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# Katalog cmentarzysk kurhanowych kultury komarowskiej w dorzeczu górnego Dniestru (dawne województwo stanisławowskie)

# Каталог курганних могильників комарівської культури в басейні Верхнього Дністра (колишнє Станіславське воєводство)

ARCHAEOLOGIA BIMARIS

Monografie • tom 8

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Adam Mickiewicz University in Poznań
Institute of Archaeology
Department of East-Central European Prehistory

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# Catalogue of Komarów Culture Barrow Cemeteries in the Upper Dniester Drainage Basin (former Stanisławów province)

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*To the memory of Professor Tadeusz Sulimirski,*
*a great explorer of barrows in Eastern Galicia*

# Contents

# Editor's Foreword

The present volume of "*Archaeologia Bimaris*" is published in a different convention from that of earlier monographs or articles in collective publications, which appeared in this series in national languages, mainly Polish, Ukrainian and Belorussian. "*Catalogue of Komarów Culture Barrow Cemeteries in the Upper Dniester Drainage Basin (former Stanisławów province)",* being published in English, satisfies the need to make the results of the joint Polish-Ukrainian research project more widely accessible. Its target audience is researchers studying barrows throughout Eurasia who have no command of Slavic languages. Usually, this purpose is met by "*Baltic-Pontic Studies*" (BPS), an English language journal published jointly by the AMU Institute of Prehistory and AMU Institute of Eastern Studies in Poznań (Aleksander Kośko, editor). However, its small format would not allow us to present best the extensive iconography. The reason for publishing the "*Catalogue…*" in the form hitherto reserved for BPS is therefore strictly practical in fact. The publication of this volume of "*Archaeologia Bimaris*" coincides with the renaming of the Department of Polish Prehistory, Department of East-Central European Prehistory at the AMU Institute of Prehistory, reflecting the evolution of scholarly interests of its staff members.

# Introduction

Komarów culture barrows in the upper Dniester drainage basin were amateurishly explored already in the second half of the 19th century, even though the culture itself was distinguished only several decades later (Sulimirski 1936). The methodology of exploration employed at that time was highly imperfect, consisting basically in digging up a barrow mound and attempting to reach the grave chamber. Laconic mentions about numerous Late Neolithic and Bronze Age tumulus cemeteries in the region in question appeared in various publications (Schneider 1871; Kirkor 1878; Kohn, Mechlis 1878; Ziemięcki 1884; 1887; Hampel 1885; Szaraniewicz 1886; Ossendowski 1890; Hadaczek 1907). Most were collected by Bohdan Janusz in his "*Zabytki przedhistoryczne Galicyi Wschodniej*" [Prehistoric Artefacts of Eastern Galicia] (1918). The early 20th century, especially the interwar period, owing to intensive field investigations by Polish and Ukrainian archaeologists, witnessed a large growth in the knowledge of Corded Ware and Komarów culture tumuli, which often were found next to one another in upper Dniester necropolises. These excavations were reported in the press, presented in many report papers and, albeit less often, in material and analytical publications (Bryk 1932; 1934/1935; Pasternak 1933; 1933a; 1936; 1937; 1937a; Sulimirski 1936; 1936a; 1937; 1939; Siwkówna 1938; Kozłowski 1939).

A special place in this corpus of literature was held by the works of Tadeusz Sulimirski, reporting on his many excavation surveys in the 1930s: on the eponymous necropolis in Komarów (in 1935-1936, together with Dr Jan Grabowski, Director of the Pokuttya Museum in Stanisławów) and other Komarów culture cemeteries (Sulimirski 1964; 1968). The typescript of the monograph he worked on, devoted to this cultural formation, was lost during the Second World War. Equally unfortunately, a substantial portion of the collections accumulated thanks to archaeological excavations carried out in the interwar period was dispersed or destroyed in the course of establishing the post-Yalta order in Europe. In the 1960s, however, T. Sulimirski succeeded in reconstructing a considerable part of his original text and was able to publish it as the monograph "*Corded Ware and Globular Amphorae North-East of the Carpathians*", which still remains the most exhaustive source on Komarów culture barrow cemeteries on the upper Dniester (Sulimirski 1968). We cite from this monograph in the "*Catalogue…*" where appropriate, considering it the basic and most comprehensive compendium of information on past investigation results. We quote from it data on the investigated necropolises (in italics), including also data on Corded Ware culture barrows but leaving out detailed footnote information. Thus, Professor Tadeusz Sulimirski is in fact a co-author of the "*Catalogue...*". Only when describing the Bukówna necropolis, have we used data from other records, mainly from the unpublished typescript of a report by Jan Bryk (1932a) and unpublished field notes by Marcjan Śmiszko [Smishko] (1937). This site received special treatment because it was excavated as part of another project (Makarowicz, Lysenko, Kočkin 2016). Importantly, in the descriptions of archival materials from barrows, present-day classification criteria were used in the creation of a relevant taxonomy with different points of reference than the vessel types suggested by T. Sulimirski.

After 1945, several other major record publications appeared in which materials collected during pre-war investigations in Eastern Subcarpathia were discussed and interpreted. They included the first excavation season in Bukówna – investigations by Jan Bryk (Rogozińska 1959) – or a discussion paper

on the Komarów culture in northern Subcarpathia and western Volhynia by Igor K. Sveshnikov (1958; Swiesznikow 1967, in Polish; 1976). Other articles and sections of monograph devoted to the Komarów culture were not that significant, especially in respect of barrow necropolises, as they only summarized earlier knowledge.

The 1990s saw the beginning of a Polish-Ukrainian research programme pursued for many years by Kraków and Lviv archaeological centres and headed by Professor Jan Machnik. As a result, ca. 2500 barrows from the Late Neolithic and Bronze Age were recorded in the drainage basin of the upper Dniester. Some of the tumuli were excavated, revealing also the relics of ritual activity by Komarów culture communities. The programme team, in almost 25 years of their work, produced many papers and monographs in Polish, Ukrainian and English (see – for instance – papers from Harmata, Machnik, Starkel [eds.] 2006; Harmata, Machnik, Rybicka [eds.] 2013; Czopek, Machnik, Pasterkiewicz, Pawliw, Petehyrycz [eds.] 2016).

The idea to inventory and document Komarów culture barrow cemeteries in the drainage basin of the upper Dniester was born in 2009 during the incidental field-walking survey of the eponymous necropolis in Komariv (Komarów). It revealed that north of the village, in a vast forest extending over the watershed between the basins of the Limnitsa and Lukva rivers – right-bank tributaries of the Dniester – there were still many earthen barrows extant. Most had been excavated using the method mentioned earlier, which left considerable portions of mounds unexplored, several others, in particular smaller ones, bore traces of robber trenches, while only few were intact. Interest in other Komarów culture barrow cemeteries in the upper Dniester drainage basin produced the development of a broader research project, which received a grant under the National Programme for the Development of the Humanities (no. 12H 12 001981) entitled "*Catalogue of Komarów Culture Barrow Cemeteries in the Upper Dniester Drainage Basin (former Stanisławów province)*" and was realized in 2013-2016 in the Institute of Prehistory, Adam Mickiewicz University, Poznań, Poland, in cooperation with the Ukrainian partners: the Institute of Archaeology, Ukrainian National Academy of Sciences in Kiev, and the Chair of Ethnology and Archaeology, Institute of History, Political Science, and International Relations, Vasyl Stefanyk Precarpathian National University, Ivano-Frankivsk, Ukraine.

The chief objective of the project was to compile a catalogue of barrow necropolises known from the relevant literature and raised in the 2nd millennium BC by Komarów culture communities – the south-eastern branch of the Trzciniec Cultural circle – in the upper Dniester drainage basin, largely coextensive with the former Stanisławów province (altogether 24 sepulchral sites in 17 localities). The barrow necropolises have been preserved in various degrees: their state of preservation is best in forested areas, it is poorer on meadows and pastures, and only vestigial or non-existent on arable land. The "*Catalogue…*" comprises the cemeteries that were located in the Stanisławów province or immediately across its border with the Lwów province prior to World War II.

The choice of the territory to be covered by the "*Catalogue…*" was an effect of research interests of the Project Head (Makarowicz 2010). Komarów culture barrows appeared in this region 400-500 years after the raising of the last tumuli by Corded Ware culture communities, frequently on the necropolises of the latter. It appears that a factor in the rise of these extended cemeteries was the strategic role of the Dniester as a transit communication route along which people travelled, goods and cultural patterns flowed, and knowledge and know-how were transmitted (cf. Czopek 2009). This region may be considered an important part of the 'Dniester' section of the transit route, joining – at least from the 4th millennium BC – the drainage basins of the Baltic and Black seas (Czopek 2009; 2011; Kośko; Klochko 2009; Kośko, Kločko 2011; Makarowicz 2009; 2011; 2012; 2015; Makohonienko 2009). It lies in the broad borderland between eastern and western Europe taken to be not only a geographic concept but also one of culture and mental systems: territories where the influences of central European agrarian communities merged with forest-steppe/steppe traditions, and initial cultural patterns were syncretised and transformed. In the 2nd millennium BC, this area saw intensive contacts with the communities of highly-developed Bronze Age cultures from the Carpathian Basin (Makarowicz 2010; 2012; 2015). The barrow cemeteries of Komarów culture populations, besides funerary functions, served also as landmarks delineating the territory under the jurisdiction of a local community and marked stage points on long-distance exchange routes. Grave goods and numerous deposits found in the tumuli were often very spectacular, suggesting that individuals buried in them represented local elites with cosmopolitan aspirations (Makarowicz 2016).

Embarking on the broad surface survey, comprehensive inventoring and cataloguing of these objects, using contemporary non-invasive methods, was justified by their scientific and historical value as monuments of the cultural heritage of communities once

inhabiting the borderland between Europe's East and West. The work was also motivated by the advancing destruction of the barrows – visible objects, standing out against the landscape with their own peculiar forms – caused by anthropogenic processes (deforestation, land tillage) and natural ones (water and eolian erosion), as well as the 'plague' of prospecting with metal detectors and on-going plunder of tumuli, which the Ukrainian conservation service cannot prevent.

The execution of the project was greatly helped by the favourable climate of Polish-Ukrainian cultural and scholarly cooperation (for instance within the framework of the Eastern Partnership – an official programme of the European Union – and many other cooperation initiatives on regional and local levels) and the formal ties existing between the participating institutions. Among project staff served academics, PhD students and undergraduates from Poland and Ukraine gathered around two journals published by the AMU Institute of Prehistory in Poznań: English-language *Baltic-Pontic Studies* and *Archaeologia Bimaris*, printed usually in national languages.

The project was divided into several stages, embracing: **(a)** preliminary research, **(b)** field-walking surveys and photographic documentation, **(c)** charting topographic plans of cemeteries and selected tumuli, and exploring selected barrows, sometimes also barrow groups (terrain permitting) within the studied necropolises with a magnetometer and **(d)** publication of research results.

**a.** At this stage, work preliminary to field surveys was performed: a thorough research of archival literature and documentation of earlier field-walking surveys and excavations of "Komarów" barrow necropolises in the upper Dniester drainage basin. It also covered the archives of T. Sulimirski and I.K. Sveshnikov, who, in turn, after World War II had taken over part of the archive accumulated by T. Sulimirski in the course of his investigations, and the diary of M. Smishko of his excavations in Bukówna in 1937[1]. The archival research in the Archaeological Museum in Kraków yielded valuable data on the old investigations of several upper Dniester cemeteries, particularly Bukówna mentioned earlier.[2] In all, the research produced topographic maps, 19th- and 20th-century archival maps and high-resolution satellite photographs, facilitating the analysis of deforested areas, in which some of the investigated necropolises are located. Furthermore, this stage witnessed photographing, drawing and describing artefacts collected in the course of archival excavations and stored in museums (Archaeological Museum in Kraków, Historical Museum in Lviv, Ivano-Frankivsk Lore Museum, Museum of History of Religion in Lviv, Museum of Ancient Halych in Krylos, and the Stryi Lore Museum).

**b.** The peculiar location and disposition of barrows in the landscape of the upper Dniester drainage basin suggested that a special strategy of field research be adopted. They were mostly found on flat hilltops stretching along the watersheds of rivers – either the tributaries of the Dnieper or ones flowing immediately outside of its vast valley. Additionally, their disposition followed similar spatial patterns (group and group-linear arrangements of barrows, occurring at a certain distance, sometimes over an area of several square kilometres). Detailed field-walking surveys consisted in passing several times over and penetrating areas where cemeteries were expected to be found. The areas were selected by using archival information and studying topographic maps and satellite photographs. Barrows were located using RTK GPS equipment in the Geographic Information System format (see below). They were also photographed and described.

**c.** At the next stage of investigations, topographic plans of cemeteries were drawn in 2D and 3D versions to various scales (digital models of site terrain), giving locations of tumuli On selected fragments of necropolises, barrows and barrow clusters were geomagnetically explored, using terrain accessibility (degree of its forestation) as the selection criterion. This method helped record magnetic anomalies related to the archaeological features that are no longer visible on the surface of the ground (see below).

**d.** Next to this English language version, an enlarged version of the "*Catalogue…*" was published as a bilingual Polish-Ukrainian e-book (Makarowicz *et al* 2016). It has more illustrations which could not possibly be fitted into the printed version.

"*Catalogue…*" gives information on particular cemeteries in 17 localities (over 20 sites, involving specific barrow groups) (**Fig. 0.1**). The entry format for each site is identical: it gives the location of the necropolis, characteristic of its geographic environment, archival data (descriptions, drawings and photographs produced in the course of old excavations), description of the spatial arrangement of cemeteries,

[1] The authors wish to thank cordially Prof. Jan Machnik and Dr Paweł jarosz, Institute of Archeology and Ethnology Polish Academy of Sciences and Prof. Alexander Sytnyk, Director of Department of Archaeology, the I. Krypjakievych Institute of Ukrainian Studies, Lviv, for making the documentation available to us.

[2] For making the archival data available to us, we wish to express our gratitude to Dr Jacek Górski, Director of the Archaeological Museum in Kraków.

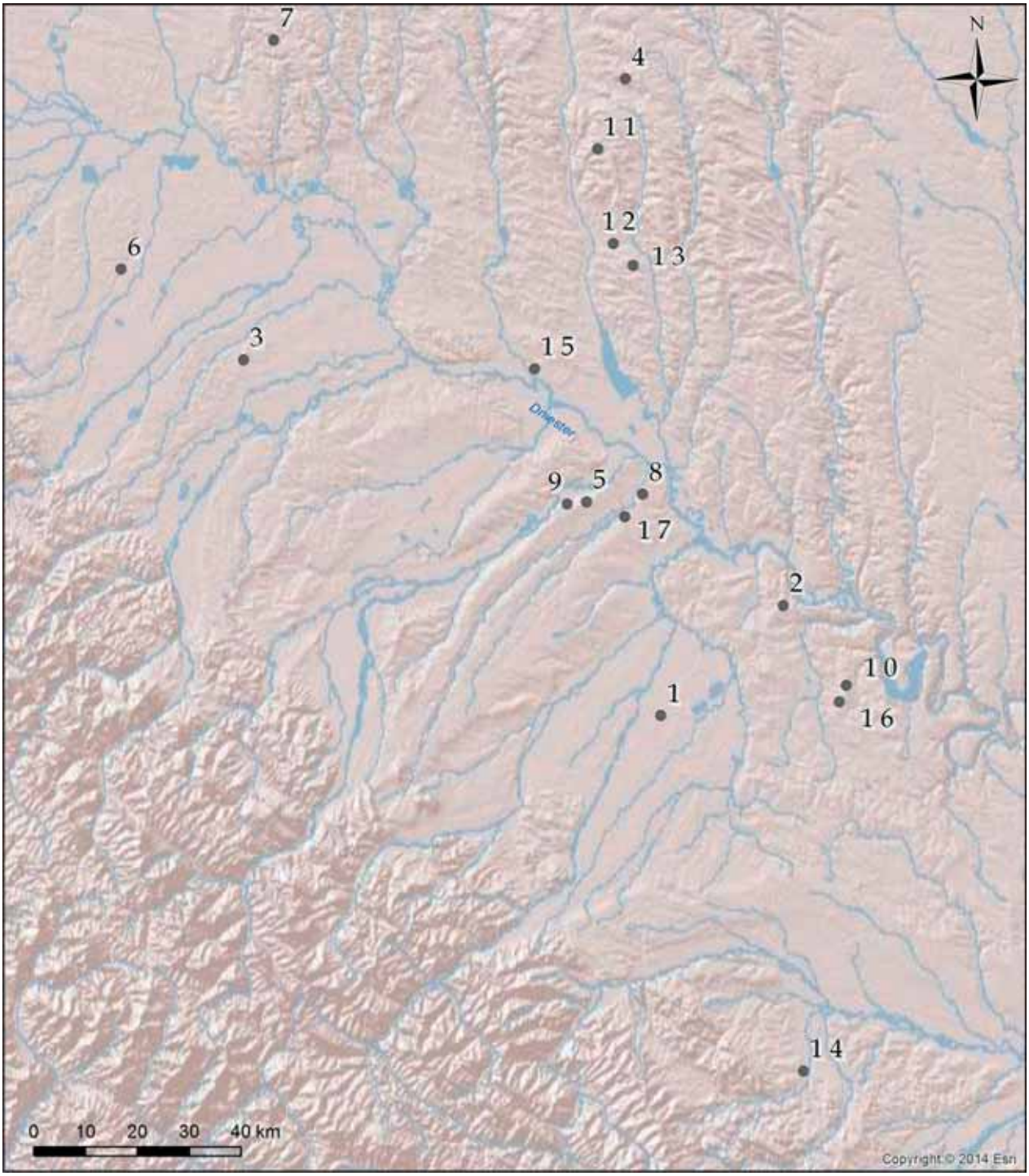


**Fig. 0.1.** Location of Komarów culture cemeteries in the upper Dniester basin. 1 – Bratkowce (Bratkivcy), 2 – Bukówna (Bukivna), 3 – Daszawa (Dashava), 4 – Janczyn (Ivanivka), 5 – Komarów (Komariv), 6 – Kawsko (Kavsko), 7 – Krasów (Krasiv), 8 – Kryłos (Krylos), 9 – Medynia (Medynia), 10 – Okniany (Vikniany), 11 – Podgrodzie (Pidgorodie), 12 – Putiatyńce (Putiatyncy), 13 – Sarniki (Sirniki), 14 – Stopczatów (Stopchativ), 15 – Tenetniki (Tenetnyky), 16 – Tłumacz (Tlumach), 17 – Wiktorów (Viktoriv)

particular barrow groups and barrows, description of tumuli with photographs, and geomagnetic exploration results. We are fully aware that the information we have presented concerns not only existing Komarów culture barrows but also those of the Corded Ware culture. and other formations. However, only excavations can conclusively tell which barrow belongs to which culture. As the documentation of, and publications concerning pre-war investigations vary considerably as to their character, entries for individual cemeteries differ considerably too: from laconic to the elaborate.

When working on the project in Ukraine, we have been warmly welcomed by both academics and local people. We would like to offer our thanks to everyone and all the institutions providing us with support in our work on this research project. We owe our immense gratitude to Dr Jacek Górski, Director of the Archaeological Museum in Kraków and the recently departed Dr Bohdan Chaykovski, Director of the Historical Museum in Lviv, as well as to their staff, and the directors and staff of other museums in western Ukraine mentioned earlier. We would like to thank Prof. Jan Machnik, Prof. Aleksander Sytnyk, Dr Paweł Jarosz, Dymytro Pavliv, Volodymyr Petehyrych and Mykola Franko for their help in realisation of our project. Special thanks go to Oksana and Roman Rybchin whose hospitality and home in Bukivna afforded us both a welcome refuge and command headquarters during field work.

# I. The geographic setting of barrow sites in the Upper Dniester Area

Most of the inventoried barrow sites are located in the Ivano-Frankivsk *oblast*, which is slightly smaller than the former Stanisławów province (**Fig. I.1**).

In terms of physical geography, the investigated area lies between the Fore-Carpathian Plain, otherwise known as Subcarpathia, and the Podolia Upland, forming part of the fold Volhynia-Podolia Plate (Kondracki 1968) (**Fig. I.2**).

The Fore-Carpathian Plain extends as a narrow, 300-km-long belt along the north-eastern part

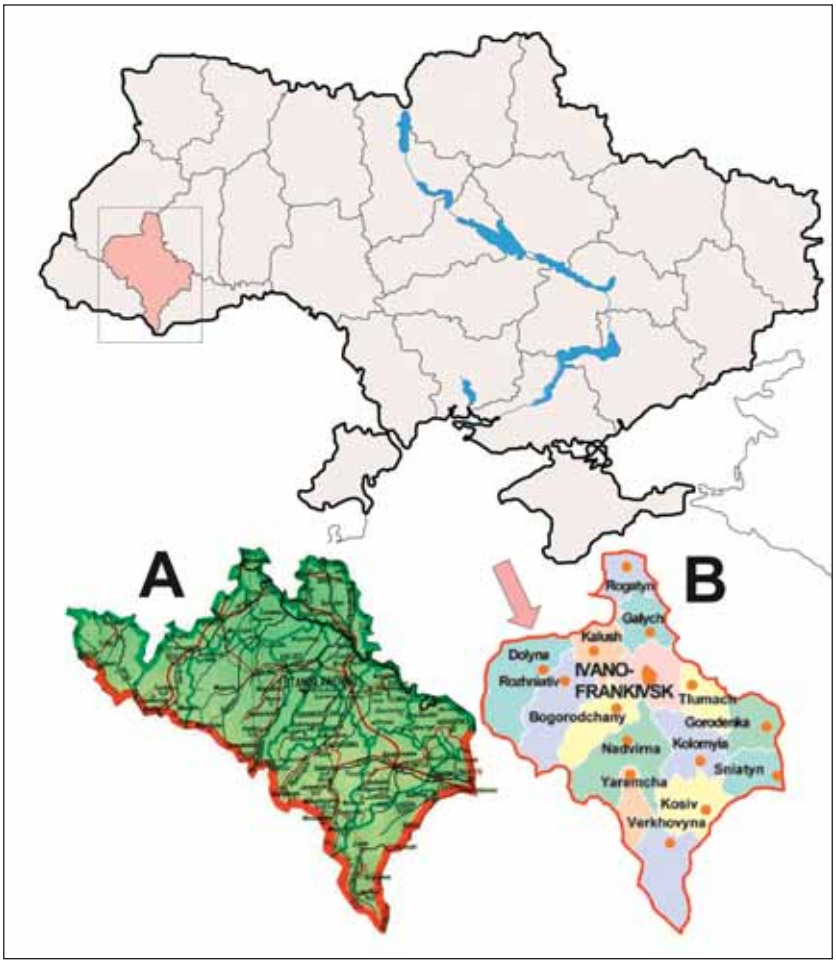


**Fig. I.1.** Investigated area shown against the administrative division of Ukraine: A – former Stanisławów province, B – Ivano-Frankivsk oblast

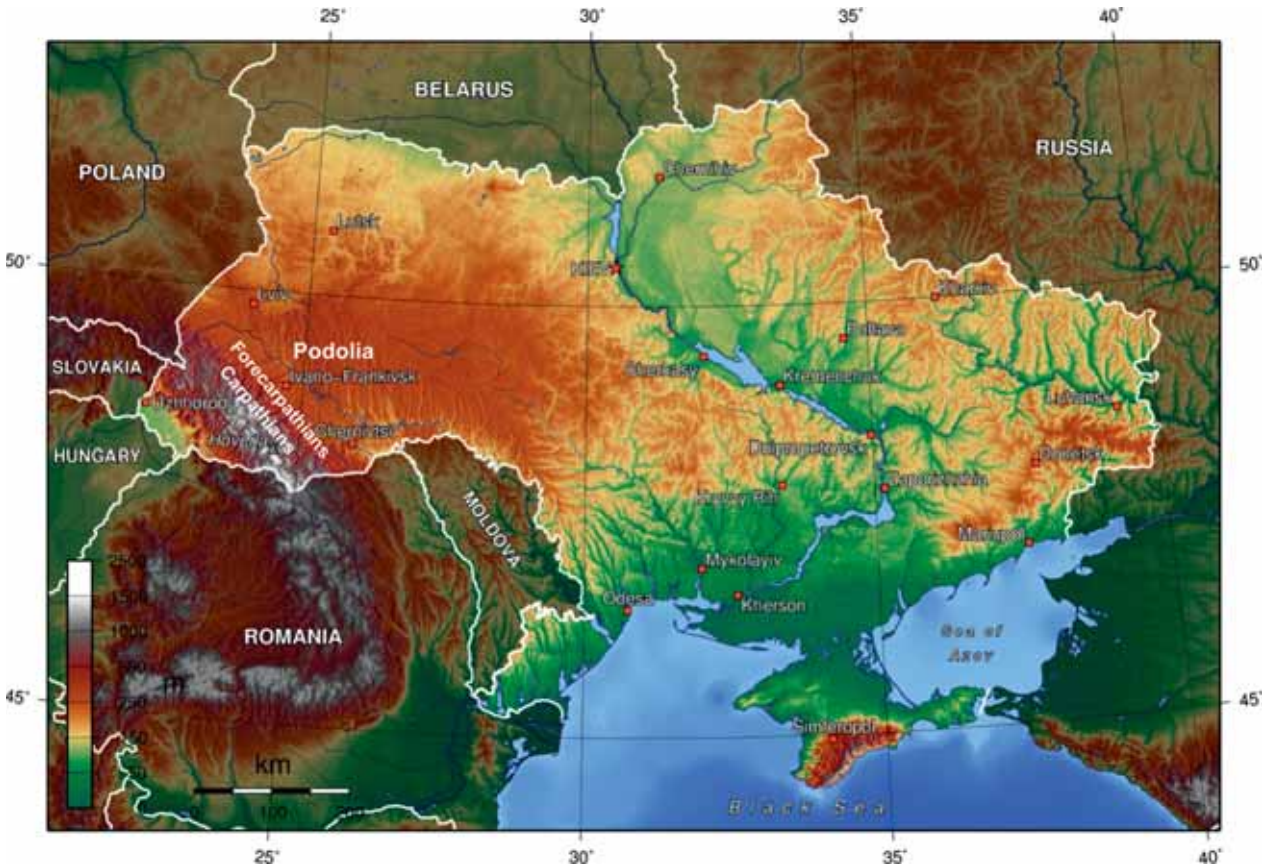


**Fig. I.2.** Investigated area against the physico-geographical map of Ukraine (https://pl.wikipedia.org)

of the Outer Carpathians. The plain's foundation is the Subcarpathian Tilt – an intermediate link between the Podolia-Volhynia Plate and Carpathian fold structures. This region is structurally connected to the Ukrainian Carpathians. In terms of geology, it is built of units characterized by strong folding, which sets it apart from the north-eastern regions of the Podolia-Volhynia Plate (Mizerski, Stupka 2005; Łanczont *et al.* 2013). The plain rises from 200 to 700 m.a.s.l. The investigated area is strongly affected by dissection caused by river erosion. A characteristic landform is an elongated watershed (interfluve) that separates broad valleys or basins. Deep and broad valley dissections are a consequence of the fact that a considerable portion of the area is covered by loess deposits. The latter, in turn, are related to the location of the area in the extraglacial zone of Pleistocene glaciations. In the foregrounds of glaciated areas, eolian alimentation has occurred (Matoshko 2004).

In terms of geology, the Ivano-Frankivsk *oblast* lies halfway between the Eastern European Platform and Fore-Carpathian Depression. The zone across which the Dniester flows should be included in the Eastern European Platform, specifically its epicratonic portion. The region is built of fold and overthrust structures which have not yielded to orogenic consolidation but have been subjected many times to tectonic movements instead (Mizerski, Stupka 2005).

On that part of the Platform which in the investigated area coincides with the Podolia-Volhynia Plate, crystalline rocks of Proterozoic and Early Palaeozoic age occur, covered by a sedimentation layer of Palaeozoic, Cretaceous and Tertiary rocks. The thickness of the layer grows westwards, that is in the direction of the Fore-Carpathian Depression.

Cretaceous-age rocks are built of grey or white marls, limestone, sandstone, or sandy marls. They can be seen in the cliffs overhanging the Dniester and its tributaries. Younger Miocene rocks are related to molasse sedimentation in the Fore-Carpathian Depression. The sedimentary series of Miocene-age rocks is made up of grey, greenish, yellowish, limy clays, mudstones and sandstones. Some of them contain breccias of rock and potash, salt as well as gypsums and

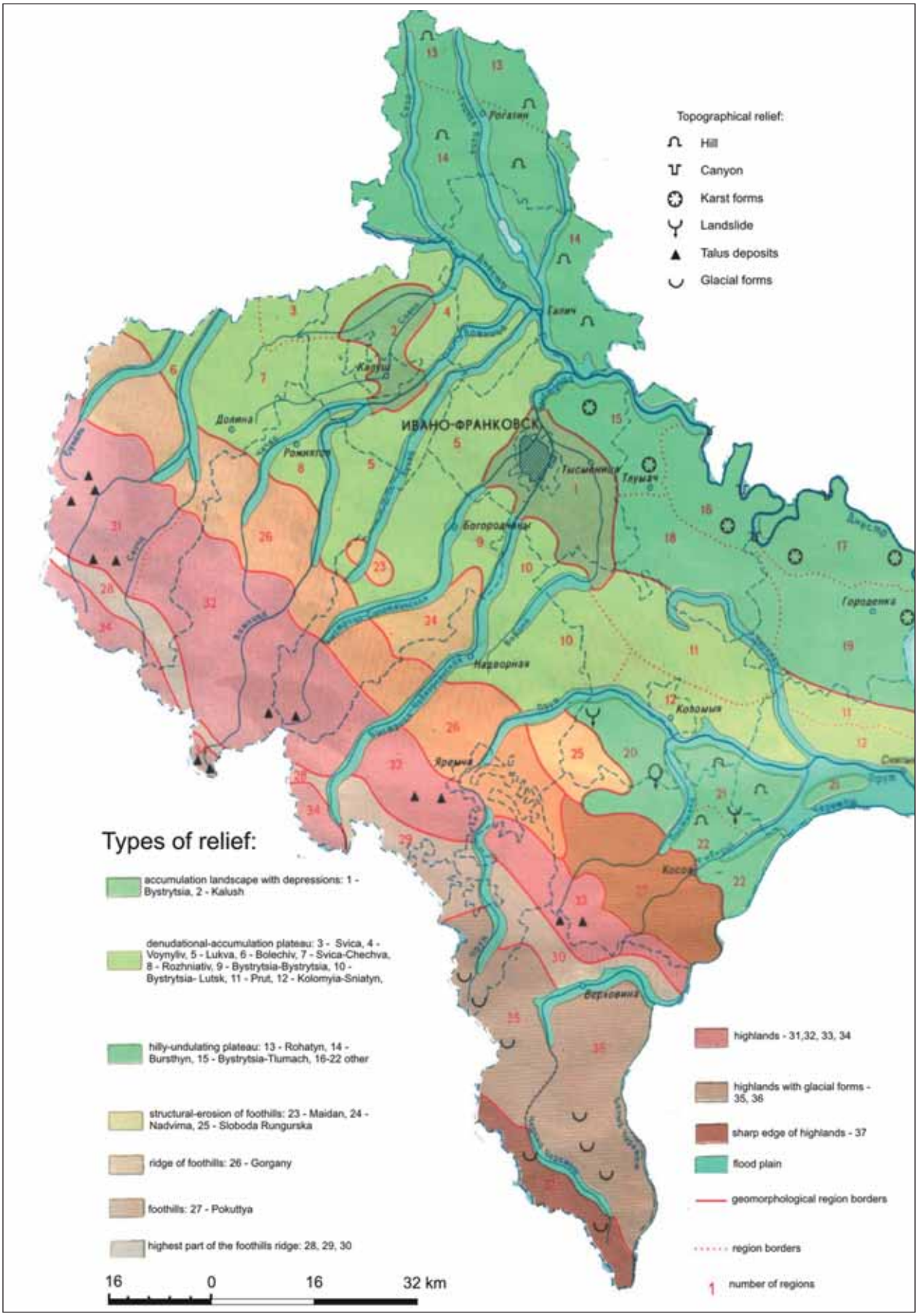


**Fig. I.3.** Map of major geomorphologic regions of the Ivano-Frankivsk *oblast* (after Kravchuk 1999)

anhydrites. In the Fore-Carpathian Depression, there also occur tuffs and tuffites (Łanczont *et al.* 2002).

The process of sedimentary series depositions was terminated by tectonic uplifts (in the Sarmatian Stage). As a result, the sea reservoir receded in the direction of the Pontic Basin. In its former place, the Dniester and its tributaries began to flow. The traces of their palaeochannels are noticeable approx. 15-20 km north of their today's course, because the Carpathian tributaries of the Dniester are that much longer.

In the Ivano-Frankivsk *oblast* elevations vary from 230 to 2061 m.a.s.l. (Mount Hoverla). Thus, it can be divided into lowlands, foothills (Fore-Carpathia) and mountains (Carpathians). The lowlands adjoin the Dniester (upper Dniester drainage basin) and cover the Opillie Upland (high plain) straddling the river, and Pokuttya extending between the Prut and Dniester rivers (Struk 1993) (**Fig. I.3**).

Eastern Subcarpathia is built of deeply dissected upland stretches of land, reflecting in their disposition the course of Dniester tributaries which fragment them. The southern boundary of the region is marked by the line of overthrusts of the Skole unit onto the inner zone of the Fore-Carpathian Depression (Zuchiewicz *et al.* 1997; Łanczont *et al.* 2002). The northern boundary, too, matches the boundary between the geological units described earlier, i.e. the Eastern European Platform and Fore-Carpathian Depression. In the southeast, the boundary crosses to the right bank of the Dniester and runs along its steep edge. The eastern boundary is marked by the right-bank edges of the Bystrytsa and Vorona rivers. As has been indicated earlier, the Podolia Upland, in this part known as the Opillie Upland, adjoins the Dniester valley in the north. This formation continues also on the right bank of the Dniester (Łanczont *et al.* 2002; Gębica *et al.* 2013).

Western Podolia is an anticline built on the substratum of archaic crystalline rocks (granites and gneisses), plate-covered by younger formations, Silurian, Devonian, Upper Jurassic, Cretaceous (containing phosphorites) and Neogene sedimentary rocks, and finally carpeted by loess. The south-western part of the Upland, where the investigated area is located, is known as Opillie. It is strongly fragmented by rivers and cut into hummocks and smaller bars, which imparts to the region a hilly or even mountainous character. Such a landscape continues as far as the confluence of the Zolota Lypa and Dniester without any marked flat hilltops (Łanczont *et al.* 2002; Łanczont, Boguckij 2007; Gębica *et al*. 2013) **(Fig. I.4)**.

The major geomorphological units of the region are uplands dissected by the terraced valleys of rivers flowing down from the Carpathians to the Dniester valley. The uplands were cut in the Miocene and covered by gravel and a layer of loess in the Pleistocene (Łanczont *et al.* 2002; Łanczont, Boguckij 2007; Gębica *et al.* 2013).

Within the high plateaus, two morphological horizons can be distinguished. The higher horizon of Krasna, dating to the Upper Pliocene, stays at 100-160 m from valley bottoms, while the horizon of Loieva, lower by 30-50 m, is dated to the Lower Quaternary.

The Voynyliv Upland stretches between the Sivka and Limnitsa rivers and rises to 370 m at the highest parts and 320 m close to the Dniester. A characteristic feature of this region, the Loieva erosion horizon displays the channels of the pre-Limnitsa (Łanczont *et al.* 2002).

The Lukva Upland stretches between the valleys of the Limnitsa, Bystrytsa of Solotvyno and Bystrytsa rivers. Its character is determined by pronounced bars with asymmetric profiles: the northern ones are steep and high, whereas the southern ones are long and gentle. Flat hilltops are at the height of the Loieva horizon, corresponding to the sixth terrace of the Dniester. The whole region lowers from 600 m at the Carpathian Foreland to about 300 m close to the Dniester valley (Łanczont *et al.* 2002).

The Bystrytsa (Stanisławów) Basin is bounded by the Bystrytsa of Solotvyno and Vorona rivers. The highest elevations recorded within it reach 450 m.a.s.l. At present, its formation is associated with an uneven tectonic depression-forming movement, i.e. the sinking of the discussed area, with the uplifting of the surrounding Podolia and Lukva uplands (Kravchuk 1999; Łanczont *et al.* 2002).

The Halych-Bukachivtsi Basin is a vast unit characterized by an erosional-depositional relief type. In it, the Carpathian and Podolian (Opillian) tributaries of the Dniester meet: the Limnitsa, Sivka, Lukva, Hnyla Lypa and Naraivka. The basin extends from the Zhuravets gorge to Nizhiniv (below Halych). Below Nizhniv, the gorge (canyon) section of the Dniester valley begins (Romer 1906; Gębica *et al.* 2013). The shape of the basin suggests that the form shaped by the Dniester was erosional in nature, especially as the river moved its bed SW. However, the causes and time of this process could not be established in any detail so far.

The South Opillia Upland extends on the right and left sides of the Dniester. It is characterized by elongated and strongly elevated hummocks, rising to a height of 350-400 m.a.s.l. The highest fragments represent the vestigial Krasna horizon. The varied escarpment relief is fragmented by deep ravines and

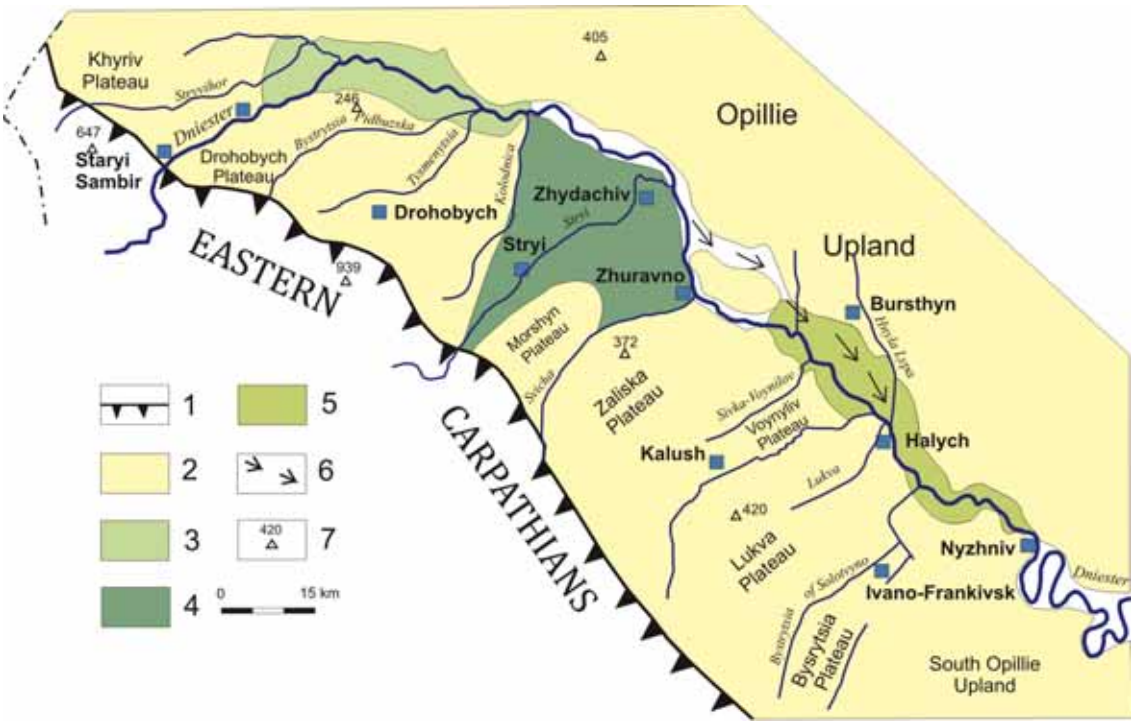


**Fig. I.4.** Location of the investigated area against the geomorphological division of Eastern Subcarpathia and the Podolia Upland based on Gębica *et al.* 2013a: 1 – edge of the Carpathians, 2 – high plateaus and uplands, 3 – upper Dniester basin, 4 – Stryi-Zhydachiv Basin, 5 – Halych-Bukachivtsi Basin, 6 – presumed course of the Dniester in Lower Pleistocene, 7 – elevation in m.a.s.l.

gullies. Flat hilltops often have marls and limestone of the Cretaceous age as their bedrocks which are covered by Neogene sands, sandstones and gypsums, and loess as the top layer. In the gypsums, surface and subterranean karst formations are present (Gębica *et al.* 2013). On the left bank of the Dniester, elevations reach 350 m. This area is characterized by long hummocks running meridian-wise and cut by Dniester tributaries having broad and flat bottoms.

The landscape type of the region is largely determined by the Dniester. It rises in the Eastern Carpathians, about 3 km south of the Ukrainian village of Rozluch, under the culmination of a mountain (913 m.a.s.l.) of the same name. Its course can be divided into the upper portion, as far as Nizhniv, the middle as far as Tiraspol, and the lower down to its mouth. The investigated area is covered mostly by the middle section of the Dnieper. From its source, for about 50 km, it is a mountain river. In the vicinity of Staryi Sambir, the river leaves the mountainous terrain and enters the lowlands. This section of the Dniester has a gentle gradient. From the confluence with the Svitsa river, the terrain begins to rise. At Nizhniv, the Dniester enters the Podolia Upland. This section of the river is characterized by deep gorges and numerous rapids (*porohy*). The Dniester empties into the Black Sea with a liman 9 km wide and 32 km long (OSCE/UNECE Project 2005).

The upper, right bank of the Dniester is best developed. Its longest tributaries include the Tysmenytsa, Kolodnitsa, Stryi, Svitsa, Sivka, Lukva, and Bystrytsa of Solotvyno. The left-bank tributaries are: the Vereshchytsa, Zubzha, Lug, Svirzh, Hnyla Lypa, Zolota Lypa, Strypa, and Seret. The tributaries, especially those flowing down from the Carpathians, are characterized by strong erosion: their valleys cut into the surrounding terrain for even more than 100 m. Deep river valleys, cutting into the crystalline Ukrainian massif, form erosional and depositional terraces. In places, the valleys look more like ravines while river beds frequently feature rock steps. Along valley edges, there is a dense network of gullies, both young, deep-cut and narrow as well as old ones of the 'balka' type (Dobrynin 1956).

In the valleys of the Dniester and its tributaries, a step terrace system can be observed. A stratigraphic scheme, developed by Ukrainian scientists and based on the morphological-hypsometric criterion, dis-

tinguishes seven terrace horizons (Kravchuk 1999). The oldest terrace VII is correlated with the Upper Pliocene Krasna planation surface, which has developed in the Carpathian Foreland (Gofstein 1957). The next terrace VI is connected to the Carpathians as well and referred to as the Loieva horizon. In the opinion of Kravchuk (1999), it is of the Eopleistocene age. The other terraces formed already inside river valleys in the Pleistocene and Holocene as a result of the impact of two major factors: climate and tectonic movements (Łanczont *et al.* 2002). According to Kravchuk (1999), terrace V (50-70 m above the valley bottom) can be chronologically associated with the Eopleistocene, terrace IV (up to 45 m) with the Mesopleistocene, while terraces III (15-25 m) and II (5-8 m) may be linked to the Neopleistocene. Terrace I is dated to the Holocene and rises 2.5-5 m above the valley bottom.

The barrow-building communities were surrounded by loess plateaus hypsometrically rising towards the Carpathians. The plateau landscape varied thanks to the outliers of deeper strata, and calcareous and gypsum klippen. On the terrain surface, other karst forms occur as well, such as sinks and sinkholes, in which gypsum caves have formed. This landscape is dissected by a dense network of the Dniester and its tributaries, which are mostly meandering rivers, following broad bends. In addition, the Dniester has a canyon section produced by the tectonic uplifting of the Podolia Plate. The river network features many ravines deeply cut into soft loess rocks, in places down to 100-150 m. On loess surfaces, fertile soils have developed. There is no doubt that the natural conditions of the Dniester Area – its terrain, lithology, hydrographic network and soils – were favourable to the existence of prehistoric communities.

# II. Methods

Documentation of the barrow cemeteries discussed in this catalogue was conducted by various geodetic and geo-information, and geophysical methods. They comprise numerous geodetic measurement equipment, as well as GIS software for visualization and evaluation of research results.

## A. Geodetic and geo-information methods

Due to the significant forest coverage in the study area the base measurement equipment chosen were laser tachimeters (Total Station Leica TCR407 and TCR407Power). In the case of sites that were located on the edges of the forested area or on open space, GNSS RTK receivers were used.

The entire corpus of tachimetrical measurements was transferred from the equipment to a central database by Leica GeoOffice Tools in .idx format. After adjustment and conversion to .xls format of points ID, X and Y coordinates, the spatial distribution of measurement was displayed in the ArcGIS (ArcMap). The surface interpolation was conducted in the same software of ArcMap. The method for interpolation depended on the spatial arrangements of measurement points and density of measured object occurrence in the study area. In the main, the TopoToRaster and Triangulated Irregular Network methods were applied.

Most of the measurement polygons on cemeteries documented in the project were established in an arbitral metrical coordinate system. They were elaborated for each of the sites. The geodetic X axis was designed parallel to the geographic north direction while the Y coordinate perpendicular to the first (rising in the geographic east direction). After the measurements based on established fixed points at least three of them were positioned in a coordinate system of Pulkovo 1942 Zone V by using a GNSS RTK receiver. All of the measurements were therefore rectified from a locally designed into an actual geodetic system.

Depending on the morphological differentiation of both measured objects and adjacent landscape different methods of sampling were used. Nevertheless in each site a context of 15 m to every funeral object was always documented. As a result the exact data was obtained such as barrow diameter, its borders or height. Sampling of the mounds was planned due to its size or eventual features related to its state of preservation (both anthropogenic or natural destruction). In the case of illicit trenches the density of sampling was higher so as to document them in the proper resolution. In most cases when the barrows were well preserved the density was four measurements per 1 $m^2$. Sampling was arranged thorough transects from the bottom of the mounds, through its summit to the opposite bottom line and a few perpendicular transects for cross-sampling. In the cases of very low barrows that were hardly visible in the terrain, an additional circle was sampled around the bottom of the mounds. The context of the tumuli for considerably flat areas were one measurement per 1 $m^2$ and for a diversified landscape the density was increased for the purposes of documenting selected features.

In addition to traditional measuring techniques (tachimetrical) RTK positioning was also applied and subsequently employed in the Tlumach, Stopchativ and Bukivna sites. Measurements were characterized by a regular density of sampling – four measurements per 1 $m^2$ by method of obtaining the receiver position each 25 cm of movement.

For each of the sites discussed in this catalogue Digital Elevation Models of their context in macro-scale were created. The base for this purpose were the topographical maps in 1:10 000 scale. The entire procedure of vectorization of height isolines and elevation points was conducted in ArcMap. In the same software the respective geotiff and TIN models were produced. Apart from the information about the elevation of terrain, also hydrological features were digitized such as streams, rivers or lakes. On this basis an interpretation of spatial arrangements was confronted with the actual position in terms of height, distance to hydrological features or slope degree. Basing on the size of site a different numbers of topographical maps were digitized, i.e. for the Komariv site it was six sheets and for Bratkivcy – only one sheet.

During the vectorization a different method of projection was applied, which depended on contour intervals in the original map sheet. In the regions elevated high (above 400 m.a.s.l.) only each 10 m isolines were vectorized, while a more precise projection was applied in the cases when sloping was irregular. The areas located below 400 m.a.s.l. were digitized more consistently – each 1.25 m or 2 m isolines for better representation of terrain on the model.

The location of barrows in the terrain was determined by positioning them with the aid of hand-held GPS receivers. The positioning was performed in the WGS84 system. Further coordinates in geographic projection were converted in ArcMap into geodetic ones of the Pulkovo 1942 Zone V system. Subsequently, their position was projected on the digitized Digital Elevation Models produced earlier. The archival barrows, known from earlier research, old maps and prospection plans needed a comparative georeference. Therefore these plans were rectified with the aid of a Pulkovo 1942 system basing on the position of railroads, road intersections or distinctive buildings such as churches. As a result, an approximate view of barrow location was obtained. In a larger scale (above 1:50 000) this can be considered as precise.

## B. Geophysical methods

In a geophysical survey of barrows from Ukrainian cemeteries, researched within the scope of the project, magnetometry has been applied. Nowadays, it is one of the most frequently used geophysical methods by archaeologists in non-invasive prospections of prehistoric relicts. In general, the reasons for the adoption of magnetometry in archaeological studies are tightly connected with *archeomagnetism* – that is the science and utilization of the magnetization of objects associated with sites and ages in order to obtain important information useful in the archaeological context (Schmidt 2007:23; Tarling 2007:31). Predominantly, it is based on measurements of the gradient of earth's magnetic field disturbances, caused by features and material accumulations characterized by endogenic magnetization or increased magnetic susceptibility, which are located in the upper layers of the soil (Weymouth, Huggins 1985:192; Schmidt 2007:25; Pospieszny 2011:72).

A characteristic that distinguishes magnetometry from other geophysical methods is its *passivity*. While instruments used in various techniques of remote sensing, including e.g. electric resistivity or geo-radar scanning, are generating an artificial signal or field to measure responses in the ground, magnetometers employ the earth's magnetic field (Kvamme 2006:206). The physical unit used to describe the strength of magnetic field is called the nanoTesla [nT] (1 nano Tesla [nT] = 10-9 Tesla [T]).

The chemical and physical properties of different materials make magnetisation a varied phenomenon. Thanks to this, one can detect contrasts between subsoil features and natural background, resulting from local disturbances of magnetic field (anomalies). These anomalies arise as a result of residual magnetization or induced magnetization.

Residual magnetization is permanent and endogenous, however it applies only to certain materials, e.g. glacial erratics on post-glacial areas, containing ferromagnetic minerals in the form of iron oxides (Sala *et al.* 2012:137; cf. Clark *et al.* 1992). Although most soils, clays and rocks contain between 1 and 10 percent of iron oxides that form small magnetic domains pointing in random directions, their net magnetic effect is small owing to mutual annulment (Kvamme 2006:207). Nevertheless, in the event of heating to a certain temperature, beyond what is known as the Curie point, these domains become ordered, thus emitting significantly stronger and long-lasting magnetisation, known as thermoremanent or simply thermo-magnetisation. The level of magnetisation the material has acquired during the heating and subsequent cooling within the surrounding magnetic field will not change until the next heating event. Domains producing magnetic field are lined up according to the orientation and strength of the earth's magnetic field present at the time of the event (Schmidt 2007:23; Sala *et al.* 2012:139).

Examples of such magnetization are items made of metal, mostly of modern origin that appear as litter on archaeological sites (Pospieszny 2011:72; Sala *et al.* 2012:139). The remains of anthropogenic features such as hearths or kilns, which are often the targets of geophysical prospections on prehistoric settlements, are also subject to thermo-magnetization. These structures, built from clay containing iron compounds, such as magnetite ($Fe_3O_4$) or maghemite ($\gamma$-$Fe_2O_3$), can reach their Curie temperature (respectively 578°C and 578-675°C) while heating and cooling (Gaffney, Gater 2003:37; Schmidt 2007:23; Henry 2007). The same also applies to fired bricks and pottery. If the latter was accumulated shallowly beneath the top layer of soil, it can be discernible in the magnetometry image (Sala *et al.* 2012:139). Even, if their substance contains only weakly magnetic hematite ($\alpha$-$Fe_2O_3$), exposing them to a sufficiently high temperature it can result in the conversion of the former mineral into ferromagnetic iron oxide. As opposed to burned clay, the dried one can also be distinguished in the image of magnetometry, when contrasting with more magnetically susceptible context (Pospieszny 2011:72). Detritus (the product of weathering of rocks) is also susceptible to residual magnetization. It accumulates in waste pits and graves, as well as (in the form of iron sulfide) on the bottoms of waterbodies characterized by low flow rates (Schmidt 2007:24; Kosterov 2007:519). The earth's magnetic field causes the susceptible magnetic particles to line up in a characteristic way, resulting in weak but recognizable anomalies.

Induced magnetization, by contrast, is an exogenous phenomenon that appears in materials with a higher magnetic susceptibility when they are exposed to the influence of an external magnetic field, such as the earth's magnetic field (Weymouth, Huggins 1985:194; Schmidt 2007:24). Magnetization induced in this way is not permanent, as it disappears with the removal of the external magnetic field. The soil's components responsible for strengthening induced magnetization are mainly iron oxides in the form of mineral hematite ($\alpha$-$Fe_2O_3$), magnetite ($Fe_3O_4$) and maghemite ($\alpha$-$Fe_2O_3$), however only the last two are significantly magnetic (Clark 2000:100).

An increase in the soil's magnetic susceptibility can be caused by natural and anthropogenic factors. Proper differentiation between the two requires a broad knowledge of human activities taking place on the surveyed area. This common process can be explained by the "Le Borgne effect" (Le Borgne 1955; 1960), according to which the combustion of organic material (e. g. during firing of vegetation or hearths) and thus the passage of oxygen, follows the reduction of weakly magnetic hematite (anti-ferromagnetic) to magnetite (ferromagnetic). During the subsequent cooling, re-oxidation of the latter into ferromagnetic maghemite occurs, so that strong magnetization is preserved (Schmidt 2007:24). As a result, the top layer of soil has a generally higher magnetic susceptibility than the subsoil, which can facilitate the detection of archaeological features that, after a period of use, were filled with earth exposed to pedogenetic processes, anthropogenic modifications or even sunlight (Weymouth, Huggins 1985:195; Sala *et al.* 2012:137--139). Conversely, spaces filled with subsoil or mixed material may have a lower magnetic susceptibility than the surrounding humus, which will also be visible on the resulting image of magnetometry.

Similar reactions of reduction and oxidation occur due to the presence of anaerobic bacteria in decaying organic material left in waste pits or graves (Schmidt 2007:24). As an "effect of fermentation", hematite transforms into magnetite, which is accompanied by a change in pH and increased magnetic susceptibility (cf. Linford 2004). Detritus, understood this time as dead particulate organic material, is also a nourishment for magnetotactic bacteria, which produce magnetite crystals within their bodies (Fassbinder *et al.* 1990; Fuller, Dobson 2007:50).

During the geophysical prospections carried out within the scope of the project two types of magnetometers were used. The first geophysical survey conducted on the cemetery in Bukivna in 2013 employed a caesium magnetometer (supervisor – Sc.D. Ksienia M. Bondar).

During all subsequent surveys a fluxgate magnetometer was used. In contrast to proton or cesium-vapor devices, fluxgate magnetometers do not measure the absolute value of magnetic field in a given place, but its vertical component calculated along the axis of electromagnetic coil (Kvamme 2006:212; Schmidt 2007:27; David *et al.* 2008:21). Since such instruments are highly dependent on direction, they use a vertically mounted sensor, separated from each other by 0.5 to 1 m (Weymouth, Huggins 1985, 195; David *et al.* 2008:21; Sala *et al.* 2012:139). Consequently, it can be stated that in the course of prospection a gradient of the magnetic field's intensity (nT $m^{-1}$) is measured between two coils, however it is much more appropriate to say that actually it represents the difference in the magnetic field's induction (nT) between the sensors (Schmidt 2007:27). The earth's magnetic field affects both sensors alike, nonetheless underground sources emitting their own magnetic fields are more effectively registered by the lower sensor (Pospieszny

2011:73). Eventually the value encoded in the instrument's memory is the difference between the readings of the upper and lower sensor (Sala *et al.* 2012:139).

Fluxgate gradiometers are subject to drift (a systematic change in the instrument's zero point) with temperature changes and must be frequently calibrated (Kvamme 2006:212-213). Also, due to the diurnal variation of the earth's magnetic field value, there is a need to calibrate the instrument several times a day, bearing in mind that in the course of the afternoon its level decreases by 20-30 gamma in comparison to higher readings in the morning, as well as evening hours (Weymouth, Huggins 1985:194).

Most magnetometers currently in use by archaeologists achieve a measurement accuracy from 0.3 to 0.1 nT (Schmidt 2007:26; David *et al.* 2008:21). Therefore, it is possible to register objects, such as ditches or pits, which are usually characterized by an anomaly of ca. 4.8 nT (nanotesla). At the same time they are capable of capturing signals emitted by all forms of residual magnetization. Accumulations of objects and structures made of metal significantly limit the use of geomagnetic survey in urbanized and industrial areas. On the other hand, some magnetometers can be too weak to detect induced magnetization, associated with the presence of magnetotactic bacteria capable of reaching only 0.3 nT (cf. Fassbinder, Irlinger 1994). Readings above 50 nT generally indicate the presence of metal objects, but can also emanate from objects subjected to thermo-magnetization, for example hearths (Schmidt 2007:26). However, it should be noted that the strength of the reading depends largely on the depth below the surface, on which the source of the magnetic field has been buried.

A maximum, vertical range within which magnetometers can capture magnetic anomalies is explained differently. In the scientific literature one may find a given depth of about 2 meters in the case of ground structures filled with soil, such as ditches or pits, up to 5 meters when it comes to metal objects (Schmidt 2007:27). The measurement result is also dependent on the accuracy of the measuring device, as well as on the intensity of the object's magnetization, hence it is difficult to determine the depth of the object's location. Estimation of the source's location requires the evaluation of the horizontal distribution of the anomaly, since the objects located deeper tend to emit broader signals (Schmidt 2007:26).

Finally, one has to remember that the polarization of the magnetic field and, consequently, its depiction on the image of magnetometric prospection will differ according to the location of the surveyed area on the earth's globe (Kvamme 2006:209). In most of the areas located in the northern hemisphere, the inclination angle at which the lines of the earth's magnetic field intersect the globe's surface varies from about 55 to 75 degrees (Mussett, Kahn 2000:139-142). In the case of induced magnetization, the magnetic field emitted by a given feature is always polarized parallel to the contemporary axis of the earth's magnetic field. This results in a *normal* alignment of dipoles with the positive peak generally lying somewhat south of the true locus of the anomaly and the negative occurring to the north (Weymouth, Huggins 1985:196; Kvamme 2006:209).

On the other hand residual magnetisation, especially in respect to ferromagnetic minerals within rocks, can reveal various ways of polarization. It stems from a different orientation of the earth's magnetic field at the time of their formation, so-called *secular* migrations of magnetic poles over the globe (Kvamme 2006:209). Also, in the case of iron artefacts one should not expect the dipoles to be always aligned according to the present polarization of the earth's magnetic field. The orientation of dipolar anomalies emitted by them depends on their shape, with non-spherical objects possessing a principal axis prone to deviations from the north-south axis (Kvamme 2006:221). If the positive and negative peaks of the anomaly are not aligned in the arrangement described above, one is dealing with an *abnormal* dipolar anomaly.

It should also be mentioned that most of the sites investigated with magnetometry in the course of the project are located within dense forests, hence barrows subjected to prospection were sometimes densely overgrown with vegetation. Although the time of conducting the survey, if possible, was chosen to avoid the growing season, it was not possible to escape all the problems stemming from the present land cover of the cemeteries. One has to realize that heavily vegetated or wooded landscapes make instrument passage difficult and can greatly slow down the progress of a magnetometric survey (Kvamme 2006:224).

Even though it is possible to clear the surveyed area of fallen branches or small plants, trees and shrubs often form significant obstacles that cannot be removed, owing to their size, not to mention legal regulations. Such obstructions can affect the precision of the measurements, if the operator of the instrument is not adjusting constantly the spatial position and pace of sampling. In some cases when a tree is standing directly in the way of a transect, it is necessary to skip a certain amount of measurements or

even cancel the whole transect, if the terrain cover is really dense. Nevertheless, it is difficult to completely avoid errors, therefore the resulting images are characterized by imperfections, such as missing traverses or measurements, or sharp contrasts between them. To some extent these can be corrected during data processing, but still many images bear witness to problems that can occur during a magnetometric survey in a forest.

Also, the landform of a barrow itself causes some difficulties when surveying. In general the higher and steeper the barrow's embankment is, the more errors can be expected. Climbing the slopes of large mounds is often connected with the displacement of the measurements, resulting in mismatched grids. Moreover, surveyed barrows were often excavated in the past, thus leaving ditches or pits cutting through the embankments. These remains of human activity, not connected originally with the creation of a barrow, can significantly disturb the resulting images, especially if containing iron litter left after the excavations. Hence, the images of many barrows reveal strong dipolar anomalies, covering any weaker signals emitted by potential archaeological features. Even, if the barrow did not bear the traces of excavations, one has to consider the possibility that, rather than prehistoric features, strong dipolar anomalies are emitted by modern remains rich in iron oxides and deposited in the topsoil.

The caesium magnetometer used during the first geophysical prospection on the site in Bukivna is PKM-1 (Geologorazviedka, Russian Federation). Induction of the earth's magnetic field (B) was measured with 0.001nT accuracy. The distance between measurement profiles was 1 m. The length of the step along the profile, set to an automated mode (10 measurements per seconds) on average was 15 cm. Measurements were conducted in motion.

In geophysical surveys on other sites a Bartington "Grad 601" fluxgate magnetometer was used. The instrument is composed of one probe, containing two sensors with a vertical spacing of 1 m. The survey was conducted with 0.1 nT accuracy, with a single measurement taken at every 0.25 m along transects and a spacing of 1 m between the transects. In the case of several barrows, rare vegetation covering their embankments allowed for narrowing the intervals dividing transects to 0.5 m. Transects were predominantly oriented approximately along the geographic north-south axis, with the probe always heading north. However, in several cases it was necessary to abandon this rule due to the prevailing conditions at specific sites. At every site the magnetometer was calibrated in a single, designated spot, where the strength of the magnetic field did not exceed -1/1 nT.

Gradiometer sensors are highly sensitive to changes in direction. Therefore, to improve data quality, the surveys were carried out in a so-called "parallel mode", meaning that the instrument was carried only in one direction when taking measurements. In contrast to the "zigzag mode", in which transects are walked with alternating directions, the parallel mode doubles the distance to be walked since the operator always has to return to the starting line before initiating the next transect of measurements. Nevertheless, the latter method helps to avoid accidental errors leading to the displacement of transects along the geodetic x axis.

The surveyed areas were divided into measurement polygons (grids) in the shape of squares with dimensions ranging from 10 × 10 m to 20 × 20 m. Together the adjacent grids created frameworks encompassing single barrows or whole fragments of the sites. Detailed description of grid frameworks established over surveyed areas has been included in the presentation of the results of magnetometric surveys.

The processing of the data obtained with a caesium magnetometer was done in a computer program. The normal component of the magnetic field was defined by calculating it from original measurements of the average magnetic induction for every profile. This particular method allows one to avoid the influence of geomagnetic variation. As a result, a map of local anomalies of the magnetic induction was obtained.

Geoplot 3.0 software was used for processing, analysing and mapping of the results of measurements with a fluxgate magnetometer. In the visualization of magnetic variation a mode called *shaded relief plot* was applied, while to improve the resolution of the images and enhance the contrast between anomalies the following functions were used: zero mean traverse, despike, clip, low pass filter, high pass filter and interpolation.

All the attached figures visualizing results of the prospections were created with Surfer ver. 11 software. On most of the figures the actual values of the magnetic field have been compressed to a range of +5 to -5 nT, which corresponds to the accompanying greyscales. Therefore, all the readings of +5 nT or higher and -5 nT or lower have been marked respectively with black and white color. In some cases, when the -5/+5 range was insufficient to reveal the contrast between anomalies, compression of the values to a smaller range was applied.

