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## NEW EVIDENCE ON THE INTERACTION BETWEEN THE YAMNAYA AND GLOBULAR AMPHORA CULTURES

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### ABSTRACT

In the first half of the 3rd millennium BC in the steppe Ukraine, stone tombs with an entrance appeared which are similar in design to the burial structures of the Globular Amphora culture. Two were investigated in the Molochnaya River basin near the Kamyana Mohyla monumental site. These unique structures differ from the stone cists of the Yamnaya culture as well as the burial constructions of the preceding Eneolithic period. Probably, the distribution of stone tombs with an entrance in the North Pontic area is connected with the influence of the Globular Amphora culture.

**Keywords:** Azov Sea area, Kamyana Mohyla, Early Bronze Age, Yamnaya culture, Globular Amphora culture, stone tomb

In 2017, the archaeological expedition of the Institute of Archeology, Ukrainian Academy of Sciences, excavated a burial place in the Kamyana Mohyla National Historical and Archaeological Reserve, located 2 km to the east of the Mirne village, Melitopol district, Zaporizhzhya oblast, and 200 m to the North of the Kamyana Mohyla hill (Fig. 1).

Kamyana Mohyla monadnock consists of a few 14-million-years-old blocks of sandstone that formed in the deposits of the Sarmatian Sea. Rising above a river



- settlement
- burial place

Fig. 1. Location of the excavated area near the Kamyana Mohyla hill: 1 – Kamyana Mohyla 1 settlement; 2 – Kamyana Mohyla 2 settlement; 3 – stone tomb and ritual complex

valley, it always drew the attention of ancient populations of the region. Numerous petroglyphs were made within the site along with slab cracking that created caves and grottoes. More than 60 rock art locations from the Mesolithic to the Modern Age were found there [Radchenko *et al.* 2020]. About 10 settlements, including two multilayer ones, and numerous kurgans of various periods were discovered in the vicinity of Kamyana Mohyla, too (Fig. 1). Site 1 has been excavated for the last 10 years within the framework of a joint Swiss-Ukrainian project [Kotova *et al.* 2017].

## MATERIALS

The excavated burial place was severely damaged by plowing and the root system of acacia trees. Any visible traces of a burial mound (kurgan) were lacking on the surface. The following sequence of soil horizons was traced: chernozem (19-24 cm thick), light gray loam (35-50 cm), brown loam with crushed shells (40-60 cm) and the underlying light loam.

Three burials and a ritual complex were discovered in the investigated area (Fig. 2: a).

Burial 1 was located at a depth of 38–40 cm from the surface in a layer of light gray loam. It included a flexed skeleton lying on its left side with the head oriented north and lacking any grave goods. A radiocarbon date for human bones was unsuccessful due to the low content of collagen.

Burial 3 was linked to the Early Middle Ages [Makhortykh *et al.* 2019].

Burial 2 in the stone tomb and the ritual complex belonged to the Early Bronze Age.

**Burial 2** was found in a stone tomb which was constructed on the original ground level – brown loam with crushed shell (Fig. 2: b). Its stone covering could have been destroyed by plowing and small fragments of sandstone in the upper part of light loam near the northwestern section of the tomb can be considered its remains. The tomb had a rectangular shape (2.35 × 1.66 m) and northeast-southwest orientation. Its longer walls consisted of sandstone slabs, measuring 1.82 × 0.67 × 0.31 m and 1.82 × 0.69 × 0.33 m. They were supported by smaller stones (0.5 × 0.3 m). The eastern wall was probably built of small sandstones mixed with silty soil. The original entrance was located in the southwestern sector of the tomb. From the outside, it was covered with small rubble mixed with clay. This soil was probably brought from multilayer Site 1 near the Kamyana Mohyla hill. This is evidenced by a shard of the second period of the Azov-Dnieper culture, found among the rubble in the central part of the entrance (Fig. 3: 3). In addition,

the use of small stones to regulate the height and position of the slabs was recorded under the southern slab and the base of the entrance.

The flexed skeleton lay on the left side, with its head oriented to the east with a deviation to the north (Fig. 2: b). It had belonged to a young man less than 25 years old according to identification by Dr. L.V. Litvinova.

An *Unio* shell was found at the bottom of the tomb. A fragment of limestone with traces of processing was among the stones from the destroyed covering (Fig. 3: 1-2). In the upper part of the tomb fill, animal bones were found: two ribs of cattle, a slate bone (→scapula?) and a third phalanx of a domesticated horse. The metatarsal bone of cattle and the slate bone of a domesticated horse were found near the tomb (identification by palaeozoologist Dr. O. P. Zhuravlev).

Radiocarbon dates were obtained for the bones of humans and animals from the stone tomb. Hereinafter, the dates are calibrated by the Quickcal 2007 ver.1.5 software, using the calibration curve CalPal 2007\_HULU. The age of the human skeleton is set at 4116±23 BP (BE-8040.2.1) or 2831–2635 BC. The rib of a domesticated bull from the upper part of the tomb fill is dated to 4142±23 BP (BE-8041.2.1) or 2839–2675 BC. The common interval for the bones of animals and humans is 2831–2675 BC, and it determines the time of construction of the stone tomb, which corresponds to the Early Bronze Age in the steppe zone of eastern Europe (3000–2500 BC) [Kaiser 2019: 20].

**The ritual complex** consisted of two features. They were located not far from Burial 3 (Fig. 2: a), which was accompanied by an early medieval vessel. Burial 3 was found at a depth of 0.24–0.26 m from the benchmark, but the Bronze Age complexes were found at a depth of 0.63–0.70 m. The first feature included a pot of the Yamnaya culture, which lay bottom up at a distance of 6 m to the north of the tomb. The pot, 14 cm high, had an admixture of sand, a flat base, a low rim, and hatches on its surface (Fig. 4). It should be emphasized that to Yamnaya culture, we assign only sites synchronous with the upper layer of the Mikhailovka settlement, which is dated to the early 3rd millennium BC. The sites and burials of the Repin and Rogachik types, we attribute to the previous cultural-chronological horizon.

The second feature was located 1.40 m to the west of the pot. It included animal bones, which are identified by Dr. O. P. Zhuravlev as the skull parts of a young bull and the bones of its limbs. Radiocarbon analysis estimated their age at 3976±21 BP (BE-8044.4.1) or 2554–2478 BC.

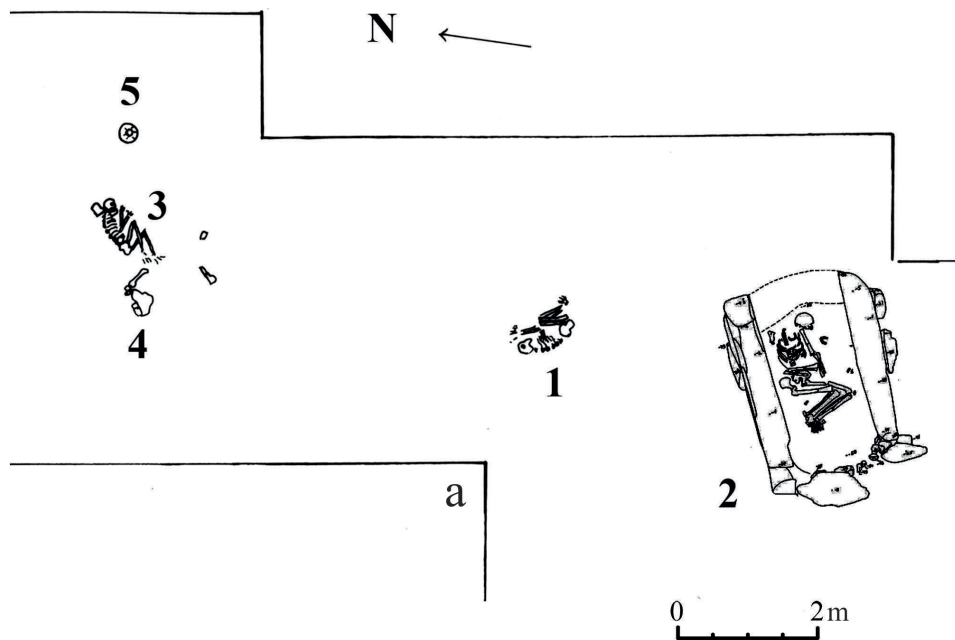


Fig. 2. Burials near the Kamyana Mohyla. Plan: 1 – burial 1; 2 – burial 2; 3 – burial 3; 4 – bones of cattle; 5 – a pot of the Yamnaya culture; 2 – burial 2

