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BARROWS IN THE FOREST-STEPPE BETWEEN THE DNISTER AND SOUTHERN BUG, UKRAINE. INITIAL RESULTS OF COMPREHENSIVE RESEARCH

ABSTRACT

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The article presents the preliminary results of research by a Polish-Ukrainian team who in 2018-2023 worked on the project of comprehensive exploration of barrows situated in the forest-steppe between the Southern Bug and Dnister in modern Ukraine. There, two major stages of erecting and using barrows were distinguished for the 3rd and 1st millennia BC. Two barrows discussed herein, explored as part of the project, were erected in the second stage. Barrow 3 in Ivanivtsi-Antonivka can be dated to the second half of the 10th – first half of the 8th century BC, whereas Barrow 6 in Sloboda Noskovetska to the late 8th – early 7th century BC. The older one was erected and then used by communities related to the early period of the Chornolis culture. The younger one is at present one of the main pre-Scythian complexes of eastern Podillia. The multi-component set of artefacts deposited under its mound represents a mixture of the Chornolis culture, Basarabi-Şoldăneşti influences and the impact of early steppe nomads (Kimmerians?). This well illustrates the complex cultural mosaic found in the forest-steppe between the Southern Bug and Dnister rivers.

Keywords: barrows, Eastern Podillia, 1st millennium BC, Chornolis culture, Basarabi-Şoldăneşti culture, early nomads impact

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1. INTRODUCTION

The barrows in the forest-steppe between the upper Southern Bug and Dnister were explored by a Polish-Ukrainian archaeological expedition under agreements between the Institute of Archaeology, National Academy of Sciences of Ukraine, Kyiv, and the Adam Mickiewicz University, Poznań, Poland, and the Archaeological Museum in Poznań (Rud *et al*. 2020; Przybyła *et al*. 2021). On the Ukrainian part, fieldwork was led by Vitalii Rud and scientific expertise was provided by Yurii Boltryk. On the Polish part, the project was headed by Marzena Szmyt and Piotr Włodarczak.

The purpose of the joint project was to research the form and intensity of intercultural contacts in the forest-steppe between the upper Southern Buh and middle Dni ester (Fig. 1: A).

For detailed exploration, an area on the upper reaches of the Murafa (a left tributary of the Dnister) and Riv (a right tributary of the Southern Bug) was selected in the Zhmerynka and Bar territorial communities of the Zhmerynka *raion*, Vinnytsia *oblast* (Fig. 1: B-C). The study area lies where the Dnister and Southern Bug flow close to each other and is dissected by the tributaries of the two great rivers (Fig. 2) that may have provided convenient transportation routes in prehistoric times. It is thus part of the wider issue of routes between the Baltic and the Black Sea (Kośko and Klochko eds 2009). Hence, a working hypothesis was adopted that the study area had served as a communication hub in the past, probably at least since the 3rd millennium BC. As such it must have witnessed multilateral cultural contacts and the merging of influences by various cultural units from the

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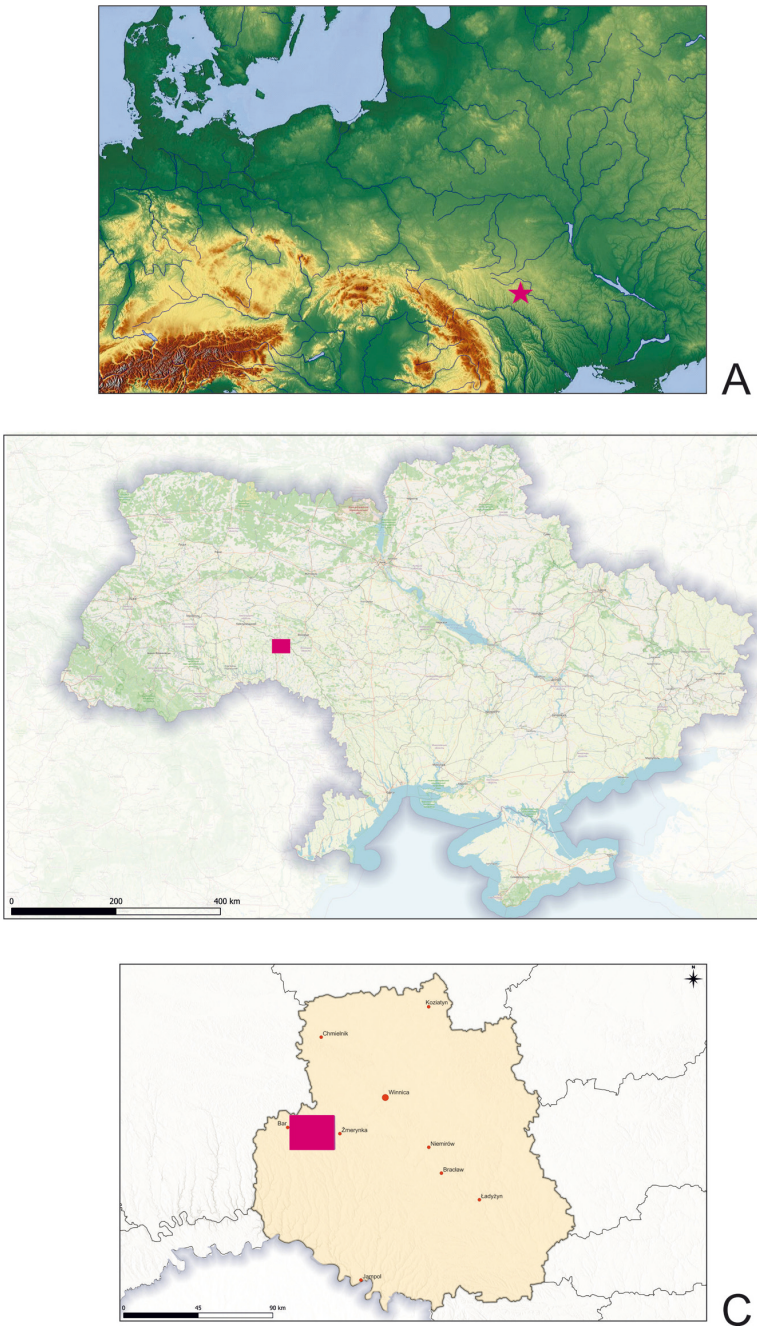


Fig. 1. Location of the study area: A – in the European context; B – in Ukraine; C – in Vinnytsia *oblast*. Prepared by M. Ławniczak and M. Szmyt

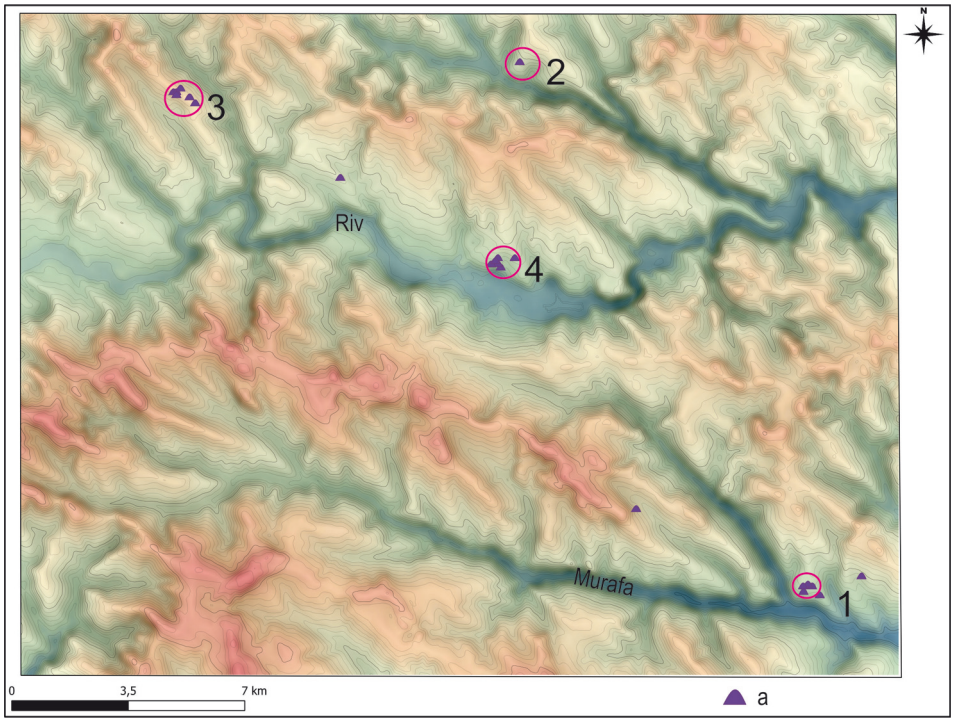


Fig. 2. Location of barrows in the study area. Prepared by M. Ławniczak
Key: a – barrow; 1 – group of barrows in Sloboda Noskovetska; 2 – barrow in Sloboda Mezhyrivska; 3 – group of barrows in Ivanivtsi-Antonivka; 4 – group of barrows in Tokarivka

East-European forest-steppe and steppe. It was further assumed that the exploration of barrows, which are the most numerous relics there of human activity from the 3rd to 1st millennium BC, would yield some material evidence of such contacts.

2. STATE OF RESEARCH

Barrows on the Murafa and Riv rivers were explored first in the late 19th century. In 1886 and 1889, two such features in the village of Tokarivka were excavated, exposing stone grave structures in them that held flint or stone axes (Sitsinskyi 1901, 27). However, the absence of any maps, plans or relics prevents the location of the two barrows and the verification of observations made by their explorer. The cited publication also mentions barrows close to other villages in the vicinity of Bar such as Ivanivtsi, Luka Barska or Mizhlissia as well as in the vicinity of Zhmerynka such as Severynivka, Somaky, Noskivtsi, Sloboda Noskovetska, Stanislavchyk (Sitsinskyi 1901).