# III. Cemetery in Bratkowce/Bratkivcy (Fig. III.1)

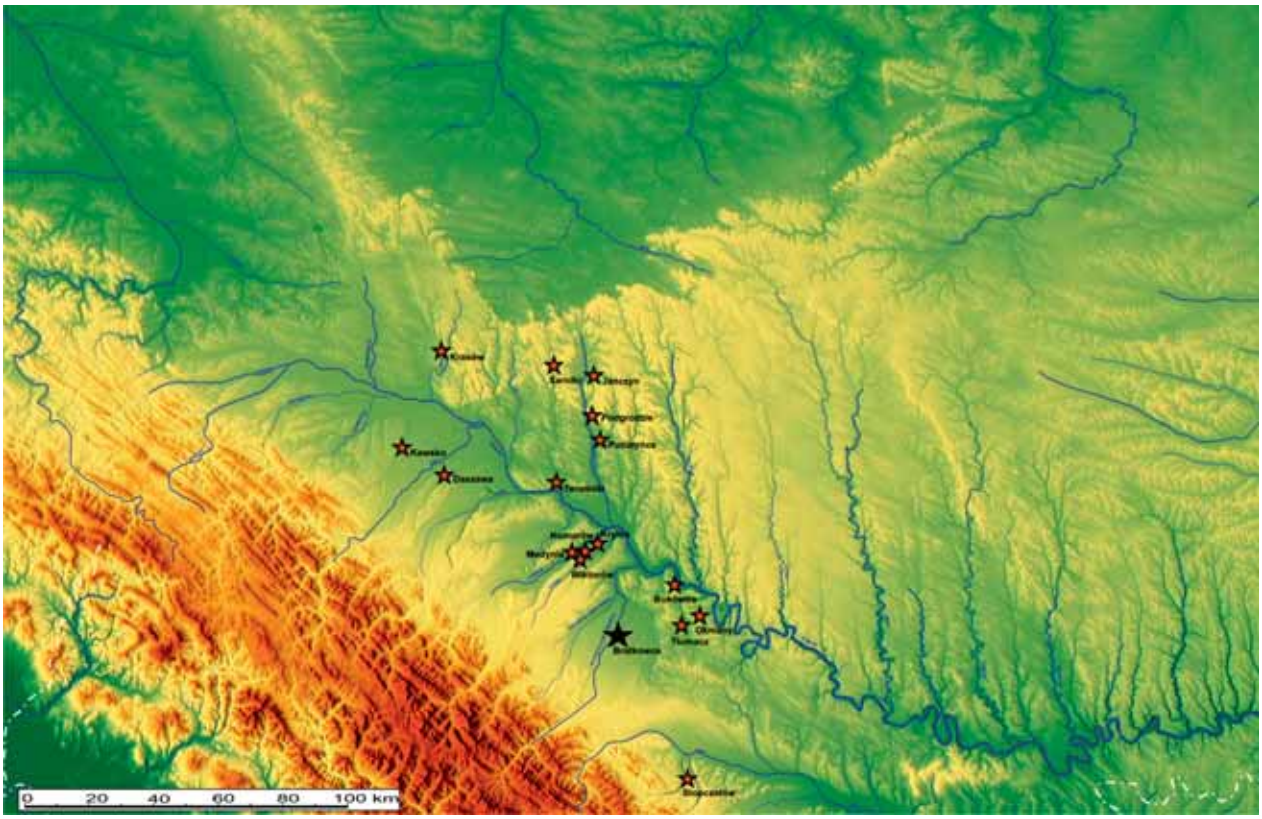


**Fig. III.1.** Location of the cemetery in Bratkivcy in relation to other barrow necropolises

## A. Geographical description

One barrow was found on the site. It was located south-eastwards of Podhorodna and its tributary, which flows into the Bystrytsa leg of the Nadvirna river (**Fig. III.2 and Fig. III.3**). Its position is connected with the relatively low placed area of the Bystytsa- -Prilukvinska Upland (more precisely, the geomorphological division of the Bystrytsa Plain). The lowest elevation in the study area was recorded in river valleys – 265 m.a.s.l., while the highest in the interfluve areas – 288 m.a.s.l. Differences in altitude are not excessive and are around 23 m. Land elevation differences are directly connected with the geological processes in the area, especially the unequal tectonic depression. Stanislav Valley, delimited by the Bystrytsa leg of the Solotvyno and Vorona rivers, is characterised by incurves, which at the same time elevate

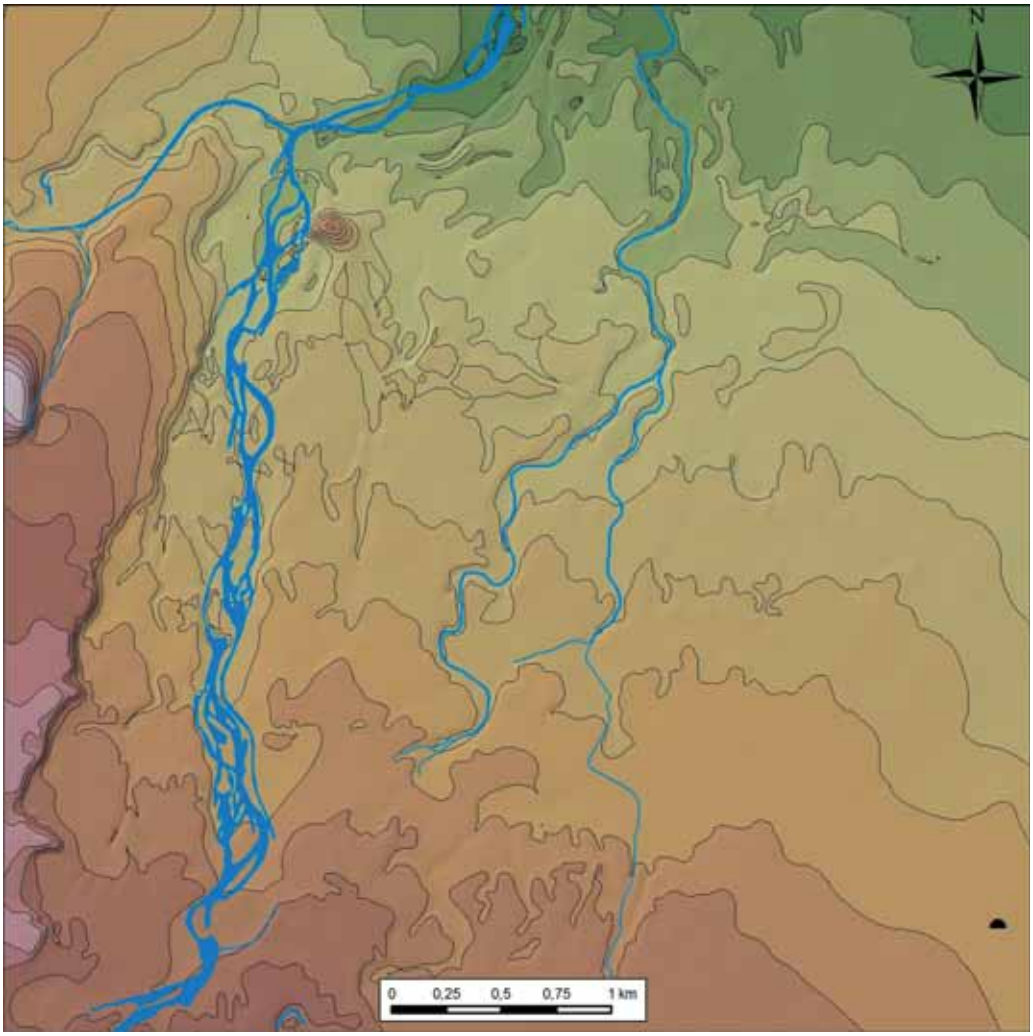


**Fig. III.2.** Bratkivcy. Digital Elevation Model of the cemetery

the surrounding highland, namely the Podolian and Przylukvinska Uplands (Kravchuk 1999; Łanczont *et al.* 2002).

The Bystytsa-Przylukvinska Upland was classified by Kravchuk (1999) as a second, Neo-pleistocene upper terrace. It has a hilly, undulating surface covered with coarse-grained sand and gravel sediments, topped by a loess layer. An additional feature of the plain is a dense drainage system resulting from a concentration of flow lines in this predestined, low-lying area. It is noticeable that the majority of the surface in the area shows traits of fluvial system transformation. An indicator of such processes is the type of riverbed observable in the Bystrytsa River in the Nadvirna Valley. The basin represents a multi-channelled structure, clearly attesting to an overload of the material carried from the mountainous and hilly areas. In the fairly flat area of the Bystrytsa Plain, the river has a lesser decline.

A barrow in Bratkivcy was found West of the Bystrytsa leg of the Nadvirna River. At a similar distance from the east are the tributaries of the Uniava. Taking into consideration the generally flat landscape, the barrow itself was visibly exposed due to its position at 280 m.a.s.l. This could be a result of unfavourable environmental conditions, as well as the relatively flat and hardly diversified morphometry of the Bystrytsa Plain.

## B. Description of the barrow

The barrow in Bratkivcy (no. 102) is a single monument located in a hornbeam-alder forest with a grass underbrush, at 276.5 m.a.s.l **(Fig. III.4)**. Geographic coordinates: N – 48°50'165"; E – 024°44'855". Circular in shape, 23 m in diameter, 0.6 m high **(Fig. III.5)**.


**Fig. III.3.** Bratkivcy. Location of the barrow using satellite imagery (Yandex)

**Fig. III.4.** Barrow 102, view from the E

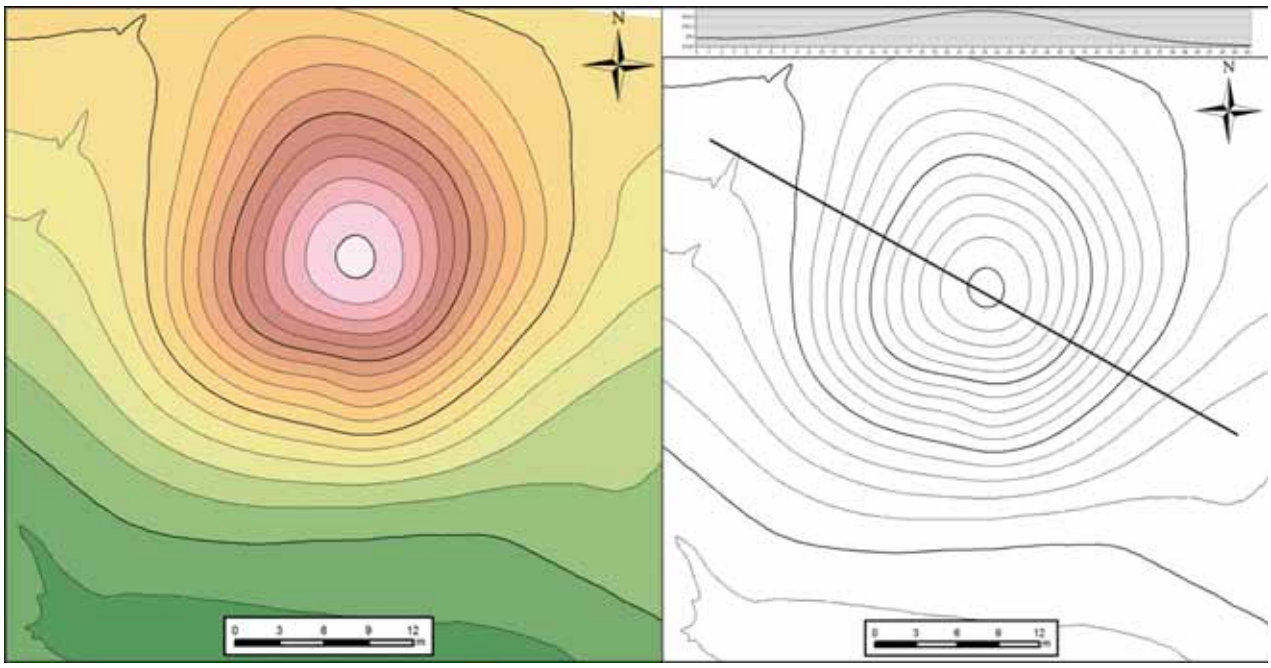

**Fig. III.5.** Barrow 102: hypsometric plan and cross-section

The mound is slightly flattened on top; no further damage was identified. The tumulus was subject to geophysical survey.

## C. Geophysical survey

Barrow no. 102 located on the site near Bratkivcy was surveyed in April 2015. It has an extensive, but low embankment (**Fig. III.6**). The tumulus and its closest surroundings were included in the measurement surface, comprising four grids each with dimensions of 20 × 20 m, totally covering an area of 0.16 ha. The terrain in which the survey took place is entirely overgrown by deciduous forest. Nevertheless, fairly large spaces between the trees, as well as a general lack of dense vegetation on the ground, allowed for the full registration of the mound together with the wider context.

The barrow is well visible on the resulting image of the magnetometric prospection and clearly distinguishes itself from the context, the latter characterized by uniform values of the magnetic field (**Fig. III.7**). The survey made it possible to estimate the current ambit of the barrow, which in reality is smooth and difficult to trace (**Fig. III.8**). Basing on the image, the shape of the tumulus can be described as circular with a diameter slightly exceeding 20 m. In particular, attention is draw by numerous anomalies of the magnetic field, located in a complex pattern within the embankment. Spots characterized by high values of magnetisation are surrounded by tracts of land, where the recorded gradient does not exceed 0nT. Some of these strong signals have noticeably distributed dipoles, sometimes not oriented normally, therefore pointing to a residual type of magnetization and most probably indicating

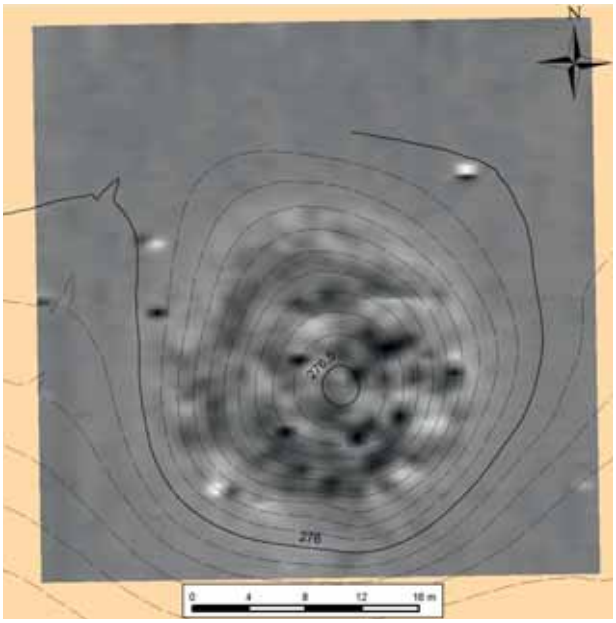

**Fig. III.6.** Bratkivcy. Position of geophysical survey

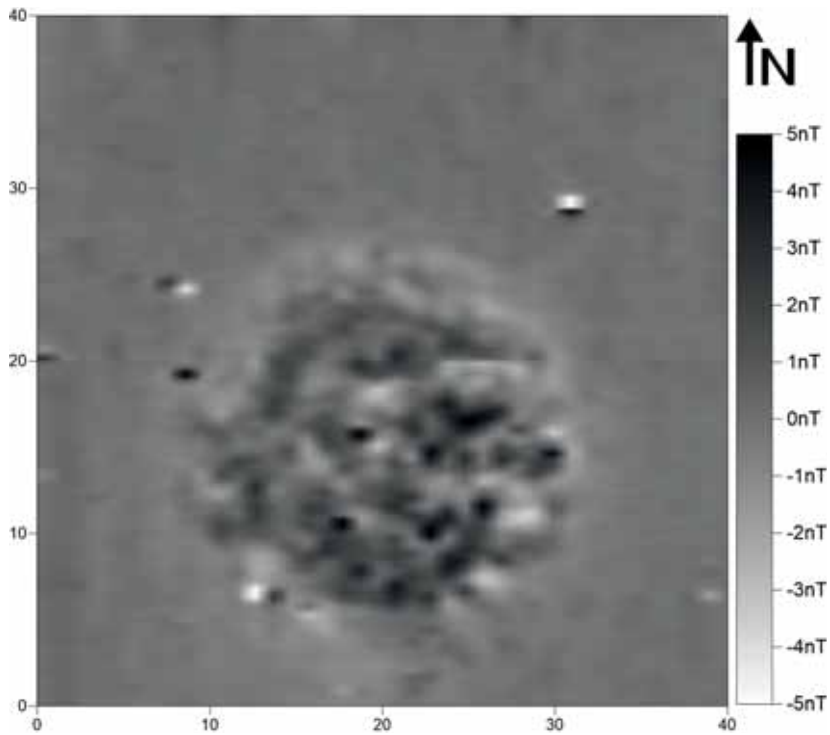


**Fig. III.7.** Resulting image of magnetometric survey of barrow no. 102 on the site near Bratkivcy (gradiometer Bartington Fluxgate Grad 601-1; measuring grid: 20 × 20 m, sampling density per transect spacing: 0.25 × 1.0 m, interpolated up to 0.25 × 0.5 m; real values of magnetic field gradient compressed in greyscale to the range -5 – +5nT)

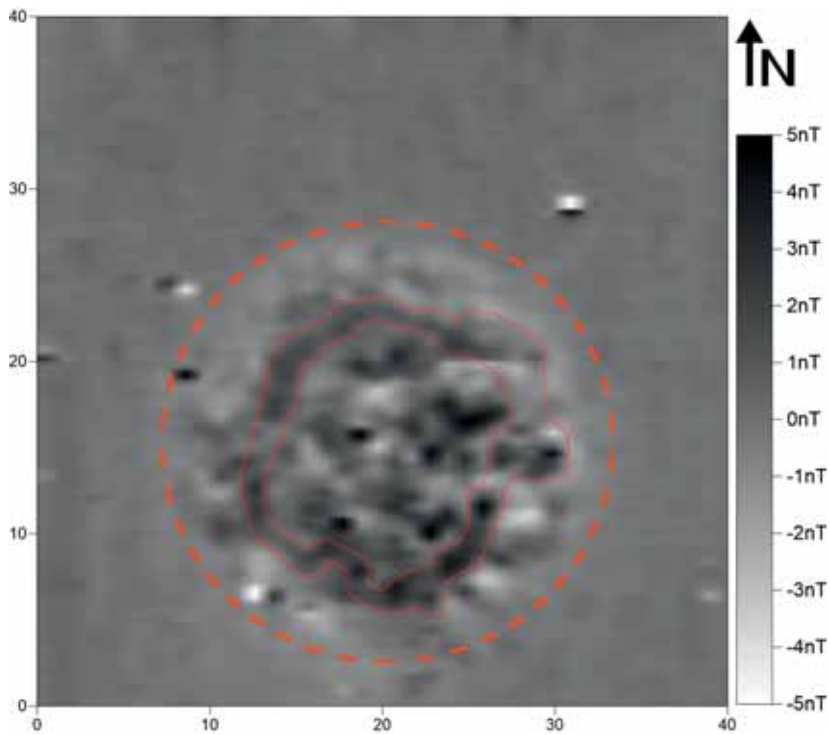


**Fig. III.8.** Resulting image of magnetometric survey of barrow no. 102 on the site near Bratkivcy with highlighted anomalies discussed in the text.

--- approximate spatial extent of the barrow

— approximate delimitation of a ring-like anomaly, potentially indicating an internal feature of the barrow

metal objects of modern origin. The remaining anomalies with values outlying from 0nT, due to their discreet display, normally oriented dipoles and also regular shape, as in the case of ring-like anomaly encircling centre of the barrow (Fig. III.8), resemble induced magnetization. The aforementioned anomaly has values ranging from 2 to 3nT and is less pronounced than positive and negative peaks of magnetisation, especially concentrated in the east part of the mound. Additionally, it does not reveal an intensive negative maximum of magnetization that usually accompanies signals of residual magnetization. Together with its fairly regular shape, these characteristics show plausible grounds for viewing the discussed anomaly as a relict associated with the barrow's internal structure. Perhaps it shows the remains of an encircling groove known from some Corded Ware culture barrows or some other feature with a high concentration of material with strong magnetic susceptibility. Moreover, it is surrounded for the outer side by a strip of low values of magnetic field that leads to the view that the most peripheral part of the embankment is made up of a soil devoid of mineral compounds. Presumably they were washed out from the slopes in the course of time following the barrow's formation.

From the information acquired before the survey, it can be ascertained that the barrow probably has been excavated in the past, however the extent of these works remains unknown. In this case the landform still observable in the terrain is what has remained from the original embankment. Consequently, it can be inferred that the diversified character of the magnetic field within the barrow's limits was mainly created due to the excavations. Subsequent intermixing of previously stratified soil layers caused disorder in the way anomalies emitted by barrow's internal features are displayed. This interpretation is especially plausible, if the soil once dug out form the embankment was later deposited in the same place. In the following period it could acquire new, externally induced magnetic properties, however one has to expect also the presence of materials accidentally left inside, such as metal pieces producing residues of strong magnetization. Nonetheless, it is still possible to detect at least one anomaly (a ring-shaped feature encircling the centre), potentially connected with original internal structure of the barrow, that was not completely destroyed in the course of excavations. The presented results, however, need to be clarified and verified by further research.

## D. Archival information

Bratkowce, district of Stanisławów (after Sulimirski 1968:130)

*In 1935, a barrow-grave with a cremation burial was investigated by Dr J. Pasternak (Pasternak 1936:132). Vessels typical of the Komarów culture and a flint flake were found in it.*

The materials have never been published.

# IV. Cemeteries in Bukówna/Bukivna and environs: Bukówna/Bukivna-Olszanica/Vilshanitsa and Bukówna/Bukivna-Miłowanie/Milovanie (Fig. IV.1)

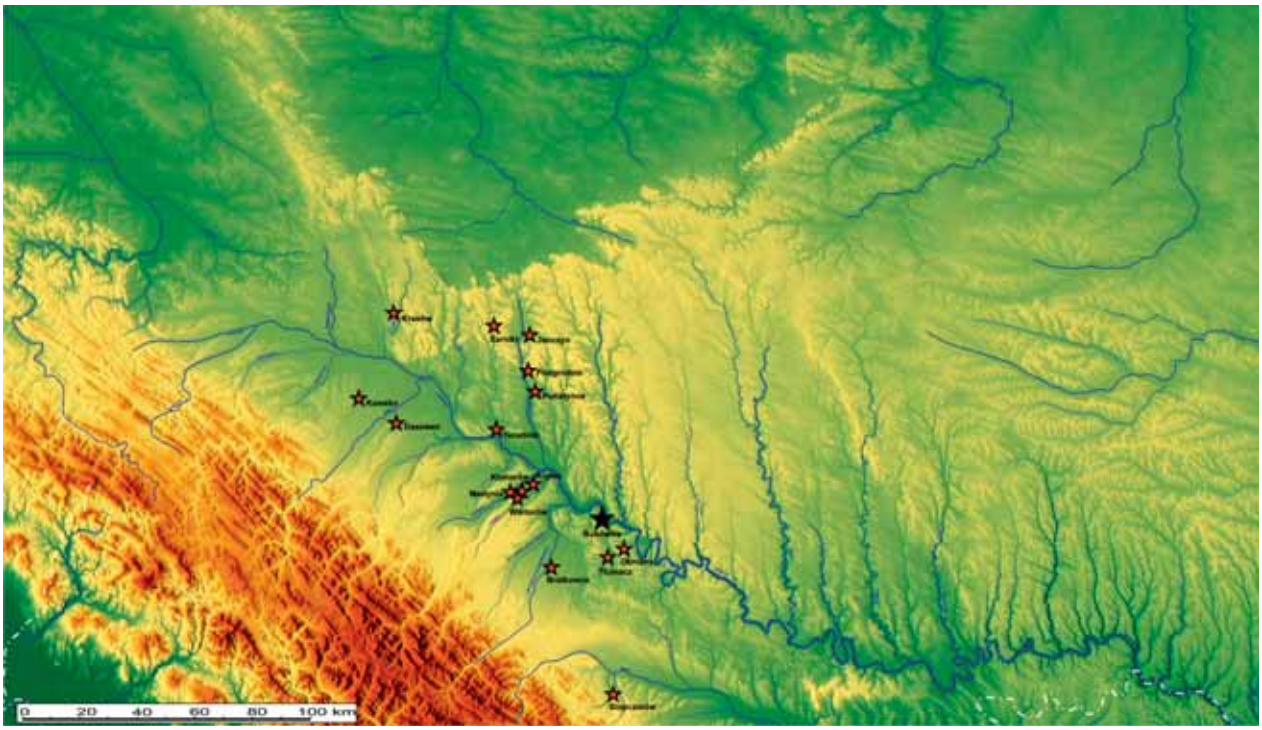


**Fig. IV.1.** Location of cemeteries in Bukivna, Bukivna-Vilshanitsa, Bukivna-Milovanie in relation to other barrow necropolises

## A. Cemetery in Bukówna/Bukivna

### A.1. Geographic description

This site comprises of several barrow concentrations located on the right bank of the Dniester, in the Bystrytsa-Tlumach Upland. The main geomorphological units in the area are highlands cut by terraced river valleys, mainly ones flowing from the Carpathians down to the Dniester valley. Uplands were formed in the Miocene, and in the Pleistocene were covered by coarse-grained sands and gravels. Their surface was later covered by loess sediments, which are the main supply source for rivers in the area (Łanczont *et al.* 2002; Łanczont, Boguckij 2007; Gębica *et al.* 2013).

Plateau areas are characterised by elongated humps located between 350-400 m.a.s.l. Considering the impact of differing geological processes in the past, the terrain can be classified as the accumulation-denudation-erosion type. Denudation processes are typical for plateau zones, while erosion and accumulation dominate river valleys. Such plateaus were selected for barrow cemeteries in the Bukivna and Milovanie regions. Barrow groups are located between 300-350 m.a.s.l. The study area, as well as the rest of the region, is characterised by a diversified topographic relief, divided by a river system set in gorges and ravines. All of the cemeteries (barrow groups) were located 1.5-2 km from the Dniester or its tributaries (second or third class of river systems). Differences in relative elevation between the highest plateaus and bottoms of river valleys sometimes exceed 110-150 m.

Considering the geological setting, barrows are located close to the Ukrainian threshold of the East European Craton. It is characterised by Baikal structures surrounded by Caledonian formations, which belong to the Palaeozoic platform of Western and Central Europe. The border with the platform is located along the Radechov-Rohatin overfold. It is covered with a sediment layer, as well Cretaceous and Tertiary rocks. The thickness of this layer increases to the West – in the direction of the Fore-Carpathian Depression. Cretaceous rocks comprise of grey or white marls, limestone, sandstones, or sandy marls. They are visible in the precipice zones of the Dniester and its tributaries. Younger Miocene rocks are related to the Molas formation in the Fore-Carpathian Depression. The sedimentation sequence of the Miocene comprises of grey, greenish, yellowish, and limestone loams, as well as siltstones and sandstones (Łanczont *et al.* 2002).

The analysed barrow groups are located on the watersheds of small Dniester tributaries. In macroscale they are arranged along plateau peaks.

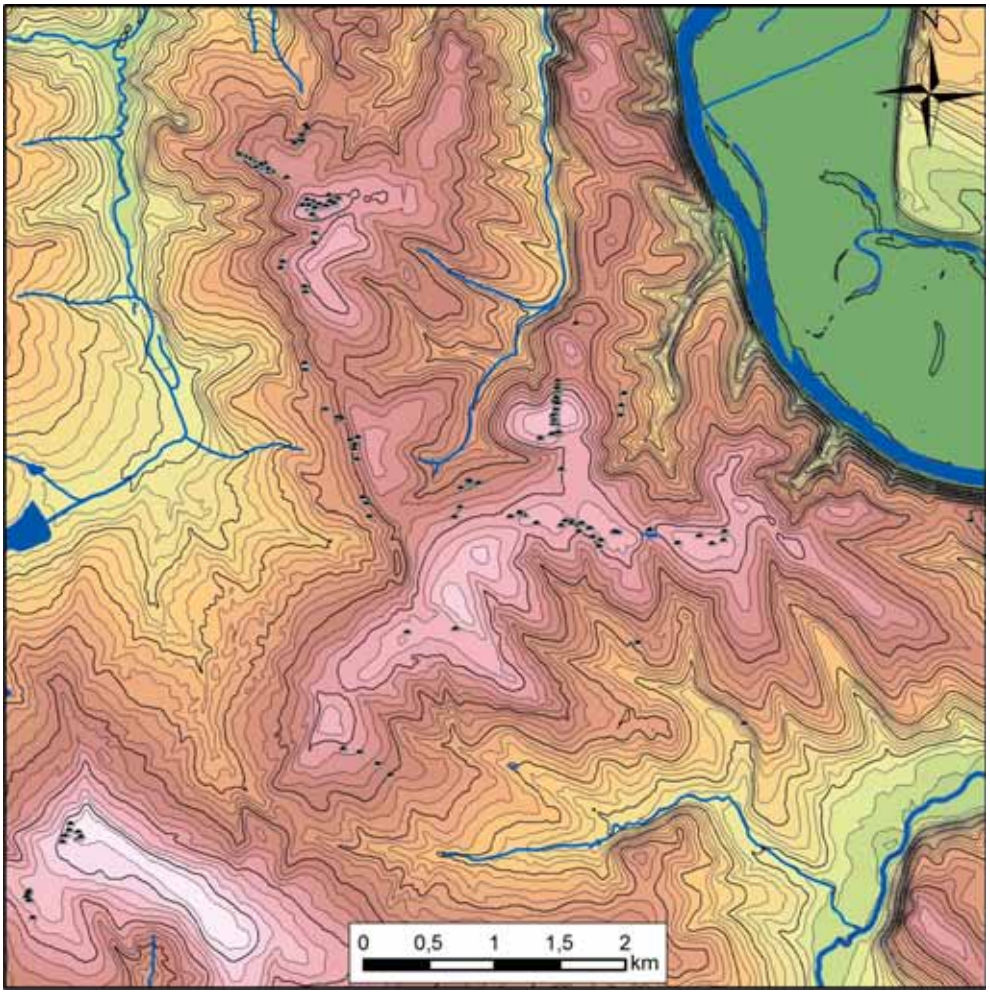


**Fig. IV.2.** Digital Elevation Model of barrow cemeteries in Bukivna, Bukivna-Vilshanitsa, and Bukivna-Milovanie

Monuments were constructed in similar environmental conditions. These were peak zones of elongated plateaus, which at the same time were the watersheds of Dniester tributaries or deep-profiled lower class watercourses, which, due to the loess coverage in the area, formed gorges and ravines.

## A.2. Spatial arrangement of the cemetery (cemeteries)

The cemetery in Bukivna is one of the largest barrow necropolises of the Komarów culture, both in terms of area covered and the number of monuments recognised. Due to the research conducted between 2010 and 2015 (field-walking prospection, geophysical surveying, excavations and recognition of pre-war excavated barrows) it is plausible that ca. 70 barrows were constructed in the area.

The cemetery in Bukivna covers an area of several square kilometres (**Fig. IV.2, Fig. IV.2a)**. It comprises two main alignments. Initially there were more barrows with only the ones erected in the present-day beech forest preserved and a handful of tumuli located on fields or meadows. The longer alignment is located along the E – W axis (3.5 km in length with small intervals). The shorter one is aligned along the N – S axis, spreading along ca. 1 km distance (also with intervals). Apart from the main ones, smaller, separated concentrations or single barrows, were recorded. Within the two main alignments there are smaller concentrations, usually separated from others. They were usually placed on exposed terrain – flattened ridges of slight slopes separated by a lowering of terrain. For field-walking prospection they were divided into barrow groups (**Fig. IV.3**).

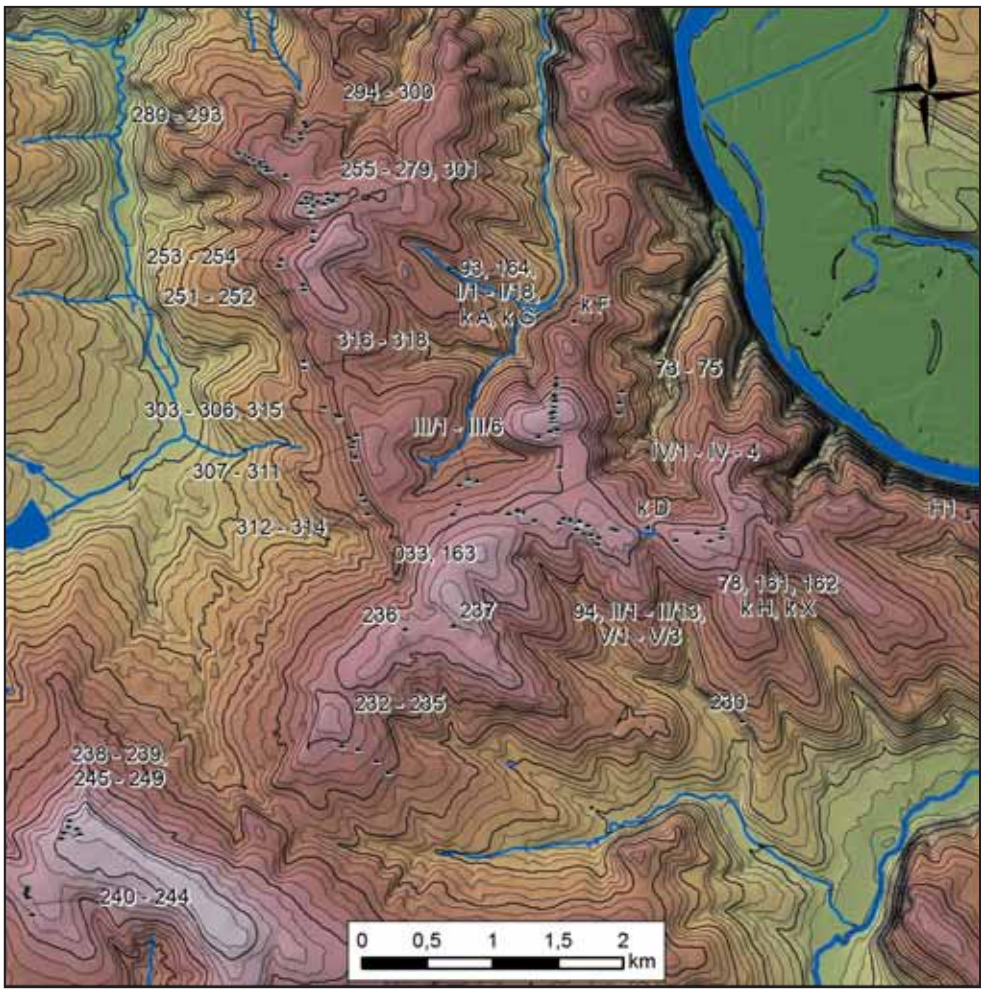


**Fig. IV.2a.** Digital Elevation Model of barrow cemeteries in Bukivna and Bukivna-Vilshanitsa and Bukivna-Milovanie with numbers of groups and barrows


**Fig. IV.3.** Bukivna, Bukivna-Vilshanitsa and Bukivna-Milovanie. Location of cemeteries using satellite imagery (Yandex)

**A.2.1. Meridian arrangement**

The barrow alignment is stretched along the N – S axis – it comprises 21 objects forming group I and two additional mounds located north and south of the main concertation. The authors of pre-war papers and excavation report (Bryk 1932; 1932a; Śmiszko 1937; Siwkówna 1938) claimed that there were more barrows in the fields north of the necropolis. However, already then they were destroyed and are now no longer visible.

Barrows belonging to group I are located in the beech forest (partially in the clearing) almost entirely linearly arranged along a 500 m distance, except for barrow 14/I, which is situated in the south-eastern boundary of the concentration (**Fig. IV.4**). In the south-central part of the group monuments were erected on the eastern, slighter slope of a small hill, 40-50 m east of its culmination. Hill, a wide watershed between two dried watercourses – tributaries of the Dniester – is nearly parallel to its valley, ca. 1.5 km from the riverbed. In general, the terrain drops in the southern, eastern and northern directions, and the height difference between the highest (south-central part) and lowest (northern part) placed mounds is 10 m (332-342 m.a.s.l.).

Within the described group, tumuli form smaller concentrations – clusters, which comprise a few tumuli erected one next to another or single barrows arranged in lines (one after another). The distances between close monuments measures from a few to several metres, and in special cases they are adjoining.

In the northern part of group I, five barrows are arranged in line. On the northern edge there is barrow G/I, and south of it – at a few metres distance – barrow 164/I. Some 15 m, almost in a straight line from it, is barrow 13/I and ca. 10 m in the same direction – excavated barrow 2/I/2010/12. The distances between the last one and additional tumuli erected south of it – 3/I/2012, 6/I/2014 and 7/I/2014 – are 20 m and 12 m respectively. Barrows 6/I/2014 and 7/I/2014 forms a single, oval mound, while from the south-east they were joined by barrow 18/I and to the south of them, several meters apart was bar-

row 17/I. On the southern side of the field road, transverse to the main road from Bukivna to Milovanie, ca. 30 m south of the aforementioned barrows, there is a single barrow 16/I and a further 30 m in the same direction, a concentration comprising six monuments stretched across an 80 m distance, which is formed on the northern side by mound 11/I and neighbouring it (ca. 5 m distance) from the SW, barrow VI/1937 (12/I). The distances between them and four additional barrows 10/I, 9/I, 8/I and smaller tumulus 93/I are 5 to 10 m. The next cluster of monuments is located ca. 50 m to the S, which comprises three larger mounds (barrows 5/I, 4/I and excavated 1/I/2010) that form a triangular arrangement, where barrows are set 10-15 m apart, and one smaller one (15/I) located on the south-western side, over 20 m away from barrows 1/I/2010 and 4/I. Barrow group I comprises also tumulus 14/I, situated ca. 90 m SW of the closest mound(15/I) and 120 m from the main alignment.

Within the meridian arrangement, apart from the described barrow concentration, there are two additional mounds. The first is located ca. 700 m N of the northern flank of group I (barrow F – V/1937), in the yard of a former mansion. The second one (barrow A) – ca. 350 m of the southern borderline of the meridian alignment, more or less half of the distance from barrow group II (central part of the latitudinal arrangement).

Around 650 m E of the main meridian alignment there were three barrows excavated in the 1930s. They are arranged along the N – S axis (I/1937, II/1937 and III/1937 – Śmiszko 1937; Siwkówna 1938). All of them are located on the slope of a small river valley that drops to the east. Presently it is the village meadow. Barrow III/1937 is located 100 m N/NE of the centrally placed barrow I/1937. Tumulus II is situated ca. 70 m S/SE of the latter.

**A.2.2. Latitudinal arrangement**

The latitudinal arrangement is located along the ridge of low hills, on the right side of the Dniester. It comprises a few barrow groups, 37 mounds in total. On the basis of 1930s research (Bryk 1932; 1932a; Śmiszko 1937; Siwkówna 1938) it is plausible that initially – especially in the eastern part of the arrangement, as well as in the fields and meadows – there were more barrows, presently completely destroyed ("excavated" in the past). The described constellation of barrows usually comprises linear structures and

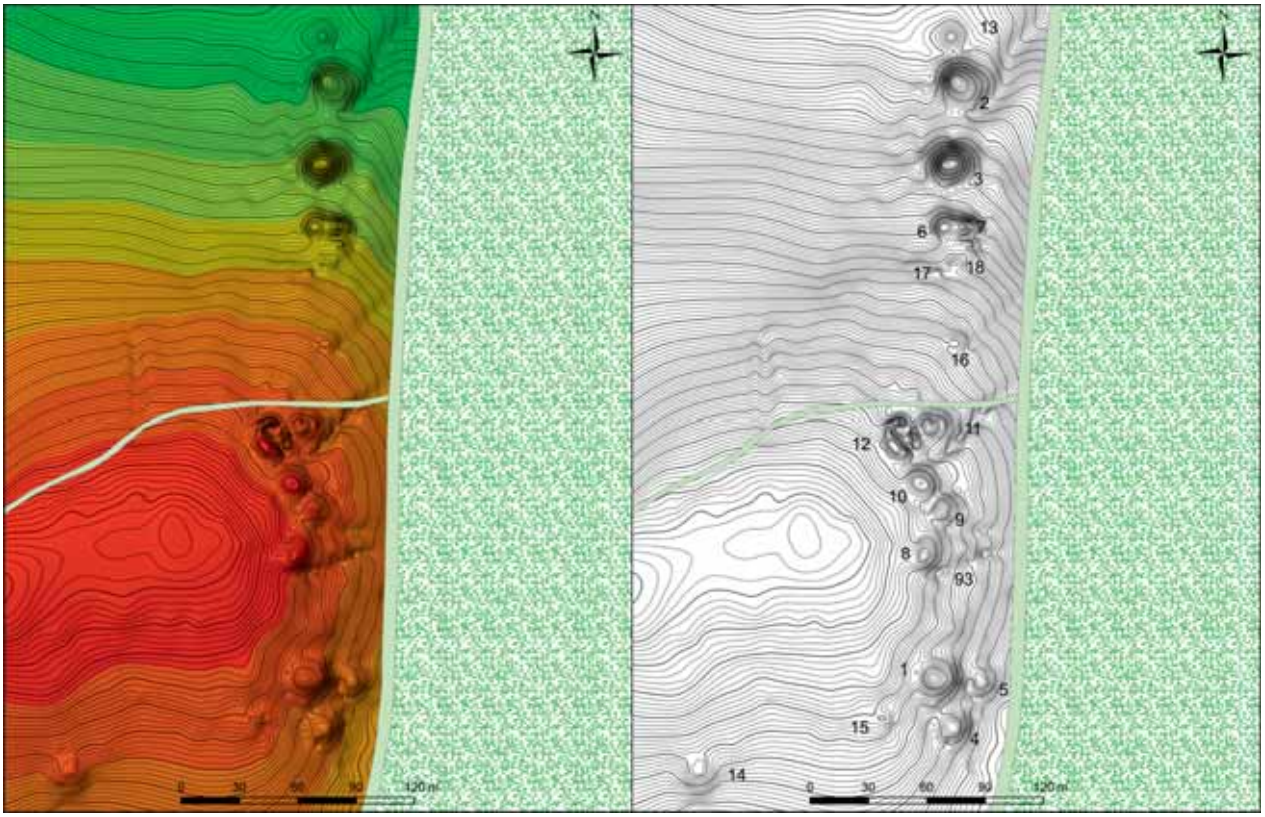


**Fig. IV.4.** Bukivna. Spatial arrangement of the central part of barrow group I

spreads across a 3.5 km long distance, and is characterised by the presence of a few monument concentrations and intervals without mounds. Apart from the H1 mound in the E, which is located 1.8 km from any barrow, the rest of them are located along a 1.7 km distance (Figs IV.2, IV2a). However, the mentioned two kilometres-long distance is covered with fields, as well as village buildings and garden, thus making the existing terrain completely different from the past (cf. the issue of so-called map formation process – Bourgeois 2013).

During fieldwork the mentioned latitudinal arrangement of barrows was divided into groups II, III, IV and V with barrows numbered accordingly. All of them are located in the beech forest. From a general perspective groups II and V can be connected since they are located on the same terrain form. In the western part of the latitudinal line a number of tumuli are spread across a large area in quite large intervals. They are referred to as group VI.

Barrow group II is located in the central part of the western zones of the latitudinal alignment, and stretches across 380 m (**Fig. IV.5**). It comprises 14 monuments situated across a wide ridge and a southern slope which is perpendicular to where the watershed barrow group I is located. The distance of this group from the Dniester riverbed is 1.5-2 km. The area, where the group is located, drops towards NW and SE. Denivelations between the highest (central part of the cluster) and lowest placed barrows (south-eastern part) is 11 m (345,5-355.5 m.a.s.l.), while the difference in height between group I and II is ca. 20 m.

On the western flank of the group there is barrow 94/II and 12 m N of it, barrow 12/II. Some 20-50 m towards SE from the latter are three barrows (9/II, 10/II and 11/II) of similar size, which form a triangular arrangement. The distance between barrows is 5 to 8 m. Another sub-group covers the culmination and southern slope of the hill. It consists of six or (as suggested by geophysical survey) seven barrows (mounds nos. 1/II, 2/II, 3/II, 4/II, 5/II, 13/II, and the supposed barrows, invisible in the terrain). This concentration is located 40 to 120 m from the aforementioned triangular arrangement of barrows. The furthest to the W is the excavated tumulus 1/II/2013. Two smaller mounds (3/II and 4/II) are located 8 m NE and E of it, and form a triangular arrangement together. The largest of all recognised barrows–monument 2/II – is located 20 m to the SE. Barrow 5/II is situated 15 m to the SW of the latter and 35 m to the NE – mound 13/II. The supposed barrow (no number) is not visible in the area but can be clearly discerned in the geomagnetic visualisation and is located 20 m to the S of tumulus I/II/2013. Some 8 m to SE of barrow 2/II there is another large mound – 6/II, behind are two additional ones – 7/II and 9/II. The first is located 55 m SE of it, while the second one is 65 m away in the same direction (a bit more to the S).

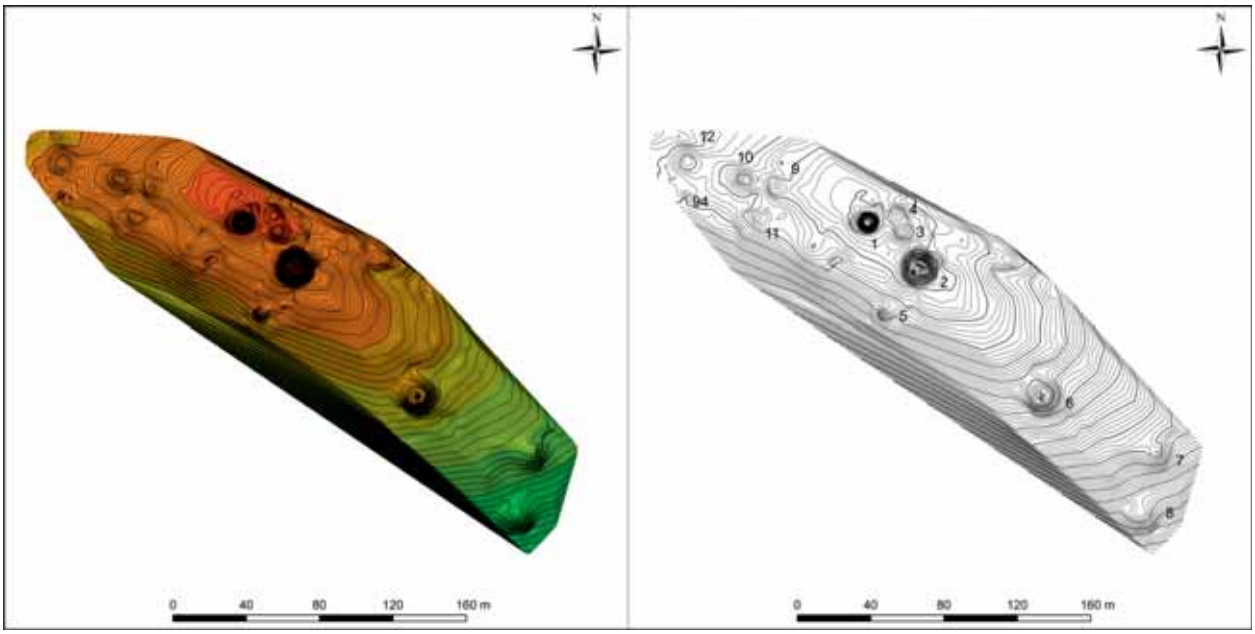


**Fig. IV.5.** Bukivna. Spatial arrangement of the central part of barrow group II

Three barrows which were initially classified as group V (1/V, 2/V and 3/V) can be assigned to group II due to their presence on the same terrain – on the north-western slope of the hill (Fig. IV.2). They are situated 150 m to the north-east of barrow 7/II and form a triangular arrangement, while monument 3/V is located 30 m east of barrow I/V. The distance between barrows 2/V and 3/V is 16 m.

West of barrow group II there are two smaller concentrations defined as groups IV and III. Group IV (**Fig. IV.6**) comprises four barrows situated on a hill Adjoins the one group II is located on. Barrow 4/IV is located ca. 280 m west of barrow 94/II, the furthest monument in this direction. The first of the three tumuli (1/IV) is located ca. 150 m NW of it, while 100 m and 130 m further in that

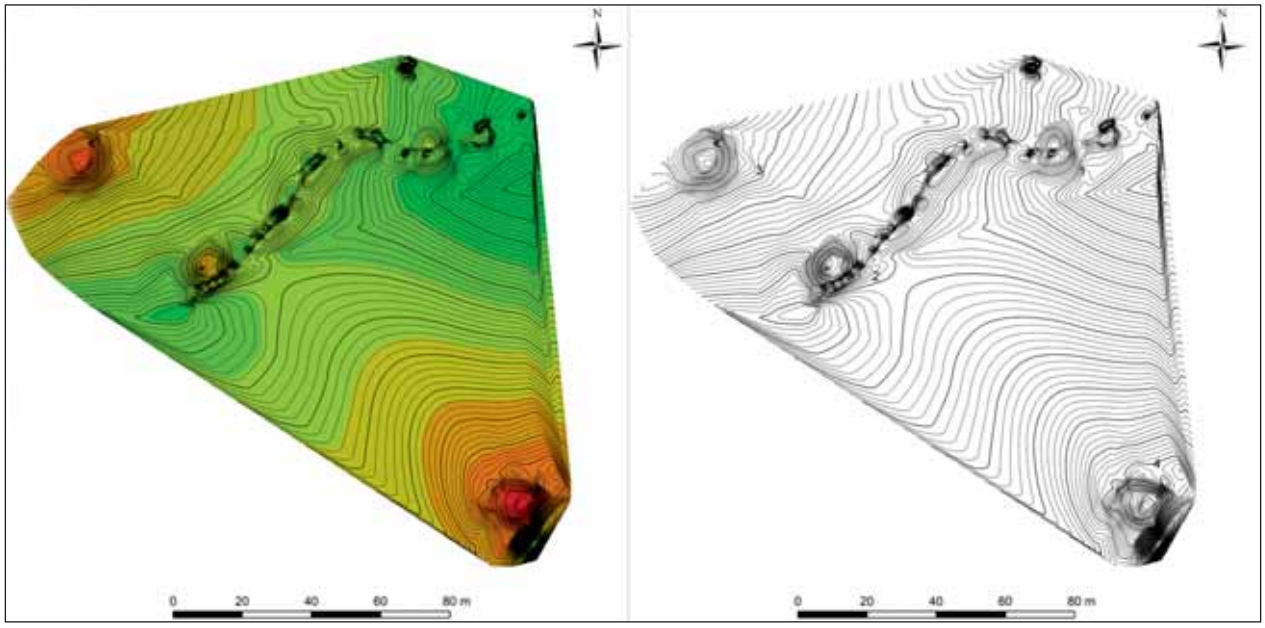


**Fig. IV.6.** Bukivna. Spatial arrangement of barrow group IV

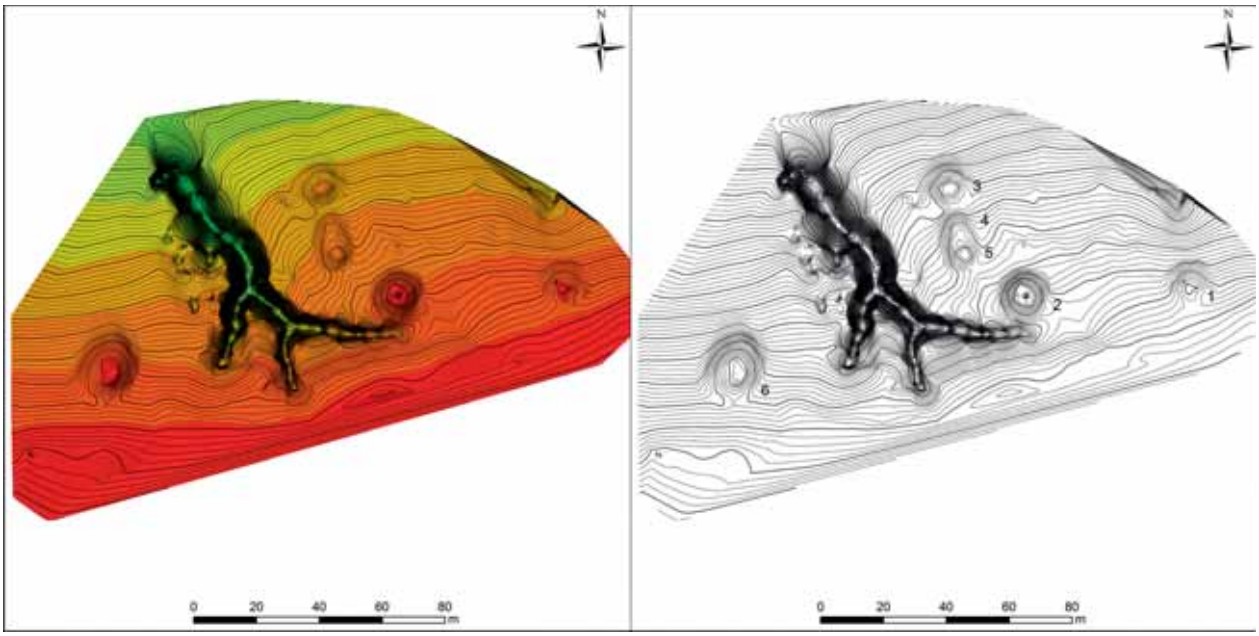


**Fig. IV.7.** Bukivna. Spatial arrangement of barrow group III

direction – there can be found two additional barrows – 2/IV (destroyed by WWII trenches) and 3/IV respectively.

Group III (**Fig. IV.7**) comprises six barrows located quite close to each other (1/III, 2/III, 3/III, 4/III, 5/III, 6/III) and two monuments placed far from the described concentration (7/III i 8/III). It is situated nearly 400 m west and NW of group IV. The furthest to the E is small barrow 1/III and 40 m west of it there is a large monument, 2/III. Barrow 3/IV and adjoins mound 4/IV and is located 10 and 15 m to the NW of barrow 2/III. Tumulus 5/III is located 5 m away from barrow 4/III. Large mound 6/III is on the other side of a deep gorge, ca. 80 m to the SW of barrow 2/III and ca. 70 m from tumuli 3/III and 4/III. The latter two are around 220 m away from the main concentration (8/III) and nearly 300 m (7/III) to the S/SE. Both are located on the extension of group II and IV, ca. 500 m from the later. Barrow 8/III is located over 100 m NE of mound 7/III.

The described group is located much lower (ca. 25-30 m) than other barrow concentrations (324-325 m.a.s.l.) Denivelations between six barrows in the concentration are small and measure 1-1.5 m. Larger differences in height are visible between this cluster and two, single monuments.

The remaining barrows do not form any concentrations, they are dispersed. Most are situated on an extensive plateau stretching E of the II and V barrow groups, which is an isolated geomorphological form (mounds: D, E, X, 78, 161, 172 and H (near the church). These kurgans are referred to as group VI, which was comprised of a larger number of barrows in the past but the area was transformed as a result of human activity. It is covered with fields, meadows, gardens and buildings, which must have destroyed the barrows still visible in the 1930s.

Group VI consists of seven barrows stretched across a 1.4 km distance (Fig. 2a – eastern part). Two of them, located on its western flank, were excavated in the 20th century (modern signatures – D and E[1]), of which only dig-ins in the centre and soil thrown around the barrow remain. Further observations are difficult to make due to dense bushes covering the barren waste. Mound D was located ca. 330 m E/NE of barrow 3/V. Barrow E is situated several metres S of barrow D. Close to the plateau, ca. 320 m to the SE of the aforementioned mounds was barrow X, while 250 m to the NE of it was tumulus 78. Two further monuments were documented SE of barrow 78. Barrow 162 was erected 150 m from it, while 130 m to the NW of mound 162, on the slight slope of the plateau was barrow 161. Close to the church, 80 m to the N of the last of the mentioned barrows is mound H, ca. 2.5 m high.

Last of the documented, single barrows – H1 – was isolated on the border of the forest, ca. 1.7 km from the eastern part of the group, some 250 m to the S of the Dniester riverbed, close to a steep, right-bank slope of its valley (Fig. 2a, last barrow to the east).

### A.2.3. Barrow group I

**Barrow F/I (V/1937)** was recorded outside of the former mansion/orchard. Geographic coordinates: N – 48°58'660", E – 24°57'346"; h – 326.5 m.a.s.l. Excavated in 1937. 12 × 10 m, 1,5 m high (Siwkówna 1938). The depression remains and soil is scattered around the barrow. Covered with trees and bushes.

**Barrow 1/I/2010 (Fig. IV.8; Fig. IV.9)** is located in a hundred-year-old beech forest, covered with several large trees and bushes. Geographic coordinates: N – 48°58'199", E – 24°57'242"; h – 343 m.a.s.l. Oval in shape, 15 × 13 m (NNE – SSW), 1.3 m high. Constructed on a small hill dropping to the E and N. No significant damage. Excavated barrow.

**Barrow 2/I/2010/2012 (Fig. IV.10; Fig. IV.11)** is situated on the edge of the beech forest, covered with trees and bushes. Geographic coordinates: N – 48°58'378", E – 24°57'236", h – 334.5 m.a.s.l. Oval in shape, 22 × 18 m (EW – NS), 1.8 m high. An extensive dig-in in the centre. Excavated barrow.

**Fig. IV.8.** Barrow 1/I/2010. View from the NE

[1] Barrows were excavated using the so-called 'circular' method, hence it is impossible to identify them properly, even according to information published by J. Bryk (1932; 1932a), M. Śmiszko (1937) and I. Siwkówna (1938). They could be barrows 3/1931, 4/1931 or VII/1937.

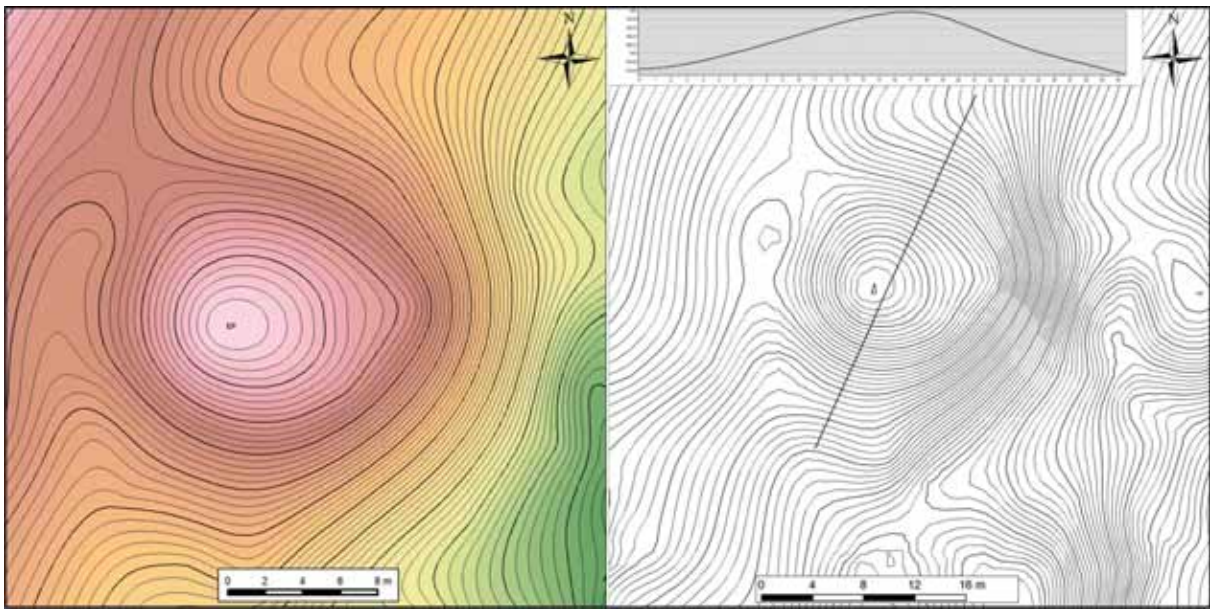

**Fig. IV.9.** Barrow 1/I/2010. Hypsometric plan and cross-section

**Fig. IV.10.** Barrow 2/I/2010, 2012. View from the NE

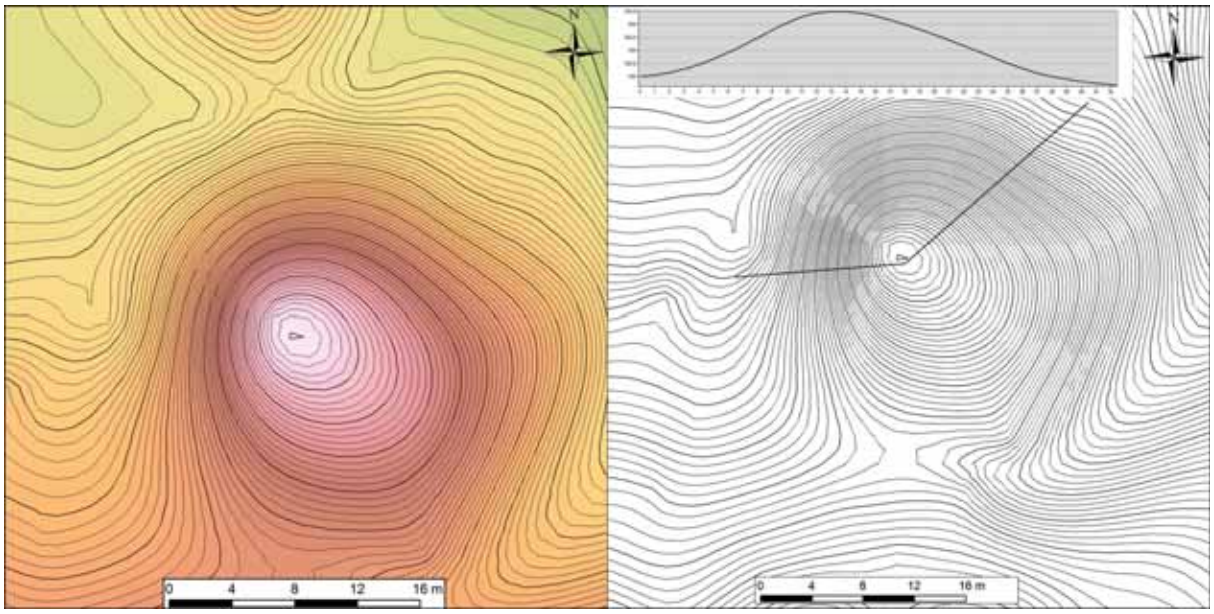

**Fig. IV.11.** Barrow 2/I/2010, 2012. Hypsometric plan and cross-section

**Barrow 3/I/2012 (Fig. IV.12, Fig. IV.13)** is located in a beech and young forest, covered with large and small trees, as well as thick bushes. Geographic coordinates: N – 48°58'354", E – 24°57'236", h – 337 m.a.s.l. Oval in shape, 16 × 15 m (NNE – SSW), 1.3 m high. Built on a hill dropping towards E, thus appearing larger than in reality. A dig-in in the centre of the mound. Excavated barrow.

**Fig. IV.12.** Barrow 3/I/2012. View from the NE

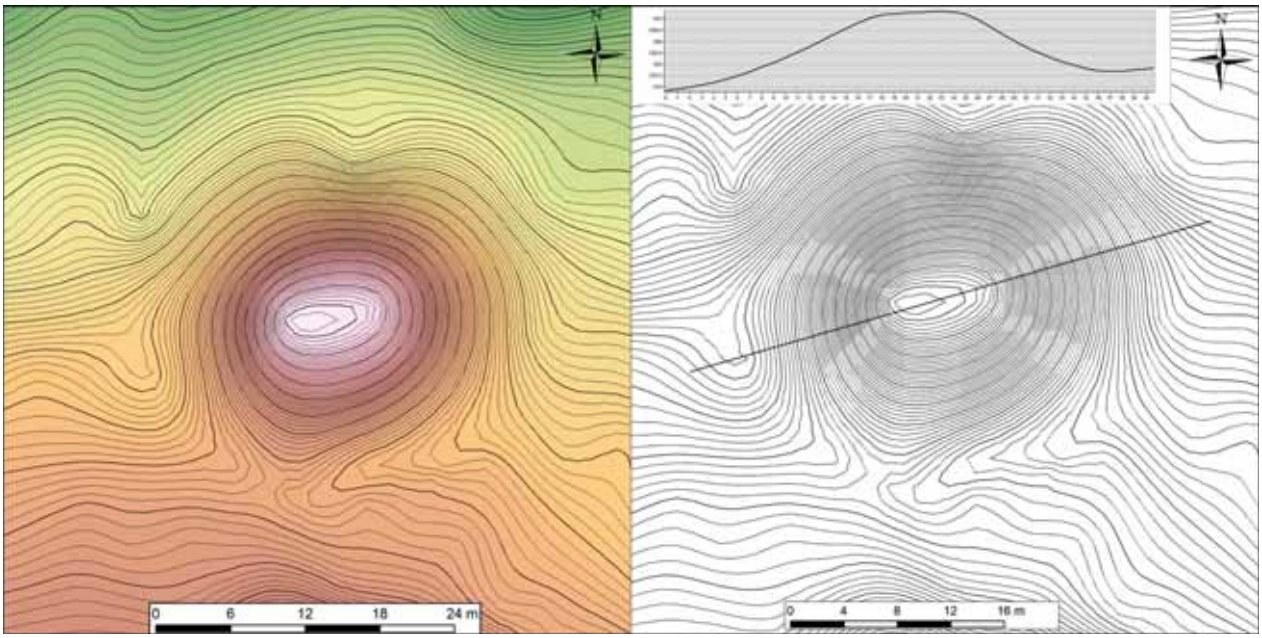


**Fig. IV.13.** Barrow 3/I/2012. Hypsometric plan and cross-section

**Barrow 4/I (Fig. IV.14**; **Fig. IV.15**) was found in a beech forest Covered with trees and bushes. Geographic coordinates: N – 48°58'197", E – 24°57'248", h – 341.3 m.a.s.l. Circular in shape, 16 m in diameter, 0.6 m high. A forest road crosses the mound. No further damage was recorded.

**Fig. IV.14.** Barrow 4/I. View from the NE

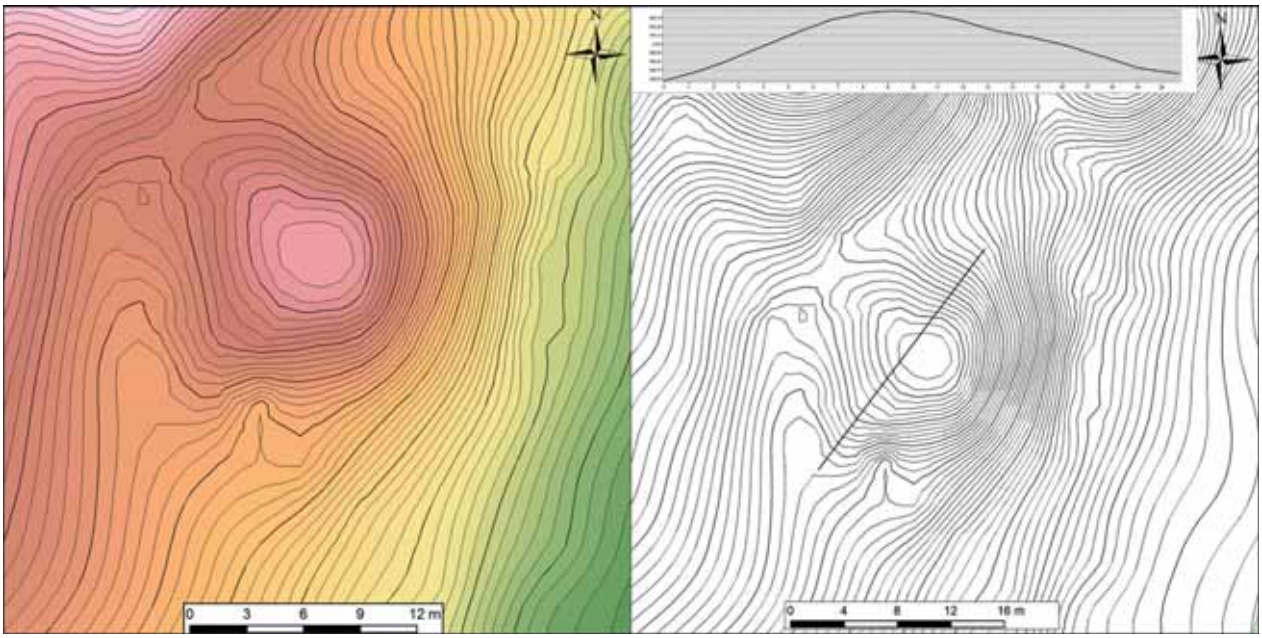


**Fig. IV.15.** Barrow 4/I. Hypsometric plan and cross-section

**Barrow 5/I (Fig. IV.16**, **Fig. IV.17**) was recorded in the beech forest, close to a field road, covered with trees and bushes. Geographic coordinates: N – 48°58'209", E – 24°57'259", h – 340.8 m.a.s.l. Oval in shape, 15 × 13 m (NNE – SSW), 0.5 m high. Built on a slight slope dropping towards E. No damage recorded.

