ANALECTA

ARCHAEOLOGICA RESSOVIENSIA

VOLUME 19 RZESZÓW 2024

ISSN 2084-4409 | DOI: 10.15584/anarres

ANALECTA

ARCHAEOLOGICA RESSOVIENSIA

ANALECTA

ARCHAEOLOGICA RESSOVIENSIA

VOLUME 19 RZESZÓW 2024

FUNDACJA RZESZOWSKIEGO OŚRODKA ARCHEOLOGICZNEGO

Uniwersytet Rzeszowski
Kolegium Nauk Humanistycznych
Instytut Archeologii

WYDAWNICTWO UNIWERSYTETU RZESZOWSKIEGO

Abstracts of articles from Analecta Archaeologica Ressoviensia are published
in the Central European Journal of Social Sciences and Humanities
Analecta Archaeologica Ressoviensia is regularly listed in ERIH PLUS, CEJSH and ICI

Graphic design, typesetting
DOROTA KOCZĄB

Technical editor
EWA KUC

Cover design
JULIA SOŃSKA-LAMPART

ISSN 2084-4409 DOI:10.15584/anarres

2150

Editor's Address

INSTITUTE OF ARCHAEOLOGY
RZESZÓW UNIVERSITY
ul. Moniuszki 10, 35-015 Rzeszów, Poland
e-mail: iarch@univ.rzeszow.pl
Home page: www.archeologia.rzeszow.pl

THE UNIVERSITY OF RZESZÓW
PUBLISHING HOUSE
ul. prof. S. Pigonia 6, 35-959 Rzeszów, Poland
tel. 17 872 13 69, tel./fax 17 872 14 26
Home page: https://wydawnictwo.ur.edu.pl

RZESZÓW ARCHEOLOGICAL
CENTRE FUND
ul. Moniuszki 10, 35-015 Rzeszów, Poland
email: froa@froa.pl
Home page: www.froa.pl/

First edition, A4 format, 19 publishing sheets, 21,5 printing sheets, order no. 104/2024
Printed and binded: The University of Rzeszów Printing House

ANALECTA
ARCHAEOLOGICA RESSOVIENSIA
Volume 19 / Rzeszów 2024
ISSN 2084-4409
DOI: 10.15584/anarres

Contents

ARTICLES

REVIEW

ANALECTA
ARCHAEOLOGICA RESSOVIENSIA
Volume 19 / Rzeszów 2024
ISSN 2084-4409
DOI: 10.15584/anarres

Wojciech Pasterkiewicz

DOI: 10.15584/anarres.2024.19.4

Institute of Archaeology, University of Rzeszów, Moniuszki 10, 35-015 Rzeszów, Poland;
e-mail: wpasterkiewicz@ur.eu.pl; ORCID: 0000-0002-0625-7232

"A House for the Dead" or a Cremation Pyre? The Interpretation of Grave No. 10 Discovered in the Globular Amphora Culture Cemetery in Sadowie in the Sandomierz Upland

Abstract

Pasterkiewicz W. 2024. "A House for the Dead" or a Cremation Pyre? The Interpretation of Grave No. 10 Discovered in the Globular Amphora Culture Cemetery in Sadowie in the Sandomierz Upland. *Analecta Archaeologica Ressoviensia* 19, 57–92

The subject of this study is grave no. 10 of the Globular Amphora Culture discovered in cemetery no. 23 in Sadowie near Opatów, in the Sandomierz Upland. Based on observations made during fieldwork as well as analyses of documentation, it was determined that the feature had two stages of use. The first was as an above-ground structure like a house for the dead, in which human corpses were placed for skeletonization. The second one concerned rites during which a cremation pyre was erected and human remains and grave goods were cremated. So far, there are only a few analogies for the aforementioned feature from close-range cultural circles which developed in a similar time horizon (including the Havelian culture, the circle of the Corded Ware Culture).

Keywords: Globular Amphora Culture, Sandomierz Upland, funeral practices, "a house for the dead", cremation pyre

Received: 12.12.2023; **Revised:** 22.07.2024; **Accepted:** 30.10.2024

Introduction

Several years of excavations carried out at archaeological site no. 23 in Sadowie, Opatów district, have led to the identification of a funeral and ceremonial site coming from the late Neolithic Period, related to the Złota culture and the Globular Amphora Culture (GAC; Mackiewicz *et al.* 2016; Pasterkiewicz 2017). During the research, important data were obtained for studies on the development of Neolithic communities and for the interpretation of sepulchral behaviour in the Sandomierz Upland. The results of research on the GAC features, which have revealed one of the largest known cemeteries of this culture so far, turned out to be crucial. The distinguishing characteristic of the uncovered graves was their great variability of funeral practices and which included: individual burials, partial and multiple burials often involving various stone structures, and multi-stage tombs (mainly cist burials; Pasterkiewicz 2020; 2021; Juras *et al.* 2021). GAC funeral rites also included the custom of depositing animals in human graves, both collective and individual.

Regarding the discovered funeral feature (grave no. 10), it has a unique character and does not draw an analogy with the other GAC sepulchral sites. The research of this feature provided a lot of valuable data about the burial itself and ritual practices. Observations made during fieldwork as well as analyses of documentation also allowed for the reconstruction of the details of the structure and subsequent stages of use of the discussed feature.

Description of the structure of grave no. 10

Grave no. 10 was discovered in the eastern part of the cemetery in Sadowie, on the south-eastern slope of the culmination of a hill (280 m above sea level; Fig. 1). It was part of one of the burial complexes,

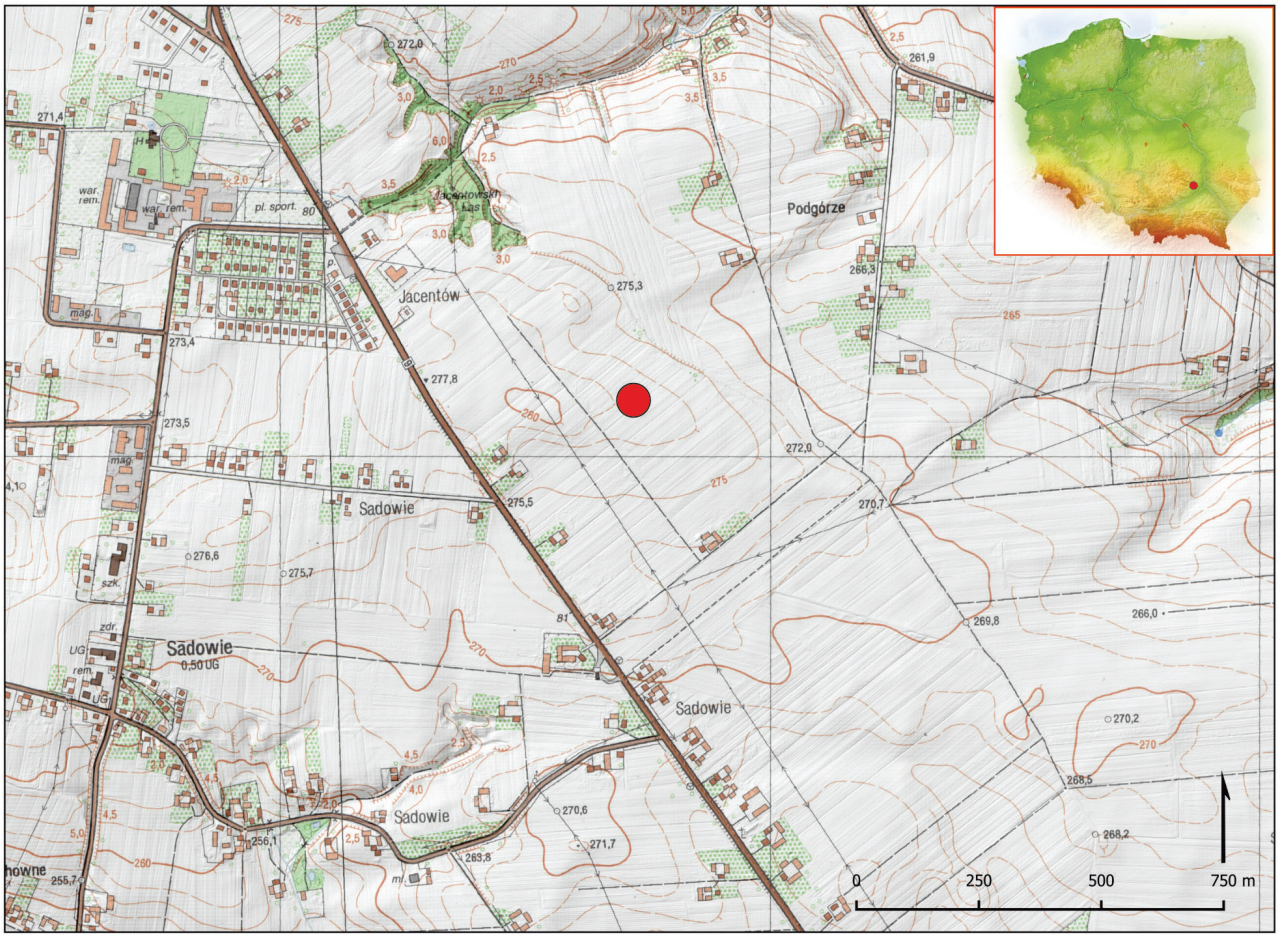

Fig. 1. Location of archaeological site no. 23 in Sadowie, Opatów district, marked on a topographic map and a digital terrain model (landform data was downloaded from the National Geodetic and Cartographic Resource).

which included human and animal burials located close to each other (also called sacrificial pits; Fig. 2). On the northern side of grave no. 10 there was a collective animal burial – grave no. 9 with deposited parts of carcasses belonging to several cattle with inventories typical of GAC. The outline of the discussed grave was found after removing the modern topsoil, coloured (grey-brown) at a depth of 30 cm from the modern ground level, in the roof of the yellow loess subsoil visible here. It appeared as an approximately rectangular patch of darkness, oriented along the NW-SE axis (the deviation from the N-S axis was exactly 45° in the NW-SE direction; Fig. 3, 4). The grave fill consisted of two parts – external and internal, differing in consistency, colour and thickness. The outer part was a kind of rectangle, a "frame" with dimensions of 2.35 × 2.71 m (measured at a depth of 30 cm). Its width in the roof part ranged from about 50 cm (E corner) to 0.65–0.75 cm (S corner). The internal part was 1.6 m long and 1.2 m wide (dimensions measured at 30 cm). At the lower levels, i.e. 10 cm and 20 cm, which is 40 and 50 cm from the current ground surface, the external dimensions of the frame were 2.1 × 2.37 m, internal 1.2 × 1.65 m and 2.1 × 2.37 and 1.22 × 1.67 m, respectively (Fig. 5, 6). The roof part of the outer part was marked by stones measuring 5–8 × 10–17 × 5–10 cm, often surrounded by smaller ones (maximum 4–5 × 8 × 5 cm), and layers of charcoal and burnt wood. The filling was grey in colour while on the outer edge on the NE and NW sides it was a dark grey colour. In the profile, the "frame" took the form of a groove dug into the subsoil (30 cm deep), in the N, NE and NW parts to about 34 cm (Fig. 7: A, B). The bottom was flat, rectangular in profile, widened in the ceiling part as a result of the collapse of the upper parts of the side walls. Above the floor, in several places, there was a layer of loose sediment which was rich in humus and charcoal.

The inner part of the feature was filled with the earth similar to subsoil, mixed in places with dark, light brown spots. On the E side, at the level of 6–10 cm, there was a slightly darker, 1–5-cm-thick layer (red-brown in colour) saturated with a smear of char-

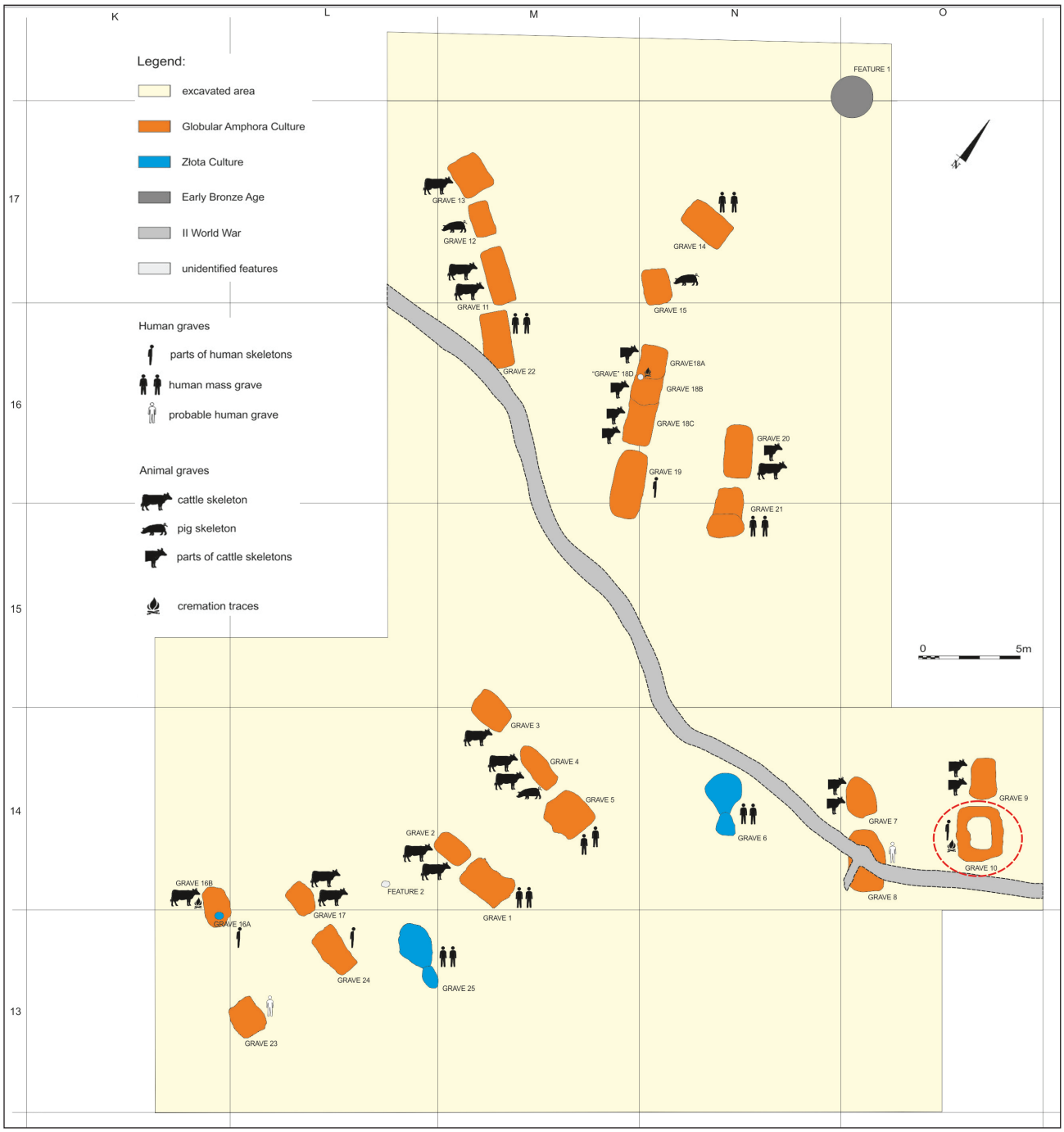

Fig. 2. The range of archaeological excavations covering the northern part of the Late Neolithic cemetery in Sadowie, carried out in 2015–2021, where grave no. 10 was uncovered (marked with a red circle; drawn by the author).

coal (Fig. 7: B). Below, there was a visible surface of the subsoil, which showed traces of burning *in situ*, reaching approximately 13–15 cm in the E part and becoming shallower towards the sides of the frame.

Within the groove (on the inner side), there were fragments of burnt riven planks, forming the actual burial chamber (Fig. 8). They took the form of compact layers of charcoal, sometimes mixed with lumps of burnt earth in the form of black layers. The riven planks were arranged parallel to the sides and vertically, i.e. with narrower edges towards the ground. They were located on four sides, with the best-preserved ones in the NW part. They had a total length of approximately 73 cm and a width of 3–4 cm and they consisted of at least 4–5 separate planks. The remaining riven planks were shorter, segmented and had a total length of 52, 56 and 73 cm. The depth of the preserved planks was at a more or less similar level

Fig. 3. The upper outline of grave no. 10 at a depth of 30 cm from the current ground level, under humus, view from the NE side (photo by the author).

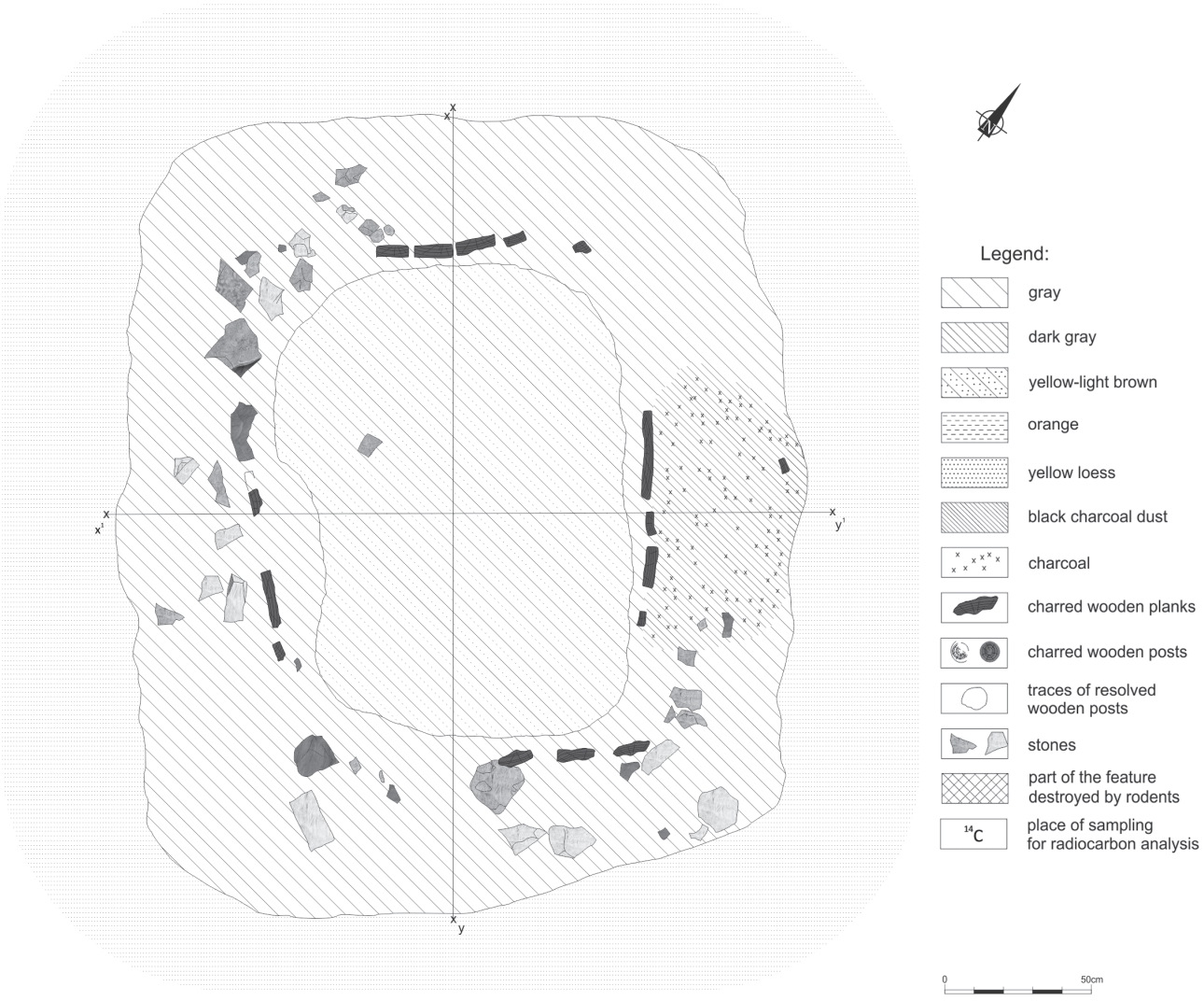

Fig. 4. Sadowie, Opatów district, site 23. A plan view of grave no. 10 on the discovery level (30 cm deep from the current ground level; drawn by the author).

