

Wojciech Pasterkiewicz

SEPULCHRAL COMPLEXES OF HUMAN BURIALS
AND ANIMAL DEPOSITS, SITE 23, SADOWIE,
OPATÓW DISTRCT.
STUDY OF SELECTED EXAMPLES

ORCID 0000-0002-0625-7232; Institute of Archaeology, Rzeszów University, S. Moniuszki
10, 35-015 Rzeszów, Poland; wojpas@vp.pl

ABSTRACT

This article attempts to reconstruct the functional relationships between human graves and animal deposits in the context of a Globular Amphora culture cemetery in Sadowie, Opatów District, Sandomierz Upland, Poland. A special characteristic of this cemetery is the grouping of graves into complexes, forming functional-chronological wholes. For the purpose of the study, three such complexes were selected: III (Graves 1 and 2), IV (Graves 5-4-3) and IX (Graves 8-7). Each consisted of a human burial and an accompanying animal deposit of mostly cattle remains. In the case of Complexes III and IX, the lack of stratigraphic relationships and similarity in cultural inventories suggest that they were built at short intervals. Complex IV in contrast, is characterised by a time spread between animal deposits and human burials, which is indicated by radiocarbon dates. The complexes of human graves and animal deposits find analogies in other sepulchral features in the Vistula drainage basin and areas settled by the other regional groups of the Globular Amphora culture at that time.

Keywords: Globular Amphora culture, Sandomierz Upland, human burials, animal deposits, radiocarbon datings

The funerary rite of the Globular Amphora culture (GAC) in Poland and across Europe has been comprehensively discussed by several authors [Wiślański 1966; Sveshnikov 1983; Beier 1988; Szmyt 1999]. They stressed the forms of grave structures, types of behaviour, cultural traditions and ideological changes from chronological and territorial perspectives. Relying on available sources, they also studied the occurrence of animal graves [Behrens 1964; Pollex 1999; Szmyt 2006; Kołodziej 2011; Szczodrowski 2012]. At present, considerable new information on behaviour patterns, relating to features containing animal remains and placed next to human burials, may be supplied by the investigation of the GAC cemetery on Site 23 in Sadowie, Opatów District, Świętokrzyskie Province.

In this brief study the term ‘animal deposit’ is used to refer to features containing complete or fragmentary animal skeletons numbering from several to over a dozen [Pollex 1999: 542; Szmyt 2006: 2–3; Kołodziej 2011: 58–59; Szczodrowski 2012: 51]. At the same time, other terms are used in the relevant literature such as ‘animal grave’ (or possibly ‘animal burial’) [Gabałówna 1958; Wiślański 1966: 73–75; Nosek 1967: 281–283; Szmyt 1996: 58–63], ‘sacrificial pit’ [Krzak 1977: 60] or ‘sacrificial animal burials’ [Wiślański 1979: 294].

CEMETERY IN SADOWIE, SITE 23

The Sadowie cemetery is a newly discovered sepulchral-ritual site, dating to the Late Neolithic and linked to the GAC and the Złota culture (ZC) [Mackiewicz *et al.* 2016; Pasterkiewicz 2017; 2020]. It is located on the northern edge of the loess patch of the Sandomierz Upland, on one of the broad elevations in the drainage basin of the Kamienna River (Fig. 1). There, a concentration of settlement points is found, comprising permanent settlements and single finds, belonging to the GAC Sandomierz-Opatów group [Kowalewska-Marszałek 2019: 124, Fig. 1:b]. The location of the site is typical of funerary facilities on the Sandomierz Upland at that time. It is on a similar terrain that *Gajowizna* [Krzak 1977: 10, Fig. 1] and *Nad Wawrem* [Krzak 1961: 7, Fig. 3] cemeteries are located in Złota as well as one on Site 10, Wilczyce, Sandomierz District [Boroń, Włodarczak 2019: 11, Fig. 3; Włodarczak 2019].

The rescue investigations in Sadowie, continuing since 2015, have explored over 1,700 sq. m. in which twenty six GAC and three ZC graves have been recorded and excavated (Fig. 2) [Pasterkiewicz 2017; 2020]. In addition, Early Bronze Age settlement relics have been discovered as well as the remains of communication

trenches dating to the end of the Second World War and Lviv-Sandomierz military operation.

GAC graves differed in terms of the funerary rite and structure. Among features with human remains, pits sunk into the ground were the most common. They

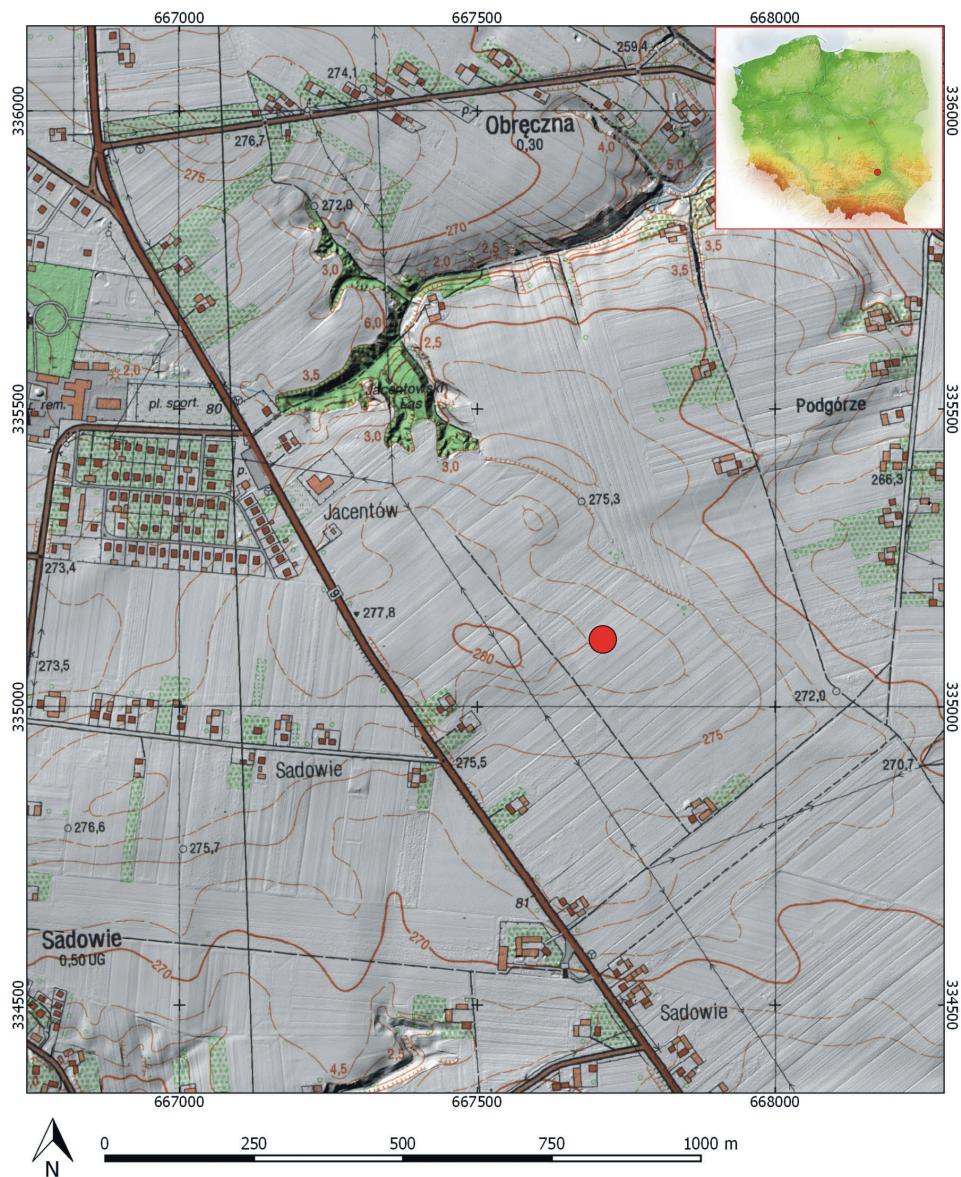


Fig. 1. Sadowie, site 23, Opatów district. Location of the site (marked as a red dot) superimposed on a shaded terrain model and a 1:100,000 map. Designed by M. Mackiewicz and B. Myślecki



Fig. 2. Sadowie, site 23, Opatów district. Layout of Late Neolithic cemetery. State of research as at 2020

showed remains of a stone-lining or pavements over bodies. Another category consisted of cists built of stone slabs or blocks and having paved bottoms. The third kind of features discovered on the site comprised niche graves typical of the communities belonging to the ZC and the Corded Ware culture (CWC) circle [Machnik 1966; Krzak 1976; Włodarczak 2006]. In addition, single cremation-pit graves were recorded as well as timber structures in the type of mortuary houses, which could have functioned as funeral pyres.

Features containing animal deposits were dominated by flat pits with stone structures in the form of pavements laid in their ceiling parts. The pits held whole animals or their very large quartered parts of various species and ages.

Characteristically, Sadowie grave features are grouped into complexes of which ten are known now, forming three or four larger clusters.

Complex I was formed by two features irregularly spaced along the NW-SE axis of which one (no. 23) showed the characteristics of a cenotaph or one that had been robbed in antiquity while the other (no. 16B) was an animal bi-ritual grave. Into its ceiling, the ZC Grave 16A was sunk.

Complex II comprised two features oriented NW-SE, one being a human grave (no. 24), disturbed in the past and the other – a pit with two cattle skeletons, known as a double grave (no. 17).

Complex III consisted of two features oriented E-W. In this case too, one feature was a collective human grave in a stone cist (no. 1), while the other was an animal deposit of the remains of two cattle (no. 2).

Complex IV comprised one collective human cist grave (no. 5) and two pits holding animal skeletons (no. 4 and 3).

Complex V was made up of four features regularly arranged along the NW-SE axis. They included one human grave containing two burials (no. 22) and three pits holding animal deposits (no. 11, 12 and 13).

Complex VI had a similar arrangement. A human grave (no. 19) was followed in line by three animal graves (no. 18A, 18B and 18C) and one cremation-pit grave (no. 18D). To this complex could have belonged Grave 15 too, holding the bones of a single pig. Furthermore, north of the cluster of Graves 19–18(A, B, C, D)-15, there was a single human stone-lined grave (14), placed away from others and unaccompanied by any animal deposit.

Complex VIII was made up of two features oriented NW-SE; one was a collective human niche-grave (no. 21) and the other an animal deposit of complete and quartered cattle skeletons (no. 20).

Complex IX encompassed two features oriented NW-SE; one was a pit holding cattle skeletons (no. 7) while the other (no. 8) could not be determined. It could have been a human grave destroyed by a WWII trench.

Complex X had a similar arrangement of features lined up along the NW-SE axis. These were Grave 9 (cremation grave with a structure resembling a mortuary house) and Grave 10 (collective grave holding quartered cattle).

DISCUSSION OF SELECTED COMPLEXES

For detailed chronological studies, Complexes III, IV and IX were selected because there were radiocarbon dates (Table 1) and rich artefact assemblages available. The latter therefore could be compared with other GAC assemblages and moreover, they allowed researchers to trace the complexity of grave structures in the context of funerary customs.

Table 1.

Sadowie, site 23, Opatów district. Radiocarbon datings for graves of the Globular Amphora culture. Calibration in OxCal v4.4.2 [Bronk Ramsey 2020]

Grave no.	Individual no.	Lab. no.	BP	BC (68.2%)	BC (95.4%)	References
1	5	Poz-102997	4075±35	2837-2500	2857-2476	Juras <i>et al.</i> 2021
5	4	Poz-102996	4125±35	2858-2625	2871-2578	Juras <i>et al.</i> 2021
4	1	Poz-111913	3995±35	2568-2470	2623-2411	Pasterkiewicz 2020, Tab. 1
3	skull no. 2	Poz-130232	4080±35	2840-2501	2861-2489	-
7	2	Poz-111914	4185±35	2882-2698	2891-2632	Pasterkiewicz 2020, Tab. 1

COMPLEX III

Grave 1. It was rectangular, measured 2.25×1.5 m and was oriented E-W, slightly deviating to NW-SE (Fig. 3: A). Its ceiling portion was destroyed by its discoverer in the course of land tillage, while its side walls were made of Triassic sandstone slabs placed upright in the ground. They differed in terms of size and shape (from 50×60 to 60×100 cm). Some (in particular those in the SE corner) bore traces of careful hewing and surface polishing. Where the walls met, they were supported with small stones and sealed with a thin layer of clay subjected to firing. The bottom of the grave chamber was paved with slabs overlapping like roofing tiles. Joins were filled with smaller stones numbering below twenty. The depth of the grave chamber reached approx. 90 cm (30–35 cm from the level of identification). Additionally, earth had been removed around its edges in order to set the walls better (Fig. 3: B). Inside, accumulations of disarticulated human bones were found, belonging to at least five to six individuals. Next to the northwestern wall, a fragment of a broken vessel lay (Fig. 4: 1). In addition, the grave fill was found to contain two flint artefacts (Fig. 4: 2–3).

Artefact inventory:

1. *Clay vessel* (no. 12–14/2015) having vase proportions, partially preserved, with a short slightly bent neck and a bulbous rather high shoulder (Fig. 4: 1). It points to connections with Type VIIIB1 according to Wiślański [1966: 34, List V], ‘miscellany’ cups in Nosek’s classification [Nosek 1967: 312, Pl. XII: 21] or IIIB1–22?-ca pots in the typology designed by Szmyt [1996: 30]. The vessel was made of clay with a large amount of temper of medium-grained white crushed stone, small amount of light-grey coarse-grained angular crushed stone and a medium amount of sand. The walls are variegated, flecked, brown in the upper part of the vessel and light brown in the middle and bottom parts. Their surfaces are carefully finished and smoothed, and shining in places; on the outside and inside, they bear traces of rubbing with grass or straw. Their fracture is uniform. Dimensions: height: 22 cm, rim diameter: 21 cm, neck diameter: 20 cm, the greatest protrusion of the belly: 25 cm, base diameter: 9 cm, wall thickness at rim: 0.4 cm, wall thickness at the middle portion of belly: 0.5 cm, wall thickness at base: 0.6 cm, base thickness: 1.3 cm.
2. *Chocolate flint blade* (no. 1/2015), regular, with a prepared butt, clear traces of removed microflakes and microchips, tip portion broken off in modern times; dimensions: 45 × 18 × 4 mm (Fig. 4: 2).
3. *Chocolate flint (crested?) blade* (no. 2/2015) produced by preliminary core exploitation; on its upper side, there are traces of scars left by the formation of a flaking surface perpendicular to its axis, a formed butt, its upper side is covered by cortex; dimensions: 54 × 20 × 6 mm (Fig. 4: 3).