In later archaeological literature, Yu. Sitsinskyi's work was rarely mentioned and when it was it was treated as controversial. For instance in the opinion of some authors, the presence of flint axes was argued for a connection of both graves directly to the Globular Amphora culture (Sulimirski 1968, 177; Sveshnikov 1983, 54). However, it is more likely that the barrows and the graves found in them may have been associated with communities of the Yamna culture that adapted selected elements of the Globular Amphora culture, as evidenced by a series of other sites from the Ukrainian forest-steppe (Szmyt 2013; 2021, here more references). With this interpretation, the barrows at Tokarivka may be the northernmost or northwesternmost relics of the Yamna culture in Podillia.

It is worth mentioning that in 1901 a flat stone grave was discovered by accident near the village of Tartak, close to Zhmerynka (Sitsinskyi 1927, 44, 45, fig. 28). A rectangular stone cist held two skeletons, one had its head pointing east and the other to the west. At the head of the first deceased, two ceramic vessels were placed, while at the head of the other there was one. The last-mentioned vessel, still kept in the Vinnytsia Regional Museum (Potupchyk *et al.* 2018, 143), strongly argues for attributing the grave to the Globular Amphora culture.

After Yu. Sitsinskyi's work, the barrows on the Murafa and Riv did not attract any attention from archaeologists for a long time. This happened even though barrow exploration was occasionally carried out on the eastern (left) side of the Southern Bug (*e.g.,* Lobai 1977; Zaec 1979; Salo *et al.* 2018). Only in the 21st century did Mykhailo Potupchyk from the Cultural Heritage Protection Sector, Regional State Administration, Vinnytsia, undertake the systematic recording the barrows between Zhmerynka and Bar. In the early 2010s, barrows in the vicinity of the village of Severynivka were verified with existing records in the course of exploration of the surroundings of a fortified settlement from the Scythian times. The exploration was headed by Y. Boltryk and M. Ignaczak (Boltryk and Ignaczak eds 2016). In 2011, these barrows were also identified by V. Rud and V. Kosakivskyi, while barrows from Ivanivtsi-Antonivka were explored in 2012 by a local historian V. Paziuk and V. Rud (Przybyła *et al.* 2021, 331).

Two conclusions can be drawn from the works cited. Firstly, despite its still poor archaeological exploration, at least two stages of barrow building and use can be expected in the study area. One is placed in the 3rd millennium BC, comprising features hypothetically related to the Yamna culture and another in the 1st millennium BC, grouping features hypothetically dated to the Scythian times. Secondly, it is unclear what local relations subsisted in the 3rd millennium BC between hypothetical 'barrow-building' communities on the Murafa and Riv, and Globular Amphora populations. The occurence of Globular Amphora culture communities on the upper Southern Bug, including the Riv, is evidenced by several finds (Szmyt *et al.* 2021, 283). Moreover, from elsewhere in the forest-steppe, we know of barrows testifying not only to the contemporaneity of the Globular Amphora and 'barrow' communities, but also close contacts between them (Szmyt 2013; 2021).

3. THE PROGRAMME OF BARROW EXPLORATION IN THE FOREST-STEPPE ON THE MURAFA AND RIV (2018-2023)

The state of the research described above was before the inception of a comprehensive research programme, implementing the project "Podolia as a contact area in the third millennium BC: Kurgans on the rivers Murafa and Riv", financed by the National Science Centre, Poland, under no. 2017/27/B/HS3/01444. It was developed using experience gathered while carrying out other important research programmes into 'barrow-building' societies in cooperation between Poland and Ukraine in the 21st century. Two deserve a special mention: a programme of barrow exploration in the forest-steppe and on the middle Dnister (The Yampil Project: Kośko ed. 2015; 2017) and another focused on the upper Dnister (The Bukivna and Catalogue projects: Makarowicz *et al.* 2021; see also Makarowicz *et al.* 2017).

The Murafa and Riv programme posed a number of research questions concerning:

– identification of local barrow stratigraphy,

– determination of the beginning of 'barrow architecture' in the study area,

– construction of a local sequence of graves dated to the Bronze and Iron Ages,

– procurement of chronometric data for as many graves as possible,

– determination of local peculiarities of grave forms and grave goods,

– description of the natural environment when barrows were erected and used,

– determination of the bio-archaeological and genetic characteristics of the deceased interred in graves covered by barrows or placed in their mounds.

The programme was planned in three major stages of which two consisted of fieldwork, while the third provided for indoor and laboratory studies. In the first stage, non-invasive investigations were to be performed such as surface surveys and magnetic examinations of barrows situated in the study area (Rud *et al.* 2020; Przybyła *et al.* 2021). In the second stage, four barrows were to be thoroughly explored: no. 6 in Sloboda Noskovetska (Murafa drainage basin), no. 3 in Ivanivtsi-Antonivka (Riv drainage basin) and nos 2 and 3 in Tokarivka (Riv drainage basin). The third stage, running partly in parallel to the second, focused on a multidisciplinary study of all retrieved sources: artefacts and ecofacts.

The research programme started to be implemented in 2019, but alas unforeseeable and insurmountable obstacles limited, impeded, delayed, and in part simply prevented, the full performance of tasks planned. Firstly, in 2020, measures related to the COVID-19 pandemic disrupted work. This was followed by the devastating effects of the war waged by Russia against Ukraine since 24 February 2022. Nonetheless, the results obtained so far have shed new light on the prehistory of the forest-steppe fragment under investigation.

4. NATURAL ENVIRONMENT

The study area is situated southwest of Vinnytsia and west of Zhmerynka. In terms of geology, it lies on the East-European Platform (Ukrainian Shield), while as far as the geomorphologic division is concerned, it is part of the Volyn-Podillia Plate known as the Zhmerynka-Shargorod Plain. This is an erosion-accumulation plain covered by loess and dissected by river valleys. In terms of geobotanical classification, the study area is included in the forest-steppe zone (Struk 1993), although it straddles the boundary between deciduous forests – of the Podillia-Besarabia Subprovince – and the forest-steppe of the Podillia-Dnister Subprovince (Fig. 3: A). Its soil cover (Fig. 3: B) is composed mostly of grey and light-grey podzolized chernozem developed on clay and loess, designated as gley soils (Jones *et al.* 2005).

5. NON-INVASIVE INVESTIGATIONS

Two non-invasive investigation methods were used: field survey and geophysical prospection.

5.1. Field survey

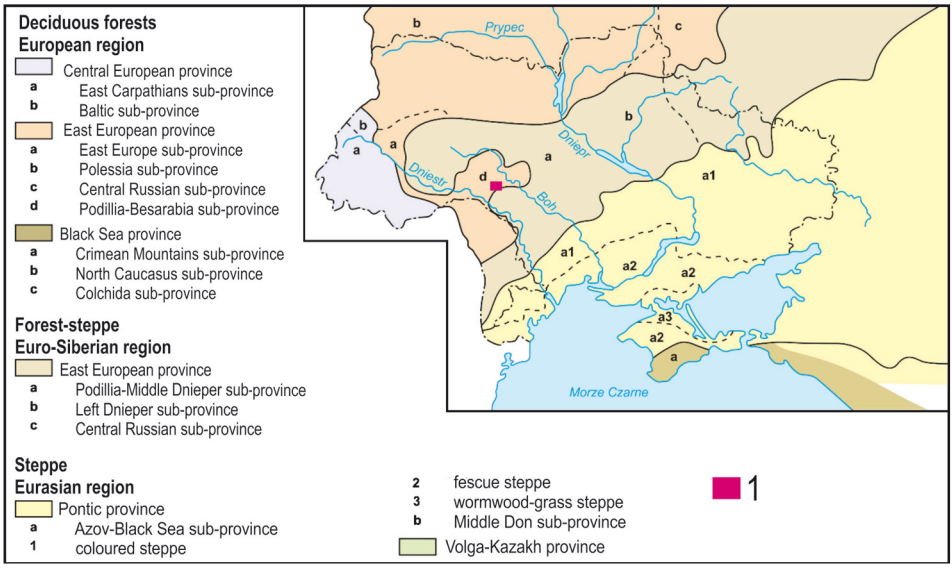
In 2019, verification field surveys covered the entire study area, focusing on the state of preservation of the barrows on record kept by M. Potupchyk of Vinnytsia. Only in the vicinity of Ivanivtsi-Antonivka were they supplemented with information collected by the local historian V. Paziuk.

As a result of the survey, four sites were selected for geophysical investigation in which single barrows or barrow groups were located in the fields of the following villages (Fig. 2): Sloboda Noskovetska (four barrows), Sloboda Mezhyrivska (one barrow), Ivanivtsi-Antonivka (six barrows), Tokarivka (four barrows).

5.2. Geophysical prospection

For geophysical prospection, the magnetic method was chosen, which allows for surveying large areas in a reasonably short time. It allows for relatively complete and quick exploration of archaeological sites (*cf.* Misiewicz 2006; Smekalova *et al.* 2008; Fassbinder 2015). Its shortcoming, though, is a rather small penetration depth only slightly exceeding 1.0 m (David *et al.* 2008, 16).

On the selected sites, magnetic measurements were made with a transductor (fluxgate) magnetometer, 4.032 DLG Foerster Ferrex, with two sensors placed 0.5 m apart (only in Tokarivka, Barrows 1, 2 and 4) or 1.0 m apart (in all the other cases) of a resolution of 0.2 nT.