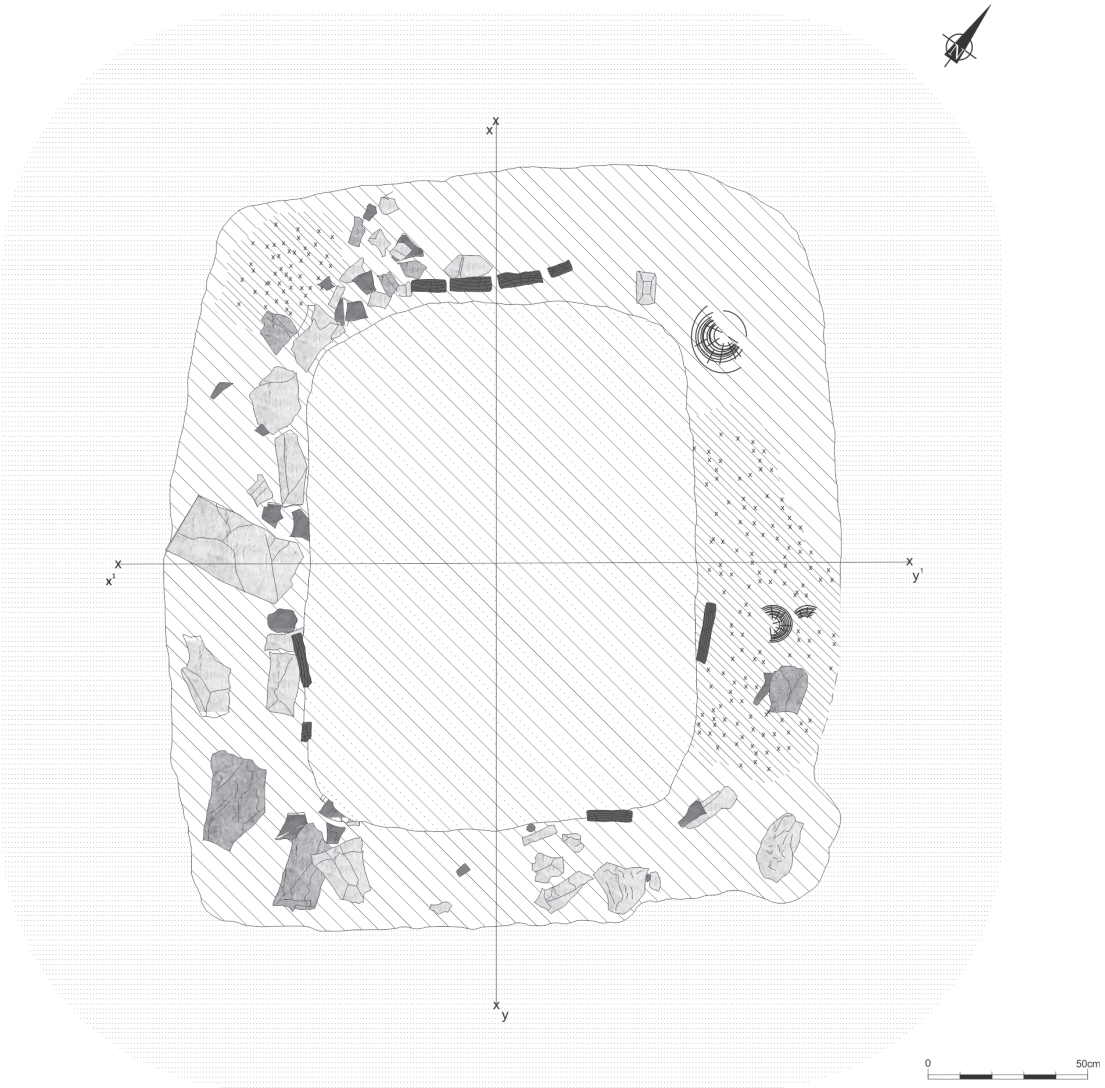

Fig. 5. Sadowie, Opatów district, site 23. A plan view of grave no. 10 at the level of 10 cm (depth 40 cm from the current ground level; drawn by the author).

– 18–20 cm, i.e. they were approximately 12–15 cm higher than the bottom of the groove and from a few to a maximum of 20 cm above the internal part of the structure (Fig. 7: A, B, G).

As for the outer side of the described structure, there was an accumulation of stone slabs forming a kind of a kerb (Fig. 9). They were adjacent directly to the centre of the feature in the NE, NW and SW sides. The dimensions of most slabs were from 30 cm to 20 cm and 7–10 cm thick, while the largest items were 41 × 33 × 7 cm. Some of them showed traces of processing and shaping in order to standardize their size and to ensure that their upper parts were at a similar height, i.e. the level of grave identification (30 cm from the current ground level), possibly selected in terms of size and location to reach the very bottom of the surrounding groove.

On the ceiling of the grave frame there were rubble and angular stone lumps scattered in small clusters. At lower depths of 10 and 15 cm and especially 20 cm, they were concentrated mainly on the inner side of the groove, along the NW, W, SE and partially E sides (Fig. 10, 11). The NE part of the outer frame was devoid of them. Single stones were also scattered within the groove, at depths of 3–18 cm, and they were more common on the edge of its fill, in the middle on the inner side. In most cases, the stones were lying horizontally or slightly tilted towards the interior of the chamber (Fig. 12). Their original task was to stabilize the riven planks forming the burial chamber. The position indicated that it had fallen over when the structure collapsed due to fire. The average dimensions of the stones ranged from 14–20 × 10–15 × 7–10 cm in thickness, whereas

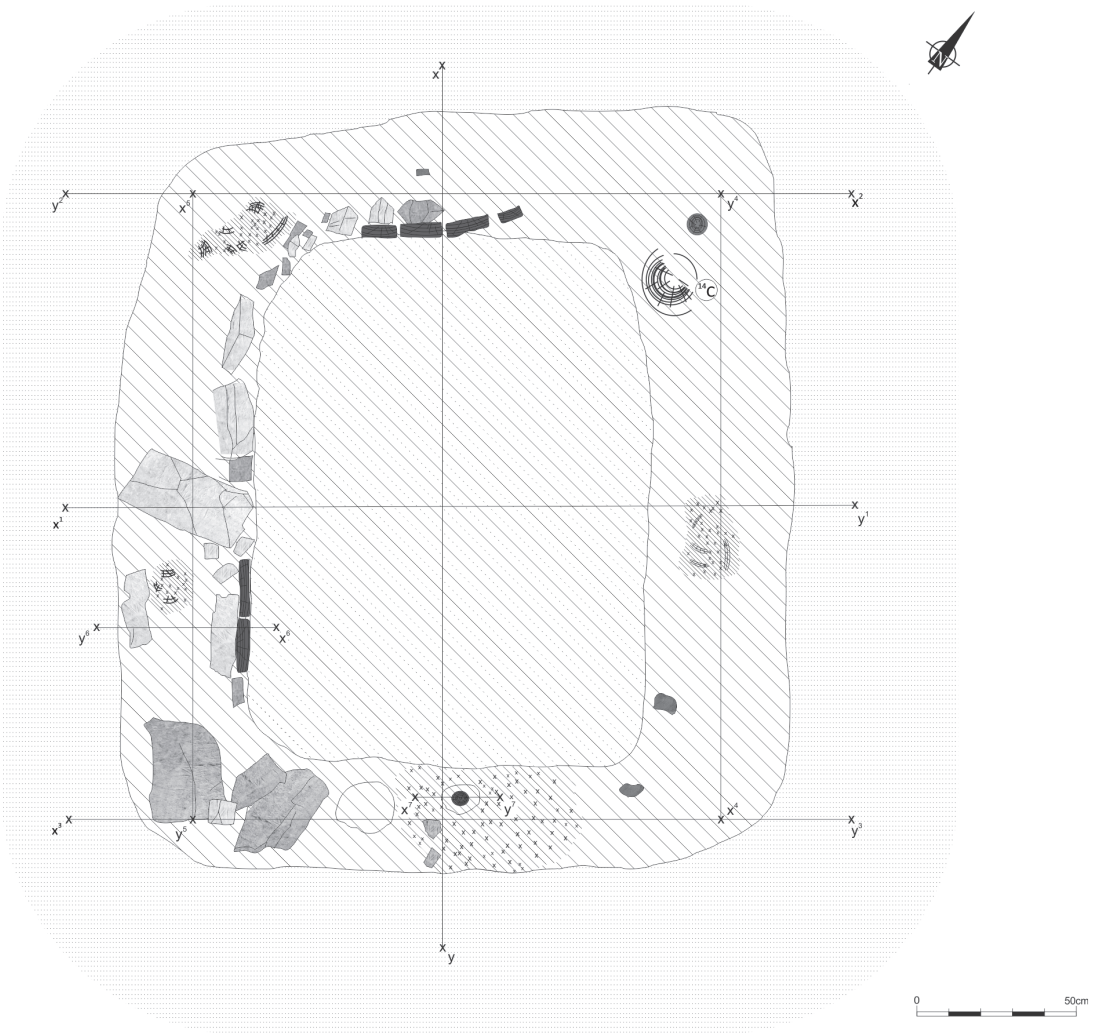

Fig. 6. Sadowie, Opatów district, site 23. A plan view of grave no. 10 at the level of 20 cm (depth 50 cm from the current ground level; drawn by the author).

the largest amounted 32 × 21 × 13 cm. Almost all of them bore traces of burning in the form of thermal cracks and the outside was covered with a black layer of earth mixed with charcoal dust. In the NW corner, the stones reached the interior of the structure and formed a smaller cluster there. It consisted of small lumps measuring 4 × 5 to a maximum of 5 × 10 cm, which revealed traces of intentional cutting or were waste from the processing of larger stone slabs. The preserved traces suggest that the knapping technique was used here.

Most of the stones used to build the grave kerb are made of fine-grained light grey sandstone, the nearest deposits of which occur in the Jurassic formations, approximately 5 km to the SE, in the village Podole (Dowgiałło 1974). In two places of the groove, other small stones were found – fragments of red-coloured Triassic sandstone from Czerwona Góra (Romanek 1991), approximately 4.5 km west of the cemetery.

Within the grave's frame (groove), there were also traces of posts placed vertically in the ground in several places, which were the constructions for supporting the wooden above-ground structure. They were found in the corners (N, NW; Fig. 13) and in the middle of the sides (NE, SW and SE; Fig. 14, 15). In three cases, these were the remains of burnt or charred logs, with a diameter of 12–14 cm and in one case 18 cm, reaching to a depth of 20–23 cm, i.e. 5–10 cm above the bottom of the feature. The posts, as can be revealed from the preserved traces, had flat ends. Some of them were covered with bark on the outside and showed traces of charring. It is worth adding that traces of repairs or support were discovered in the vicinity of some of the posts. In one case (in the N corner) there was a small

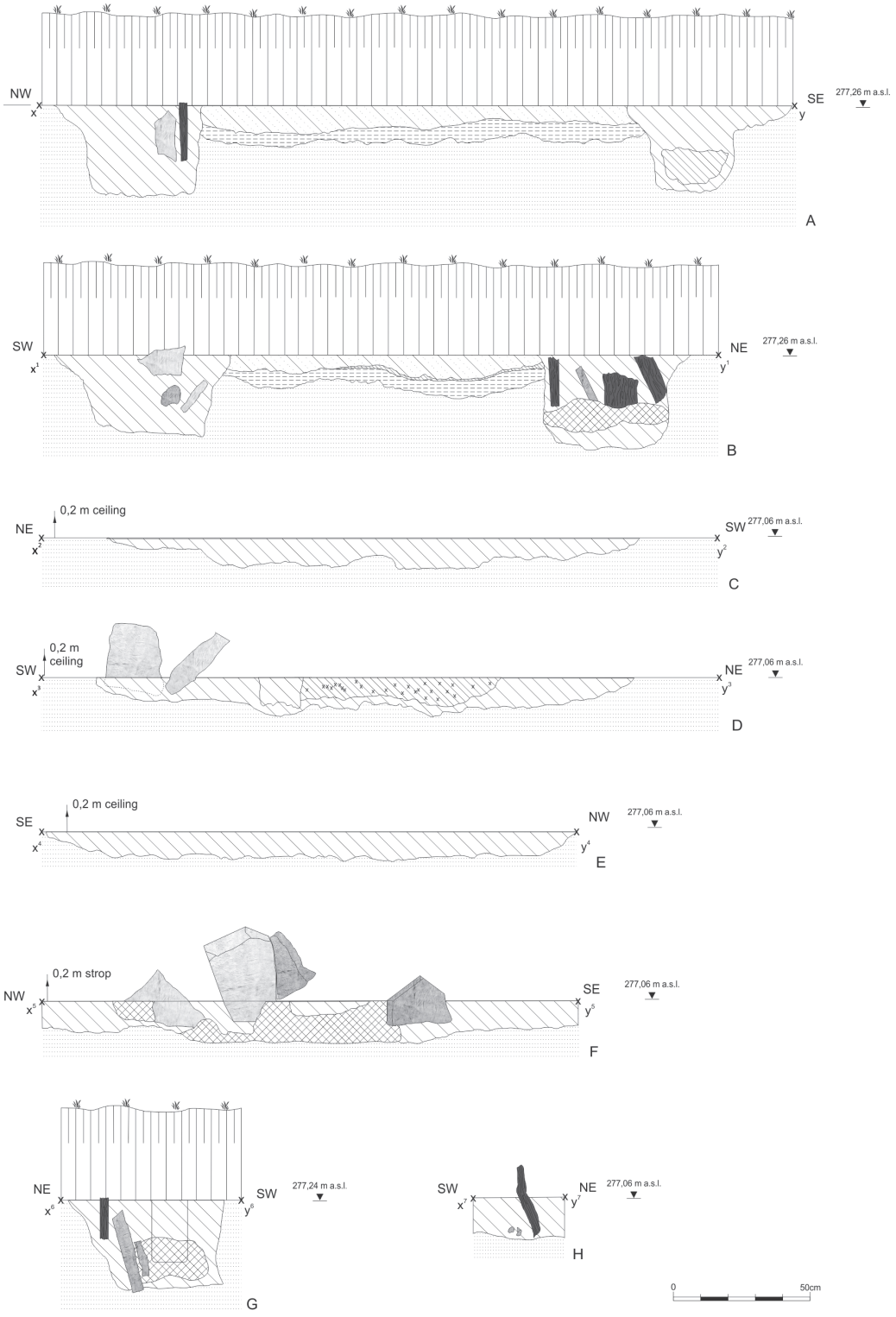

Fig. 7. Sadowie, Opatów district, site 23. Vertical cross-sections of grave no. 10 (drawn by the author).

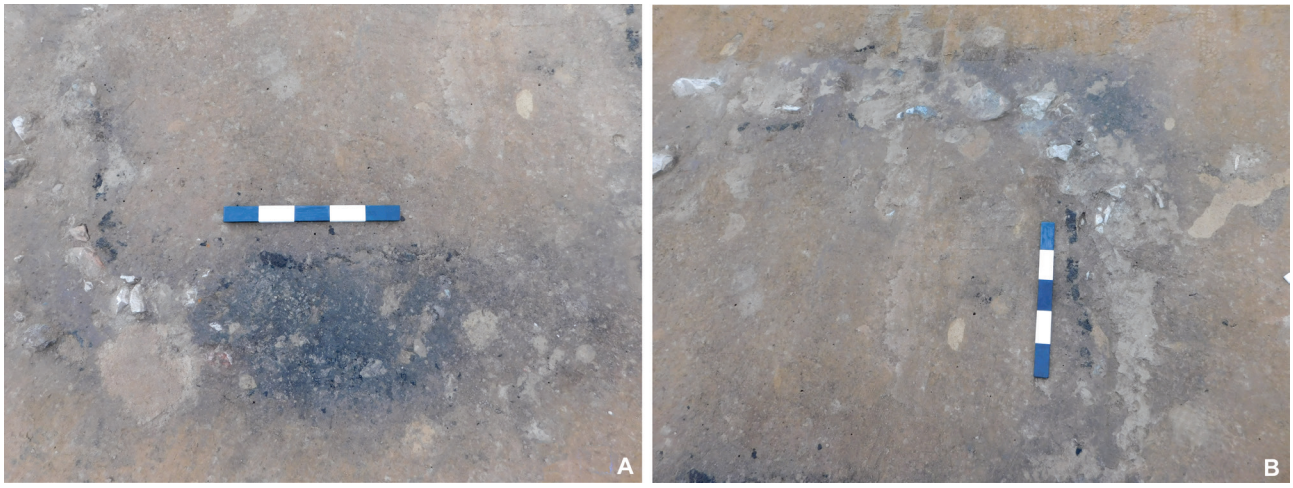

Fig. 8. Fragment of the inner part of the fill of grave no. 10, at a depth of 30 cm, visible remains of wooden riven planks deformed (bent) as a result of high temperature.
A – eastern corner, view from the NE side; B – side NW, view from the NE side (photo by the author).

Fig. 9. Plan view of grave no. 10 at a depth of 20 cm with preserved profile baulks. A visible foundation groove near the wall in an intensely black colour, with slabs and stone lumps supporting the wooden walls of the burial chamber (photo by the author).

Fig. 10. Partially excavated burial feature with visible traces of a stone base strengthening the foundation of the side walls of the burial chamber, W corner, view from the NW side (photo by the author).

Fig. 11. Clusters of stones in the ceiling of the foundation groove, creating a covering of the outer wall of the burial chamber; a preserved fragment of a charred plank is visible under the ruler; NW side, view from the SW side (photo by the author).

Fig.12. One of the stone lumps leaning towards the interior of the burial chamber due to the collapse of the structure, under the influence of fire, view from the NW side (photo by the author).

Fig. 13. A charred wooden post at the bottom of the foundation groove, originally supporting the roof over the burial chamber. In the background, at the SE baulk, along the axis, there is a vertical cross-section of the inner part of the grave with a visible dark layer, saturated with a smear of charcoal, and a layer of overheated loess subsoil underneath it (traces of overheating of the bottom of the pit – marked with a red arrow) (photo by the author).

Fig. 14. Fragments of a vertical cross-section of the groove of grave no. 10 in the NE side, with a charred post and a riven plank (i.e. part of the wall of the burial chamber) adjacent to the inner part, view from the NW side (photo by the author).

Fig. 15. Fragments of a vertical cross-section of the wall groove of grave no. 10 in the SW side, with part of the stone structure supporting a wooden, burnt post and a charred plank from the inside of the burial chamber, view from the NW side (photo by the author).

circle with a diameter of 7 cm, placed on the outside, which lay a few cm below the bottom of the groove. Similar strengthening was noted in the NE part, near the central post in the form of a picket with a diameter of 12–13 cm. In the S side, more or less in the middle of its length, there was a burnt, small wooden post, 26 cm high and about 5–7 cm thick (Fig. 16). It was tilted towards the southern corner, departing from the bottom by about 10–15° (i.e. from the vertical line). It is likely that it responded to pressure when the wooden structure collapsed under the pressure of falling ashes. The end of this post had a sharp point, as can be revealed from the preserved traces.

In two places within the outline of the wall groove, additional structures were uncovered aimed at the stabilization of the vertical wooden elements. On the longer N side, clusters of stones were found in the form of "nests" surrounding empty spaces where the posts were originally located (Fig. 17). Another one was observed in the SE corner. In the S and SW

Fig. 16. Fragment of a vertical cross-section of grave no. 10 along the SE part, with a preserved burnt post bent to the side; view from the SE side (photo by the author).

Fig. 17. A view of the bottom part of the groove fill with stones surrounding the post negative; view from the SE side (photo by the author).