**Fig. IV.16.** Barrow 5/I. View from the SW

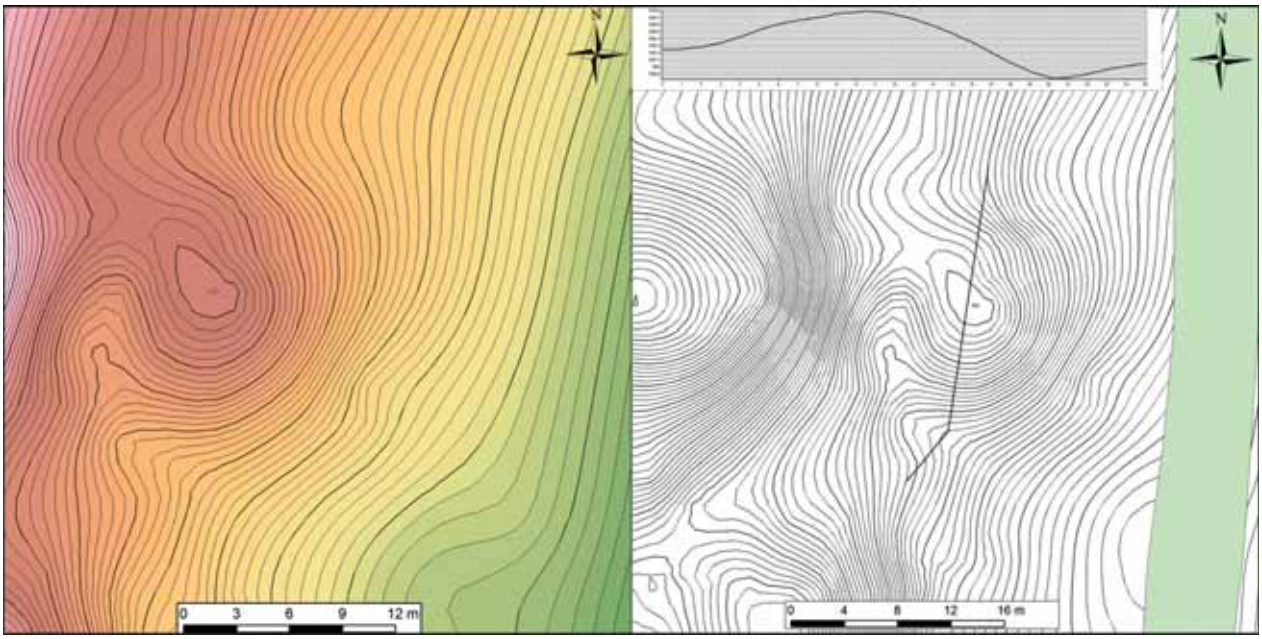


**Fig. IV.17.** Barrow 5/I. Hypsometric plan and cross-section

**Barrow 6/I/2014 (Fig. IV.18, Fig. IV.19)** was discovered in the beech forest. Geographic coordinates: N – 48°58'336", E – 24°57'230", h – 337.6 m.a.s.l. Northern side covered with trees and bushes. From the west adjoins barrow 7/I/2014. Oval in shape: 15 × 14.5 m (EW – NS), 1.3 m high. Located on a hill dropping towards N. Fig-ins visible in the centre of the mound. Subject to geophysical survey and excavations.

**Barrow 7/I/2014 (Fig. IV.18, Fig. IV.19)** was recorded in the beech forest. Covered with trees and – especially on the northern side – bushes. Geographic coordinates: N – 48°58'335", E – 24°57'246", h – 337.5 m.a.s.l. From the west it adjoins barrow 6/I/2014. Oval in shape: 17 × 14.5 m (EW – NS), 1.5 m high. Located on a hill dropping towards E and N. A large dig-in visible in the central part of the mound. Subject to geophysical survey and excavations.

**Fig. IV.18.** Barrow 6/I/2014 (right) and 7/2014 (left). View from the NW

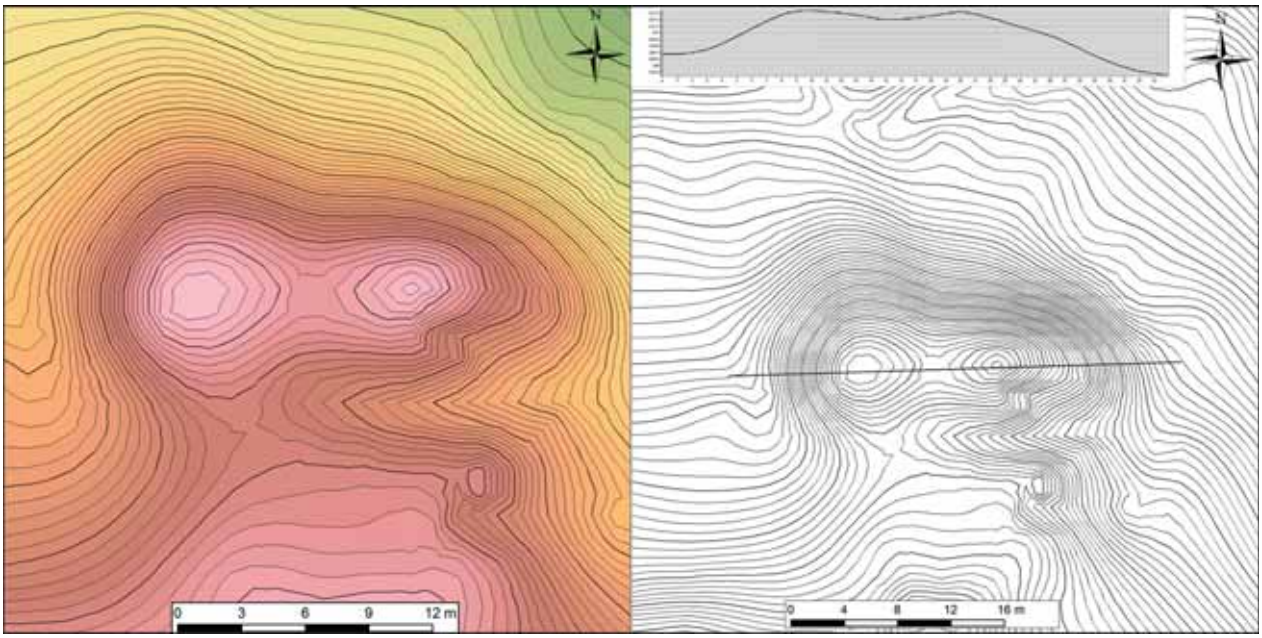


**Fig. IV.19.** Barrow 6/I/2014 (right) and 7/2014 (left). Hypsometric plan and cross-section

**Barrow 8/I (Fig. IV.20, Fig. IV.21)** was documented in the beech forest, covered with trees and bushes. Geographic coordinates: N – 48°58'245", E – 24°57'224", h – 344.1 m.a.s.l. Oval in shape: 17 × 15 m (NNE – SSW), 0.8 m high. Located on a hill dropping towards E and N. A dig-in visible in the centre of the mound. Subject to geophysical survey.

**Fig. IV.20.** Barrow 8/I. View from the W

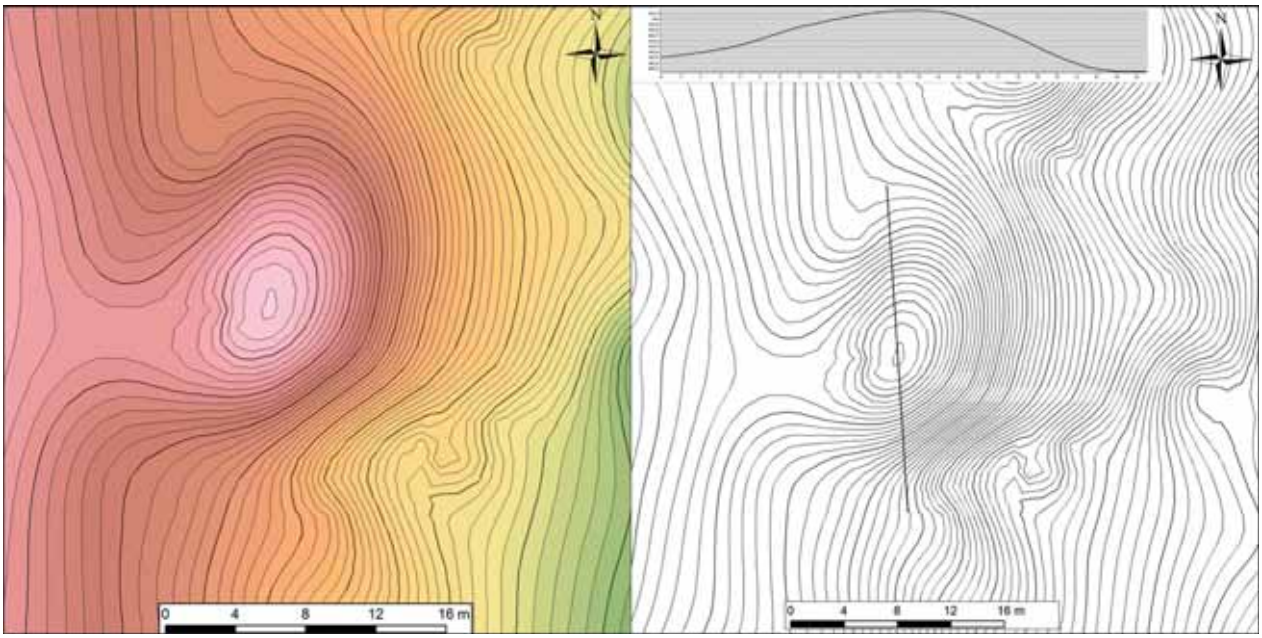


**Fig. IV.21.** Barrow 8/I. Hypsometric plan and cross-section

**Barrow 9/I (Fig. IV.22, Fig. IV.23)** is located in a beech forest, covered with trees and bushes. Geographic coordinates: N – 48°58'260", E – 24°57'235", h – 343.4 m.a.s.l. Oval in shape: 14.5 ×13.5 m (NNE – SSW), 0.5 m high. Constructed on a small hill dropping towards N and E. No dig-ins or other signs of damage. Subject to geophysical survey.

**Fig. IV.22.** Barrow 9/I. View from the SW

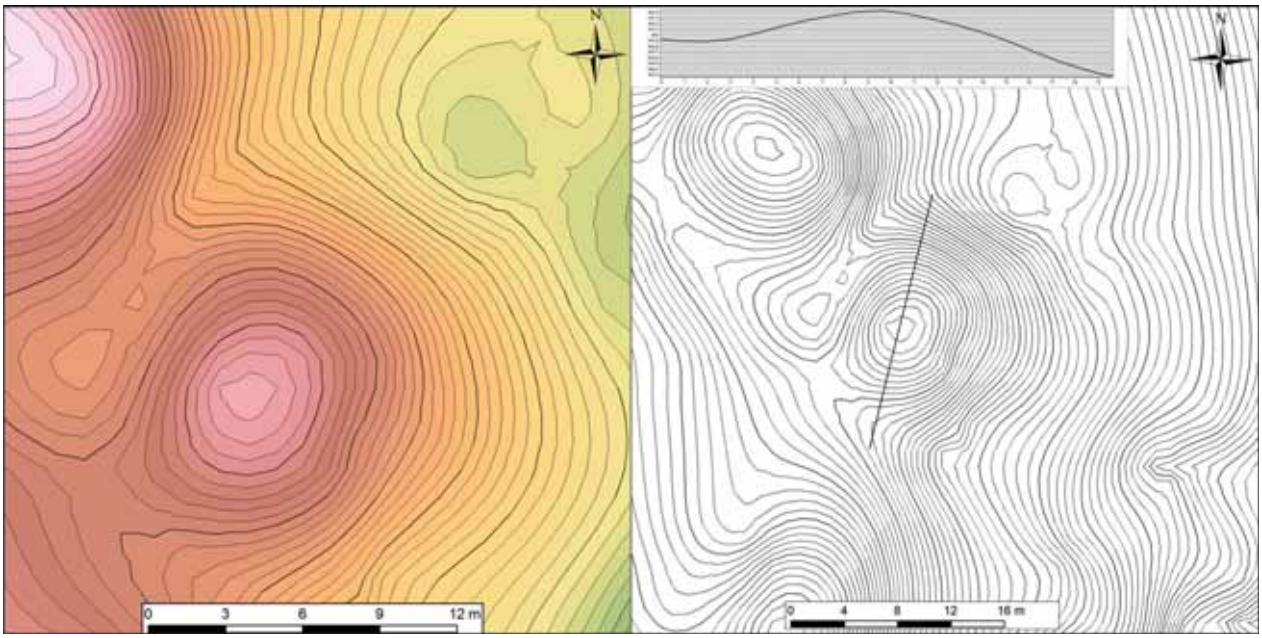


**Fig. IV.23.** Barrow 9/I. Hypsometric plan and cross-section

**Barrow 10/I (Fig. IV.24, Fig. IV.25)** was recorded in a beech forest, covered with trees and bushes. Geographic coordinates: N – 48°58'261", E – 24°57'227", h – 343.7 m.a.s.l. Oval in shape: 18 × 16 m (NNE – SSW), 0.9 m high. Located on a small hill dropping towards E and N. No damage recorded. Subject to geophysical survey.

**Fig. IV.24.** Barrow 10/I. View from the E

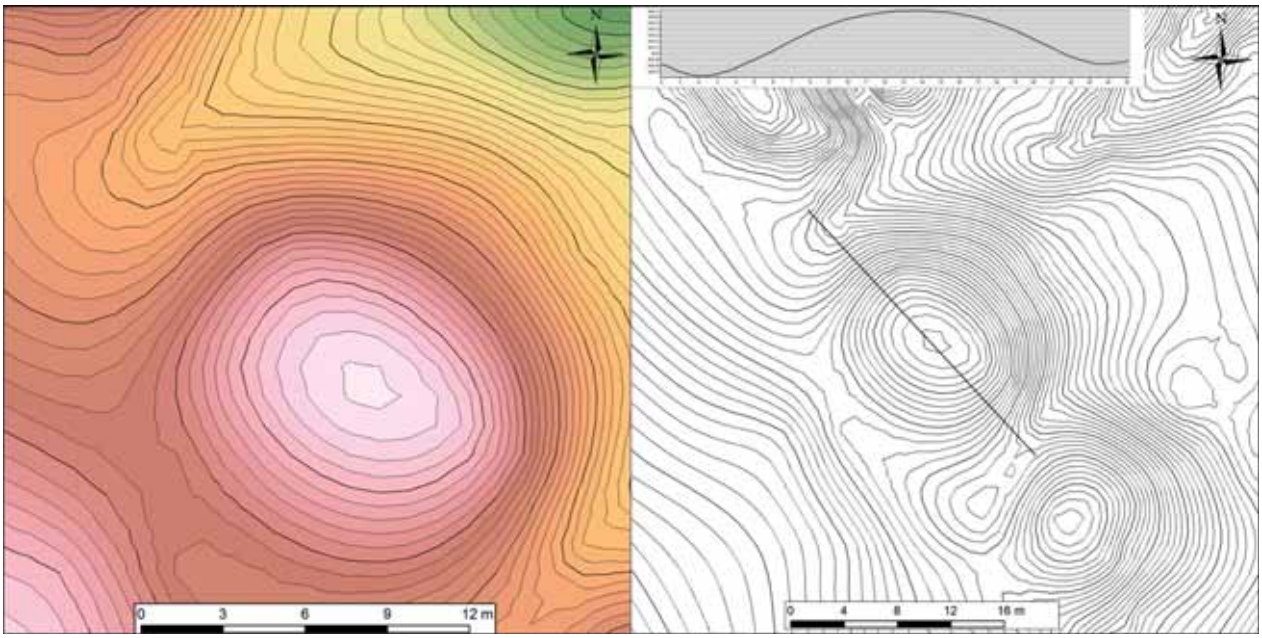


**Fig. IV.25.** Barrow 10/I. Hypsometric plan and cross-section

**Barrow 11/I (Fig. IV.26, Fig. IV.27)** is located in the beech forest, covered with trees and bushes. Geographic coordinates: N – 48°58'282", E – 24°57'232", h – 342.9 m.a.s.l. Oval in shape: 16 × 15 m (NNE – SSW), 0.9 m high. It is located on a small hill dropping towards E and N. In the central part is an extensive dig-in. Subject to geophysical survey.

**Fig. IV.26.** Barrow 11/I. View from the E

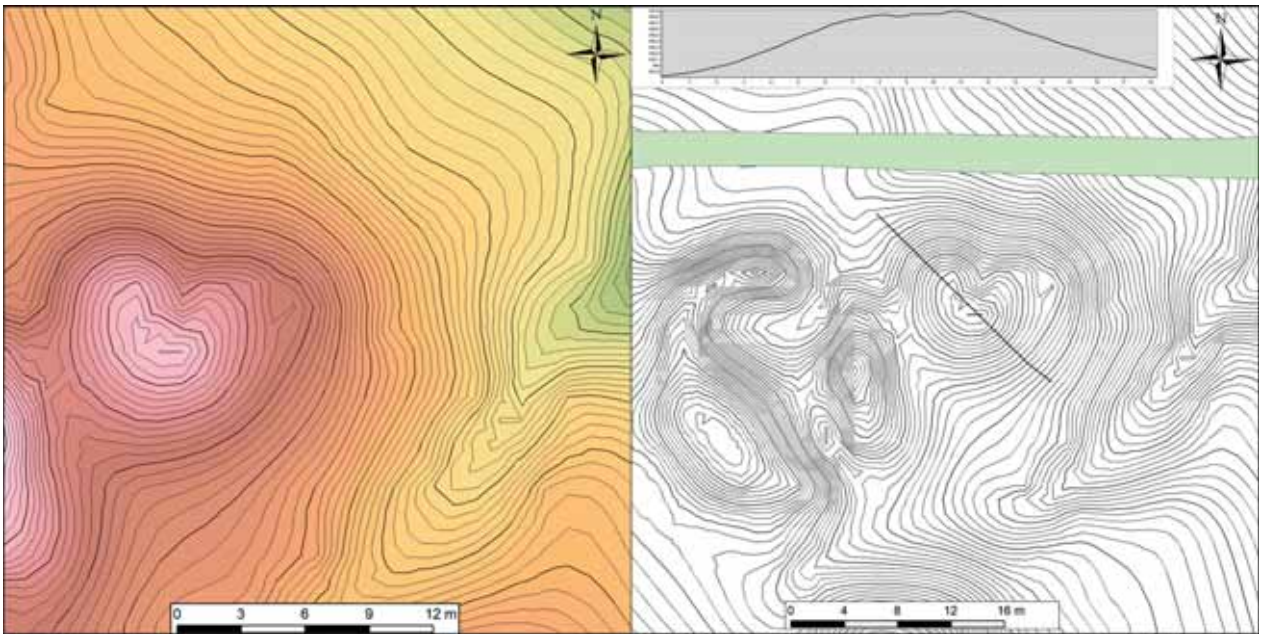


**Fig. IV.27.** Barrow 11/I. Hypsometric plan and cross-section

**Barrow 12/I = VI/1937 (Fig. IV.28, Fig. IV.29)** was recorded in a beech forest, covered with trees and thick bushes. Geographic coordinates: N – 48°58'279", E – 24°57'217", h – 343.7 m.a.s.l. Circular in shape, 11.5 m in diameter, 1.5 m high. Barrow excavated in 1937 (Śmiszko 1937; Siwkówna 1938). All that remains is an extensive depression and soil scattered around.

**Fig. IV.28.** Barrow 12/I (VI/1937). View from the E

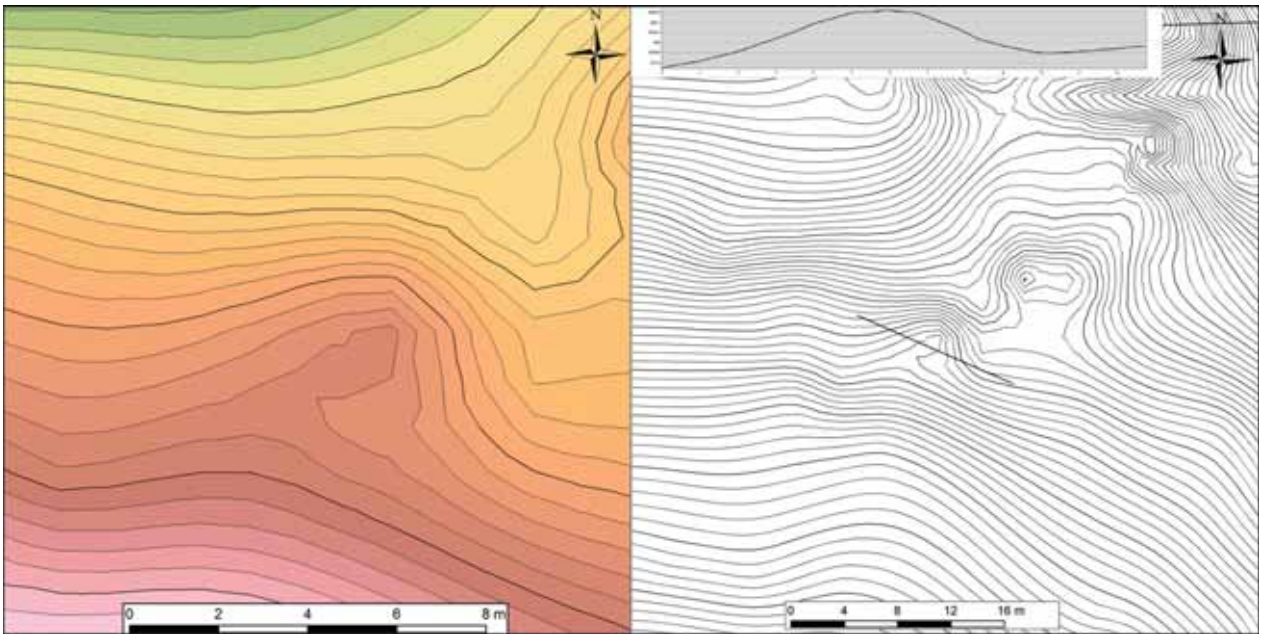


**Fig. IV.29.** Barrow 12/I (VI/1937). Hypsometric plan and cross-section

**Barrow 13/I (Fig. IV.30, Fig. IV.31)** was found in a young, dense forest, covered with trees and bushes. Geographic coordinates: N – 48°58'390", E – 24°57'241", h – 332.1 m.a.s.l. Circular in shape, 14 m in diameter, 0.7 m high. Insignificant destruction of the mound.

**Fig. IV.30.** Barrow 13/I. View from the NW

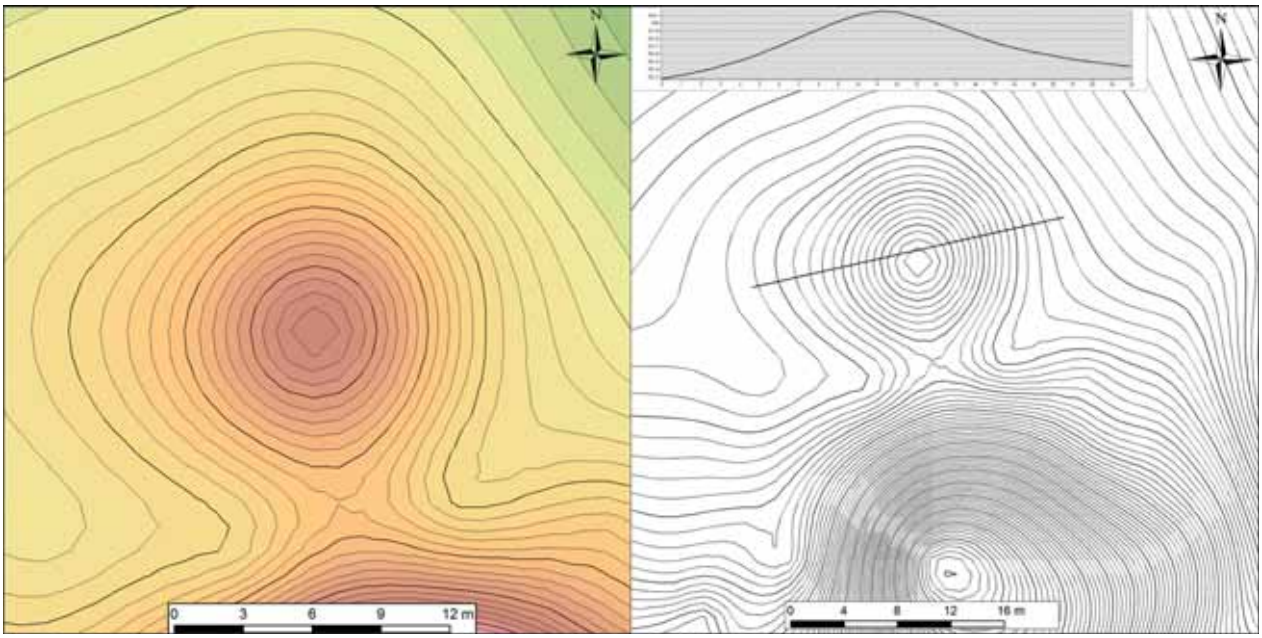


**Fig. IV.31.** Barrow 13/I. Hypsometric plan and cross-section

**Barrow 14/I (Fig. IV.32, Fig. IV.33)** was recorded in a beech forest, covered with trees and bushes. Geographic coordinates: N – 48°58'180", E – 24°57'142", h – 342.2.2m.a.s.l. Oval in shape: 19.5 ×17 m (NNE – – SSW), 0.6 m high. Located on a small hill dropping towards S. No dig-ins visible.

**Fig. IV.32.** Barrow 14/I. View from the NE

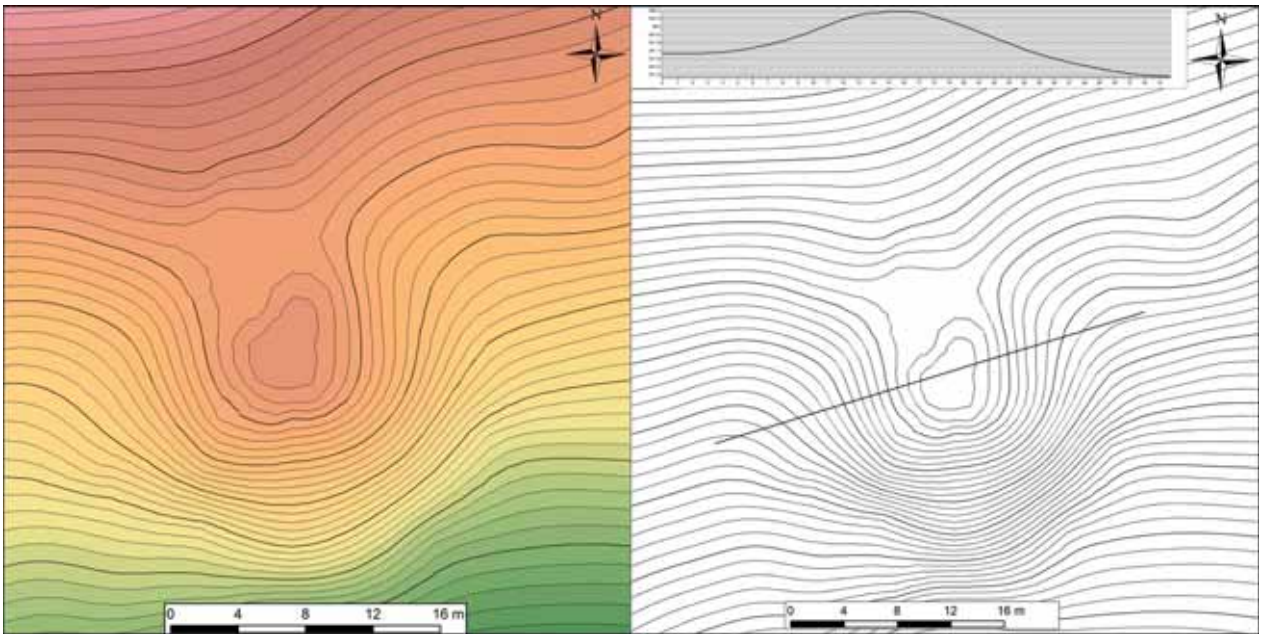


**Fig. IV.33.** Barrow 14/I. Hypsometric plan and cross-section

**Barrow 15/I (Fig. IV.34, Fig. IV.35)** is located in a beech forest, covered with trees and bushes. Geographic coordinates: N – 48°58'200", E – 24°57'213", h – 342.5 m.a.s.l. Circular in shape, 10.5 m in diameter, 0.3 m high. Located on a small hill dropping towards SE. A dig-in in the centre of the mound.

**Fig. IV.34.** Barrow 15/I. View from the SW

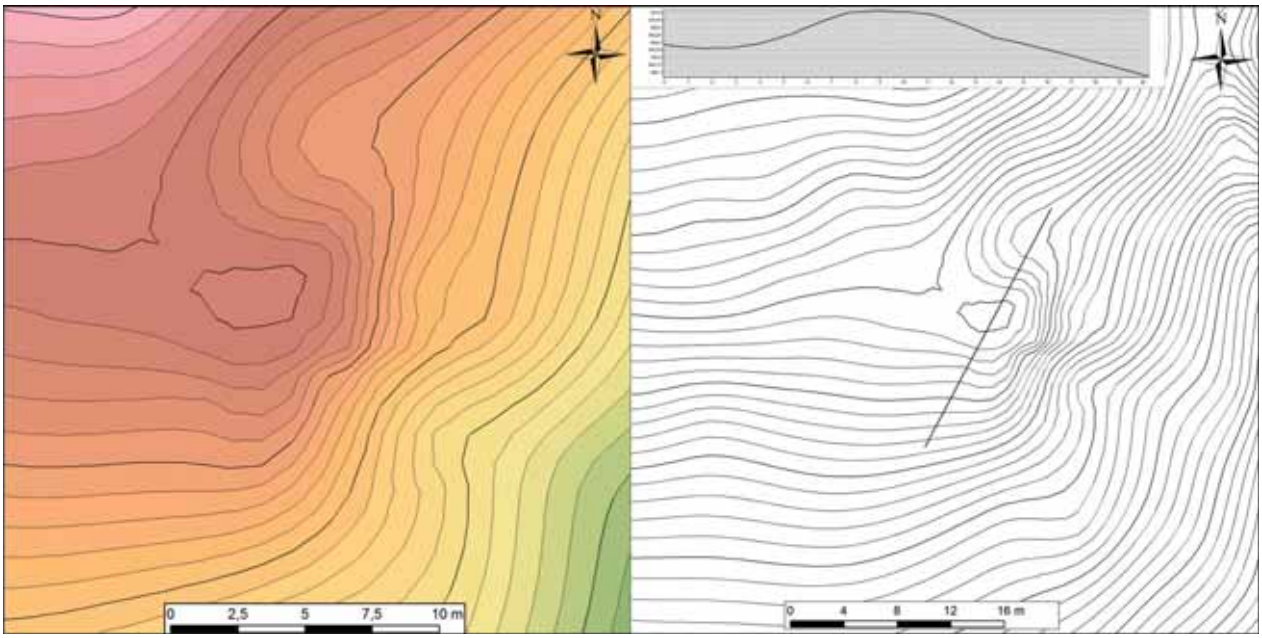


**Fig. IV.35.** Barrow 15/I. Hypsometric plan and cross-section

**Barrow 16/(Fig. IV.36, Fig. IV.37)** was recorded in a beech forest, covered mainly with bushes. Geographic coordinates: N – 48°58'180", E – 24°57'142", h – 342.2. m.a.s.l. Oval in shape 10 × 9 m (NNE – SSW), 0.4 m high. Located on a small hill dropping towards NE. No visible damage.

**Fig. IV.36.** Barrow 16/I. View from the E

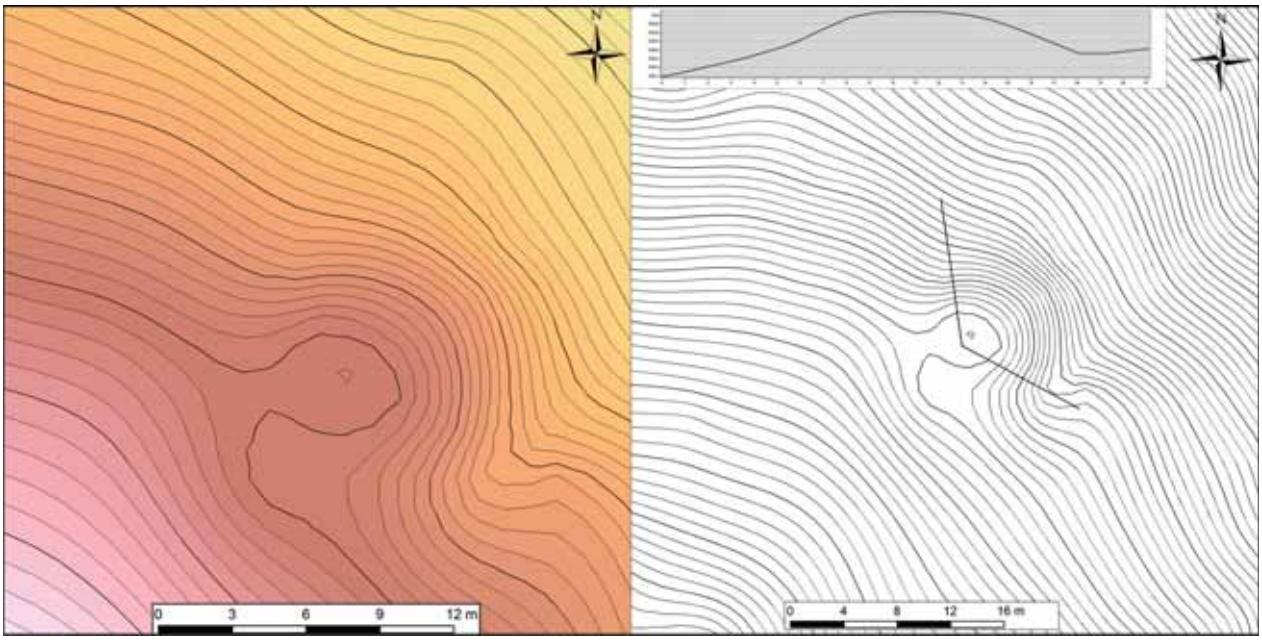


**Fig. IV.37.** Barrow 16/I. Hypsometric plan and cross-section

**Barrow 17/I (Fig. IV.38, Fig. IV.39)** was discovered in a deforested area, covered with bushes. Geographic coordinates: N – 48°58'325", E – 24°57'240", h – 338.1 m.a.s.l. Circular in shape, 10 m in diameter, 0.3 m high. Located on a small hill dropping towards SE. Dig-in in the centre of the mound.

**Fig. IV.38.** Barrow 17/I. View from the W

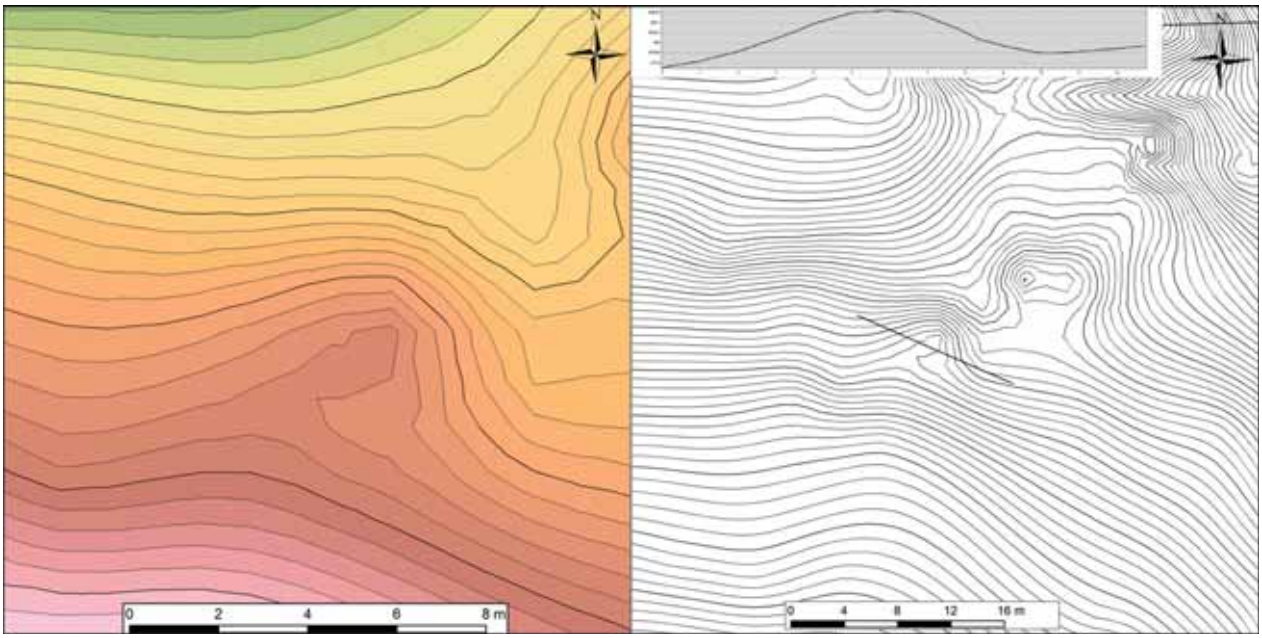


**Fig. IV.39.** Barrow 17/I. Hypsometric plan and cross-section

**Barrow 18/I (Fig. IV.40, Fig. IV.41)** was recorded in a deforested area, covered with bushes. Geographic coordinates: N – 48°58'329", E – 24°57'242", h – 338 m.a.s.l. Circular in shape, 9 m in diameter, 0.3 m high. No damage found.

**Fig. IV.40.** Barrow 18/I. View from the W

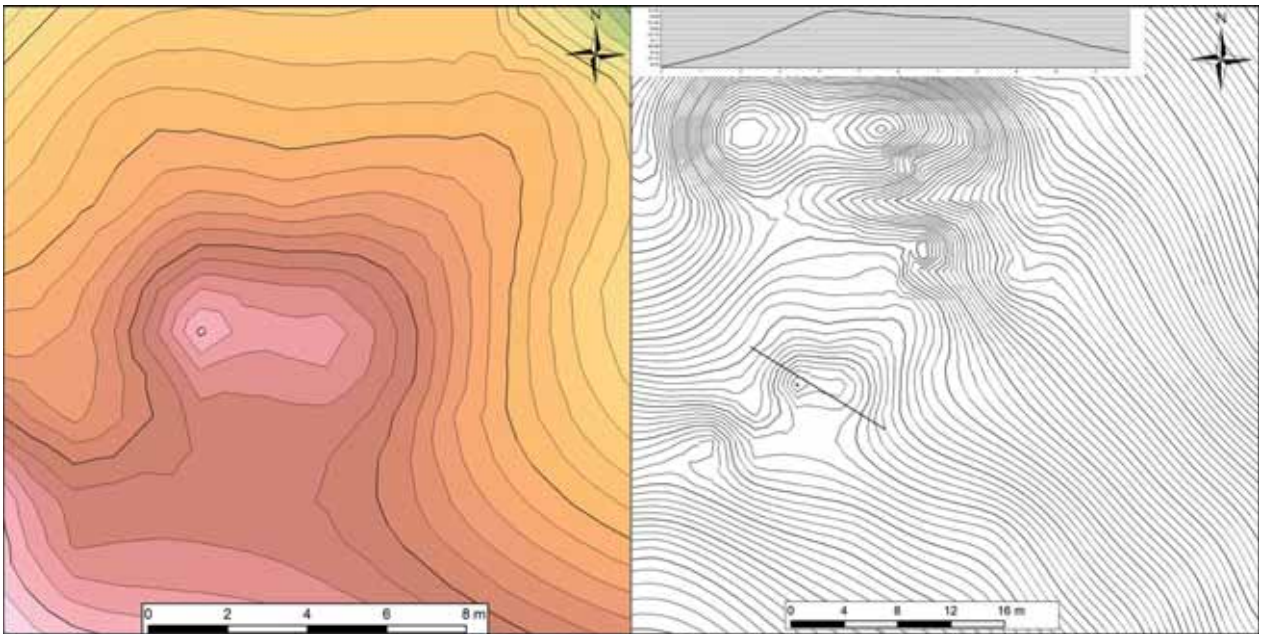


**Fig. IV.41.** Barrow 18/I. Hypsometric plan and cross-section

**Barrow 93/I (Fig. IV.42)** is situated in a beech forest, covered with trees. Geographic coordinates: N – 48°58'241", E – 24°57'244", h – 343.9 m.a.s.l. Circular in shape: 9.5 m in diameter, 0.2 m high. Partially destroyed by a road.

**Fig. IV.42.** Barrow 93/I. View from the SW

**Barrow 164/I (Fig. IV.43)** was recorded in a densely covered young concentration of trees and bushes. Geographic coordinates: N – 48°58'407", E – 24°57'245", h – 332.1 m.a.s.l. Circular shape, 12 m in diameter, 0.5 m high. A dig-in is visible in the centre.

**Fig. IV.43.** Barrow 164/I. View from the E

**A.2.4. Barrow group II**

**Barrow 1/II/2013 (Fig. IV.44, Fig. IV.45)** is situated in the beech forest, covered with trees. Geographic coordinates: N – 48°57'831", E – 24°57'395", h – 355.5 m.a.s.l. Circular in shape, 12 m in diameter, 2.5 m high. Built on a small hill. In the central part of the hill was a dig-in. Subject to geophysical survey. Excavated barrow.

**Fig. IV.44.** Barrow 1/II/2013. View from the NE

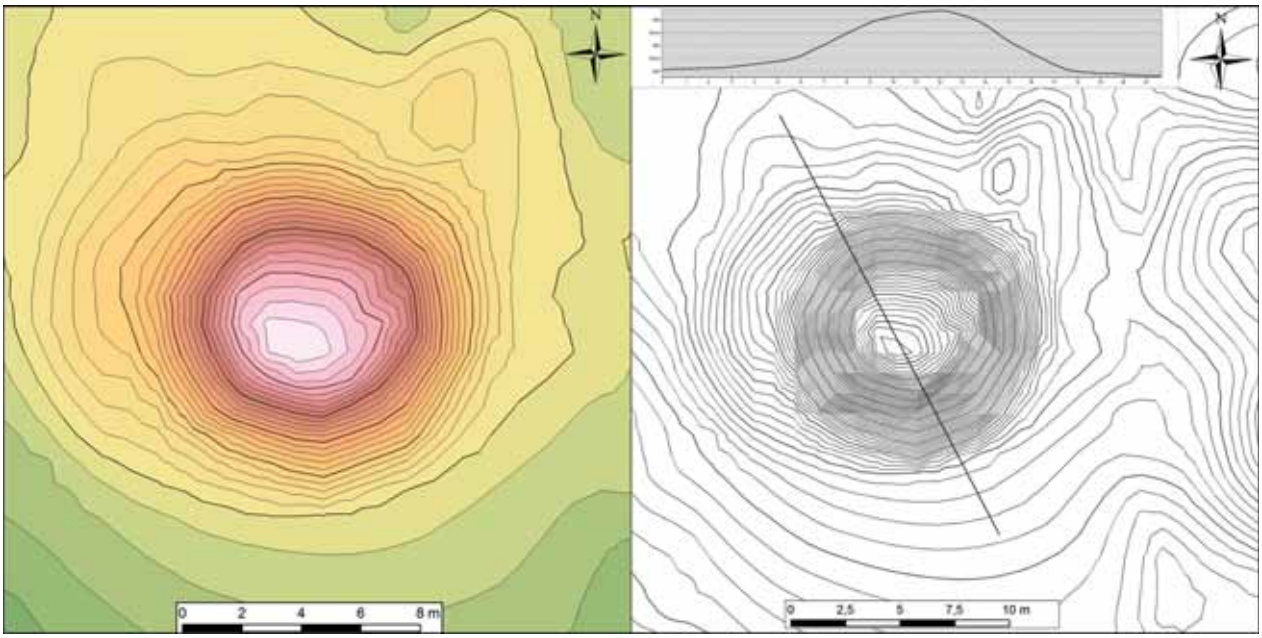


**Fig. IV.45.** Barrow 1/II/2013. Hypsometric plan and cross-sect

**Barrow 2/II (Fig. IV.46, Fig. IV.47)** is located in the beech forest, covered with many trees. Geographic coordinates: N – 48°57'826", E – 24°57'428", h – 355.5 m.a.s.l. Oval in shape: 23 × 20 m (NNE – SSW), 2.4 m high. An extensive dig-in is visible in the middle of the mound. Subject to geophysical survey.

**Fig. IV.46.** Barrow 2/II. View from the SE

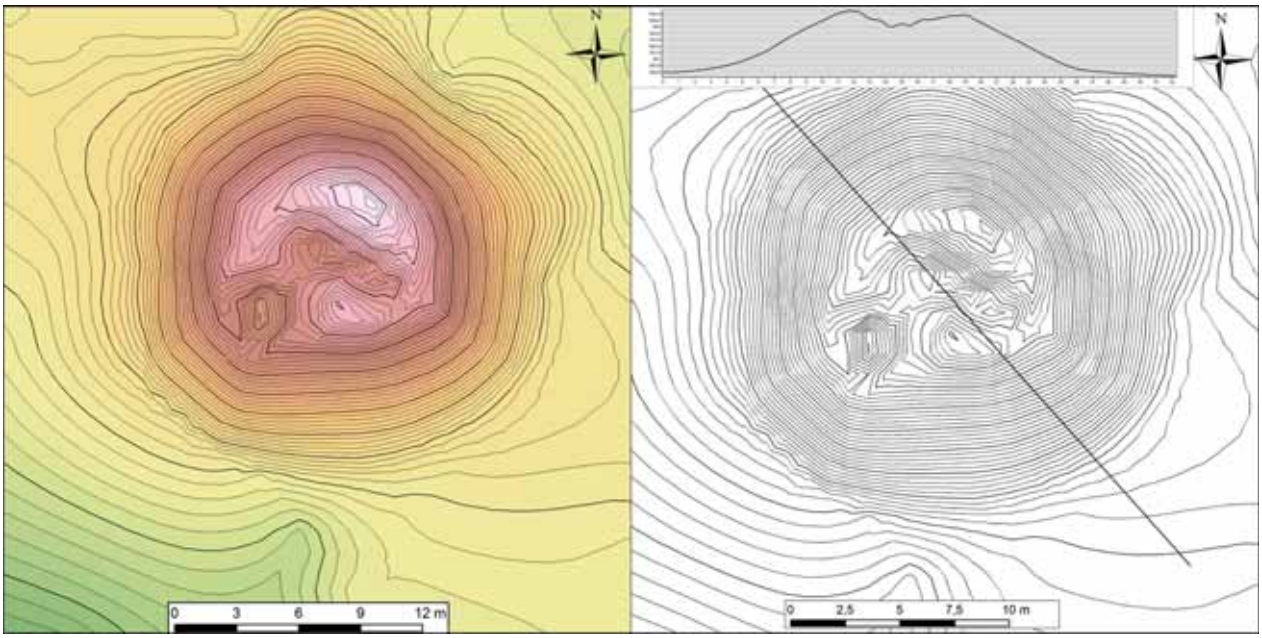


**Fig. IV.47.** Barrow 2/II. Hypsometric plan and cross-section

**Barrow 3/II (Fig. IV.48, Fig. IV.50)** is situated in a beech forest, covered with trees. Geographic coordinates: N – 48°57'832", E – 24°57'417", h – 353.4 m.a.s.l. Oval in shape: 8.5 × 7.5 m (NNE – SSW), 0.5 m high. Built on a small hill. No damage identified. Subject to geophysical survey.

**Barrow 4/II (Fig. IV.49, Fig. IV.50)** was recorded next to barrow 3/II in the beech forest, covered with a few trees. Geographic coordinates: N – 48°57'414", E – 24°57'840", h – 353.3 m.a.s.l. Oval in shape: 9.5 × 9 m (NNE – SSW), 0.5 m high. Built on a small hill. No damage was recorded. Subject to geophysical survey.

**Fig. IV.48.** Barrow 3/II. View from the W

**Fig. IV.49.** Barrow 4/II. View from the SE

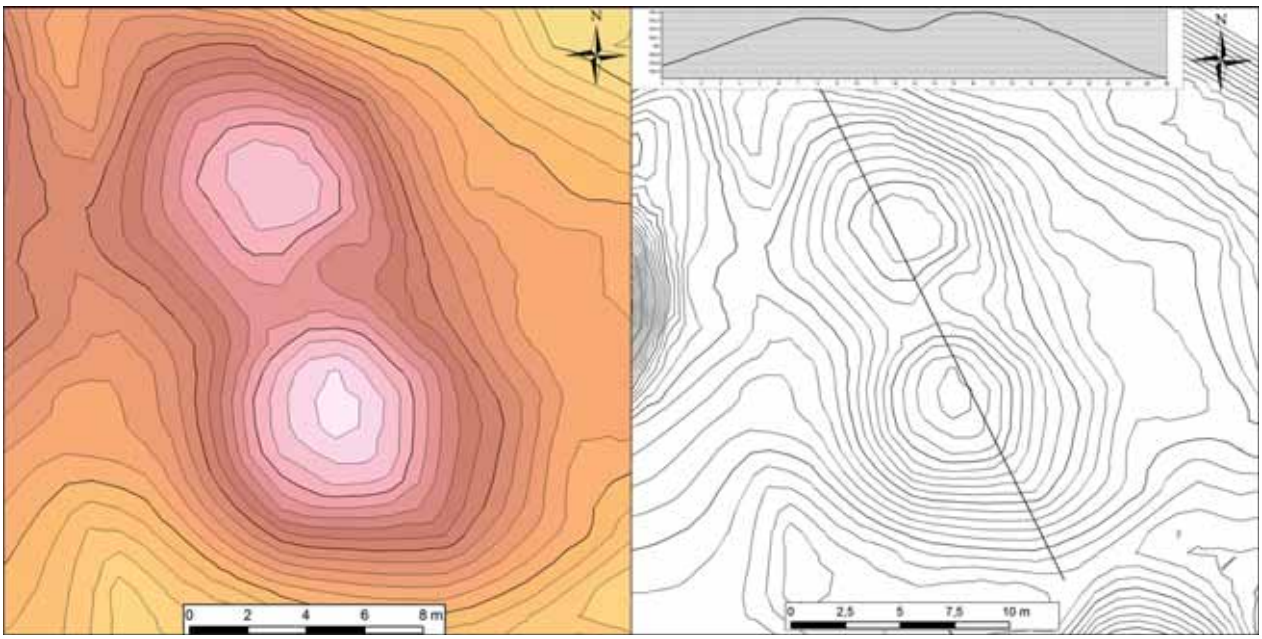


**Fig. IV.50.** Barrow 3/II and 4/II. Hypsometric plan and cross-section (barrow 3/II – bottom of the plan, barrow 4/II – top of the plan)

**Barrow 5/II (Fig. IV.51, Fig. IV.52)** was found in a beech forest, covered with trees and bushes. Geographic coordinates: N – 48°57'805", E – 24°57'399", h – 352.1 m.a.s.l. Oval in shape: 10 × 9 m (NNE – SSW), 0.4 m high. Built on a small hill dropping towards SE. No dig-ins were observed. Partially destroyed by road. Subject to geophysical survey.

**Fig. IV.51.** Barrow 5/II. View from the NE

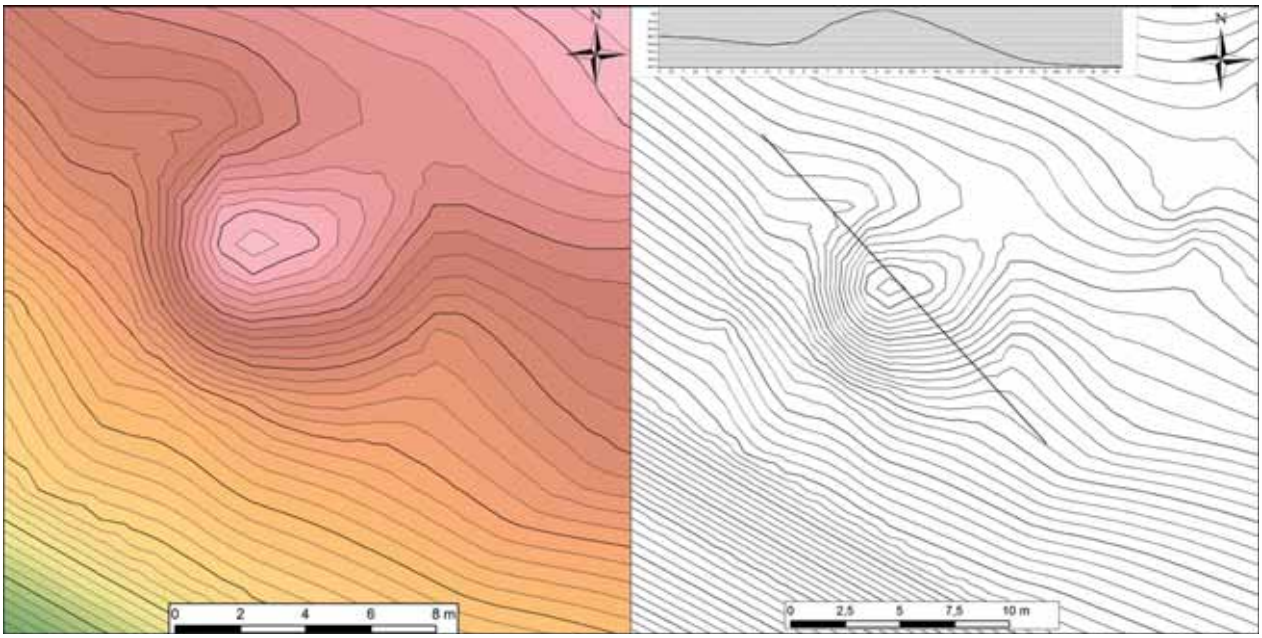


**Fig. IV.52.** Barrow 5/II. Hypsometric plan and cross-section

**Barrow 6/II (Fig. IV.53 Fig. IV.54)** is located in a beech forest, covered with trees and bushes. Geographic coordinates: N – 48°57'784", E – 24°57'488", h – 351 m.a.s.l. Oval in shape: 22 × 21 m (NNE – SSW), 1.3 m high. Built on a small hill dropping towards SE. In the central part of a hill is a large, somewhat shallow dig-in. Subject to geophysical survey.

**Fig. IV.53.** Barrow 6/II. View from the W

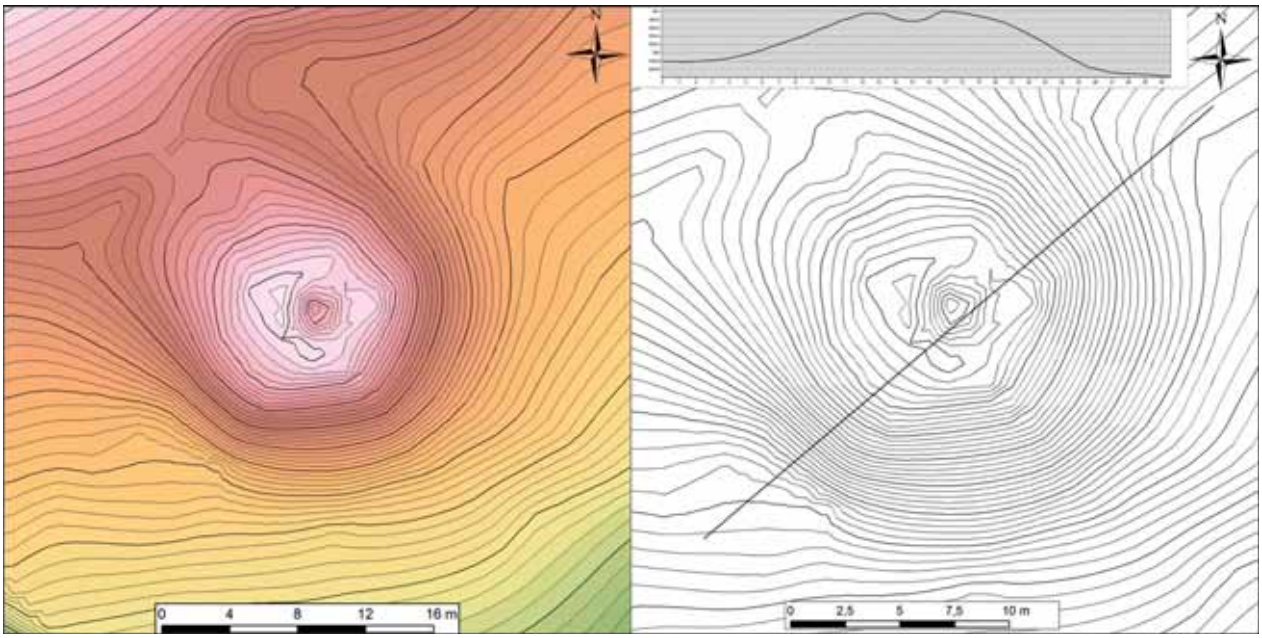


**Fig. IV.54.** Barrow 6/II. Hypsometric plan and cross-section

**Barrow 7/II (Fig. IV.55, Fig. IV.56)** was recorded in the beech forest, covered with trees and bushes. Geographic coordinates: N – 48°57'772", E – 24°57'538", h – 347.7 m.a.s.l. Oval in shape: 16 × 15,5 m (NNE – SSW), 0.5 m high. Built on a small hill, dropping towards SE. No extensive damage was recorded. Subject to geophysical survey.

**Fig. IV.55.** Barrow 7/II. View from the W

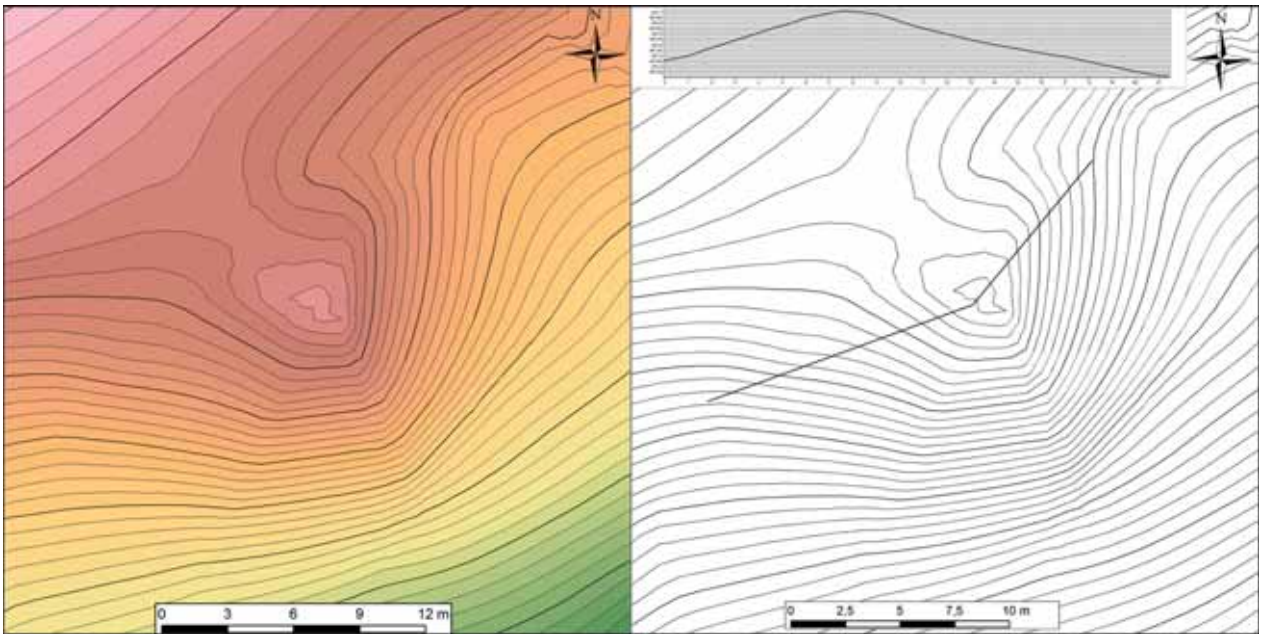


**Fig. IV.56.** Barrow 7/II. Hypsometric plan and cross-section

**Barrow 8/II (Fig. IV.57, Fig. IV.58)** is located in the beech forest, covered with trees and bushes. Geographic coordinates: N – 48°57'746", E – 24°57'530", h – 345.9 m.a.s.l. Oval in shape: 17.5 × 15 m (EW – NS), 0.35 m high. Located on a hill dropping towards S. No major damage. Subject to geophysical survey.

**Fig. IV.57.** Barrow 8/II. View from the NE

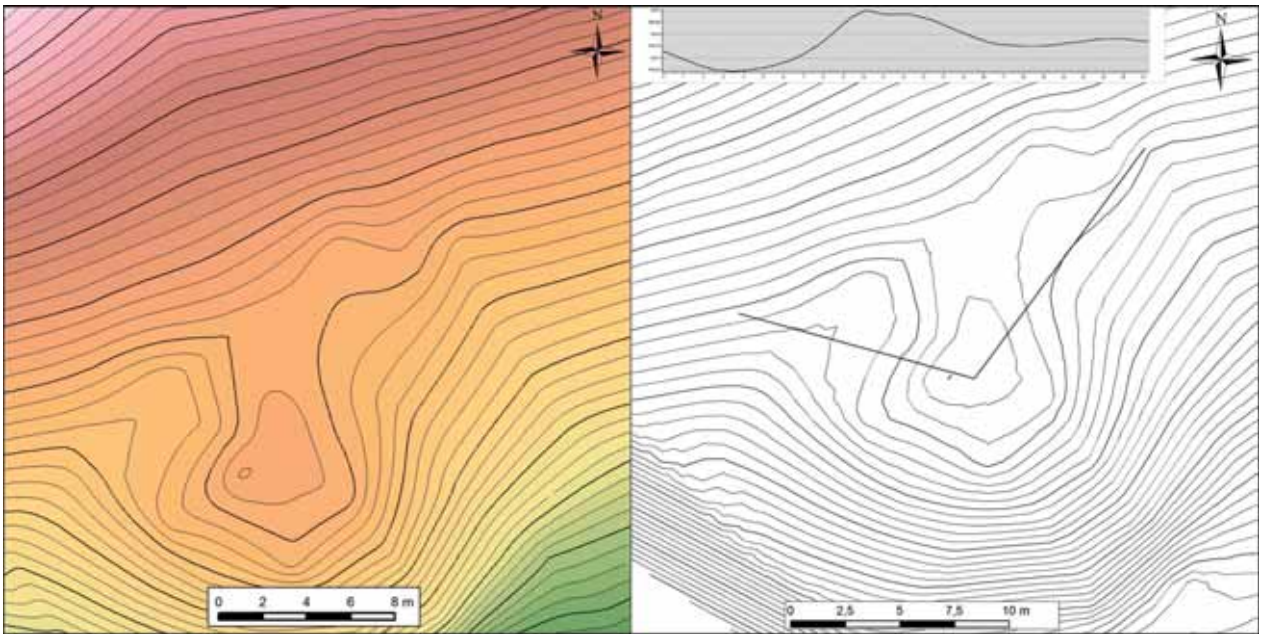


**Fig. IV.58.** Barrow 8/II. Hypsometric plan and cross-section

**Barrow 9/II (Fig. IV.59, Fig. IV.60)** was recorded in the beech forest, covered with trees. Geographic coordinates: N – 48°57'847", E – 24°57'352", h – 352.7 m.a.s.l. Circular in shape, 12.5 m in diameter, 0.45 m high. Situated on a small hill. No dig-ins were observed.

**Fig. IV.59.** Barrow 9/II. View from the SW

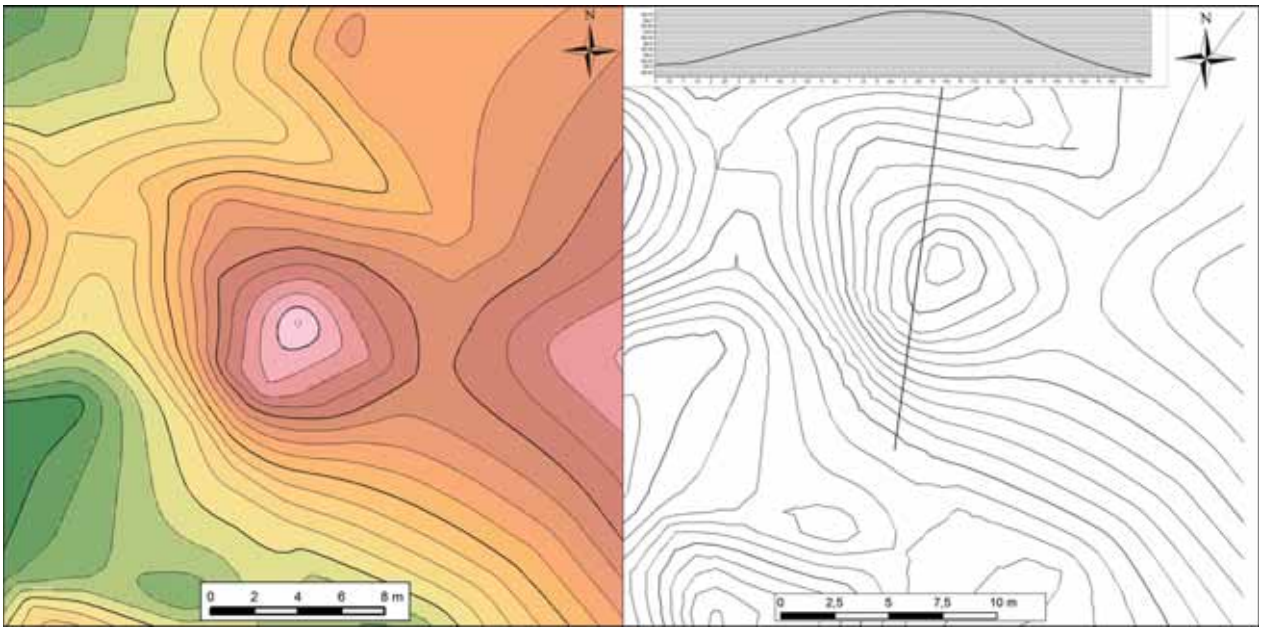


**Fig. IV.60.** Barrow 9/II. Hypsometric plan and cross-section

**Barrow 10/II (Fig. IV.61, Fig. IV.62)** is located in a beech forest, covered with trees. Geographic coordinates: N – 48°57'848", E – 24°57'329", h – 352.7 m.a.s.l. Oval in shape: 15 × 13 m (EW – NS), 0.6 m high. No dig-ins observable.