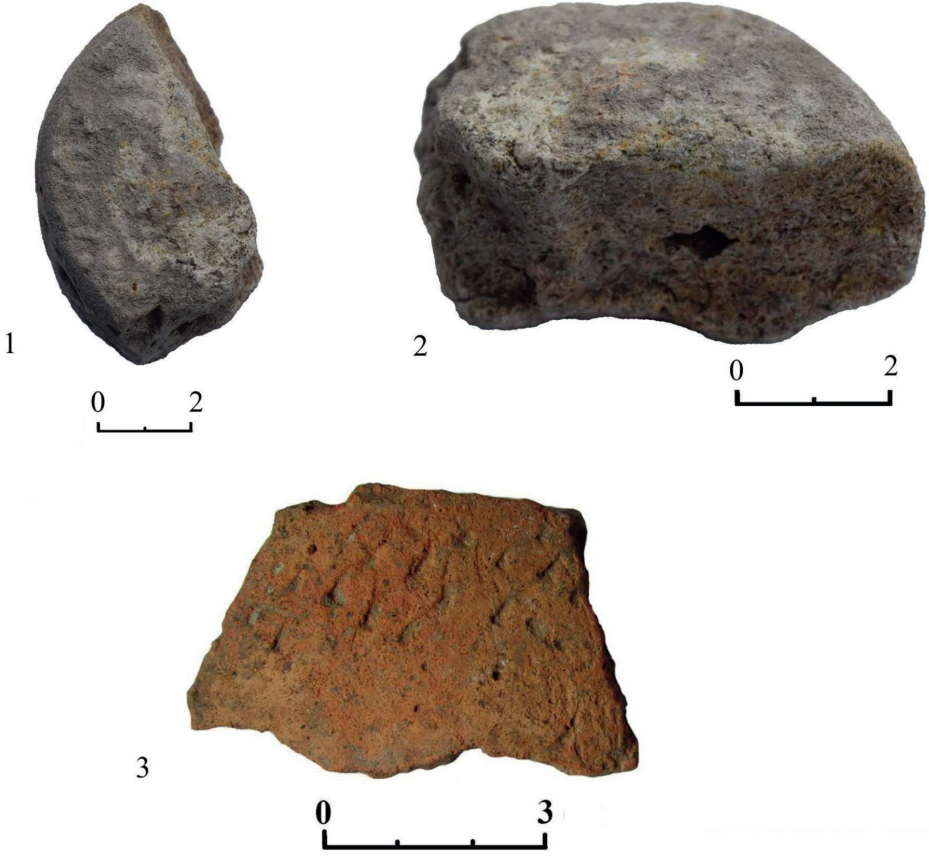


Fig. 3. Burial 2: 1, 2 – fragment of the stone tool from the burial 2; 3 – fragment of the Azov-Dnieper vessel from the burial 2

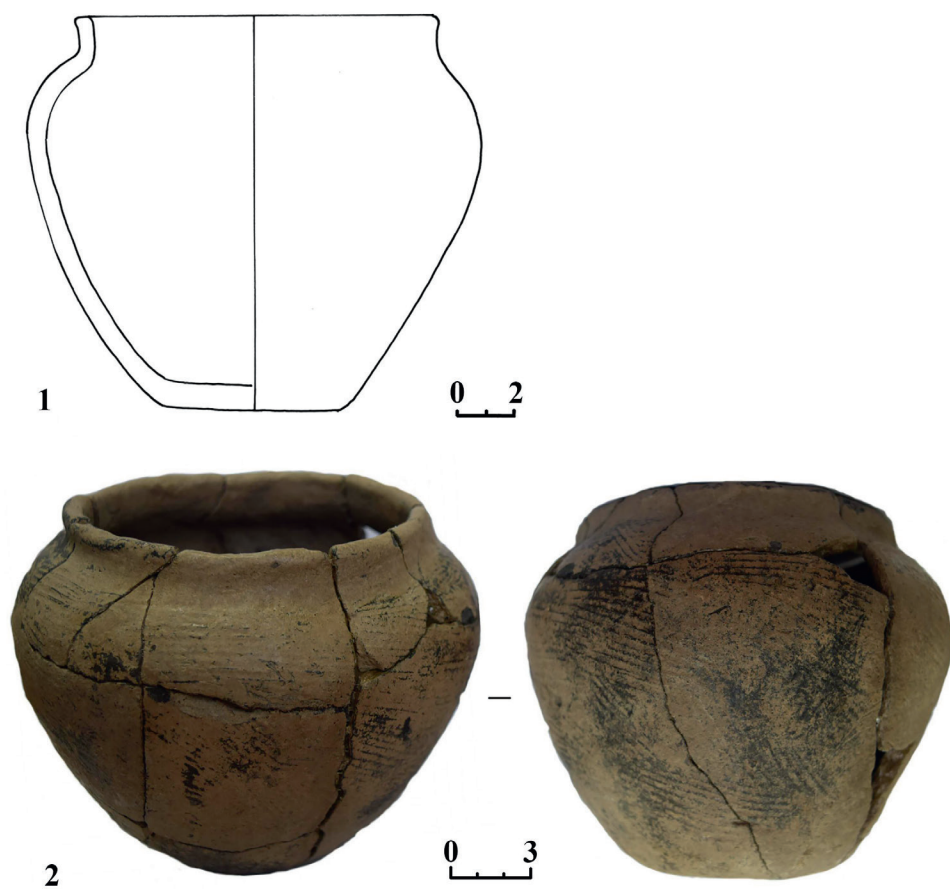


Fig. 4. Pot of the Yamnaya culture from the ritual complex

The radiocarbon dates for Burial 2 (2831–2675 BC) and the ritual complex with the Yamnaya culture pot (2554–2478 BC) demonstrate the successive use of this place located nearby Kamyana Mohyla by the populations of the Early Bronze Age.