Fig. 18. Fragment of a groove with a double row of stone kerbs in the form of a "corridor", originally surrounding wooden posts supporting the roof over the grave pit, SE side; view from the SE side (photo by the author).

parts of the groove, a stone "corridor" 13–15 cm wide (directed towards the SW) was found, which ran for about 70 cm (Fig. 18). The interior contained relatively loose fire remains, "packets" of burnt earth, and scattered layers of charcoal. It is believed that posts were originally built here and fell over during the fire.

It is worth adding that in some places at the bottom of the groove there were traces of decomposed (rotten?) posts. They were located approximately in the middle of the SE and SW sides. They had a different consistency and lighter colour than the rest of the fill. Most likely, these posts are traces of *ad hoc* repairs or preservation of the construction – "house for the dead".

Speaking of the inside the groove, small pieces of charcoal were recorded and larger concentrations of such coals were found in two places, i.e. on the SW and NE sides (Fig. 19). These were most often traces of subsequent posts or logs with a diameter of about 20–25 cm that had fallen during the fire. Another such accumulation was located in the W corner of the feature, occupying a space of approximately 18 × 35 cm.

Regarding the groove fill, there were also numerous lumps of black daub, strongly hardened during the fire. Some of them had angular shapes, which indicates that they were used to fill the spaces between the stones. The burnt daub usually showed no traces of wood impressions or organic components.

Fig. 19. Traces of burning discovered within the fill of the foundation groove – fragments of charred posts, burnt tree bark (consisted of layers of fibres pressed together, bearing a flexible structure) (photo by the author).

Characteristics of movable artefacts from the grave fill

Within the grave (starting from a depth of 5 cm) there was a collection of 39 movable artefacts, consisting of 19 items of pottery sherds and 6 flint artefacts. In several places, clusters of burnt, very small human bones were also noted (14 fragments in total). Anthropological analysis indicated human origins of the remains.

Ceramic artefacts:

1. A fragment of the rim of a thin-walled pottery vessel (mass find no. 533/16; Fig. 20: 1). The clay paste contains an admixture of medium-grained crushed rock and quartz grains. Coarse, rough surface (roughness is the result of using sharp-edged crushed rock for the clay paste). The fragment is burnt and is dark grey in colour. Weight 2 g. Preserved wall thickness: 2.5 mm.

2. Six fragments of the rim and upper part of an undecorated pottery vessel, most likely a vase with a short cylindrical neck (mass find nos. 524/16, 527/16, 528/16; Fig. 20: 2). The clay paste contains an admixture of large- and fine-grained crushed rock and fine quartz. The surfaces of the external and internal walls and fractures are uniform and orange in colour. Some of the external surfaces are slightly damaged, covered in some places with dark brown deposits of burnt loess and charcoal dust. There are visible traces of smearing on the outer sides of the sherds. The sherds are quite fragile and breakable. Weight 36 g. Thickness of the vessel walls: 4.5–6.5 mm.

3. A fragment of the edge of a pottery vessel, undecorated (mass find no. 535/16; Fig. 20: 3). The clay paste contains a small amount of large-grained crushed rock, burnt and grey in colour. The surface is uneven, dark grey on the outside and fracture, with traces of burning, and light brown on the inside. Weight 2 g. Preserved wall thickness: 5 mm.

4. A fragment of the edge of a pottery vessel, decorated under the outer edge with a double row of horizontal impressions of an irregular, quadrsharp-edged stamp (mass find no. 523/16; Fig. 20: 4). The clay paste contains an admixture of sharp-edged, large- and fine-grained white or light grey crushed rock. The outer surface is partially damaged, it is dark brown on the outside, light brown on the inside and a dark brown fracture. On the inside, there are visible burnt marks extending slightly into the ceramic wall. Weight 5 g. Preserved wall thickness: 5.5 mm.

5. A small fragment of the body of a probably small pottery vessel (amphora) with a horizontally pierced

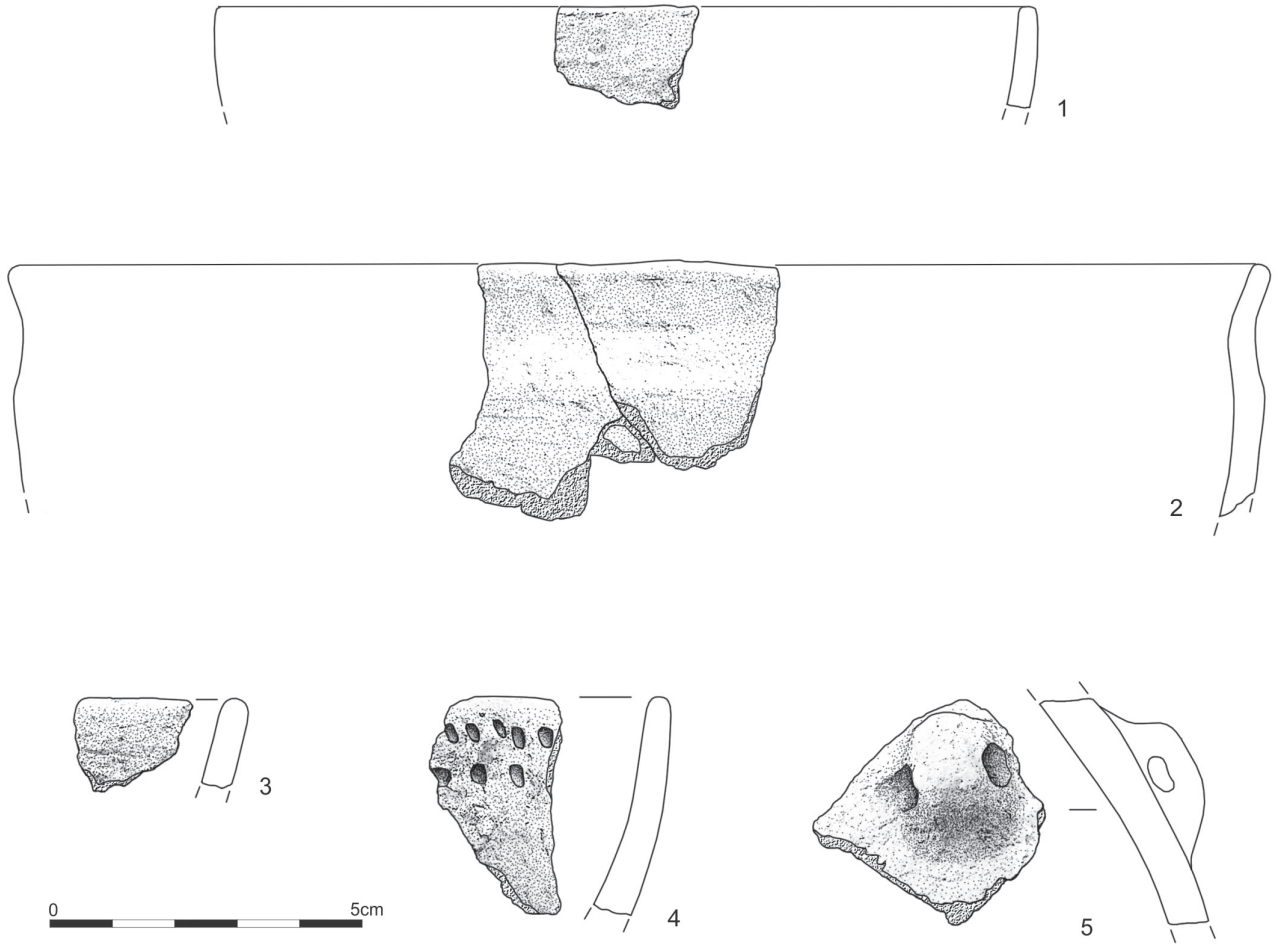

Fig. 20. Sherds of pottery vessels of the Globular Amphora Culture uncovered in the fill of grave no. 10.
1 – mass find no. 533/16; 2–mass find nos. 524/16, 527/16, 528/16; 3 – mass find no. 535/16; 4 – mass find no. 523/16; 5 – mass find no. 526/16 (drawn by A. Bardec´kij).

handle (mass find no. 526/16; Fig. 20: 5). The clay paste contains an admixture of fine-grained quartz and small amounts of sharp-edged, large-grained crushed rock of light grey and whitish colour. The surface is smoothed, dark brown on the outside and inside, and has a black fracture. From the outside, the item is covered in some places with light brown deposit – a burnt layer of loess. A hard item. Weight 16 g. Preserved wall thickness: 6.5–7 mm. A handle dimensions: height 2.8 cm, width in the middle part 1.1 cm, width at the base 1.8 and 2.2 cm, hole diameter 0.5–0.6 × 1.7 cm.

6. A small fragment of a pottery vessel, decorated with faded impressions of a stamp and a cord (mass find no. 531/16). The clay paste contains an admixture of fine-grained quartz grains. The surface is damaged and abraded, in orange colour on the outside and inside and brick-red colour in the fracture. A fragile item. Weight 1 g. Preserved wall thickness: 5 mm.

7. Four undecorated fragments of the body of a pottery vessel (mass find nos. 527/16, 539/16). The clay paste contains an admixture of medium-grained white crushed rock and occasionally fine-grained quartz. The surfaces of the items are smooth, uniform, black in colour on the outside, light brown on the inside, and with black fractures. The external surfaces are covered in some places with a light brown layer of burnt loess. Weight 5 g. Preserved wall thickness: 4.5–5.5 mm.

8. Two undecorated fragments of a pottery vessel (mass find nos. 529/16 and 532/16). The clay paste contains an admixture of large- and medium-grained crushed rock of white and grey colour and fine-grained sand. Fragments are slightly burnt, with grey external and internal surfaces and fractures. The pottery sherds are fragile and separating. Weight 10 g. Preserved wall thickness: 6.5 and 8 mm.

9. A small fragment of a pottery vessel (mass find no. 530/16). The clay paste contains sharp-edged, large- and medium-grained crushed rock of white and transparent colour. The surfaces of the walls are

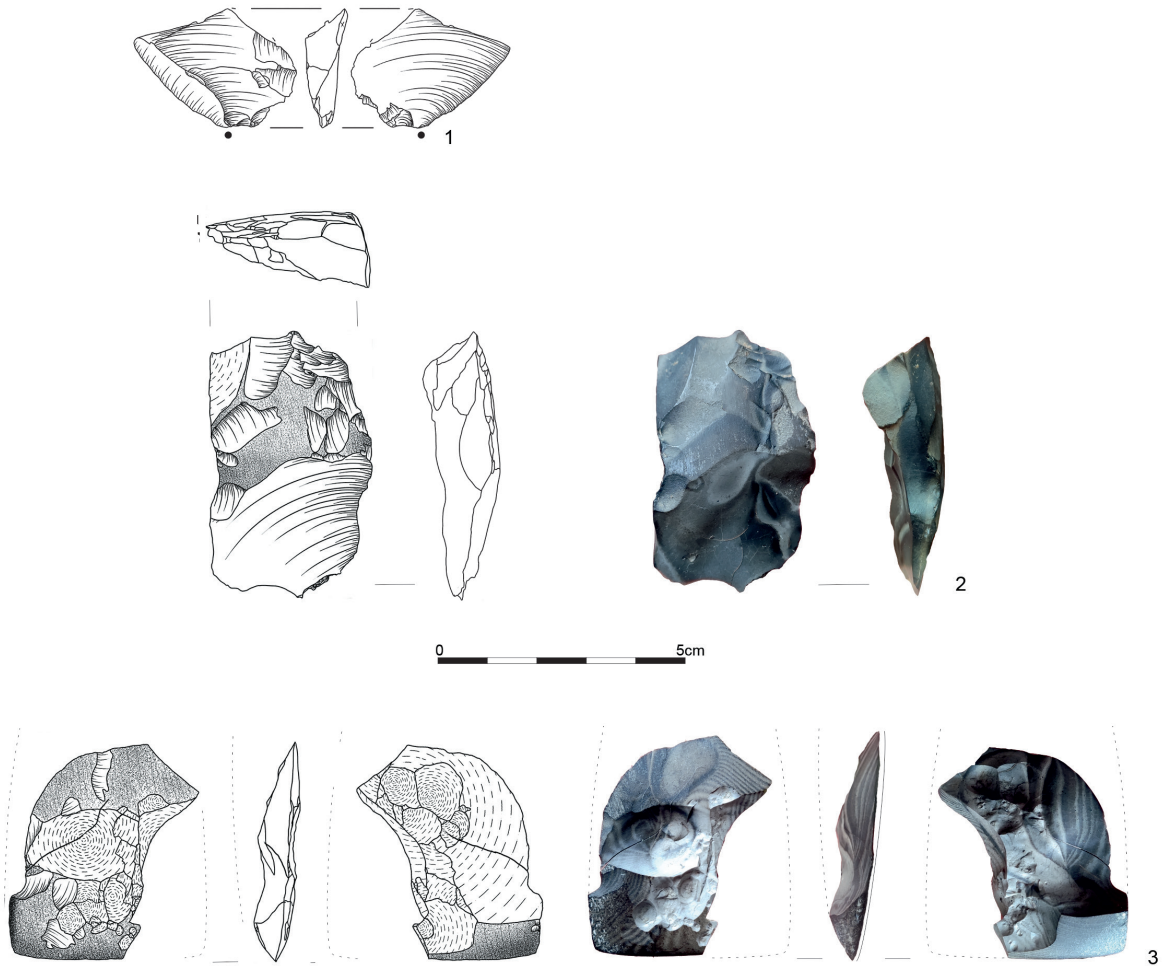

Fig. 21. Flint artefacts discovered in the grave, including fragments of damaged and burnt flint axes (2, 3).
1 – registered find no. 40/2016; 2 – registered find no. 42/2016; 3 – registered find no. 41/2016 (drawn by A. Nowak).

smooth, grey on the outside and black on the inside and in the fracture. The firing is good and the sherd is quite hard. Weight 2 g. Preserved wall thickness: 4 mm.

10. A small fragment of a pottery vessel (mass find no. 534/16). The clay paste consists of large- and medium-grained crushed rock, grey and white in colour. The surface is uneven, orange on the outside and in the fracture, and black on the inside. There are visible traces of smearing with straw or grass on the outside and inside. The firing is good and the sherd is quite hard. Weight 9 g. Preserved wall thickness: 6 mm.

Flint artefacts:

1. One flint flake (registered find no. 43/16). Striped flint. Dimensions: length – 12 mm, width – 12 mm, thickness – 2 mm.

2. One flint flake (registered find no. 40/16; Fig. 21: 1). Chocolate flint. Dimensions: length – 25 mm, width – 35 mm, thickness – 6 mm.

3. One flake with one of its sides partially broken off (registered find no. 44/16). The item is heavily burnt (most likely striped flint). Dimensions: length – 6 mm, width – 16 mm, thickness – 1.5 mm.

4. One small flake, struck from a flint axe or a chisel, with traces of polishing preserved on the upper side (registered find no. 45/16). Striped flint, showing signs of cracking and colour changes due to heating. The edges of the artefacts are fragile and breakable. Dimensions: length – 5 mm, width – 11 mm, thickness – 1 mm.

5. Fragment of a flint axe blade with one of the side edges partially preserved (registered find no. 41/16; Fig. 21: 3). It comes from an axe with a trapezoidal shape and a tetrahedral cross-section. Striped flint, showing signs of cracking and colour changes due to heating. Dimensions: length – 46 mm, width – 37 mm, thickness – 9 mm.

6. Fragment of the central part of the axe with a preserved frontal and side surfaces, showing traces of polishing (registered find no. 42/16; Fig. 21: 2). Striped flint, showing signs of thermal changes (cracks

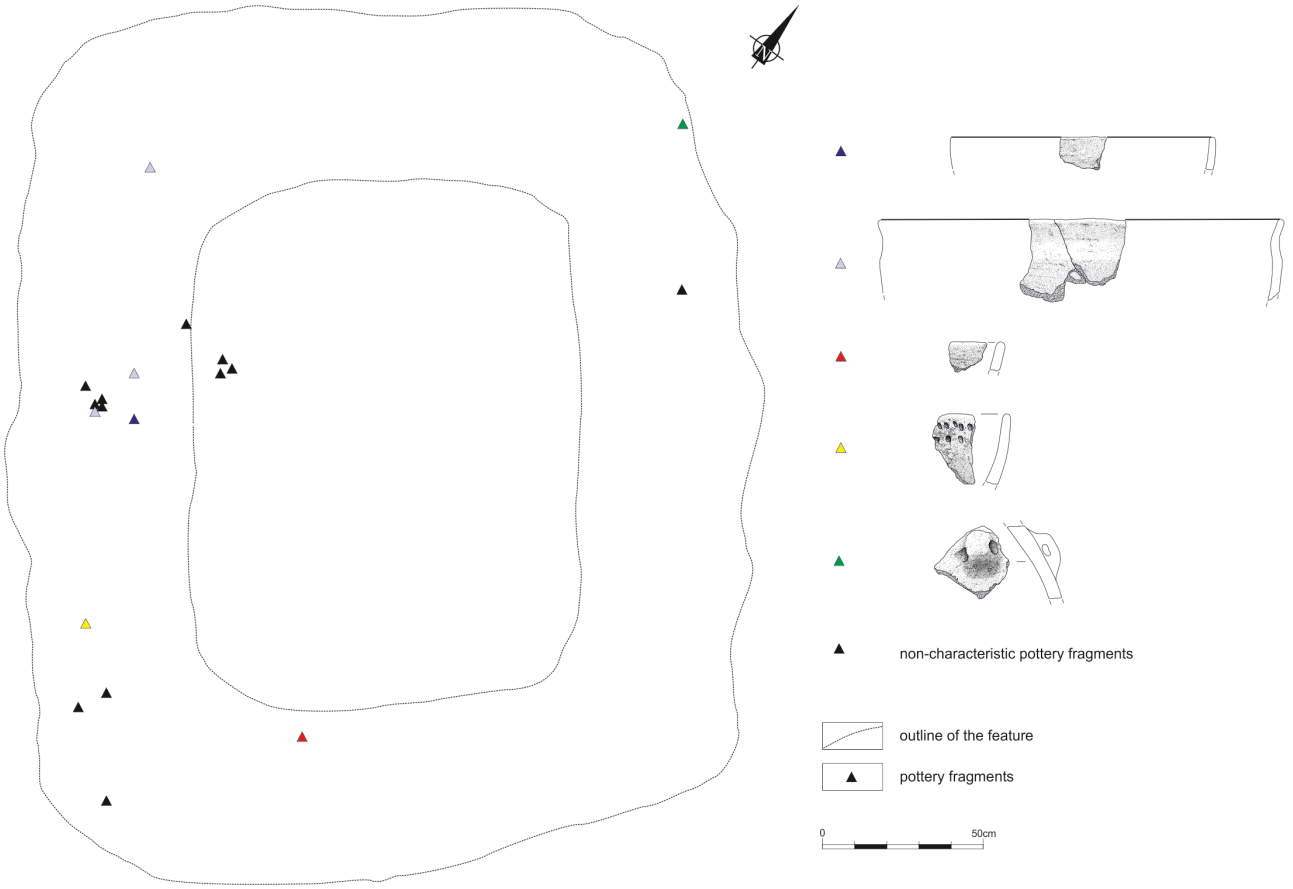

Fig. 22. Sadowie, Opatów district, site 23. Grave no. 10. Planigraphy of pottery with the location of characteristic GAC pottery sherds (drawn by the author and A. Bardec´kij).

and colour changes). The side edges of the item are easily chipped. Dimensions: length – 55 mm, width – 33 mm, thickness – 12 mm.