The vase-like vessel from Grave 1 does not have many analogies in GAC pottery inventories in the Vistula drainage basin. The only close counterpart is an unornamented vessel from collective Grave 523 in Koszyce, Proszowice District, Site 3 [Przybyła *et al.* 2013: 35, Pl. 4:7] for which a series of 24 radiocarbon dates is available, staying within the range of 2880–2776 BC [Włodarczak, Przybyła 2013, Tab. 5; Schroeder *et al.* 2019, Dataset 1]. Similar vessels are found in the artefact assemblage from Grave II, Site 1, Klementowice, Puławy District [Uzarowiczowa 1968: 220, Fig. 5: a]. Moreover, it resembles in terms of morphology some vessels from the settlement in Mierzanowice, Opatów District, Site I, classified as belonging to the earlier stage of GAC presence on the Sandomierz Upland. Examples include specimens from Pit 174 [Balcer 1963: 129, Pl. II: 7–8,11] and Pit 221 [Balcer 1963: 137, Pl. X: 5].

In addition, Grave 1 yielded chocolate flint blades, including a very regular one with a straight profile (Fig. 4: 2–3). Such objects are found in considerable numbers in GAC human grave inventories in the upper Vistula drainage basin. Examples are offered by objects found in Grave 523 in Koszyce [Przybyła *et al.* 2013: 28–30], Grave 1 in Klementowice, Site 2 [Nosek 1967: 220, Fig. 157: 3] or Grave X, Site 78, in Sandomierz [Ścibior, Ścibior 1990: 189, Fig. 28: c-d]. They

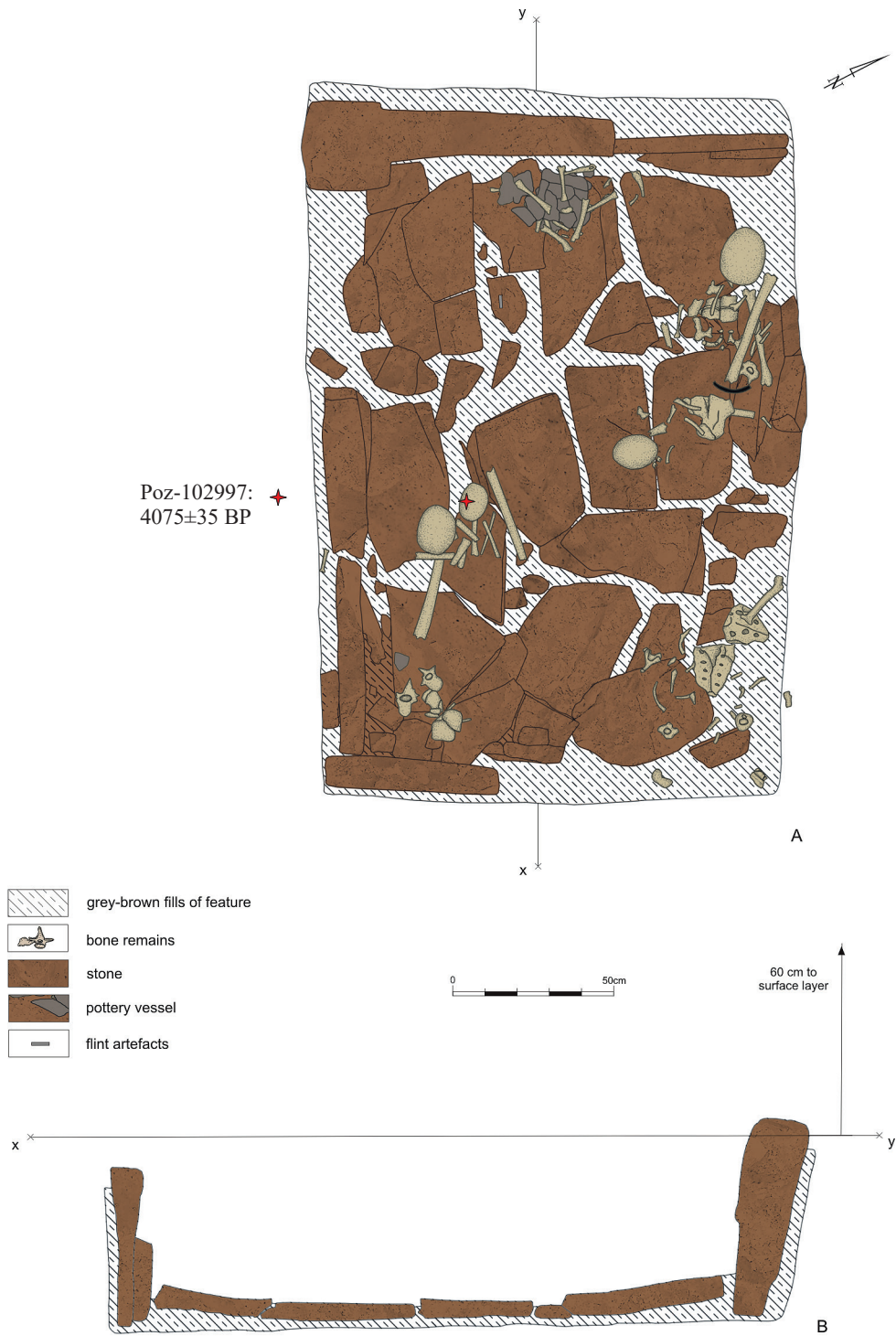


Fig. 3. Sadowie, site 23, Opatów district. Documentation of Grave 1. Drawn by A. Bardetsky

were also found in cist graves such as Deputycze Nowe-Kolonia, Site 12, Chełm District [Bronicki 2007: 192, Fig. 6: 2], Huta, Site 2, Chełm District [Bronicki 2016: 70] and Stefankowice Kolonia, Site 33, Hrubieszów District [Ścibior *et al.* 1991: 88, Fig. 8: e-i].

A ^{14}C determination for Grave 1, dating the skull bones of Individual 5, dates this to 4075 ± 35 BP (Poz-102997) [Juras *et al.* 2021]. After calibration, the dates are 2837–2500 BC at a probability of 68.2% and 2857–2476 BC at a probability of 95.4% (Table 1).

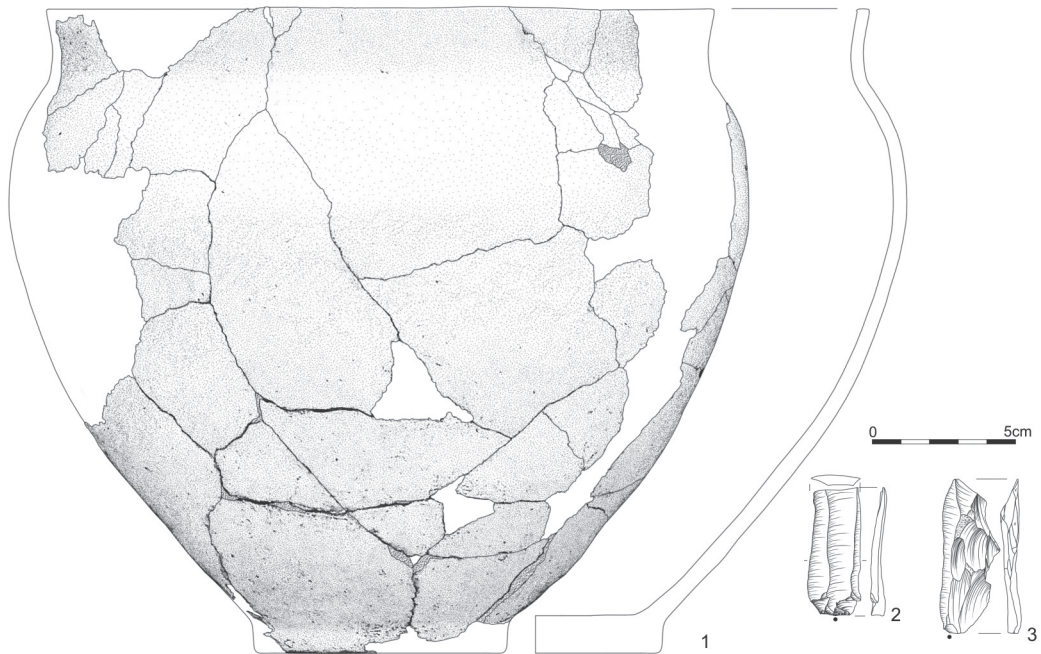


Fig. 4. Sadowie, site 23, Opatów district. Artefacts from Grave 1. Drawn by A. Bardetsky and A. Nowak

Grave 2. Its outline, exposed at a depth of 30 cm, measured $2.05\text{ m} \times 1.3\text{ m}$ and was oriented W-E (Fig. 5: A). In the western portion of the grave chamber, at a level of 10 cm, a small stone pavement was unearthed that was made up of slabs measuring $20 \times 10\text{ cm}$ and $25 \times 25\text{ cm}$. On the pit bottom, at a level of 20–30 cm, a so-called paired animal deposit was discovered, consisting of two cattle (Fig. 5: B-C) [Zabilska-Kunek, Pasterkiewicz in press]. The arrangement of their bones suggested that the animals had been placed on their sides with their heads opposite each other. Furthermore, the grave fill was found to contain pig bones – a mandible and a fragment of a long bone, deposited as grave goods. Apart from that, no other artefacts were found.

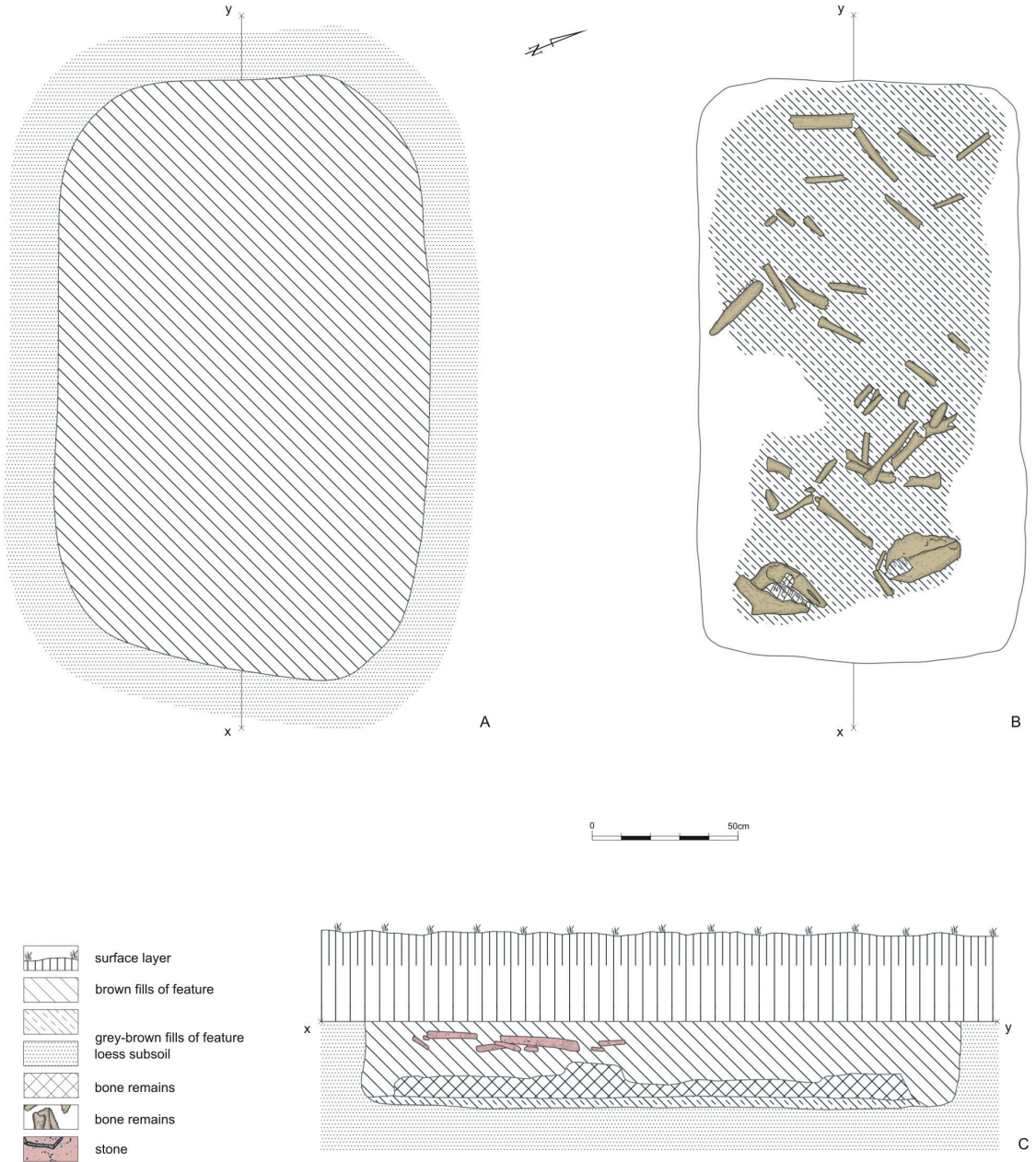


Fig. 5. Sadowie, site 23, Opatów district. Documentation of Grave 2. Drawn by A. Bardetsky

Grave 5. Its outline stood out at a depth of 30 cm from today's ground level as an irregular square with rounded corners (dimensions: 2.20 × 2.15 m) and its longer axis oriented WNW-ESE (Fig. 6: A). At a depth of 20 cm, an outline of a stone cist was exposed, measuring 1.85 × 1.27/1.15 m and shaped like an irregular rectangle and was built of sandstone slabs of varied sizes (Fig. 6: B). The longer (southwestern) wall was an irregular block slightly moved towards the grave interior (dimensions: 130 × 90 × 17 cm). It could have got in the way of land cultivation and must have been moved by the owner of the field. The southeastern part was made of a slab, bearing traces of dressing, measuring 78 × 52 × 14 cm, and a few lumps forming the southern corner. In turn, the northeastern wall was incomplete: a stone slab was missing and only in the northern part, was a corner of closely fitted slabs left. An even and flat bottom stretched at a depth of 40–45 cm (Fig. 6: C). It was completely paved with fitted stone slabs, forming a rather tight pavement. The grave chamber held strongly dispersed bone remains of at least five individuals. The bones bore traces of secondary damage and most were preserved only in pieces. This was a result of opening and disturbing the grave possibly to add more corpses. At the southeastern side, under an upright slab, four skulls had been deposited with their occipital parts pointing towards the grave bottom. Next to them, lay a flint chisel and four boar tusks (Fig. 7: 2–4, 6, 8). The rest of the chamber held a flint chisel blank, another three boar tusks and shards of three clay vessels, a hammerstone, a flint blade and flake (Fig. 7: 1, 5, 7, 9–12).

