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SOME REMARKS ON FLAT GRAVES OF THE SOUTHEASTERN GROUP OF THE FUNNEL BEAKER CULTURE

ABSTRACT

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Flat graves of the southeastern group of the Funnel Beaker Culture (FBC SE) are a phenomenon underrepresented in archaeological studies of the Eneolithic. Researchers' focus on "the megalithic idea" in recent decades left other forms of burial largely unexplored. In fact, it seems that even 70% of graves of the FBC SE could be described as part of the latter group. In this study, some comments on the location of flat graves within cemeteries, the construction and orientation of graves, as well some insights about the buried population will be provided. This research is based on a sample collected from previously published studies from most of the known geographical range of the FBC SE. As will be shown, the problem of flat graves is a complex one, which should be considered in the context of the entirety of FBC SE funerary practices.

Keywords: SE group of Funnel-Beaker Culture, Funnel Beaker Culture, cemeteries, funerary practises
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INTRODUCTION

This study focuses on graves of the southeastern group of the Funnel Beaker Culture (henceforth FBC SE), that have been found outside monumental tombs. So-called flat graves of the southeastern group of the FBC SE, despite quite large quantities of known

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examples, remain a poorly understood phenomenon. One possible reason for that is the fact that most of discussions on the funerary sphere of this cultural formation are focused on its monumental forms. Although there is no denying that the appearance of monumentalism is one of most distinctive traits of the Funnel-Beaker Culture, in terms of conceptualising funerary practices, flat graves are equally important, as they are present in all of its regional variations (for example, at sites such as Ostorf in NE Germany, Dragsholm in Denmark, and Sarnowo, site A1 in Kuyavia; Sjögren *et al.* 2015, 5; Król 2015, 108-109). This is especially true for the southeastern group of the FBC, where flat graves – both those spatially connected to chamberless tombs, and those set apart from them – are a complementary (or even major, in terms of the numbers of buried dead) element of funeral practice. For this reason, the aim of this work is to represent different aspects of these burials. The underlying question, therefore, is whether "monumental" vs. "non-monumental" is the only axis of diversification of FBC SE burials. Are there deeper differences in burial customs between the two groups, and how can we define them? To answer this, a more detailed question needs to be asked about flat graves found in the vicinity of monuments: do they represent the same, or a complementary funerary tradition to monumental barrows, or should they be considered separate flat cemeteries, "incidentally" set on the same site? For that purpose, the spatial context of the graves will be used as a major factor distinguishing them for further comparison.

This study focuses on the possibilities of classification of burial practices of the FBC SE as manifested in the archaeological record; there is no attempt to build a universal model of burial practices within the whole range of the FBC. The reason for the chosen focus is that the existing models for funeral practices in a regional scale are mostly either based on chamberless tombs (which are, in fact, more studies of monumentality than of the entirety of burial customs; *e.g.*, Król 2015; 2016), or they are case studies. In this context, two works of Marek Florek are worth noting; one specifically focuses on flat graves (Florek 2006a), while the second is a regional study of funeral rites of the FBC SE in the Sandomierz Upland (Florek 2008). These studies, however, do not exhaust the subject – which the present work, it is humbly hoped, will in some part fill in.

Data used in this study, suitable – in terms of quantity and quality – for wider analyses include constructions of graves, their location and orientation at the site, the state of preservation and number of individuals, their position, orientation (usually in relation to a grave), sex determination and estimation of age at death. In some graves, post-mortem manipulations have been registered, along with the use of fire and other traces of supposedly ritual activities. They are, however, not numerous enough for wider comparison. Though their presence is noted, for now they are considered variations in the more general categorisation. Grave goods have been found in a minority of graves and are usually limited to ceramic vessels or their parts and stone objects. Therefore, more elaborate methods of estimating relative wealth have not been used. Instead, the frequency of graves equipped with different categories of goods has been used for comparison between groups.

The terms "monumental tomb", "monumental barrow", "chamberless tomb" and similar labels will be used for large, stone, earthen or timber structures (or made of any combination of those materials) under which burials have been found, or into which have they been dug. Terms like "megalith" and "megalithic" will be avoided when possible, as will be any other material-specific equivalents of it (*e.g.* "megaxylon"). Graves that have not been part of these structures will be conventionally named "flat graves", while the term "flat cemetery" will be reserved only for groups of these graves, found on sites where no remains of chamberless tombs have been discovered.

For the analyses, plots, and map, open source software has been used, such as: QGIS, R, RStudio, and additional R packages (corrplot, ggplot2, plotly; cited as: R Core Team 2013; Wickham 2016; Wei and Simko 2017; QGIS Development Team 2019; RStudio Team 2019; Sievert 2020).

DATABASE

Examples chosen for this study come from well-known and published funeral sites of the FBC SE. The classification of a grave form, location, orientation, and position, as well as analyses of the anthropological characteristics of buried bodies were carried out based

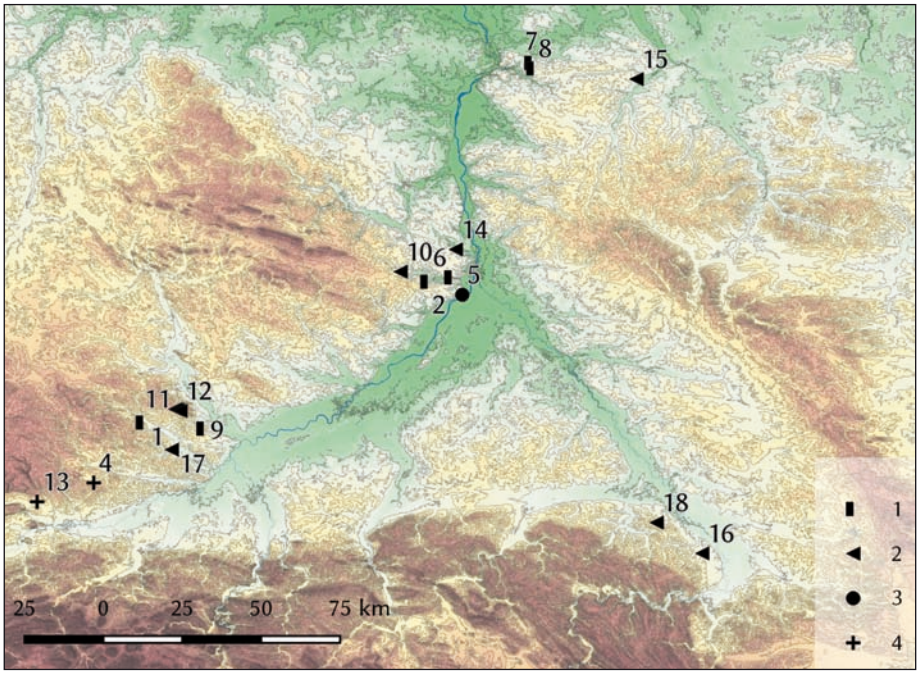

Fig 1. The area of interest with marked sites included in analyses. 1 – Flat cemeteries, 2 – Cemeteries with monumental tombs, 3 – Burials in settlements, 4 – unknown type of site. Numbering of sites as in Table 1

Table 1. Graves included in database. Burial zones as in Fig. 3

No.	Site	Monument = Zone 0	Zone 1	Zone 2	Zone 3	Zone 4	Flat cemetery = Zone 5	Settlement = Zone 6	Source
1	Bronocice 1	-	-	-	-	-	13	4	Milisauskas *et al.* 2016
2	Dacharzów 1	-	-	-	-	-	6	-	Florek 2006a; 2008
3	Gorzyczany 7	-	-	-	-	-	-	1	Florek 2006a; 2006b; 2008
4	Goszyce	-	-	-	-	-	3	-	Reyman 1936
5	Kamień Łukawski 1	-	-	-	-	-	-	1	Kempisty 1965; Florek 2006a
6	Kichary Nowe 2	-	-	-	-	-	6	-	Kowalewska-Marszałek *et al.* 2006
7	Klementowice XII	-	-	-	-	-	7	-	Uzarowiczowa 1966
8	Klementowice XIV	-	-	-	-	-	17	-	Uzarowiczowa 1970
9	Kolosy	-	-	-	-	-	2	-	Kempisty 1970; Włodarczak 2008
10	Malice Kościelne 1	18	7	8	-	-	-	-	Bargieł and Florek 2006a
11	Małżyce 30	4	-	-	-	-	-	-	Jarosz *et al.* 2009; Szczepanek 2009; Tunia and Włodarczak 2011;
12	Małżyce 31	1	-	-	-	-	-	-	Jarosz *et al.* 2013
13	Modlnica 5	-	-	-	-	-	-	1	Zastawny *et al.* 2011
14	Pawłów 3	10	-	8	-	11	-	-	Bargieł and Florek 2005; 2006b
15	Pilszczyn 9	10	-	-	-	-	-	1	Chmielewski 2015a
16	Skołoszów 7	7	-	21	-	3	-	-	Król *et al.* 2014a; Król *et al.* 2014b
17	Słonowice 5	7	-	12	6	-	-	-	Tunia 2006; Przybyła and Tunia 2013
18	Szczytna 6	1	-	-	-	7	-	-	Król *et al.* 2014b
19	Zagaje Stradowskie	1	-	-	-	-	-	-	Burchard 1998; 2006
Sum in zones		**59**	**7**	**49**	**6**	**21**	**54**	**8**	
Sum of flat graves		**59**	**145**						

on the authors' original descriptions and drawings in case studies and later, in published analyses. The main analytical database consists of 231 records representing human individuals buried in 204 graves, inside or outside of monumental structures (58 and 146, accordingly) from a total of 19 sites in SE Poland (Table 1, Fig. 1). Sites included in the data-

base should be considered a sample, not a complete list of sites including flat graves of the FBC SE. Many of the graves associated with this archaeological taxon remain unpublished or only partially published. This is the case of the well-recognised site 35 in Karmanowice (Nogaj 1987).