The pottery sherds found within the grave fill can be classified into at least ten forms. Among them we are able to distinguish a fragment of a small amphora (Fig. 20: 5) and a vase with a bend under the rim without any ornament (Fig. 20: 2). One of the edge fragments of a rather large vessel has a decoration in the form of multiple stamp impressions (Fig. 20: 4). In the case of other uncovered sherds, the technological criteria of the ceramics determine their inclusion in the GAC category, i.e. the type of admixture (mainly crushed rock), fracture (usually single-colour), surface treatment and firing, which have good analogies among other ceramic assemblages from this site. The majority of the discovered pottery sherds are highly fragmented and have traces of burning and being covered with a layer of burnt loess mixed with charcoal dust. As for the distribution of the sherds, they were unevenly scattered within the grave, concentrating mainly in the western part of the grave, directly at the W corner and SW side of the ditch, at a depth of 0 to 10 cm (Fig. 22:). Some of them were located in the SW part of the ditch where bones and flints were grouped. Three pottery sherds were also found outside the ditch, on its E side, in the ceiling of the burnt subsoil at the depth of 20 cm. Near the burnt wooden pole, in the N corner, two more fragments of vessels were found, including a part of the vessel body with a preserved handle.

Six flint artefacts were also discovered within the grave. Among them, there were 2 fragments of a broken, polished axe (or axes; Fig. 21: 2, 3) made of striped flint and 3 flint flakes. Additionally, there was one small flake with traces of polishing, which could also be a fragment of a flint chisel or another small axe. Unlike pottery, flint artefacts were concentrated in the NW side of the ditch, inside the stone slabs (Fig. 23). A single artefact – a flake with traces of polishing – was located in the SW side of the ditch. Near the N corner of the grave, the two fragments of a burnt axe were also found.

Moreover, in the grave fill, 14 very small bone fragments were also discovered, only a few cm in size, showing signs of severe burning (colour ranging from

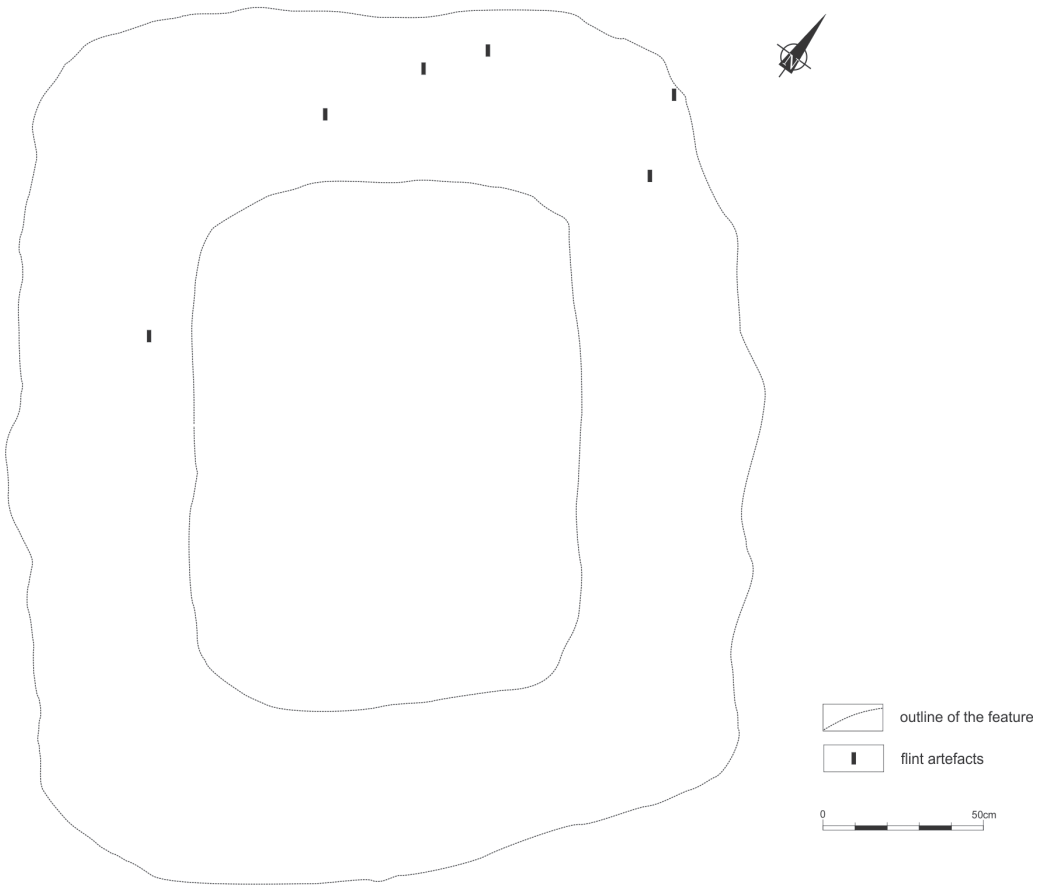

Fig. 23. Sadowie, Opatów district, site 23. Grave no. 10. Planigraphy of GAC flint artefacts (drawn by the author).

white to cream). The vast majority of them were located in the north-western part of the ditch, where pottery sherds and flints were clustered (Fig. 24). Some of them were also found near the south-eastern side and the western corner of the grave at the depth of 5–15 cm. At the bottom, more or less in the middle of the side, there was also a burnt phalanx, which undoubtedly came from a human hand. The anthropological expertise was performed by Dr Joanna Rogóż from the Institute of Archaeology of the University of Rzeszów.

Interpretation of the discovered "grave" no. 10 and an attempt to reconstruct the burial rites

Based on observations made during fieldwork as well as subsequent analyses of documentation and movable artefacts, an attempt can be made to reconstruct the original function of the grave and the subsequent burial rites. It should be assumed that the discussed feature had two stages of use related to its construction.

The first stage included the construction of a rectangular ground structure, marked by a 2.1 × 2.37 m groove sunk into the original level by at least 30–40 cm. On the inside, wooden riven planks were placed vertically (Fig. 8, 14, 15). They had similar features in sizes, i.e. up to 4 cm thick and approximately 20 cm long each. Thus, they created in this way the proper burial chamber with a rectangular outline, a size of 1.2–1.3 × 1.7 m and an area of approximately 2.21 m^2. It is very likely that the strengthening in the form of planks were placed at the bottom, preventing the walls from coming apart. They could have played the role of a wooden "floor" on which the body of the deceased individual(s) along with the grave goods were placed (Fig. 25: A). The wooden walls on the outer sides (the chamber) were enclosed and wedged with vertically placed slabs and sandstone lumps (Fig. 10, 11). The stones were laid loosely, only in one place there was a clear trace of using clay for strengthening. As mentioned, the material used to build the stone kerb was characterized by a high degree of standardization, i.e. in most cases it consisted of blocks knapped to provide a similar size and placed in a groove so that their

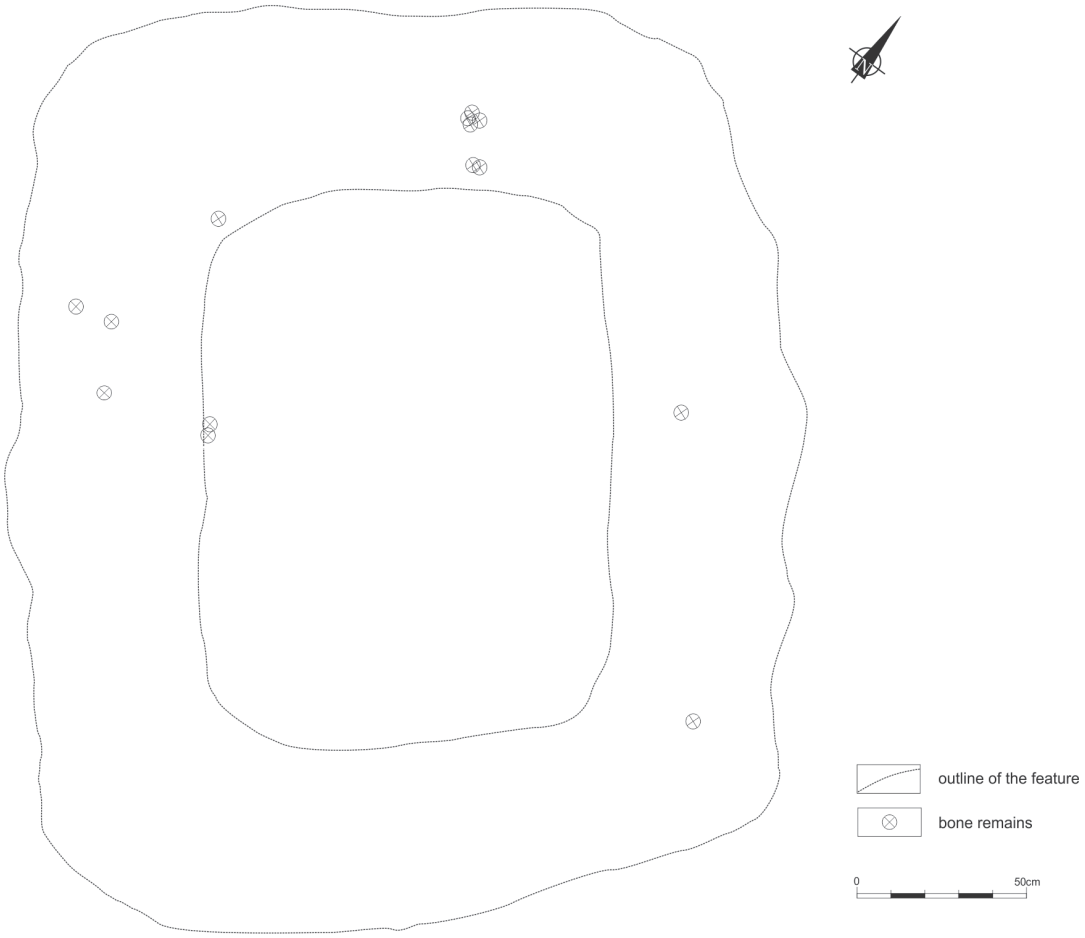

Fig. 24. Sadowie, Opatów district, site 23. Grave no. 10. Planigraphy of fragments of burnt human bones (drawn by the author).

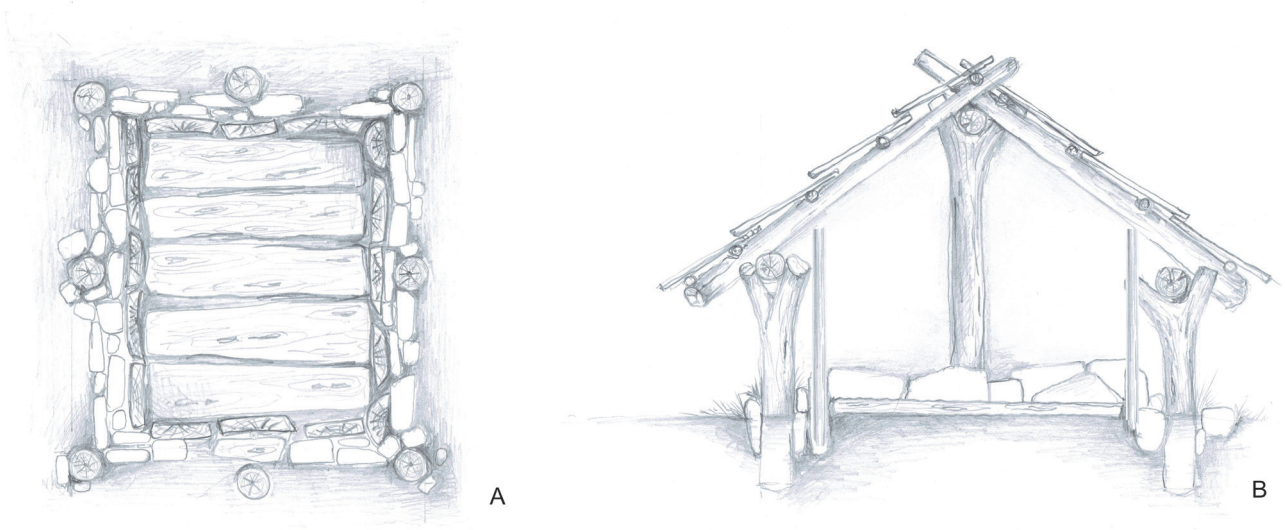

Fig. 25. A reconstructed plan view (A) and cross-section (B) of the "house for the dead", according to Dr M. Gransicki.

upper surface was even and had the same height. On the outside of the groove there were traces of strengthening the structure in the form of wooden posts. They were uncovered directly next to the walls, in all four corners (Fig. 13). The other ones were located on both sides of the structure, approximately halfway along each side. The sizes of the preserved traces indicate that the posts could have had diameters of up to 20 cm. Their arrangement was consistent with the outline of the grave chamber and indicated that they were functionally related to the central chamber. In several places (on the SE and SW sides), within the surrounding groove, there were traces of posts which did not show any signs of burning. Their diameters ranged from 15 to 20 cm, and their depth was about 20 cm. One may presume that they were the remains of ad hoc repairs or the preservation of the construction.

During the period of use, the wooden structure must have been relatively airtight (e.g. to prevent wild animals from getting inside). Unfortunately, now we are unable to determine the location of the entrance to the burial chamber. However, it is worth emphasizing that the bottom layer of the preserved planks was almost continuous on all four sides of the structure. Therefore, this suggests that perhaps one of the planks was removed for opening. Based on the discovered gap in the stone kerb, it can be assumed that the entrance was on the narrower SE side. In this area, a charred post set vertically with a sharp end at the bottom was found, which could have been used to cover the entrance to the chamber (Fig. 16). We cannot determine the actual height of the structure. Taking into account that the dead had to be carried inside easily, its height must have reached at least 1.5–1.7 m. It is worth considering the average height of people from the Late Neolithic, which amounted from 1.63 m to 1.71 m in men and from 1.46 m to 1.62 m in case of women (e.g. Miszkiewicz 1977; Szczepanek 2013, 84–87, tab. 8). Analysing the available data, we cannot say anything certain about the roofing of the structure. The presence of charred posts in the corners of the structure and traces of poles placed halfway along the shorter sides may indicate the use of a gable roof based on a Y-shaped posts and a ridge pole construction (Fig. 25: B). The evidence that seems to confirm this is the need to protect the building against rainfall by quickly draining rainwater. At the same time, we cannot exclude the possibility of a flat covering of the structure, where the roof was an extension of the walls and closed from above. It is probable that the posts could also have formed the base of the scaffold-frame, which was used as a support for the planks forming the sides of the chamber. This suggestion is confirmed by the fact that the building stood freely and may have required bolting of the walls, especially at the corners, where the planks met.

To sum up, it should be assumed that we are dealing with an above-ground construction in which wooden and stone elements created a closed space in the form of a "house for the dead" (other terms found in the literature: pre-funeral house, charnel house, decarnation house; Kjærum 1967; Larsson 2003; Hecht 2007, 126–129; Sjögren 2014, 1015–1016). This structure would only provide temporary protection of the body against further activities related to cremation and various ceremonies preceding it, most likely extended in time. It was probably about protecting the bodies during the decomposition of soft tissues (so-called decarnation; more broadly about taphonomic processes – e.g. Haglund and Sorg 1997). Then, the construction was burned down. Probably it took place during the culmination of the burial ceremony, which was the finale of multiple sacrificial acts. Were the dead cremated then?

The answer to this question seems clear based on the data obtained. It should be noted that the material used to build the house consisted of several planks and at least 8 posts-logs and were structurally incapable of effective cremation. In total, its area amounted approximately 0.75 m^3. In order to cremate the bones, it was necessary to use proper secondary cremation and build a proper funeral pyre.

Regarding the correct interpretation of the further function of grave no. 10, the results of experimental cremations of human remains on pyres may be important (Strzałko and Piontek 1974; McKinley 1993; 1997; Marshall 1998; Fülöp 2018). Moreover, valuable data for reconstruction also result from anthropological, historical, and ethnographic sources (Hiatt 1969; Becker *et al.* 2005; Oestigaard 2005; Davies and Mates (eds.) 2006; Strong 2007; Ulguim 2015). Based on the available scientific advice, funeral pyres have common features, regardless of the chronological period in which they were created (McKinley 1997, 132). They require a sufficient amount of fuel (appropriately chipped and good quality wood), proper arrangement to allow free circulation of oxygen for burning and to ensure the appropriate temperature to complete the cremation. As a rule, pyres have a cuboid or trapezoid form made of wooden logs arranged alternately in layers (Fig. 26; e.g. Piontek 2002, 97, fig. 1; Oestigaard 2005, 14, fig. 1.5, 1.6; Fülöp 2018, 288, fig. 1). Empty spaces are usually filled with smaller branches or brushwood. What is more, reed or straw is

Fig. 26. Examples of cremation pyres.
A – a Hindu funeral pyre used currently in India (Oestigaard 2004, 28, fig. 1);
B – a pyre taken from experimental research (Piontek 2002, 97, fig. 1).

used as an additional burning material, which speeds up the burning process and increases heat emission. Most of the pyres were built on the ground with small additional elements such as supports and posts in the corners (Marshall 2011, 10, fig. 5). Their goal was also to provide stable support for the bodies placed on the pyre and the collected grave goods. In some cases, there are wooden logs placed at the bottom, creating a kind of horizontal wooden structure that strengthens the walls of the pyre (Ulguim 2015, 200, fig. 8.15). This allows the cremation to be completed effectively, as the pyre often collapses after some time due to uneven burning (McKinley 1997, 135, fig. 4).

Speaking of the course of cremation, it is worth mentioning that temperature fluctuations may occur between individual cremations, depending on the type of wood used, its quantity and the intensity of adding wood to the fire. Moreover, the time and effectiveness of cremation are also influenced by several environmental variables, such as the availability of oxygen, wind strength and appropriate weather (heavy rain, for example, may extinguish such a pyre or cause it to burn unevenly and collapse). In addition, the nature of the burning process is also determined by the arrangement of corpses at the top of the pyre, i.e. in places where the highest temperature is reached and oxygen is supplied. It is assumed that the burning time of the pyre, depending on the size and wood used, could last from 3 to 10 hours (McKinley 1997, 134; Piontek 2002, 97). Data collected from various experiments indicate that the minimum temperature needed to burn soft tissues and human or animal bones is at least 700°C. In the case of some metal objects uncovered in urn graves, it was calculated that the temperature of the pyre reached up to 800°C–1000°C (Piontek 2002, 100; Oestigaard 2013, 504). In modern crematoriums fired with natural gas, the temperature during cremation reaches a value between 1000°C and 1300°C (Oestigaard 2013, 502).

Most researchers report that even after intense cremation, there are few traces left on the ground that are legible in the archaeological record. The pyres collapse downwards, with a small extension beyond the original boundaries, and the cohesive layer of daub usually remains relatively weak on the ground surface (easily destroyed by weathering or trampling; Fig. 27, 28; Fülöp 2018, 289, fig. 2, 3). Wood ash, which is the evidence of an intense activity in cremation, is not preserved because it is easily washed away by water and easily blown away by the wind. Experimental studies carried out by Piontek and McKinely show that after the pyre cooled, collecting small fragments of bones, such as the phalanges and teeth, did not pose any difficulties (Piontek 2002, 97; McKinley 1997, 134). They were clearly visible among the remains of the pyre and easy to collect by hand. This activity took up to several working hours.

As noted earlier, it is unlikely that human remains and furnishings would have been cremated in the course of fire of the house for the dead. The next stage of the use of grave no. 10 concerned funeral rites, during which a cremation pyre was built. It is assumed that the time interval in which this happened was probably not very long.