Artefact inventory:

1. *Small tetrahedral-cross-section striped flint chisel* (no. 9/2015), carefully smoothed on its entire surface, in particular from half of its length to the crescentic cutting edge. It is symmetrical and slightly damaged (Fig. 7: 8). On its upper portion, there are several scars. At the butt, there are polished marks left by a mounting. Dimensions: 92 × 15 mm at the butt, 19 mm in the middle, 17 mm at the cutting edge; thickness: 15 mm at a half of its length.
2. *Blank of a small striped flint chisel* (no. 13/2015). This is an unfinished specimen left as a blank due to damage to its cutting edge in the course of knapping (Fig. 7: 9). On its side walls, no traces of polishing were found; dimensions: 91 × 17 mm at the butt and in its middle, 13 mm at the cutting edge; thickness: 14 mm at the butt.
3. *Regular Świeciechów flint blade* (no. 12/2015); dimensions: 65 × 16 × 3 mm (Fig. 7: 10).
4. *Striped flint flake* (no. 6/2015); at its distal-end right side, minor retouch can be seen; dimensions: 29 × 27 × 5 mm (Fig. 7: 11).

5. *Hammerstone* (no. 5/2015) preserved only in half of its original size. One of its tips bears multiple chippings and crushing marks, spreading to its sides; similar marks can be seen on its dorsal, broken off face. They indicate that the tool was used after it had been damaged. Hard crystalline rock of a light grey colour; dimensions: 92 × 80 × 37 mm.
6. *Boar mandible tusk* (no. 7/2015). Height: 68 mm, maximum width and thickness: 11 mm and 9 mm, respectively (Fig. 7: 4).
7. *Boar upper-jaw tusk* (no. 11/2015). Height: 97 mm, maximum width and thickness: 16 mm and 5 mm, respectively (Fig. 7: 6).
8. *Boar upper-jaw tusk* (fragment, no. 8/2015). Height: 46 mm, maximum width and thickness: 8 mm and 4 mm, respectively (Fig. 7: 1).
9. *Boar upper-jaw tusk* (fragment, no. 10/2015). Height: 59 mm, maximum width and thickness: 10 mm and 4.5 mm, respectively (Fig. 7: 2).
10. *Boar mandible tusk* (no. 14/2015). Height: 108 mm, maximum width and thickness: 19 mm and 17 mm, respectively (Fig. 7: 7).
11. *Boar upper-jaw tusk* (fragment, no. 15/2015). Height: 62 mm, maximum width and thickness: 12 mm and 5 mm, respectively (Fig. 7: 3).
12. *Boar upper-jaw tusk* (fragment, no. 16/2015). Height: 82 mm, maximum width and thickness: 15 mm and 5.5 mm, respectively (Fig. 7: 5).
13. *Four clay-vessel shards* (no. 234–237/2015) including a fragment of the base (Fig. 7: 12). The clay includes fine- and coarse-grained crushed stone of a whitish colour. The surfaces of outer walls are polished and uniformly light brown, while inner surfaces are black. The firing is quite good, the fracture is compact and the shards are hard. Weight: 36 g. Dimensions: base thickness: 10 mm, wall thickness: 6–9 mm.
14. *Three fine fragments of a thin-walled clay vessel* (no. 238–240/2015) made of clay tempered with medium- and coarse-grained crushed stone of a whitish colour. Wall surfaces are smooth and polished. On the outside, they are variegated light beige, while on the inside they are black or dark brown. These are quite hard ceramics of a compact fracture. Weight: 11 g. Dimensions: wall thickness: 3–4 mm.

Owing to their shape, the flint chisels (Fig. 7: 8, 9) are typical of the so-called GAC Gierczanka industry [Balcer 1983: 209–211]. They are not often found among grave goods on the Sandomierz Upland, but they were discovered, nonetheless, for instance, in Chwałki near Sandomierz [Nosek 1967: 190–192, Fig. 128: 5]. These artefacts are more numerous in the area occupied by the Nałęczów group as for instance in graves from Łopiennik Dolny-Kolonia, Site 1, Krasnystaw District [Gołub 1996: 48, Fig. 4: 2], Klementowice, Puławy District, Site 1, Grave II

[Bronicki 2016: 77, Fig. 29: 5], Las Stocki, Puławy District, Site 7 [Zakościelna 1989: 49, Fig. 2: B] and Grave V from Site 16 [Bronicki 2016: 137, Fig. 88], and Opole Lubelskie [Bronicki 2016: 162, Fig. 113]. Similar tools are known from other GAC grave assemblages from the upper Vistula drainage basin. A grave in Koszyce yielded two tools in the type of a chisel together with five axes [Przybyła *et al.* 2013: 27–28, Fig. 21]. Interestingly, this assemblage included one specimen of an unfinished chisel. In the opinion of Włodarczak and Przybyła, its presence is related to the symbolism of depositing unfinished specimens or ones requiring an alteration in graves holding larger assemblages of core tools [Włodarczak, Przybyła 2013: 219–220].

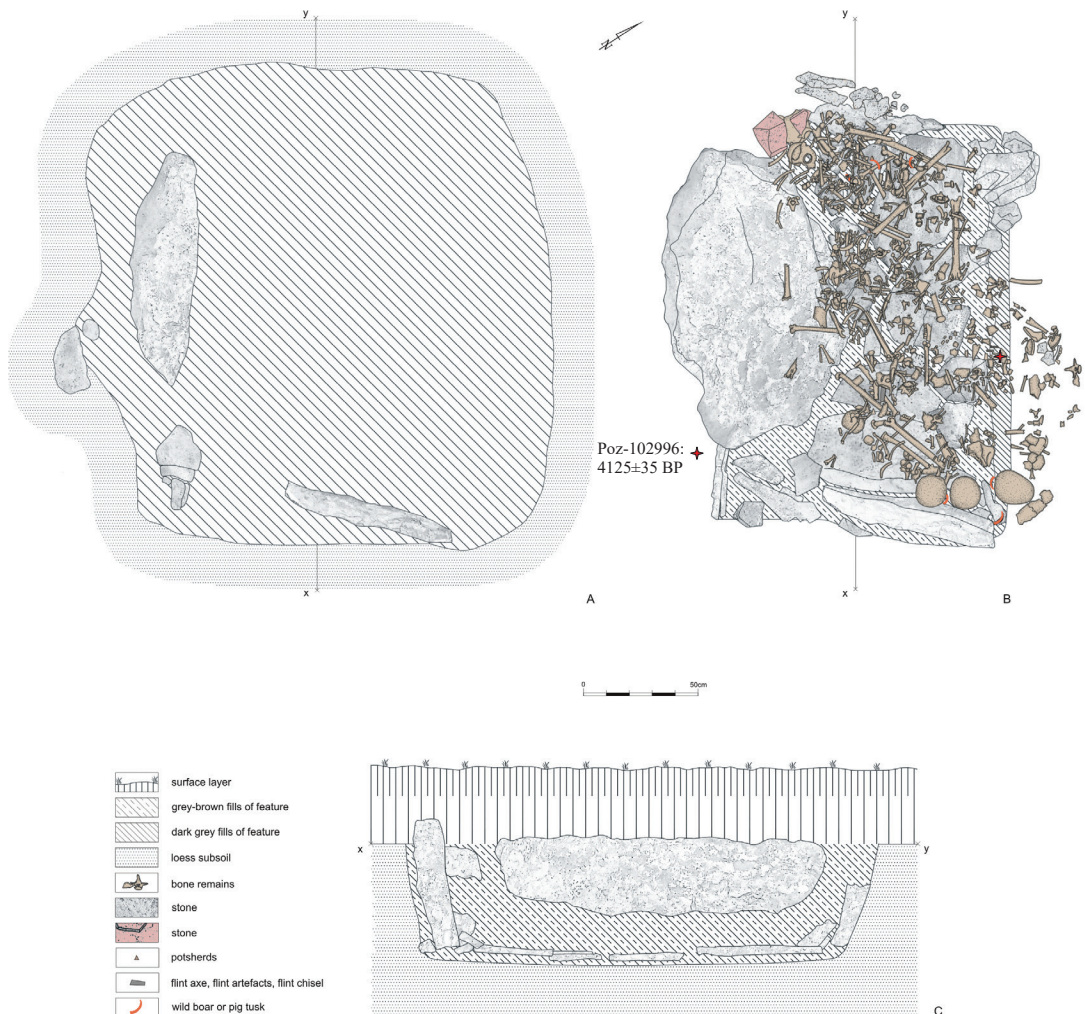


Fig. 6. Sadowie, site 23, Opatów district. Documentation of Grave 5. Drawn by A. Bardetsky

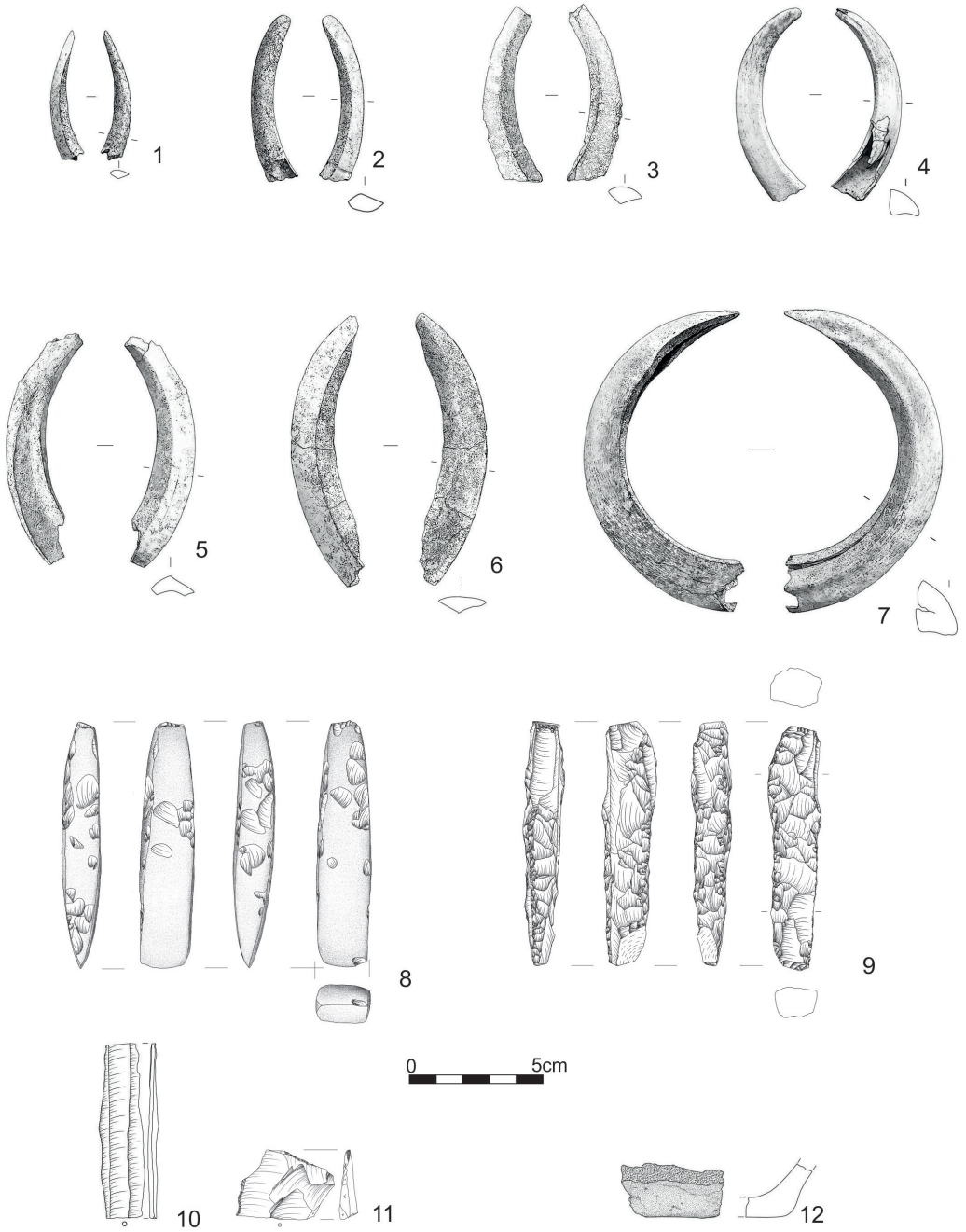


Fig. 7. Sadowie, site 23, Opatów district. Artefacts from Grave 5. Drawn by A. Bardetsky and A. Nowak

The inventory comprised also a large series of bone artefacts such as boar or pig tusks (Fig. 7: 1–7) that are often found among grave goods in male graves in the upper Vistula drainage basin [Bronicki 2016: 240, 242, 246, 247, Tab. 10–12, 250]. They are especially numerous on the Lublin Upland, for instance, in Grave I, Site 2, Klementowice [Nosek 1951: 71, Fig. 5], in burials from Nałęczów [Nosek 1967: 236] and Włostowice, Puławy District, Site 1 [Gurba *et al.* 1978: 139]. So far, the only example of boar tusk deposition in an animal grave is Grave 11, Sadowie, which held the remains of two cattle [Pasterkiewicz 2020: 67, Fig. 11].

A ^{14}C determination for Grave 5, obtained from the skull of Individual 4, is 4125 ± 35 BP (Poz-102996) [Juras *et al.* 2021]. After calibration, it is 2858–2625 BC at a probability of 68.2% and 2871–2578 BC at a probability of 95.4% (Table 1).

Grave 4. Its outline was rectangular-oval and elongated along the WNW-ESE axis (Fig. 8: A), with its preserved dimensions being 2.45×1.1 m. On the grave chamber bottom, at a level of 30 cm, the fragments of three animal skeletons were found piled one upon another (Fig. 8: B, C). They were identified as two cattle and a pig [Zabilska-Kunek, Pasterkiewicz in press]. On the animal remains, lay stone lumps, forming a small pavement. Next to the skull of Cattle 2, there lay a broken vessel – a cord-impression ornamented amphora (Fig. 9) [Pasterkiewicz 2020: 58–59].