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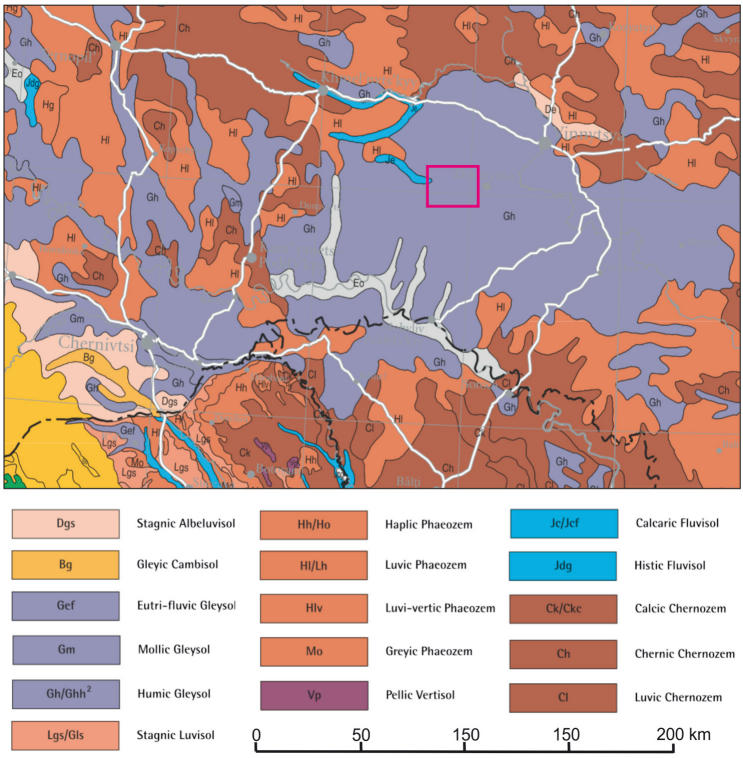

B

Fig. 3. A. Study area against the background of: A – geobotanical division of Ukraine (after Struk 1993); B – soil cover of Ukraine (Jones *et al.* 2005)

Measurements were made along lines every 10 cm in a two-way fashion. The results are presented on magnetic maps developed under Terra Surveyor 3.0.29.3.

The surveys, conducted in 2019 and 2021, covered the barrows and their immediate surroundings within a radius of 5-10 m from a mound edge. On all the sites, bedrock consisted of loess on which chernozem had developed. Overall, in Sloboda Noskovetska, 1.86 ha with four barrows were investigated (Fig. 4: A), in Ivanivtsi-Antonivka – 3.19 ha with six barrows (Fig. 4: B), in Sloboda Mezhyrivska – 1.0 ha with one barrow (Fig. 5: A) and in Tokarivka – 3.6 ha with seven barrows (Fig. 5: B). It should be noted that Barrow 4 in Tokarivka was surveyed twice (in 2019 and 2021) because in the first season prospection was hampered by a standing crop (sunflowers).

In most cases, anomalies were registered that could be interpreted as consequences of various activities connected to the erection and use of the barrows. The anomalies were of the following types: (a) positive linear circle-shaped; (b) positive spot; (c) positive longitudinal; (d) dipolar; (e) zones of raised magnetic susceptibility. In addition, anomalies located outside barrows (f) were captured as well.

a. Positive linear circle-shaped anomalies, sometimes irregular, were distinctly recorded in Sloboda Noskovetska, Barrows 6 and Barrow S, Ivanivtsi-Antonivka, Barrows 1, 2 and 3, Sloboda Mezhirivska, Barrow 1, and Tokarivka, Barrows 1 and 4.They encircled the mound, testifying most likely to an annular ditch. Their diameters varied from 20 to 30 m.

A few weaker positive linear circle-shaped anomalies were also recorded, with some being discontinuous. They were registered in Ivanivtsi-Antonivka, Barrows 5 and 6, and Tokarivka, Barrow 3. In the latter case, a weak positive linear anomaly could be seen around the mound, having a diameter of about 30 m. By reason of its low value and boundary indistinctiveness, it is likely that it was caused by the erosive accumulation of humus, a more strongly magnetic material, at the base of the barrow mound (Makarowicz *et al.* 2017, 67-69).

b. Positive spot anomalies, potentially related to archaeological features, were many and variously placed within mounds.

Special attention is due to positive anomalies in mound centres, potentially indicating main grave chambers. They were registered in Ivanivtsi-Antonivka, Barrows 1, 2 and 3, Sloboda Mezhyrivska, Barrow 1 and Tokarivka, Barrows 2, 3 and 4. In Ivanivtsi-Antonivka, Barrow 1, in the mound centre, a group of positive anomalies could be seen, arranged in a regular rectangle, oriented W-E. In Tokarivka, Barrows 3 and 4, and Sloboda Mezhyrivska, Barrow 1, in mound centres, positive spot anomalies were registered whose high value indicated some baked material in a feature (or features). A hypothesis about accumulated intensively baked material can also be advanced with respect to Tokarivka, Barrow 2. However, this is a somewhat different case: the anomaly is of a relatively low value, but of a large size. Moreover, in the centre of the same mound, there are three more positive spot anomalies, indicating such features as pits or intrusive digging.

Fig. 4. Results of magnetic surveys:
A – Sloboda Noskovetska, Barrow 6, N, E, and S; B – Ivanivtsi-Antonivka, Barrows 1-6.
Prepared by M. M. Przybyła

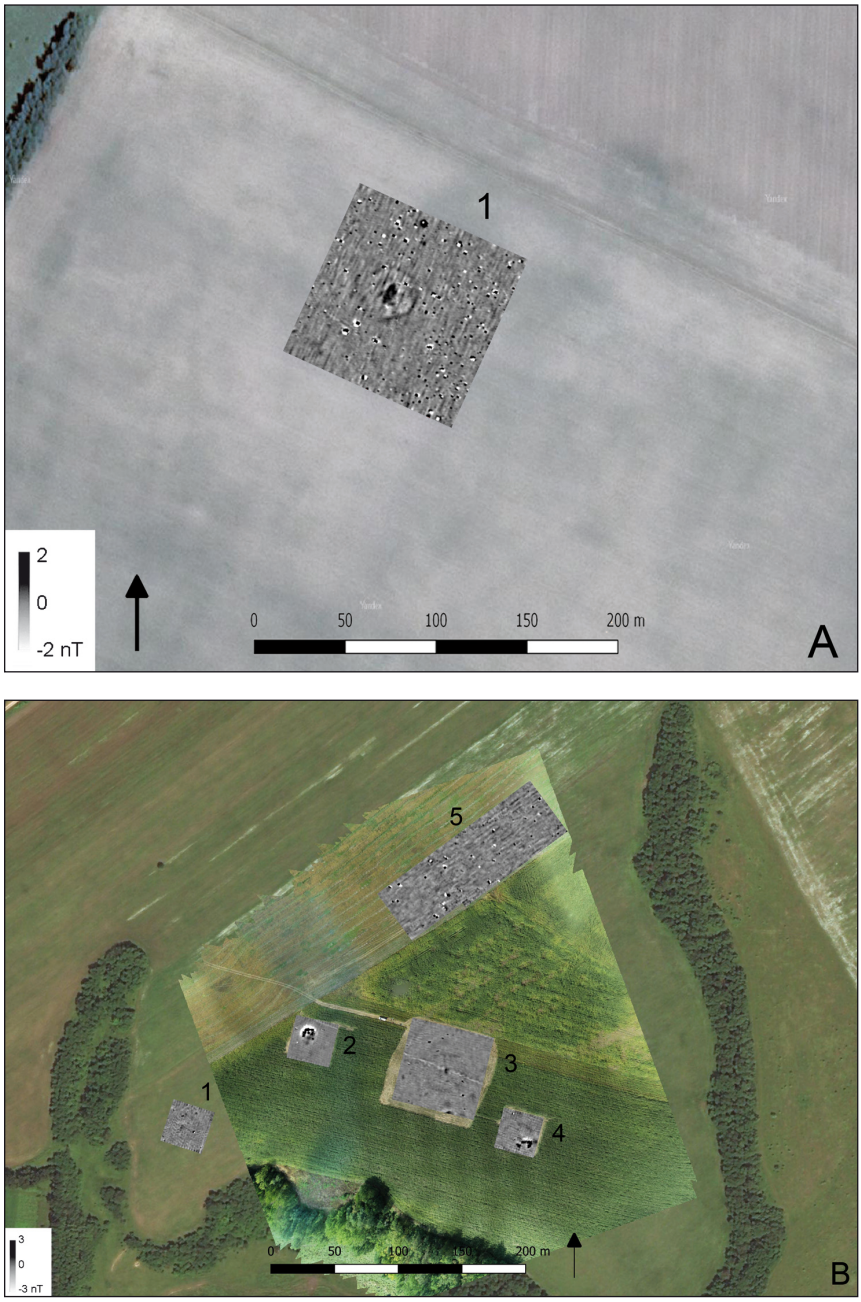

Fig. 5. Results of magnetic surveys:
A – Sloboda Mezhyrivska, Barrow 1; B – Tokarivka, Barrows 1-5 (Barrows 6 and 7 are located outside the photo). Prepared by M. M. Przybyła

Positive spot anomalies were also registered beyond mound centres, for instance in Sloboda Noskovetska, Barrow 6, where their high values may indicate burnt or overheated objects. A group of positive spot anomalies was also found in the eastern portion of Barrow 1 in Ivanivtsi-Antonivka. Most collided with a linear anomaly (annular, possibly related to a ditch surrounding the mound). These anomalies were caused by such features as pits or hearths; they may also be a sign of burials dug into the mound.

c. Two positive longitudinal anomalies were observed in the southwestern portion of Barrow 3 in Ivanivtsi-Antonivka. It cannot be ruled out that they may be related to graves dug into the mound. In Sloboda Noskovetska, Barrow E, two positive linear anomalies appeared on a magnetogram, of which one co-occurred with a linear arrangement of positive spot anomalies. It is hard to tell if they have any connection with the barrow.