The cremation pyre was built on a levelled and previously cleaned surface. From the outside, its range was limited by clusters of stone blocks placed in a surrounding frame-groove. It is very likely that wooden posts were added at the corners, creating a platform on which the deceased(s) and grave goods were placed. The preserved traces indicate that the entire structure

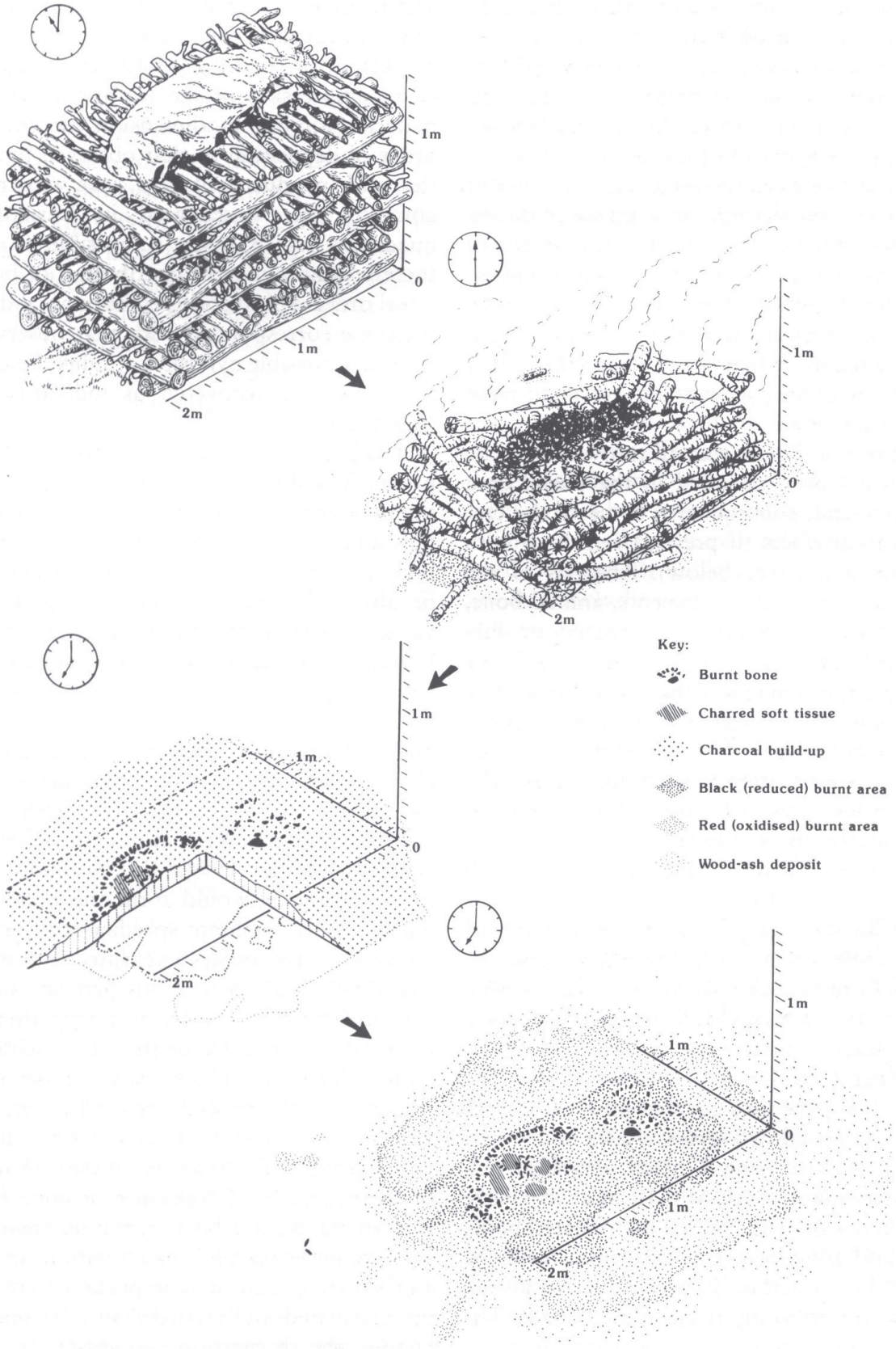

Fig. 27. Schematic illustration showing cremation pyre and different stages of collapse (according to McKinley 1997, 135, fig. 4).

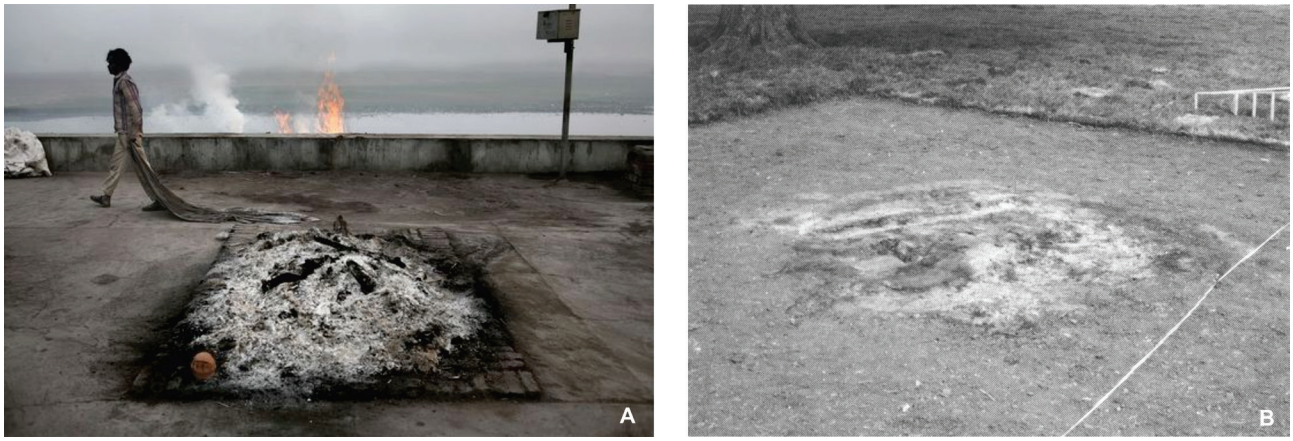

Fig. 28. Cremation sites with preserved remains of the funeral pyre. There are: ashes of burnt wood and bones from the immediate surroundings of the cremation visible after burning.

A – India; B – McKinley experimental research, visible traces of burning in the immediate vicinity after the body was burnt and the remains of the cremation pyre, clay base (McKinley 1997, 134, fig. 3).

burnt down at a very high temperature, which resulted in charring of the preserved and existing, perhaps previously unburnt, posts from the "house for the dead". A significant amount of thermal energy generated in the fire was transferred from areas of higher temperature to areas of lower temperature, and therefore in this case the direction of burning was from the top of the pyre downwards (compare Kokot 2021, 41, fig. 2). The fire resulted in charring of some wooden posts buried in the ground (i.e. coming from the structure of the house for the dead from the first stage of use of the object). Their structure and weak cohesion indicate overheating and burning without access to air (a process similar to that occurring in charcoal piles used in forests in the 20th century; e.g. Marszałek and Kusiak 2013). It is worth noting that most of the posts preserved the bark almost intact, only slightly charred. In this case, the bark was responsible for receiving heat during the fire through a strand of fibres and, after extinction, for its transfer to the surrounding stones and soil. As a result of the burning temperature of the wooden structure, the stones from the surrounding base also overheated. They became looser and their colour changed from red to yellowish. The presence of stones around the pyre resulted in a more effective retention of thermal energy generated during burning, and after the pyre had cooled down, it was released and transferred towards the interior of the original burial chamber. This resulted in the faster cremation by increasing the temperature. Similar solutions in the process of burning human corpses were used, among others, in the so-called *ustrina* (the pyre sites – repeatedly used cremation places), known from the Roman Period (e.g. Witteyer 1993; Józefów 2008).

During the burning of the wood, the immediate surroundings of the wooden structure were burnt, i.e. the upper layer of the subsoil and the covering levels within the surrounding groove. The presence of daub near the posts and stone blocks also confirms the effect of high temperature.

In the literature on the subject, it is possible to find information about cremation as well as experiments with heat transfer through various types of sediments (including sandy, gravel, clay layers; Canti and Linford 2000; Aldeias *et al.* 2016). It is established that during a fire lasting 6 hours in silty (i.e. loess) soil, the temperature reaches 950°C and decreases with its depth. At 6 cm it will be 350°C, while at 10 cm it will reach 288°C (Aldeias *et al.* 2016, 75, tab. 2). Due to the action of fire, much of the heat can be transferred to subsurface areas and to buried items, including bone, wood and stone (Aldeias *et al.* 2016, 76–77, fig. 9)

The results of field experiments clearly show that temperature also influences the colour change of sediments lying near the heat source. In the case of the subsurface layers, there is a gradual change in colour from red to yellow (Aldeias *et al.* 2016, 73, fig. 7).

At the same time, it was noticed that sediments located outside the direct heat source (i.e. sideways or at the edge of the fire) did not show thermal changes (so-called lateral diffusion). The effects of high temperatures in the experimentally burnt pyres can be compared with those visible in grave no. 10. The bottom of the grave pit (under the backfill layer) was heavily burnt, as indicated by its red-brown colour and compact consistency (Fig. 13). The burnt layer was not uniform, reaching approximately 5–8 cm. It is worth noting that burning marks were not notice-

able under the surrounding outline of the groove or outside the construction.

There is no doubt that the body of the deceased (or, more likely bodies) and the grave goods were cremated during the rituals. Ash and fine charcoal have not been preserved to modern times because they are "volatile" particles. After the pyre burnt out and the hot lumps of charcoal and wood cooled, the fire was cleaned up and the bone fragments were selected. Due to the secondary displacement of the interior contents, unfortunately, nothing certain can be said about the position of the deceased's body, its orientation and the arrangement of grave goods during cremation. We are unable to determine whether the human remains were originally placed there (bones arranged anatomically) or whether the remains were cremated after being stored for skeletonization in the house for the dead and were subjected to partial cremation there (the so-called principle of secondary burial rituals; Larsson 2003, 161–164). The poor state of preservation of the bones made it impossible to determine the number of buried individuals. We do not know what happened to the burnt bones collected after the pyre cooled down and where the cremated remains were buried. During the research, single bones were observed scattered on the top part, which were overlooked while cleaning up the burning site. Research on cremation rites in prehistory shows that cremation ashes are most often placed in an urn and transferred to another place or can be used in various funeral practices. It is worth noting here that as for one of the graves (no. 18 D) in the cemetery, a small, shallow pit was found in which there were small burnt bones. Due to defragmentation, it is impossible to say clearly whether they belonged to people or animals in this case? The pottery fragments discovered during fieldwork were mostly concentrated in the western part of the feature, which may indicate that pottery vessels were probably originally located there. It is worth noting here that a similar location, i.e. the "western" location of grave goods, can be observed in most other burials containing human remains discovered in the cemetery in Sadowie. The number of pottery vessels can be estimated as at least 8–10 pieces, mostly of medium size. Some of the pottery sherds showed traces of secondary burning, while others were covered with a layer of burnt loess mixed with charcoal dust, which indicates exposure to high temperatures *in situ* (i.e. in the fire of the cremation pyre). Unfortunately, we cannot determine whether the entire vessels were assembled or only their fragments. Certainly some of the vessels were taken from the cremation site during the cleaning of the remains of the burning site. However, some of the pottery sherds and flints do not show any traces of secondary burning (i.e. mass find nos. 529/16 i 532/16). This also applies to, among others: two flakes made of both striped flint (registered find no. 43/16; Fig. 21: 1) and chocolate flint. It can be assumed that they did not constitute the last act of sacrifice, but they came from the immediate vicinity of the grave when it was being filled. After the ritual ceremonies were carried out, the primary burial pit and the groove were covered with soil from the surroundings, approximately to the level of the stone slabs. It is very likely that a small earth mound was built over the burning site. Perhaps it could have had an additional surrounding stone structure or was topped with, for example, a stela. In the course of excavations, no traces of embankment layers were visible on the surface of the site. As a result of progressive levelling of the land and long-term agricultural cultivation, they could have been completely destroyed.

It is worth adding that an element of the rituals was the burial (sacrificial?) of cattle placed in the neighbouring grave no. 9, located approximately 0.4 m to the NW. At the bottom of the pit there were several incomplete animal skeletons, mainly limb bones and carcasses in the form of spines and ribs, lying in a layer almost 20 cm thick. Their arrangement suggests that they were placed one on top of the other. Nearby, three pottery vessels of the GAC were found – two vases and a two-handled amphora. The interior of the grave was exposed to intense fire. In the southern part of the grave there was a layer of coarse rubble and numerous charcoal, tree bark and fragments of charred logs. They could probably be related to the activities of cleaning up the burning site from the aforementioned neighbouring "grave" no. 10. The wood must have been poured into the pit, partially burning, and it probably burned for a long time, because a change in the colour of the surrounding soil to red was observed, reaching approximately 10 cm.

In the roof of the fill of grave no. 9, a trace of a secondary cut was found, which disturbed the structure of the grave. During these activities, "deposits" were made in the form of the skulls of subsequent cattle, located at various depths in the grave pit.

Cultural and chronological affiliation of grave no. 10

Grave no. 10 was constructed by the GAC people who used the necropolis at site no. 23 in Sadowie. This is evidenced by the artefacts, i.e. the characteris-

tics of pottery vessels, their decorations and the place where they were uncovered inside the construction. Moreover, the localization of it within the cemetery, i.e. within the eastern zone, near grave no. 9, determines its affiliation to the discussed taxonomic unit. The pottery vessels found in the inventory are analogous to other assemblages in the aforementioned necropolis. As for the vase (Fig. 20: 2), it is possible to find similarities in grave no. 1 and no. 20 (Pasterkiewicz 2021, 130, fig. 4: 1; unpublished research results). Slightly similar to the form found among the pottery vessels in the mass grave no. 523 in Koszyce, Proszowice district, site 3 (Przybyła *et al.* 2013, 35, pl. 4: 7). Considering the grave no. 10, it is worth mentioning the original number of vessels deposited in the grave – i.e. at least 8–10 items or their fragments, which have no analogy with other graves in this necropolis. The remaining artefacts from grave 10, such as flint artefacts are also typical for GAC items. It regards the core products in the form of polished axes (Nosek 1967, 323–325; Wiślański 1966, 37–39; Szmyt 1996, 49–51). What is more, flint chisels also often appear in graves.

Speaking of grave no. 10, one radiocarbon date was obtained from a charcoal sample taken from the post discovered in the N corner: 4130±50 BP (MKL-4329). After the calibration at the level of (1σ) –68.3% BC, it amounts to 2866–2624 BC (Bronk Ramsey 2021) and with the probability of (2σ) –95.4% we receive the range: 2879–2574 BC (Fig. 29). The results are similar to the data for other graves from the cemetery in Sadowie and indicate the first half of the third millennium BC (Pasterkiewicz 2020, 68, tab. 1). In that way they connect the discussed object to the late stage of GAC development in the Sandomierz–Opatów region (Witkowska 2021, 34–36, fig. 18; Florek and Witkowska 2021, 181–183, tab. 1, fig. 15). Similar series of ^{14}C results were identified in graves no. 3, 6, 27 and 31 from Złota, site "Gajowizna" (Witkowska *et al*. 2020, 275, fig. 10, tab. 2) and no. 31 and 32 from Malice, Sandomierz district, site 1 (Witkowska *et al.* 2021, tab. 2). Analogous dating comes from the features at the settlements in Mierzanowice, Opatów district, sites 1 and 4 (Florek and Witkowska 2021, tab. 1) and in Złota, at the "Nad Wawrem" site (Florek and Witkowska 2021, tab. 1).

Examples of the use of fire in connection with burial practices (including variously interpreted traces of bone burns and incomplete cremation) are known from the area covered by the GAC settlement (Tab. 1; Fig. 30). In the case of the central group, they are particularly numerous in the cemetery in Złota, "Gajowizna" site, Sandomierz district (Krzak 1977, 62–64). According to anthropological analysis, the skeleton from grave 1 (no. XVIII) identified as a male aged *maturus*, had burnt leg bones (the talus, calcaneal and metatarsal), whereas the skeleton X (female) had the right side of the postcranial skeleton (Miszkiewicz 1977, 135–137). Moreover, the skeleton of a child (no. IX) from grave no. 28 showed traces of high temperature. In features no. 1, 13, 28 and 30 at the same site, there were elements of the wooden structures of the burial chamber burned as part of pre-funeral ceremonies (Krzak 1977, 12–16, 31, 46–49). These included: layers of ash, charcoal, pieces of charred wood and thick layers of loess clay lying on the bottom. Treating the bodies of the dead by fire was recorded in Koszyce, site 3, Proszowice district in grave no. 523. Among the 15 individuals buried there, two of them (no. 12 and 14) were bearing traces of burns, mainly in the area of the skulls and fragments of the upper limbs (Szczepanek 2013, 72, 73). They were also found on one of the clavicles of the individual no. 12. Similar treatments are provided by funeral features from the Lublin Upland. These include, among others: grave II in Las Stocki, site 16, where the skeleton of a female with a burnt skull and the right side of the postcranial skeleton were found (Dzierżykray-Rogalski 1947, 246, 247, 249–251; Nosek 1967, 225). What is more, the damaged skull of another individual with traces of burning on the inside, used for cannibalistic practices, was also found in the grave.

However, more complete cremation of human remains is recorded at other sites of the central group, including the Kujawy region. Krusza Zamkowa, Inowrocław district, site 13, should be included here, where a grave with a cist structure and a corridor (feature 1) was found, inside which burnt and severely damaged, crushed human bones were deposited (Kośko 1989, 33–46). An earth mound was most likely built over the described construction. Cremation, probably of human remains, was also recorded inside a stone cist in Zbyszewo (Zagórki), Słupsk district, site 12, in Western Pomerania (Siuchniński 1969, 23).

Particularly many traces of fire and cremation come from the sepulchral sites of the western group of GAC, where a large range of variability can be observed. They include both single graves and larger necropolises with up to several graves (known from Pevestorf site 19 and from more recent studies in Potsdam, site Alter Markt – Meyer 1993; Beran *et al.* 2016). Mostly, these were cremation burials in urns (Havelberg, site 52 – Beier 1988, 92; Ködderitzsch, site An Walthers Weg – Müller 1976) or pits located in small, in-ground pits with a diameter of several dozen

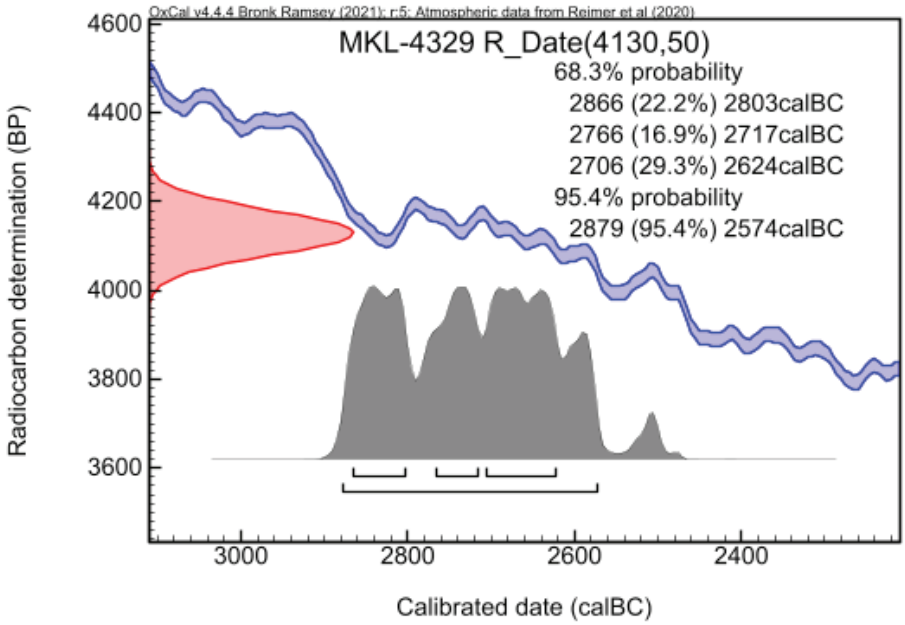

Fig. 29. Sadowie, site 23, Opatów district. A chart of calibration of radiocarbon date from grave no. 10. In calibration the software OxCal v 4.4.4. Bronk Ramsey (2021) was used.