The amphora has analogies in assemblages from the Gajowizna site in Złota, from an unknown part of the site [Krzak 1977: 58, Fig. 75], Peresopnica on the Stubła [Shelomentsev-Terskiy 1996, Fig 3:6], radiocarbon-dated to 3910 ± 50 BP [Kadrow, Szmyt 1996, Tab. 1], and Site 1, Mierzanowice, Opatów District [Balcer 1963, Pl. III: 11, VII: 17].

A ^{14}C determination for Grave 4 was obtained from teeth belonging to Skeleton 1 (Poz-111913: 3995 ± 35 BP) [Pasterkiewicz 2020: 68]. After calibration, it is dated to 2568–2470 BC at a probability of 68.2% and 2623–2411 BC at a probability of 95.4% respectively (Table 1).

Grave 3. The grave chamber outline of stones was perceptible at a level of 30 cm, forming a kind of discontinuous lining. It had the shape of an irregular rectangle with rounded corners and the longer side oriented along the axis ($2.1/2.15 \times 1.3$ and 1.52 m; Fig. 10: A). In its ceiling part, along the northern edge, there were fine rock rubble and sandstone slabs, forming a ‘loose lining’. In the northern corner, there were two large lumps, measuring $60 \times 30 \times 40$ cm and $35 \times 15 \times 15$ cm and over a dozen smaller ones lying between them, measuring below 10×10 cm. In the pit centre, a stone slab, measuring $96 \times 18 \times 26$ cm, stood upright, oriented roughly in agreement with the grave axis orientation. At a level of 50 cm, an incomplete cattle skeleton was discovered, lying on its right side with limb bones contracted and the head pointing east (Fig. 10: B-C) [Zabilska-Kunek, Pasterkiewicz in press]. Its hind limb bones and cervical vertebrae were missing. At a small distance from the head, there lay a slightly crushed amphora ornamented

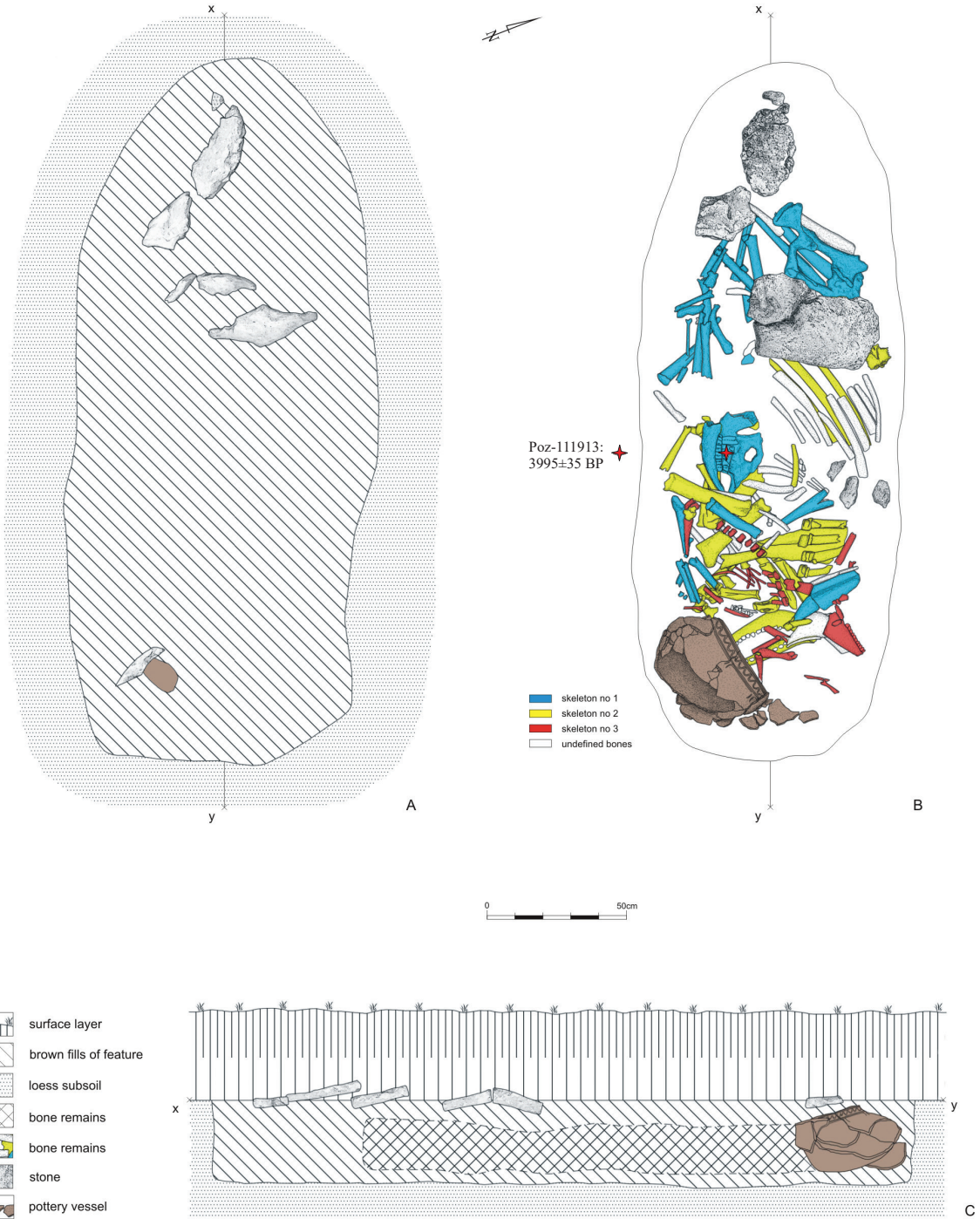


Fig. 8. Sadowie, site 23, Opatów district. Documentation of Grave 4. Acc. to Pasterkiewicz 2020: 57, Fig. 3

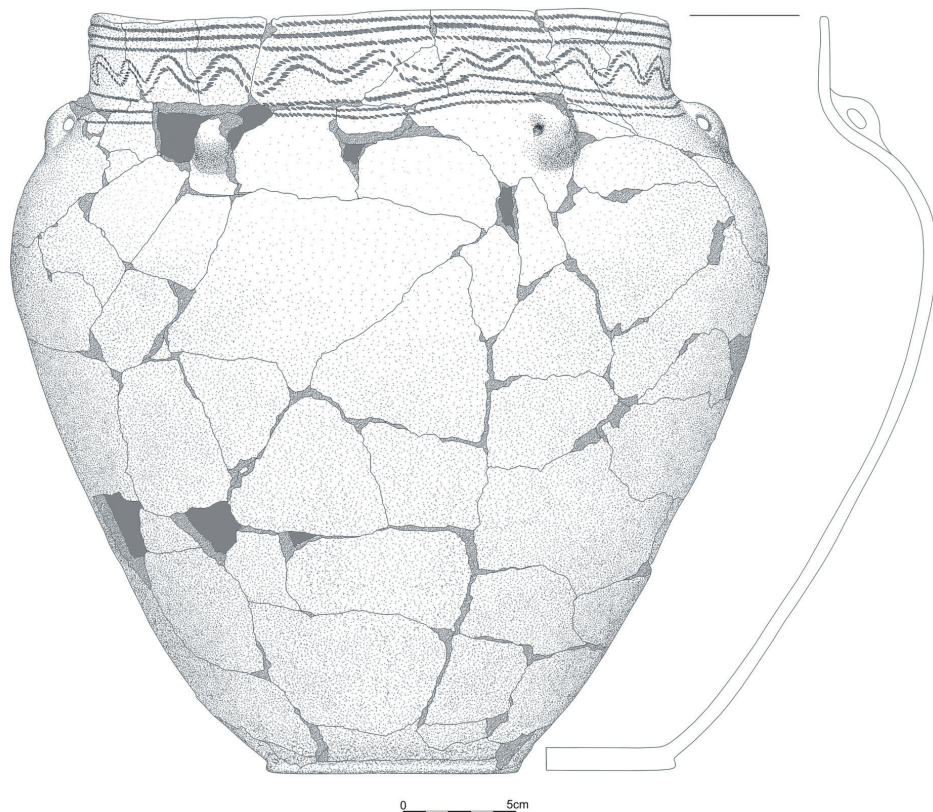


Fig. 9. Sadowie, site 23, Opatów district. Artefacts from Grave 4. Acc. to Pasterkiewicz 2020: 58, Fig. 4

with cord and stamp impressions. At its belly, a flint axe was found, while south of it – a flint retouched blade and another clay vessel (small amphora), bearing an ornament of round impressions (Fig. 11). At the same level, in the southeastern part, another two cattle skulls were found of which only teeth had been preserved, which were intentionally deposited (grave goods?).

Artefact inventory:

1. *Clay vessel* (no. 148/2015) – four-handled amphora (Fig. 11: 1), representing Type IIA1 according to Wiślański [1966: 28, 29, List II] or so-called ‘Kujawy-type amphorae’ according to Nosek [1967: 292–295, Pl. III-IV]. In Szmyt’s classification, in turn, it can be assigned to Type VBII1–21–2b-ca or -cb [Szmyt 1996: 31]. Its cylindrical neck prominently stands out from the belly and is fitted with four symmetrically-placed, elbow-shaped handles. A globular belly, being slightly asymmetrical, makes the vessel seem to lean to one side. Its base is clearly marked, forming a low foot, while the neck and upper belly are

ornamented with horizontal and curved lines of left-twisted cord impressions and arrangements of vertical and horizontal motifs of rectangular and crescentic stamp impressions. Going from the rim edge, these are two horizontal cord impressions super-adjacent on a band of nine drooping festoons (made up of four parallel cord impressions each) followed underneath by vertical bands of three or four crescents that are underlined by a single row of similar impressions, but arranged horizontally. The belly displays vertical stamp-impressions arranged in groups of ten and separated by vertical columns of crescents (preserved asymmetrically, therefore not visible in Fig. 11: 1). The entire ornament is underscored by a double horizontal line of crescents. The clay is tempered with a large amount of sand and medium-grained crushed stone, in particular in the bottom part of the vessel, which shows that it was made of two kinds of mass of clay. The vessel surface is smooth and of a variegated colour with blotches in its lower portion. Its upper portion around handles, in turn, bears traces of rubbing or brushing. Fractions are uniform in the upper and middle portions and three-layered in the bottom portion. Dimensions: height: 23.5 cm, neck height: 3.5 cm, rim diameter: 11.5 cm; greatest protrusion of the belly: 23.5 cm; base diameter: 8.5 cm; wall thickness: at the rim: 5–6 mm, at the shoulder: 2.5–3.0 mm, at the middle portion of the belly: 5 mm, at the base: 6.0–6.5 mm; base thickness: 7.0–7.5 mm. Handle height: 3.6–4.0 mm; handle width: 2.0–2.3 mm; handle thickness: at the middle portion: 5 mm, at the root: 6.5 mm; handle perforation diameter: 5–6 mm. Weight: 1,332 g.

2. *Clay vessel shard* (no. 149/2015) – of a small amphora (?) slightly above 10 cm high (Fig. 11: 2). It is ornamented with a single horizontal line of round-stamp impressions under the lip rim and loops placed underneath. The clay has a small amount of temper of crushed medium- and coarse grained stone of a light cream colour. Dimensions: rim diameter: approx. 7 cm, wall thickness: 5 mm, wall thickness at rim: 2 mm. Weight: 8 g.
3. *Świeciechów-flint tetrahedral axe* (no. 3/2015) of an irregular shape, resembling a trapezium and polished throughout (Fig. 11: 3). Its arched cutting edge is slightly asymmetrical and damaged in one corner while its side walls are convex. On its upper portion, there are visible scars left by low-angle retouch at the forming stage and ridges bearing wear and sheen signs resulting from its use in a haft. Dimensions: length: 138 mm, width: at the butt: 38 mm, in the middle: 47 mm, at the cutting edge: 52 mm; thickness: at the butt: 25 mm, in the middle: 30 mm, at the cutting edge: 26 mm.
4. *Chocolate-flint retouched blade* (no. 4/2015), truncated, with the tip and butt portions broken off (Fig. 11: 4). Both of its sides bear inverse retouch in part effected in the course of its use. Its right edge has a sheen. Dimensions: 83 × 26 × 5 mm.

Artefacts from this grave have analogies in a nearby GAC grave and settlement assemblages. The closest analogy to the four-handled ‘Kujawy amphora’

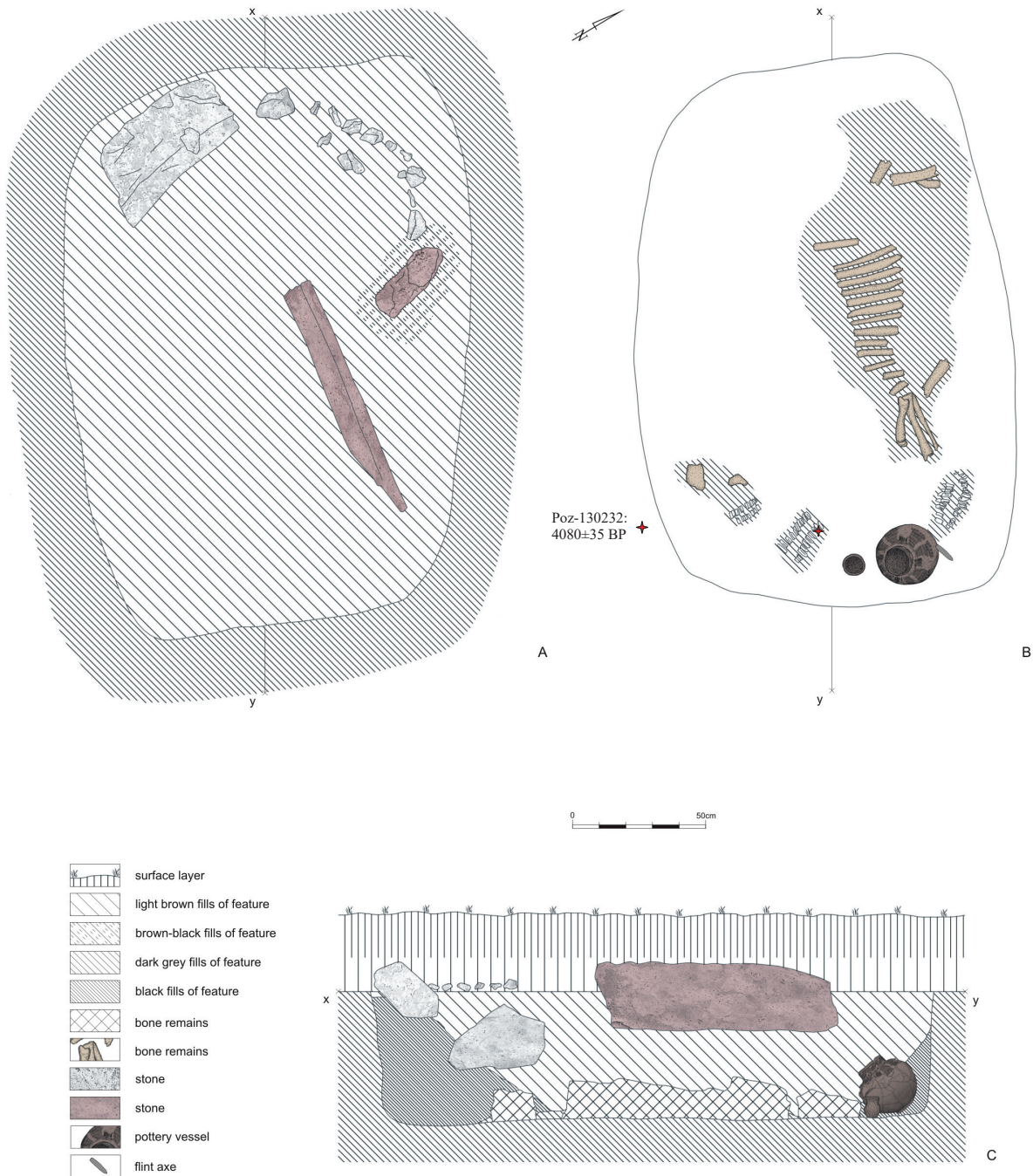


Fig. 10. Sadowie, site 23, Opatów district. Documentation of Grave 3. Drawn by A. Bardetsky