d. Many dipolar anomalies connected with modern-day iron objects were registered in Sloboda Noskovetska, Barrow 6. A rather large dipolar anomaly of a relatively low value was revealed in the mound centre, Sloboda Noskovetska, Barrow S. It may have been caused by an iron object, but its position in the mound centre suggested a connection to the central burial, containing a relatively strongly overheated object. In turn, in Tokarivka, Barrow 4, a cluster of such anomalies was found in the southern portion of the mound. They may have been related to the accumulation of overheated material, as was also the case in Tokarivka, Barrow 2. In the latter case, in the centre of the mound, a strong dipolar anomaly could be seen, measuring about 15 cm in diameter. When viewed from the north, it was regularly semicircular, while from the south it appeared irregular. With its rather low values and a considerable size, it appeared to be thermoremanent, *i.e.* it was caused by the presence of accumulated strongly overheated material. Most likely, it was a structure of which overheated daub was left. Similar anomalies, albeit of a different shape, are caused by the remains of Trypillia culture buildings (Pickartz *et al.* 2019).

e. In two barrows (Sloboda Noskovetska, Barrow N, Tokarivka, Barrow 6), there were distinct circular zones of slightly raised magnetic susceptibility, about 35 m and 12 m in diameter, respectively. It is likely that this is how mounds appear in magnetograms if their main component is humus. Such a zone but crescent-shaped, was also registered on the west side of Barrow 3, Tokarivka, where it could represent a borrow pit of earth used to build the mound.

f. In four cases, in the immediate surroundings of a barrow, positive spot anomalies were registered that could be caused by such features as pits or small hearths. In Sloboda Noskovetska, Barrow S, such anomalies were found especially on the north side of the mound, in Ivanivtsi-Antonivka, Barrow 6, – on the southeastern side, and in Ivanivtsi-Antonivka, Barrow 1 – on the southern side. They were also noticed in the surroundings of Barrow 1, Tokarivka, while in the western portion of the area where Barrow 5 once supposedly stood, a very weak positive linear crescentic anomaly was registered whose connection to the mound, however, was not certain.

6. EXCAVATIONS

Four structures were chosen for excavation. In 2019, Sloboda Noskovetska, Barrow 6, and Ivanivtsi-Antonivka Barrow 3 were examined, while in 2021 Tokarivka, Barrows 2 and 3 were excavated.

The processing of excavation results was considerably prolonged by the COVID-19 pandemic and above all by Russia's subsequent aggression against Ukraine. The circumstances that greatly impeded the research team's efforts included communication problems between Ukrainian and Polish project participants and the temporary unavailability of collections and laboratories, resulting in delays in sending materials for specialist analyses. Moreover, since the beginning of the hostilities, some specialists working on the material from barrows have been drafted into the army, while others have been available only part-time. However, against all these odds, the research team has been carrying out the tasks assigned to them, making it possible to present now the selected results of excavations of two of these barrows, those at Ivanivtsi-Antonivka and Sloboda Noskovetska. Both date to the second stage distinguished above of the erection and use of barrows in the forest-steppe between the Southern Bug and Dnister.

6.1. Ivanivtsi-Antonivka, Barrow 3

The explored barrow was in close proximity to three other, less visible barrows and at a greater distance (over 500 m) from two further mounds, much more distinctly marked in the landscape (Fig. 4: B).

The mound was only 40 cm high and 21 m in diameter. After analysing soil samples from its central part, it was found that the original ground level was at a depth of 30 cm, with loess subsoil below. While the lithology of the mound was dominated by the sandy fraction, samples from features had a higher content of finer fractions. The reason for the over-representation of the silty mineral fractions may have been the mineralisation processes of the organic matter that was originally present in the features. The intense mineralisation processes may also be evidenced by the light brown colour of the humus horizon of the original soil.

Several features were found (Fig. 6), though only one erecting horizon was traced in the mound: a ditch (Feature 7), the main grave (Feature 1), a side grave (Feature 4), relics of a funeral feast (Feature 6), and three irregular pits (Features 2, 3 and 5). A comparison of the features with the results of the magnetic survey confirmed that the geophysical work had predicted the presence of the ditch but not its form. In addition, the two longitudinal geophysical anomalies that collided with the ditch could be identified with Features 4 and 6. The cluster of structures in the barrow centre had not, however, produced a distinct magnetic signal.

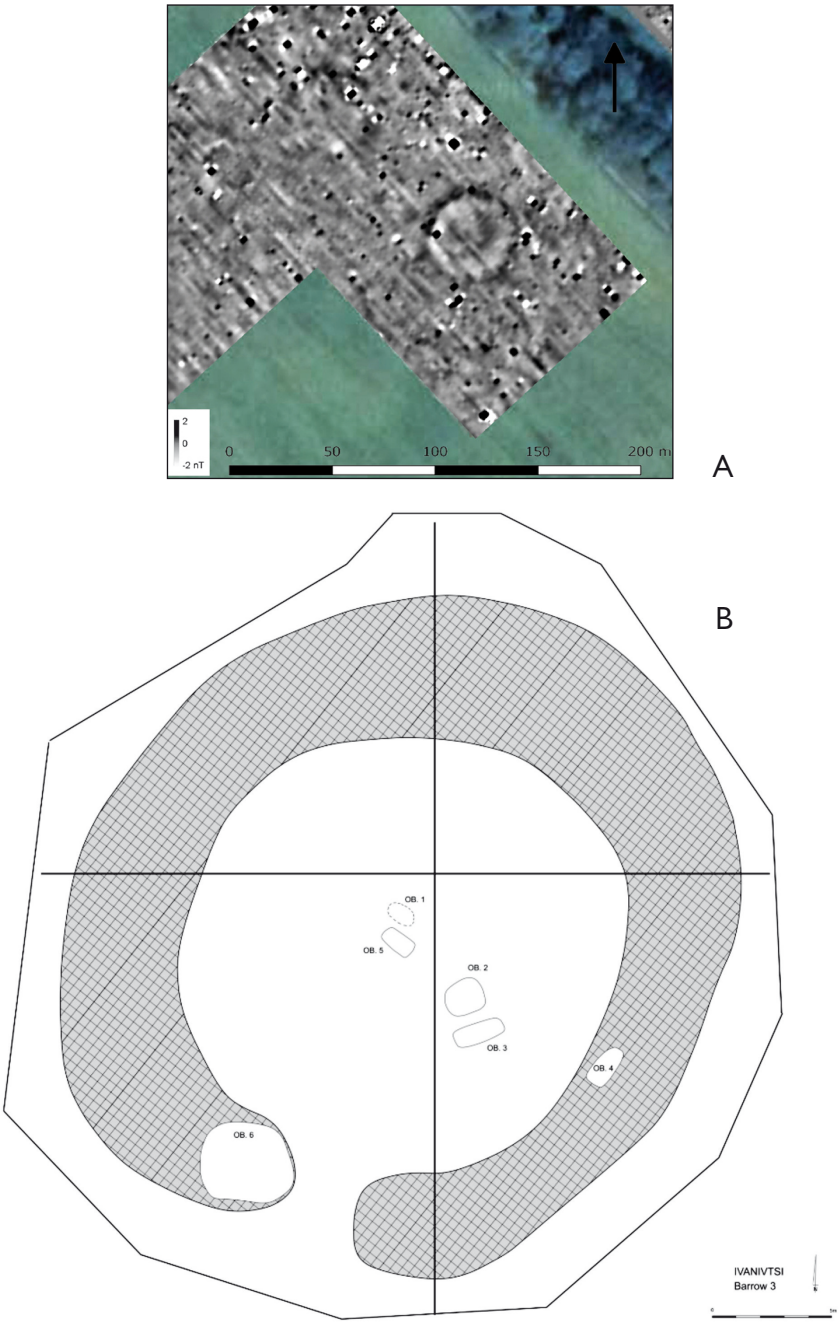

Fig. 6. Ivanivtsi-Antonivka, Barrow 3: A – results of magnetic survey; B – plan of features. Prepared by M. M. Przybyła, M. Podsiadło

In the main grave (Feature 1), that was located directly in the mound under the primary surface, the body of an individual, probably female, over 25 years old, was deposited. Only one vessel was found: a cup with an S-shaped body and high handle (Fig. 7: 2). It had a grey slightly polished surface without additional ornamentation. Similar cups were in use for quite a long period, as is shown by such Final Bronze – Early Iron Age sites as Sobkivka, Grygorivka and Severynivka (Berezanska 1964; Smirnova 1984) and Mervyntsy, Kurgan 1 (Smirnova 1977).

The ditch (Feature 7) was 25 cm deep and from 4 to 6 m wide. It had a passage in the southwestern sector and was dug out simultaneously with the main grave because in its fill scattered sherds of pottery of the same type were found as in the grave. They had a lot of crushed rock in the ceramic body.

The remnants of a funeral feast (Feature 6), including fragments of ceramic vessels and animal bones (of sheep/goats, pigs and unidentified fragments), were traced mostly to the west of the passage, however, a part of them was also found in various parts of the mound. The fragmentation of the pottery prevented any vessel reconstruction. It was only found that, as a rule, pot rims were plain or ornamented only with punctures. By contrast, many of the wall fragments were ornamented with raised bands on the body or necks (Fig. 7: 5). In some cases, the bands were additionally adorned with deep finger impressions. This assemblage of pottery fragments is similar to the finds from the Chornolis culture hillforts at Grygorivka and Subotiv (Smirnova 1983; 1984; Gershkovich 2016). Analogous pottery comes from the necropolis in Mervyntsy (Smirnova 1977).

One of the very few reconstructed vessels is an undecorated deep bowl (Fig. 7: 3). It is similar to the type of semi-globular bowls from the Sobkivka settlement of the Bilogrudivka culture (Berezanska 1964). Also, the very wide bowls of the Subotiv hillfort have the same shape. They were considered typical wares of the third horizon of this site (Gershkovich 2016).