Vessels similar to the pot from the ritual complex are reconstructed for the upper layers of the Generalka 2 settlement on Khortytsya Island, Zaporizhzhya oblast [Tuboltsev, Radchenko 2018] and Mikhailovka in the Kherson oblast [Lagodovska *et al.* 1960]. Generalka 2 also has a similar age: *c.* 3086–2295 BC [Radchenko, Tuboltsev 2019]. Quite numerous analogies to the discussed pot are also known from the burials of the Yamnaya culture in Ukraine: Vysokoe, Kurgan 20,

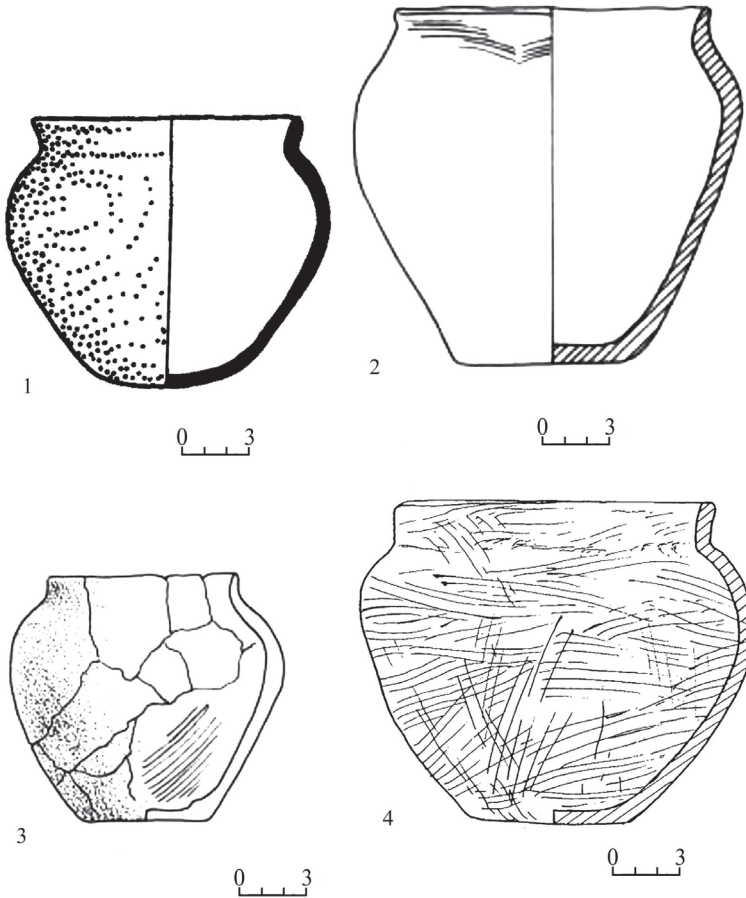


Fig. 5. Pots of the Yamnaya culture: 1 – Vysokoe, kurgan 20, burial 8 [after Samoilenko 1988]; 2 – Dubinovo, kurgan 1, burial 13 [after Ivanova *et al.* 2005]; 3 – Soldatskaya Slava kurgan, burial 9 [after Ivanova *et al.* 2005]; 4 – Stara Katerinovka, kurgan 30, burial 4 [after Chernykh, Daragan 2014]



Burial 8; Dubinovo, Kurgan 1, Burial 13; Kurgan Soldatskaya Slava, Burial 9; Stara Katerinovka, Kurgan 30, Burial 4; Novopilipovka, Kurgan 1, Burial 26; Akkermen 2, Kurgan 4 (Fig. 5; 6: 1–2) [Vyazmitina *et al.* 1960; Samoilenko 1988; Ivanova *et al.* 2005; Chernykh, Daragan 2014].

A part of Catacomb culture vessels from the Molochnaya River basin have some common traits with the pot from the ritual complex. However, in terms of proportions, they belong to high bowls, having a rim diameter that exceeds the height of the vessel: Akkermen 1, Kurgan 7, Grave 1 and Kurgan 20, Grave 1 (Fig. 6: 3–4), Yushanly, Kurgan 1 (Fig. 6: 5).

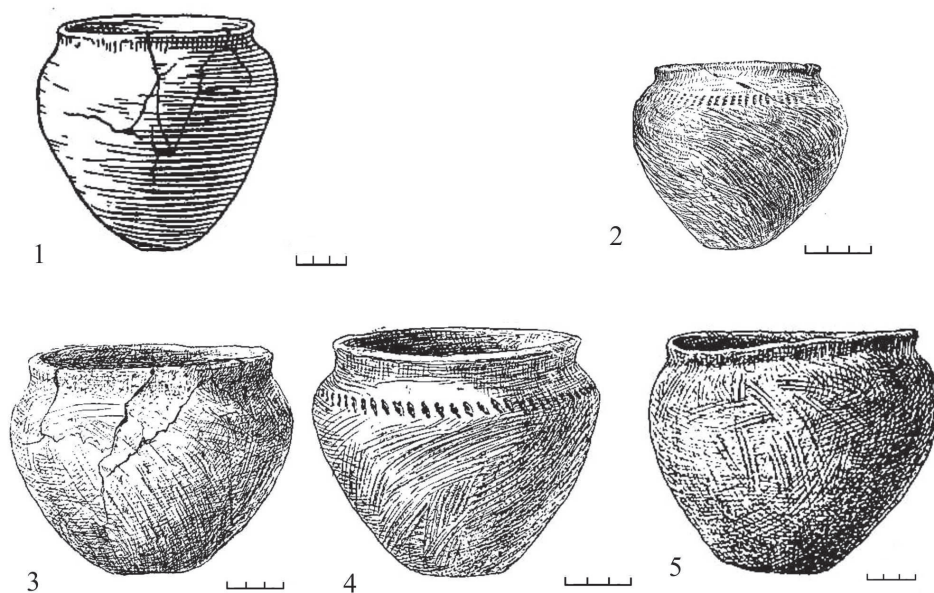


Fig. 6. Pots of the Yamnaya (1-2) culture and high bowls of the Catacomb culture (3-5): 1—Novopilipovka, kurgan 1, grave 26; 2—Akkermen 2, kurgan 4; 3—Akkermen 1, kurgan 20, grave 1; 4—Akkermen 1, kurgan 7, burial 14; 5—Yushanly, kurgan 1 [Vyazmitina *et al.* 1960].

Ritually overturned vessels are found in the burials of the Catacomb and Yamnaya cultures in the steppe Ukraine [Vyazmitina *et al.* 1960: 107, 127; Demchenko 2013]. Our materials demonstrate that the Yamnaya people used overturning pots also in ritual complexes. Of all the ethnographic, mythological and archaeological parallels given in the literature [Kovaleva 1989; Demchenko 2013; Sotnikova 2015], the data on the Late Bronze Age in the Ural region are the closest to the ritual complex of Kamyana Mohyla. Sacrificial assemblages were studied there, consisting, like our one, of overturning vessels, skulls, and leg bones of animals [Sotnikova 2015]. Common to them is a small size of vessels with an uneven bottom making them wobbly, which implies that they were not used in everyday

life, as well as the absence of any ornamentation. It is possible that these vessels were made to be used exactly in various rituals. In our case, the absence of a grave allows us to make an assumption about the connection of the Kamyana Mohyla complex with the ritual of driving away of disease, when, as a result of magical actions, a disease was transferred to a sacrificial animal. An inverted vessel made for this ceremony could contain a harmful being, such as a disease, which people hoped to destroy [Demchenko 2013].

Our vessel contained soil inside. It could have been produced by decomposing food, which also suggests another rite, when turning over a filled vessel ‘communicates the sense of returning to earth what was taken from it, in order to again obtain fertility and wealth from earth’ [Sveshnikova, Tsivyan 1979]. In prehistory, a similar ceremony was relevant for the Ukrainian steppe with its regular droughts and, especially, for the population of the Yamnaya culture, who lived in the conditions of the arid maximum, when there was much less moisture in the steppe zone than today [Spiridonova, Lavrushin 1997: 154–155]. The ritual and everyday significance of the bull, whose bones were found in the cult complex, for the population of the studied steppe region is reflected in the rock paintings of the Kamyana Mohyla hill, rich in characteristic and expressive images of wild bulls and cattle [Radchenko, Nykonenko 2019].