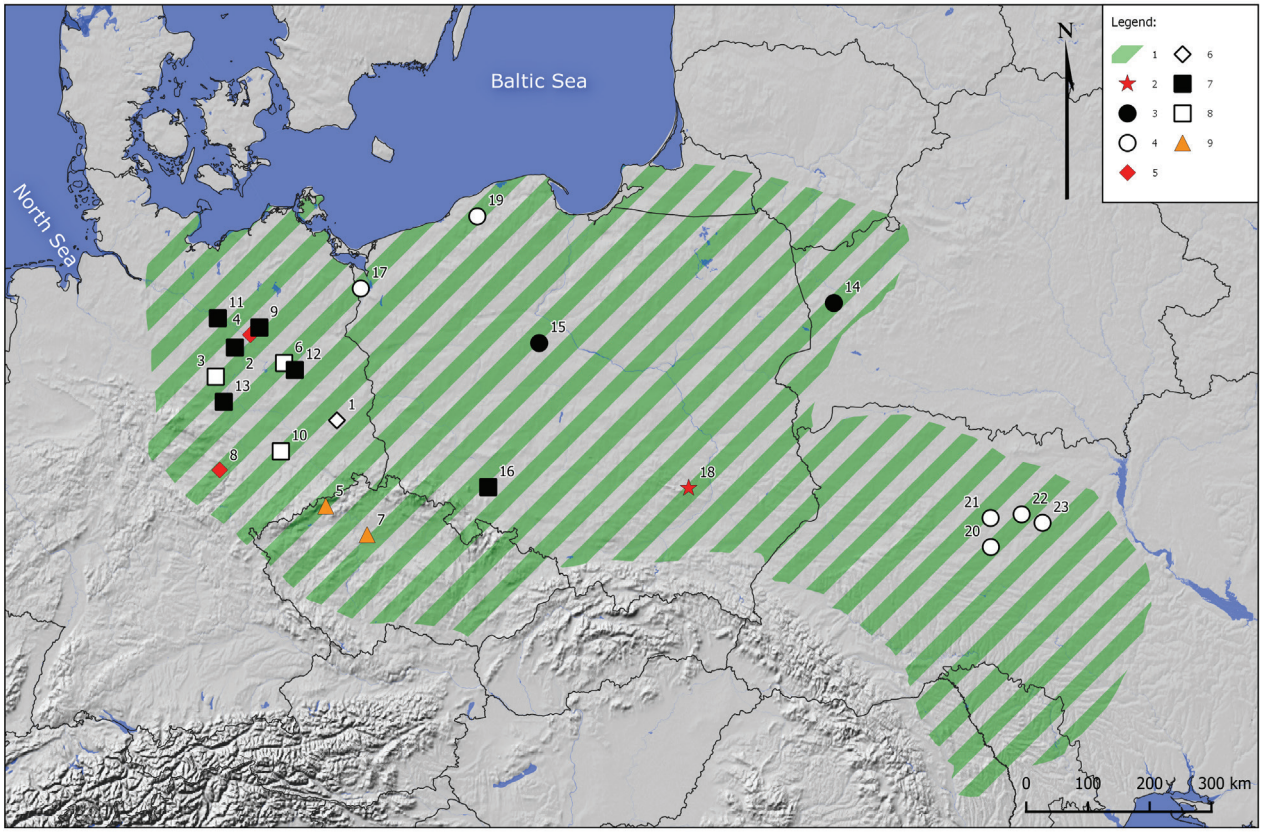

Fig. 30. Map of the GAC settlements in Europe along with the location of sites where traces of cremation were found. 1 – area of the GAC settlement; 2 – place of human cremation; 3 – cist grave with cremation burial; 4 – cist grave with cremation burial – presumed; 5 – cremation urn grave; 6 – cremation urn grave – presumed; 7 – cremation pit grave; 8 – cremation pit grave presumed; 9 – pit with burnt animal bones.

Table 1. List of GAC graves with traces of cremation

No. on the map	Town, number (local name of the site)	Type of grave	Characteristics	Comments	Literature
1	2	3	4	5	6
GAC western group					
1.	**Calau, site 2, Landkreis Oberspreewald–Lausitz**	cremation urn grave – presumed	During the research in 1928 of the Lusatian culture cemetery, a pottery vessel – a richly decorated amphora – was found. There were supposed to be "cremation remains" inside.	-	Kirsch 1975, 136–137
2.	**Groß Schwechten-Peulingen, site 1, Landkreis Stendal**	cremation pit grave	In the pit, next to the burnt bones, three pottery vessels were deposited.	-	Beier 1988, 94–95, pl. 5: 4; Woidich 2014, 134
3.	**Haldensleben I, site 21, Landkreises Börde**	cremation pit grave – presumed	There was "burnt earth" in a funnel-shaped pit with a bottom 1.0 m deep. In the fill of the feature, two pottery vessels were found, including a decorated amphora.	-	Beier 1988, 99, pl. 13: 5, 6
4.	**Havelberg, site 52, Landkreis Stendal**	cremation urn grave	In the pit (0.4 m deep), there was a pottery vessel – a four-handled amphora containing burnt bones of an adult, 20–50 years old.	-	Beier 1988, 92, pl. 7: 1
5.	**Hrdlovka, site open pit mine "Bílina", Okres Teplice**	pit with burnt animal bones	In the pit with dimensions of 2.68 × 1.1–1.6 m and a depth of 0.1–0.35 m, traces of a fire burning *in situ* – a cremation site – were most likely found. Stone paving was found at the bottom of the structure. The fill contained burnt and unburnt animal bones belonging to three pigs, including one piglet. Additionally, the equipment included 4 pottery vessels, 2 flint axes and a flint flake.	-	Dobeš 1997/1998, 138, 157, 158, fig. 8; 9: 2–3
6.	**Ketzin, Landkreis Havelland**	cremation pit grave – presumed	In 1883, a flat grave with "stone wedges" and a cremation was accidentally discovered. Inside there were three pottery vessels and their fragments, including: an undecorated amphora and an ornamented pot.	-	Grebe 1962, 16
7.	**Kostelec nad Labem, site Hof einer Zuckerfabrik, Okres Mělník**	pit with burnt animal bones – presumed	In 1908, a 1.5 m wide pit filled with "dark slag earth" was accidentally discovered. It included inside animal bones, 7 pottery vessels (3 amphorae, 3 bowls, 1 small vessel) and a bone chisel.	A feature explored by accidental explorers.	Dobeš 1997/1998, 142

1	2	3	4	5	6
8.	**Ködderitzsch, site An Walthers Weg, Landkreises Weimarer Land**	cremation urn grave	At a depth of 0.8 m from the ground surface there was a large amphora placed on a layer of cremation remains (remains of the pyre) – ashes and charcoal. Inside the vessel, cremated bones of an adult woman (aged 30–40), the remains of a child and single animal bones were found.	-	Müller 1976
9.	**Kyritz-Rehfeld, site 16, Landkreis Ostprignitz–Ruppin**	cremation pit grave	Grave no. 1 – a pit with a diameter of about 0.7 m and a depth of 0.5 m. At the bottom, there was a pottery vessel – an amphora, 2 flint axes and a flake located on fieldstones. The grave inclusions were strewn with remains of the cremation pyre and burnt bones.	-	Geisler and Teske 1971; Kirsch 1993, 230, 231, fig. 164: 972.1, 972.2
10.	**Nemt-Wurzen or Wurzen-Nemt, site "westlich des Läuseberges", Landkreises Leipzig**	cremation pit grave – presumed	In 1934/1935, probably a destroyed cremation grave was discovered, containing burnt bones, fragments of at least two pottery vessels and a flint axe.	-	Weber 1964, 120–122, fig. 30; Beier 1988, 144
11.	**Pevestorf site 19, Landkreis Lüchow–Dannenberg**	biritual cemetery, cremation pit graves	6 to 7 graves with traces of human cremation were researched. Additionally, three double biritual graves were recorded (marked as K 1, K 3, K 15).	-	Meyer 1993
12.	**Potsdam, site Alter Markt**	biritual cemetery, cremation pit graves	12 GAC graves were researched, of which at least 4 were cremation pit graves. The dimensions of individual graves were as follows: no. 4 – 1.0 × 0.77 m, depth 0.17 m; no. 5 – 1.08 × 1.08 m, depth 1.18cm; grave no. 7 – 1.92 × 1.92 m, depth 0.35 m; no. 9 – destroyed grave, depth 0.4 m. The inclusions of individual graves vary from single pottery vessels to several dozen fragments of pottery sherds and a few flint items.	-	Beran *et al.* 2016
13.	**Stemmern (Sülzetal), site 2, Landkreises Börde**	cremation pit grave	A pit grave with dimensions of 2.2 × 0.93 m and a depth of 0.8 m, with single stones in the fill. At the bottom, there was a layer of burnt material from the cremation of an adult. The grave inclusions included a pottery vessel, ornaments made of amber, animal teeth and shells, as well as flint blades and a flake.	-	Nowak 1963; Beier 1988, 102, pl. 16: 7–22

1	2	3	4	5	6
GAC central group					
14.	**Krasnasel`skì, Vaŭkavyskì raën** [Краснасельскі, Ваўкавыскі раён]	cremation pit grave	A pit grave (no. 2) measuring 4.3 × 2.0 m with a bottom originally covered with stone paving. The fill contained remains of burnt human bones and far from numerous grave inclusions – about 10 items of pottery sherds, a flint fragment and a stone plug from a drilled hole in an axe.	-	Černâŭski 1972; Černâvskij 1972; Charniauski 1996
15.	**Krusza Zamkowa, site 13, Inowrocław district**	cist grave with cremation burial	A cist grave with a rectangular shape, dimensions 3.0 × 1.5 m, with an entrance corridor on the shorter side. Inside, the construction is divided into two, almost square chambers. In the SW part, a cluster of small, burnt human bones was found. Outside the structure, there was a pottery cluster, with fragments belonging to at least 11 pottery vessels and 6 flint artefacts.	-	Kośko 1989, 33–46
16.	**Kurzątkowice, Oława district**	cremation pit graves – presumed (?)	Seven destroyed pits containing burnt human and animal bones were discovered. Dimensions of individual graves: no. 1 – 1.3 × 0.8 m and 0.4 m deep; no. 2 – 2.7 × 0.8 m and 0.2–0.3 m deep; no. 3 – 2.3 × 0.8 m and 0.2–0.3 m deep; no. 4 – 0.7 × 0.4 m; no. 5 – 1.1 × 0.8 m and 0.3 m; no. 6 – 1.5 × 0.8 m and 0.15–0.3 m, grave; no. 8 – severely damaged. The pits contained, mainly single, small sherds of GAC vessels. Near grave no. 6, a cattle burial with a single fragment of a GAC vessel was found. A vase and a fragment of a bowl were discovered in grave 8.	The graves are heavily damaged and GAC materials may be found on secondary deposits of cremation graves from younger prehistoric periods.	Czerska 1963; Wojciechowski 1967, 12–17
17.	**Mierzyn, site 2c, Police district**	cist grave with cremation burial –presumed	A cist grave (no. III) made of stone slabs measuring 0.5 × 0.5 m covered with a stone cover. Inside, there was a cluster of burnt bones (undetermined) and sherds of at least 4 GAC pottery vessels.	The grave was excavated in 1936. There is no drawing records or detailed data on the structure of the object (e.g. the dimensions of the grave are underestimated).	Siuchniński 1969, 151
18.	**Sadowie, site 23, Opatów district**	place of human cremation	The remains of a cremation pyre built on the site of a "house for the dead" were discovered. The burn layer contained some burnt human bones and sherds coming from 8–10 items of pottery vessels and 6 flint artefacts, including 2–3 damaged axes (inventory).	–	in this paper

1	2	3	4	5	6
19.	**Zbyszewo (Zagórki), site 12, Słupsk district**	cist grave with cremation burial –presumed	A cist grave with a rectangular shape and dimensions 4.4 × 2.1 m. The S part was supposed to contain a cremation burial. The inclusions included sherds of at least 7 pottery vessels, including a beaker and a pot.	–	Wiślański 1966, 190; Nosek 1967, 49; Siuchciński 1969, 23
			GAC eastern group		
20.	**Kolodâžne, Romanìvs`kij rajon** [Колодяжне, Романівський район]	cist grave with cremation burial –presumed	A cremation burial was to be held in a cist grave (no. I) covered with a stone slab.	There is no information about the dimensions and construction of the grave and the artefacts inventory.	Levic'kij 1929, 203; 1930, 162
21.	**Kikova, Novograd-Volins`kij rajon** [Кикова, Новоград-Волинський район]	cist grave with cremation burial –presumed	A cist grave (no. 1), measuring 1.85 × 1.8 m, made of stone slabs, with a corridor on the long side, containing a significant amount of "human ashes" and ochre. Additionally, 9 pottery vessels and 3 flint axes or chisels were found inside.	A grave explored by accidental explorers.	Levic'kij 1929, 201-202
22.	**Skolobìv, Horošìvs`kij rajon** [Сколобів, Хорошівський район]	cist grave with cremation burial –presumed	An oval-shaped cist grave (dimensions 2.15 × 1.18 m) with a stone cover and a small corridor next to the narrower wall. There were supposed to be "human ashes" and ochre at the bottom. The grave inventory included 19 pottery vessels, flint artefacts (including 12 axes and chisels) and amber ornaments.	A grave explored by accidental explorers.	Levic'kij 1929, 199–200; Svešnikov 1983, 34, 35
23.	**Visoke, Žitomirs`kij rajon** [Високе, Житомирський район]	cist grave with cremation urn grave –presumed	A rectangular cist grave (dimensions 1.5 × 0.7 m) with an entrance corridor and a cover. The inventory included an amphora with a lid, 5 other pottery vessels, 3 axes and 2 flint chisels. Inside the amphora there were supposed to be "ashes from cremation".	A grave explored by accidental explorers.	Levic'kij 1929, 199; Svešnikov 1983, 35

centimetres (np. Kyritz-Rehfeld, site 16 – Kirsch 1993, 230–231; Stemmern (Sülzetal), site 2 – Nowak 1963; Beier 1988, 102).

With reference to remains of burnt animal remains in pits (burial?), they were discovered in the Czech Republic. In Hrdlovka (site open pit mine "Bílina" – Dobeš 1997/1998, 138) and Kostelec nad Labem (site Hof einer Zuckerfabrik – Dobeš 1997/1998, 142), large pits filled with ash, charcoal, pieces of pottery sherds and burnt bones, mostly belonging to pigs, were discovered. These features are manifestations of undetermined worship practices.

Evidence of traces of fire, including cremation, is also known from the areas east of the Vistula. A good example is grave no. 2 (partially destroyed) in the GAC cemetery in Krasnasel`skì, Vaŭkavyskì raën in Belarusian Polesie (Charniauski 1996). Fragments of burnt human remains were found at the bottom of a flat pit grave covered with stone pavement. Moreover, in the 1920s, several presumed traces of cremation were also recorded in cemeteries located in the Volhynia area. According to Levicki's description, there were "human ashes" or "ashes from cremation" inside stone cist structures discovered in Kolodâžne, Romanìvs`kij rajon; Kikova, Novograd-Volins`kij rajon; Skolobìv, Horošìvs`kij rajon; Visoke, Žitomirs`kij rajon (Levic′kij 1929; 1930). In two cases (Kikova and Skolobìv) they were accompanied by traces of "ochre" which were part of the funeral rites.

Finally, it should be emphasized that there were no cases of the remains of a structure that could be described as a "house for the dead" or a cremation pyre in the GAC milieu. Houses for the dead are known from various prehistoric contexts in Europe. Numerous examples of the use of such structures are known from the Middle Neolithic Period, especially from TRB from Jutland and Scandinavia (Sjögren 2014, 1016). In Fågelbacken, Västmanland and Mogetorp, Södermanland in Sweden (Hallgren 2008, 107–111), complex wooden and stone structures (with walls made of palisades) located near megalithic tombs were discovered. It is believed that these facilities were used to store corpses before being buried together in one grave as part of complex rituals. Some researchers assume that megalithic structures could have been used as a kind of charnel house (Kjærum 1967; Shanks and Tillley 1992; Graslund 1994). Examples of such places include e.g. the graves of the SOM culture from La Chaussee–Tirancourt (the areas of northern France), dating back to the 4th/3rd millennium BC (Masset 1972). Structures that allowed for repeated opening and protecting at the same time were discovered there, i.e. the structures created for long-term use and storage of bodies before common burial in a single grave.

During the Late Neolithic period, houses of worship and charnel houses (ossuaries) were developed within the cultures of Western Europe. Numerous examples come from sepulchral sites of the Walternienburg (Nordhausen, Landkreis Nordhausen – Feustel and Ullrich 1965) and Bernburg cultures (Schönstedt, Landkreis Unstrut-Hainich-Kreis – Feustel 1972; Apfelstädt Landkreis Gotha – Küßner 2016; Großeibstadt, Landkreis Rhön-Grab – Koch 2014). An analogous structure to the burial structure from Sadowie is known from the Havelian culture, more or less contemporary with GAC, from Buchow-Karpzow, site 8, Landkreis Wustermark, in Brandenburg area (Kirsch and Plate 1984). The construction had the form of a U-shaped ("horseshoe") foundation groove with an open side on the SE side, dug into a depth of 0.6 m and oriented along the WNW-ESE axis (Fig. 31). Its dimensions were larger than the object uncovered in Sadowie: 4.8 × 2.6 m (outer frame) and 1.2 × 3.6 m (inner part). As for the upper part, there were stone blocks forming a kind of pavement, concentrated in smaller or larger clusters. At the bottom of the groove, in several places, traces of charred posts and riven planks reinforced with stones were found. The structure inside included burnt bones, pottery sherds, flint and amber artefacts covered with a thick layer of charcoal, mud-daub and burnt earth. They revealed traces of secondary burning. Anthropological analysis indicated the presence of human remains of at least 25 individuals of different ages and sexes (the total weight of the discovered bones amounted approximately 40 kg; Wetzel 1984). Field observations indicate that the burial chamber, built at the highest point of the site, was covered with an earth mound after burning. Researchers of this grave believe that the structure described was a wooden burial house (*totenhütte*) where human corpses and grave inventories were placed. After a long period of use, it was burnt as part of a larger ritual ceremony. Furthermore, the researchers recorded a cult square next to the aforementioned structure, interpreted as a place where offerings were made to the dead. In the course of funeral rites associated with subsequent funerals, pottery vessels were broken, such as pottery drums that were scattered in the immediate area. Moreover, a child sacrifice was also part of the funeral acts, along with animal burials (mainly cattle), including double burials, representing approximately 11 graves. In the light of descriptions, attached figures and photographs, it does not seem that the discussed "death house" with human corpses inside burnt down during a single cremation