**Fig. IV.61.** Barrow 10/II. View from the NW

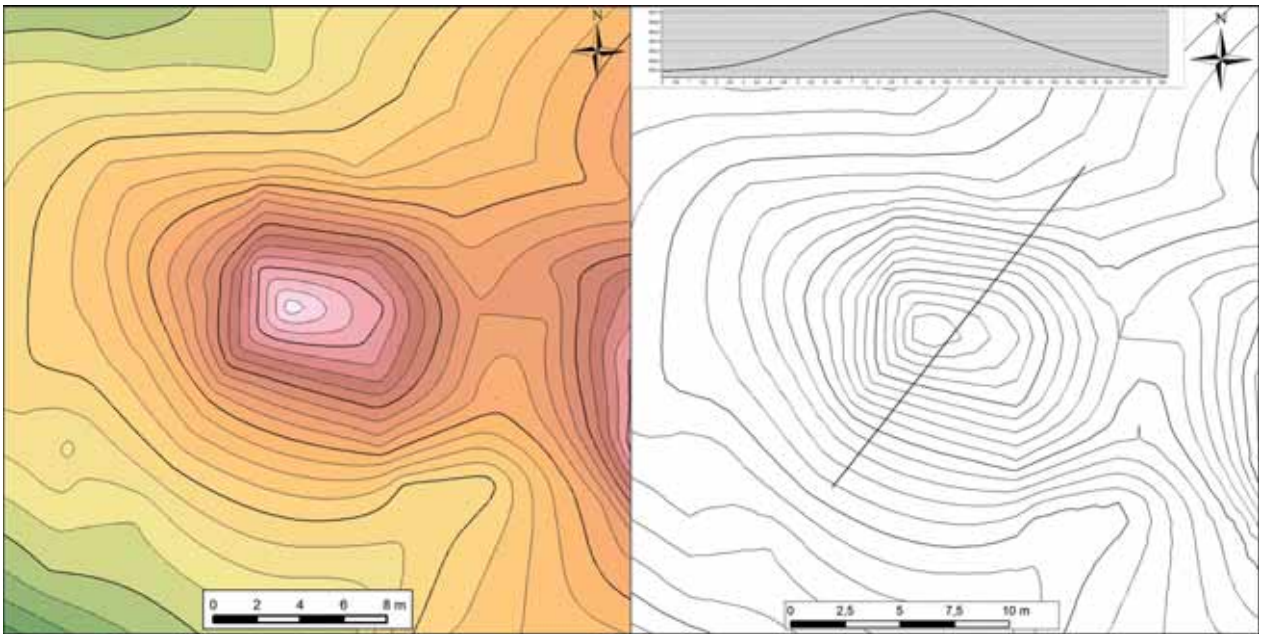


**Fig. IV.62.** Barrow 10/II. Hypsometric plan and cross-section

**Barrow 11/II (Fig. IV.63, Fig. IV.64)** is situated in a beech forest, covered with trees. Geographic coordinates: N – 48°57'839", E – 24°57'351", h – 352.4 m.a.s.l. Oval in shape: 11.5 × 9,5 m (EW – NS), 0.35 m high. Built on a small hill dropping towards E. No major disturbances were observed.

**Fig. IV.63.** Barrow 11/II. View from the W

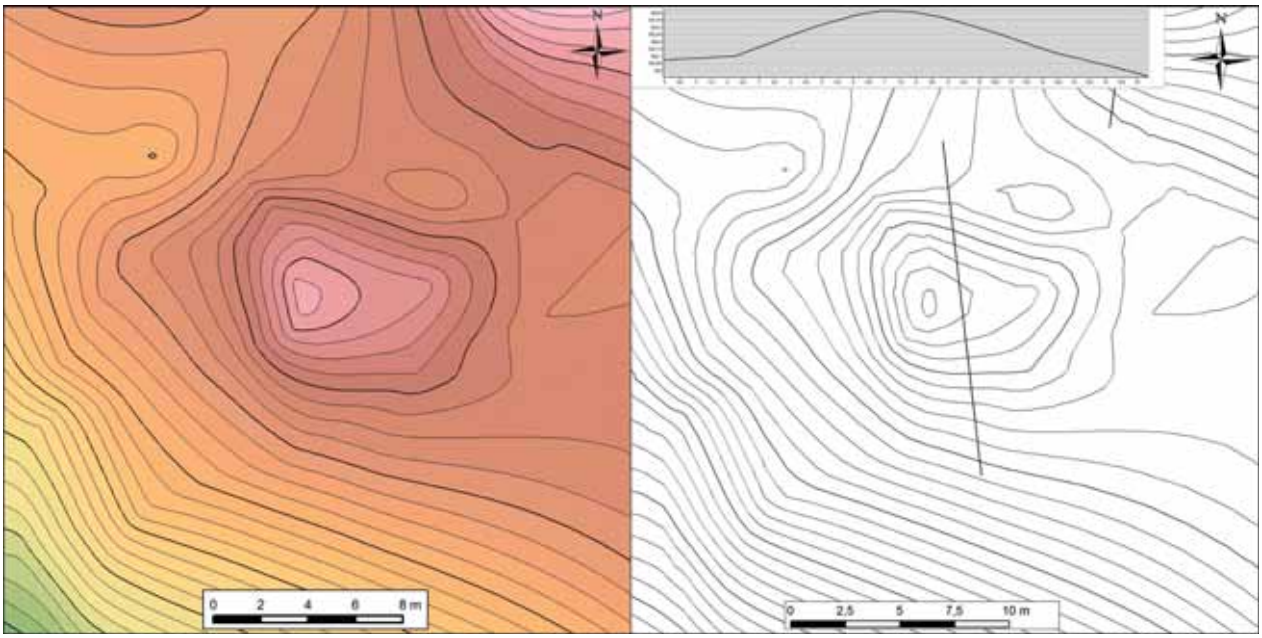


**Fig. IV.64.** Barrow 11/II. Hypsometric plan and cross-section

**Barrow 12/II (Fig. IV.65, Fig. IV.66)** was recorded in the beech forest, covered with trees. Geographic coordinates: N – 48°57'847", E – 24°57'311", h – 352.4 m.a.s.l. Oval in shape: 17.5 × 16 m (NNE – SSW), h – 0.5 m. Situated on top of a small hill dropping towards NW. No dig-ins were recognised.

**Fig. IV.65.** Barrow 12/II. View from the NW

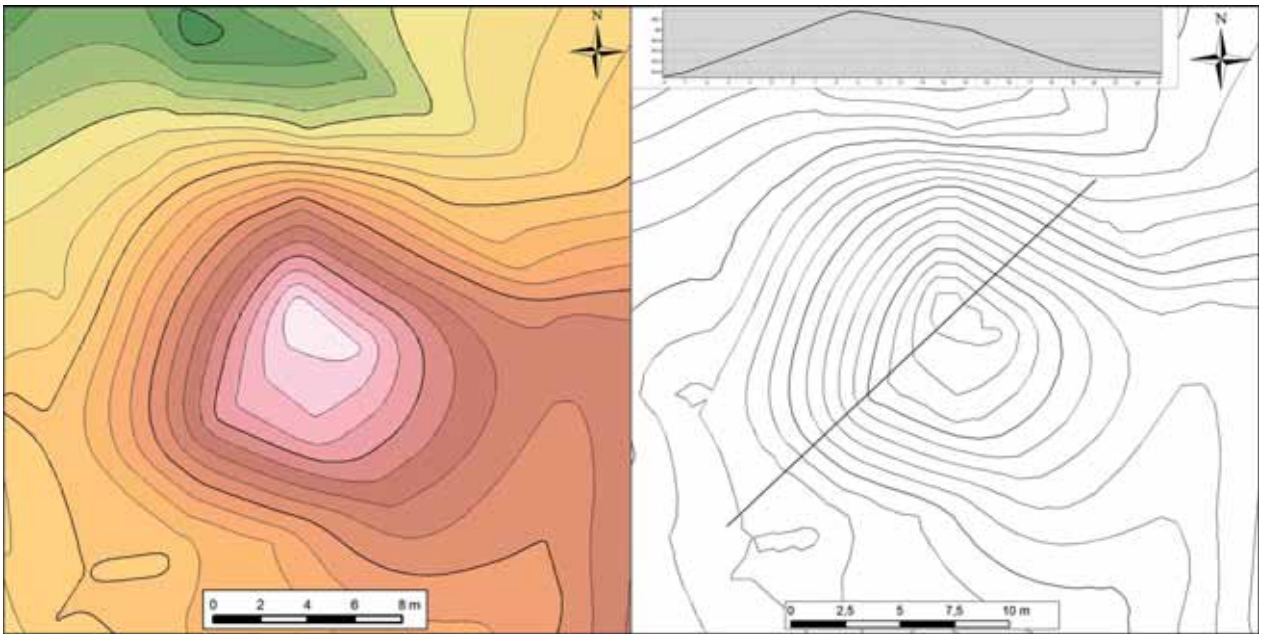


**Fig. IV.66.** Barrow 12/II. Hypsometric plan and cross-section

**Barrow 13/II (Fig. IV.67, Fig. IV.68)** is situated in a beech forest, covered with trees and bushes. Geographic coordinates: N – 48°57'821", E – 24°57'468", h – 352 m.a.s.l. Oval in shape: 11 × 10 m (EW – NS), 0.45 m high. Situated on a small hill dropping towards E. No dig-ins were recognised.

**Fig. IV.67.** Barrow 13/II. View from the W

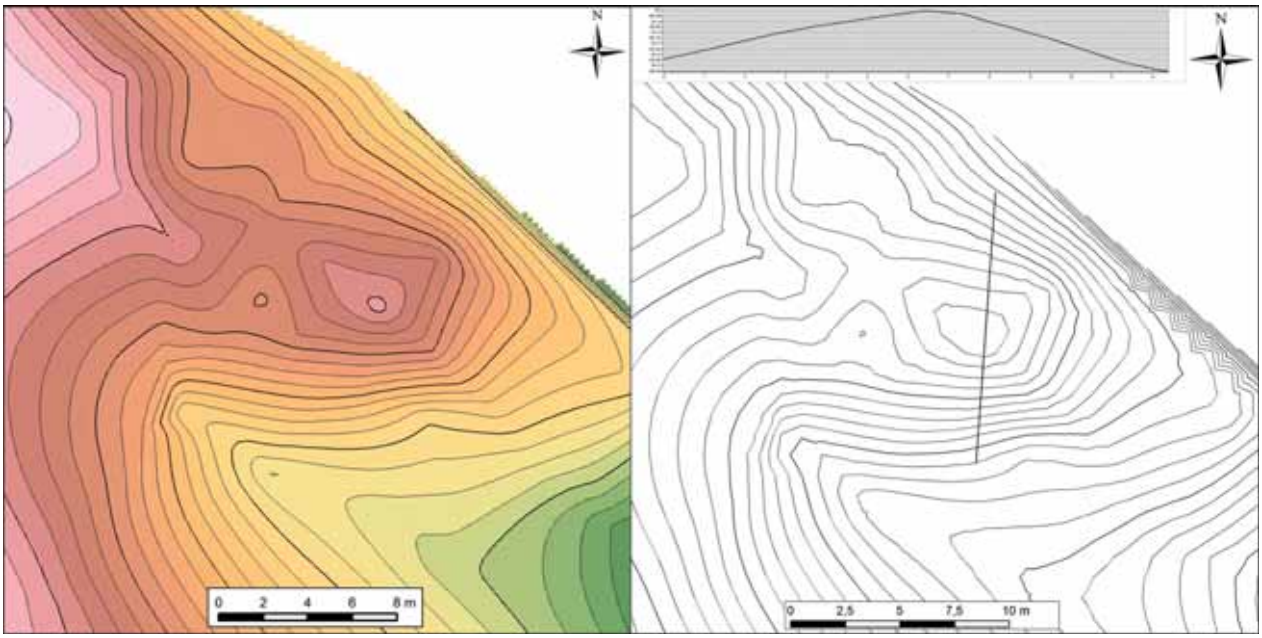


**Fig. IV.68.** Barrow 13/II. Hypsometric plan and cross-section

**Barrow 94/II (Fig. IV.69, Fig. IV.70)** was recorded in the beech forest, covered with trees and bushes. Geographic coordinates: N – 48°57'829", E – 24°57'287", h – 351.8 m.a.s.l. Oval in shape: 10.5 × 9.5 m (N – S), 0.4 m high. No significant damage was observed.

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**Fig. IV.69.** Barrow 94/II. View from the S

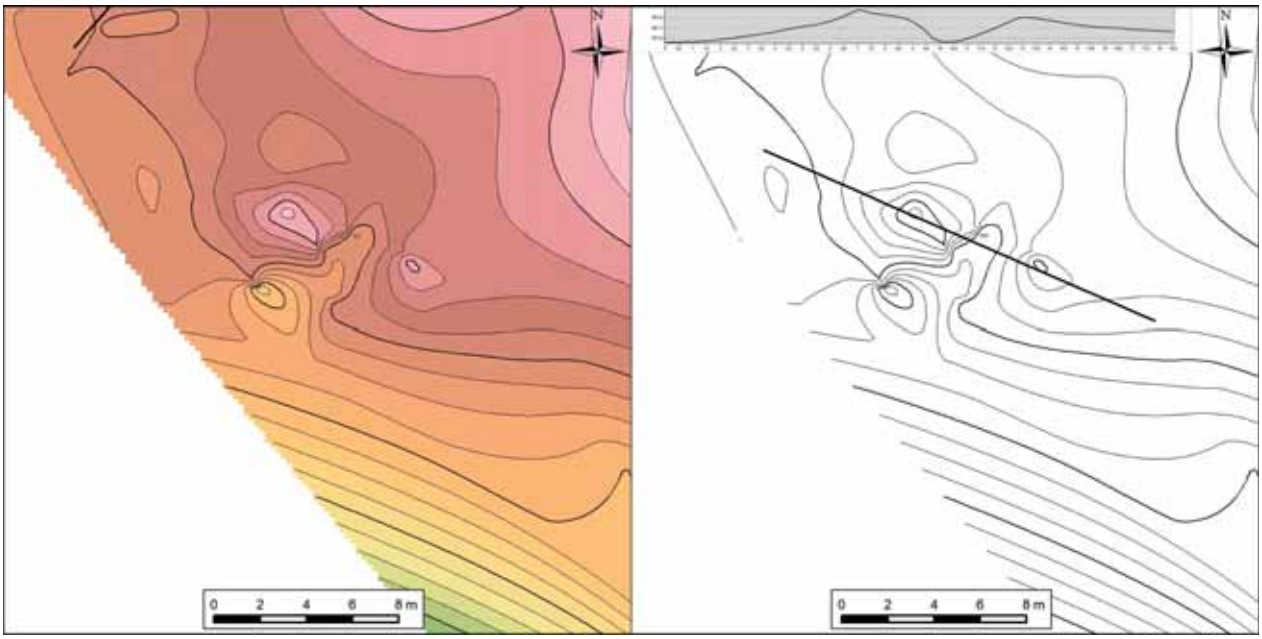



**Fig. IV.70.** Barrow 94/II. Hypsometric plan and cross-section

**A.2.5. Barrow group III**

**Barrow 1/III (Fig. IV.71, Fig. IV.72)** is located in a beech forest, covered with trees. Geographic coordinates: N – 48°57'989", E – 24°56'765", h – 325.5 m.a.s.l. Circular in shape, 10 m in diameter, 0.5 m high. Situated on a small hill dropping towards N. No damage was observed. Subject to geophysical survey.

**Fig. IV.71.** Barrow 1/III. View from the S

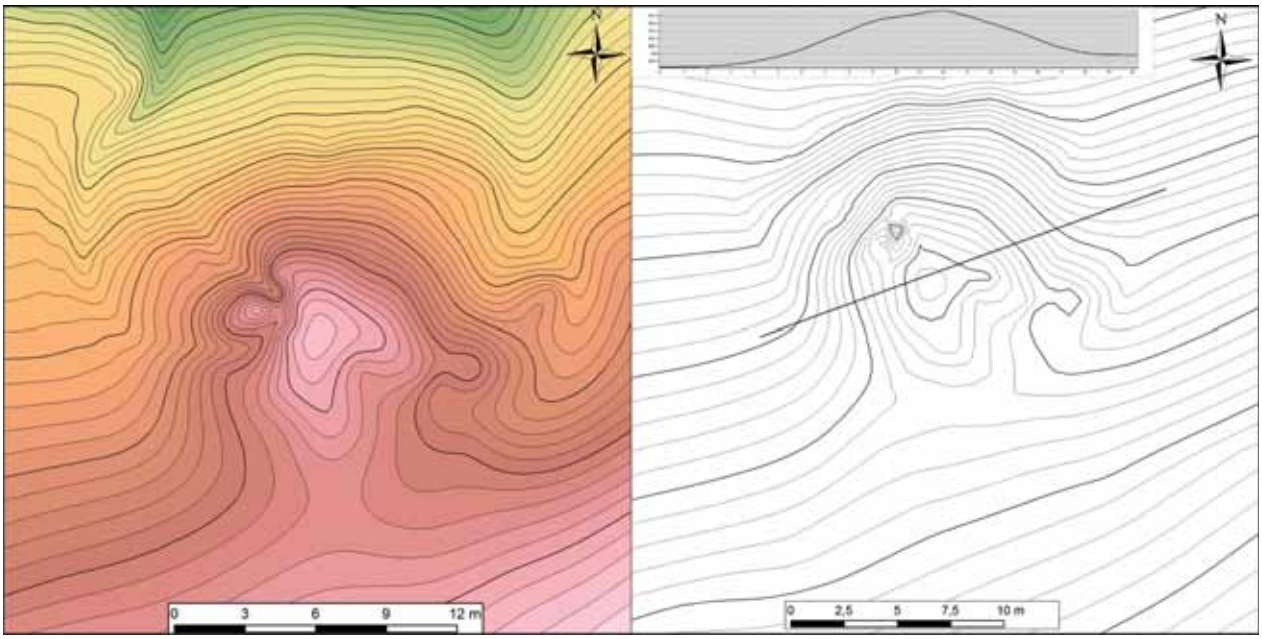



**Fig. IV.72.** Barrow 1/III. Hypsometric plan and cross-section

**Barrow 2/III (Fig. IV.73, Fig. IV.74)** was recorded in the beech forest, covered with trees. Geographic coordinates: N – 48°57'981", E – 24°56'725", h – 325.6 m.a.s.l. Oval in shape: 19.5 × 17.5 m (NNE – SSW), 1.5 m high. Located on top of the hill dropping towards NW. Several small dig-ins are visible in the mound, especially in its central part. Subject to geophysical survey.

**Fig. IV.73.** Barrow 2/III. View from the NE

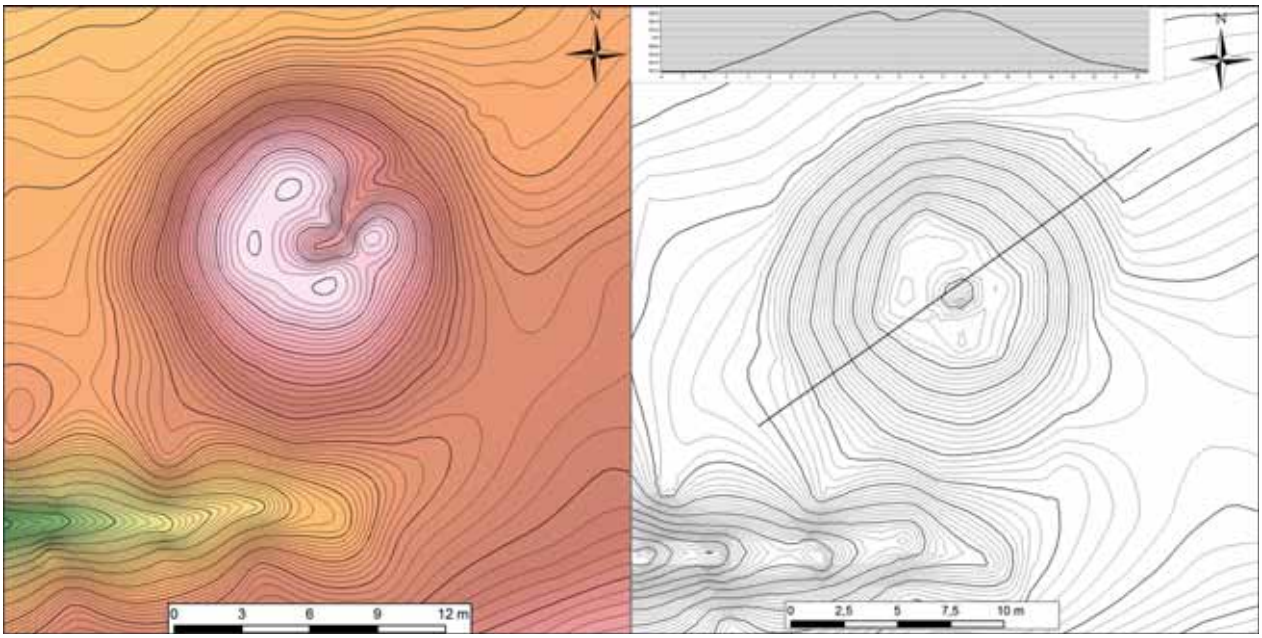



**Fig. IV.74.** Barrow 2/III. Hypsometric plan and cross-section

**Barrow 3/III (Fig. IV.75, Fig. IV.76)** is located in a beech forest, covered with trees and bushes. Geographic coordinates: N – 48°57'985", E – 24°56'704", h – 324.2.2 m.a.s.l. Adjoins barrow 4/III ("doubled mound"). Oval in shape: 9 × 8.5 m (NS – EW), 0.5 m high. Situated on a small hill dropping towards N. Small dig-ins are observable.

**Fig. IV.75.** Barrow 3/III. View from the SW

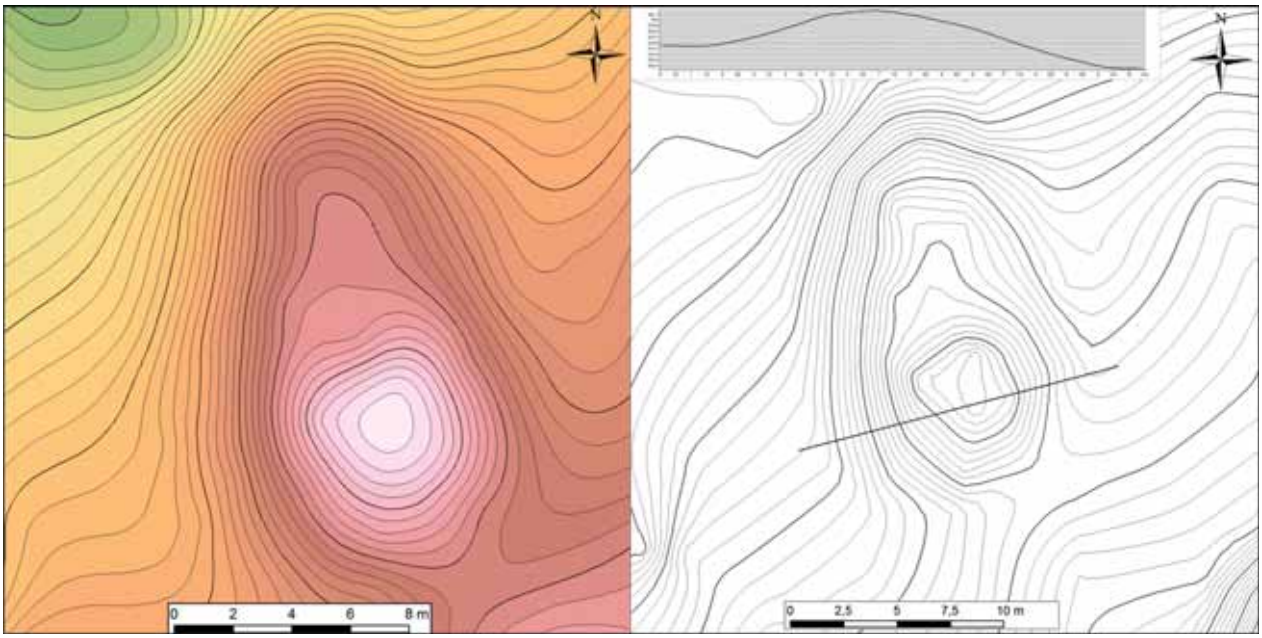



**Fig. IV.76.** Barrow 3/III. Hypsometric plan and cross-section

**Fig. IV.77.** Barrow 4/III. View from the E

**Barrow 4/III (Fig. IV.77)** was recorded in the beech forest, covered with trees and bushes. Geographic coordinates: N – 48°58'000", E – 24°56'700", h – 323.2.2 m.a.s.l. Adjoins barrow 3/III ("doubled mound"). Circular in shape, 9 m in diameter, 0.9 m high. Situated on top of a hill dropping towards NW. No damage was observed.

**Barrow 5/III (Fig. IV.78, Fig. IV.79)** was found in the beech forest, covered with trees and bushes. Geographic coordinates: N – 48°57'997", E – 24°56'710", h – 325.6 m.a.s.l. Oval in shape: 15 × 14.5 m (NS – EW), 1.2 m high. Situated on a hill dropping towards N. A dig-in was observed.

**Fig. IV.78.** Barrow 5/III. View from the S

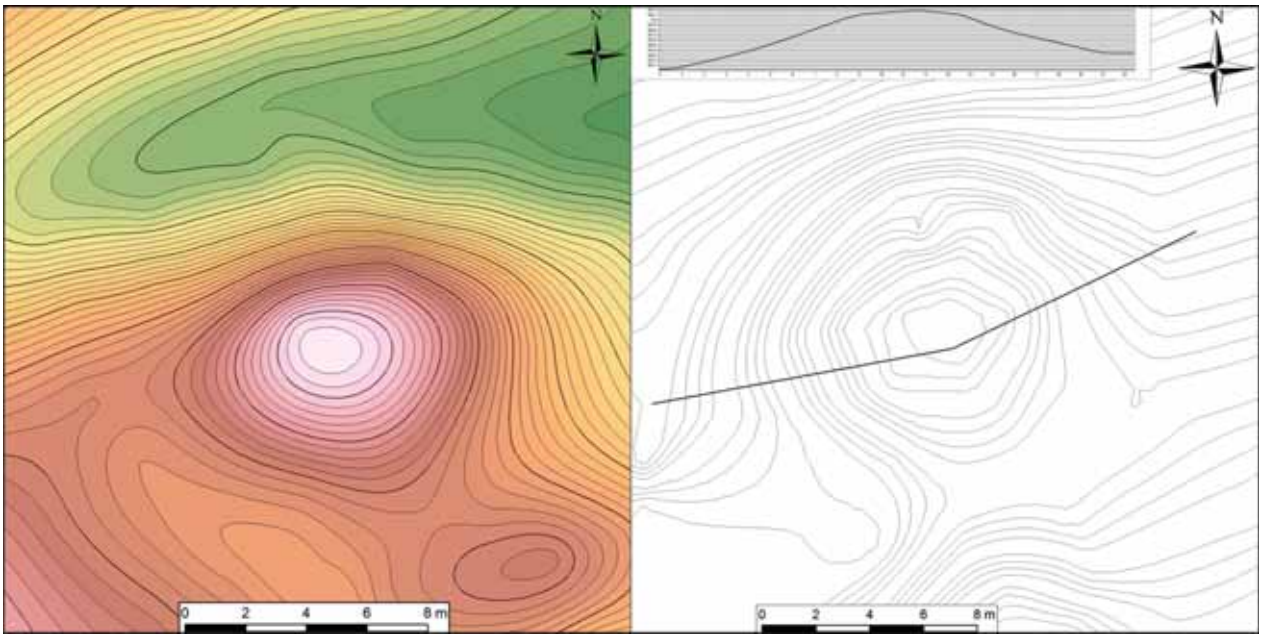



**Fig. IV.79.** Barrow 5/III. Hypsometric plan and cross-section

**Barrow 6/III (Fig. IV.80, Fig. IV.81)** is localised in a beech forest, covered with trees and bushes. Geographic coordinates: N – 48°57'967", E – 24°56'654", h – 325.6 m.a.s.l. Oval in shape: 18 × 14 m (NNE – SSW), 1.3 m high. Situated on a small hill dropping towards N. A dig-in was recorded in the centre of the mound. Subject to geophysical survey.

**Fig. IV.80.** Barrow 6/III. View from the NE

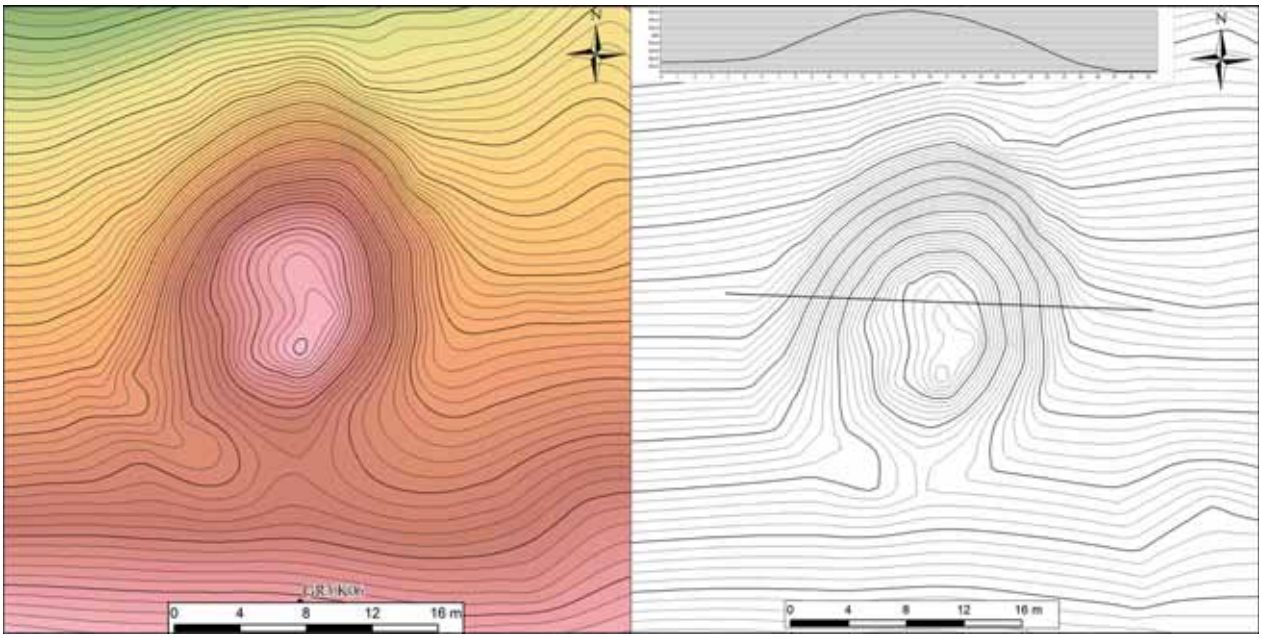



**Fig. IV.81.** Barrow 6/III. Hypsometric plan and cross-section

**Barrow 33/III (Fig. IV.82, Fig. IV.83)** was documented in the beech forest, covered with trees and bushes. Geographic coordinates: N – 48°57'852", E – 24°56'619", h – 322.2.2 m.a.s.l. Oval in shape: 18 × 17 m (NNE – SSW), 1.6 m high. Situated on a small hill dropping towards north.

**Fig. IV.82.** Barrow 33/III. View from the NE

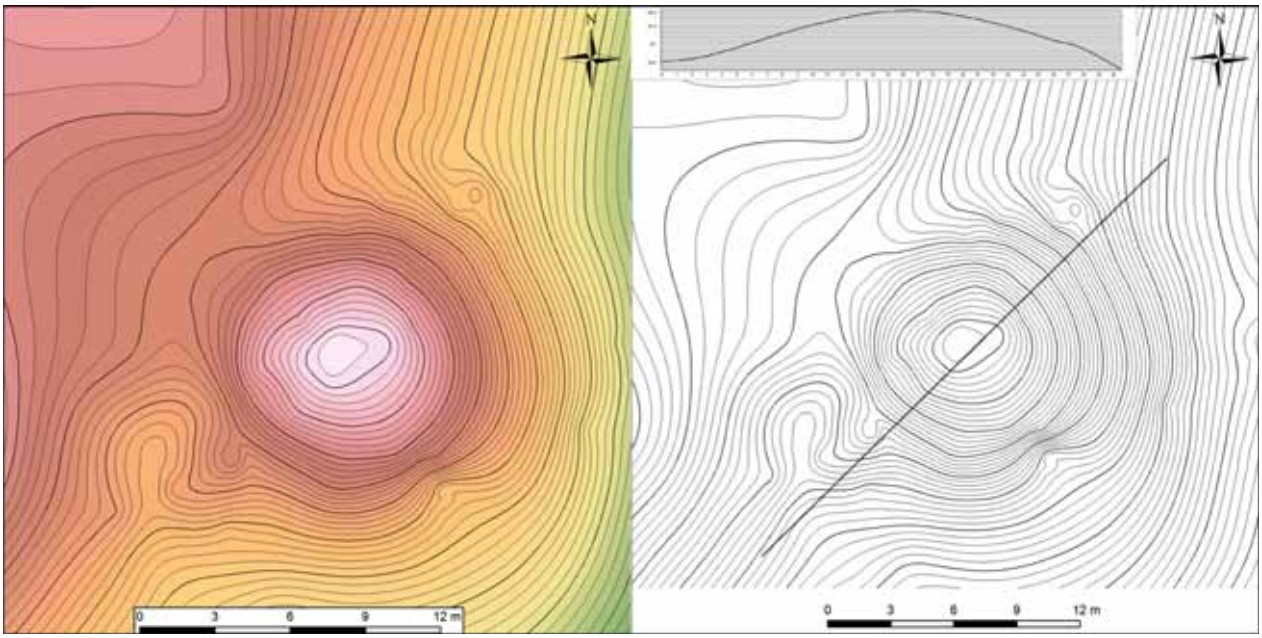



**Fig. IV.83.** Barrow 33/III. Hypsometric plan and cross-section

**Barrow 163/III (Fig. IV.84)** is situated in the beech forest, covered with trees and bushes. Geographic coordinates: N – 48°57'888", E – 24°56'652", h – 325.8 m.a.s.l. Oval in shape: 13.5 × 12 m (NNE – SSW), 1.5 m high. Localised on a small hill dropping towards N.

**Fig. IV.84.** Barrow 163/III. View from the NE

**Fig. IV.85.** Barrow 1/IV. View from the NE

**A.2.6. Barrow group IV**

**Barrow 1/IV (Fig. IV.85, Fig. IV.86)** is located in the beech forest, covered with trees and bushes. Geographic coordinates: N – 48°57'865", E – 24°57'054", h – 352.2. m.a.s.l. Oval in shape: 16.5 × 15 m (NNE – SSW), 0,9 m high. Dig-ins and other damage is visible.

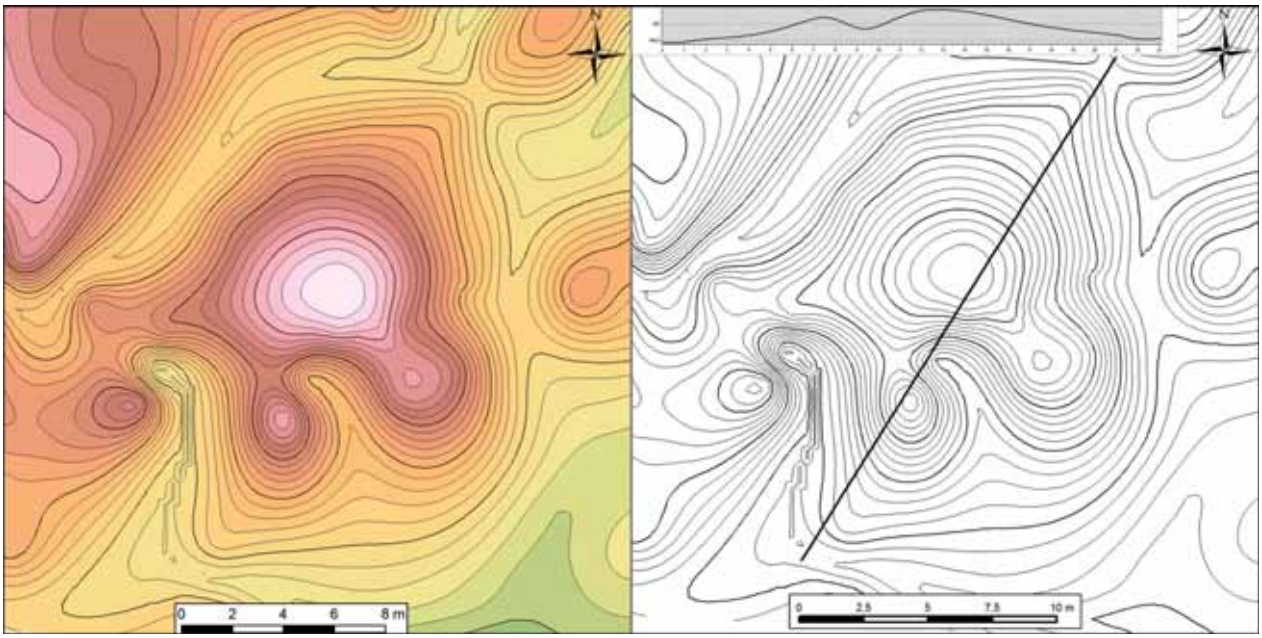



**Fig. IV.86.** Barrow 1/IV. Hypsometric plan and cross-section

**Barrow 2/IV (Fig. IV.87, Fig. IV.88)** was recorded in the beech forest, covered with trees and bushes. Geographic coordinates: N – 48°57'874", E – 24°57'026", h – 351.2 m.a.s.l. Oval in shape: 15 × 12 m (NNE – SSW), 0.8 m high. Visible dig-ins, barrow is cut by a trench from WWII.

**Fig. IV.87.** Barrow 2/IV. View from the SE

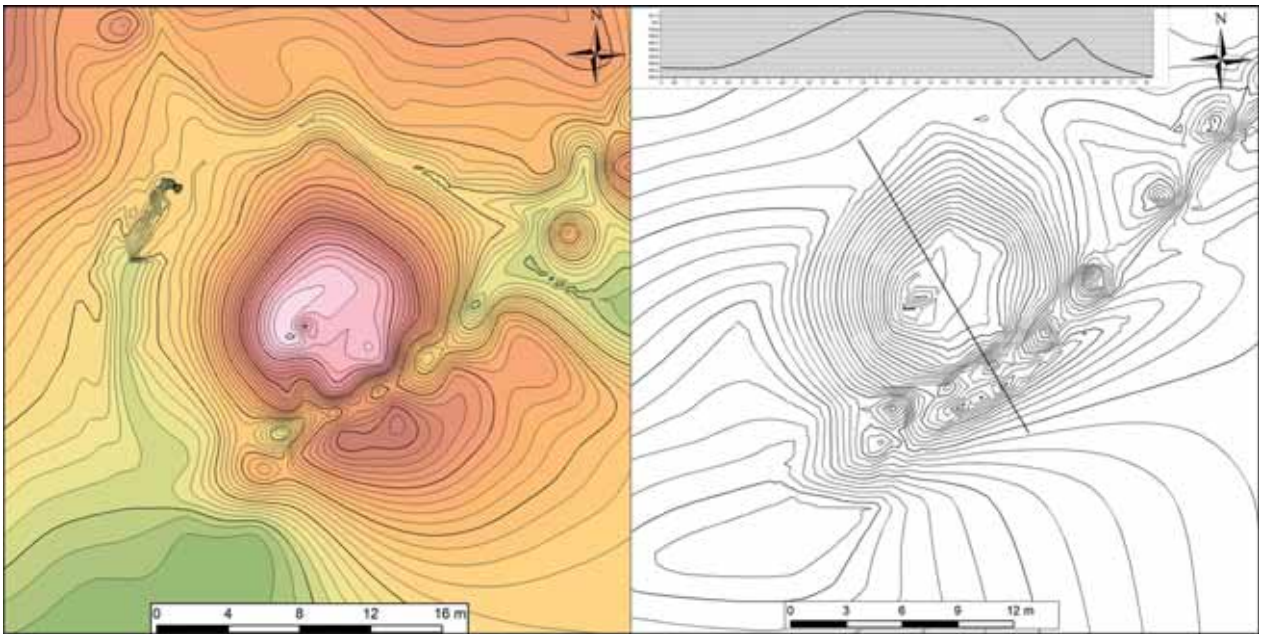



**Fig. IV.88.** Barrow 2/IV. Hypsometric plan and cross-section

**Barrow 3/IV (Fig. IV.89, Fig. IV.90)** was found in the beech forest, covered with trees and bushes. Geographic coordinates: N – 48°57'859", E – 24°56'969", h – 350.3 m.a.s.l. Oval in shape: 10.5 × 10 m (NNE – SSW), 0.5 m high. Destroyed by a trench from WWII.

**Fig. IV.89.** Barrow 3/IV. View from the S

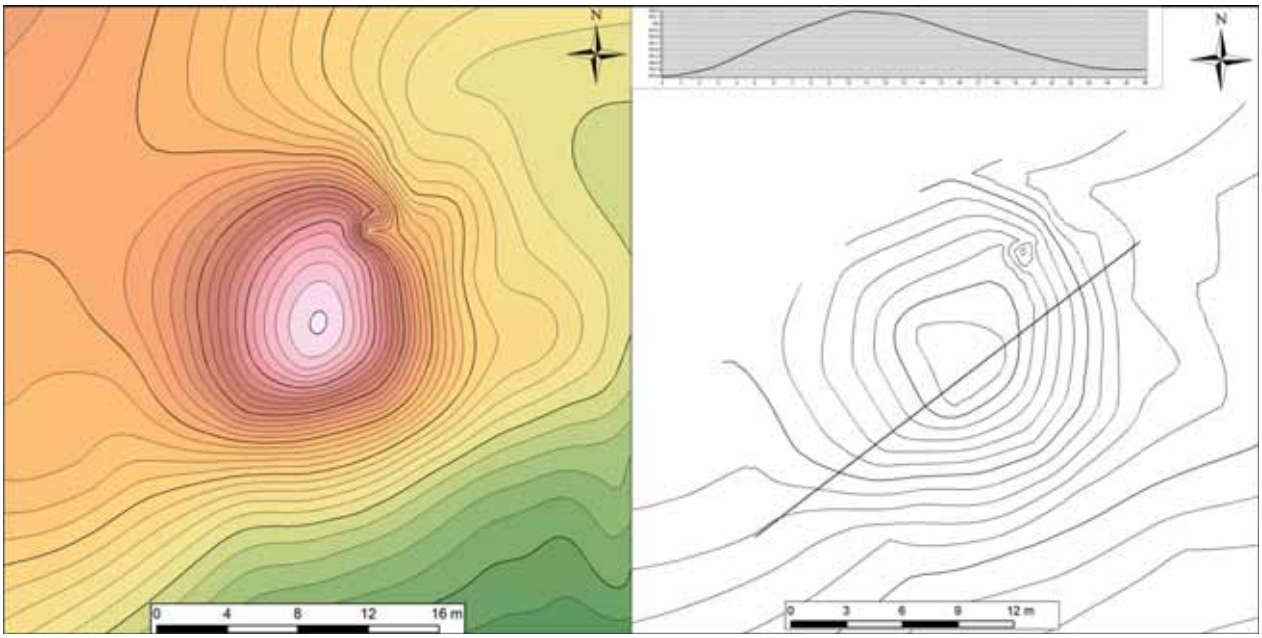



**Fig. IV.90.** Barrow 3/IV. Hypsometric plan and cross-section

**Barrow 4/IV (Fig. IV.91, Fig. IV.92)** is located in a small, dense forest, covered with small trees and bushes. Geographic coordinates: N – 48°57'835", E – 24°57'131", h – 352.9 m.a.s.l. Oval in shape: 19 × 18 m (NNE – SSW), 1.1 m high. No dig-ins were observed.

**Fig. IV.91.** Barrow 4/IV. View from the SE

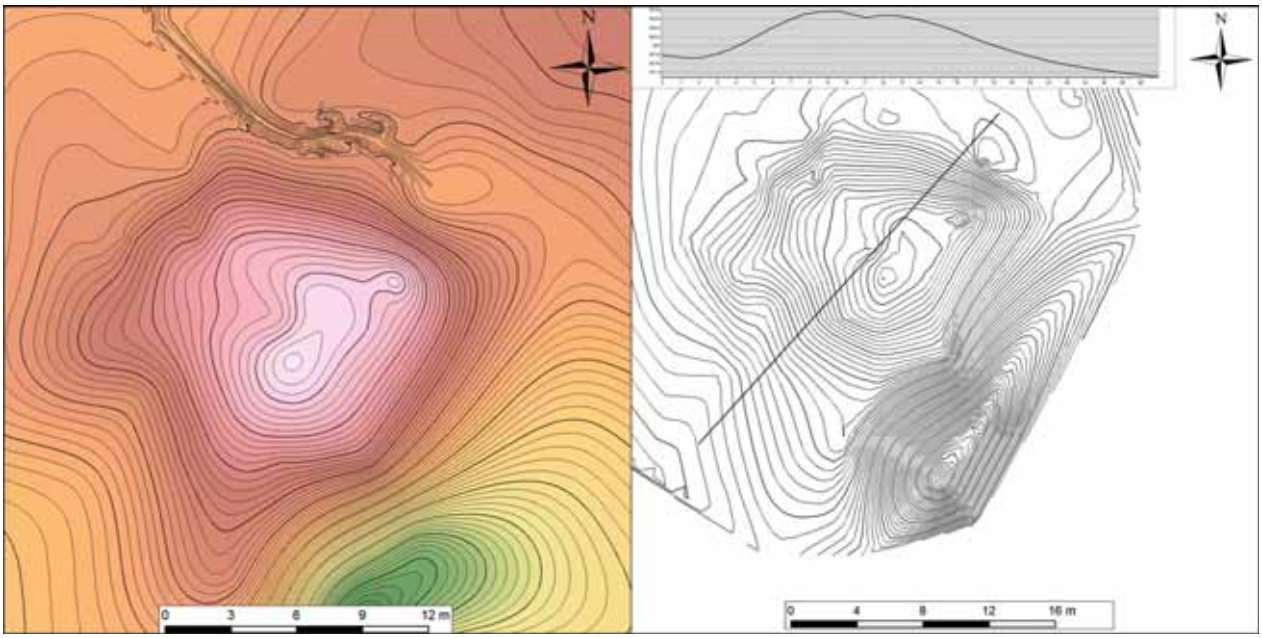



**Fig. IV.92.** Barrow 4/IV. Hypsometric plan and cross-section

**A.2.7. Barrow group V**

**Barrow 1/V(Fig. IV.93, Fig. IV.94)** was discovered in the beech forest, covered with trees and bushes. Geographic coordinates: N – 48°57'807", E – 24°57'617", h – 345.3 m.a.s.l. Oval in shape: 14.5 × 12 m (NNE – SSW), 1.2 m high. No dig-ins were observed.

**Fig. IV.93.** Barrow 1/V. View from the NW

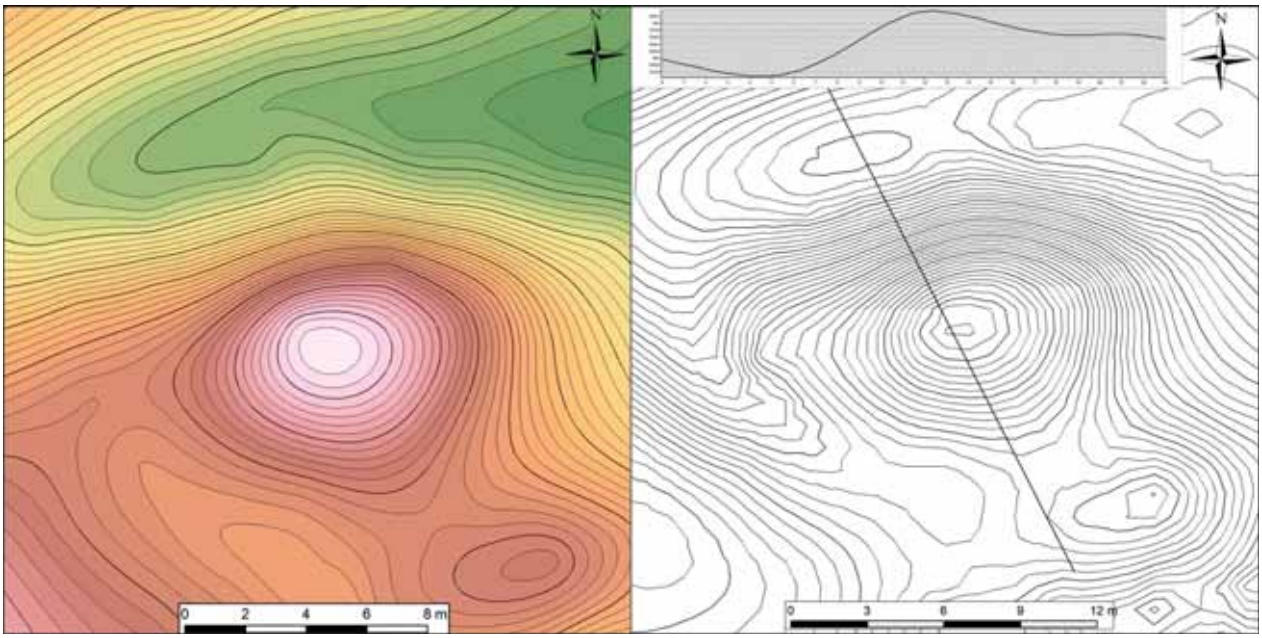



**Fig. IV.94.** Barrow 1/V. Hypsometric plan and cross-section

**Barrow 2/V (Fig. IV.95, Fig. IV.96)** is located in the beech forest, covered with trees and bushes. Geographic coordinates: N – 48°57'809", E – 24°57'625", h – 343.8 m.a.s.l. Oval in shape: 9 × 8 m (EW – NS), 0.7 m high. No dig-ins visible in the mound.

**Fig. IV.95.** Barrow 2/V. View from the SW

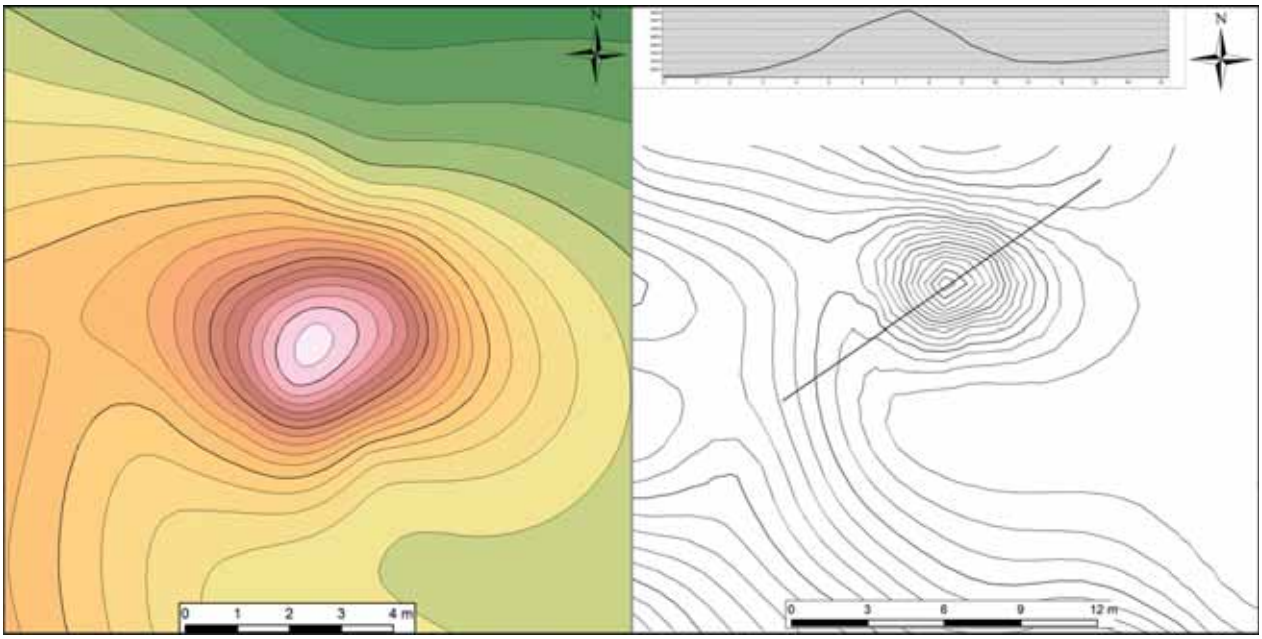



**Fig. IV.96.** Barrow 2/V. Hypsometric plan and cross-section

**Barrow 3/V (Fig. IV.97, Fig. IV.98)** is situated in the beech forest, covered with trees and bushes. Geographic coordinates: N – 48°57'806", E – 24°57'646", h – 344.5 m.a.s.l. Oval in shape: 17.5 × 16 m (NNE – SSW), 0.9 m high. No dig-ins or other damage.

**Fig. IV.97.** Barrow 3/V. View from the NW

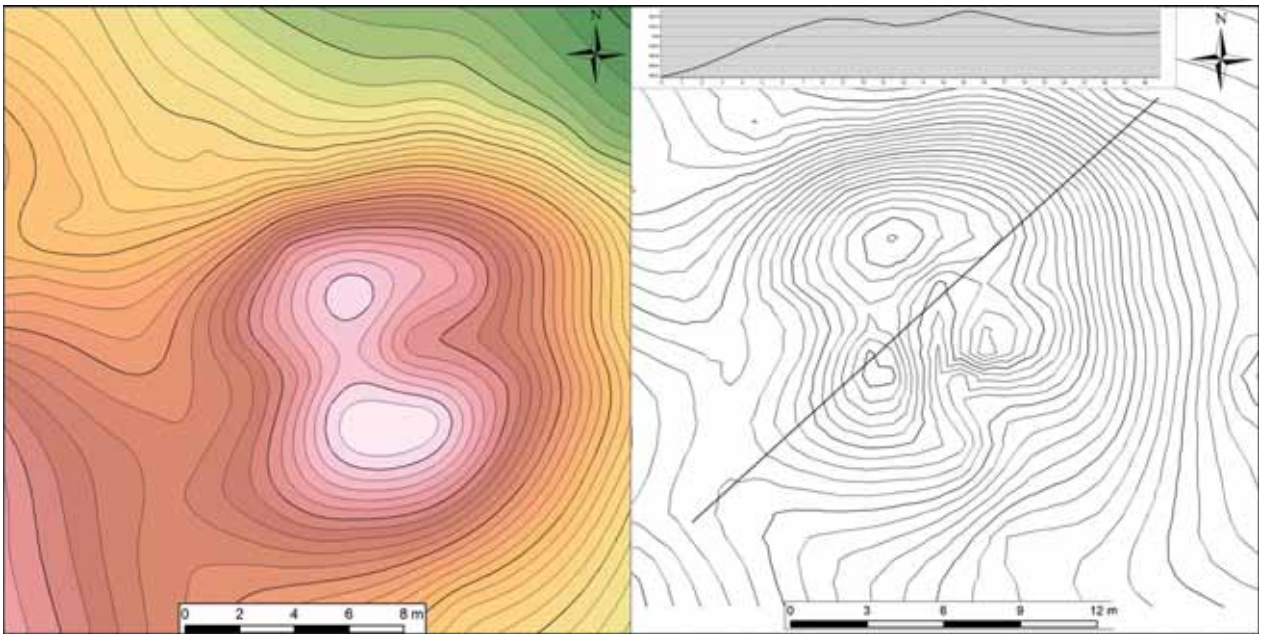



**Fig. IV.98.** Barrow 3/V. Hypsometric plan and cross-section

**A.2.8. Barrow group VI**

**Barrow 1/VI** ("near the church"; **Fig. IV.99, Fig. IV.100)** was recorded in the village, close to the church, covered with trees. Geographic coordinates: N – 48°57'821", E – 24°58'313", h – 345.5 m.a.s.l. Circular in shape, 14 m in diameter, 2.5 m high. No damage was observed in the mound.

**Fig. IV.99.** Barrow 1/VI. View from the SW

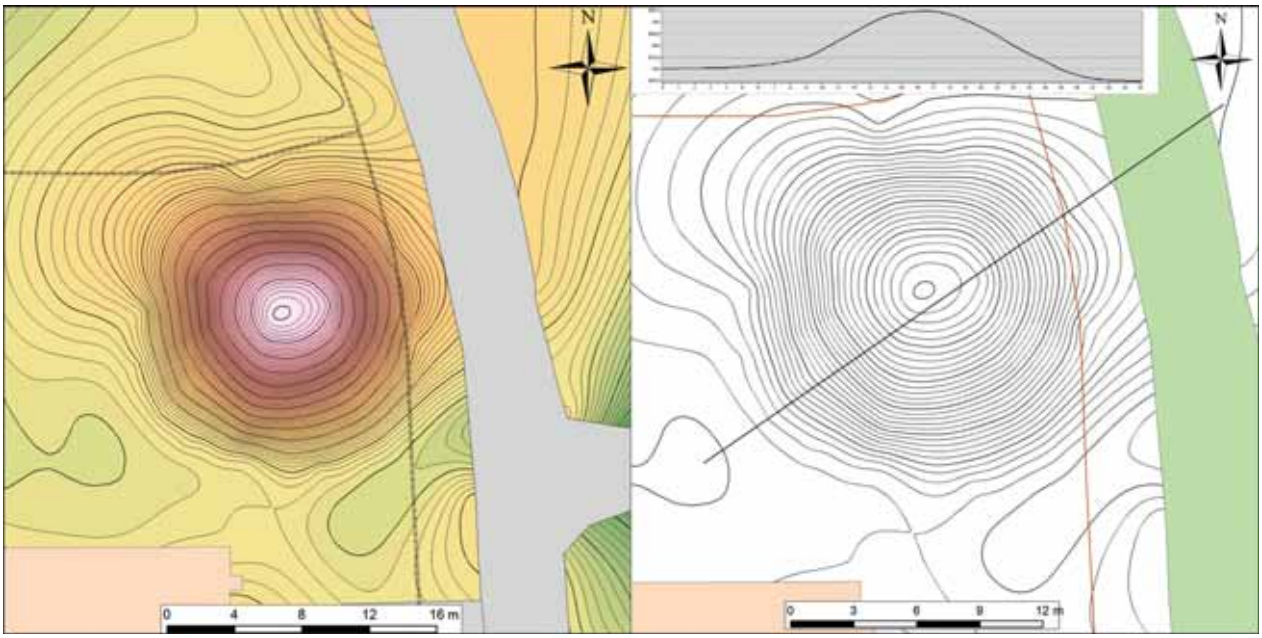



**Fig. IV.100.** Barrow 1/VI. Hypsometric plan and cross-section

**Barrow D/VI = 3/1931? (Fig. IV.101, Fig. IV.102)** is situated in the western part of a small, flattened hill, west of the church. Geographic coordinates: N – 48°57'823", E – 24°57'846", h – 300.9 m.a.s.l. Barrow excavated in the 1930s. All that remains are a circular dig-in and soil scattered around. Covered with bushes, trees and weed.

**Fig. IV.101.Barrow** D/VI = 3/1931? View from the SE

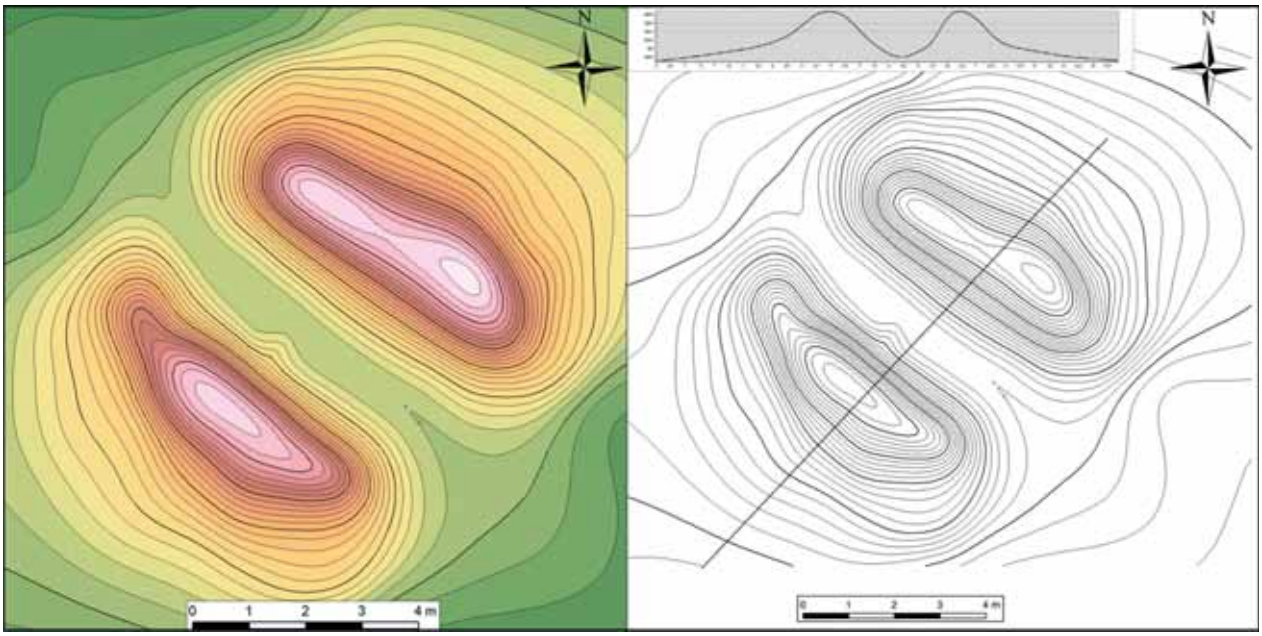



**Fig. IV.102.** Barrow D/VI = 3/1931? Hypsometric plan and cross-section

**Barrow E/VI = 4/1931? (Fig. IV.103**) is located in the western part of a small, flattened hill, close to barrow D. Geographic coordinates: N – 48°57'817", E – 24°57'842", h – 301 m.a.s.l. Barrow excavated in 1930s. All that remains are a circular dig-in and soil scattered around.

**Fig. IV.103.** Barrow E/VI = 4/1931? View from the N

**Fig. IV.104.** Barrow X/VI. View from the E

**Barrow X/VI (Fig. IV.104, Fig. IV.105)** was recorded in the village, close to agriculture buildings. Geographic coordinates: N – 48°57'769", E – 24°58'021", h – 349.3 m.a.s.l. Destroyed in the centre by a triangulation tower and numerous surrounding dig-ins. Covered with trees and grass. Oval in shape: 16 × 15 m (NNE – SSW), 0.6 m high.

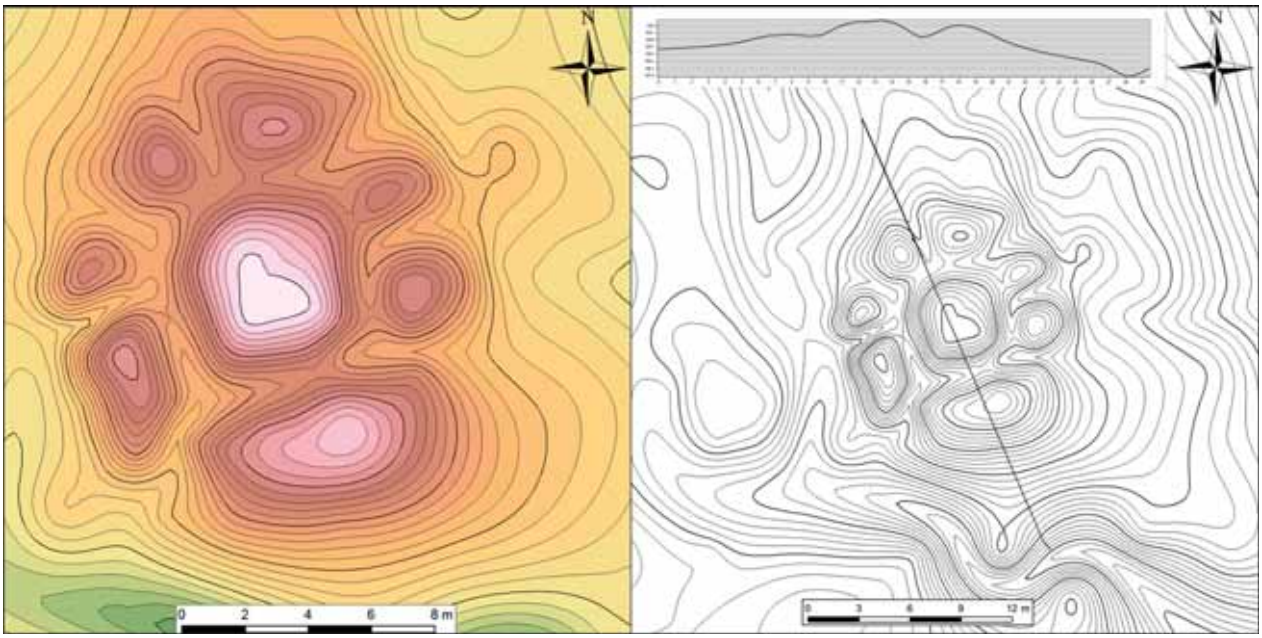



**Fig. IV.105.** Barrow X/VI. Hypsometric plan and cross-section

**Barrow 78/VI (Fig. IV.106, Fig. IV.107)** is located in the village, W of the church, on a meadow (present-day football pitch). Geographic coordinates: N – 48°57'800", E – 24°58'155", h – 309.6 m.a.s.l. Oval in shape, 11 m in diameter, 0.3 m high. Severely damaged, covered with grass.

**Fig. IV.106.** Barrow 78/VI. View from the S

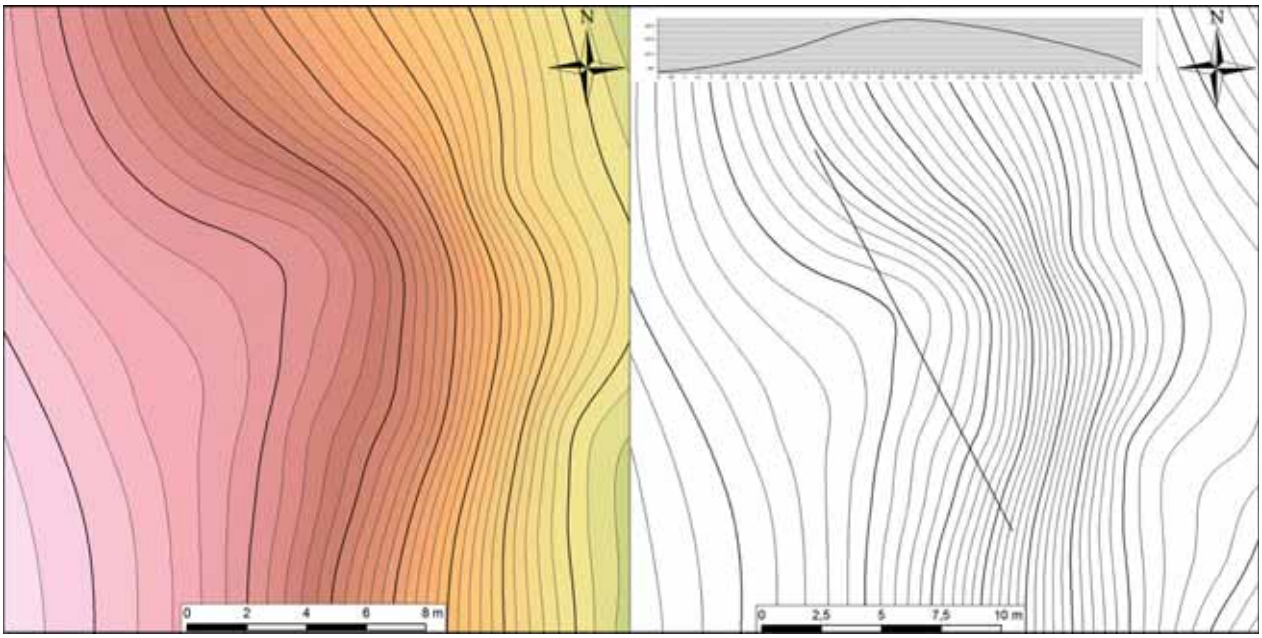



**Fig. IV.107.** Barrow 78/VI. Hypsometric plan and cross-section

**Barrow 161/VI (Fig. IV.108, Fig. IV.109)** was discovered in a village, close to the old Polish school (present-day farm building), in an orchard, south of the church. Geographic coordinates: N – 48°57'784", E – 24°58'308", h – 343.7 m.a.s.l. Mound severely damaged, covered with grass. Circular in shape, 13 m in diameter, 0.6 m high.