Data are grouped on the basis of observed clusters that are discovered inside supposed chamberless tombs, in aggregations outside of them, or in relative separation from any other graves. Of the graves in the database, about 185 could be described according to their construction, or at least by the presence or absence of stone elements in them. The age of the deceased could be approximated for 153 individuals, and sex could be estimated for 75. Information on the position and orientation of a body was available in 114 and 140 cases, respectively. The presence of grave goods had been confirmed in 72 cases.

Data concerning flat graves consists of 145 structures, with 161 burials within them. Of that number, 83 graves have been found along with monumental tombs, 54 in "flat" cemeteries, and 8 in settlement context.

In all analysed geographical areas, a majority of graves were found outside monumental tombs. They consist of about 71% in whole analysed sample. This number is more or less constant in the analysed regions. In western Lesser Poland, it is 75.9%, in Sandomierz Upland, 63.2%, in the Rzeszów Foothills, 79.4%, and in the Lublin area, 71.4% of graves consists of those not buried inside nor dug-in chamberless tombs. Unfortunately, the analysed data do not allow a more detailed comparison of regional differences. The reason for that is that most of the sites included in the database come from the first two of the aforementioned regions.

ABSOLUTE CHRONOLOGY

A precise chronology of flat graves of the FBC SE is, at this point, hard to establish. This type of burial seems to be in use throughout the duration of the southeastern group of the Funnel Beaker culture, with both the earliest and possibly the latest of dated graves (Fig. 2, Table 2). Although, the latter (*i.e.* Kichary Nowe 2) is the subject of discussion in terms of classification and dating (see Florek 2006a, 410; Włodarczak 2013, 375; Król 2015, 219). The earliest dated grave, no. XX from Bronocice, is a burial in an irregular pit. Three published dates from Słonowice come from graves supposedly aligned to chamberless tombs M VII and M VIII. The pits had a rectangular shape and no stone constructions, although traces of a wooden coffin have been found in grave 111. No burial goods have been found in any of the graves. In case of dated grave 1233 from Skołoszów, it was a rectangular pit set along the remains of a monumental tomb. A collared flask has been found in this grave. Two other dated flat graves, associated with classical phase of the FBC SE, are grave nos. 14 and 18 from Bronocice. The former is a burial in storage pit, while grave 18 was found in the vicinity of grave 19. These were probably part of cemetery, as both were burials in

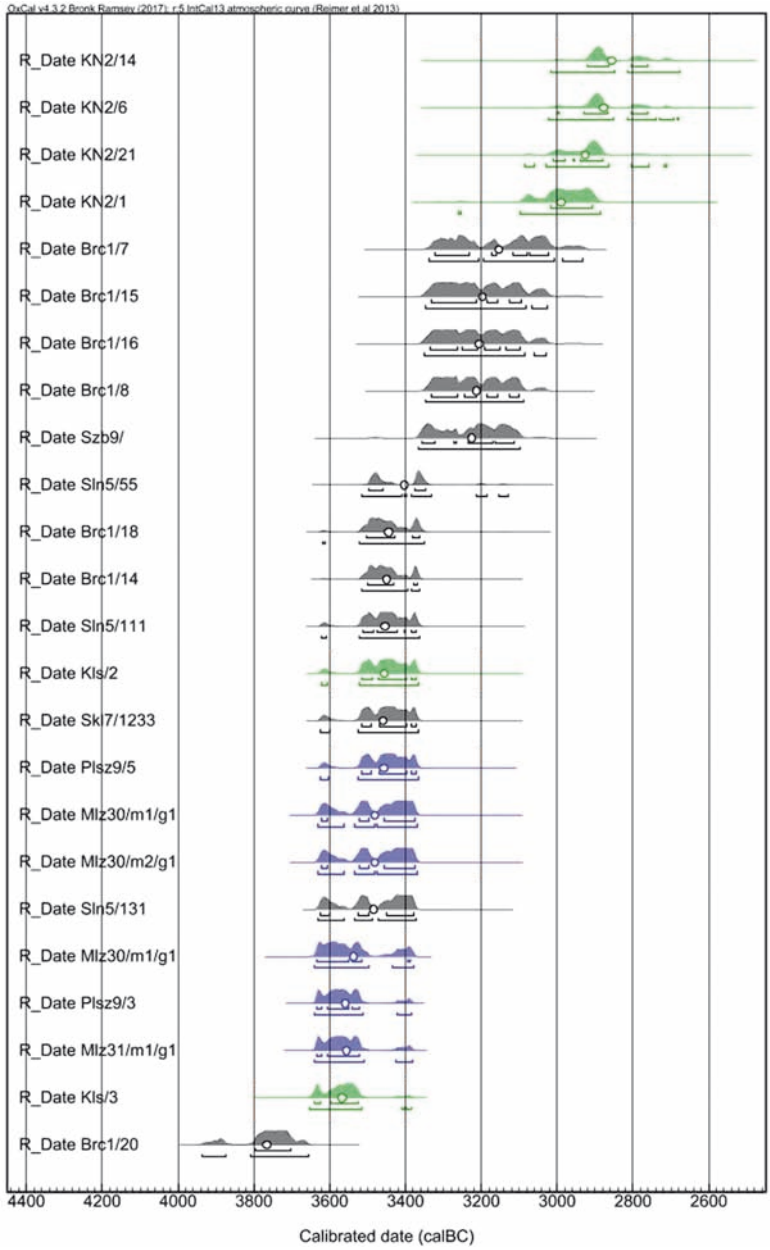

Fig. 2. Plot of radiocarbon dates from graves of the FBC SE. KN2 – Kichary Nowe, site 2, Brc1 – Bronocice, site 1, Szb9 – Szarbia, site 9, Sln5 – Słonowice, site 5, Kls – Kolosy, Sk7 – Skołoszów, site 7, Plsz9 – Pilszczyn, site 9, Mlz30 – Malżyce, site 30, Mlz31 – Malżyce, site 31; Grey – flat graves (from cemeteries and settlements), blue – graves from monumental tombs, green – graves from possible monumental tombs (see Table 2 for details and references)

Table 2. Details of radiocarbon-dated samples used in paper. Hbone – human bone

No.	Code	Site	Grave	Material	Lab code	BP	Std	13C‰ VPDB	Reference
1	KN2/14	Kichary Nowe 2	14	Hbone	Ki-6760	4260	50		Kowalewska-Marszałek *et al*. 2006, 348
2	KN2/6	Kichary Nowe 2	6	Hbone	Ki-6147	4270	50		Kowalewska-Marszałek *et al*. 2006, 348
3	KN2/21	Kichary Nowe 2	21	Hbone	Ki-6761	4295	50		Kowalewska-Marszałek *et al*. 2006, 348
4	KN2/1	Kichary Nowe 2	1	Hbone	Ki-6759	4350	50		Kowalewska-Marszałek *et al*. 2006, 348
5	Brc1/7	Bronocice 1	7		ICA-B/0422	4450	40		Milisauskas *et al*. 2016, 46-47, Tab. 1
6	Brc1/15	Bronocice 1	15	Hbone	ICA-B/0417	4480	40		Milisauskas *et al*. 2016, 46-47, Tab. 1
7	Brc1/16	Bronocice 1	16		ICA-B/0421	4490	40		Milisauskas *et al*. 2016, 46-47, Tab. 1
8	Brc1/8	Bronocice 1	8	Hbone	ICA-14B/0738	4490	30		Milisauskas *et al*. 2016, 46-47, Tab. 1
9	Szb9/	Szarbia 9		Hbone	Poz-34684	4530	40		Włodarczak 2013, 374
10	Sln5/55	Słonowice 5	55	?	Poz-53329	4605	35		Przybyła and Tunia, 2013, 157
11	Brc1/18	Bronocice 1	18	Hbone	ICA-15B/0614	4640	40		Milisauskas *et al*. 2016, 46-47, Tab. 1
12	Brc1/14	Bronocice 1	14	Hbone	ICA-14B/0737	4650	30		Milisauskas *et al*. 2016, 46-47, Tab. 1
13	Sln5/111	Słonowice 5	111	?	Poz-53330	4665	35		Przybyła and Tunia, 2013, 157
14	Kls/2	Kolosy	2	Hbone	Poz-9455	4670	35		Włodarczak 2008, 154
15	Skl7/1233	Skołoszów 7	1233	Hbone	Poz-82441	4675	35		Król 2018, 47, Tab. 2
16	Plsz9/5	Pilszczyn 9	5	Hbone	Ua-41756	4675	33	-19.7	Chmielewski 2015b, 220
17	Mlz30/m1/g1	Malżyce 30	m1/g1	*Quercus* sp.	Poz-34736	4700	40		Tunia and Włodarczak 2011, 210
18	Mlz30/m2/g1	Malżyce 30	m2/g1	Hbone	Poz-27989	4700	40		Jarosz *et al*. 2009, 209
19	Sln5/131	Słonowice 5	131	?	Poz-53331	4705	35		Przybyła and Tunia, 2013, 157
20	Mlz30/m1/g1	Malżyce 30	m1/g1	*Quercus* sp.	Poz-34682	4750	40		Tunia and Włodarczak 2011, 210
21	Plsz9/3	Pilszczyn 9	3	Hbone	Ua-41757	4763	32	-19.4	Chmielewski 2015b, 220
22	Mlz31/m1/g1	Malżyce 31	m1/g1	Hbone	Poz-48428	4765	35		Jarosz *et al*. 2013, 300
23	Kls/3	Kolosy	3	Hbone	Poz-9456	4790	40		Włodarczak 2008, 154
24	Brc1/20	Bronocice 1	20	Hbone	AA-90115	4978	40		Milisauskas *et al*. 2016, 46-47, Tab. 1

rectangular pits, with typical extended supine position. No grave goods have been found in any of them.

