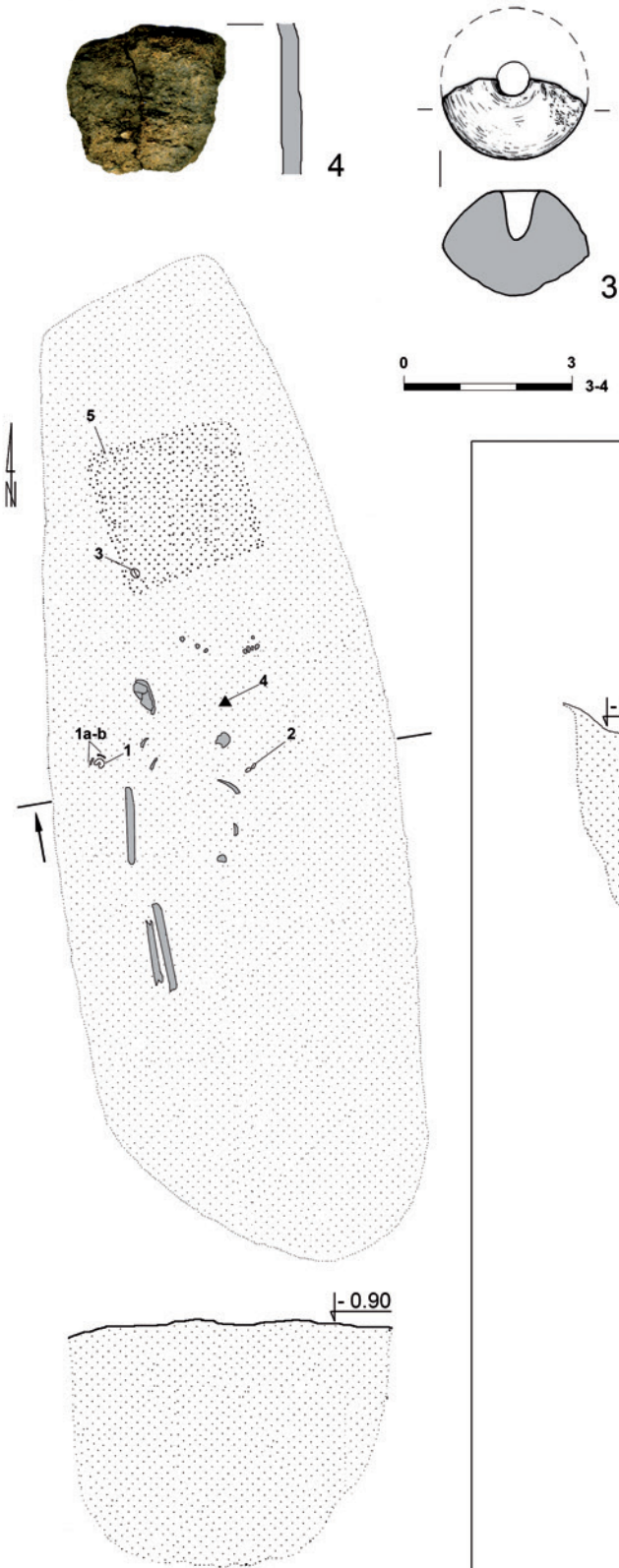


Grave 528

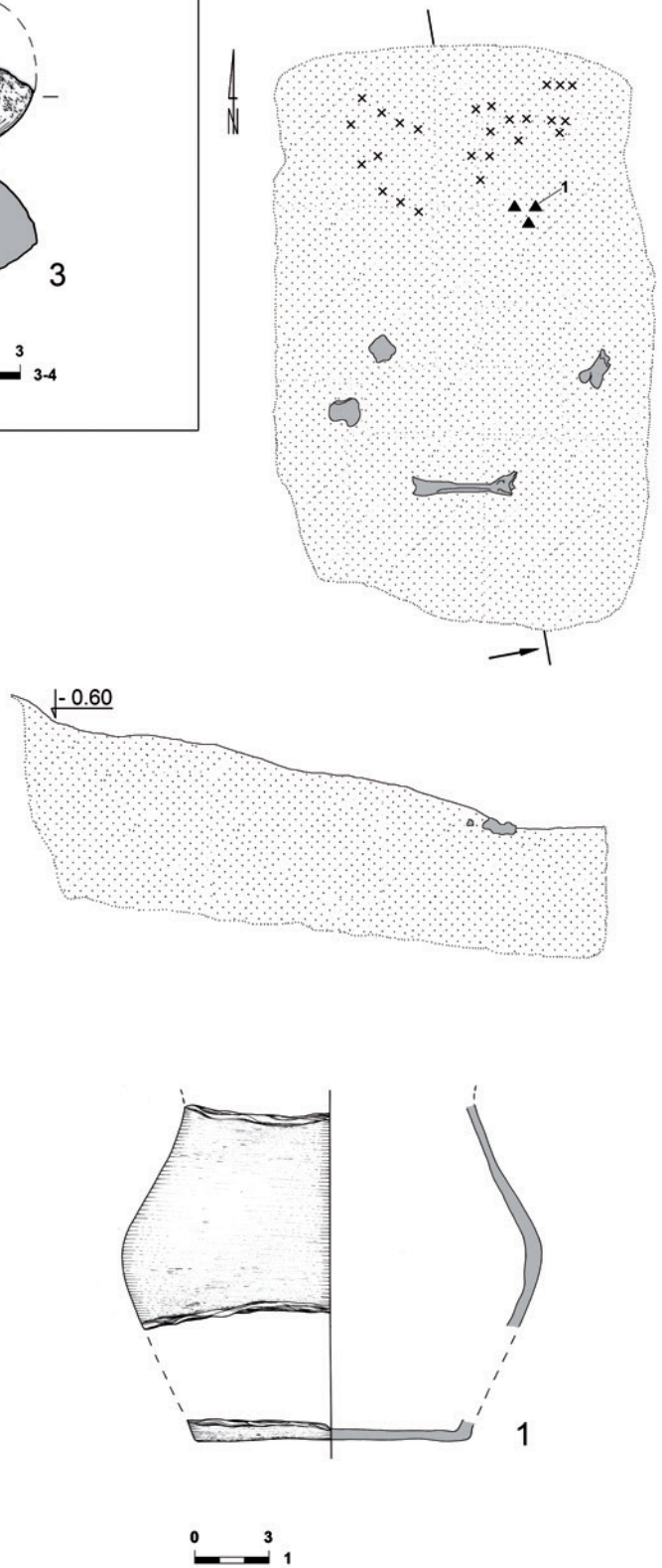


Pl. XXX. Grave 526. Grave 527 & Feature 527A. Feature 527A; 1 – ceramic. Grave 528: 1 – amber; 1a–b.2 – copper alloy

Grave 528

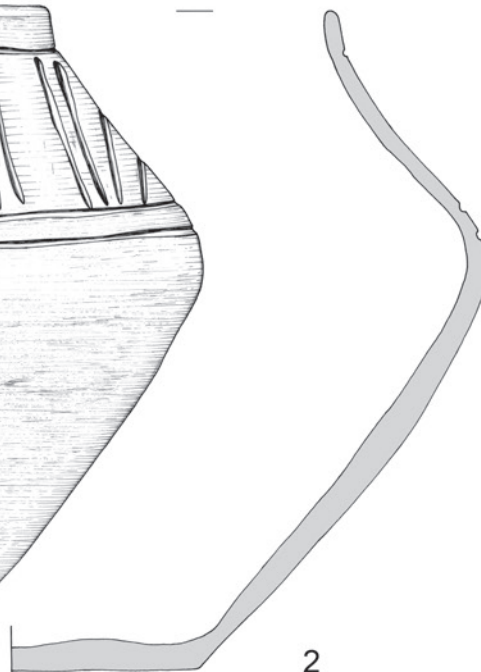
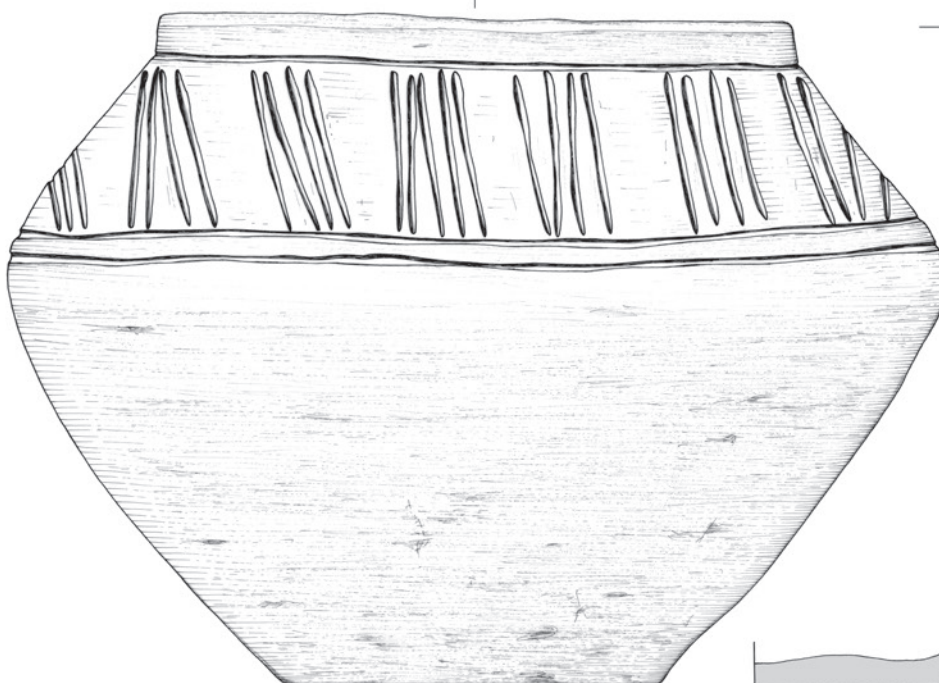
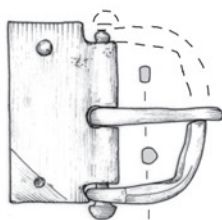


Grave 530



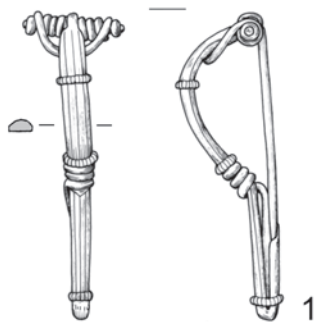
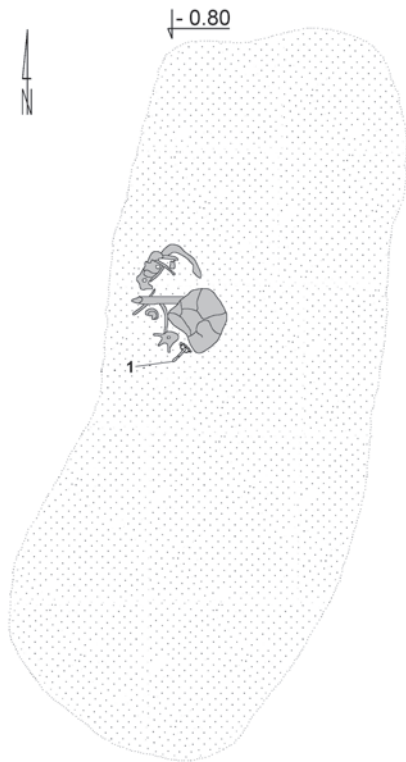
Pl. XXXI. Grave 528: 3-4 – ceramic; 5 (on plan) – organic. Grave 530: 1 – ceramic

Grave 529

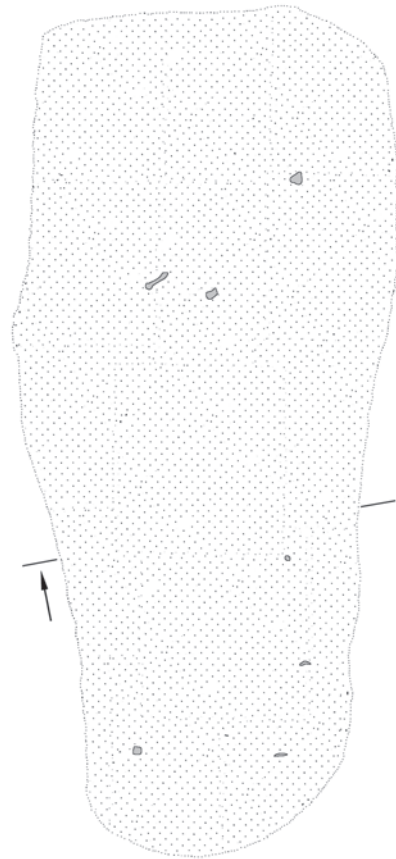


Pl. XXXII. Grave 529: 1 – brass; 2 – ceramic

Grave 532

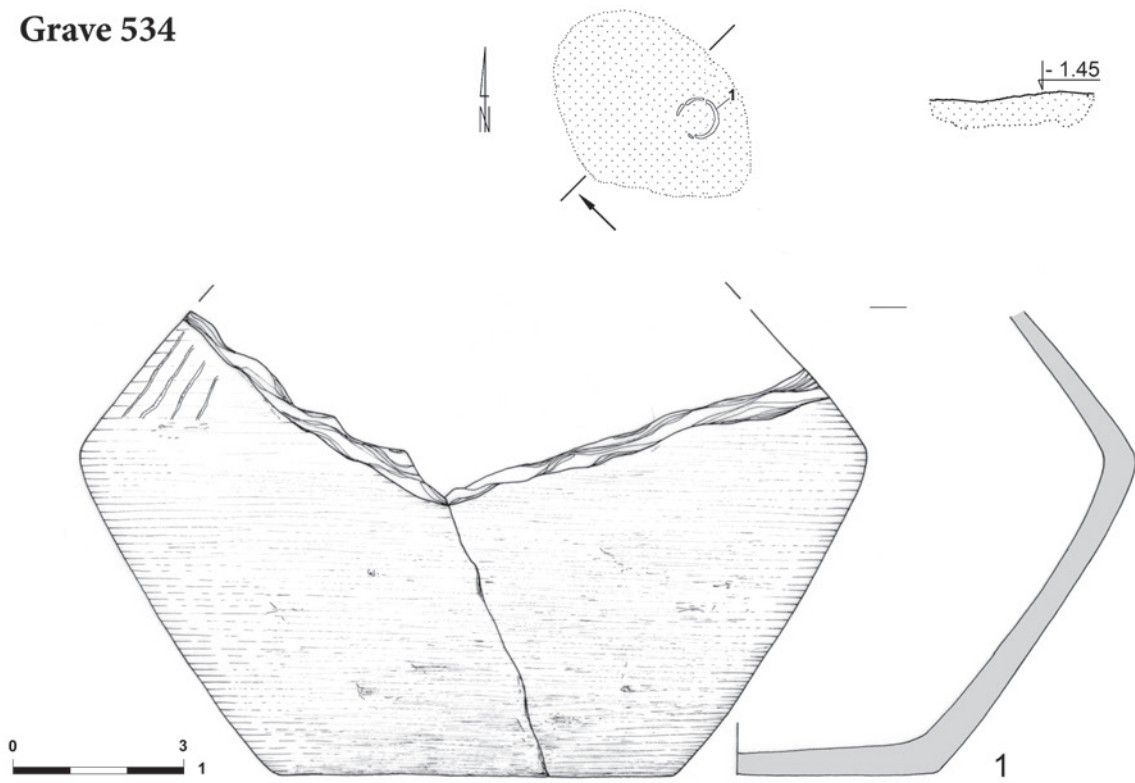


Grave 533

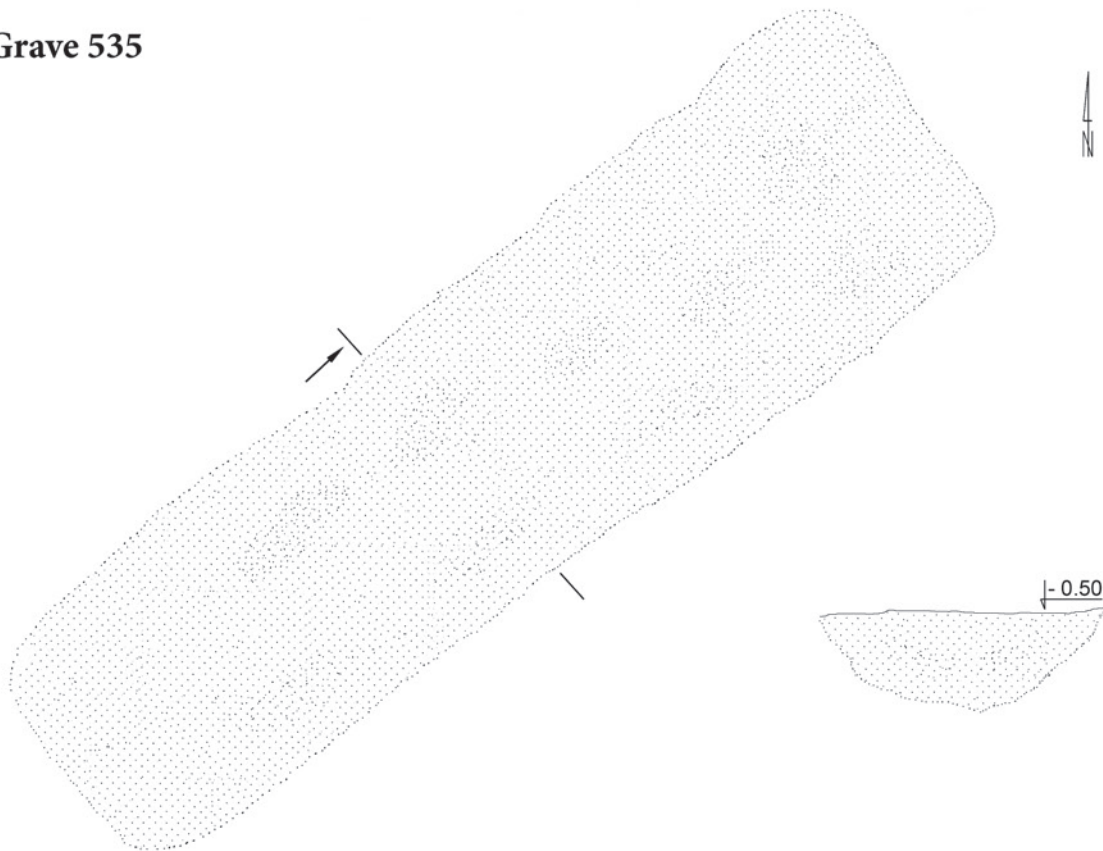


Pl. XXXIII. Grave 532: 1 – brass. Grave 533

Grave 534

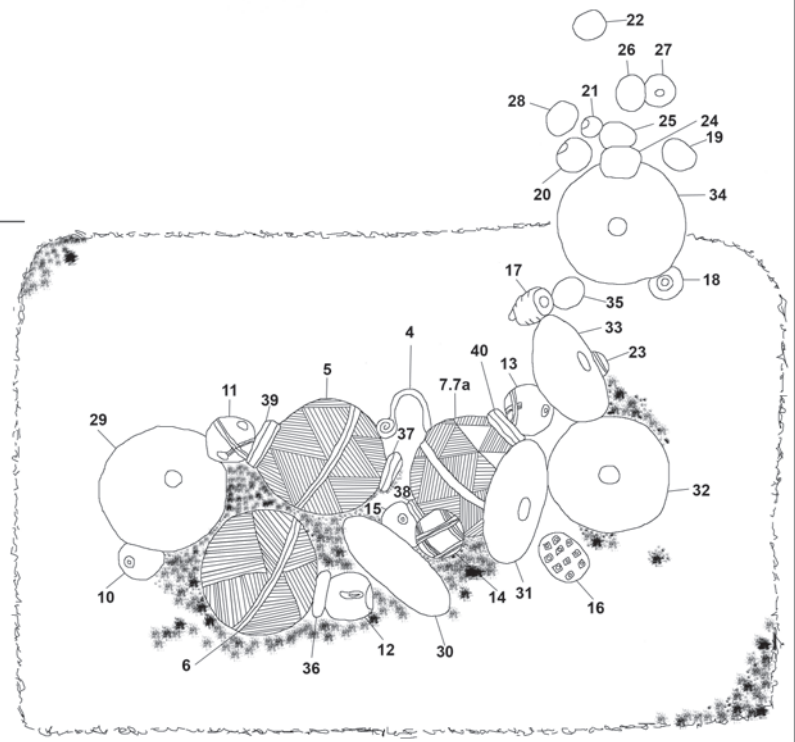
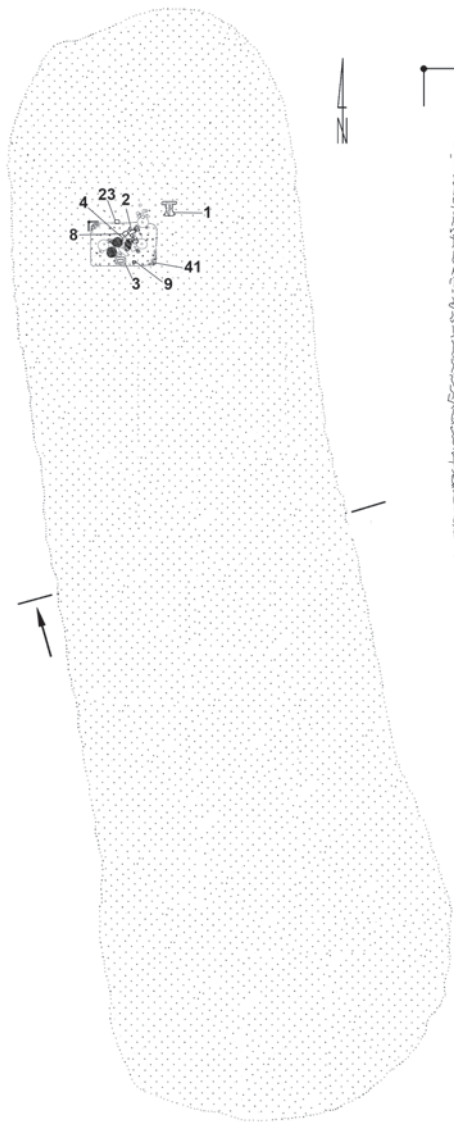


Grave 535

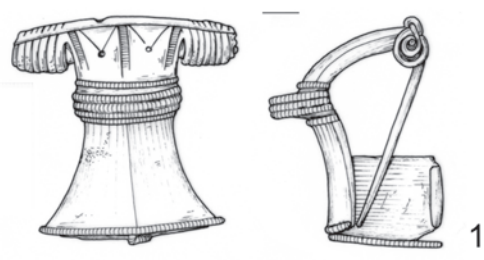


Pl. XXXIV. Grave 534: 1 – ceramic. Grave 535

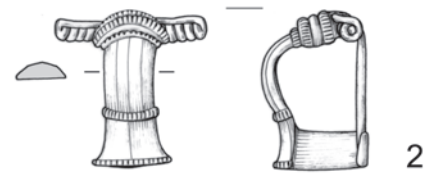
Grave 536



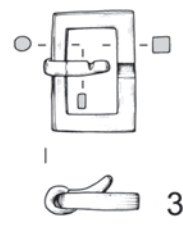
41



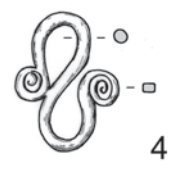
1



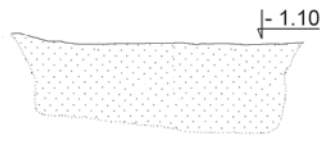
2



3

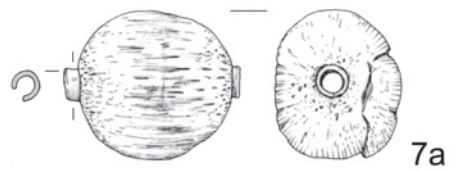
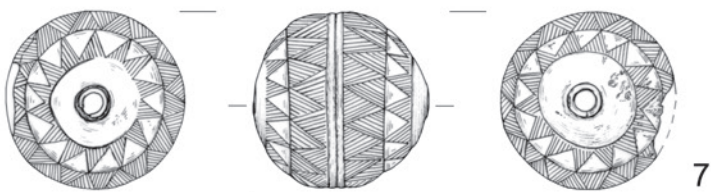
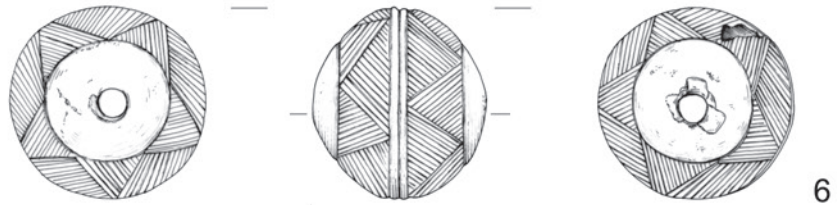
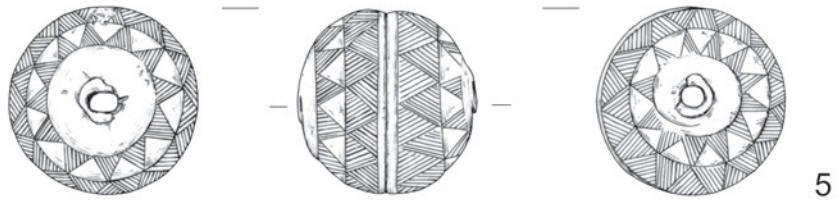


4



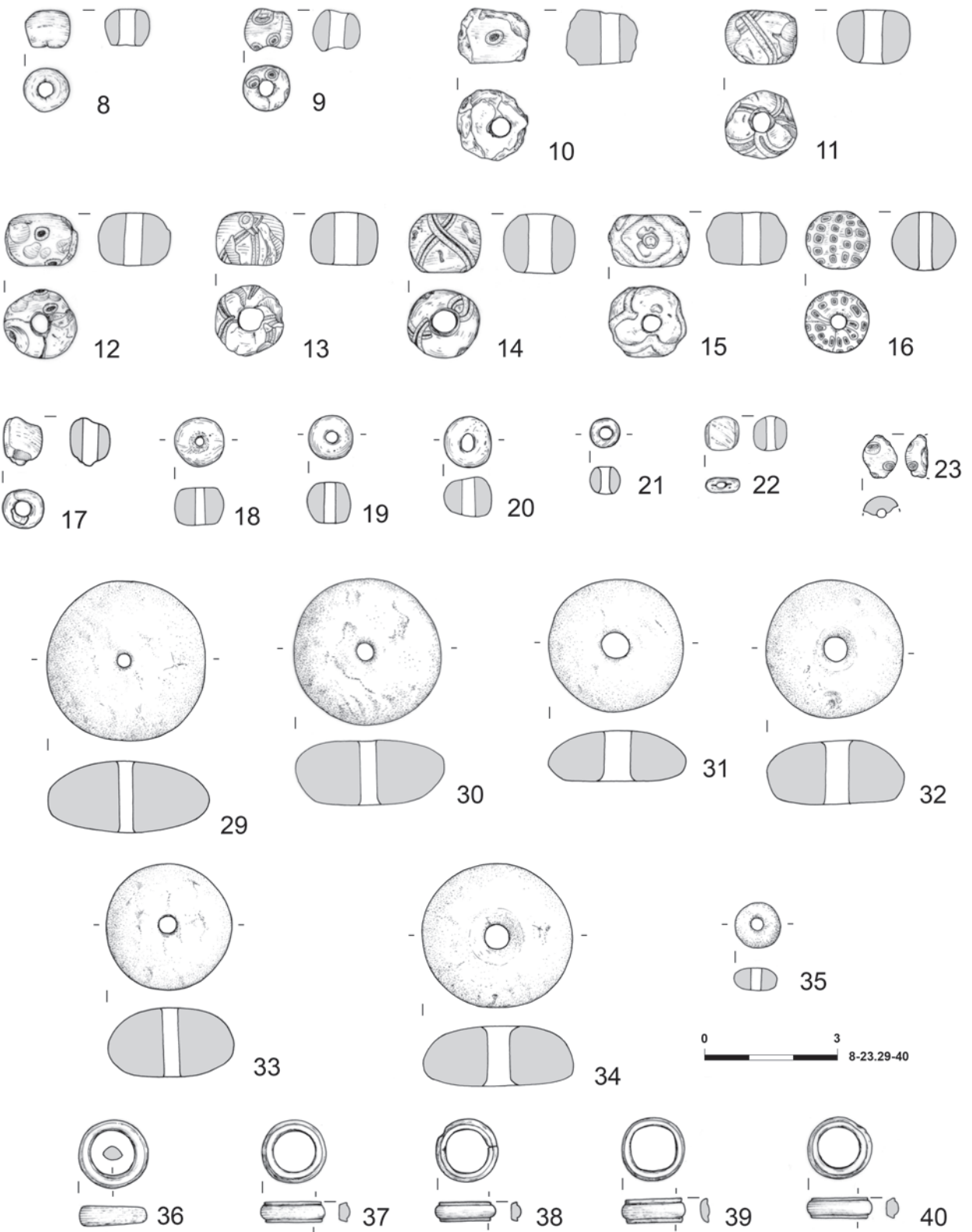
Pl. XXXV. Grave 536: 1 – brass and silver; 2 – silver; 3–4 – brass; 41 – wood

Grave 536



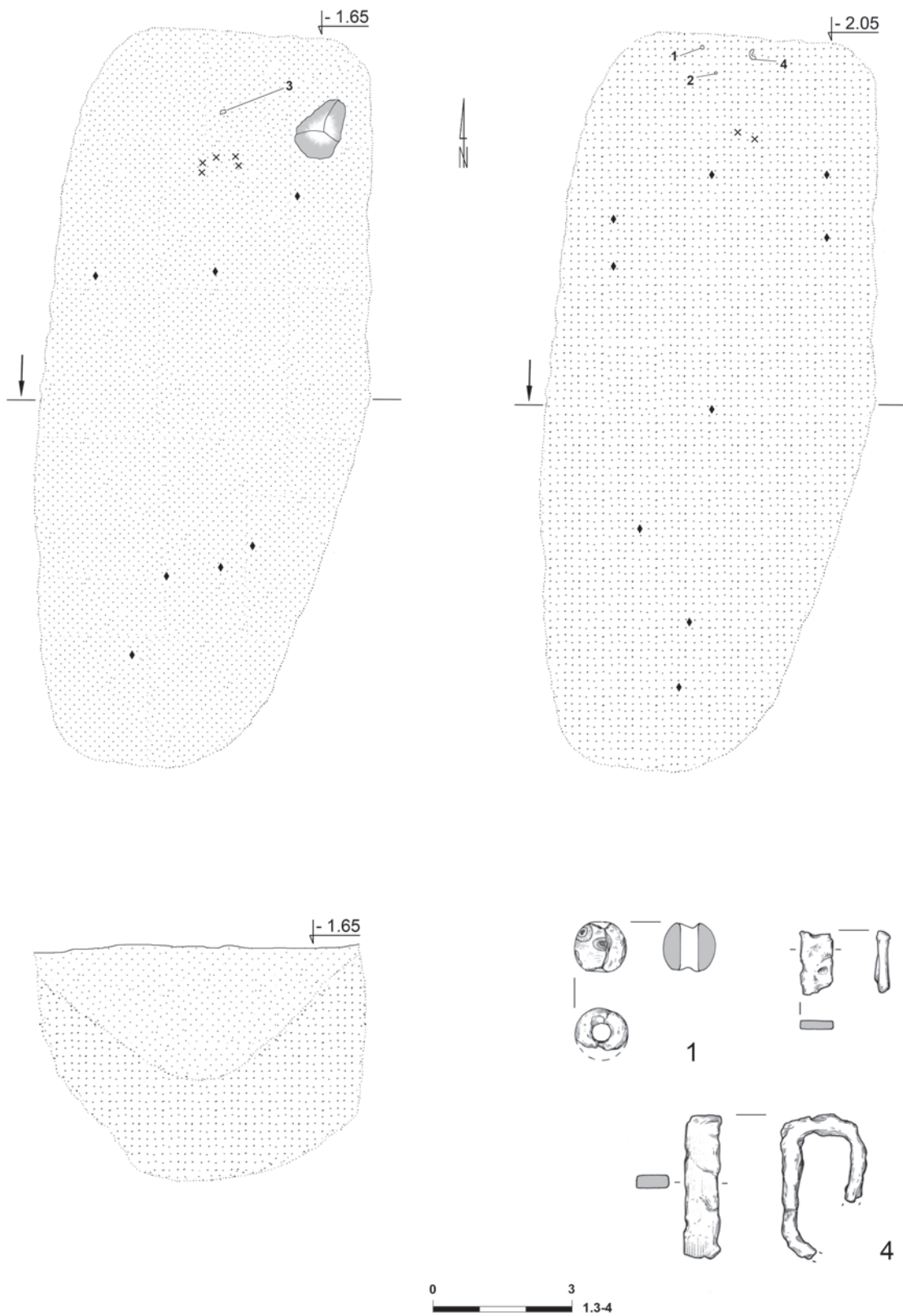
Pl. XXXVI. Grave 536: 5-7 – brass; 7a – wood and brass

Grave 536



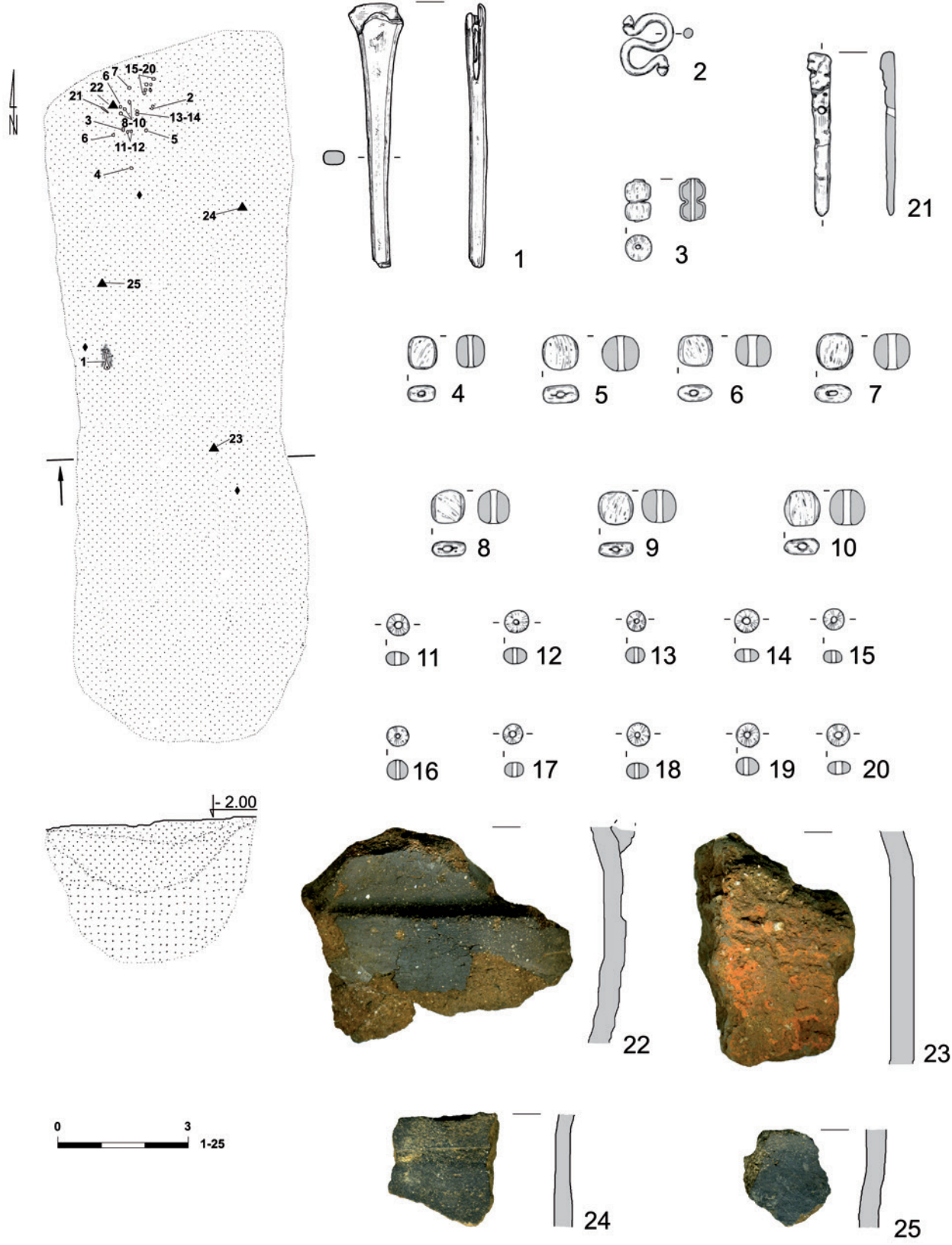
Pl. XXXVII. Grave 536: 8-23 - glass; 29-35 - amber; 36-37,40 - copper alloy; 38-39 - brass

Grave 537



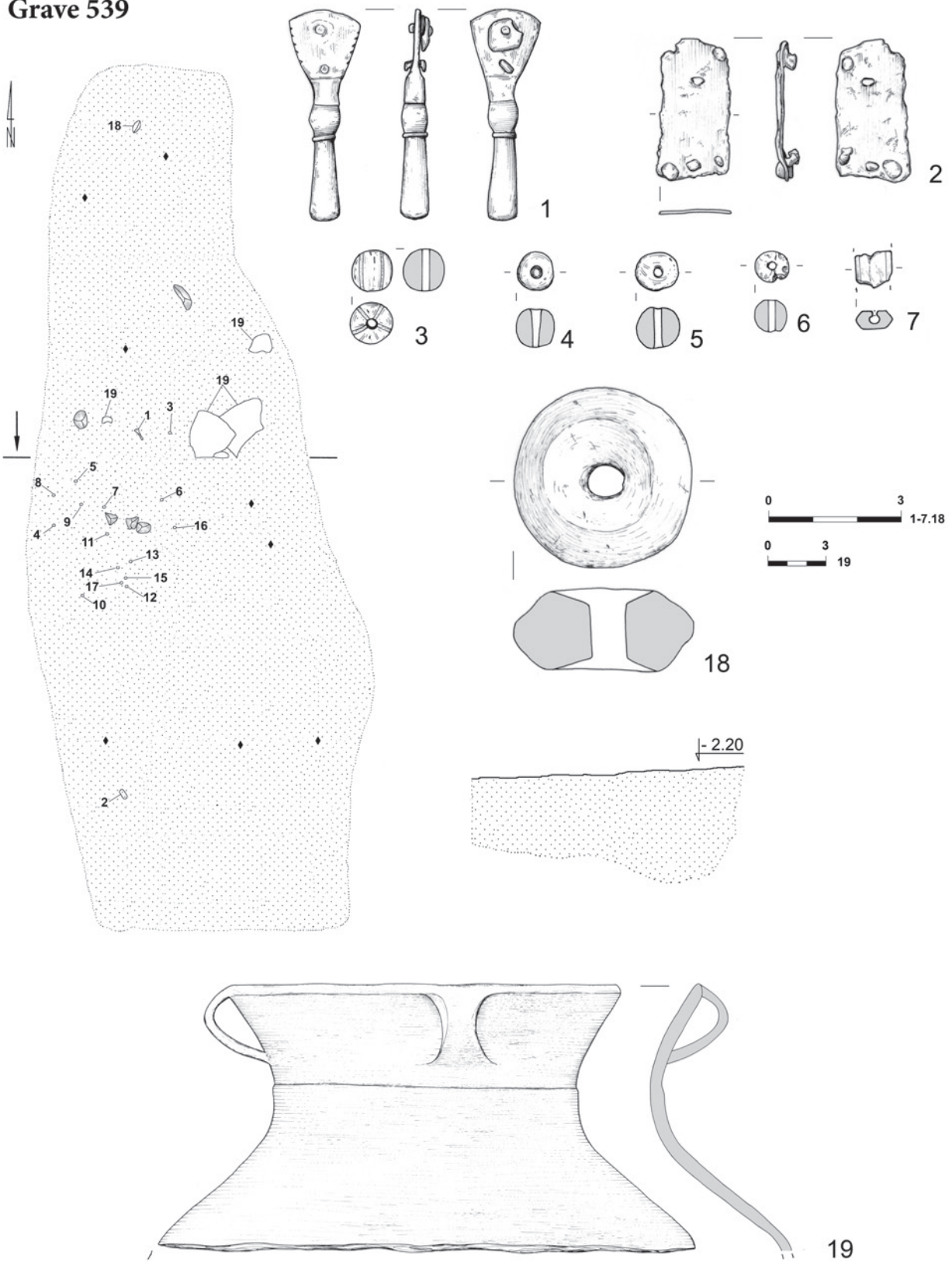
Pl. XXXVIII. Grave 537: 1 – glass; 3–4 – iron

Grave 538



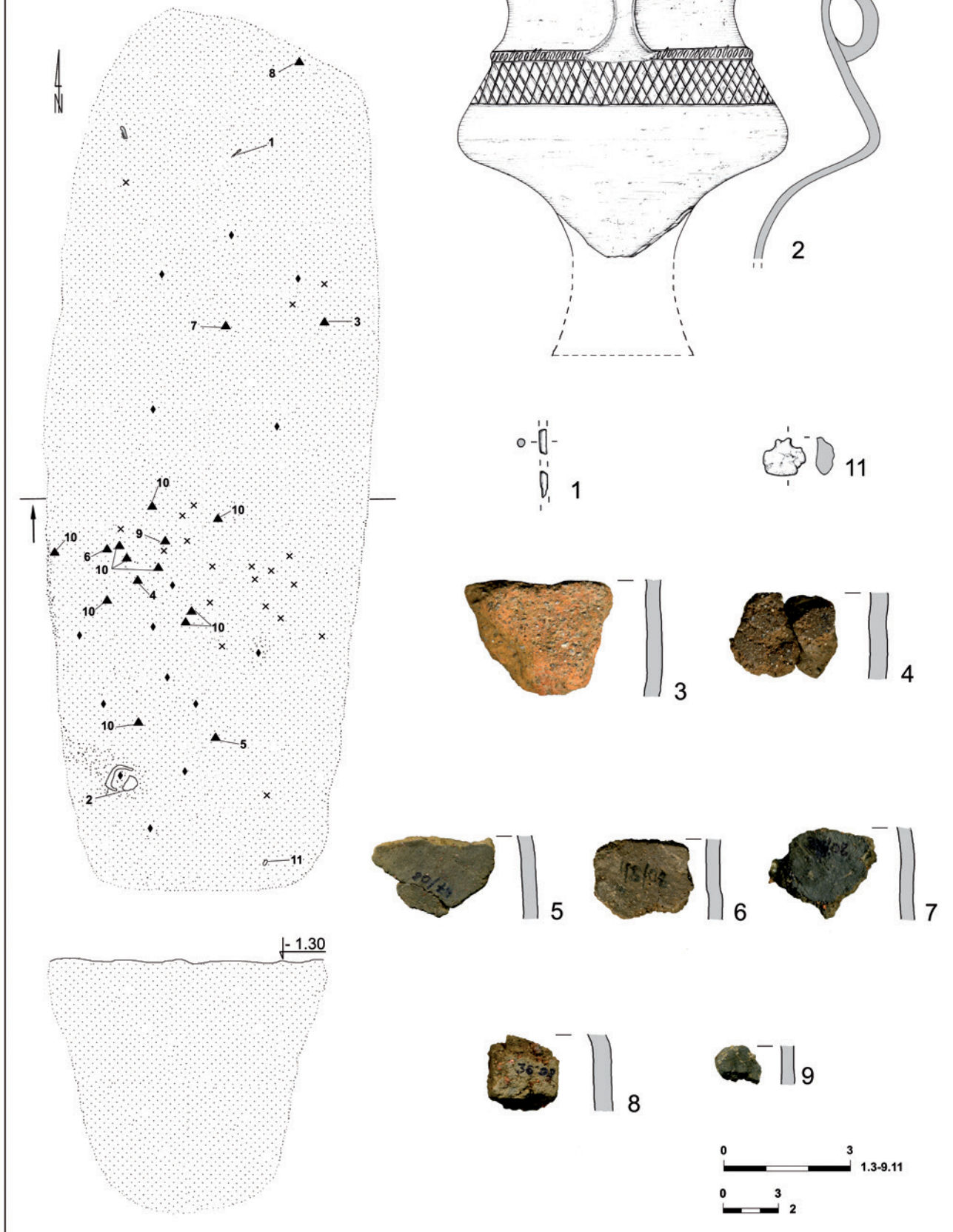
Pl. XXXIX. Grave 538: 1 – copper alloy; 2 – silver; 3–20 – glass; 21 – iron; 22–25 – ceramic

Grave 539



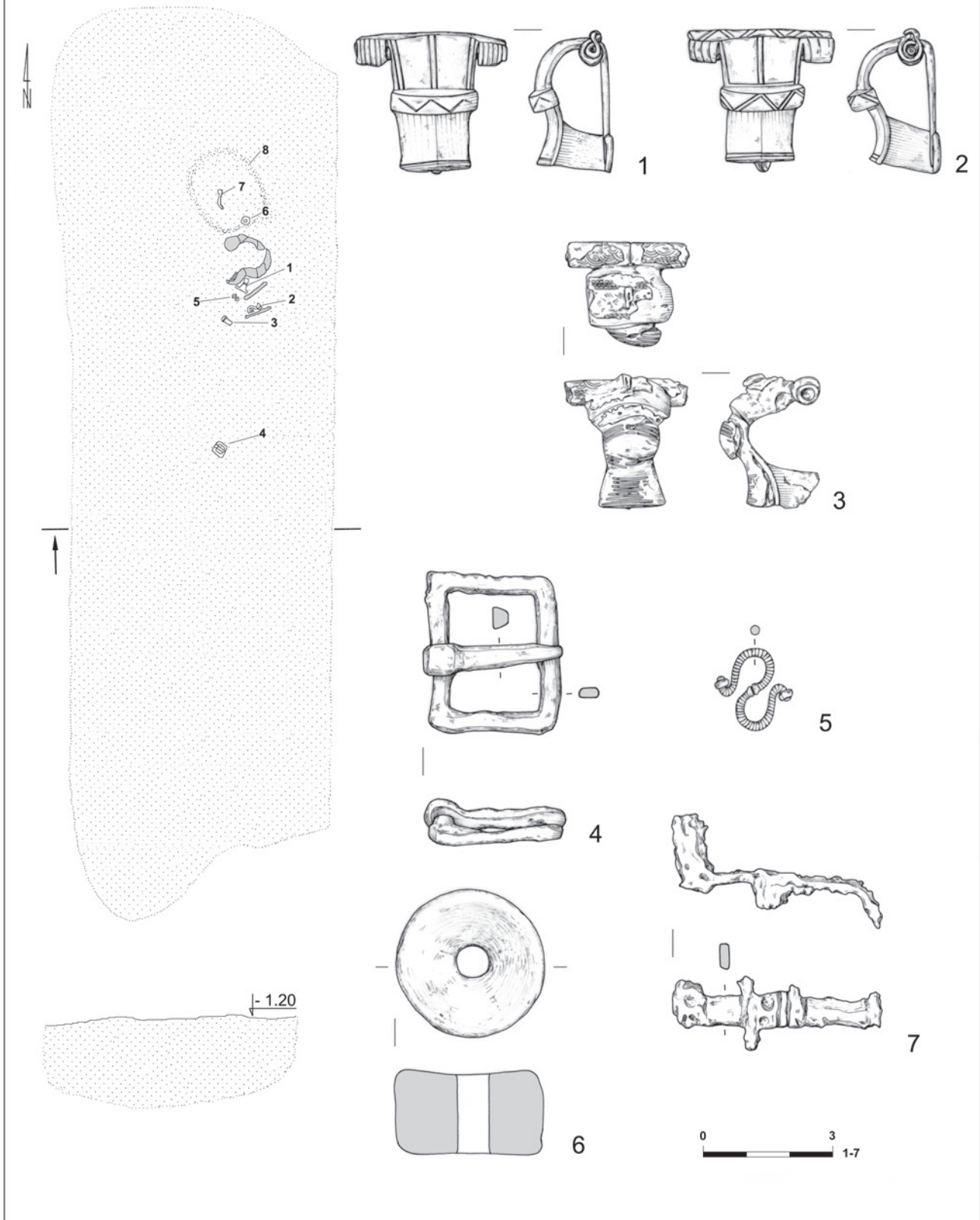
Pl. XL. Grave 539: 1 – tin-lead bronze; 2 – copper alloy; 3-7 – glass; 18-19 – ceramic

Grave 540



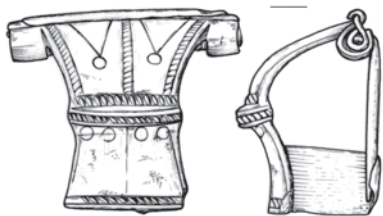
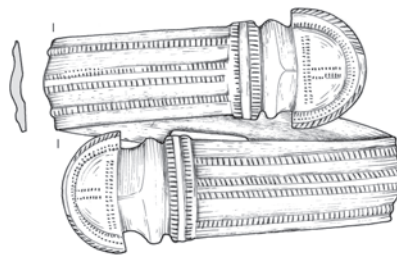
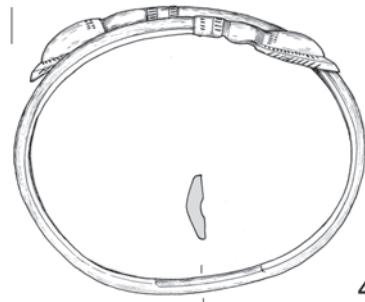
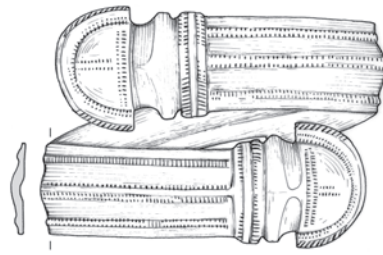
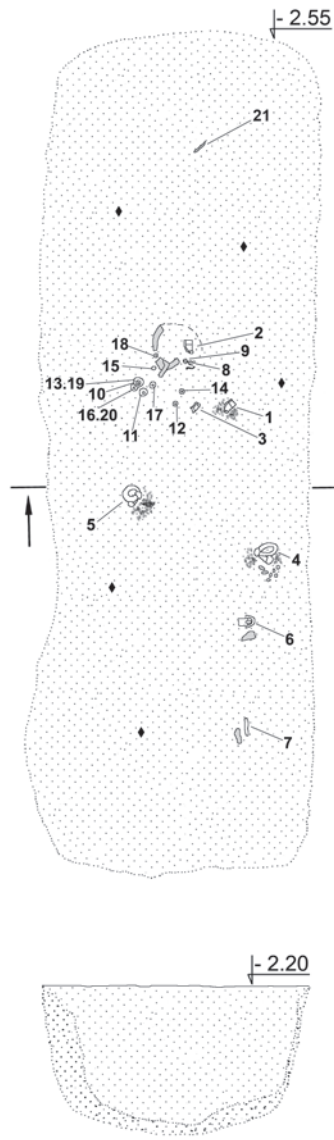
Pl. XLI. Grave 540: 1 – copper alloy; 2–9 – ceramic; 11 – amber

Grave 541

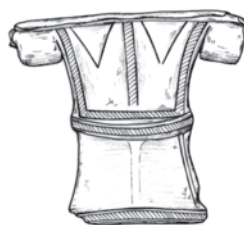


Pl. XLII. Grave 541: 1-2 – brass; 3 – iron and silver foil; 4,7 – iron; 5 – silver; 6 – ceramic; 8 (on plan) – organic

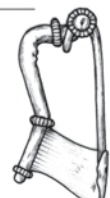
Grave 542



1



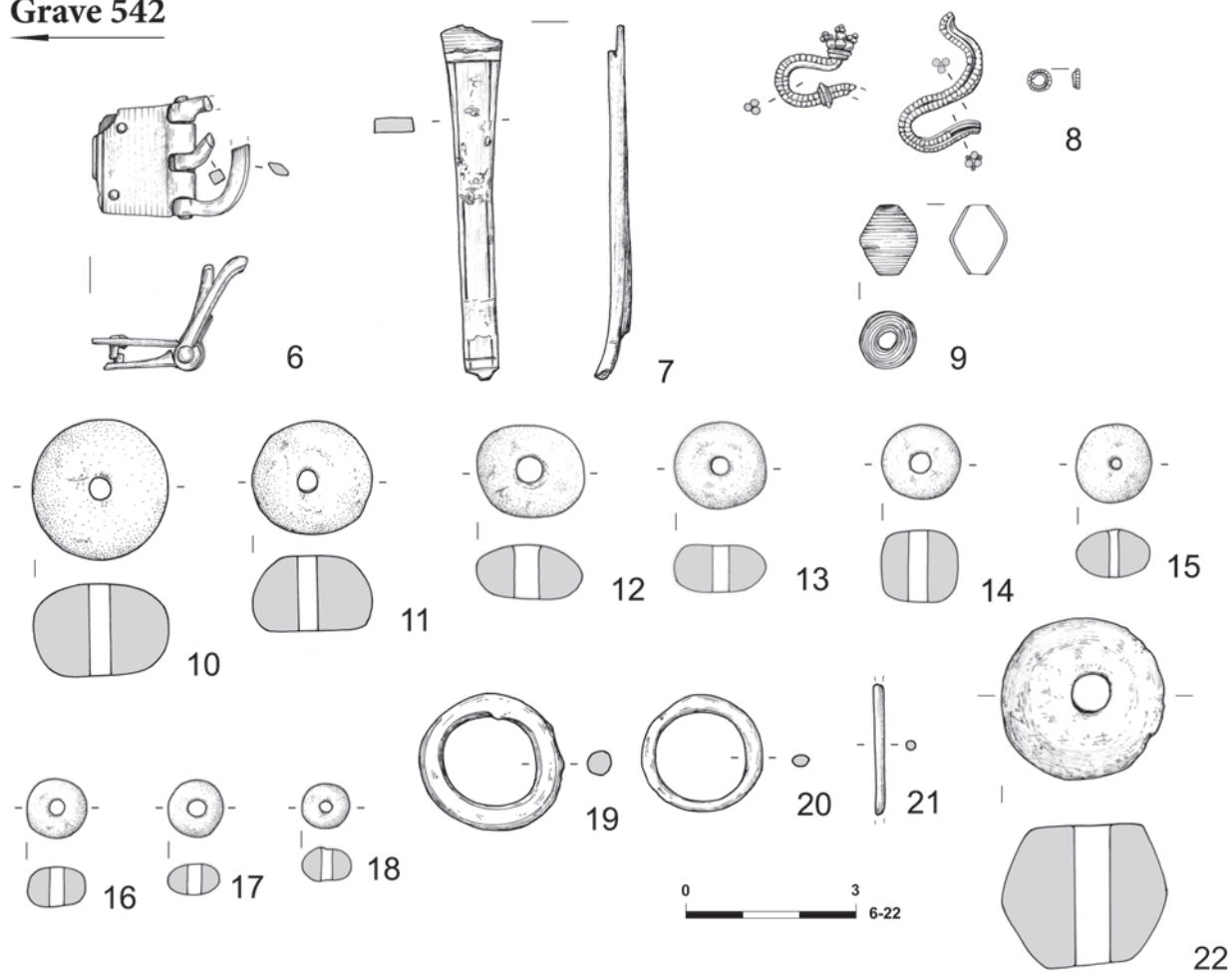
2



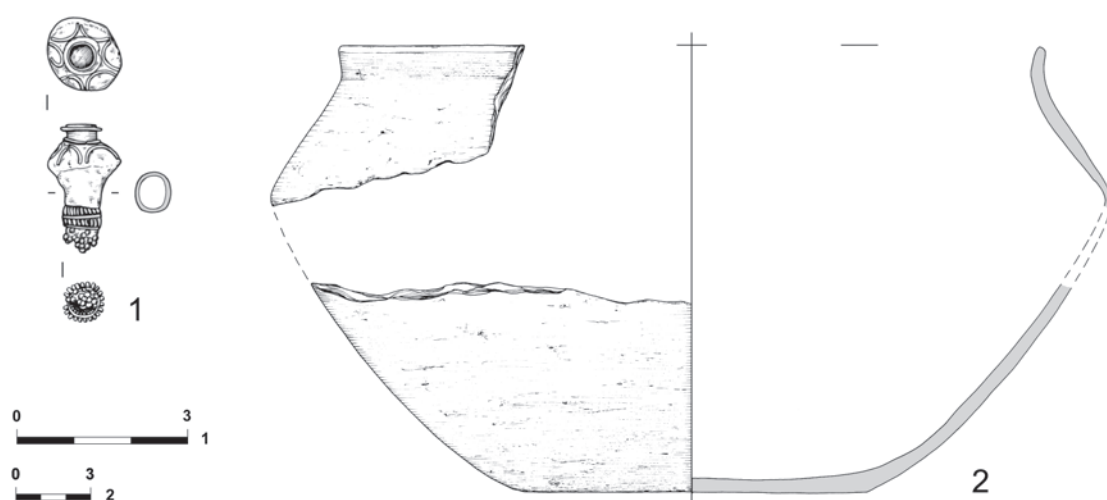
3

Pl. XLIII. Grave 542: 1-2 – brass; 3-5 – silver

Grave 542



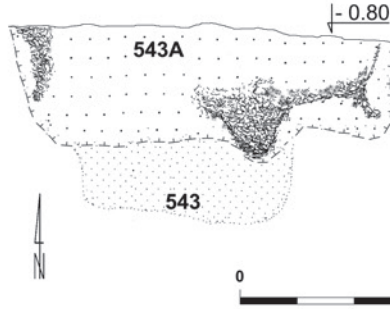
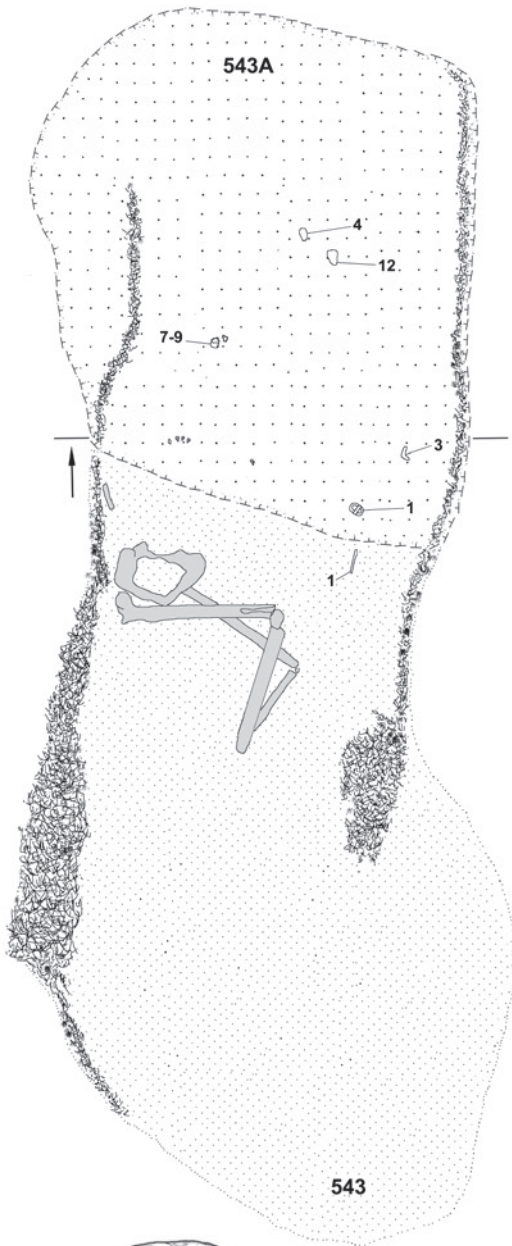
Grave 544



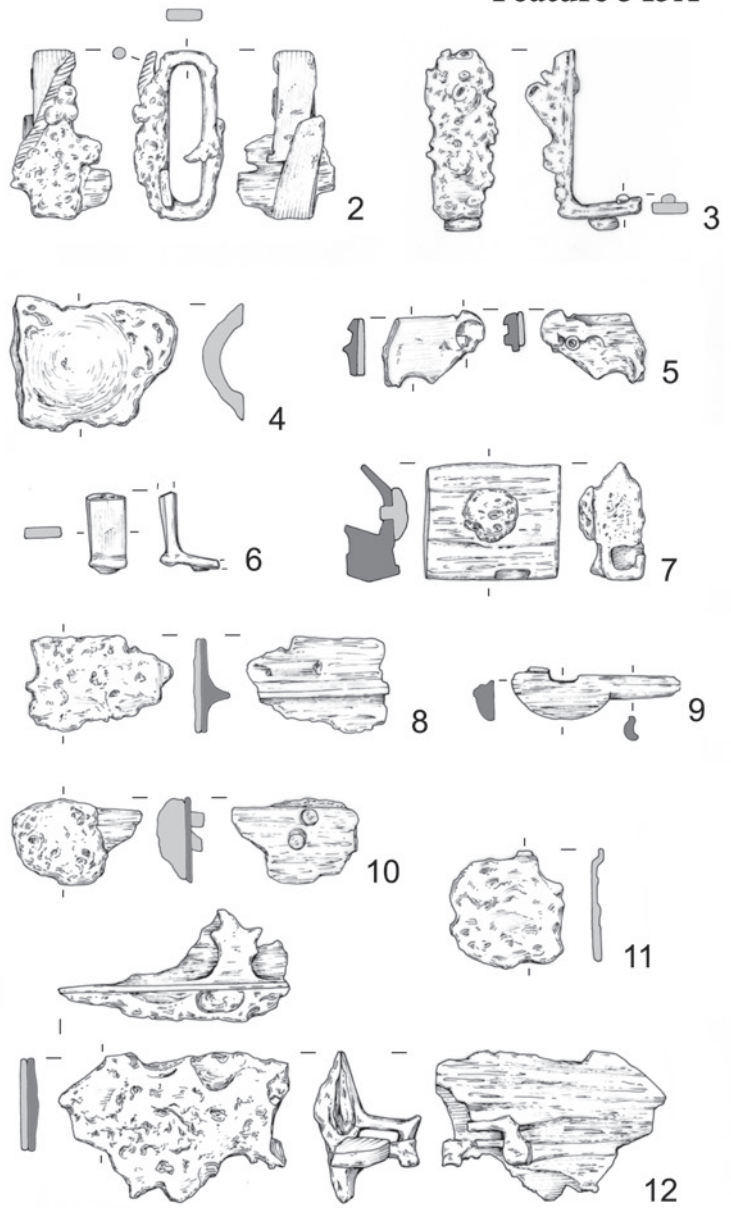
Pl. XLIV. Grave 542: 6.19–21 – copper alloy; 7 – brass; 8–9 – silver; 10–18 – amber; 22 – ceramic. Grave 544: 1 – electrum; 2 – ceramic

Grave 543 & Feature 543A

Grave 543

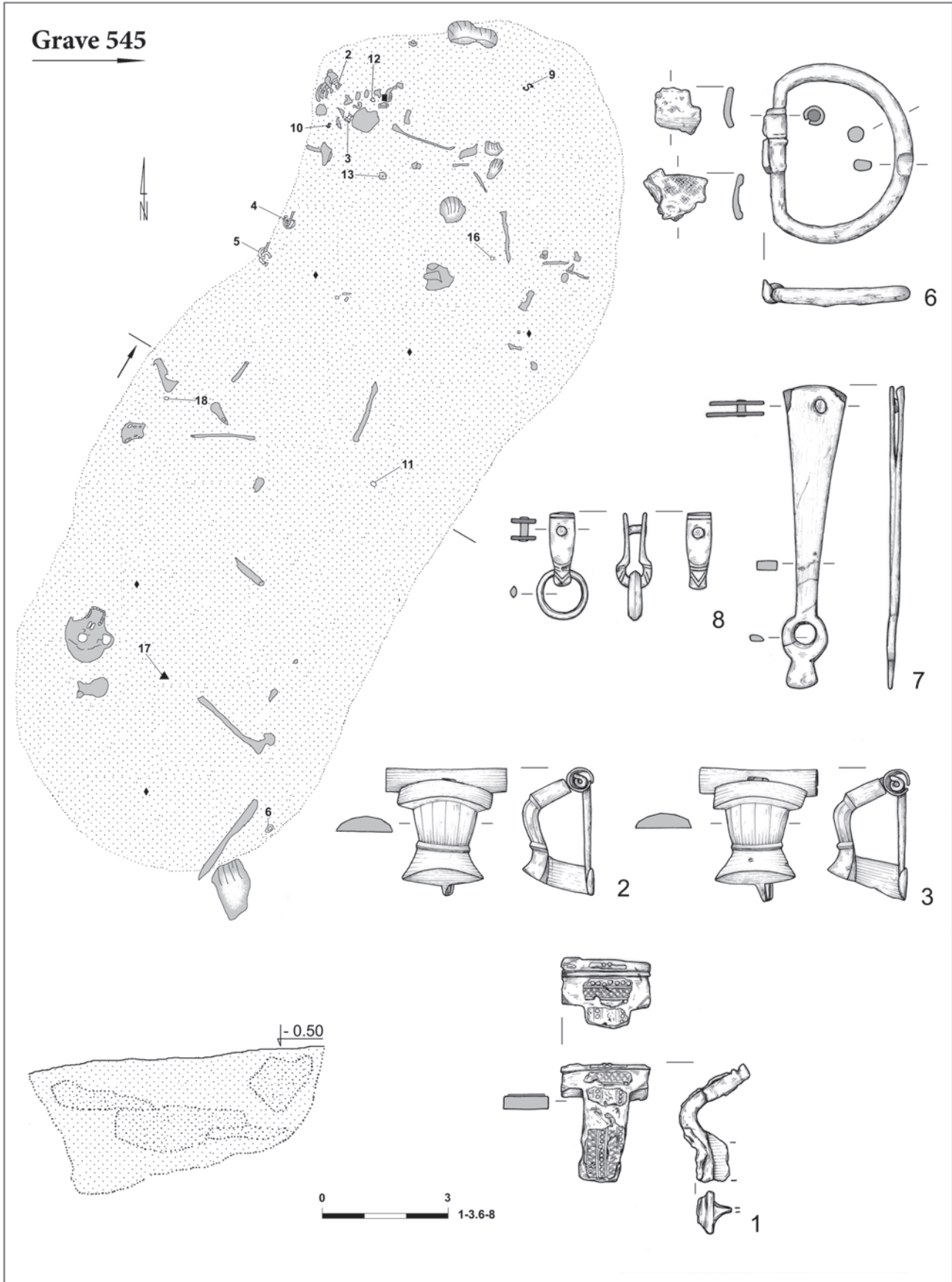


Feature 543A



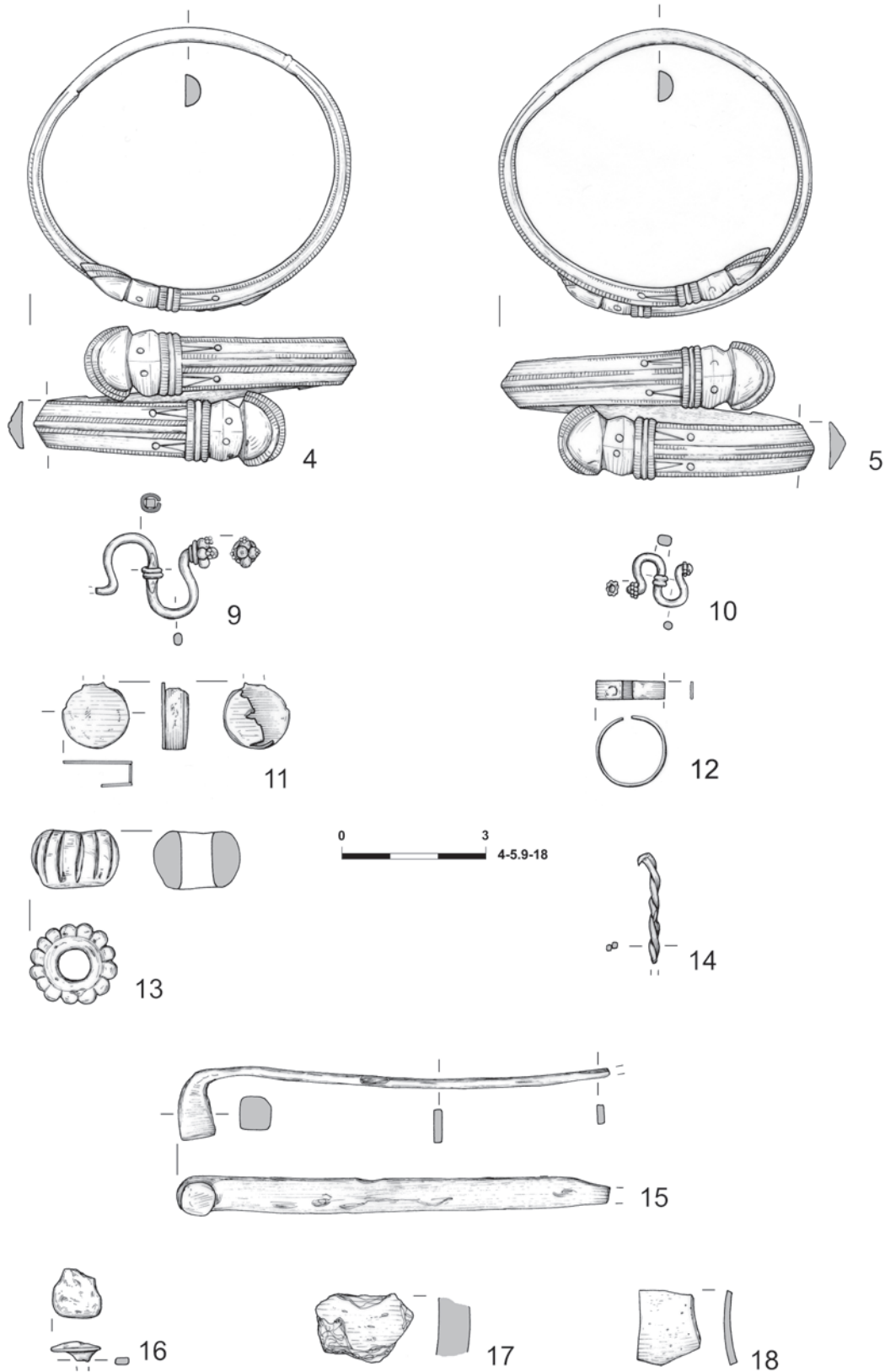
Pl. XLV. Grave 543 & Feature 543A. Grave 543: 1 – copper alloy. Feature 543A: 1.4.6.11.13 – iron; 2–3.5.7–8.10.12 – iron and wood; 9 – wood

Grave 545



Pl. XLVI. Grave 545: 1 – iron and silver foil; 2–3.7–8 – brass; 6 – iron

Grave 545



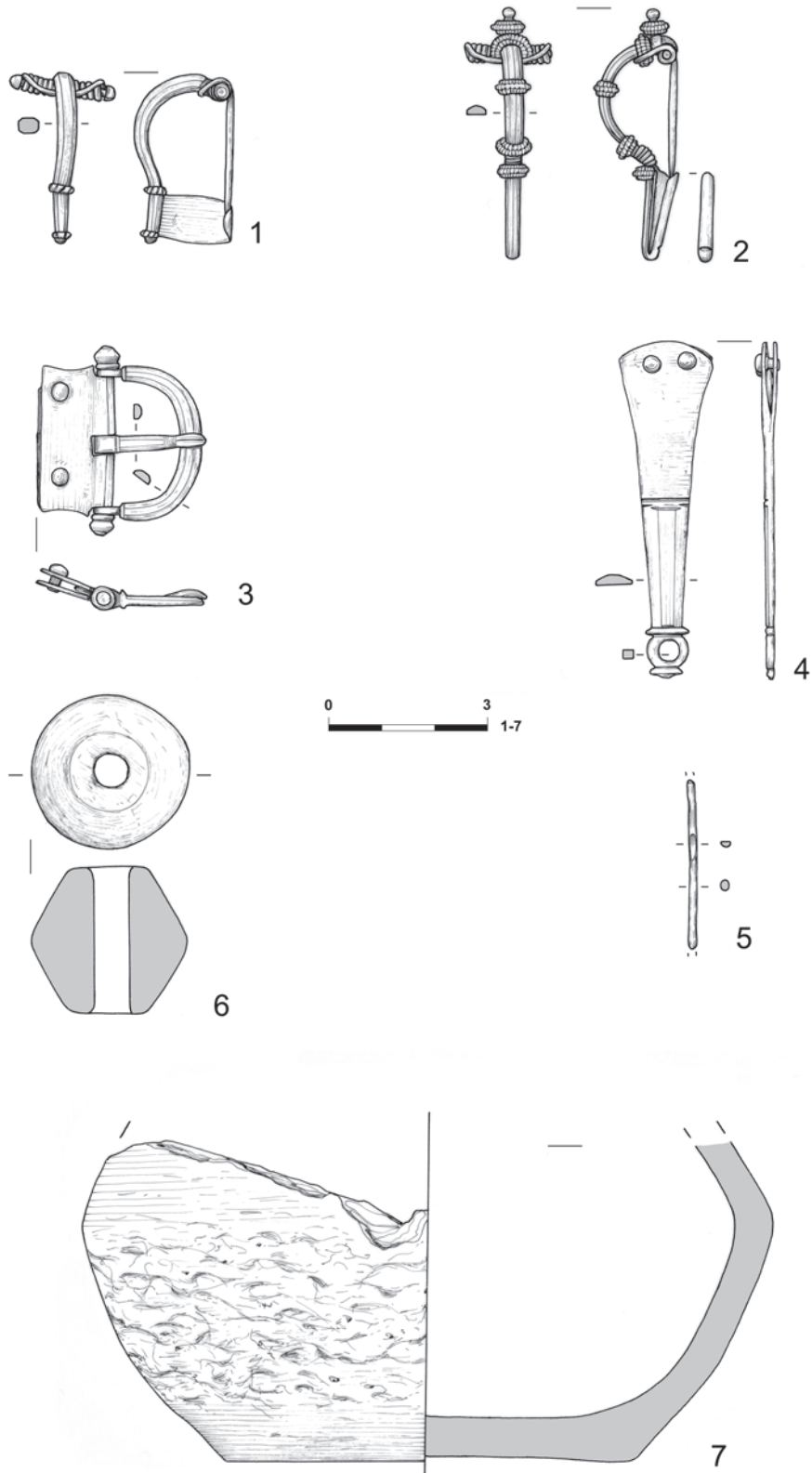
Pl. XLVII. Grave 545: 4-5, 10-12 - brass; 9 - silver; 13, 18 - glass; 14-16 - iron; 17 - ceramic

Grave 546



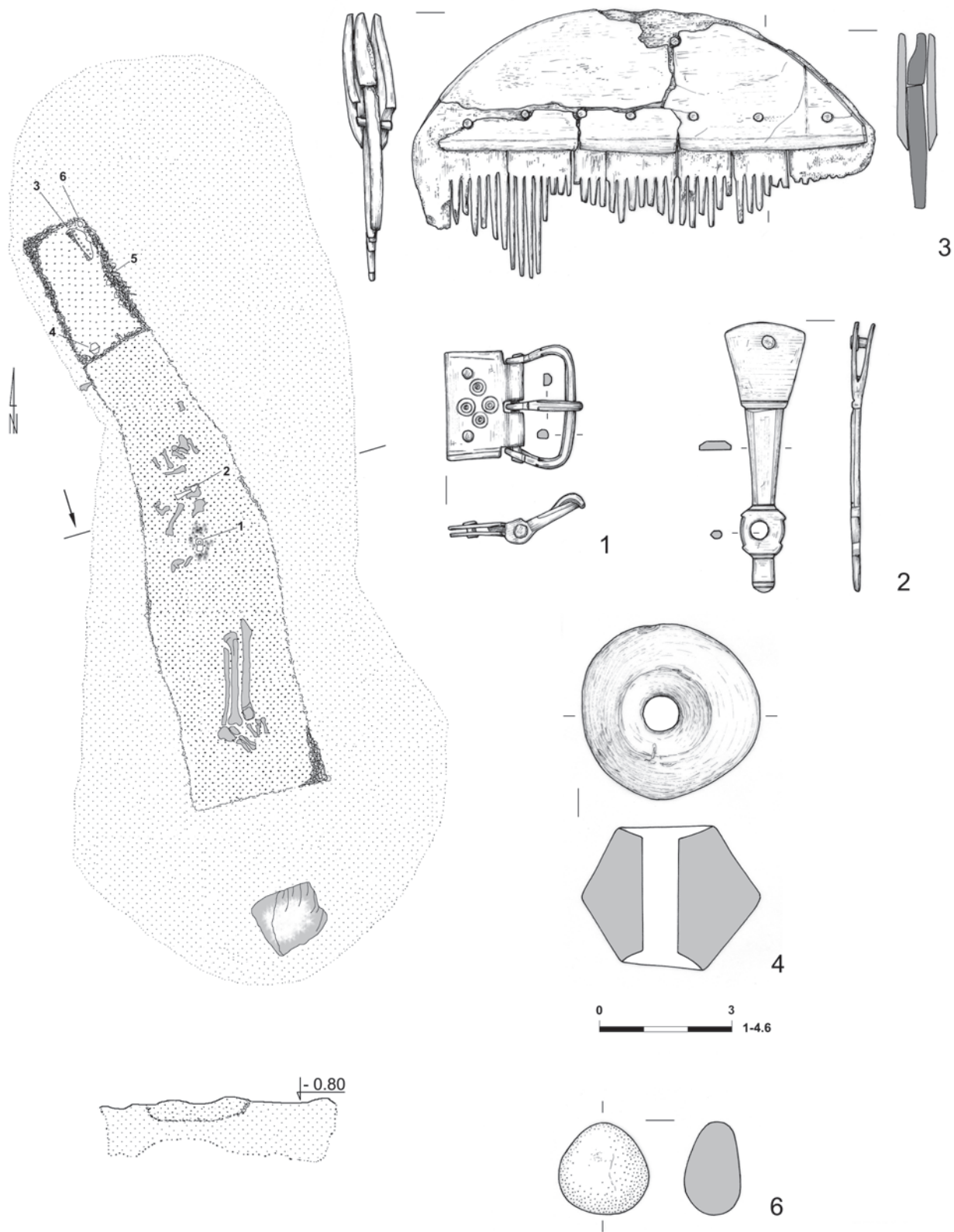
Pl. XLVIII. Grave 546

Grave 546



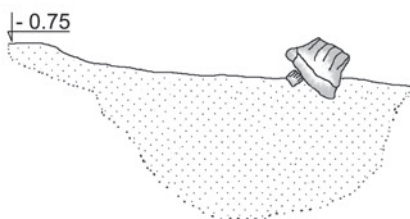
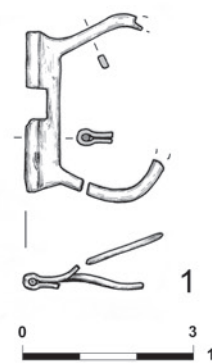
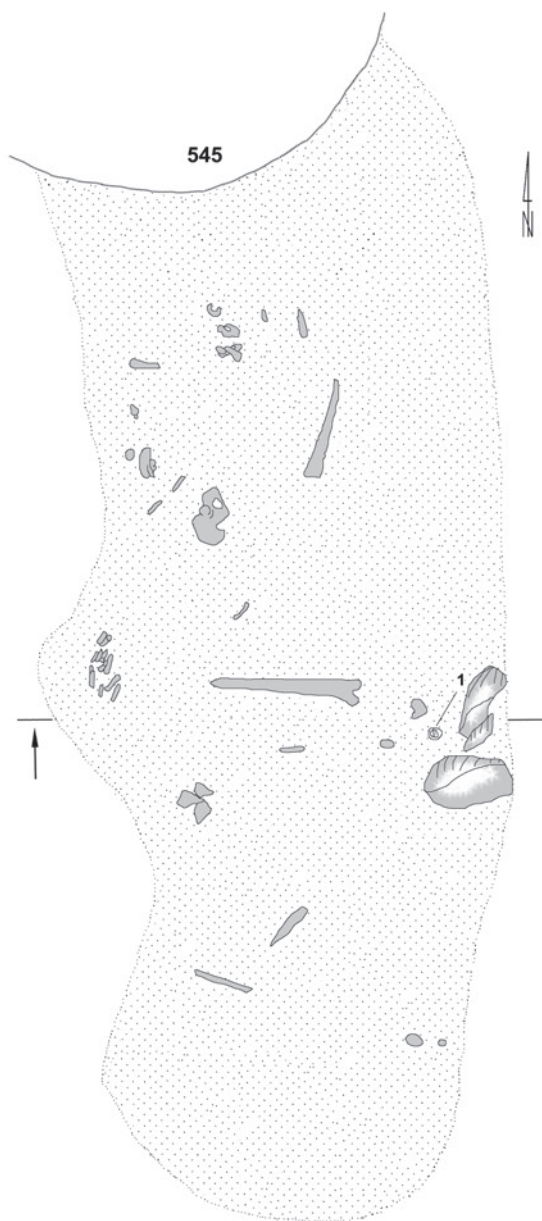
Pl. XLIX. Grave 546: 1.3-4 - brass; 2 - silver; 5 - iron; 6-7 - ceramic

Grave 547

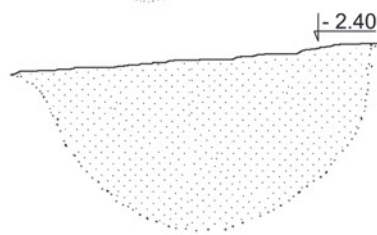
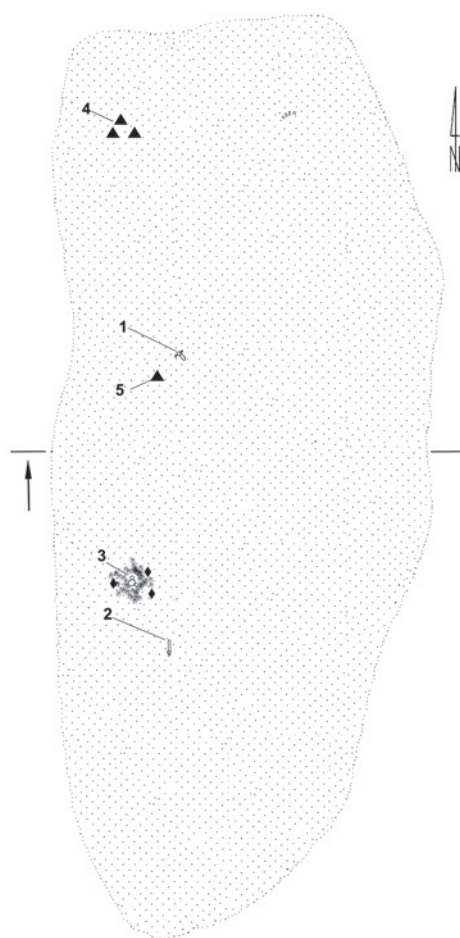