The Kamyana Mohyla stone tomb is a unique structure, not typical of the steppe people in Ukraine. To search for its analogies, it is necessary to clarify first the applicable terminology. The present authors draw a distinction between stone cists and stone tombs. The latter are few in number and differ from cists by the presence of an entrance, which theoretically made it possible to use tombs for several successive burials. Secondly, it is important whether a cist or tomb is surmounted by a kurgan or not. Thirdly, the location of a cist or tomb may differ: in a pit dug in the original ground level or sunk into an older burial mound. The history of stone burial structures on the Pontic steppe and their evolution are considered in a special article [Kotova *et al.* 2020]. Here, only a brief overview is given of the development of stone burial structures on the Pontic steppe.

The first such structures emerged in the Early Eneolithic, at the beginning of the 5th millennium BC, in the second period of the Azov-Dnieper culture. Its people piled up stones above large burial pits in the Nikolsky and Yasinovatka 1 cemeteries. After corrections, these cemeteries can be dated to 4900–4700 BC [Kotova 2018: 63]. They demonstrate contacts with the Balkan population of the third period of the Hamangia culture [Kotova 2016], who actively used stones in burial rites [Bojadziev 2002].

Stone cists on the Pontic steppe are also known in the Early Eneolithic [Manzura 2000: 245] in the burials of the Sredniy Stog culture [Kotova 2008], which is sometimes called the Novodanilovka [Telegin *et al.* 2001] or Skelya [Rasamakin 2004: 204–206] culture. About 4700–4300 BC, this steppe population built cairns above graves and partially lined burial pits with stone slabs. Early Eneolithic

burials with stone structures were placed in pits uncovered by kurgans. Like the Azov-Dnieper population, the Sredniy Stog people borrowed stone structures from the Balkans, owing to close contacts with the bearers of the Hamangia and Varna cultures.

In the steppe Dnieper and Azov Sea regions, the Middle Eneolithic (4300–3650 BC) is represented by the Dereivka culture and the Lower Mikhailovka group [Kotova 2013]. For the Dereivka culture, only stone cromlechs (i.e. stone kerbs) and cairns above graves are currently known. There were also wooden burial tombs on the ancient horizon [Kotova 2013: 66, 135]. At present, there are no burials in stone cists known of with ceramics of the type corresponding to the layer of Mikhailovka or with radiocarbon dates, assigning them to the Middle Eneolithic. Thus, an interruption is assumed of the tradition of building stone cists in the Pontic steppe for about 800–1000 years.

Stone cists appeared in the Pontic steppe again in the second half of the 4th millennium BC, but, as distinct from the Early Eneolithic, they were covered by kurgans this time. The archaeological sites of this chronological period in the Lower Don basin belonged to the Late Eneolithic – Early Bronze Age Konstantinovka culture, which had evolved from the eastern part of the Dereivka culture under the Maikop culture influence [Kotova 2013]. Taking into account the dating of the Maikop culture of 3800–3100 BC [Kohl, Trifonov 2014: 1578] or 3900–3000/2900 BC [Korenevskiy 2016: 12], the rise of the Konstantinovka culture can be dated to the first quarter of the 4th millennium BC. The stratigraphic position of the cultural layer with Konstantinovka materials under the Repin culture layer at the Razdorskoye 1 site [Kiyashko 1994] suggests that the Konstantinovka population was assimilated by the Repin population. In general, the Repin culture sites in the Don and Northern Donets river basins can be dated by radiocarbon dates and imports of Repin vessels in the middle layer of Mikhailovka (3700/3650–3200/3000 BC) [Kotova, Spitsyna 2003]. The available materials suggest the coexistence of Repin and Konstantinovka culture population groups in the Northern Donets basin around 3600–3450 BC [Kotova 2013: 151]. Hence, the decline of the Konstantinovka culture on the Lower Don can be dated to the end of the third quarter of the 4th millennium BC.

One burial in a stone cist has been associated with the Konstantinovka culture (Khapry, Grave 1, Kurgan 8). The stone cist of small slabs holding a flexed skeleton lying on its back was built in a pit and was surrounded by a cromlech (Fig. 7) [Faifert 2014]. Next to it, two vessels were found. One was typical of the Konstantinovka culture (Fig. 7: 3) while the other had a polished decoration and was similar in shape to Maikop culture vessels (Fig. 7: 2). Trifonov noted that the polished decoration appeared in the Maikop culture in the second half of the 4th millennium BC [Trifonov 2014: 281–282]. Thus, taking into account the dating of the Konstantinovka culture (3750–3250 BC), the Maikop-like vessel from the Khapry burial limits the age of this burial to 3500–3250 BC.

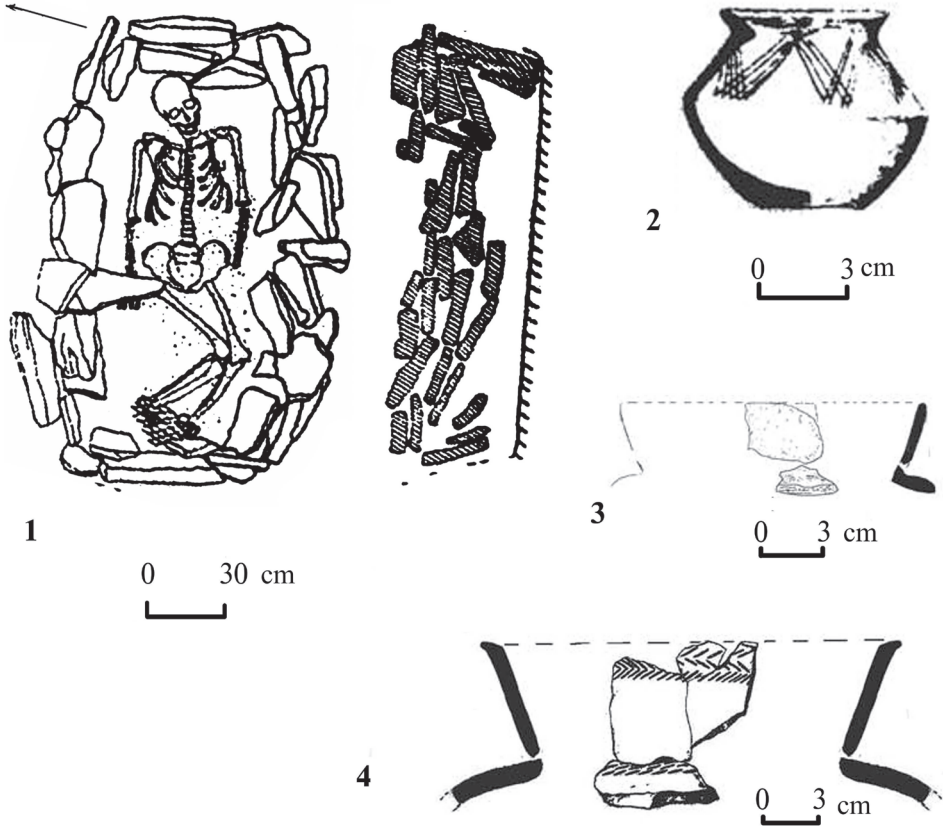


Fig. 7. Burial of the Konstantinovka culture: Khapry, kurgan 8, grave 1. After Faifert 2014

According to Trifonov, the formation of the Zhivotilovska-Volchansk group of burials was connected with the migration of Maikop colonists across the Pontic steppe in the second half of the 4th millennium BC [Trifonov 2014]. The burial at the village of Konstantinovka near Melitopol in the Molochnaya River valley can be assigned to the same chronological period. In it, a destroyed skeleton lay in a stone cist standing on the ancient horizon under a kurgan. The grave goods comprised a stone axe, flint tools (including an asymmetrical point of the Maikop type), and a pot similar to Maikop pottery [Rassamakin 2004: 160].