All dated burials in chamberless tombs are associated with the classical phase of the FBC SE. They consist of two graves from Pliszczyn, one from Malżyce, Site 30, mound 1 (two dates), one from mound 2 at the same site, and one from mound 1 in Malżyce, site 31. Except for grave 1 from mound 1 in Malżyce 30, all had some kind of stone construction. Pottery was discovered in two of them. From grave 1 in mound 1 at Malżyce 30, an "ansa lunata" cup was obtained, and in grave no. 3 at Pliszczyn, an amphora and a jug were found. Two graves from Kolosy, discovered by A. Kempisty (Kempisty 1970; Włodarczak 2008), were found under a circular mound of unknown chronology. Structures such as that are traditionally recognized as related to Corded Ware Culture in Lesser Poland. Since features associated with this taxon were also found at the site, and at least one of the FBC SE graves seem to be older than the embankment of the mound (grave no. 3, Włodarczak 2008, 153), in this study, the mound was therefore assumed as not related to FBC SE, and the graves are classified as a (part of?) flat cemetery. However, the case of barrow I from Malżyce, site 30, shows that a circular form of chamberless tomb could be also present in the FBC SE. The five remaining dates consist of 4 from Bronocice, and one from Szarbia. Only the latter and grave 8 from Bronocice had rectangular pits. The construction of grave 15 from Bronocice is uncertain, as according to excavators it was dug into an older storage pit (Milisauskas *et al.* 2016, 79). The positions of the bodies, suggest that they were carefully laid, although child was found in a flexed position on its right side. These 5 graves yielded dates more likely connected with the Funnel Beaker-Baden horizon. The younger dating comes, as mentioned above, from Kichary Nowe, site 2. In this study, it is classified as a flat cemetery. However, stratigraphic observation during excavation (Kowalewska-Marszałek *et al.* 2006, 342-344) suggests that the graves may be part of some kind of larger construction. In this case the embarkment does not seem to damage the graves, as has been observed in Kolosy. Moreover, some graves seem to be secondarily dug into the fill of it. This suggests that some monumental structure might be present there.

CLUSTERS AND BURIAL ZONES

In the analysed sample of flat graves, 19 were described as single graves and 12 as pairs, along with 2 groups of 3, and 2 of 4 graves, 3 clusters of 5 graves, and two clusters of 6 graves. Groupings of 7, 8, 13 and 15 graves have been found only once each. For comparison, among the chamberless tombs, the maximal size of the clusters was 7 graves, but a tendency toward smaller groups is also visible. The predominantly small sizes of these clusters generally do not allow for detailed comparison between them. Because of this, groups of graves have been assigned to larger burial zones. Graves found in the supposed outline of chamberless graves have been assigned as zone 0, regardless if considered primary or

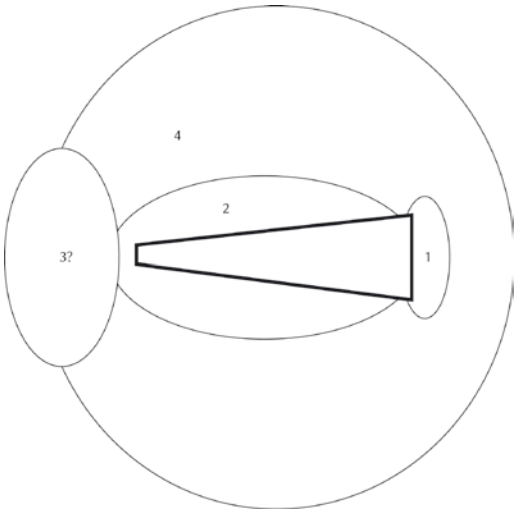

Fig. 3. Schematic zones of occurrence of flat graves at cemeteries with monumental barrows. 0 – graves inside the outline of a monumental tomb. 1 – in front of the forehead of a barrow, 2 – along a barrow, 3 – behind the tail of a barrow, 4 – beyond the barrow area

secondary graves in structure. The area surrounding the monumental constructions was divided based on the observed spread of graves in relation to their orientation and geometry (Fig. 3). Zone 1 includes space near the supposed forehead of the construction, while zone 2 refers to its sides (usually Southern and Northern), and zone 3 to the area "behind", on the western side of it. Zone 4 aggregates the remaining burials that are found in the same complex as monumental barrows, and have no visible spatial relation to them. Additionally, zones 5 and 6 have been defined for consistency of description, including flat cemeteries (complexes without known remains of chamberless tombs) and graves inside or in the vicinity of settlements, which could not be defined as cemeteries.

In burial zone 1, that is, in the area to the east of a forehead or near the entrance to a monumental barrow, 7 flat graves have been found in Malice Kościelne. Only at this site have graves been located in this position. They clustered in front of the entrances to chamberless tombs I and II. All but one of them have some kind of stone construction element. In three cases, this consisted of a stone frame and paving at the bottom of the grave (nos. 5, 7, 8). In another two, layers of stone covering them has been documented (nos. 4 and 6). There is an interesting observation that sandstone was use for the construction of these graves, not the limestone used for the other graves on the sites and walls of monumental barrows (Bargieł and Florek 2006a, 377). Another grave was a rectangular pit with only covered by stone pavement (no. 9), while none of these stone elements were discovered in last one (no. 19). Graves were mostly oriented on a NNW-SSE axis, more or less perpendicularly to the tombs themselves. Only graves 8 and 9 were aligned to a WSW-ENE axis.

Interestingly, there are only singular burials of children in this cluster. Grave 5 was a double burial of a *Maturus* female and a child (*Infans I*).

Burial zone 2 are areas along a barrow. Altogether, there were 49 graves in zone 2 areas: 8 in Malice Kościelne (nos. 12/3, 12/4, 12/5, 12/6, 12/7, 12/12, 12/14, 12/15), 8 in Pawłów (nos. 8, 18, 32, 33, 34, 37, 40, 41), 21 in Skołoszów (nos. 538, 638, 639, 640, 641, 1220-1228, 1231, 1233, 1234, 1240, 1251, 1265, 1272, 1273, 1278, 1280), and 12 in Słonowice (nos. 55, 101, 105, 111, 114-117, 119, 120, 123 and 131). In Malice Kościelne, all of the graves from this area have been paved with stones and aligned to the monumental barrow (WSW-ENE axis). They seem to make up one cluster along the wall (and probably with graves on the opposite side of the tomb outline). In all graves, a single body was laid in an extended supine position with the head towards the WSW. Out of 8 graves, 5 were children in the *Infans I* age-class, 2 were adults (probably females), and in one case, age and sex determination is lacking. Graves buried along a wall inside a tomb bear stark similarities to those described above. All 7 of them keep the same alignment to the WSW-ENE axis, and all have bottoms paved with stones. There are also mostly children buried in them – 3 described as *Infans I* and 1 as *Infans II*. Of the three remaining graves, one was an *Adultus* female, one was a *Maturus* of undetermined sex, and one was an adult without more a precise description of age or sex. Graves in zone 2 from Pawłów were set on the northern and southern sides of barrow 2. The southern group consisted of 4 graves (nos. 8, 9, 11 and 18). Some more detailed information is available only for graves 8 and 18. Grave 8 was constructed with a stone frame, filled with stones and covered by yet another layer of stones. It was oriented on a N-S axis. Inside, the remains of an individual in the *Infans I* age-class was found, but the position and orientation of the body could not be determined. Grave 18 had a paved bottom and was covered with stones . It was oriented along a W-E axis and consisted of a burial of a *Maturus* male individual, laid in an extended position on his back, with his head toward the west. The second group of graves, found on the northern side of the barrow, had characteristics similar to the graves from zone 2 in Malice Kościelne. Three of them were grouped together (nos. 32, 33 and 34), about 10 meters west of the eastern end of the chamberless tomb, along its northern wall. The remaining three were also buried along the wall, with some distance between them, in the western part of the "tail" of this barrow (nos. 37, 40, 41). Of these 6 graves, all were aligned along a W-E axis. Four of them were rectangular pits without stone constructions, and two had paved bottoms (nos. 32 and 33). In the latter graves, two children (both *Infans I*) were buried, with their heads toward the western side of pits. In grave 34, a *Maturus* female was buried in an extended supine position, but in the opposite direction – with her head to the east (and towards the children). Data on the individuals from the 3 remaining graves is unavailable. Graves from the northern group are in some ways similar to those from zone 2 from Malice Kościelne: all are set along the monumental barrow, with a rather simple grave construction. Also, there are singular graves of children, and none of the sexed adult graves included a male. A cluster of graves found on the southern side of the mound, however, bears

closer resemblance to the graves from zone 1 in Malice Kościelne, or to the graves from chamberless tombs at Pawłów. Especially puzzling is the rite of filling a burial pit with stones, which, aside from grave no. 8, is found exclusively in the supposedly "central graves" of monumental barrows. Also, the nonlinear layout of all four graves in this cluster is not consistent with the "northern graves" of the barrow or the graves from zone 2 in Malice Kościelne. This pattern seems to be visible also in Słonowice. Graves registered in zone 2 make up 2 clusters, consisting of 7 (nos. 111, 114-117, 119, 120) and 2 graves (nos. 123, 131). There are also 3 relatively separated graves (nos. 55, 101, 105). Data on grave construction are available for only 3 graves (nos. 111, 114 and 115). All three are rectangular pits, and in grave 111, traces of a wooden coffin have also been found. All graves in this area were oriented along a W-E axis (with a deviation toward NW-SE in the case of grave no. 105). In graves nos. 111, 114 and 115, the body was laid in an extended position, with the head toward the west (in the case of graves 111 and 114) or the east (in the case of grave 115). The first cluster consisted of the burials of 6 children (*Infans I*) and one *Maturus*, probably female individual (grave 111). In the second cluster, a child and an *Adultus* female were buried). In grave 55, the remains of a probable female of the *Maturus*/*Senilis* age-class were found, while grave 105 included an *Adultus*/*Maturus* female, and grave 101, an *Adultus* female. In Skołoszów, there are 21 burials in the areas along the sides of the chamberless tomb. They formed 2 clusters, consisting of 15 (nos. 538, 1220-1228, 1231, 1233, 1234, 1240, 1251, 1265, 1272, 1273) and 6 graves (nos. 638-641, 1278, 1280). All of them were rectangular pits, generally oriented along a W-E axis (with deviations both toward NW-SE and SW-NE). Grave 1280 was oriented closer to a NNE-SSW axis. Only in grave 1233 could the orientation of the body itself be determined. It was consistent with the WNW-ESE orientation of the grave pit. In this grave, the remains of a *Maturus* individual were found. A determination of age-at-death was also possible for grave 1240, where the remains of an *Adultus* individual were found.