Pl. L. Grave 547: 1-2 – brass; 3 – bone (antler [?]); 4 – ceramic; 5 (on plan) – wood; 6 – stone

Grave 548

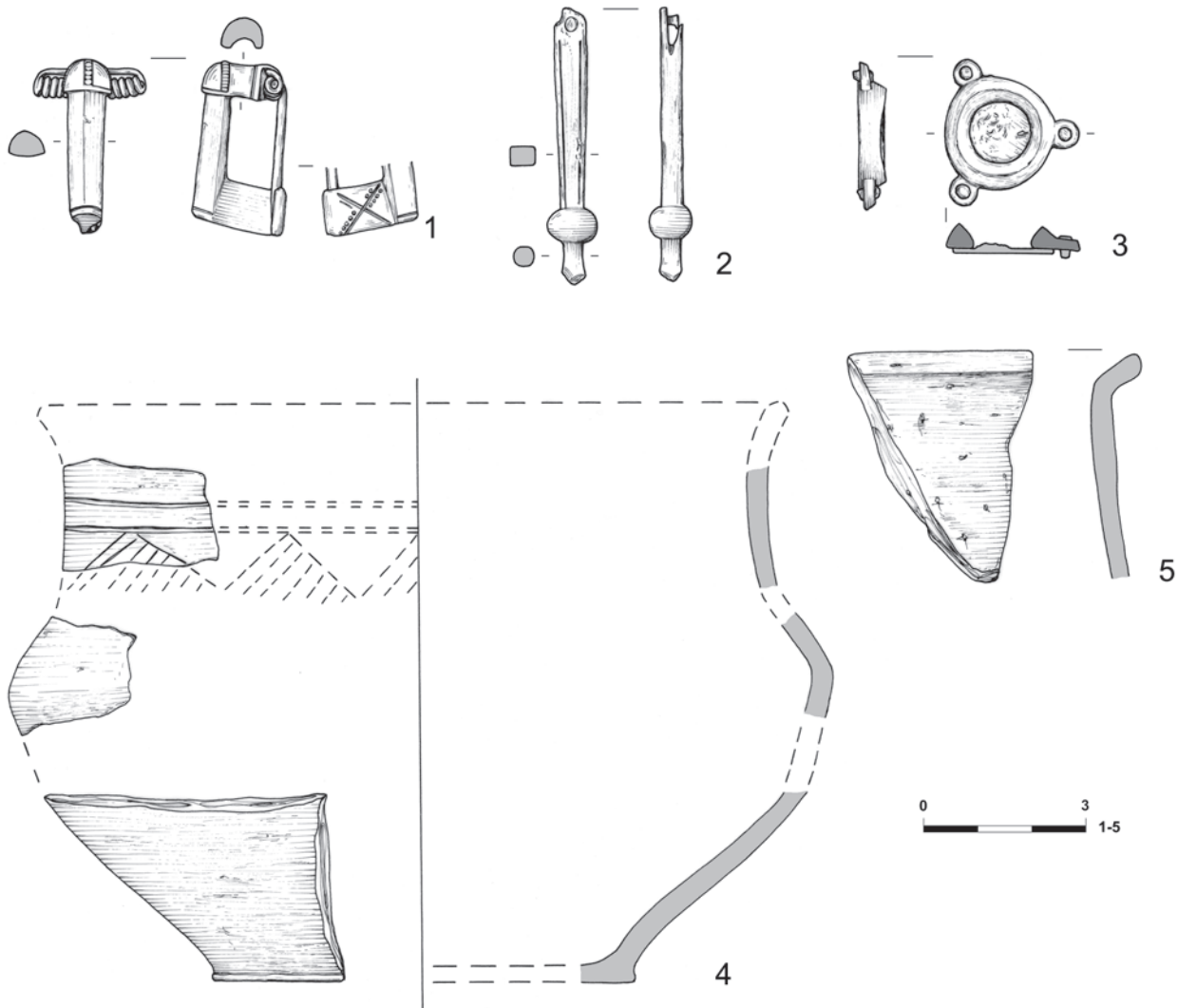


Grave 550

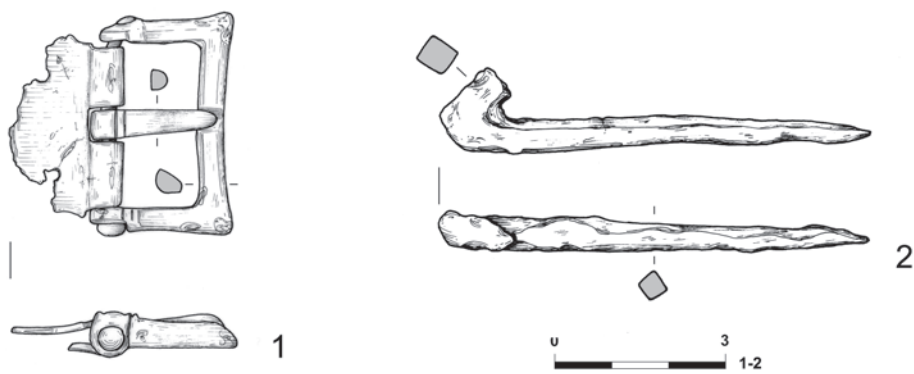


Pl. LI. Grave 548: 1- iron. Grave 550

Grave 550

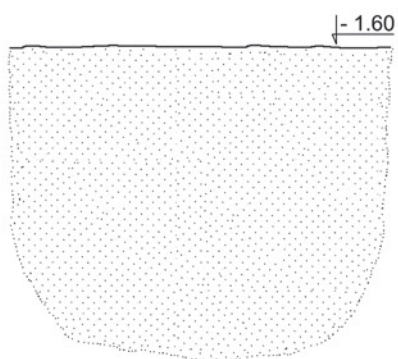
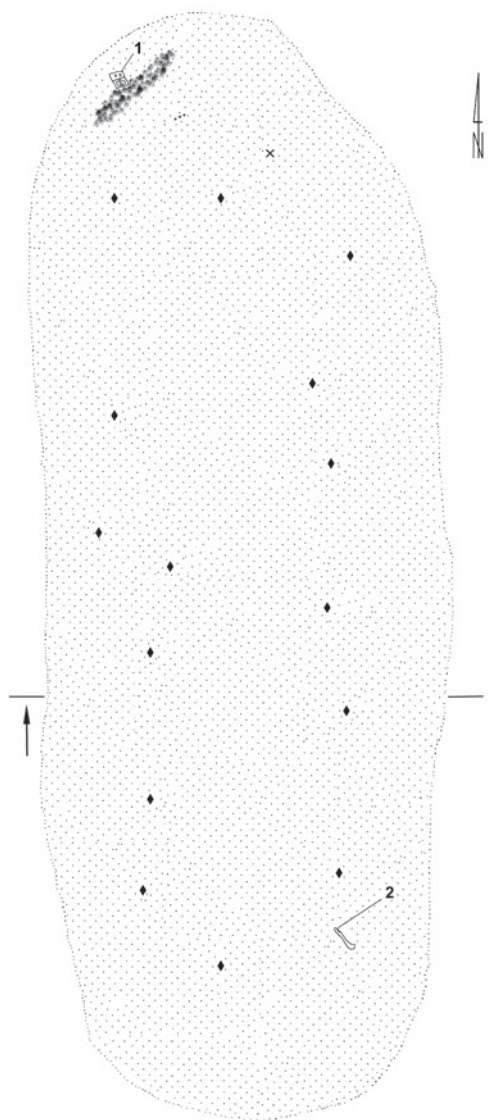


Grave 549

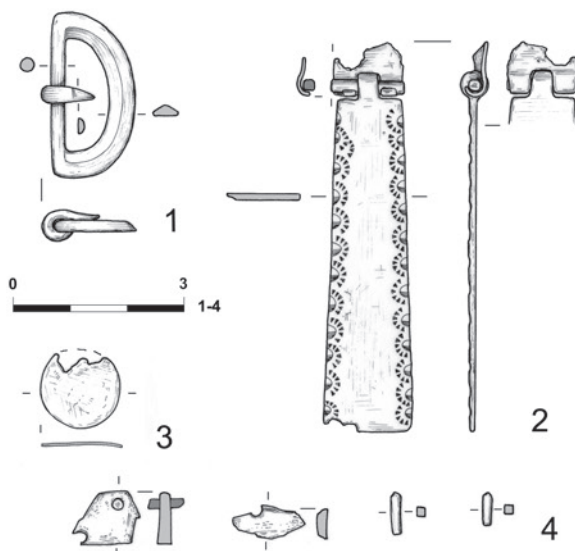
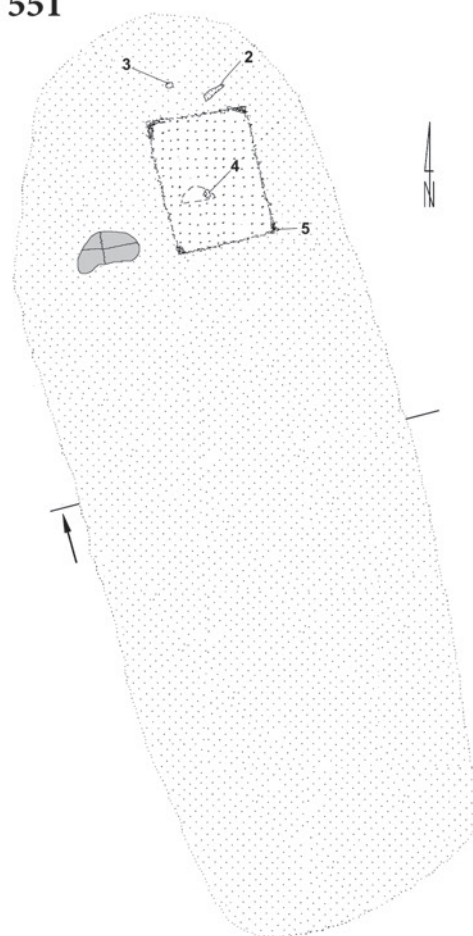


Pl. LII. Grave 549: 1 – copper alloy; 2 – iron. Grave 550: 1 – brass; 2–3 – copper alloy; 4–5 – ceramic

Grave 549

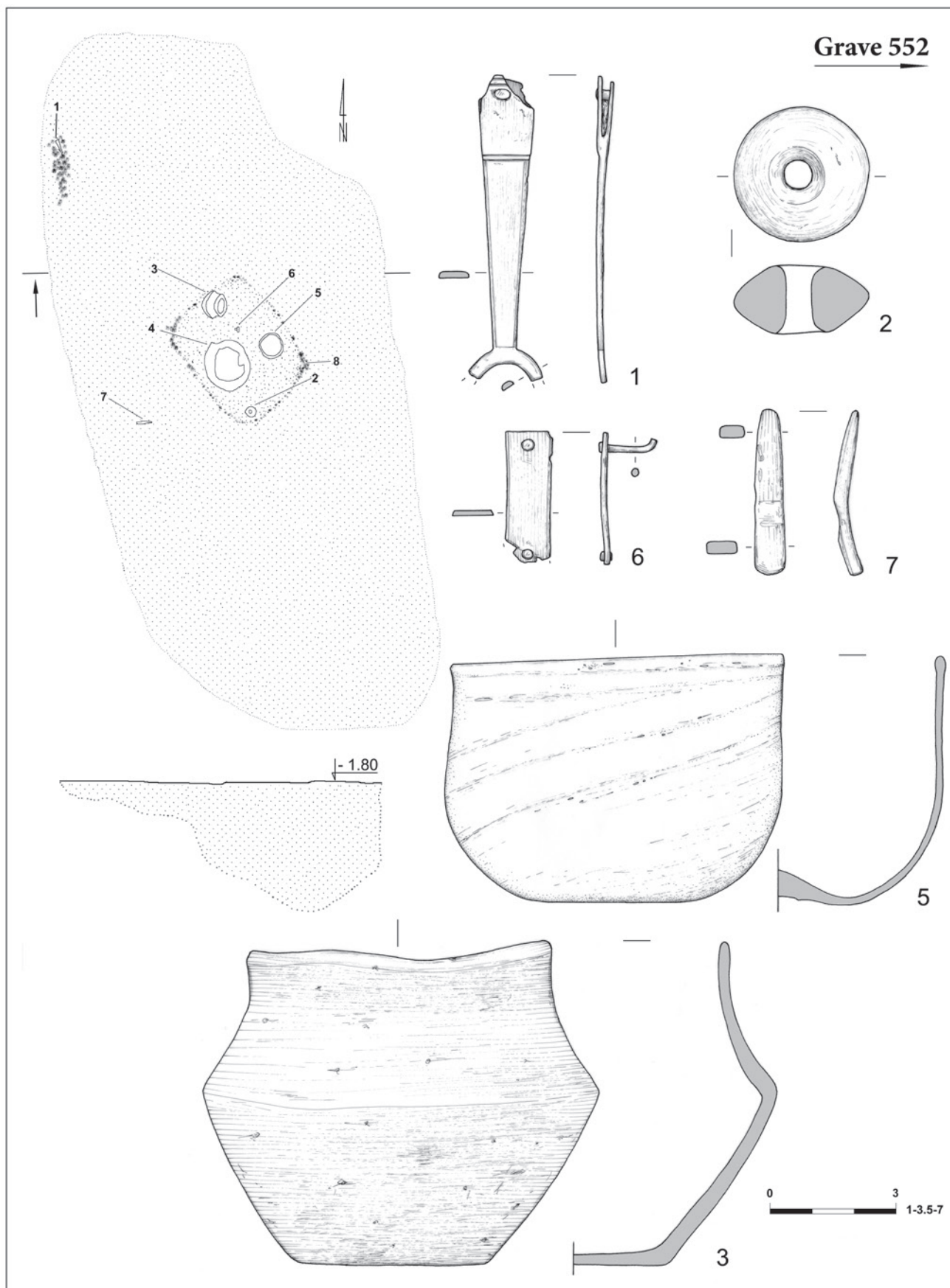


Grave 551



Pl. LIII. Grave 549. Grave 551: 1-2 – tin-lead bronze; 3 – silver; 4 – bone (antler [?]) and copper alloy; 5 (on plan) – wood

Grave 552

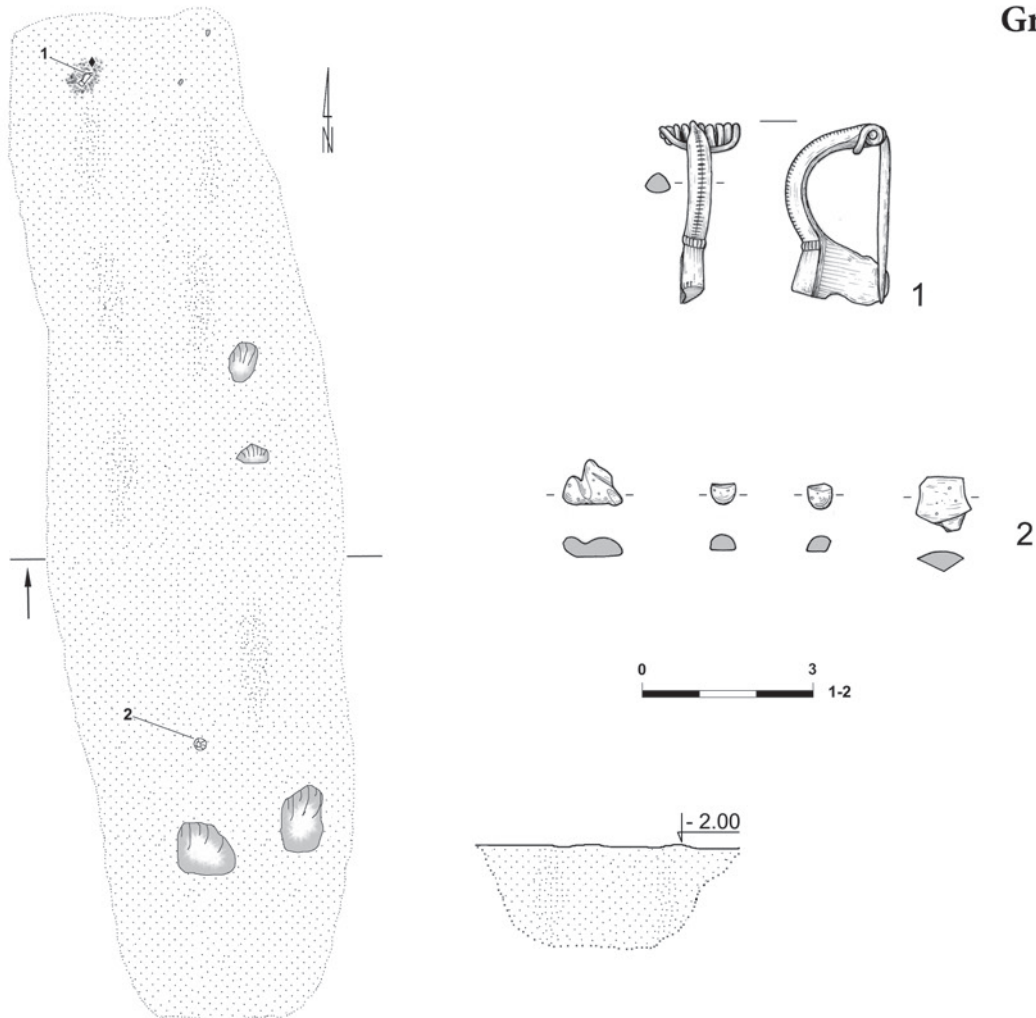


Pl. LIV. Grave 552: 1 – tin bronze; 2-3 – ceramic; 5 – glass; 6 – copper alloy; 7 – iron; 8 (on plan) – wood

Grave 552

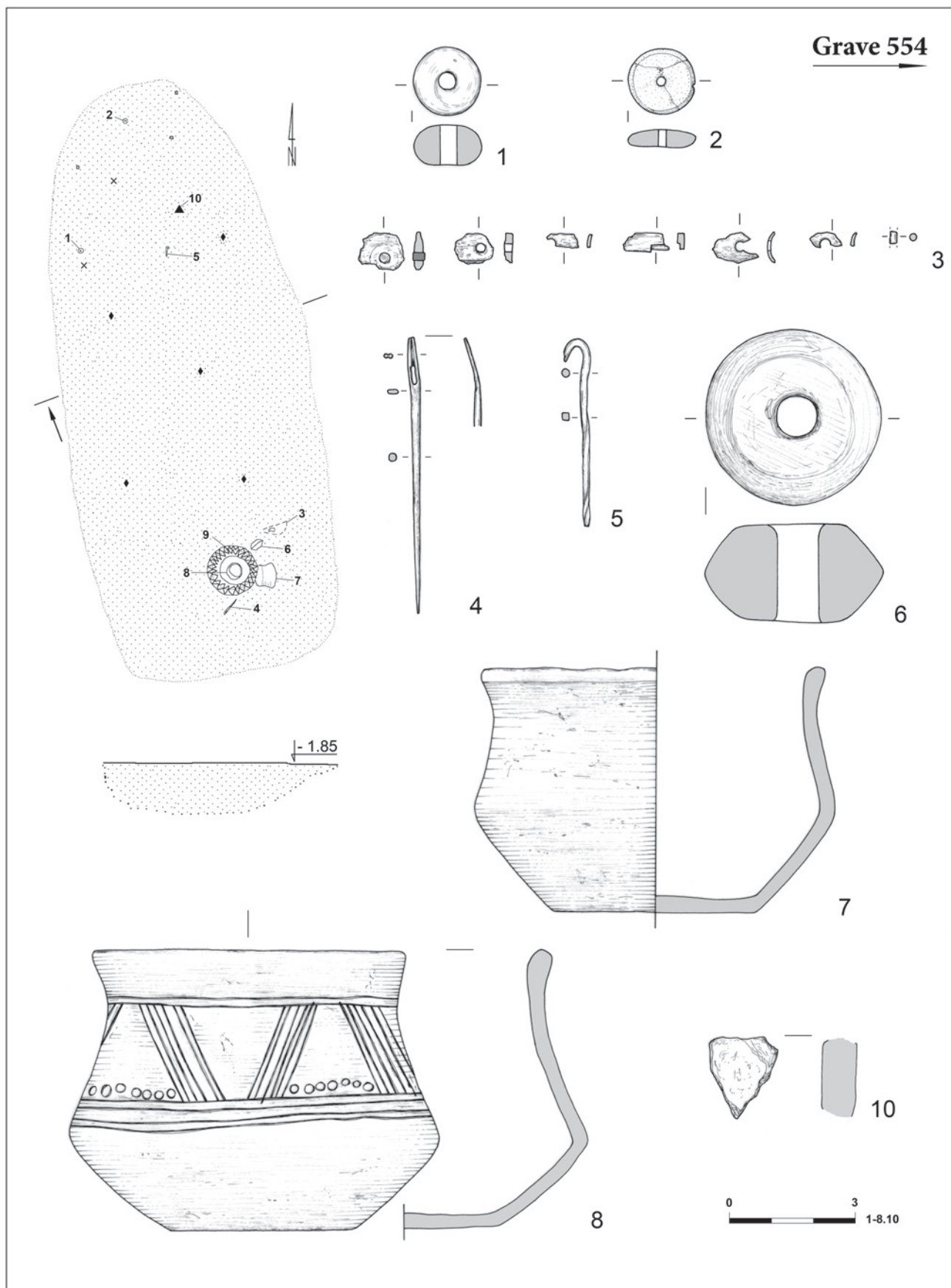


Grave 553



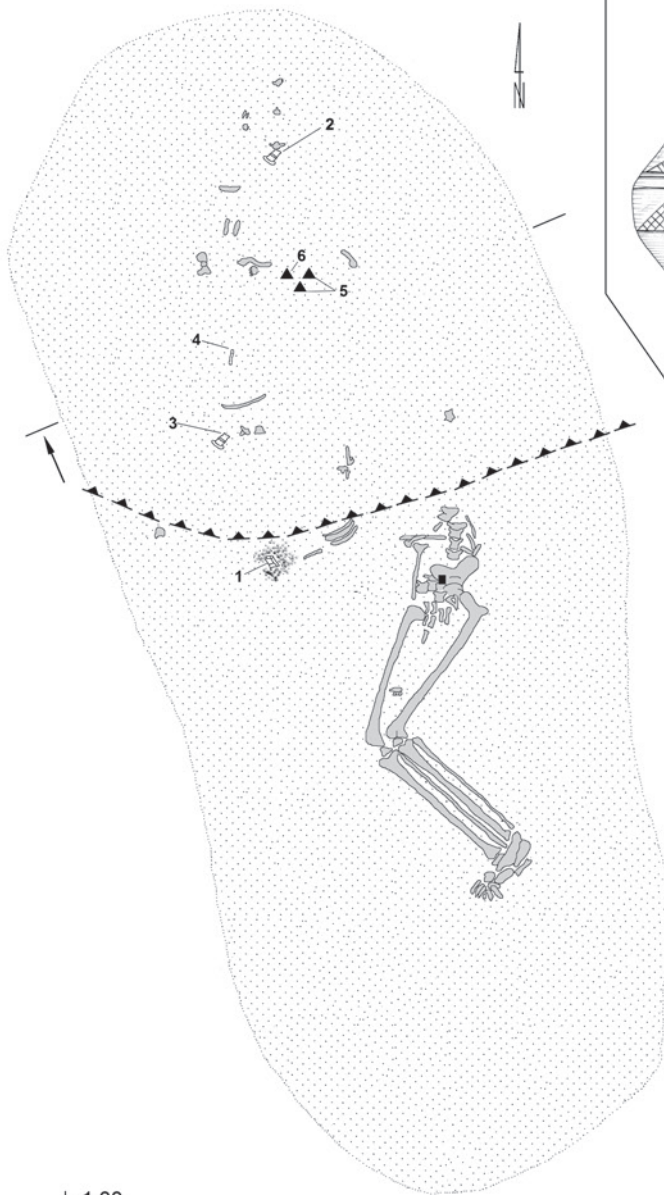
Pl. LV. Grave 552: 4 – ceramic. Grave 553: 1 – copper alloy; 2 – glass

Grave 554

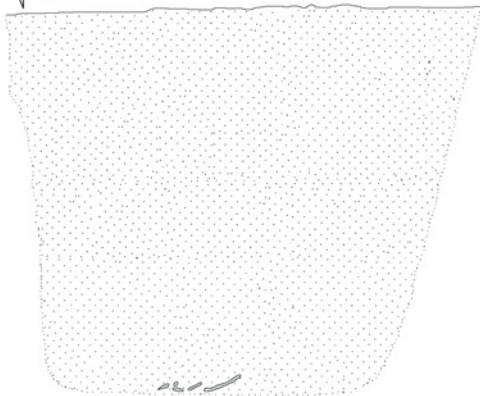


Pl. LVI. Grave 554: 1 – glass; 2 – amber; 3 – bone (antler [?]) and copper alloy; 4-5 – copper alloy; 6-8.10 – ceramic

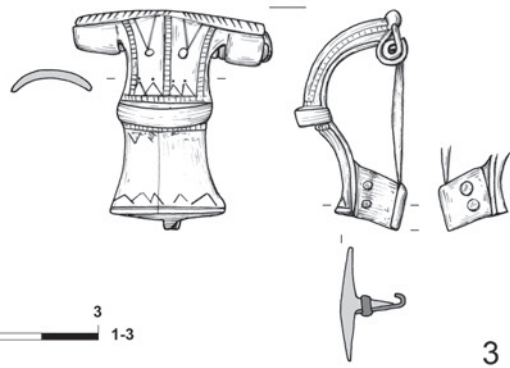
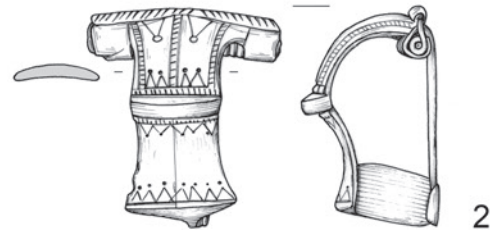
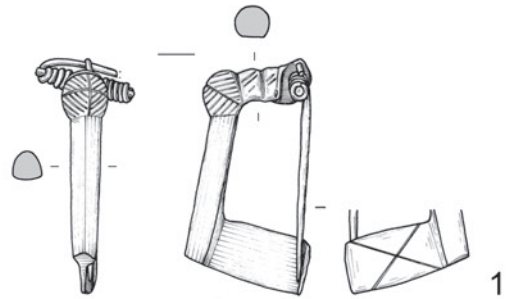
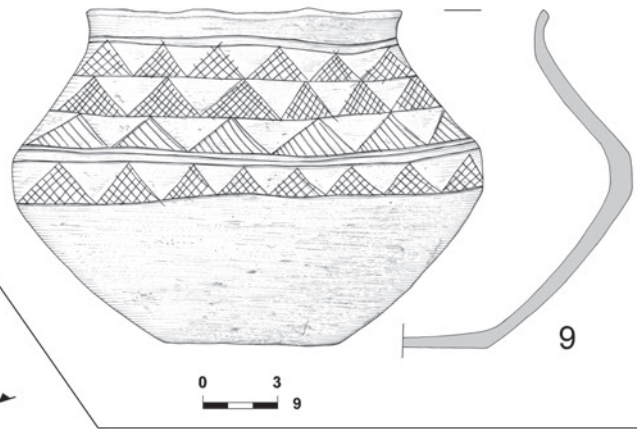
Grave 555



± 1.00

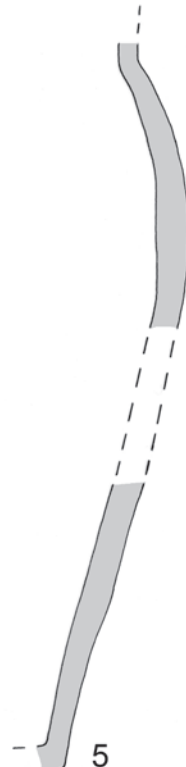
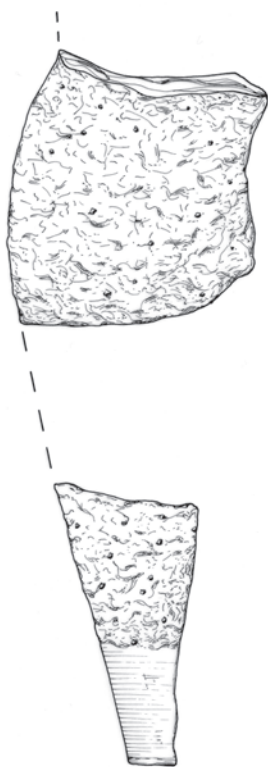
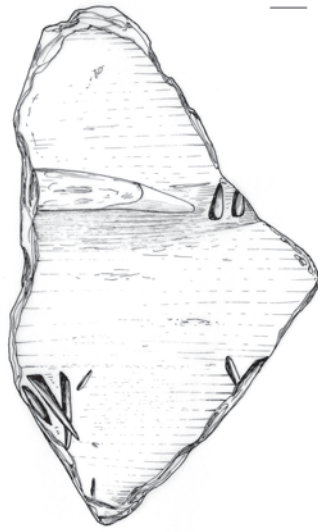
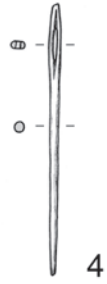


Grave 554



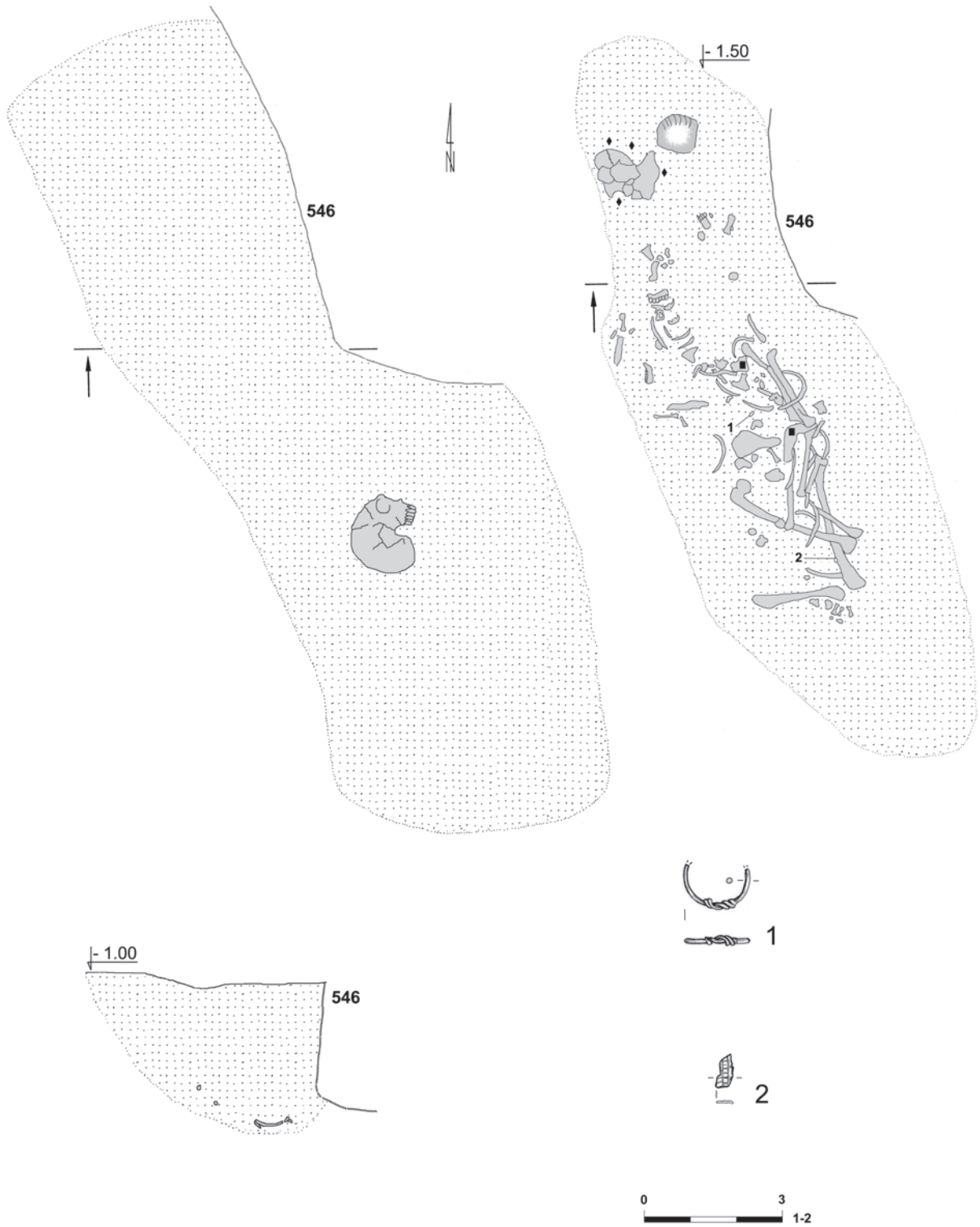
Pl. LVII. Grave 554: 9 – ceramic. Grave 555: 1 – tin bronze; 2 – copper alloy; 3 – brass

Grave 555



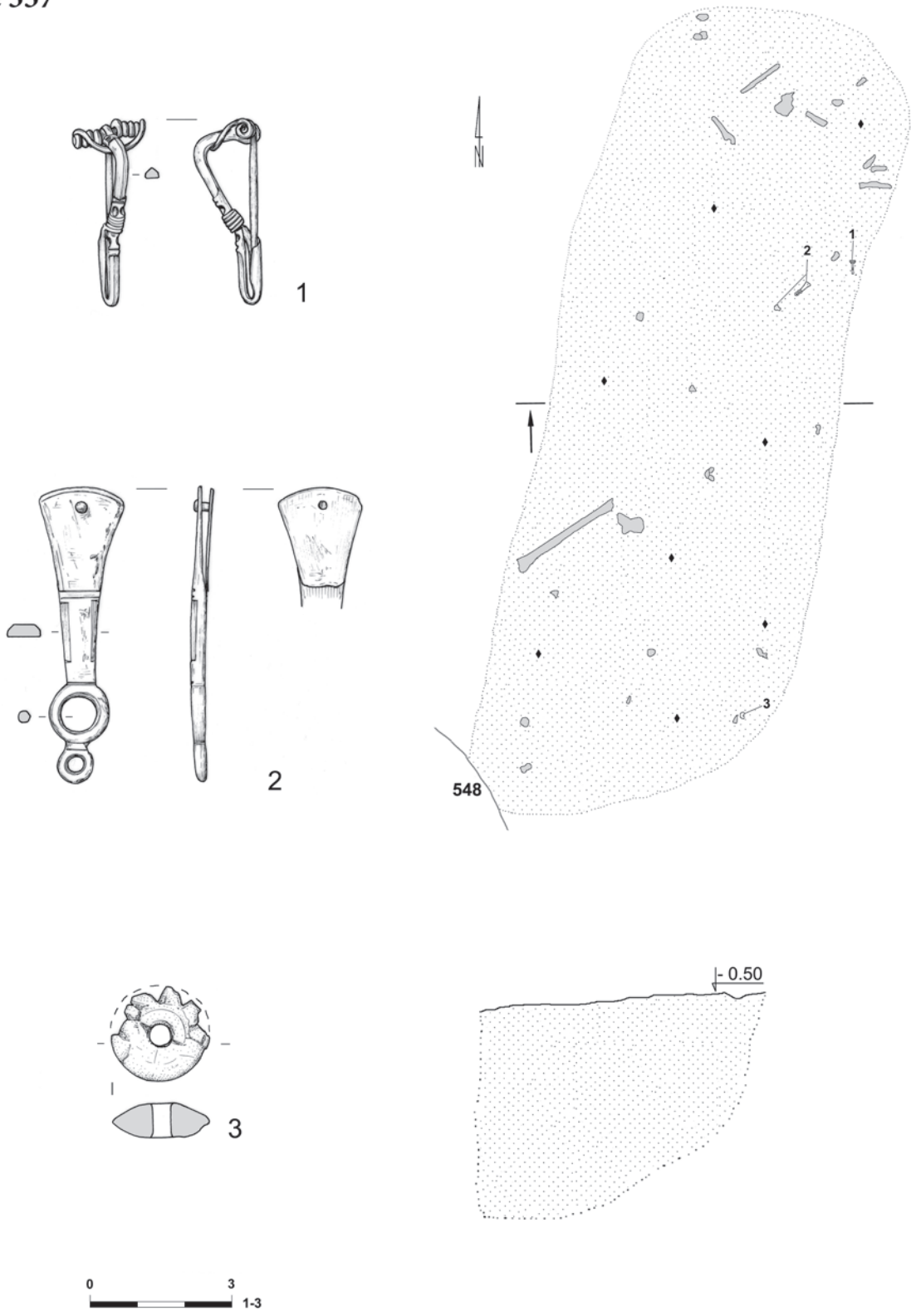
Pl. LVIII. Grave 555: 4 – copper alloy; 5–6 – ceramic

Grave 556

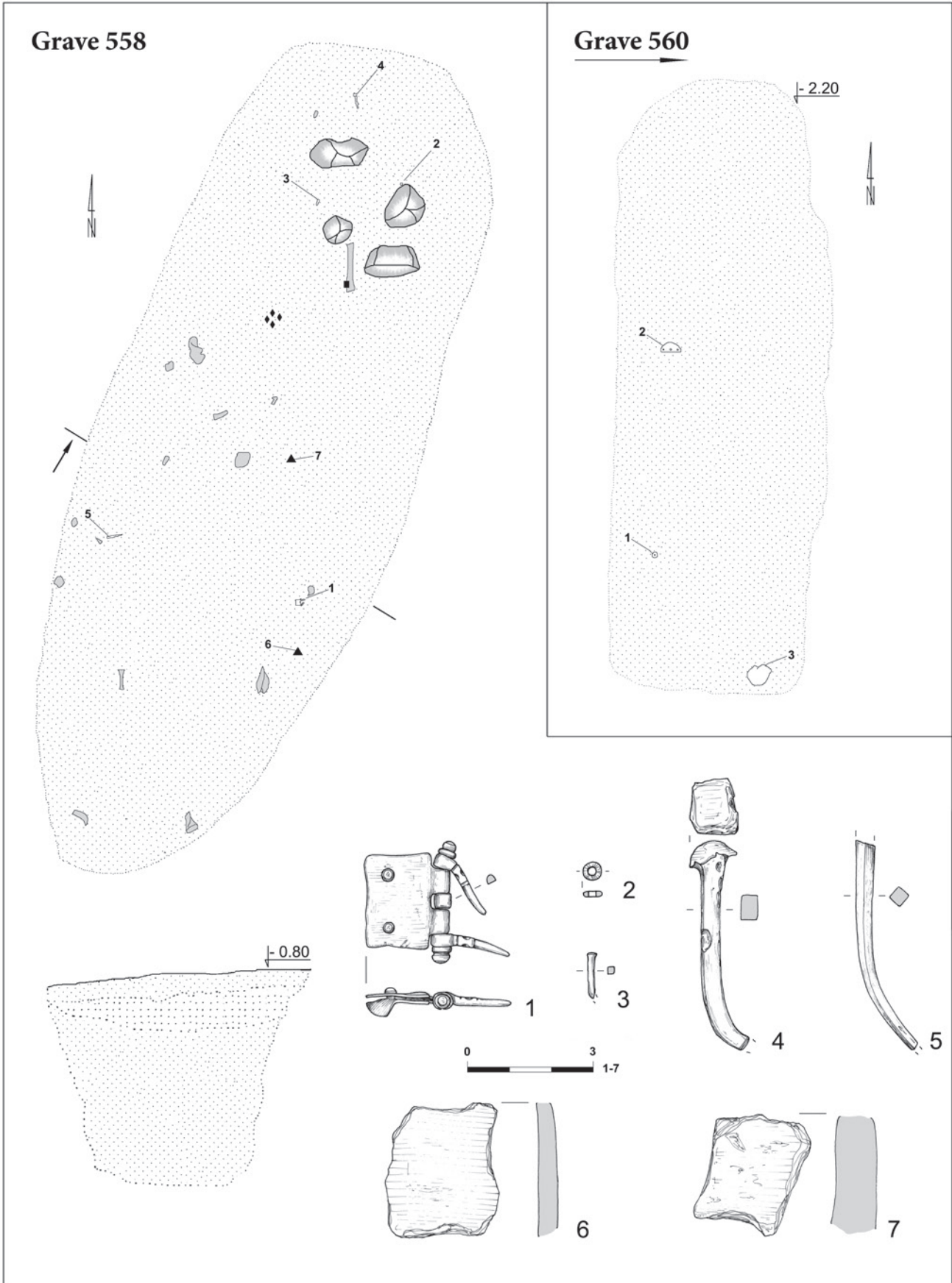


Pl. LIX. Grave 556: 1-2 – copper alloy

Grave 557

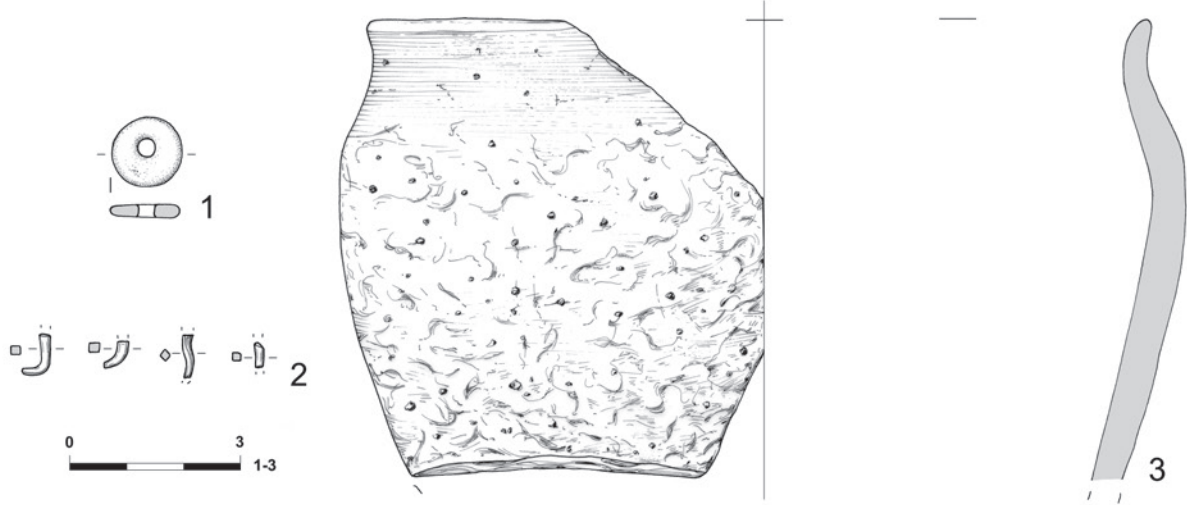


Pl. LX. Grave 557: 1 – copper alloy; 2 – brass; 3 – amber

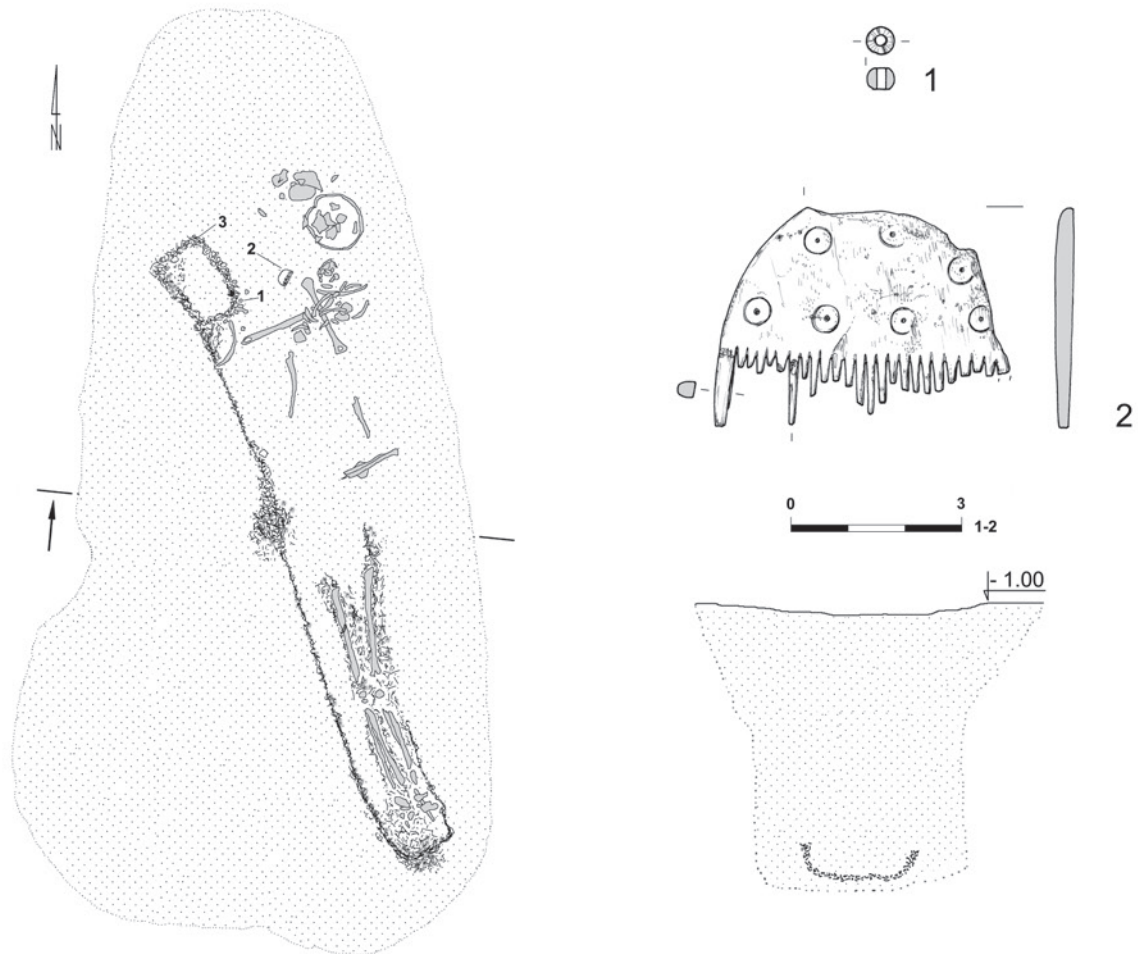


Pl. LXI. Grave 558: 1 – copper alloy; 2 – glass; 3–5 – iron; 6–7 – ceramic. Grave 560

Grave 560

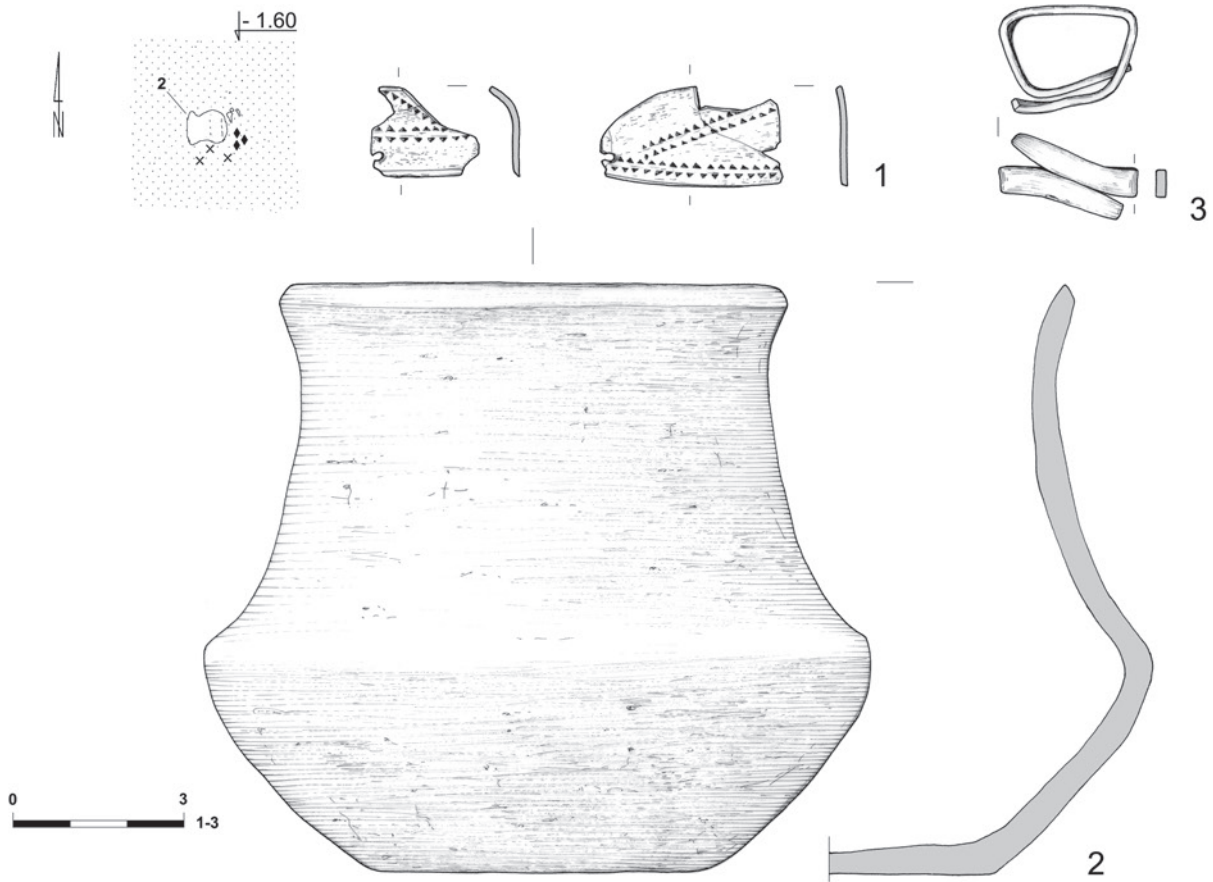


Grave 559

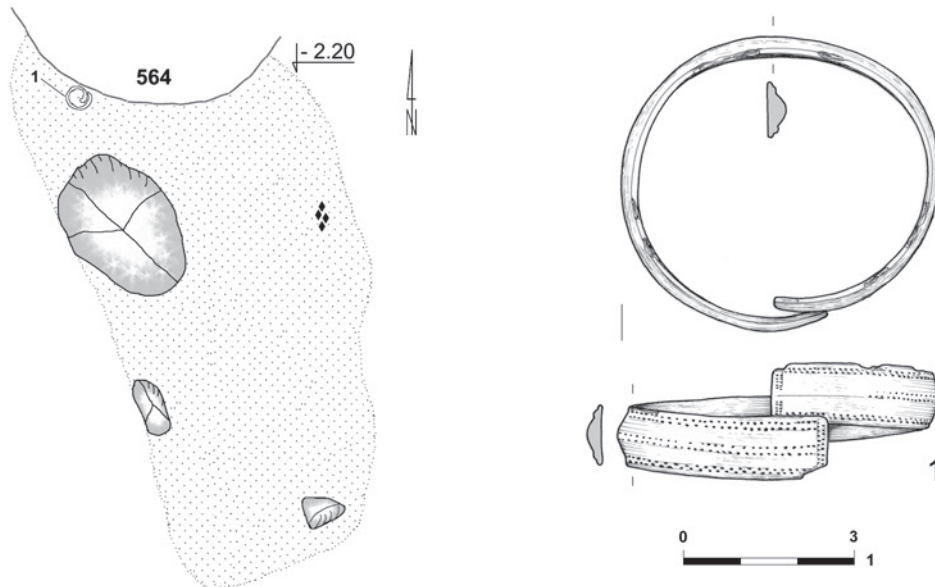


Pl. LXII. Grave 559: 1 – glass; 2 – bone (antler [?]); 3 (on plan) – wood. Grave 560: 1 – amber; 2 – copper alloy; 3 – ceramic

Grave 561

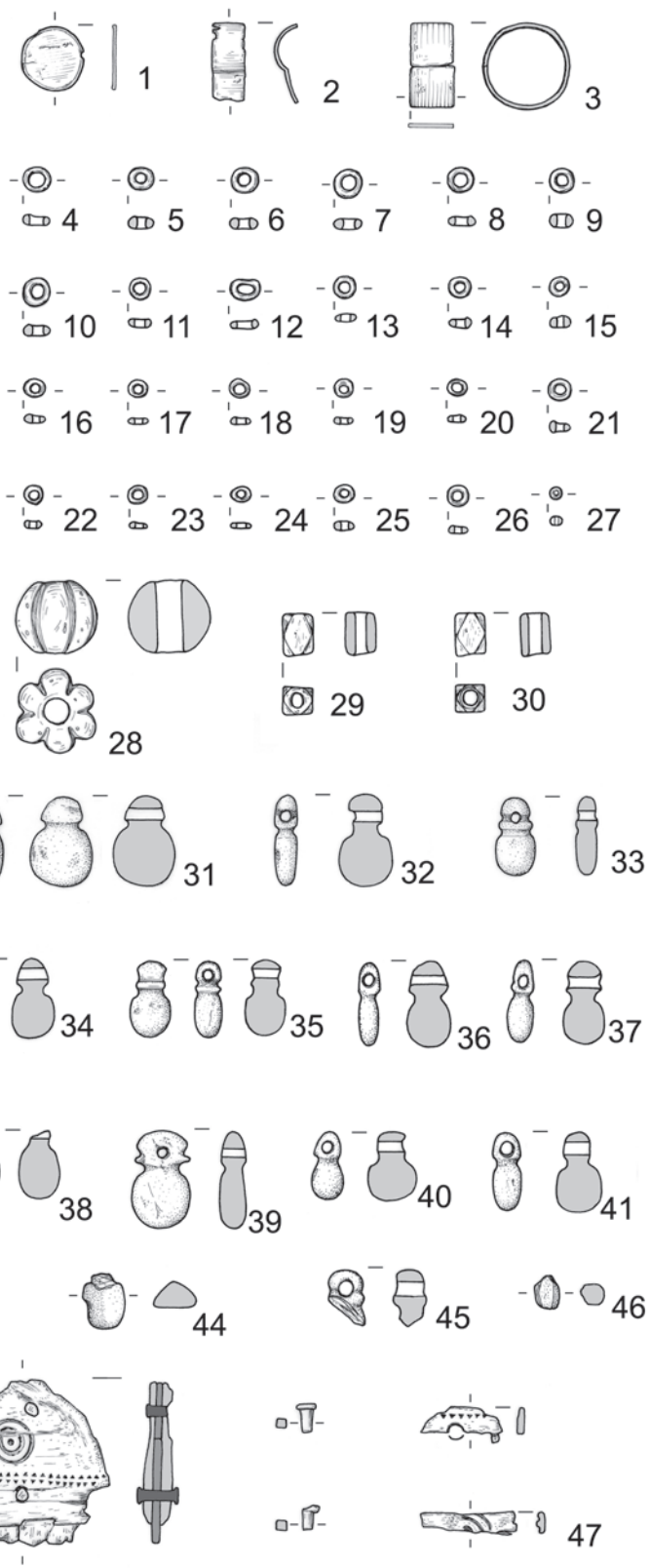
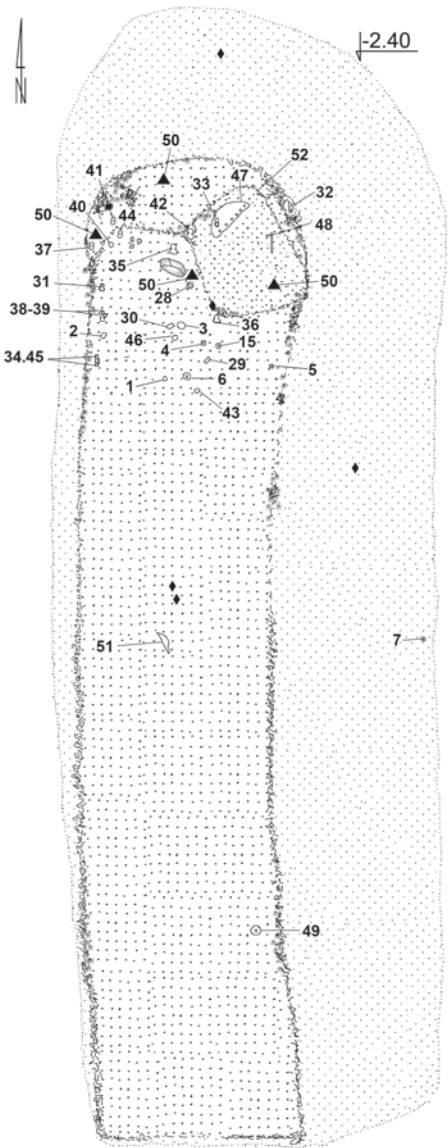


Grave 565

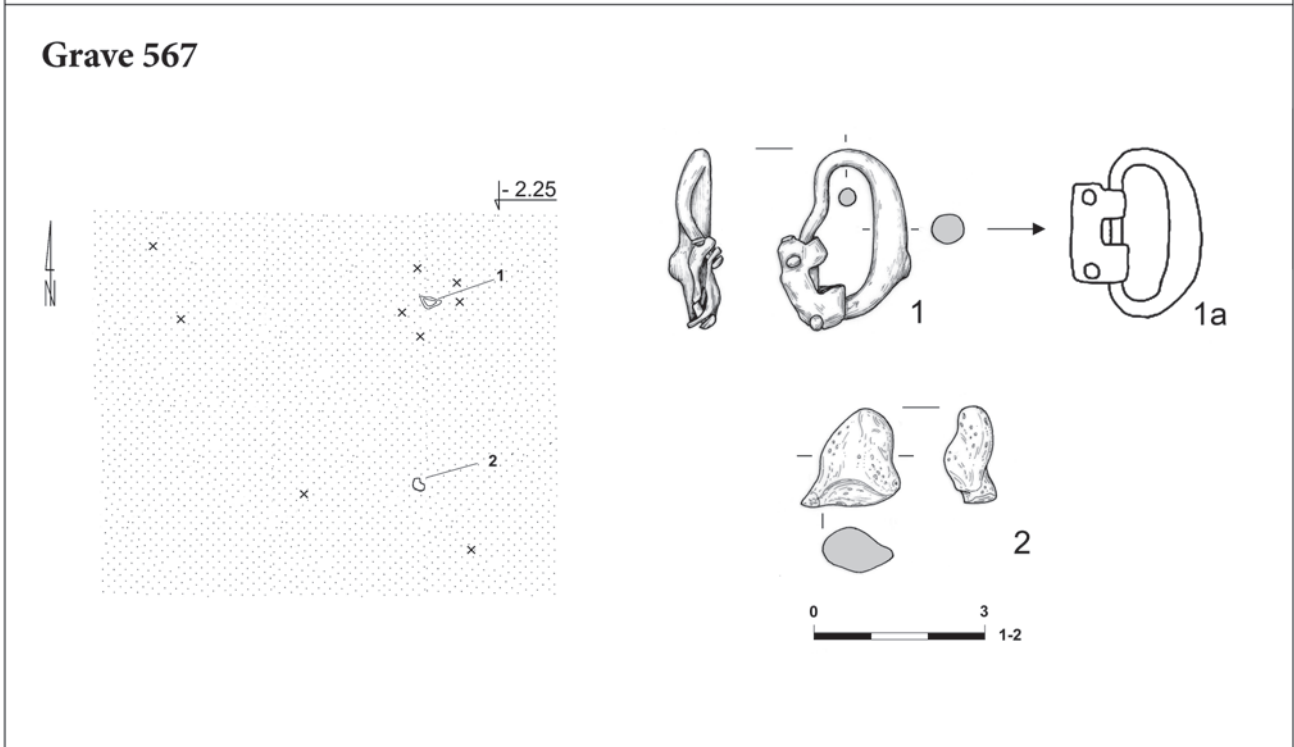
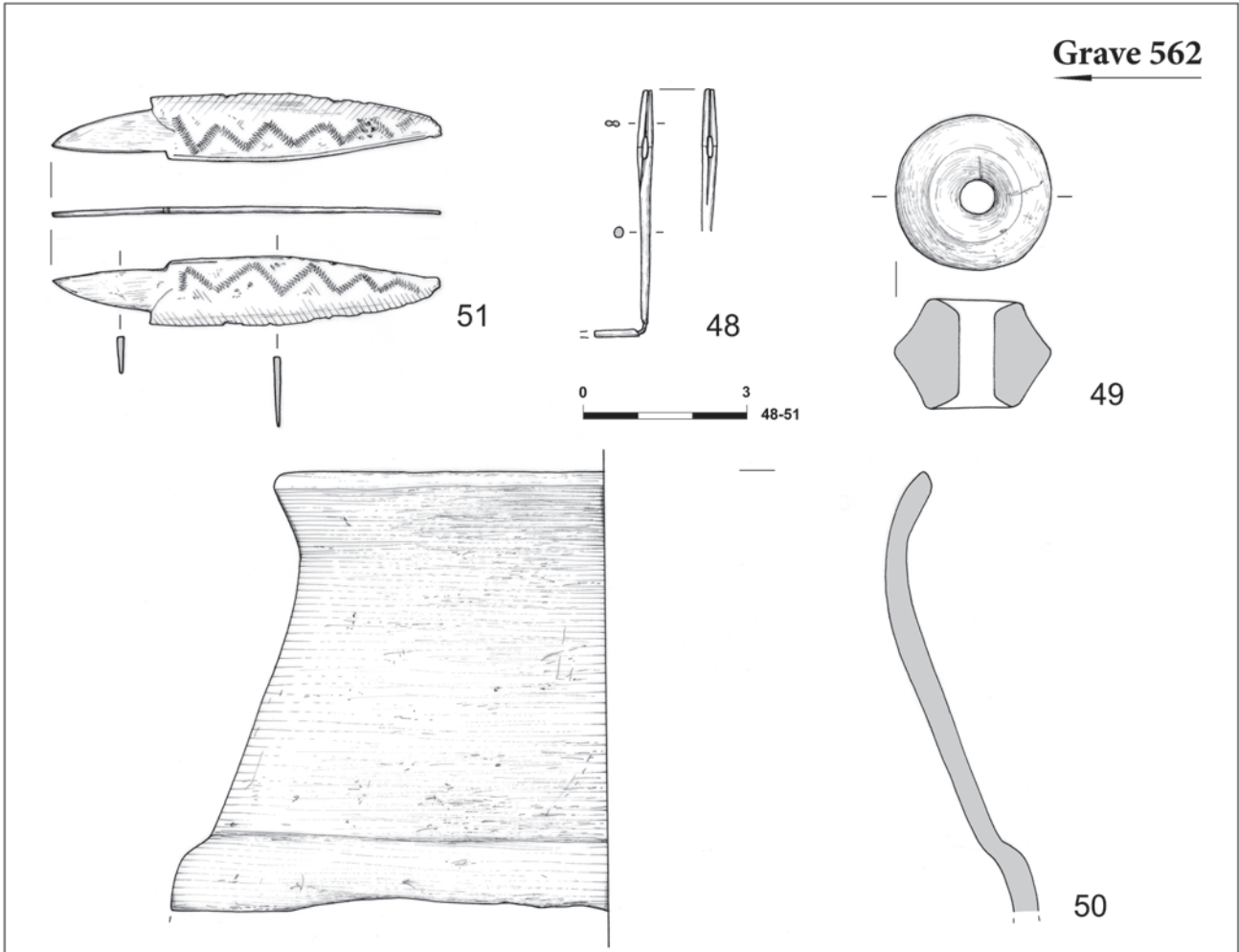


Pl. LXIII. Grave 561: 1 – bone (antler [?]); 2 – ceramic; 3 – copper alloy. Grave 565: 1 – copper alloy

Grave 562

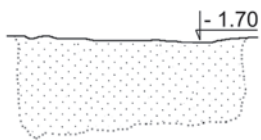
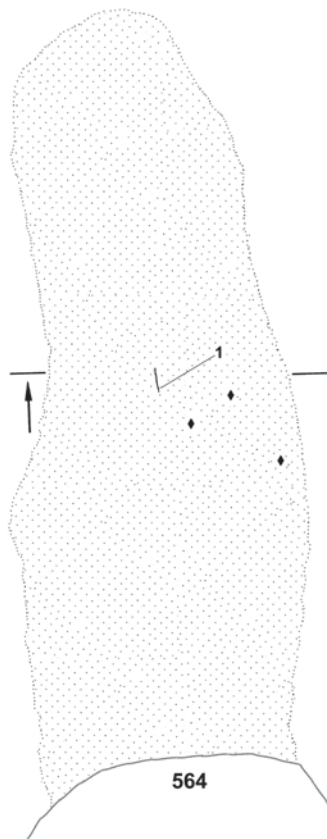


Pl. LXIV. Grave 562: 1-3 – copper alloy; 4-30 – glass; 31-46 – amber; 47 – bone (antler [?]) and copper alloy; 52 (on plan) – wood

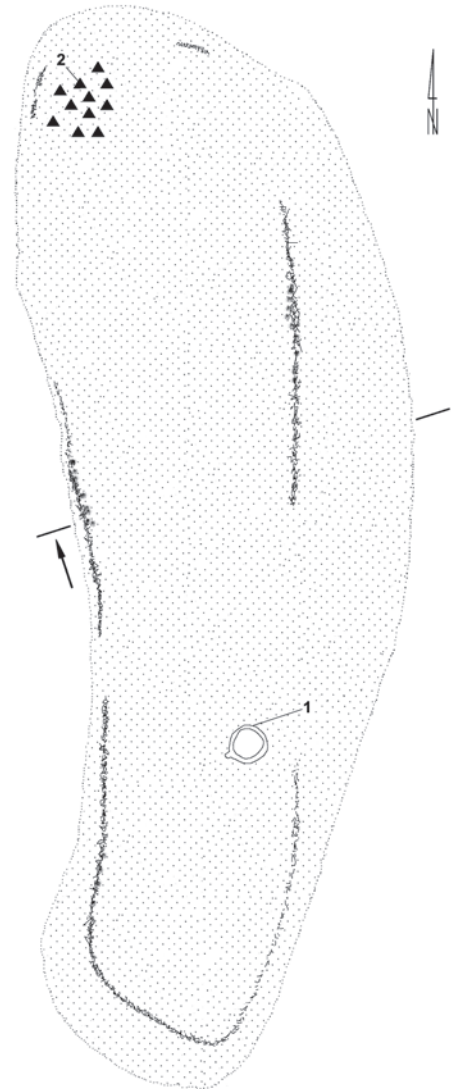


Pl. LXV. Grave 562: 48.51 – copper alloy; 49–50 – ceramic. Grave 567: 1–1a – tin-lead bronze; 2 – glass

Grave 566

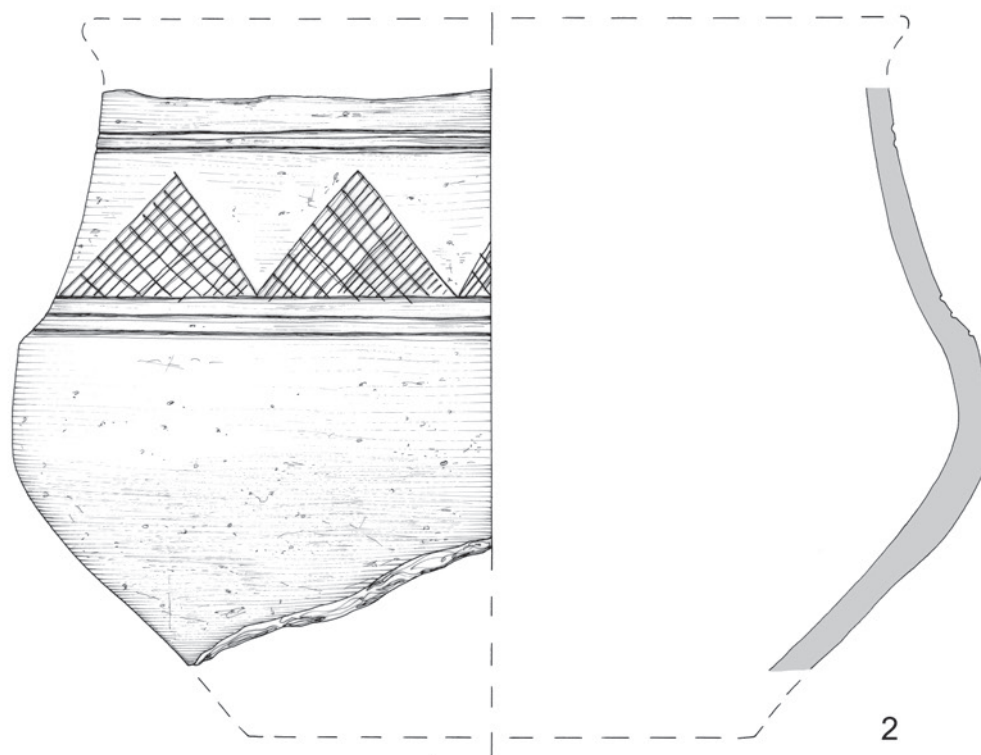
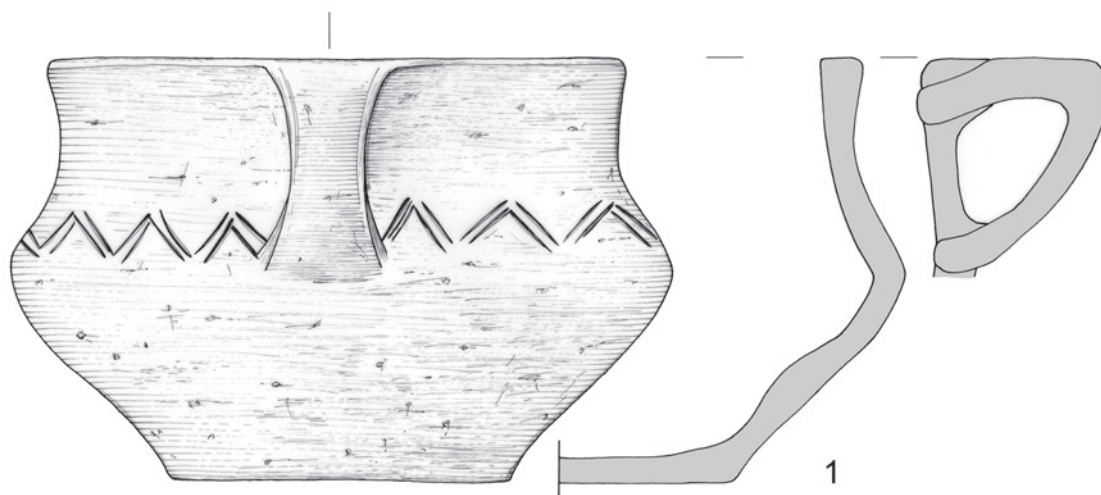


Grave 563



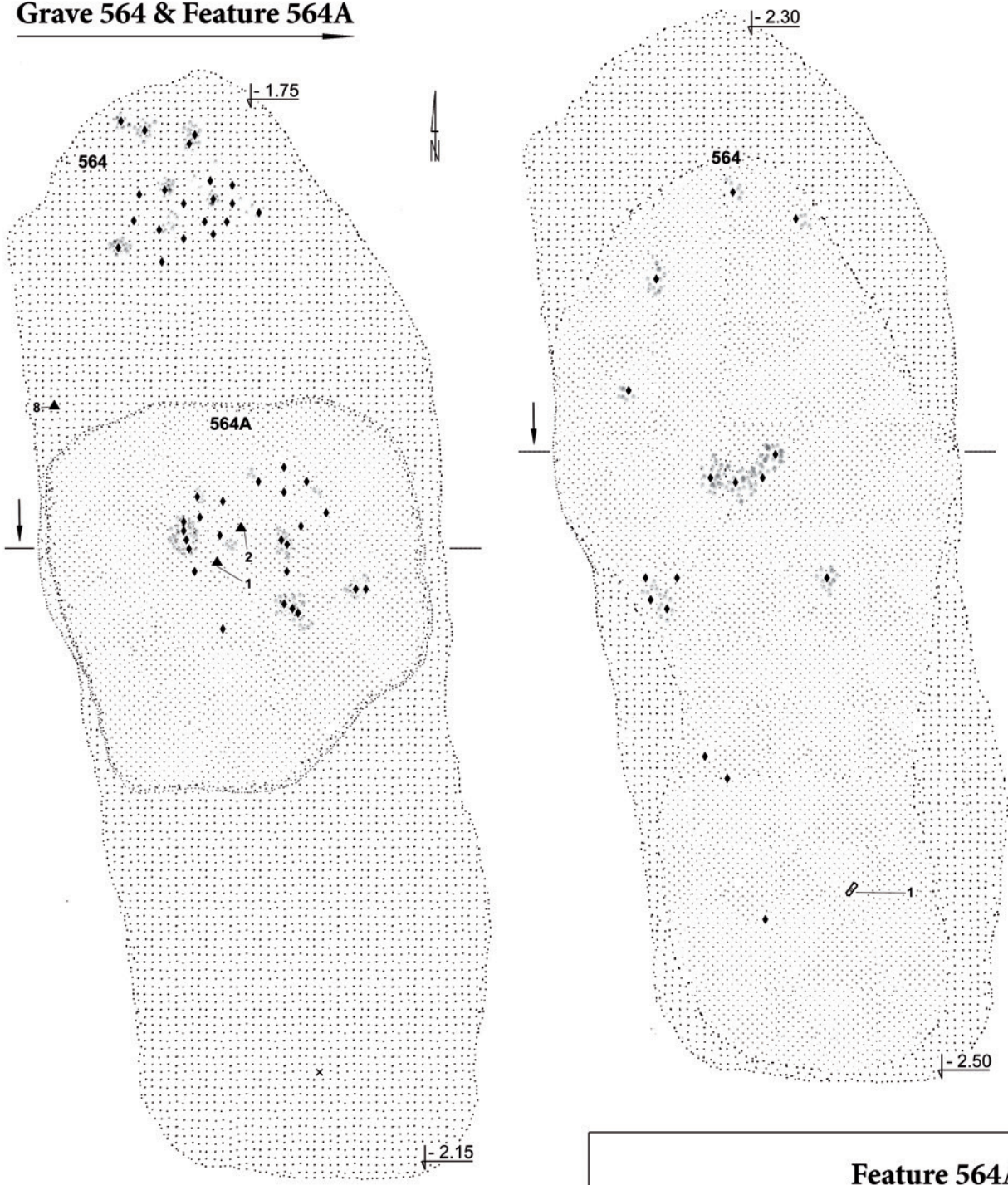
Pl. LXVI. Grave 563. Grave 566: 1 – copper alloy

Grave 563

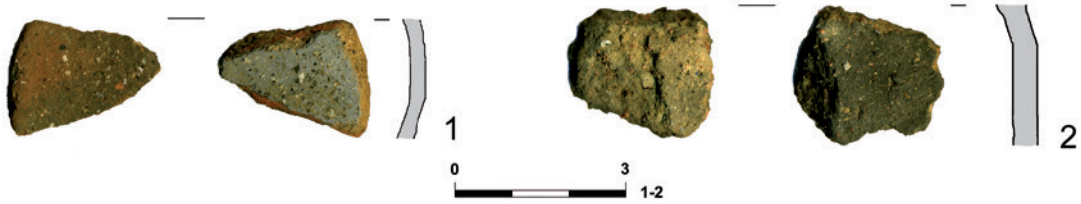


Pl. LXVII. Grave 563: 1-2 – ceramic

Grave 564 & Feature 564A

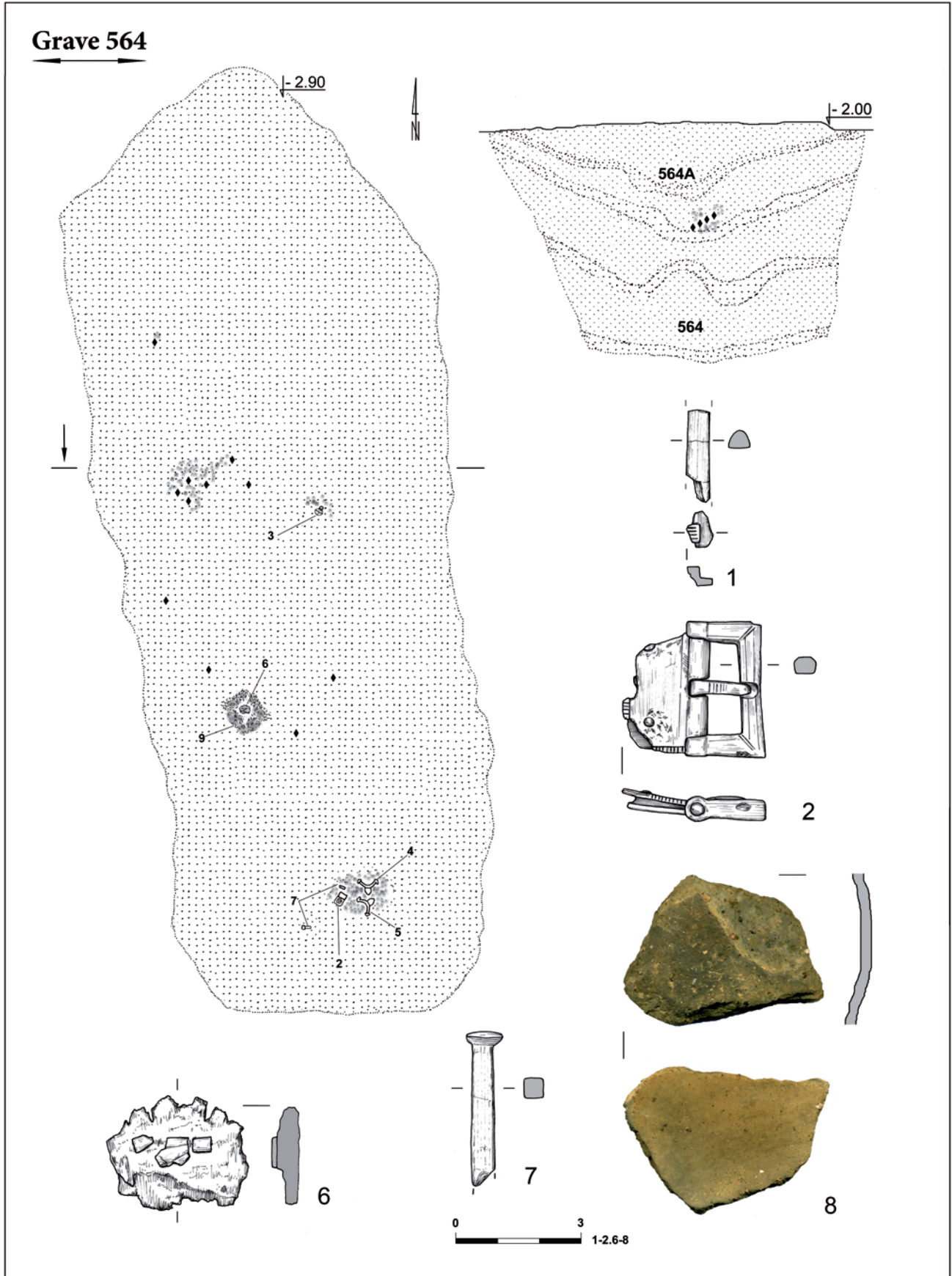


Feature 564A



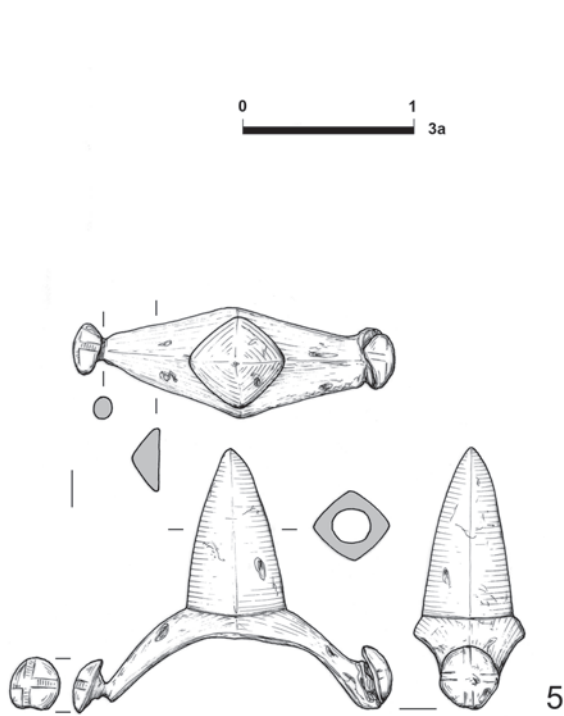
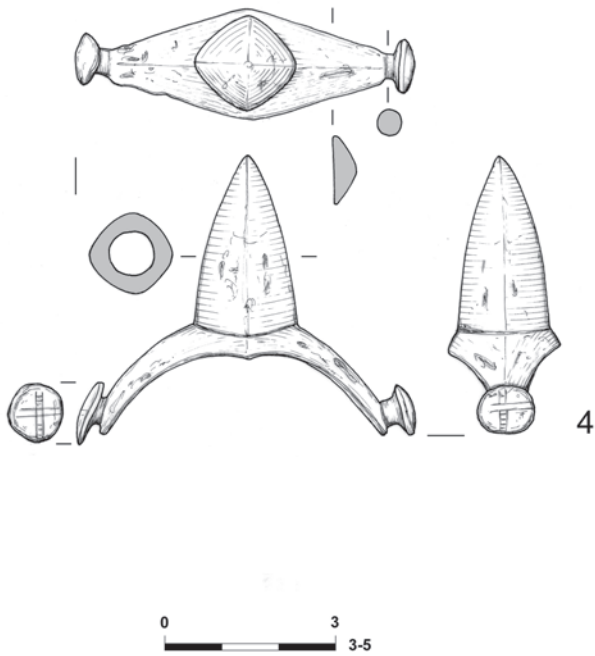
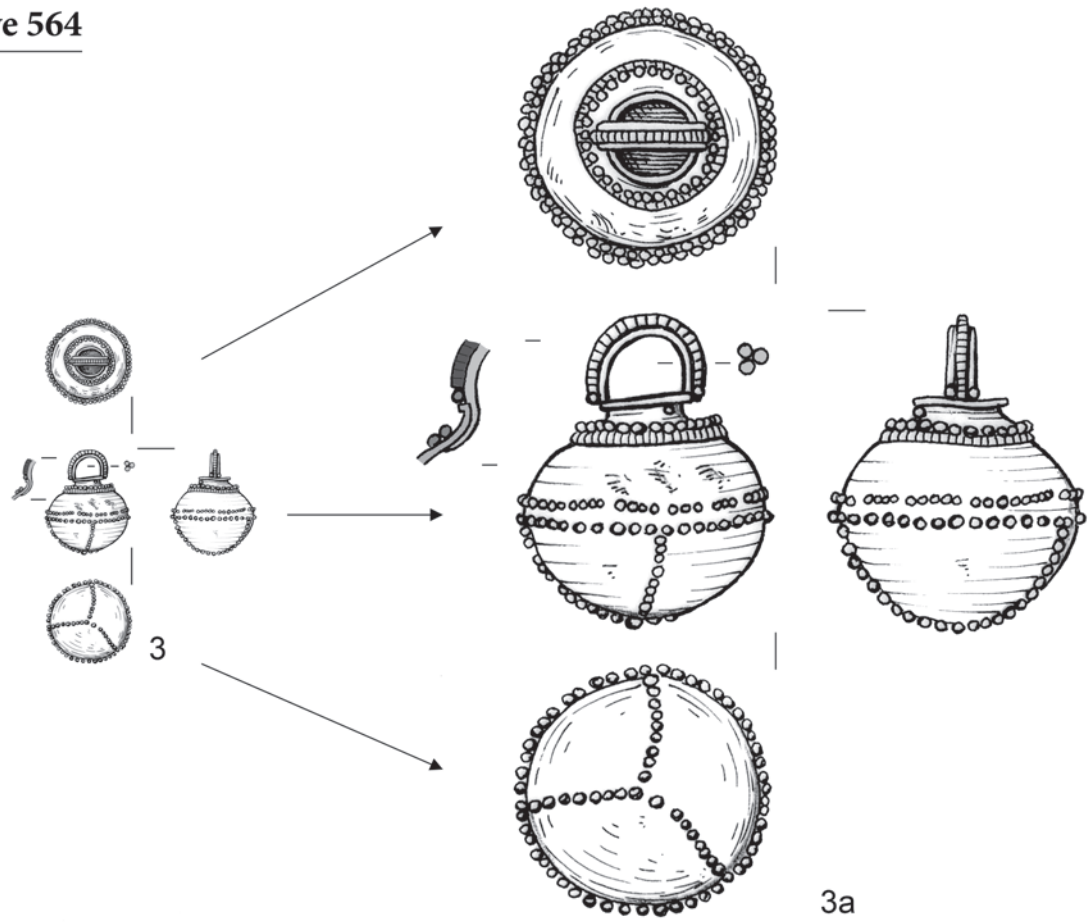
Pl. LXVIII. Grave 564 & Feature 564A. Feature 564A: 1-2 – ceramic