A peripheral grave (Feature 4), detected in the south-western part of the ditch, contained the burial of an individual (possibly a female) about 50 years old. Next to the body, a cup was deposited (Fig. 7: 1). This is a poorly fired vessel with a smooth non-polished surface of various shades of grey and brown. It has an everted rim that is wider than its body, a high handle and a flat base. Its ornament is a range of stamped dots and three smooth knobs on the shoulder. The shape of this specimen resembles the Type 1 cups of the Saharna culture, e.g., in Kurgan V at Saharna I (Ţiglău) necropolis (Kashuba 2000). However, its simplified decoration and poor quality indicate the local production of this vessel.

Of the three irregular pits (Features 2, 3 and 5) that were explored under the central part of the mound, only one (Feature 2) contained artefacts – single fragments of pottery. Only a clay 'loaf' was notable. It is a poorly-fired light-orange figurine (Fig. 7: 4). Such brightly-coloured votive objects were typical of the sites of the Bilogrudivka and Chornolis cultures (Terenozhkin 1961; Berezanska 1964).

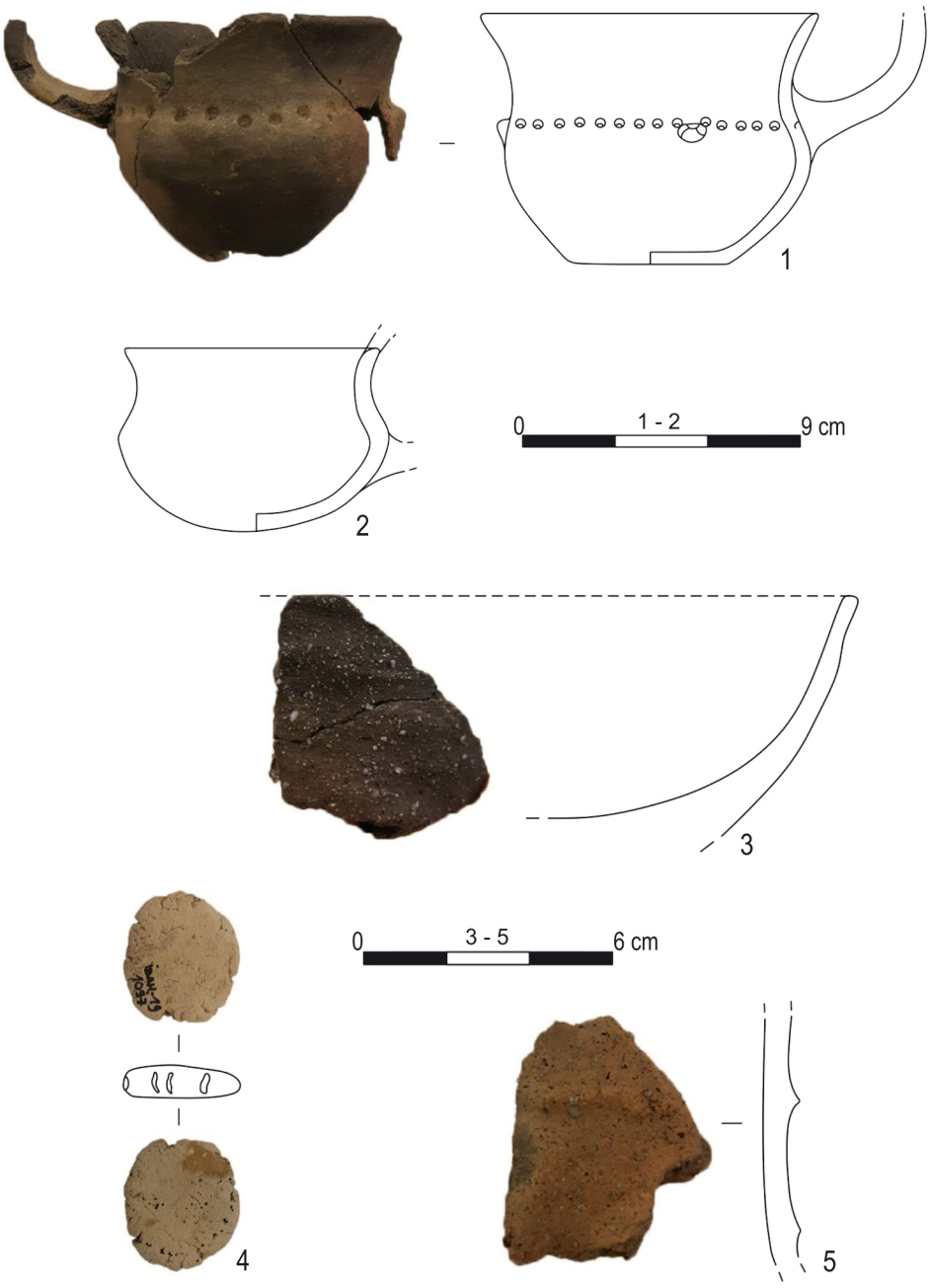

Fig. 7. Ivanivtsi-Antonivka, Barrow 3. Selected finds: 1 – from Feature 4; 2 – from Feature 1; 3, 5 – from Feature 6; 4 – from Feature 2. Prepared by V. Rud and V. Kosakivskyi

The chronological position of Barrow 3 in Ivanivtsi-Antonivka can be determined only with a certain level of probability as metal objects are absent from it. The assemblage of pottery, in turn, is quite monotonous. In it, the sherds of poorly fired kitchenware dominate. Most contain a lot of sand and large pieces of crushed rock in the ceramic body, making their surface rough and ragged. This kind of pottery is typical of the Bilogrudivka and early Chornolis cultures (Terenozhkin 1961; Berezanska 1964; Gershkovich 2016). In eastern Podillia, similar materials were found at the Sandraky settlement (Lagodovska 1954). Among burial sites, one can mention the Pechery necropolis, where a relatively numerous set of early Hallstatt adornments was retrieved together with similar vessels (Rybalova 1961).

The most notable find is a cup from the peripheral grave (Feature 4), for which an analogy has been found in the Saharna I (Ţiglău) necropolis. Since it existed from the second half of the 10th to the early 8th century BC (Kashuba 2000) and taking into account analogies for the rest of the material, it may be assumed that the barrow in question belongs to the early period of the Chornolis culture. Parallels with Bilogrudivka materials do not contradict this supposition, as their traditions continued for a long time. Based on this observation, Barrow 3 in Ivanivtsi-Antonivka can be dated to the second half of the 10th – first half of the 8th century BC.

So far, one ^{14}C AMS measurement has been obtained for the main grave (Feature 1): Poz-120856, 2395±30 BP, 729-398 BC. Unfortunately, it does not fully agree with the relative chronology suggested by the artefacts. Since no reservoir effect has been found, it is difficult to explain this inconsistency at present. It is likely that further chronometric analyses, which are in progress, will help to unravel this issue.

6.2. Sloboda Noskovetska, Barrow 6

The explored barrow was one of six scattered on the slope of the Murafa river valley. It was clearly visible in the landscape and marked with an information board by the Vinnytsia Cultural Heritage Service. Prior to the excavation, its diameter was about 35 metres and its height 1.8-2.2 metres (Fig. 8: A; 9: A).

The lithology of the barrow was established on the basis of a soil profile from its central part. This was 250 cm deep and contained 31 samples, which were analysed for sediment grain size, organic matter and calcium carbonate content. For comparison purposes, a reference profile was obtained outside the mound. Fourteen sediment samples were taken from it, reaching a depth of 70 cm. Finally, six lithofacies were identified in the barrow, originating with the building of the barrow (from a depth of 250 to 190 cm) and subsequent post-depositional processes (from a depth of 190 cm to the barrow surface). The lithological variability of the sediments may indicate either a slightly different source of soil for the construction of the barrow (from a greater distance?) or stages of raising it with soil from the surrounding ditch after it had been periodically filled with colluvial deposits.

Fig. 8. Sloboda Noskovetska, Barrow 6: A – view from the south; B – view from the drone. Photo by P. Włodarczak and M. Ławniczak

Fig. 9. Sloboda Noskovetska, Barrow 6: A – results of magnetic survey; B – plan of features. Prepared by M. M. Przybyła, M. Podsiadło