The relationship to monuments is less certain in the case of graves set in burial zones 3 and 4. The former is set "behind" the tails of barrows. This spatial arrangement may be adjusted to (thus, later than) mounds, but graves in the area do not keep closely to axes of monumental constructions, nor form specific clusters aligned to them. Graves have been found in this location only in Słonowice. There, 6 graves were found in such a location; four of them are clustered in two pairs, with the other two graves placed separately. All of them consisted of a nearly rectangular pit, and two were oriented on a W-E axis (graves nos. 130 and 143), two on a N-S axis (nos. 142, 149) and two on a NNE-SSW axis (nos. 125, 126). Information on the position and orientation of the body is only available for two of them, both laid in an extended supine position – one with the head toward the west (no. 130) and the other toward the north (no. 125). No data on age-at-death or sex are available. Due to the small number of graves, they will be analysed together with graves from zone 4.

Burial zone 4 includes the rest of the graves that do not correspond with any observable remains of chamberless tombs, but occur together in the same site. In zone 4, 21graves

have been counted. They consist of 11 graves from Pawłów, site 3, 7 from Szczytna 6 and 3 from Skołoszów 7. At Pawłów, site 3, graves have been clustered in one group of 5 (graves nos. 28, 29, 30, 31 and 39) and one of 4 (nos. 43, 44, 45, 46). Also, two separate graves (nos. 27 and 42) have been found. In Szczytna, graves formed two pairs (nos. 376 and 377, 367 and 378) with 3 separated from the others (nos. 95, 351, 354). At the cemetery of Skołoszów, two graves were found near each other (no. 1223 and 1241), and one was located separately (no. 1250). There are differences between the construction of graves in Pawłów and cemeteries from the Rzeszów Foothills. Almost all graves from zone 4 in Pawłów have some stone elements of construction, with the exception of graves 44 and 28. Graves 29 and 30 have bottoms paved with limestone and stone frames supporting the walls. The group of burials 44, 45, 46 and 43 is the only aggregation with a dominant N-S axis in Pawłów 3. This is even more interesting, since 3 of 4 graves in this concentration are collective burials, and some of them are characterised by unusual arrangements of the bodies. Graves in the other cluster in zone 4 from this site are uniformly oriented on a WSW-ENE axis, along with grave 42. Grave 27 seems to be set closer to an actual W-E axis. What is interesting is that the graves without any stone constructions have been found in each of the two concentrations, one per cluster. The orientation of grave no. 28 is consistent with other graves in its cluster; it is aligned to a N-S axis, the same way the 2 other graves in this cluster are. Graves in zone 4 from Szczytna and Skołoszów have the form of rectangular pits. In the cases of both sites, alignment to a W-E axis is dominant, with some graves deviating towards a SW-NE axis. Skeletal remains were not preserved in any of the graves from these sites, so a comparison of even the positions and orientations of buried bodies is impossible.

Burials in cemeteries without chamberless graves – *i.e.* burial zone 5 – have been found in Bronocice, site 1 (13 graves), Dacharzów, site 1 (6 graves), Klementowice XII (7 graves), and Klementowice IV (17 graves). Additionally, 6 graves from Kichary Nowe, site 2, 2 from Kolosy, and 3 graves from Goszyce have been included in analysis. In case of Bronocice and Dacharzów, the presence or absence of a monumental structure is a matter of discussion. In Kichary Nowe, 5 graves were found in a depression of elongated shape and oriented on a WSW-ENE axis. However, no other visible traces of monumental construction the construction have been found. In vicinity of this structure, graves of the Corded-Ware Culture and Mierzanowice Culture have been located in a pattern similar to cases in which a monumental barrow is present. The graves associated with the FBC SE were not damaged by the depression, and some of seem to have been set after it was filled (Kowalewska-Marszałek *et al.* 2006). Graves at the site in Kolosy were found under a round mound of unknown chronology. In this case, however, the embankment damaged at least one of the graves. Graves from Bronocice, due to their uncertain stratigraphic position and the unclear spatial relation of at least some of the graves in region C, have been divided between two groups – a flat cemetery and graves inside the settlement – due to their overlapping ranges. According to the excavators, the settlement from phases BR II and III did not occupy region C,

where the majority of graves were found. Since only classic FBC SE graves are included in this study, all graves should be classified as belonging to (probably) one cemetery. This is not the case, however, since some of the graves dated to this stage were burials in storage pits. These have been uniformly classified as burials in the settlement. Similarly, a burial in a storage pit from Pilszczyn have been classified, despite the fact, that it was found about halfway between the place where a settlement supposedly was (or, at least, where other features related to the settlement concentrate), and a funerary complex. At Dacharzów, site 1, 5 graves were clustered together, and one was set separately. In the first group, 3 were constructed with paved bottoms, a stone wall construction and a stone covering (graves nos. 2, 3 and 4), one consisted only of stone walls (no. 6), and one had only a stone pavement covering a rectangular pit (no. 7). Grave 5 was constructed in the same way as grave nos. 2, 3 and 4. Grave nos. 2, 3, 6 and 5 were aligned to a WNW-ESE axis, while graves 4 and 7 to a W-E axis. Graves 4 and 7 consisted of two burials, while in each of the remaining 4 burials only one body was found. Information on the position and orientation of the bodies is available for graves 2, 3 and 5, and for one of the bodies in grave 4. In every case the dead was lying in an extended supine position with the head toward the WSW or W (in accordance with the orientation of the grave). In grave 2, an *Adultus* female was buried, in grave 3 a *Maturus* male, in 5 gave an *Adultus* male, and in grave 6 an *Adultus* female. Both double burials consisted of one *Iuvenis* of unknown sex and one *Infans I*. It is interesting that the double burials are constructed on a slightly different angle (on a W-E axis) than the single graves. In Klementowice XII, 6 out of 7 graves were grouped together, and one (grave no. 7) was set separately. All of the graves had some stone elements of construction: graves 1, 4, and 6 had a stone covering, and in graves 2, 3, 5, and 7 the bottom was also paved. Two graves were oriented along a N-S axis (nos. 2 and 3), two along a W-E axis (nos. 6, 5), one on a NW-SE axis and one on a WSW-ENE axis (graves 4 and 7, respectively). The orientation of grave 1 is unknown. Only in grave no. 4 were two bodies buried, while all others are single burials. The position of the body was determined for grave nos. 2, 4, 5, 6 and 7, and with the exception of individual 2 in grave 4, all of them lay in an extended, supine position. Individual 2 from grave 4 was also extended, but slightly moved to the right side. All bodies were oriented along with the grave pits, but with different directions. In grave no. 2, the head was directed to the north, while in grave 3 toward the south. In graves 5 and 6, both bodies were directed with their heads to the west, and in grave 7 toward the WSW. In grave 4, one of the bodies lay with its head toward the SE, while the second was towards the NW (ind. 2). No data on age or sex is available for this site. In Klementowice XIV, 17 graves were excavated and classified into 3 aggregations. The first consisted of 13 graves, and the other 2 numbered 2 graves each. The most numerous cluster contained grave nos. 1, and 4-15. All of them consisted of some kind of stone construction, except for grave 7, on which no data is available. In grave nos. 6, 10, 11, 12, and 15 only a stone covering was documented, while in graves 4 and 5 there were additionally stone frames supporting the walls. In grave 14, the bottom was also paved, forming

a cist-like construction. In other graves from this group, the character of stone construction was undefined. In the second cluster, grave 2 consisted of a paved bottom and was covered with a layer of stones, while grave no. 16 had only a stone frame and covering, like graves 4 and 5. The third group was comprised of grave number 3 and "pit 1" (different than grave 1). Stone elements of grave 3 are undefined. "Pit 1" was rectangular in shape, without any stone elements. The orientation of graves varied in the first cluster, with 4 graves oriented along a N-S axis (nos. 7, 8, 14, 15), 4 along a W-E axis (nos. 4, 6, 11, 12), 3 on a WNW-ESE axis (nos. 1, 5, 10), and one on a NW-SE axis (no. 4). Orientation of grave 13 is unknown. In the remaining clusters, all graves were oriented on a W-E axis. Graves 7 and 14 consisted of the remains of 3 individuals each, while graves nos. 2 and 9 were double burials, and all other graves were singular. In "pit 1", only the skull of a *Maturus* male individual was buried, and in grave 14, along with two individuals, the teeth of a third were found. Bodies were almost uniformly laid in an extended, supine position, when the position could be determined. The only exception was grave 10, in which an *Infans II* individual lay in a flexed position on their left side). In Kichary Nowe, 5 graves were found inside of the depression, and one (no. 25) outside of it. All graves had stone constructions, and all – except the partially destroyed grave no. 5 – they could be classified as cist-like graves. Graves 1 and 14 were covered by stone pavements separately, and additionally covered by yet another layer of stones together. All graves were oriented on a WSW-ENE axis, and buried bodies were laid in an extended, supine position with their heads directed toward the WSW. In Grave no. 5, the arrangement of the body could not be determined. All graves were single burials. One child was found (*Infans I*, in grave no. 6), and one individual was described as *Adultus* (grave no. 5). In grave no. 14, a *Maturus* female was found, while grave no. 1 contained a *Maturus* male, and grave no. 21, an individual of age *Maturus* who was also probably male. The individual from grave 25 was classified as an adult, without sex specification.