Grave 564



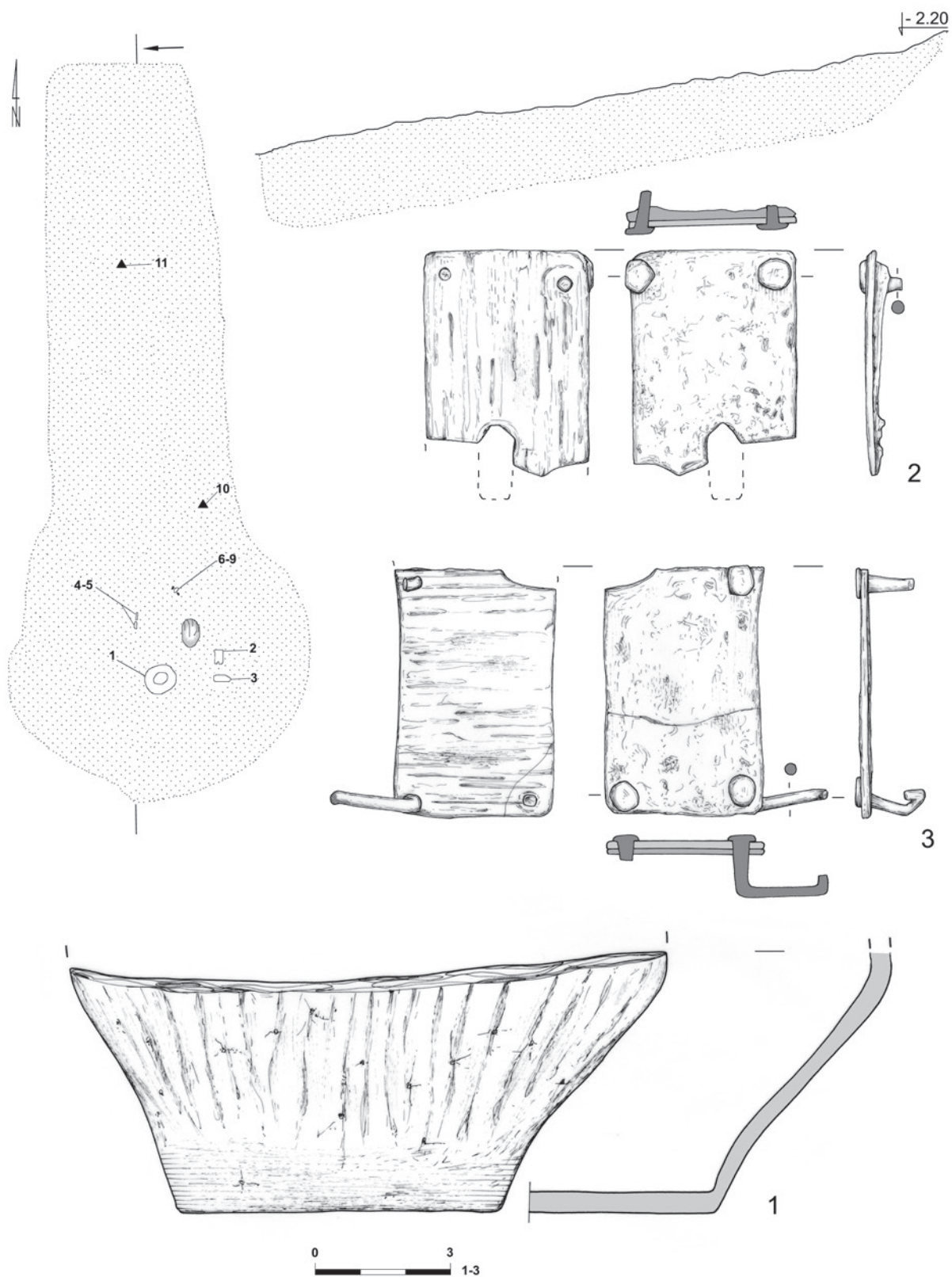
Pl. LXIX. Grave 564: 1-2 – copper alloy; 6 – copper alloy and wood; 7 – iron; 8 – ceramic; 9 (on plan) – wood

Grave 564

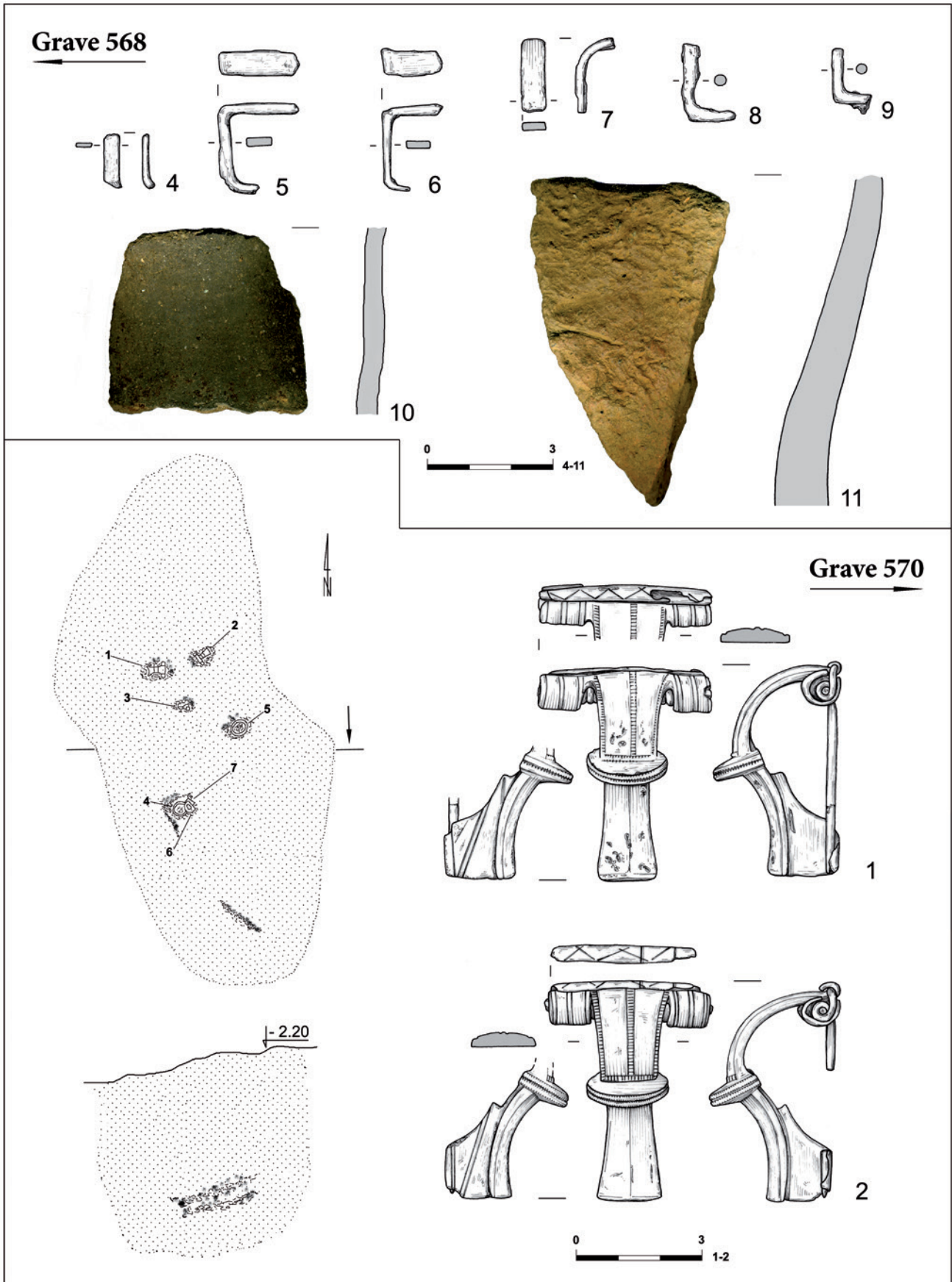


Pl. LXX. Grave 564: 3-3a - gold; 4-5 - tin-lead bronze

Grave 568

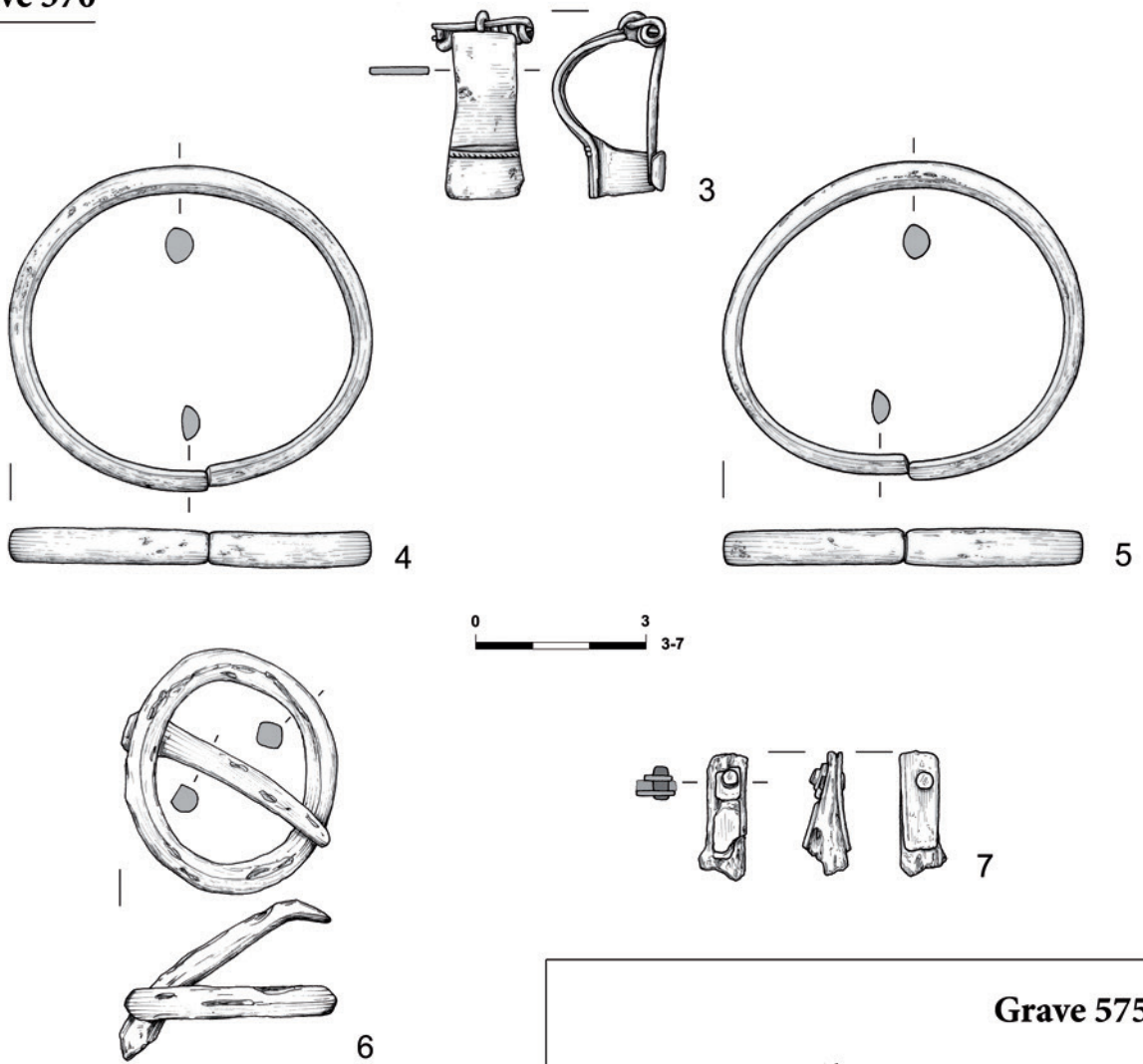


Pl. LXXI. Grave 568: 1 – ceramic; 2–3 – iron and wood

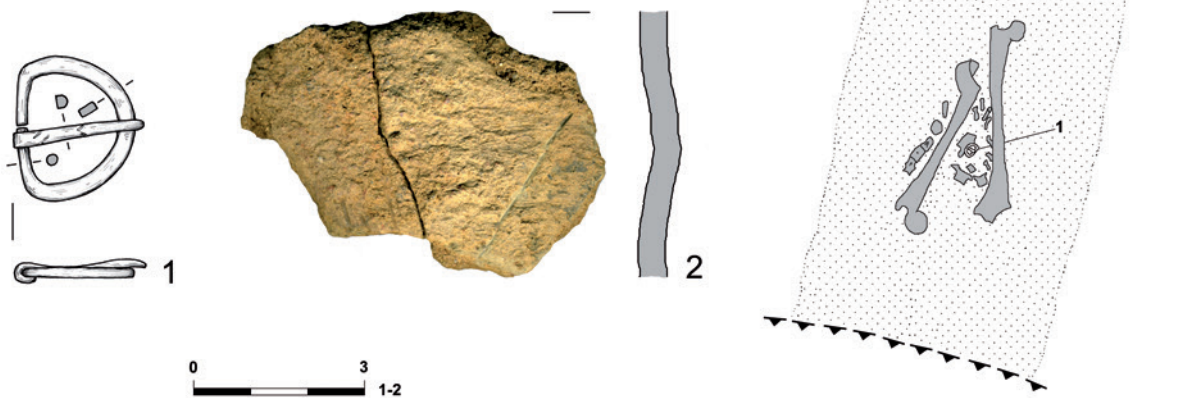


Pl. LXXII. Grave 568: 4-9 – iron; 10-11 – ceramic. Grave 570: 1-2 – brass and silver

Grave 570

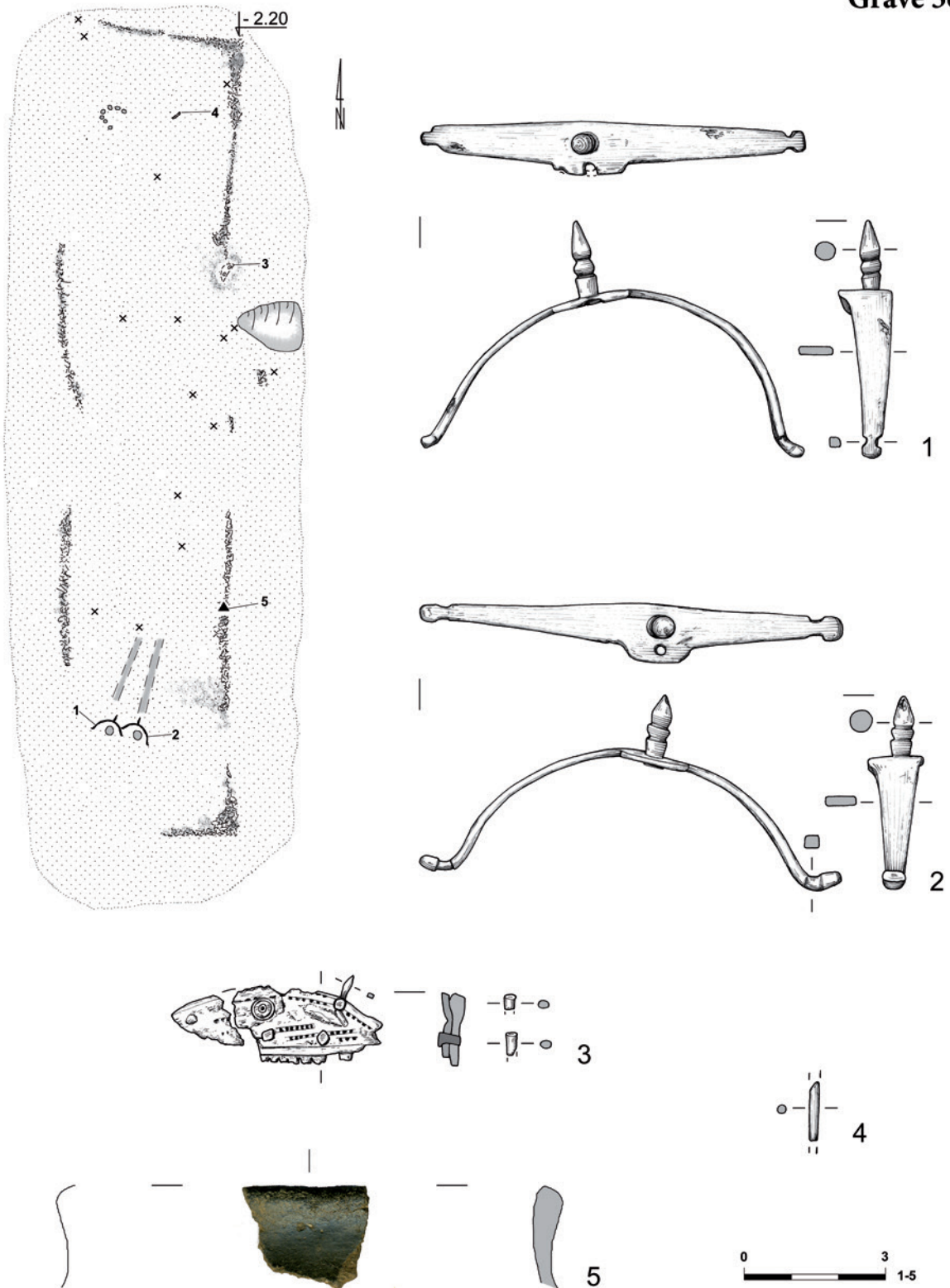


Grave 575



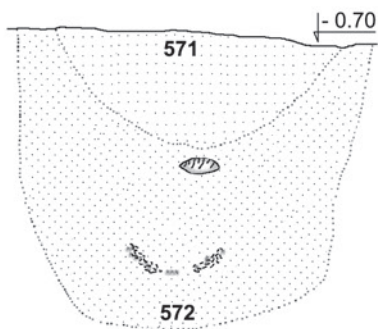
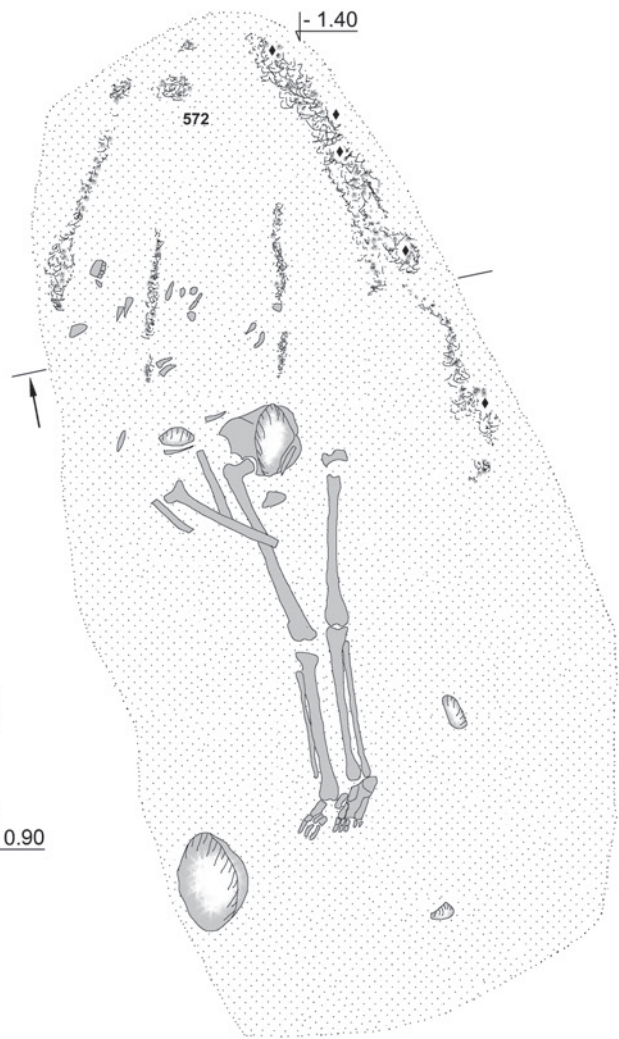
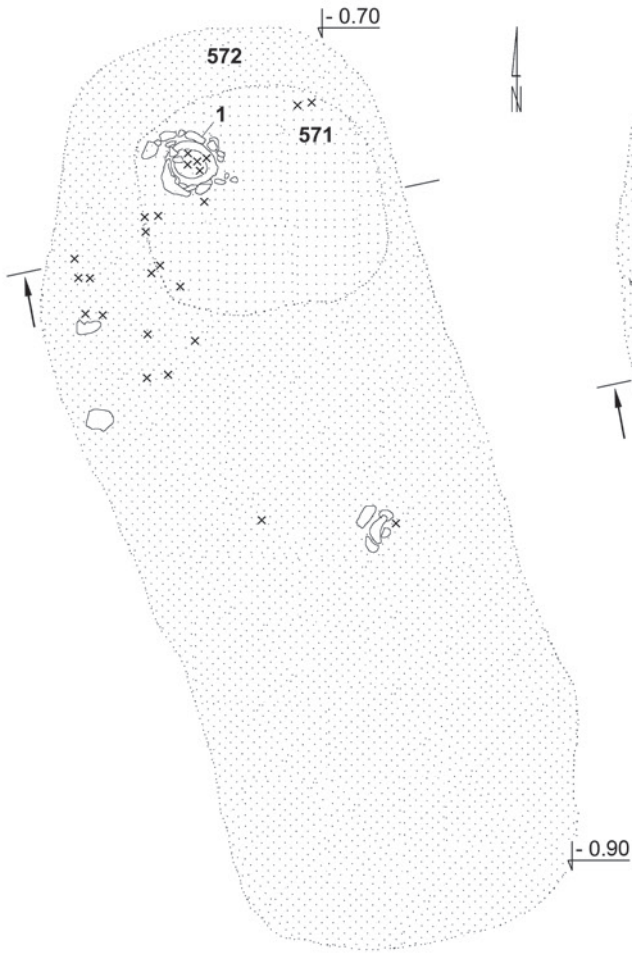
Pl. LXXIII. Grave 570: 3-4 - brass; 5,7 - copper alloy; 6 - iron. Grave 575: 1 - copper alloy; 2 - ceramic

Grave 569

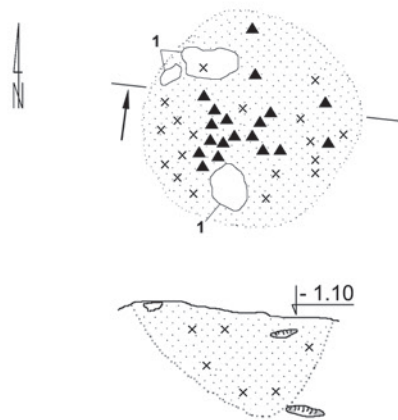


Pl. LXXIV. Grave 569: 1-2 – tin bronze; 3 – bone (antler [?]) and copper alloy; 4 – copper alloy; 5 – ceramic

Graves 571 & 572

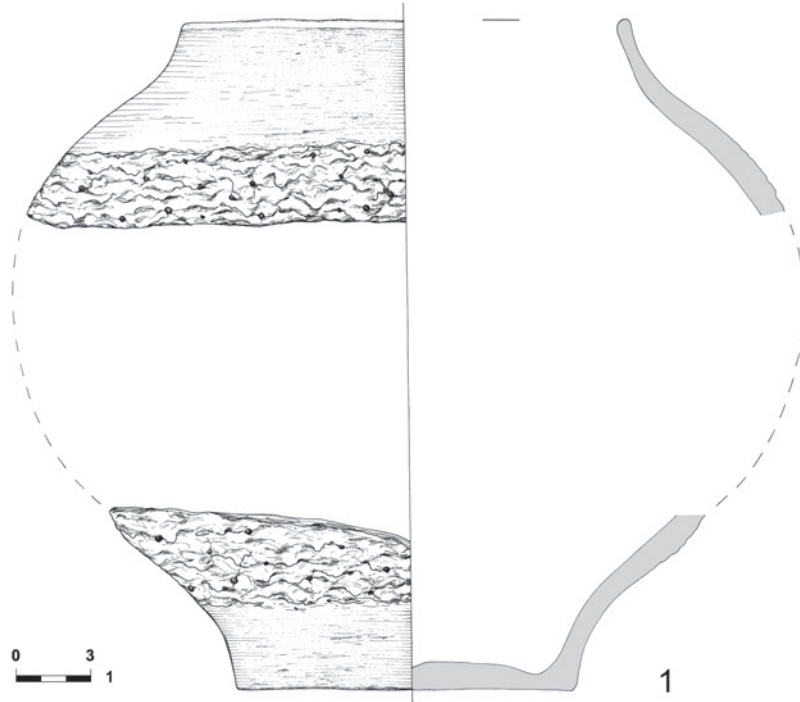


Grave 573

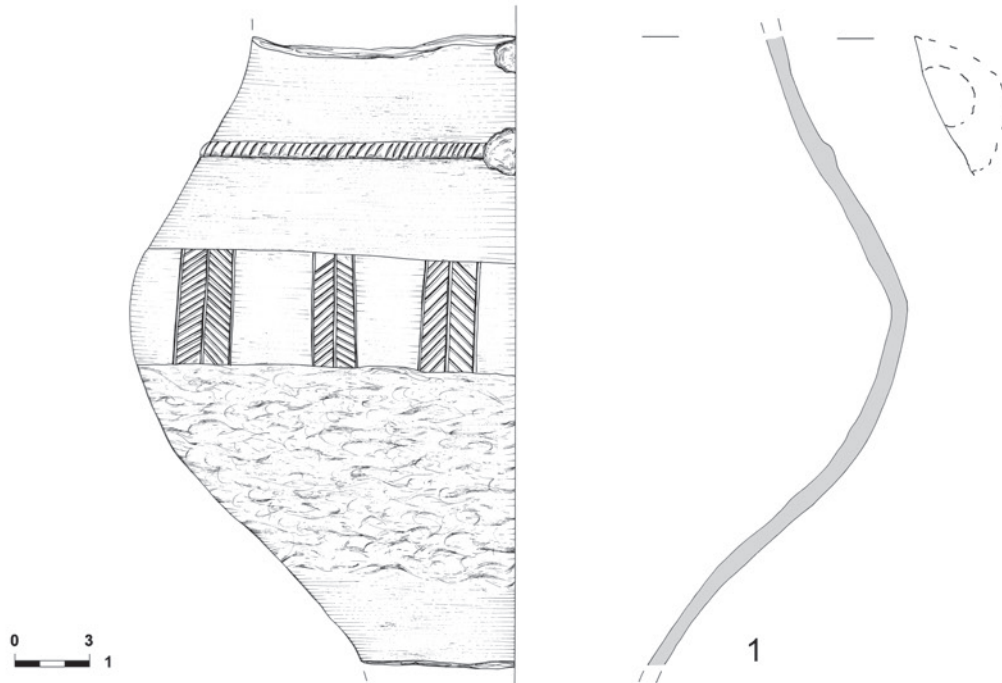


Pl. LXXV. Graves 571 & 572. Grave 573

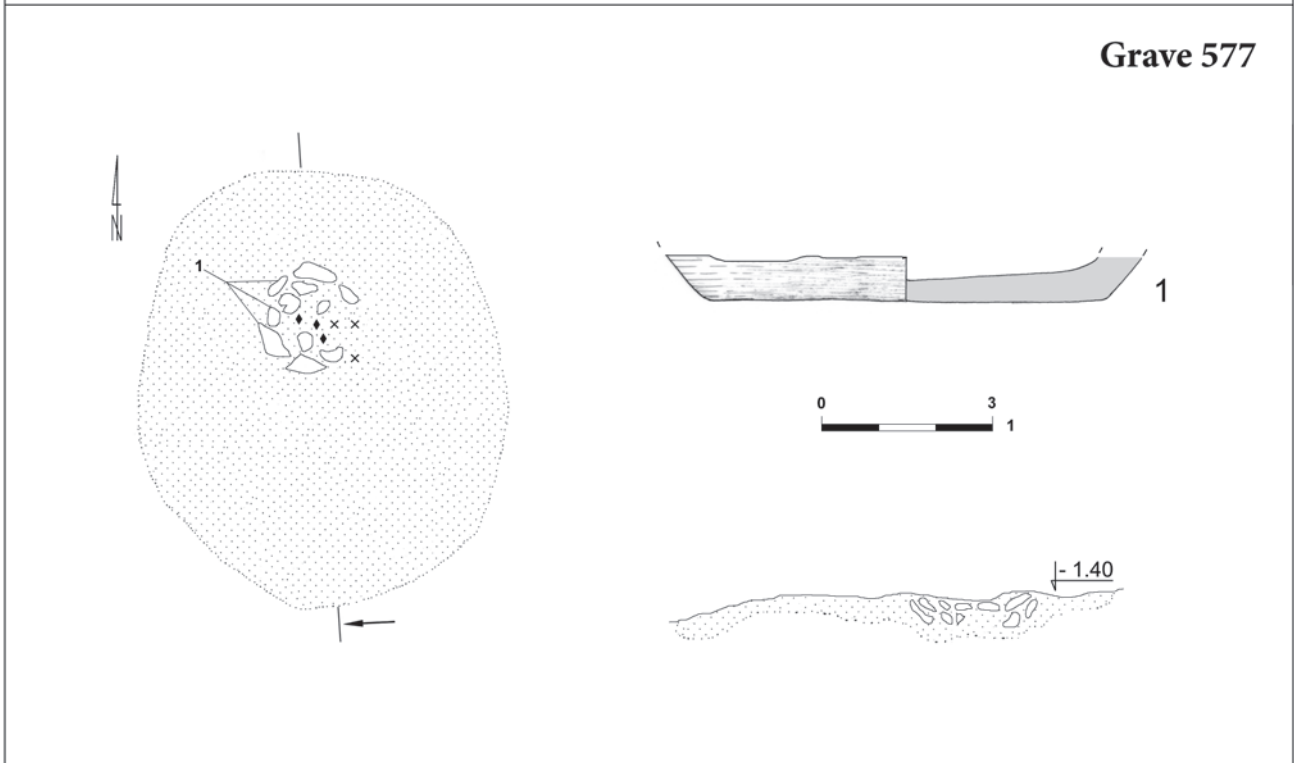
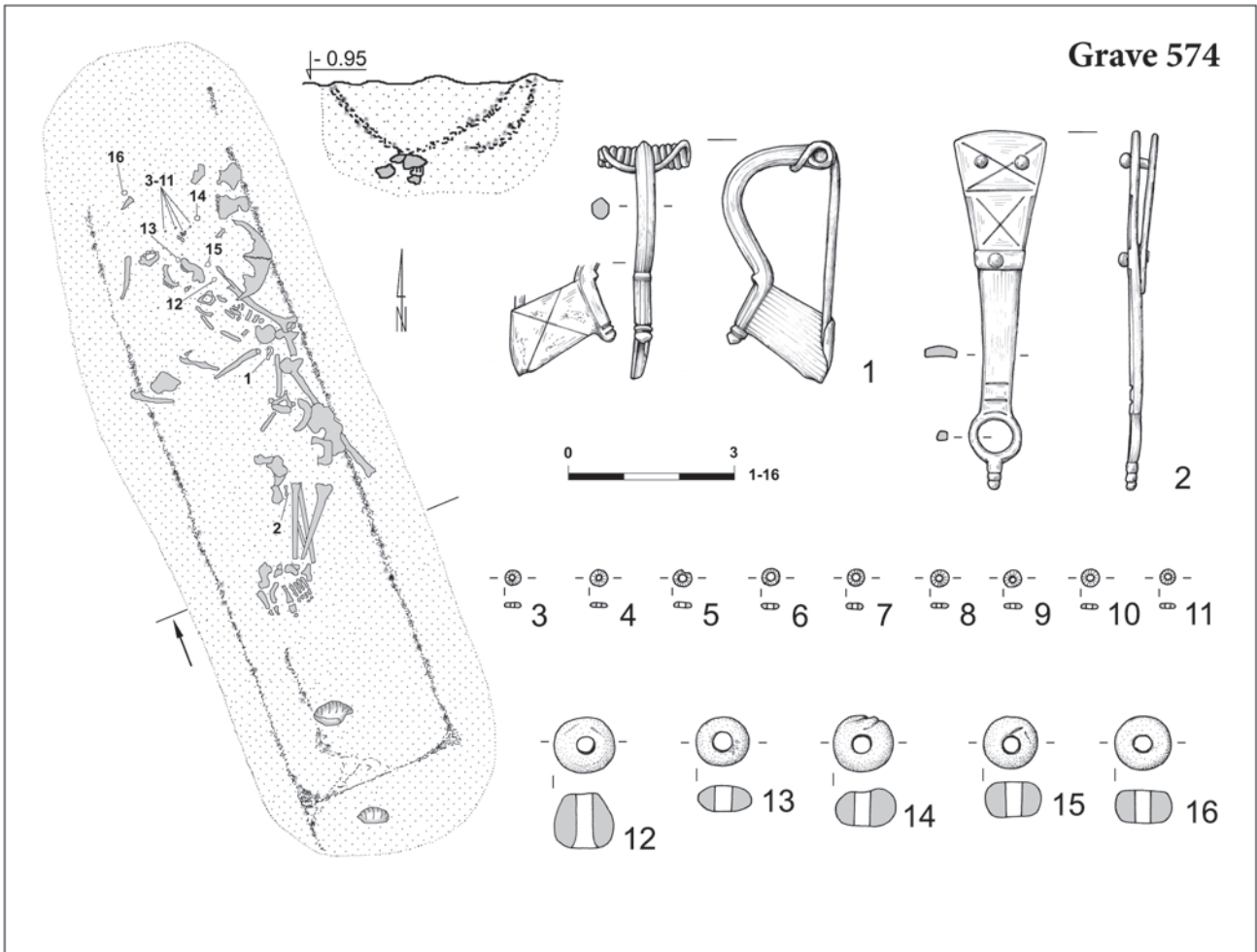
Grave 571



Grave 573

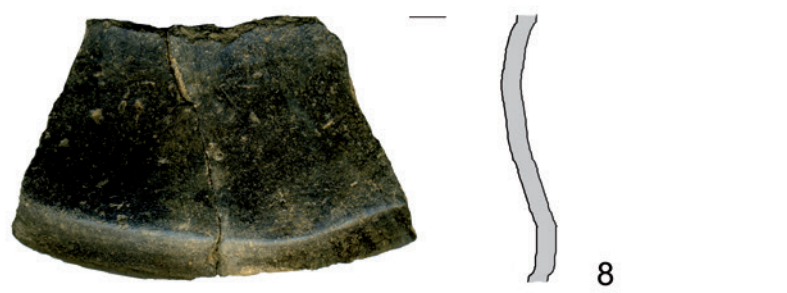
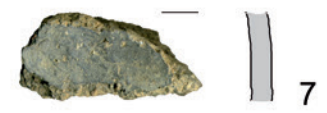
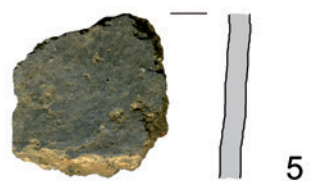
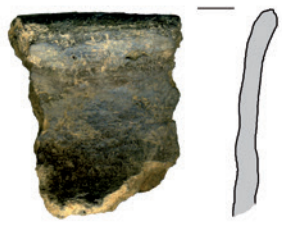
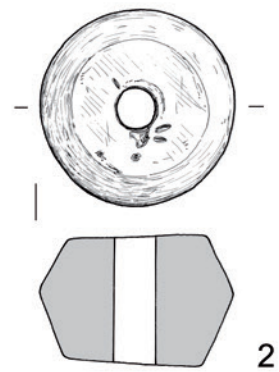
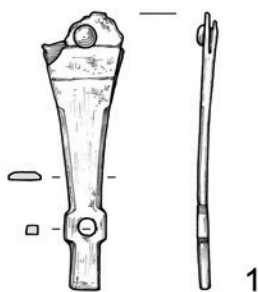


Pl. LXXVI. Grave 571: 1 – ceramic. Grave 573: 1 – ceramic

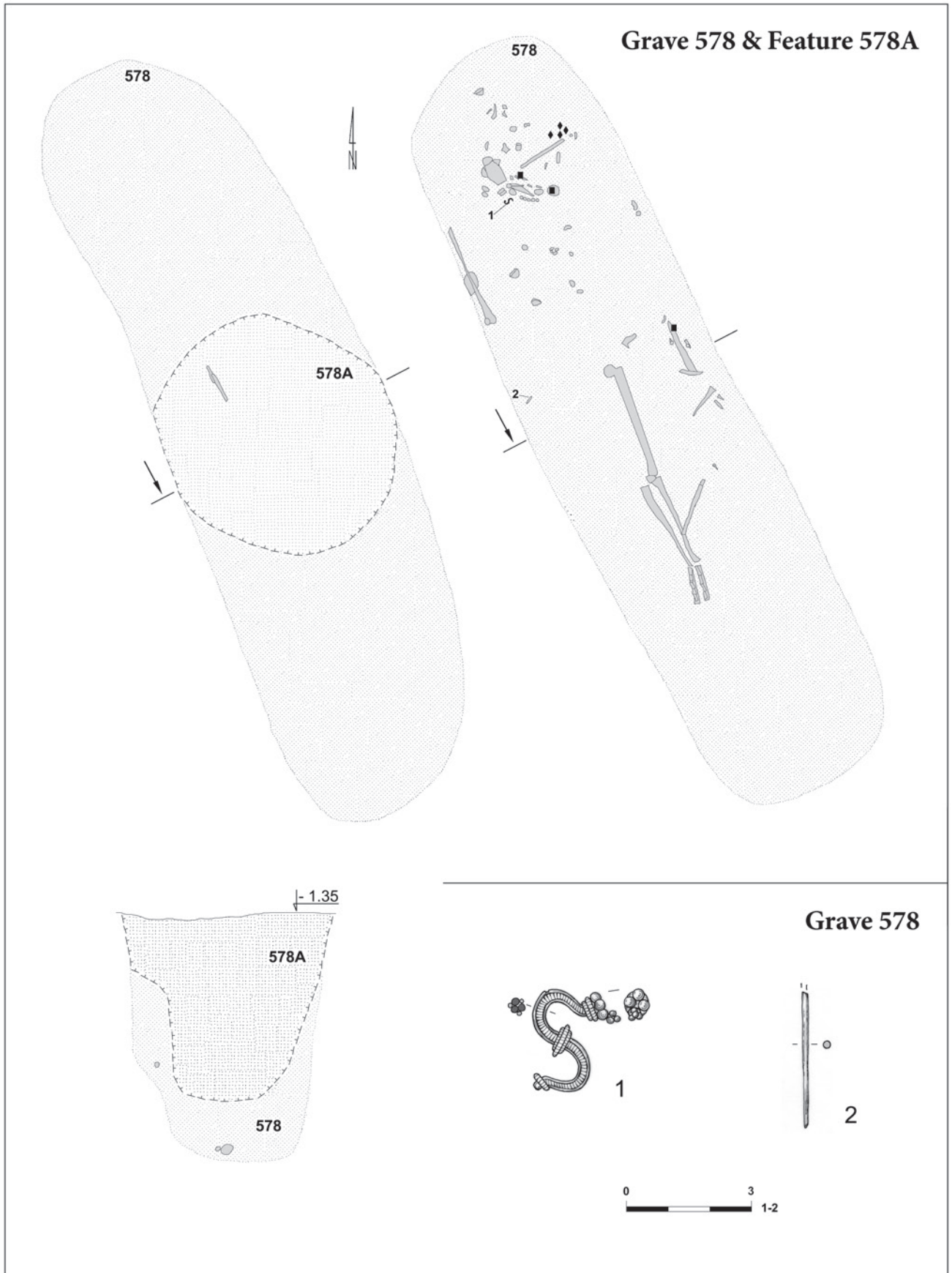


Pl. LXXVII. Grave 574: 1 – brass; 2 – copper alloy; 3–11 – glass; 12–16 – amber. Grave 577: 1 – ceramic

Grave 576

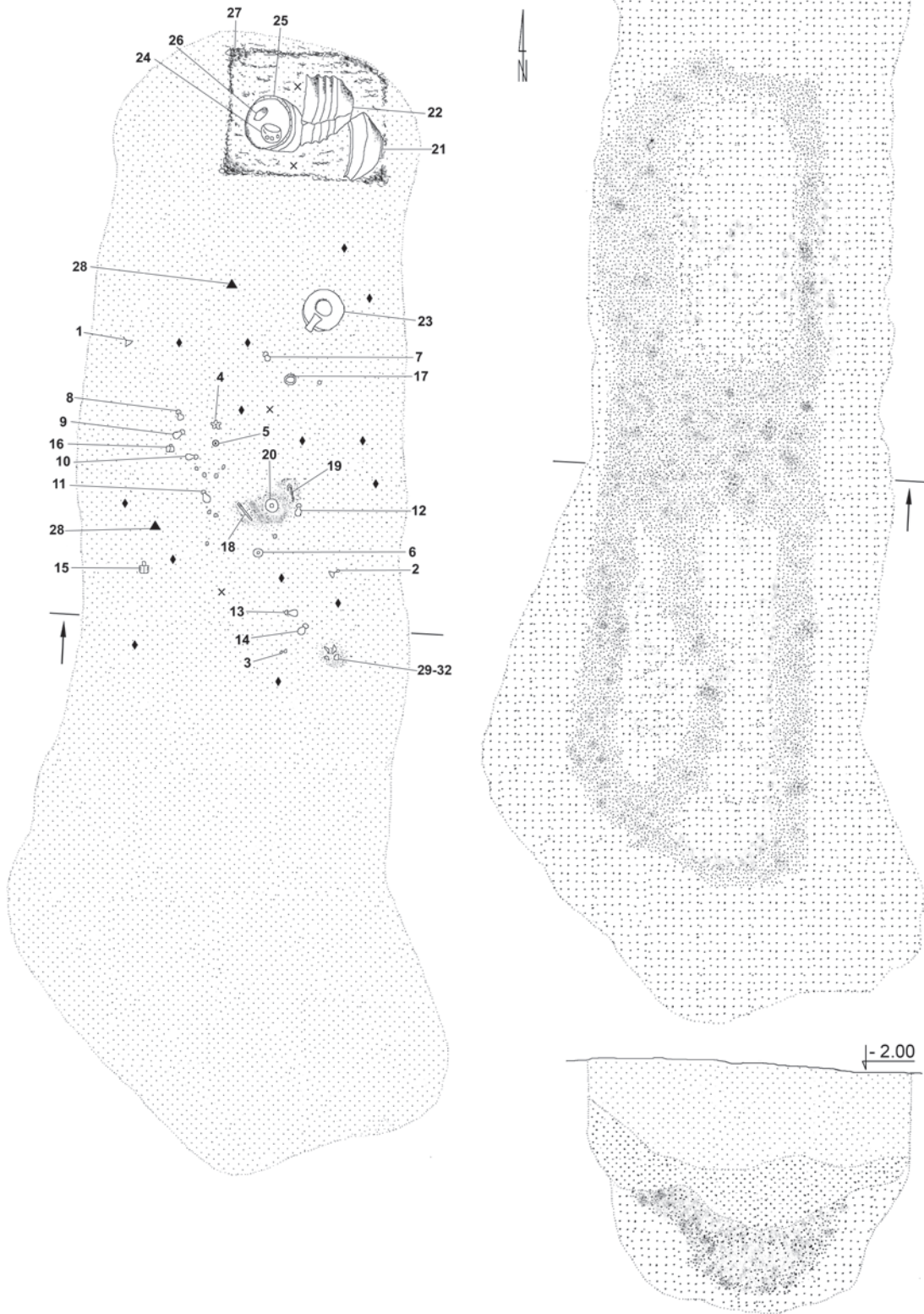


Pl. LXXVIII. Grave 576: 1 – copper alloy; 2-8 – ceramic



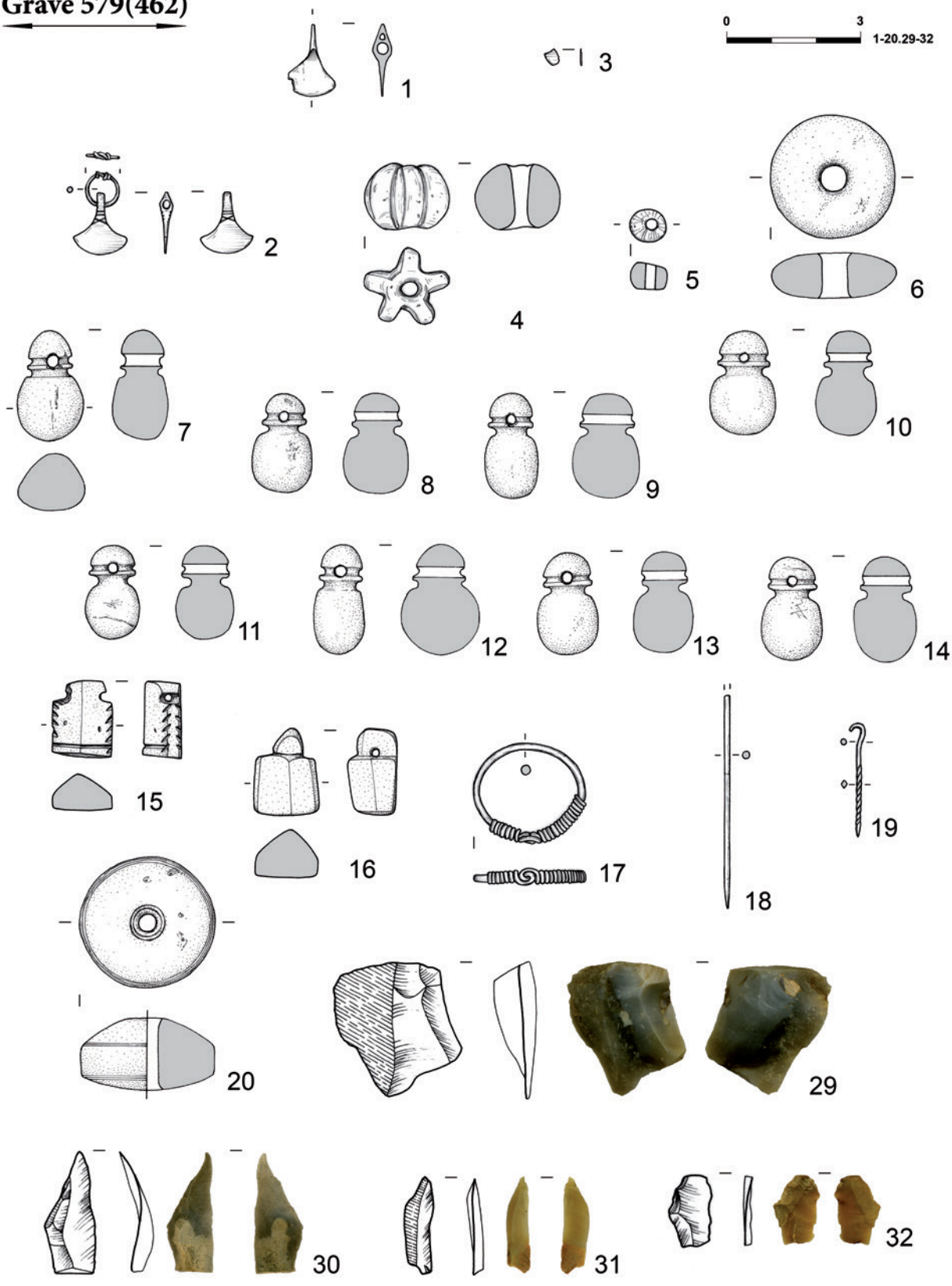
Pl. LXXIX. Grave 578 & Feature 578A. Grave 578: 1 – silver; 2 – copper alloy

Grave 579(462)



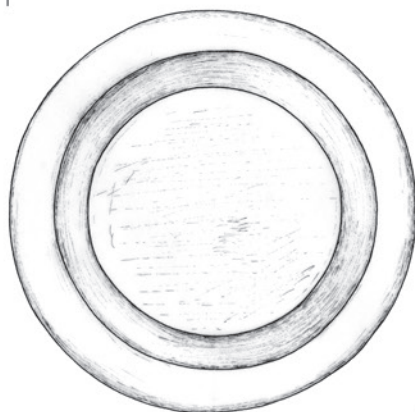
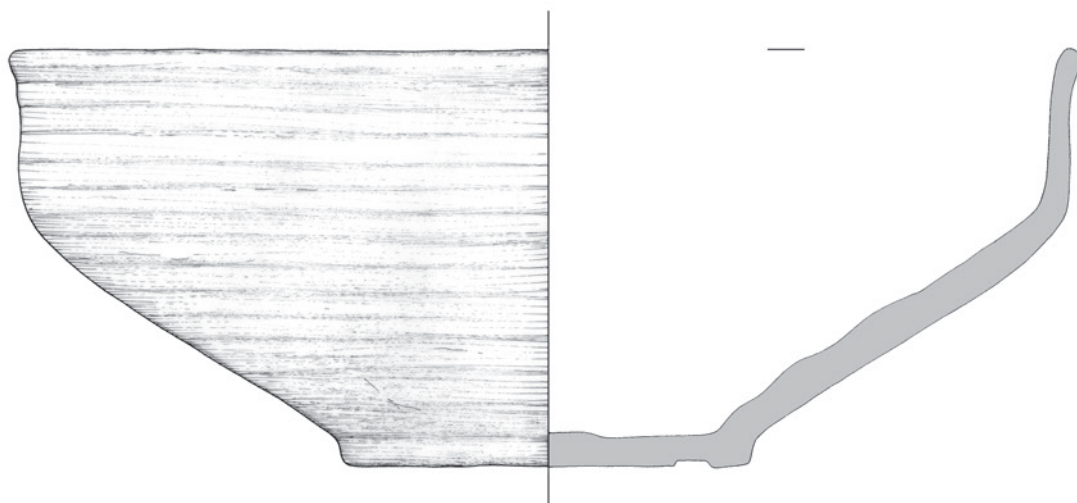
Pl. LXXX. Grave 579(462): 27 (on plan) – wood

Grave 579(462)

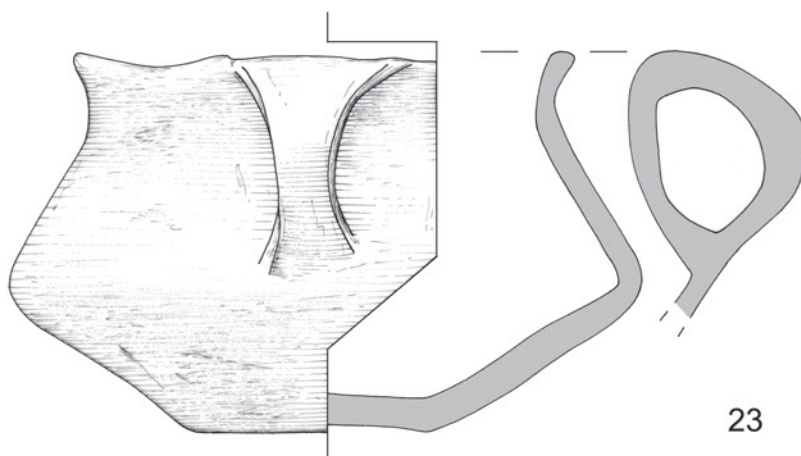


Pl. LXXXI: Grave 579(462): 1-3,17-19 – silver; 4-5 – glass; 6-16,20 – amber; 29-32 – flint

Grave 579(462)



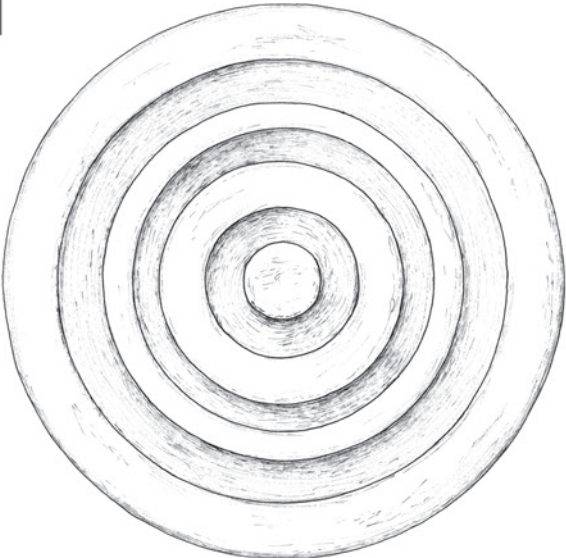
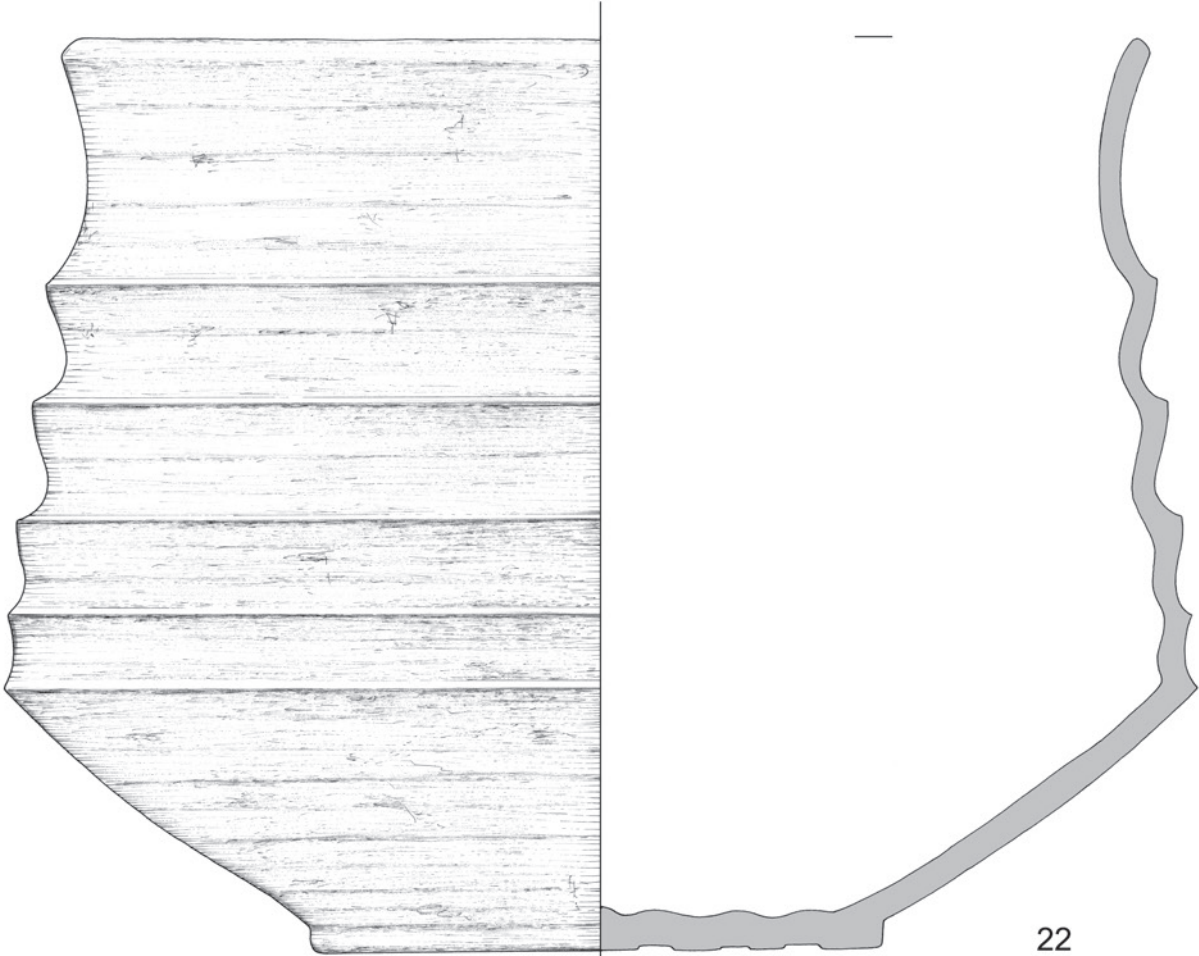
21



23

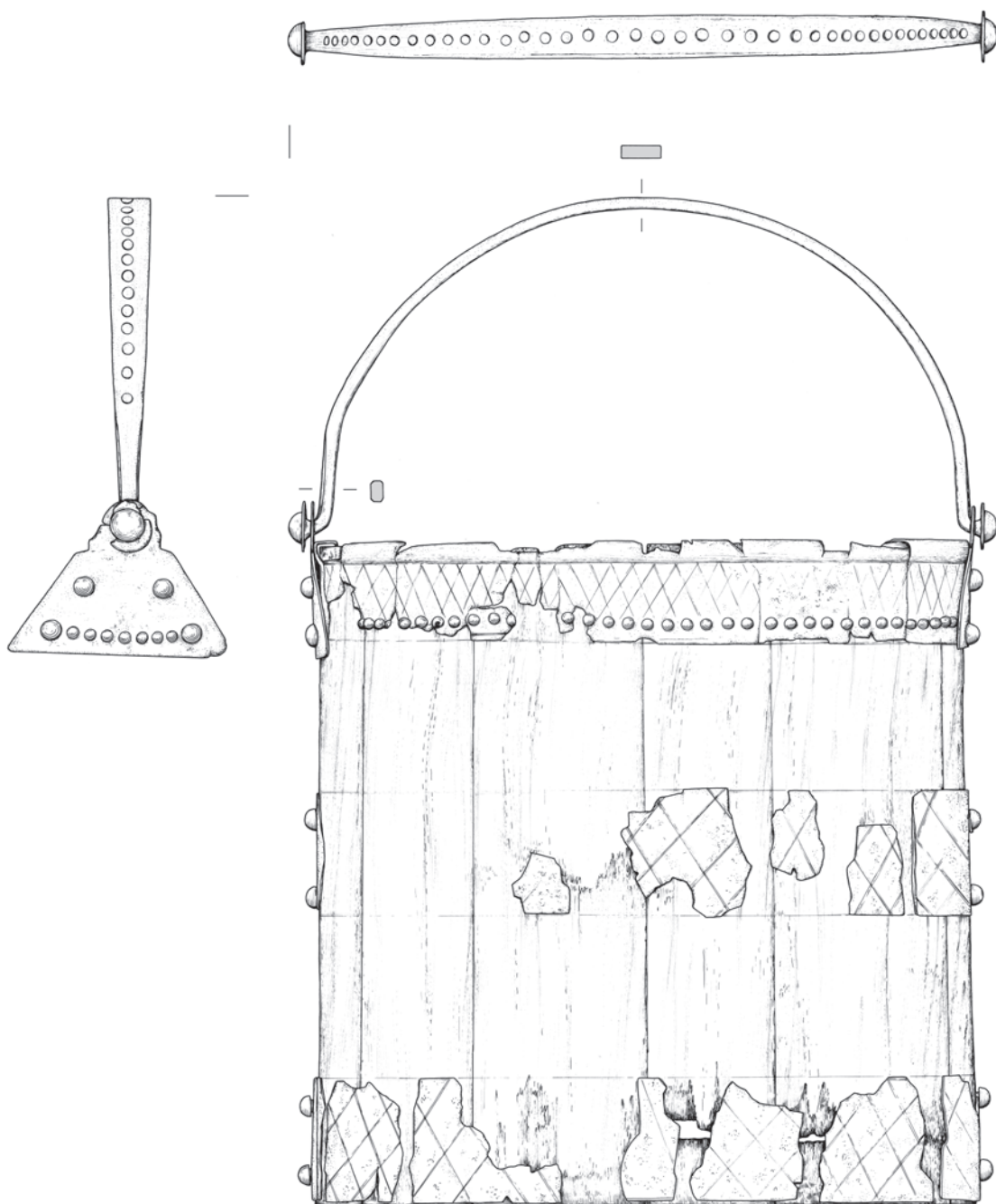
Pl. LXXXII: Grave 579(462): 21.23 – ceramic

Grave 579(462)



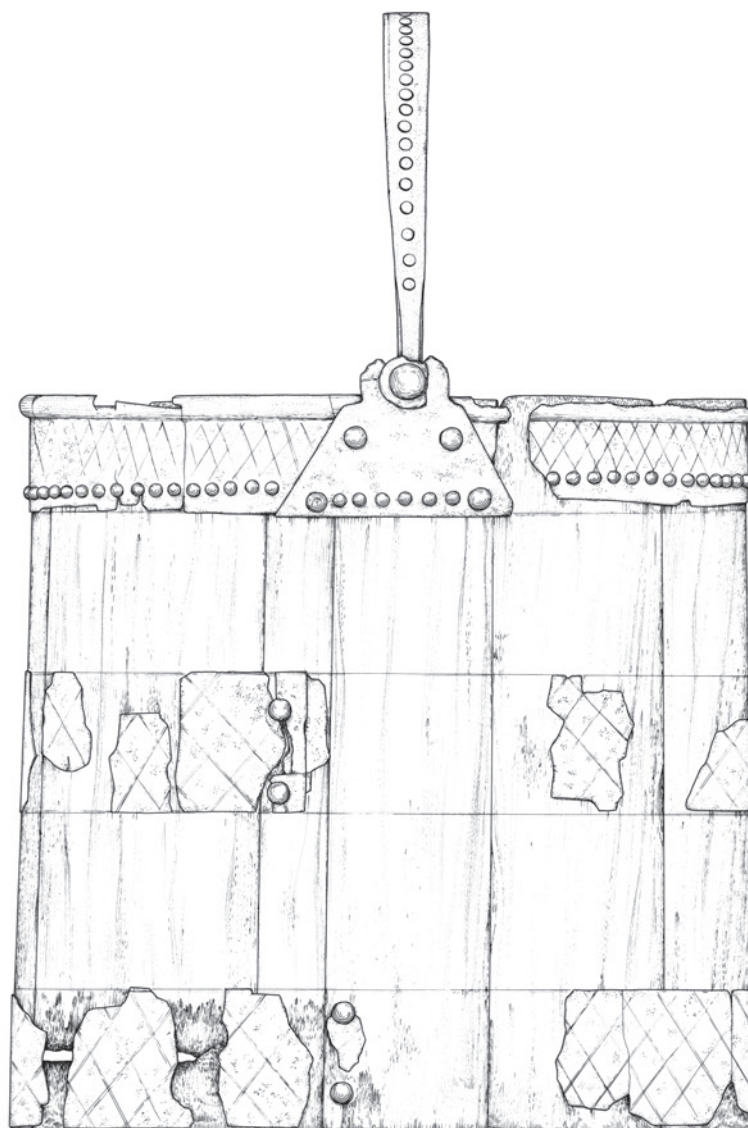
Pl. LXXXIII: Grave 579(462): 22 – ceramic

Grave 579(462)



Pl. LXXXIV: Grave 579(462): 25 – wood and brass

Grave 579(462)

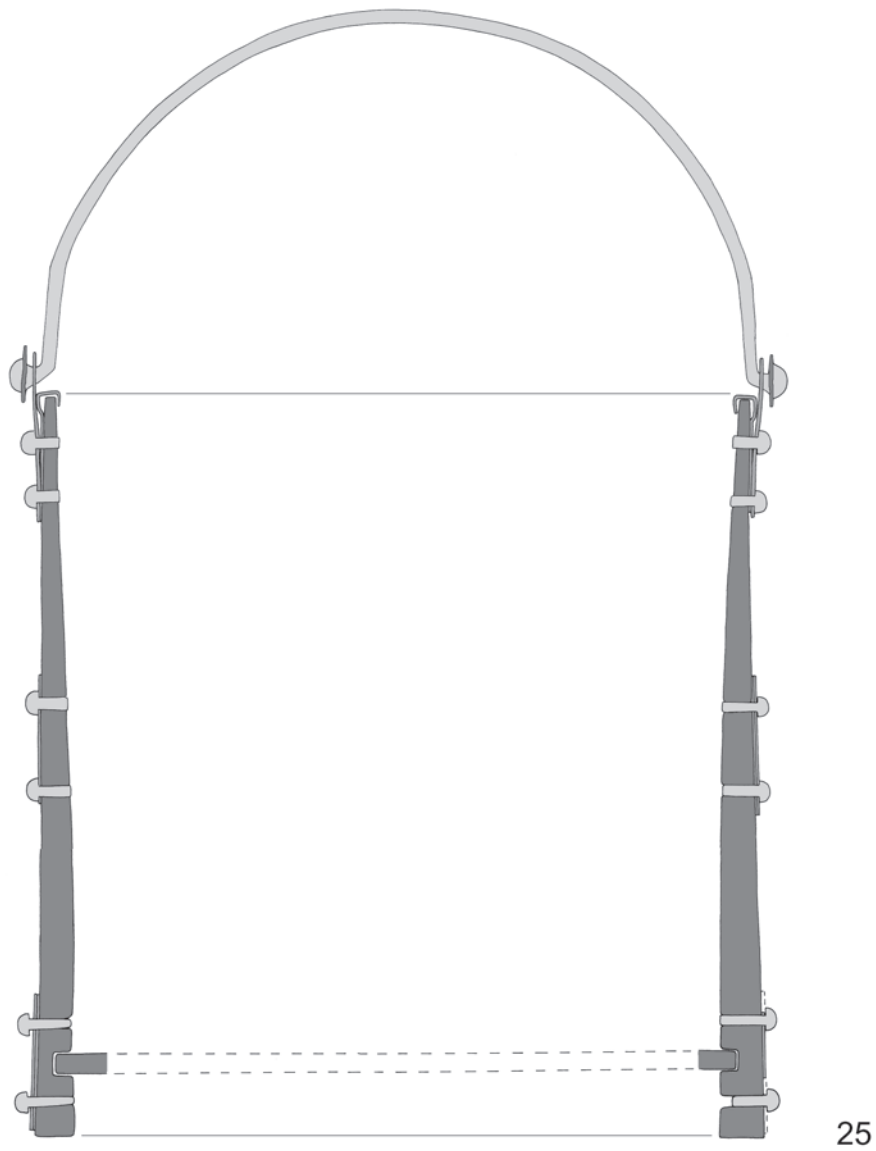


25



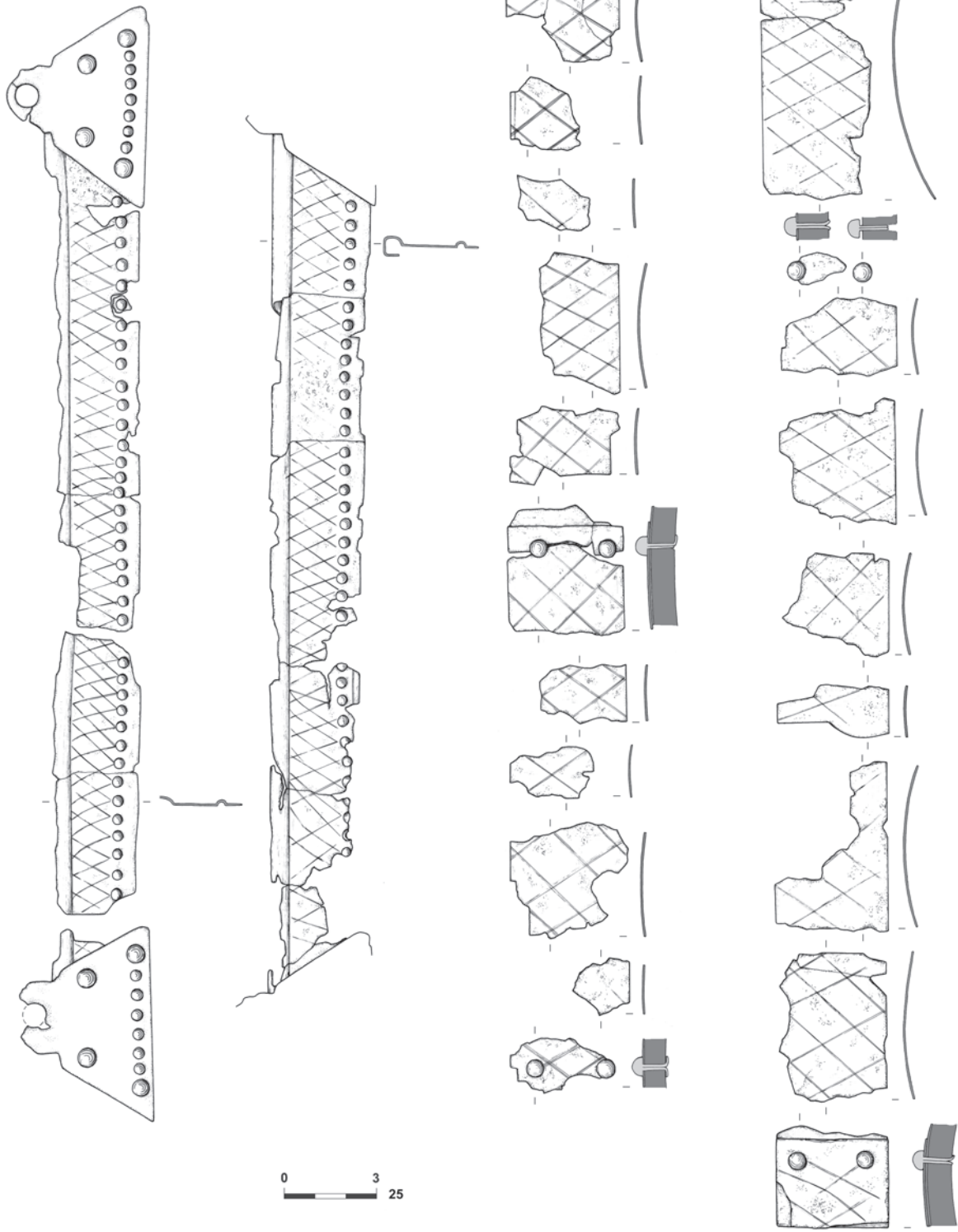
Pl. LXXXV: Grave 579(462): 25 – wood and brass

Grave 579(462)



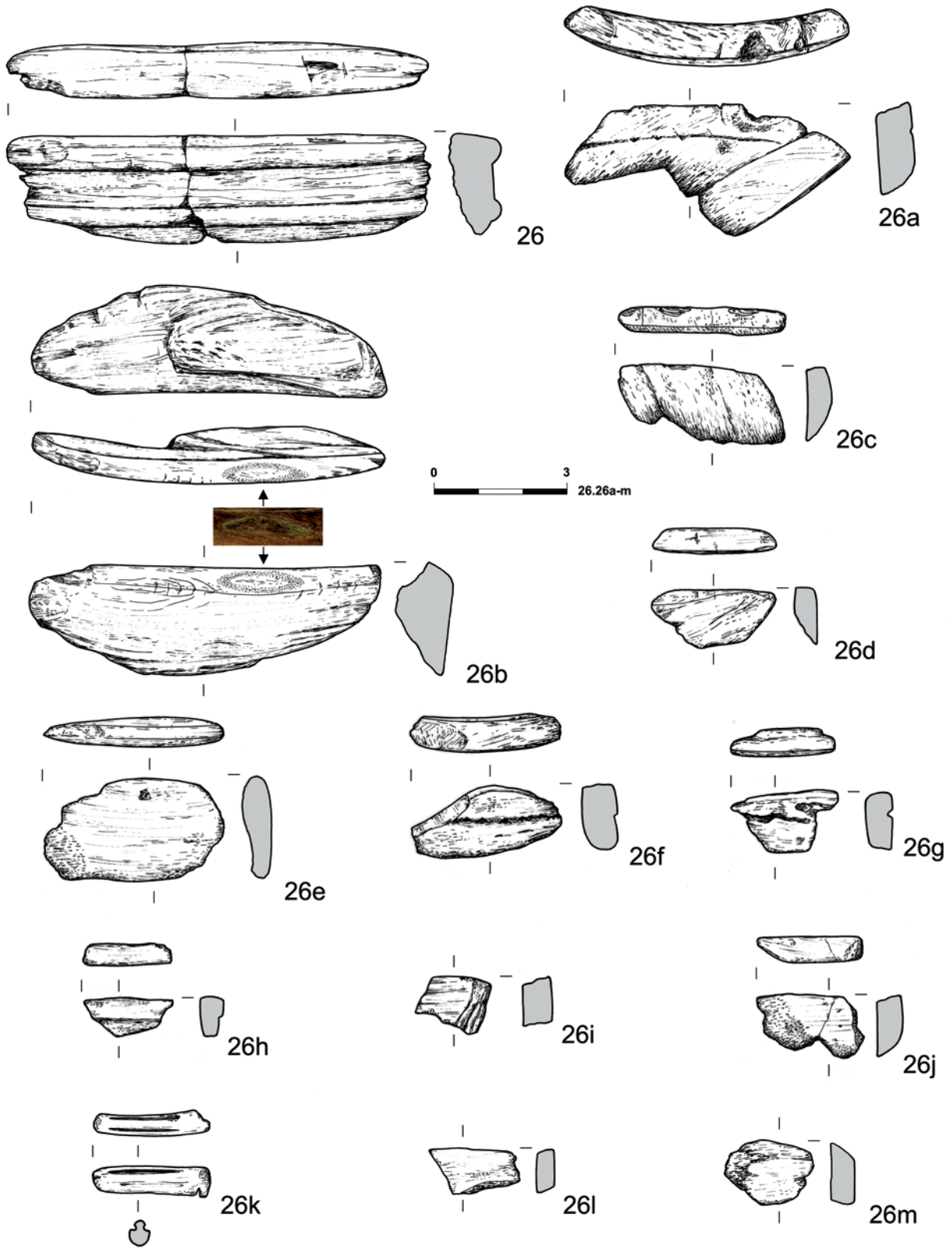
Pl. LXXXVI: Grave 579(462): 25 – wood and brass

Grave 579(462)



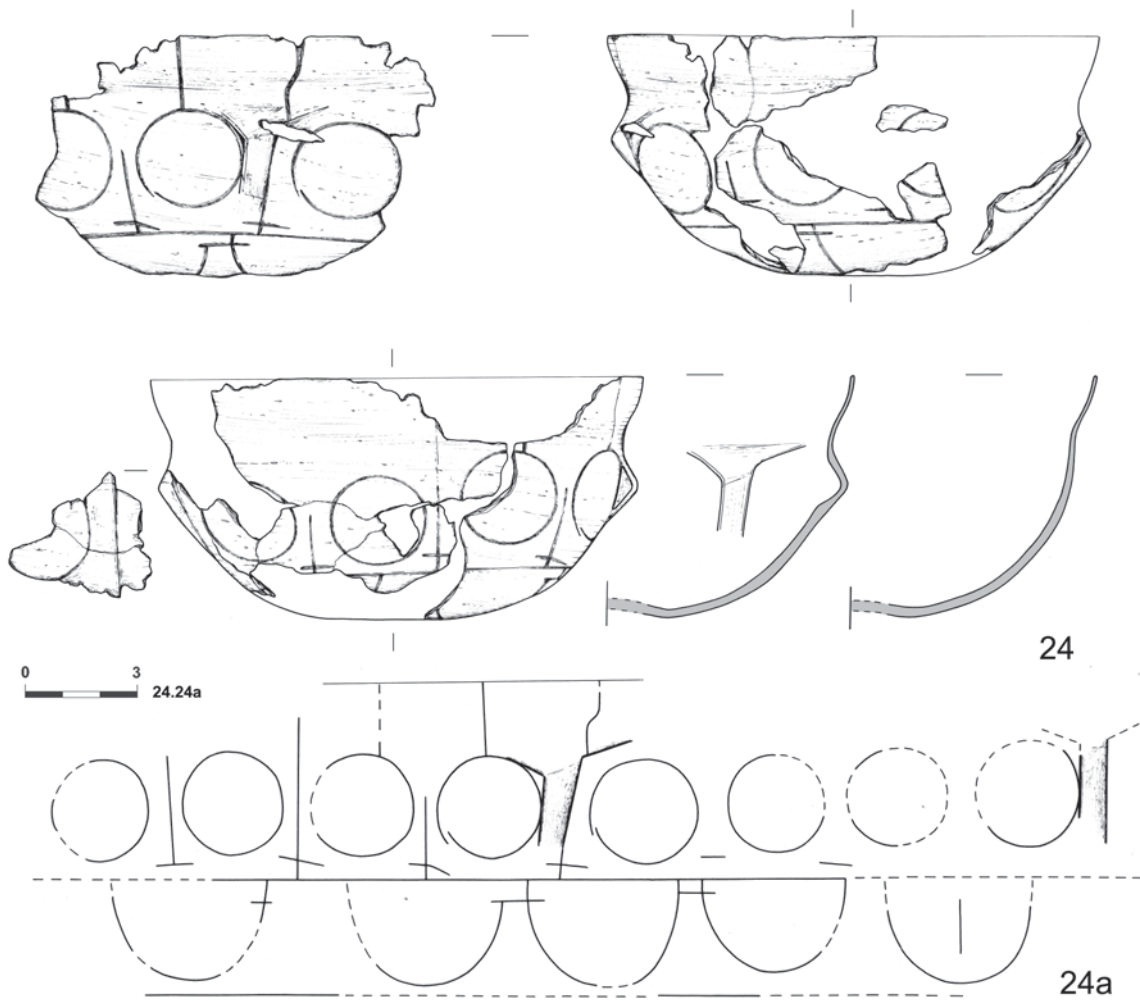
Pl. LXXXVII: Grave 579(462): 25 – brass and wood

Grave 579(462)

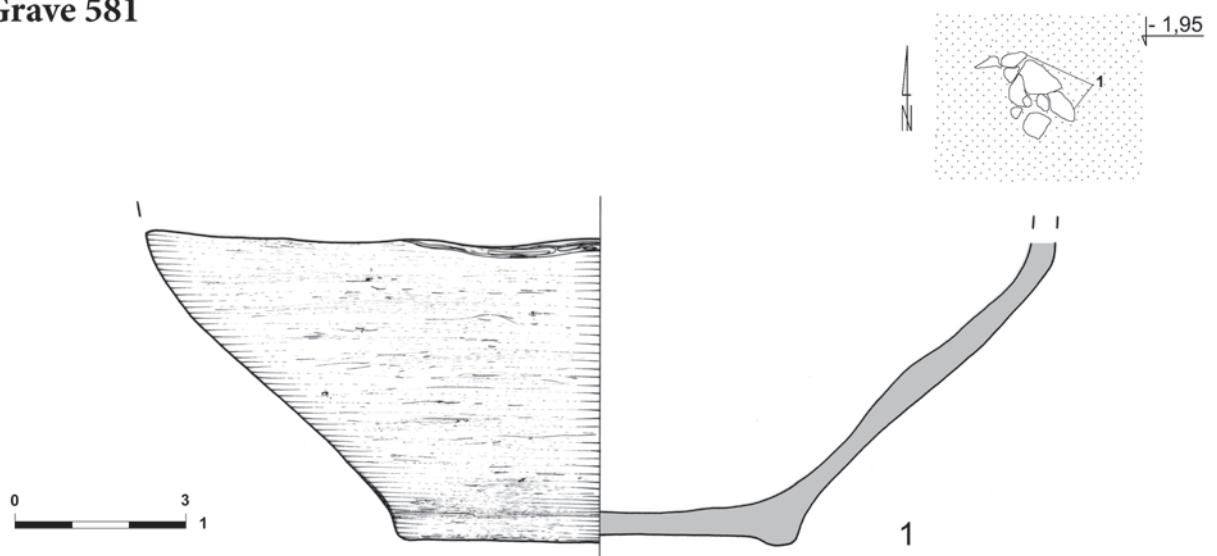


Pl. LXXXVIII: Grave 579(462): 26.26a-m – wood

Grave 579(462)