**Fig. IV.108.** Barrow 161/VI. View from the W

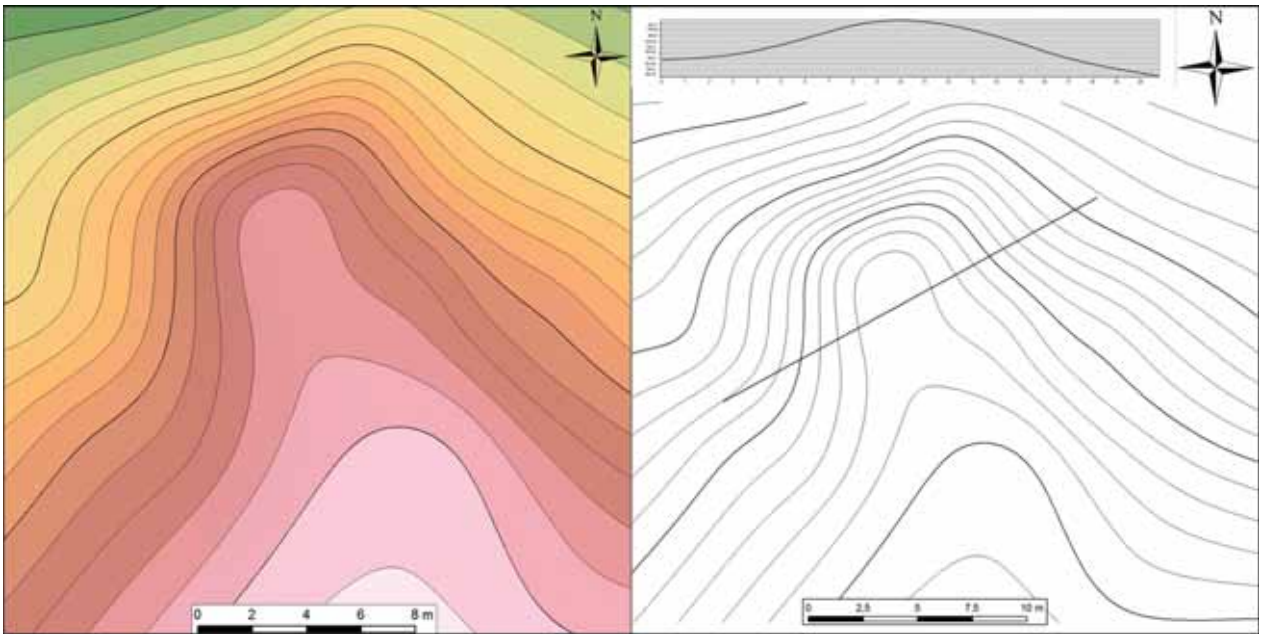



**Fig. IV.109.** Barrow 161/VI. Hypsometric plan and cross-section

**Barrow 162/VI (Fig. IV.110)** is located in the village, close to the old Polish school (present-day farm building), in an orchard, S of the church. Geographic coordinates: N – 48°57'771", E – 24°58'235", h – 310.1 m.a.s.l. Excavated (?) in 1930s, covered with grass. Circular shape of remains, 13 m in diameter, 0.5 m high.

**Fig. IV.110.** Barrow 162/VI. View from the W

**Fig. IV.111.** Barrow H1/VI. View from the SW

**Barrow H1/VI (Fig. IV.111, Fig. IV.112)** was recorded on the eastern edge of the latitude concentration of barrows, close to the Dniester valley. Geographic coordinates: N – 48°57'891", E – 24°59'849", h – 320.4 m.a.s.l. Covered with trees and bushes. Oval in shape: 13 × 11,5 m (NS – EW), 1.4 m high. Cut by the road.

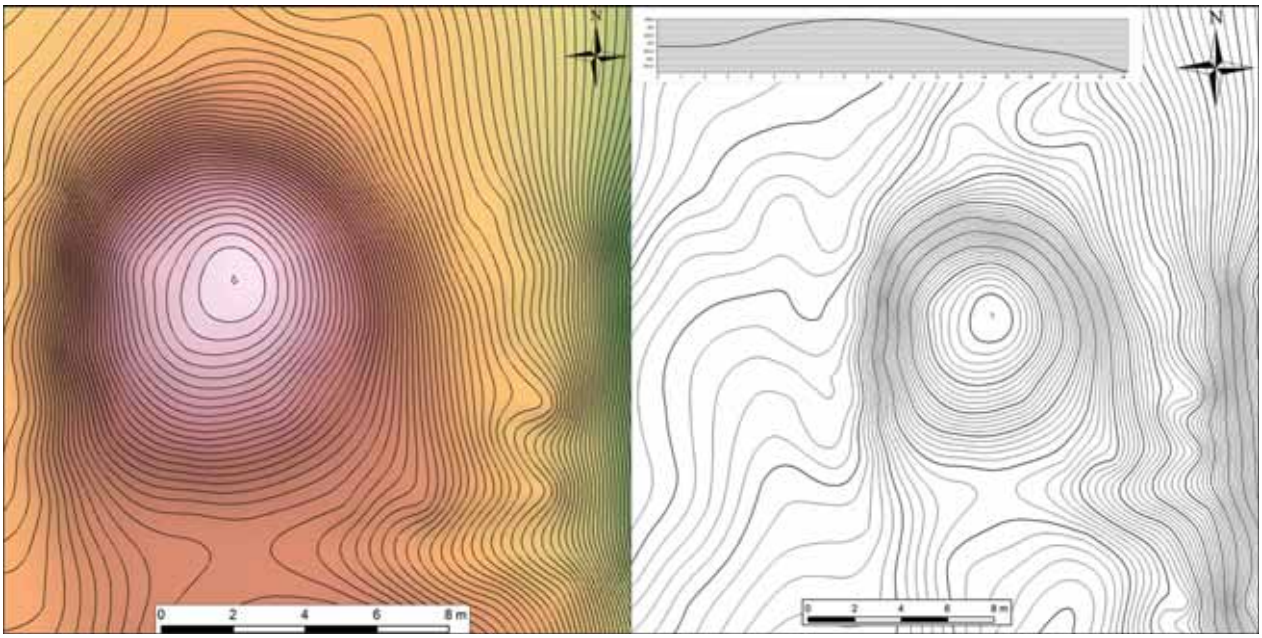



**Fig. IV.112.** Barrow H1/VI. Hypsometric plan and cross-section

**A.2.9. Other barrows**

**Barrow 73 = I/1937 (Fig. IV.113, Fig. IV.114)** is located on the meadow. Geographic coordinates: N – 48°57'327", E – 24°57'645", h – 295.5 m.a.s.l. Excavated in 1937 (Śmiszko 1937; Siwkówna 1938; Sulimirski 1968:50). Shape: remaining mound (secondary deposit) of circular shape, 7.5 m diameter, 0.6 m high; initially: 12 m in diameter, 1.7 m high (originally). Remains of the mound were subject to a geophysical survey.

**Fig. IV.113.** Barrow 73. View from the S

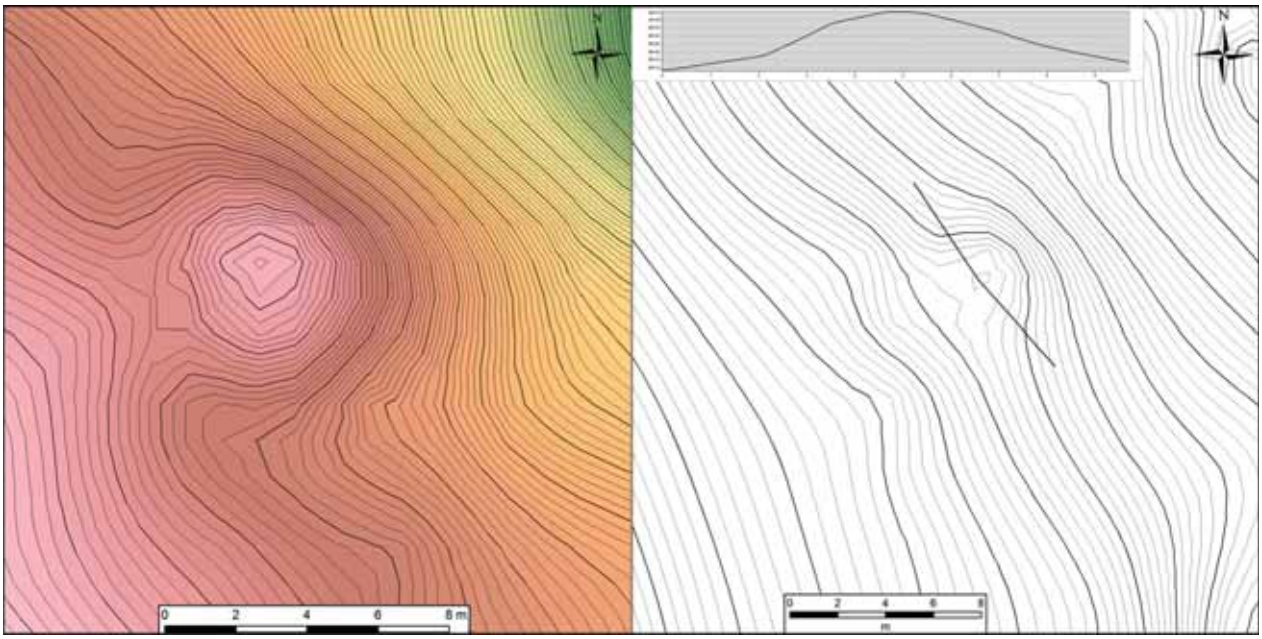



**Fig. IV.114.** Barrow 73. Hypsometric plan and cross-section

**Barrow 74 = II/1937 (Fig. IV.115, Fig. IV.116)** was discovered on the meadow. Geographic coordinates: N – 48°58'286", E – 24°57'640", h – 298.7 m.a.s.l. Barrow excavated in 1937 (Śmiszko 1937; Siwkówna 1938; Sulimirski 1968:150). Shape: irregular remains (secondary deposit) of a circular shape, 16.5 m in diameter, 0.4 m high; initial diameter: 10 m, 0.5 m high. Relics of the monument were subject to a geophysical survey.

**Fig. IV.115.** Barrow 74 (II/1937). View from the SW

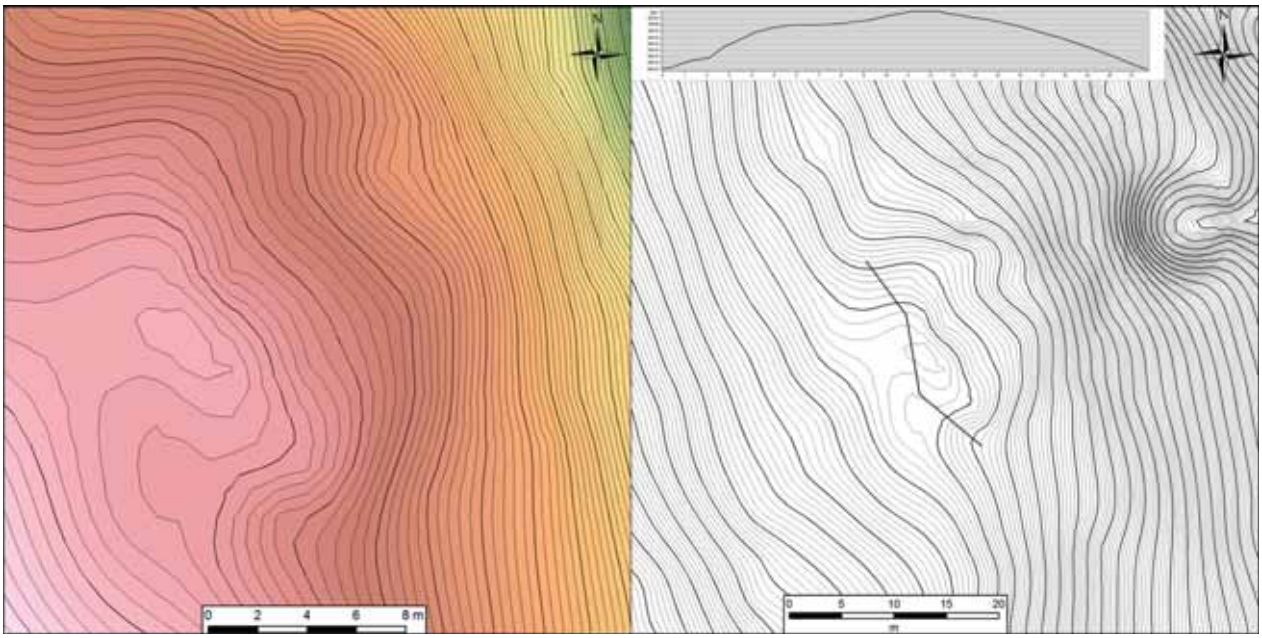



**Fig. IV.116.** Barrow 74 (II/1937). Hypsometric plan and cross-section

**Barrow 75 = III/1937 (Fig. IV.117)** was recorded on the meadow. Geographic coordinates: N – 48°58'377", E – 24°57'659", h – 299.1 m.a.s.l. Excavated in 1937 (Śmiszko 1937; Siwkówna 1938; Sulimirski 1968:150). The remaining shape is circular, 7.5 m in diameter, 1.7 m high; initial diameter – 12 m, 2 m high. The remains were subject to a geophysical survey.

**Fig. IV.117.** Barrow 75 (III/1937). View from the SW

**Fig. IV.118.** Barrow A. View from the SE

**Barrow A (Fig. IV.118, Fig. IV.119)** is situated in the beech forest between groups I and II. Geographic coordinates: N – 48°58'055", E – 24°57'280", h – 342.1 m.a.s.l. Covered with trees and bushes. Oval in shape: 21 × 18 m (NNE – SSW), 0.8 m high. A large dig-in is visible in the centre of the mound.

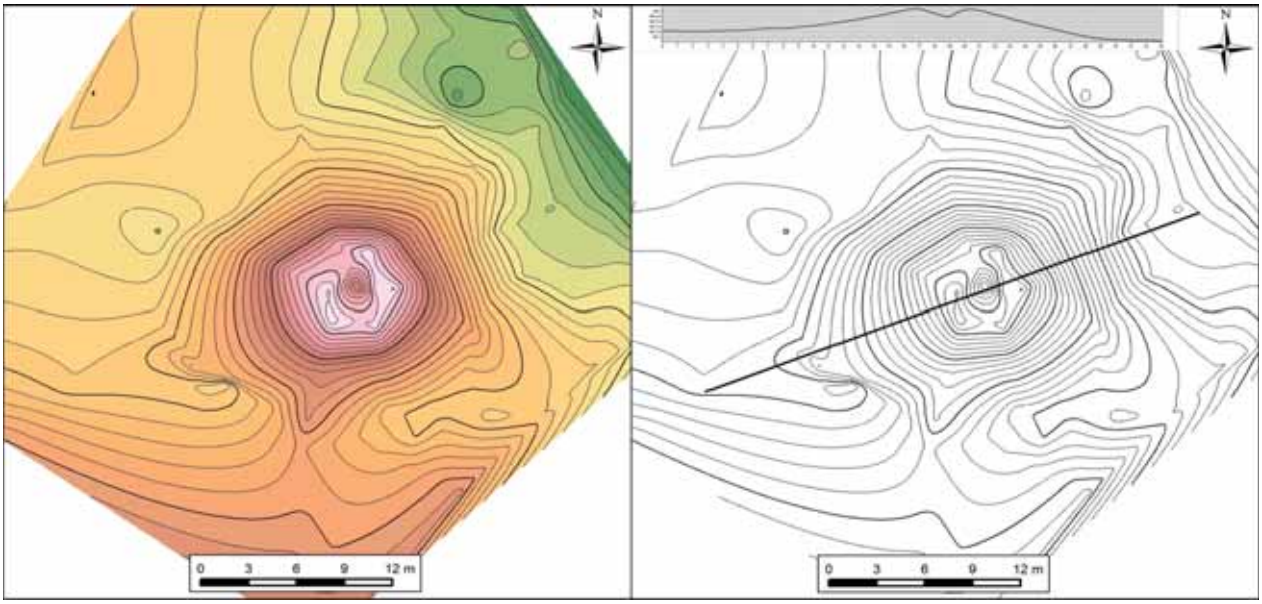



**Fig. IV.119.** Barrow A. Hypsometric plan and cross-section

**Barrow F = V/1937 (Fig. IV.120)** was found on the courtyard of old mansion. Geographic coordinates: N – 48°58'660", E – 24°57'346"; h – 326,5 m.a.s.l. Oval in shape: 12 × 10 m, high. Excavated in 1937 (Siwkówna 1938; Sulimirski 1968, 150). The place is covered with trees and bushes.

**Fig. IV.120.** Barrow F (V/1937). View from the SE

**Fig. IV.121.** Barrow 230. View from the N

**Barrow 230 (Fig. IV.121, Fig. IV.122)** is situated south of the village, 30 m E of the road from Bukivna to Oleshiv. Geographic coordinates: N – 48°57'029", E – 24°58'472", h – 282.4 m.a.s.l. Covered with trees. Circular in shape, 12 m in diameter, 2,5 m high. No damage was recorded.

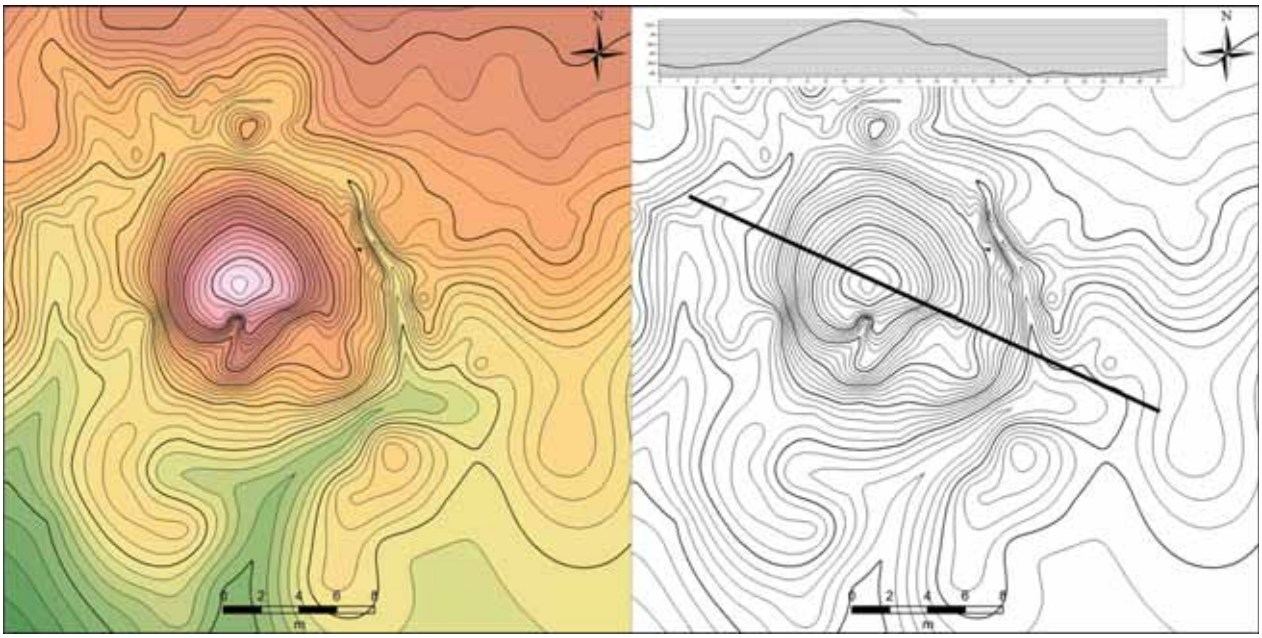



**Fig. IV.122.** Barrow 230. Hypsometric plan and cross-section

**Fig. IV.123.** Barrow G. View from the S

**Fig. IV.124.** Barrow 232. View from the W

**Fig. IV.125.** Barrow 233. View from the SE

**Barrow G (Fig. IV.123)** was discovered in the beech forest, 30 m N of barrow 13/I. Geographic coordinates: N – 48°58'055", E – 24°57'280", h – 342.1 m.a.s.l. Covered with trees and bushes. Oval in shape: 21 × 18 m (NNE – SSW), 0.8 m high. A large dig-in is visible in the centre of the mound.

## B. Cemeteries in environs of Bukówna/Bukivna: Olszanica/ /Vilshanitsa, Miłowanie/Milovanie (see Fig. IV.2, Fig. IV.2a, Fig. IV.3)

In close proximity to Bukivna, to the S, SW and NW, a number of barrows were detected. They were situated on adjacent hills to the ones on which lies the cemetery of Bukivna within the administrative borders of neighbouring villages, W to the Dniester Valley.

### B.1. Environs of Vilshanitsa

2 km SW from II and III barrow groups in Bukivna, in the south-eastern part of a vast hilltop of NE – SW orientation, a group of four tumuli (no. 232-235) were recorded on a watershed between two tributaries of the Dniester River. They create an arched line of 420 m long, oriented on a SE – NW axis.

**Barrow 232 (Fig. IV.124)** is situated on the south--eastern edge of this group, 125 m SE of barrow 233 at 319.5 m.a.s.l. Geographical coordinates: N – 48°56'777", E – 24°56'259". Overgrown by trees and dense bushes. Circular in shape, 13 m in diameter, 2 m high.

**Barrow 233 (Fig. IV.125)** is located in the south--eastern of the group, 125 m N of barrow 232, at 327 m.a.s.l. Geographical coordinates: N – 48°56'823", E – 24°56'180". Overgrown by trees. Circular in shape, 10 m in diameter, 0.3 m high.

**Barrow 234 (Fig. IV.126)** documented in the north-western part of the group, 120 m SW of barrow 235 and 160 m NW of mound 233, at 334.5 m.a.s.l. Geographical coordinates: N – 48°56'869", E – 24°56'067". Circular in shape, 9 m in diameter, 0.3 m high.

**Barrow 235 (Fig. IV.127)** was erected on the north-western edge of the group, 120 m NW of barrow 234, at 337.5 m.a.s.l. Geographical coordinates: N – 48°56'882", E – 24°55'961". Circular in shape, 14 m in diameter, 1 m height. At a distance

**Fig. IV.126.** Barrow 234. View from the N

**Fig. IV.127.** Barrow 235. View from the W

**Fig. IV.128.** Barrow 236. View from the S

**Fig. IV.129.** Barrow 237. View from the SW

of app. 1 km NE from the group of four barrows, two tumuli were recorded (236 and 237). They are located on a hilltop, approximately halfway between the aforementioned group and barrow group II in Bukivna.

**Barrow 236 (Fig. IV.128)** is situated 370 m W of barrow 237 at 348 m.a.s.l. Geographical coordinates: N – 48°57'371", E – 24°56'342". Densely overgrown by trees and bushes. Circular in shape, 14 m in diameter, 0.7 m high.

**Barrow 237 (Fig. IV.129)** was registered 370 m E of tumulus 237, at 347 m.a.s.l. Geographical coordinates: N – 48°57'390", E – 24°56'633". Densely overgrown by bushes. Circular in shape, 11 m in diameter, 0.3 m high.

At a distance of 2 km SW to the mentioned group of four mounds, on a north-western part of a vast hill oriented on a NW – SE axis, which is a discussed watershed, a next group was detected, consisting of five tumuli.

The first of the discussed groups presents a linear distribution consisting of four mounds (nos 238, 239, 248, 249). The line is oriented on a NE – SW axis and has a length of 160 m. The next part of the group is represented by a triangular arrangement of the latter three barrows (nos 245, 246, 247), located 70-100 m east from the linear unit.

**Barrow 238 (Fig. IV.130)** is located in the northern part of the linear group of four tumuli, 55 m SW of barrow 248 and 50 m NE of monument 249, at 366

**Fig. IV.130.** Barrow 238. View from the S

**Fig. IV.131.** Barrow 239. View from the N

**Fig. IV.132.** Barrow 245. View from the N

**Fig. IV.133.** Barrow 246. View from the N

m.a.s.l. Geographical coordinates: N – 48°56'514", E – 24°54'263". Overgrown by trees. Circular in shape, 22 m in diameter, 0.8 m high.

**Barrow 239 (Fig. IV.131)** was recorded on the south-western edge of the mentioned linear pattern of four mounds, 46 m SW of tumulus 249, at 362 m.a.s.l. Geographical coordinates: N – 48°56'465", E – 24°54'222". Overgrown by trees. Circular in shape, 18 m in diameter, 0.3 m high.

**Barrow 245 (Fig. IV.132)** is located in the south--eastern part of the group of seven barrows and on the southern edge of a triangularly arranged group, 18 m SW of mound 247, at 365 m.a.s.l. Geographical coordinates: N – 48°56'478", E – 24°54'321", Densely overgrown by bushes. Circular in shape, 17 m in diameter, 0.5 m high.

**Barrow 246 (Fig. IV.133)** was observed in the eastern part of the aforementioned group and on the northern edge of their triangularly arranged part, at a distance of 46 m NW from tumulus 247 and 70 m E from barrow 238 from the linear group, at 366 m.a.s.l. Geographical coordinates: N – 48°56'508", E – 24°54'319". Densely overgrown by bushes. Circular in shape, 11 m in diameter, 0.3 m high.

**Barrow 247 (Fig. IV.134)** is the most eastern one from discussed group and located on the eastern edge of the triangular group, 46 m SE of mound 246 and 18 m NE of tumulus 245, at 366 m.a.s.l. Geographical coordinates: N – 48°56'487", E – 24°54'336". Densely overgrown by bushes. Circular in shape, 15 m in diameter, 0.4 m high.

On the same hilltop on which the above group was located, there is another cluster of tumuli detected on the south-western slopes. Barrows occur in a nearly linear arrangement, oriented on a N – S axis of 210 m length. Four of them (nos 240-243) were erected near to each other at a distance of 80 m. Fifth (no 244) was recorded S, at a distance of 130 m.

**Barrow 240 (Fig. IV.135)** is situated on the northern edge of the discussed group, 25 m N/NE of mound 241 and 450 m SE from monument 239 – the most northern one in the first group. Tumulus was recorded at 351 m.a.s.l. Geographical coordinates: N – 48°56'260", E – 24°54'021". Overgrown by bushes. Circular in shape, 26 m in diameter, 2.3 m high.

**Barrow 241 (Fig. IV.136)** was erected on the northern edge of the discussed group, 25 m S/SW of barrow 240 and 250 m S/SE of mound 242, at 351 m.a.s.l. Geographical coordinates: N – 48°56'246", E – 24°54'222". Overgrown by trees. Circular in shape, 15 m in diameter, 0.4 m high.

**Barrow 242 (Fig. IV.137)** was documented in the center of a linear concentration of tumuli, 25 m SW of tumulus 241 and 30 m N/NW of mound 243, at 355.5 m.a.s.l. Geographical coordinates: N – 48°56'232", E – 24°54'008". Overgrown by trees. Circular in shape, 16 m in diameter, 0.2 m high.

**Barrow 243 (Fig. IV.138)** is located in the southern part of the five-barrow group, 30 m S/SW of barrow 242, at 349.5 m.a.s.l. Geographical coordinates: N – 48°56'232", E – 24°54'008". Densely overgrown by trees and bushes. Circular in shape, 13 m in diameter, 0.3 m high.

**Fig. IV.134.** Barrow 247. View from the N

**Fig. IV.135.** Barrow 240. View from the N

**Fig. IV.136.** Barrow 241. View from the N

**Fig. IV.137.** Barrow 242. View from the S

**Fig. IV.138.** Barrow 243. View from the N

**Fig. IV.139.** Barrow 244. View from the N

**Barrow 244 (Fig. IV.139)** is the most S situated mound in the five-barrow group. It was recorded 130 m S/SE of tumulus 243, at 344.5 m.a.s.l. Geographical coordinates: N – 48°56'149", E – 24°54'052". Overgrown by bushes. Circular in shape, 23 m in diameter, 0.7 m high.

## B.2. Environs of Milovanie (see Fig. IV.2, Fig. IV.2a)

West and NW from the barrow groups in Bukivna, a similar in number concentration of tumuli was detected, which is situated on a hill that spreads parallel to the Dniester valley at a length of 3 km. These groups are located on the most prominent hilly parts in this region, between the two tributaries of the Dniester.

**Main group (Fig. IV.140, Fig. IV.141)**
One of the larger concentrations comprising 30 mounds (nos 251-301) is situated app. 2 km NW from the first barrow group. It is situated on the summit and western slope of the hill. The barrows create groupings of a linear arrangement with little concentration. The largest located most northwards consists of 23 mounds occurring on an area of 280 × 190 m

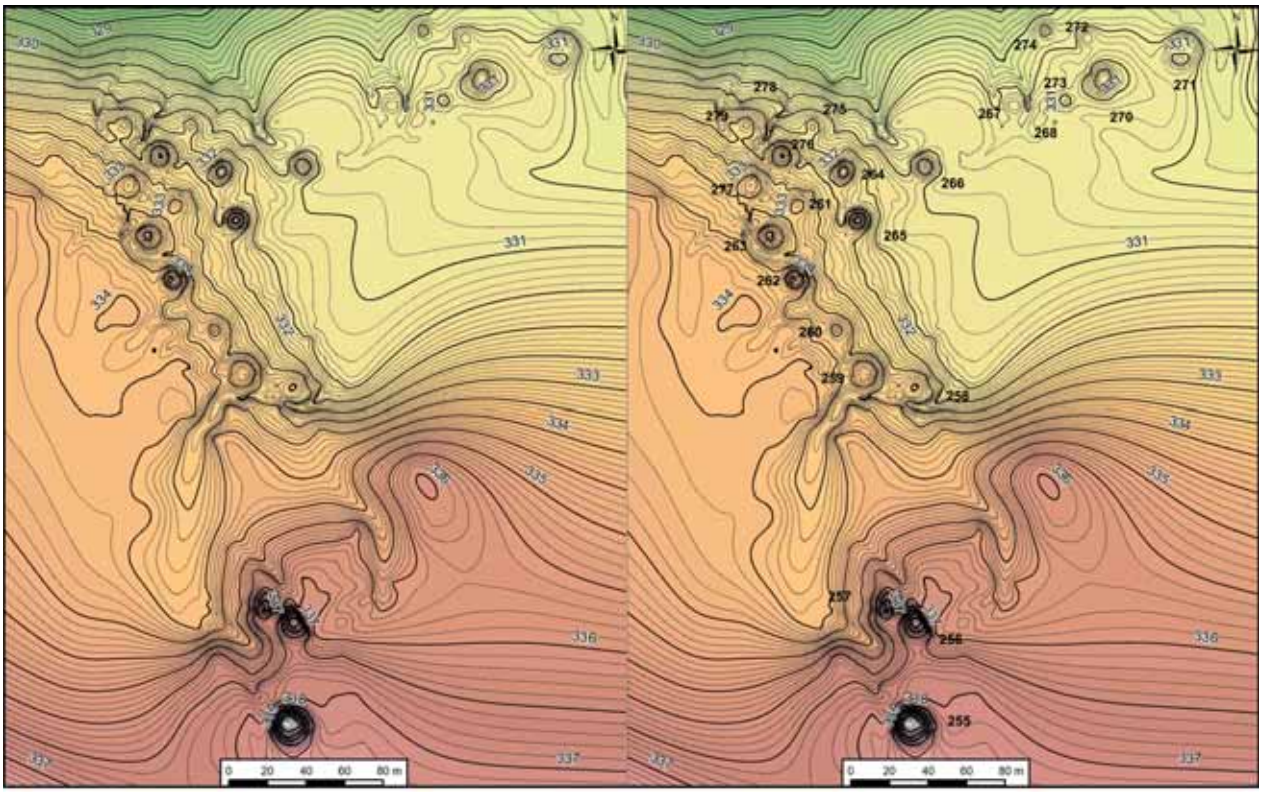



**Fig. IV.140 and Fig. IV.141**. Central part of the main group of barrows in Milovanie

(W – E/N – S). Minor groupings are located S to this cluster. These are a group of three mounds and two groups of two monuments. The first is placed 100 m S to the most edged barrow from the large northern group. The following group is located 270 m SW from these three mounds and the last 220 m further to the SE.

**Barrow 251 (Fig. IV.142)** was erected in the southern part of this grouping, S to the main group, 40 m N of mound 252, at 343.5 m.a.s.l. This mound is located on a freshly deforested area. Geographical coordinates: N – 48°58'782", E – 24°55'641". Circular in shape, 18 m in diameter, 0.2. m high.

**Barrow 252 (Fig. IV.143)** lies on a southern edge of the aforementioned grouping, S from the main concentration, 40 m S of mound 251, at 343.5 m.a.s.l, which is located on a freshly deforested area. Geographical coordinates: N – 48°58'761", E – 24°55'648", Circular in shape. 10 m in diameter, 0.2 m high. In the central part of the mound a looting trench is visible.

**Barrow 253 (Fig. IV.144)** is situated in the southern part of the discussed grouping, SW to the main concentration, in the upper part of the slope, 53 m SW of mound 255, at 338.5 m.a.s.l. Overgrown by tress. Geographical coordinates: N – 48°58'883", E – 24°55'501". Oval-shaped, 18 m in diameter, 0.2 m high.

**Barrow 254 (Fig. IV.145)** was recorded on a southern edge of the discussed grouping and SW from the main group at a distance of 53 meters SW of mound 253 at 338.5 m.a.s.l. Geographical coordinates: N – 48°58'856", E – 24°55'489". Mound overgrown by trees. Circular in shape, 15 m in diameter, 0.2 m high.

**Fig. IV.142.** Barrow 251. View from the E

**Fig. IV.143.** Barrow 252. View from the E

**Fig. IV.144.** Barrow 253. View from the SE

**Fig. IV.145.** Barrow 254. View from the SE

**Barrow 255 (Fig. IV.146, IV.147)** is located on a eastern edge of the main concentration of mounds at a distance of 65 m SW of tumulus 256 and 75 m S of monument 257, at 337 m.a.s.l. They create a ternary system of barrows. Geographical coordinates: N – 48°58'963", E – 24°55'696". Mound overgrown by trees. Circular in shape, 30 m in diameter, 3.5 m high. On the surface several cuts and trenches are observable.

**Fig. IV.146.** Barrow 255. View from the S

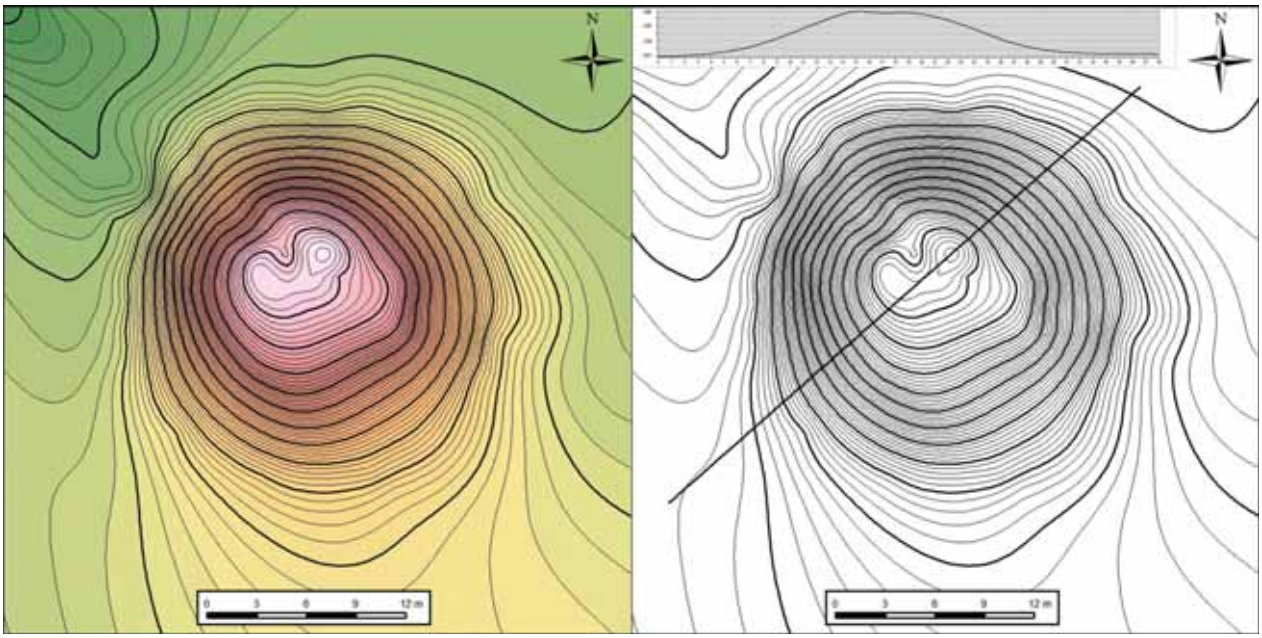



**Fig. IV.147.** Barrow 255. Hypsometric plan and cross-section

**Barrow 256 (Fig. IV.148, IV.149)** is situated in the southern part of the main grouping, 65 m NE of mound 255 and 10 m SE of 257, with which it forms a ternary arrangement, at 337 m.a.s.l. Geographical coordinates: N – 48°58'856", E – 24°55'489". Overgrown by trees and bushes. Circular in shape, 22 m in diameter, 2.5 m high. Barrow extremely eroded and destroyed from the eastern side.

**Fig. IV.148.** Barrow 256. View from the SW

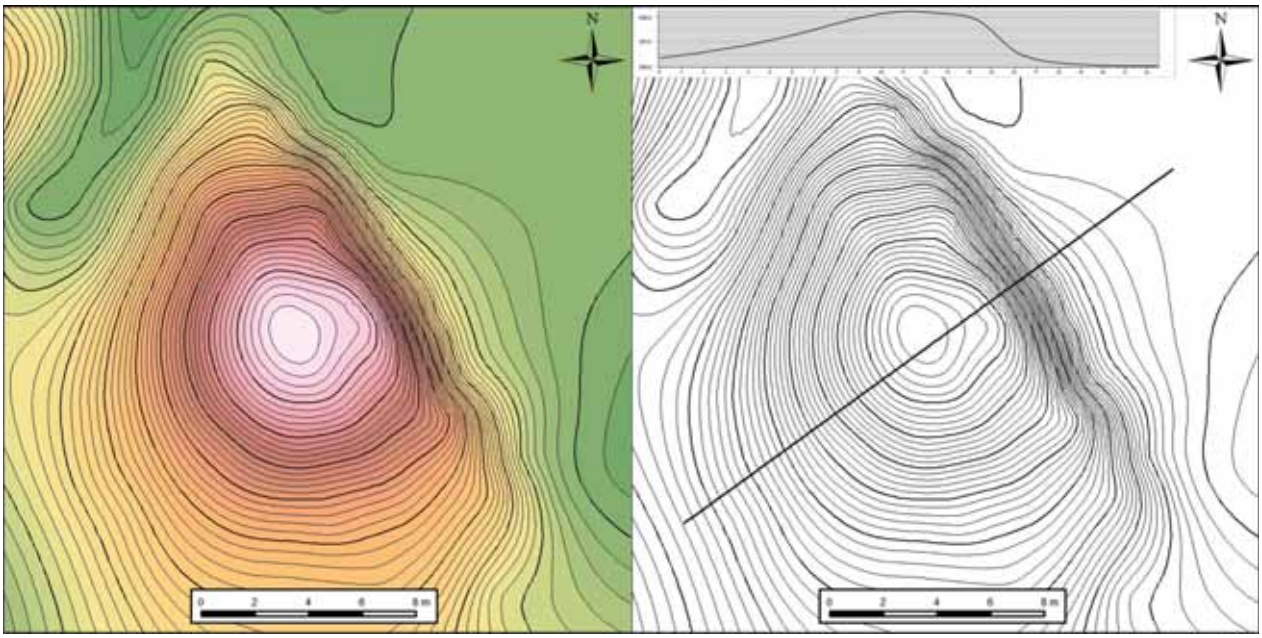



**Fig. IV.149.** Barrow 256. Hypsometric plan and cross-section

**Barrow 257 (Fig. IV.150, Fig. 151)** was documented in the southern part of the main grouping, 10 m NE of mound 256 and 65 m N of barrow 255, with which it forms a ternary arrangement, at 336 m.a.s.l. Geographical coordinates: N – 48°59'003", E – 24°55'694". Overgrown by trees. Circular in shape, 17 m in diameter, 1 m high. The mound is partially destroyed in central part by an illicit trench.

**Fig. IV.150.** Barrow 257. View from the SW

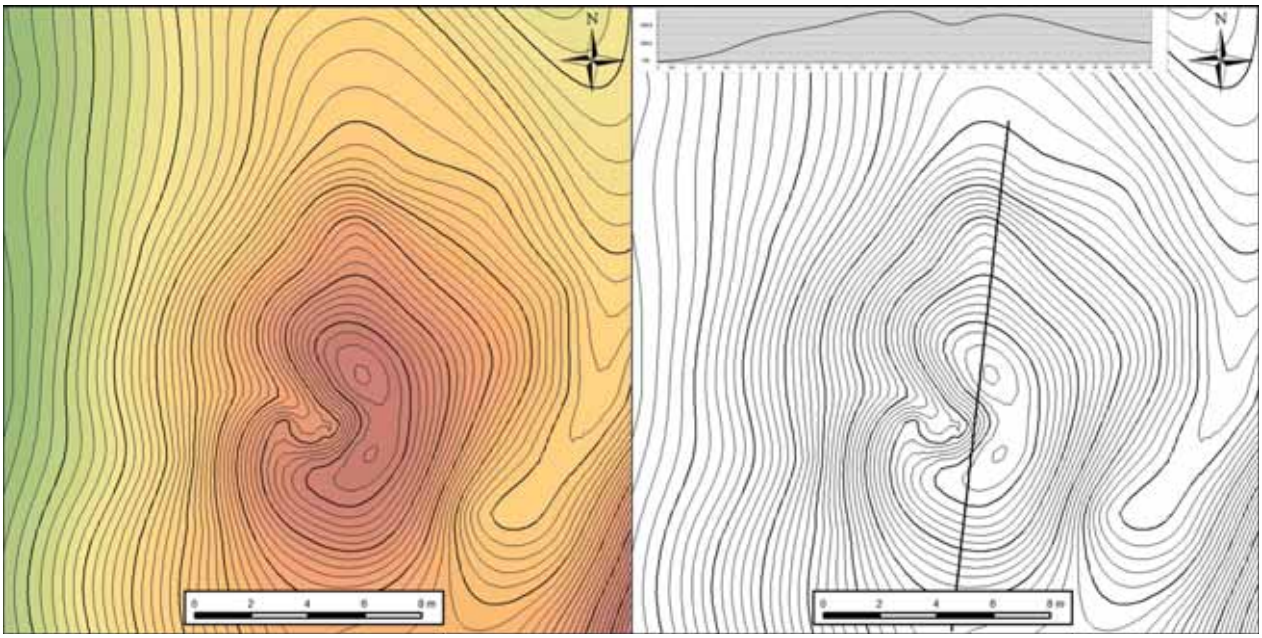


**Fig. IV.151.** Barrow 257. Hypsometric plan and cross-section

**Barrow 258 (Fig. IV.152, Fig. IV.153)** is located in the southern part of the main grouping. Together with mounds 259 and 260 it creates a linear arrangement oriented on a NW – SE axis. The tumulus is situated in the SE part of this group, 35 m SE of mound 259 and 54 m SE of barrow 260, at 332 m.a.s.l. Geographical coordinates: N – 48°59'058", E – 24°55'705". Overgrown by tress. Circular in shape, 20 m in diameter, 0.5 m high. Subject to geophysical survey.

**Fig. IV.152.** Barrow 258. View from the N

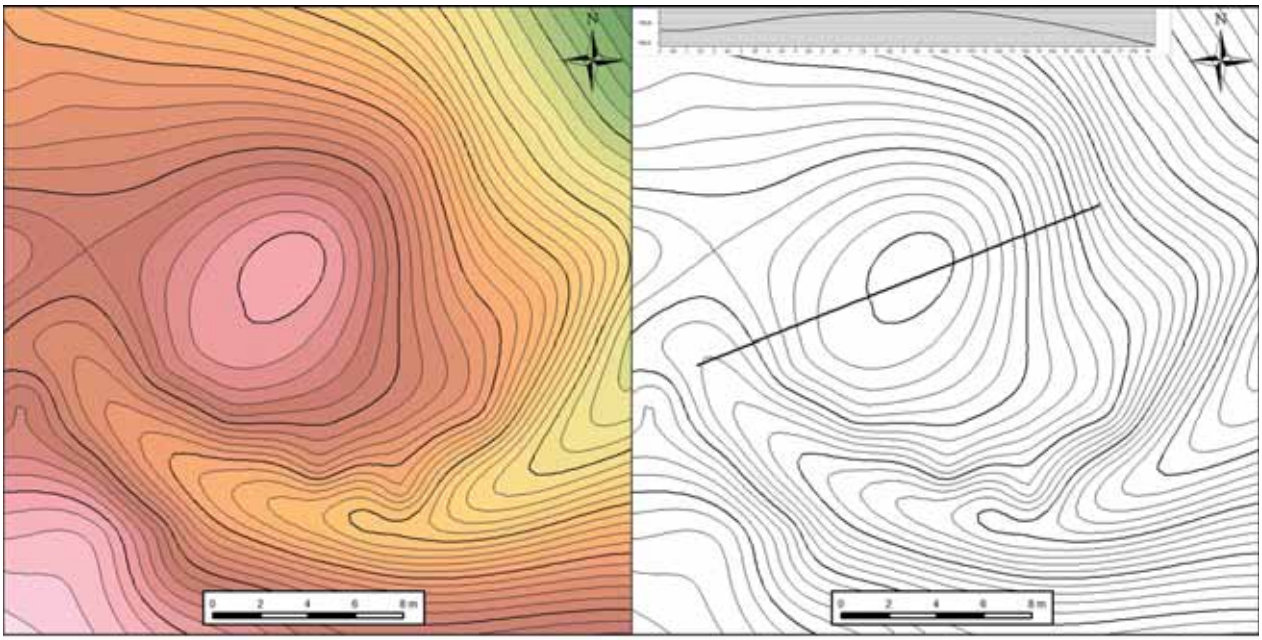


**Fig. IV.153.** Barrow 258. Hypsometric plan and cross-section

**Barrow 259 (Fig. IV.154, Fig. IV.155)** was erected in the southern part of the main grouping. Together with mounds 258 and 260 it creates a linear arrangement oriented on a NW – SE axis. It is situated in the center of this arrangement, 35 m NW of mound 258 and 21 m SE of tumulus 260, at 333.5 m.a.s.l. Geographical coordinates: N – 48°59'073", E – 24°55'691". Overgrown by trees. Circular in shape, 20 m in diameter, 1.2 m high. Subject to geophysical survey.

**Fig. IV.154.** Barrow 259. View from the SE

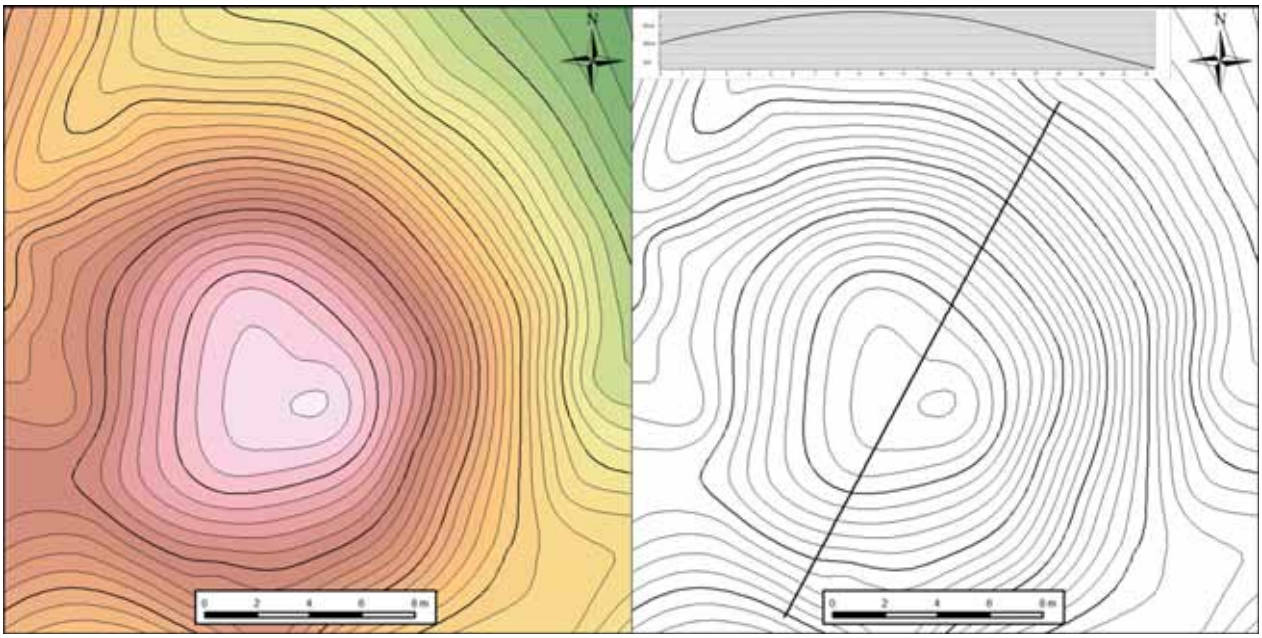


**Fig. IV.155.** Barrow 259. Hypsometric plan and cross-section

**Barrow 260 (Fig. IV.156, Fig. IV.157)** was recorded in the southern part of the main grouping. Together with mounds 258 and 259 it creates a linear pattern, oriented on a NW – SE axis. It is located on a NW edge of this arrangement, 21 m NW of mound 259 and 54 m NW of barrow 258, at 333 m.a.s.l. Geographical coordinates: N – 48°59'081", E – 24°55'076". Overgrown by trees and bushes. Circular in shape, 14 m in diameter, 0.4 m high. Subject to geophysical survey.

**Fig. IV.156.** Barrow 260. View from the S

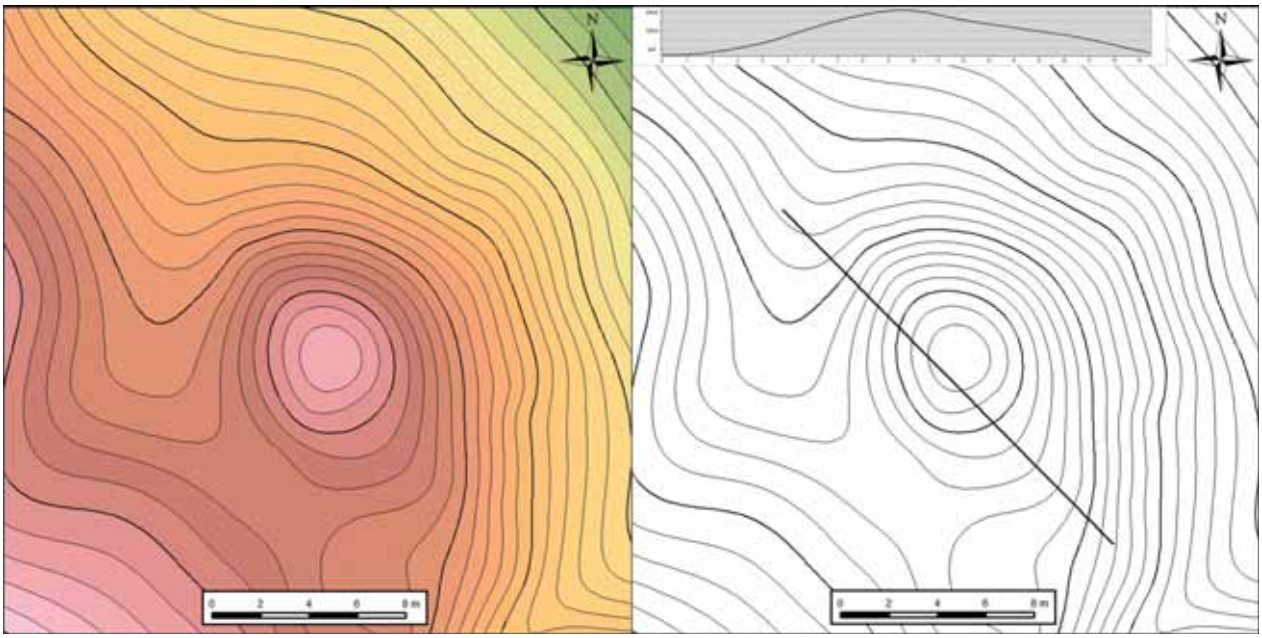


**Fig. IV.157.** Barrow 260. Hypsometric plan and cross-section

**Barrow 261 (Fig. IV.158, Fig. IV.159)** is situated in the central part of the main grouping. It is located in an almost linear arrangement with mounds 258--260, 42 m NW of tumulus 260 and 8 m E of mound 262, at 332.5 m.a.s.l. Geographical coordinates: N – 48°59'103", E – 24°55'668". Overgrown by tress. Circular in shape, 18 m in diameter, 1.5 m high. Subject to geophysical survey.

**Fig. IV.158.** Barrow 261. View from the SW

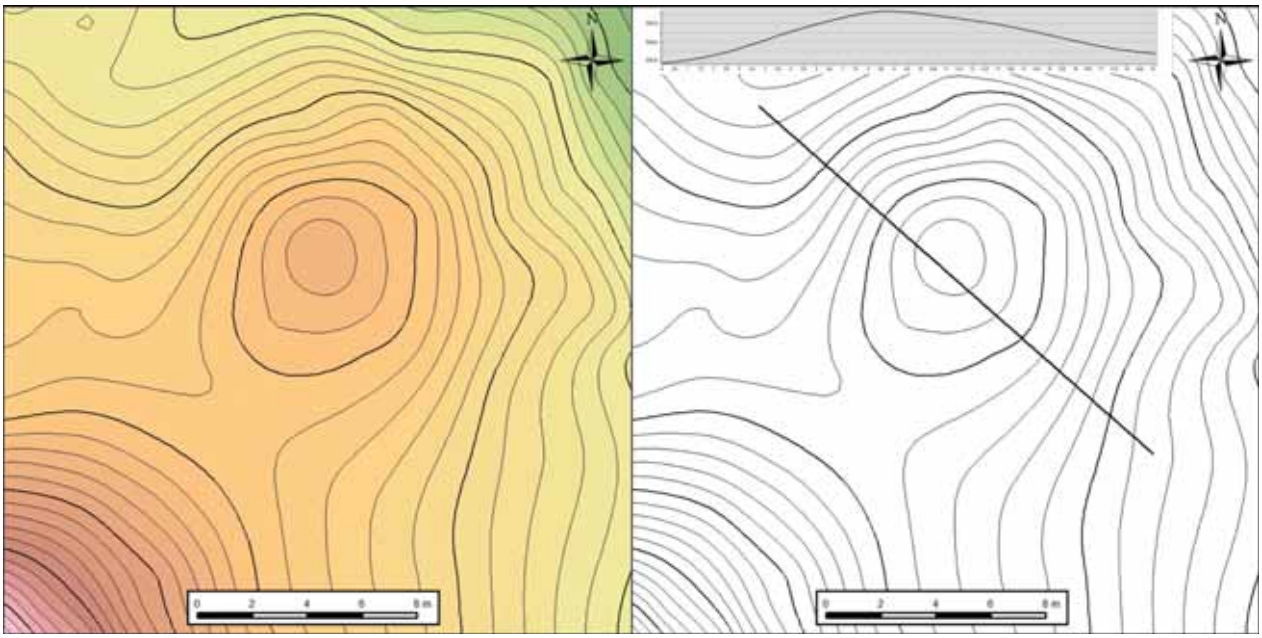


**Fig. IV.159.** Barrow 261. Hypsometric plan and cross-section

**Barrow 262 (Fig. IV.160, Fig. IV.161)** was documented in the central-western part of the main concentration of mounds, 8 m W of tumulus 261, at 333 m.a.s.l. Geographical coordinates: N – 48°59'104", E – 24°55'656". Overgrown by trees. Circular in shape, 18 m in diameter, 0.6 m high. Subject to geophysical survey.

**Fig. IV.160.** Barrow 262. View from the NW

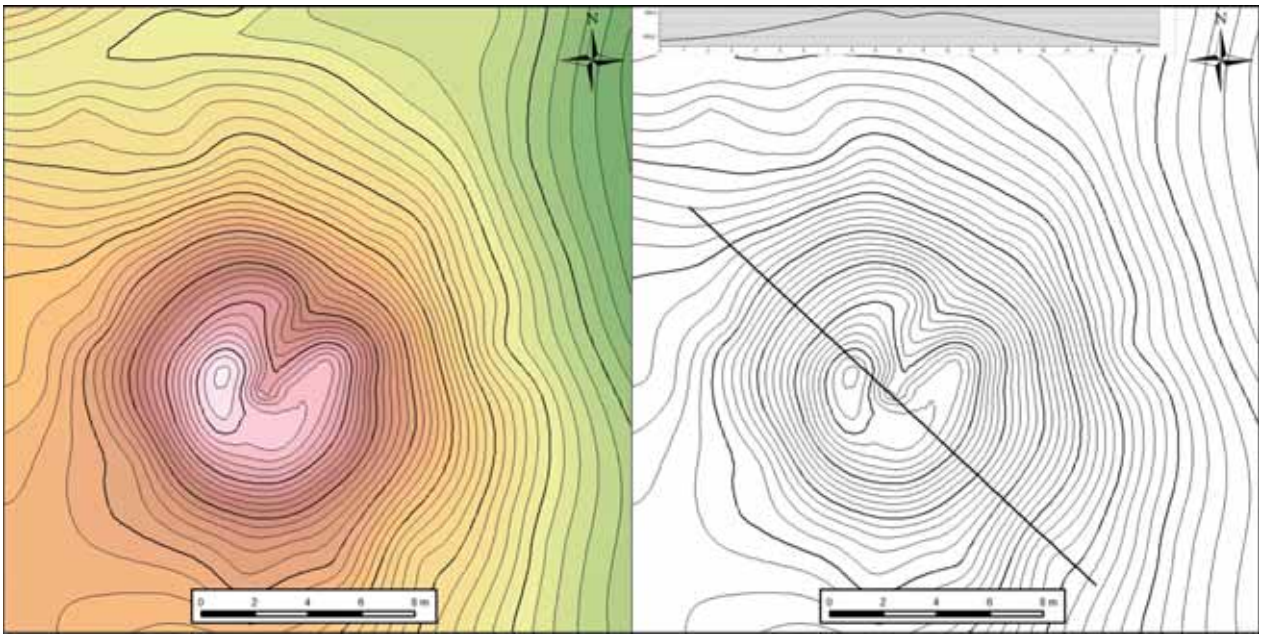


**Fig. IV.161.** Barrow 262. Hypsometric plan and cross-section

**Barrow 263 (Fig. IV.162, Fig. IV.163)** is localized in the central-western part of the main grouping, 19 m N of mound 261 and 24 m NE of barrow 262, at 333 m.a.s.l. Geographical coordinates: N – 48°59'114", E – 24°55'670". Overgrown by trees and bushes. Circular in shape, 14 m in diameter, 0.4 m high. Subject to geophysical survey.

**Fig. IV.162.** Barrow 263. View from the NW

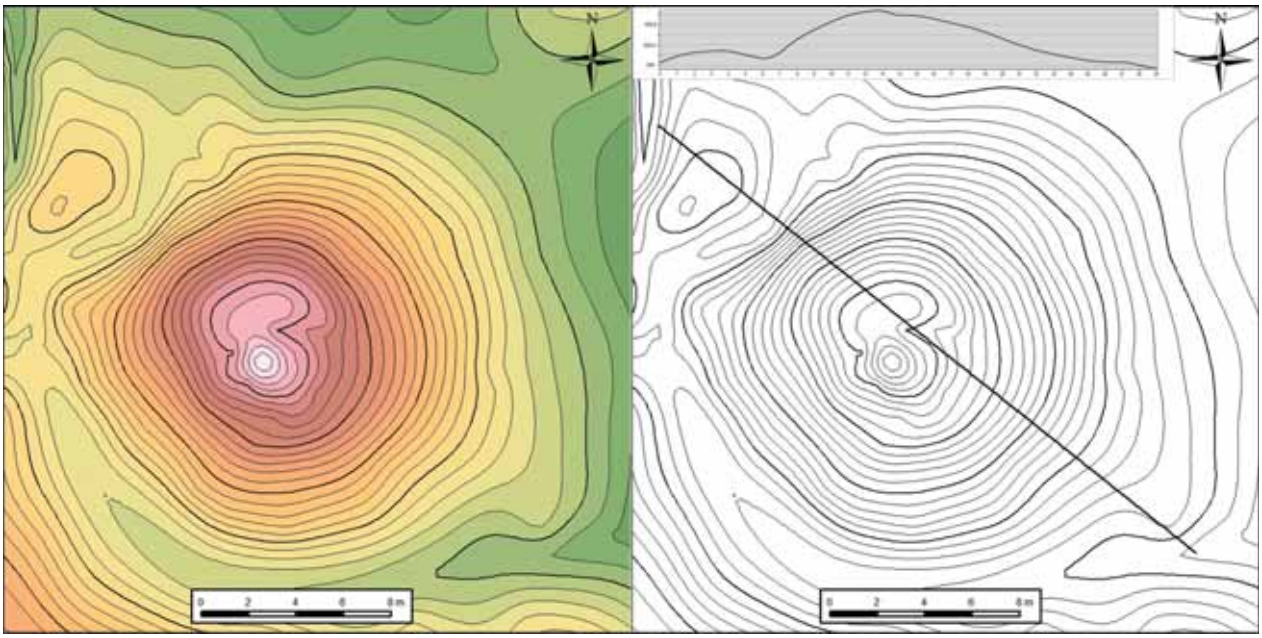


**Fig. IV.163.** Barrow 263. Hypsometric plan and cross-section

**Barrow 264 (Fig. IV.164, Fig. IV.165**) was erected in the central part of the main grouping, 22 m N of mound 265, at 331.5 m.a.s.l. Geographical coordinates: N – 48°59'121", E – 24°55'694". Overgrown by trees and bushes. Circular in shape, 18 m in diameter, 1.3 m high.

**Fig. IV.164.** Barrow 264. View from the SE

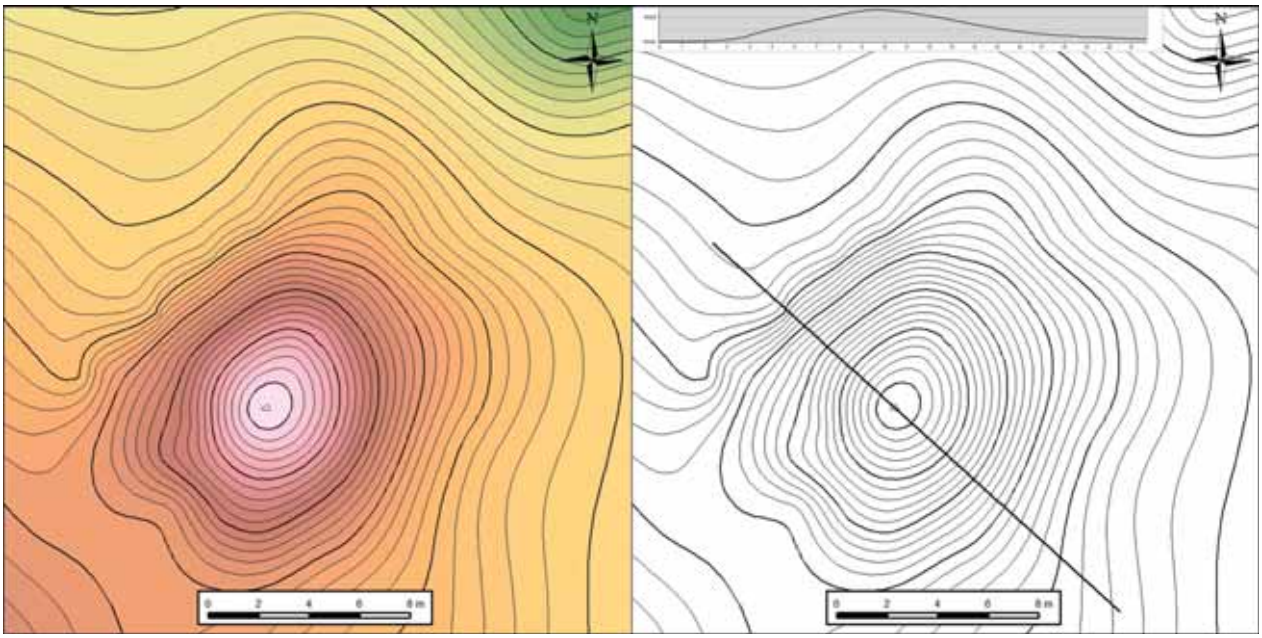


**Fig. IV.165.** Barrow 264. Hypsometric plan and cross-section

**Barrow 265 (Fig. IV.166, Fig. IV.167)** was recorded in the central part of the main grouping, 22 m S of mound 264 and 35 m NE of tumulus 263, at 332 m.a.s.l. Geographical coordinates: N – 48°59'109", E – 24°55'695". Overgrown by trees and bushes. Circular in shape, 20 m in diameter, 1.7 m high.