Graves found in settlements that were included in the analyses consisted of 8 burials. Among these, there are 4 graves from Bronocice (graves VII, XIV, XVI and XX) and one burial from each of following sites: Gorzyczany, site 1; Kamień Łukawski, site 1, Modlnica, site 5, and Pliszczyn, site 9. In grave VII from Bronocice, a skeleton was found at a depth of 30-50 cm, in the NW part of a pit. A *Maturus* female lay on her abdomen with slightly flexed legs and her hand under her body (Milisauskas *et al.* 2016, 75-76, fig. 24-25). In grave XVI, an *Infans I* individual lay near the southern part, on the bottom. The body lay in an extended position on its left side, with its head unnaturally twisted toward its back. In grave XIV, a body was found lying on the bottom of a storage pit in extended, supine position with its head directed toward the south. In grave XX, the body of an adult female was found in the western part of an irregular pit, near to the bottom of it. The body was twisted toward its left side, with a hand extended toward the western wall of the pit. Marek Florek (2006b) interprets the pit in Gorzyczany as a trapezoidal storage pit, although only the lower parts of it have been preserved. The body of a child was found at the bottom of

the pit, along with waste. The grave in Kamień Łukawski, described by E. Kempisty, was a burial of (probably) a girl that died at age 7-9 years old. The body was found in an ellipsoidal pit, between 64 and 92 cm from the surface (an outline of the pit was spotted at a depth of about 60 cm; Kempisty 1965, 159). The body lay on a NE-SW axis, with the head directed toward the SW. The body was sloping towards the NE, with the legs lying deeper than the head. Above the head, a large, flat stone was found. Near the bones of the right hand was a bone awl. It is impossible to establish whether it was placed there as a grave good, or was just included in the fill of the pit. In Modlnica, site 5, a rectangular pit was found in the vicinity of the remains of a settlement. Unfortunately, no bones were preserved. The grave goods consisted of numerous pottery fragments, including large parts of a pot, an amphora, and other forms. These forms (except the amphora) and a quantity of pottery fragments stand out from other graves of the FBC SE. Fragments of at least 3 spindle whorls were also found (Zastawny *et al.* 2011, 240-242). In Pliszczyn 9, the body of a child was found near the bottom of a pit, although the publication lacks a detailed description of the feature (Chmielewski 2015a, 161, pl. 21).

CONSTRUCTION OF GRAVES

Grave constructions in the analysed sample vary. Some consist of stone elements such as layers of stone at the bottom of a pit, walls, and covering, while some present themselves as just rectangular or nearly rectangular pits, without stone elements. In some graves, timber elements have been found. In grave nos. 104 and 135 from Słonowice, wooden elements were arranged as supports or as the floor of grave pit. In grave no. 111 from the same site, the probable remains of a coffin were discovered (Przybyła and Tunia 2013, 154). In some others, the presence of such elements is also suspected (*e.g.* grave no. 25 from Kichary Nowe, site 2; Kowalewska-Marszałek *et al.* 2006). Although it is suspected that wooden elements were used more often, at this point it is impossible to estimate the frequency of these constructions.

Graves with stone constructions have been divided into more specific groups according to the type of stone construction. The classification concerned the presence of pavements on the bottoms of pits, stone walls or frames (usually erected with large, flat blocks of limestone – or sandstone, in the case of some graves at Malice Kościelne). Lids and pavements covering the graves are often damaged or disturbed due to external activity, or decomposition of supposed wooden constructions of the graves (*e.g.* Włodarczak 2008, 153). Because of that, and the differences in descriptions, differentiation between lids and pavements covering a grave is nearly impossible. Therefore, in following analyse and in figures a term coating will be used for all kind of coverings of the graves, and for distinction for pavements set below the level of skeleton. Those elements appeared separately or in combinations in graves (Fig. 4: A:a-f, Table 3). In this no-stone – all-stone spectrum, on the

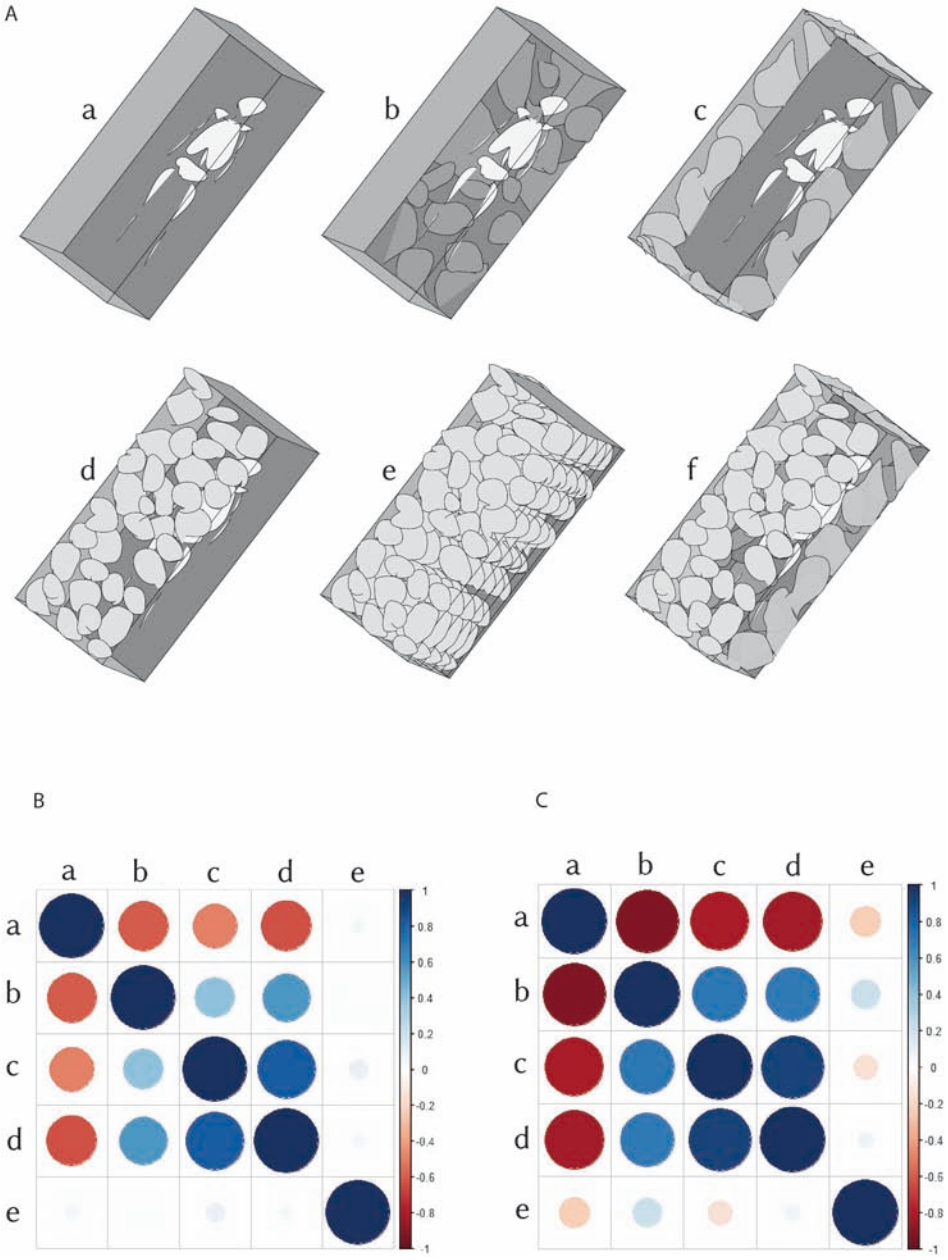

Fig. 4. A: Elemental types of grave constructions in FBC SE graves and correlation matrices of their co-occurrence at sites (B) and in burial zones (C). A: a – pit without stone constructions, b – stone pavement on bottom, c – frame of stone walls, d – stone coating, e – stone fill of the grave, f – combination of b, c and d. Size of circle in matrices B and C represents the strength of correlation, while colour represents its direction: blue for positive and red for negative. Reference text for details

Table 3. Number of graves of each type in burial zones included in analyses; types of graves as in Fig. 4A and text; description of burial zones in text

Burial zone	a	b	c	d	e
0	17	19	9	16	6
1	1	3	5	5	0
2	28	2	1	11	1
3 and 4	18	0	2	2	0
5	14	27	14	15	0
6	8	0	0	0	0

one end there are graves from Bronocice, Słonowice or Skołoszów, among which either no graves, or only a very few graves, have stone constructions. On the other end, there are funerary constructions from Pawłów, Malżyce or Kichary Nowe, with apparently prepared stone bottoms, walls and coatings, and some constructions are even filled with stones. The differences in structures of graves in sites and in aggregations should be discussed further. Particular elements of stone construction are coded as 1 when present, and 0 when absent, in the respective columns of the table. Note, that in case of construction type a in Fig. 4: A:a (*i.e.* pit graves without stone elements), it is mutually exclusive with other types, which are sometimes combined together (*e.g.* Fig. 4: A:f). To limit the effect of overrepresentation of graves with stone elements, they have been weighted in relation to graves with no stone structures, and all data have been normalised to 1 before further calculations. Correlations represented in Fig. 4: B and 4: C show a somewhat similar pattern, although comparison between burial zones is characterised by stronger negative correlations between simple pit-graves and those with stone elements, than in comparison between sites. At the same time a stronger positive correlation between the occurrence of various types of stone elements can be seen between burial zones than between sites. This may suggest a higher consistency between these groups. The number of graves filled with stones (Fig. 4: A:e) shows little correlation with other groups. This is outcome is expected, as graves of this type are generally rare. It is probably worth noting that this stone element of construction has been noted only in graves found in monumental tombs. The only exception is grave no. 8 from Pawłów.