Grave 581



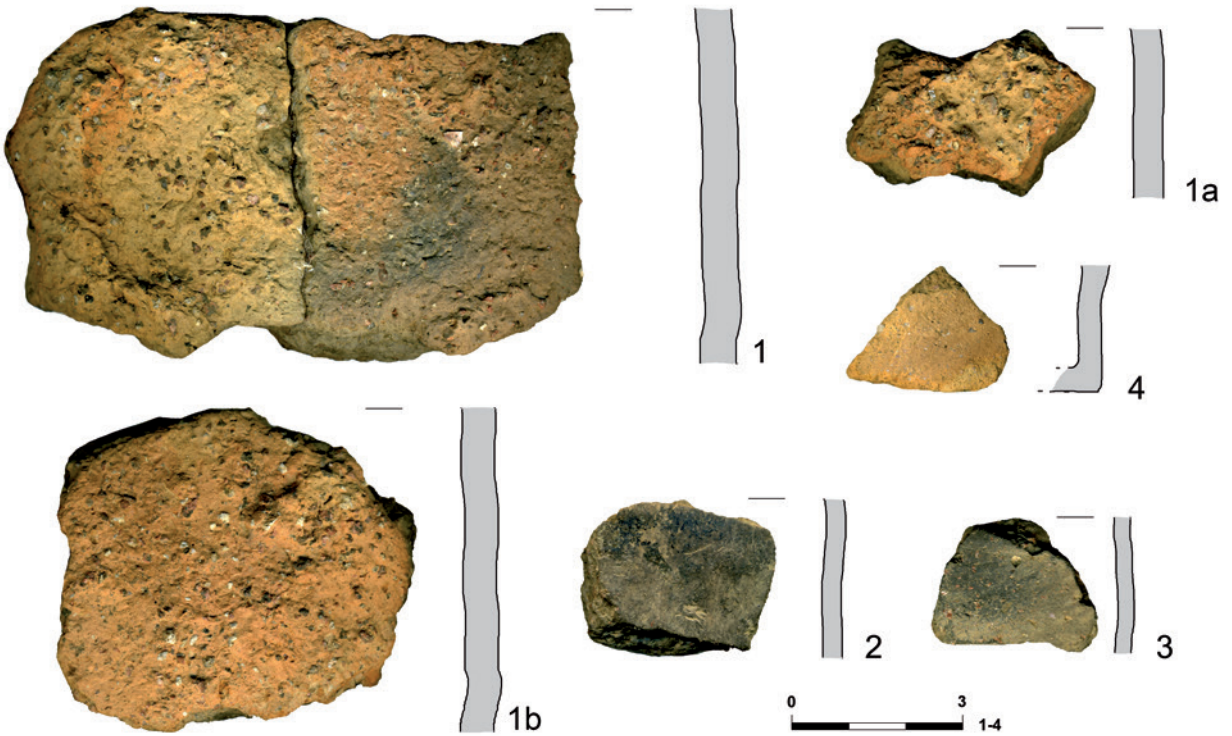
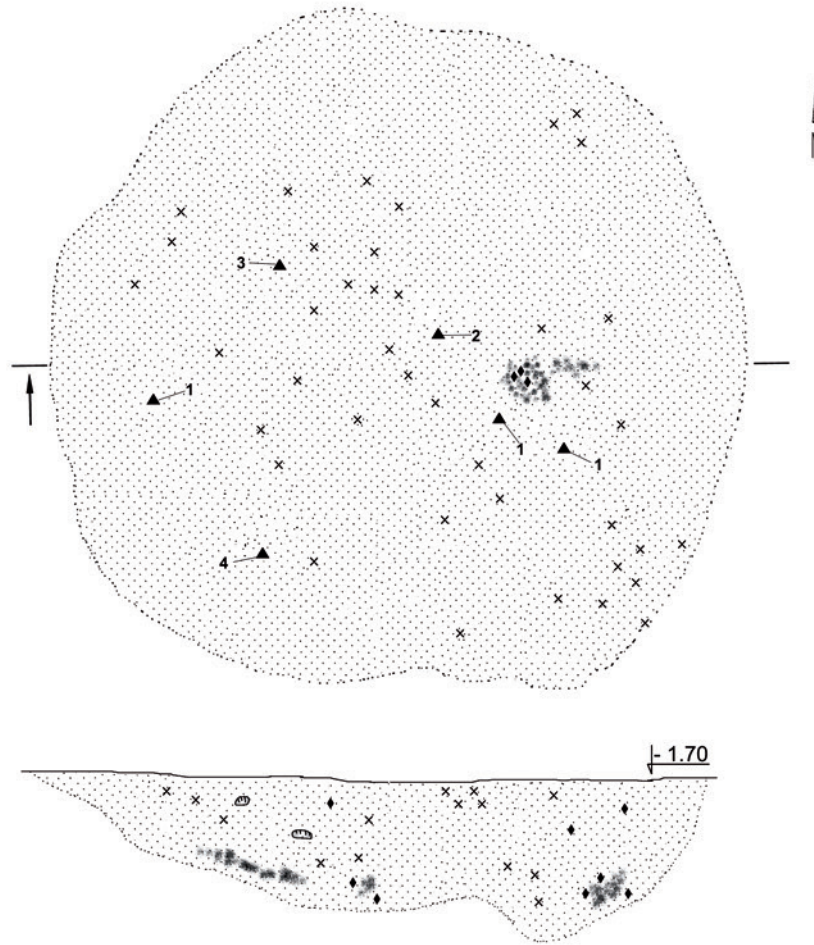
Pl. LXXXIX. Grave 579(462): 24 – glass. Grave 581: 1 – ceramic

Grave 580



Pl. XC. Grave 580

Grave 580



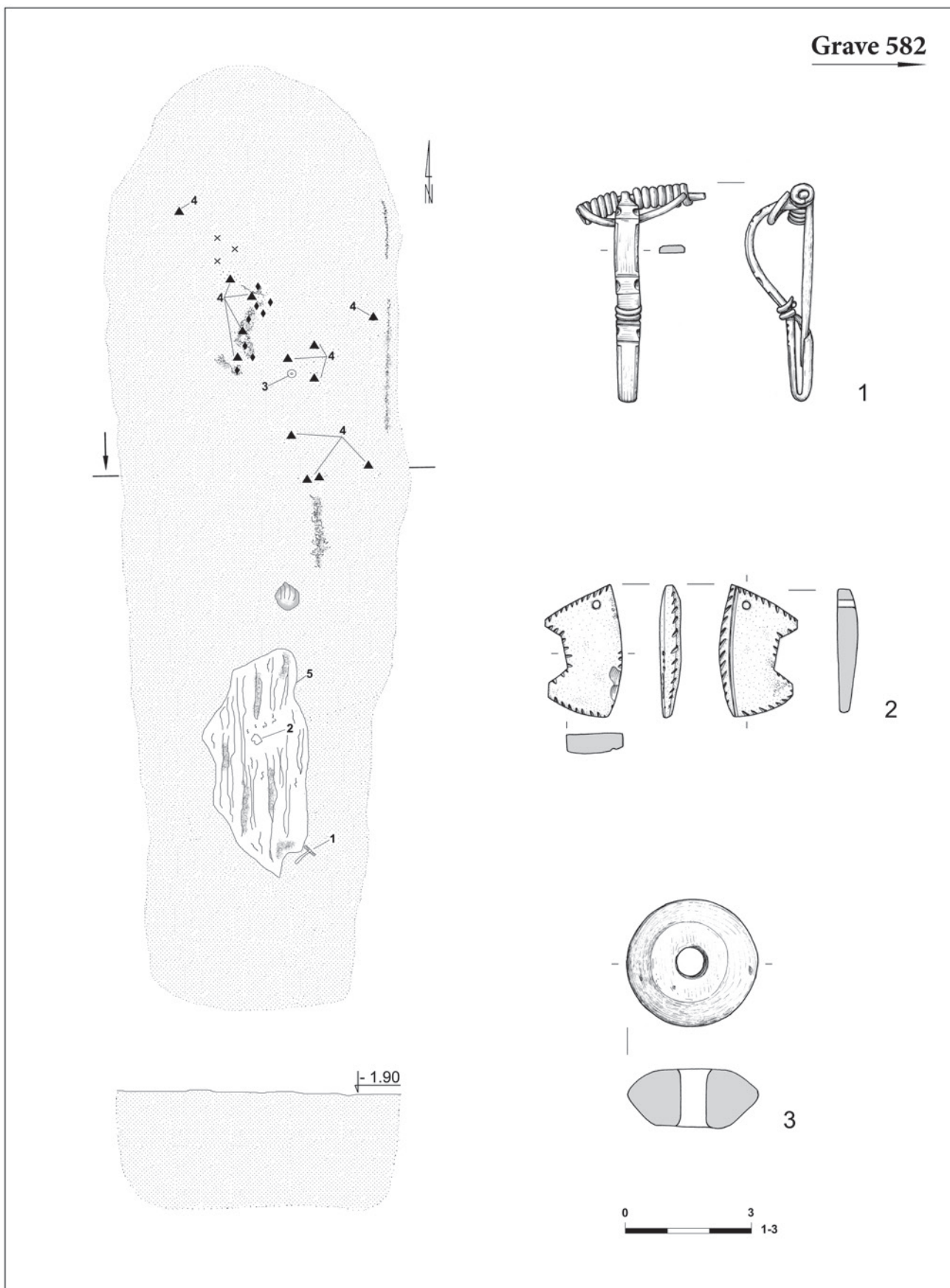
Pl. XCI. Grave 580: 1.1a-b-4 - ceramic

Grave 580



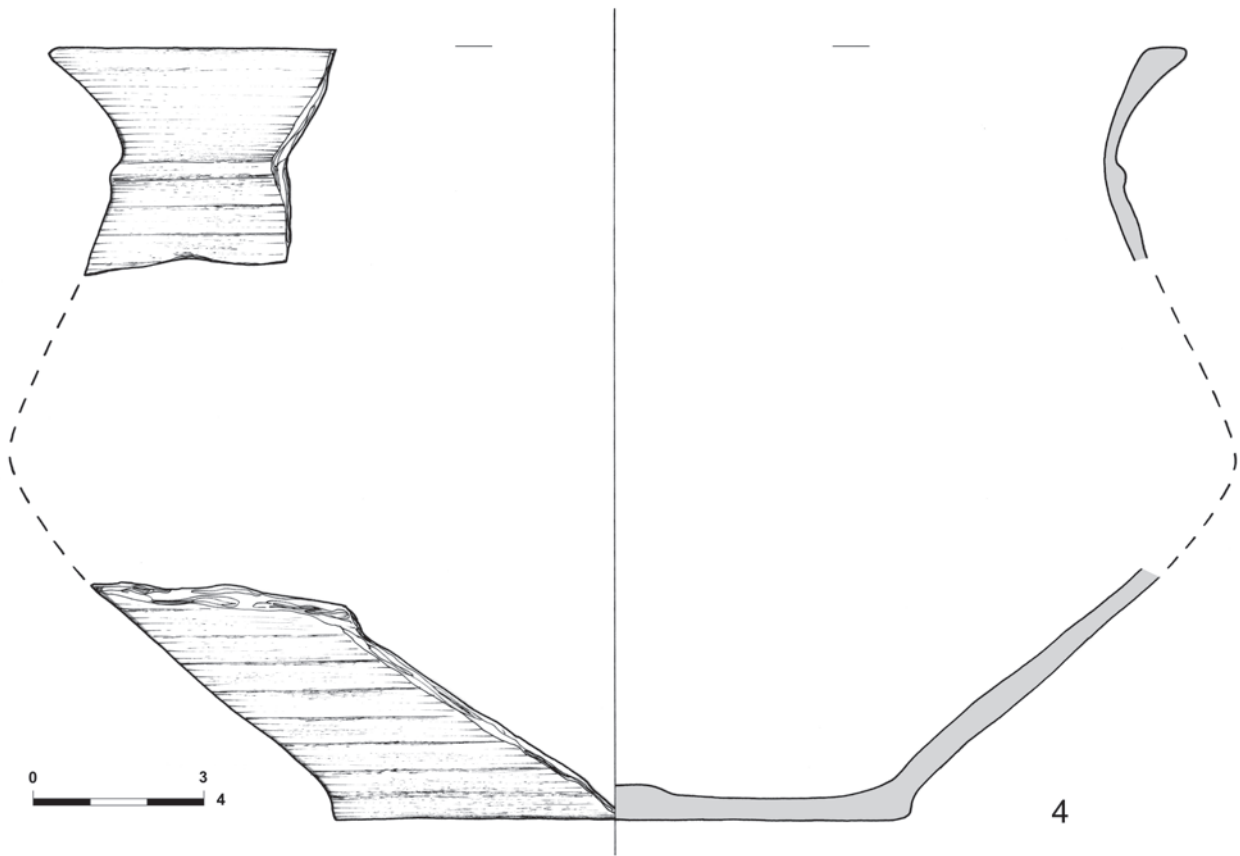
Pl. XCII. Grave 580: 1c-m – ceramic

Grave 582

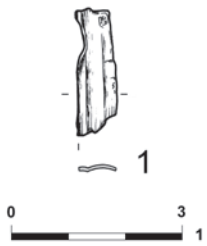


Pl. XCIII. Grave 582: 1 – tin bronze; 2 – amber; 3 – ceramic; 5 (on plan) – wood

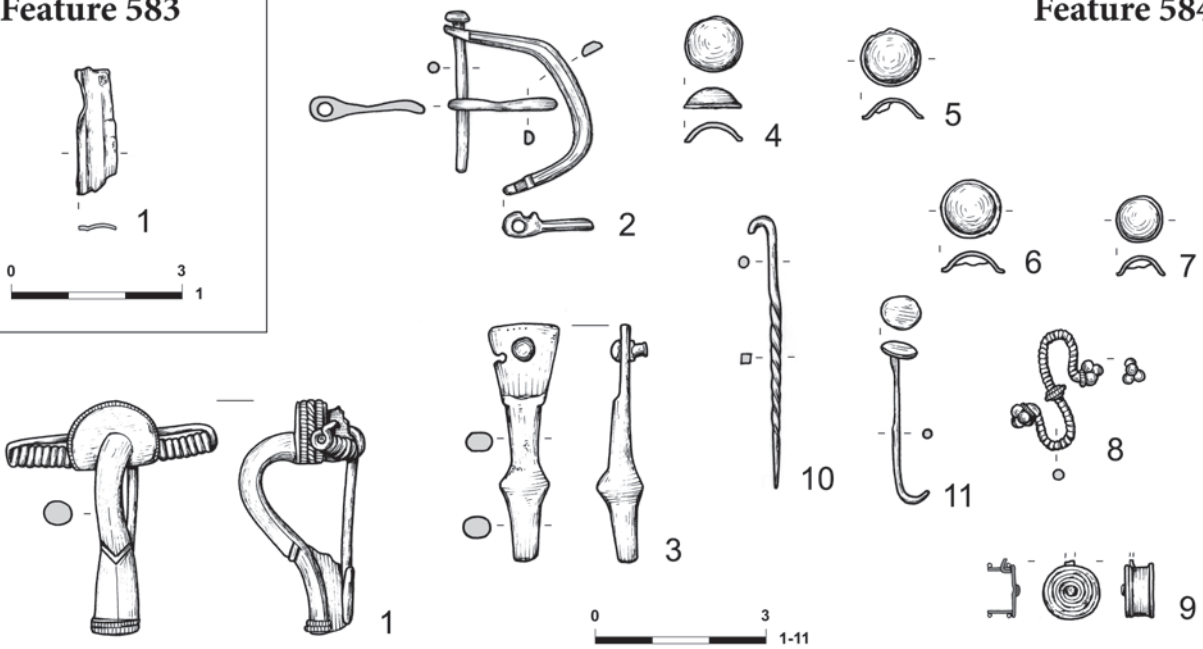
Grave 582



Feature 583

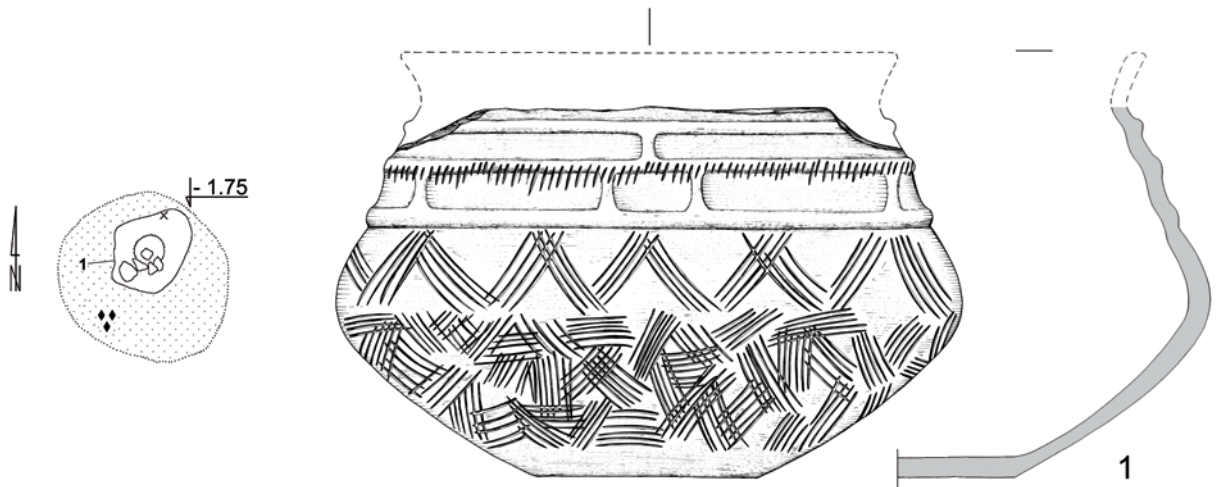


Feature 584

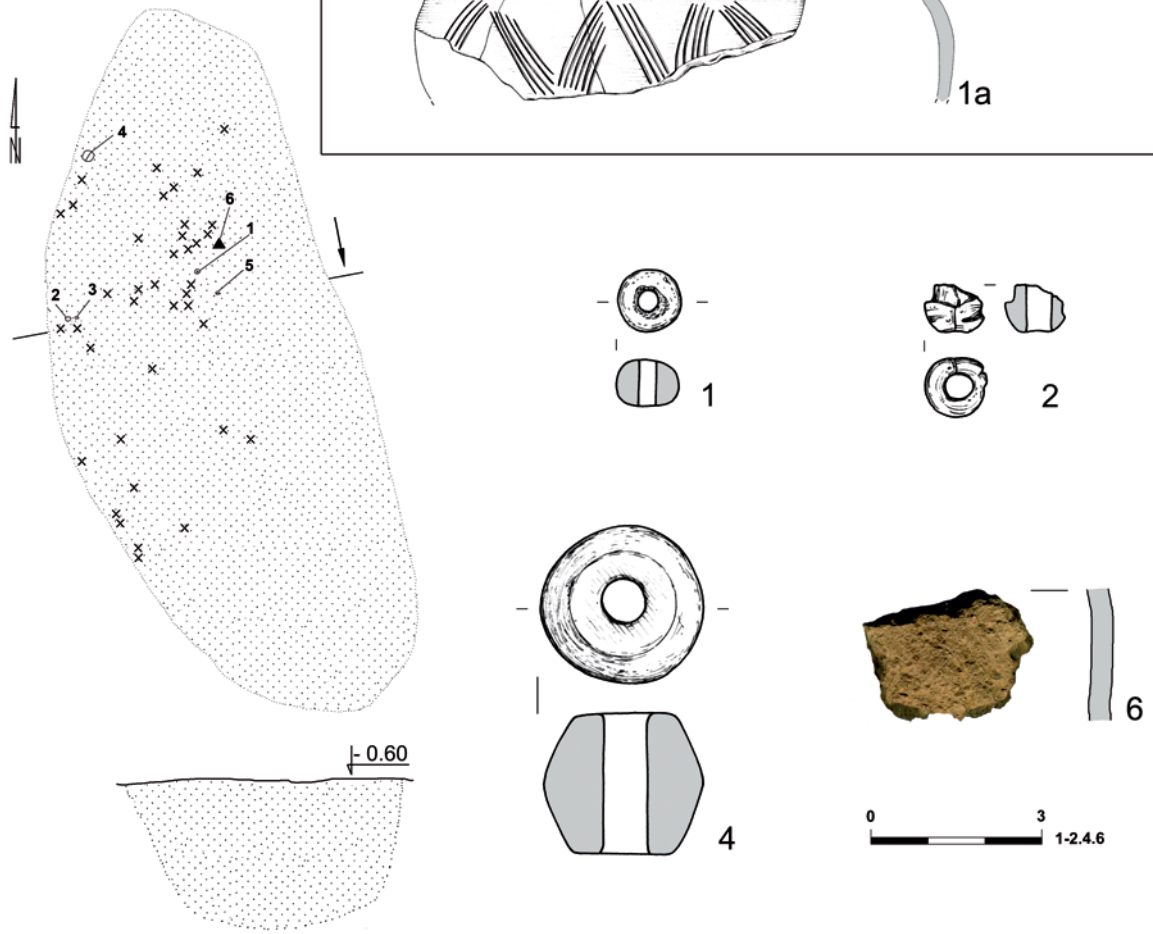
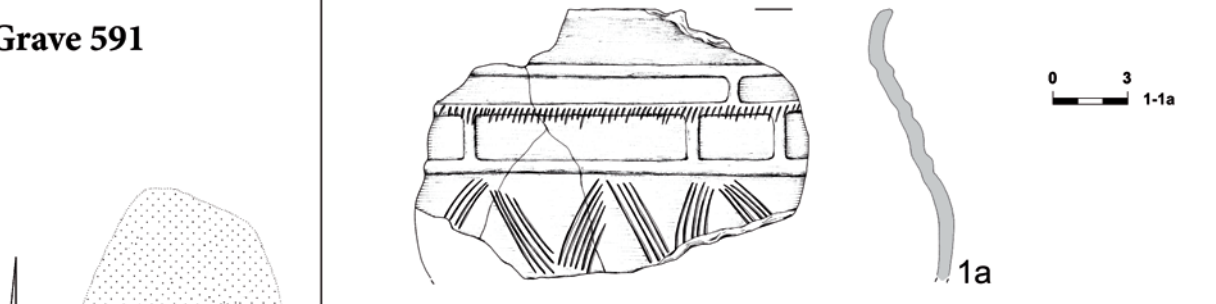


Pl. XCIV. Grave 582: 4 – ceramic. Feature 583: 1 – brass. Feature 584: 1 – brass and silver; 2-7.10-11 – copper alloy; 8-9 – silver

Grave 585(290A)

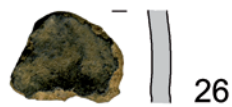
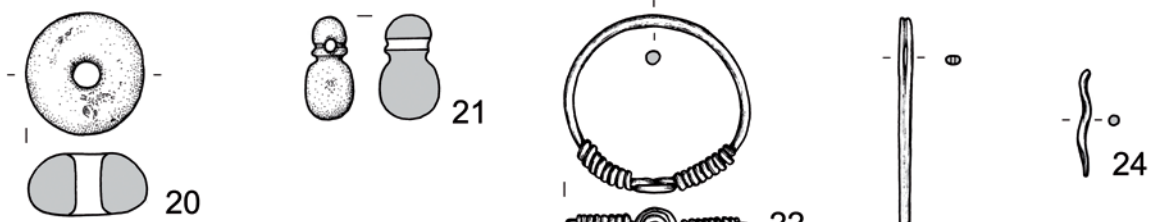
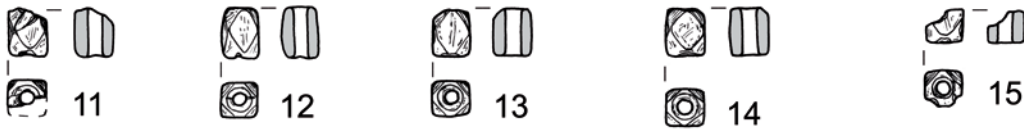
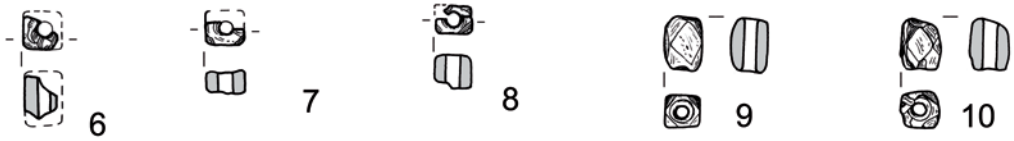


Grave 591



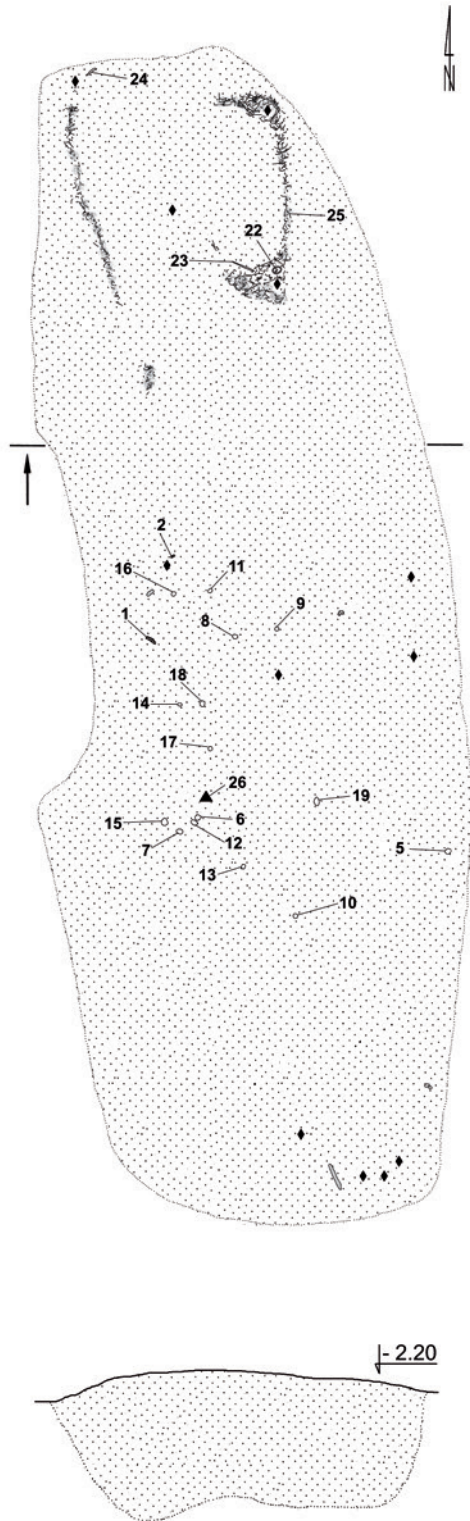
Pl. XCV. Grave 585 (290A): 1-1a – ceramic. Grave 591: 1-2 – glass; 4,6 – ceramic

Grave 586

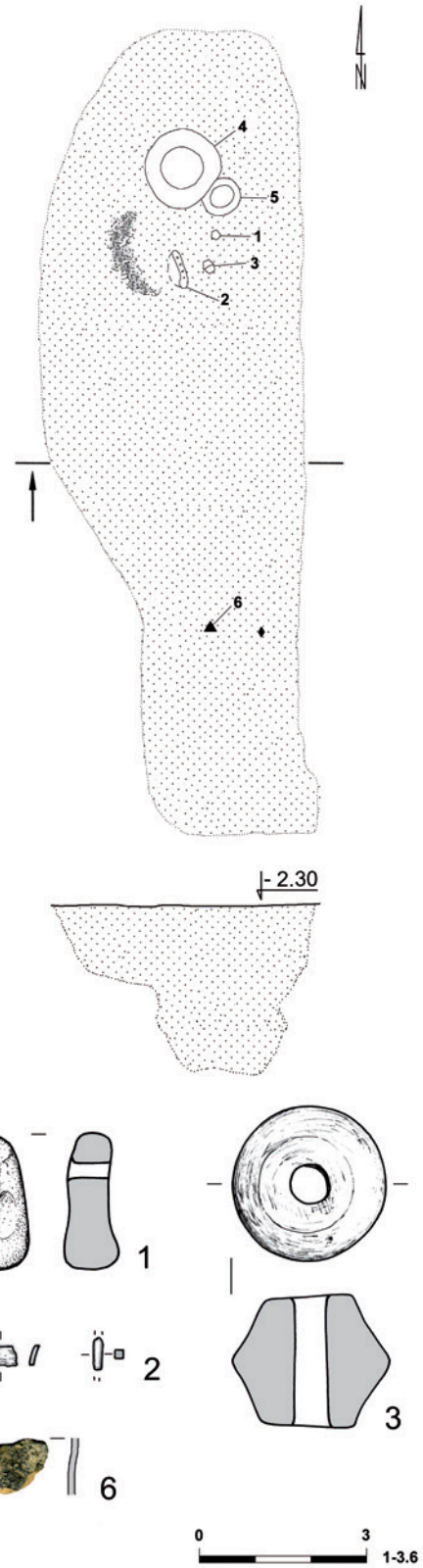


Pl. XCVI. Grave 586: 1.22.24 – silver; 2.23 – copper alloy; 3–15 – glass; 20–21 – amber; 26 – ceramic

Grave 586

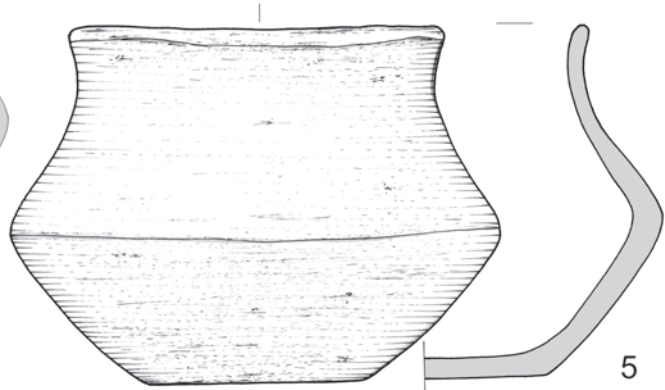
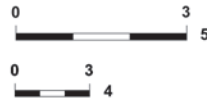
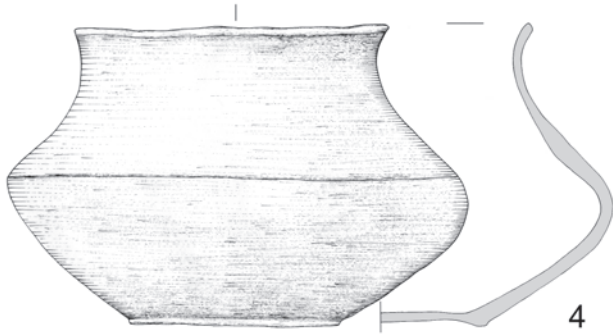


Grave 589

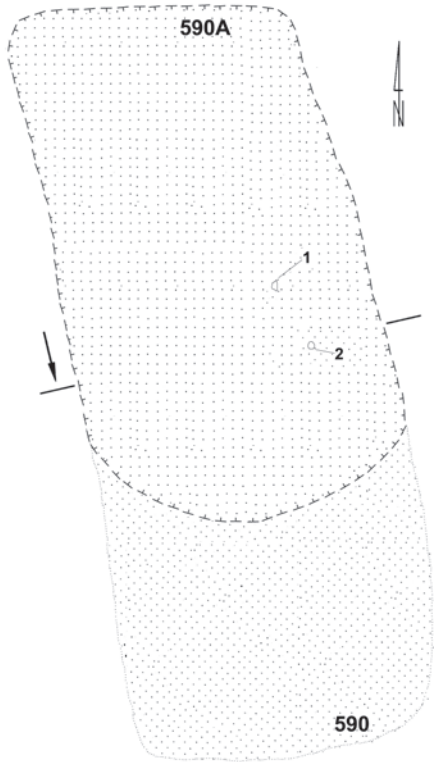


Pl. XCVII. Grave 586: 25 (on plan) – wood. Grave 589 : 1 – amber; 2 – bone (antler [?]) and copper alloy; 3,6 – ceramic

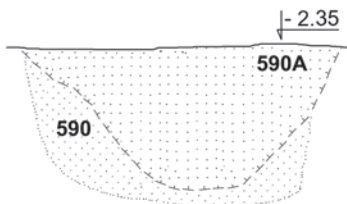
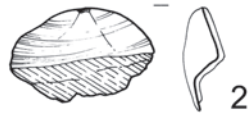
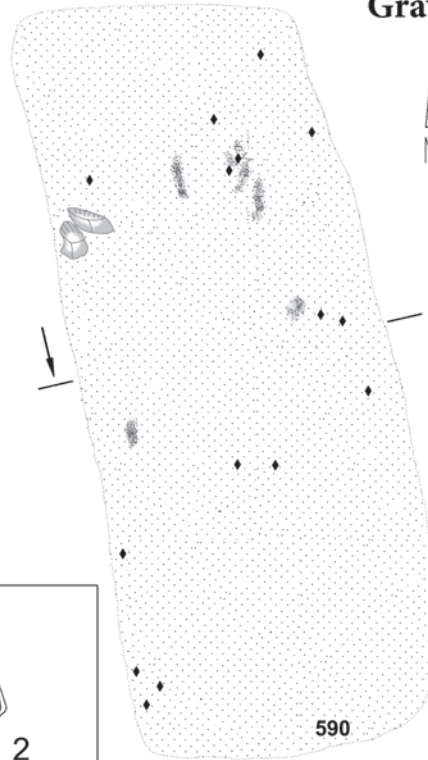
Grave 589



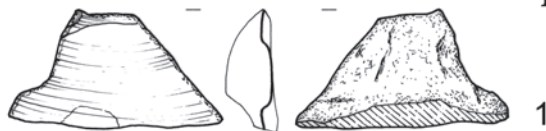
Grave 590 & Feature 590A



Grave 590

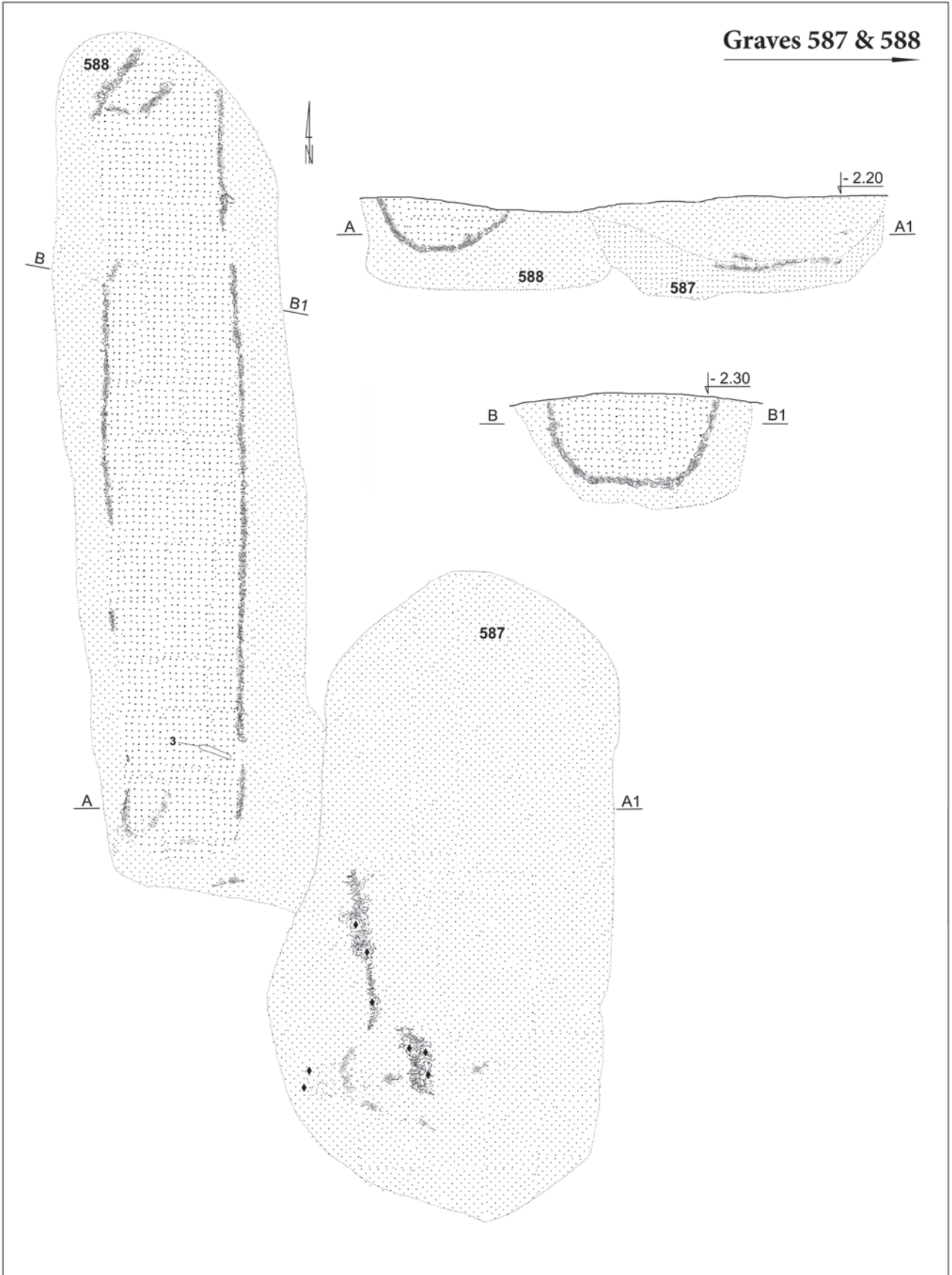


Feature 590A

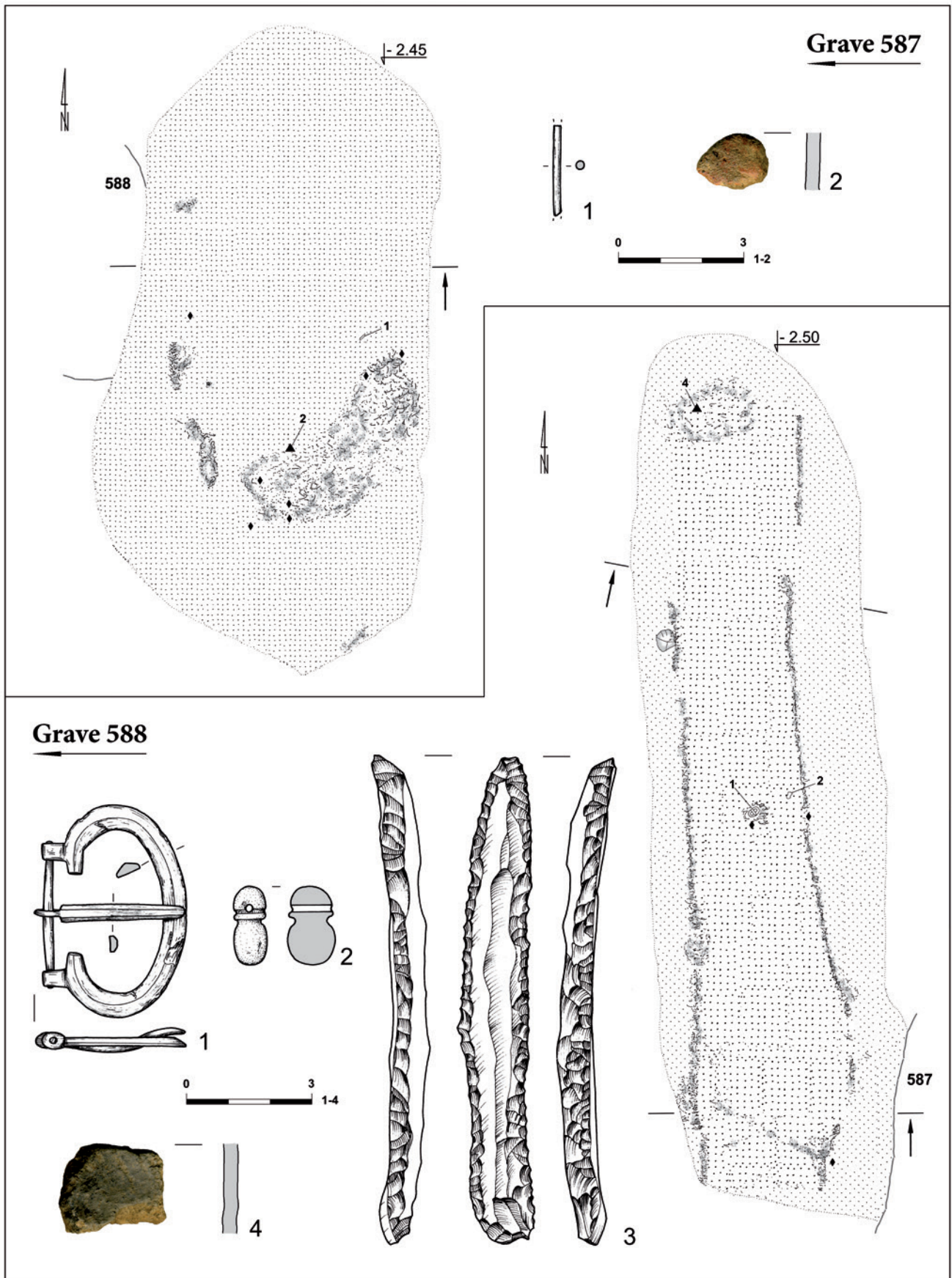


Pl. XCVIII. Grave 589: 4-5 – ceramic. Grave 590 & Feature 590A. Grave 590. Feature 590A: 1-2 – flint

Graves 587 & 588



Pl. XCIX. Graves 587 & 588



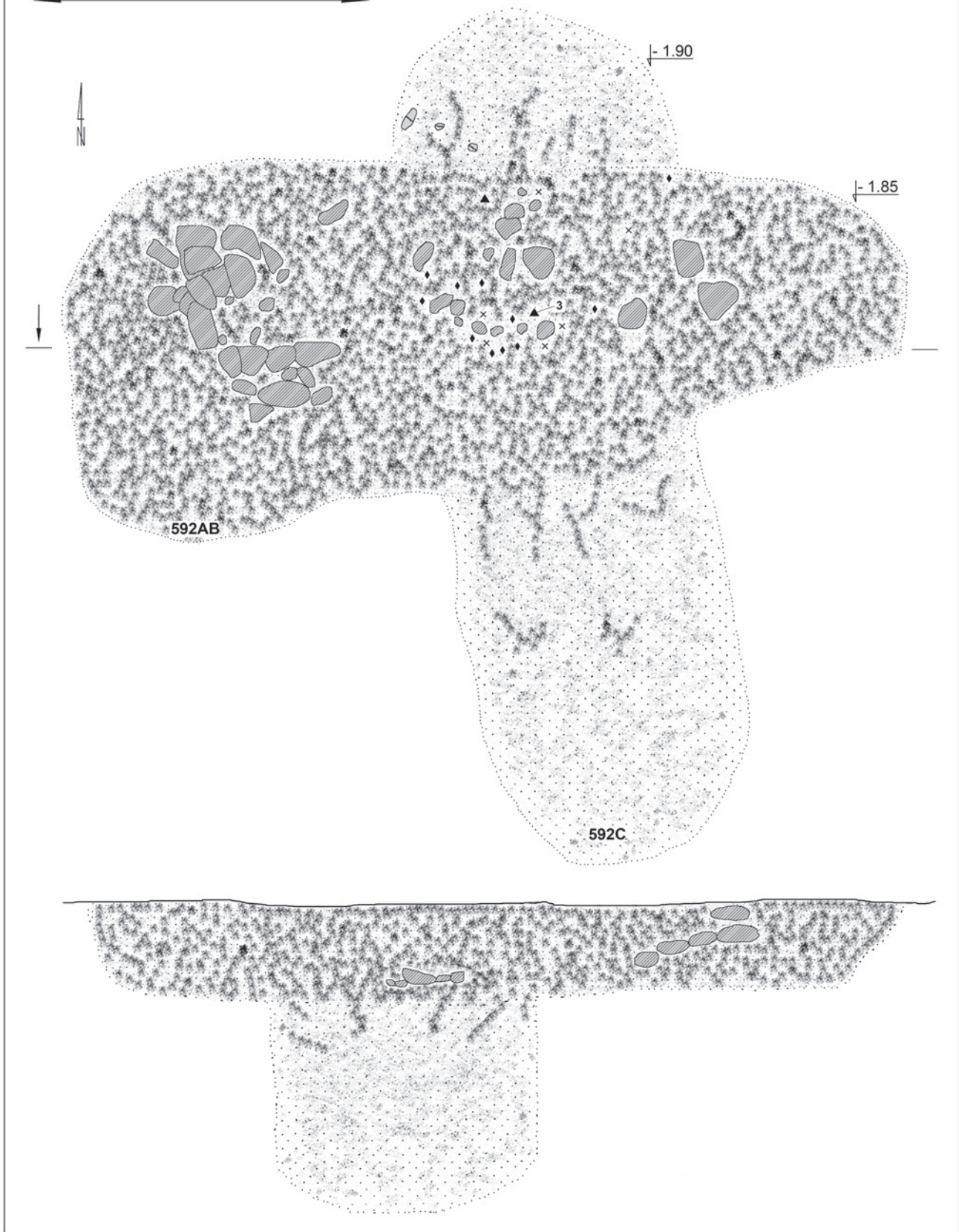
Pl. C. Grave 587: 1 – copper alloy; 2 – ceramic. Grave 588: 1 – copper alloy; 2 – amber; 3 – flint; 4 – ceramic

Feature 592AB & Grave 592C



Pl. CI. Feature 592AB & Grave 592C

Feature 592AB & Grave 592C



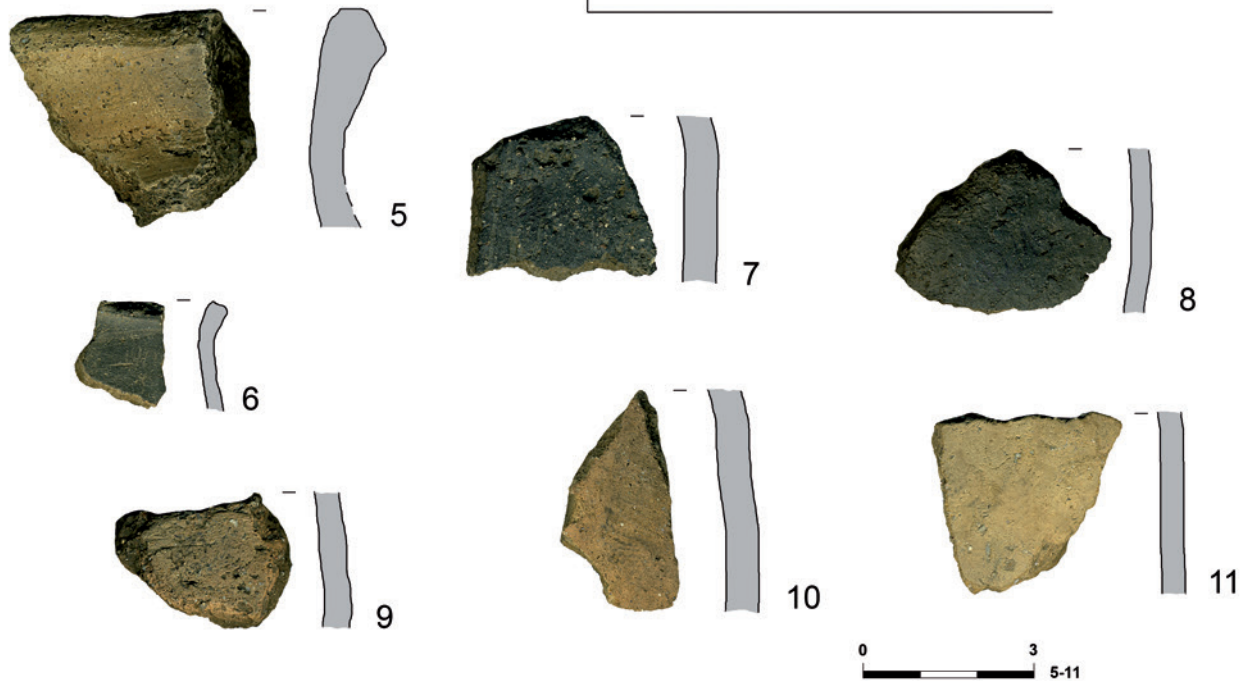
Pl. CII. Feature 592AB & Grave 592C

Feature 592AB & Grave 592C

Feature 592AB

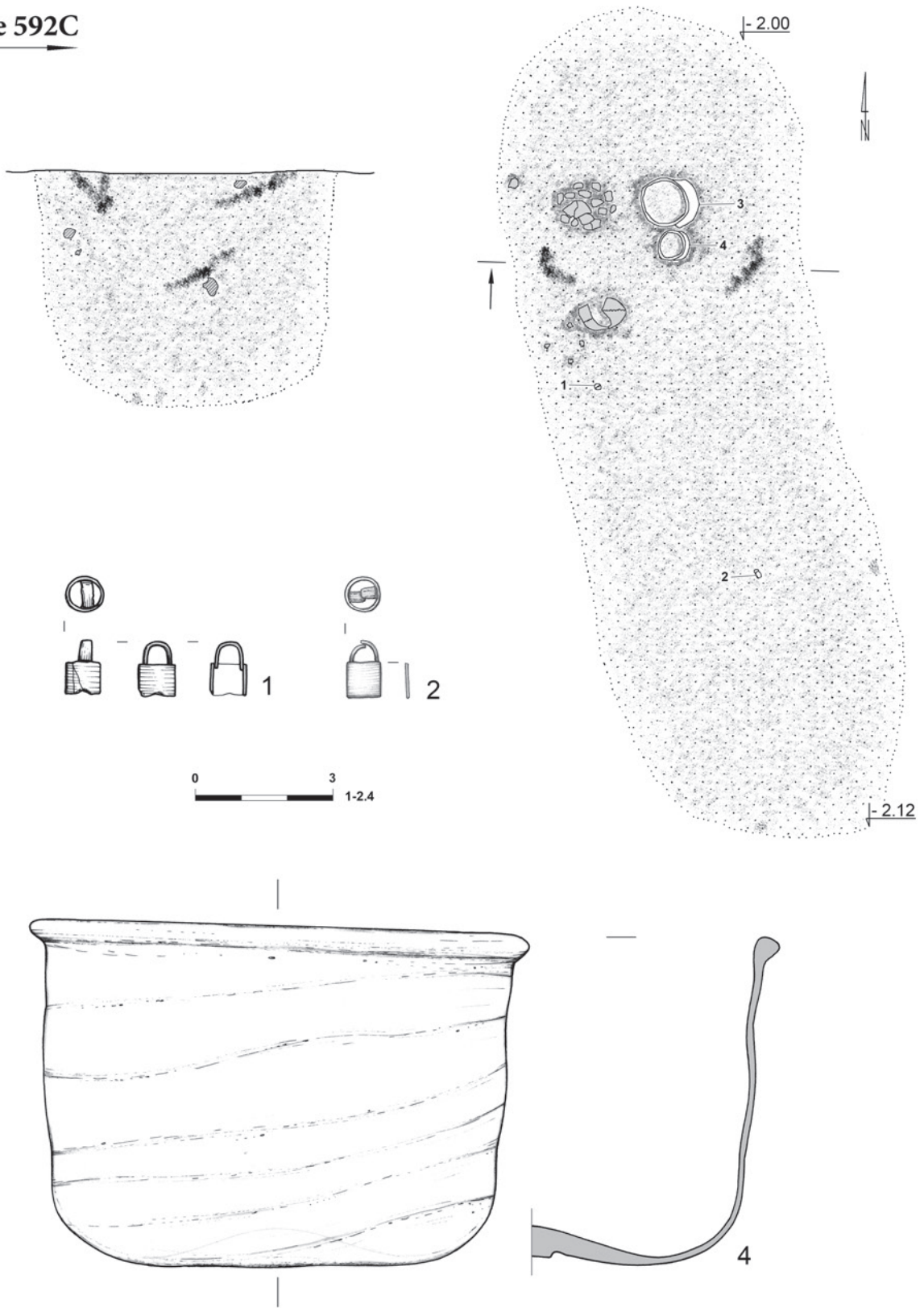


Grave 592C



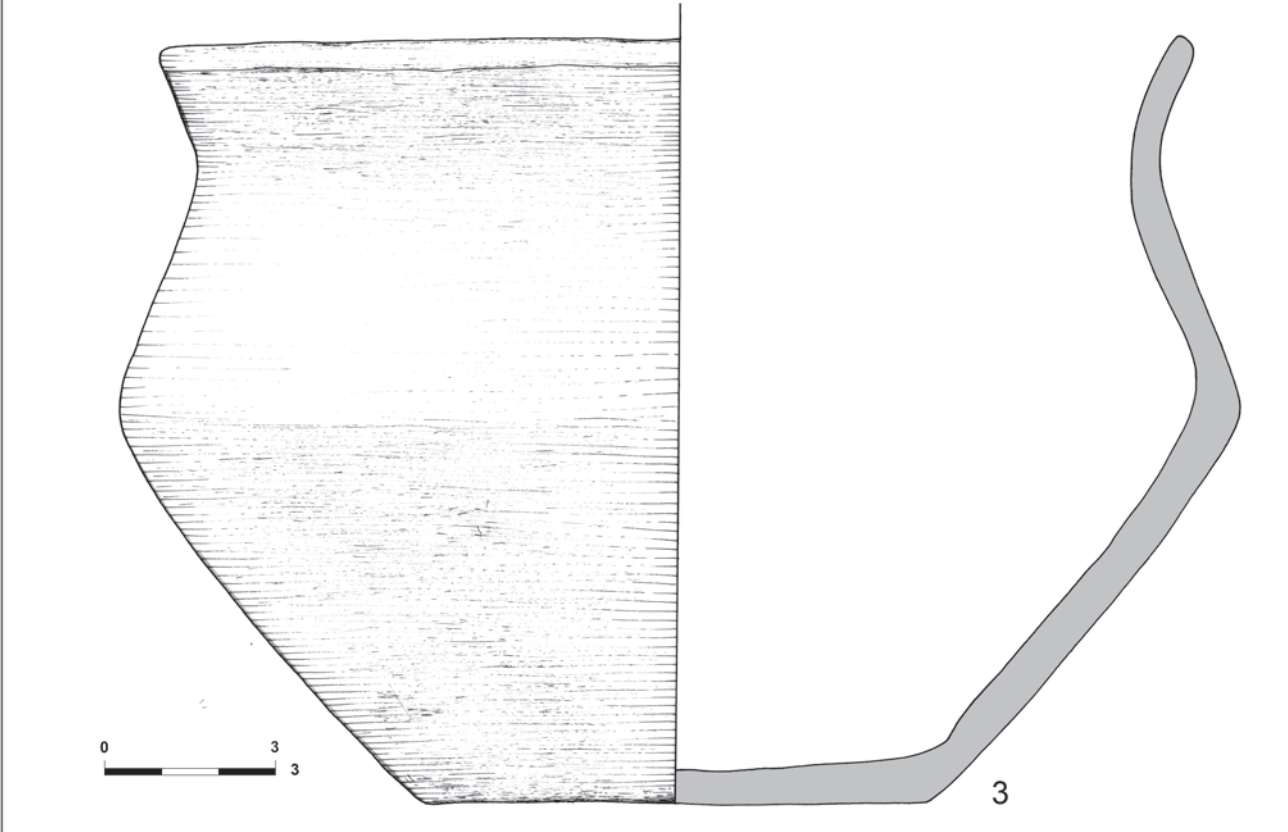
Pl. CIII. Feature 592AB: 1 – fossil; 2–15 – ceramic. Grave 592C: 5–11– ceramic

Grave 592C

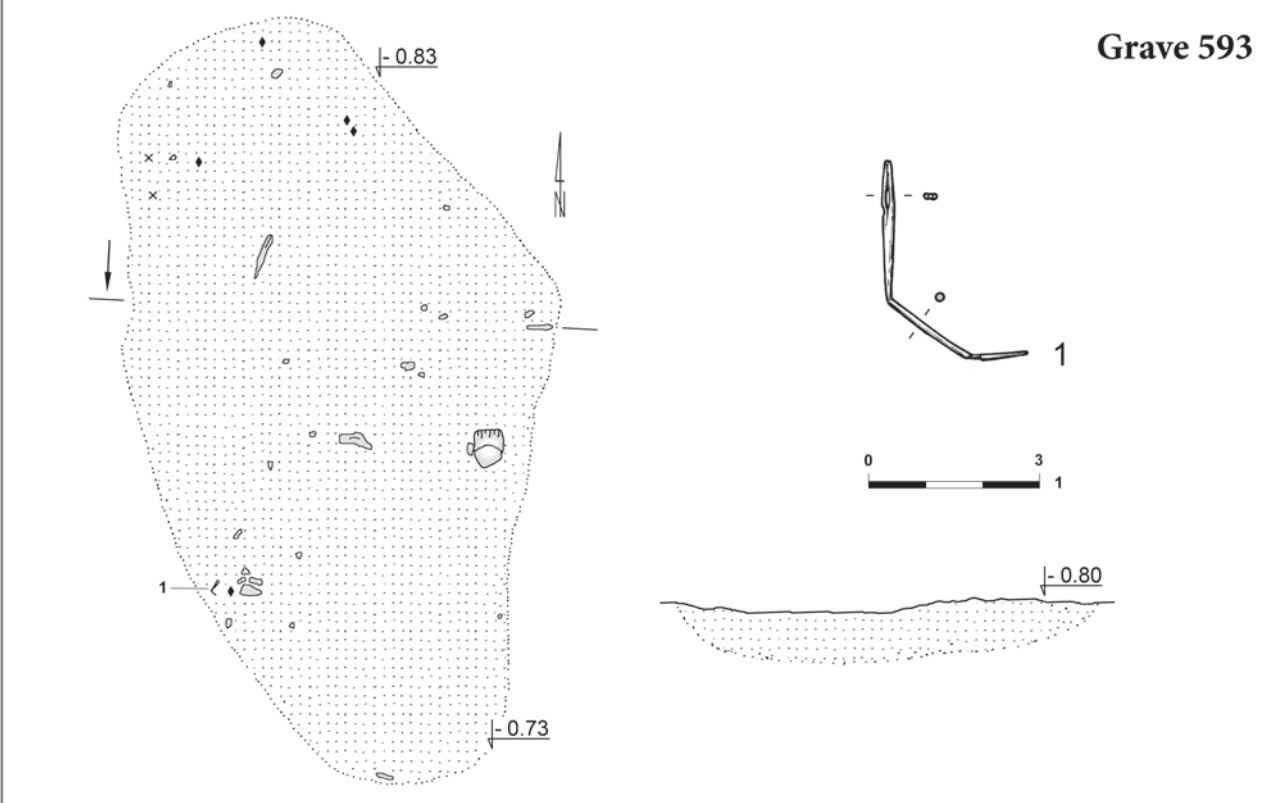


Pl. CIV. Grave 592C: 1-2 - tin bronze; 4 - glass

Grave 592C

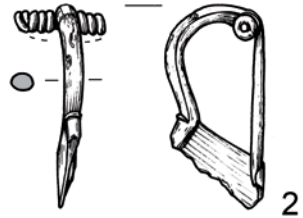
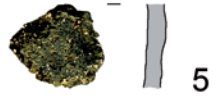
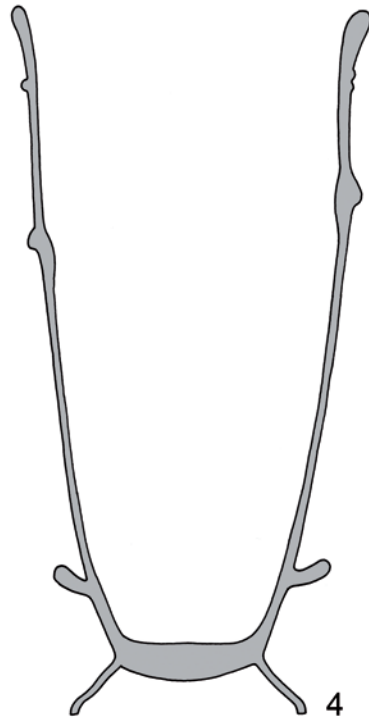
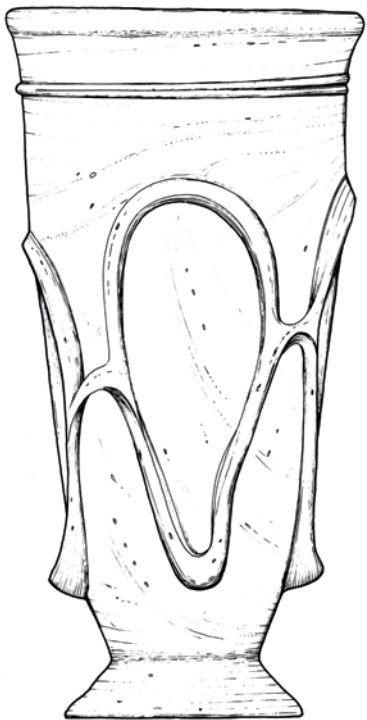
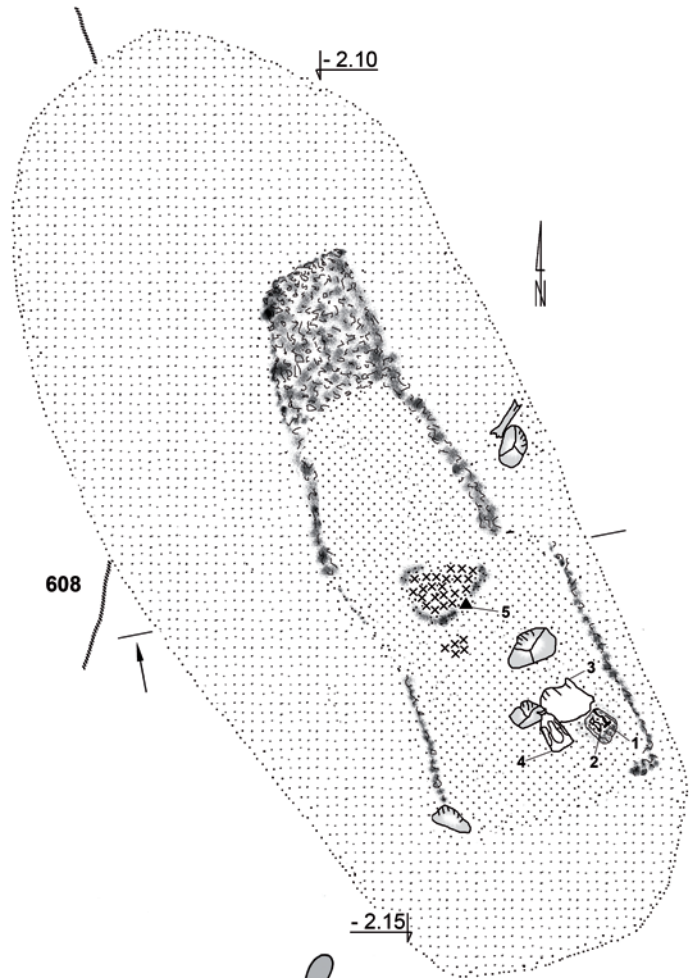
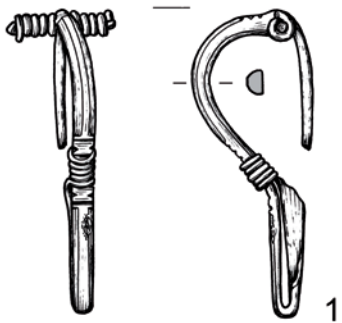


Grave 593



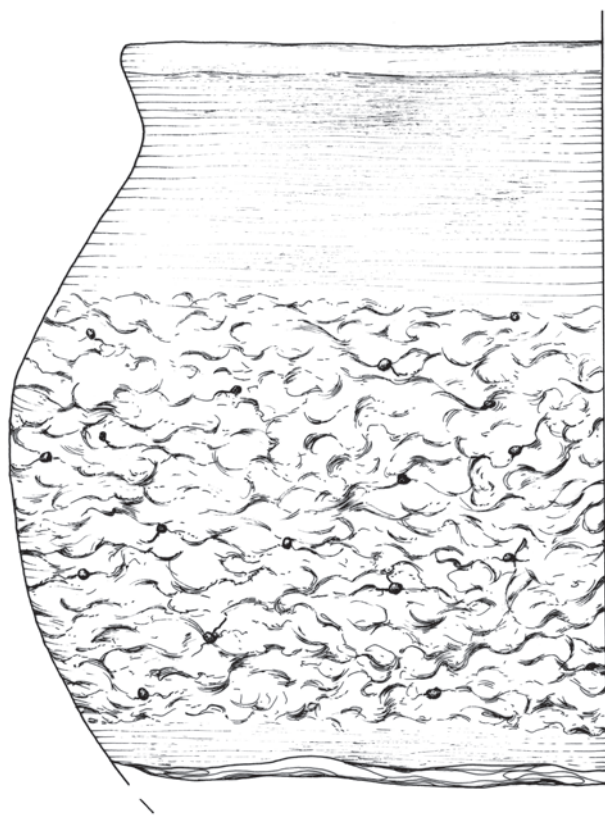
Pl. CV. Grave 592 C: 3 – ceramic. Grave 593: 1 – copper alloy

Grave 594

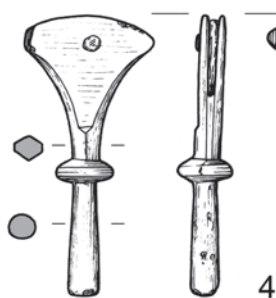
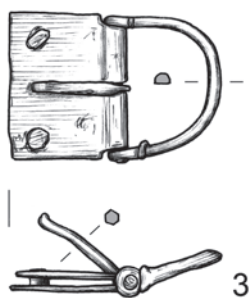
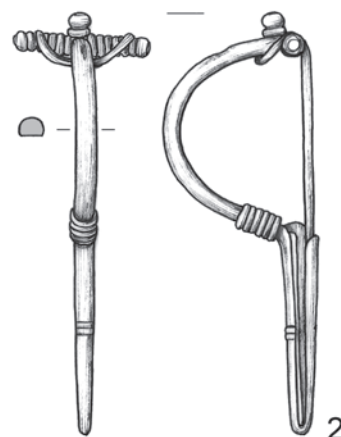
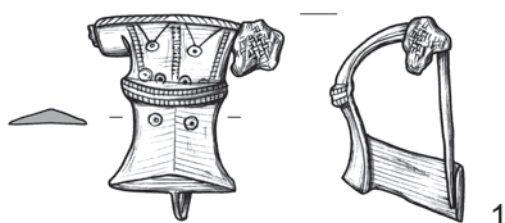


Pl. CVI. Grave 594: 1-2 – copper alloy; 4 – glass; 5 – ceramic

Grave 594

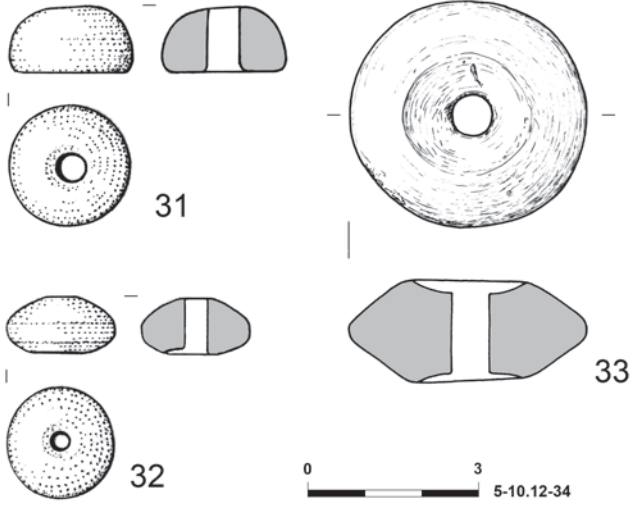
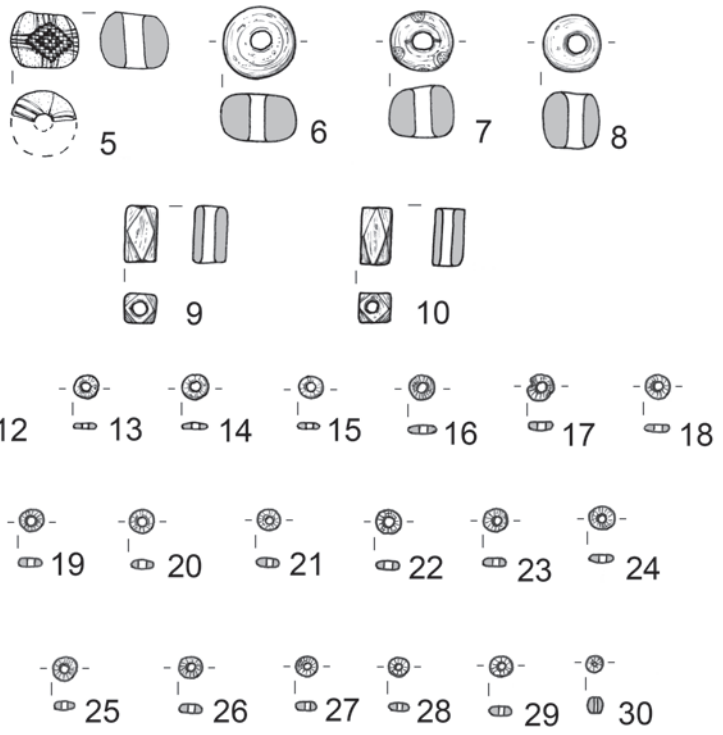
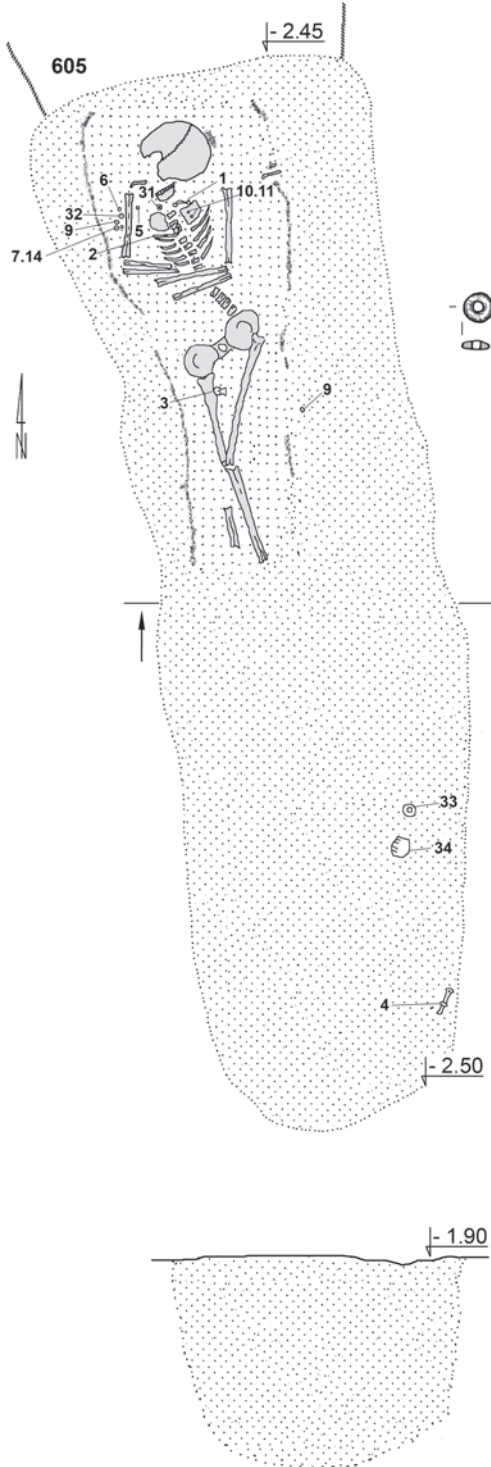


Grave 595



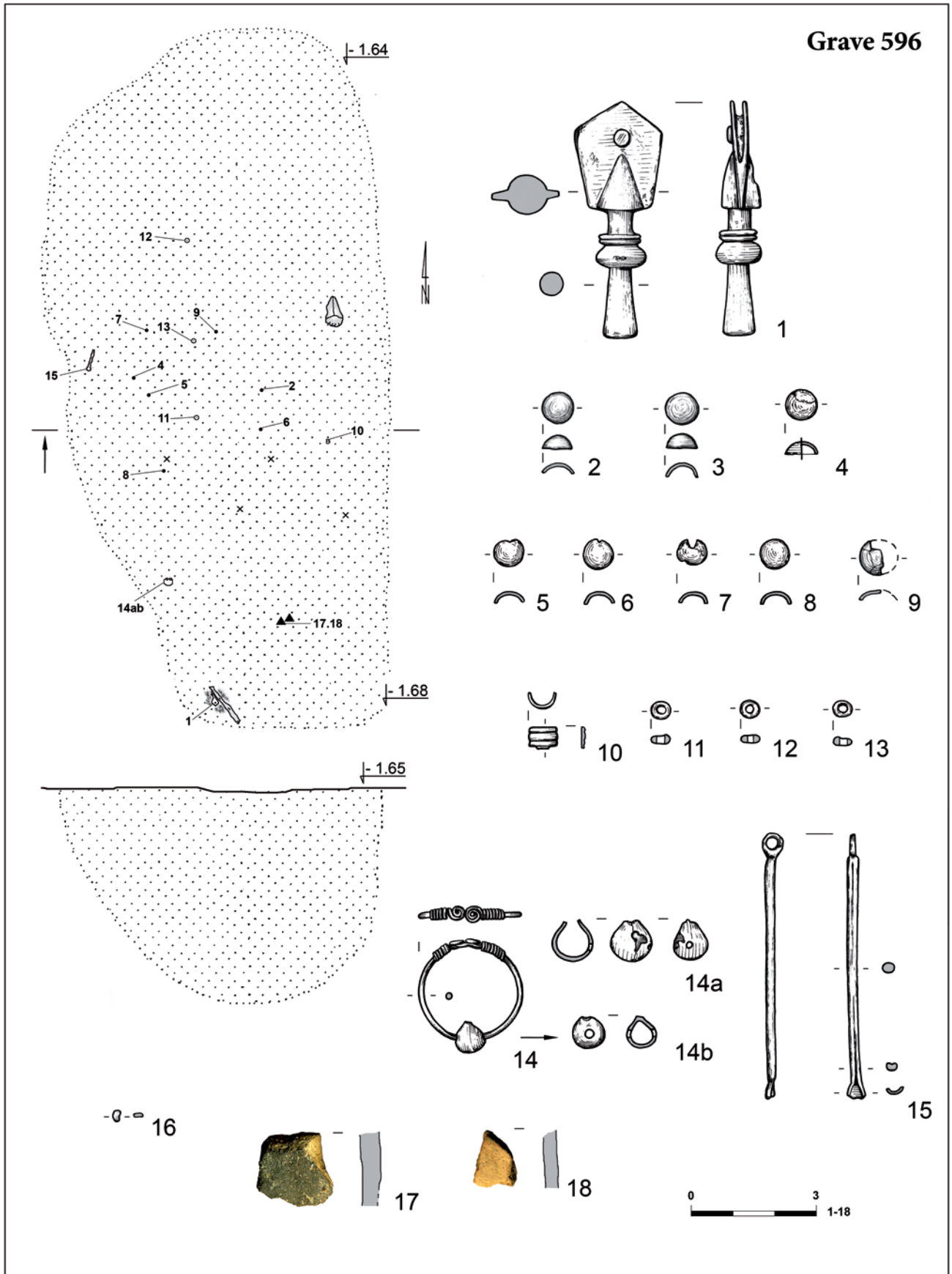
Pl. CVII. Grave 594: 3 – ceramic. Grave 595: 1 – silver; 2–3 – copper alloy; 4 – brass

Grave 595

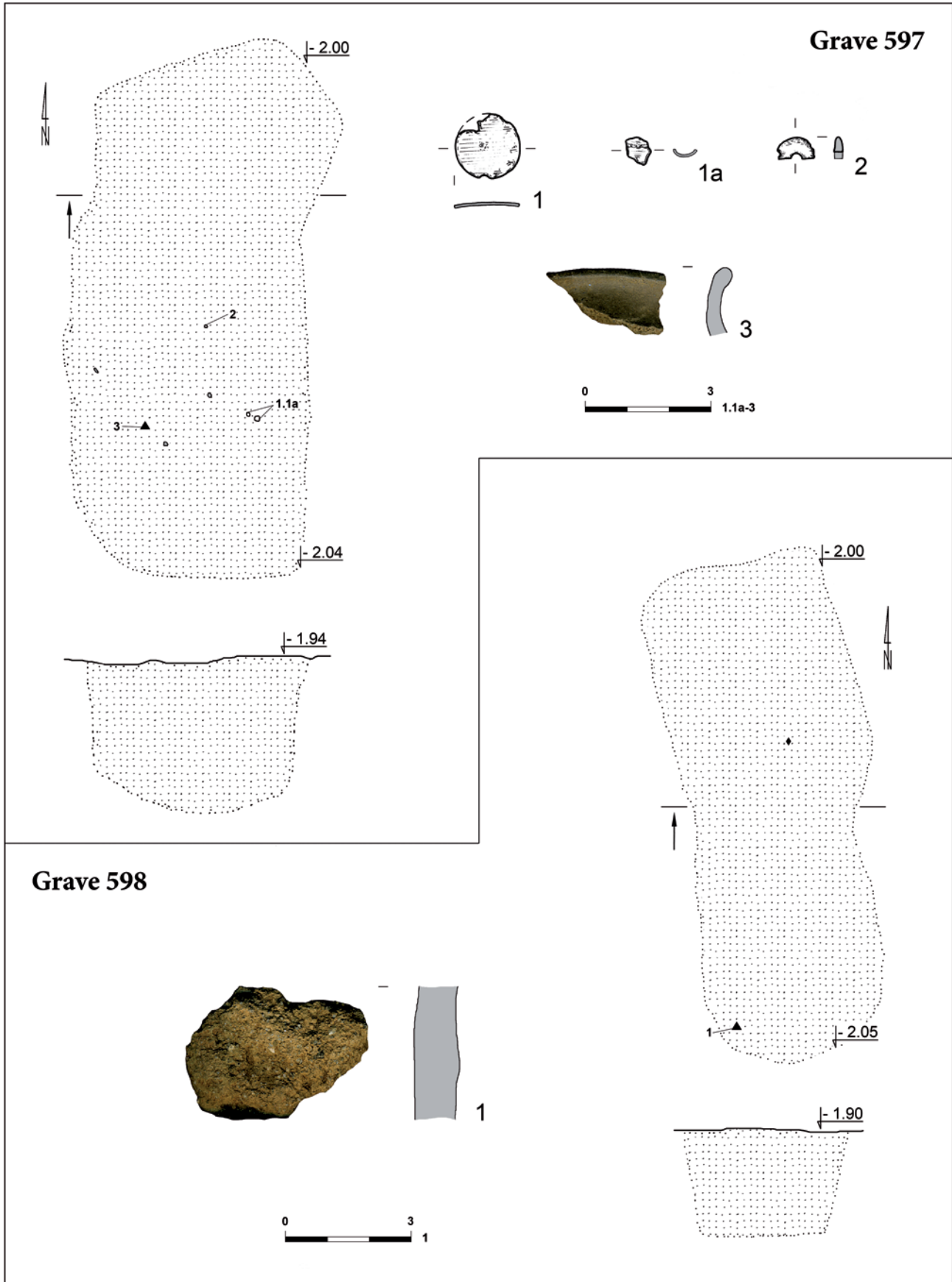


Pl. CVIII. Grave 595: 5-10.12-30 – glass; 31-32 – amber; 33-34 – ceramic

Grave 596

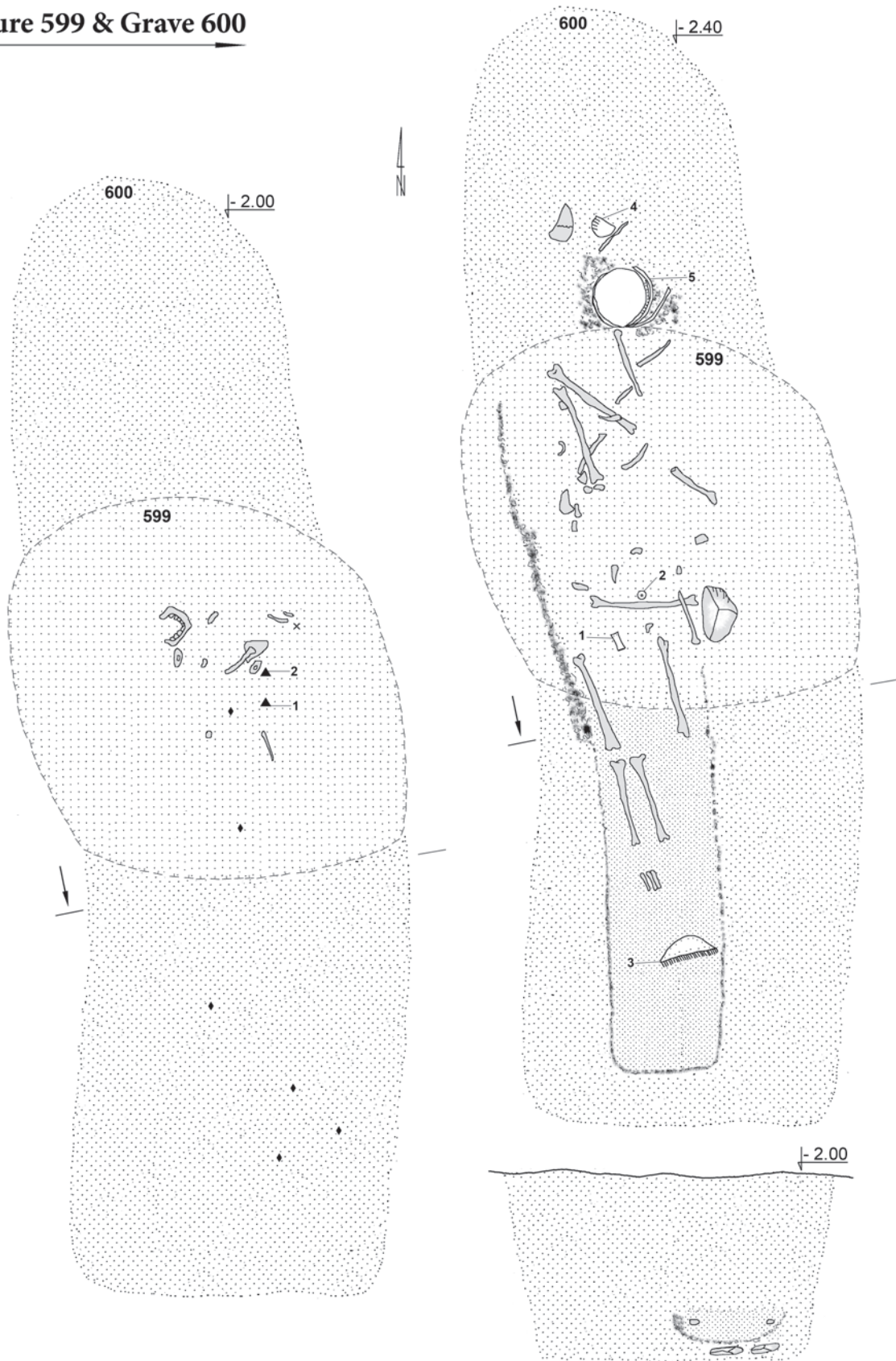


Pl. CIX. Grave 596: 1 – tin-lead bronze; 15 – tin bronze; 16 – copper alloy; 2–10 – silver; 11–13 – glass; 14.14a–b – silver and nutshell; 17–18 – ceramic