**Fig. IV.166.** Barrow 265. View from the S

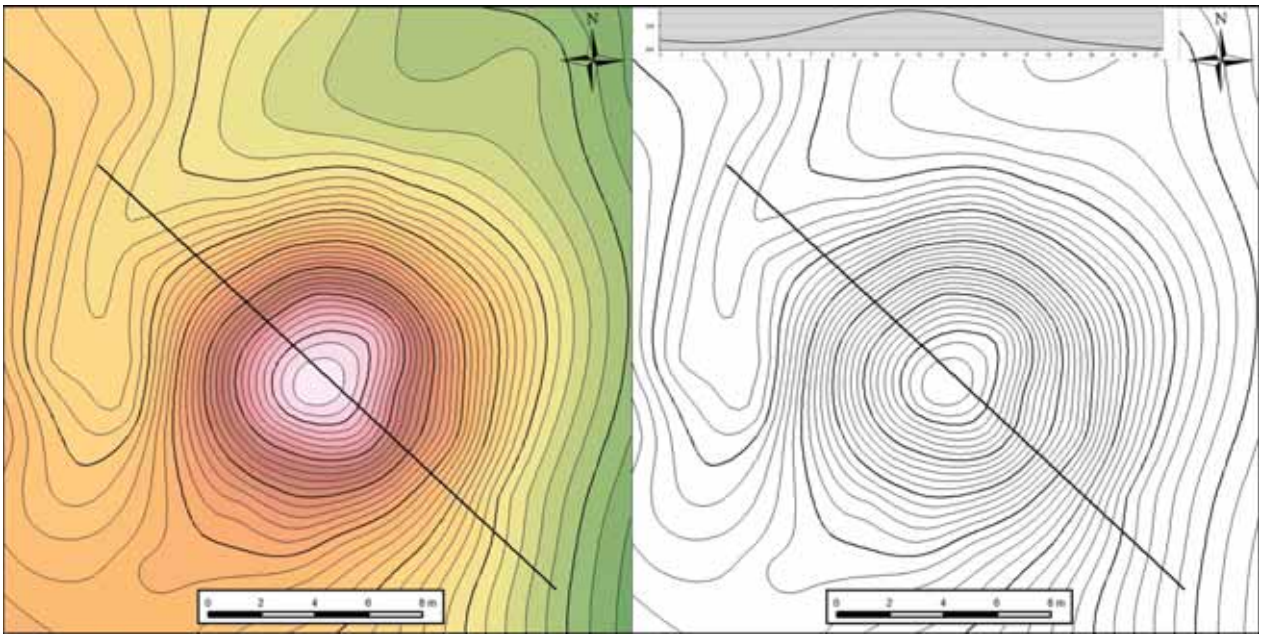


**Fig. IV.167.** Barrow 265. Hypsometric plan and cross-section

**Barrow 266 (Fig. IV.168, Fig. IV.169)** is situated in the central part of the main grouping, 33 m NE of mound 264 and 41 m NE of tumulus 265, at 331 m.a.s.l. Together with barrows 268, 275 and 278 it creates a line on a NW – SE axis 150 m long. Geographical coordinates: N – 48°59'126", E – 24°55'720". Overgrown by trees and bushes. Circular in shape, 21 m in diameter, 0.7 m high.

**Fig. IV.168.** Barrow 266. View from the N

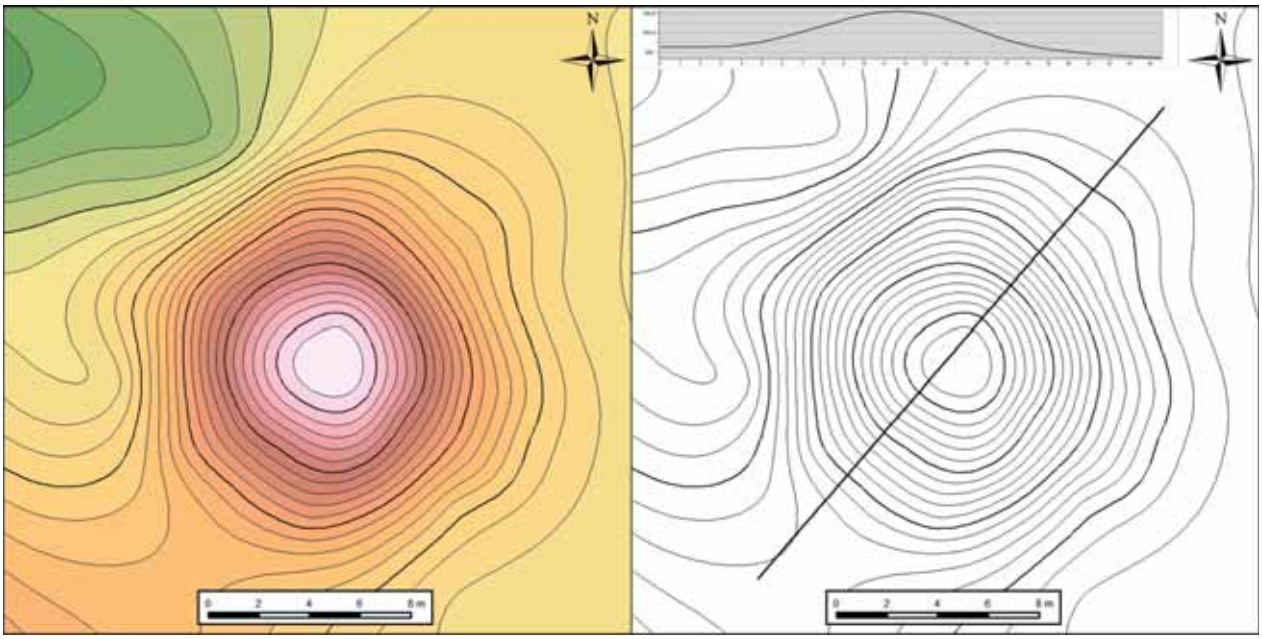



**Fig. IV.169.** Barrow 266. Hypsometric plan and cross-section

**Barrow 267 (Fig. IV.170, Fig. IV.171)** was documented in the south-eastern part of the main concentration of mounds. Together with tumuli 268, 270, 272 and 273 it creates a line oriented on an NE – SW axis. This barrow is located in the SW edge of this arrangement, 21 m SW of mound 268, at 330.5 m.a.s.l. Geographical coordinates: N – 48°59'109", E – 24°55'753". Overgrown by trees and bushes. Circular in shape, 14 m in diameter, 0.2 m high.

**Fig. IV.170.** Barrow 267. View from the SW

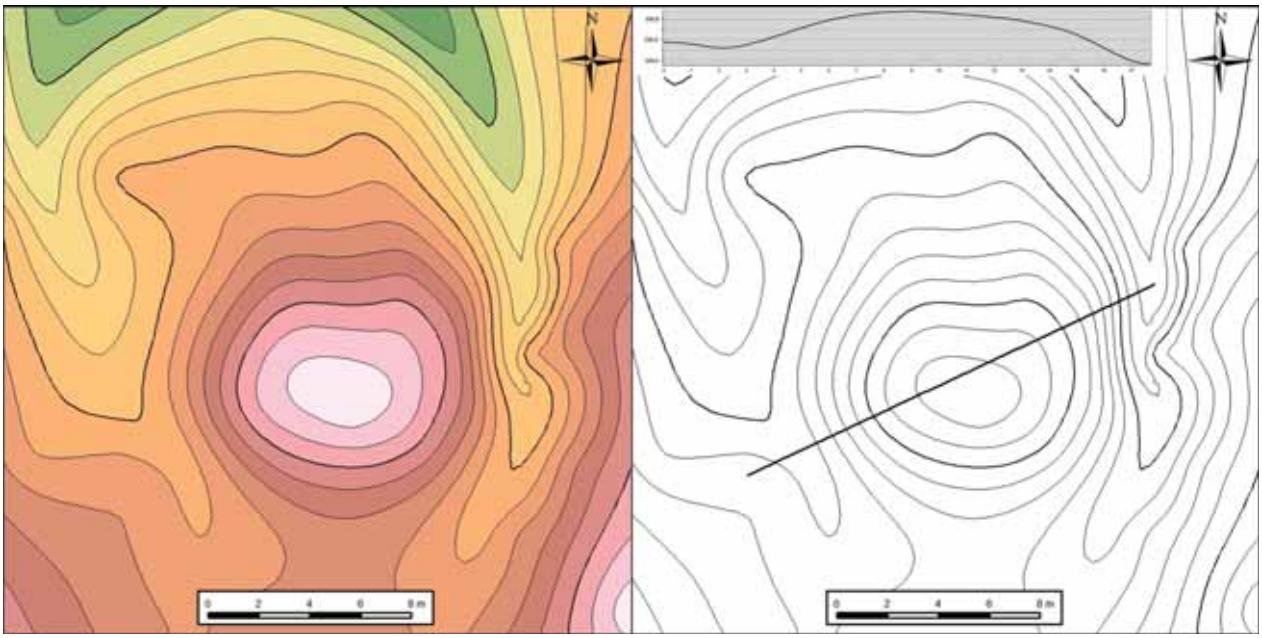


**Fig. IV.171.** Barrow 267. Hypsometric plan and cross-section

**Barrow 268 (Fig. IV.172, Fig. IV.173)** was recorded in the central-eastern part of the main grouping. Together with mounds 267, 270, 272 and 273 it creates a linear arrangement oriented on an axis NE – SW. The tumulus is located in the SW part of this unit, 21 m NE of mound 267 and 42 m SW of barrow 273, at 330.5 m.a.s.l. Moreover with barrows 266, 275 and 278 they create a linear pattern oriented on a NW – SE axis 250 m long. Geographical coordinates: N – 48°59'119", E – 24°55'761". Overgrown by trees and bushes. Circular in shape, 14 m in diameter, 0.3 m high.

**Fig. IV.172.** Barrow 268. View from the NE

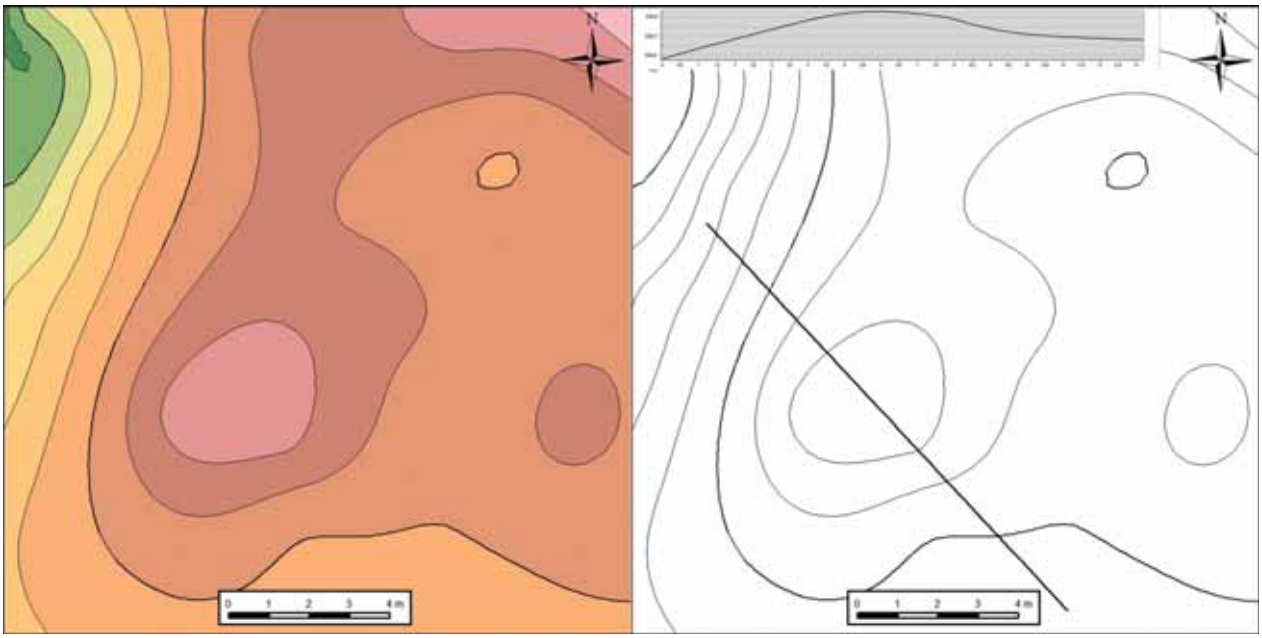


**Fig. IV.173.** Barrow 268. Hypsometric plan and cross-section

**Fig. IV.174.** Barrow 269. View from the N

**Barrow 269 (Fig. IV.174)** is situated in the south-eastern portion of the main grouping. Together with mounds 271 and 301 it creates a linear arrangement oriented on a NE – SW axis. It is located on a SW edge of this pattern, 20 m SW of barrow 301, at 331 m.a.s.l. Geographical coordinates: N – 48°59'122", E – 24°55'809". Overgrown by trees and bushes. Circular in shape, 14 m in diameter, 0.3 m high.

**Barrow 270 (Fig. IV.175, Fig. IV.176)** is located in the north-eastern portion of the main grouping. Together with mounds 267, 268, 272 and 273 it creates a linear unit oriented on a NE – SW axis. It is situated in the NE part of this group, 20 m NE of mound 273 and 18 m S/SE of tumulus 272, at 331 m.a.s.l. Geographical coordinates: N – 48°59'145", E – 24°55'796". Overgrown by tress. Circular in shape, 22 m in diameter, 0.6 m high.

**Fig. IV.175.** Barrow 270. View from the E

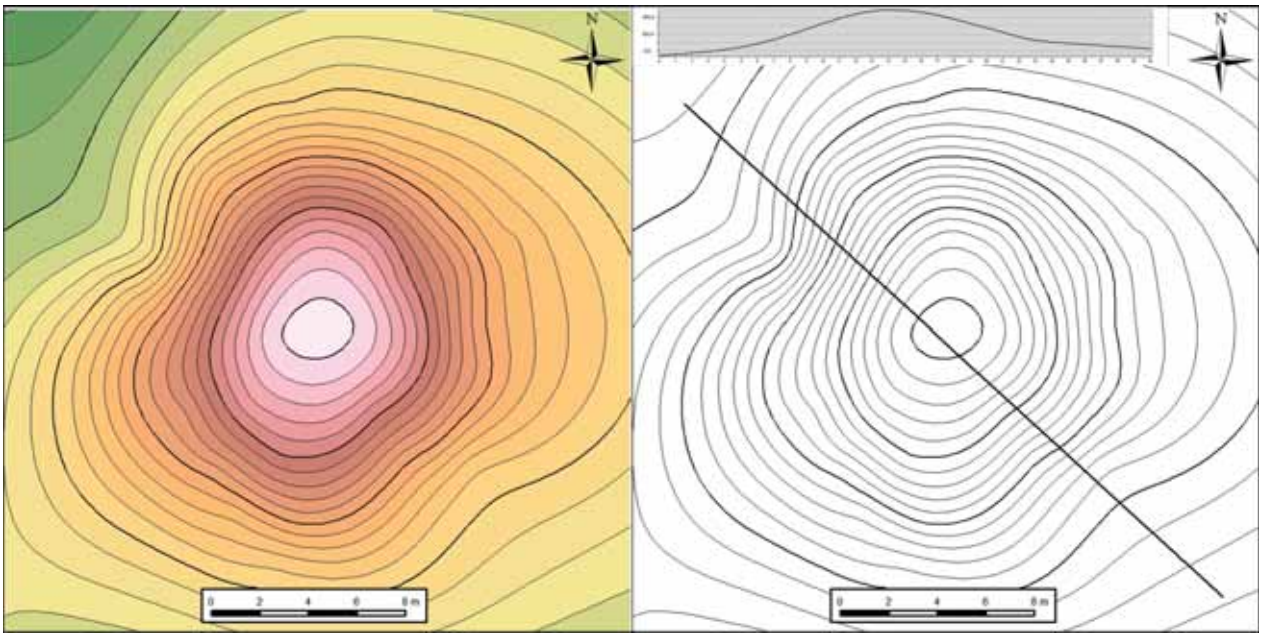



**Fig. IV.176.** Barrow 270. Hypsometric plan and cross-section

**Barrow 271 (Fig. IV.177, Fig. IV.178)** was erected in the north-eastern portion of the main grouping. Together with mounds 271 and 301 they create a linear arrangement on a NE – SW axis. The tumulus is located on the NE edge of this pattern, 20 m NE of mound 301, at 330.5 m.a.s.l. Geographical coordinates: N – 48°59'151", E – 24°55'837". Overgrown by trees and bushes. Circular in shape, 30 m in diameter, 0.4 m high. In the central part an illicit trench was recorded.

**Fig. IV.177.** Barrow 271. View from the SW

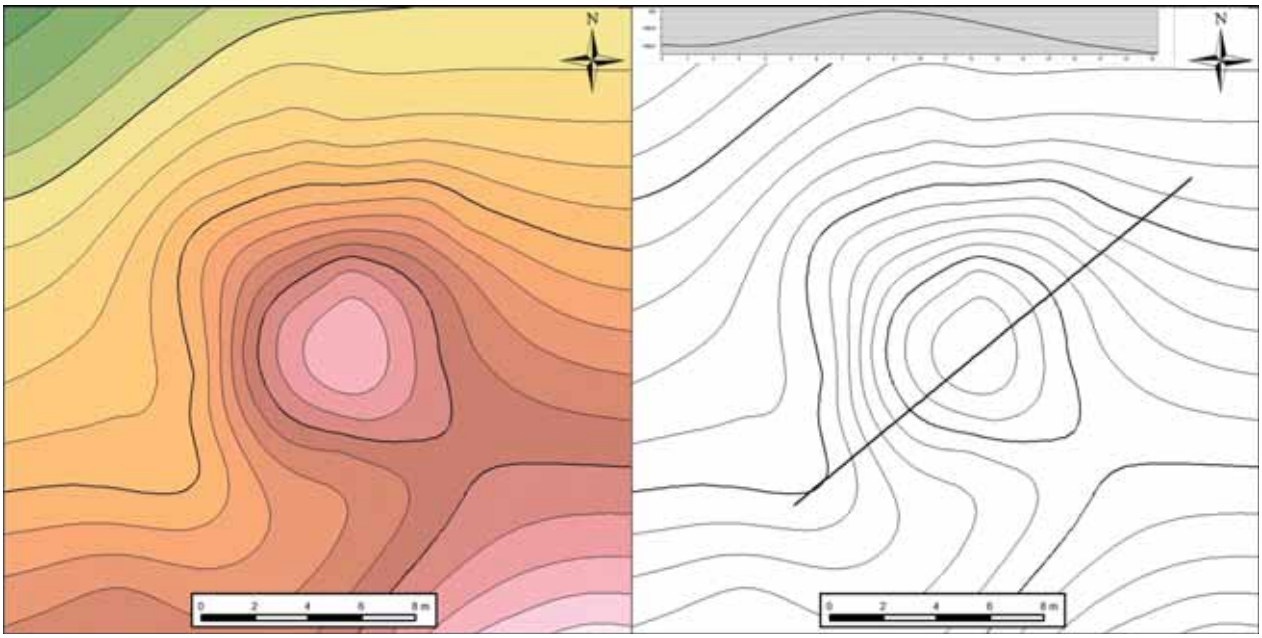



**Fig. IV.178.** Barrow 271. Hypsometric plan and cross-section

**Barrow 272 (Fig. IV.179, Fig. IV.180)** is situated in the north-eastern part of the main grouping. Together with mounds 267, 268, 270 and 273 it creates a linear arrangement oriented on a NE – SW axis. Tumulus is located on its NE edge, 18 m N/NE of barrow 270, at 330.5 m.a.s.l. Geographical coordinates: N – 48°59'155", E – 24°55'798". Overgrown by trees and bushes. Circular in shape, 10 m in diameter, 0.2 m high.

**Fig. IV.179.** Barrow 272. View from the SW

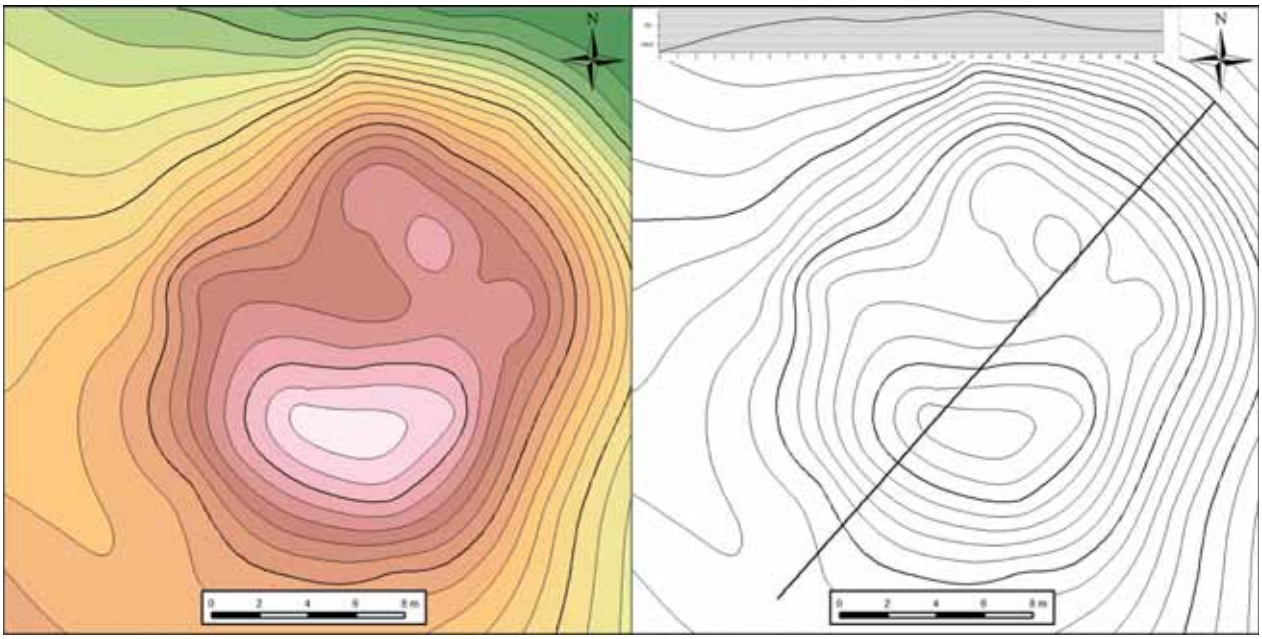


**Fig. IV.180.** Barrow 272. Hypsometric plan and cross-section

**Barrow 273 (Fig. IV.181, Fig. IV.182)** is located in the north-eastern part of the main grouping. Together with mounds 267, 268, 270 and 272 it creates a linear arrangement of NE – SW. Barrow is situated in the central part of this pattern, 20 m SW of tumulus 270 and 43 m NE of barrow 268, at 330.5 m.a.s.l. Geographical coordinates: N – 48°59'138", E – 24°55'786". Overgrown by trees and bushes, 10 m in diameter, 0.4 m high.

**Fig. IV.181.** Barrow 273. View from the SE

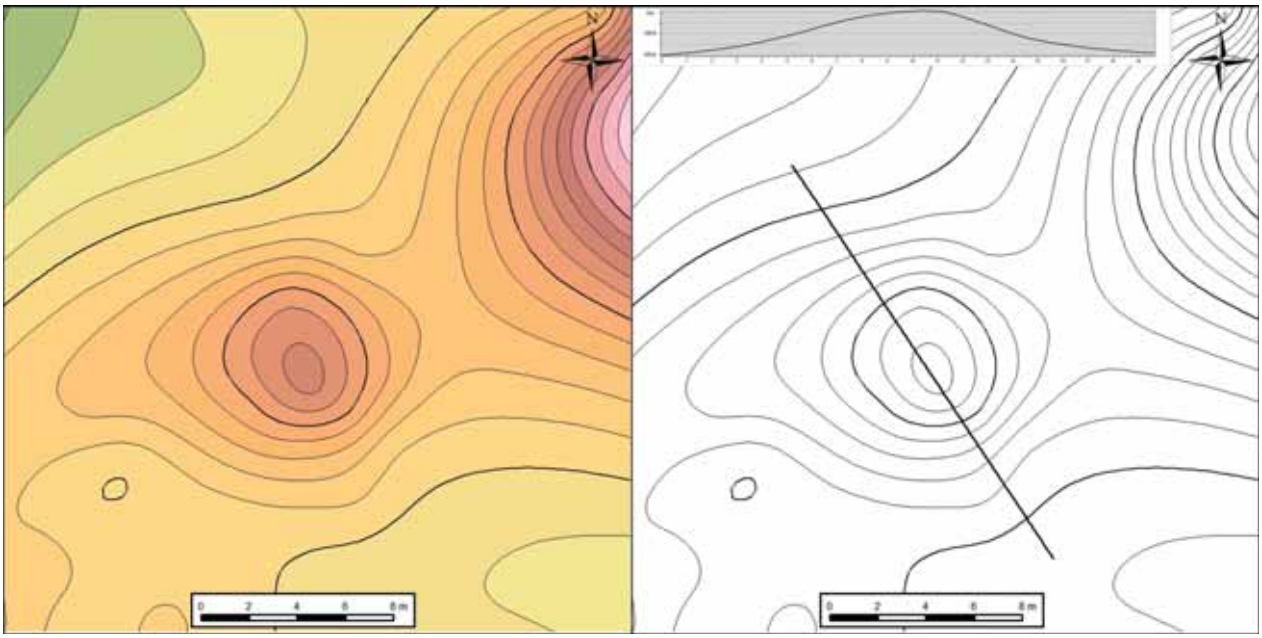


**Fig. IV.182.** Barrow 273. Hypsometric plan and cross-section

**Barrow 274 (Fig. Fig. IV.183, Fig. IV.184)** was documented in the north-eastern part of the main grouping, 26 m NE of mound 272 and 48 m northwards to 273, at 330 m.a.s.l. Geographical coordinates: N – 48°59'162", E – 24°55'778". Overgrown by trees. Circular in shape, 10 m in diameter, 0.4 m high.

**Fig. IV.183.** Barrow 274. View from the S

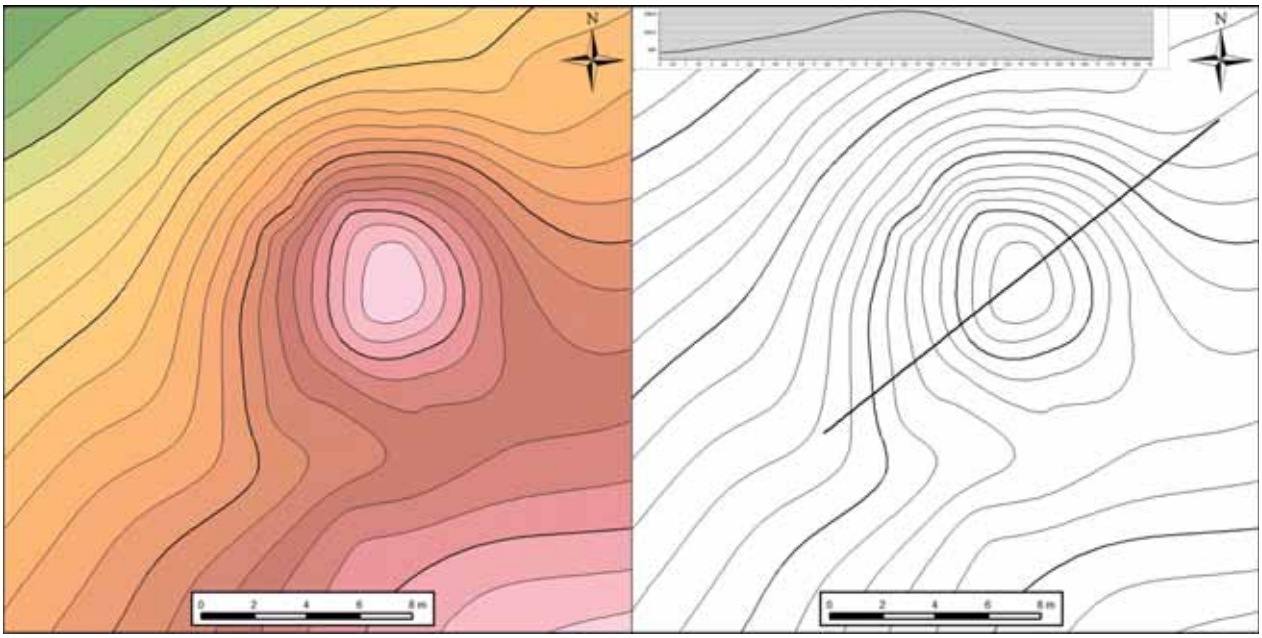



**Fig. IV.184.** Barrow 274. Hypsometric plan and cross-section

**Barrow 275 (Fig. IV.185, Fig. IV.186)** was recorded in the north-western part of the main grouping. Together with mounds 266, 268 and 278 it creates a line on a NW – SE axis of 150 m long. It is situated 40 m SE of barrow 278 and 55 m NW of mound 266, at 331 m.a.s.l. Geographical coordinates: N – 48°59'136", E – 24°55'678". Overgrown by trees and bushes. Circular in shape, 15 m in diameter, 0.3 m high. Subject to geophysical survey.

**Fig. IV.185.** Barrow 275. View from the NW

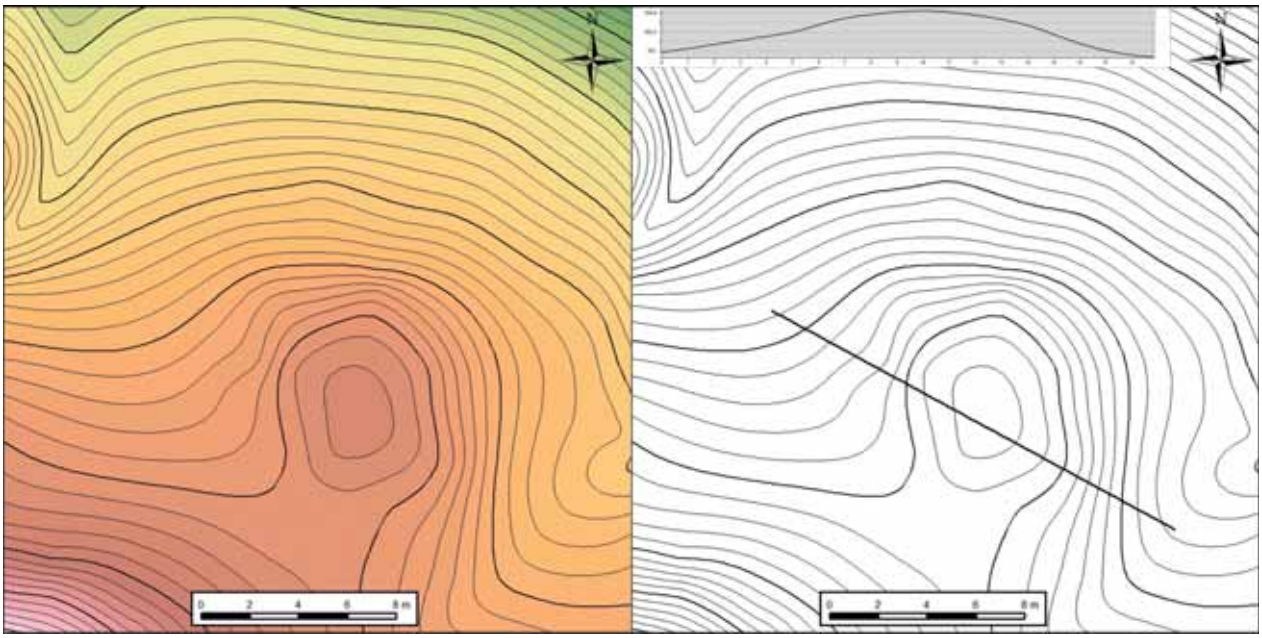


**Fig. IV.186.** Barrow 275. Hypsometric plan and cross-section

**Barrow 276 (Fig. IV.187, Fig. IV.188)** is situated in the north-western part of the main grouping, 15 m NE of mound 277, at 332 m.a.s.l. Geographical coordinates: N – 48°59'177", E – 24°55'657". Overgrown by trees and bushes. Circular in shape, 18 m in diameter, 1.8 m high. Subject to geophysical survey.

**Fig. IV.187.** Barrow 276. View from the N

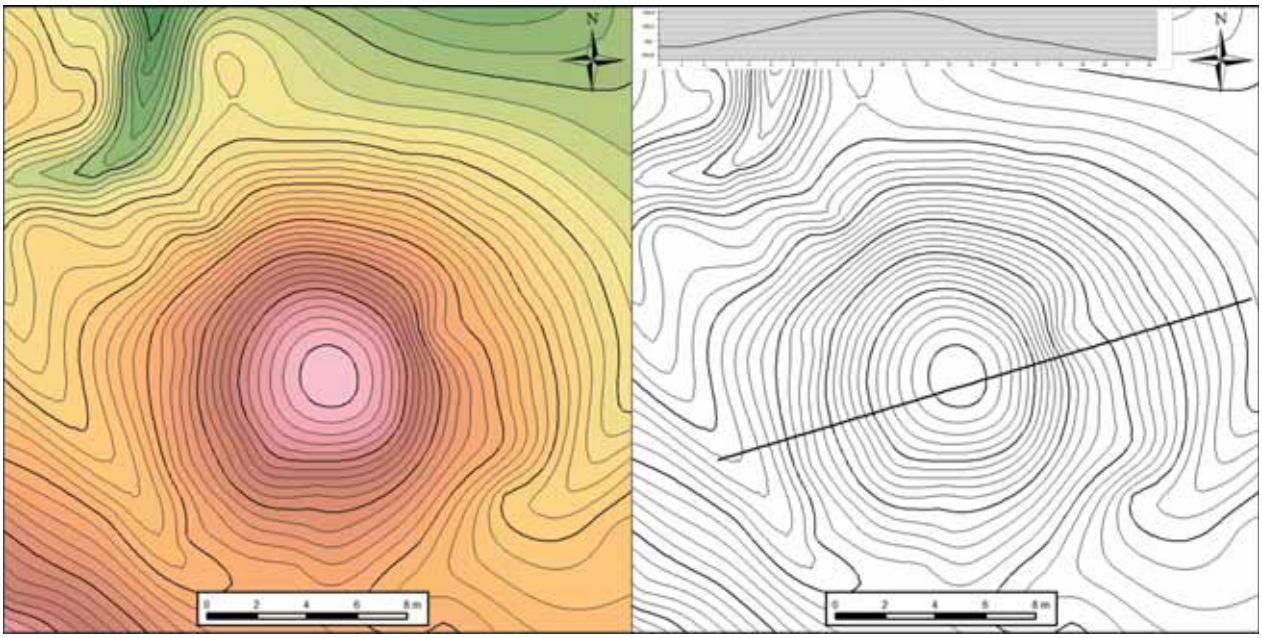


**Fig. IV.188.** Barrow 276. Hypsometric plan and cross-section

**Barrow 277 (Fig. IV.189, Fig. IV.190)** was erected in the north-western part of the main concentration of mounds, 15 m SW of tumulus 276 and 25 m NW of 263, at 332.5 m.a.s.l. Geographical coordinates: N – 48°59'120", E – 24°55'652". Overgrown by trees and bushes. Circular in shape, 18 m in diameter, 1 m high. Subject to geophysical survey.

**Fig. IV.189.** Barrow 277. View from the S

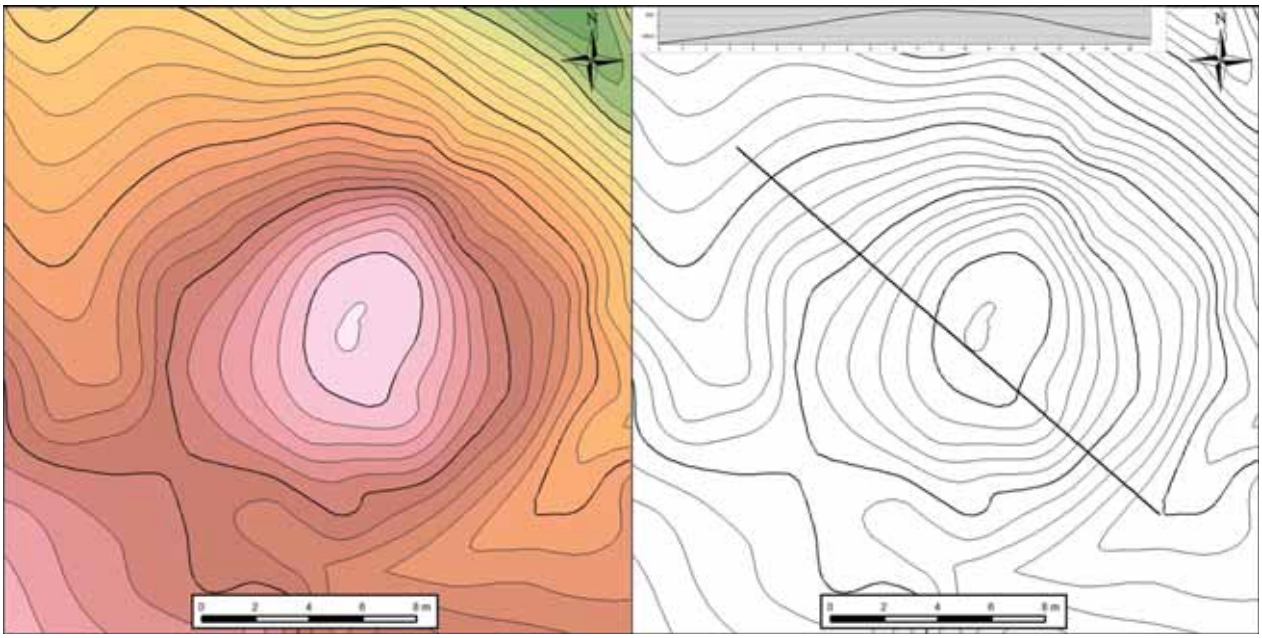


**Fig. IV.190.** Barrow 277. Hypsometric plan and cross-section

**Barrow 278 (Fig. IV.191, Fig. IV.192)** is located in the north-western part of the main grouping. Together with mounds 266, 268 and 275 it creates a line oriented on a NW – SE axis of 150 m long. The tumulus is located on its NW edge, 40 m NW of mound 275, at 340 m.a.s.l. Geographical coordinates: N – 48°59'141", E – 24°55'645". Overgrown by trees and bushes. Circular in shape, 15 m in diameter, 0.4 m high.

**Fig. IV.191.** Barrow 278. View from the NW

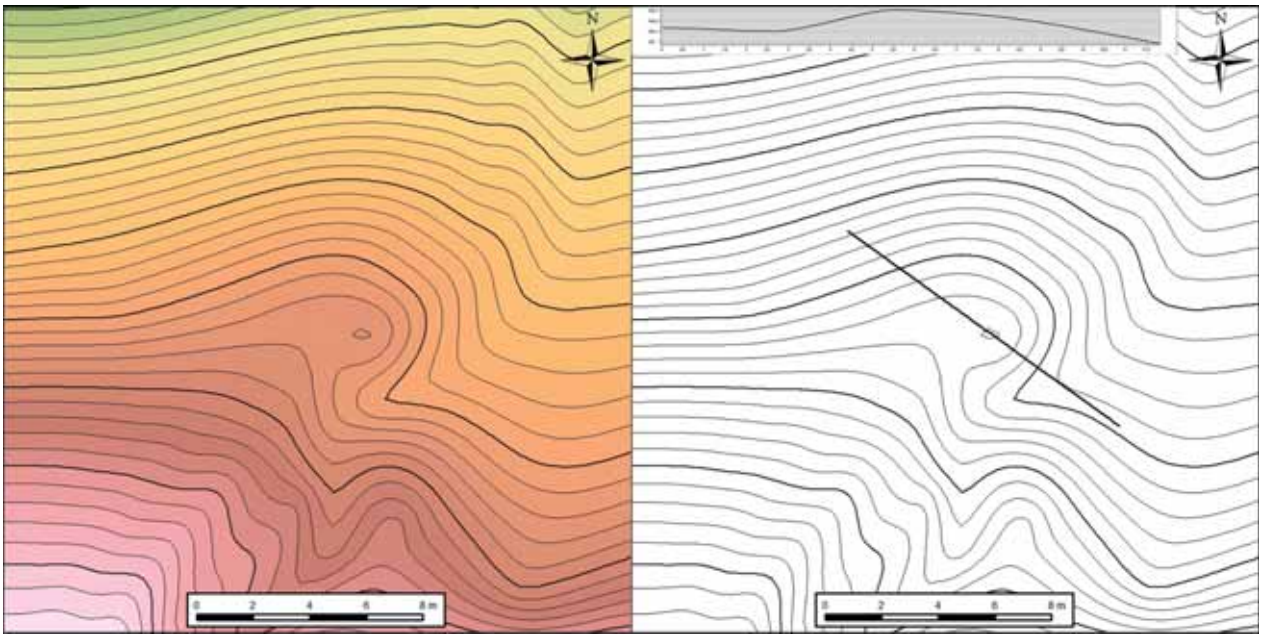


**Fig. IV.192.** Barrow 278. Hypsometric plan and cross-section

**Barrow 279 (Fig. IV.193, Fig. IV.194)** is situated in the northern part of the main mound concentration, 45 m westwards of tumulus 277, at 330.5 m.a.s.l. Geographical coordinates: N – 48°59'119", E – 24°55'614". Overgrown by trees and bushes. Circular in shape, 18 m in diameter, 0.4 m high. There is a road across the mound. Subject to geophysical survey.

**Fig. IV.193.** Barrow 279. View from the E

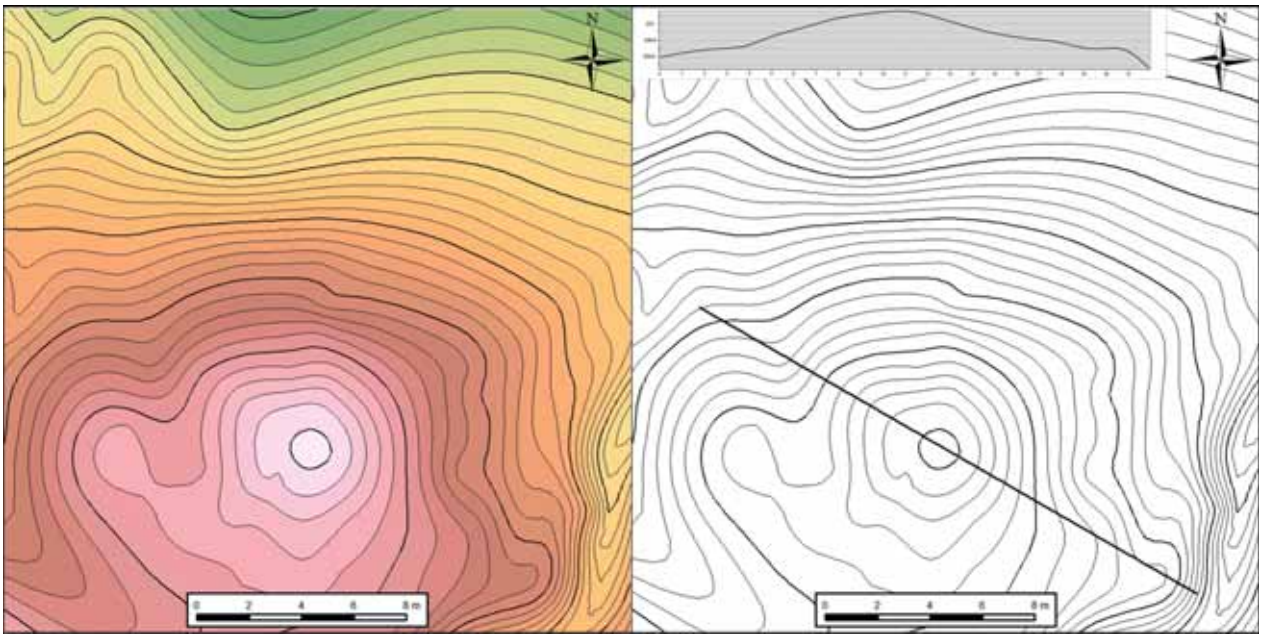


**Fig. IV.194.** Barrow 279. Hypsometric plan and cross-section

**Fig. IV.195.** Barrow 301. View from the N

**Barrow 301 (Fig. IV.195)** was erected in the eastern part of the main grouping. Together with mounds 269 and 271 it creates a linear arrangement oriented on a NE – SW axis. It is located in the middle of this pattern, 20 m SW of barrow 269, at 325 m.a.s.l. Geographical coordinates: N – 48°59'132", E – 24°55'554". Overgrown by trees and bushes. Circular in shape, 9 m in diameter, 0.2 m high.

**Western group (Fig. IV. 196, Fig. IV.197)**

The most western concentration of barrows consists of 14 mounds, that create a linear-group arrangement, spreading across a NW – SE axis for 400 m. The main linear arrangement comprises of monuments 280, 281, 283, 284, 288, 289, 290, 292 and 293. Second linear pattern located southwards from the previous is determined by barrows 282, 285, 287, 291. Mound 286 is situated between barrows 285 and 293.

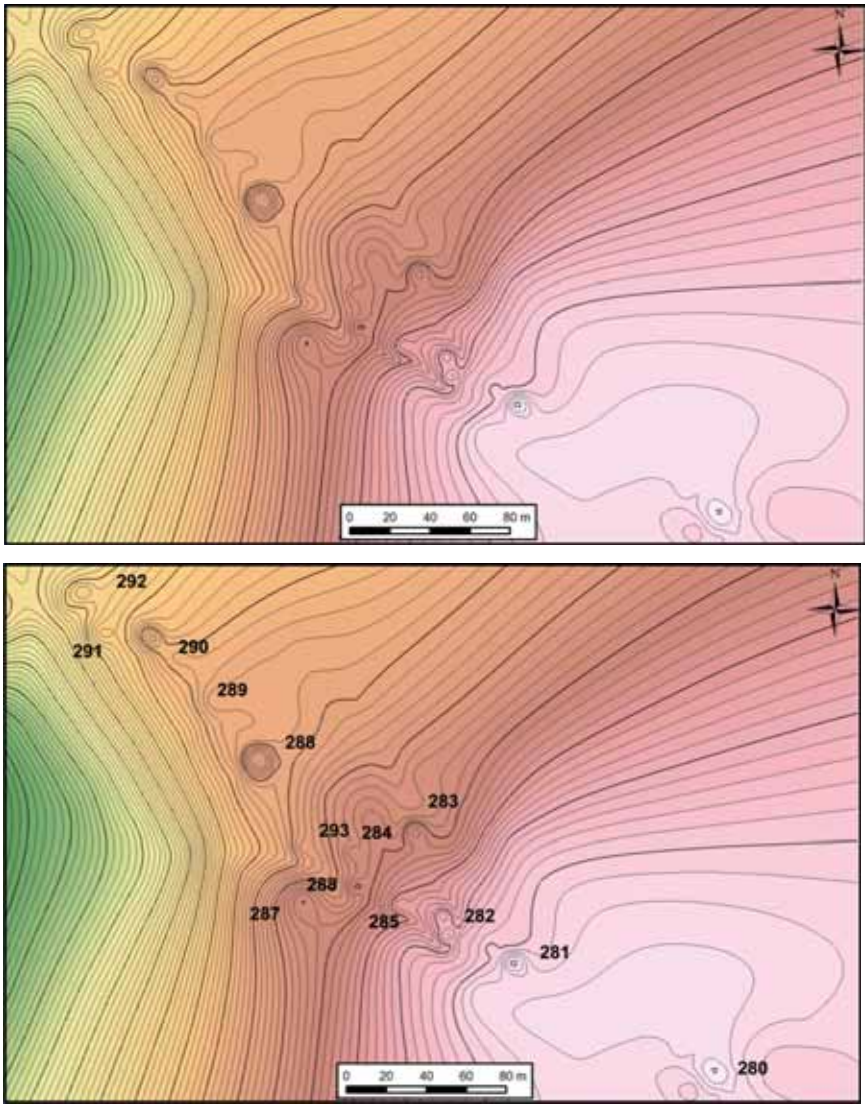



**Fig. IV. 196, Fig. IV.197.** Western group of barrows in Milovanie

**Barrow 280 (Fig. IV.198, Fig. IV.199)** was documented approximately 230 m NW from the main grouping, on the SE edge of the next grouping (that consists of 14 mounds) and at the same time on the SE edge of the longest linear arrangement created by eight barrows. The tumulus is situated 115 m SE of mound 281, at 334 m.a.s.l. Geographical coordinates: N – 48°59'230", E – 24°55'512". Overgrown by trees. Circular in shape, 15 m in diameter, 0.35 m high.

**Fig. IV.198.** Barrow 280. View from the W

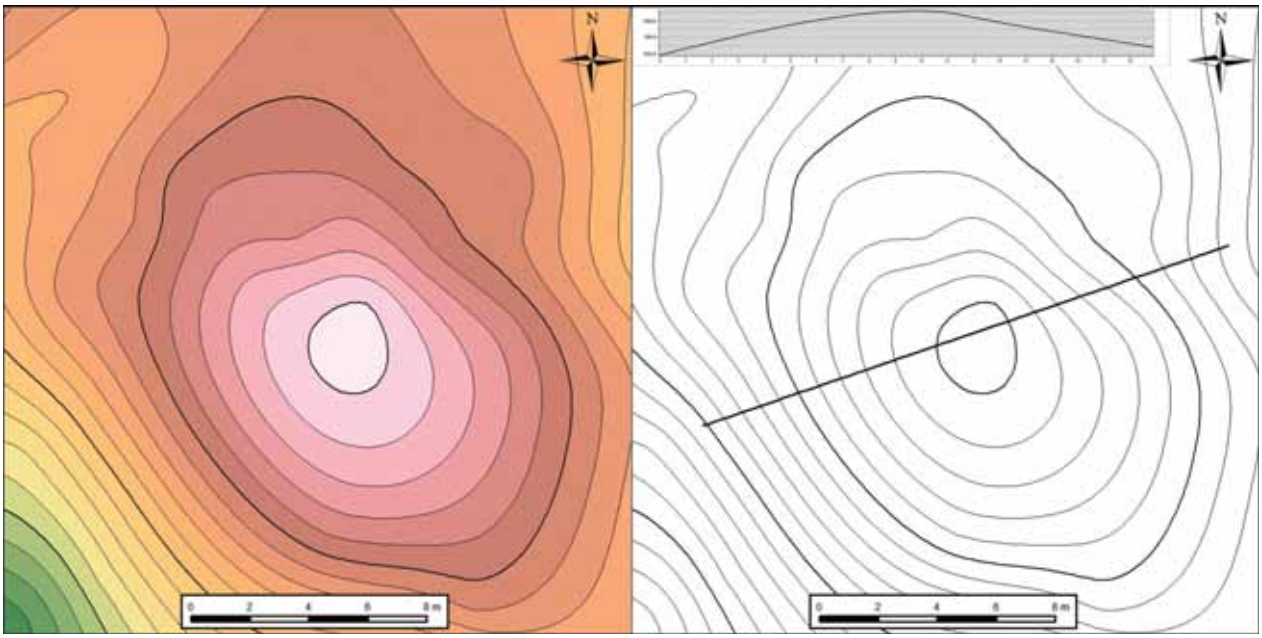



**Fig. IV.199.** Barrow 280. Hypsometric plan and cross-section

**Barrow 281 (Fig. IV.200, Fig. IV.201)** is located in the south-eastern part of the group that consists of 14 mounds and at the same time in the SE part of the longest transect of barrows that comprise eight barrows. It is situated 115 m NW of barrow 280, at 333.5 m.a.s.l. Geographical coordinates: N – 48°59'252", E – 24°55'421". Overgrown by tress. Circular in shape, 16 m in diameter, 0.7 m high.

**Fig. IV.200.** Barrow 281. View from the NW

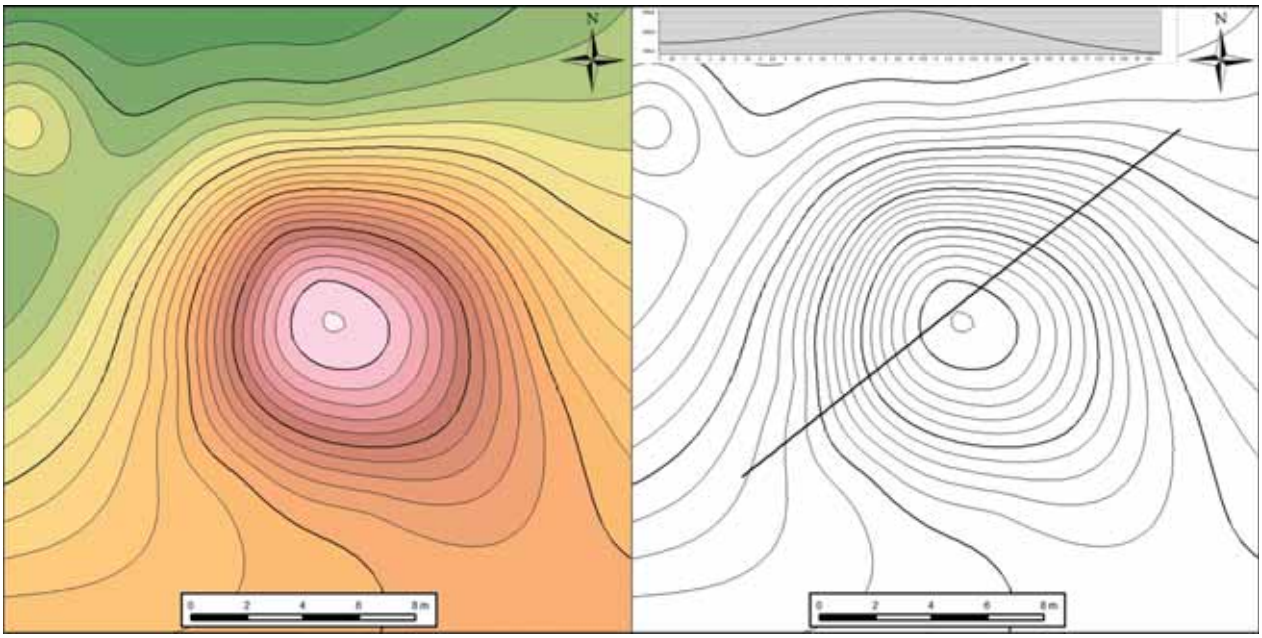



**Fig. IV.201.** Barrow 281. Hypsometric plan and cross-section

**Barrow 282 (Fig. IV.202, Fig. IV.203)** is situated in the south-eastern part of the barrow group that consist of 14 objects and at the same time in the SE part of the shorter line of monuments comprising four tumuli. It is located 50 m SE of barrow 285, at 332.5 m.a.s.l. Geographical coordinates: N – 48°59'250", E – 24°55'396". Overgrown by trees and bushes. Circular in shape, 14 m in diameter, 0.4 m high.

**Fig. IV.202.** Barrow 282. View from the S

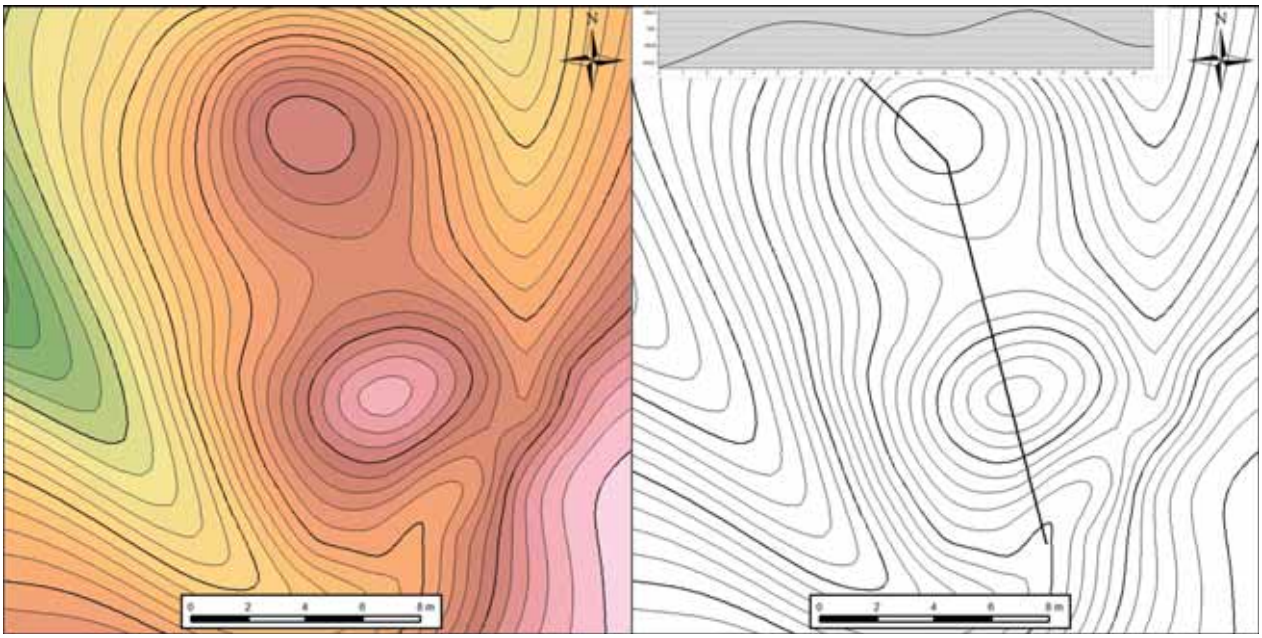


**Fig. IV.203.** Barrow 282. Hypsometric plan and cross-section

**Kurhan 283 (Fig. IV.204, Fig. IV.205)** was registered in the south-eastern part of the group that consists of 14 objects and at the same time in the SE part of the longest line comprising eight mounds. It is situated 42 m NW of barrow 281 and 55 m SE of monument 293, at 331 m.a.s.l. Geographical coordinates: N – 48°59'266", E – 24°55'389". Overgrown by trees and bushes. Circular in shape, 10 m in diameter, 0.3 m high.

**Fig. IV.204.** Barrow 283. View from the E

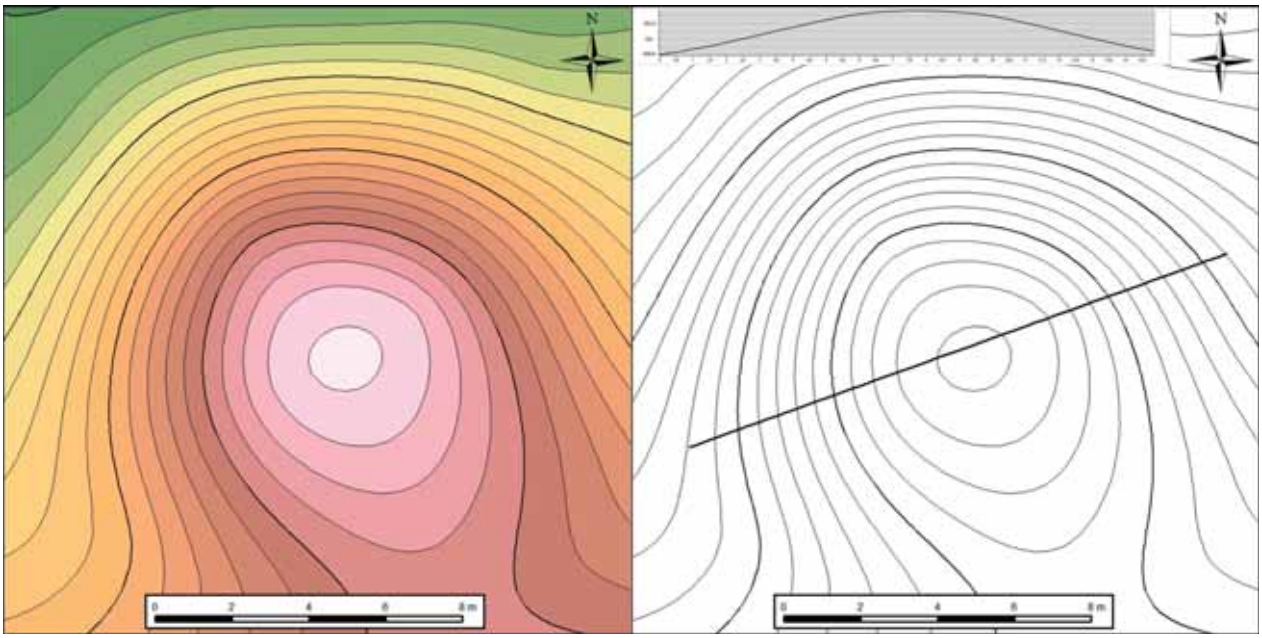



**Fig. IV.205.** Barrow 283. Hypsometric plan and cross-section

**Barrow 284 (Fig. IV.206)** was documented in the central-northern part of the tumuli group consisting of 14 objects. It is located 25 m NE of barrow 293, at 331.5 m.a.s.l. Geographical coordinates: N – 48°59'286", E – 24°55'370". Overgrown by trees and bushes. Circular in shape, 12 m in diameter, 0.4 m high.

**Barrow 285 (Fig. IV.207, Fig. IV.208)** is located in the south-eastern part of the group comprising 14 objects and at the same time in the SE part of the shorter line of monuments in the same group. It is situated 50 m NW of barrow 282 and 45 m SE of tumulus 287, at 332 m.a.s.l. Geographical coordinates: N – 48°59'259", E – 24°55'356". Overgrown by trees and bushes. Circular in shape, 14 m in diameter, 0.4 m high. There is a road across the mound.

**Fig. IV.206.** Barrow 284. View from the S

**Fig. IV.207.** Barrow 285. View from the SE

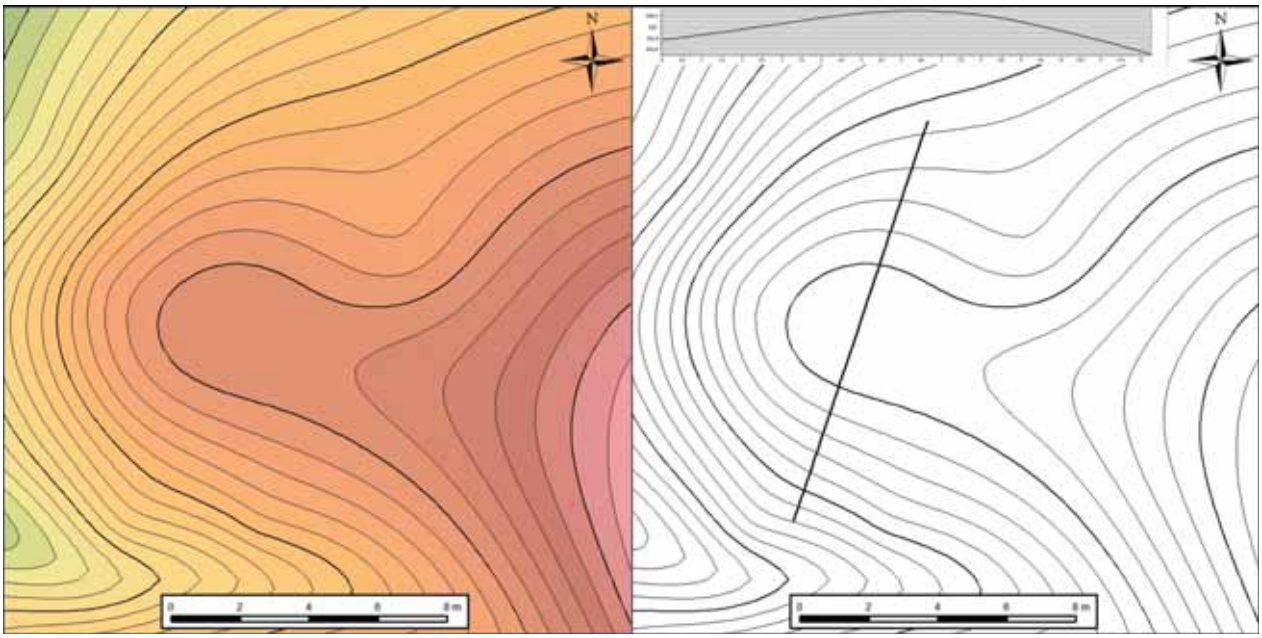


**Fig. IV.208.** Barrow 285. Hypsometric plan and cross-section

**Barrow 286 (Fig. IV.209, Fig. IV.210)** was recorded in the central part of the group comprising 14 monuments, between two lines of tumuli. It is located 25 m S of barrow 293 and 20 m NW of mound 285, at 330.5 m.a.s.l. Geographical coordinates: N – 48°59'268", E – 24°55'350". Overgrown by trees and bushes. Circular in shape, 10 m in diameter, 0.3 m high.

**Fig. IV.209.** Barrow 286. View from the NE

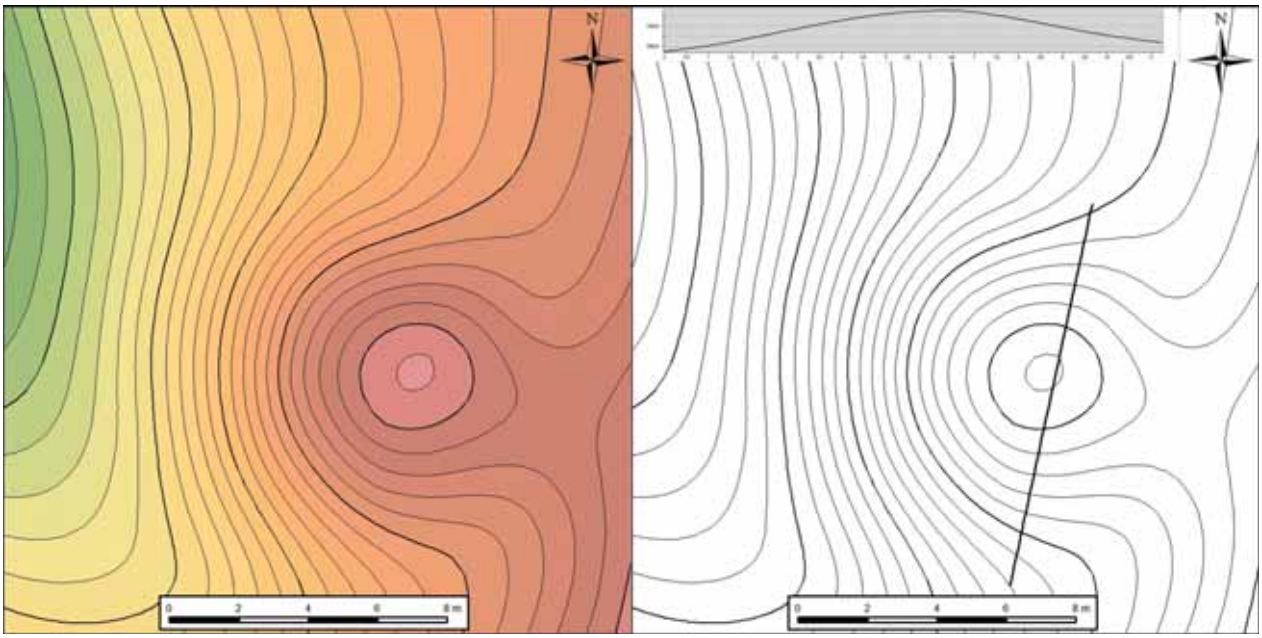



**Fig. IV.210.** Barrow 286. Hypsometric plan and cross-section

**Barrow 287 (Fig. IV.211, Fig. IV.212)** is situated in the central-southern part of the group that consist of 14 mounds and at the same time in the middle of the shorter line of tumuli in this group, created by four monuments. It is located 45 m NW of barrow 285 and 140 m SE of tumulus 291, at 330.5 m.a.s.l. Geographical coordinates: N – 48°59'269", E – 24°55'320". Overgrown by trees and bushes. Circular in shape, 8 m in diameter, 0.2 m high.