Pit graves are often close to rectangular in shape and section. These include grave no. 19 in Malice Kościelne, 28 and 44 in Pawłów, 24 graves from Skołoszów, grave no. 769 in Modlnica, 7 graves from Szczytna, 9 graves from Słonowice (including one with traces of a wooden coffin), and 12 graves from Bronocice. They seem to be found rather in distinctive geographical areas than in specific settings. In Szczytna and Skołoszów, and also in Słonowice, graves in pits have been found in all burial zones. In the flat cemetery in Bronocice, only pit burials have been found. Pits in settlements in which burials have been found, with the exception of some found in regular rectangular pits, were not different from others

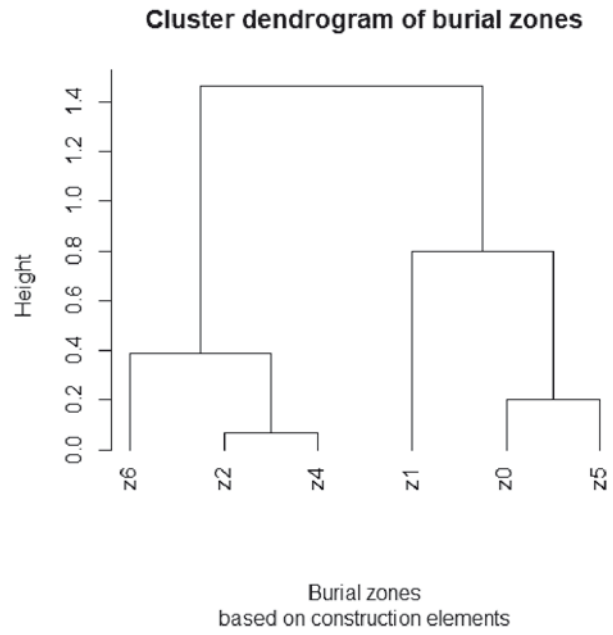

Fig. 5. Dendrogram of burial zones, based on types of grave construction. Zones numbered according to text; zones 3 and 4 counted together as "z4"

used for economic purposes. In general, burials in rectangular pits without any stone constructions are more often found in certain regions, namely the western part of Little Poland, and the Rzeszów foothills. The reason for that is unknown; however, M. Florek suggested that a lack of the needed material in these areas explained this fact (Florek 2006a, 413).

Based on the frequency of different types of graves a hierarchical clustering analysis has been performed in order to reveal the most similar zones (Euclidean distance and Ward's clustering method have been used in hclust function of 'stats' package of R; Fig. 5). Interestingly, graves from flat cemeteries and monumental tombs seem to be grouped close together, along with the less-related group of graves from zone 1. Graves located in the remaining parts of funerary complexes were clustered together, along with more distant relation to graves from settlements. As clearly shown in Fig. 4: A and 4Ba, the main line of division was the relative frequency of graves without stone elements. Therefore, this result has limited interpretative importance, especially when we consider the aforementioned regional patterns in the usage of stone in the construction of graves. Nonetheless, the observation that the constructions of graves do not necessarily follow the distinction between monumental tombs and flat graves is an informative one. Even more importantly, differences seen between flat graves from different contexts should be examined more closely.

ORIENTATION OF GRAVES

The orientations of grave axes according to the cardinal directions were determined on the basis of available published descriptions and plans. As most of the graves have been described rather generally, the results also need to be considered in the same way. In this study, graves were subdivided by directional axes, more for pointing out deviations from general rules observed on the site, than for giving exact descriptions of grave orientations (Fig. 6). As far as the collected data are reliable in this aspect, flat graves seem to follow similar preferences for a W-E axis (with deviations) over a N-S axis, versus the pattern observed in graves from "chamberless" tombs. NE-SW and NW-SE directions were usually avoided. The differences are mostly seen in zones 1 and 3, with 71.4% and 66.6% of graves aligned to a N-S axis (or with slight deviations), respectively. Graves in monumental tombs are oriented this way in 22.1% of cases. It is worth noting, that, while in flat cemeteries this proportion is higher (29.5%), it is more similar to graves from chamberless barrows and other burial zones.

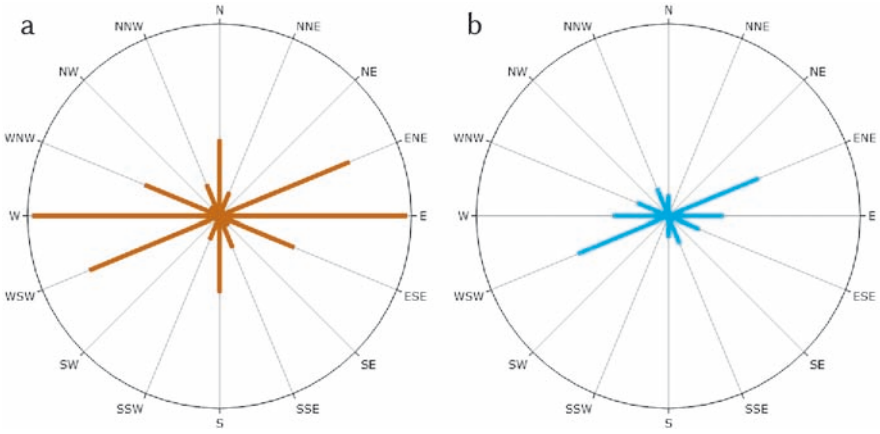

Fig 6. Polar plots representing proportions of flat graves (a; not including burials in storage pits) and graves from monumental tombs (b) in specified orientations

BURIED DEAD

In analysed sample, out of 231 burials, the age-at-death was determined in 153, among which all categories of age are represented. The group of *Infans I* burials consisted of 33 individuals, ranging from *ca*. 0-7 years old, with representation of all major stages of development. There were 10 individuals in the *Infans II* class, of which one was possibly female, and one was classified as *Infans I/II*. The *Iuvenis* age-class was represented by 7

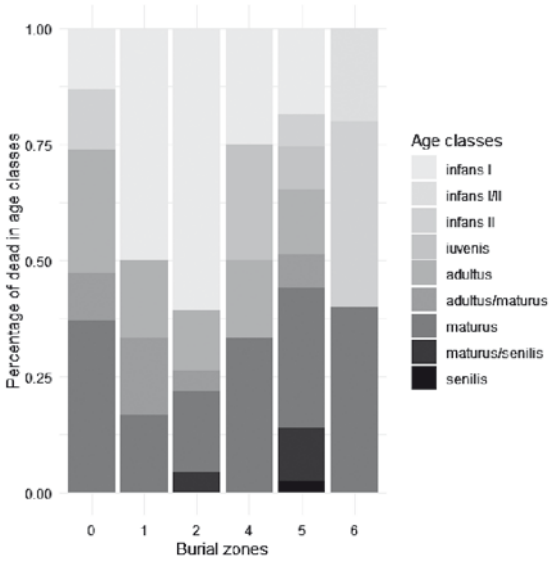

Fig. 7. Structure of ages-at-death of individuals buried in burial zones (without zone 3 ; "adults" and "children" are omitted)

individuals, and possibly one more who may have also died at this age. For two of them, sex has been estimated as one male and one female. In the class of *Adultus*, 22 individuals were found, with 10 females, 3 possible females, 2 possible males, and 3 males. Nine individuals have been described as *Adultus/Maturus*, of which sex has been estimated for 6: 3 females, 1 possible female, and 2 males. The class *Maturus* consisted of 38 individuals of which 8 were females, 5 possible females, 2 possible males, 17 males and 5 undetermined. In the class *Maturus/Senilis*, 1 female, 1 possible female, 1 possible male, and 3 males were found. One individual described as *Senilis* was found in the sample, and was estimated to be female. In addition, 3 individuals were described as children without more specific descriptions, along with 22 individuals as adults.

The proportion of age-classes among the dead varies across burial zones (Fig. 7). Most of the youngest children (*Infans I*, 72.7%), were buried in single graves. Of them, most graves (58.3%) were located alongside monumental tombs. About 12.5% of children were buried inside monumental tombs. Interestingly, single burials of *Infans I* individuals were located only in the "tail" part of monuments, seemingly dug into the already existing structure. The same number have been found in flat cemeteries. Equally, *ca.* 8.3% of the youngest children were found in zone 1, as well as in zones 3 and 4, combined. Children classified as *Infans II* were buried in single graves in 70% of cases. About 57.1% of them were found in monumental tombs, 28.6% were buried in settlements, and the remaining 14.3% in flat cemeteries. Individuals in the *Iuvenis* age-class were most often buried in collective burials

(71.4%). Of the remaining 28.6%, all were found in zone 4. *Adultus* individuals were buried in single graves in 63.6% of cases. Most often, they were found in flat cemeteries (35.7%), in chamberless barrows (28.6%) and in zone 2 (21.4%). Zones 1 and 4 accounted for 7.1% each. Individuals in the *Maturus* age-class were buried in single graves 78.9% of the time, most often located in chamberless tombs and flat cemeteries (40.0% and 36.7%, respectively). About 13.3 % of them were buried in zone 2, and another 6.7% in settlements. Only 3.3% of individuals who died at this age were buried in zone 4. The only individual of the *Senilis* age-class was found in a flat cemetery.