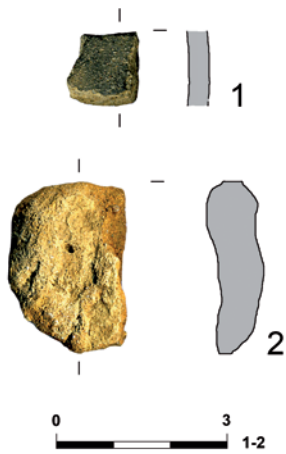
Pl. CX. Grave 597: 1-1a – copper alloy; 2 – bone (antler [?]); 3 – ceramic. Grave 598: 1 – ceramic

Feature 599 & Grave 600

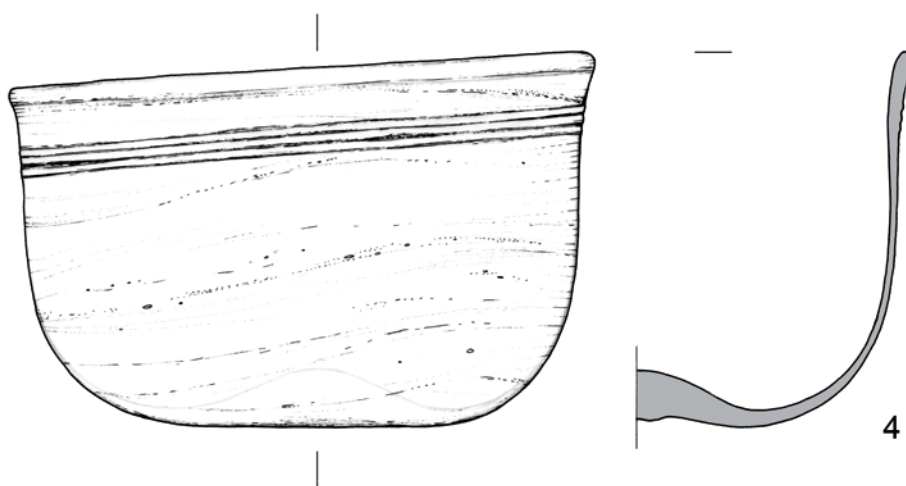
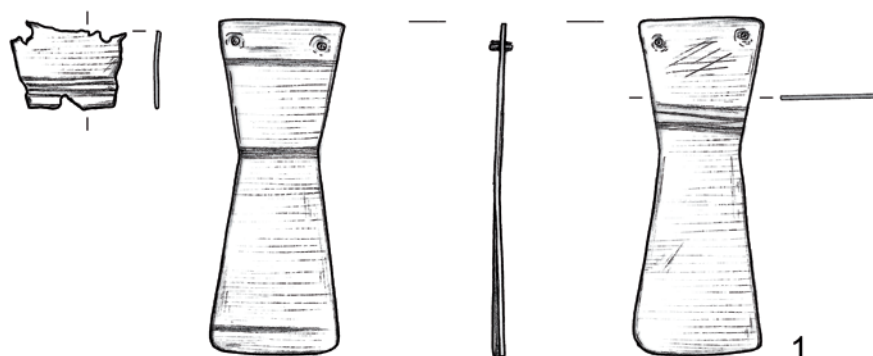
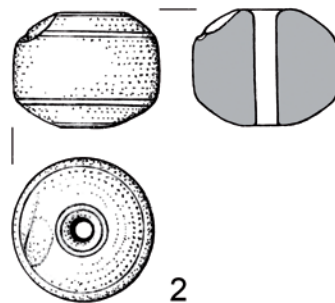


Pl. CXI. Feature 599 & Grave 600

Feature 599

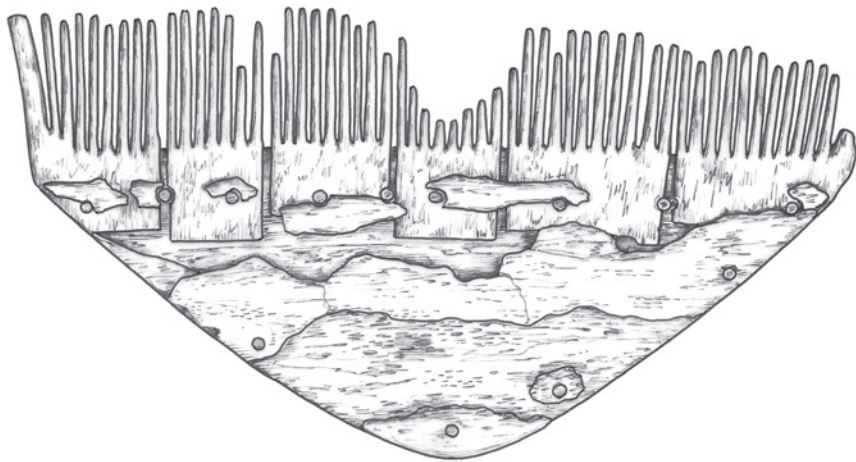
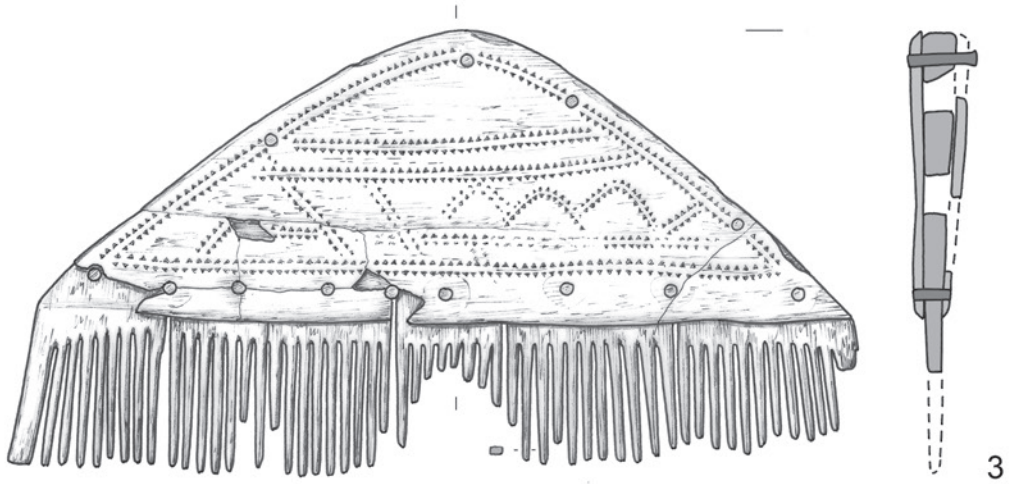


Grave 600



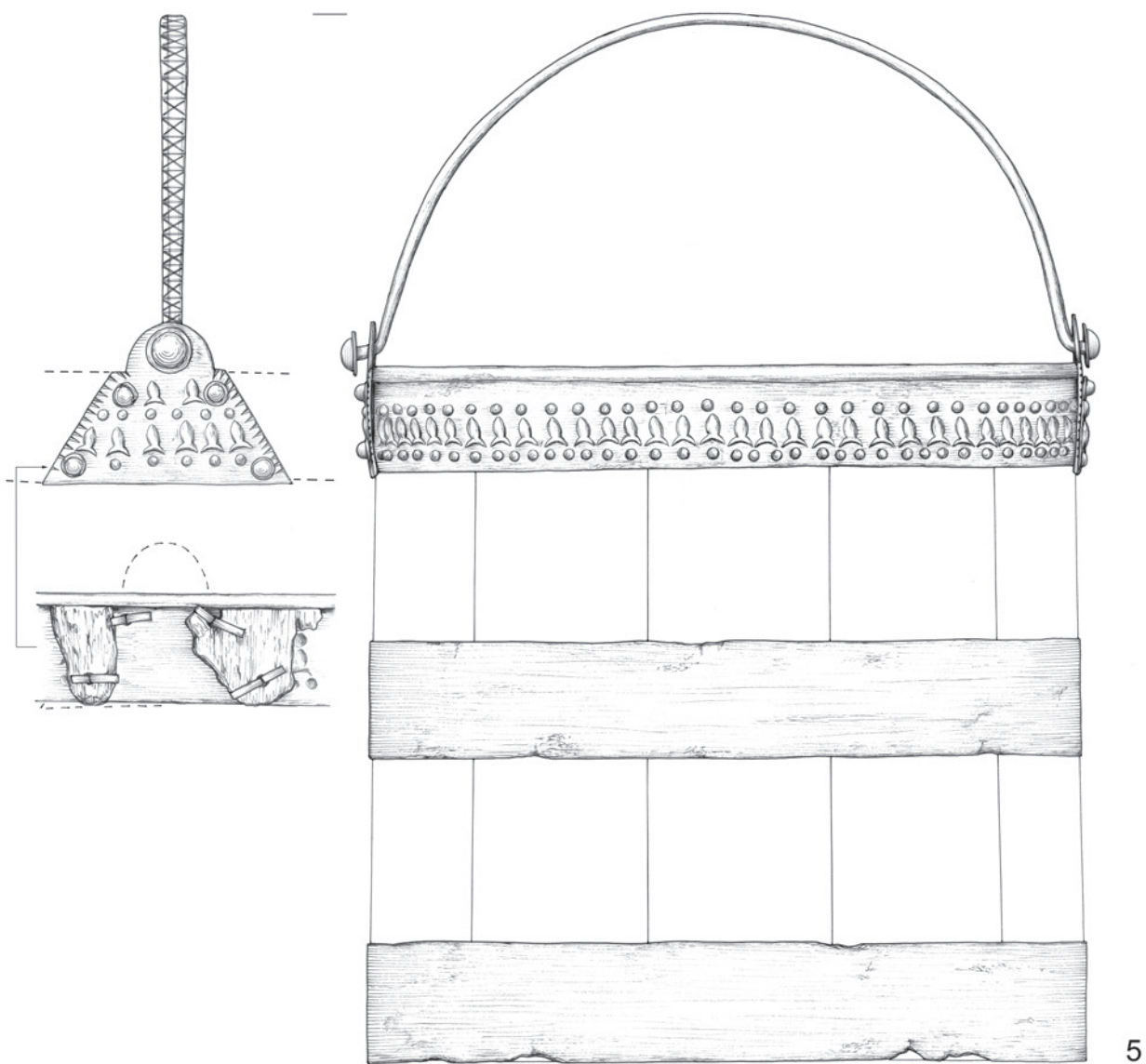
Pl. CXII. Feature 599: 1-2 – ceramic. Grave 600: 1 – tin-lead bronze; 2 – amber; 4 – glass

Grave 600



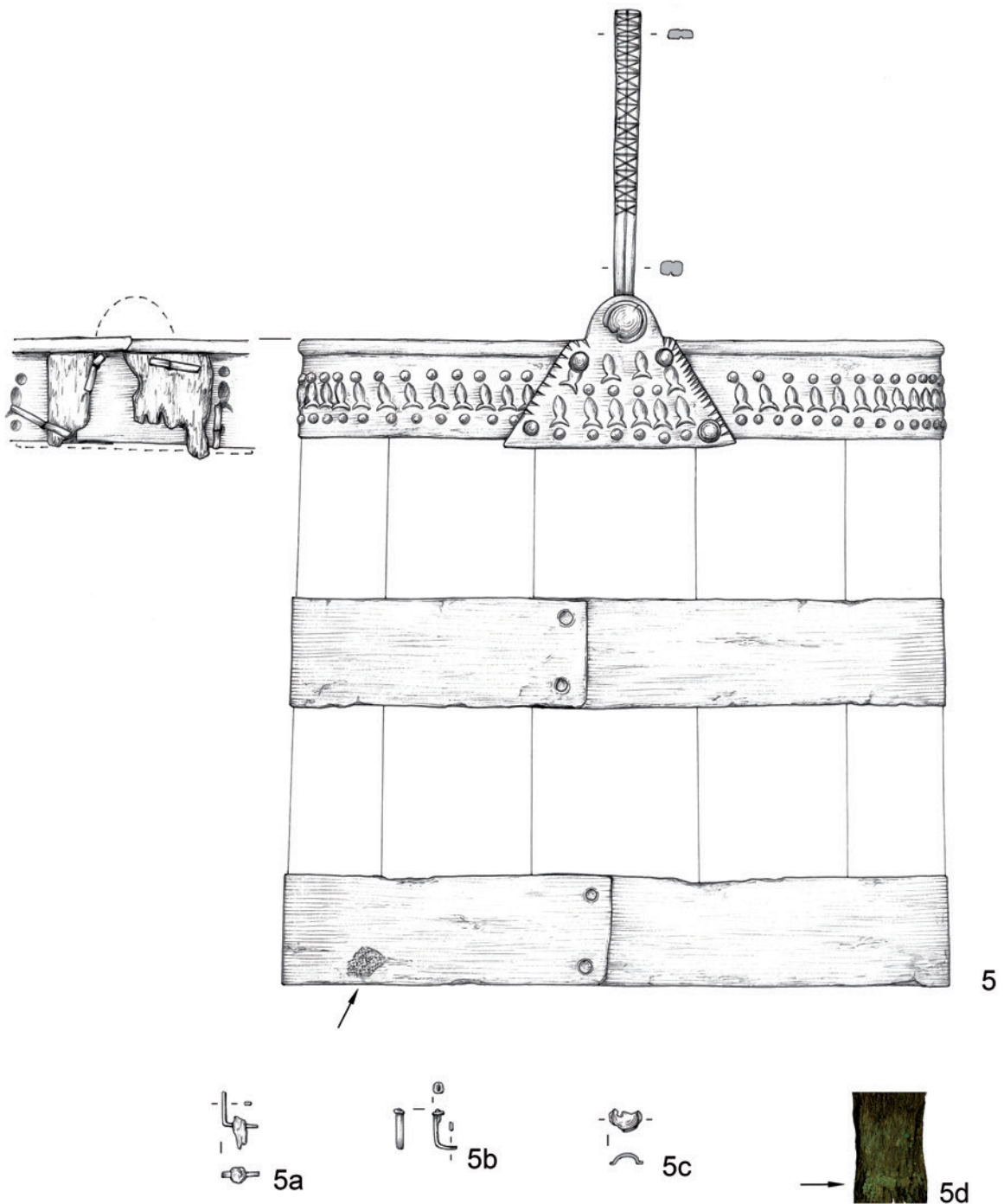
Pl. CXIII. Grave 600: 3 – bone (antler [?]) and copper alloy

Grave 600



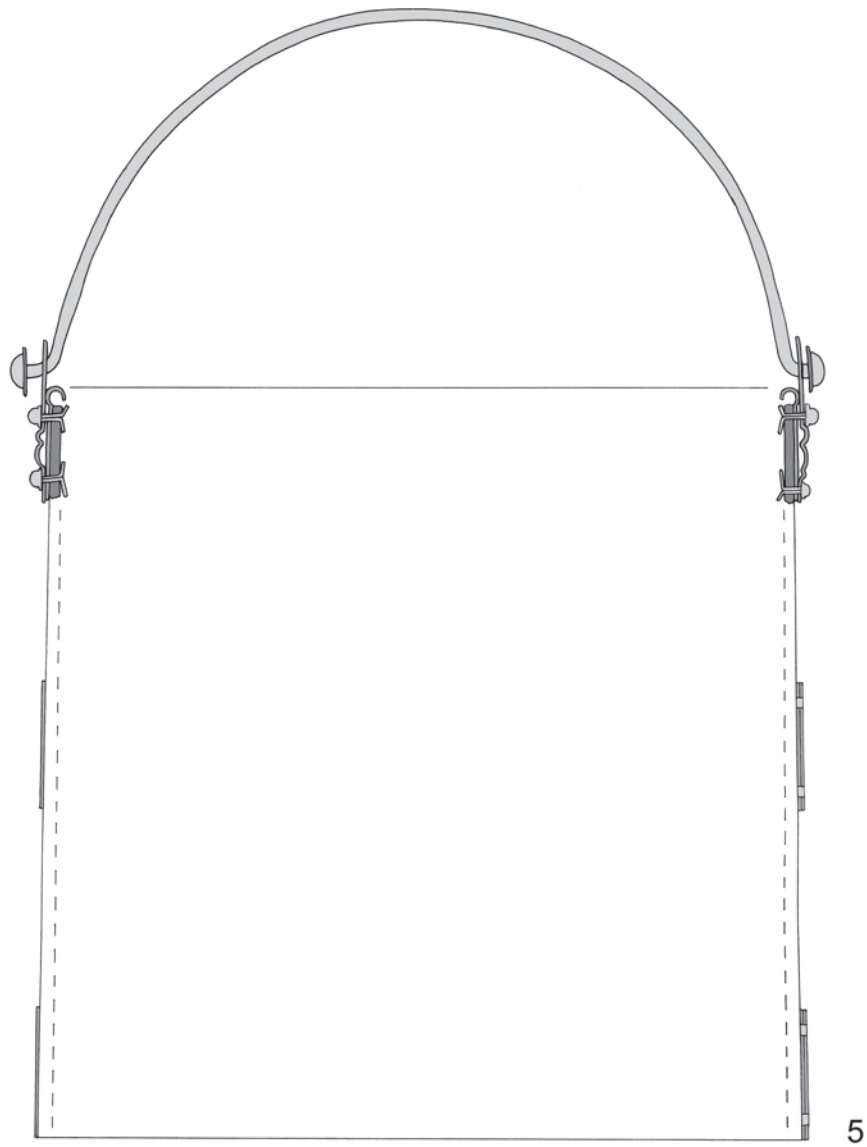
Pl. CXIV. Grave 600: 5 – tin bronze and wood

Grave 600



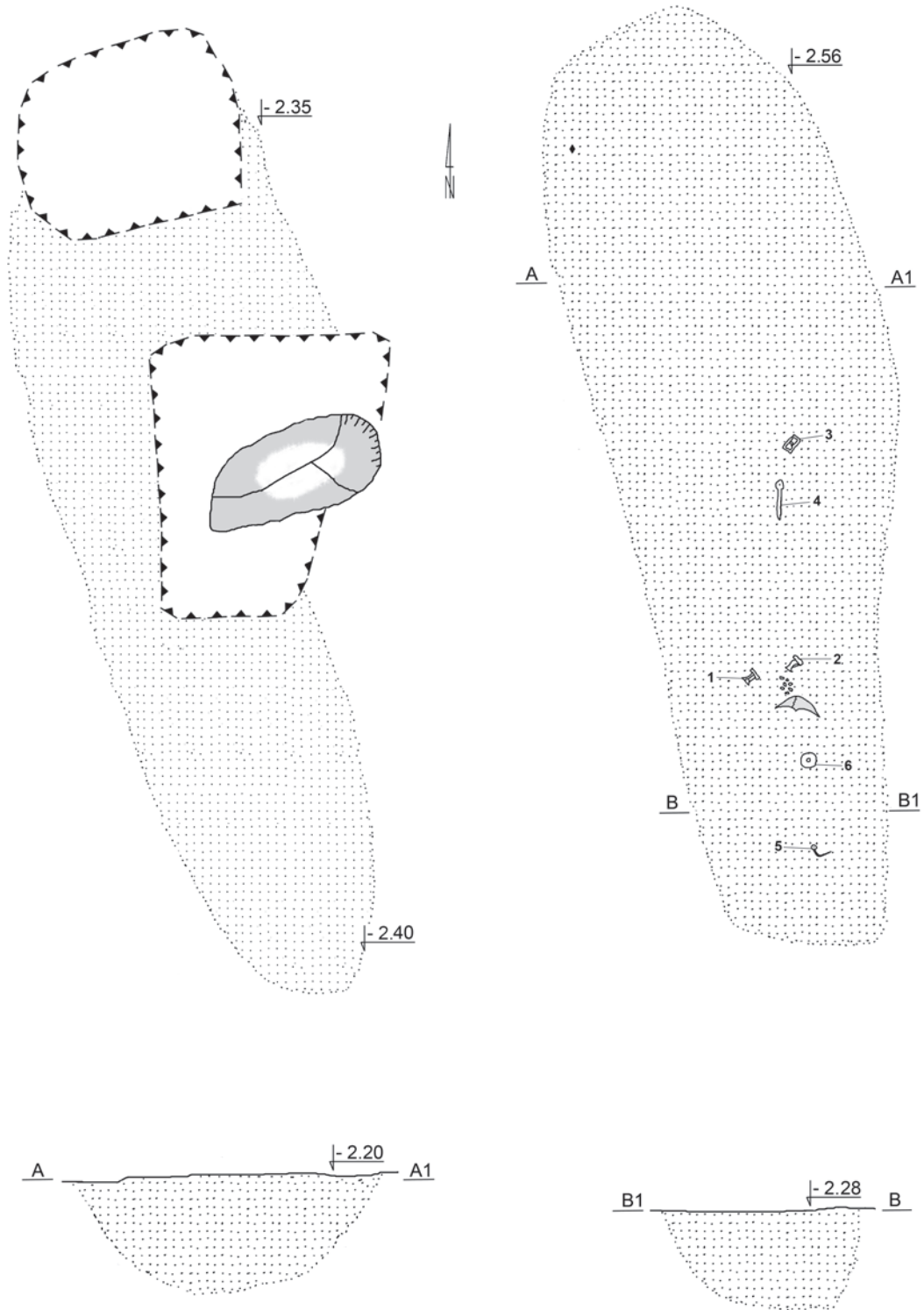
Pl. CXV. Grave 600: 5.5a-c – tin bronze and wood; 5d – wood and textile

Grave 600



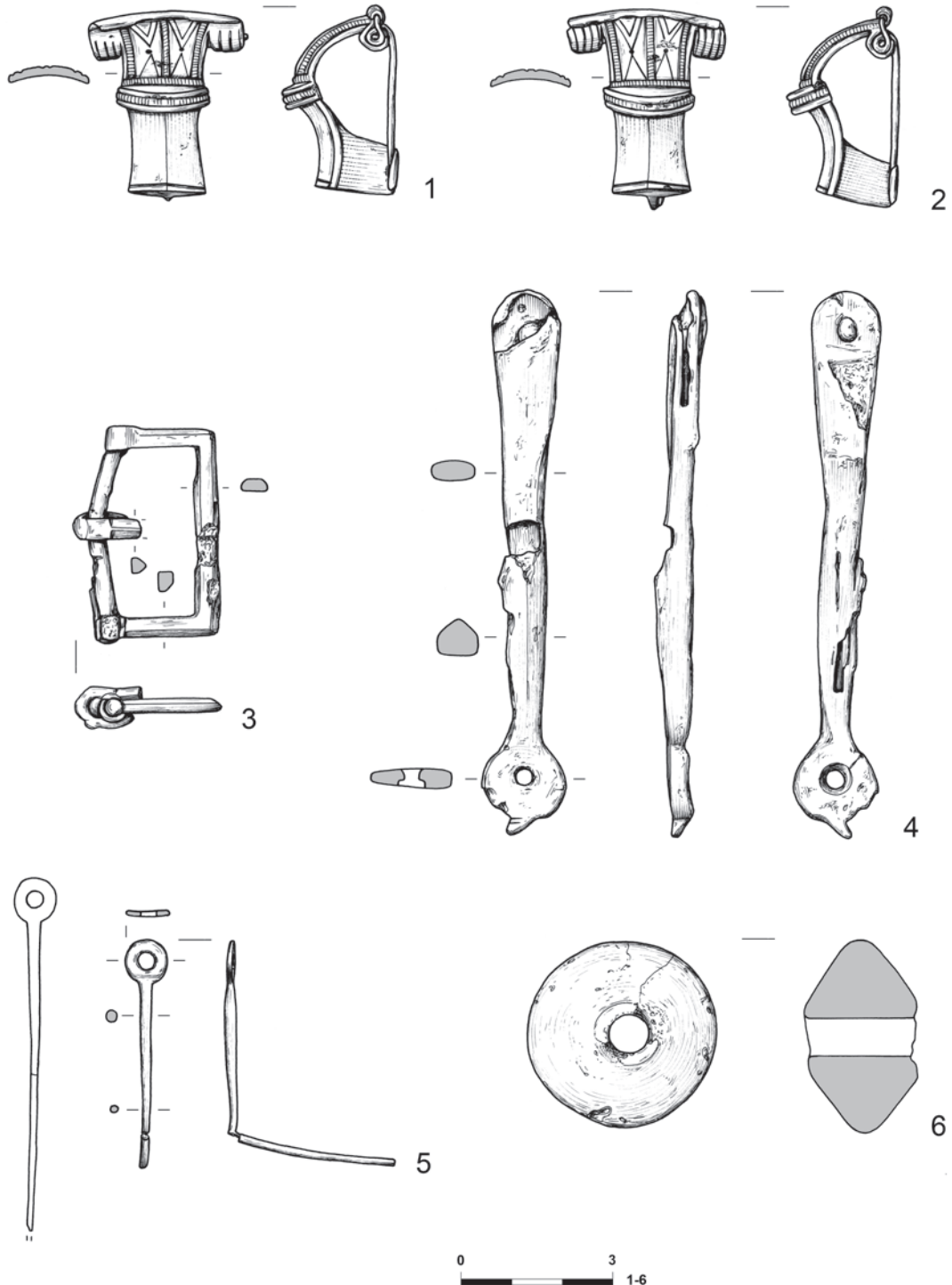
Pl. CXVI. Grave 600: 5 – tin bronze and wood

Grave 601

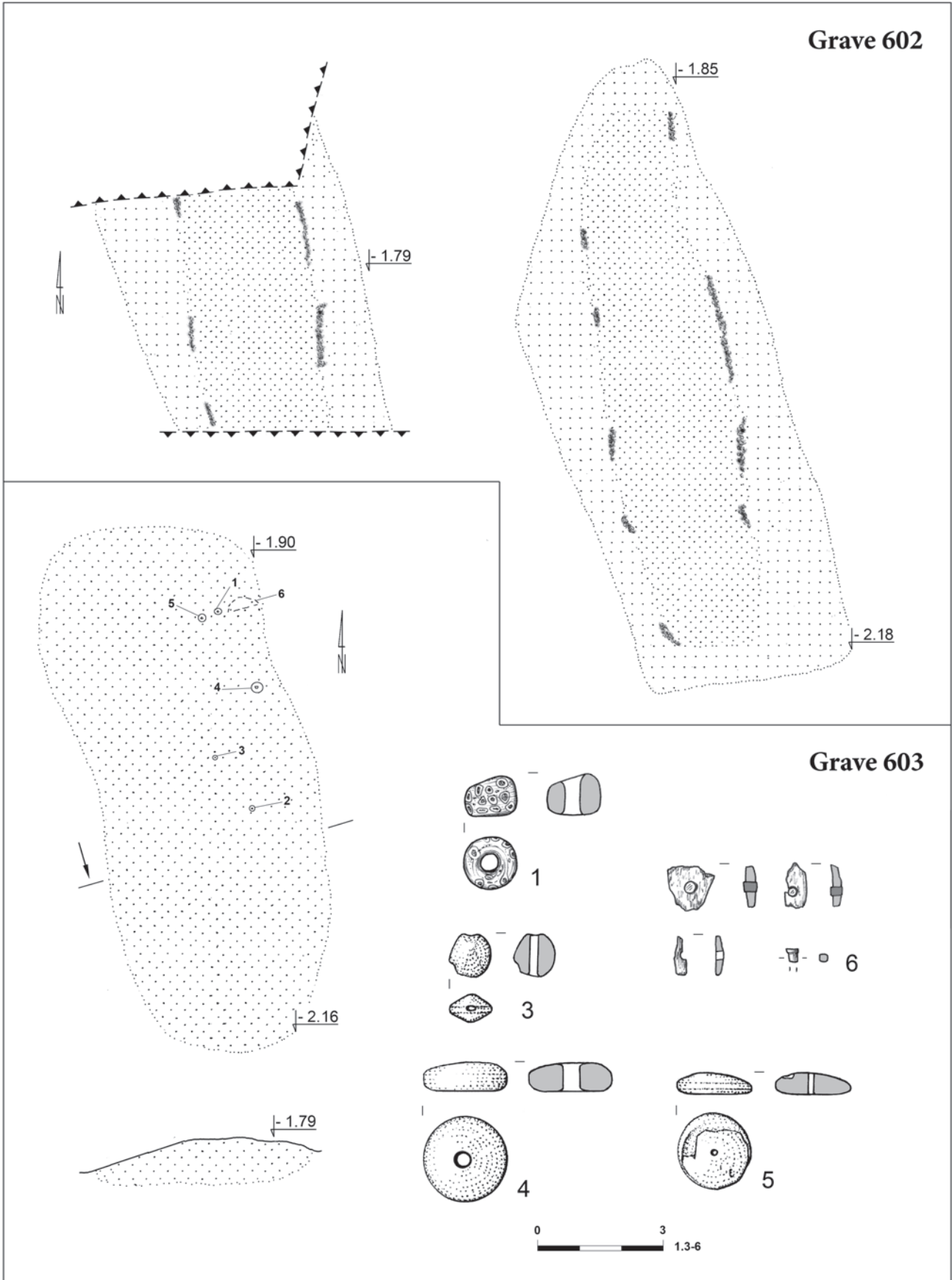


Pl. CXVII. Grave 601

Grave 601

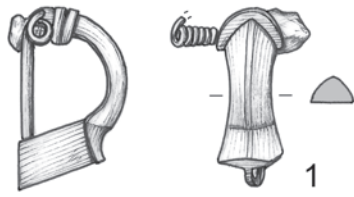


Pl. CXVIII. Grave 601: 1-2.5 - copper alloy; 3-4 - iron; 6 - ceramic

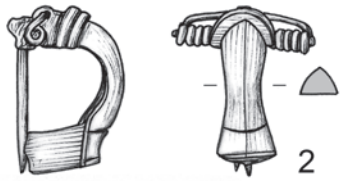


Pl. CXIX. Grave 602. Grave 603: 1.3 – glass; 4–5 – amber; 6 – bone (antler [?]) and copper alloy

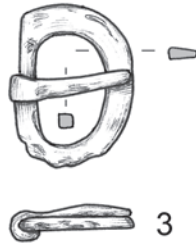
Grave 604



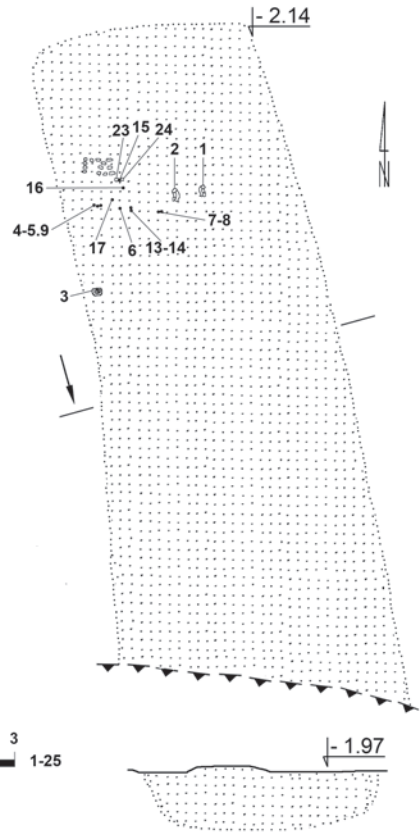
1



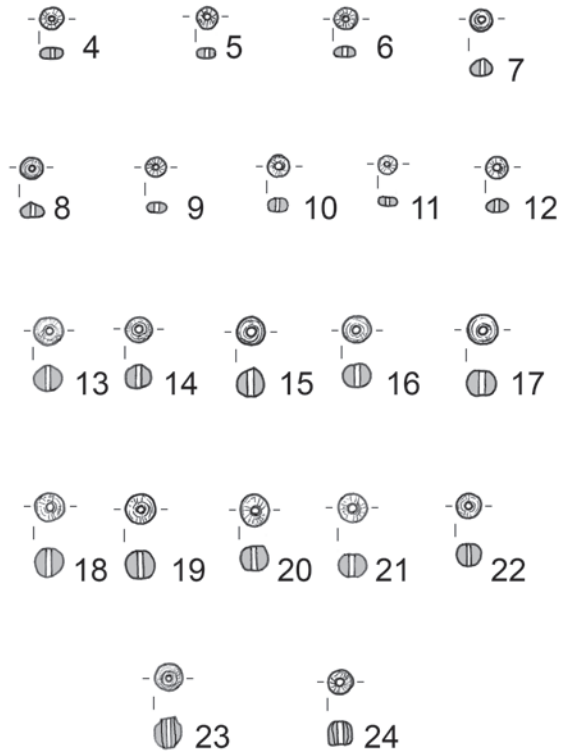
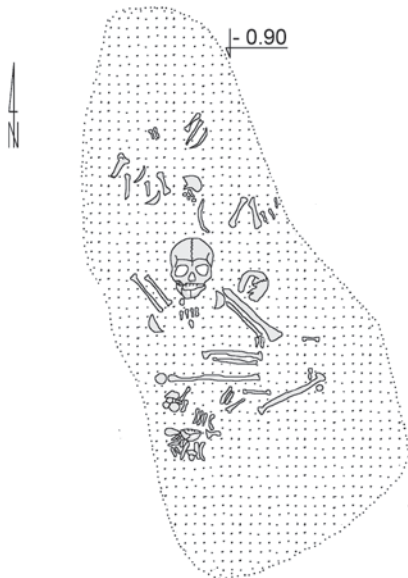
2



3

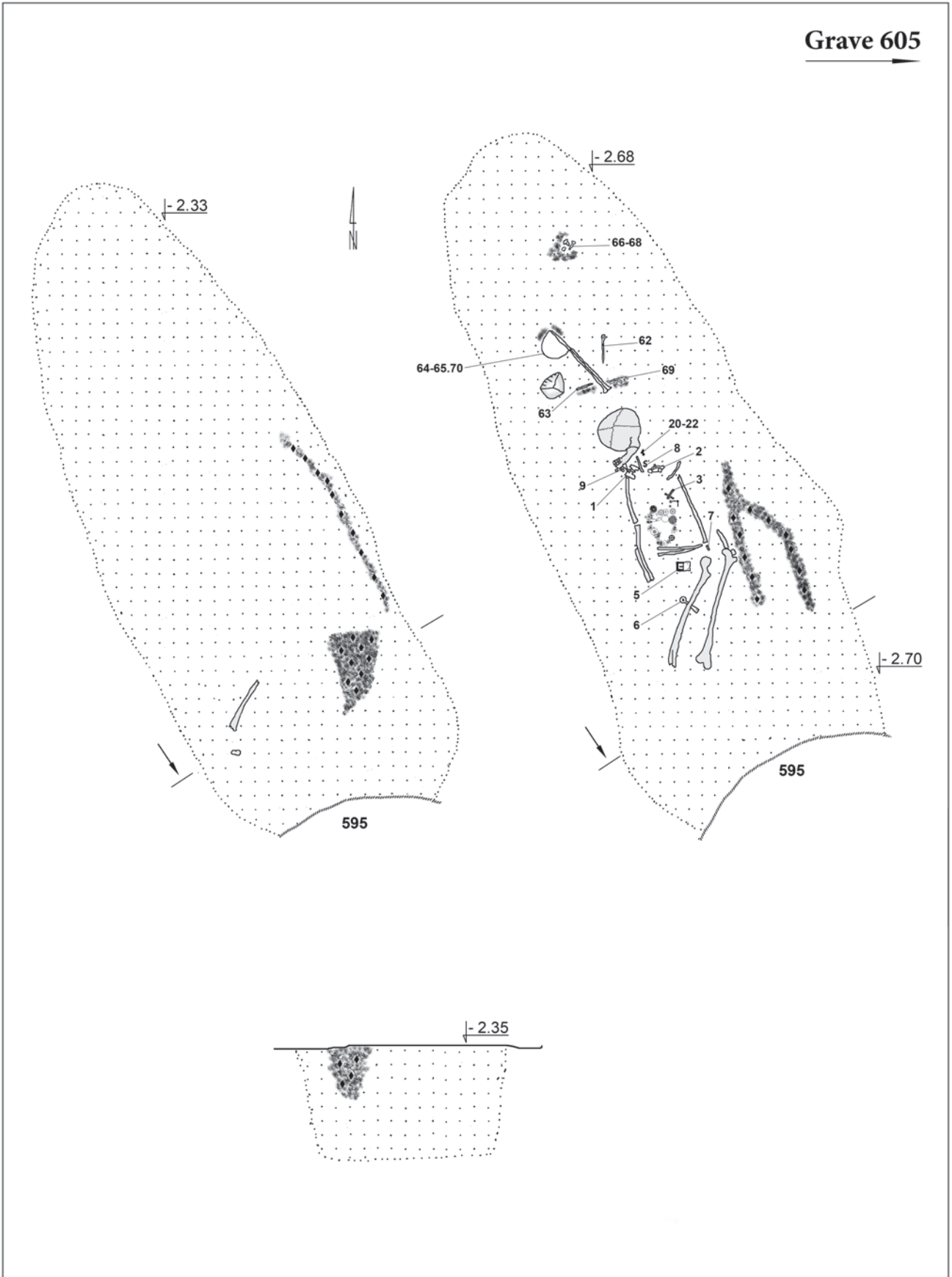


Grave 607



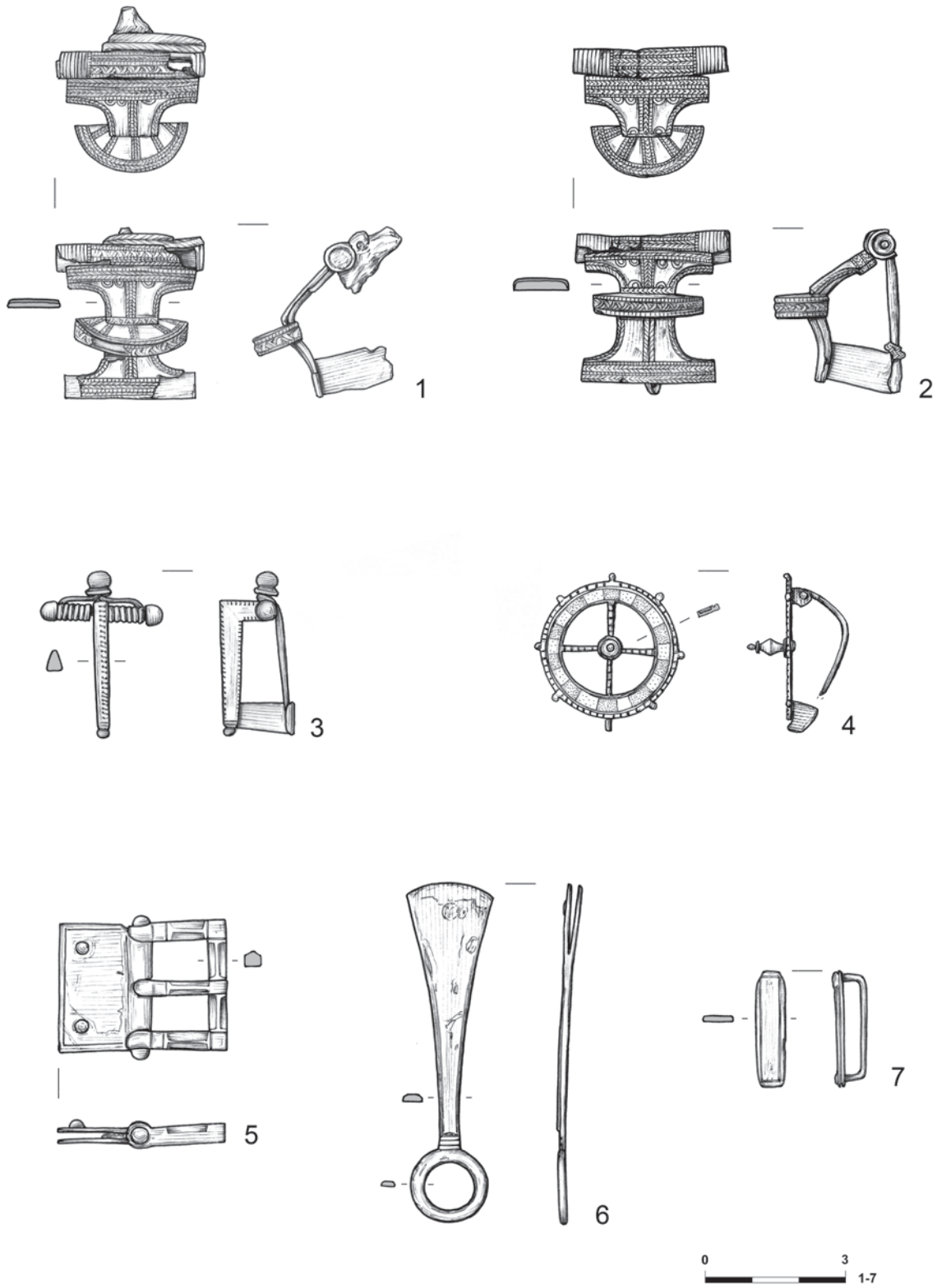
Pl. CXX. Grave 604: 1-2 – copper alloy; 3 – iron; 4-24 – glass. Grave 607

Grave 605



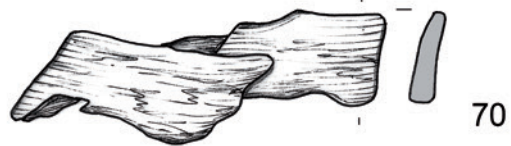
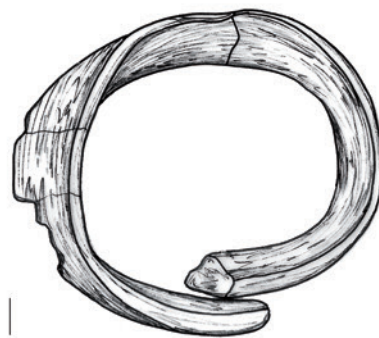
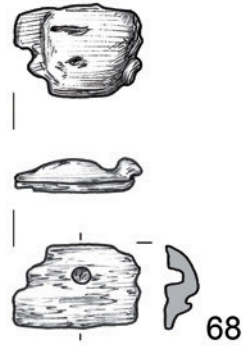
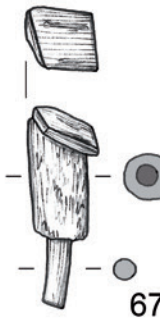
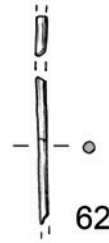
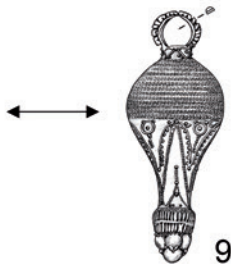
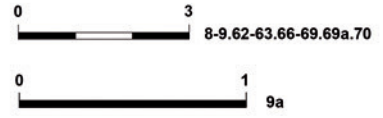
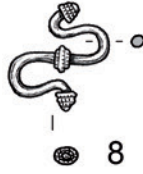
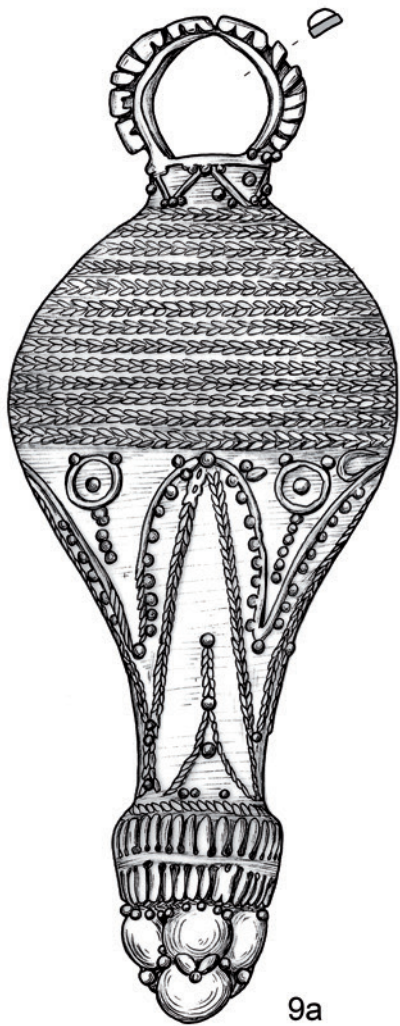
Pl. CXXI. Grave 605

Grave 605



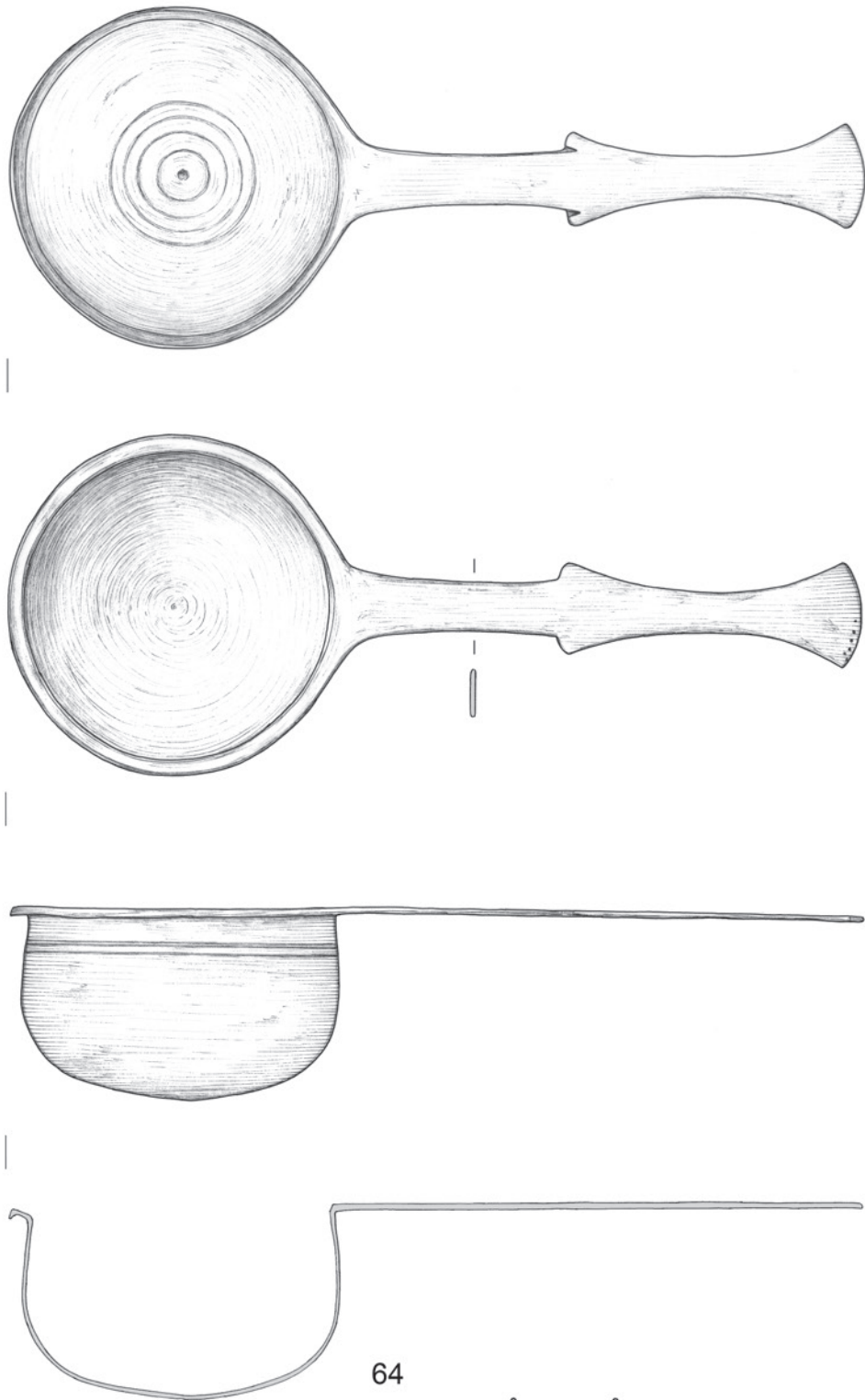
Pl. CXXII. Grave 605: 1-2 – brass, iron and gilded silver foil; 3 – silver; 4 – tin-lead bronze and enamel; 5-6 – tin bronze; 7 – copper alloy

Grave 605



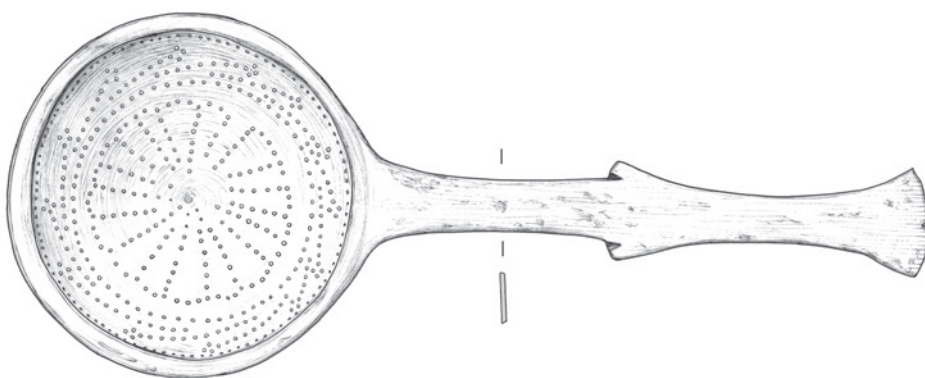
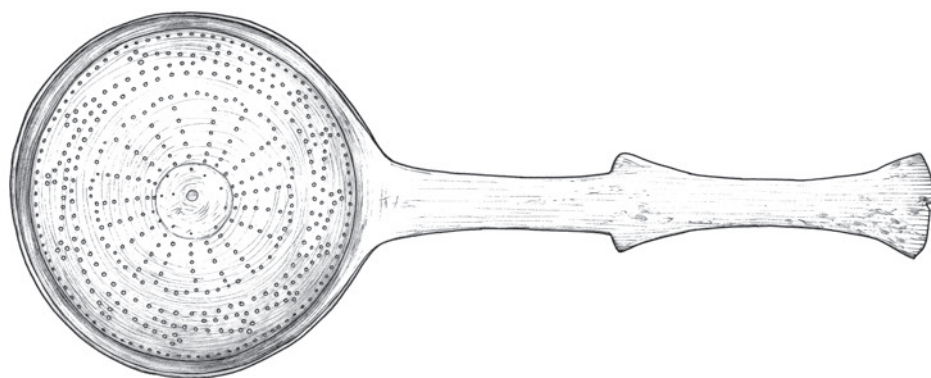
Pl. CXXIII. Grave 605: 8 – silver; 9,9a – gold; 62–63 – copper alloy; 66–68 – iron and wood; 69,69a – wood and gold (gilt [?]); 70 – wood

Grave 605



Pl. CXXIV. Grave 605: 64 – copper alloy

Grave 605

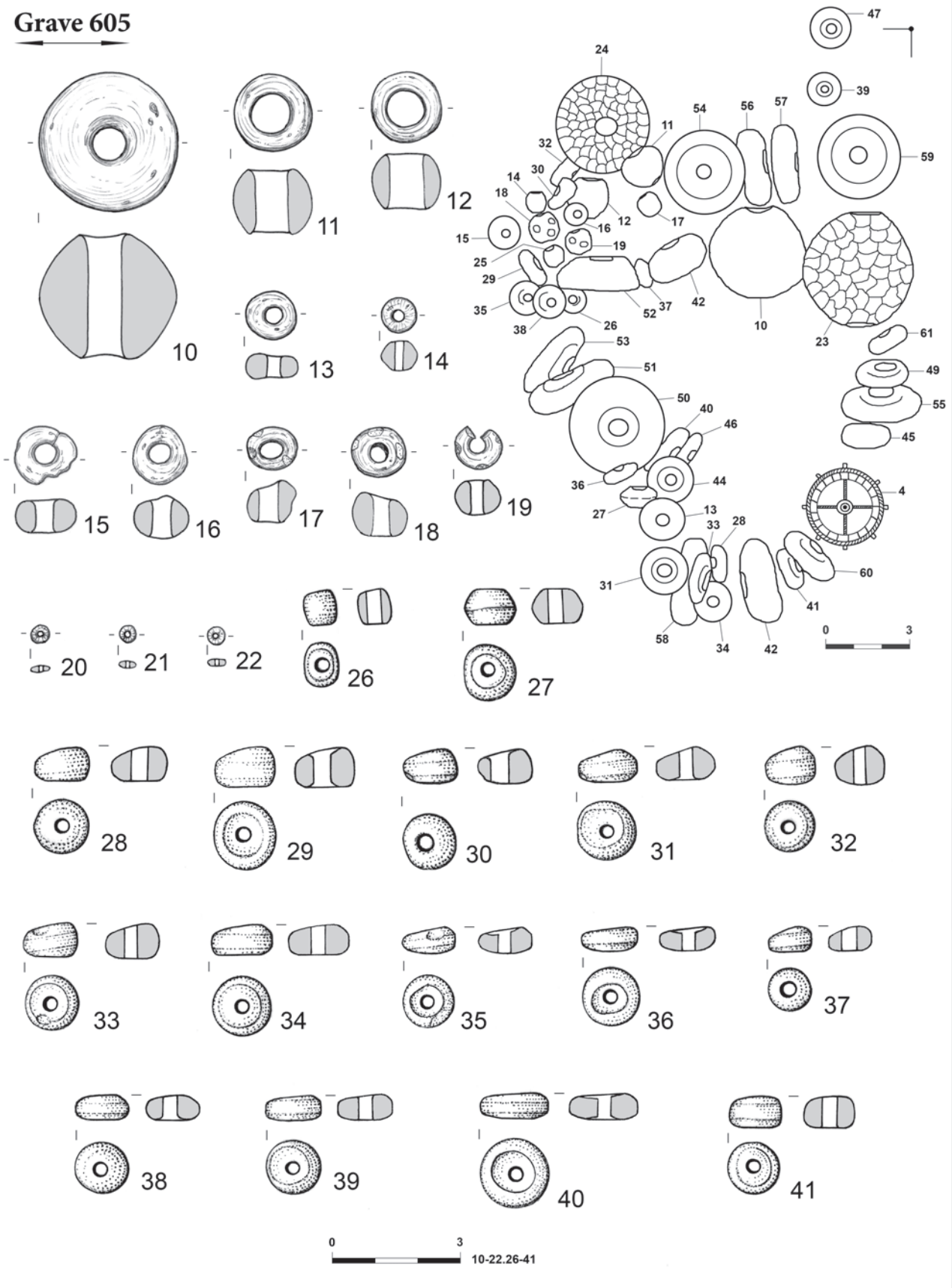


65



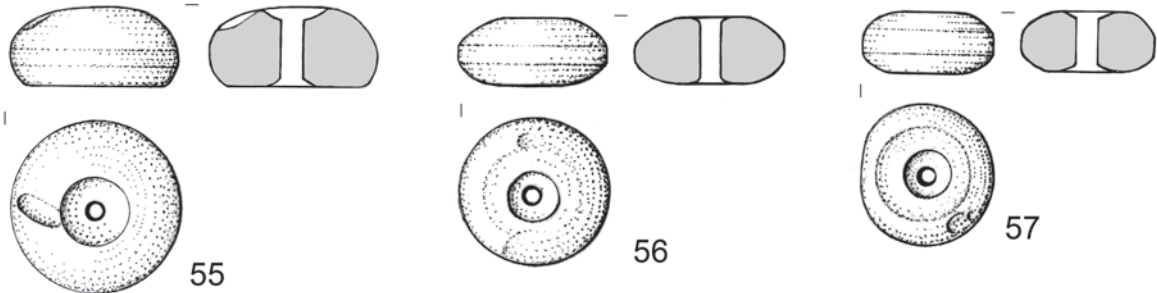
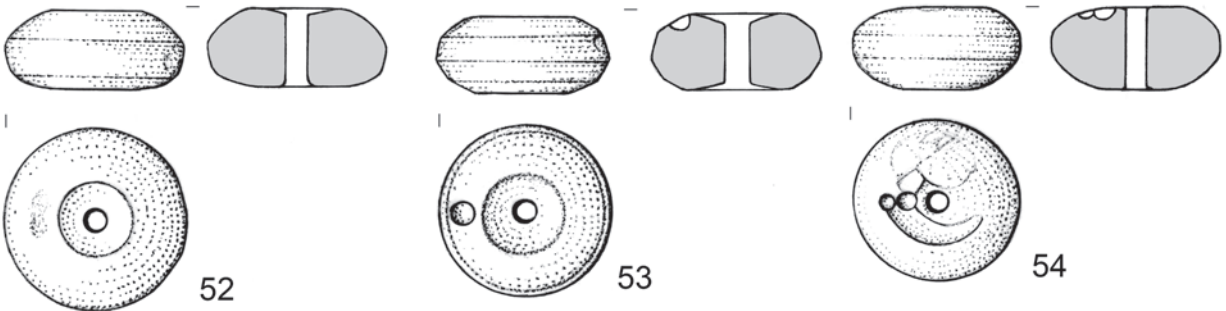
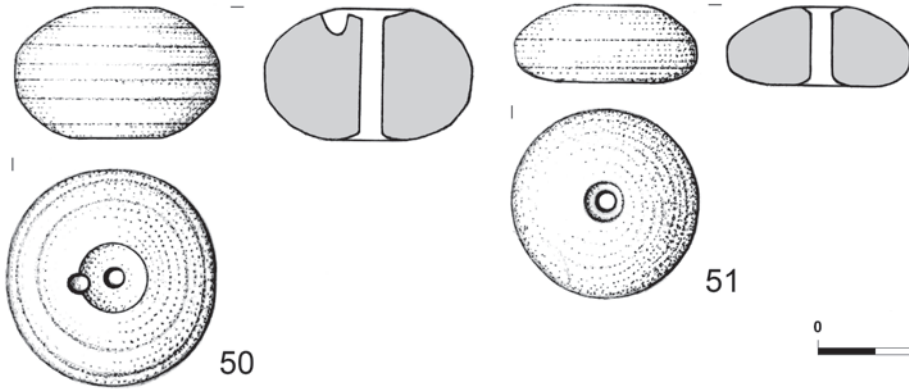
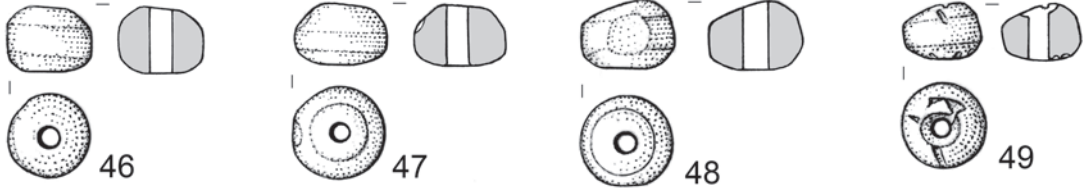
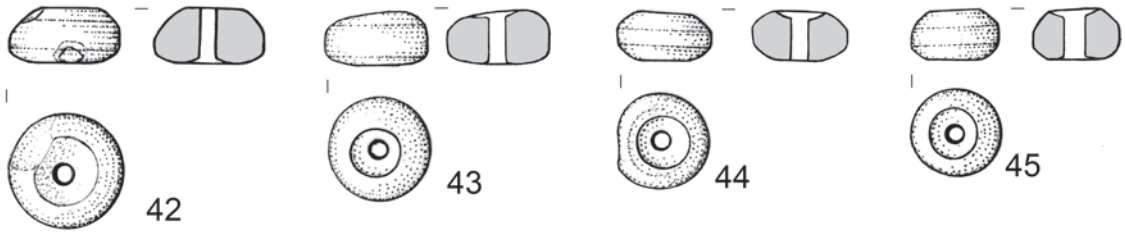
Pl. CXXV. Grave 605: 65 – copper alloy

Grave 605



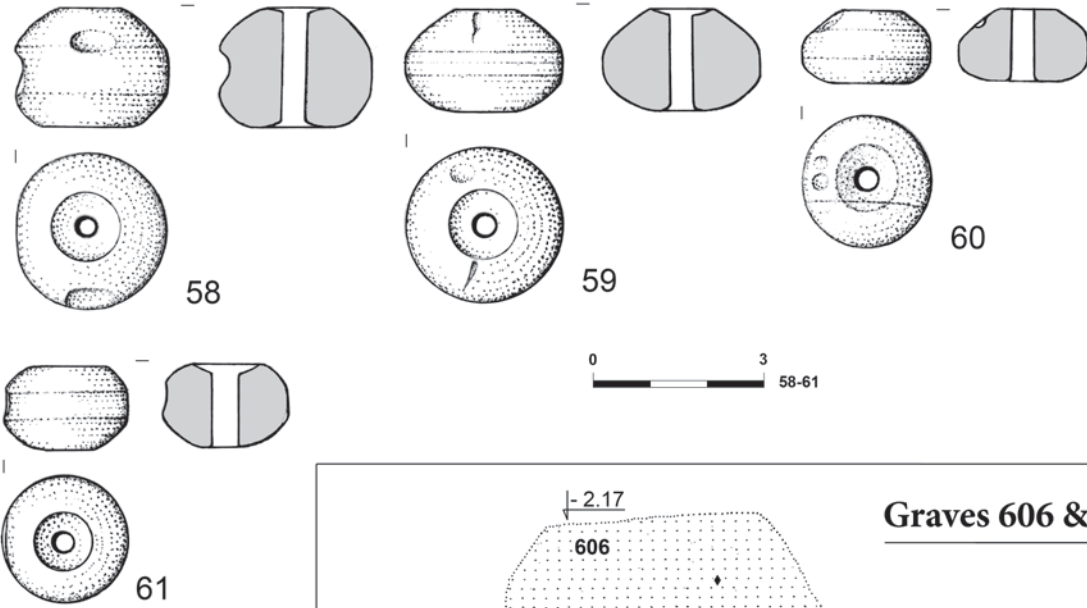
Pl. CXXVI. Grave 605: 10-22 - glass; 27-41 - amber

Grave 605



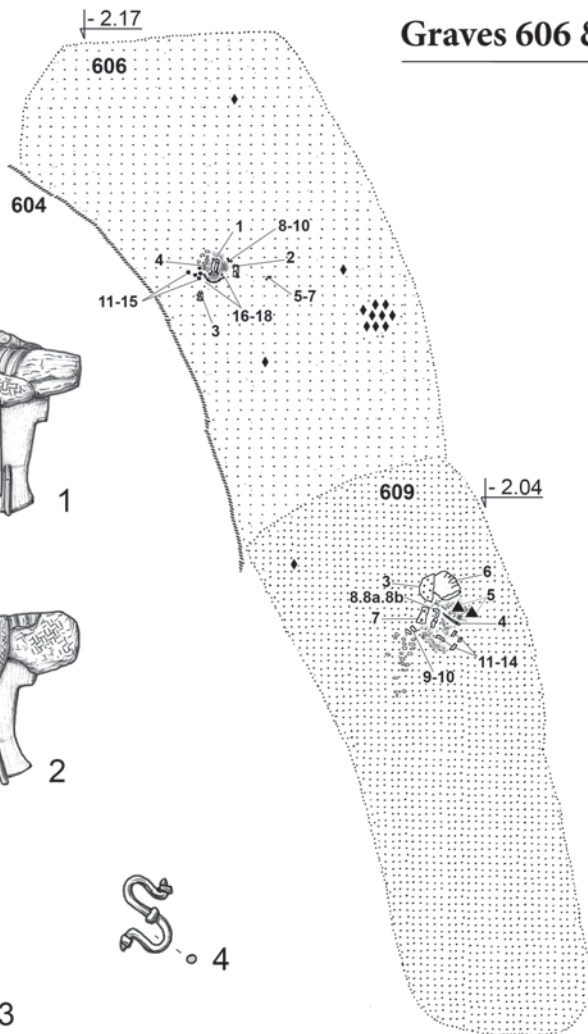
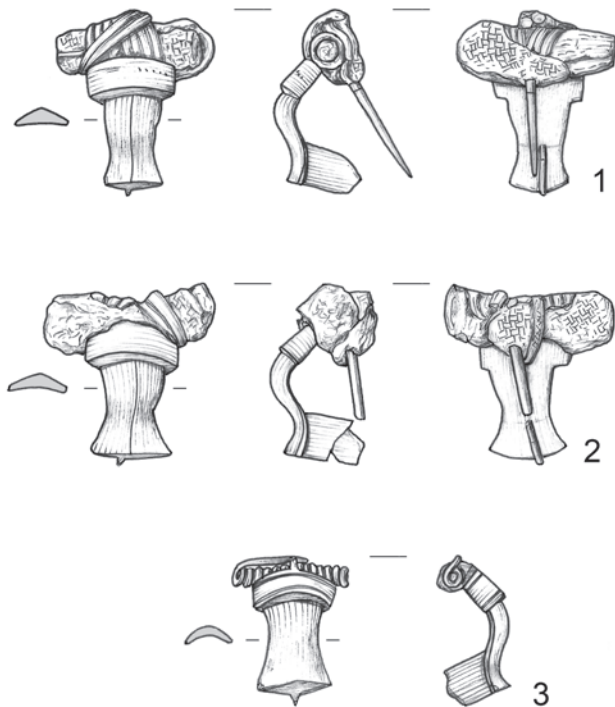
Pl. CXXVII. Grave 605: 42-57 - amber

Grave 605



Graves 606 & 609

Grave 606

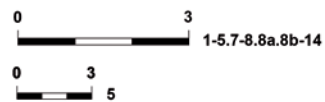
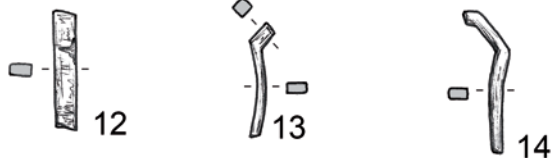
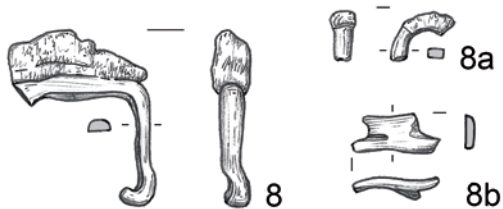
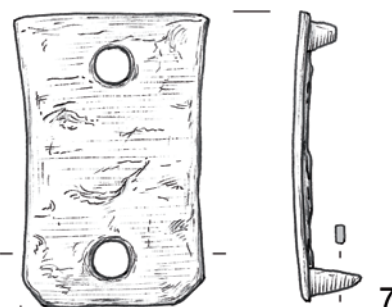
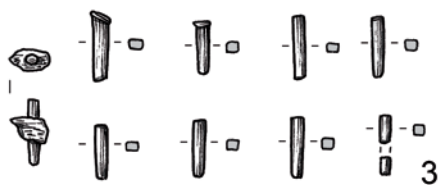
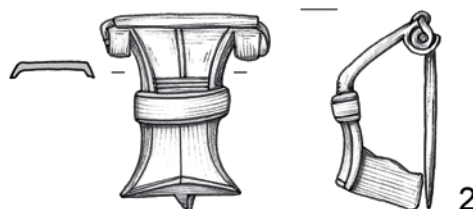
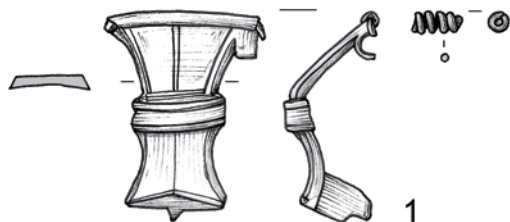


Pl. CXXVIII. Grave 605: 58-61 – amber; Graves 606 & 609. Grave 606: 1-2 – brass and tin-silver coating; 3 – copper alloy; 4 – silver

Grave 606

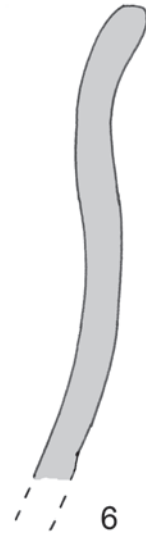
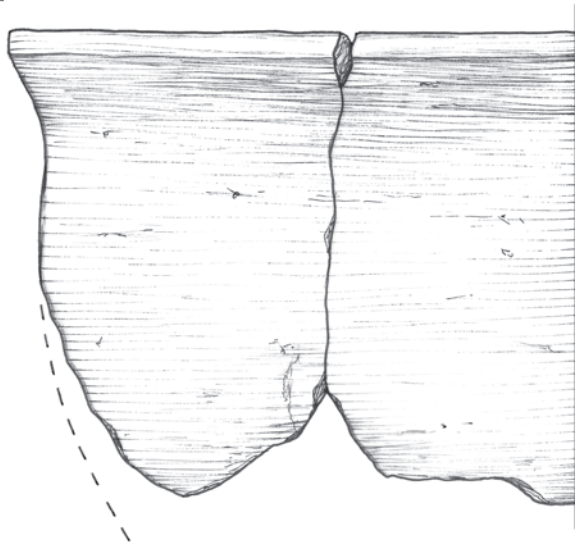


Grave 609

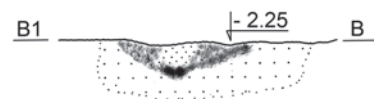
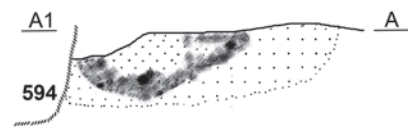
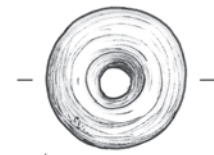
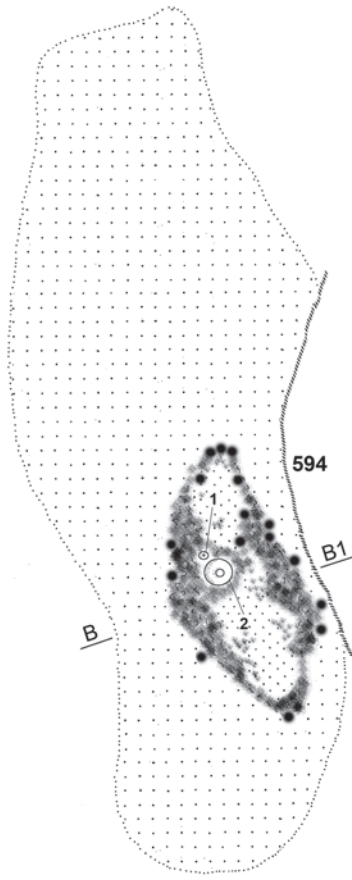
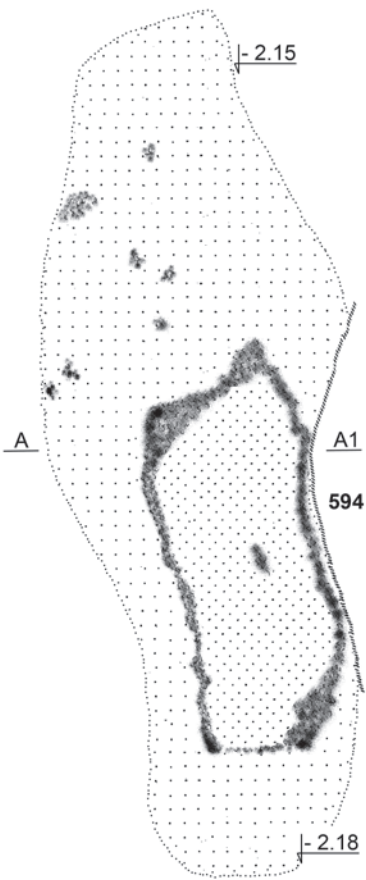


Pl. CXXIX. Grave 606: 5–17 – glass. Grave 609: 1–2.4 – copper alloy; 3 – copper alloy and bone (antler [?]); 5 – ceramic; 8.8a–b – iron and wood. 7.9–14 – iron

Grave 609

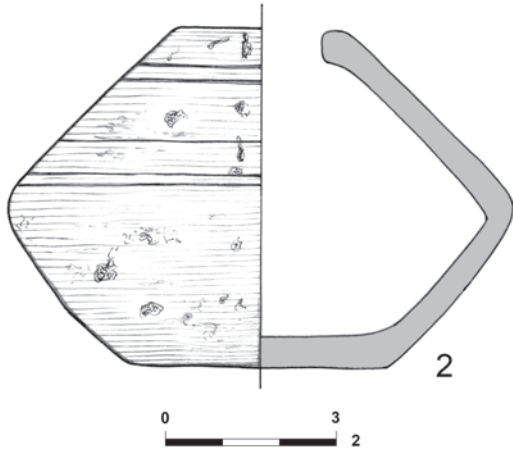


Grave 608

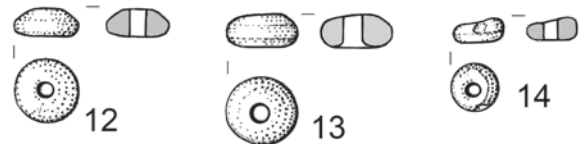
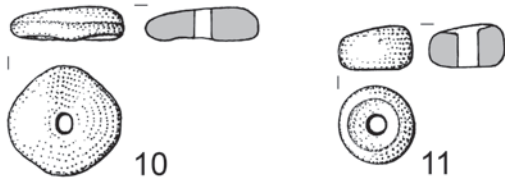
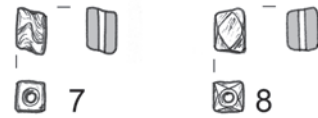
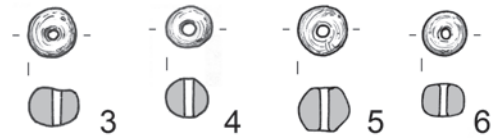
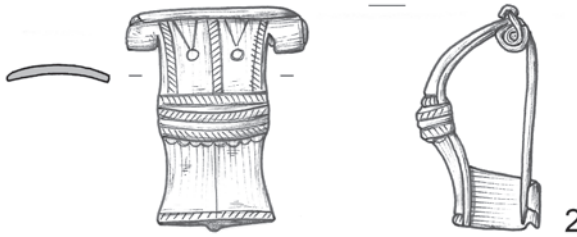
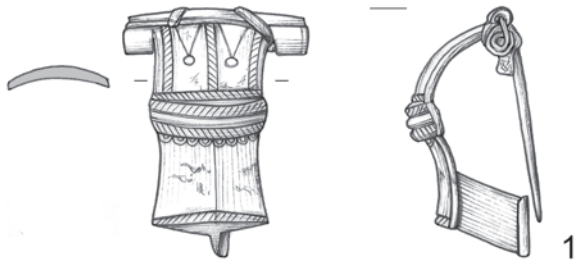
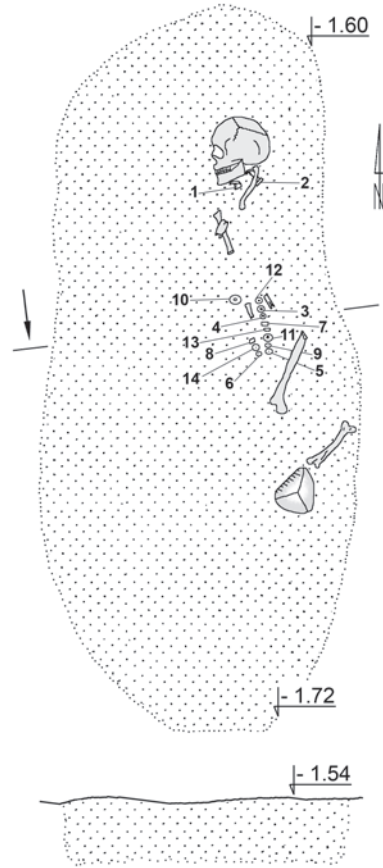


Pl. CXXX. Grave 608: 1 – ceramic. Grave 609: 6 – ceramic

Grave 608



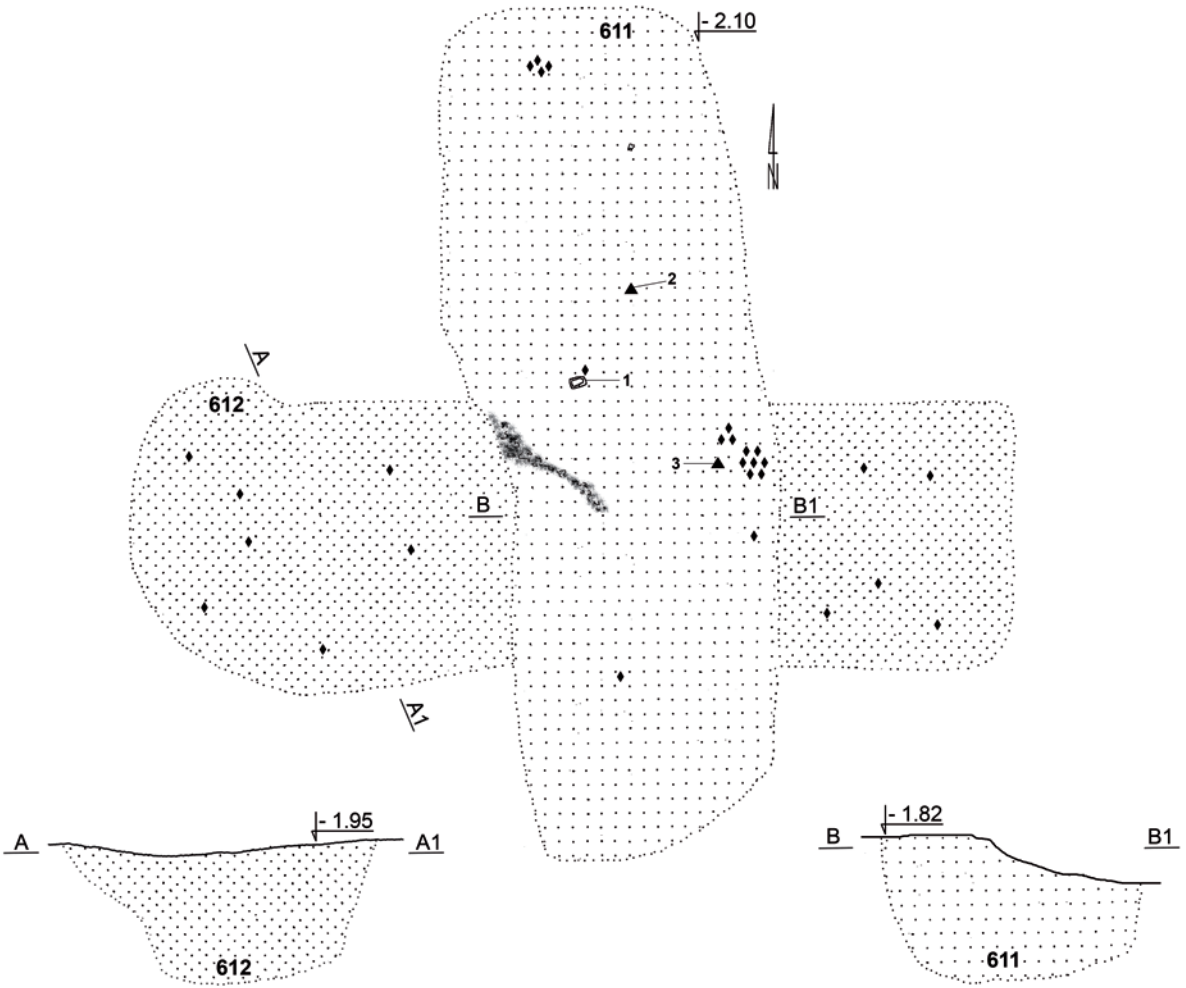
Grave 610



0 3 1-8.10-14

Pl. CXXXI. Grave 608: 2 – ceramic. Grave 610: 1-2 – copper alloy; 3-8 – glass; 10-14 – amber