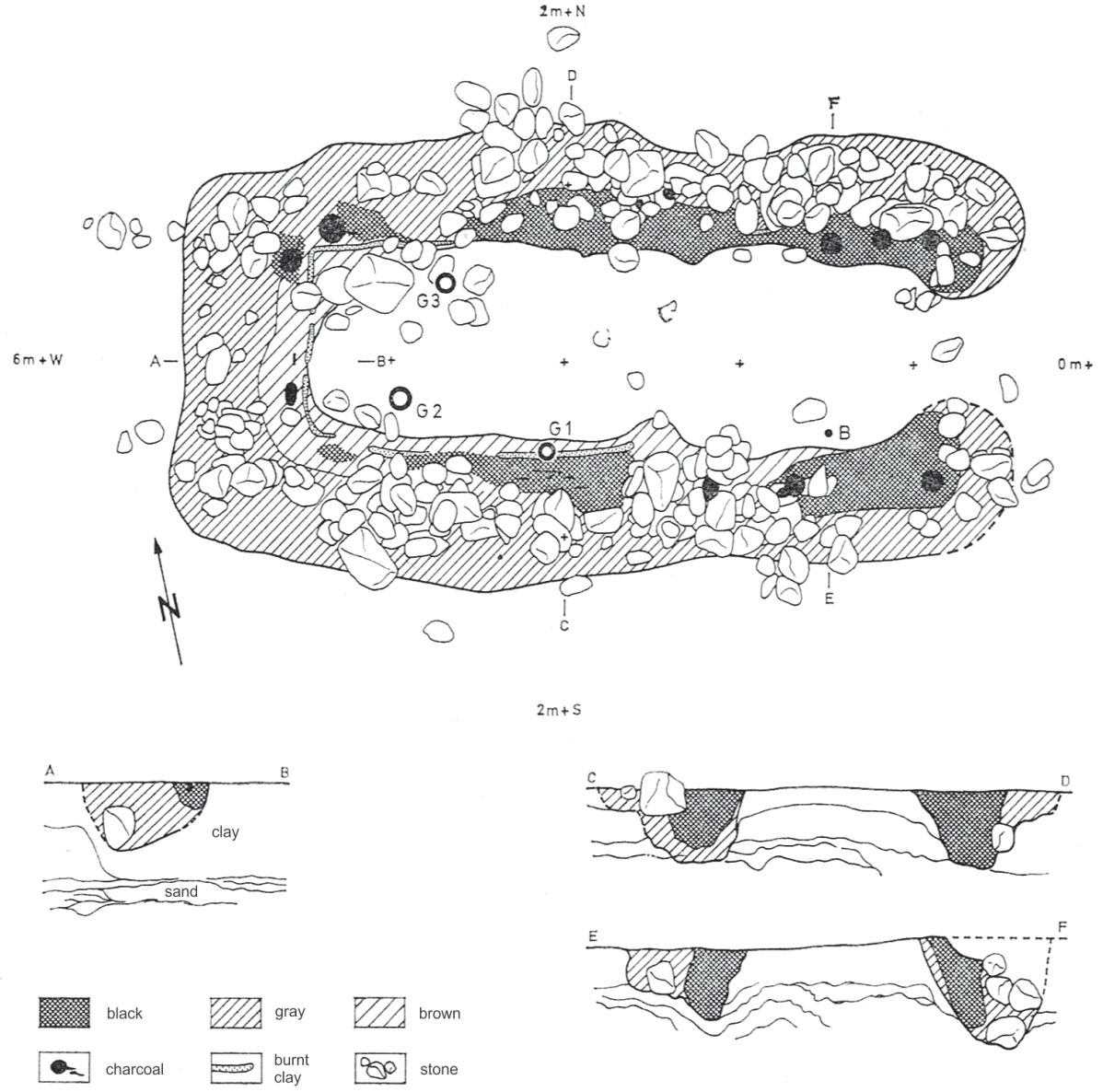

Fig. 31. A stone and wooden structure with a cremation site and a collective cremation burial of the Schönfeld culture, coming from Buchow-Karpzow, site 8, Landkreis Wustermark, in Brandenburg area (according to Kirsch and Plate 1984, 9, fig. 3).

act. Traces of burning (layers of ash, charcoal, pieces of charred wood, thick layers of burnt daub lying on the bottom) and their quantity indicated that the fire lasted for a long time and the fire was perhaps renewed many times. Additionally, it is impossible to ignore the fact that burning 20 to 30 corpses requires a lot of fuel, more than the structural volume of a wooden "burial house". Therefore, it should be assumed that in this particular case the structure was originally built as a house for the dead, burnt during the rituals, and the place was repeatedly used for the cremation of the dead for a longer period of time.

Traces of burial chambers made of wood and burnt are also known from several necropolises of the Walternienburg-Bernburger culture. The community of the described culture in the Harz region built rectangular walls and wooden chambers in the vicinity of various types of in-ground graves (Fischer 1956, 90). A stone mound comes from Kreienkopp near Ditfurt (Schirwitz 1935), under which there was a burnt burial chamber made of oak wood (preserved until excavations carried out by Karl Schirwitz in 1933) with dimensions of 2.0 × 2.4 m and a height of 1.2 m. It was built of vertical oak boards (riven planks) 15 cm thick and supports, and it had a horizontal ceiling. A corridor with a paved bottom and wooden walls led to its interior. The chamber was originally covered with stones, over which an earth mound was built in the

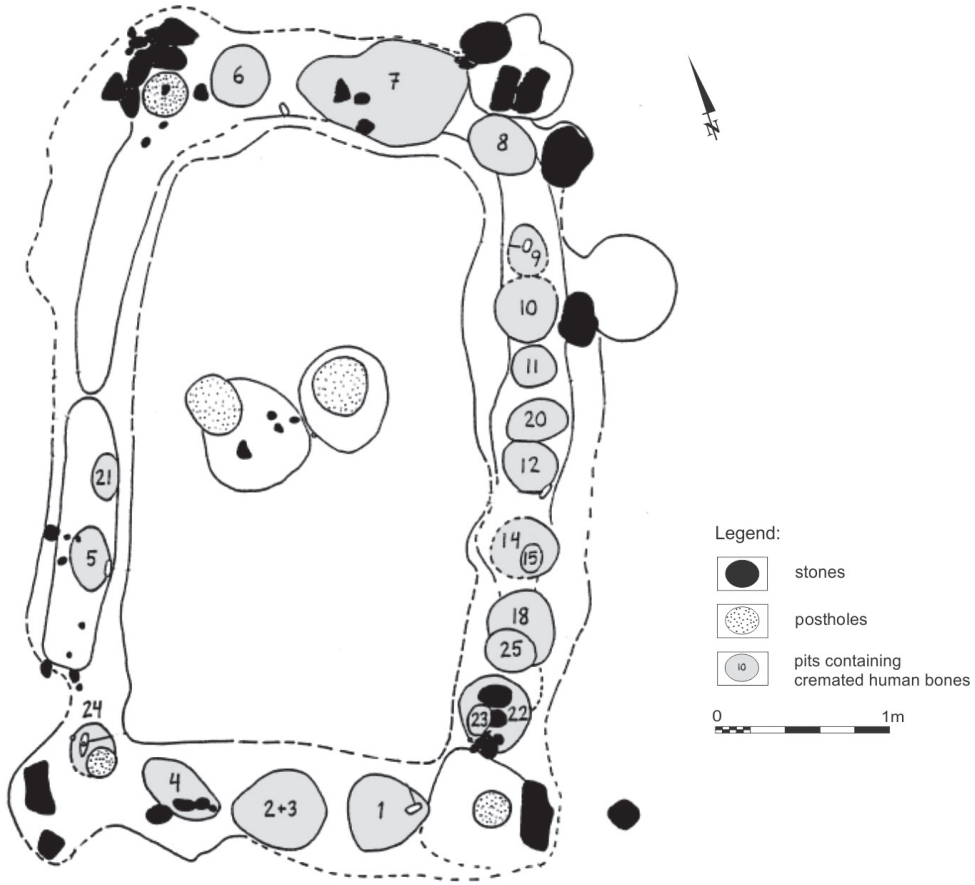

Fig. 32. An example of "a house for the dead" with walls of the internal chamber made of planks and posts placed in a groove, with the addition of vertical poles at their corners, which supported the roof over the chamber. There are "fire pits" around the construction – pits with burnt human bones and buried grave goods. Turinge, Nykvarns kommun, Södermanland (Sweden) – the Battle Axe Culture, late phase (according to Lindström 2000, 19, fig. 7).

final phase of the rituals. The structure is known as the "Ditfurt plank chamber".

Grave structures similar to those discovered in Sadowie, such as "houses for the dead", are known from the broadly understood circle of the Corded Ware Culture in Europe. Such examples are provided by, among others: sepulchral sites from central Germany (Thuringia and Saxony – Behm-Blancke 1953/1954; Hecht 2007, 126–129), the Netherlands (Lanting and van der Waals 1976) and western Ukraine (Czopek *et al.* 2016, 372–377, fig. 9.17).

The concept of a funeral house is a characteristic feature of the funeral rite of local the Corded Ware Culture groups in Scandinavia. A number of elements comparable to those found in the case of Sadowie are present at the site from Turinge, Nykvarns komun (Södermanland; SE Sweden; The Battle Axe Culture, late phase – Lindström 2000). The structure had a shape similar to a rectangle with dimensions of 3.1 × 4.8 m with postholes in the corners (Fig. 32). Between the side walls there was a groove slightly sunken into the ground. At its bottom, the remains of vertical plank were found, which formed the walls of the building – a rectangular burial chamber. The corner posts supported the roof, which was gable and rested on a ridgepole placed in the middle of the structure. On the E side, 15 shallow pits filled with burnt human bones, remains of the cremation pyre and elements of grave inventories (so-called "fire pits") were recorded. The researchers of the site believe that the aforementioned structure can be described as a decarnation house (charnel house), where corpses were stored for skeletonization. After some time needed for the decomposition of soft tissues, the bone remains were cremated and placed in pits under the wall of the building. Utilization of the structure according to the authors could have lasted for as long as several decades. Anthropological analyses proved that the remains of at least 25 individuals of different ages and sexes were buried here (ranging

from infants, children to the elderly), the inhabitants of a nearby settlement.

A funeral construction akin to the object from Sadowie was discovered in Spreitenbach-Moosweg (canton Aargau, district Baden in Switzerland – Spörri *et al.* 2012). The discussed structure had an approximately rectangular shape, measuring 3.7 × 4.5 m, with a wooden burial chamber measuring 1. 5 × 2.3 m, oriented NE-SW (Fig. 33). It was made up of planks placed vertically, next to each other like a palisade. On both sides of the chamber walls, near the lower parts, there were clusters of large rock rubble. On the longer and shorter sides, a wall groove was dug, in which traces of thick posts were preserved, supporting the structure interpreted by researchers as a superstructure or roofing. According to the researchers, access to the

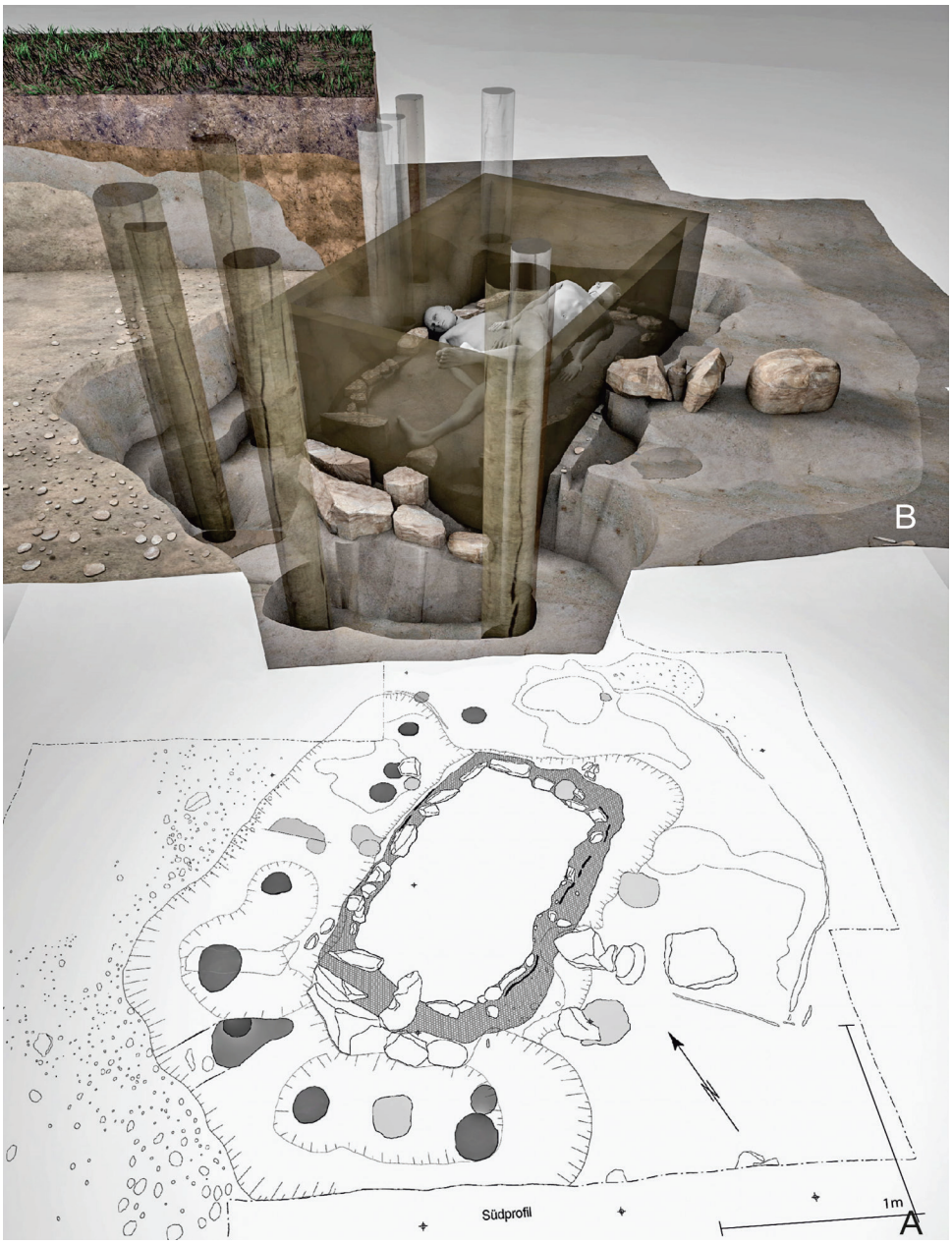

Fig. 33. "A house for the dead" with wooden and stone structures, including a collective burial of the Corded Ware Culture from the late Neolithic Period, Spreitenbach-Moosweg, Aargau canton, Baden district in Switzerland.
A – a horizontal view with traces of a wooden burial chamber and posts supporting the roof. On the ground level there is a concentration of large stones reinforcing the wall structure (according to Spörri *et al.* 2012, 38, fig. 15); B – computer reconstruction of a wooden and stone burial structure (according to Spörri *et al.* 2012, 47, fig. 39).

burial was probably near a pile of large stones found in one of the shorter sides of the SW part of the structure. Inside the wooden box, there were unburned remains arranged regularly of 12 individuals representing two generations of the local community, related to each other, placed at different time intervals. The entire grave, unlike in Sadowie, was not burnt after the end of the burial cycle, but covered with an earth mound.

Finally, it is worth mentioning the use of riven planks in the construction of the "grave house" in Sadowie. Speaking of the GAC settlement sites from the Uplands, it is worth noting that the remains of aboveground constructions were discovered, preserved in the form of lumps of daub bearing traces of wooden structures. They include traces of flat planks from the walls of daub dwellings with impressions of tree rings. Such examples are provided by the site 5 in Wilczyce, Sandomierz district (Balcer 2012, 138 referring to oral information from the researcher of this site) and the site 4 in Janowice, Opatów district (unpublished research results of Agnieszka Kubicka-Marek).

Conclusion – the significance of the discovery of grave no. 10 in Sadowie

In case of grave no. 10 from Sadowie, we have clear evidence of cremation performed by the GAC population. Cremation (understood as a pyre with burned corpses and accompanying artefacts) is one of the funeral practices used in prehistory. Unlike inhumation, it is not the last stage in the rite of burial of the deceased but can be used for other sepulchral purposes. Furthermore, it opens up enormous possibilities for the ritual use and handling of the remains of the deceased. Burnt bones could have been placed in various places - vessels, pits and other graves – as reburials (e.g. McKinley 2013, 151–152). The funeral of the remains might have taken place long after burning and was used in the cult of the dead (Barrett 1988; Williams 2015). Most researchers emphasize that the cremation ritual was more time consuming and demanding than other funeral practices. Therefore, it is worth considering the interpretation of this type of funeral rites. Was it intended for people playing a special role in the social life of the group who used the cemetery? Could the people buried here have come from outside and been unfamiliar to the local population?

The grave structure presented above is a unique construction among the sepulchral sites of GAC. Due to the good condition of the burial chamber, it was possible not only to recreate the details of the structure and stages of use related to the function of the feature, but also other aspects of the funeral rites. So far, there have been identified only a few analogies for the grave, originating from quite distant Neolithic cultural contexts in Western and Northern Europe. The described construction is unique as the earliest documented trace of a cremation pyre discovered in Polish areas. It significantly expands our knowledge of the burial practices of the GAC community and the phenomenon of the burial rites in "houses for the dead".

Acknowledgements

The author would like to thank Dr Joanna Rogóż for the anthropological expertise of the skeletal remains. He would also like to express his sincere gratitude to Agnieszka Kubicka-Marek MA for providing the results of excavations at site no. 4 in Janowice and to Dr Marek Gransicki for the graphic reconstructions.

References

Aldeias V., Dibble H. L., Sandgathe D., Goldberg P. and McPherron S. J. P. 2016. How heat alters underlying deposits and implications for archaeological fire features. A controlled experiment. *Journal of Archaeological Science* 67, 64–79.

Balcer B. 2012. *Budownictwo mieszkalne i gospodarcze w neolicie ziem Polski*. Warszawa: Instytut Archeologii i Etnologii Polskiej Akademii Nauk.

Barrett J. C. 1988. The living, the dead and the ancestors. Neolithic and Early Bronze Age mortuary practices. In J. C. Barrett and I. A. Kinnes (eds.), *The Archaeology* of *Context in the Neolithic and Bronze Age. Recent Trends*. Sheffield: Department of Archaeology and Prehistory, University of Sheffield, 30–41.

Becker M., Döhle H.-J., Hellmund M., Leineweber R. and Schafberg R. 2005. Nach dem großen Brand – Verbrennung auf dem Scheiterhaufen – ein interdisziplinärer Ansatz. *Bericht der Römisch–Germanischen Kommission* 86, 63–195.

Behm-Blancke G. 1953/1954. Die schnurkeramische Totenhütte Thüringens, ihre Beziehungen zum Grabbau verwandter Kulturen und zum neolithischen Wohnbau. *Alt-Thüringen* 1, 63–83.

Beier H.-J. 1988. *Die Kugelamphorenkultur im Mittelelbe-Saale-Gebiet und in der Altmark* (= *Veröffentlichungen des Landesmuseums für Vorgeschichte Halle* 41). Berlin: Deutscher Verlag der Wissenschaften.

Beran J., Hensel N. and Richter F. 2016. Ein Brand- und Körpergräberfeld der Kugelamphorenkultur am Alten Markt in Potsdam. In J. Beran, R. Einicke, V. Schimpff,

K. Wagner and T. Weber (eds.), *Lehren – Sammeln – Publizieren. Hans-Jürgen Beier gewidmet*. Leipzig: Leipziger Universitätsverlag, 207–230.

Bronk Ramsey C. 2021. OxCal v. 4.4.4. Oxford (https://c14.arch.ox.ac.uk, access: 12.09.2023).

Canti M. and Linford N. 2000. The effects of fire on archaeological soils and sediments: temperature and colour relationships. *Proceedings of the Prehistoric Society* 66, 385–395.

Černâŭski M. M. 1972. Mogìl'nìk na Rosì. *Pomnìkì gìstoryì ì kul'tury Belarusì* 4, 30–33.

Černâvskij M. M. 1972. Novye nahodki kul'tury šarovidnyh amfor v Zapadnoj Belorussii. In *XV Naukova konferencìâ Ìnstitutu arheologìï. Tèzi plenarnih ì sekcìjnih dopovìdej*. Odesa: Nauka, 141–143.

Charniauski M. 1996. Materials of the Globular Amphora Culture in Belarus. In A. Kośko (ed.), *Eastern Exodus of the Globular Amphora People: 2950–2350 BC* (= *Baltic-Pontic Studies* 4). Poznań: Adam Mickiewicz University, Eastern Institute, Institute of Prehistory, 87–97.

Czerska B. 1963. Sprawozdanie z badań archeologicznych w Kurzątkowicach w pow. Oława w 1963 roku. *Śląskie Sprawozdania Archeologiczne* 6, 16–17.

Czopek S., Machnik J., Pasterkiewicz W., Pawliw D. and Petehyrycz W. 2016. *Wielokulturowe stanowiska archeologiczne w Bykowie koło Drohobycza*. Kraków: Polska Akademia Umiejętności.

Davies D. J. and Mates L. H. (eds.) 2006. *Encyclopedia of Cremation*. Aldershot: Ashgate Publishing.