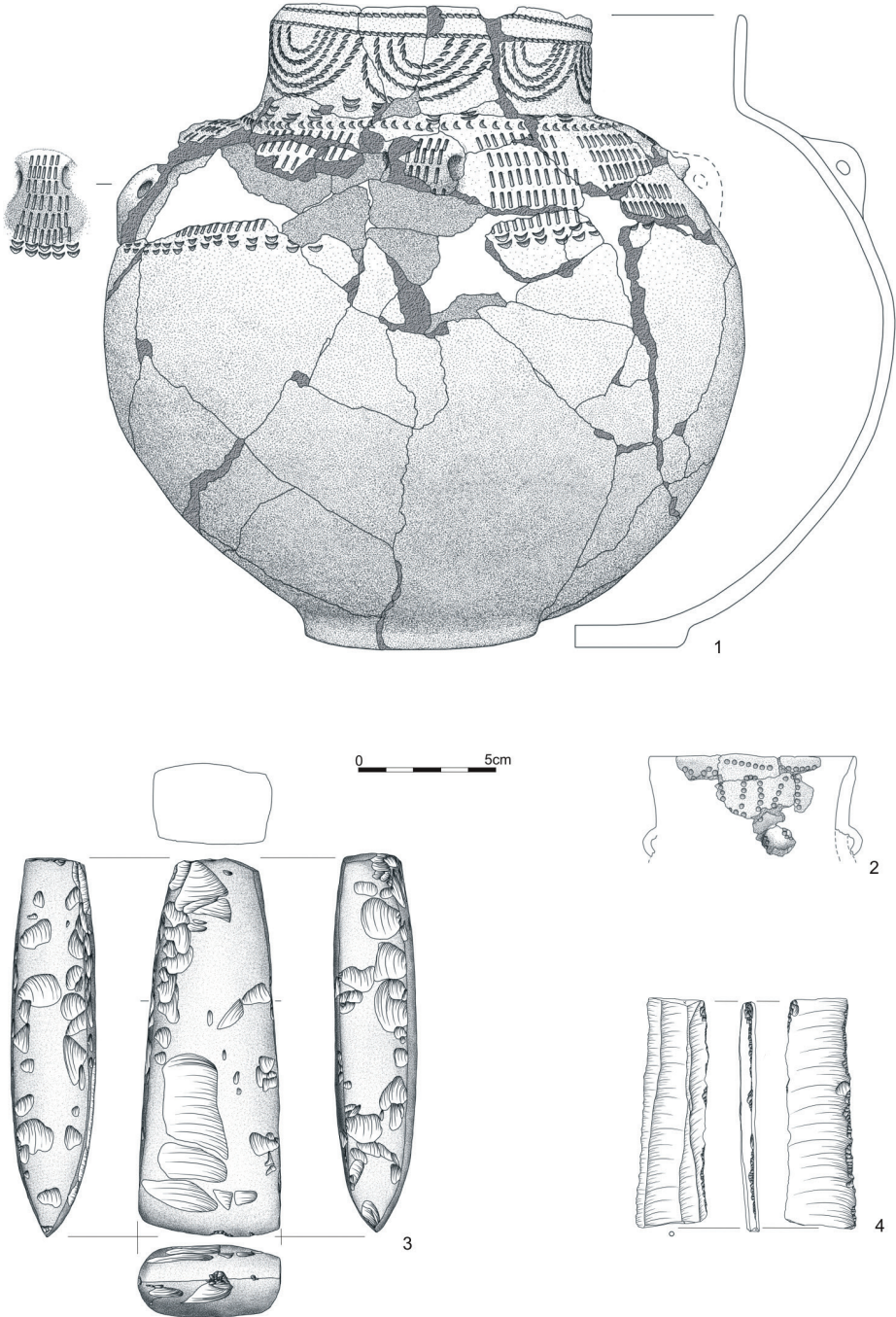


Fig. 11. Sadowie, site 23, Opatów district. Artefacts from Grave 4. Drawn by A. Bardetsky and A. Nowak

(Fig. 11: 1) is afforded by a specimen retrieved from Grave VIII, Site 78, Sandomierz [Ścibior, Ścibior 1990: 186, Fig. 25:a]. The two vessels differ solely in proportions and the shape of lower belly. Their ornaments resemble closely one another, too. For Grave VIII in Sandomierz, there is an age determination made from a charcoal sample found next to the skeleton; it gives its age as 4370±70 BP [Ścibior, Ścibior 1990: 192]. Another, recent determination made for one of the bones suggests a slightly younger age, synchronous with most dates for GAC assemblages in southeastern Poland [Witkowska *et al.* 2020: 278].

The artefact inventory comprises also a small amphora ornamented with tiny round impressions (Fig. 11: 2). This type of ornament is not very common in GAC materials from other sites. A similar ornament is found on a bowl retrieved from Pit 5 on the Mierzanowice settlement [Gardawski, Miśkiewicz 1958: 236, Pl. 49: 6]. Meanwhile, motifs made with a round stamp/point are quite common in the ZC. Examples come from Grodzisko I site in Złota, Grave 33 (325) [Krzak 1976: 54, Fig. 13: c], Grave 14 [Krzak 1976: 57, Fig. 15: f], Grodzisko II site – Pit 139 [Krzak 1976: 77, Fig. 29: g] and the Nad Wawrem site (unknown portion of the site) [Krzak 1976: 107, Fig. 38: c].

In the case of Grave 3, the Świeciechów flint axe deserves special attention (Fig. 11: 3). Such objects are not often found among grave assemblages with animal remains. So far, a similar artefact, made also of Świeciechów flint, has been found in the fill of Grave I, Site 78 in Sandomierz [Ścibior, Ścibior 1990: 159, Fig 2: c]. Another, more distant example comes from Site 6, Husynne-Kolonia, Hrubieszów District, Lublin Province [Ścibior *et al.* 1991: 90, Fig. 10: c-d].

Furthermore, the grave inventory was found to contain a retouched blade, bearing traces of use, made from a large massive chocolate-flint blade (Fig. 11: 4). Such artefacts are rarely found in inventories of GAC features with animal burials. The only example has been supplied so far by Grave 1, Site 7, Klementowice [Bronicki 2016: 106; cf. Uzarowiczowa 1968].

A ¹⁴C determination for Grave 3, obtained from the teeth of cattle skull 2, is 4080±35 BP (Poz-130232). After calibration, it gives its age as 2840–2501 BC, at a probability of 68.2%, or 2861–2489 BC, at a probability of 95.4% (Table 1).

COMPLEX IX

Grave 8. It was rectangular-oval in shape and measured 2.95/3.0 × 1.75/1.65 m, being elongated in the NW-SE direction (Fig. 12: A). Its central portion was damaged by a World War II communication trench, which branched southward in this very place. In the southwestern corner, a fragment of a stone structure was exposed, built of medium-sized rubble (50/40 × 30/20 cm) arranged in layers (Fig. 12: B, C). In fill layers, no skeletal remains were found but its position in respect of other

GAC graves and Grave 7 with an animal deposit shows that the feature belonged to the GAC and presumably held human remains. The fill of the feature and WWII trench yielded a lot of strongly comminuted pottery. The shards belonged to at least five vessels, including two amphorae and a vessel with a stamp-impressed ornament (Fig. 13).

Artefact inventory:

1. *Thirteen clay vessel shards* (no. 484, 487, 488, 490, 492, 496, 498, 499, 502/2016) belonging to an unornamented amphora with two vertical handles placed symmetrically on its sides (Fig. 13: 1). Its form indicates connections to some amphorae of Types IA1 and IA4 according to Wiślański [1966: 26–28, List 1], while in Nosek's typological division, it may represent so-called 'globular' or 'ovoid' amphorae [Nosek 1967: 289–292, Pl. I and II]. Its neck is short, slightly S-shaped and turning outward at the rim. The clay contains a medium amount of sand and whitish fine-grained crushed stone. Wall surfaces are carefully smoothed and black on the outside and inside while their fractions are brick-red in colour. Some shards had their inner surfaces rubbed with a bunch of grass or straw. The vessel has been well-fired and the shards are medium-hard. Weight: 52 g. Dimensions: rim diameter: 6.5–7.0 cm; neck height: 2.5 cm; wall thickness: at the rim: 3 mm, at other places: 4–5 mm.
2. *Twenty clay vessel shards* (no. 380, 473–478, 486, 489, 491, 494, 501, 504–506, 512, 513/2016) left most likely of an amphora with horizontally perforated handles (Fig. 13: 4). The clay contains whitish fine- and medium-grained crushed stone. Wall surfaces are uneven, brown-orange on the outside and black on the inside with light brown blotches. The vessel has been well-fired, making its fracture compact and shards hard. Weight: 99 g. Dimensions: wall thickness: 5–7 mm.
3. *Three clay vessel shards* (no. 479, 493, 495/2016) ornamented with a band of horizontal and angular impressions of a rectangular stamp (Fig. 13: 2–3). In addition, a fragment of the vessel base and adjacent walls has been preserved. The clay contains temper of a whitish colour and varied grain sizes. Wall surfaces are smooth, slightly burnished, uniformly black with brighter, dark grey blotches in places. On the inside, there are signs of rubbing with a bunch of grass or straw. The vessel has been quite well-fired, making its fracture compact and shards quite hard. Weight: 35 g. Dimensions: base diameter: approx. 7 cm; base thickness: 7 mm, wall thickness: 3.0–4.5 cm, at the base: 4 mm.
4. *Sixteen clay vessel shards* (no. 481–483, 485, 500, 503, 508–511/2016). They were made of clay with the temper of whitish medium- and coarse-grained crushed stone. The walls are smooth, their colour varies from light brown to orange on the outside and inside, while their fractures are grey. They have been well-fired, making shards hard. Weight: 99 g. Dimensions: wall thickness: 8–10 mm.

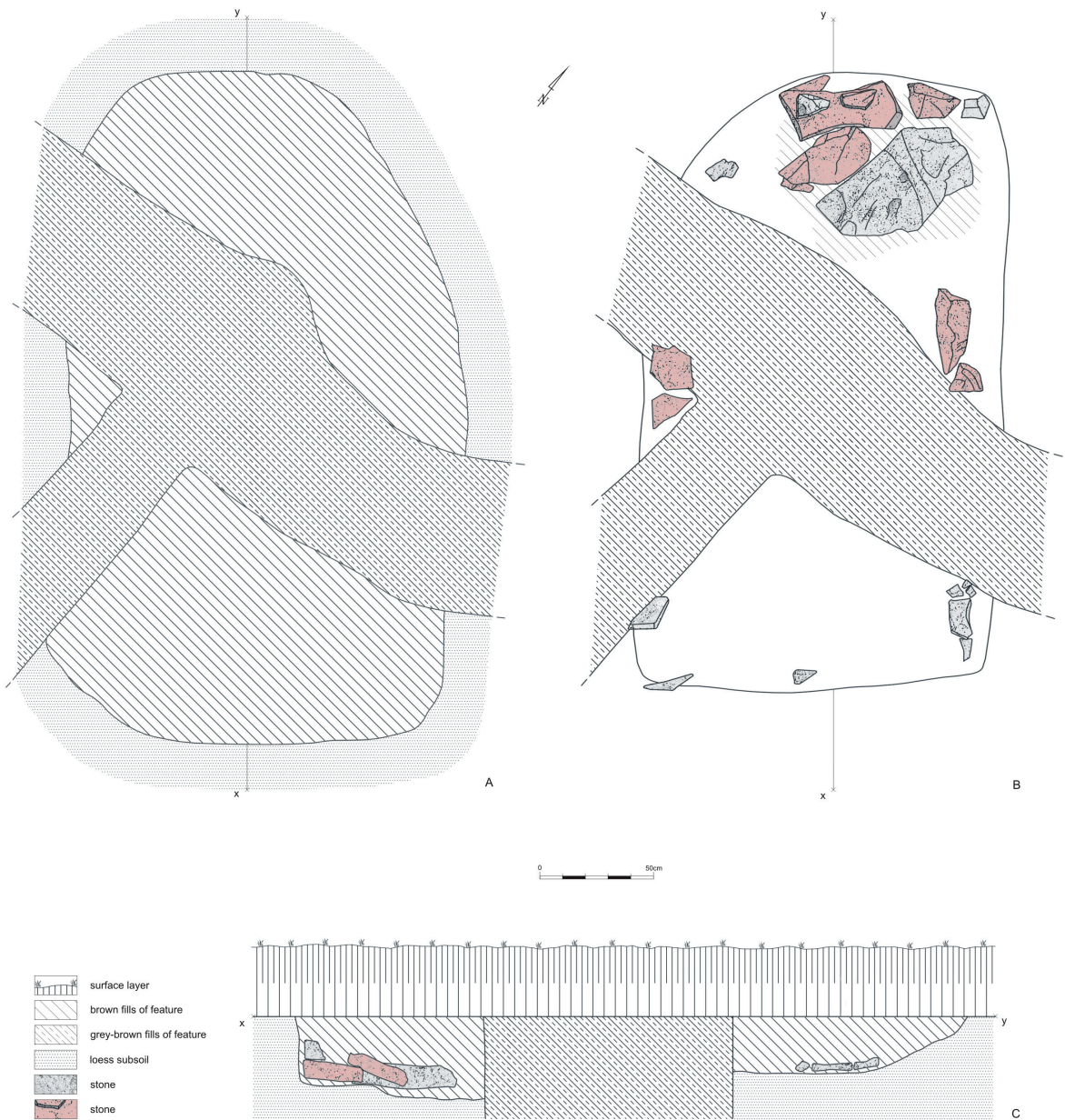


Fig. 12. Sadowie, site 23, Opatów district. Documentation of Grave 8. Drawn by A. Bardetsky