The overall age distribution of the individuals described above is fairly similar to that observed in graves of the FBC SE in the Lublin Region. There, the sample of 156 individuals consisted of about 25.1% *Infans I*, 13.3% *Infans II*, 2.1% *Iuvenis*, 18.6% *Adultus*, 38.4% *Maturus*, and 1.9% *Senilis* (Kozak-Zychman and Winiarczyk 2016, 112, Table 1). In the present study, *Infans I* makes up 26.2%, *Infans II* – 8.2%, *Iuvenis* – 6.3%, *Adultus* – 20.7%, *Maturus* – 35.6% and *Senilis* – 3.2% of the 128 individuals in the sample (after the even redistribution of individuals in intermediate age classes; "adults" and "children" are omitted).

A total of 13 collective burials were found: grave nos. 4 and 7 in Dacharzów (2 individuals each), grave no. 5 in Malice Kościelne (2 ind.), grave nos. 43 (2 ind.), 44 (2 ind.) and 46 (3 ind.) in Pawłów, grave no. XV in Bronocice (2 ind.), grave no. 3 in Kolosy, grave nos. 2 (2 ind.), 7 (3 ind.), 9 (2 ind.) and 14 (3 ind.) in Klementowice XIV, and grave no. 4 in Klementowice XII (2 ind.). None of them was a separated from the main grouping of burials on the cemetery or a grave laid in a storage pit, with the exception of grave XV in Bronocice, which was the only one found in trench C1, and according to excavators was dug into an earlier feature (Milisauskas *et al.* 2016, 79). A radiocarbon dating of the grave suggests that it should be associated with the Funnel Beaker-Baden horizon. Most of the collective burials in flat graves were found in cemeteries without traces of monumental structures, or at some distance from chamberless barrows (zone 4). Only one grave was found supposedly near the entrance to a tomb: grave no. 5 in Malice Kościelne (zone 1). There is no correlation between the construction of a grave and the number of individuals buried there. Most of the collective burials consist of children at different stages of development, accompanied by an adult. Among the flat graves, only grave no. 44 consisted of a buried *Maturus* female and *Iuvenis* individuals. The arrangement of the bodies was also unique in this grave, as the younger individual was laid directly(?) on the woman. Moreover, the arrangement of bones of a younger individual suggested that the body was cut in half and buried in different directions prior to skeletonization (Bargieł and Florek 2005, 21-22). In chamberless tombs, there are 8 collective burials. In three of them, no remains of children were discovered: grave no. 7 from Pawłów, and grave nos. 1 and 3 from barrow 2 in Malżyce, site 30.

A hierarchical clustering analysis based on ages-at-death from single and collective burials (rendered with the use of Euclidean distance and Ward's clustering method) resulted

Fig. 8. Dendrogram of burial zones, based on percentage of dead in age classes in each burial zone (without zone 3 ; "adults" and "children" are omitted)

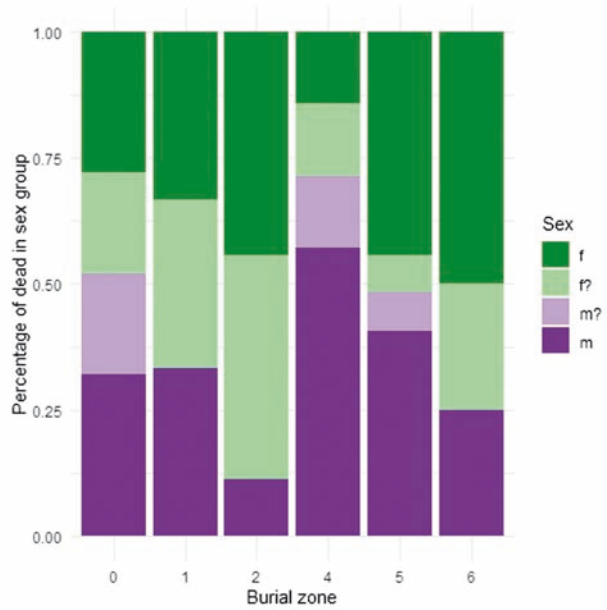

Fig. 9. Structure of sex of individuals buried in burial zones (without zone 3)

in three clusters, the first of which contained graves from chamberless tombs and flat cemeteries. Graves from zone 4 were relatively close to these. The second cluster contained graves from zones 1 and 2, while the third cluster contained graves from settlements (Fig. 8). These results seem to at least partially support observations on the constructions of stone graves. Again, flat cemeteries and monumental barrows show some similarities, while graves set along the barrows reveal a different pattern. Conversely, similarities in the constructions of graves from zone 1 and 4 do not reflect the population buried there.

The proportions of females and males are equal in graves from chamberless tombs and in flat cemeteries (Fig. 9). Other burial areas show, however, disproportions in this respect. There are almost no male graves in zone 2. In zone 1 and in settlements males are represented in 1/3 and 1/4 of graves. Conversely, in zone 4, a majority of individuals with estimated sex were males. However, only in case of graves from monumental tombs and flat cemeteries (zones 1 and 5) number of individuals which sex have been estimated exceeds 10 (25 and 27 individuals, respectively). Differences seen in other zones cannot be, therefore, considered reliable.

POSITION AND ORIENTATION OF BODIES

The dominant position of bodies in graves was supine. It was observed in the majority of graves – for nearly 9 out of 10 skeletons for whom position could be determined, regardless of the type of cemetery, burial area, grave type, sex and age of the dead. The only exceptions are observed in settlement pits in Bronocice and Gorzyczany (burials XX, VII, XV and XVI in the former site, and burial 1 in the latter), as well as burial no. 44 in Pawłów, and burial 5 in Malice Kościelne, consisting of a *Maturus* female and a child.

The orientations of bodies, however, vary. In one group of graves from flat cemeteries, the dominant trend seems to be with the head towards the west. There is also a group of graves in which the dead are set with their heads directed to the north. In both groups, some deviations can be observed, especially among the west-oriented graves, in which some are directed more toward the SW. In general, directing the head to west corresponds well with graves from chamberless tombs, and to the tombs themselves (Fig. 10). The second group, the north-oriented burials, is puzzling. Apparently, this orientation was not popular in graves related to monuments. Even in graves set perpendicularly to monuments, the heads of the dead are rather directed toward the S or SSE. Out of 23 graves in which the head of the dead was directed toward the north (with deviations toward the NE and NW), 19 were found in flat cemeteries, in zone 4 and in monuments (43.5%, 21.7% and 17.4%). Moreover, it seems that there is some sort of difference in orientation between males and females, with a slight preference for the W-E axis for the former, and the N-S for the latter group (Fig. 11). In the group of graves with heads directed northward, out of 14 examined bodies, 7 were females and 3 probable females. Seemingly, an eastern orientation

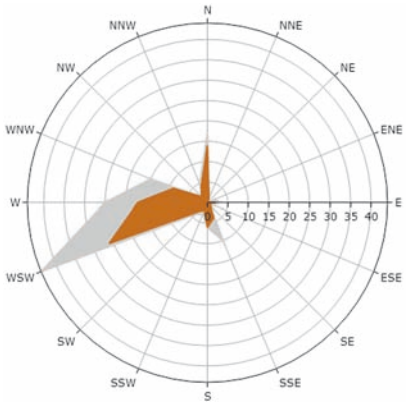

Fig. 10. Body orientation in analysed graves

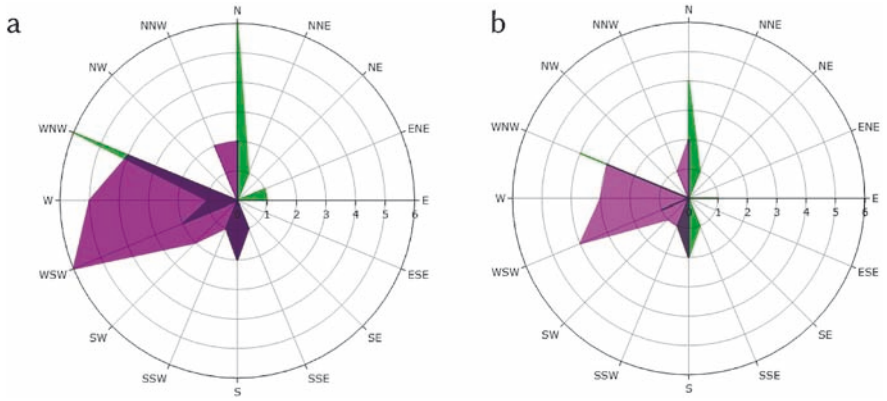

Fig. 11. Body orientation by sex: a – all graves, b – flat graves; green – female, purple – male

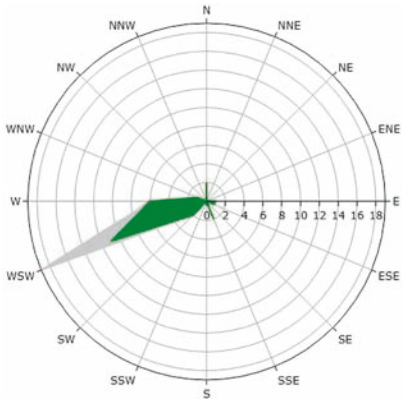

Fig. 12. Body orientation of children in flat graves (green) versus all children individuals (grey)

of the head is avoided for individuals of both sex groups. Although not numerous, there are some exceptions to this pattern. Bodies of children seem to be mostly oriented along the axes of monumental structures, mostly with heads to the west, with some deviation toward the SW (Fig. 12). That pattern is visible in most graves of children, whether they were constructed inside, later dug into, or not connected with monumental structures. Generally, only children deviating from this pattern are buried in collective burials and storage pits.