**Fig. IV.211.** Barrow 287. View from the N

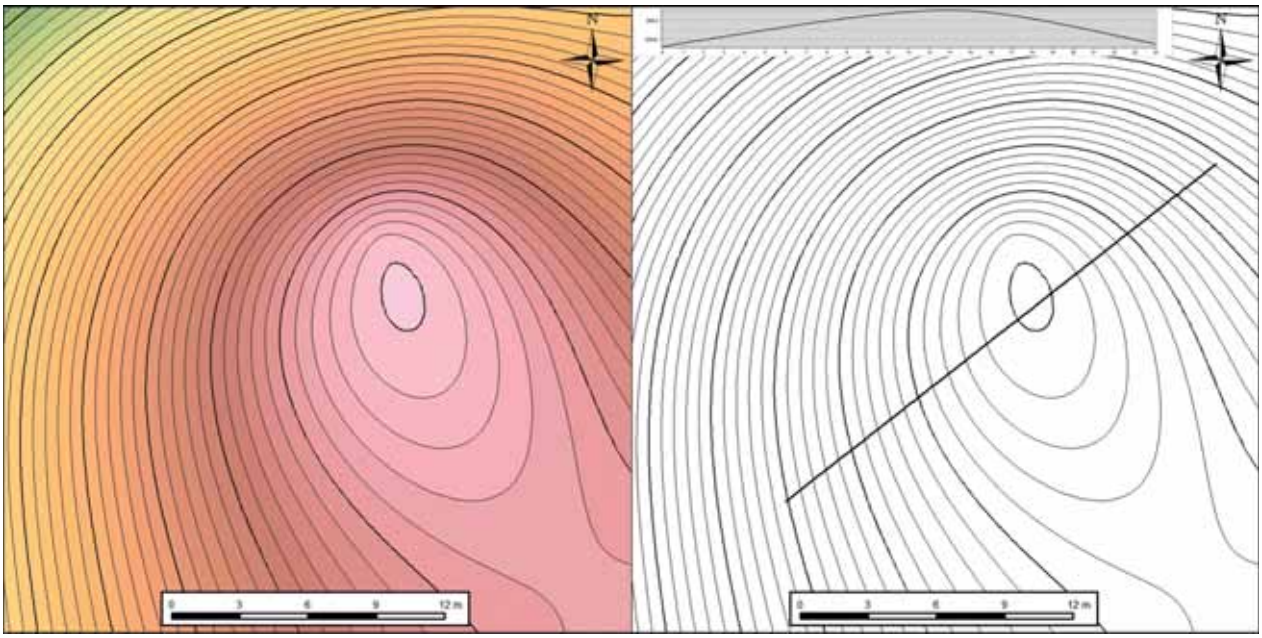


**Fig. IV.212.** Barrow 287. Hypsometric plan and cross-section

**Barrow 288 (Fig. IV.213**, **Fig. IV.214)** was documented in the central-northern part of the group that consists of 14 mounds and at the same time in the central-northern part of the longest line of eight tumuli. It is located 63 m NW of barrow 293 and 40 m SE of monument 289, at 329 m.a.s.l. Geographical coordinates: N – 48°59'266", E – 24°55'389". Overgrown by trees and bushes. Circular in shape, 28 m in diameter, 1.6 m high. An illicit trench was recorded at the summit of mound.

**Fig. IV.213.** Barrow 288. View from the W

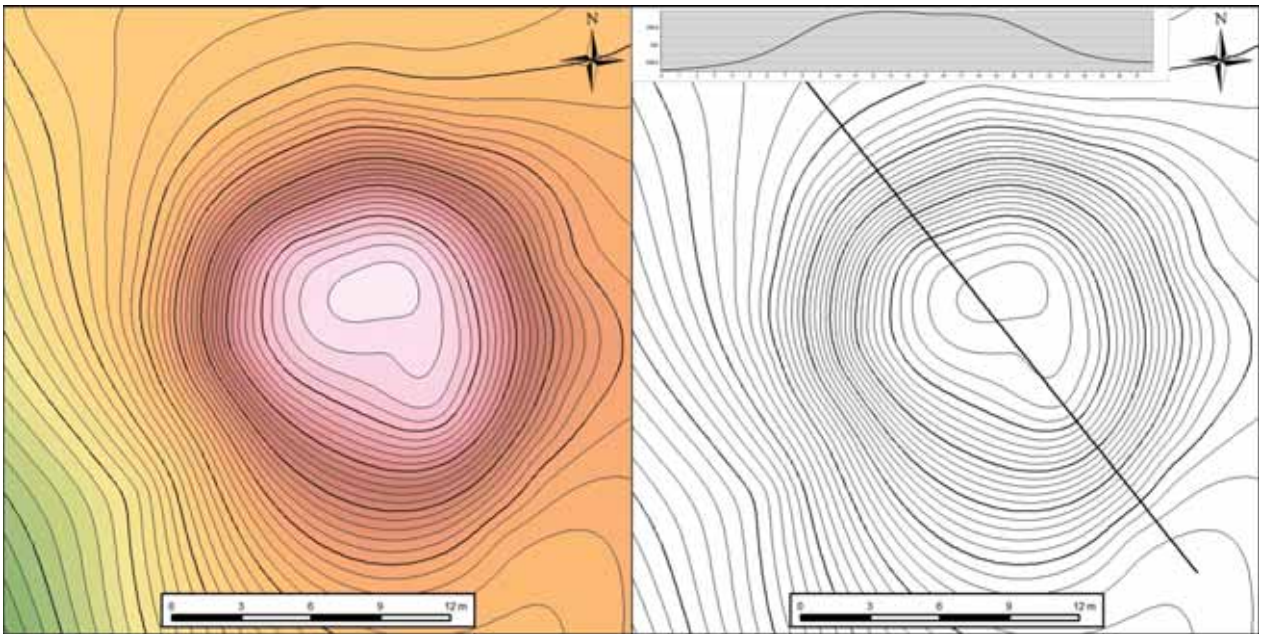



**Fig. IV.214.** Barrow 288. Hypsometric plan and cross-section

**Barrow 289** (**Fig. IV.215**, **Fig. IV.216**) is situated in the north-western part of the group that consist of 14 mounds and at the same time in the NW part of the longest line of eight tumuli. It is located 40 m NW of barrow 288 and 43 m SE of 290, at 329.5 m.a.s.l. Geographical coordinates: N – 48°59'304", E – 24°55'277". Overgrown by trees and bushes. Circular in shape, 12 m in diameter, 0.2 m high. There is a road crossing the barrow in its eastern part.

**Fig. IV.215.** Barrow 289. View from the SE

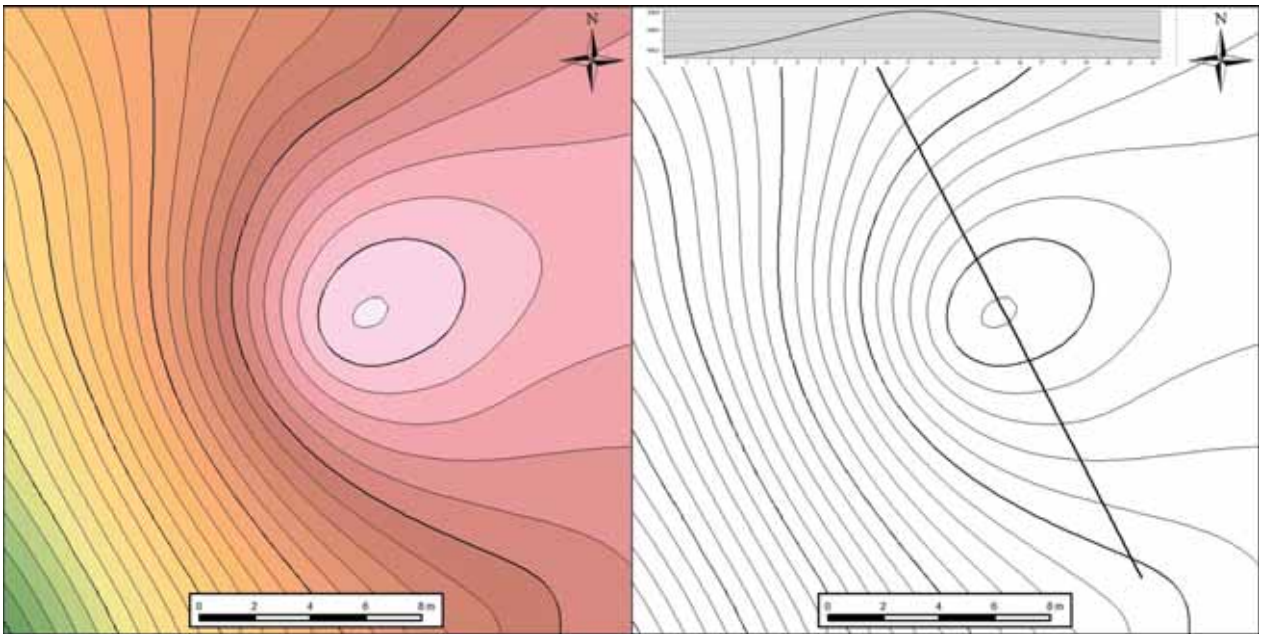



**Fig. IV.216.** Barrow 289. Hypsometric plan and cross-section

**Barrow 290 (Fig. IV.217, Fig. IV.218)** is located in the north-western part of the group comprising 14 monuments and at the same time in the NW part of the longest line of eight tumuli. It is situated 43 m NW of barrow 289 and 45 m SE of tumulus 292, at 327 m.a.s.l. Geographical coordinates: N – 48°59'312", E – 24°55'245". Overgrown by trees and bushes. Circular in shape, 22 m in diameter, 1.6 m high. On the top of the mound there is an illicit trench. A road cross the barrow at the lowest part of the slope from the eastern side.

**Fig. IV.217.** Barrow 290. View from the E

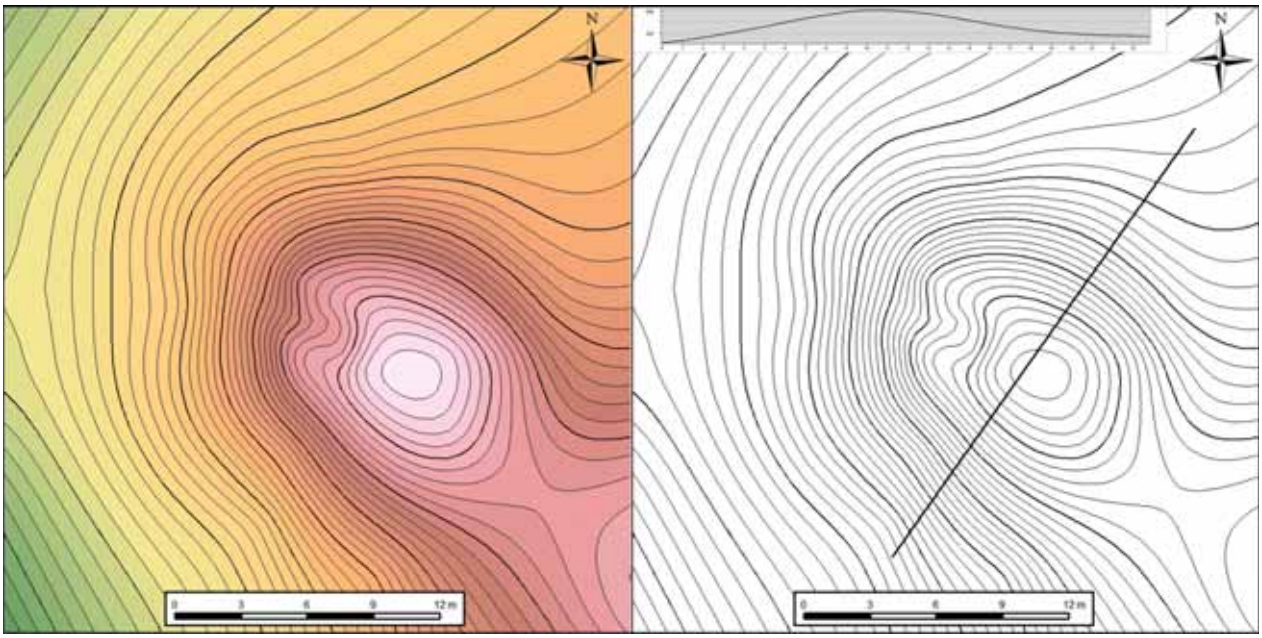



**Fig. IV.218.** Barrow 290. Hypsometric plan and cross-section

**Barrow 291 (Fig. IV.219, Fig. IV.220)** was erected in the north-western part of the group that consists of 14 objects and at the same time in the NW part of the shorter line of four tumuli. It is situated 140 m NW of barrow 287 and 27 m SE of mound 292, at 326 m.a.s.l. Geographical coordinates: N – 48°59'312", E – 24°55'223". Overgrown by trees and bushes. Circular in shape, 18 m in diameter, 0.5 m high.

**Fig. IV.219.** Barrow 291. View from the SW

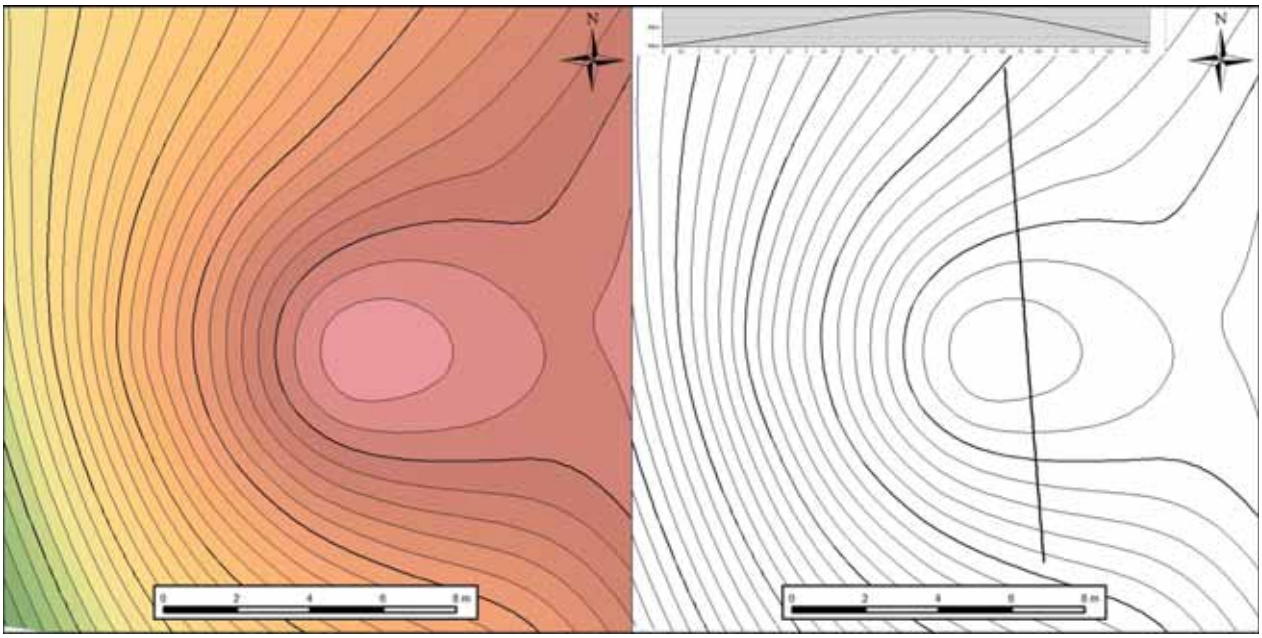


**Fig. IV.220.** Barrow 291. Hypsometric plan and cross-section

**Barrow 292 (Fig. IV.221, Fig. IV.222)** is situated in the north-western part of the group that consists of 14 objects and at the same time on the NW edge of the longest line of the eight tumuli. It is located 45 m NW of barrow 290, at 325 m.a.s.l. Geographical coordinates: N – 48°59'321", E – 24°55'211". Overgrown by trees and bushes. Circular in shape, 18 m in diameter, 0.6 m high. There is a road crossing the mounds.

**Fig. IV.221.** Barrow 292. View from the SE

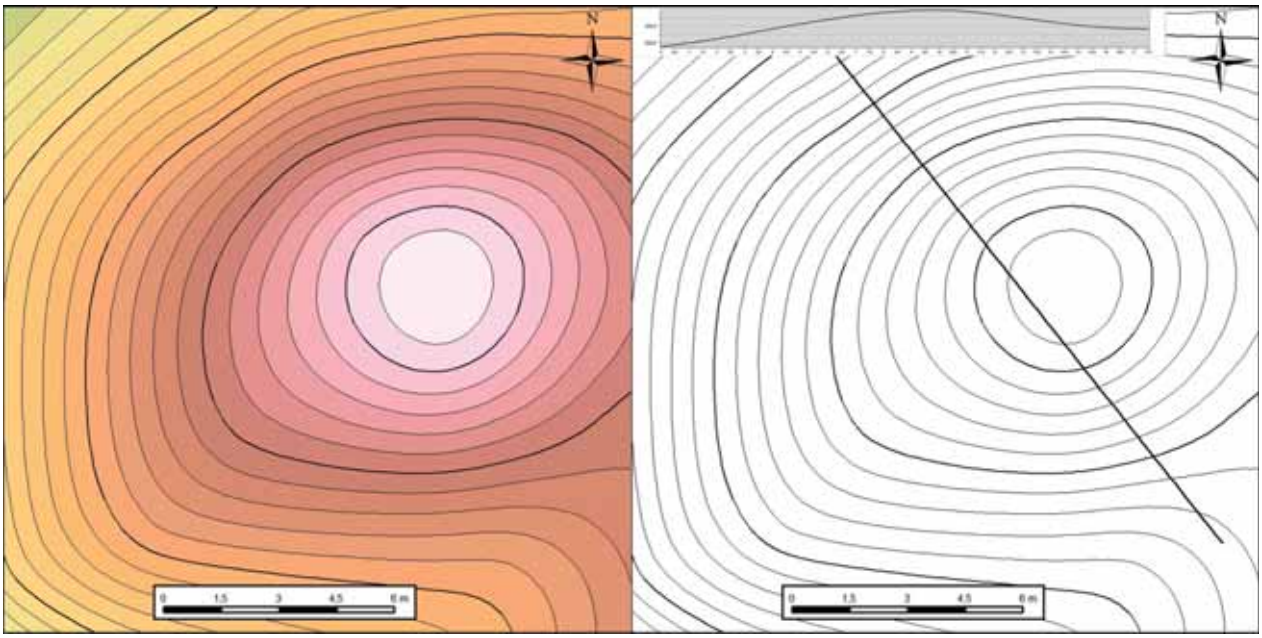



**Fig. IV.222.** Barrow 292. Hypsometric plan and cross-section

**Barrow 293 (Fig. IV.223, Fig. IV.224)** was recorded in the central-northern part of the group comprising 14 mounds and at the same time in the central-north part of the longest line of eight tumuli. It is located 55 m NE of barrow 283, at 330.5 m.a.s.l. Geographical coordinates: N – 48°59'282", E – 24°55'351". Overgrown by trees and bushes. Circular in shape, 12 m in diameter, 0.3 m high.

**Fig. IV.223.** Barrow 293. View from the W

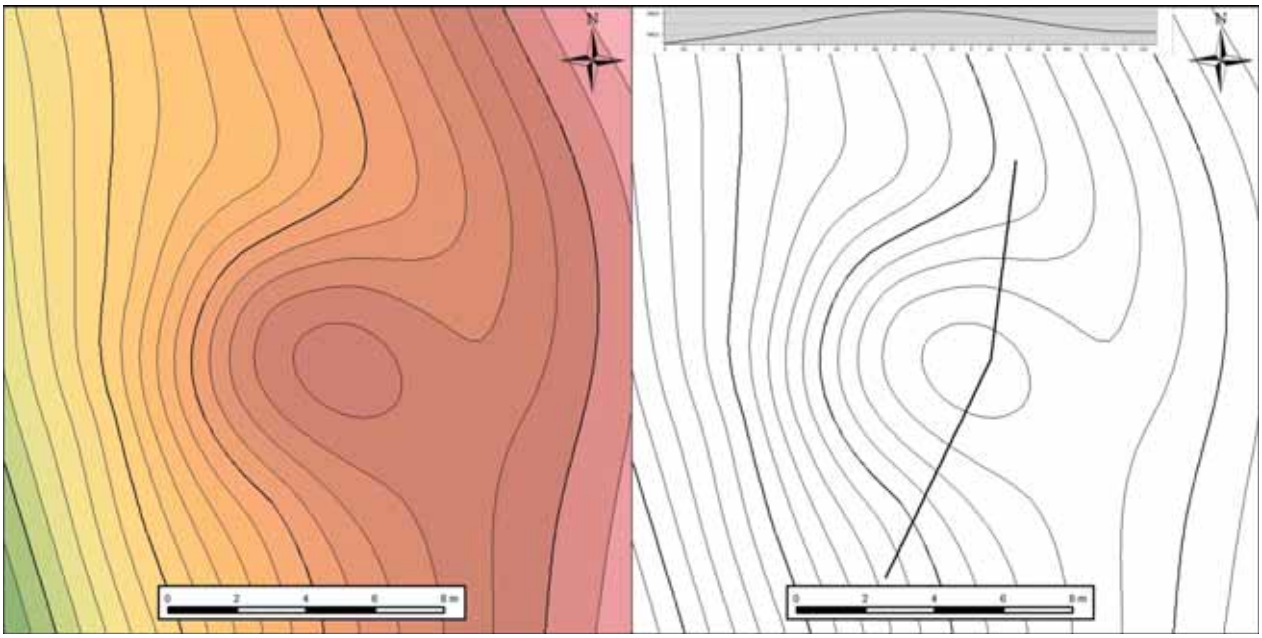


**Fig. IV.224.** Barrow 293. Hypsometric plan and cross-section

**Northern group (Fig. IV.225, Fig. IV.226)**
The most northern located grouping of the barrows is situated 250 m NE from the above discussed concentration and app. 400 m N/NW from the main grouping of the northern slope of the hill on the deforested area. This group comprises of seven barrows that created a group-linear arrangement on a NE – SW axis (no. 294-300). Four mounds (no. 295-297 and 299) are grouped in a line. The rest are adjacent.

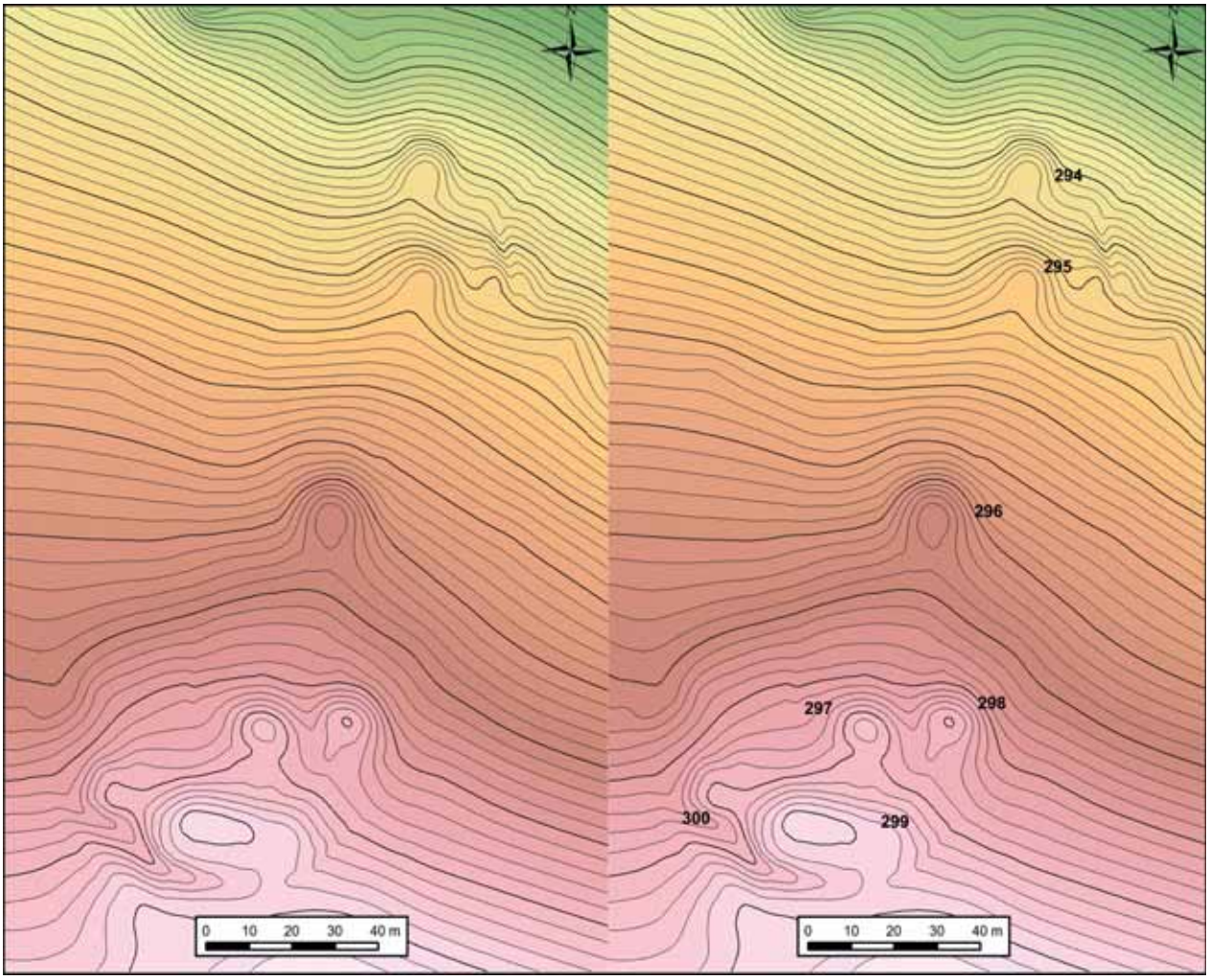



**Fig. IV.225, Fig. IV.226.** Northern group of barrows in Milovanie

**Barrow 294 (Fig. IV.227, Fig. IV.228)** is located in the northern part of the discussed group, 33 m NW of mound 295, at 323 m.a.s.l. Geographical coordinates: N – 48°59'452", E – 24°55'619". Circular in shape, 14 m in diameter, 0.6 m high. Subject to geophysical survey.

**Fig. IV.227.** Barrow 294. View from the S

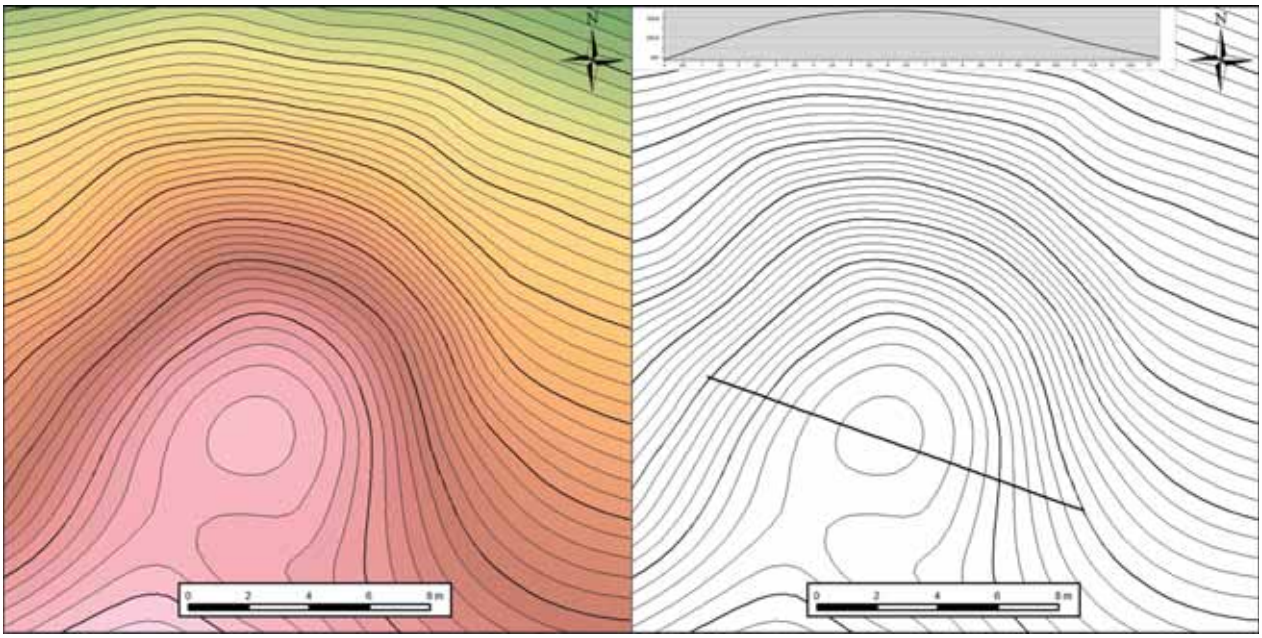


**Fig. IV.228.** Barrow 294. Hypsometric plan and cross-section

**Barrow 295 (Fig. IV.229, Fig. IV.230)** is situated in the northern of the group on the edge of a forest, 33 m SW of mound 294 and 75 m NE of tumulus 296, at 325 m.a.s.l. Geographical coordinates: N – 48°59'438", E – 24°55'635". Circular in shape, 14 m in diameter, 0.6 m high. Subject to geophysical survey.

**Fig. IV.229.** Barrow 295. View from the SE

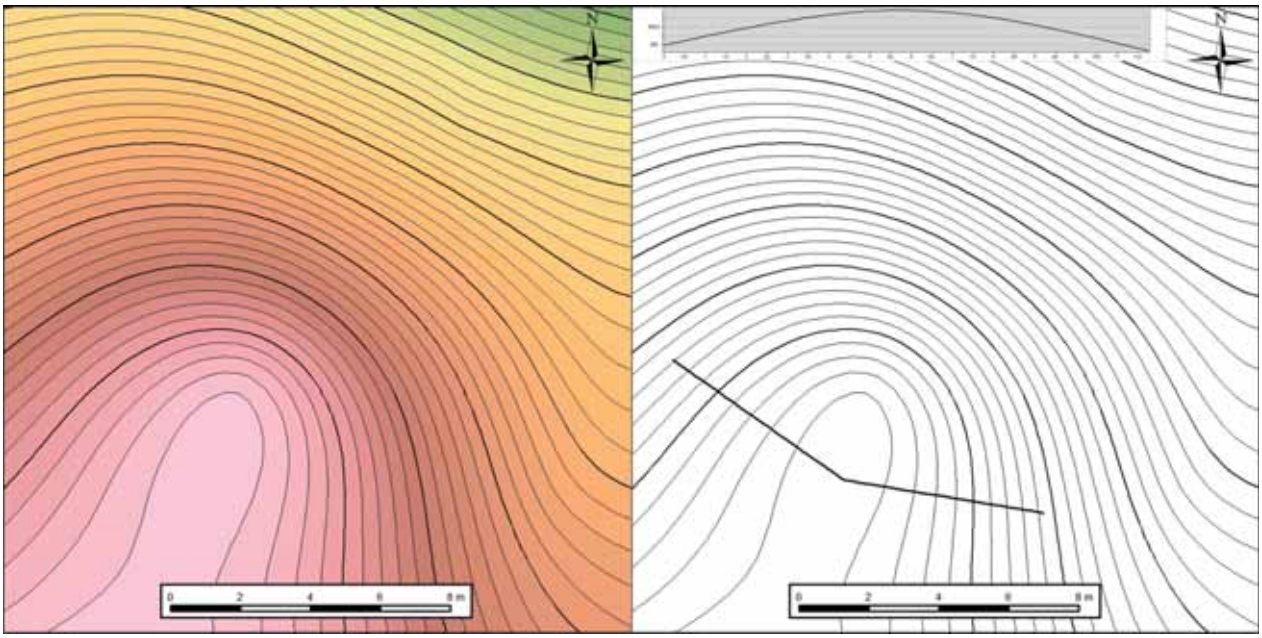


**Fig. IV.230.** Barrow 295. Hypsometric plan and cross-section

**Barrow 296 (Fig. IV.231, Fig. IV.232)** was recorded in the central part of the group on a deforested area. It is situated 75 m SW of mound 295 and 48 m NE of 297, at 328.5 m.a.s.l. Geographical coordinates: N – 48°59'408", E – 24°55'599". Circular in shape, 20 m in diameter, 1.1 m high. Subject to geophysical survey.

**Fig. IV.231.** Barrow 296. View from the SW

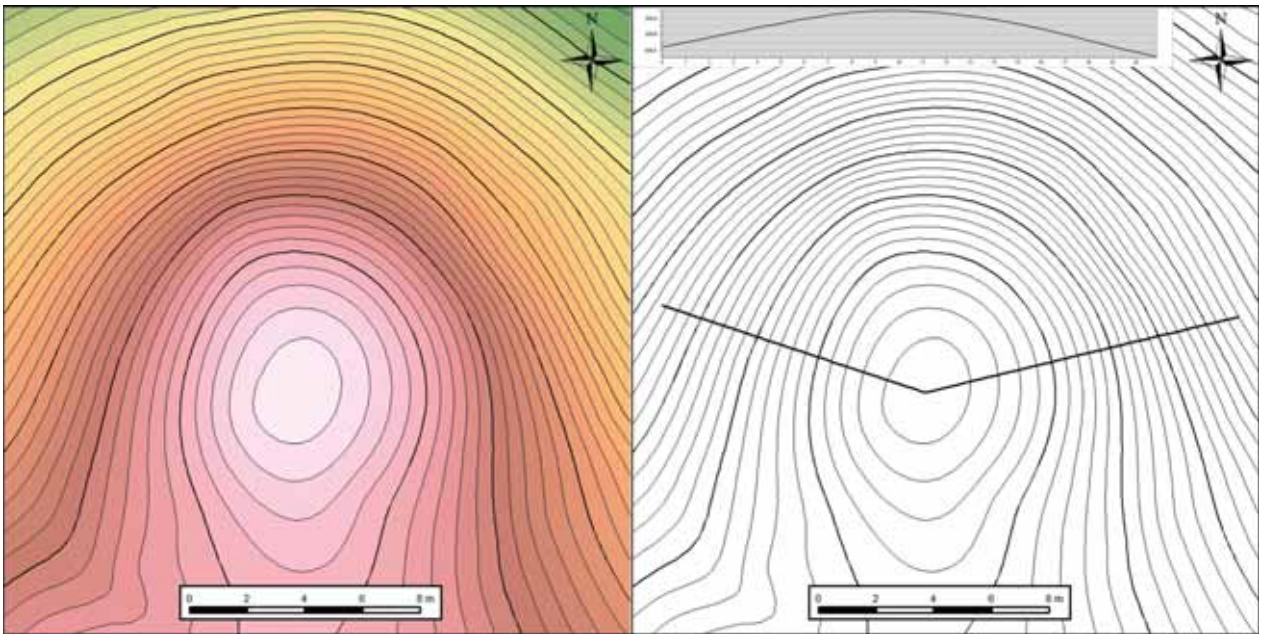


**Fig. IV.232.** Barrow 296. Hypsometric plan and cross-section

**Barrow 297 (Fig. IV.233, Fig. IV.234)** is located in the southern part of the discussed group on a deforested area. It is situated 48 m SW of mound 296 and 25 m NE of monument 299, at 331 m.a.s.l. Geographical coordinates: N – 48°59'385", E – 24°55'583". Circular in shape, 13 m in diameter, 0.9 m high.

**Fig. IV.233.** Barrow 297. View from the W

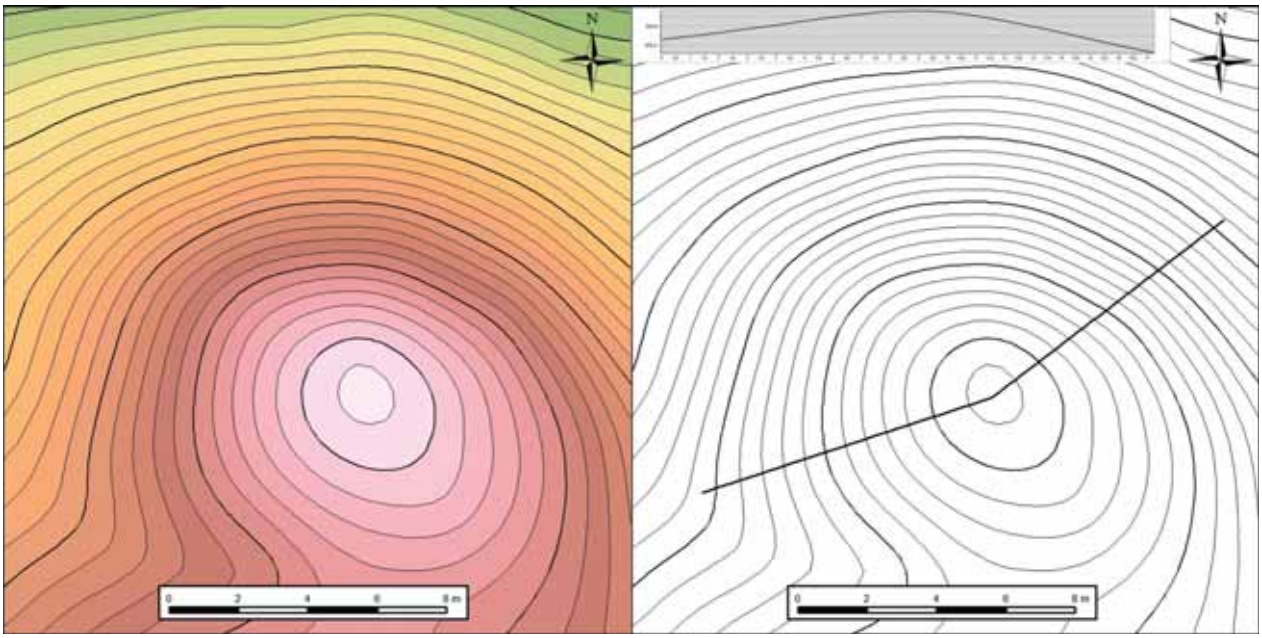



**Fig. IV.234.** Barrow 297. Hypsometric plan and cross-section

**Barrow 298 (Fig. IV.235, Fig. IV.236)** was erected in the south-eastern part of the group on a deforested area, 23 m eastwards to mound 297, at 331 m.a.s.l. Geographical coordinates: N – 48°59'38", E – 24°55'602". Circular in shape, 15 m in diameter, 1 m high.

**Fig. IV.235.** Barrow 298. View from the W

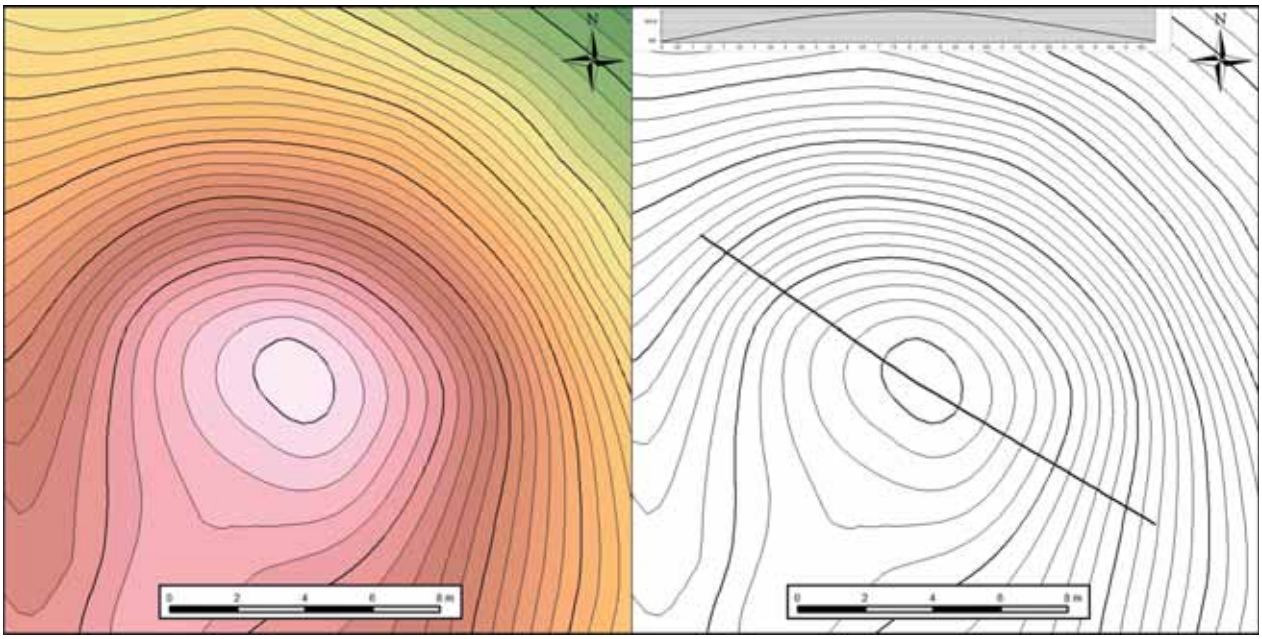


**Fig. IV.236.** Barrow 298. Hypsometric plan and cross-section

**Barrow 299 (Fig. IV.237, Fig. IV.238)** is situated in the southern part of the discussed group on a deforested area, 25 m SW of mound 297, at 332 m.a.s.l. Geographical coordinates: N – 48°59'375", E – 24°55'565". Circular in shape, 14 m in diameter, 0.6 m high. A road is crossing the tumulus.

**Fig. IV.237.** Barrow 299. View from the NW

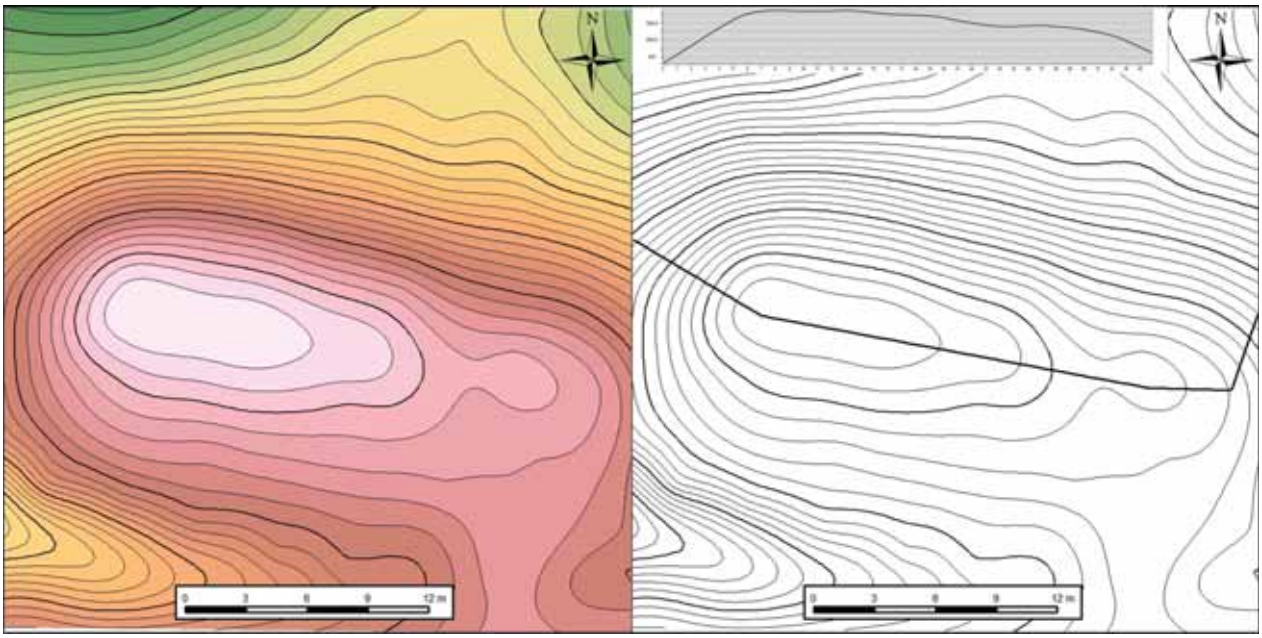


**Fig. IV.238.** Barrow 299. Hypsometric plan and cross-section

**Barrow 300 (Fig. IV.239, Fig. IV.240)** was recorded in the south-western edge of the group on a deforested area, 18 m westwards to mound 299 and 43 m SW from 297, at 331.5 m.a.s.l. Geographical coordinates: N – 48°59'374", E – 24°55'554". Circular in shape, 11 m in diameter, 0.2 m high. There is a road crossing that crosses the barrow.

**Fig. IV.239.** Barrow 300. View from the SW

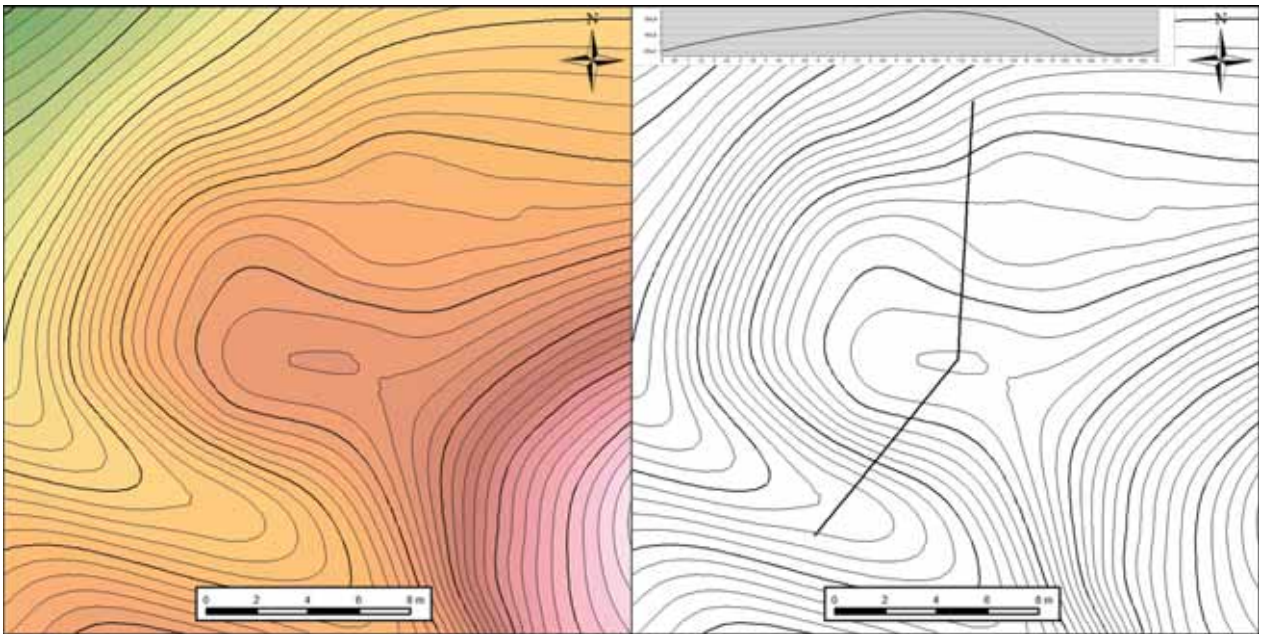


**Fig. IV.240.** Barrow 300. Hypsometric plan and cross-section

**Fig. IV.241.** Barrow 302. View from the E

**Individual barrow**

**Barrow 302 (Fig. IV.241)** was documented far from other groups approximately 2.35 km NE from the northern edge of the northern grouping. It is elevated at 316 m.a.s.l. Geographical coordinates: N – 49°00'067", E – 24°57'290". Circular in shape, 15 m in diameter, 2.2 m high.

**Southern group (Fig. IV.242, Fig. IV.243)**
The next concentration of barrows is located southwards to the main grouping at a distance of 550 m from its southern edge, on the western and northwestern part of the slope. It comprises 16 monuments that create a linear arrangement spreading across a distance of 1.3 km on a NW – SE axis.

Inside this grouping it is possible to distinguish four concentrations that consists of 3 (two) and 5 (two) barrows. The most northern located group com-

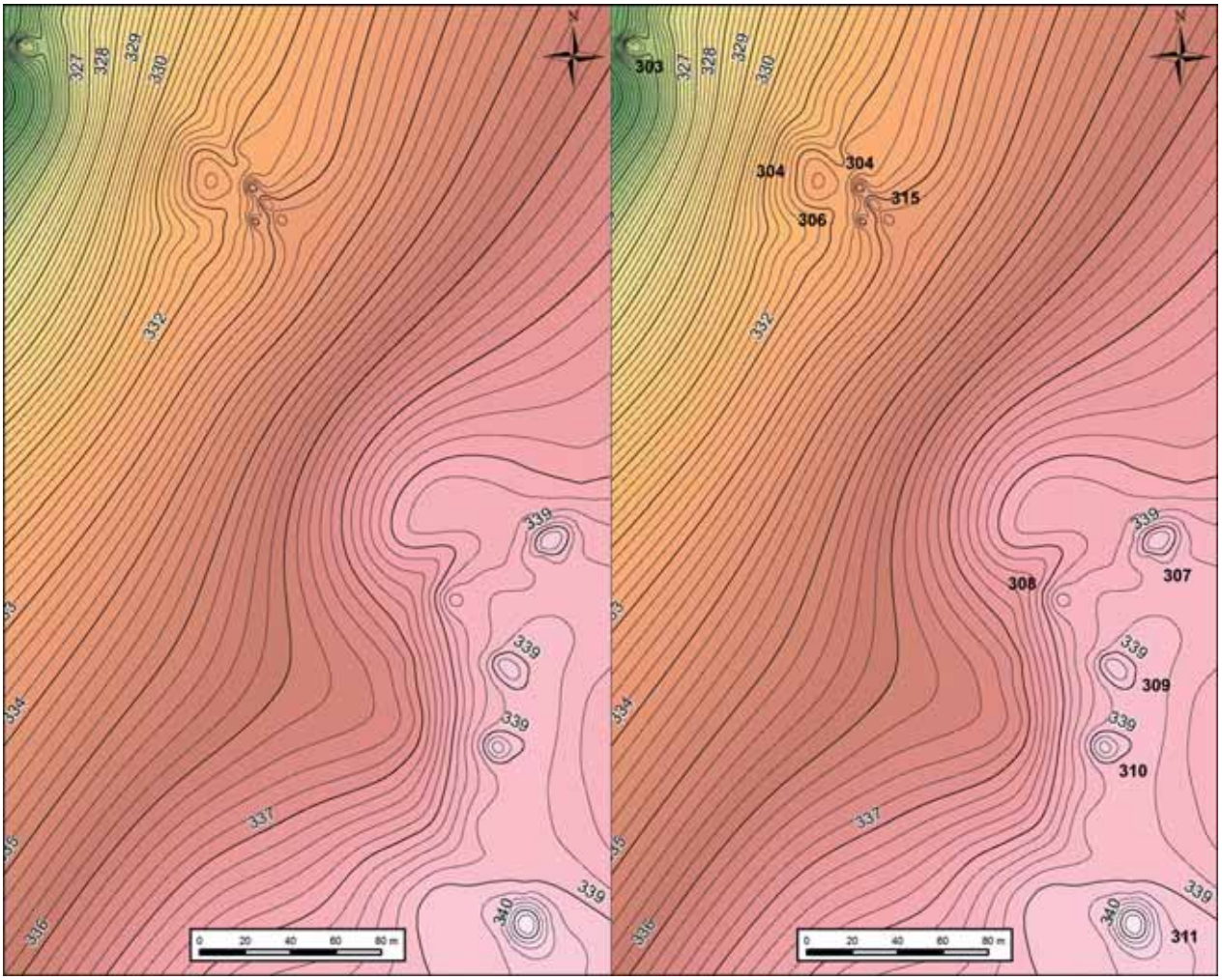



**Fig. IV.242, Fig. IV.243.** Central part of the southern group

prises three mounds (no. 316-318), that occur on a line of 55 m and 350 m SE to it there exists a group of five tumuli (no. 303-306 and 315) that spreads across a distance of 150 m. The following concentration of five mounds (no. 307-311) that creates a linear arrangement of 160 m long, was recorded 170 m SE from the above mentioned group. At a distance of 300 m SE the last group is located, which consists of three barrows (no. 312-314) on a length of 150 m.

**Barrow 303 (Fig. IV.244, Fig. IV.245)** was registered in the second group of the discussed concentration on its NW edge, 350 m SE of mound 316 and 110 m NW of tumulus 304, at 331 m.a.s.l. Geographical coordinates: N – 48°58'277", E – 24°55'793". Overgrown by trees and bushes. Circular in shape, 14 m in diameter, 0.6 m high.

**Fig. IV.244.** Barrow 303. View from the SE

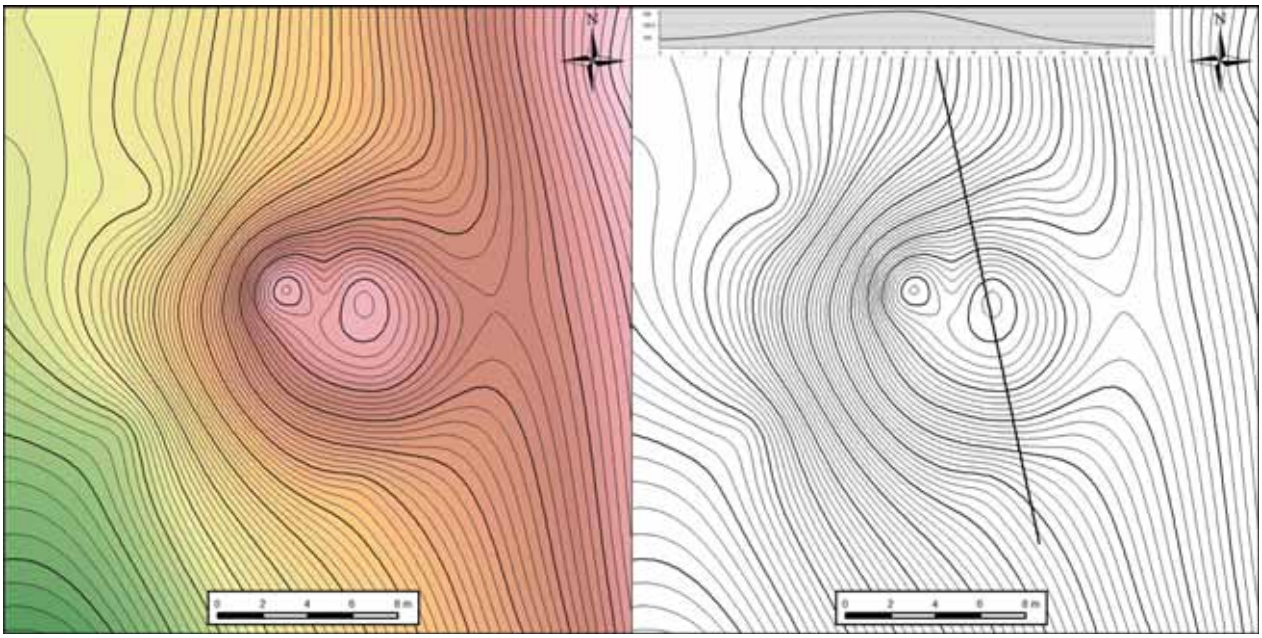


**Fig. IV.245.** Barrow 303. Hypsometric plan and cross-section

**Barrow 304 (Fig. IV.246, Fig. IV.247)** was documented at a distance of 110 m SE of mound 303 inside the minor concentration of four tumuli (305, 306 and 315). It is located 25 m NW of mound 305, at 332 m.a.s.l. Geographical coordinates: N – 48°58'247", E – 24°55'873". Overgrown by trees and bushes. Circular in shape, 8 m in diameter, 0.3 m high.

**Fig. IV.246.** Barrow 304. View from the SW

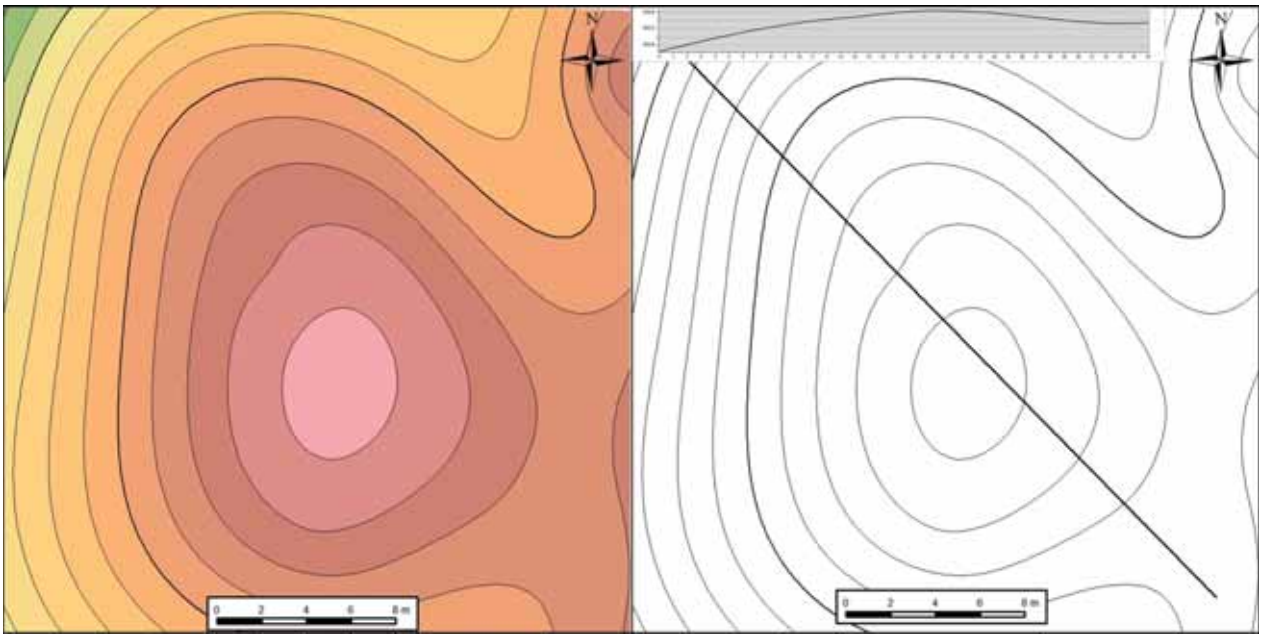


**Fig. IV.247.** Barrow 304. Hypsometric plan and cross-section

**Barrow 305 (Fig. IV.248, Fig. IV.249)** was erected on the north-eastern edge of the second concentration of monuments, 25 m SE of tumulus 304 and 14 m SW of mound 315, at 332 m.a.s.l. Geographical coordinates: N – 48°58'239", E – 24°55'885". Overgrown by trees and bushes. Circular in shape, 8 m in diameter, 0.4 m high.

**Fig. IV.248.** Barrow 305. View from the NE

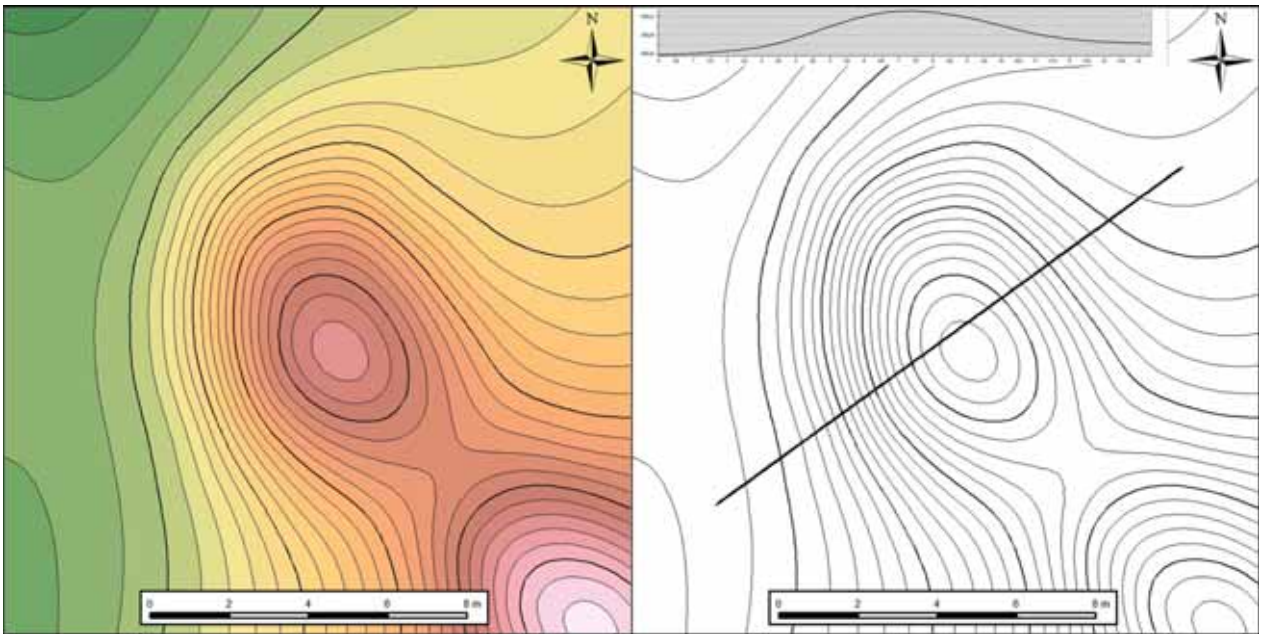



**Fig. IV.249.** Barrow 305. Hypsometric plan and cross-section

**Barrow 306 (Fig. IV.250, Fig. IV.251)** is situated near three other mounds (305, 306 and 315), 18 m southwards to tumulus 305 and 25 m SW from 315, at 332.5 m.a.s.l. Geographical coordinates: N – 48°58'231", E – 24°55'884". Overgrown by trees and bushes. Circular in shape, 8 m in diameter, 0.4 m high.

**Fig. IV.250.** Barrow 306. View from the NE

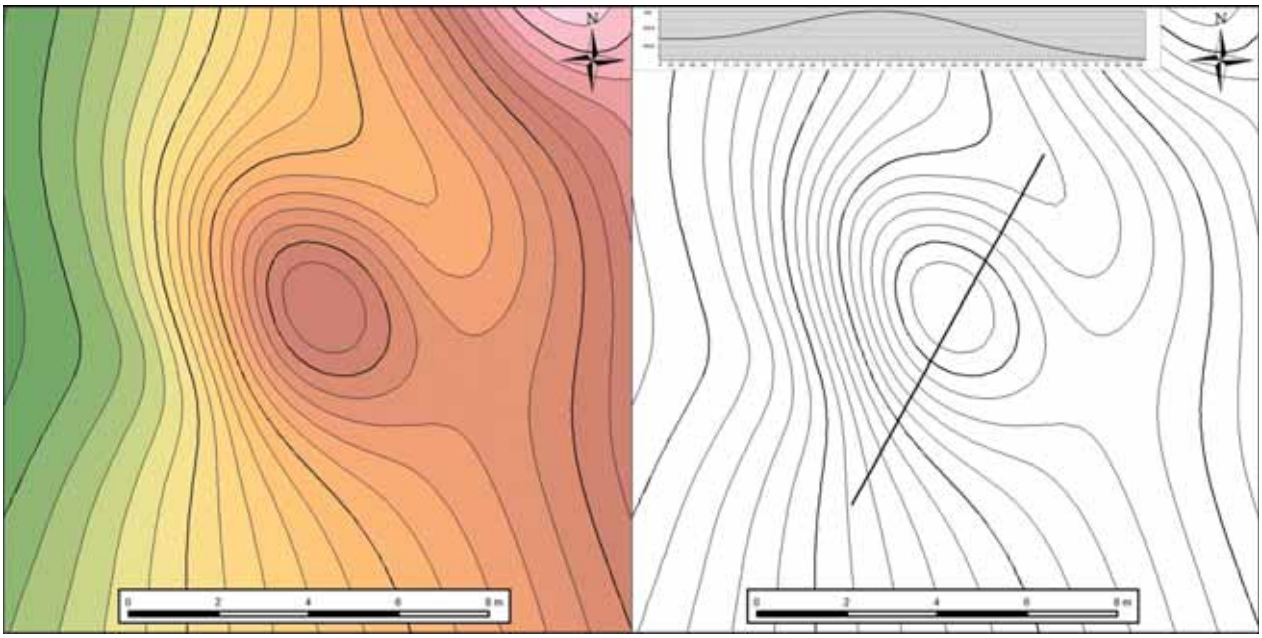


**Fig. IV.251.** Barrow 306. Hypsometric plan and cross-section

**Barrow 307 (Fig. IV.252, Fig. IV.253)** is located on the north-eastern edge of the third group of mounds, 55 m NE of tumulus 308 and 67 m in the same direction of barrow 309, at 338.5 m.a.s.l. Geographical coordinates: N – 48°58'165", E – 24°55'001". Overgrown by trees. Circular in shape, 20 m in diameter, 0.4 m high.

**Fig. IV.252.** Barrow 307. View from the SW

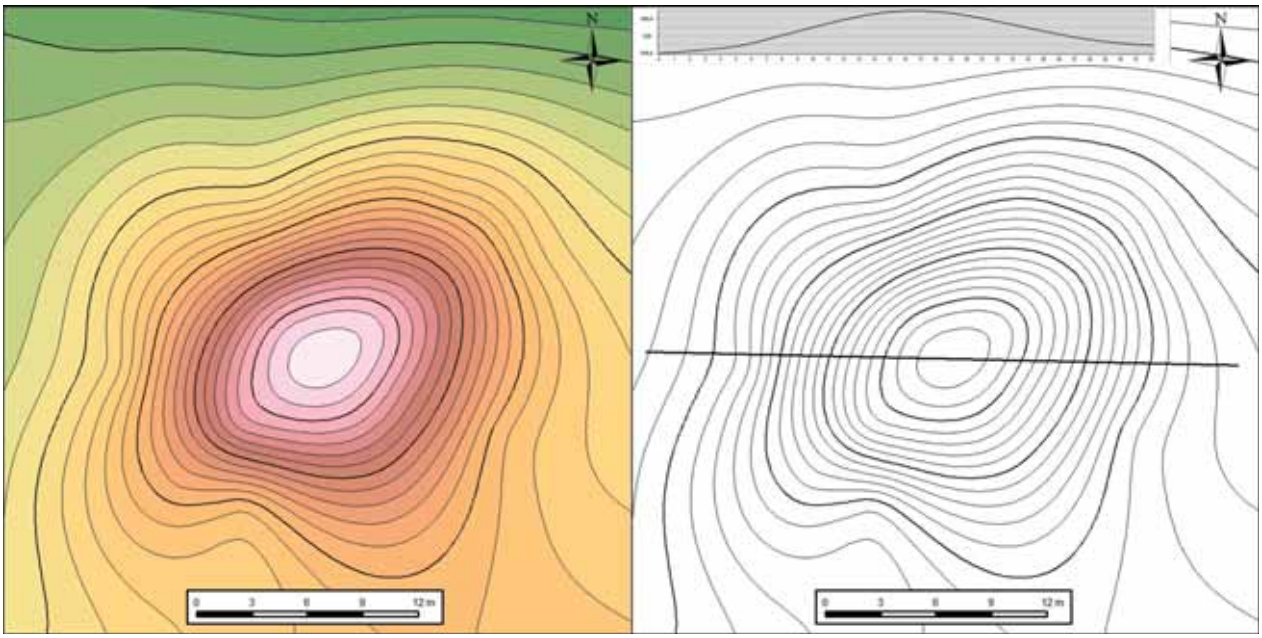



**Fig. IV.253.** Barrow 307. Hypsometric plan and cross-section

**Barrow 308 (Fig. IV.254, Fig. IV.255)** is situated on the north-western edge of the third group of mounds, 55 m SW of tumulus 307 and 45 m NW of monument 309, at 338.5 m.a.s.l. Geographical coordinates: N – 48°58'152", E – 24°55'956". Overgrown by trees. Circular in shape, 15 m in diameter, 0.3 m high.