Graves 611 & 612

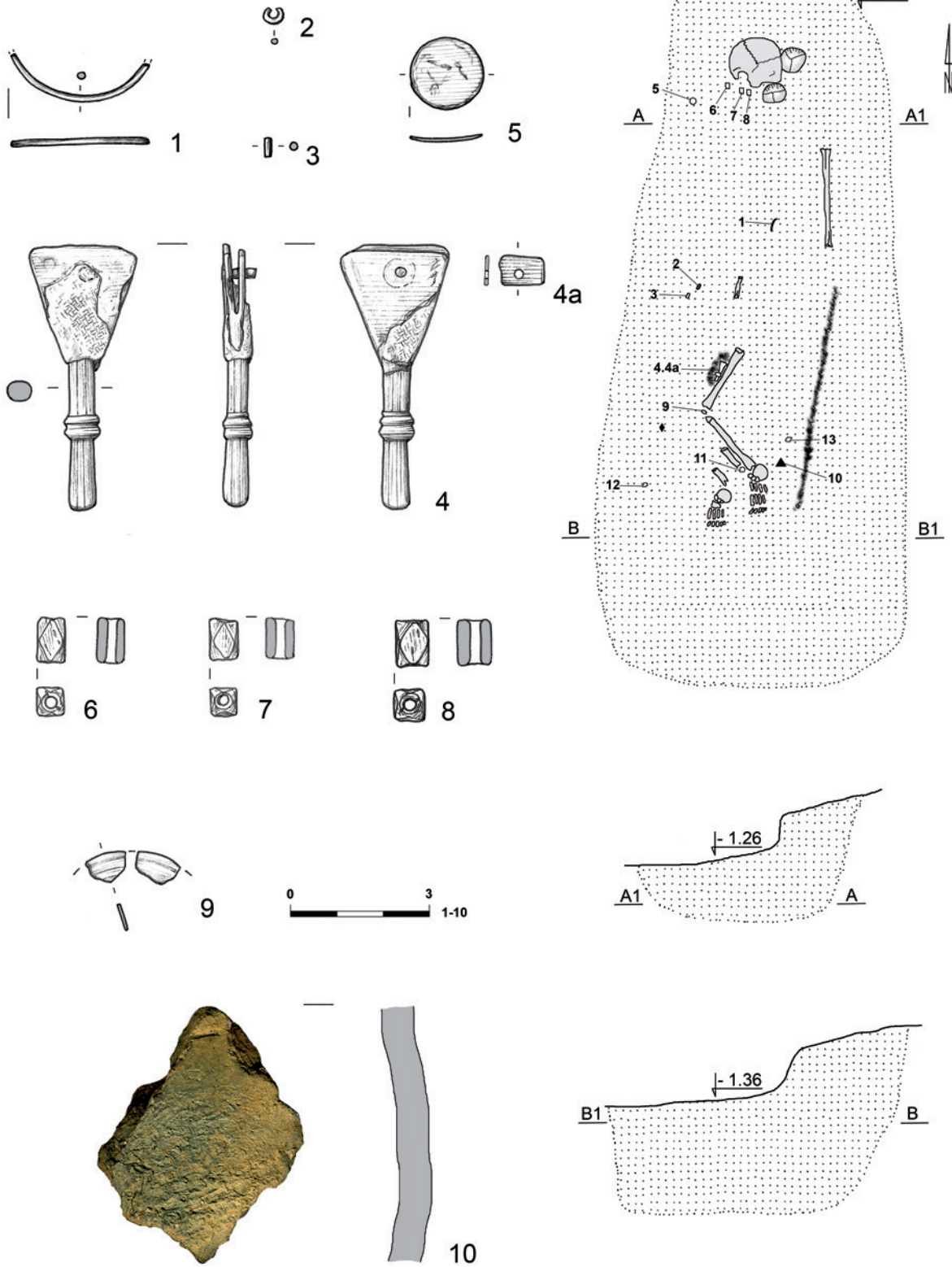


Grave 611



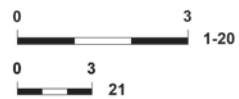
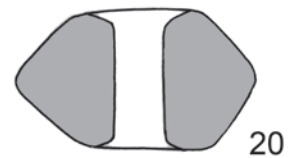
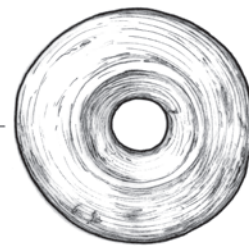
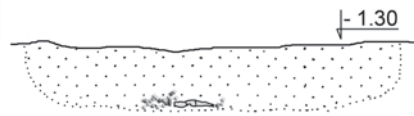
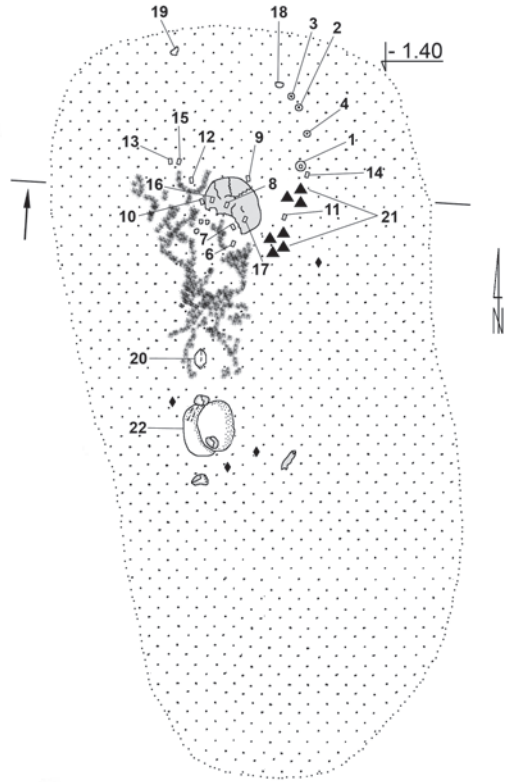
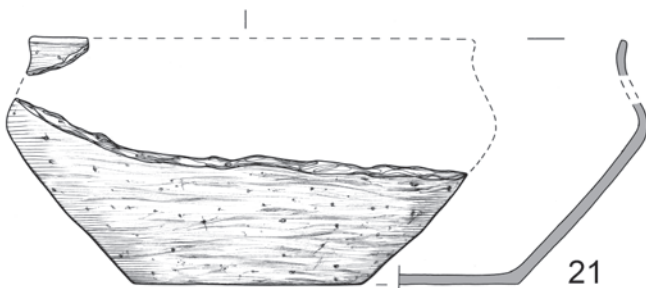
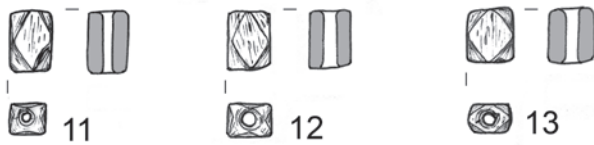
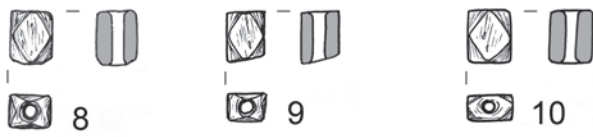
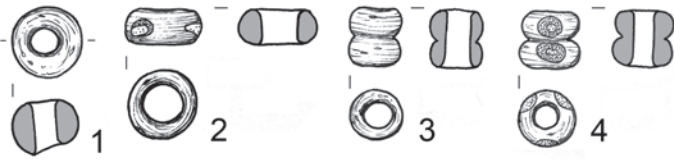
Pl. CXXXII. Graves 611 & 612. Grave 611: 1 – iron; 2-3 – ceramic

Grave 613



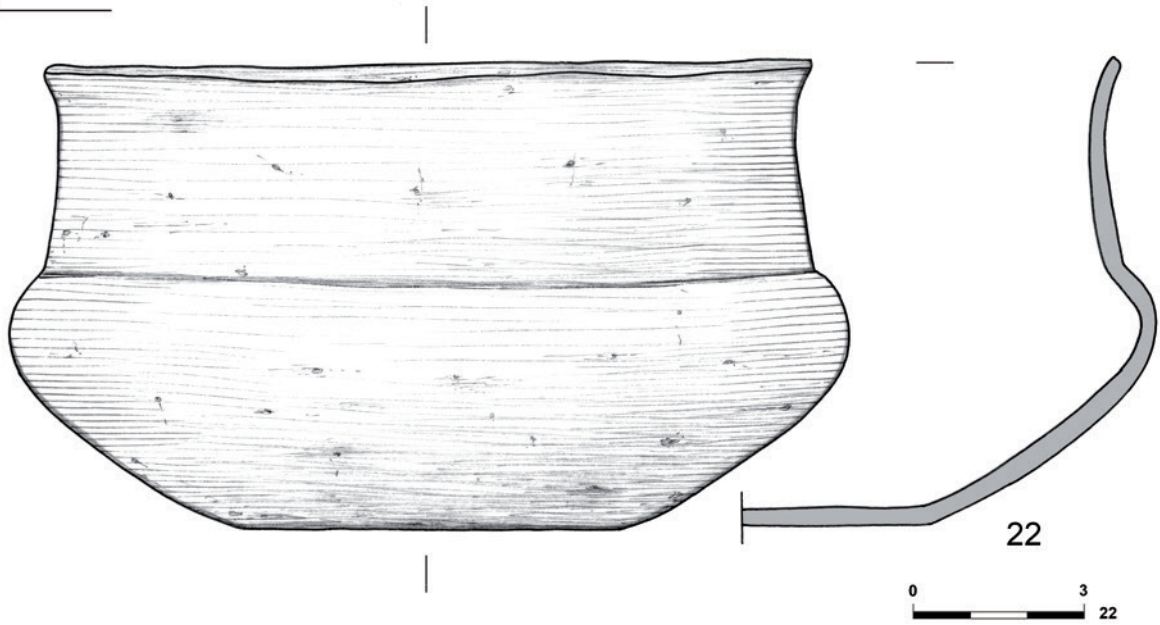
Pl. CXXXIII. Grave 613: 1.3-5.9 – copper alloy; 2 – silver; 6-8 – glass; 10 – ceramic

Grave 614

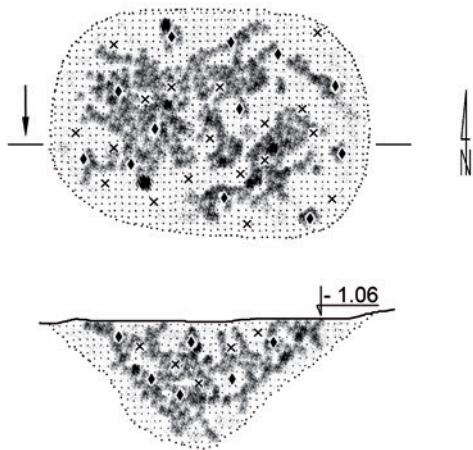


Pl. CXXXIV. Grave 614: 1-17 - glass; 18-19 - amber; 20-21 - ceramic

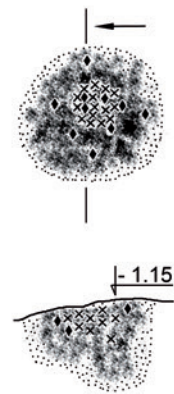
Grave 614



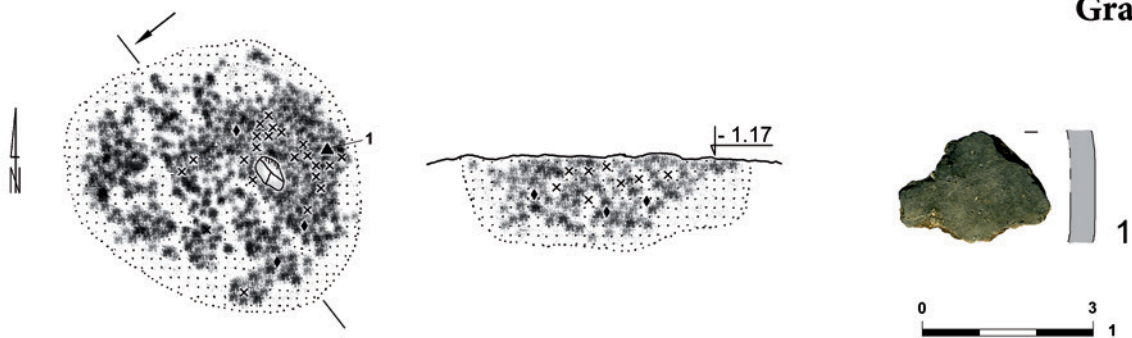
Grave 615



Grave 617

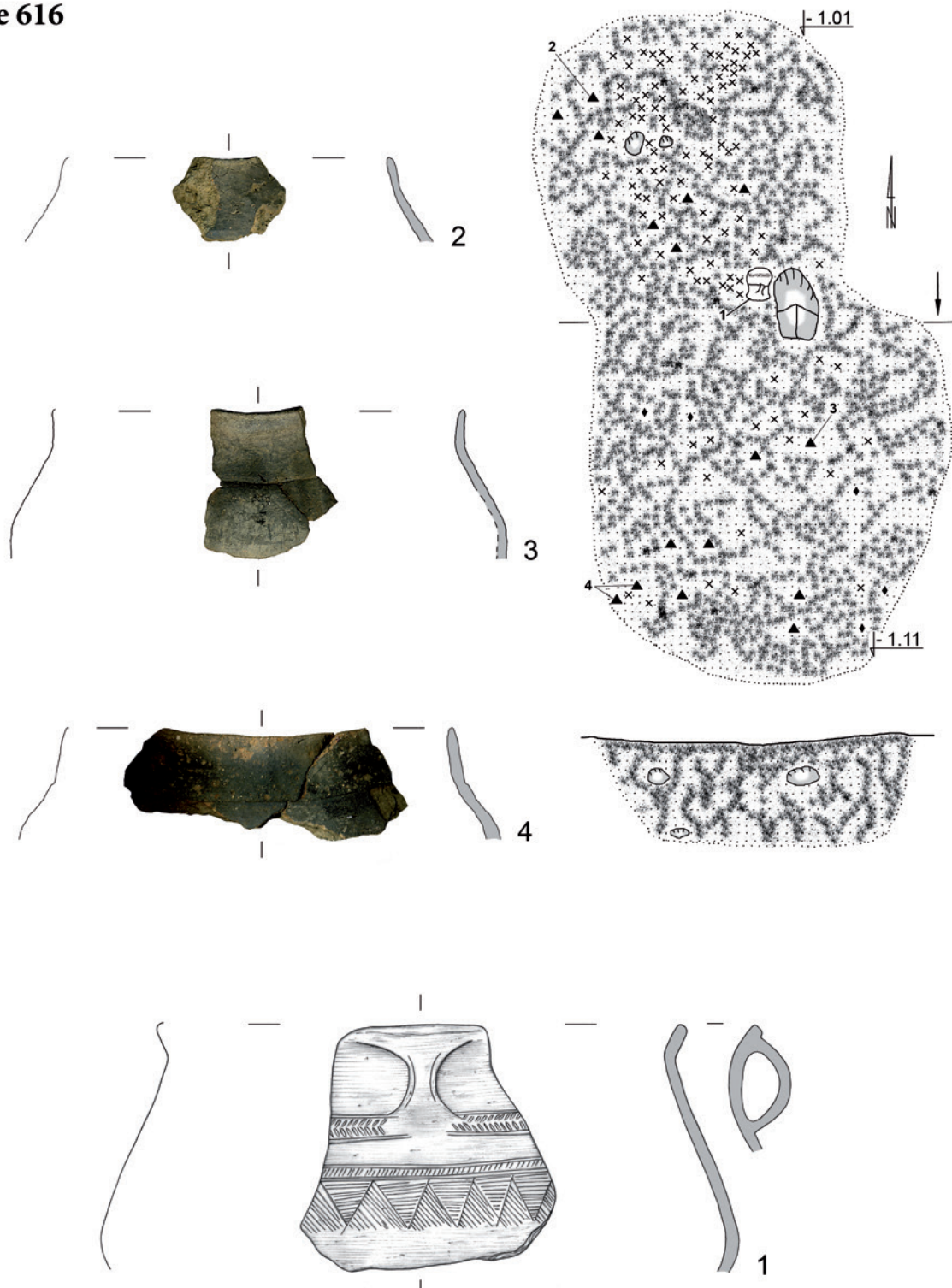


Grave 619



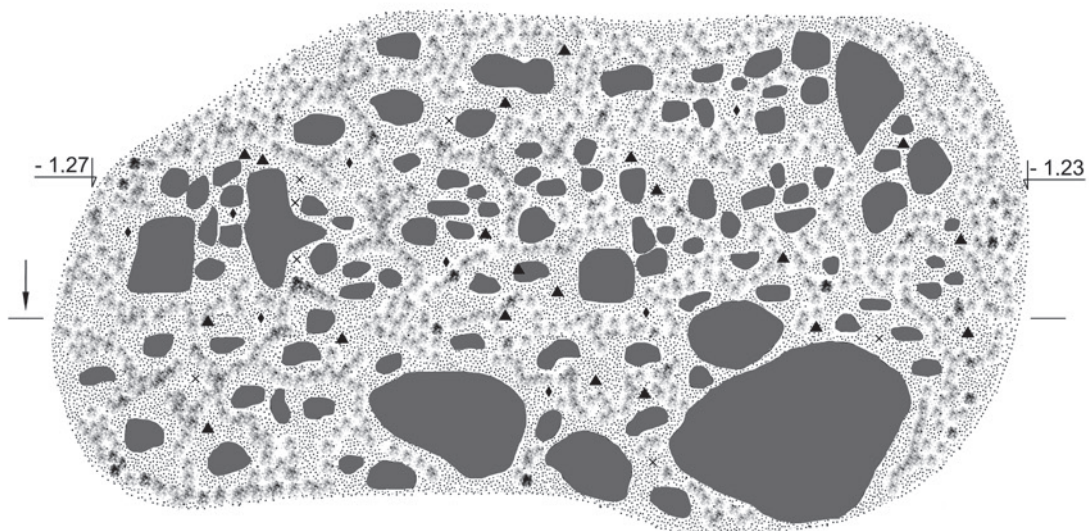
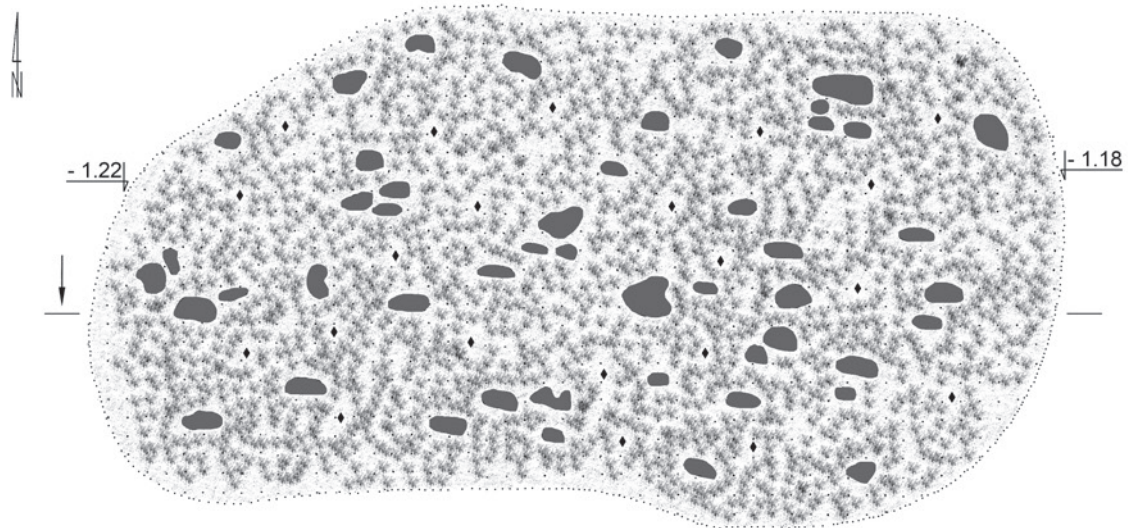
Pl. CXXXV. Grave 614: 22 – ceramic. Grave 615. Grave 617. Grave 619: 1 – ceramic

Grave 616

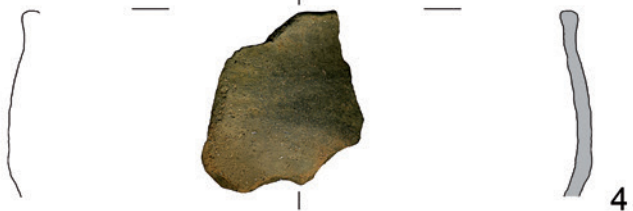
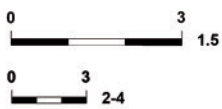
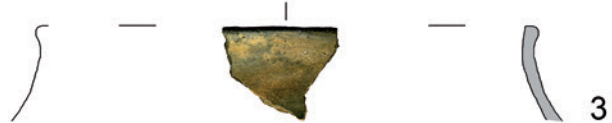
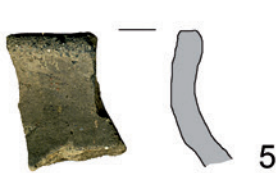
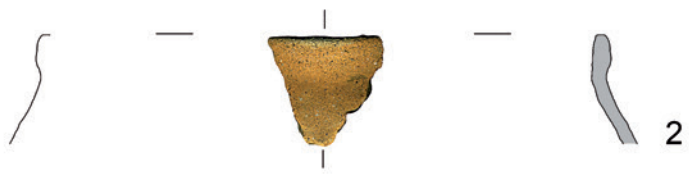
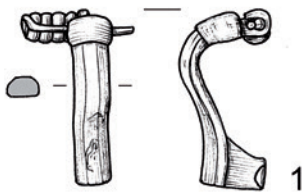
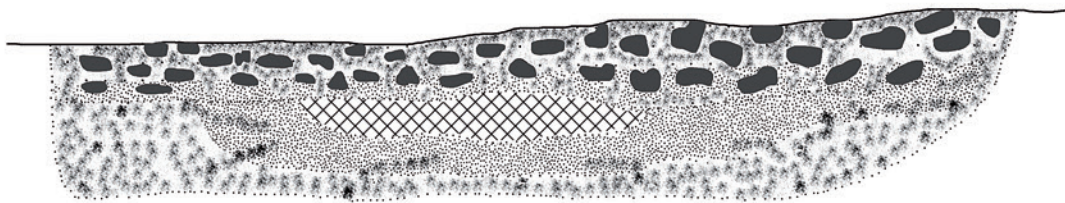
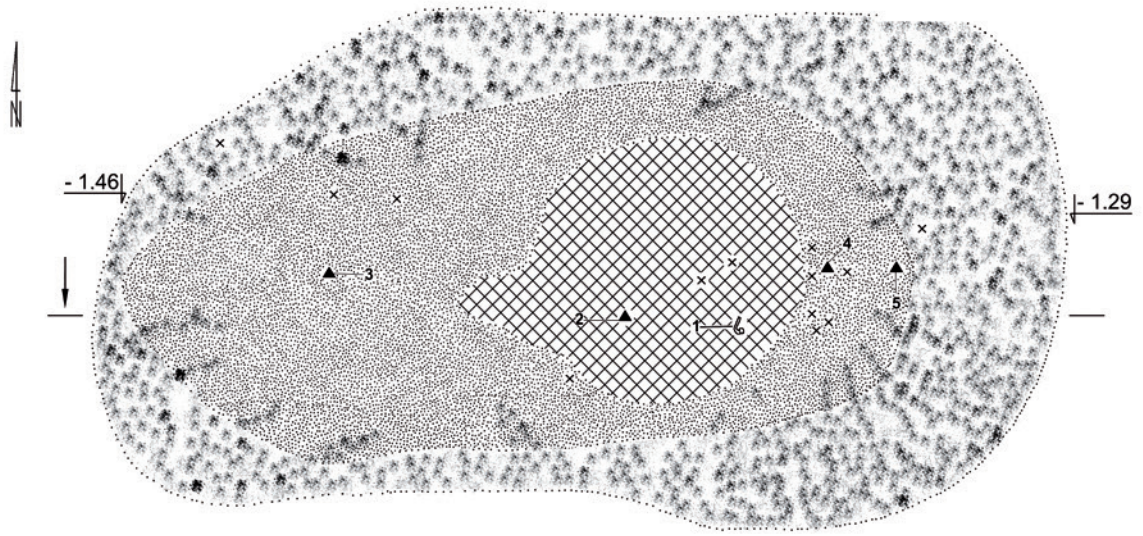


Pl. CXXXVI. Grave 616: 1-4 – ceramic

Feature 618



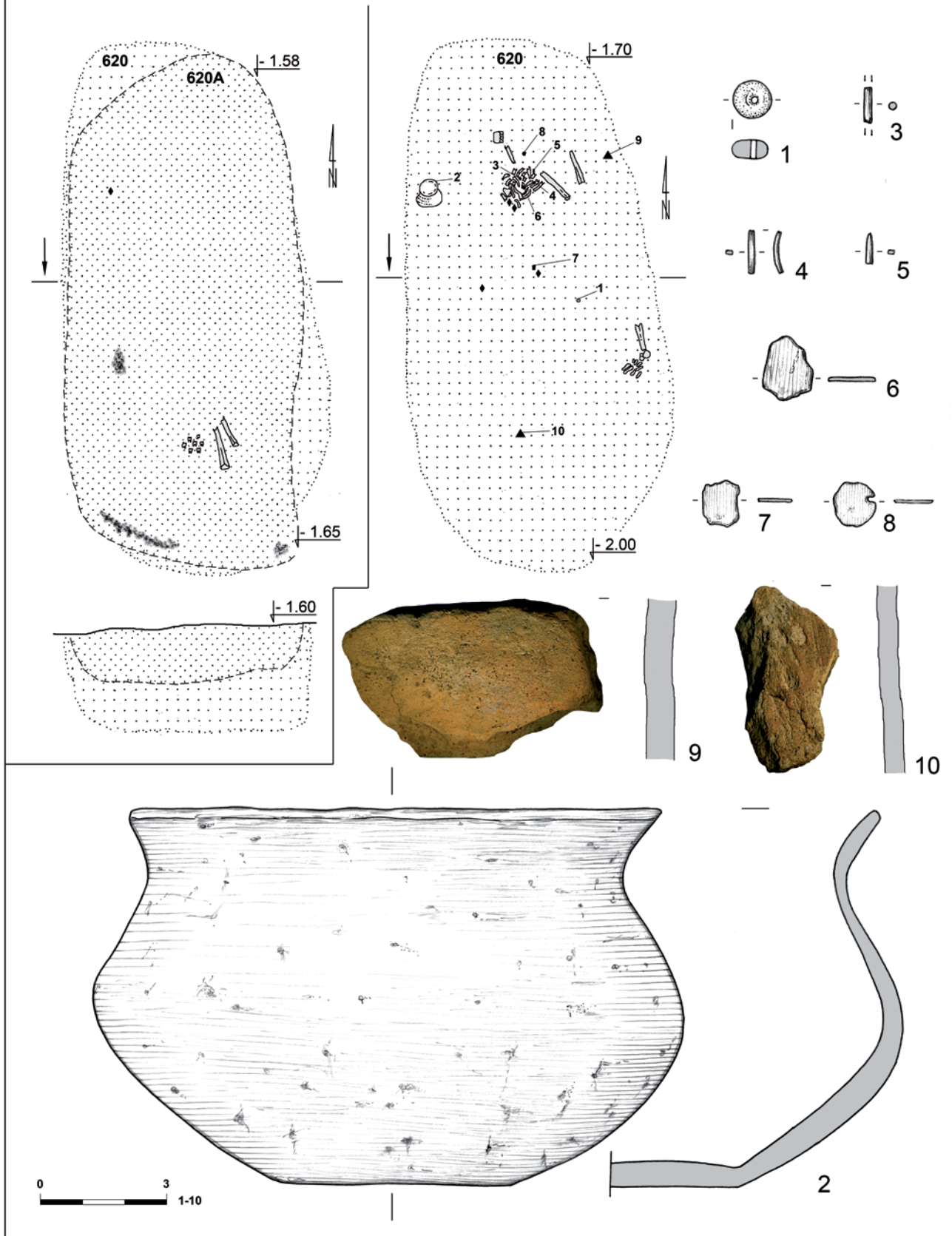
Feature 618



Pl. CXXXVIII. Feature 618: 1 – copper alloy; 2-5 – ceramic

Grave 620 & Feature 620A

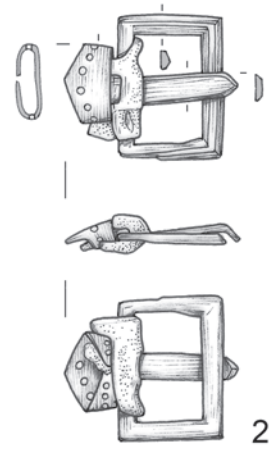
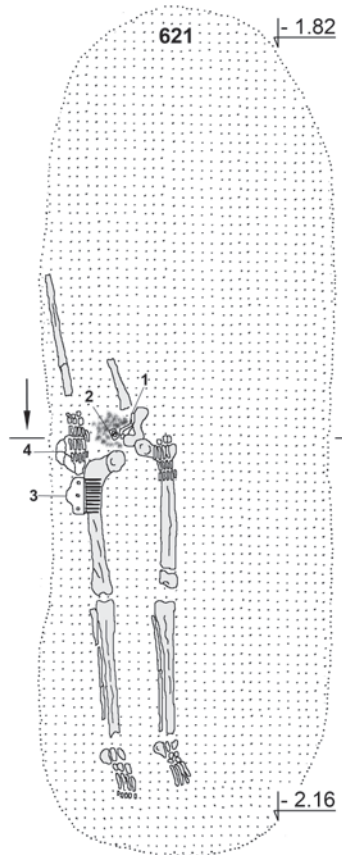
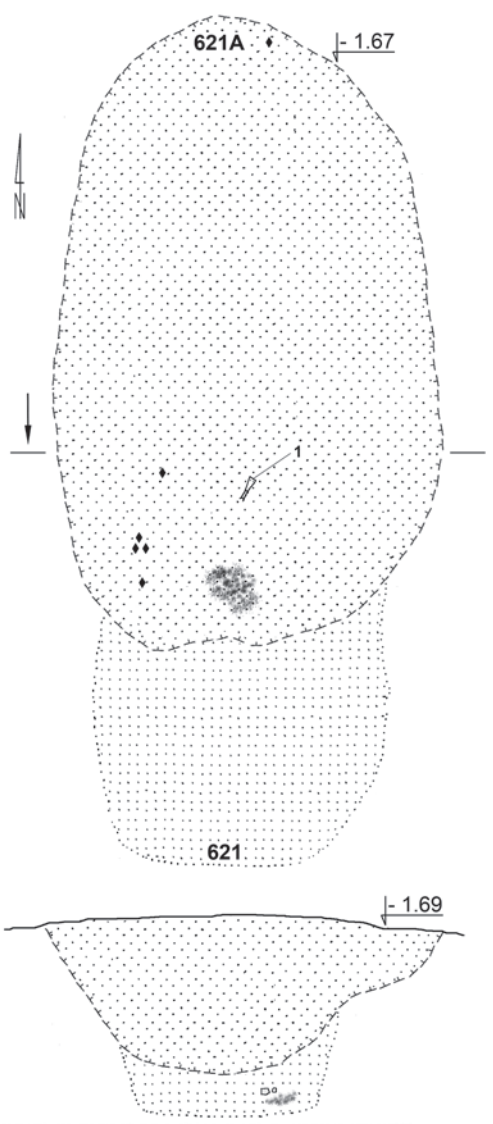
Grave 620



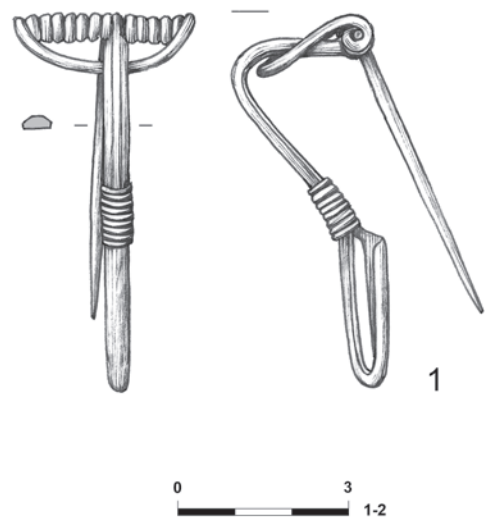
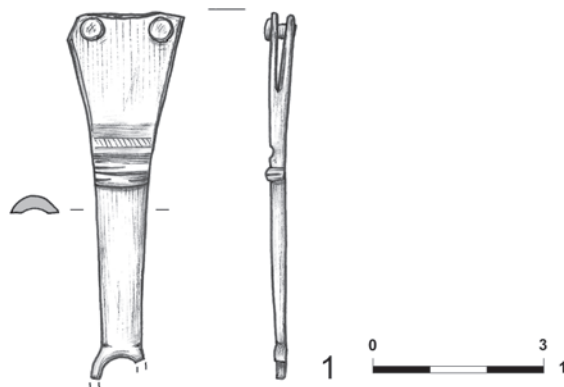
Pl. CXXXIX. Grave 620 & Feature 620A. Grave 620: 1 – amber; 2,9–10 – ceramic; 3–8 – copper alloy

Grave 621 & Feature 621A

Grave 621

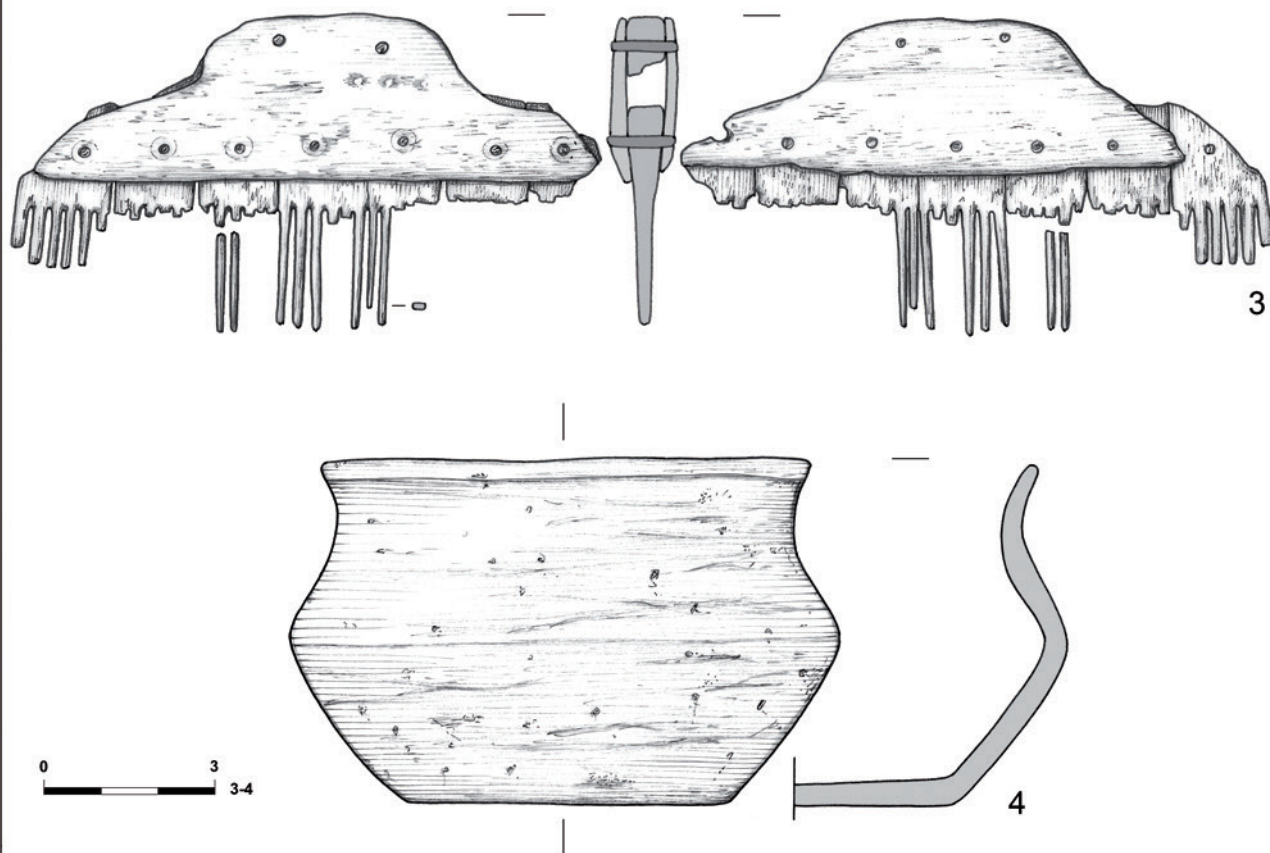


Feature 621A

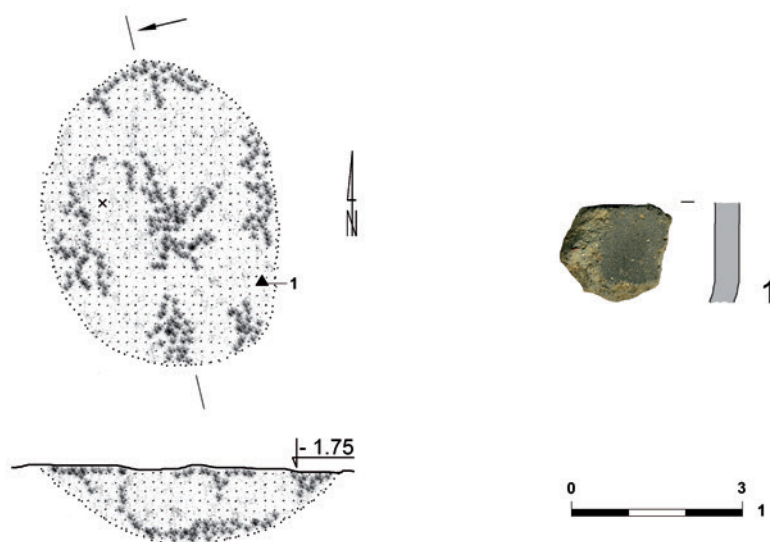


Pl. CXL. Grave 621 & Feature 621A. Grave 621: 1 – tin bronze; 2 – tin bronze and tin-lead bronze. Feature 621A: 1 – brass

Grave 621

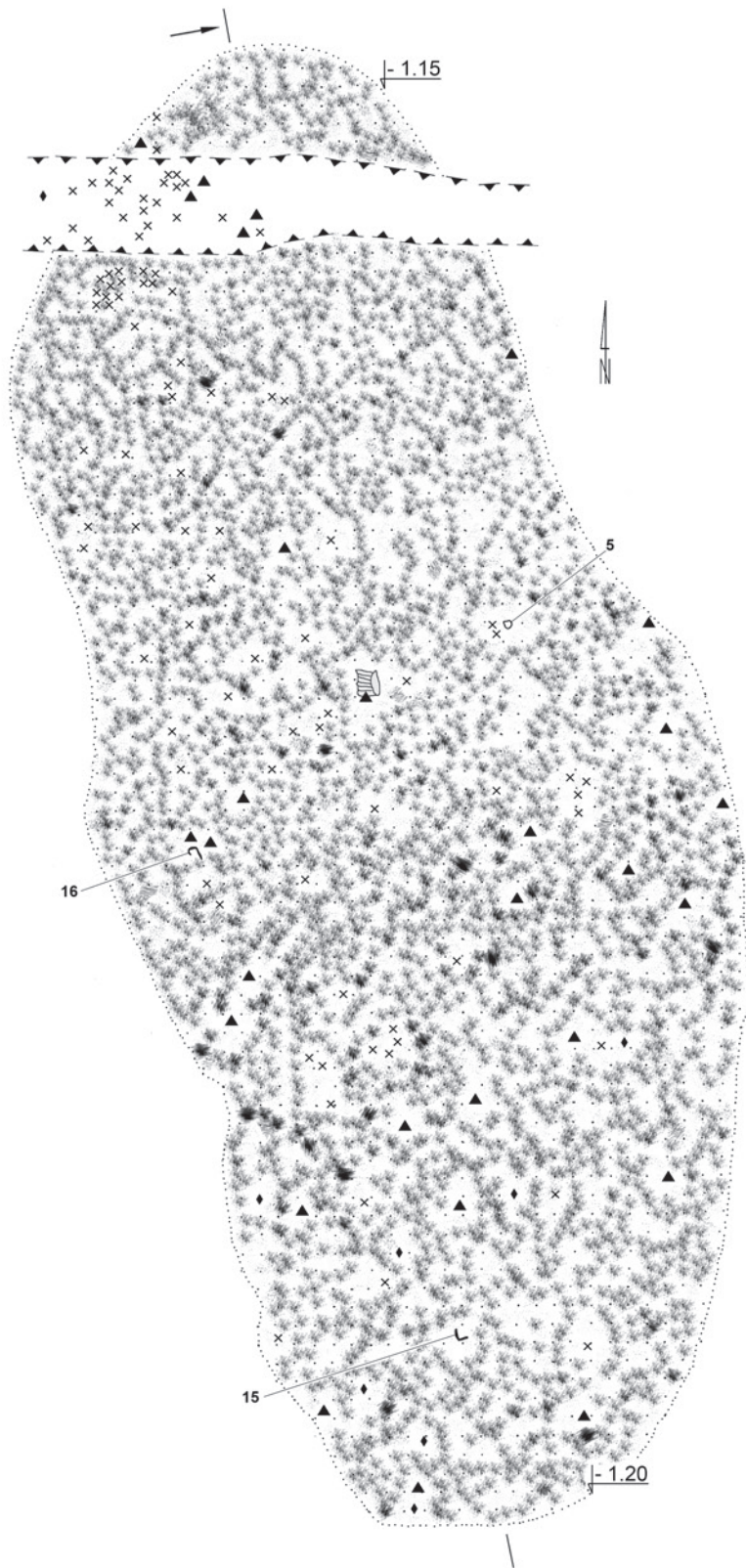


Grave 637



Pl. CXLI. Grave 621: 3 – bone (antler [?]) and copper alloy; 4 – ceramic. Grave 637: 1 – ceramic

Grave 622



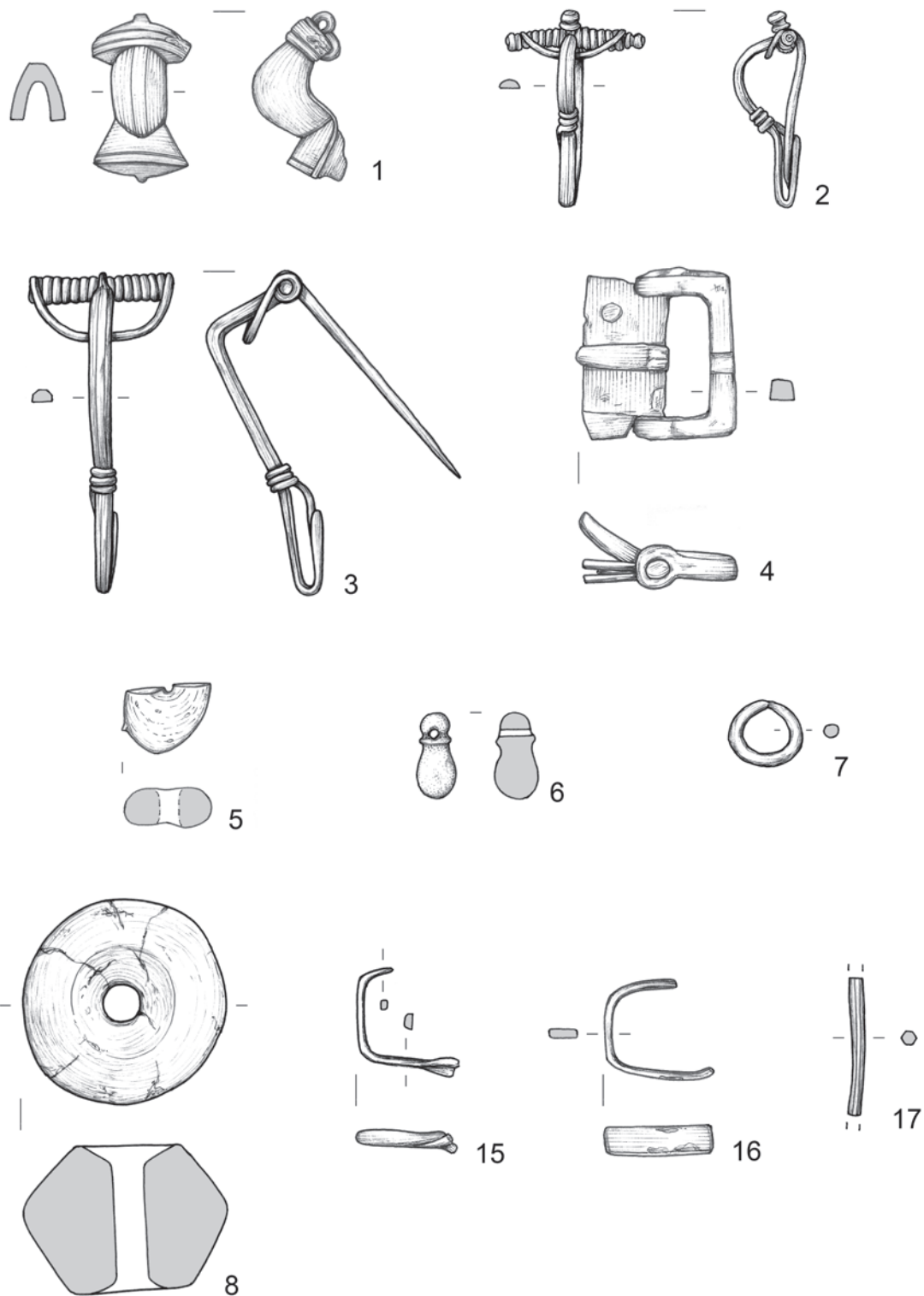
Pl. CXLII. Grave 622

Grave 622



Pl. CXLIII. Grave 622

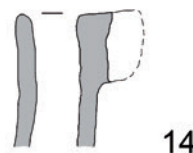
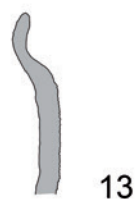
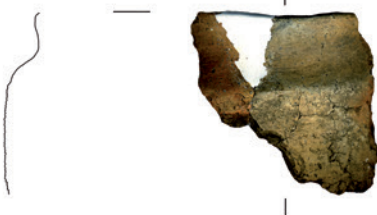
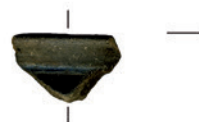
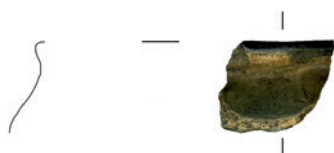
Grave 622



0 3
1-8.15-17

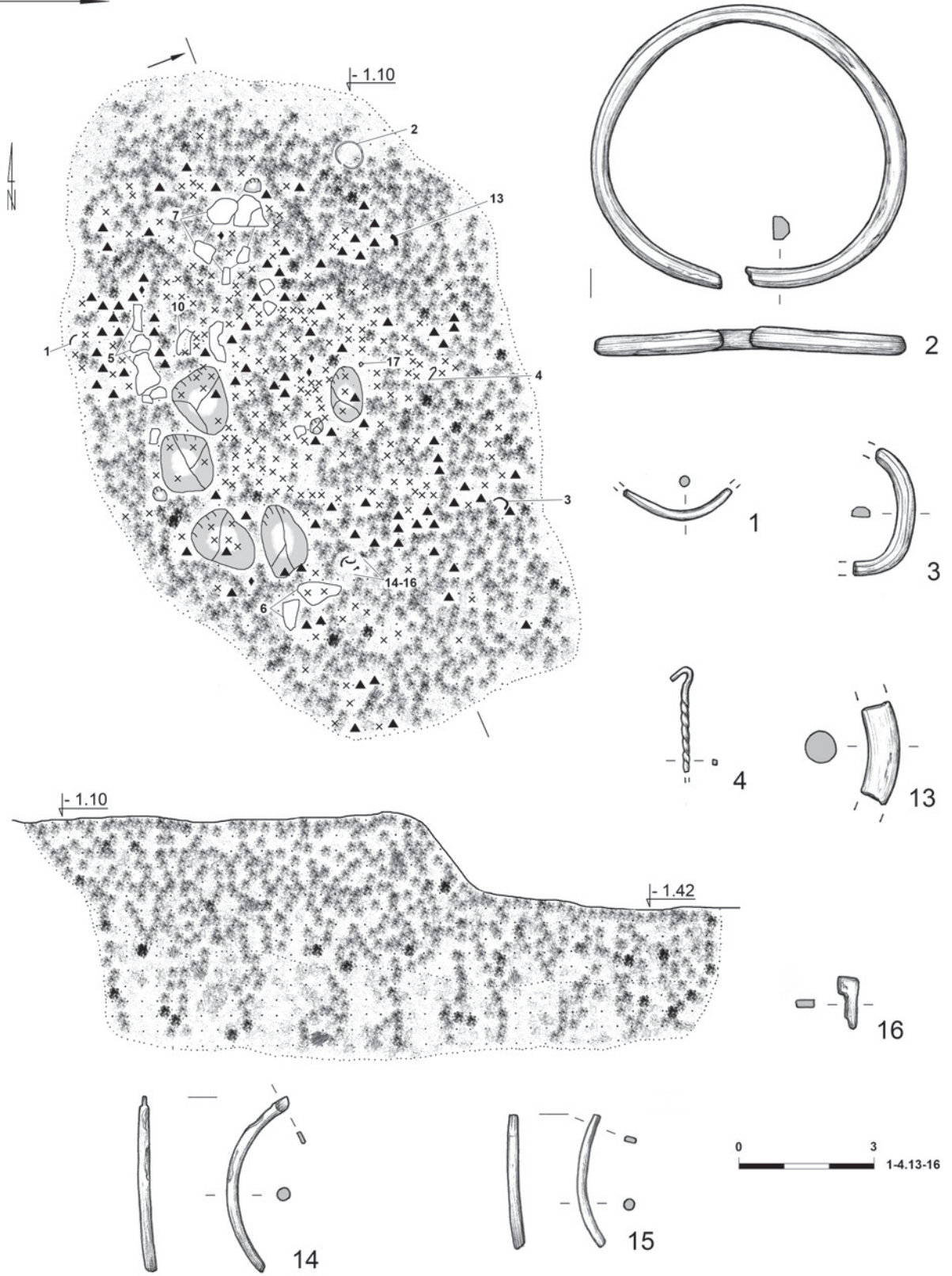
Pl. CXLIV. Grave 622: 1- tin-lead bronze; 3.7.17 - copper alloy; 4.15-16 - iron; 5 - glass; 6 - amber; 8 - ceramic

Grave 622



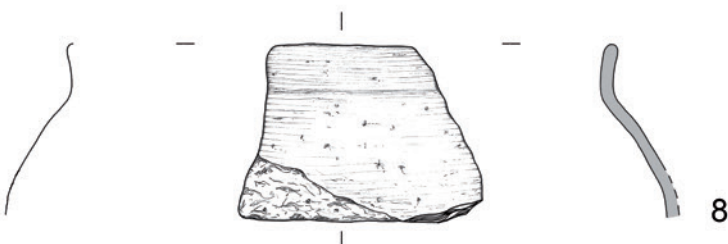
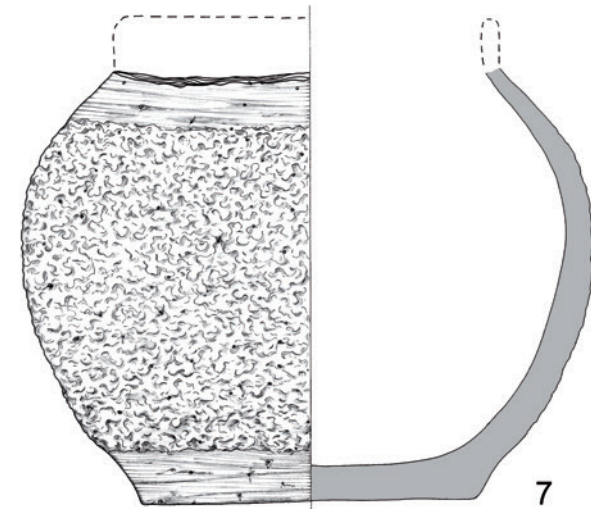
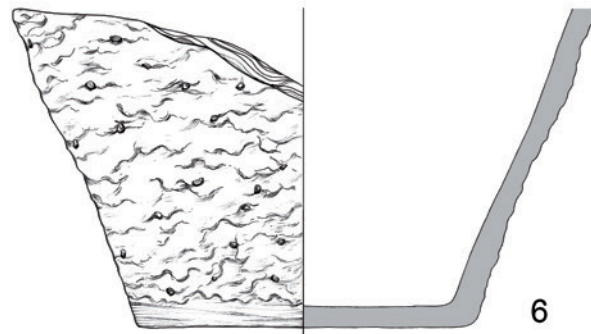
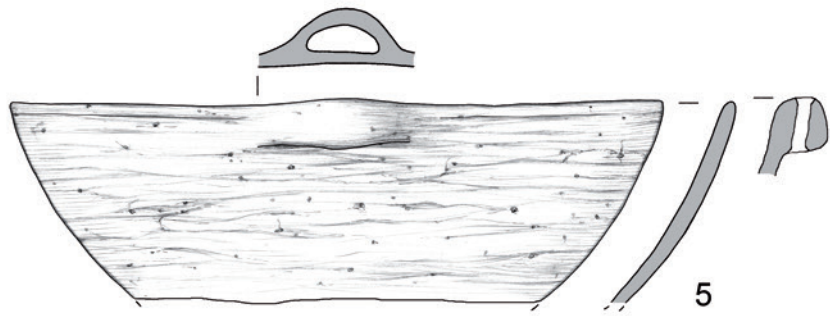
Pl. CXLV. Grave 622: 9-14 - ceramic

Grave 623



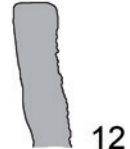
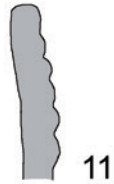
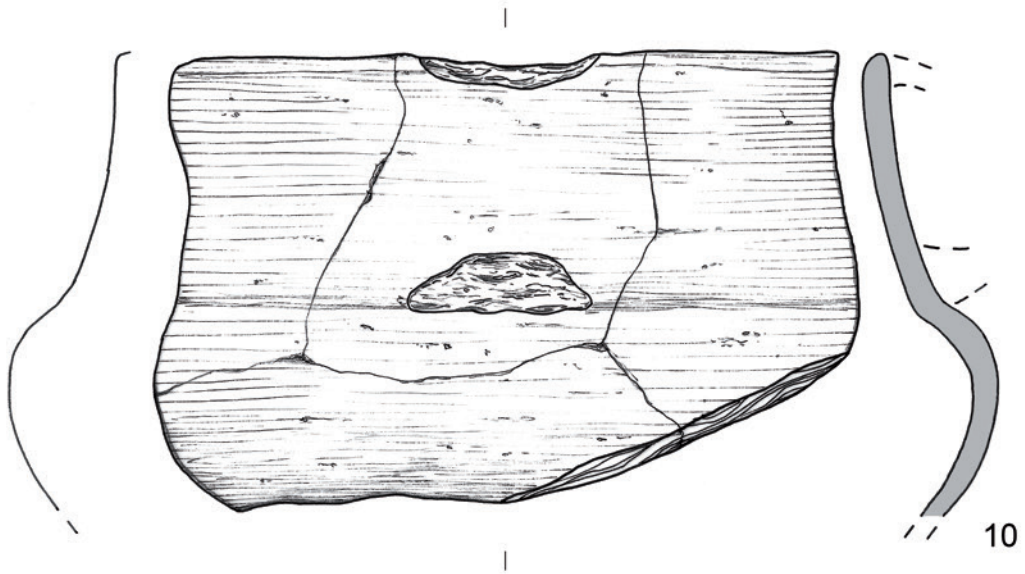
Pl. CXLVI. Grave 623: 1.3-4.13 – copper alloy; 2.14-16 – iron

Grave 623

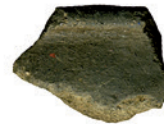
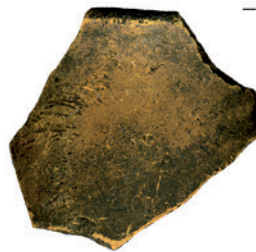
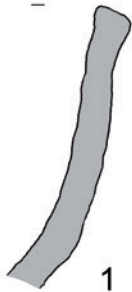


Pl. CXLVII. Grave 623: 5-9 - ceramic

Grave 623



Grave 623A



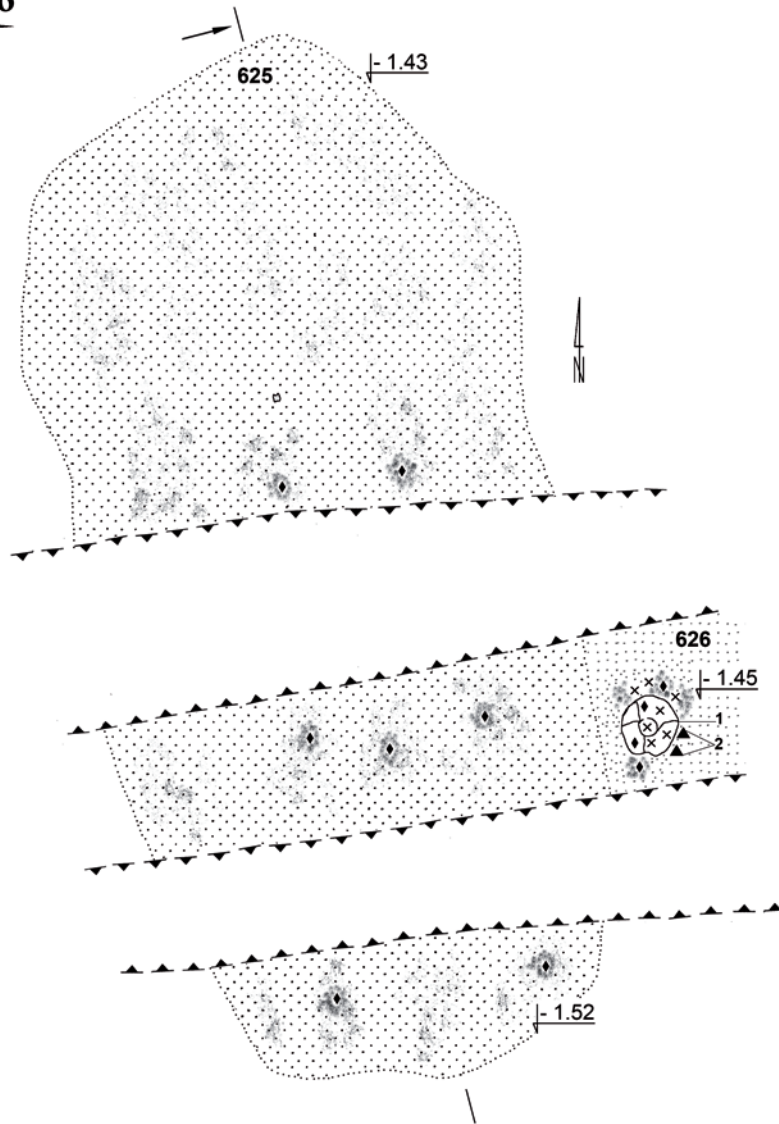
Pl. CXLVIII. Grave 623: 10-12 – ceramic. Grave 623A: 1-3 – ceramic

Grave 623A

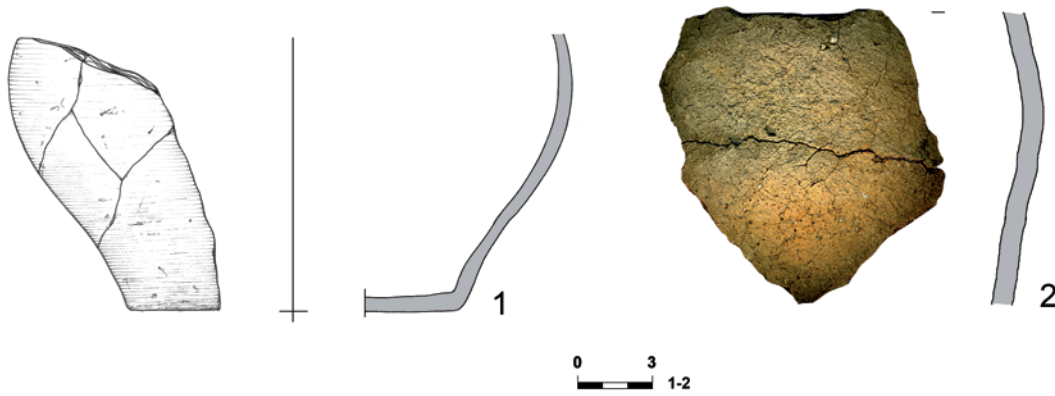


Pl. CXLIX. Grave 623A

Graves 625 & 626

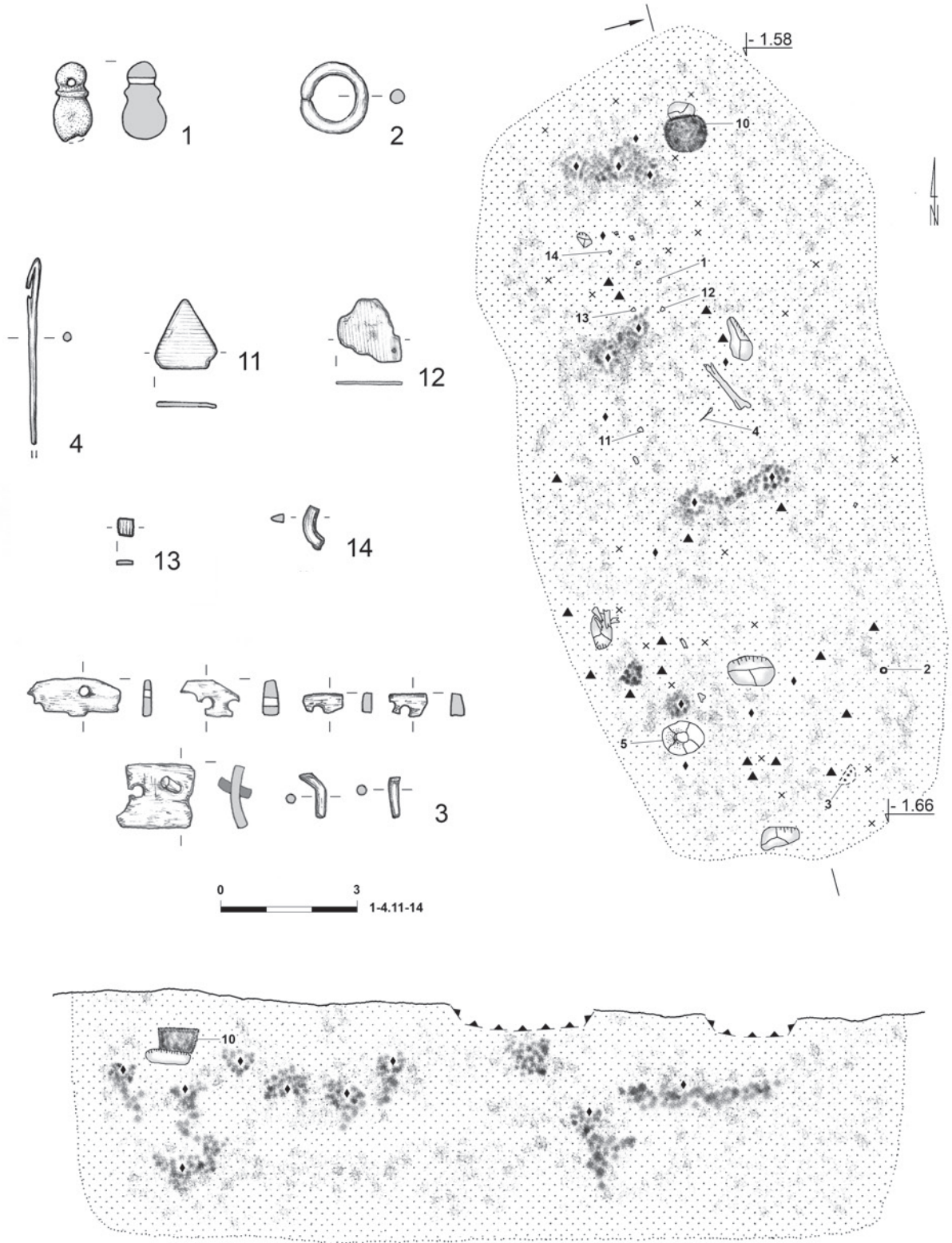


Grave 626



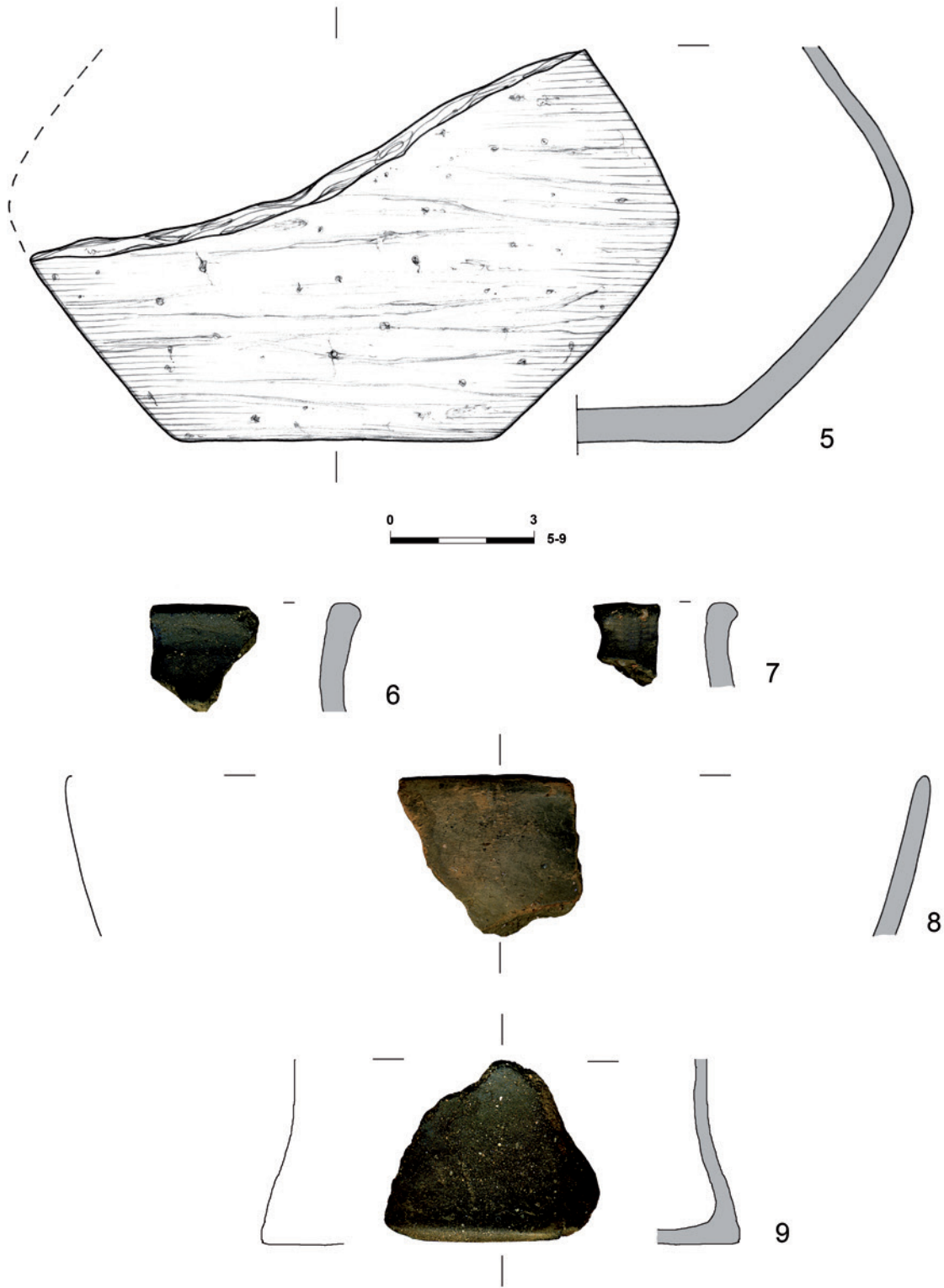
Pl. CL. Graves 625 & 626. Grave 626: 1-2 – ceramic

Grave 625



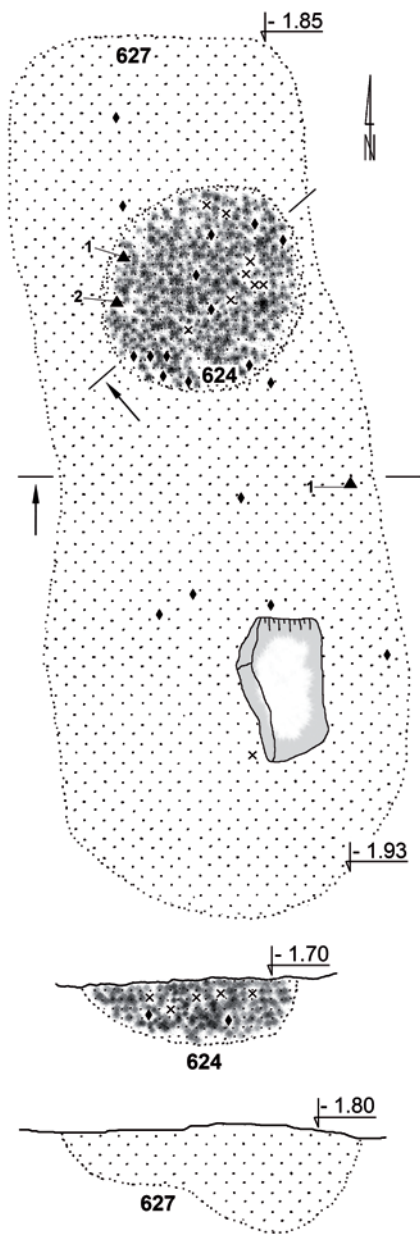
Pl. CLI. Grave 625: 1 – amber; 2.4.11–14 – copper alloy; 3 – bone (antler [?]) and copper alloy; 10 (on plan) – organic

Grave 625

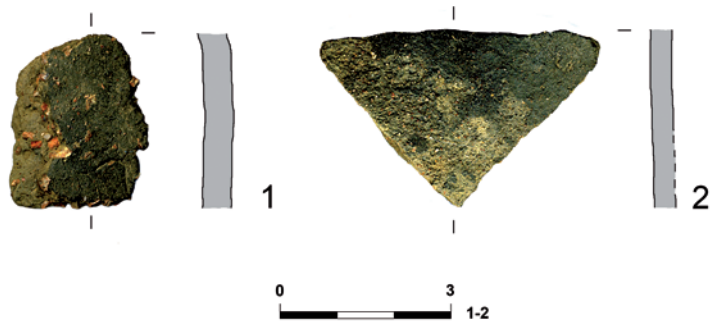


Pl. CLII. Grave 625: 5-9 - ceramic

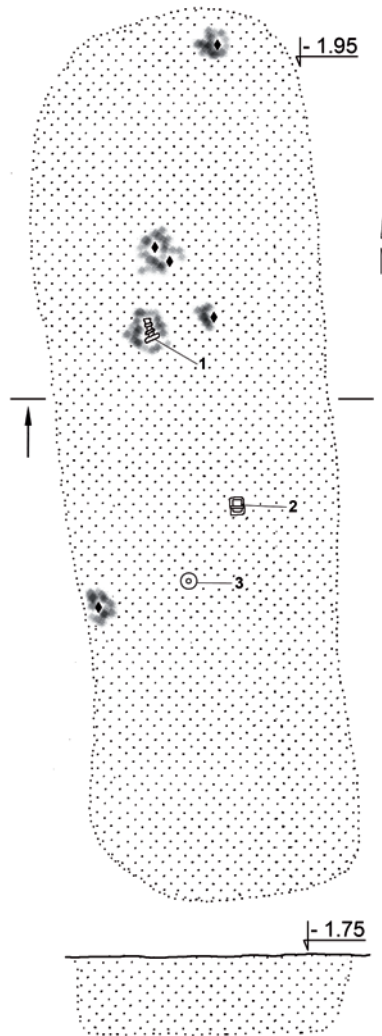
Graves 624 & 627



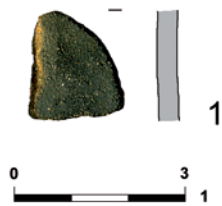
Grave 624



Grave 628

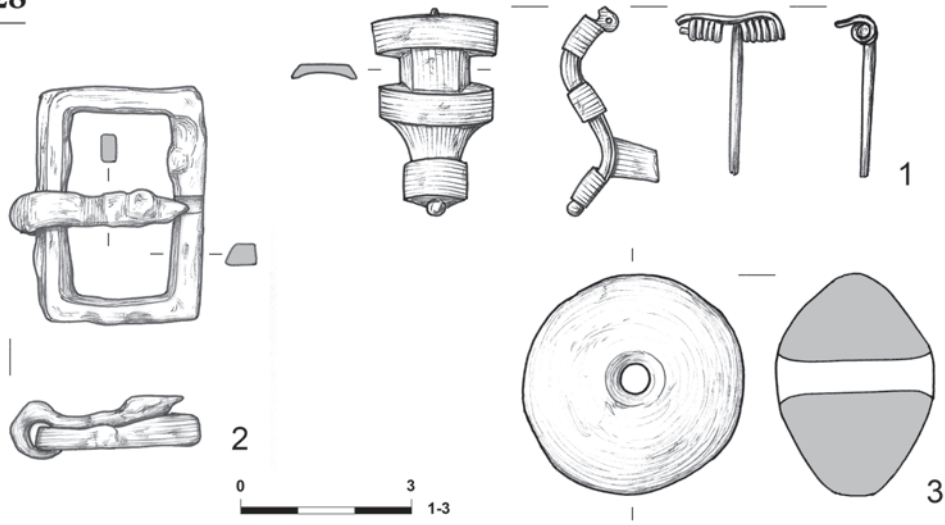


Grave 627

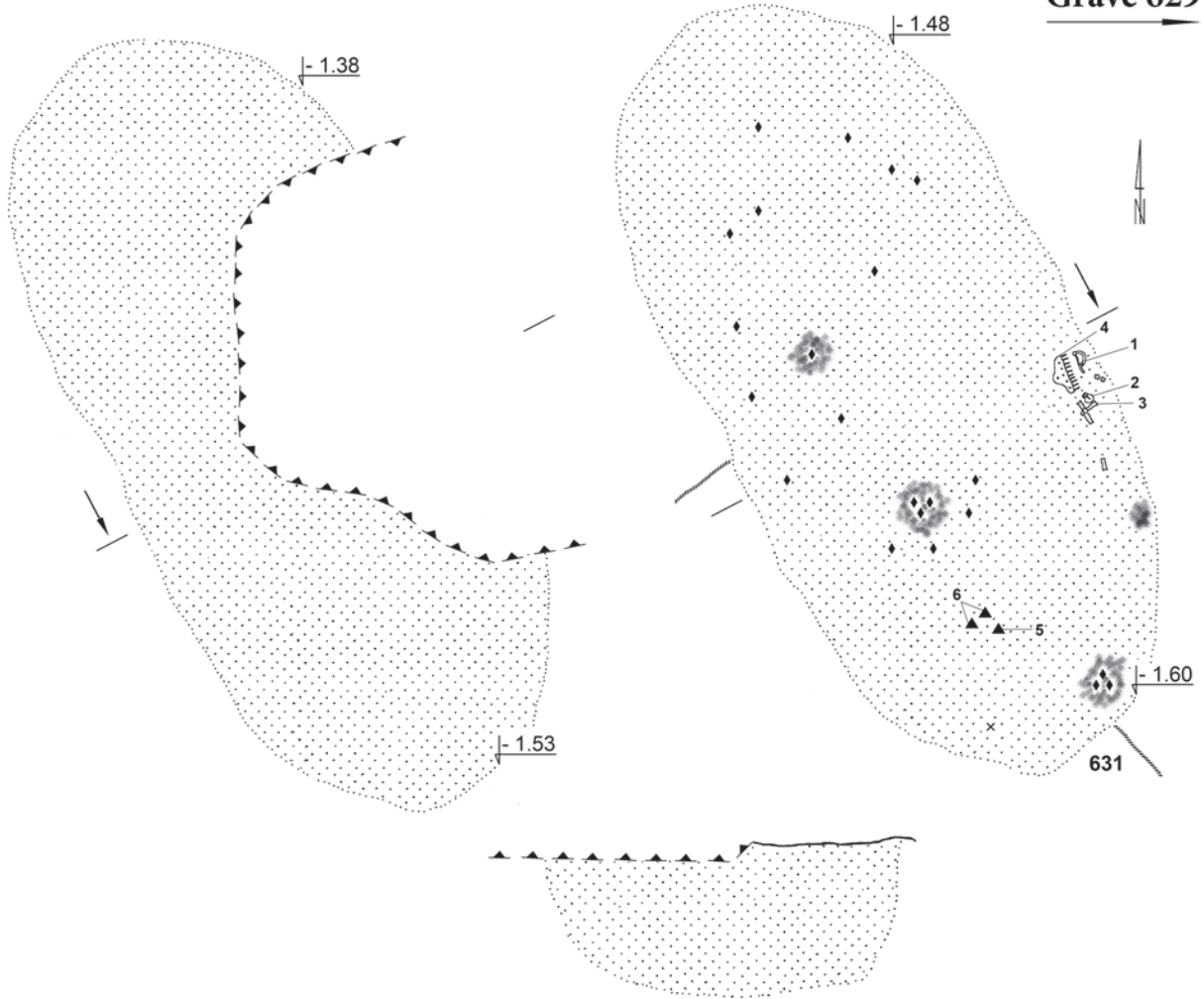


Pl. CLIII. Graves 624 & 627. Grave 624: 1-1 – ceramic. Grave 627: 1 – ceramic. Grave 628

Grave 628

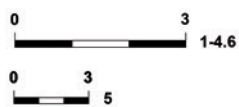
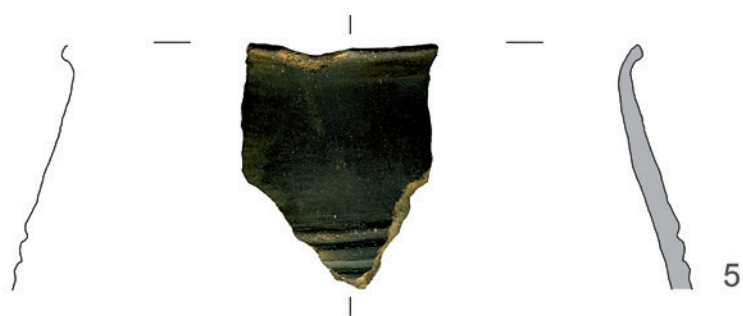
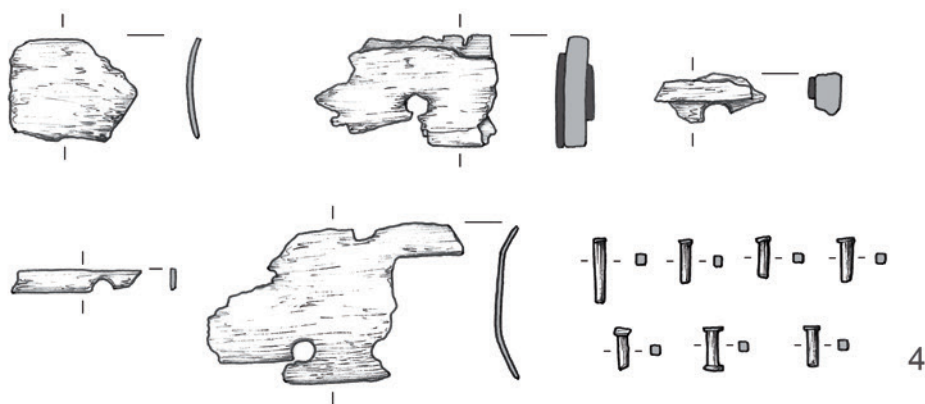
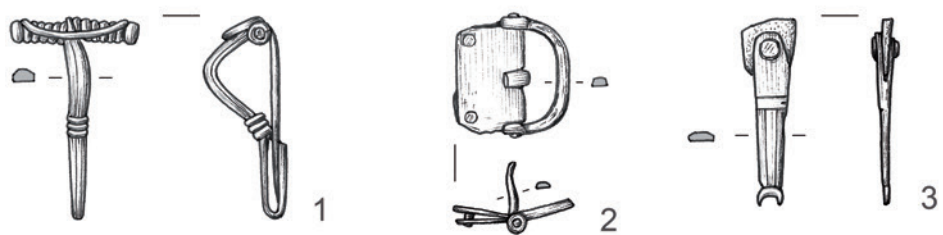


Grave 629



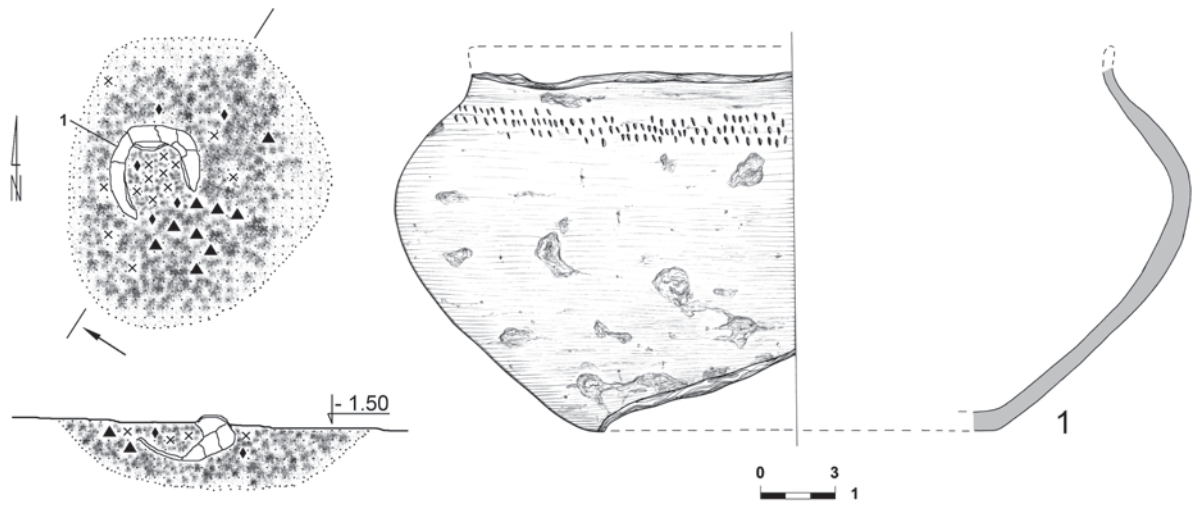
Pl. CLIV. Grave 628: 1 – copper alloy; 2 – iron; 3 – ceramic. Grave 629