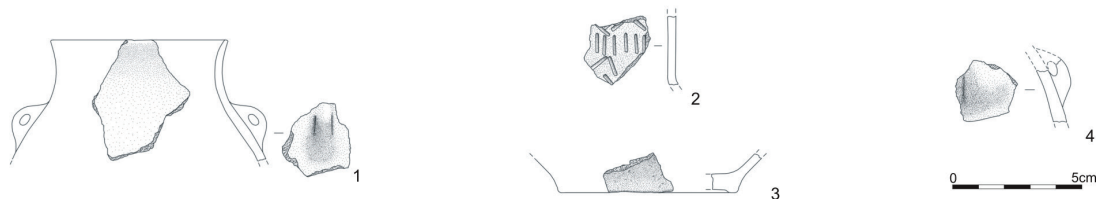


Fig. 13. Sadowie, site 23, Opatów district. Artefacts from Grave 8. Drawn by A. Bardetsky

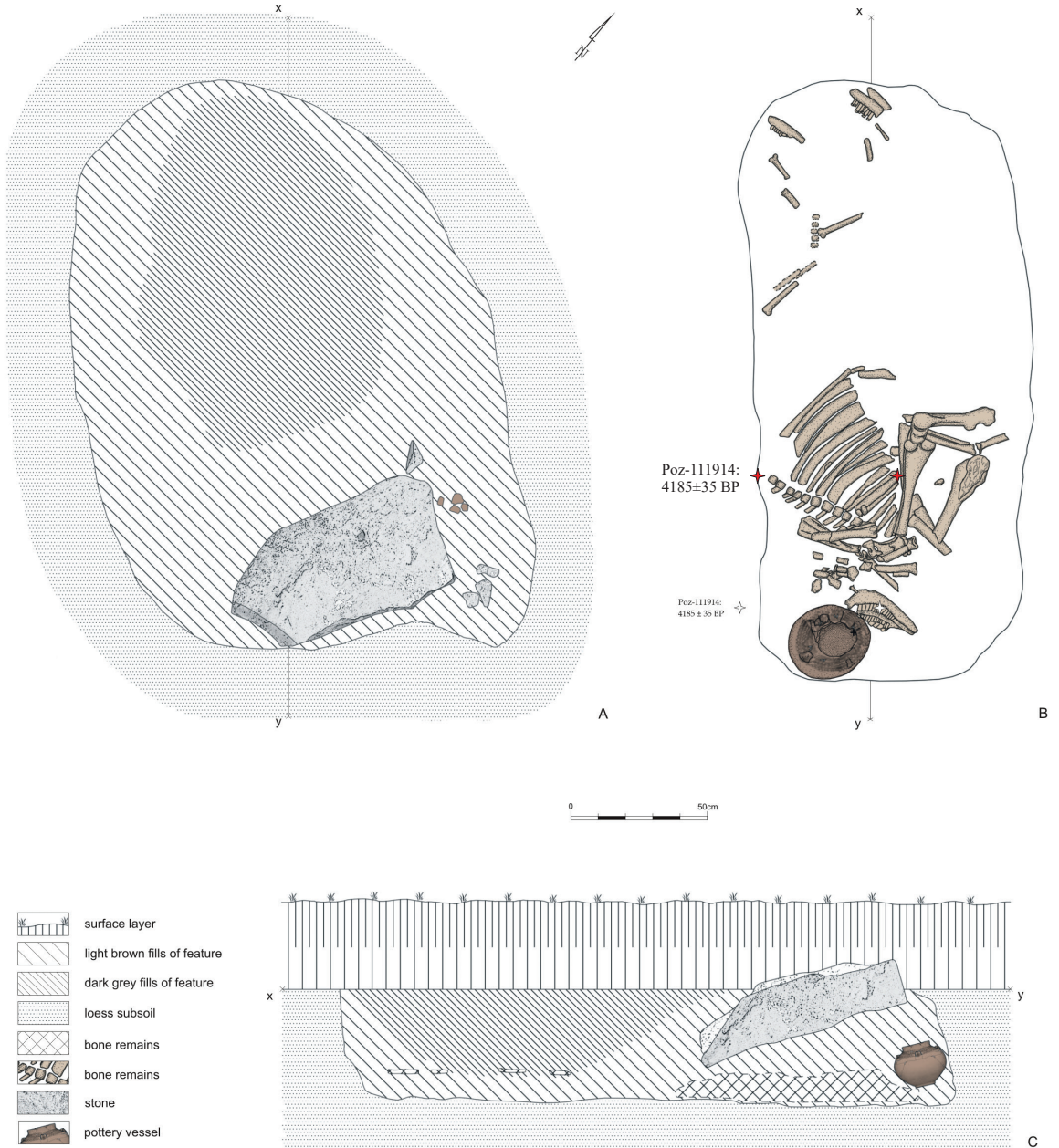


Fig. 14. Sadowie, site 23, Opatów district. Documentation of Grave 7. Acc. to Pasterkiewicz 2020: 60, Fig. 5

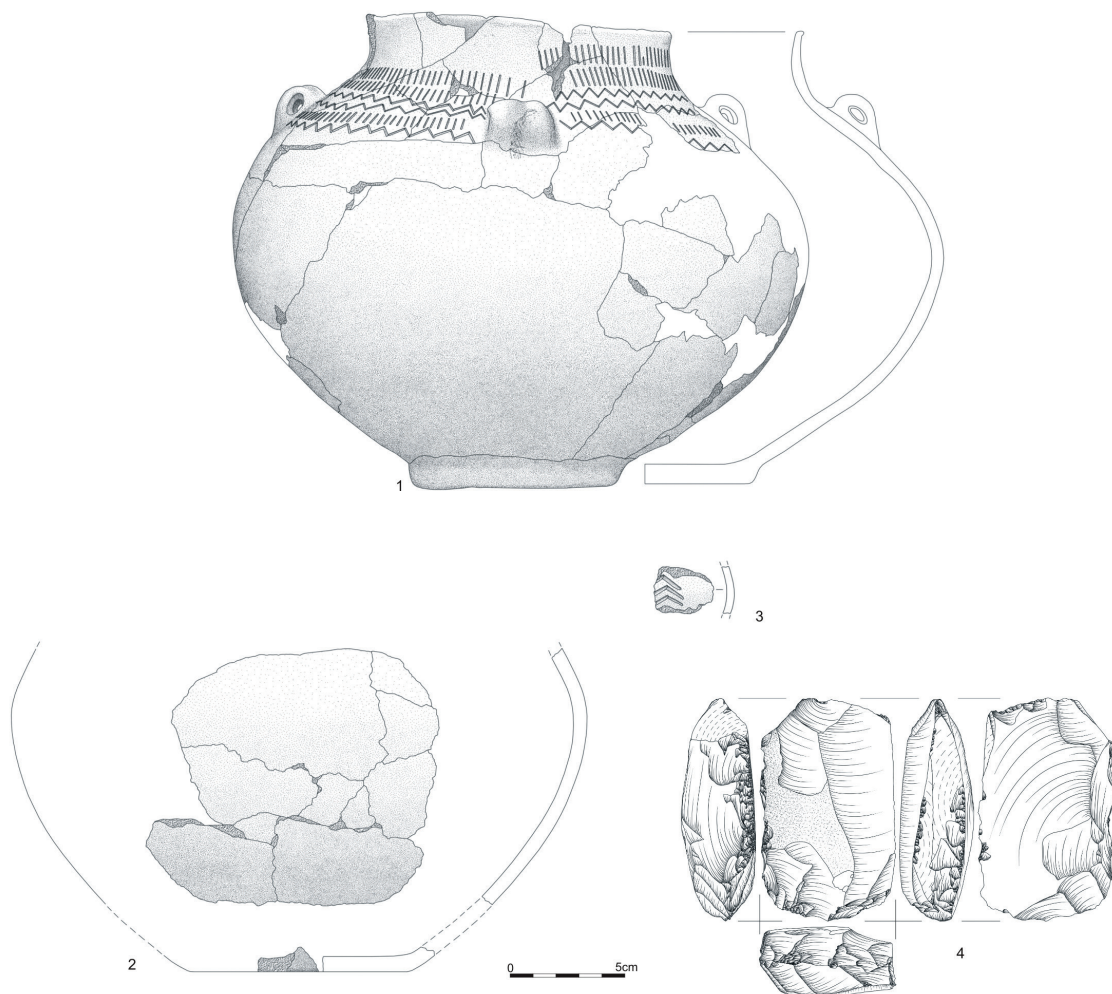


Fig. 15. Sadowie, site 23, Opatów district. Artefacts from Grave 7. Acc. to Pasterkiewicz 2020: 61, Fig. 6

5. *Two clay vessel shards* (no. 480, 507/2016). The clay contains temper of whitish fine-grained crushed stone. Wall surfaces are smooth and uniformly dark grey. The vessel has been quite well-fired, making its fracture compact and shards quite hard. Weight: 25 g. Dimensions: wall thickness: 5 mm.
6. *A flint flake* (no. 33/2016).

Due to its incompleteness, the preserved inventory does not allow any conclusions on its chronological position. It is worth noting, nonetheless, that ornament motifs on one of the preserved vessel shards to a degree resemble those on the

amphora from Grave 7 (Fig. 15: 1). Additionally, the vessels from both graves show considerable technological similarity.

Grave 7. The grave pit outline was irregular, resembling a rectangle with rounded corners, and measured 2.1×1.5 m (Fig. 14: A). Its longer axis was oriented NW-SE. Inside, in its northeastern portion, an incomplete cattle skeleton was discovered (no. 1), with its bones being badly damaged (Fig. 14: B-C) [Zabilska-Kunek, Pasterkiewicz in press]. The damage must have been caused by a purposeful grave disturbance, already in antiquity. In its southeastern portion, a stone slab lay (an element of a pit pavement), underneath which there lay the bones of the upper trunk, head and limbs of another cattle individual (no. 2).

Above the head bones, a *clay vessel* was placed – an amphora ornamented with vertical stamp impressions and a zigzag. In addition, the pit fill yielded *shards of two other vessels*, including the bottom portion of an amphora with a globular belly and a vessel bearing a herringbone ornament and a single flint lump with the traces of knapping (most likely an unfinished axe; Fig. 15).

A detailed stylistic and typological description of the inventory from this grave was given in an earlier publication [Pasterkiewicz 2020: 59–62]. It is worth stressing that particular vessels in this inventory indicate many connections to GAC grave and settlement pottery. Similar specimens come from, for instance, Świerszczów, Hrubieszów District, Site 5 [Ścibior *et al.* 1991: 82, Fig. 3: f-g], for which a ^{14}C determination is available: 4170 ± 35 BP [Kadrow, Szmyt 1996, Tab. 1], and Trzeszkowice, Świdnik District, Site 14, from a grave whose age is determined by the ^{14}C date: 4170 ± 35 BP obtained by sampling bones [Polańska 2016: 42].

A ^{14}C determination for Grave 7 was obtained from Skeleton 2: Poz-111914 4185 ± 35 BP [Pasterkiewicz 2020: 68]. After calibration, the dates are 2882–2698 BC at a probability of 68.2% and 2891–2632 BC at a probability of 95.4% (Table 1).

COMPARATIVE ANALYSIS

Cist graves are the most common sepulchral features throughout the GAC oecumene, in all territorial groups. The basic type is made up of structures carefully built of stone slabs or blocks, often taking the shape of rectangles or trapezia, with their bottoms being paved with smaller stones. The dimensions of classic cist range from 1.0/1.5 m to 1.5/2.5 m [Priebe 1938: 6–8; Wiślański 1966: 54–66; Nosek 1967: 261–265; Sveshnikov 1983: 12–16; Szmyt 2014: 214, Fig. 8; Bronicki 2016: 228–229]. In the case of Sadowie, the grave structure is different: an incomplete rectangular single-chamber cist built of sandstone slabs with a paved bottom. In Graves 1 and 5, the walls are not complete: no closing of the chamber on the longer

side was found. In neither case, was a cover identified, either; it is very likely that it was no longer there when the grave was being used. The shortage of appropriate construction material could have forced GAC communities to replace stone covers with, let's say, wood. What else distinguishes the cist burials is the lack of bones. Most such burials lack from several to over a dozen bones and what's more, those that are left are disarticulated. This was a result of multiple opening of graves to add skeletons of the dead, and of the ritual grave disturbance that took place in the course of the burial cycle. A frequent consequent occurrence was the disturbance of grave goods with some going missing.

Moreover, another characteristic of the Sadowie sepulchral complexes is the deposition of skulls at the shorter side of graves (this is also true for stone-lined Grave 14 on this site). Interestingly, these features do not show any affinities with other GAC sepulchral features on the upper Vistula. Admittedly, from the Sandomierz Upland, information comes on graves constructed as stone-slab cists, for instance, from Ossolin [Pyzik 1959: 349–350], Stodoły [Nosek 1967: 188] and Sandomierz, Pepper Mountains (*Góry Pieprzowe*) [Nosek 1967: 195–196], but their structure was a typical stone cist. It cannot be ruled out, therefore, that the Sadowie graves form a local type of a cist grave with a limited incidence range. Its construction differences may follow from diverse reasons such religious-ideological, cultural or chronological [Włodarczak 2016b: 553]. Alternatively, the differences may result from the shortage of suitable rock material. In the immediate vicinity of the Sadowie cemetery, we know of the deposits of Jurassic quartzitic sandstone in Podole, approx. 5 km to the southeast [Dowgiałło 1972]. Another locally available rock is reddish Triassic sandstone from Czerwona Góra [Romanek 1991], located approx. 4.5 km to the west. The properties of these kinds of sandstone, however, do not lend them to making slabs of a suitable size and necessary thickness. According to the recent findings [Włodarczak 2016a; 2016b: 551, Fig. 1; Bronicki 2019, Table 3], cist graves emerged between 2900 BC and 2800 BC and continued in existence until the second half of the 3rd millennium BC on the Lublin Upland. The available radiocarbon dates from Grave 1 and Grave 5 fall on a similar chronological bracket, which points to synchronism with materials from the Nałęczów and East Lublin groups.