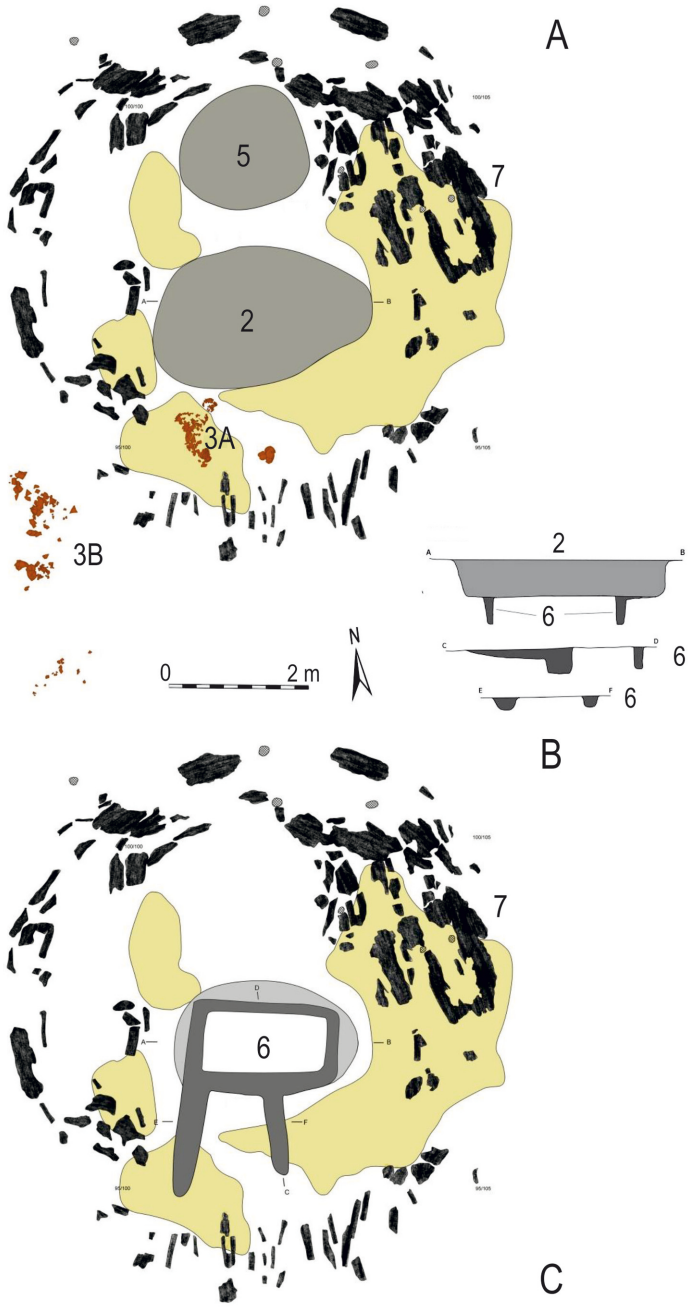

Fig. 10. Sloboda Noskovetska, Barrow 6. Plan of features in the central part of the barrow:
A – level 220 cm; B – cross-sections of features; C – level 260 cm. 2, 3A, 3B, 5, 6, 7 – numbers of features.
Prepared by M. Podsiadło

The barrow was surrounded by a shallow ditch (Feature 10) 3-5 m wide and 20-40 cm deep, filled by homogeneous grey-brown soil (Fig. 8: B; 9). This was sediment derived from the topsoil of the barrow, which had filled the ditch by natural processes.

Eight features were identified under the mound or in the mound (Fig. 9: B; 10; 11): the main grave (Feature 6) with a wooden structure (Feature 7), a peripheral grave (Feature 4), remains of a funeral feast (Features 3A and 3B), two robber pits (Features 2 and 5) and two other intrusions that seem to be datable to the modern age (Features 1 and 8). It is worth mentioning that the excavation confirmed the presence of the ditch and main grave (together with robber trenches) as well as modern intrusions that had been registered as anomalies in the magnetic survey (Fig. 9: A). It also appeared that the peripheral grave (Feature 4) was actually visible in the magnetic image, but its visibility was hampered by numerous dipolar anomalies.

The main grave (Feature 6) was almost destroyed by two robber pits (Features 2 and 5; Fig. 10: A). The original grave probably had the form of a square and two additional ditches sloping from its south side (Fig. 10: B). Possibly, the base of a wooden structure was placed in them. Only the two ditches, up to 50 cm deep, remained untouched. Single fragments of pottery (Fig. 12: 1-3) as well as a large amount of cremated bones of a human individual (male, aged 30-40 years) were found in their fills.

A thin layer of clayey dumped soil lay to the west, east and south of the main grave. The remains of a burnt oak wood structure (Feature 7) were found on this clay layer and the buried surface under the mound (Fig. 10; 11: A). Most of the burnt logs were placed in a semicircle, surrounding the grave on the east, west and north sides. Charred wooden boards formed a radial pattern in the southern sector of the mound. Additionally, seven postholes with pieces of wood inside were discovered in the northern part of the mound. All these remains show that a wooden structure made of large oak logs up to 2.5 m long was erected above the grave, which had a circular plan, and the whole structure could have taken the form of a hut or yurt.

Inside Feature 7, some artefacts were found: parts of at least nine ceramic vessels, fragments of two iron knives and a globular openwork bronze pendant that could be considered a rattle (Fig. 13: 1-3). It is highly probable that the metal and clay artefacts belonged to the furnishings of the deceased from the main grave and were relocated during the robbery.

Two clusters of fragmented pottery were found under the burned-wood layer on the dumped soil (Fig. 10: A): Feature 3A was located in the south-western part of the wooden structure, while Feature 3B lay outside the structure, in front of its south-western wall, about 2 m from the previous one. Feature 3A consisted of eight fragmented vessels (Fig. 14) and Feature 3B contained another three vessels (Fig. 13: 4-5).

Numerous artefacts, mostly pottery sherds, were found under and in the same layer with the wooden logs. Several sherds appeared to come from the same broken vessels found in the main grave and robber pits. However, many others could not be connected

Fig. 11. Sloboda Noskovetska, Barrow 6: A – wood construction (Feature 7) during exploration; B – peripheral grave (Feature 4) during exploration. Prepared by M. Podsiadło, P. Włodarczak

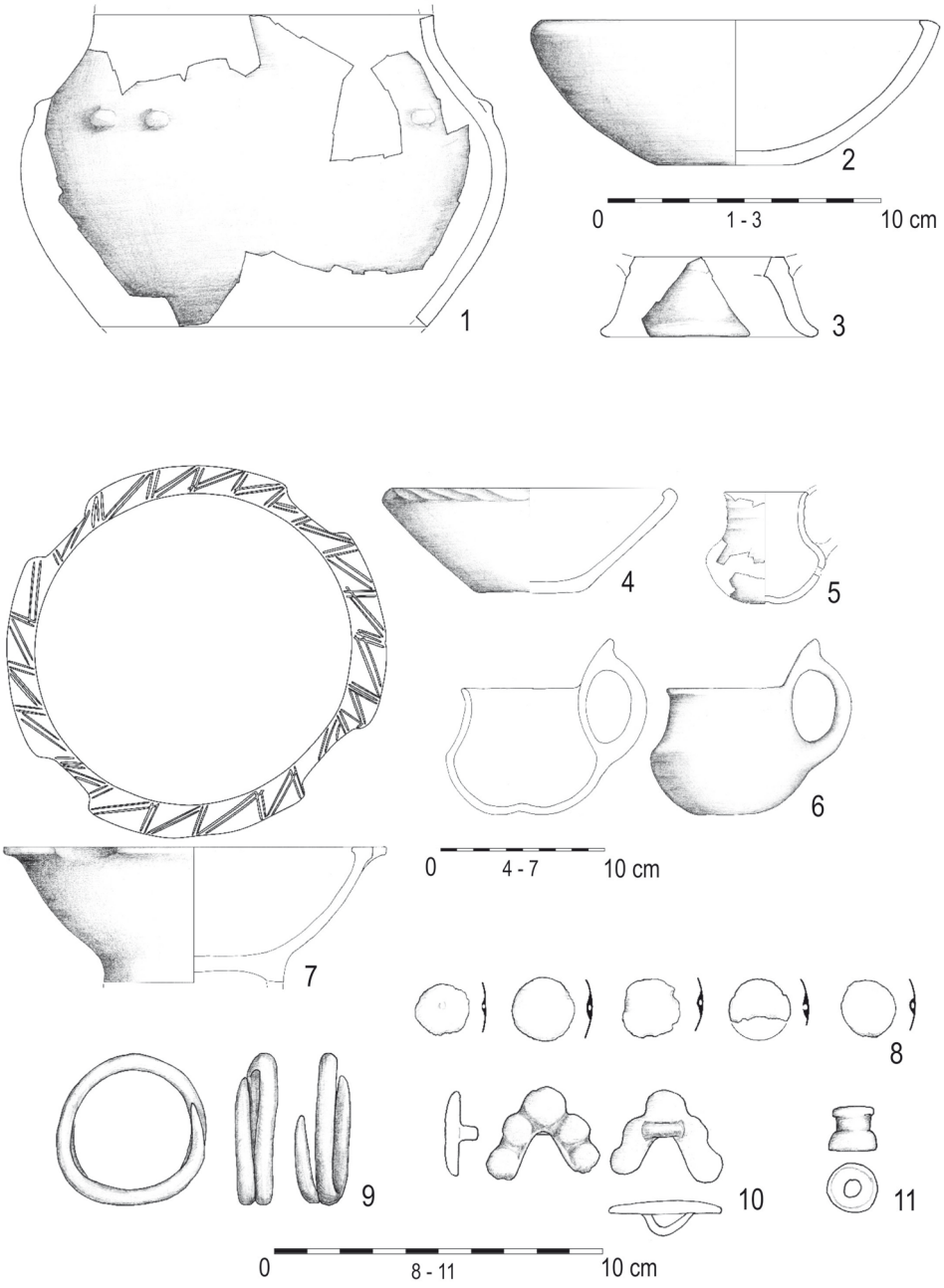

Fig. 12. Sloboda Noskovetska, Barrow 6. Selected finds:
1-3 – from the central grave (Feature 6); 4-11 – from the peripheral grave (Feature 4).
Prepared by O. Shelekhan and V. Rud

Fig. 13. Sloboda Noskovetska, Barrow 6.
Selected finds: 1-3 – from Feature 7; 4-5 – from Feature 3B.
Prepared by V. Rud and O. Pashkovskyi