The second half of the 4th millennium BC in the steppe Dnieper basin and western Azov Sea region is associated with the monuments of the Rogachik culture [Spitsyna 2017]. They are dated to 3600/3550–3200/3000 BC [Kotova, Spitsyna 2003] and held to be synchronous with the monuments of the decline of Tripolye CI (the lower horizon of the middle layer of Mikhailovka as shown by the imports of Tripolye ceramics of the Koshylovetzka group) and Tripolye CII (the upper horizon of this layer). Vessels of the Rogachik culture accompanied burials with

extended and flexed skeletons [Kotova, Spitsyna 1999]. Stone structures, as before, were represented by cairns above graves and cromlechs, however, there were also a few stone cists: Lyubimovka, Kurgan 14, Burial 7 (Kherson oblast); Baratovka, Kurgan 1, Burial 17 (Mykolaiv oblast); Primorskoe, Kurgan 4, Burial 2 (Donetsk oblast). It is possible that burials 6, 8, 9, 11, 28a, 28b, and 30 in stone cists from Starogorozheno, Kurgan 1, belonged to the Rogachik culture too [Kotova *et al.* 2020].

Some extended burials lying on their back in stone cists under kurgans are known in the steppe Dnieper basin in the second half of the 4th millennium BC: Bogdanovsky quarry, Kurgan 2, Graves 3 and 17; Valovoe, Kurgan 1, Grave 7; Zavadskie Mogily, Kurgan 7, Grave 1; Marievka, Kurgan 14, Grave 7; Nagornoye, Kurgan 1, Grave 1; Novovorontsovka, Kurgan 1, Grave 8 [Rassamakin 2004]. Their stone cists were constructed on the original ground level or on the top of an Eneolithic kurgan (Nagornoye). Like extended burials in pits, these burials are associated with the post-Mariupol or Kvityana culture [Rassamakin 2004: 206–208]. However, an analysis of the inventories of extended burials in graves without stone constructions has shown that their pottery finds analogies in the settlements of the Dereivka culture and the lower layer of Mikhailovka [Kotova 2013], or in the middle layer of Mikhailovka as well as at the Nizhny Rogachik site, which belonged to the Rogachik culture [Kotova, Spitsyna 1999]. Unfortunately,

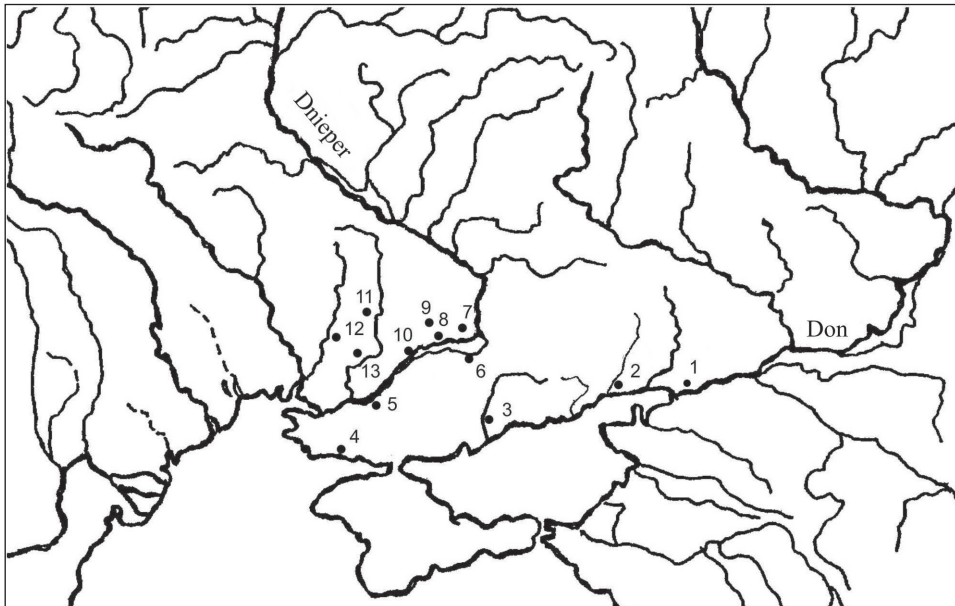


Fig. 8. Stone structures of the second half of the 4th millennium BC in the North Pontic area: 1-2 – stone cists in pits under the kurgans; 3-13 – stone cists on ancient surface under the kurgans; 1 – Khapry; 2 – Primorskoe; 3 – Konstantinovka; 4 – Skadovsk; 5 – Lyubimovka; 6 – Balki; 7 – Marievka; 8 – Nagornoye; 9 – Bogdanovsky quarry, Zavadskie Mogily; 10 – Novovorontsovka; 11 – Valovoe; 12 – Starogorozheno; 13 – Baratovka

no pottery is found with the burials in stone cists. Nonetheless, the stratigraphy of the kurgans and other indirect signs allow us to date them to the end of the 4th millennium BC [Kotova *et al.* 2020].

The territorial distribution of stone cists in the second half of the 4th millennium BC is worthy of note (Fig. 8). Stone cists in pits were found only in the eastern region, in the Kalmius-Don interfluvium: Primorskoe and Khapry. There are two explanations for this fact:

- 1) In this region, a continuous tradition of stone cist construction was preserved throughout the 5th and first half of the 4th millennia BC, but such burials have not been excavated yet.
- 2) Few stone cists in burial pits under kurgans appeared in the northern Azov Sea region among the Konstantinovka culture population in the middle of the 4th millennium BC under the influence of the Maikop culture. This hypothesis is supported by the existence of burials of the Zhivotilovska-Volchansk type, which demonstrates the spreading of Maikop grave goods to the Azov and Dnieper regions in 3500–3250 BC.

While stone cists in pits were typical of the eastern region, in the western Azov Sea area and steppe Dnieper and Ingul basins, stone cists were built on the then ground surface. A part of skeletons in the western area lay extended on their back, while others were flexed on the side. Only one individual (Starogorozheno, Kurgan 1, Grave 28b) was laid on his back, but with a tilt to the right side. A different picture is seen in the eastern region, where one skeleton was flexed on the back (Khapry), while the other was flexed on the left side (Primorskoe).

Regarding the second wave of the spreading of stone cists on the Pontic steppe, especially ones constructed on the original ground level, Rezepkin's hypothesis deserves a mention. It concerns the connection between the megalithic structures of the North Caucasus and the influence of the Funnel Beaker culture [Rezepkin 2012: 94–106]. It is exactly of this culture that stone burial structures on the original ground level with skeletons extended on the back or flexed on the side were typical. Funnel Beaker sites in Ukraine occupied the basins of the Upper Dniester and Western Bug rivers. Their inhabitants had close contacts with the Tripolye CII people in the second half of the 4th millennium BC [Videiko 2000]. At the same time, Tripolye culture bearers maintained close links with the Rogachik population which were reflected in the distribution of stone axes and imported vessels in steppe burials. The Tripolye settlements with the Funnel Beaker elements are located not far from the Rogachik culture area in the Dnieper-Ingul interfluvium, where stone cists on the original ground level are concentrated. Future studies of the DNA of steppe population and its comparison with the DNA of Tripolye and Funnel Beaker cultures people will help to clarify the problem of the appearance of the second wave of stone cists on the Pontic steppe. But even now it can be noted that, if the Funnel Beaker culture influenced the formation of the megalithic

structures of the North Caucasus, the wave went through the Lower Dnieper and Crimea, and not through the northern Azov Sea and Lower Don regions. Unfortunately, incomplete publications of finds exacerbated by the lack of radiocarbon dates do not allow a reliable analysis of the Crimean materials.