Grave 629

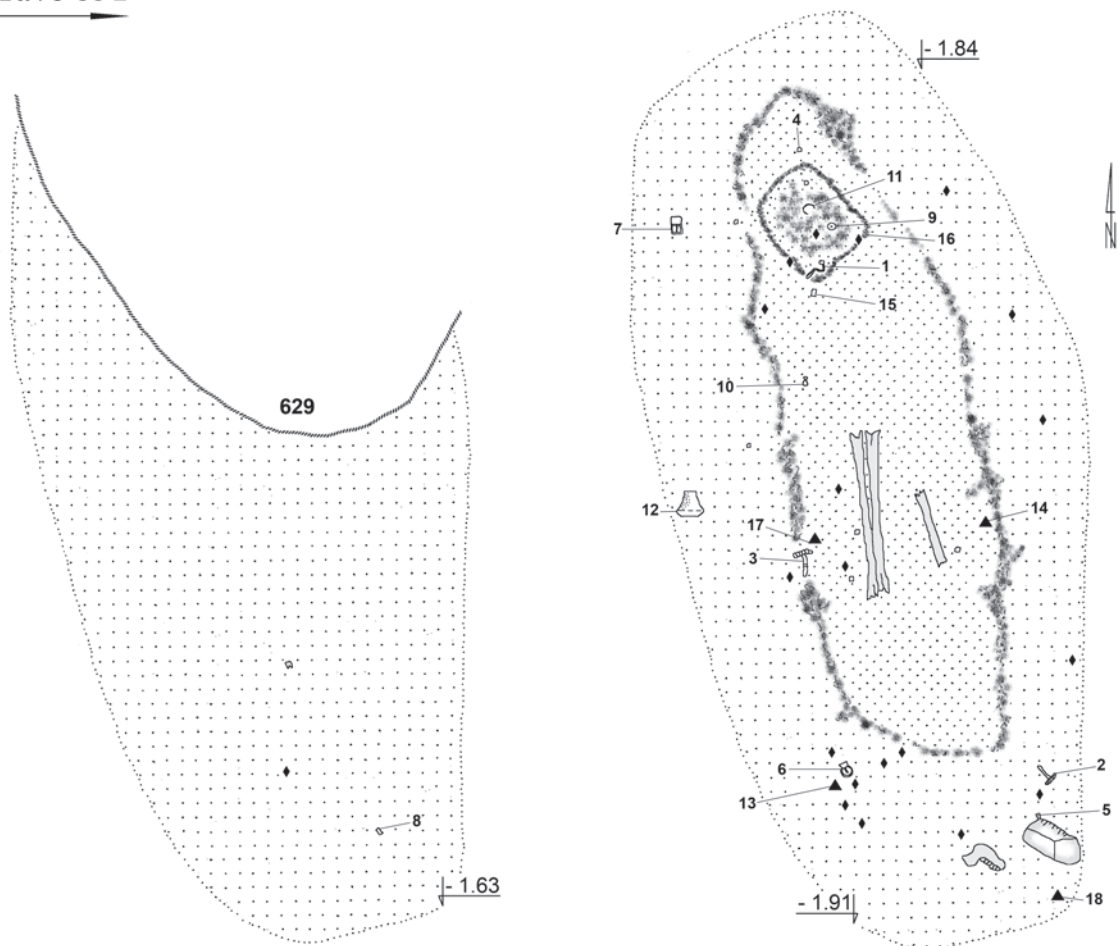


Pl. CLV. Grave 629: 1 – silver; 2-3 – copper alloy; 4 – bone (antler [?]) and copper alloy; 5-6 – ceramic

Grave 630

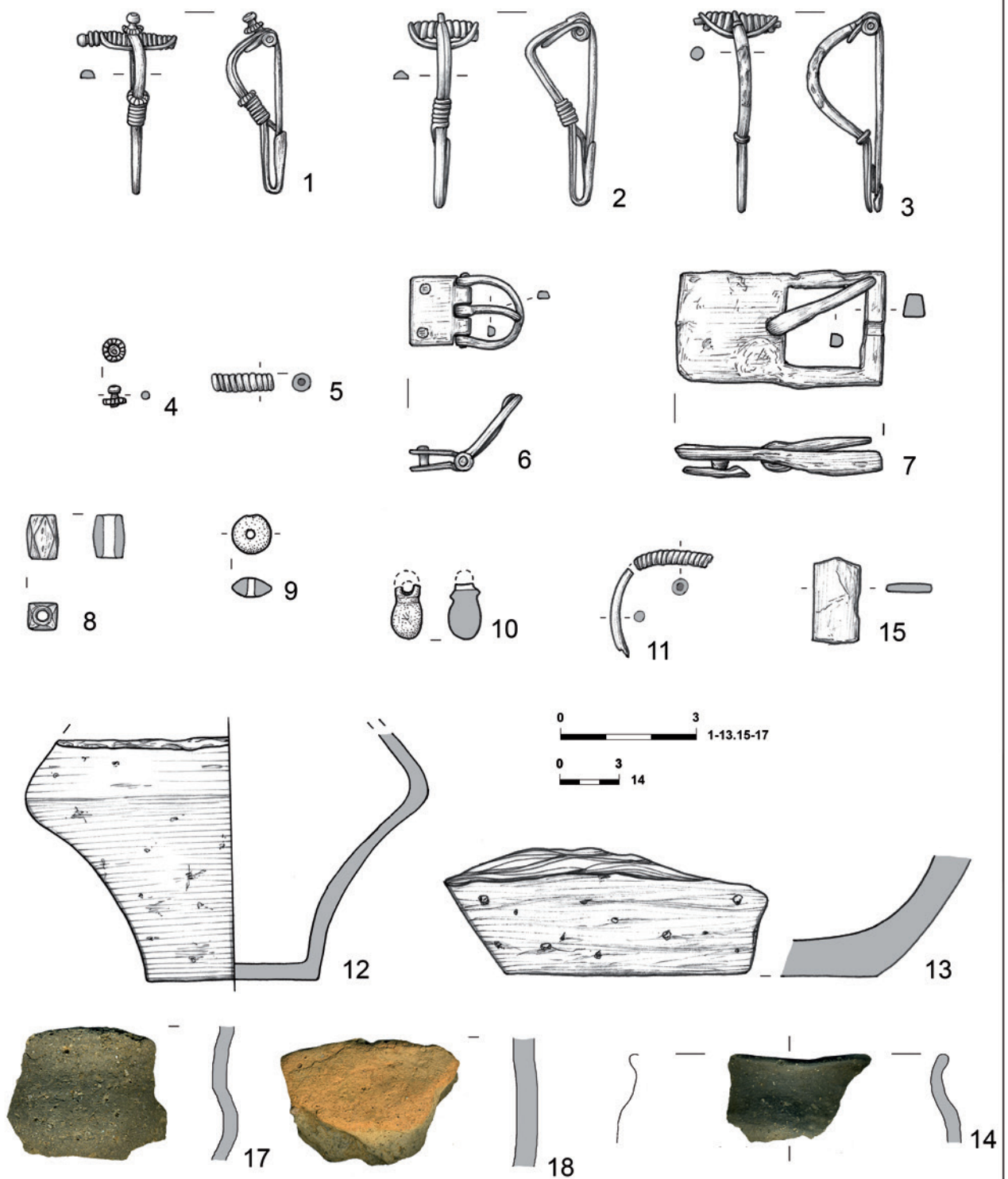


Grave 631



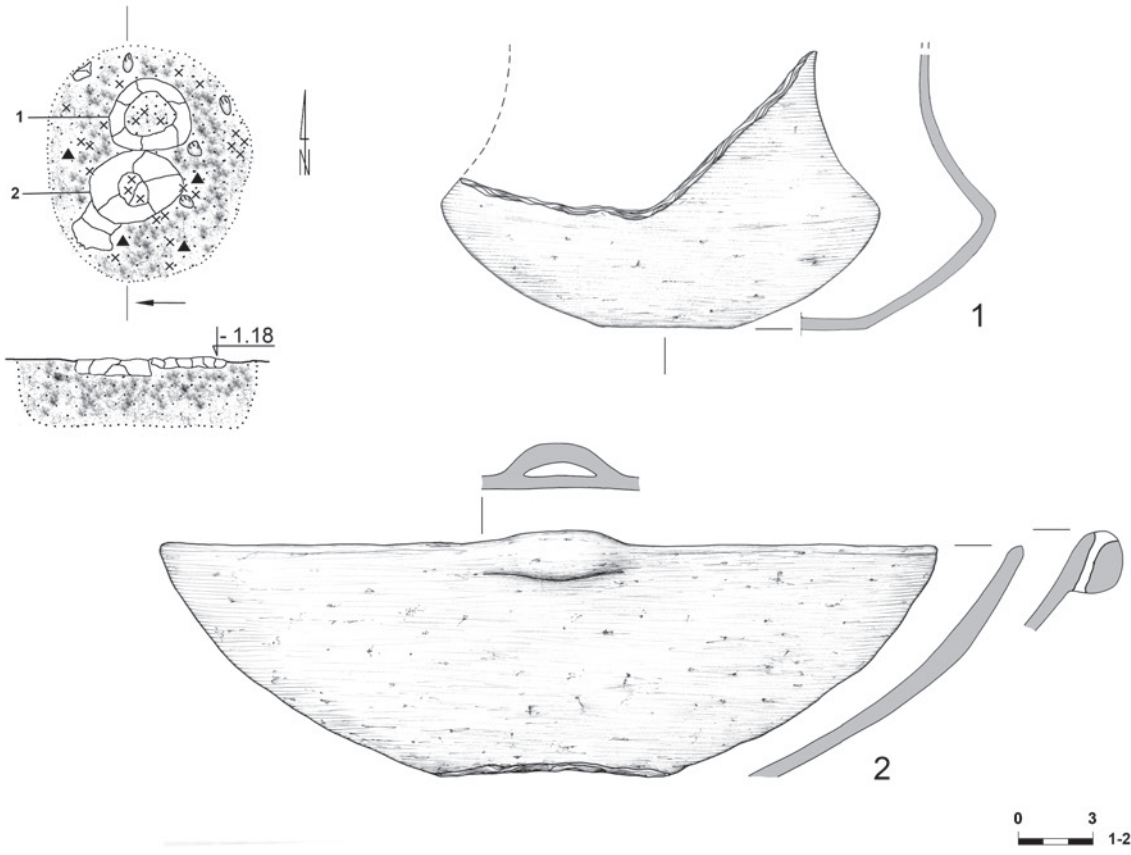
Pl. CLVI. Grave 630: 1 – ceramic. Grave 631: 16 (on plan) – wood

Grave 631

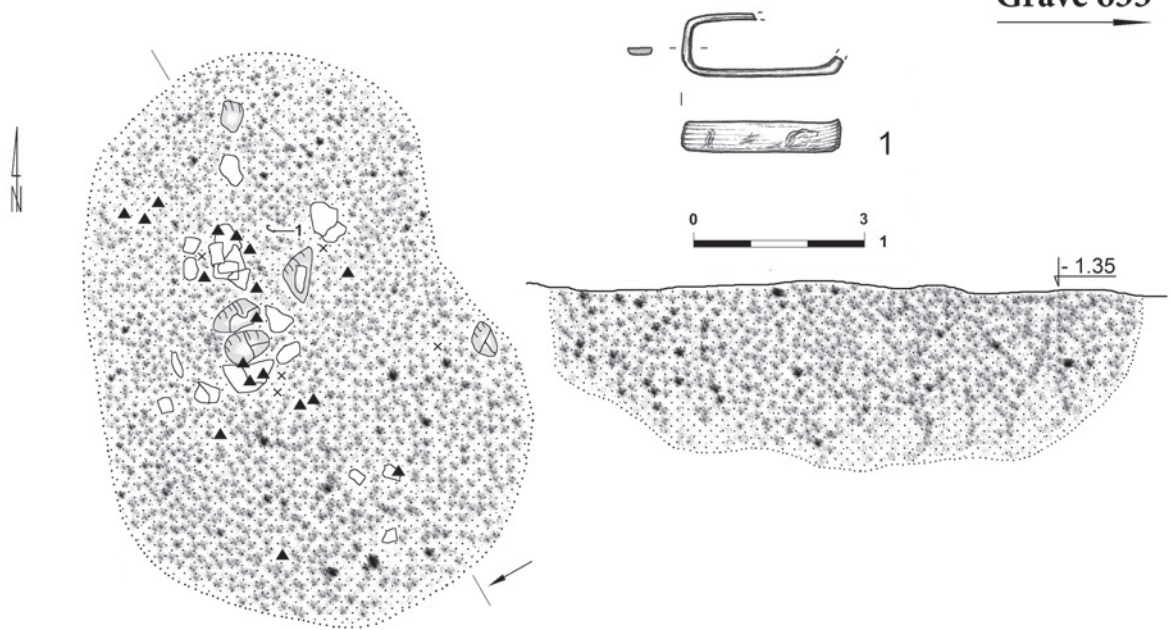


Pl. CLVII. Grave 631: 1-2.4-5 - silver; 3.6.11 - copper alloy; 7.15 - iron; 8 - glass; 9-10 - amber; 12-14.17-18 - ceramic

Grave 632

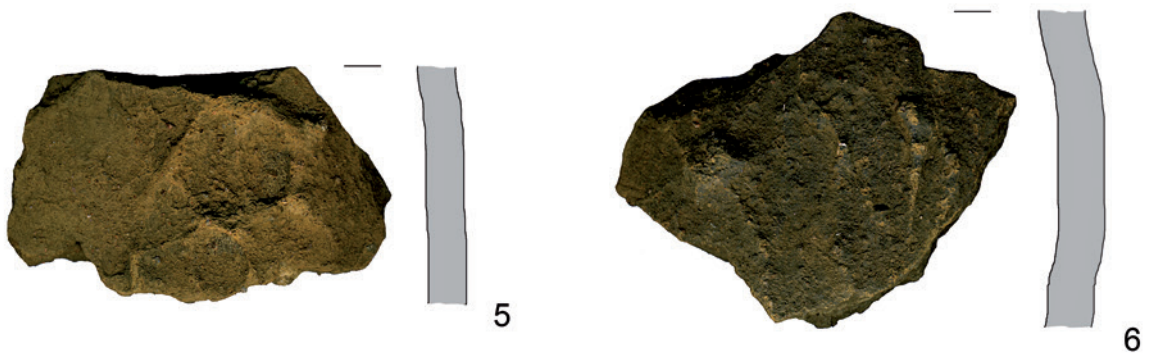


Grave 633



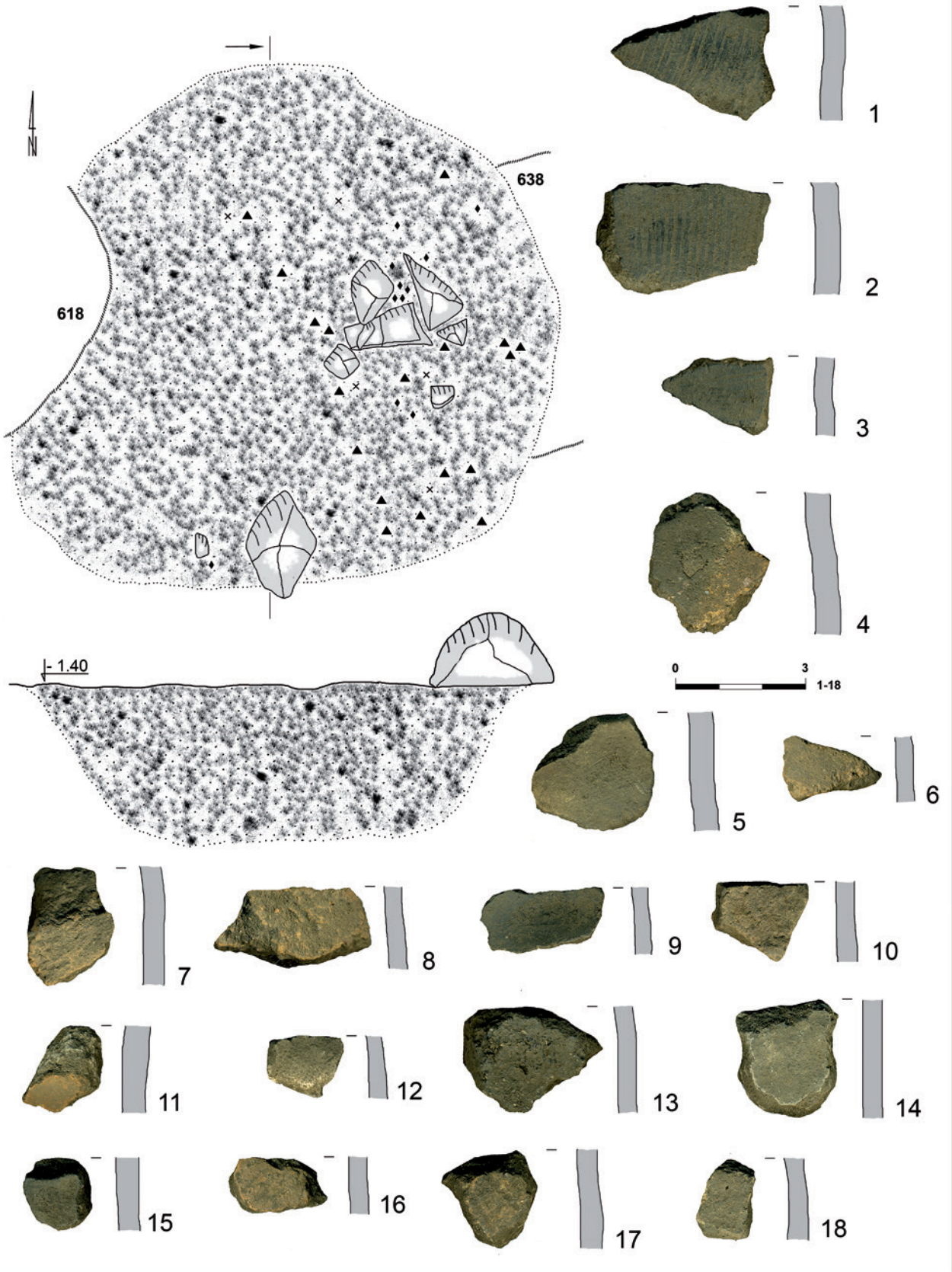
Pl. CLVIII. Grave 632: 1-2 – ceramic. Grave 633: 1 – iron

Grave 633



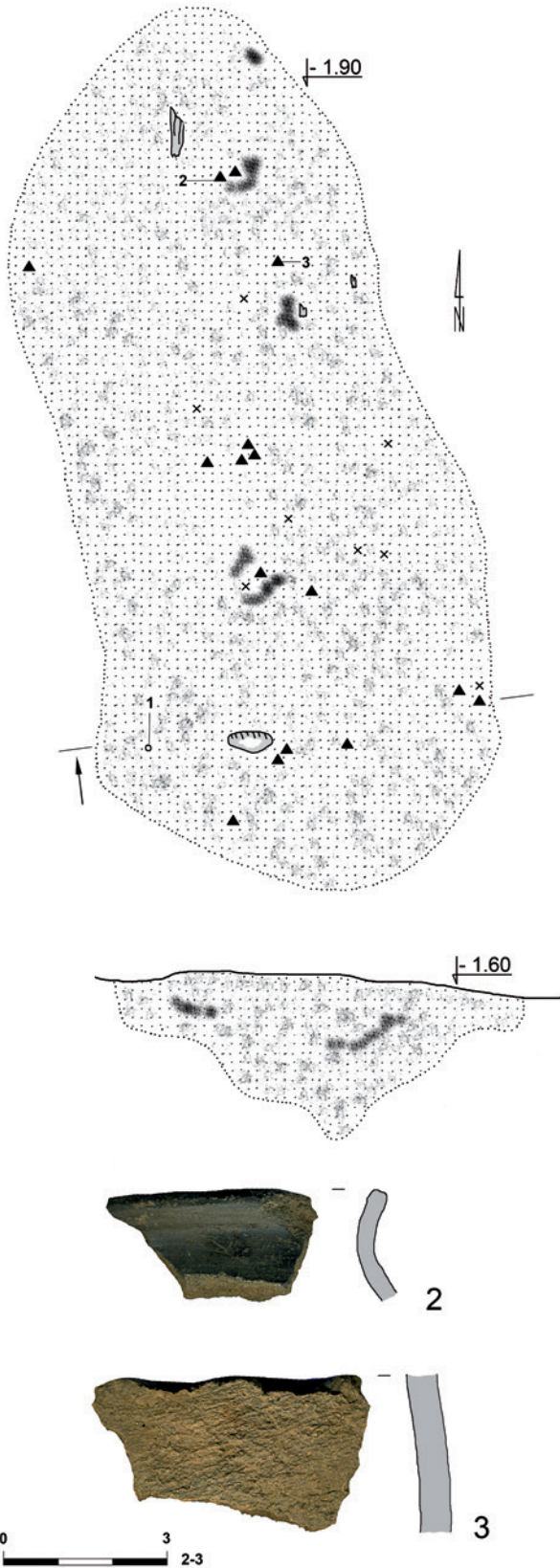
Pl. CLIX. Grave 633: 2-6 – ceramic

Grave 634

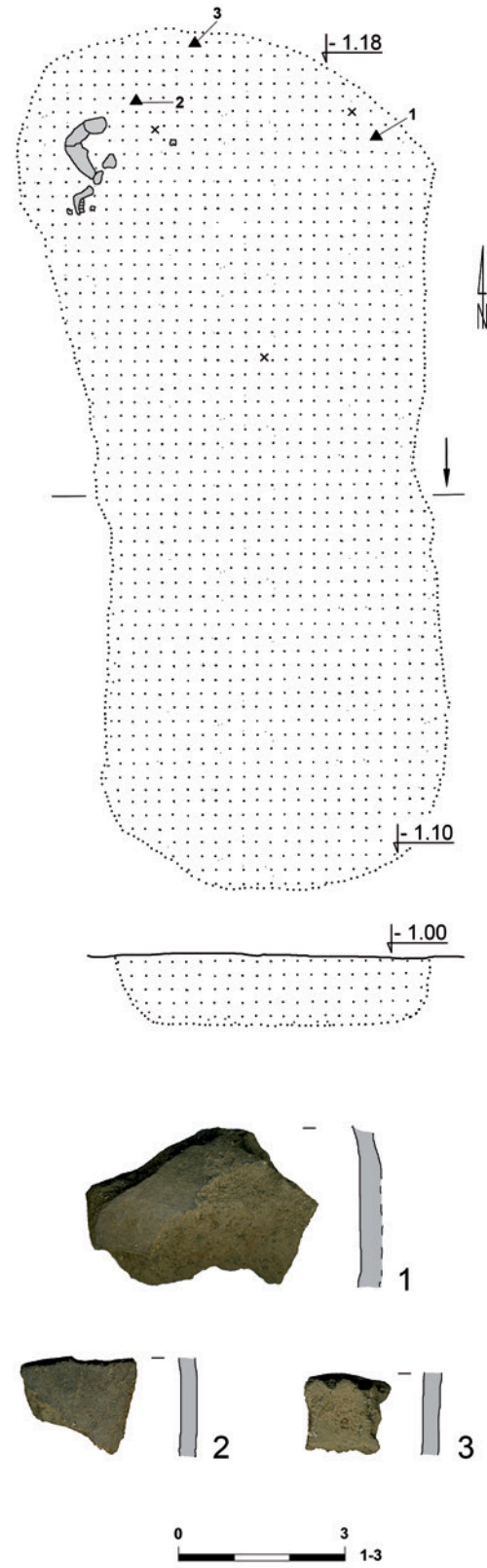


Pl. CLX. Grave 634: 1-18 – ceramic

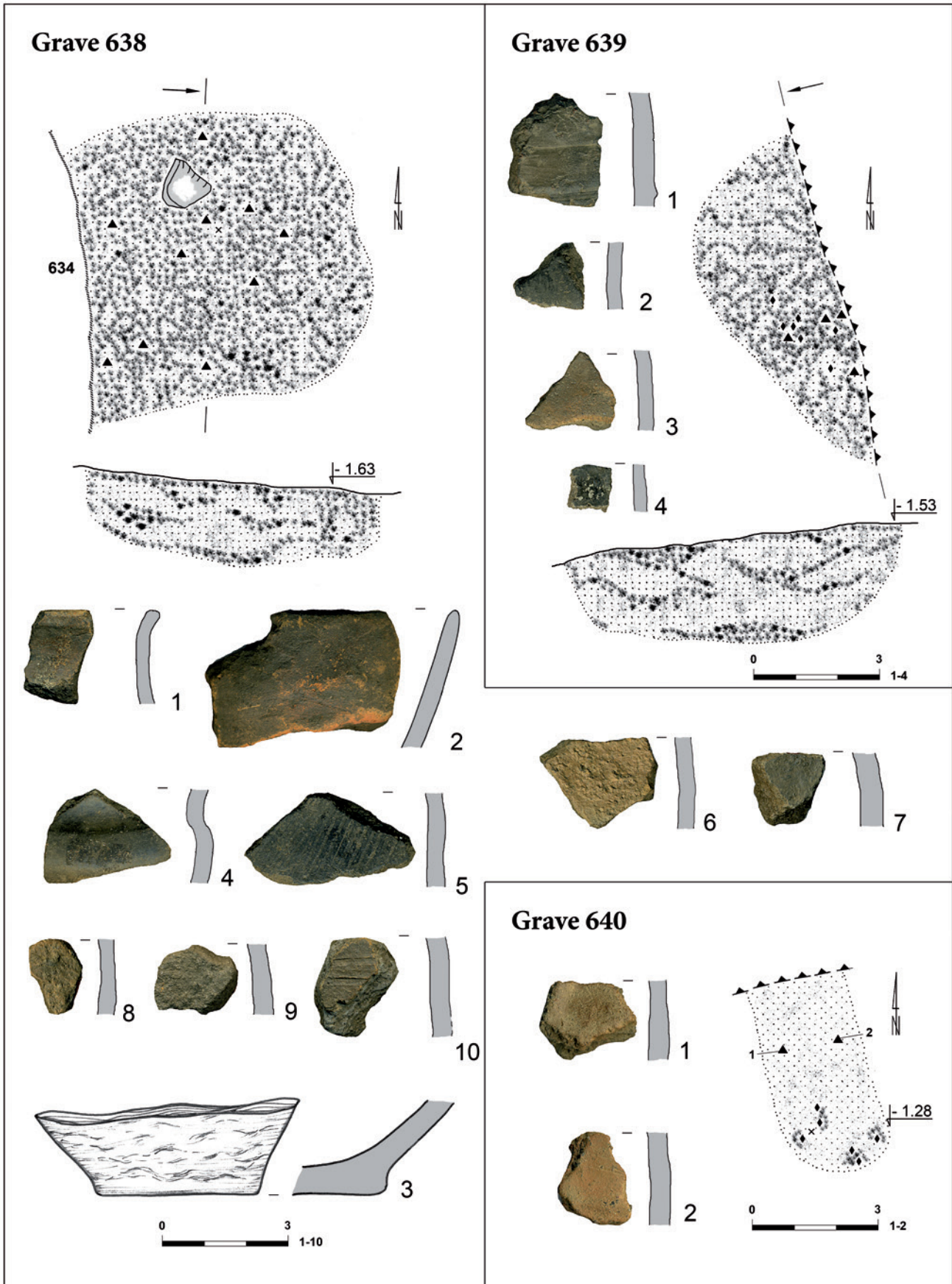
Grave 635



Grave 636

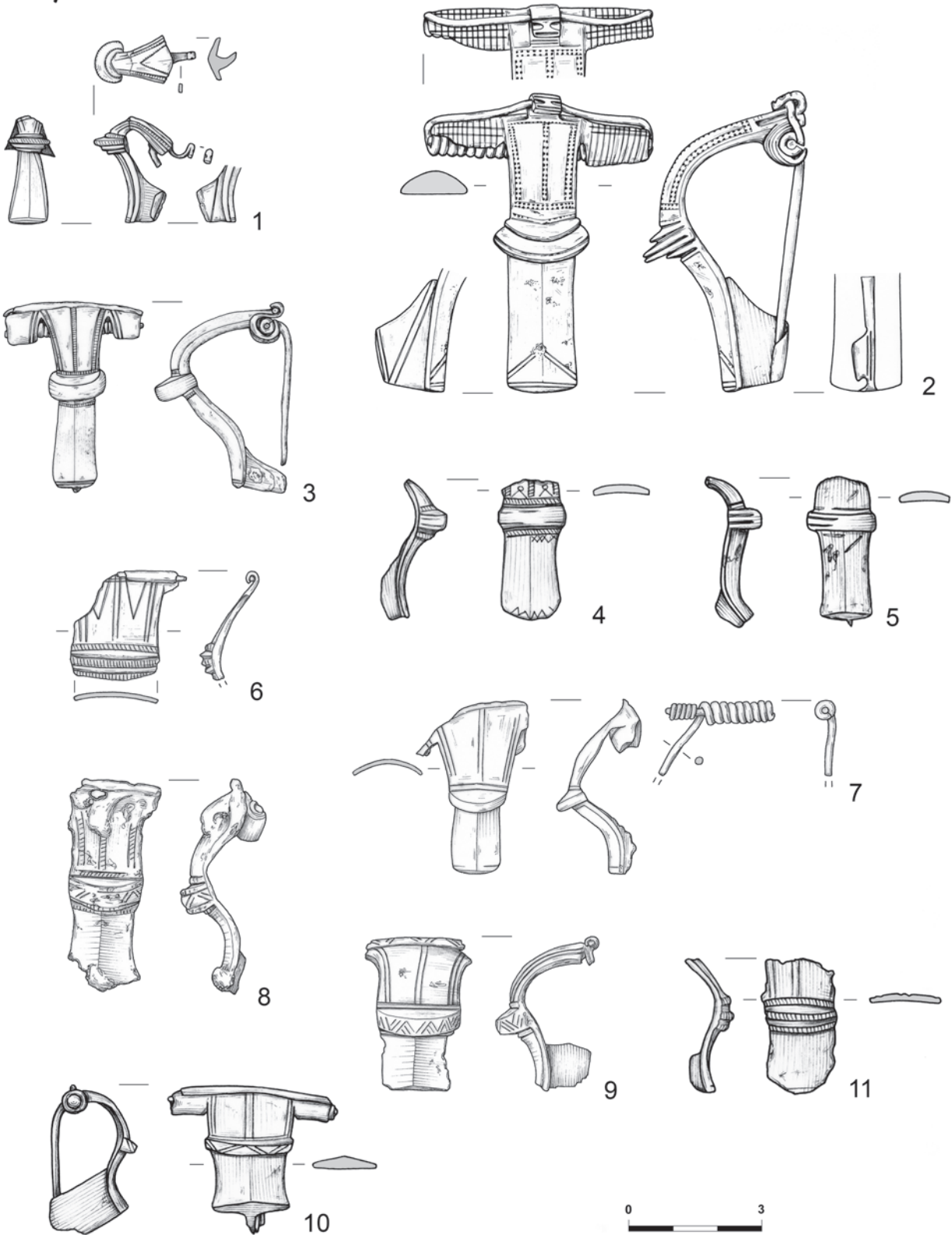


Pl. CLXI. Grave 635: 2-3 – ceramic. Grave 636: 1-3 – ceramic



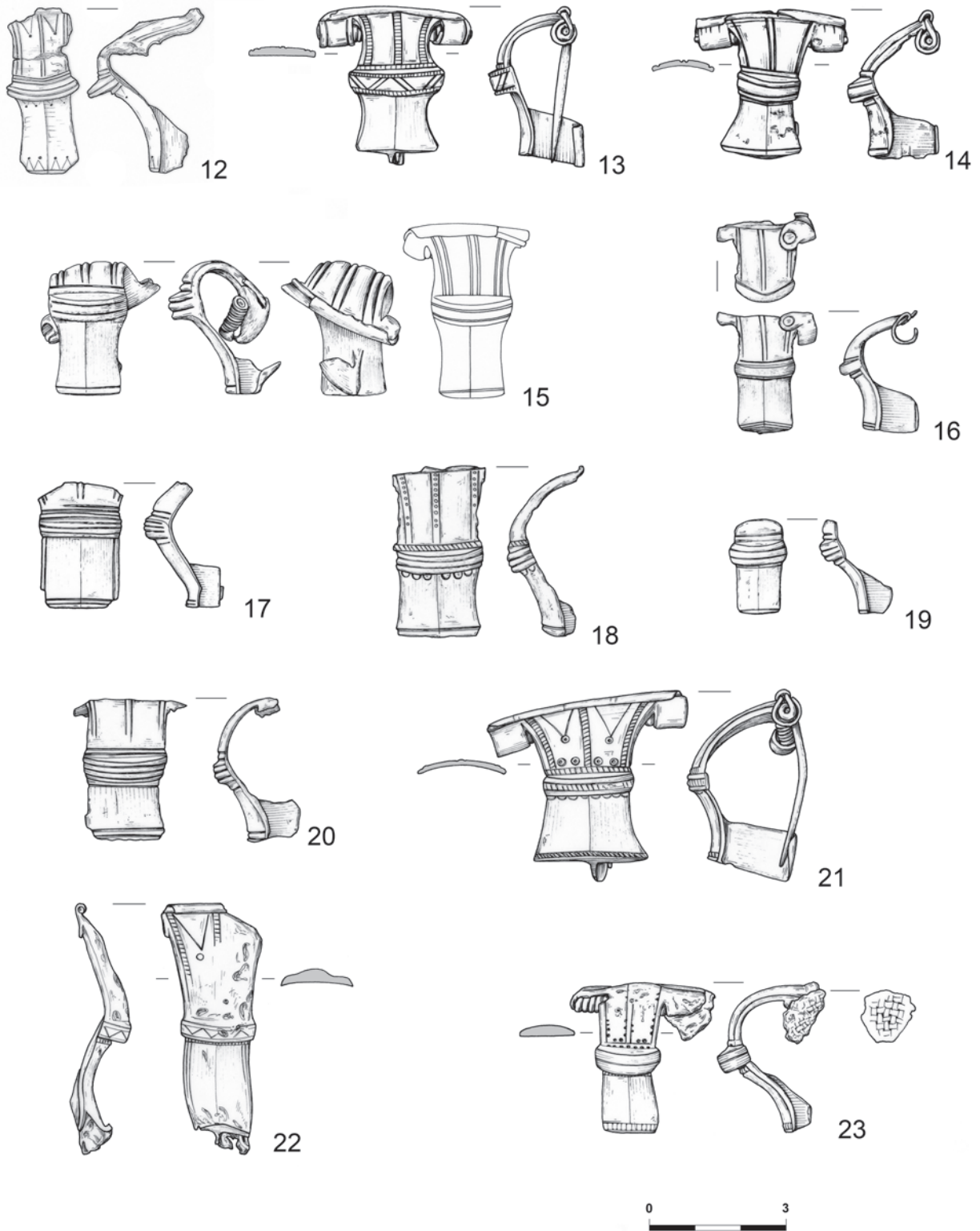
Pl. CLXII. Grave 638: 1-10 – ceramic. Grave 639: 1-4 – ceramic. Grave 640: 1-2 – ceramic

Stray finds



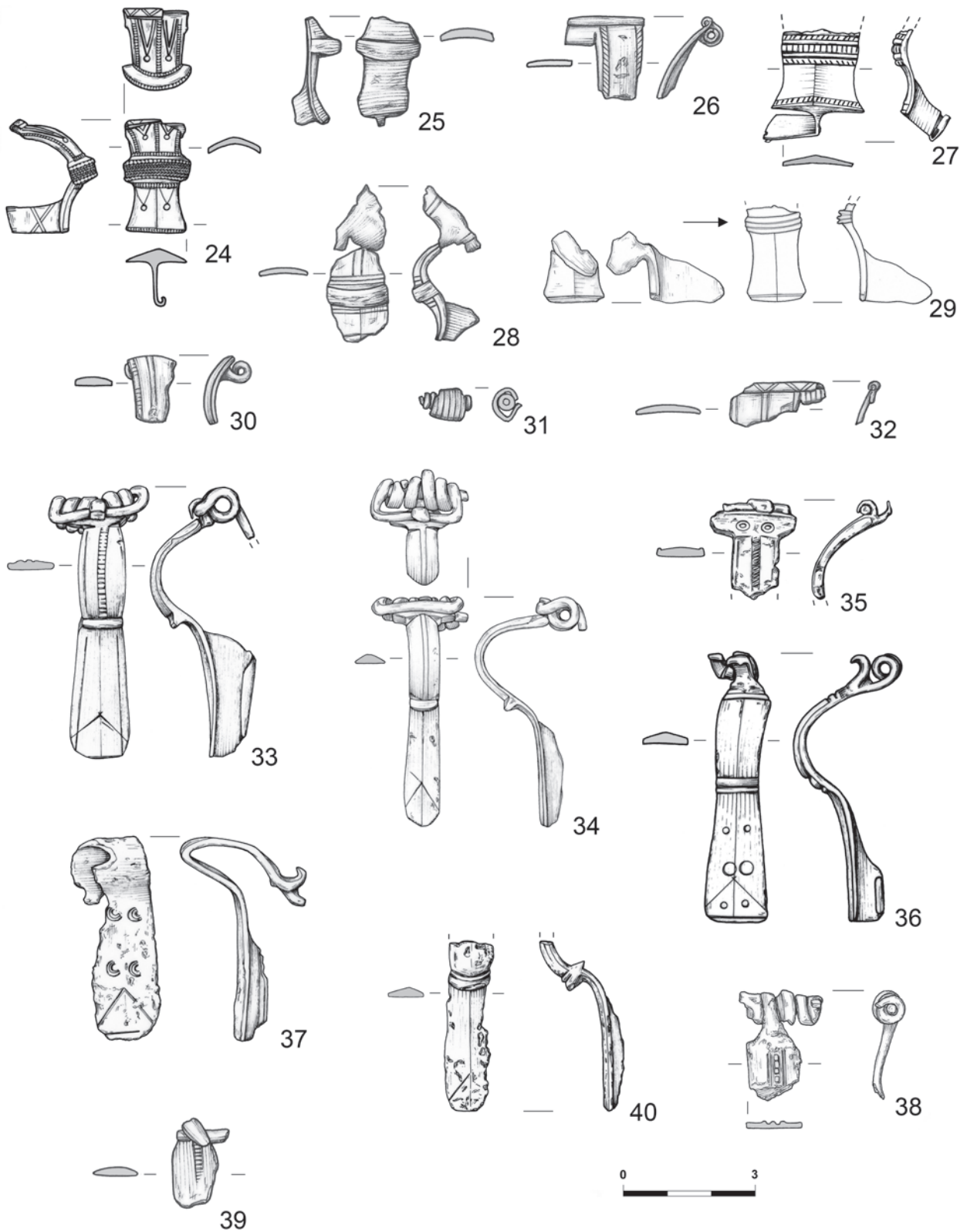
Pl. CLXIII. Stray finds: 1-2 – brass; 3-11 – copper alloy

Stray finds



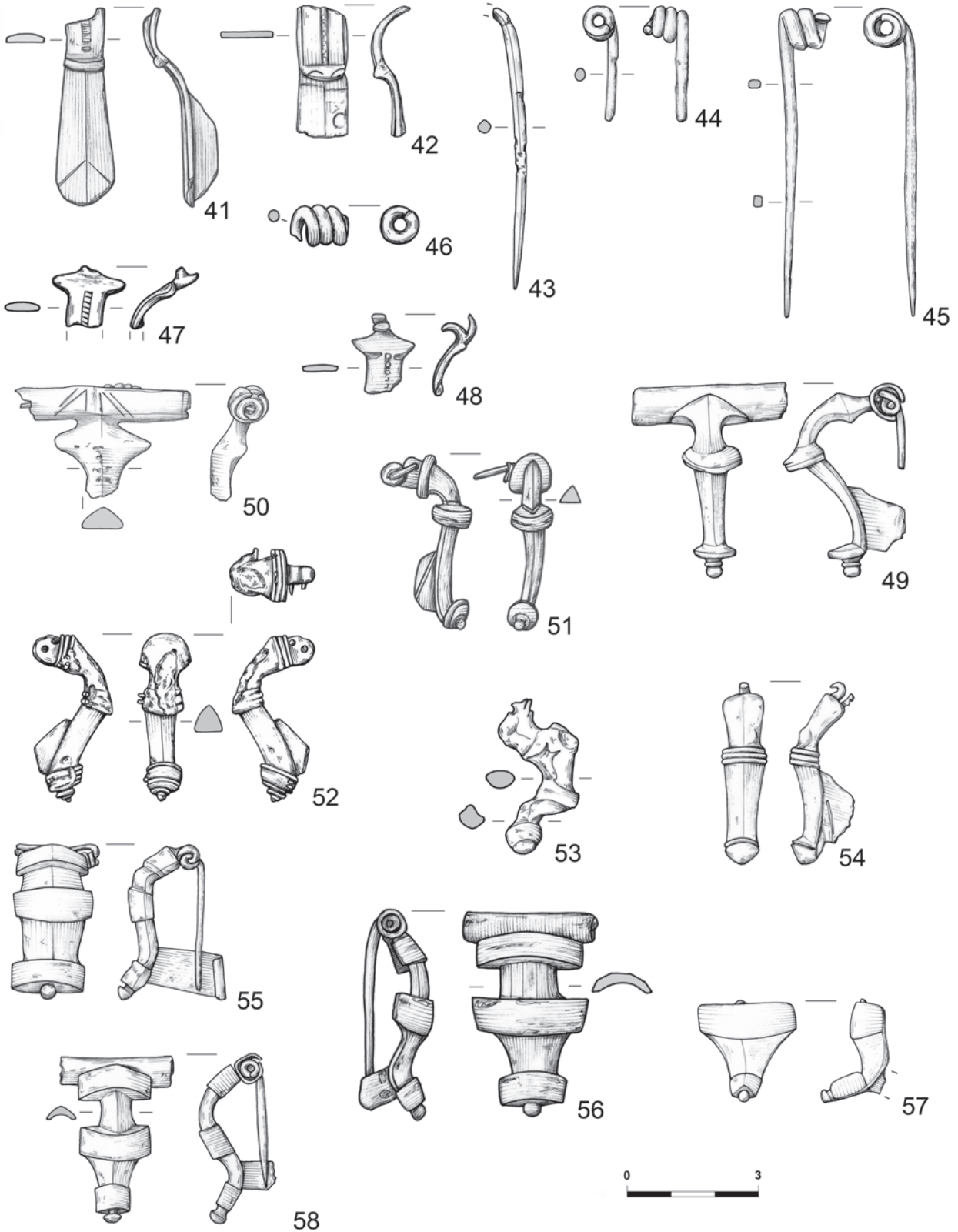
Pl. CLXIV. Stray finds: 17 – silver; 13 – brass; 12.14–16.18–23 – copper alloy

Stray finds



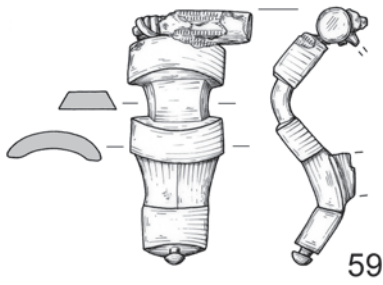
Pl. CLXV. Stray finds: 26-27 - silver, 34 - brass, 24-25.28-33.35-40 - copper alloy

Stray finds

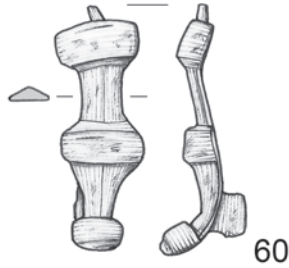


Pl. CLXVI. Stray finds: 53 – silver, 54 – brass, 41–52.55–58 – copper alloy

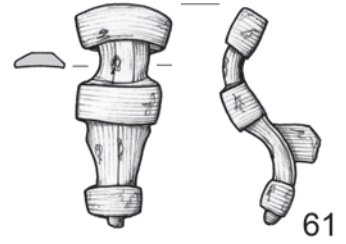
Stray finds



59



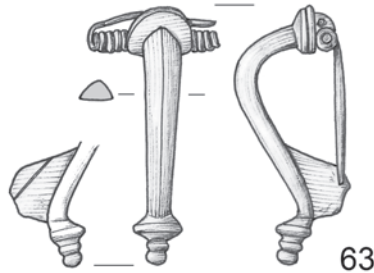
60



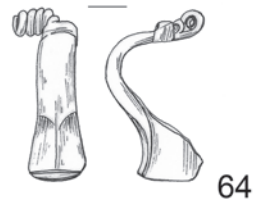
61



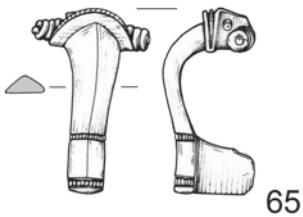
62



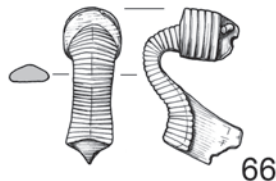
63



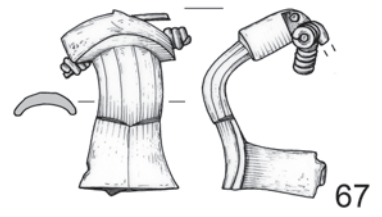
64



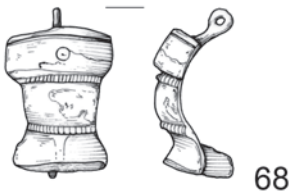
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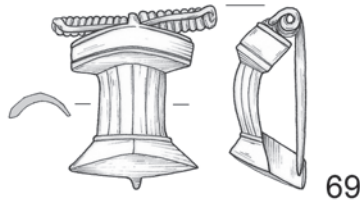
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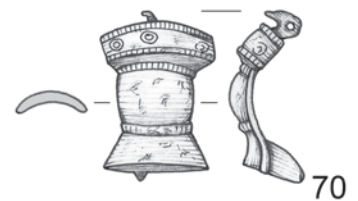
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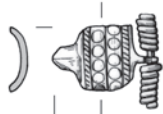
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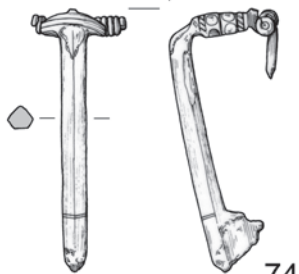
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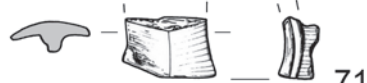
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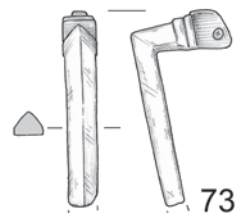
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74



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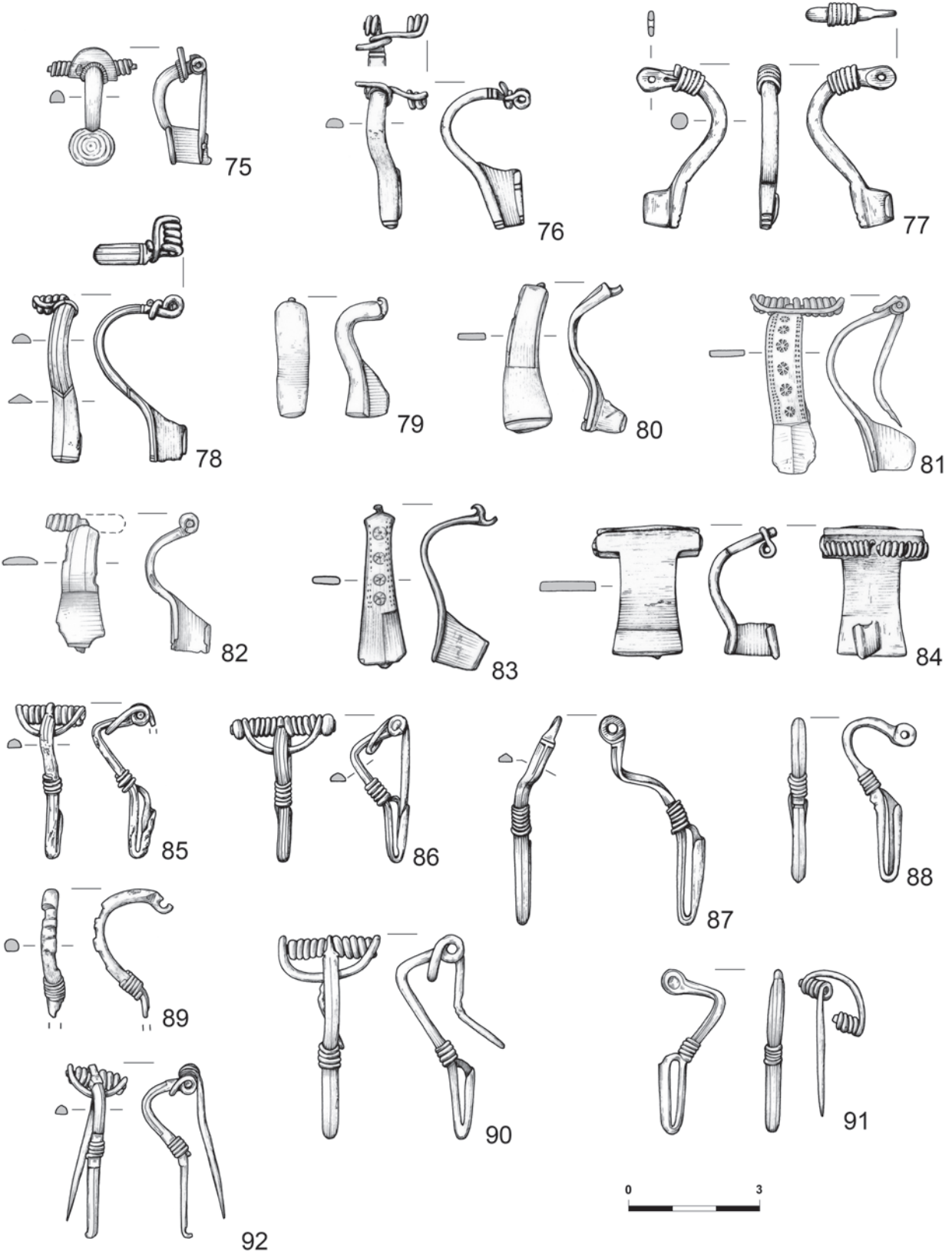


73



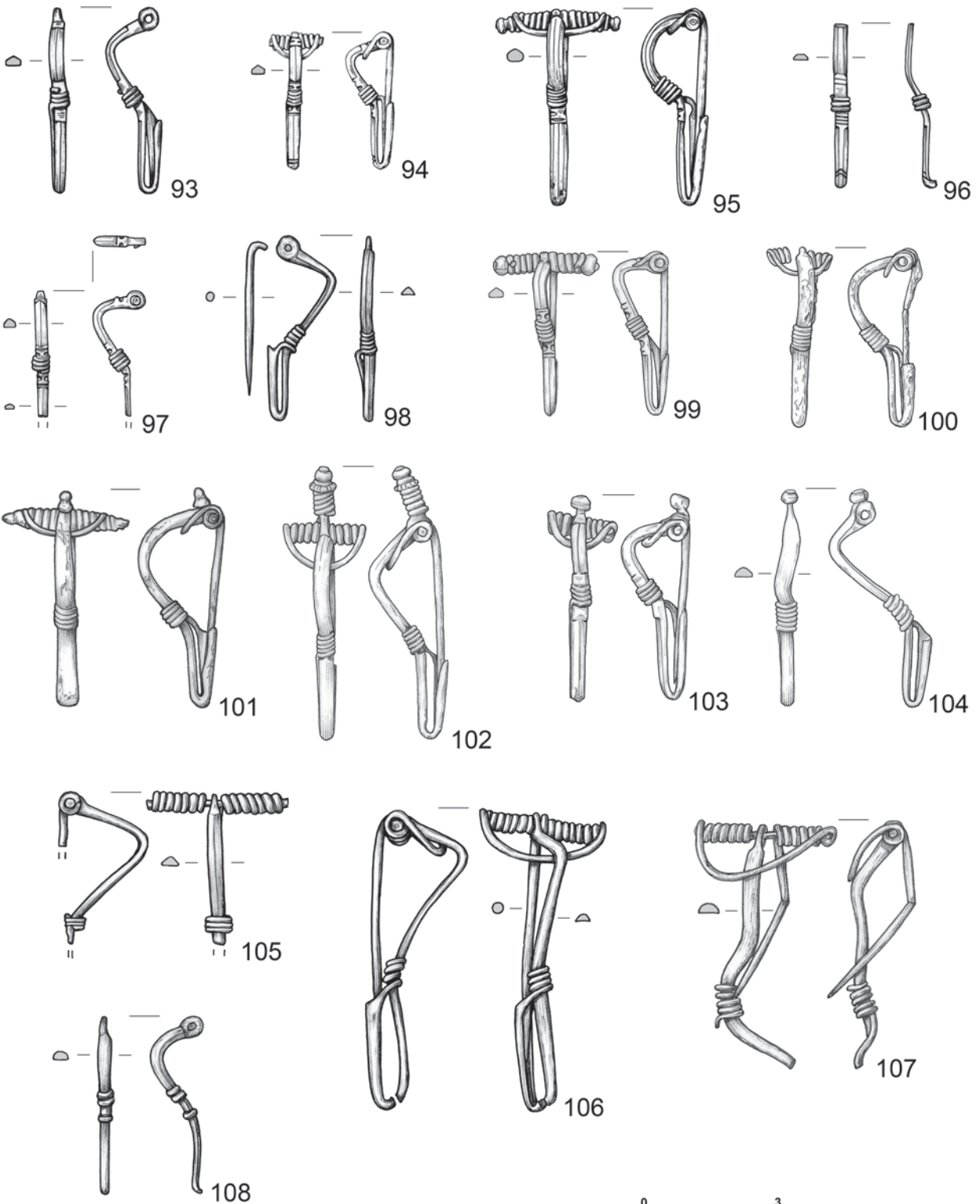
Pl. CLXVII. Stray finds: 71 – silver; 59 – copper alloy and silver foil; 60–70.72–74 – copper alloy; 66 – iron

Stray finds



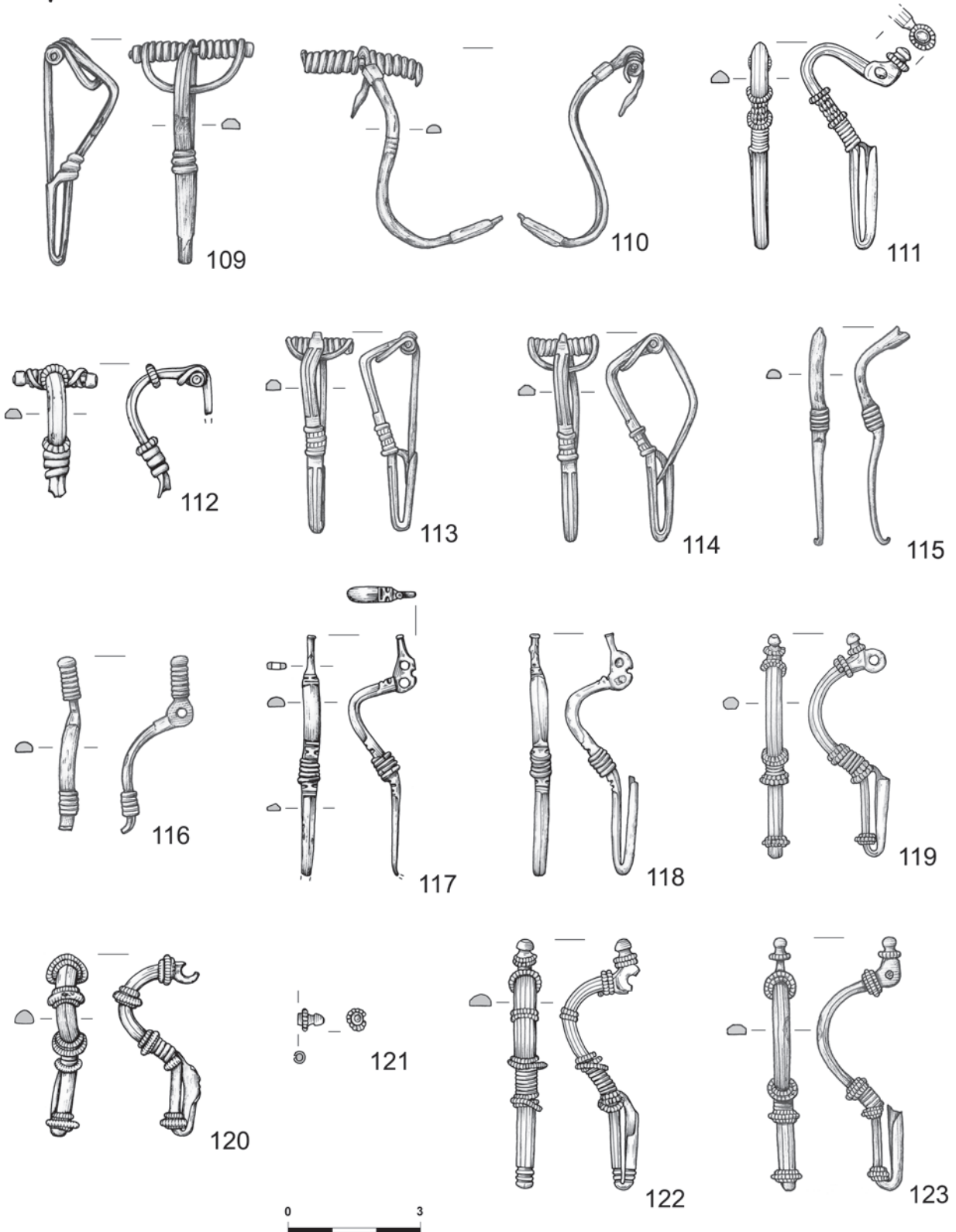
Pl. CLXVIII. Stray finds: 85-86.91 - silver; 75 - brass and gilded silver or gold foil; 76-83.87-90.92 - copper alloy; 84 - copper alloy and tin coating

Stray finds



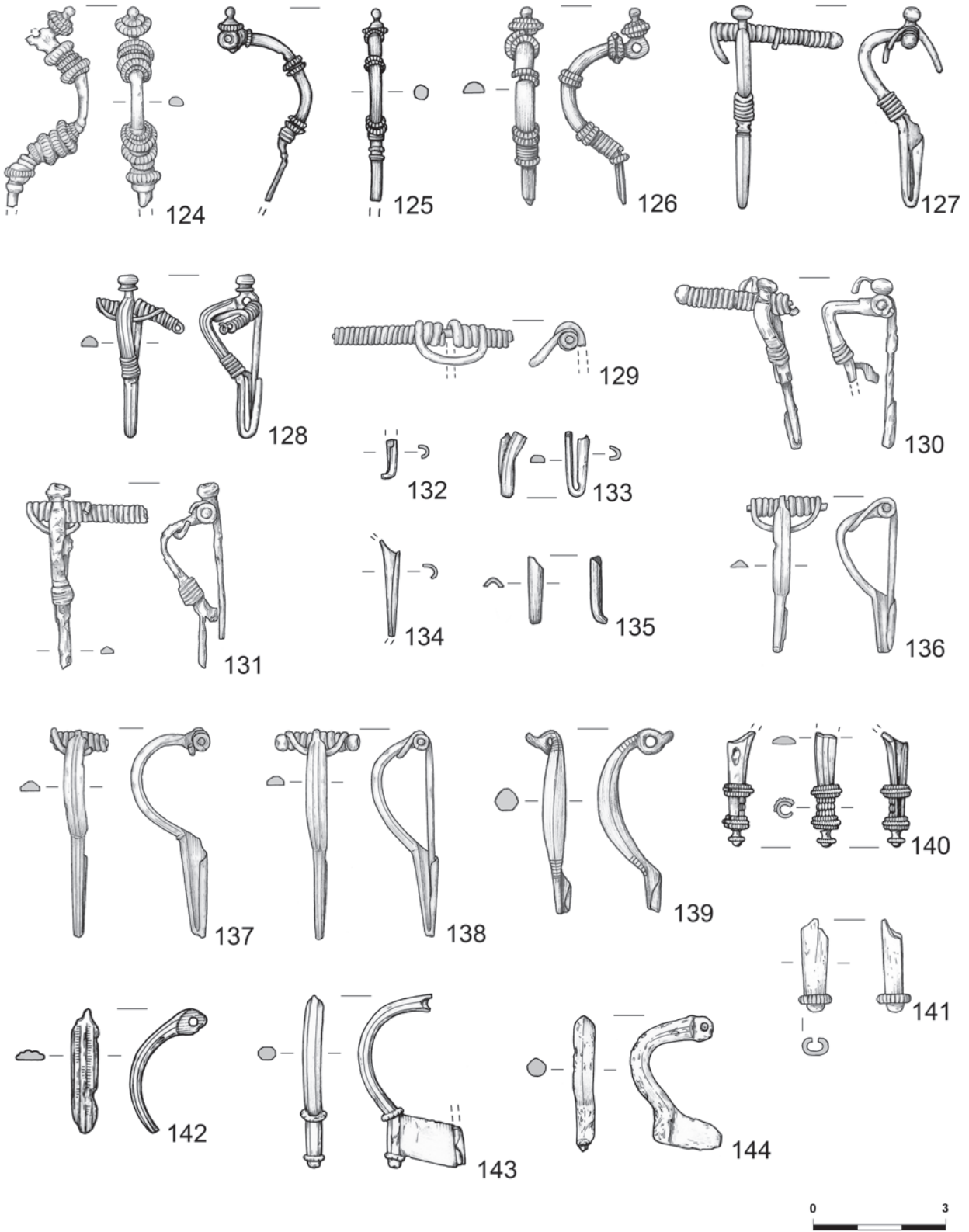
Pl. CLXIX. Stray finds: 94.96-98.102.104 - silver; 93.95.99-101.103.105-108 - copper alloy

Stray finds



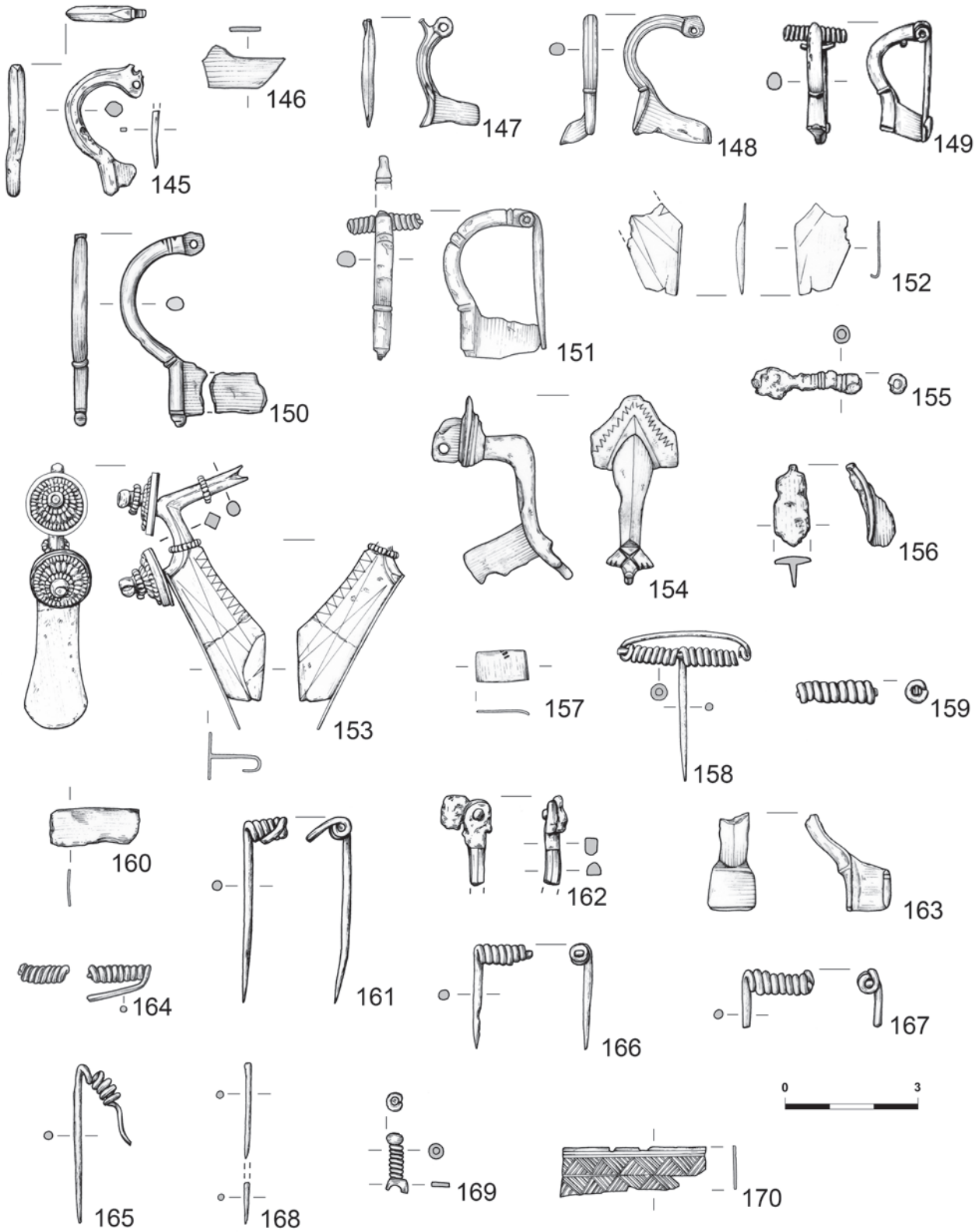
Pl. CLXX. Stray finds: 111.113 – silver and gold foil; 114 – silver and gilded silver foil; 117–119.121–122 – silver; 109–110.112.115–116.120.123 – copper alloy

Stray finds



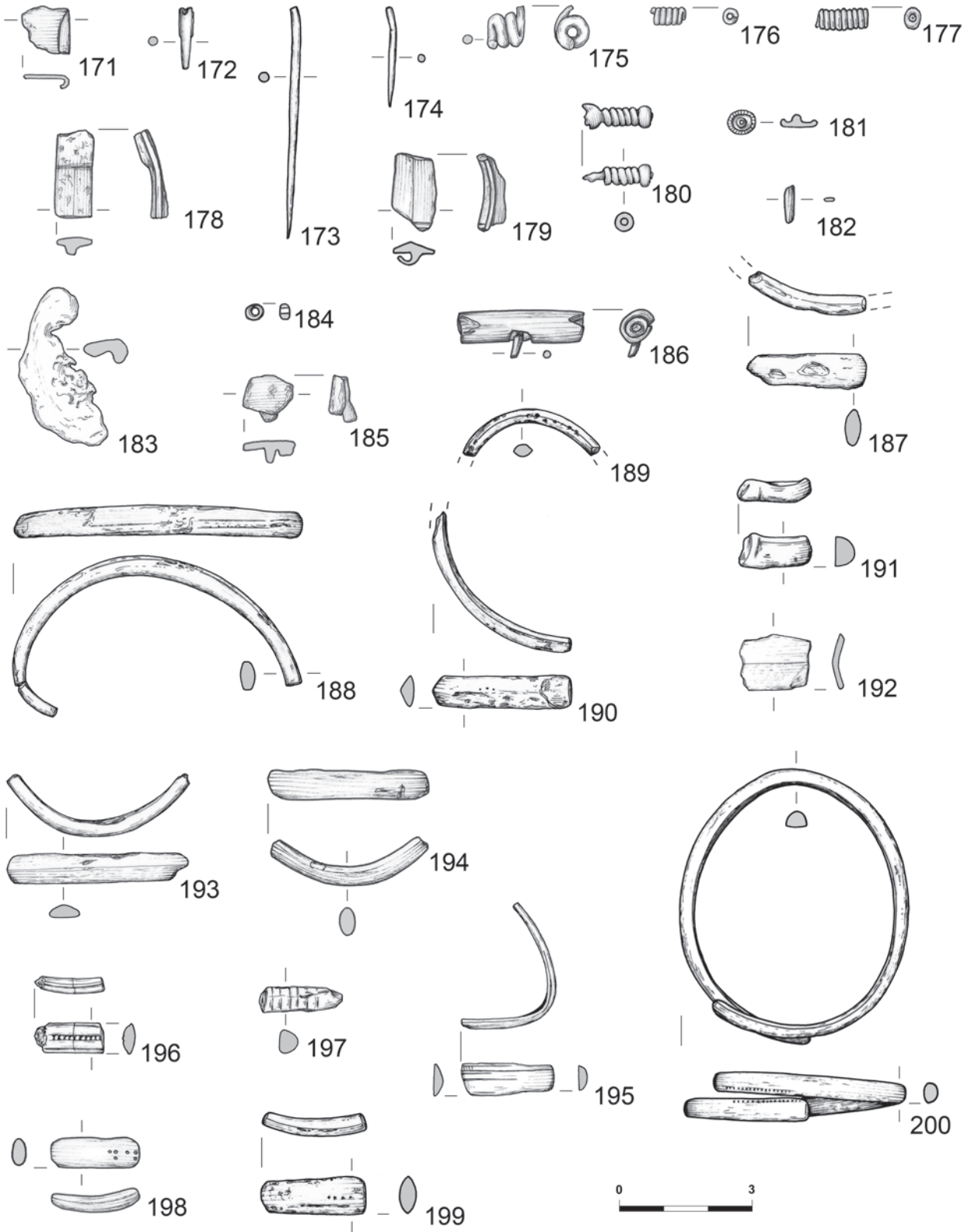
Pl. CLXXI. Stray finds: 140 – silver and gold foil; 124–126.128–129.132.134–135 – silver; 127.130.131.133.136–139.141–144 – copper alloy

Stray finds



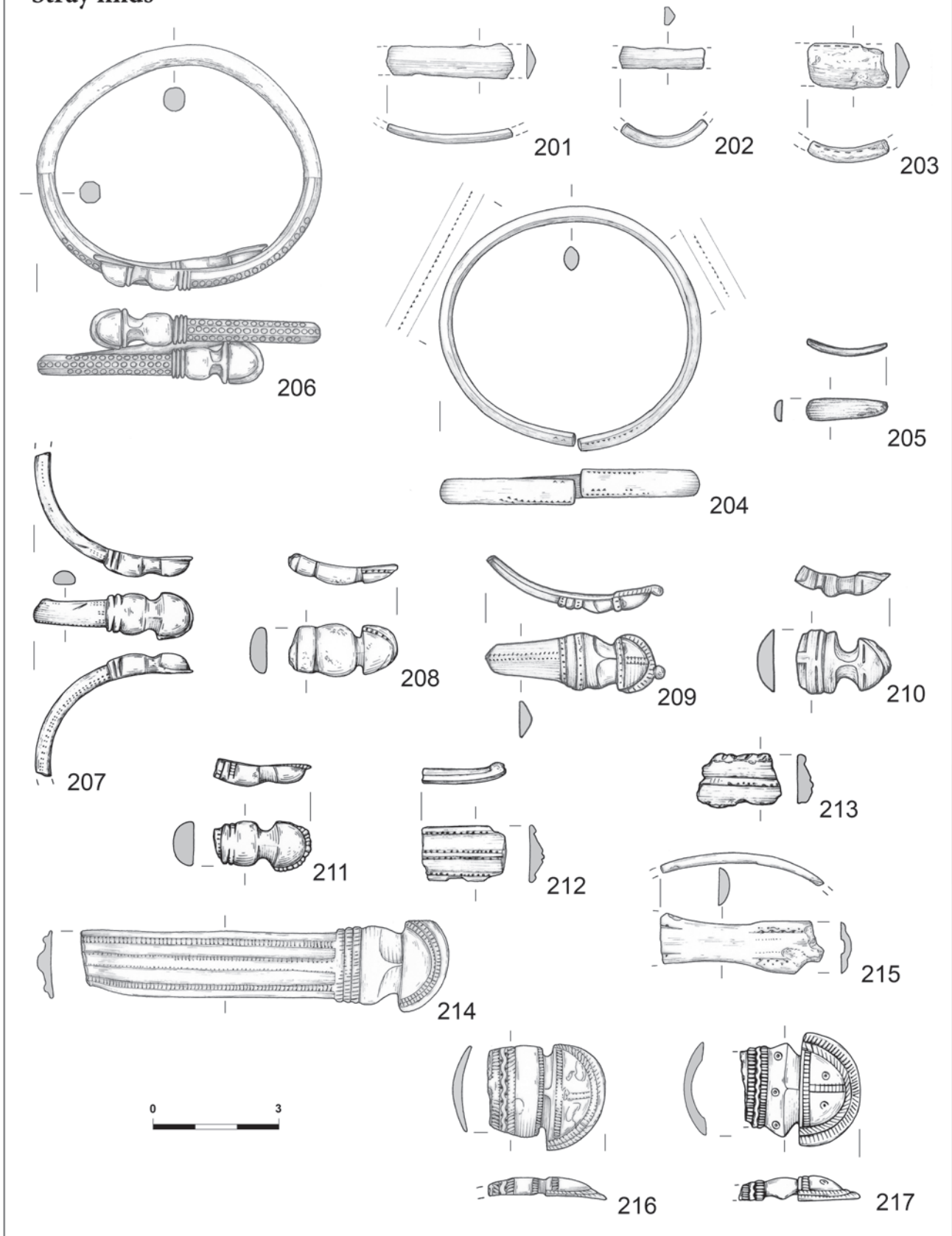
Pl. CLXXII. Stray finds: 146–147.152–157.161.169 – silver; 153 – silver and gold foil; 170 – gilded silver foil; 149 – brass; 154 – tin-lead bronze; 145.148.150–151.155–156.158–160.162–167 – copper alloy; 160 – iron

Stray finds



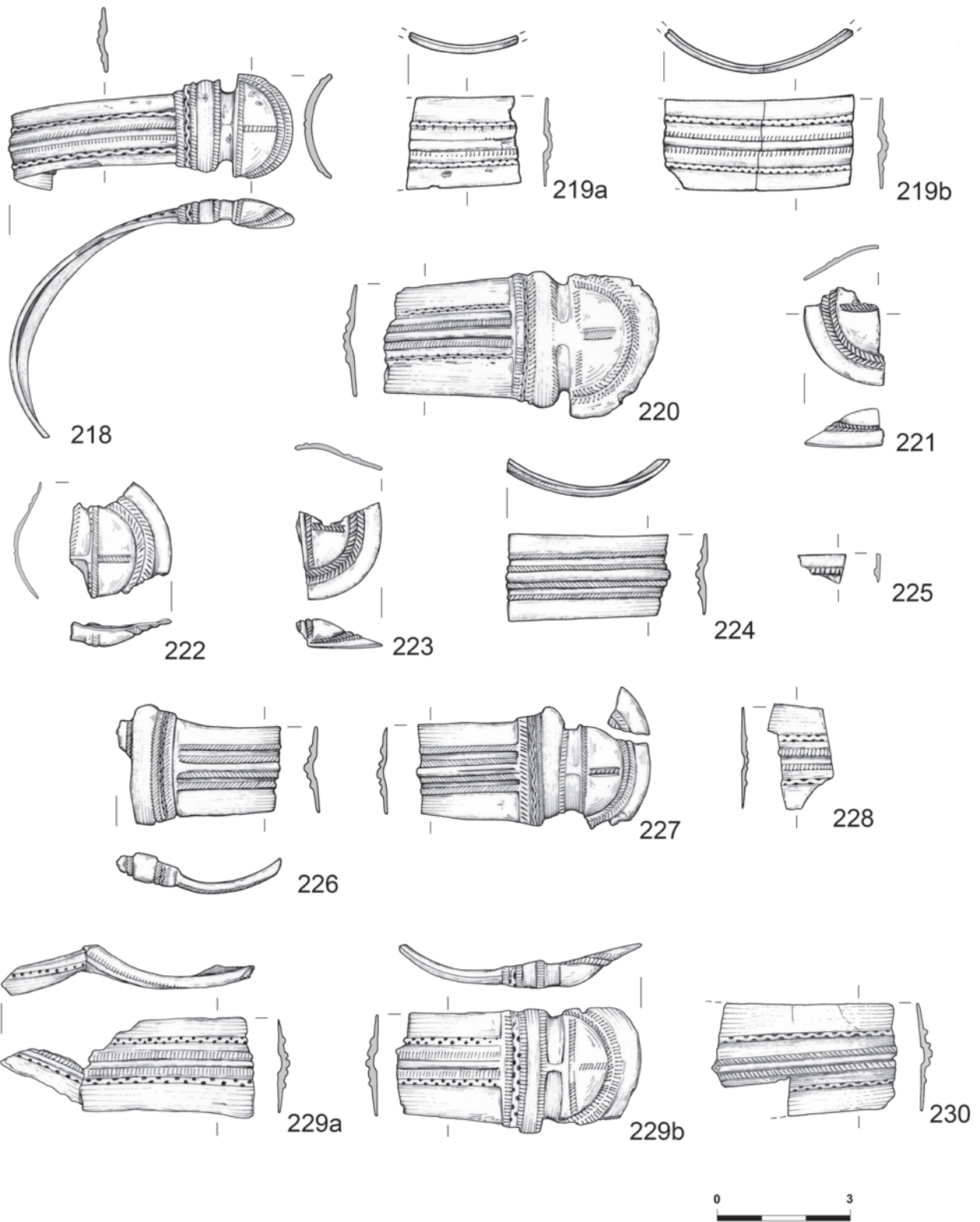
Pl. CLXXIII. Stray finds: 180-184 - silver; 171-179, 185, 187-200 - copper alloy; 186 - iron

Stray finds



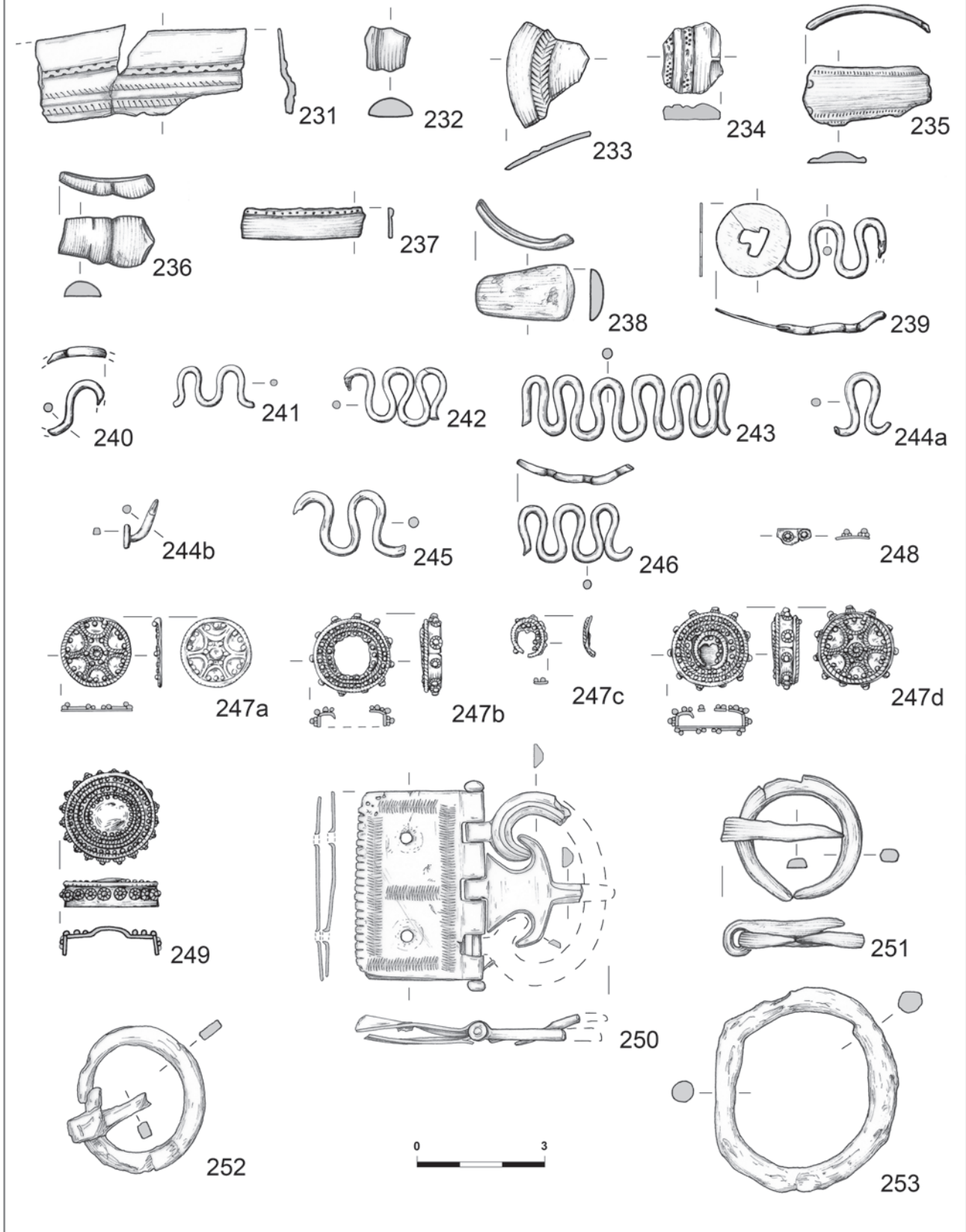
Pl. CLXXIV. Stray finds: 214-216 – silver; 201-213.217 – copper alloy