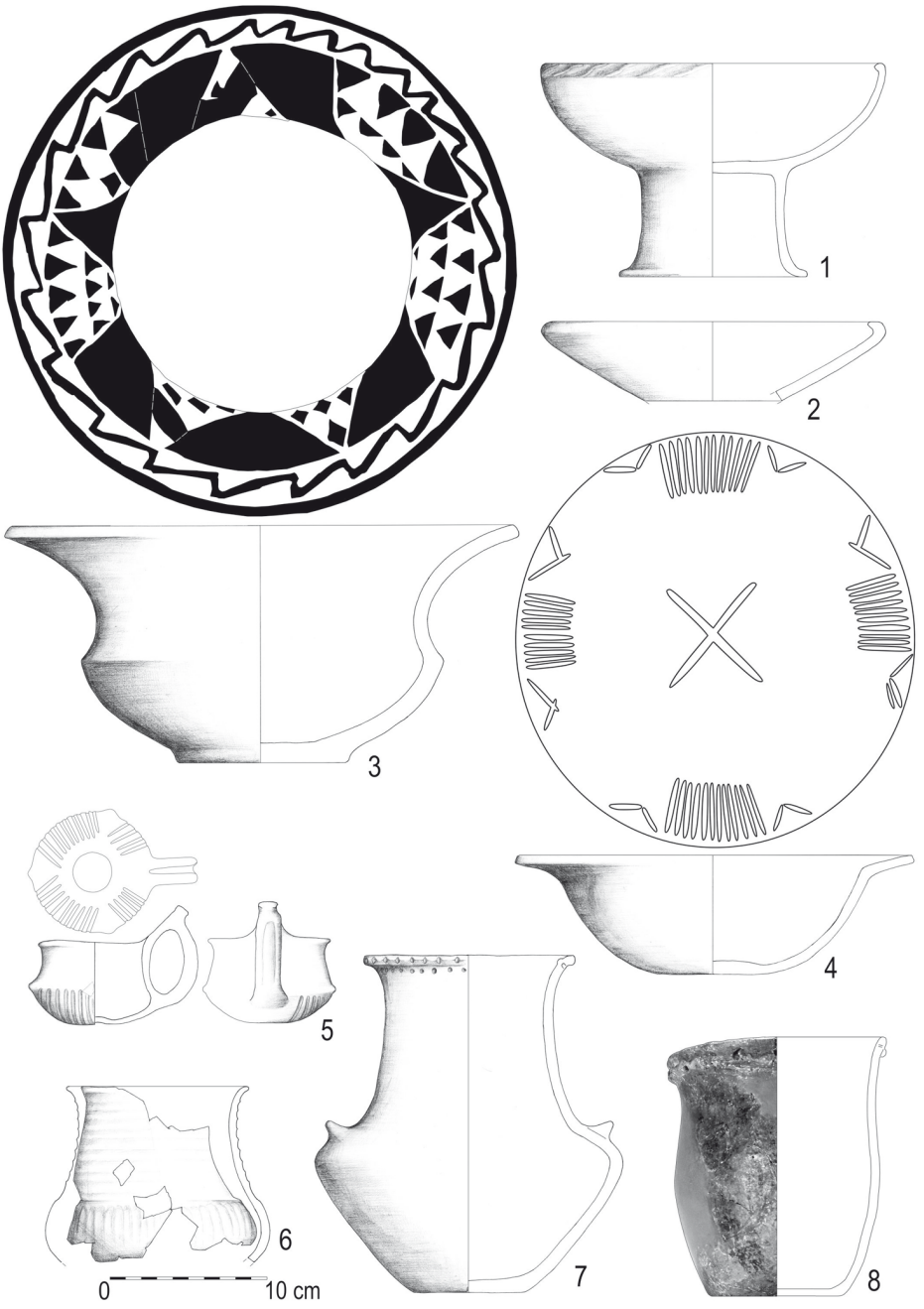

Fig. 14. Sloboda Noskovetska, Barrow 6. Selected finds from Feature 3A.
Prepared by O. Shelekhan and V. Rud

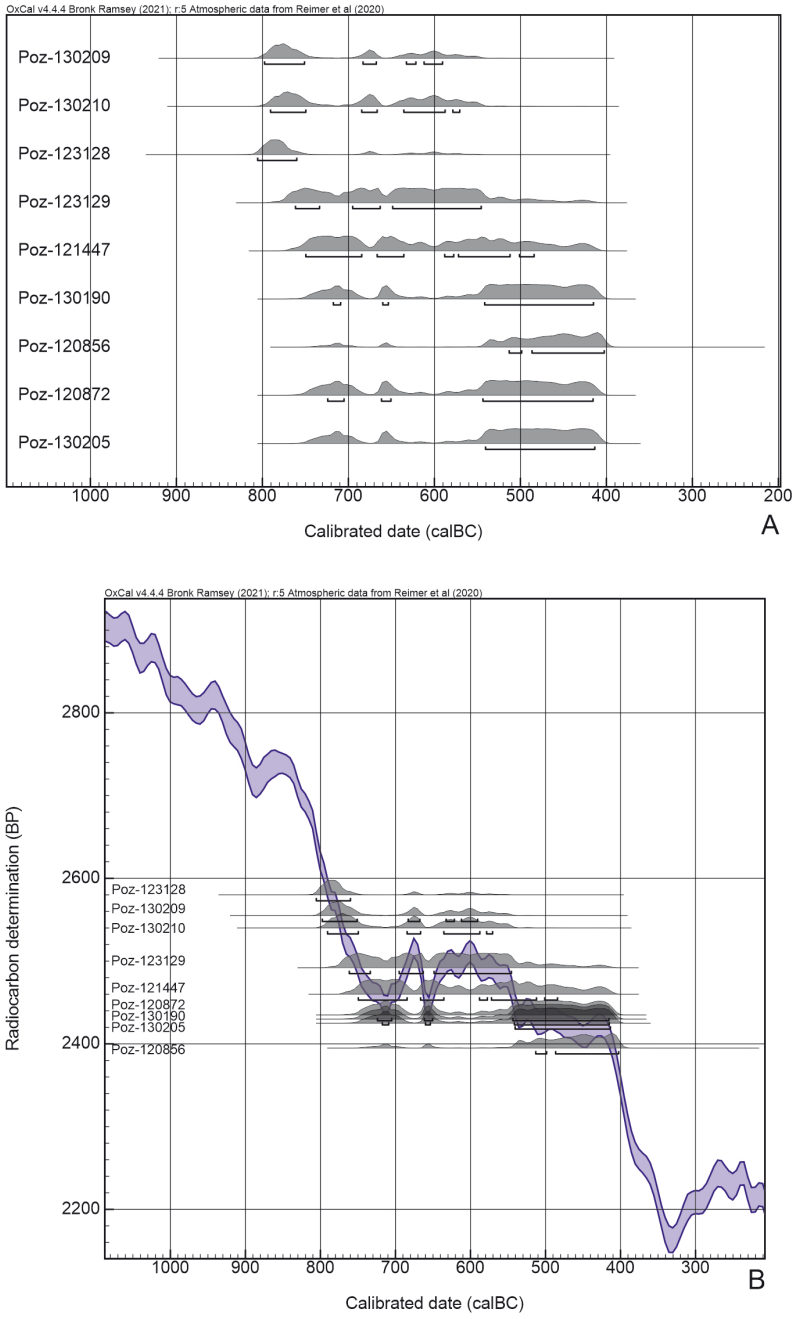

Fig. 15. Sloboda Noskovetska, Barrow 6. Radiocarbon datings for Features 4, 6 and 7. Calibration in OxCal v4.4.2 (Bronk Ramsey 2020), atmospheric data from Reimer *et al*. 2020. Prepared by M. Szmyt

with any features. Instead, the pottery from a funeral feast was probably directly covered by a layer of burnt wood. Therefore, the logs could be interpreted not as a platform, but as some standing structure that fell on the grave and relics of a funeral feast after being burnt. It is highly probable that the building of the grave, together with the wooden structure erected over it, depositing of the vessels, burning of the whole complex and erecting of the mound were all carried out within a short space of time.

Analogies in the form of similar structures can be found on the middle Dnieper in the pre-Scythian and early Scythian barrows, *e.g.,* Kvitky (Kovpanenko and Gupalo 1984), Kostantynivka (Bobrinskiy 1887, 35; Ilinskaya 1975, 30), Chervona Mohyla and Ivankovychi (Kovpanenko 1984; Bilan and Soltys 2014, 10). However, it should be noted that in the case of Sloboda Noskovetska, there are such peculiarities as, above all, massive boards up to 2.5 m long encircling the central grave along its perimeter and smaller logs radially arranged only at the southern part of the barrow (that probably mark an entrance to the wooden construction above the central grave). The central part of the wooden structure that they were once a part of could have been supported, it seems, by wooden posts fixed directly in the grave. However, due to the destruction of the grave and only partial survival of its relics, this supposition remains hypothetical.

A side burial (Feature 4) was found in the south-eastern part of the mound. It contained the non-cremated remains of a child aged 7-8 years, who lay on the buried soil in a foetal position, head pointing west (Fig. 11: B). Cremated bones of another unidentified person were deposited 20 cm above the child's feet. Four ceramic vessels and a set of bronze adornments were placed on the child's skeleton and close to it: a miniature bracelet, lunula pendant, five buttons and a bead - perhaps a figurine (Fig. 12: 4-11).

The artefacts from Barrow 6 in Sloboda Noskovetska have analogies in so-called pre-Scythian sites from the steppe and forest-steppe zones. It is highly probable that the barrow represents the last pre-Scythian period and can be dated to the late 8th – early 7th century BC. The series of radiocarbon determinations obtained from bone and wood samples (Table 1) agrees with the typo-chronological assessment, although, unfortunately, it falls within the so-called "Hallstatt plateau" (Fig. 15).

Three components could be distinguished among the materials from the Sloboda Noskovetska barrow. The first component can be linked to the local farming communities and their archaeological representation – the Chornolis culture. Most of the pottery deposited in both graves as well as that used during a funerary feast, belong to this unit. There are, for instance, bowls with a cylindrical base and relief decoration on the rim, tulip-shaped and barrel-shaped pots ornamented with punctures and raised bands, non-ornamented bowls with rounded bodies, S-shaped cups with high handles, *etc.* (*cf.* Smirnova 1982; 1983; 1986; Krushelnytska 1998; Shelekhan and Lifantii 2021). As for the late 8th century BC, simple metal tools, such as iron knives can also be considered a local element (Melyukova 1989; Smirnova *et al.* 2018).