BURIAL GOODS

In the analysed group 33.8% of burials have some form of grave inventory. Interestingly, differences are visible between groups of graves, based on their burial spaces: in monumental tombs, *ca*. 35.6 % of graves have some grave inventory, similar to graves from flat cemeteries (*ca*. 37,0 %), while graves located in zone 2 were equipped only in 18.4% of cases. Zones 1, 3 and 6 are not numerous, so their statistics can be misleading, but they are as follows: 28.6% of graves in zone 1 have accompanying goods, 33.3% in zone 3, and 75% for burials in settlements. In zone 4, 42.3% of graves had grave goods, and when combined with zone 3, the figure is 40.7% of graves. As limited as the interpretation of this pattern may be, it seems that graves from chamberless tombs, flat cemeteries, and possibly graves from zone 1 are similar in this account. Graves from zone 2, however, depart from this pattern. Also, when combining all graves from areas surrounding chamberless tombs, there is still a visible difference between the frequency of equipped graves in these areas (*ca*. 26.5%) versus graves from monuments and flat cemeteries. Pottery was found in 36.2% of equipped, and 12.3% of all graves. Numbers vary from 7.4 % when counting zones 3 and 4 together, to 16.7% in flat cemeteries. No pottery was observed in graves from zone 1. Aside from this latter zone, differences in the proportions of graves with pottery are not large: 11.8% in monuments, 12.3% in zone 2, 7.4% in zones 3 and 4 combined, and 12.5% in settlement burials. Overall, 9.6% of graves surrounding monumental tombs were equipped with pottery. Similarly to the pottery, flint tools were found in 36.2% of equipped, and 12.3% of all graves graves – most often in monumental tombs and flat cemeteries (17.0% and 16.7%, respectively). They are almost as frequent in zone 1 (14.3%), while in other zones, less than 10% of graves have any flint tools (2.0% in zone 2, 0.7% in zones 3 and 4 combined). Altogether, only about 4.8% of graves from the surroundings of monuments are equipped with flint tools, and the figure is similar in settlement burials. Tools and other objects made of clay (spindle whorls, loom weights), stone (including flakes and pieces of flint), copper or bone have been observed only sporadically. Copper daggers have been found only in monuments and flat cemeteries, namely in Goszyce, Kichary Nowe and Słonowice. In general, grave goods were found more often in male burials than in female burials (*ca*. 48.4% to 30.3% accordingly). This difference diminishes slightly, however, when the burials of possible males and females are added (43.2% for males and 31.8% for

females). Pottery was found in 7.7% of female burials, and 20.8% of male burials, and flint tools were found in about 11.5% of female burials and 29.1% of male burials.

SUMMARY

The performed analyses do not resolve all problems concerning flat graves of the FBC SE. In particular, the relative chronology of different burial customs, and the sequence of burials in supposedly more developed funerary complexes, could not be fully understood. The reason for that is the small number of absolute dates and chronology-sensitive artefacts in graves.

About 60-80% of burials in all analysed regions consist of some form of flat graves (including those inside settlements). Even though the Lublin region is underrepresented in the data base, a deviation from the obtained 70.1% probably would not exceed the above range. In any case, it should be stated that flat graves are substantial elements of the funerary rites of the FBC SE.

The available absolute dates suggest the more or less contemporary development of monumental and flat cemeteries. The dates obtained from the surroundings of monumental tombs at Słonowice and Skołoszów fit in the same range. The small sample size of radiocarbon dates does not allow for the building of more detailed chronological models that would be reliable. The earliest date from Bronocice seems to predate this chronological range. It is unclear, however, if this structure – burial no. XX – should be classified as part of the cemetery or as a burial in the settlement. Only dated burials of the latter kind are known from this site, and were used throughout the whole span of the FBC and FBC-Baden occupation. The very late dating of Kichary Nowe, due to controversies regarding the classification of the site and the dates themselves, can be regarded only as a suggestion that some funerary activities of the FBC might have been performed at the beginning of the 3rd millennium BC.

Graves in flat cemeteries have shared characteristics with graves found in chamberless tombs. This is particularly visible in graves with stone constructions. Only the custom of filling a grave with layers of stone seems to be more strongly related to the latter group. The proportion of graves aligned to an W-E axis seems to be more similar in these two groups. The almost identical age and sex structures of the dead add to the overall similarities between groups. Lastly, the frequency of burials with grave goods, such as pottery, is also similar between the two groups. Unfortunately, the scarcity of radiocarbon dates provides only limited insight into the chronology of the flat cemeteries (and monumental ones). As can be seen, all dated graves from monumental tombs point to the classical phase of the FBC SE, that is 3650-3400/3300 BC. The only dates concerning flat cemeteries came from Bronocice. The chronological range is wider here, even excluding the latest of them, more probably relating to the Funnel Beaker-Baden horizon. It should be assumed

that both types of cemeteries were more or less contemporary, with, possibly, a slightly earlier beginning for flat cemeteries, assuming that burial XX from Bronocice was a part of the regular cemetery. Dates from Kolosy, regardless of the interpretation of this site, fit this chronological model. It is unclear, however, if graves with stone constructions were built outside chamberless tombs in the classic phase of the FBC SE. The shortage of radiocarbon data from the Nałęczów area is especially perceptible in this context. Quite opposite to Kolosy, dates from Kichary Nowe do not fit the chronological model in any way. The relative and absolute chronology of the FBC SE from the Sandomierz Upland is, however, poorly understood as a whole. The later phases of the 4th millennium BC, which in the western area of this group can be distinguished by Baden influences, need more attention in future research.

Graves that were placed in front of the tomb (*i.e.* along the supposed longer base of the trapeze) in Malice Kościelne do not distinguish themselves with regard to their construction. However, age structures in this area are more similar to graves from zone 2. The dominant orientation of graves along a N-S axis here is similar only to the pattern observed among the equally small number of graves from zone 3 in Słonowice. This location of graves has not been observed in other sites.

Burials located along monuments are oriented the same way as the monuments themselves, and rarely consist of stone wall supports or coatings. Grave goods are less frequently found in this than in other zones. In such locations, mostly children (*Infans I*) and adult women were buried. Although this pattern has been observed in Pawłów and Słonowice, in Malice Kościelne, these characteristics seem to be shared by graves found in the "tail" of barrow I. This fact, and the lack of detailed data on most of the graves from Słonowice, suggest caution in the interpretation of this zone.

Zones 3 and 4 (combined) aggregate the remaining graves from the surroundings of chamberless tombs. Their relations to monuments are uncertain. The fact that these zones consist of scattered groups of graves makes it difficult to treat them as homogeneous. The age and sex structures of burials from zone 4 connect it mostly to graves from chamberless tombs and flat cemeteries. However, the overrepresentation of males and the youngest group of children (*Infans I*), and the lack of *Iuvenis* individuals, is visible.

The last burial zone consists of singular graves set in settlements or in their proximity. These burials differ from nearly all others. The generally small number of published graves of this type, and the quite high variability among them makes it hard to describe them together. To this group, generally single graves that were found in settlements have been classified. However, also double burials occure in this group. Some of the burials were set in rectangular pits, and others (most of them?) in storage pits. They are mostly graves of children (*Infans II*) and women(?). Although among some of them the position and orientation of the grave is similar to other graves, they look less carefully made, as the remains of the dead often deviate from an extended position. In one case at Kamień Łukawski, the body was sloping downward, but in an extended, supine position. It may be that the lack

of preparation in those graves leads to later, taphonomic disruptions. This does not seem to be the case, however, in grave XX from Bronocice, where the arms and torso seem to be intentionally arranged in position deviating from standard of FBC SE. Some other burials in storage pits are also known. In pit no. 16 in Zawichost-Podgórze, site "Pieczyska", a nearly complete skeleton of an *Adultus* male was found in non-anatomical position, but in a manner that suggested intentional arrangement (Balcer 1968, 326). The body was found at a depth of 90-120 cm, *i.e.* about 35 cm above the bottom of the pit. Apart from the presence of the body, the pit did not differ from other storage pits of the FBC SE (Balcer 1967, 32). In the fill of the pit, above the level of the body, a bone from a human fetus was also found (Balcer 1968, 326). In Niedźwiedź, a body was found in a supine position, with its head directed westward, on the bottom of trapezoidal storage pit no. 46. In pit 60-61 on the same site, a human skull was found at a depth of 40 cm. About half a meter deeper, a bowl was found (Burchard 1977, 69-70). The small number of graves of this type, as well as their variability, suggests caution in interpreting them on an equal scale with other burial zones. The characteristics of these forms of graves seem to suggest that there was no widespread custom of burying people inside of settlements, and that these kinds of burials were, in fact, incidental.

In conclusion, the adopted approach to the problem of flat graves of the FBC SE produced a picture of complex funerary rituals among these societies. The general distinction between monumental and flat cemeteries does not seem to comprehend the variability of grave forms in this group. Although groups of graves found in chamberless tombs reveal similarities to non-megalithic cemeteries, the same cannot be said about flat graves that are part of cemeteries with monuments, which is best illustrated by zone 2. Other graves from the surroundings of monumental tombs show less consistent characteristics, so it is not clear whether they (or which of them) should be considered part of a separate cemetery, of a complex (chronologically or functionally consistent with monuments), or yet another variant of the funerary tradition. Presently, the lack of datable material in most graves, the low resolution of the relative chronology based on ceramic forms, and the small number of radiocarbon dates, hinder further interpretations of these problems.

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