The Early Bronze Age (3000-2600 BC) witnessed an increase in the number of stone cists in steppe burials (Fig. 9). Formerly, most of them were considered in the context of the Kemi-Oba culture, especially ones in painted stone cists. Currently, researchers associate them with the Yamnaya culture. Toshchev considered in detail the history of the study of such monuments [Toshchev 2007]. These burials do not include vessels similar to the pottery from the Repin site or the middle layer of Mikhailovka and Rogachik. Yet, their clay pots have numerous parallels in the sites synchronous with the upper layer of Mikhailovka (sites of the Yamnaya culture, according to our terminology).

The Early Bronze Age burials with stones constructions are divided into several groups:

- 1) Kurgan burials with stone cists in a pit, where the cist and pit are similar in size (Fig. 10: 1): Northern mining and processing plant of Krivyy Rig, Kurgan 1, Grave 14; Novokryvorizky mining and processing plant, Kurgan 2, Grave 2; Vesnyane, Graves 3, 5; Alkalia, Kurgan 33, Grave 1; Sanzheyka, Kurgan 1, Grave 1, etc. [Subbotin 1995; Teslenko, Grebennikov 2002; Melnik, Steblina 2013].
- 2) Kurgan burials in stone cists that are smaller than the burial pit (Fig. 10: 2): Malaya Aleksandrovka, Kurgan 1, Grave 6; Tomarino, Kurgan 14, Grave 5; Shevchenko, Kurgan 29, Grave 3; Staroselie, Graves 3, 4; Starye Belyary, Kurgan 1, Grave 14; Katarzhino, Kurgan, 1 Grave 1; Tatarbunary, Grave 2, etc. [Shilov 1977; Ivanova *et al.* 2005; Rassamakin, Evdokimov 2010; Rassamakin 2014]. Some of the stone cists have their walls decorated with ocher ornaments (Katarzhino, Tomarino, etc.).

Human bones from two burials of this group were dated. The age of the burial in Starye Belyary is  $4030 \pm 80$  BP (Ki-11209), and in Shevchenko –  $4680 \pm 90$  BP (Ki-13869) and  $4542 \pm 49$  BP (Bln-5777). The dates obtained for the latter burial are considered too early by Rassamakin as a result of the reservoir effect because they contradict the stratigraphy of the mound, where Grave 3 was dug into Mound 5 in Kurgan 29 together with Grave 19 and thus should have a similar age. At the same time, Grave 19 is also dated ambiguously:  $3965 \pm 70$  BP (Ki-14719) and  $3530 \pm 80$  BP (Ki-13867) [Rassamakin 2014: 497–498 and Table 1]. Judging by the location of the stone cist in a large pit dug into an earlier mound, it really has to date to the first half of the 3rd millennium BC and belong to the Yamnaya culture. It is exactly of the Yamnaya burials that this arrangement of stone cists is typical, which is not known among the monuments of the second half of the 4th millennium BC.

- 3) Kurgan burials in stone cists constructed on the original ground level or an older mound (Fig. 10: 3): Andrusovka, Kurgan 2, Grave 17; Balki-Vysoka Mogila, Grave 4; Balki, Kurgan 4, Grave 1; Baratovka, Kurgan 1, Grave 8; Velikoaleksandrovskiy Kurgan, Grave 7; Vesnyane, Kurgan 1, Grave 2; Voikovo, Grave 1; Dovga Mogila, Chertomylyk group, Grave 6; Krasne, Kurgan 1, Grave 4; Moiseevka, Kurgan 1, Grave 4; Soldatska Slava, Grave 9; Starogorozheno, Kurgan 1, Grave 1, etc. [Shaposhnikova *et al.* 1977; Androsov, Melnik 1991; Mozolevsky, Pustovalov 1999; Rassamakin 2004]. Some of these stone cists have their walls decorated with ocher ornaments (Andrusovka, Moiseevka, Starogorozheno) or with carved linear geometric patterns (Vysoka Mogila).
- 4) Stone tombs with an entrance: Kurgan 11, Grave 14, group Akkermen 1, between the villages of Novopilipovka and Zarechne (Zaporizhzhya oblast); Kurgan 1, Grave 6 near the village of Baratovka (Mykolaiv oblast); Grave 2 of Kamyana Mohyla. All these structures have a different design, but the presence of an entrance is common to all (Fig. 11). Only the Kamyana Mohyla tomb was not covered with a kurgan.

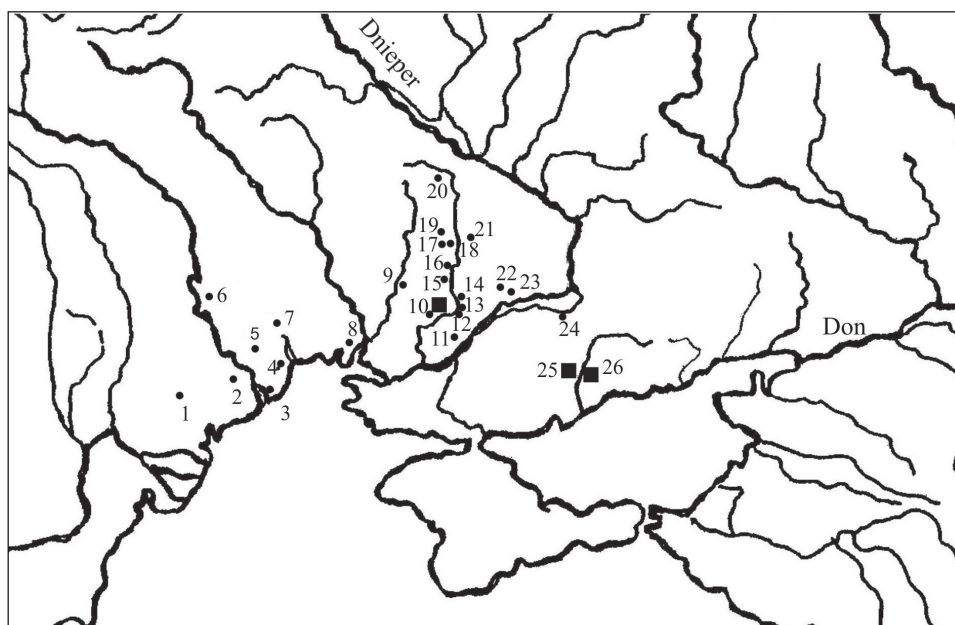


Fig. 9. Burials with stone structures under the kurgans of the 3rd millennium BC in the North Pontic area: 1 – Tatarbunary; 2 – Alkaliya; 3 – Sanzheyka; 4 – Starye Belyary; 5 – Katarzhino; 6 – Krasne; 7 – Soldatskaya Slava; 8 – Vesnyane; 9 – Starogorozheno; 10 – Baratovka; 11 – Tomarino; 12 – Malaya Aleksandrovka; 13 – Velikoaleksandrovka; 14 – Staroselie; 15 – Zeleniy Gai; 16 – Voikovo; 17 – Dolgintsevo; 18 – Northern mining and processing plant of Krivy Rig; 19 – Moiseevka; 20 – Aleksandria; 21 – Andrusovka; 22 – Shevchenkovo; 23 – Chertomylyk; 24 – Balki; 25 – Kamyana Mohyla; 26 – Akkermen