Table 1. Barrows in Ivanivtsi-Antonivka and Sloboda Noskovetska. Radiocarbon datings performed in the Poznań Radiocarbon Laboratory. Calibration in OxCal v4.4.4 (Bronk Ramsey 2020); IntCal13 atmospheric curve (Reimer *et al.* 2020)

Sample signature	Barrow and feature	Material	Lab. no.	^{14}C BP	Cal BC (68,2%)	Cal BC (95,4%)	Comment
Ivanivtsi 1	Ivanivtsi-Antonivka 3, feature 1	human bone	Poz-120856	2395±30 BP	507BC (4.0%) 501 BC 490BC (64.2%) 404 BC	729 BC (6.0%) 693 BC 658 BC (0.7%) 653 BC 543 BC (88.7%) 398 BC	4.0%N 11.0%C, 10.6%coll
Sloboda 1	Sloboda Noskovetska 6, feature 4	human bone	Poz-120857	2435±30 BP	728 BC (5.2%) 716 BC 709 BC (6.5%) 694 BC 657 BC (1.2%) 654 BC 542 BC (55.2%) 416 BC	751 BC (21.5%) 683 BC 669 BC (7.7%) 637 BC 625 BC (1.0%) 615 BC 592 BC (65.1%) 406 BC	1.7%N 6.4%C, 4.2%coll
Sloboda 2	Sloboda Noskovetska 6, feature 4	human bone	Poz-120872	2435±30 BP	728 BC (5.2%) 716 BC 709 BC (6.5%) 694 BC 657 BC (1.2%) 654 BC 542 BC (55.2%) 416 BC	751 BC (21.5%) 683 BC 669 BC (7.7%) 637 BC 625 BC (1.0%) 615 BC 592 BC (65.1%) 406 BC	3.9%N 11.3%C, 7.6%coll
Sloboda 3	Sloboda Noskovetska 6, in the mound	human bone, burnt	Poz-121447	2460±30 BP	751 BC (27.0%) 683 BC 668 BC (11.7%) 637 BC 623 BC (2.0%) 616 BC 591 BC (26.9%) 509 BC 497 BC (0.7%) 495 BC	758 BC (29.5%) 678 BC 672 BC (65.9%) 429 BC	0.0%N 0.6%C carbonate
Sloboda 4	Sloboda Noskovetska 6, in the mound	human bone, burnt	Poz-123128	2580 ± 35 BP	806 BC (68.2%) 765 BC	816 BC (77.0%) 748 BC 685 BC (4.9%) 667 BC 642 BC (10.4%) 587 BC 582 BC (3.1%) 556 BC	0.0%N 0.3%C carbonate
Sloboda 5	Sloboda Noskovetska 6, in the mound	human bone, burnt	Poz-123129	2492 ± 35 BP	766 BC (12.9%) 735 BC 689 BC (11.1%) 663 BC 648 BC (44.2%) 547 BC	790 BC (94.6%) 507 BC 501 BC (0.8%) 490 BC	0.0%N 0.3%C carbonate

Sample signature	Barrow and feature	Material	Lab. no.	^{14}C BP	Cal BC (68,2%)	Cal BC (95,4%)	Comment
Sloboda 6	Sloboda Noskovetska 6, feature 3	charcoal	Poz-130190	2430 ± 30 BP	718 BC (3.8%) 710 BC 661 BC (2.9%) 654 BC 542 BC (61.6%) 416 BC	750 BC (18.2%) 686 BC 667 BC (7.8%) 638 BC 588 BC (0.9%) 579 BC 571 BC (68.7%) 404 BC	charcoal - sample no. 20
Sloboda 7	Sloboda Noskovetska 6, feature 5	charcoal	Poz-130205	2425 ± 30 BP	541 BC (68.3%) 414 BC	749 BC (16.1%) 686 BC 666 BC (6.8%) 640 BC 587 BC (0.3%) 583 BC 570 BC (72.3%) 403 BC	charcoal - sample no. 12
Sloboda 8	Sloboda Noskovetska 6, feature 6	charcoal	Poz-130209	2555 ± 35 BP	798 BC (42.6%) 752 BC 684 BC (9.2%) 668 BC 633 BC (4.8%) 622 BC 613 BC (11.7%) 591 BC	805 BC (47.5%) 741 BC 693 BC (12.8%) 663 BC 647 BC (35.2%) 548 BC	charcoal - sample no. 11
Sloboda 9	Sloboda Noskovetska 6, feature 7	charcoal	Poz-130210	2540 ± 35 BP	791 BC (28.8%) 750 BC 685 BC (11.0%) 667 BC 636 BC (25.2%) 588 BC 579 BC (3.3%) 571 BC	800 BC (35.7%) 726 BC 701 BC (15.8%) 662 BC 651 BC (43.9%) 544 BC	charcoal - sample no. 6

The second component is identified as influences of the Basarabi-Şoldăneşti culture from the south and south-west. Their markers are above all black-glazed tableware, large storage vessels and bowls decorated with flutes, as well as the composition of incised and fluted ornaments. They have their closest analogies in ceramics from the areas of today's Moldova and East Romania (Melyukova 1958; Vulpe 1965; 1986; Golceva and Kashuba 1995; Zverev 2004; Kulkova *et al.* 2020). However, it should be noted that the vessels from Sloboda Noskovetska have some peculiarities in contrast to the truly Basarabi artefacts that have stricter and symmetrical decoration. The bronze bracelet and buttons from the peripheral grave could also be considered part of the south-western component because analogies to them can be found on the Danube (Vulpe 1986; Gumă 1993). However, if we take into account the longevity of such finds and their simple form, it cannot be ruled out that by the late 8th century BC, they had already become an integral part of the local dress.

Impulses from the same direction are likely to be reflected in the form of the cremations deposited in both central and lateral graves at Sloboda Noskovetska. Varied funerary rites, including both cremation and inhumation, were usual for the communities that occupied the western and south-western parts of the North Pontic region (Melyukova 1979; Klochko and Skoriy 1993). The opposite was true in the steppe and forest-steppe, where cremation was relatively rarely practiced. Only Stebliv, Barrow 10 and the Butenky barrow can be mentioned in this context (Klochko and Skoriy 1993; Skoriy 1999; but *cf.* Scythian cremations in the northwestern Black Sea region: Kashuba 2015; Sinika *et al.* 2020; Hutsal *et al.* 2021).

The third component is represented by the elements of steppe pre-Scythian culture: namely the lunula pendant from Feature 4 (child grave) and the rattle probably from the main grave (probably relocated in Feature 7). A wide circle of analogies to these finds can be mentioned, *e.g.*, for the rattle: Chauchitsa necropolis (Kilian-Dirlmeier 1979), Khurvin and Tepe Sialk B (Pogrebova 1984; Castelluccia and Dan 2014), Rožanci in Serbia (Sveshnikov 1964; Bouzek 1973; Metzner-Nebelsick, Nebelsick 1999). Even a larger set of analogies can be found regarding the lunula pendant because such artefacts, which are considered to be horse-bridle adornments, were most widespread in the Northern Caucasus and Kuban basin (Mogilov 2004; Erlih 2007). If we take a look at complexes from Eastern Europe, an analogous bronze lunula with a silver cover was found in a Kvitky barrow (Kovpanenko and Gupalo 1984). Another similar find is a seven-circle lunula from Yasnoziria, Barrow 8 (Kovpanenko *et al.* 1994). A well-known set of lunulae made of antler originated from a barrow at Zolne in Steppe Crimea (Schepinskiy 1962). Closer to the study area, no similar specimens have yet been found in Podillia. Only two low-profile lunulae can be mentioned from Barrows 1 and 2 near the village of Bandyshivka (Boiko 1989; Zagoruiko 1990). Such a broad range of analogies is not a surprise as artefacts of this type were spread over Eastern Europe by early steppe nomads (Kimmerians?), who sometime later appeared in the forest-steppe (Skoriy 1999; Makhortykh 2005).

7. SUMMARY

Until recently, the relics of the Bronze and Iron Ages communities in the middle part of the forest-steppe between the Southern Bug and Dnister have been poorly explored by archaeologists. Although Severynivka, a fortified settlement dated to the Early Iron Age, was an important exception that continued to be excavated for several years (Ignaczak *et al.* 2016), the exploration of local barrows that was begun almost 130 years ago (Sitsinskyi 1901) was not continued. This was only to be undertaken in 2018-2023 by a Polish-Ukrainian research team that conducted a comprehensive exploration of barrows located between Zhmerynka and Bar. It involved comprehensive non-invasive surveys, excavations, and multidisciplinary analyses of the discovered artefacts and ecofacts.

In the study area, two major stages of barrow building and use can be distinguished. One in the 3rd millennium BC, comprising features hypothetically related to the Yamna culture (perhaps with the influx of the Globular Amphora communities) and another in the 1st millennium BC, grouping features hypothetically dated to the Scythian times. Both excavated barrows preliminarily discussed above date to the latter stage: Barrow 3 in Ivanivtsi-Antonivka can be dated to the second half of the 10th – first half of the 8th century BC, whereas Barrow 6 in Sloboda Noskovetska to the late 8th – early 7th century BC. The older – Barrow 3 in Ivanivtsi-Antonivka – was erected and then used by communities related to the early period of the Chornolis culture. The younger – Barrow 6 in Sloboda Noskovetska – is one of the main pre-Scythian complexes of Eastern Podillia at present. The multi-component set of artefacts deposited under its mound represents a mixture of the Chornolis culture, Basarabi-Şoldăneşti influences and the impact of early steppe nomads (Kimmerians). It is a good illustration of a complex cultural mosaic in the forest-steppe between the Southern Bug and Dnister rivers, as well as being a marker of a so-far little-known route along which early nomad influence spread northwards.

Acknowledgements

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