Grave 8, in turn, represents a type of flat pit feature with an inner stone lining along the bottom. In terms of its structure, it is typical of the area occupied by the GAC Nałęczów group [Bronicki 2016: 229–232], while being rather rare west of the Vistula. The only similar instance was recorded in Sandomierz, Site 78, Grave X [Ścibior, Ścibior 1990: 189, Fig. 28:a]. However, any closer study of this grave is prevented by damage caused to it by a World War II trench.

'Animal deposits' were placed in flat pits sunk into the ground and supported by simple stone structures. This was the most common GAC type of a sepulchral feature with animal bones [Behrens 1964: 96–105; Wiślański 1966: 73–75; Nosek 1967: 281–283; Krzak 1977: 59–70; Bronicki 2016: 232]. Grave 2, described

above, held a paired cattle burial placed in a pit, with cattle heads pointing in the direction of human Grave 1. Remains were similarly arranged in a human-animal grave in Zdrojówka, Koło District, Site 1 [Wiślański 1966: 155, Fig. 14:11]. Good examples of a paired arrangement of skeletons come from an animal cemetery in Brześć Kujawski [Gabałówna 1958: 63]. Grave 5 discovered there held a double burial of cattle, lying in parallel, their heads pointing northeast [Gabałówna 1958: 75]. Additionally, on the remains of one of the cattle, there lay a dog skull and bones. Analogous animal pairs were found in Grave 2 and Grave 3 in Brześć Kujawski [Gabałówna 1958: 78–79].

To Sadowie Grave 3, the closest analogy is the burial discovered on Site 6 in Dobre, Radziejów District, and found to contain a cattle skeleton, lying on its left side [Wiślański 1966: 183, Fig. 30:9]. In addition, close analogies are offered by graves in Kuczkowo, Aleksandrów Kujawski District, Site 1, Features A136 and C2 [Szmyt 2000: 175, 183, Fig. 11]. In them, single complete and articulated cattle skeletons were discovered that had been placed on their sides with contracted legs. In this set, one should also include Grave 1, Site 1, in Mierzanowice not far away from Sadowie [Gardawski, Miśkiewicz 1958: 327, Fig. 6]. In Grave 3 there, certain ritual traits merit attention, namely, the deposition of skulls belonging to other cattle. In the upper Vistula drainage basin, a similar example comes from Złota, Feature 24, in which, next to animal skeletons, a cattle skull and human bones were discovered [Krzak 1977: 40–42]. A similar situation was recorded in Feature 22, too [Krzak 1977: 38–39, Fig. 48].

In Sadowie Grave 4, incomplete bones originating with two cattle were recorded (one adult individual with massive bones had been placed on the pit bottom) topped by the bones of one pig. Presumably, the grave was disturbed, bringing about the loss of some bone remains or addition of others. Leaving aside the secondary opening of the grave, analogous ways of depositing animals are observable, for instance, in *Złota-Gajowizna*, Feature 24, where at least ten cattle were deposited: six adult individuals, three young ones and one calf. The cattle were laid in layers consistently with the pit direction and with their heads pointing in one direction [Krzak 1977: 40–42]. Among the bones, there were others of two sheep and two pigs. Some of these skeletons were not complete. A similar arrangement of animals was revealed in *Ostróg-Zeman* Site, Volhynia Upland [Pozikhovskiy, Samolyuk 2007: 313]. In this case, three cattle lay on their backs side by side in the pit together with one pig; the animals' heads pointed in the direction of human Grave 1. A similar arrangement was also observed in Features 2, 3 and 5 from Brześć Kujawski, referred to earlier [Wiślański 1966: 205, Fig. 42: 7–8, 10]. Grave 4 is special owing to the presence of stones over the remains of dead animals. The stones were either elements of a lining (pavement) or were to 'weigh down the animal material' [Krzak 1977: 61]. A similar practice was observed on the *Złota-Gajowizna* cemetery, in Features 7, 8, 16, 22, 24, 25, 29, 31 [Krzak 1977: 23, 24, 35, 38, 40–43, 49, 53–55].

The principal characteristic of Grave 7 was the deposition of two different parts of skeletons in the two opposite parts of the pit. Such an antipodal orientation of a pair of animals is very rare: apart from Sadowie, such orientations were documented only on the cemetery in *Złota-Gajowizna*, referred to earlier, as illustrated by collective multi-species Features 27, 29 and 31 [Krzak 1977: 44–55, Figs. 59, 63, 71]. Fragmentary animal burials, in contrast, are much more frequent. They are known from Kujawy GAC cemeteries, as for instance, Kolonia-Dębice, Site 1, Włocławek District, where the remains were weighed down with stone boulders [Jażdżewski 1936]. Similar paired burials were recorded in Brześć Kujawski, Site 4, where in Grave 4, one half of a cattle skeleton had been weighed down with a stone to the pit bottom [Wiślański 1966: 205, Fig. 42:6].

CEMETERY ORGANISATION IN SADOWIE, SITE 23. A COMPARISON

A special characteristic of the Sadowie cemetery is the grouping of graves into functional-chronological complexes. Most of the time, these are pairs of features of which one is a human grave and the other an animal deposit, containing on most occasions cattle remains. Such complexes are not frequent GAC finds in Europe. Of all the three GAC territorial groups, they are most often found within the Polish group in the Vistula drainage basin, whence we know of 75 features [Kołodziej 2011: 89]. A particularly large number is located on the Sandomierz Upland. Analogies to the Sadowie features can be encountered on other sites of the GAC Sandomierz-Opatów group. With respect to Graves 5–4–3, this is a cluster of Features 24–25–14 in *Złota*, comprised of a collective human burial (14) and two animal deposits located close to one another. One contained pig skeletons (25) while the other (24) was a collective multi-species deposit [Krzak 1977: 10, Fig. 2]. A certain similarity is also seen in a human stone-lined grave from *Ostrog-Zeman* Site, and a pit located nearby, holding the remains of three cattle and pig individuals [Pozikhovskiy, Samolyuk 2007: 310–313]. This type of features is also observed within the GAC western group. Good examples come from Zauschwitz, Ldkr. Leipzig, Saxony [Coblentz, Fritzsche 1962], Börnecke, Ldkr. Harz [Döhle, Pape 2006] and Stobra, Ldkr. Weimarer Land [Schirmer 1939], where next to human graves, double pits were exposed, holding animal deposits.

A slightly different complex is represented by Graves 7 and 8 with similar grave pairs being encountered in *Złota*: 32–33, 23–22, 9–8 and 17–16 [Krzak 1977: 10, Fig. 2]. Separate grave features located close to each other of which one holds human remains and the other animal ones are also known from Raciborowice-Kolonia, Site 2, near Chełmno [Polańska 2016: 20, Fig. 3]. A similar feature pair was recorded in Zdrojówka, Site 1 [Wiślański 1966: 155–156, Fig. 14:11]. In this

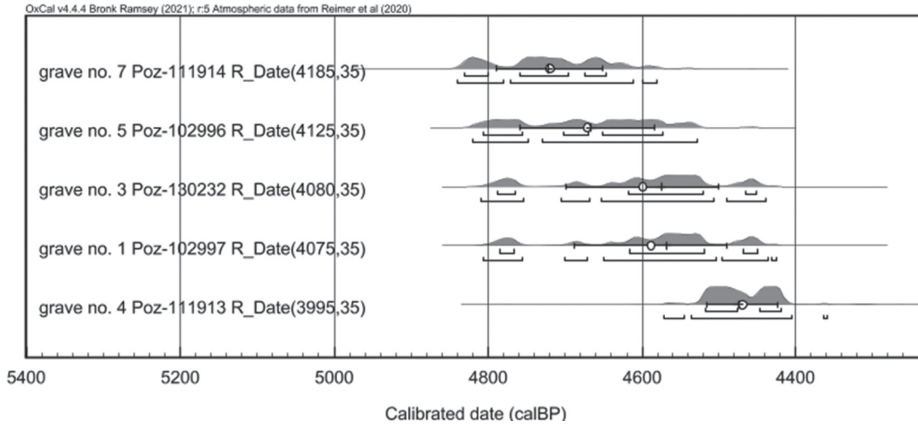


Fig. 16. Sadowie, site 23, Opatów district. Radiocarbon determinations for Graves 1, 5, 4, 3 and 7. Calibration in OxCal v4.4.2 [Bronk Ramsey 2020]

case, it was a joint human-animal burial in a stone cist accompanied nearby by two cattle skeletons placed symmetrically in a regular pit grave.

A dominating view in the relevant literature is that separate grave features located close to each other of which one contained human remains and the other animal ones were contemporaneous [Witkowska *et al.* 2020: 277]. Both were related to a single ceremonial-funerary act whereby animals were slaughtered and deposited as an offering next to a human grave. This interpretation was borne out, for instance, in the case of two features from Koszyce: Feature 543 (human collective grave with 24 radiocarbon determinations) [Włodarczak, Przybyła 2013: Table 5; Schroeder *et al.* 2019, Dataset 1] and Feature 506 (animal grave with one radiocarbon determination dating it) [Włodarczak, Przybyła 2013, Table 5]. The series of determinations indicates unambiguously a similar age of 2880–2776 BC (i.e. the time of skeleton deposition), coinciding well with the development of the GAC there. Furthermore, these age determinations agree well with the results of stylistic-typological analyses of grave inventories. Another complex for which absolute dates are available comprises graves from Zauschwitz, Ldkr. Leipzig, Saxony. The results of dating bones from a human grave (4185±30 BP and 4120±25 BP) and a cattle grave (4110±25 BP and 4190±25 BP) are consistent with similar age brackets and put the age of the complex at 2890–2570 BC [Bergemann 2018: 316–317, Abb. 182]. The synchronism of human graves and animal deposits was confirmed also in the case of the Gajowizna cemetery in Złota. Recently, ¹⁴C determinations have been published for six features from this cemetery. Interestingly, the datings for Features 6 and 3 are consistent, being 4090±40 BP and 4100±40 BP, respectively [Witkowska *et al.* 2020, Table 2], and pointing with a high probability to the first half of the 3rd millennium BC. For Features 28 and 31, the determinations are as follows: 4500±35 BP, 4500±35 BP,

4480±35 BP and 4180±40 BP. They are not synchronous because the first three dates, obtained from charred wood, after calibration, indicate the end of the 4th millennium BC. It has been determined that this age bracket does not correspond to the age of the grave and is caused by the so-called ‘old wood’ effect [Witkowska *et al.* 2020: 278].

For Sadowie Graves 5, 4 and 3, one radiocarbon determination each was obtained by dating bone samples taken from human and animal skeletons (Table 1; Fig. 16). The dates for Graves 3 and 5 are consistent and indicate with a high probability the same calendar age of 2853–2507 BC. Published earlier, a ¹⁴C date for Grave 4 is slightly younger and after calibration indicates the period of 2568–2470 BC [Pasterkiewicz 2020, Table 1]. This determination discrepancy may be caused by the complex GAC funerary ritual. The cist structure of graves allowed for multiple funerary rituals over a long period of time [Wiślański 1969: 304–305]. In this context, valuable data on the use of such graves was supplied by the study of a sepulchral feature from Kierzkowo, Żnin District, Pałuki. Twenty-eight dates for particular individuals indicated a considerable time spread, suggesting that the grave had been used for a very long time, for a period of 100–400 years, between 3180 and *c.* 2760 BC [Pospieszny 2017: 283]. A long period of use characterised also a ritual-funerary site from Kowal, Site 14, Włocławek District [Osipowicz *et al.* 2014].

This evidence supports the view that cist graves were used for a long time over several generations and that they served as family tombs. In the case of the Sadowie complex of Graves 5–4–3, spatial relationships and the absence of any stratigraphic relationships between the features suggest that they were built at short time intervals. If the dating results are considered credible, Graves 3 and 5 must be held to come from a single initial phase of the complex use. In Grave 4, in turn, the arrangement of bones indicates that secondary rituals were performed in it and bones of another animal were added subsequently. Possibly, the ¹⁴C date indicates one of the younger stages of the funerary cycle. To determine time relationships with any greater precision, it will be necessary to obtain more dates for each individual deposited in Graves 4 and 5.

For Sadowie Features 2 and 8, there are no radiocarbon determinations available due to a lack of suitable organic material. Judging by stratigraphic relationships, orientation and grave goods, it can be claimed, nonetheless, that they are contemporaneous with Graves 1 and 7.

REFERENCES

Balcer B.

1963 Osada kultury amfor kulistych na stanowisku 1 w Mierzanowicach, pow. Opatów. *Materiały Starożytne* 9: 99–142.

1983 *Wytwórczość narzędzi krzemiennych w neolicie ziem Polski*. Wrocław – Warszawa – Kraków – Gdańsk – Łódź.

Behrens H.

1964 *Die neolithisch-frühmetallzeitlichen Tierskelettfunde der Alten Welt*. Berlin.

Beier H.J.

1988 *Die Kugelamphoren-Kultur im Mittelelbe-Saale-Gebiet und in der Altmark*. Veröffentlichungen des Landesmuseums für Vorgeschichte in Halle 41. Berlin.

Bergemann S.

2018 *Zauschwitz (Lendkreis Leipzig): Siedlungen und Gräber eines neolithisches Fundplatzes*. Universitätsforschungen zur prähistorischen Archäologie 314. Human Development in Landscapes 13. Bonn.

Boroń T., Włodarczak P.

2019 Stanowisko 10 w Wilczycach: miejsce schyłkowoeneolitycznych praktyk funeralnych. In: P. Włodarczak (Ed.) *Wilczyce, stanowisko 10. Norma i precedens w rytuale pogrzebowym małopolskiej kultury ceramiki sznurowej*. Ocalone Dziedzictwo Archeologiczne 9, 9–16. Kraków – Niepołomice – Pętkowice.

Bronicki A.

2007 Box grave of the Globular Amphora Culture in Kolonia Depułtycze Nowe, site 12, Chełm Commune, Chełm district, Lublin voivodship/ Grób skrzynkowy kultury amfor kulistych w Kolonii Depułtycze Nowe, stanowisko 12, gm. Chełm, pow. Chełm, woj. Lublin. *Sprawozdania Archeologiczne* 59: 181–212.