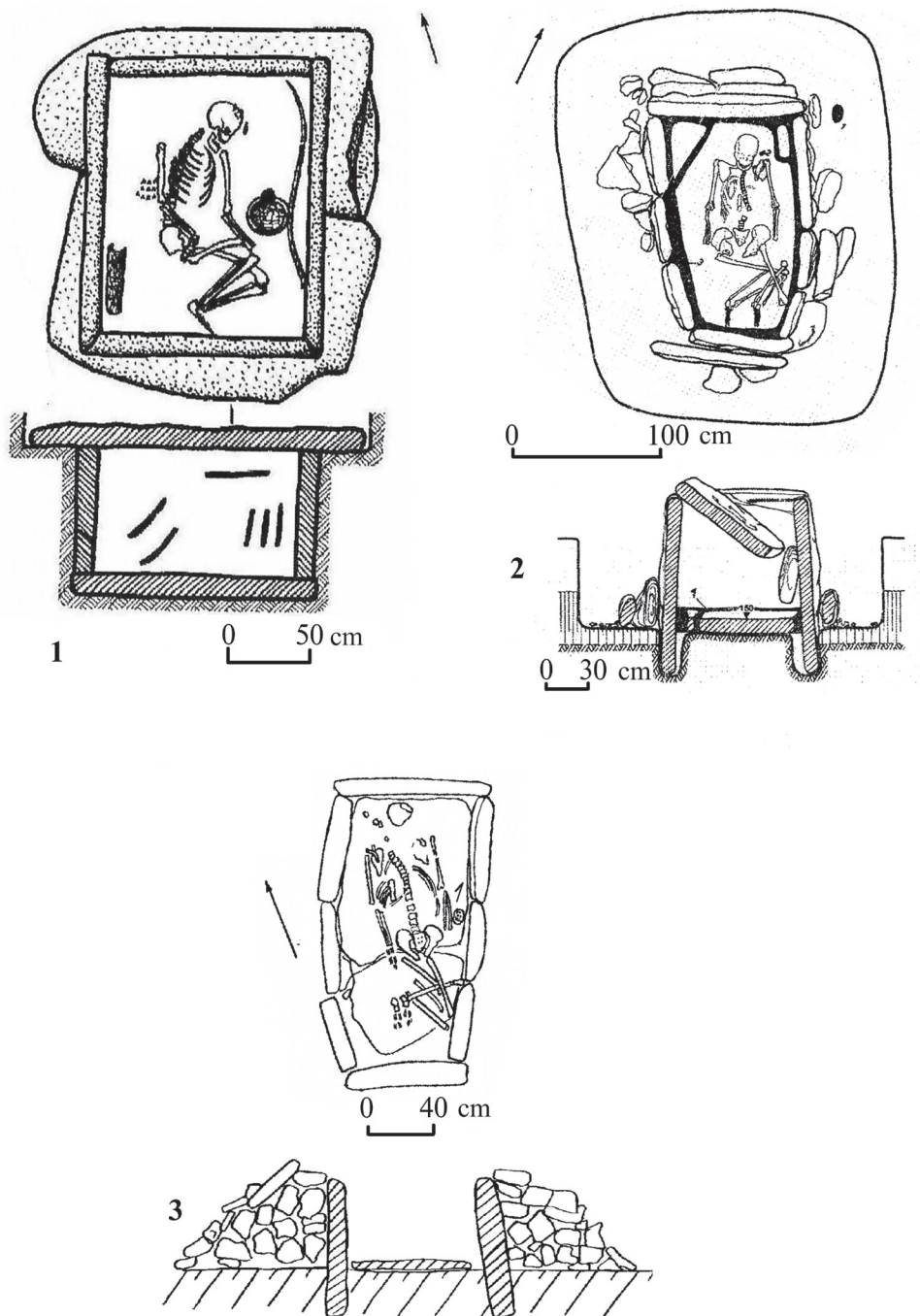


Fig. 10. Types of stone burial structures of the Yamnaya culture: 1 – Alkaliya, kurgan 33, grave 1; 2 – Tomarino, kurgan 14, grave 5; 3 – Baratovka, kurgan 1, burial 8. After Subbotin 1995; Rassamakin 1996; Rassamakin, Evdokimov 2010

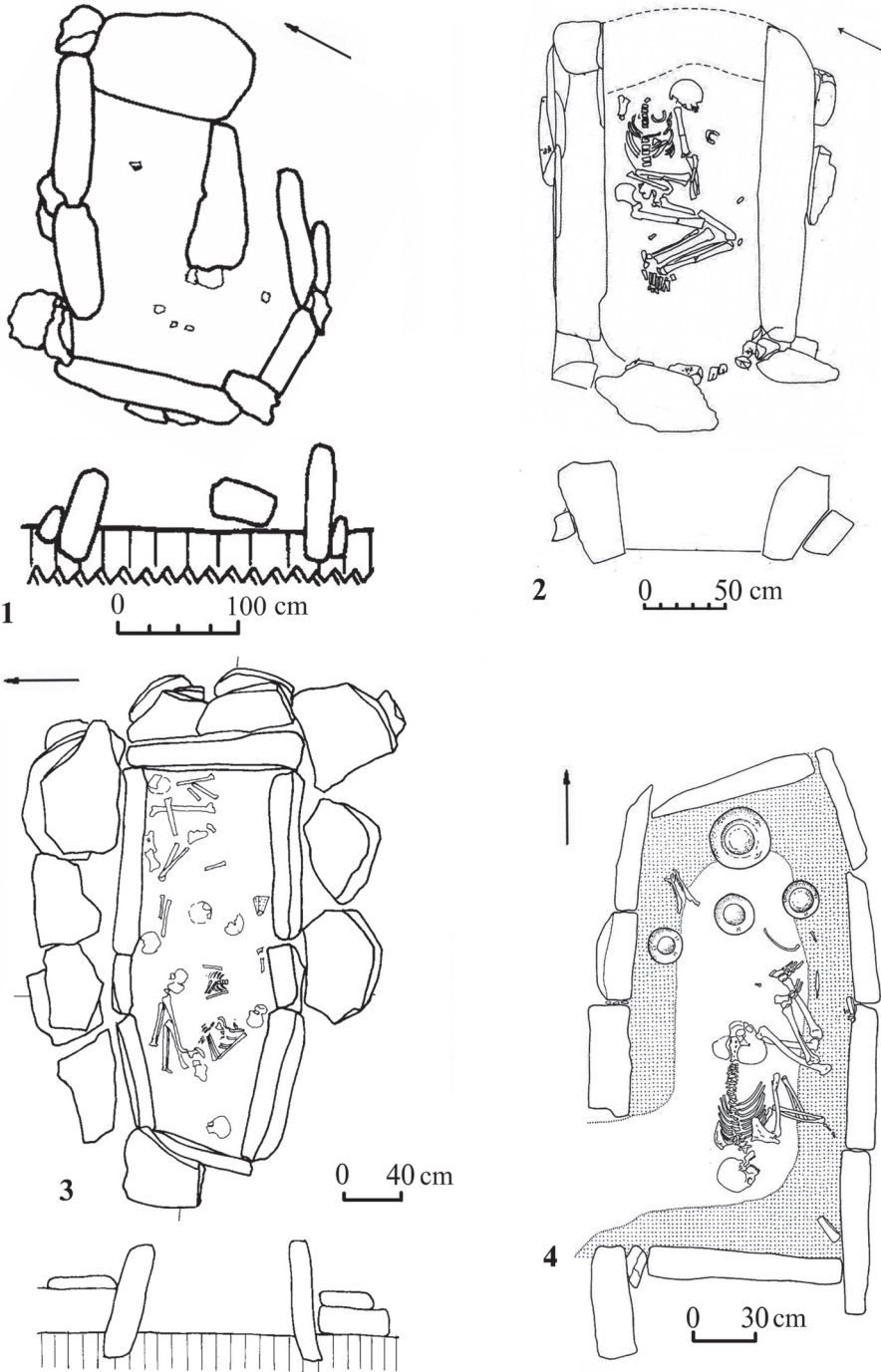


Fig. 11. Examples of stone tombs from the North Pontic area (1-3) and central group of the Globular Amphora culture (4): 1 – Akkermen 1, kurgan 11, burial 14; 2 – Kamyana Mohyla, burial 2; 3 – Baratovka, kurgan 1, burial 6; 4 – Sahryn 1. 1, 3 – after Rassamakin 2004; 4 – after Szmyt 2010