Stray finds



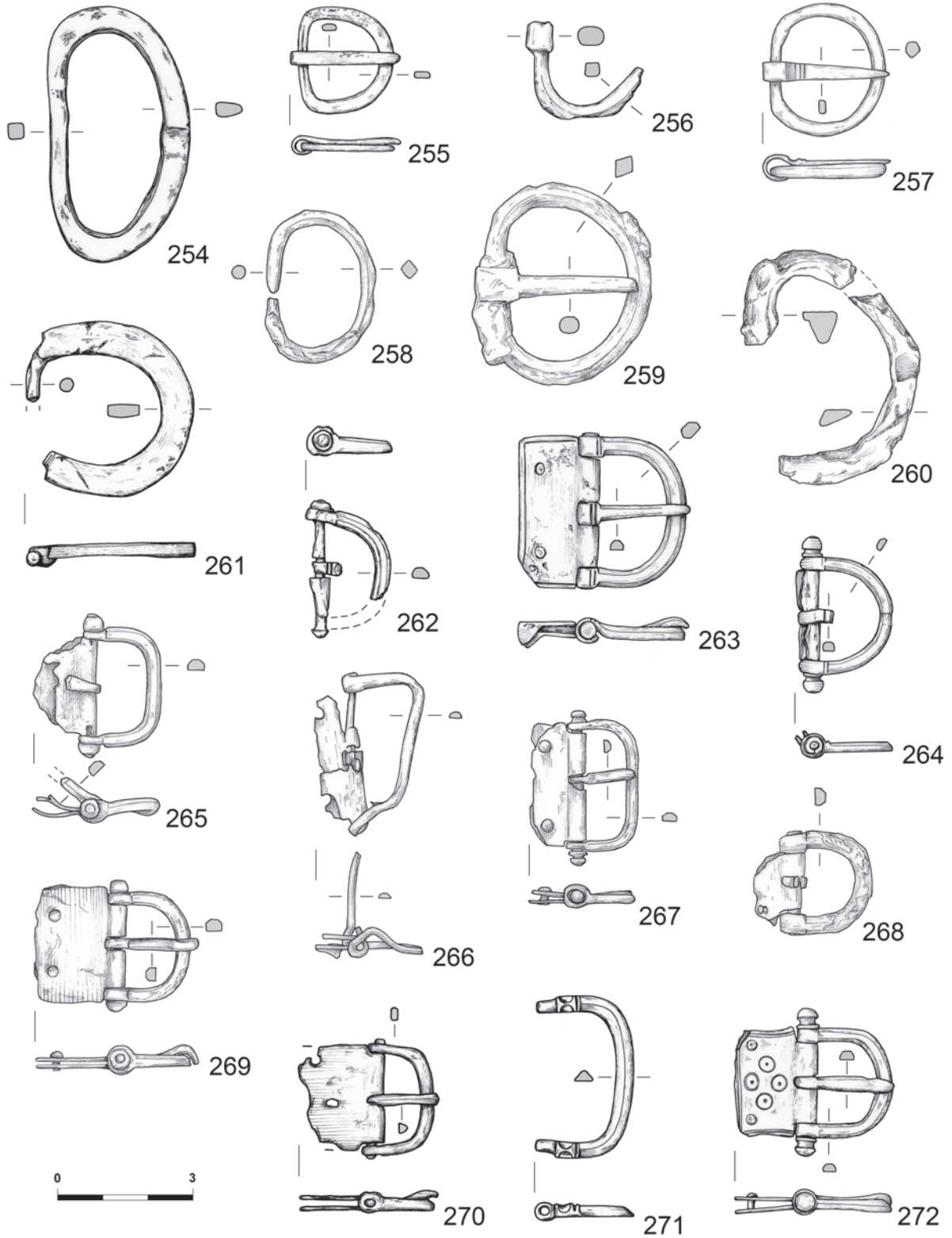
Pl. CLXXV. Stray finds: 218–230 – silver

Stray finds



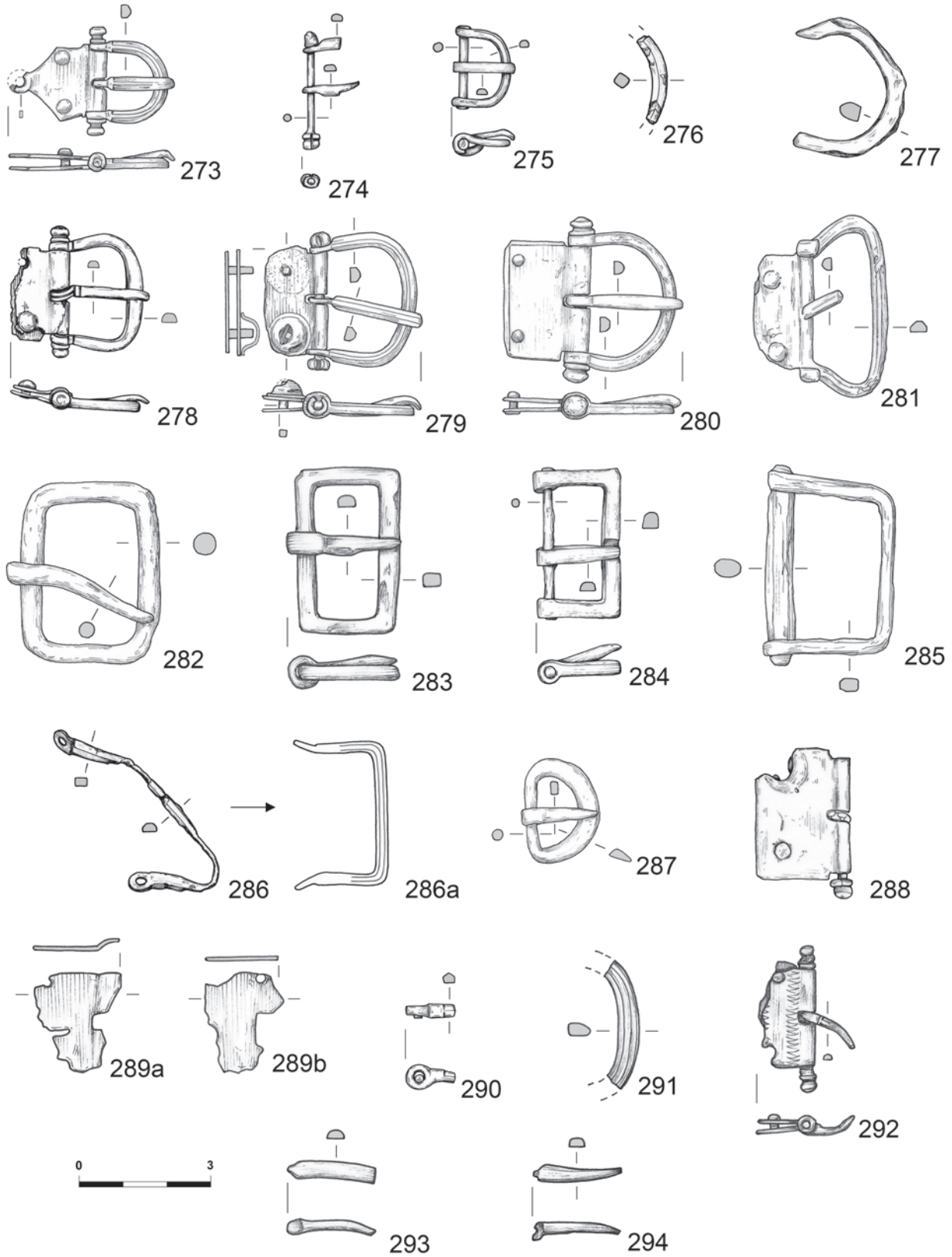
Pl. CLXXVI. Stray finds: 231.233.237.239–249 – silver; 232.234–236.238.250 – copper alloy; 251–253 – iron

Stray finds



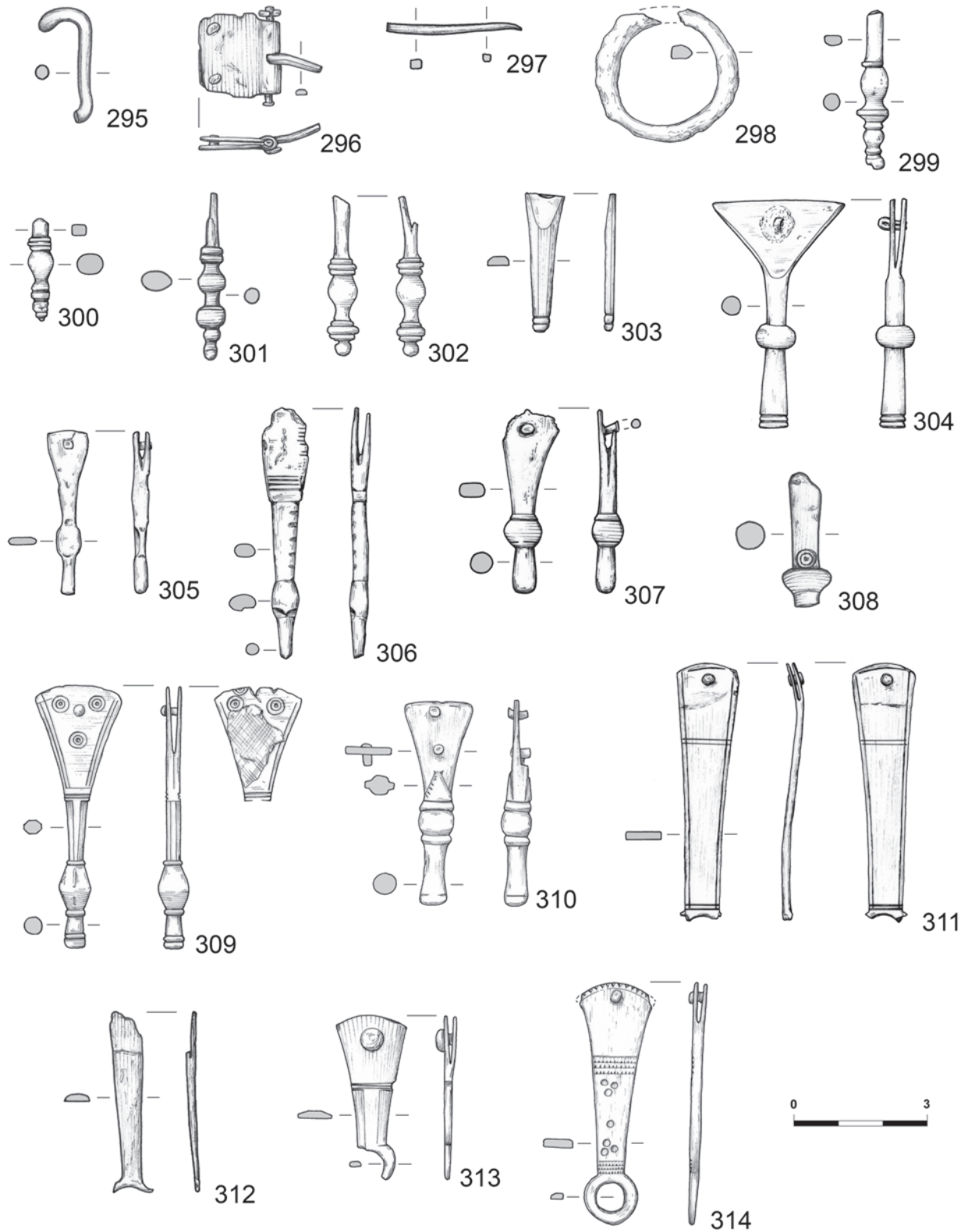
Pl. CLXXVII. Stray finds: 271 – silver; 255.257.262–270.272 – copper alloy; 254.256.258–261 – iron

Stray finds



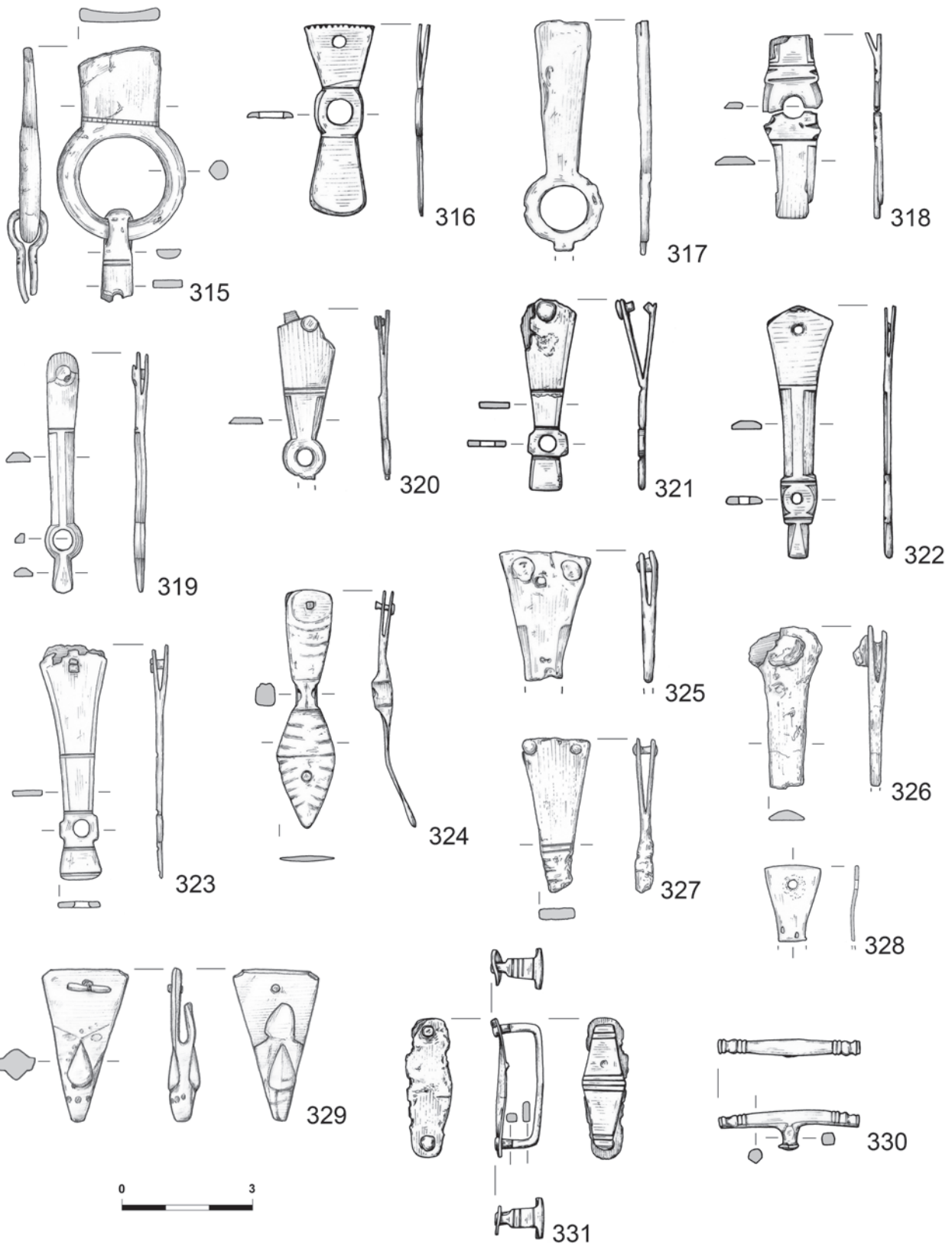
Pl. CLXXVIII. Stray finds: 273–276.278–281.286–294 – copper alloy; 277.282–285 – iron

Stray finds



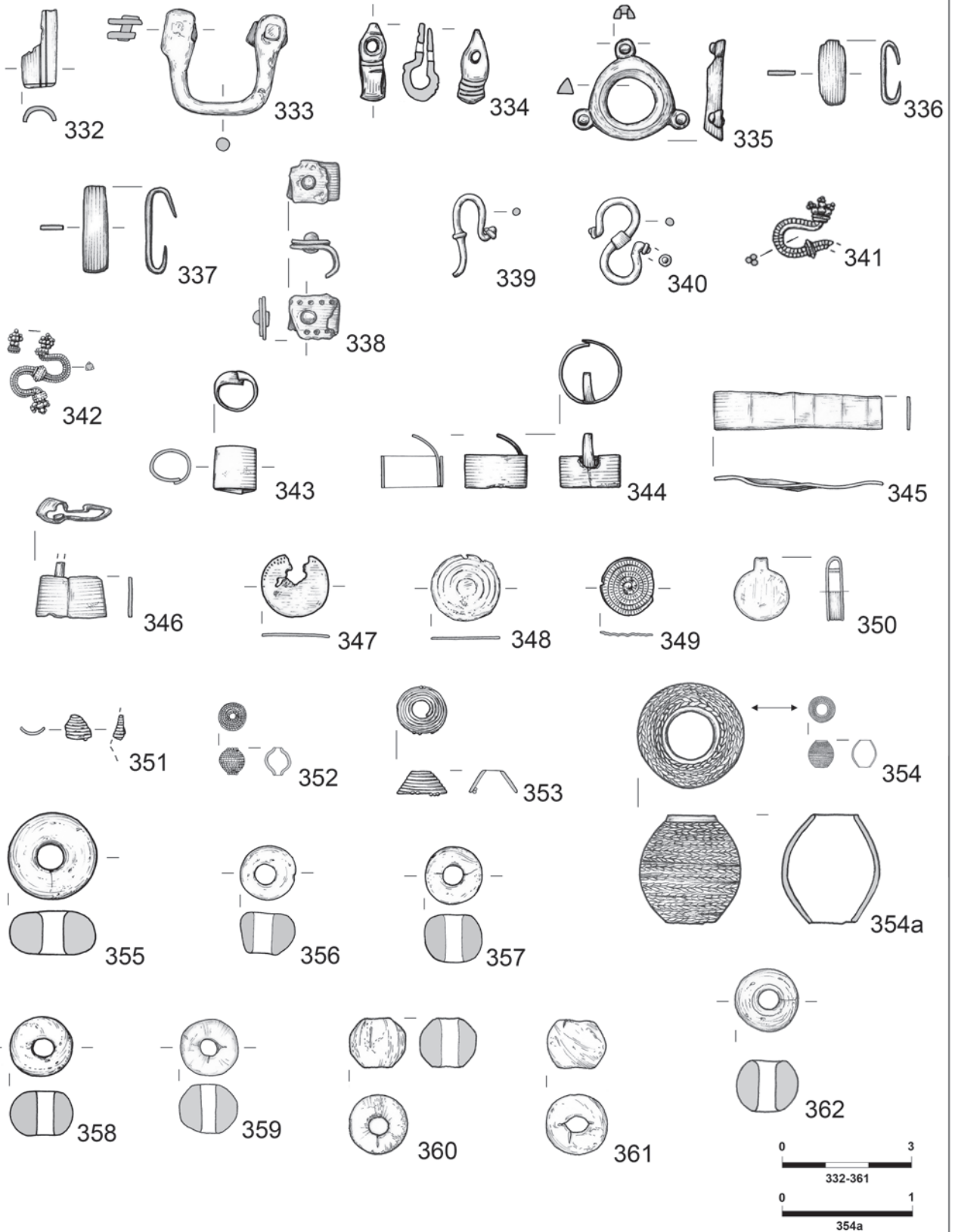
Pl. CLXXIX. Stray finds: 304.307 – tin-lead bronze; 295–296.299–303.305–306.308–314 – copper alloy; 297–298 – iron

Stray finds



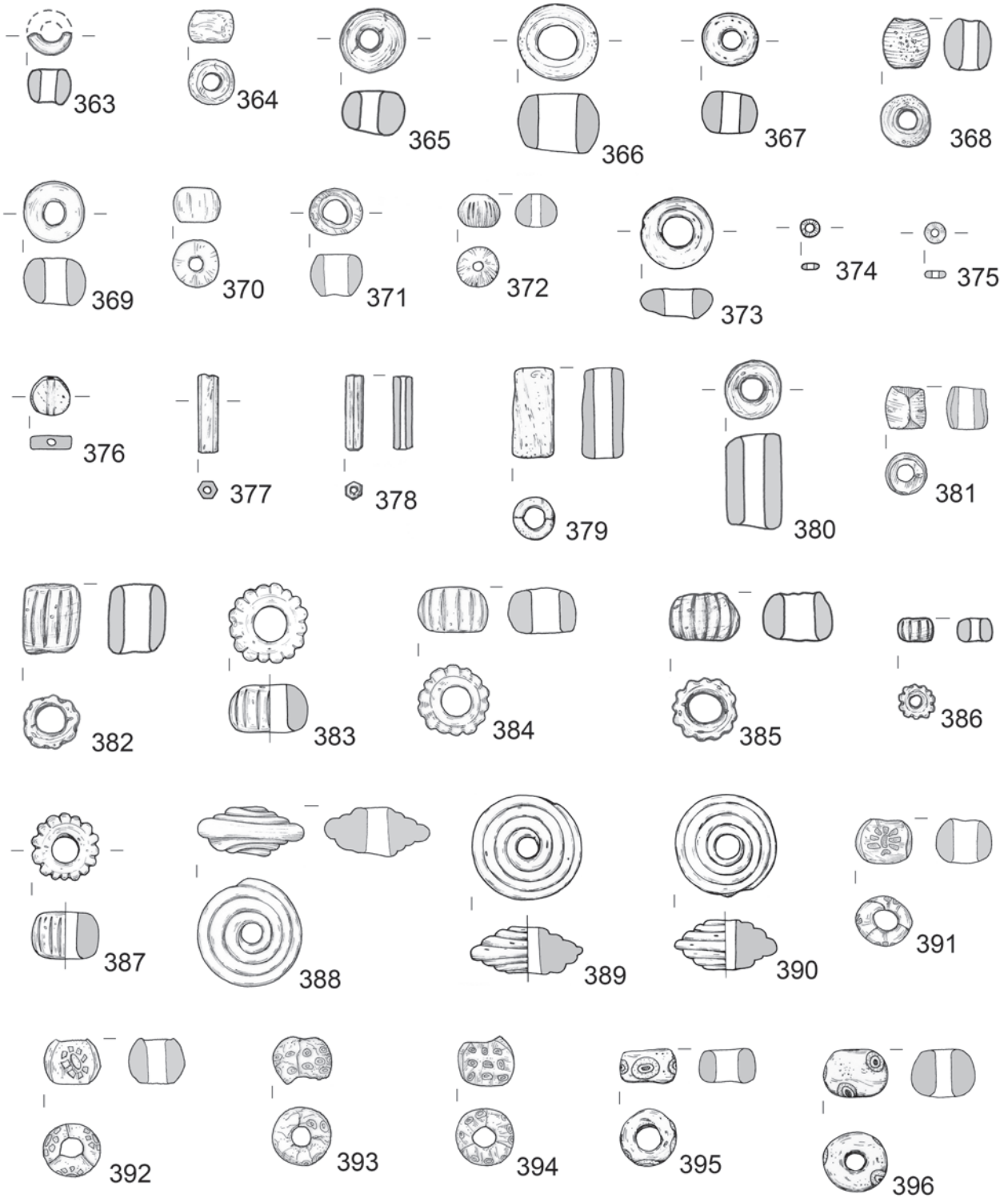
Pl. CLXXX. Stray finds: 316 – silver; 315.318–325.327–331 – copper alloy; 317.326 – iron

Stray finds



Pl. CLXXXI. Stray finds: 342.352.354–354a – gold; 339–341.343.345.349.351.353 – silver; 335 – tin-lead bronze; 332.334.336–338.344.346–348.350 – copper alloy; 333 – iron; 355–362 – glass

Stray finds



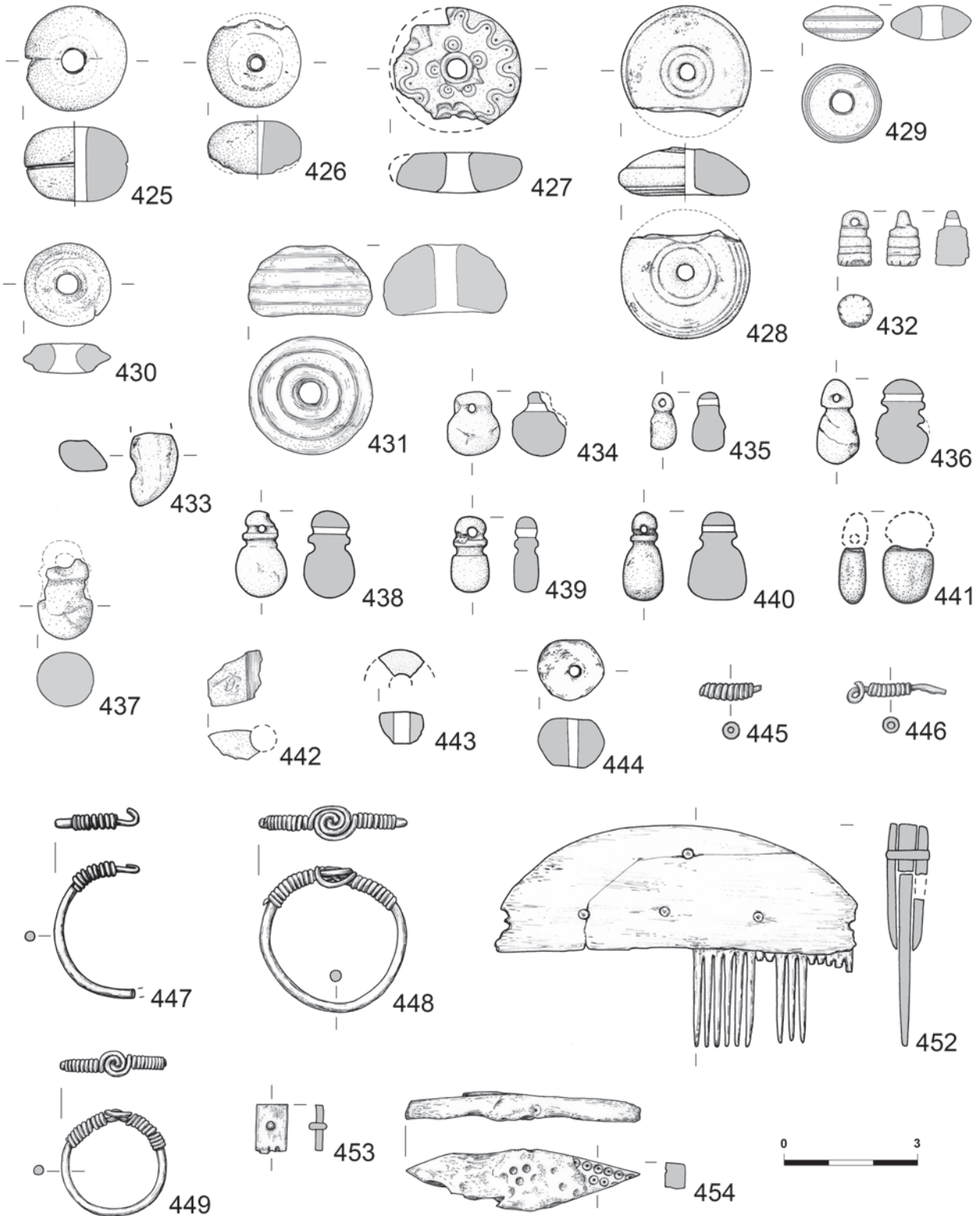
Pl. CLXXXII. Stray finds: 363–396 – glass

Stray finds



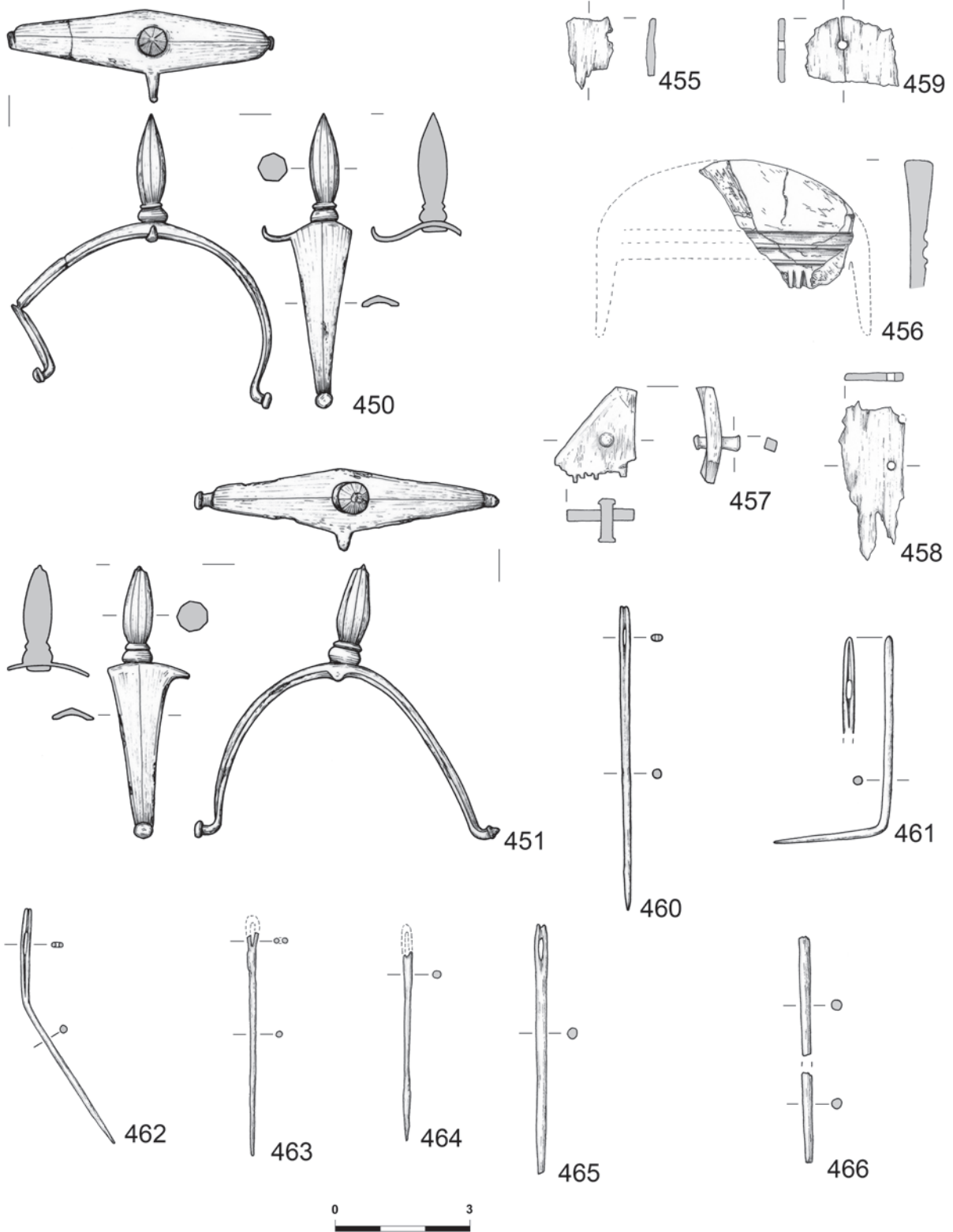
Pl. CLXXXIII. Stray finds: 397-410 - glass; 411-424 - amber

Stray finds



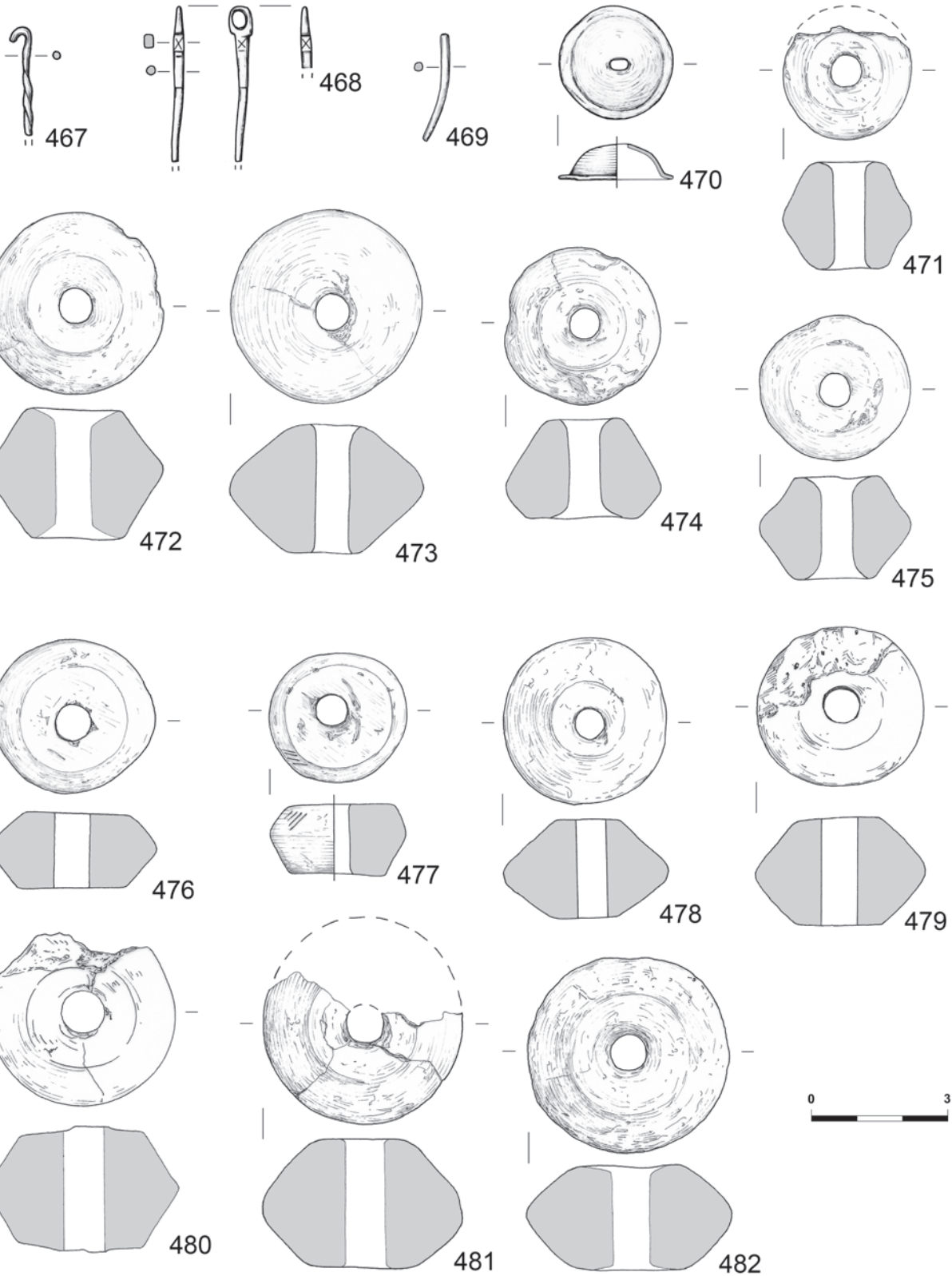
Pl. CLXXXIV. Stray finds: 447.449 – silver; 445–446.448 – copper alloy; 425–443 – amber; 444 – stone; 452–453 – bone (antler [?]) and copper alloy; 454 – bone (antler [?])

Stray finds



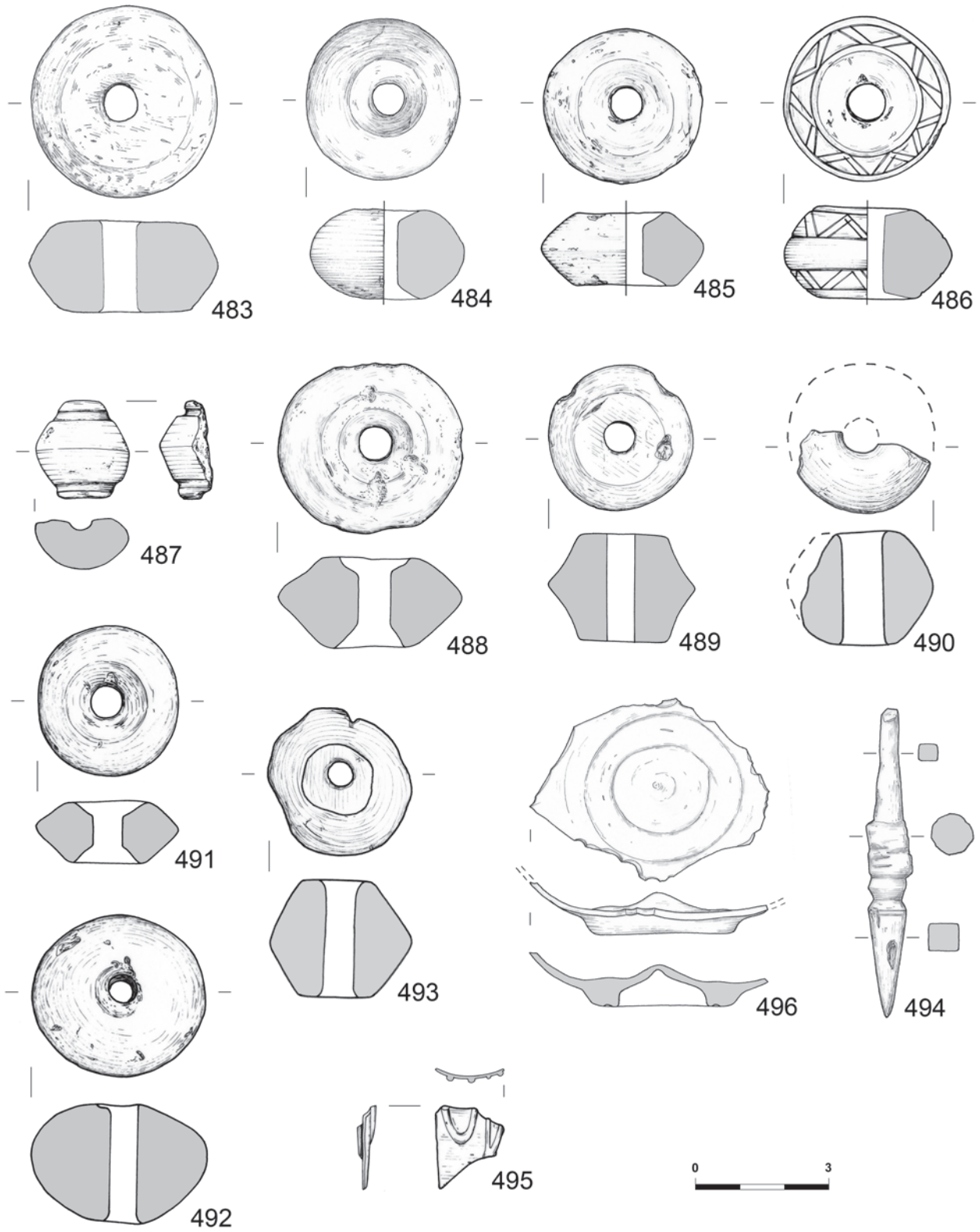
Pl. CLXXXV. Stray finds: 450-451 - brass; 460-466 - copper alloy; 457 - bone (antler [?]) and copper alloy; 455-456.458-459 - bone (antler [?])

Stray finds



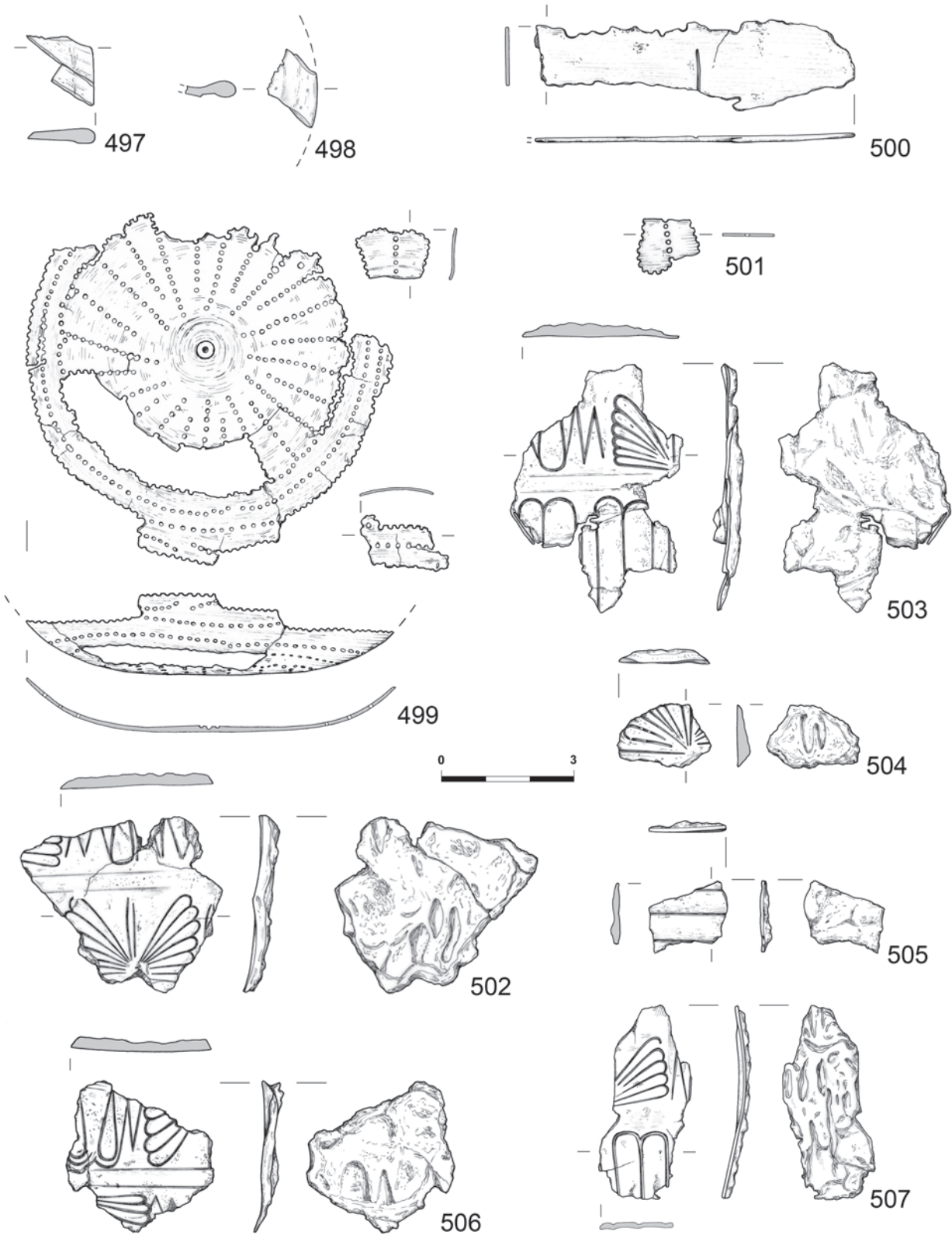
Pl. CLXXXVI. Stray finds: 468 – silver; 467.469–470 – copper alloy; 471–482 – ceramic

Stray finds



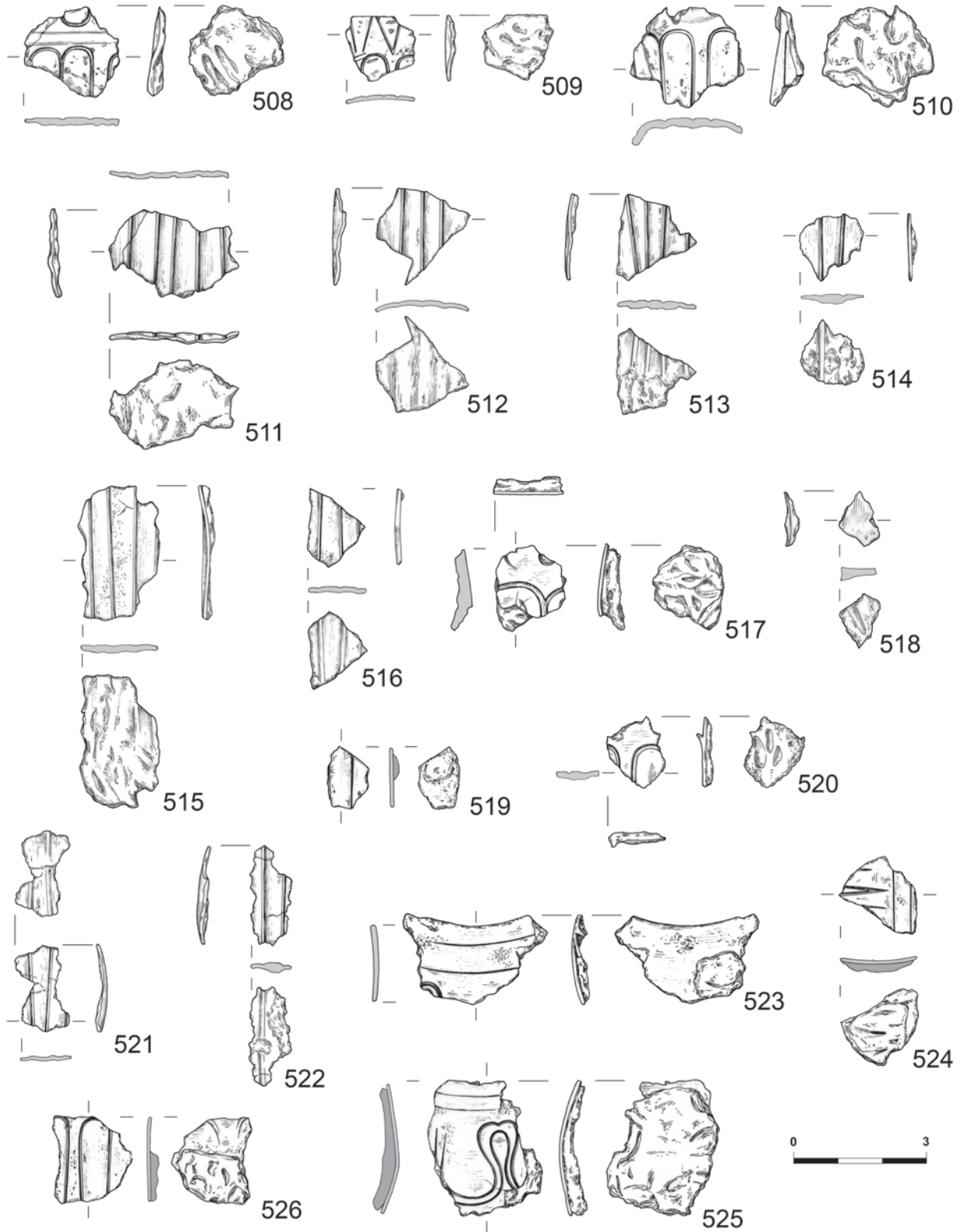
Pl. CLXXXVII. Stray finds: 494 – iron; 495–496 – glass; 483–493 – ceramic

Stray finds



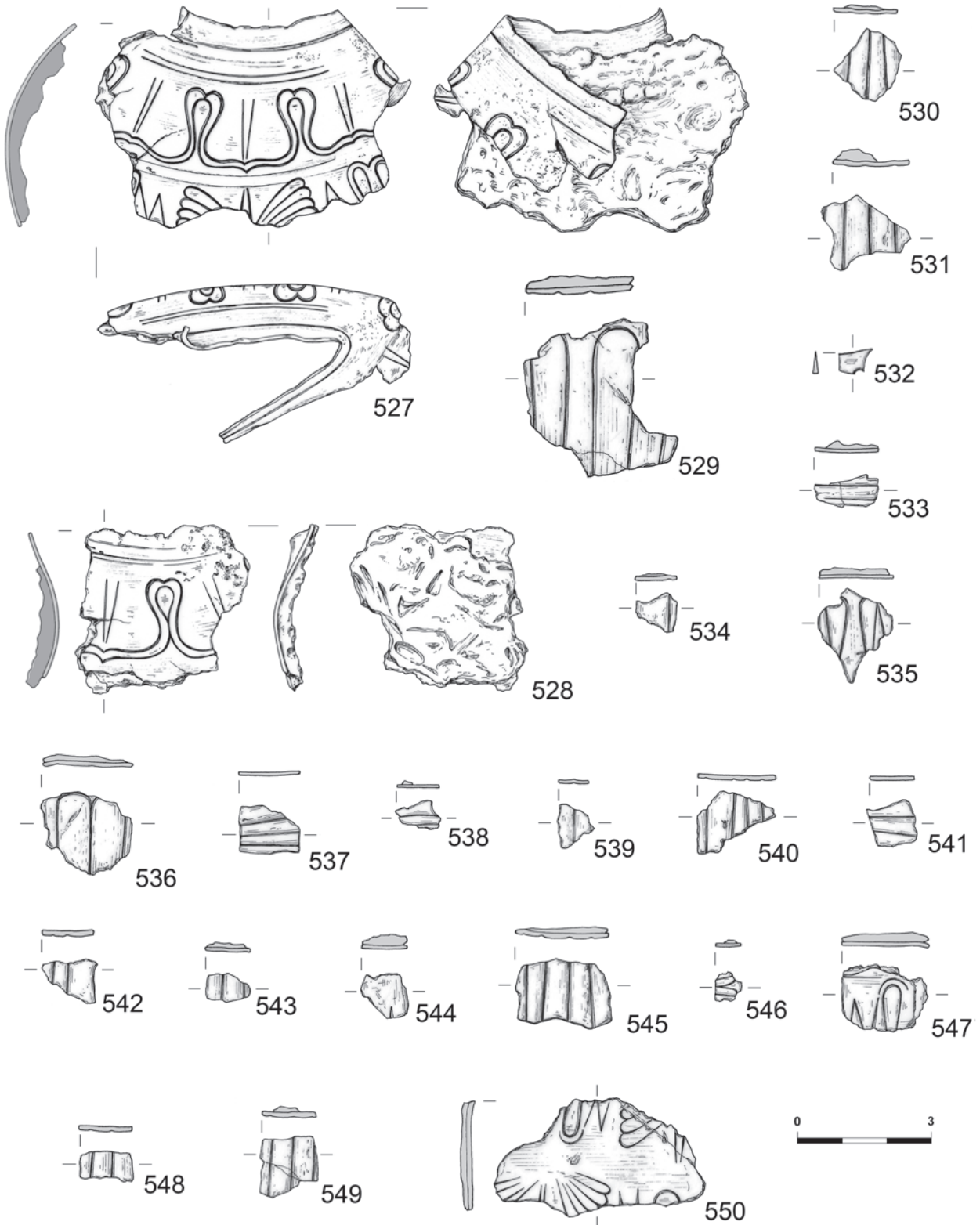
Pl. CLXXXVIII. Stray finds: 502-507 – brass; 499-501 – tin bronze; 497-498 – glass

Stray finds



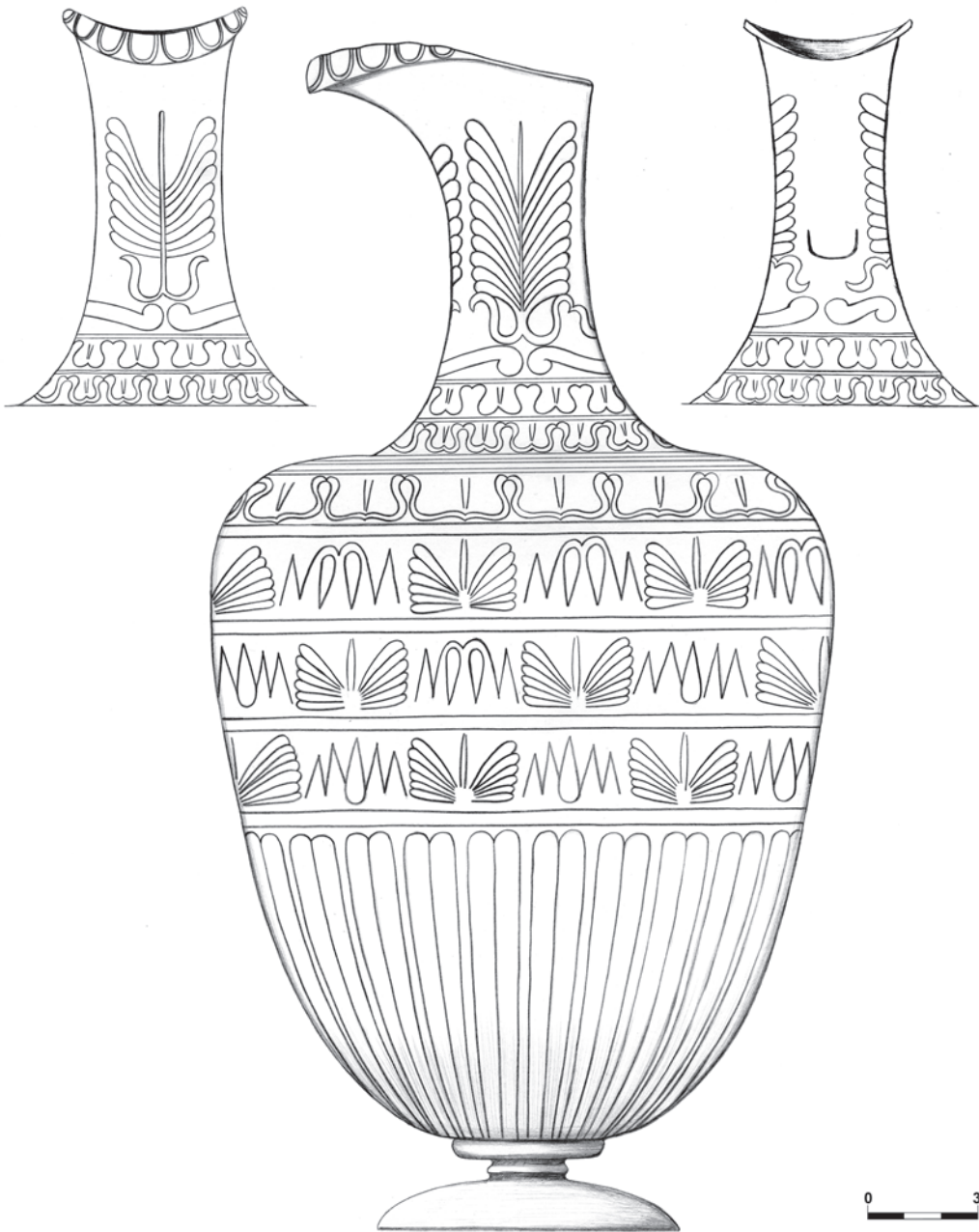
Pl. CLXXXIX. Stray finds: 508–526 – brass

Stray finds



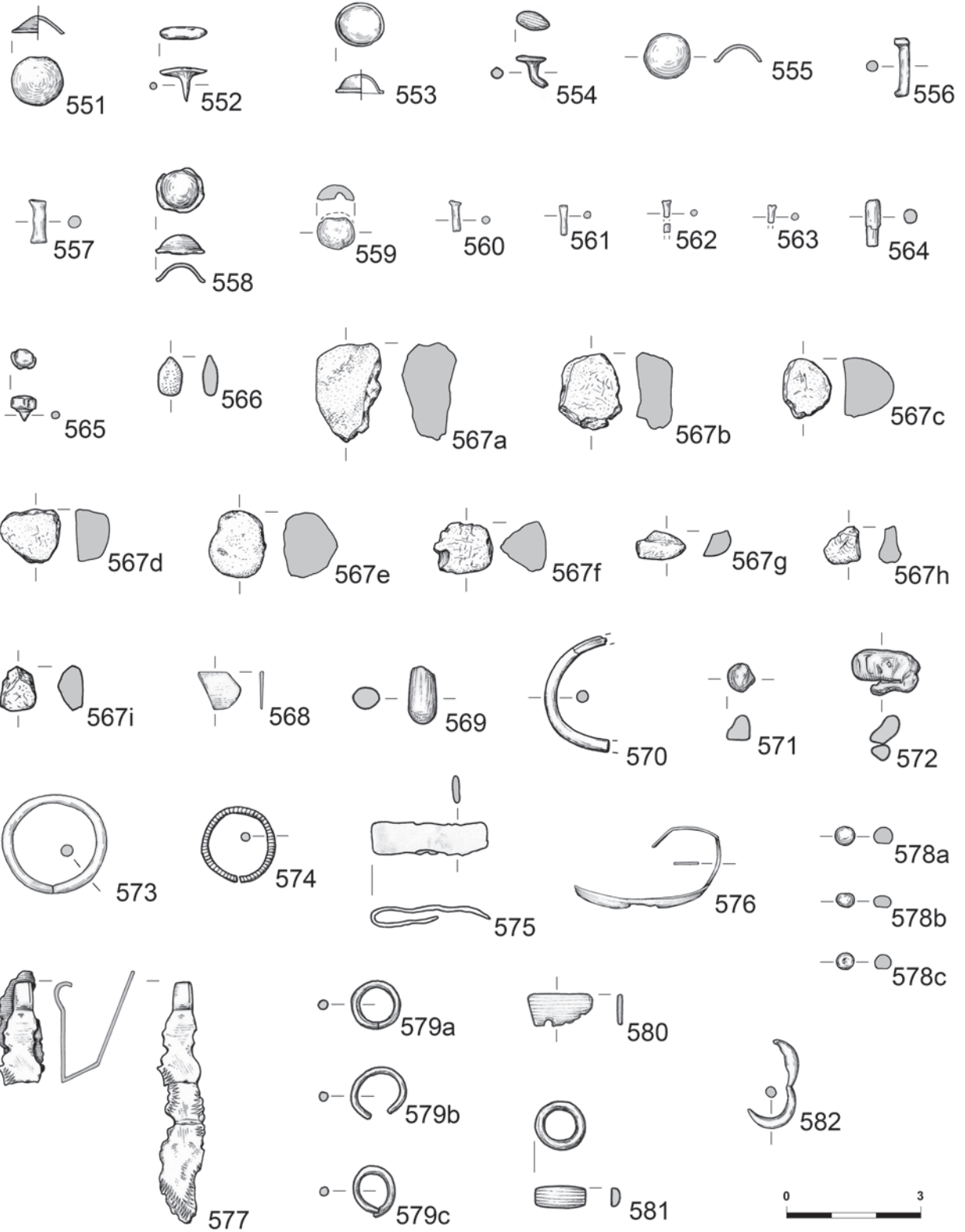
Pl. CXC. Stray finds: 527–550 – brass

Stray finds



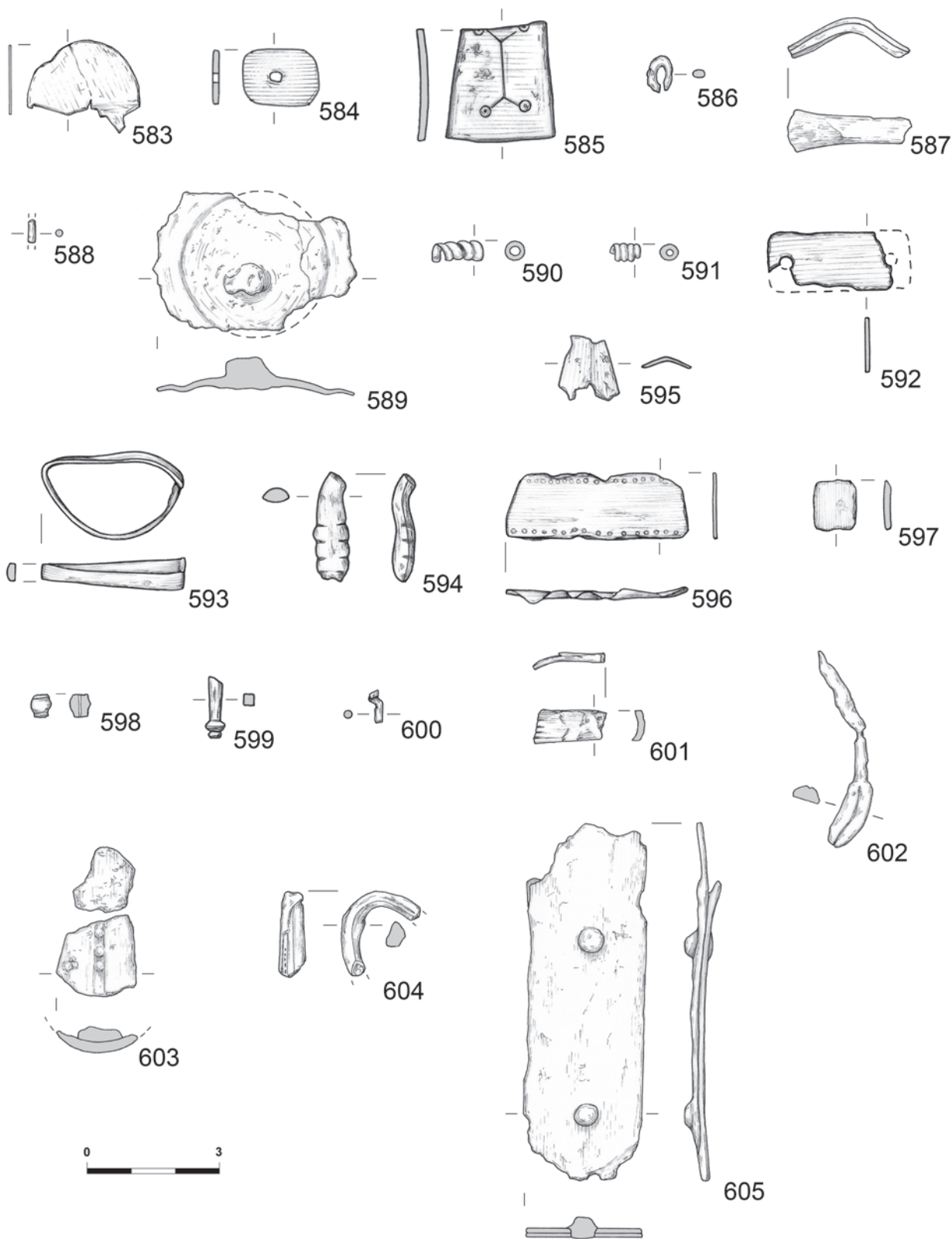
Pl. CXCI. Reconstruction of the brass jug

Stray finds



Pl. CXCII. Stray finds: 568–574 – silver; 551–563, 575–582 – copper alloy; 565 – bone (antler [?]) and copper alloy; 566–567–h – amber

Stray finds



Pl. CXCIII. Stray finds: 583-586, 588-598 - copper alloy; 587, 599-605 - iron



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Pl. CXCIV. Wekllice. Graves: 1-2) 495; 3) 517; 4) 518; 5) 542



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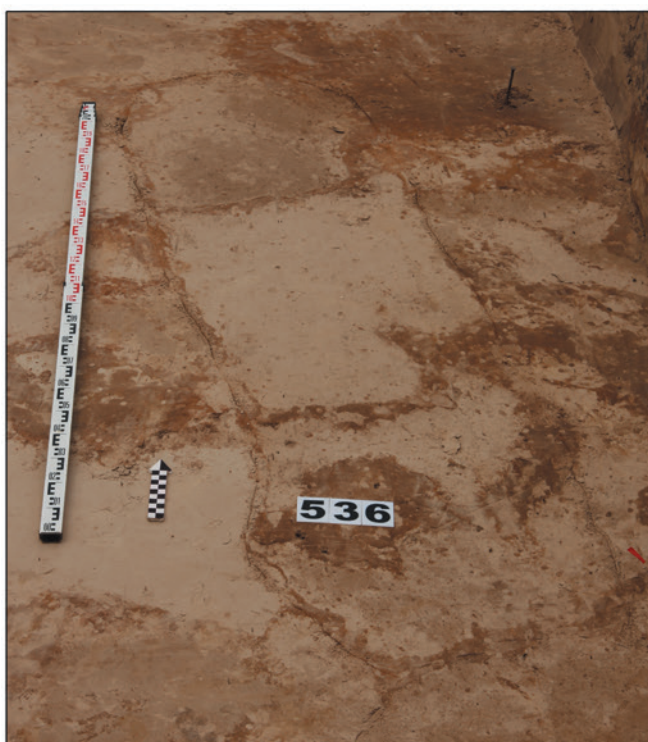
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Pl. CXCIV. Weklice. Graves: 1) 521; 2-3) 527

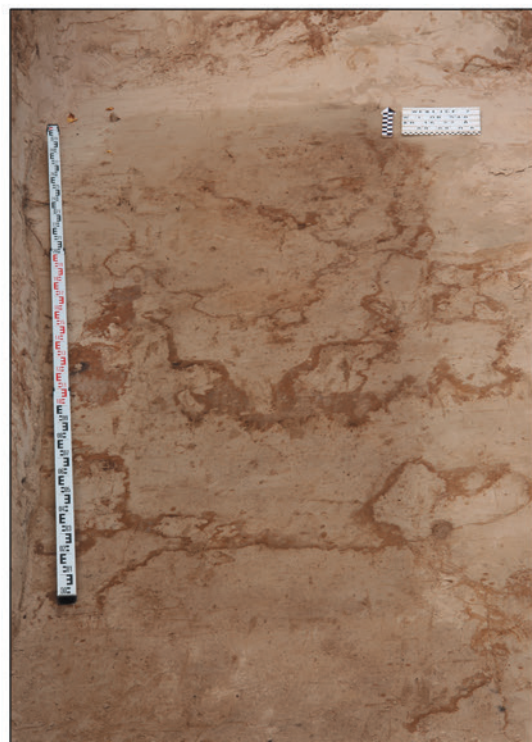


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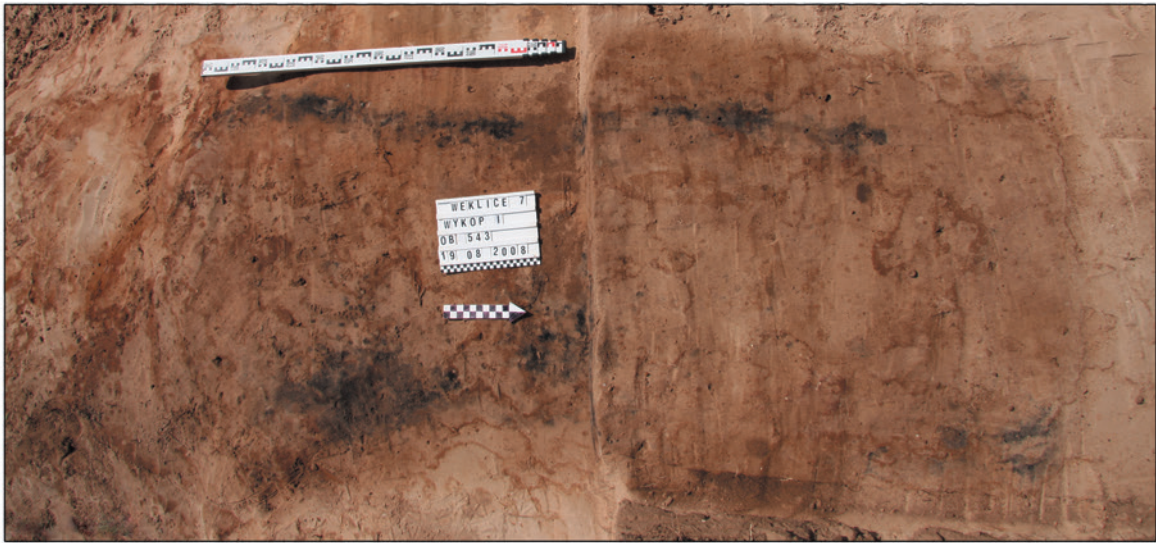


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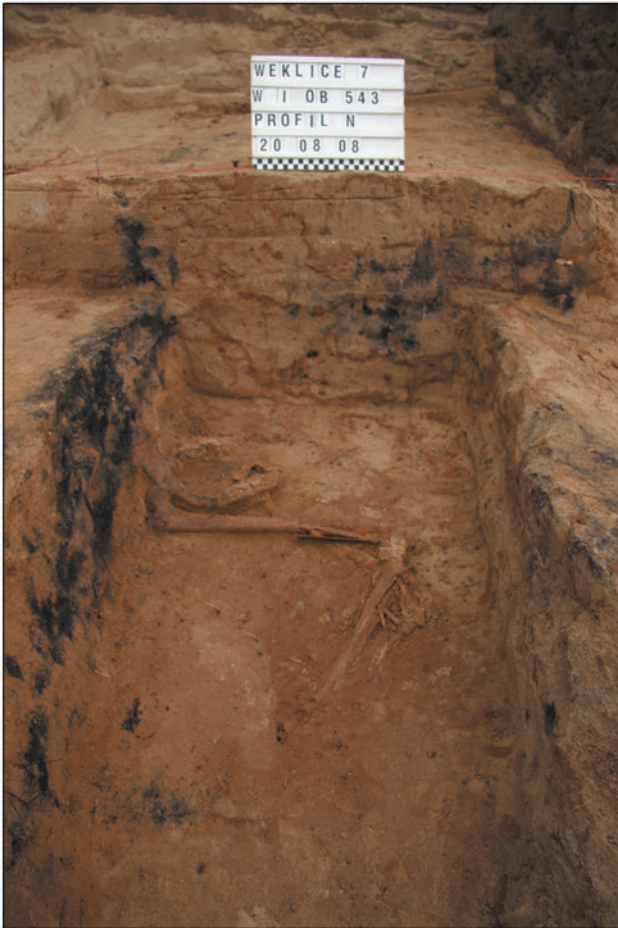


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Pl. CXCVI. Wekllice. Graves: 1–2) 529; 3–4) 536; 5) 540



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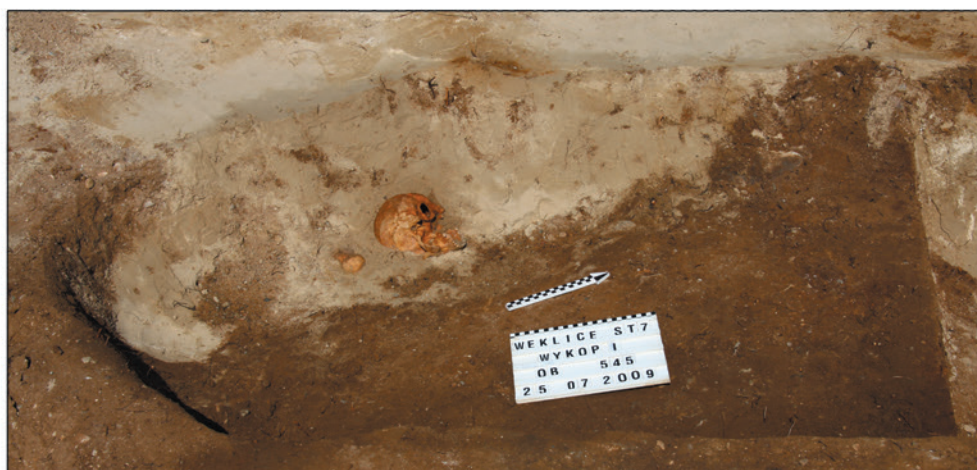


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Pl. CXCVII. Wekllice. Graves: 1-2) 543; 3) 546



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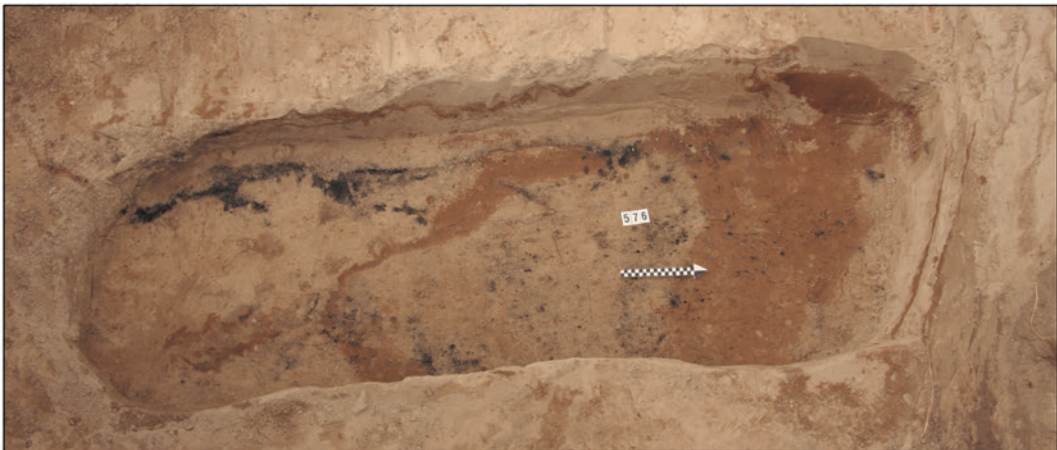


5

Pl. CXCVIII. Wekllice. Graves: 1) 545; 2-3) 556; 4) 572; 5) 575



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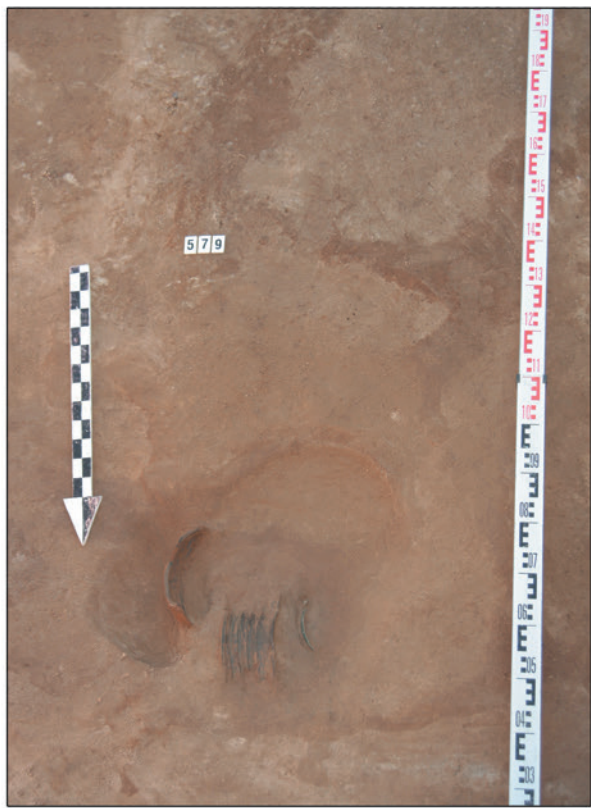


3



4

Pl. CXCIX. Wekllice. Graves: 1) 574; 2) 576; 3) 586; 4) 582



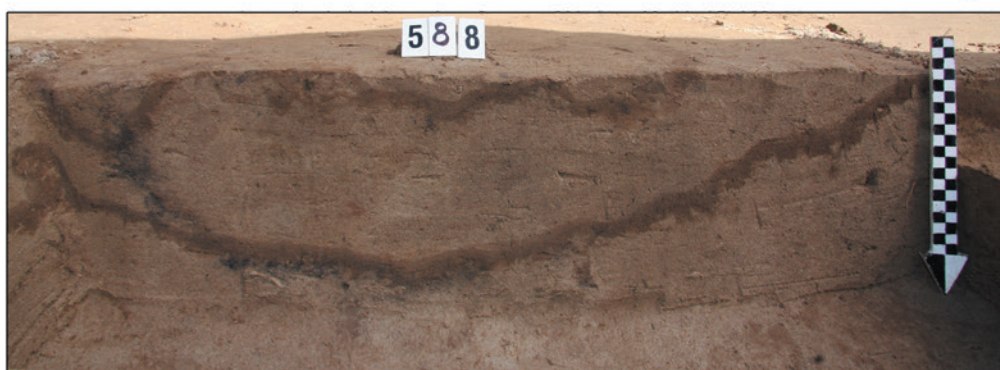
1



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Pl. CC. Weklice. Graves: 1-2) 579(462); 4) 588. Feature: 3) 592AB



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Pl. CCI. Weklice. Graves: 1-2) 600; 3) 599; 4) 594; 5) 589



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Pl. CCII. Weklice. Graves: 1-3) 605; 4) 602 & 603



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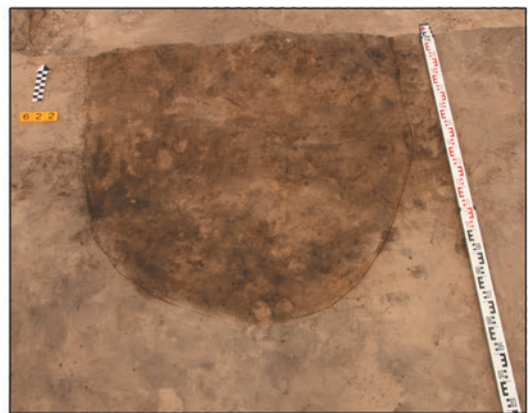
2



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5

Pl. CCIII. Weklice. Feature: 1–2) 618. Graves: 3) 638; 4) 632; 5) 622



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2

Pl. CCIV. Wekllice. Graves: 1) 536, 537, 538, 539, 540, 541, 542; 2) 586, 587, 588, 589, 590



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Pl. CCVI. Weklice. Grave finds: 1) 494/1; 2) 502/1; 3) 518/1-3; 4) 519/1-33



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3

Pl. CCVII. Wekllice. Grave finds: 1) 524/2; 2) 529/2; 3) 536/1-7.10-14. 29-40



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Pl. CCVIII. Wekllice. Grave finds: 1) 538/1-21; 2) 542/1-5; 3) 542/1-22



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4

Pl. CCIX. Wekllice. Grave finds: 1) 544/1; 2) 565/1; 3) 552/3-5; 4) 554/7-9



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8

Pl. CCX. Wekllice. Grave finds: 1) 547/1-4.6; 2) 559/1-2; 3) 550/1-3; 4) 551/2; 5) 555/1-3; 6) 557/1-2; 7) 545/1-10.15; 8) 564/2-5



1



2



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6

Pl. CCXI. Weklice. Grave finds: 1) 562/1.4-49.51; 2) 574/1-16; 3) 570/1-7; 4) 588/1-3; 5) 592C/1-4; 6) 582/1-3



1



2



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4



5

Pl. CCXII. Weklice. Grave finds: 1-2) 579(462)/1-26; 3) 594/1-4; 4) 595/1-34; 5) 596/1-15



1



2

Pl. CCXIII. Weklice. Grave finds: 1) 600/3-5; 2) 605/1-6.8-68.70



1



2



3



4



5



6

Pl. CCXIV. Weklice. Stray finds: 1) 2; 2) 24; 3) 75; 4) 81; 5) 102; 6) 111



1



2



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4



5



6

Pl. CCXV. Weklice. Stray finds: 1) 122; 2) 114; 3) 128; 4) 153; 5) 154; 6) 170



1



2



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4



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6

Pl. CCXVI. Wekllice. Stray finds: 1) 204; 2) 218; 3) 247; 4) 249; 5) 250; 6) 304



1



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3



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Pl. CCXVII. Wekllice. Stray finds: 1) 272; 2) 316; 3) 342; 4) 352



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3

Pl. CCXVIII. Wekllice. Stray finds: 1) 402; 2) 486; 3) 450-451

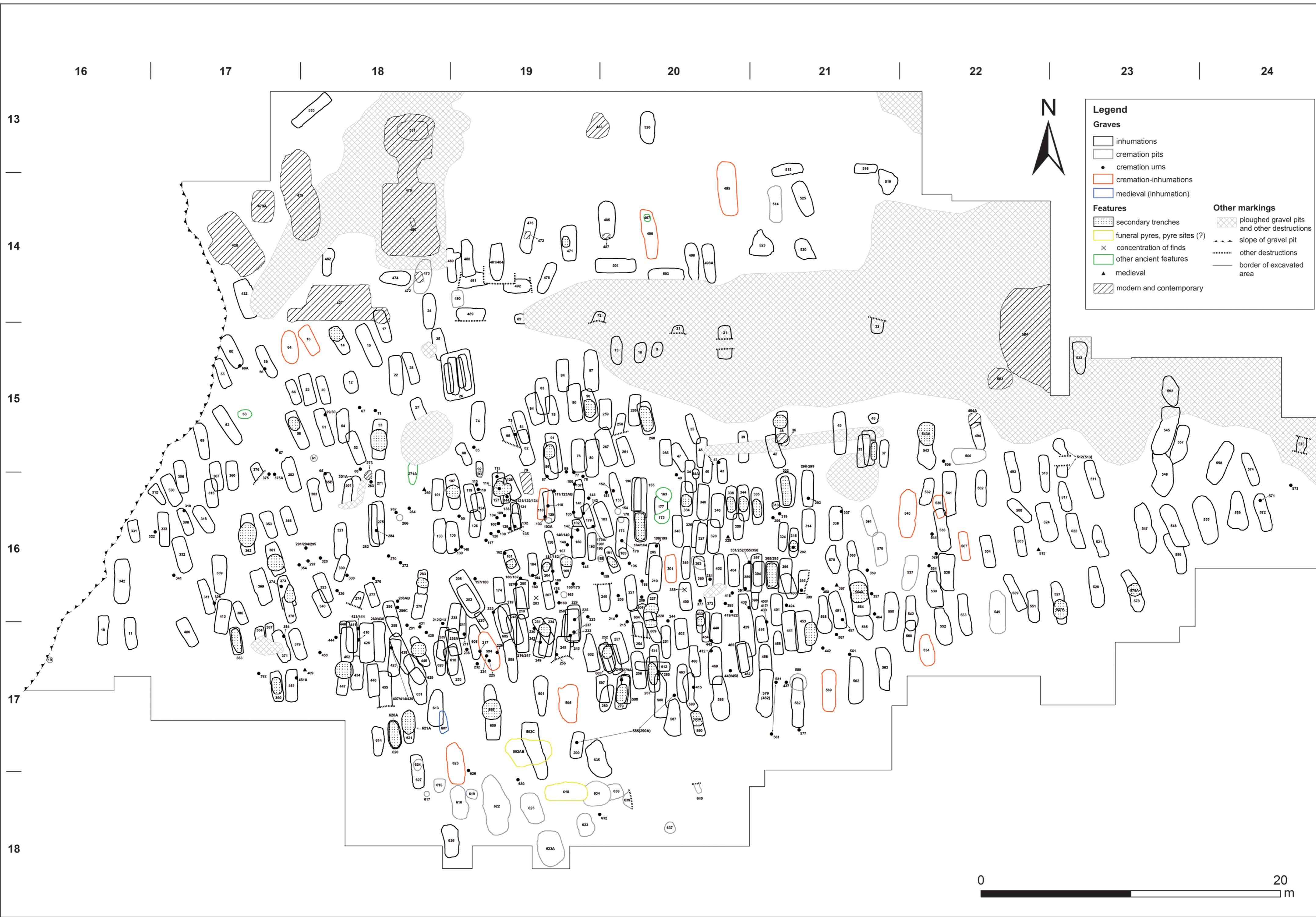


Fig. 4. Weklice. Plan of the area explored in 1984–2018. Graphics: M. Baczewski, M. Natuniewicz-Sekula



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