Dobeš M. 1997/1998. Gräber der *Kugelamphorenkultur* in Nordwestböhmen. In J. Lichardus and F. Stein (eds.), *Saarbrücker Studien und Materialien zur Altertumskunde* 6/7. Bonn: Dr. Rudolf Habelt GmbH, 133–179.

Dowgiałło W. D. 1974. *Objaśnienia do szczegółowej mapy geologicznej Polski. Arkusz Opatów (854) 1:50 000 (z 2 tab. I 5 tabl.)*. Warszawa: Wydawnictwo Geologiczne.

Dzierżykray-Rogalski T. 1947. Szczątki kostne z grobu kultury amfor kulistych w Stoku w powiecie puławskim. *Annales Universitatis Mariae Curie-Sklodowska* 2, 245–253.

Feustel R. 1972. Die Walternienburg/Bernburger Totenhütte von Schönstedt im Thüringer Becken. *Alt-Thüringen* 12, 31–58.

Feustel R. and Ullrich H. 1965. Totenhütten der neolithischen Walternienburger Gruppe. *Alt-Thüringen* 7, 105–202.

Fischer U. 1956. *Die Gräber der Steinzeit im Saalegebiet. Studien über neolithische und frühbronzezeitliche Grab- und Bestattungsformen in Sachsen-Thüringen*. Berlin: De Gruyter.

Florek M. and Witkowska B. 2021. Absolute chronology of settlement remains of the Globular Amphora culture in the Sandomierz Upland (Site Gałkowice-Ocin, Mierzanowice, Złota-Nad Wawrem). In M. Szmyt (ed.), *Globular Amphora Culture, Central and Eastern Groups: insight into new chronometric and taxonomic data* (= *Baltic-Pontic Studies* 25). Poznań: Adam Mickiewicz University, Faculty of Archaeology, 159–188.

Fülöp K. 2018. Why is it so rare and random to find pyre sites? Two cremation experiments to understand the characteristics of pyre sites and their investigational possibilities. *Dissertationes Archaeologicae ex Instituto Archaeologico Universitatis de Rolando Eötvös nominatae* 3(6), 287–311.

Geisler H. and Teske M. 1971. Ein Brandgrab der Kugelamphorenkultur aus Rehfeld, Kr. Kyritz. *Ausgrabungen und Funde: Nachrichtenblatt für Vor- und Frühgeschichte* 16(3), 128–131.

Graslund B. 1994. Prehistoric Soul Beliefs in Northern Europe. *Proceedings of the Prehistoric Society* 60, 15–26.

Grebe K. 1962. Gräber der Kugelamphorenkultur aus Ketzin, Kr. Nauen, und Brandenburg (Havel)-Neuendorf. *Veröffentlichungen des Museums für Ur- und Frühgeschichte Potsdam* 1, 16–35.

Haglund W. D. and Sorg M. H. 1997. *Forensic Taphonomy. The Postmortem Fate of Human Remains*. Boca Raton: CRC Press.

Hallgren F. 2008. *Identitet i praktik. Lokala, regionala och överregionala sociala sammanhang inom nordlig trattbägarkultur* (= *Coast to Coast-Books* 17). Uppsala: Department of Archaeology and ancient History, Uppsala University.

Hecht D. 2007. *Das schnurkeramische Siedlungswesen im südlichen Mitteleuropa. Eine Studie zu einer vernachlässigten Fundgattung im Übergang vom Neolithikum zur Bronzezeit*. Heidelberg (https://archiv.ub.uni-heidelberg.de/volltextserver/7313/, access: 15.03.2023).

Hiatt B. 1969. Cremation in Aboriginal Australia. *Mankind* 7(2), 104–119.

Józefów B. 2008. Typologia obiektów kremacji w okresie rzymskim. Na przykładach wybranych z terenów prowincji rzymskich i Barbaricum. In J. Skowron and M. Olędzki (eds.), *Kultura przeworska. Odkrycia – interpretacje – hipotezy*, 2. Łódź: Wydawnictwo Uniwersytetu Łódzkiego, 211–242.

Juras A., Ehler E., Chyleński M., Pospieszny Ł., Spinek A., Malmström H., Krzewińska M., Szostek K., Pasterkiewicz W., Florek M., Wilk S., Mnich B., Kruk J., Szmyt M., Kozieł S., Götherström A., Jakobsson M. and Dabert M. 2021. Maternal genetic origin of the Late and Final Neolithic human populations from present-day Poland. *American Journal of Physical Anthropology*

176(2), 223–236 (https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.24372, access: 10.04.2023).

Kirsch E. 1975. Die Funde der Kugelamphorenkultur im Bezirk Cottbus. In J. Preuß (ed.), *Symbolae Praehistoricae. Festschrift zum 60. Geburtstag von Friedrich Schlette*. Berlin: Akademie Verlag, 133–152.

Kirsch E. 1993. *Funde des Mittelneolithikums im Land Brandenburg* (= *Forschungen zur Archäologie im Land Brandenburg* 1). Potsdam: Verlag Brandenburgisches Landesmuseum für Ur- und Frühgeschichte.

Kirsch E. and Plate F. 1984. Zwei mittelneolithische Fundplätze bei Buchow-Karpzow, Kr. Nauen. *Veröffentlichungen des Museums für Ur- und Frühgeschichte Potsdam* 18, 7–61.

Kjærum P. 1967. Mortuary Houses and Funeral Rites in Denmark. *Antiquity* 41(163), 190–196.

Koch J. K. 2014. Neolithische Kollektivgräber von Großeibstadt, Kr. Rhön-Grabfeld. In M. Wunderlich, J. K. Koch and P. Dieck (eds.), *Denhoog – Großeibstadt – Rastorf. Studien zu neolithischen Gräbern und Häusern* (= *Frühe Monumentalität und soziale Differenzierung* 5). Bonn: Dr. Rudolf Habelt GmbH, 159–252.

Kokot S. 2021. Teoria spalania i pożaru – najnowsze badania i stare prawdy. In M. Szymczak (ed.), *Pożary – kompendium wiedzy*. Katowice: Elamed Media Group, 36–65.

Kośko A. 1989. Formy eksploatacji terenu stanowiska w epokach neolitu i brązu. In A. Cofta-Broniewska (ed.), *Miejsce pradziejowych* i *średniowiecznych praktyk kultowych w Kruszy Zamkowej, województwo Bydgoszcz, stanowisko 13* (= *Studia i Materiały do Dziejów Kujaw* 3). Poznań: Wydawnictwo Naukowe im. Adama Mickiewicza w Poznaniu, Bydgoskie Towarzystwo Naukowe, 13–61.

Krzak Z. 1977. Cmentarzysko na „Gajowiźnie" pod względem archeologicznym. In J. Kowalczyk (ed.), *Cmentarzysko kultury amfor kulistych w Złotej sandomierskiej*. Wrocław, Warszawa, Kraków, Gdańsk: Zakład Narodowy im. Ossolińskich, Wydawnictwo Polskiej Akademii Nauk, 9–82.

Küßner M. 2016. Das Kollektivgrab von Apfelstädt (Lkr. Gotha) und das Aufkommen von Totenhütten in Thüringen. In J. Beran, R. Einicke, V. Schimpff, K. Wagner and T. Weber (eds.), *Lehren – Sammeln – Publizieren. Hans-Jürgen Beier gewidmet*. Leipzig: Leipziger Universitätsverlag, 159–180.

Lanting J. N. and van der Waals J. D. 1976. Beaker culture relations in the Lower Rhine Basin. In J. N. Lanting and J. D. van der Waals (eds.), *Glockenbecher Symposion Oberried 1974*. Bussum, Haarlem: Fibula-Van Dishoeck, 1–80.

Larsson Å. M. 2003. Secondary Burial Practices in the Middle Neolithic. Causes and Consequences. *Current Swedish Archaeology* 11, 153–170.

Levic′kij Ì. 1929. *Pam`âtki megalìtičnoï kul′turi na Volinì*. Antropologìâ 2, 192—222.

Levic′kij Ì. 1930. Domovina kìncâ neolìtičnoï dobi na pravobereżžì seredn′oï tečiï r. Slučì (c. Kolodâžne na Volinì). *Zapiski Vseukraïns′kogo arheologìčnogo komìtetu* 1, 159–178.

Lindström J. 2000. *Ett dödshus från stridsyxetid* (= *Rapport* 2000: 8). Stockholm: Stockholms läns museum.

Mackiewicz M., Pasterkiewicz W. and Myślecki B. 2016. Badania geomagnetyczne w obrębie późnoneolitycznego kompleksu sepulkralno-obrzędowego w Sadowiu. In M. Furmanek, T. Herbich and M. Mackiewicz (eds.), *Metody geofizyczne w archeologii polskiej 2016*. Wrocław: Instytut Archeologii Uniwersytetu Wrocławskiego, Fundacja Nauki Archaeologia Silesiae, 73–76.

Marshall A. 1998. Visualising burnt areas: patterns of magnetic susceptibility at Guiting Power 1 round barrow (Glos., UK). *Archaeological Prospection* 5, 159–177.

Marshall A. 2011. *Experimental Archaeology*, 1: *Early Bronze Age Cremation Pyres*, 2: *Iron Age Grain Storage* (= *British Archaeological Reports. British Series* 530). Oxford: Archaeopress.

Marszałek E. and Kusiak W. 2013. Wypał węgla drzewnego w Bieszczadach w przeszłości i obecnie. *Roczniki Bieszczadzkie* 21, 164–183.

Masset C. 1972. The megalithic tomb of La Chaussée-Tirancourt. *Antiquity* 46(184), 297–300.

McKinley J. I. 1993. Bone fragment size and weights of bone from modern British cremations and the implications for the interpretation of archaeological cremations. *International Journal of Osteoarchaeology* 3, 283–287.

McKinley J. I. 1997. Bronze Age "Barrows" and Funerary Rites and Rituals of Cremation. *Proceedings of the Prehistoric Society* 63, 129–145.

McKinley, J. I. 2013. Cremation: excavation, analysis and interpretation of material from cremation-related contexts. In L. Nilsson Stutz and S. Tarlow (eds.), *Handbook on the archaeology of death and burial*. Oxford: Oxford University Press, 147–171.

Meyer M. 1993. *Pevestorf 19. Ein mehrperiodiger Fundplatz im Landkreis Lüchow-Dannenberg* (= *Veröffentlichungen der Urgeschichtlichen Sammlungen des Landesmuseums zu Hannover* 41). Oldenburg: Isensee Verlag.

Miszkiewicz B. 1977. Analiza antropologiczna kości z „Gajowizny". In J. Kowalczyk (ed.), *Cmentarzysko kultury amfor kulistych w Złotej sandomierskiej*. Wrocław, Warszawa, Kraków, Gdańsk: Zakład Narodowy im. Ossolińskich, Wydawnictwo Polskiej Akademii Nauk, 133–153.

Müller D. W. 1976. Ein Urnengrab der Kugelamphorenkultur von Ködderitzsch, Kreis Apolda. *Jahresschrift für Mitteldeutsche Vorgeschichte* 60, 217–234.

Nosek S. 1967. *Kultura amfor kulistych w Polsce*. Wrocław, Warszawa, Kraków, Gdańsk: Zakład Narodowy im. Ossolińskich, Wydawnictwo Polskiej Akademii Nauk.

Nowak H. 1963. Ein neolithisches Brandgrab von Stemmern, Kr. Wanzleben. *Ausgrabungen und Funde: Nachrichtenblatt für Vor- und Frühgeschichte* 8, 28–31.

Oestigaard T. 2004. Death and Ambivalent Materiality – Human Flesh as Culture and Cosmology. In T. Oestergaard (ed.), *Combining the Past and the Present. Archaeological Perspectives on Society*. Oxford: Archaeolpress, 23–30.

Oestigaard T. 2005. *Death and Life-giving Waters. Cremation, Caste and Cosmogony in Karmic Traditions* (= *British Archaeological Reports. International Series* 1353). Oxford: Archaeopress.

Oestigaard T. 2013. Cremations in culture and cosmology. In L. Nilsson Stutz and S. Tarlow (eds.), *Handbook on the archaeology of death and burial*. Oxford: Oxford University Press, 497–509.

Pasterkiewicz W. 2017. Wyniki badań archeologicznych na cmentarzysku z późnego neolitu w Sadowiu koło Opatowa. *Materiały i Sprawozdania Rzeszowskiego Ośrodka Archeologicznego* 38, 281–290.

Pasterkiewicz W. 2020. The first radiocarbon dates for the Globular Amphora culture cemetery in Sadowie in the Sandomierz Upland. *Analecta Archaeologica Ressoviensia* 15, 53–75. DOI: 10.15584/anarres.2020.15.5

Pasterkiewicz W. 2021. Sepulchral complexes of human burials and animal deposits, site 23, Sadowie, Opatów distrct. Study of selected examples. In M. Szmyt (ed.), *Globular Amphora Culture, Central and Eastern Groups: insight into new chronometric and taxonomic data* (= *Baltic-Pontic Studies* 25). Poznań: Adam Mickiewicz University, Faculty of Archaeology, 121–159.

Piontek J. 2002. Wpływ procesu kremacji na morfologię kości szkieletu ludzkiego. Wyniki badań eksperymentalnych. In J. Wrzesiński (ed.), *Popiół i kość* (= *Funeralia Lednickie Spotkanie* 4). Sobótka, Wrocław: Muzeum Ślężańskie w Sobótce, 95–108.

Przybyła M. M., Włodarczak P., Podsiadło M. and Tunia K. 2013. Obiekt kultury amfor kulistych. In M. M. Przybyła, A. Szczepanek nad P. Włodarczak (eds.), *Koszyce, stanowisko 3. Przemoc i rytuał u schyłku neolitu* (= *Ocalone Dziedzictwo Archeologiczne* 4). Kraków, Pękowice: Wydawnictwo Profil-Archeo, 11–64.

Romanek A. 1991. *Szczegółowa Mapa Geologiczna Polski 1:50 000 (SMGP). Arkusz: Ostrowiec Świętokrzyski* (http://metadane.pgi.gov.pl, access: 05.11.2022).

Schirwitz K. 1935. *Zwei Großgräber aus dem Harzvorland: Der "Kreienkopp" bei Ditfurt* (= *Zeitschrift des Harz-Vereins für Geschichte und Altertumskunde* 68). Wernigerode: Selbstverlag.

Shanks M. and Tilley C. 1992. *Re-constructing Archaeology: Theory and Practice*. London: Routledge.

Siuchniński K. 1969. *Klasyfikacja czasowo-przestrzenna kultur neolitycznych na Pomorzu Zachodnim*, 1: *Katalog źródeł archeologicznych*. Szczecin: Muzeum Pomorza Zachodniego.

Sjögren K.-G. 2014. Mortuary Practices, Bodies and Persons in Northern Europe. In C. Fowler, J. Harding and D. Hofmann (eds.), *The Oxford Handbook of Neolithic Europe*. Oxford: Oxford University Press, 1005–1022.

Spörri D., Huber H. and Langenegger E. 2012. Die Fundstelle / Le site. In. T. Doppler (ed.), *Spreitenbach-Moosweg (Aargau, Schweiz): ein Kollektivgrab um 2500 v. Chr. / Spreitenbach-Moosweg (Argovie, Suisse): une sépulture collective vers 2500 av. J.-C.* (= *Antiqua* 51). Basel: Archäologie Schweiz.

Strong J. S. 2007. The Buddha's funeral. In B. J. Cuevas and J. I. Stone (eds.), *The Buddhist Dead: Practices, Discourses, Representations*. Hawaii: Kuroda Institute, 32–59.

Strzałko J. and Piontek J. 1974. Wpływ spalania w warunkach zbliżonych do kremacji pradziejowych na morfologię kości. *Przegląd Antropologiczny* 40, 315–326.

Svešnikov I. K. 1983. Kul′tura šarovidnyh amfor (= *Arheologiâ SSSR. Svod arheologičeskih istočnikov* B1-27). Moskva: Nauka.

Szczepanek A. 2013. Analiza antropologiczna szkieletów. In M. M. Przybyła, A. Szczepanek and P. Włodarczak (eds.), *Koszyce, stanowisko 3. Przemoc i rytuał u schyłku neolitu* (= *Ocalone Dziedzictwo Archeologiczne* 4). Kraków, Pękowice: Wydawnictwo Profil-Archeo, 65–91.

Szmyt M. 1996. *Społeczności kultury amfor kulistych na Kujawach*. Poznań: Uniwersytet im. Adama Mickiewicza w Poznaniu.

Ulguim P. F. 2015. Analysing cremated human remains from the southern Brazilian highlands. Interpreting archaeological evidence of funerary practice at mound and enclosure complexes in the Pelotas River Valley. In T. J. U. Thompson (ed.), *The Archaeology of Cremation*. Oxford: Oxbow Books, 173–212.

Weber V. 1964. Die Kugelamphorenkultur in Sachsen. *Arbeits- und Forschungsberichte zur sächsischen Bodendenkmalpflege* 13, 73–192.

Wetzel G. 1984. *Der menschliche Leichenbrand aus der Totenhütte von Buchow-Karpzow, Kr. Nauen*. *Veröffentlichungen des Museums für Ur- und Frühgeschichte Potsdam* 18, 63–64.

Williams H. 2015. Towards an archaeology of cremation. In C. W. Schmidt and S. Symes (eds.), *The Analysis of Burned Human Remains*. London: Academic Press, 259–293.

Wiślański T. 1966. *Kultura amfor kulistych w Polsce północno-zachodniej* (= *Polskie Badania Archeologiczne* 13). Wrocław, Warszawa, Kraków: Zakład Narodowy im. Ossolińskich, Wydawnictwo Polskiej Akademii Nauk.

Witkowska B. 2021. Radiocarbon dating of the archival funeral complexes of the Globular Amphora culture on the Sandomierz Upland: Gajowizna, Malice, Mierzanowice and Sandomierz sites. In M. Szmyt (ed.), *Globular Amphora Culture, Central and Eastern Groups: insight into new chronometric and taxonomic data* (= *Baltic-Pontic Studies* 25). Poznań: Adam Mickiewicz University, Faculty of Archaeology, 7–47.

Witkowska B., Czebreszuk J., Gumińska-Nowak B., Goslar T., Szmyt M. and Ważny T. 2020. The cemetery of the Globular Amphora culture community at the Złota-Gajowizna site in the light of radiocarbon analysis and dendrochronology. *Sprawozdania Archeologiczne* 72(2), 61–86.

Witkowska B., Przybyła M. M., Podsiadło M., Szczepanek A. and Włodarczak P. 2021. Absolute chronology of the Globular Amphora funeral complex at Malice, Sandomierz Upland. In M. Szmyt (ed.), *Globular Amphora Culture, Central and Eastern Groups: insight into new chronometric and taxonomic data* (= *Baltic-Pontic Studies* 25). Poznań: Adam Mickiewicz University, Faculty of Archaeology, 49–78.

Witteyer M. 1993. Die Ustrinen und Busta von Mainz-Weisenau. In M. Struck (ed.), *Römerzeitliche Gräber als Quellen zu Religion, Bevölkerungsstruktur und Sozialgeschichte. Internationale Fachkonferenz vom 18.–20. Februar 1991 im Institut für Vor- und Frühgeschichte der Johannes Gutenberg-Universität Mainz*, 3. Mainz: Universität Mainz, 69–80.

Woidich M. 2014. *Die Westliche Kugelamphorenkultur. Untersuchungen zu ihrer raum-zeitlichen Differenzierung, kulturellen und anthropologischen Identität* (= *Topoi – Berlin Studies of the Ancient World* 24). Berlin: De Gruyter.

Wojciechowski W. 1967. Kultura amfor kulistych na Dolnym Śląsku. *Silesia Antiqua* 9, 7–36.

FUNDACJA
RZESZOWSKIEGO OŚRODKA
ARCHEOLOGICZNEGO

Uniwersytet Rzeszowski
Kolegium Nauk Humanistycznych
Instytut Archeologii

Wydawnictwo Uniwersytetu Rzeszowskiego