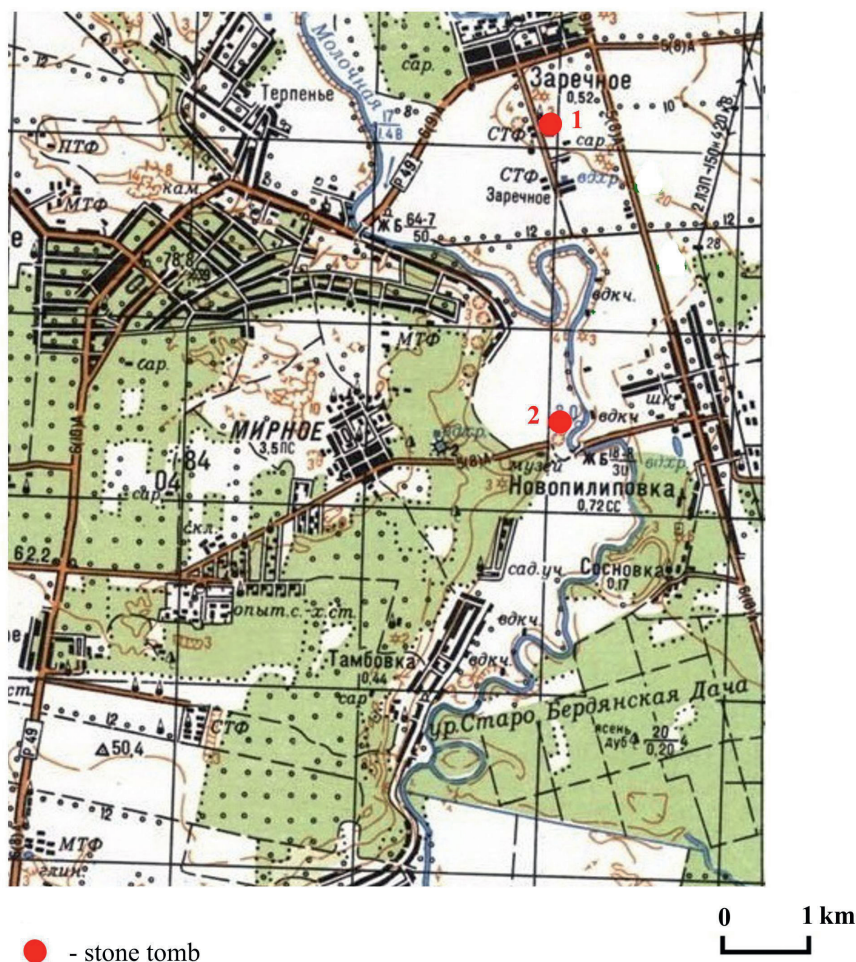


Fig. 12. Localization of the stone tombs in the vicinity of Kamiana Mohyla: 1 – Akkermen 1, kurgan 11, burial 14; 2 - Kamiana Mohyla, burial 2.

Kurgan 11, Grave 14, group Akkermen 1 was located not far from Kamiana Mohyla (Fig. 12). It was attributed by the authors of the excavations to the Yamnaya culture [Vyazmitina *et al.* 1960: 116]. The tomb was built on the original ground level under a kurgan and surrounded by a cromlech. It was rectangular and oriented southwest–northeast (Fig. 11: 1). Taking into account the seasonal deviations of the sun, it can be assumed that the tomb was oriented with its long walls along the west-east line and that it was built in August or May. Its outer slabs were covered with red ocher. It is possible that the remains of a sanctuary are associated with this tomb. Thus, the Akkermen burial is distinguished by a more complex funeral ritual and construction than the stone tomb of Kamiana Mohyla. In both cases, bones of domestic animals were present in the tomb: in Akkermen, teeth and fragments of the lower jaw of a sheep were identified, in the Kamiana

Mohyla burial – bones of cattle and a horse. An interesting feature of both stone tombs is a kind of entrance arranged in their southwestern part.

The tomb in Baratovka was constructed on the original ground level [Rassamakin 2004: 152–153]. Its western wall stood 0.30–0.40 m below the upper edge of the other walls. There was an entrance opening covered by a higher slab (Fig. 11: 3). In the tomb, six skulls and two whole skeletons were found. The skeletons were flexed on their side, painted with ocher and oriented south with their heads (?). The grave goods included a piece of ocher in the form of a truncated pyramid.

Rassamakin attributes the Baratovka and Akkermen burials to the Late Eneolithic [Rassamakin 2004]. Szmyt considers them a result of the Globular Amphora culture influence [Szmyt 2010: 148–150]. We support her idea and trace some elements of the Kamyana Mohyla tomb to the Globular Amphora culture. For example, the entrance with an unfolded slab in the Kamyana Mohyla tomb finds an analogy in burial Sahryn 1 in southeastern Poland (Fig. 11: 4). However, while the three tombs from the steppe Ukraine have long-wall orientation along the east-west line, taking into account the seasonal deviations of the sun, the Sahryn 1 tomb was oriented with its long sides along the north-south line. The entrance to it, however, was located in the southwestern part, like in the tombs in Akkermen and Kamyana Mohyla. The entrance to the Baratovska tomb was from the west.

Owing to the available radiocarbon dates, our excavations near Kamyana Mohyla show a clear sequence of complexes: the burial in the tomb was deposited earlier (about 2831–2675 BC) than the ritual complex with a typical Yamnaya pot (2554–2478 BC) was used. The stratigraphic position of the other two tombs from the steppe Ukraine also indicates that they were constructed in the first half of the 3rd millennium BC. Consequently, in Kurgan 11 of the Akkermen group, the tomb of Grave 14 preceded the Yamnaya burials. In the Baratovka kurgan, the stone tomb in Grave 6 was built later than Grave 17, dated by Serezlievka type figurines to the end of the 4th millennium BC, but preceded the Yamnaya burials, including Grave 8 in a stone cist [Rassamakin 2004: 176]. Thus, all the three stone tombs, which closely resemble the authentic Globular Amphora burial structures, appeared in the steppe Ukraine around 2850–2670 BC.

The infiltration by Globular Amphora people into the Western Bug basin and the formation of the eastern group of this culture took place around 3000–2950 BC. Its stable contacts with the Yamnaya culture are recorded after 2700 BC [Szmyt 2010: 203–205]. These contacts are observable in ceramic imports and imitations and are confirmed by imported stone items [Iwanowa *et al.* 2014]. Perhaps the stone tombs from Kamyana Mohyla, Akkermen and Baratovka record the first penetration of the steppe by Globular Amphora people, and it is the representatives of this culture or their direct descendants that were buried in them. Further study of ancient DNA may clarify this issue.

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