2016 Obrządek pogrzebowy społeczności kultury amfor kulistych na Wyżynie Lubelskiej. In: P. Jarosz, J. Libera, P. Włodarczak (Eds) *Schylek neolitu na Wyżynie Lubelskiej*, 45–256. Kraków.

2019 Chronologia podgrupy wschodniolubelskiej kultury amfor kulistych w świetle oznaczeń radiowęglowych. In: M. Szmyt, P. Chachlikowski, J. Czebreszuk, M. Ignaczak, P. Makarowicz (Eds) *Vir Bimaris. Od kujawskiego matecznika do stepów nadczarnomorskich. Studia z dziejów pogranicza bałtycko-pontyjskiego ofiarowane Profesorowi Aleksandrowi Kośko*. Archaeologia Bimaris – Dyskusje 5, 201–228. Poznań.

- Bronk Ramsey C.
2020 OxCal v4.4.2. Oxford (www.rlaha.ox.ac.uk).
- Coblentz W., Fritzsche K.
1962 Doppelbestattung der Kugelamphorenkultur neben der rituellen Rinderbeisetzung von Zauschwitz. *Ausgrabungen und Funde* 7 (2): 77–82.
- Dowgiałło W. D.
1972 *Szczegółowa Mapa Geologiczna Polski 1: 50 000 (SMGP)*. Arkusz: Opatów (<http://metadane.pgi.gov.pl>).
- Döhle H.-J., Pape J.
2006 Ein Grabmal der Kugelamphorenkultur auf dem Jätchenberg. *Archäologie in Sachsen-Anhalt. Sonderband 4: Archäologie XXL. Archäologie an der B 6n im Landkreis Quedlinburg*, 83–89. Halle.
- Gabałówna L.
1958 Pochówki bydłęce kultury amfor kulistych ze stanowiska 4 w Brześciu Kujawskim w świetle podobnych znalezisk kultur środkowoeuropejskich. *Prace i Materiały Muzeum Archeologicznego i Etnograficznego w Łodzi* 3: 63–108.
- Gardawski A., Miśkiewicz J.
1958 Sprawozdanie z badań podjętych w 1957 roku w miejsc. Mierzanowice, pow. Opatów. *Wiadomości Archeologiczne* 25 (4): 322–337.
- Gołub S.
1996 Grave of the Globular Amphora Culture from site no. 1 in Łopiennik Dolny Kolonia (Prov. of Chełm, Poland). *Baltic-Pontic Studies* 4: 44–50.
- Gurba J., Matyaszewski M., Miliszkiewicz G.
1978 Puławy-Włostowice, woj. lubelskie, stanowisko 2. In: M. Konopka (Ed.) *Informator Archeologiczny. Badania rok 1977*: 139. Warszawa.
- Jażdżewski K.
1936 Neolityczne groby zwierzęce z Kujaw. *Z Otchłani wieków* 11 (3): 41–50.
- Juras A., Ehler E., Chyleński M., Pospieszny Ł., Spinek A., Malmström H., Krzewińska M., Szostek K., Pasterkiewicz W., Florek W., Wilk S., Mnich B., Kruk J., Szmyt M., Kozieł S., Götherström A., Jakobsson M., Dabert M.
2021 Maternal genetic origin of the Late and Final Neolithic human populations from present-day Poland. *American Journal of Physical Anthropology* 176: 223–236. DOI: <https://doi.org/10.1002/ajpa.24372>
- Kadrow S., Szmyt M.
1996 Absolute chronology of the eastern group of Globular Amphora Culture. *Baltic-Pontic Studies* 4: 103–111.

Kołodziej B.

- 2011 Pochówki zwierzęce w neolicie na terenie ziem Polski. *Materiały i Sprawozdania Rzeszowskiego Ośrodka Archeologicznego* 32: 55–106.

Kowalewska-Marszałek H.

- 2019 The Funnel Beaker and Globular Amphora Cultures in the Sandomierz Upland in the Light of Settlement Research. *Archaeologia Polona* 57: 119–134.

Krzak Z.

- 1961 *Materiały do znajomości kultury złockiej*. Wrocław – Warszawa – Kraków – Gdańsk.
- 1976 *The Złota Culture*. Wrocław – Warszawa – Kraków – Gdańsk.
- 1977 Cmentarzysko na „Gajowiznie” pod względem archeologicznym. In: J. Kowalczyk (Ed.) *Cmentarzysko kultury amfor kulistych w Złotej Sandomierskiej*, 9–82. Wrocław – Warszawa – Kraków – Gdańsk.

Machnik J.

- 1966 *Studia nad kulturą ceramiki sznurowej w Małopolsce*. Wrocław.

Mackiewicz M., Pasterkiewicz W., Myślecki B.

- 2016 Badania geomagnetyczne w obrębie późnoneolitycznego kompleksu sepulkralno-obrzędowego w Sadowiu. In: M. Furmanek, T. Herbich, M. Mackiewicz (Eds) *Metody geofizyczne w archeologii polskiej 2016*, 73–76. Wrocław.

Nosek S.

- 1951 Kultura amfor kulistych na Lubelszczyźnie. *Annales Universitatis Mariae Curie-Skłodowska. Sectio F* 5 (1954/1955): 55–158.
- 1967 *Kultura amfor kulistych w Polsce*. Wrocław – Warszawa – Kraków.

Osipowicz G., Bokiniec A., Kurzyk K., Makowiecki D., Bienias D., Górzyński T., Jankowski M., Jędrzychowska-Dańska K., Kępa M., Kozłowska A., Kozłowski T., Noryśkiewicz A. M., Płoszaj T., Pomianowska H., Reitsema L. J., Rumiński J. K., Stepańczak B., Szostek K., Weckwerth P., Witas H. W.

- 2014 Miejsce sepulkralno-obrzędowe KAK ze stanowiska 14 w Kowalu w świetle wyników analizy pozyskanych źródeł – podsumowanie. In: G. Osipowicz (Ed.) *Kowal 14. Miejsce sepulkralno-obrzędowe ludności kultury amfor kulistych*, 251–266. Toruń.

Pasterkiewicz W.

- 2017 Wyniki badań archeologicznych na cmentarzysku z późnego neolitu w Sadowiu koło Opatowa. *Materiały i Sprawozdania Rzeszowskiego Ośrodka Archeologicznego* 38: 281–289.

- 2020 The first radiocarbon dates for the Globular Amphora culture cemetery in Sadowie in the Sandomierz Upland. *Analecta Archaeologica Ressoviensia* 15: 53–75.
- Polańska M.
2016 Obiekt kultury amfor kulistych na stanowisku 2 w Raciborowicach-Kolonii, pow. chełmski. In: P. Jarosz, J. Libera, P. Włodarczak (Eds) *Schylek neolitu na Wyżynie Lubelskiej*, 17–32. Kraków.
- Pollex A.
1999 Comments on the interpretation of the so-called cattle burials of Neolithic Central Europe. *Antiquity* 73(281): 542–550.
- Pospieszny Ł.
2017 Datowanie absolutne ludzkich i zwierzęcych szczątków kostnych z grobowca megalitycznego w Kierzkowie. In: S. Nowaczyk, Ł. Pospieszny, I. Sobkowiak-Tabaka (Eds) *Megalityczny grobowiec kultury amfor kulistych z Kierzkowa na Pałukach. Milczący świadek kultu przodków z epoki kamienia*. Biskupińskie Prace Archeologiczne 12, 267–286. Biskupin.
- Pozikhovskiy O.L., Samolyuk V.O.
2007 Doslidzhennya gruntovogo mogilnika dobi eneolitu-rannoy bronzy v m. Ostrog. *Arkheologicheskiye doslidzhennya v Ukraine 2005–2007*, 310–313. Kyiv – Zaporizhzhya.
- Priebe H.
1938 *Die Westgruppe der Kugelamphoren*. Jahresschrift für die Vorgeschichte der sächsisch-thüringischen Länder 28. Halle.
- Przybyła M. M., Włodarczak P., Podsiadło M., Tunia K.
2013 Obiekty kultury amfor kulistych, In: M.M. Przybyła, A. Szczepanek, P. Włodarczak (Eds) *Koszyce, stanowisko 3. Przemoc i rytuał u schyłku neolitu*. Ocalone Dziedzictwo Archeologiczne 4, 11–64. Kraków-Pętkowice.
- Pyzik Z.
1959 Grób kultury amfor kulistych we wsi Ossolin, pow. Sandomierz. *Wiadomości Archeologiczne* 26(3–4) [1960]: 349–350.
- Romanek A.
1991 *Szczegółowa Mapa Geologiczna Polski 1: 50 000 (SMGP)*. Arkusz: *Ostrowiec Świętokrzyski* (<http://metadane.pgi.gov.pl>).
- Schirmer E.
1939 Der Große Hügel von Stobra. *Spatenforscher* 4: 17–35.

Shelomentsev-Terskiy S.V.

- 1996 Settlement of Globular Amphora Culture in Peresopnitsa, the Volhynia Region (Ukraine). *Baltic-Pontic Studies* 4: 70–78.

Schroeder H., Margaryan A., Szmyt M., Theulot B., Włodarczak P., Rasmussen S., Gopalakrishnan S., Szczepanek A., Konopka T., Jensen T.Z.T., Witkowska B., Wilk S., Przybyła M.M., Pospieszny Ł., Sjögren K.-G., Belka Z., Olsen J., Kristiansen K., Willerslev E., Frei K.M., Sikora M., Johannsen N.N., Allentoft M.E.

- 2019 Unraveling ancestry, kinship, and violence in a Late Neolithic mass grave. *Proceedings of the National Academy of Sciences of the United States of America* 116 (22): 10705–10710. DOI: <https://doi.org/10.1073/pnas.1820210116>

Sveshnikov I.

- 1983 *Kultura sharovidnykh amfor*. Arkheologiya SSSR. Svod arkheologicheskikh istochnikov I-27. Moskva.

Szczodrowski R.

- 2012 Spatial Aspects of Globular Amphora Culture Funeral Rites with Animal Deposits in Poland. In: A. Pluskowski (Ed.) *The Ritual Killing and Burial of Animals. European Perspectives*, 51–60. Oxford.

Szmyt M.

- 1996 *Spoleczności kultury amfor kulistych na Kujawach*. Poznań.
- 1999 Between West and East. People of the Globular Amphora Culture in Eastern Europe: 2950–2350 BC. *Baltic-Pontic Studies* 8: 1–349.
- 2000 Osadnictwo społeczności kultury amfor kulistych. In: A. Koško (Ed.) *Archeologiczne badania ratownicze wzdłuż trasy gazociągu tranzytowego. III. Kujawy. 4. Osadnictwo kultur późnoneolitycznych oraz interstadium epok neolitu i brązu: 3900 – 1400/1300 przed Chr.*, 135–329. Poznań.
- 2006 Dead Animals and Living Society, *Journal of Neolithic Archaeology* 8: 1–10 (www.jungsteinsite.de).
- 2014 Fourth-third millennium BC stone cist graves between the Carpathians and Crimea. An outline of issues. *Baltic-Pontic Studies* 19: 107–147.

Ścibior J., Kokowski A., Koman W.

- 1991 Zespoły grobowe kultury amfor kulistych z zachodniej części Wyżyny Wołyńskiej. *Sprawozdania Archeologiczne* 43: 79–108.

Ścibior J., Ścibior J. M.

- 1990 Sandomierz 78 – wielokulturowe stanowisko z przełomu neolitu i epoki brązu. Badania ratownicze w 1984 r. *Sprawozdania Archeologiczne* 42: 157–201.

Uzarowiczowa A.

- 1968 Grób kultury amfor kulistych na stanowisku I w Klementowicach, pow. Puławy. *Wiadomości Archeologiczne* 33 (2): 217–223.

Wiślański T.

- 1966 *Kultura amfor kulistych w Polsce północno-zachodniej*. Wrocław – Warszawa – Kraków.
- 1969 *Podstawy gospodarcze plemion neolitycznych w Polsce północno-zachodniej*. Wrocław.
- 1979 Kształtowanie się miejscowych kultur rolniczo-hodowlanych. Plemiona kultury pucharów lejkowatych. In: W. Hensel, T. Wiślański (Eds) *Prahistoria ziem polskich. II. Neolit*, 165–260. Wrocław – Warszawa – Kraków.

Witkowska B., Czebreszuk J., Gmińska-Nowak B., Goslar T., Szmyt M., 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. DOI: <https://doi.org/10.23858/SA/72.2020.2.0XX>

Włodarczak P.

- 2006 *Kultura ceramiki sznurowej na Wyżynie Małopolskiej*. Kraków.
- 2016a Chronologia absolutna cmentarzysk późno- i schyłkoweolitycznych na Wyżynie Lubelskiej. In: P. Jarosz, J. Libera, P. Włodarczak (Eds) *Schyłek neolitu na Wyżynie Lubelskiej*, 537–548. Kraków.
- 2016b Dwa rytuały, dwie społeczności, dwie epoki, dwa światy? Obrządek pogrzebowy w późnym- i schyłkowym neolicie na Wyżynie Lubelskiej. In: P. Jarosz, J. Libera, P. Włodarczak (Eds) *Schyłek neolitu na Wyżynie Lubelskiej*, 549–561. Kraków.
- 2019 Grób z Wilczyc na tle środkowoeuropejskich odmienności i reguła w obrzędzie pogrzebowym małopolskiej kultury ceramiki sznurowej. In: P. Włodarczak (Ed.) *Wilczyce, stanowisko 10. Norma i precedens w rytuale pogrzebowym małopolskiej kultury ceramiki sznurowej*. *Ocalone Dziedzictwo Archeologiczne* 9, 169–209. Kraków – Niepołomice – Pękowice.

Włodarczak P., Przybyła M. M.

- 2013 Groby z Koszyc na tle innych późno- i schyłkoweolitycznych znalezisk środkowoeuropejskich. In: M.M. Przybyła, A. Szczepanek, P. Włodarczak (Eds), *Koszycy, stanowisko 3. Przemoc i rytuał u schyłku neolitu*. *Ocalone Dziedzictwo Archeologiczne* 4, 209–255. Kraków – Pękowice.

Zabilska-Kunek M., Pasterkiewicz W.

in press Animal burials from Globular Amphora Culture cemetery in Sadowie (Site 23), South-Eastern Poland (in print).

Zakościelna A.

1989 Grób kultury amfor kulistych na stan. 7 w Lesie Stockim, gm. Końskowola, woj. lubelskie. *Lubelskie Materiały Archeologiczne* 3: 47–54.