**Fig. IV.254.** Barrow 308. View from the NW

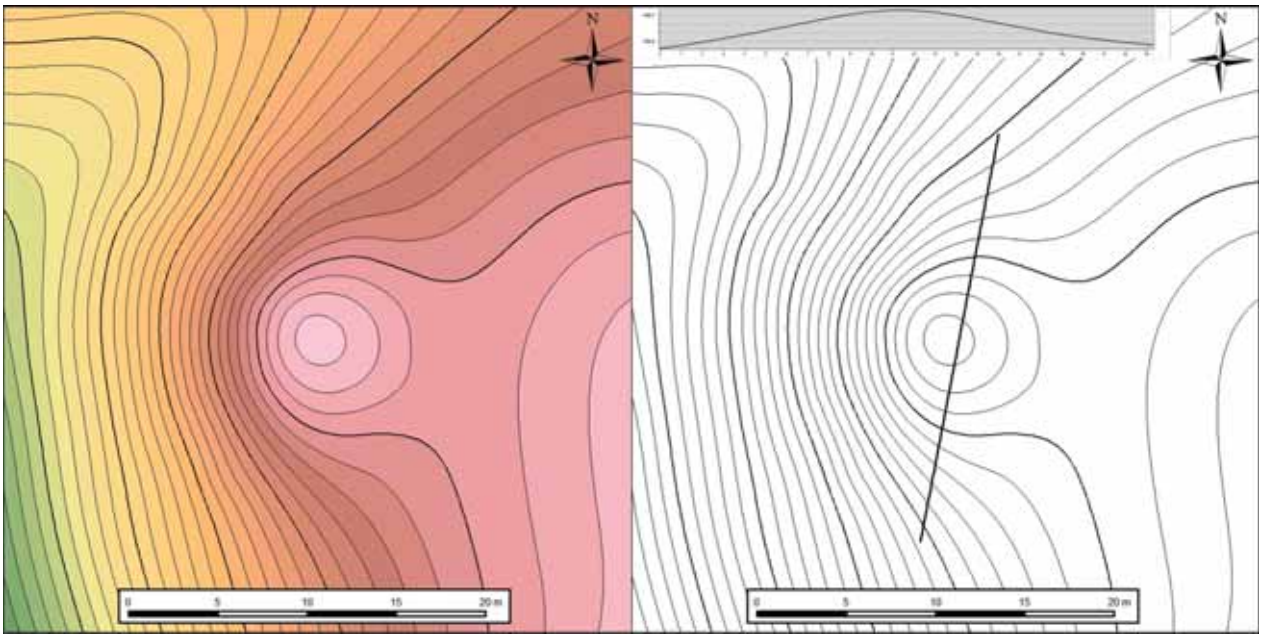



**Fig. IV.255.** Barrow 308. Hypsometric plan and cross-section

**Barrow 309 (Fig. IV.256, Fig. IV.257)** is situated in the centre of the third group of mounds, 45 m SE of monument 308, at 338 m.a.s.l. Geographical coordinates: N – 48 58'136", E – 024 55'981". Overgrown by trees. Circular in shape, 14 m in diameter, 0.4 m high.

**Fig. IV.256.** Barrow 309. View from the N

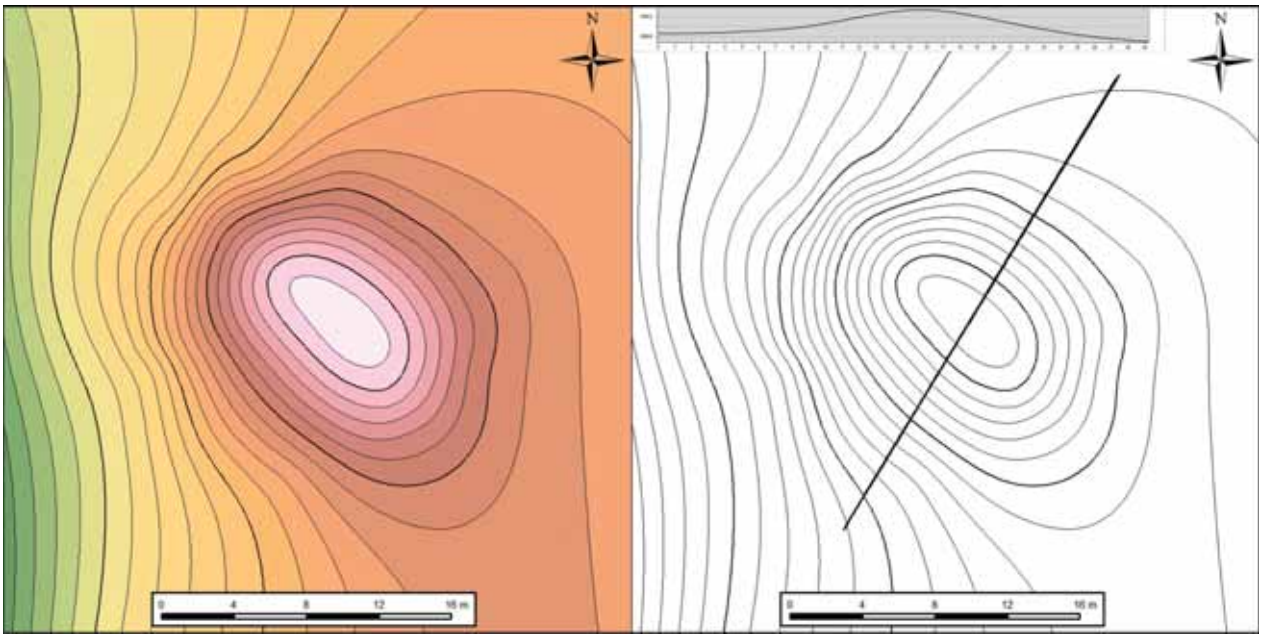



**Fig. IV.257.** Barrow 309. Hypsometric plan and cross-section

**Barrow 310 (Fig. IV.258, Fig. IV.259)** was recorded in the southern part of the group comprising three mounds, 40 m southwards to the tumulus 309, at 338.5 m.a.s.l. Geographical coordinates: N – 48°58'116", E – 24°55'979". Overgrown by trees and bushes. Circular in shape, 16 m in diameter, 0.4 m high.

**Fig. IV.258.** Barrow 310. View from the NE

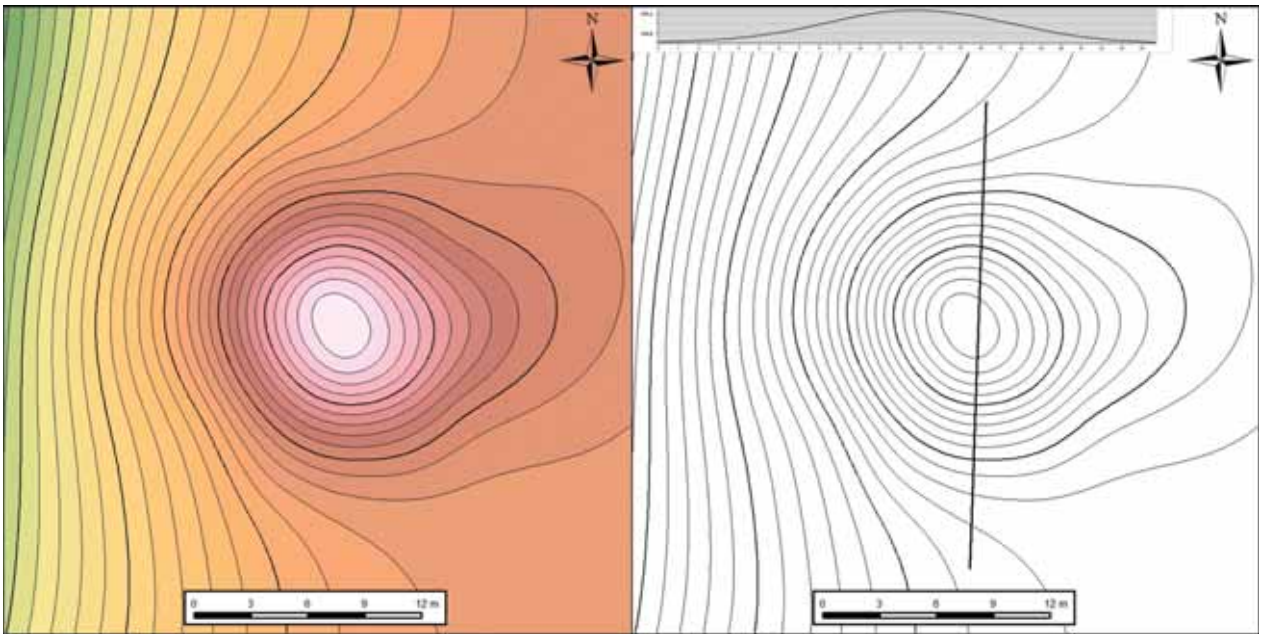



**Fig. IV.259.** Barrow 310. Hypsometric plan and cross-section

**Barrow 311 (Fig. IV.260, Fig. IV.261)** was documented on the southern edge of the third group, on a deforested area, 80 m SE of tumulus 310, at 337 m.a.s.l. Geographical coordinates: N – 48°58'073", E – 24°55'997". Circular in shape, 20 m in diameter, 1.6 m high.

**Fig. IV.260.** Barrow 311. View from the W

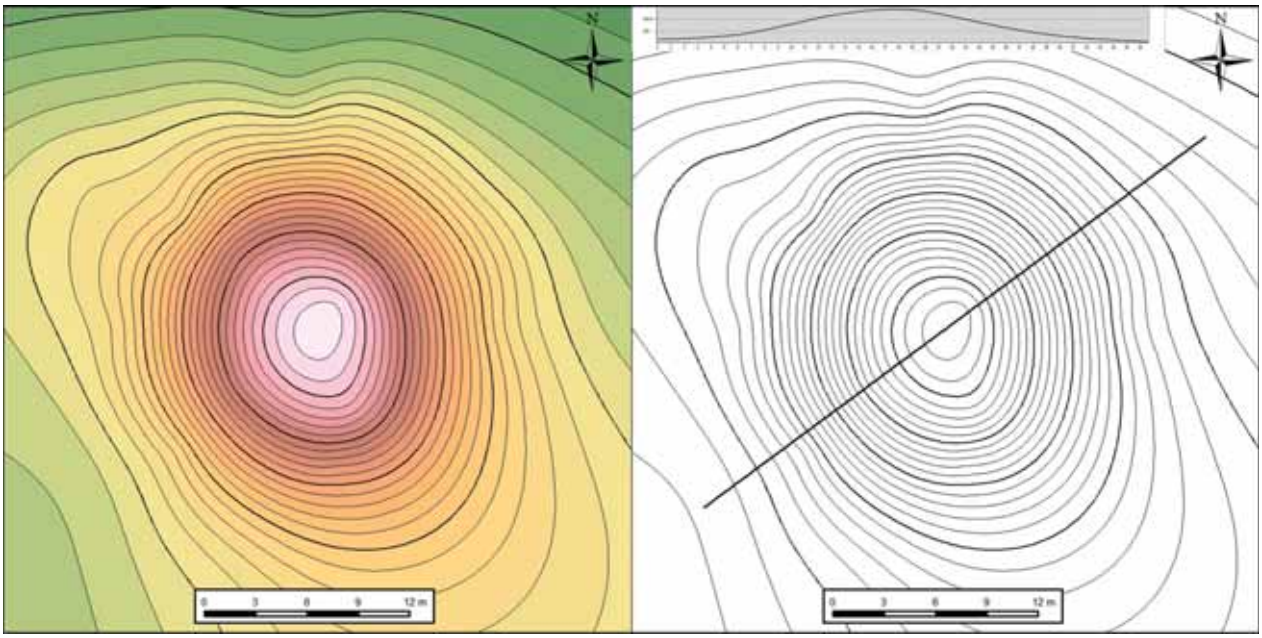


**Fig. IV.261.** Barrow 311. Hypsometric plan and cross-section

**Barrow 312 (Fig. IV.262, Fig. IV.263)** was erected on the north-western edge of the fourth group, 50 m NW of mound 313, at 331.5 m.a.s.l. Geographical coordinates: N – 48°58'918", E – 24°55'042". Overgrown by trees and bushes. Circular in shape, 10 m in diameter, 0.1 m high.

**Fig. IV.262.** Barrow 312. View from the N

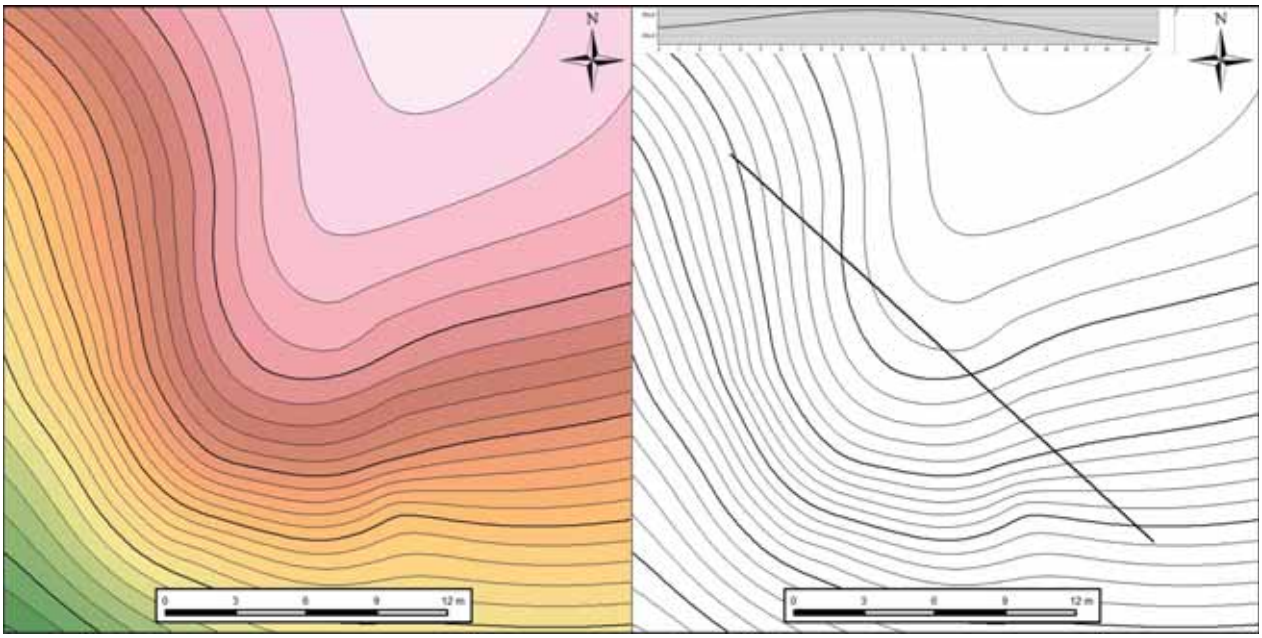



**Fig. IV.263.** Barrow 312. Hypsometric plan and cross-section

**Barrow 313 (Fig. IV.264, Fig. IV.265)** is located in the central part of the fourth group, on a deforested area, 50 m SE of tumulus 312 and 100 m NW of barrow 314, at 330 m.a.s.l. Geographical coordinates: N – 48°58'894", E – 24°55'064". Circular in shape, 16 m in diameter, 0.8 m high.

**Fig. IV.264.** Barrow 313. View from the W

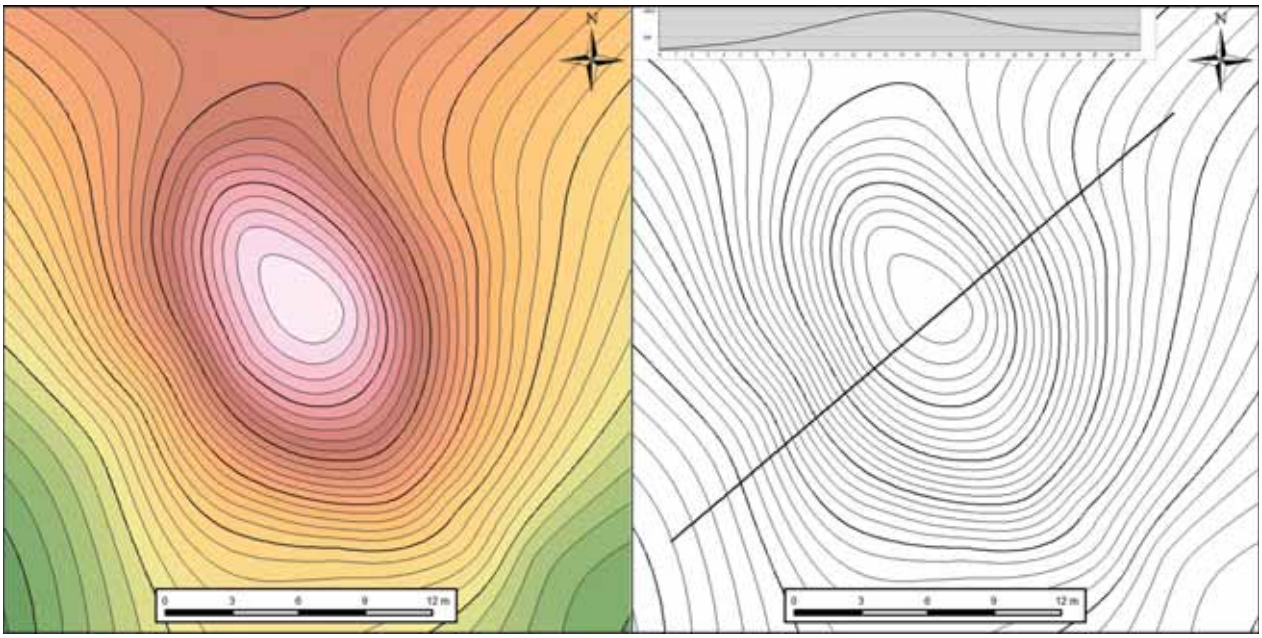



**Fig. IV.265.** Barrow 313. Hypsometric plan and cross-section

**Barrow 314 (Fig. IV.266, Fig. IV.267)** is situated on the south-western edge of the fourth group, on a deforested area, 100 m SE of tumulus 313, at 327.5 m.a.s.l. Geographical coordinates: N – 48°58'843", E – 24°55'089". Overgrown by trees and bushes. Circular in shape, 9 m in diameter, 1.8 m high.

**Fig. IV.266.** Barrow 314. View from the SW

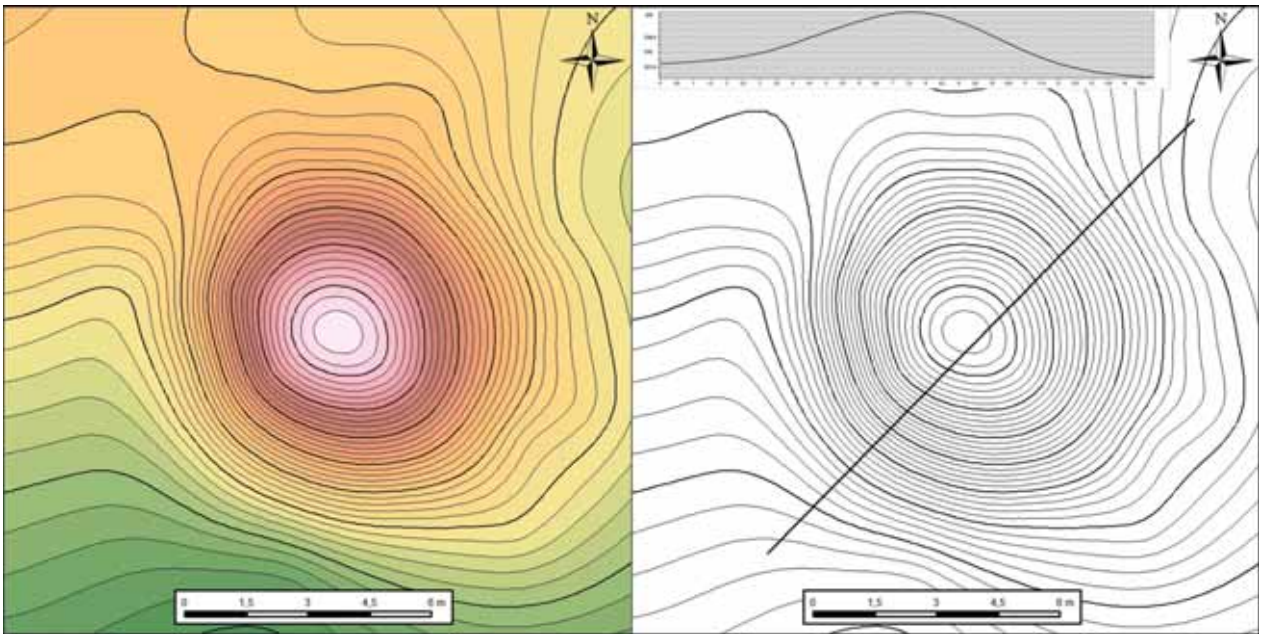



**Fig. IV.267.** Barrow 314. Hypsometric plan and cross-section

**Barrow 315 (Fig. IV.268, Fig. IV.269)** was recorded near three other mounds (304, 305, 306), 14 m NE of monument 305 and 25 m NE of mound 306, at 333 m.a.s.l. Geographical coordinates: N – 48°58'242", E – 24°55'894". Overgrown by trees and bushes. Circular in shape, 7 m in diameter, 1.1 m high.

**Fig. IV.268.** Barrow 315. View from the SW

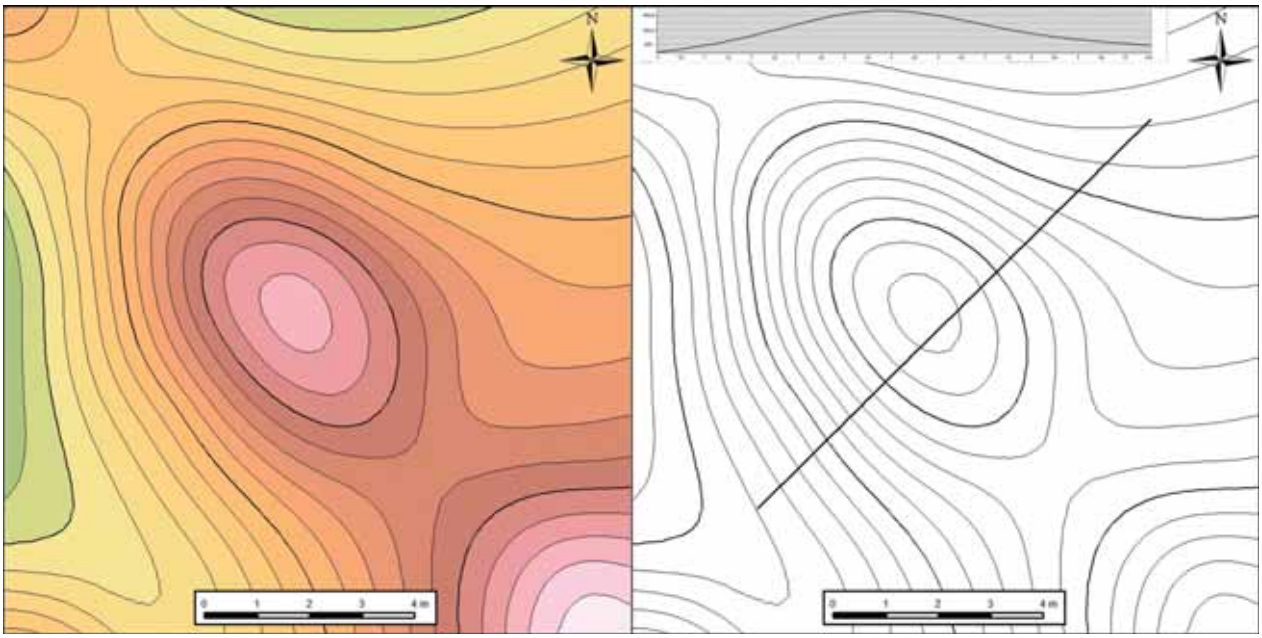


**Fig. IV.269.** Barrow 315. Hypsometric plan and cross-section

**Barrow 316 (Fig. IV.270, Fig. IV.271)** is located on the southern edge of the group, comprising three mounds (together with no. 317 and 318), situated most northwards inside the main grouping. It was documented on a deforested area, 35 m southwards to mound 317, at 326.5 m.a.s.l. Geographical coordinates: N – 48°58'439", E – 24°55'661". The mounds is destroyed by numerous mole holes. Circular in shape, 11 m in diameter, 0.3 m high.

**Fig. IV.270.** Barrow 316. View from the SE

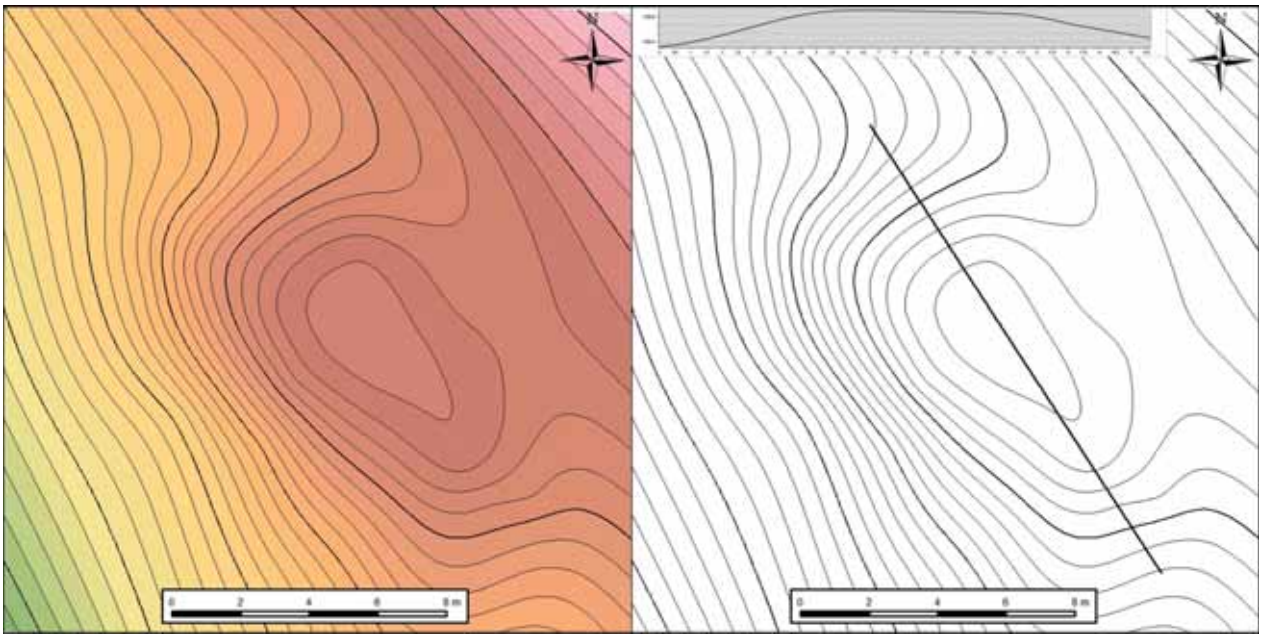


**Fig. IV.271.** Barrow 316. Hypsometric plan and cross-section

**Barrow 317 (Fig. IV.272, Fig. IV.273)** was erected in the central part of the group of three mounds that is located most northwards within the discussed main grouping. It is situated on a deforested area between tumuli 317 and 319 at a distance of 35 m northwards to barrow 316. Elevated at 327,5 m.a.s.l. Geographical coordinates: N – 48°58'459", E – 24°55'661". The mounds are destroyed by numerous mole holes. Circular in shape, 11 m in diameter, 0.3 m high.

**Fig. IV.272.** Barrow 317. View from the S

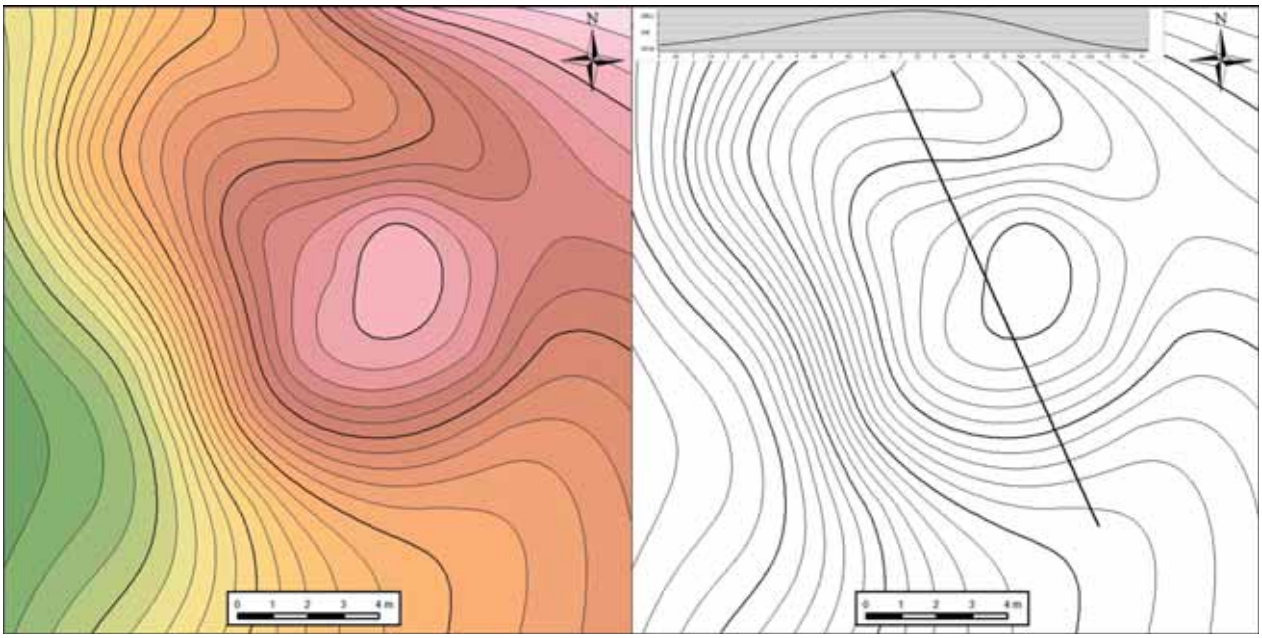



**Fig. IV.273.** Barrow 317. Hypsometric plan and cross-section

**Barrow 318 (Fig. IV.274, Fig. IV.275)** is located on the north-western edge of the group comprising three mounds situated most northwards within the discussed main grouping. The tumulus lies on a deforested area, 20 m NW of mound 317, at 327.5 m.a.s.l. Geographical coordinates: N – 48°58'466", E – 24°55'656". The mound is destroyed by numerous mole holes. Circular in shape, 9 m in diameter, 0.2 m high.

**Fig. IV.274.** Barrow 318. View from the S

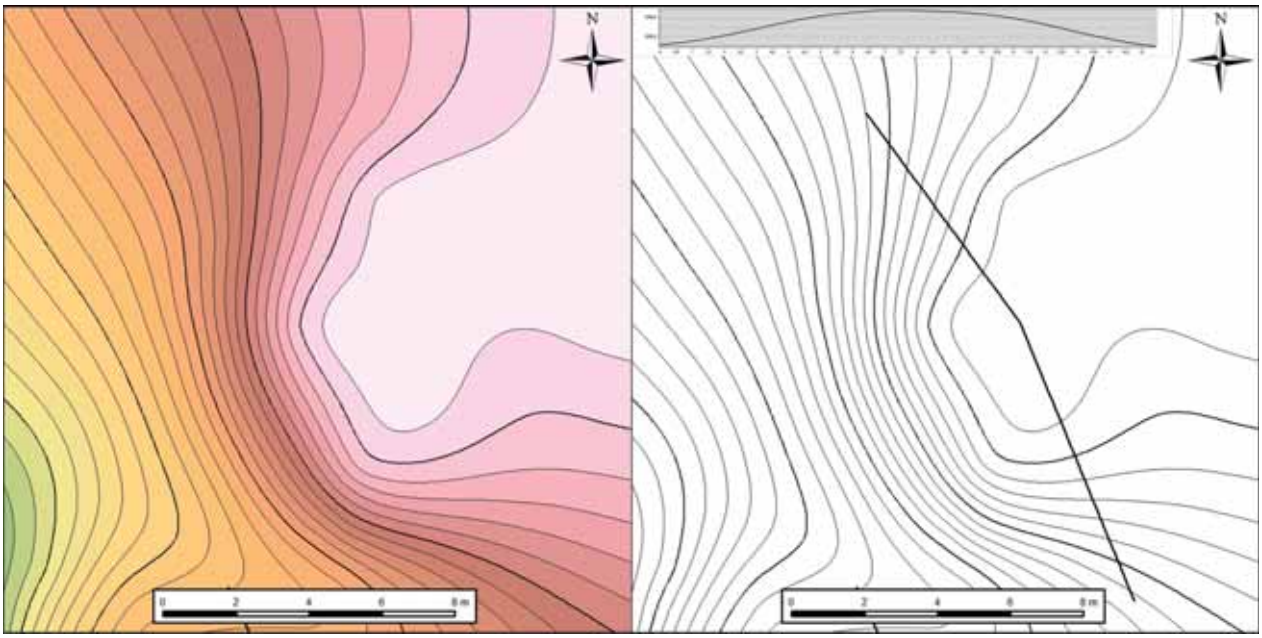



**Fig. IV.275.** Barrow 318. Hypsometric plan and cross-section

## C. Geophysical survey in Bukivna

In April 2013 the Upper Dniester expedition of Adam Mickiewicz University for the first time conducted a geophyscial survey by the magnetometric method on the cemetery in Bukivna. At the time of the prospection over 60 barrows, located within several concentrations, were known to exist at the site. The survey started with barrow group I being subjected to measurements. Monuments are characterized by a mostly good state of preservation and their embankments reach *circa* 20 m in diameter and 1.5 m in height. Nonetheless, some of them possess trenches or dig-ins situated at their middle sections, resulting from amateurish excavations and attempts to loot the grave inventories. The entire cluster takes the form of a row of barrows, stretching approximately along the N – S axis, with varied distances separating individual mounds.

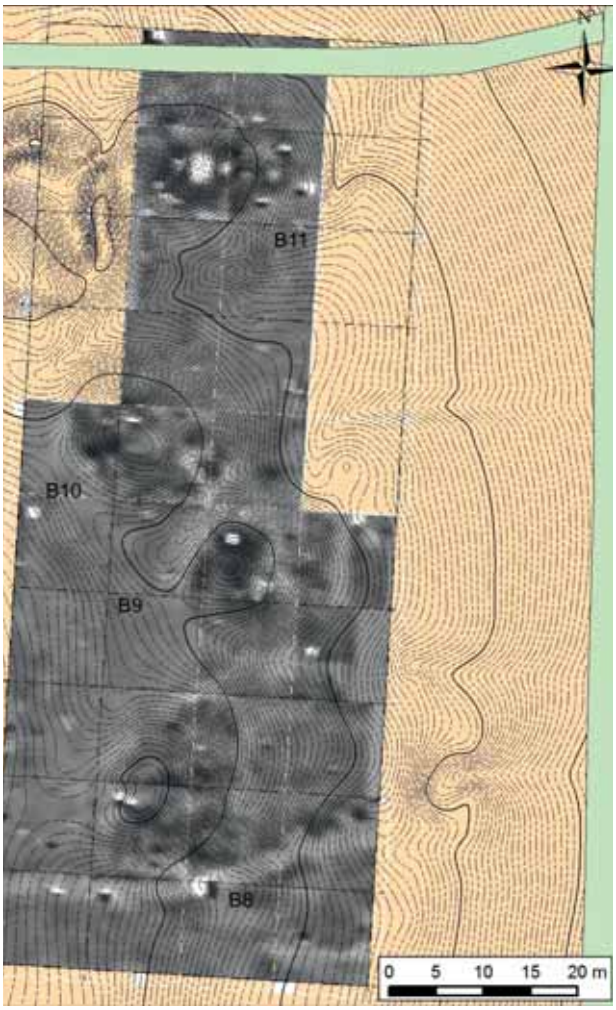



**Fig. IV.276.** Barrow group I. First measured area against the hypsometric plan

The survey area of 0.43 ha was divided into three measuring areas, adjusted in terms of dimensions and shape to local conditions, including the terrain's relief, vegetation cover and degree of concentration of the tumuli. In almost every case, prospection was conducted within the framework of grids with dimensions of 10 × 10 m each. Only once did complete deforestation of the mound's embankment, as well as its relatively small size, allow for the establishment of a single grid with 20 × 20 m dimensions. The first measured surface comprised 31 grids (0.31 ha) and covered southern part of the I barrows' group (barrows no. 8-11) (**Fig. IV.276**). Another grid (20 × 20 m; 0.04 ha) was placed over an individual barrow (no. 16) belonging to the same group, but distanced from the rest in a northern direction. Finally, eight grids (10 × 10 m; 0.08 ha) were established to include a so-called "double barrow", comprising two sepulchral objects (no. 6 and 7) connected by their embankments, in the vicinity which is located yet another mound (no. 18), only discerned thanks to the conducted survey (**Fig. IV.277**).

The survey in the southern part of the discussed group included four monuments (no. 8-11), previously unexplored by archaeologists (**Fig. IV.278, Fig. IV.279**). Most of them exhibit a considerable size and good state of preservation, apart from barrow no. 11, which has a large trench in the central part, stemming from old excavations. Yet, the whole area is overgrown by tall trees with thick trunks, hence frequently it was necessary to skip some measurements or even entire transects, which is visible as strips of light grey colour running along a N – S axis. On the resulting image barrows are well visible, thanks to the contrast of magnetic field gradient registered over them and in their vicinity. In comparison with the context, generally characterized by values of gradient near 0nT, all four mounds reveal a more diversified level of magnetisation. Their spatial extent can be delimited by irregularly shaped halos of negative responses which encircle zones of usually increased magnetisation. Irregularities of contours may possibly be a result of the barrows levelling throughout the years, in the course of which soil from the upper layers was slipping aside and depositing at the feet of embankments. Within these zones one can discern positive and negative peaks, stemming from different features, however mostly indicating induced magnetisation. These peaks sometimes possess extensive dimensions and predominantly have irregular outlines. Beside them are present strong dipolar signals, sometimes abnormally polarised, which are definitely attributable to residual magnetisation. In the light of

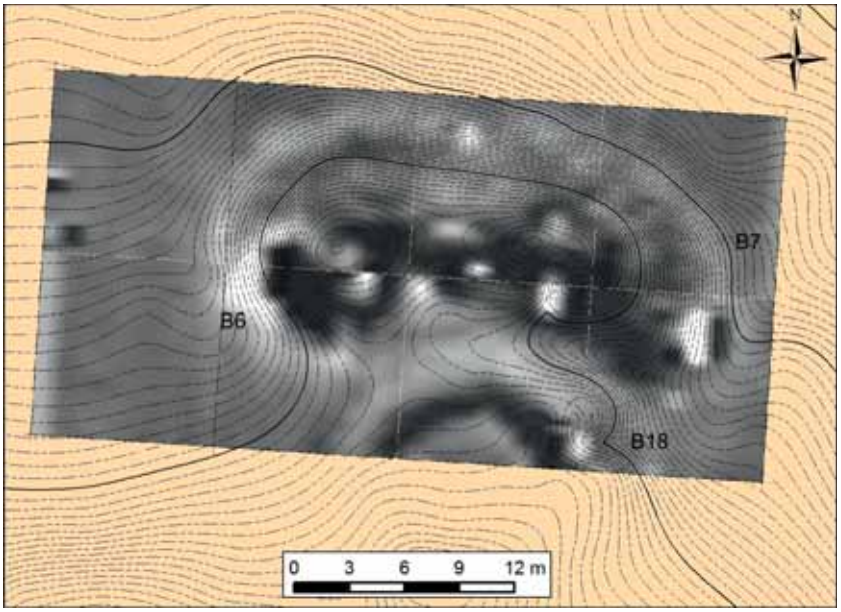
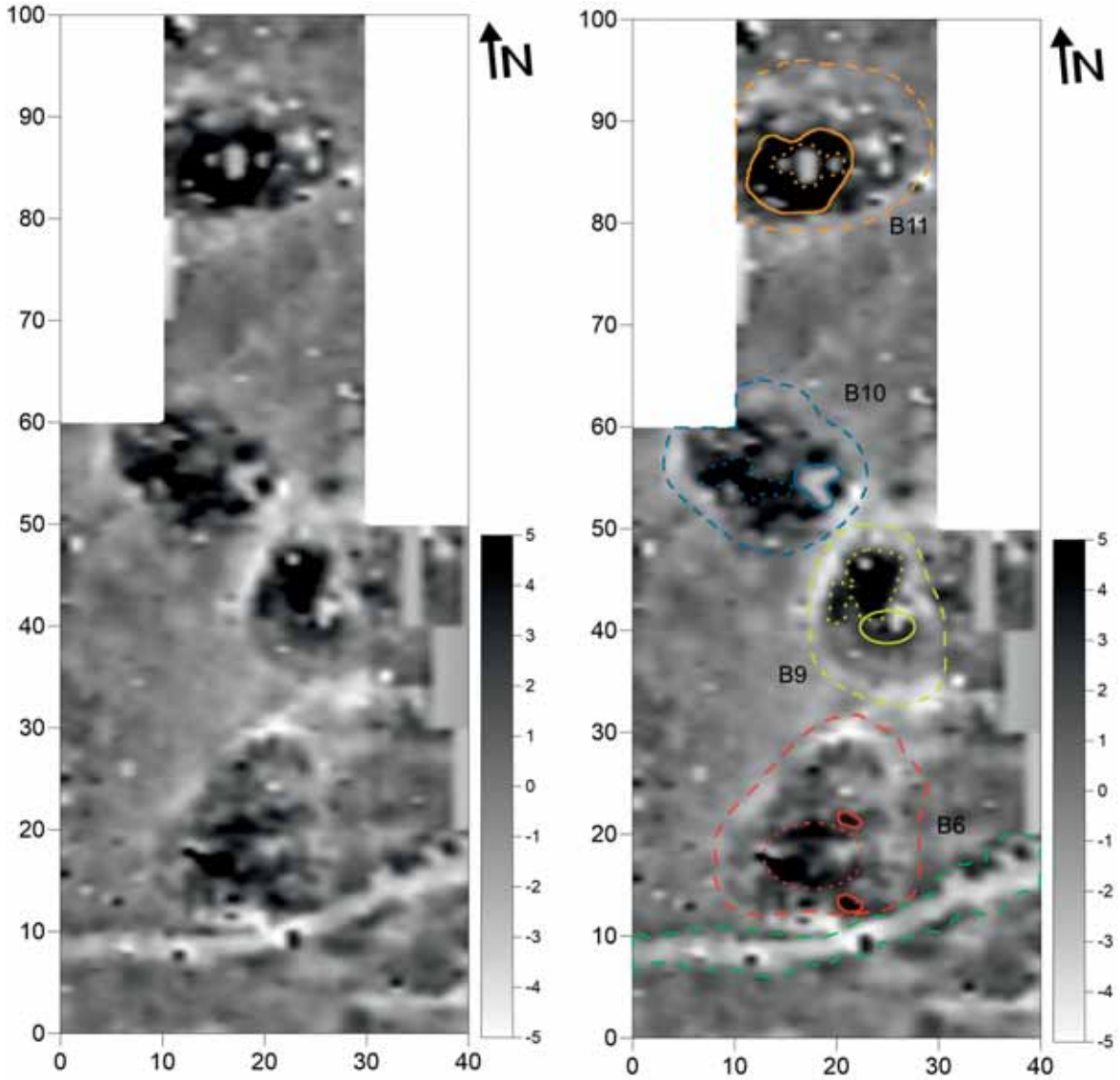



**Fig. IV.277.** Barrow group I. Third measured area against the hypsometric plan



recent forest works that took place at the site in order to cut down part of the trees, as well as the XX century history of this place which saw fighting between Hungarian and Soviet troops during the Second World War, one can infer that aforementioned anomalies are emitted by modern iron objects. This interpretation is based on pieces of machines, nails and bullet shells, frequently appearing on the surface.

Beginning the detailed description of the mounds from the southernmost part, one can discern a linear anomaly in the form of a strip of negative responses, extending roughly from W to E with slight deviation to NE (Fig. IV.279). Apparently, in this place, the soil has a lowered magnetic susceptibility, perhaps due to the removal of the uppermost layer. Also, the presence of several dipolar signals, located within the limits of the latter anomaly, should not be missed. In fact during the survey participants could notice a shallow, 1 m wide ditch, that potentially may be a residue of a WW2 trench.

Immediately N from this feature is located barrow no. 8, which is characterized by a well visible, negatively magnetised outline and quite diversified centre with several positive peaks of magnetisation (Fig. IV.278, Fig. IV.279). Among the latter, the largest two are situated nearby each other in the central section. They are slightly elongated in a W direction and occupy a roughly oval area with a diameter ranging from 1 to 2 m. Their intensive magnetisation may indicate that material rich in iron oxides was deposited in these places, however proper description of the anomalies' sources requires more detailed investigation. Slightly E from them is a discernible negative peak of magnetisation that has a corresponding, but a little unclear, positive maximum at its southern side. Together, these three signals correspond with the climax of embankment (Fig. IV.276) and may be treated as central features of the barrow's construction. Other, mostly positive peaks surround the middle part. Two among them, neighbouring with centrally located anomalies from the S and N, exhibit oval shapes and values reaching *circa* 4-5nT. Perhaps, they should also be considered as residues of the mound's internal features, e.g. pits with a magnetically susceptible content.

The next barrow, designated with no. 9, is located less than 5 m NE from the latter and has a similar bright outline, indicating a negative magnetisation at its foot (Fig. IV.278, Fig. IV.279). This approximately oval anomaly is encloses a zone characterised by a diversified level of magnetisation. Within its limits is situated an extensive, but irregularly outlined spot,

**Fig. IV.278** (left). Resulting image of magnetometric prospection of barrows no. 8-11 belonging to barrow group I on the cemetery in Bukivna (gradiometer Bartington Fluxgate Grad 601-1; measuring grid: 10 × 10 m; sampling density per transect spacing: 0.5 × 1 m, interpolated up to 0.25 × 0,5 m; real values of magnetic field gradient compressed in greyscale to the range -5 – +5nT)

**Fig. IV.279** (right). Resulting image of magnetometric prospection of barrows no. 8-11 belonging to the barrow group I on the cemetery in Bukivna with highlighted anomalies discussed in the text.

--- approximate spatial extent of negative anomaly indicating outer limits of barrow no. 8
··· approximate spatial extents of normally polarised anomalies, overlapping the climax of embankment and potentially indicating internal features of barrow no. 8
— approximate spatial extents of two positive anomalies, surrounding the central part of embankment and potentially indicating internal features of barrow no. 8
--- approximate spatial extent of negative anomaly indicating outer limits of barrow no. 9
··· approximate spatial extent of the large, positive anomaly, overlapping the climax of embankment and potentially indicating an internal feature of barrow no. 9
— approximate spatial extents of normally polarised anomaly, potentially indicating internal features of barrow no. 9
--- approximate spatial extent of negative anomaly, indicating outer limits of barrow no. 10
··· approximate spatial extent of negative anomaly, potentially indicating an internal feature of barrow no. 10
— approximate spatial extent of positive anomaly, potentially indicating an internal feature of barrow no. 10
--- approximate spatial extent of negative anomaly indicating outer limits of barrow no. 11
··· approximate spatial extent of positive anomaly, potentially indicating an internal feature of barrow no. 11
— approximate spatial extent of negative anomaly, indicating centrally located trench, left after excavations
--- approximate spatial extent of linear anomaly, presumably indicating a ditch passing through the site (potentially former WWII trench)

spreading from the centre in a northern direction, where values reach positive maximum. Its potential sources can involve material with increased magnetic susceptibility, perhaps due to combustion, that afterwards was unevenly layered under the outer mantle of the barrow. Most probably this anomaly should be considered as a residue of the former structural element of the barrow, as no traces of destruction were revealed at that place. Furthermore, southwards from the aforementioned signal is located another anomaly with normal orientation of dipoles (negative peak was not registered in its entirety due to a tree forcing omission of few measurements) and values slightly below maximal levels of the gradient. Due to a similar intensity and structure of magnetisation, it seems possible that the described anomaly, with a roughly circular contour, has a related source as the centrally placed signal from barrow no. 8. In the case of barrow no. 9, the discussed anomaly is surrounded from W, S and E by a rim unified in terms of magnetisation degree and undisturbed by other factors, overlapping with the barrow's outer mantle. Moreover, the barrow on the resulting figure seems to have the most compact image and clearly outlined borders, when compared with other mounds.

The third analysed mound belonging to the group (no. 10) is located further NW from the one previously described (Fig. IV.278, Fig. IV.279). It can be distinguished by a zone of a generally higher level of magnetisation in comparison to the context, encompassing a large positive peak situated somewhat W from the barrow's centre (Fig. IV.276). Unfortunately, it was impossible to capture the mound in its entirety, due to the dense vegetation preventing the measurement of the far NW section. Spatial limits of the discussed mound are less clearly defined than in the two, already presented cases, however a lower magnetisation halo is still surrounding its inner part. Negative responses are best represented in the easternmost section, where they eventually create a peak at the verge of the embankment. This maximum corresponds in its orientation and size with the opposite positive peak. Hence, the barrow can be described as including two large internal features, yet characterized by different magnetic susceptibility. Between them one can see intermingled high and low signals, resulting from rapid changes in the gradient, however not forming any clearly defined shapes. Thus, it is difficult to provide any detailed characteristic of the barrow. Possibly this may reflect a complex underground structure, but might just as well stem from a disturbance caused by various post-depositional factors.

The fourth, and ultimately surveyed tumulus belonging to the group (no. 11), is located near the northern edge of the measured surface (Fig. IV.278, Fig. IV.279). It prominently contrasts with the context, mostly due to the extensive zone of high magnetisation, inside of which are located three parallel, negative peaks. Among all four barrows, this one has the highest embankment that could not be measured entirely, as the trees were densely overgrowing its W part. Nonetheless, the edges of the remaining parts were effectively captured on the resulting image as a thin strip of slightly lowered responses, immediately followed by high values in S and E sections and a large zone of negative values embracing the barrow's centre from the N. The mound is characterized by a significantly diversified level of magnetisation in comparison to the rather evenly magnetised context, especially visible on the S side.

Within the borders of the embankment there are present frequent strong signals, of which the previously mentioned three parallel, negative anomalies stand out the most. In fact, they are emitted by a deep trench, now partly filled with soil, that was left most probably after amateurish excavations. Moreover, the anomalies emitted by the embankment are overlapped by many dipolar signals, most probably of modern origin. On the other hand, the large zone of positive magnetisation in the centre can be attributed to a feature located under an earthen mantle and filled with content characterized by a higher magnetic susceptibility, possibly of a similar type as in the case of barrow no. 9. Along the verge of barrow no. 11 there are situated frequent monopolar, negative maxima, particularly pronounced on the N side of the embankment. This zone stands in contrast to the S and E sections, where the magnetic field gradient indicates predominantly values above 0nT with locally occurring dipolar signals, probably representing a ferrous material of modern origin. Consequently, the barrow seems to be composed of materials with different magnetic responses, with magnetically susceptible layers located more to the S and those insusceptible to the N of the centre, thus making an impression of big dipolar anomaly. It would be interesting to inspect its interior by means of drilling or test excavations.

The subsequently surveyed barrow (no. 16) is located in the middle section of group I. It was unknown to archaeologists up to season 2014, when the aforementioned complete deforestation in this part of the site revealed a low, but visibly circular embankment that is arranged in a line with other mounds. Its height can be estimated at 0.5 m, while its diameter

does not exceed 12-14 m. No traces of trenches left after excavations or other types of damages where noted in this place. Magnetometric prospection managed to efficiently capture the changes of magnetic field gradient over the barrow and in its closest vicinity (**Fig. IV.280**). Hence, the resulting image depicts clearly distinguishable anomalies that can be attributed to the mound and rather intermingled signals with varying intensity of magnetisation that belong to the context. The embankment can be delimited by a roughly circular anomaly, comprising values around and below 0nT that covers most of its spatial extent (**Fig. IV.281**).

Outside the area overlapped by this anomaly, the gradient points to a positive degree of magnetisation with occasionally appearing peaks. The latter, as well as a generally high level of magnetisation of the context may be explained by recent deforestation that also affected the top soil, thus leading to changes of magnetic susceptibility and distortion of magnetic background of the tumulus. Why the barrow retained its quite even magnetisation despite this event is puzzling, but clearly its magnetic properties differ from those characteristic for the surrounding area. Furthermore, the survey revealed an extensive, roughly crescent-shaped maximum of positive magnetisation that covers the S and W parts of the barrow's internal side. It surrounds the central point of the previously described negative anomaly, where values create a small peak reaching -5nT. The large positive signal distinguishes itself from the uniform magnetisation of the mound's remaining parts and can be attributed to a layer of material with significantly increased magnetic susceptibility, perhaps belonging to a former grave structure. Apart from anomalies presumably connected with the barrow's internal structure, one can discern also dipolar signals, most probably indicating modern iron objects, among which the one located E from the embankment's centre is most prominent.

The third measuring area was established about 50 m north from the previously described mound, over a large "double barrow" with a characteristic kidney shape and two climaxes. At the present stage of knowledge it is difficult to decide, whether this landform should be regarded as a single sepulchral object or one comprising two mounds that were closely erected and connected with a single embankment, on purpose or due to post-depositional factors. The presence of two, roughly circular climaxes (Fig. IV.277) argues for the latter interpretation, hence the term "double barrow" consisting of mounds designated

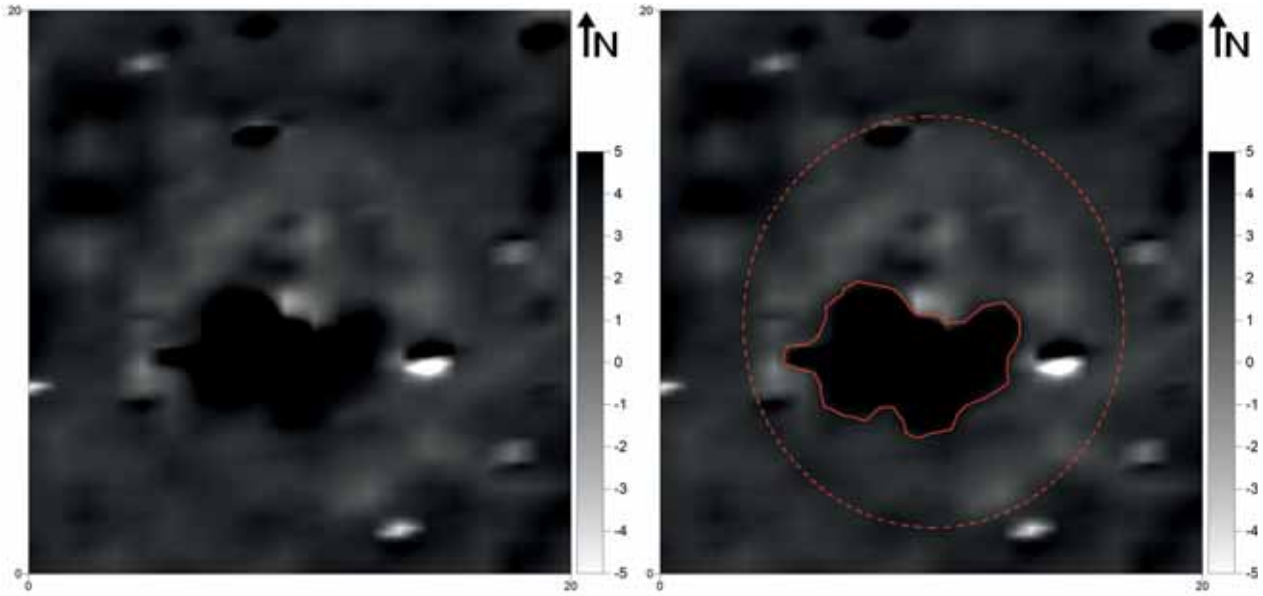



**Fig. IV.280** (left). Resulting image of magnetometric prospection of barrow no. 16 belonging to barrow group I on the cemetery in Bukivna (see Fig. IV.278, measuring grid: 20 × 20 m)

**Fig. IV.281** (right). Resulting image of magnetometric prospection of barrow no. 16 belonging to barrow group I on the cemetery in Bukivna with highlighted anomalies discussed in the text.

--- approximate spatial extent of negative anomaly indicating embankment of barrow no. 16

— approximate spatial extent of positive anomaly, potentially indicating an internal feature of barrow no. 16

with no. 6 and 7. Nevertheless, the resulting image of magnetometry is not helpful enough to observe the division between these mounds on the basis of magnetic field anomalies (**Fig. IV.282**).

The outline of the "double barrow" is well visible on the basis of the strip of negative responses, corresponding with the shape of the embankment (**Fig. IV.283**). It encloses an area of much greater diversity of magnetic field in relation to evenly magnetised context, as visible in the westernmost and easternmost sections of surveyed area. Worthy of notice is the concentration of anomalies reaching a maxima of the gradient, distributed across a W – E axis, slightly closer to the southern edge of the embankment. Although due to the overlapping of magnetic fields they all seem to create a zone of increased magnetic response with few negative peaks inside, it is possible to discern several individual signals, presumably stemming from various sources (Fig. IV.283). At two opposite ends of the embankment there are located two distinctive signals, emitted by different underground features. The first, situated in the western part, takes the shape of an oval with dimensions of *circa* 6 × 3 m and is distinguishable through specific polarization with the positive peak surrounded by the negative. Although it does not resemble typical dipolar anomalies, the strength of response suggests thermo-remanent magnetisation. Potentially, it indicates an internal feature including burnt remains, placed under the western climax interpreted as barrow no. 7. At the eastern verge of the embankment there is situated a strong, abnormally polarized anomaly, potentially emitted by the concentration of iron oxides in the form of a metal object. The southern side of the ridge connecting the two climaxes is covered with maximal positive values of the gradient, indicating increased magnetic susceptibility of the material deposited there. Nonetheless, the picture is complicated by local occurring negative peaks. Thus it creates a problem; is the anomaly emitted by several independent, strongly magnetised objects, but overlapping with signals, or does it stem from one layer of material characterised by increased susceptibility?

It is also worth mentioning the interesting arc-shaped anomaly at the southern side of the double (Fig. IV.283). It draws one's attention with its regular outline formed by strip of negative values followed by identical concentration of positive responses, both reaching maximum levels of the gradient. This regularity leads to the assumption that it is a residue of an artificial feature, belonging to another barrow. Careful examination of the hypsometric plan (Fig. IV.277) allows one to notice a slight elevation that spatially corresponds with the described anomaly. This observation led to the decision to distinguish another tumulus, designated with no. 18.

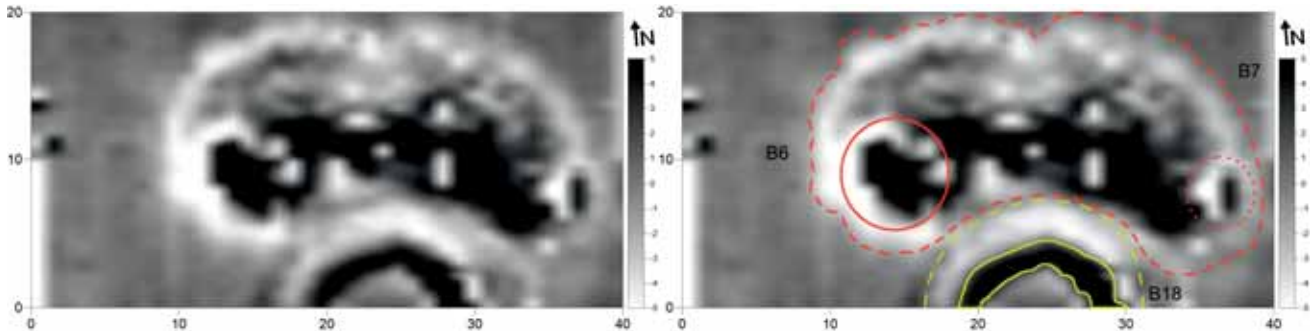



**Fig. IV.282** (left)**.** Resulting image of magnetometric prospection of "double barrow", comprising of barrows no. 6 and 7, and barrow no. 18, belonging to barrow group I on the cemetery in Bukivna (see Fig. IV.278)

**Fig. IV.283** (right). Resulting image of magnetometric prospection of "double barrow", comprising barrows no. 6 and 7, and barrow no. 18, belonging to barrow group I on the cemetery in Bukivna with highlighted anomalies discussed in the text.

--- approximate spatial extent of negative anomaly signifying outer limits of the "double barrow" comprising barrows no. 6 and 7
— approximate spatial extent of strongly polarised anomaly, potentially indicating an internal feature of barrow no. 7
··· approximate spatial extent of abnormally polarised anomaly, potentially indicating a modern iron object
--- approximate spatial extent of negative anomaly signifying outer limits of barrow no. 18
— approximate spatial extent of the ring-shaped positive anomaly, potentially indicating an internal feature of barrow no. 18


**Fig. IV.284.** Barrow group II. Measured area against the hypsometric plan

Geophysical prospection with a magnetometer of the II group of barrows on the cemetery in Bukivna took place in the 2014 season. It is situated in southern direction from the group I and, due to extensive dispersion of monuments, only one of its parts was subjected to magnetometry (**Fig. IV.284**). This concentration includes five mounds with visible landform (no. 1-5) and potentially two others that were revealed in the course of the survey and subject to concurrently conducted height measurements. Objects are not characterized by specific distribution and are separated by distances ranging from a few to tens of meters. At the time of reconnaissance most of them did not show any serious damage, apart from a large barrow located in the NE part that has two trenches in the centre, probably resulting from amateurish excavations. Mounds also significantly vary in terms of size, with the largest embankments reaching almost 20 m in diameter and around 3 m in height, while the smallest have circa 5 m and 0.5 m respectively. High embankments of two prospected barrows caused difficulties during the survey that involved problems with the correct positioning of transects and regular intervals of sampling when approaching their slopes. Thus, some grids appear to be disjointed and vertically offset in respect to each other on the resulting image (**Fig. IV.285, Fig. IV.286**). In total, the measured surface established over the discussed section of barrow group II comprised of 49 square grids with dimensions of 10 × 10 m (0,49 ha), formed into a large square-shaped framework (approximately 20 × 20 m). Mounds captured on the picture are characterized by different levels of magnetisation and varying spatial structure of anomalies that they are emitting. Thanks to the aforementioned features, most of them can be effectively distinguished from the surrounding context that has a more even degree of magnetisation.

Beginning with a description of the results from the NW part of the surveyed area one can see an extensive peak of positive magnetisation, surrounded by almost perfect ring-like signals comprising values around -5nT that again is encircled by a thin halo indicating increased magnetisation (Fig. IV.286).

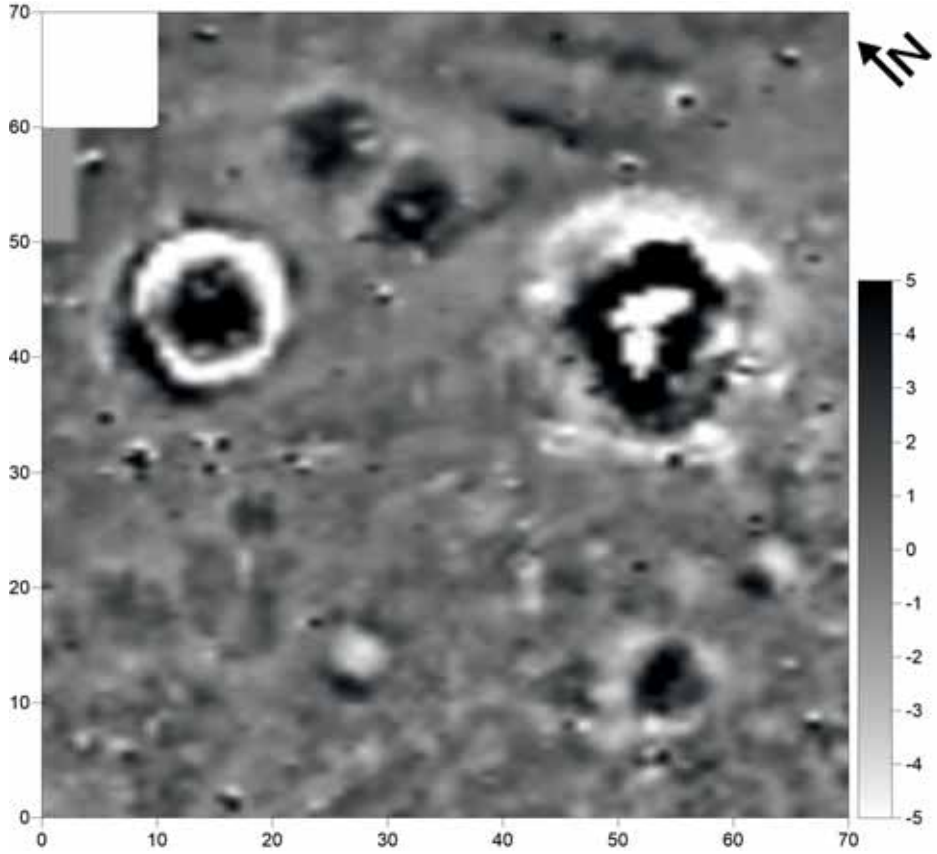
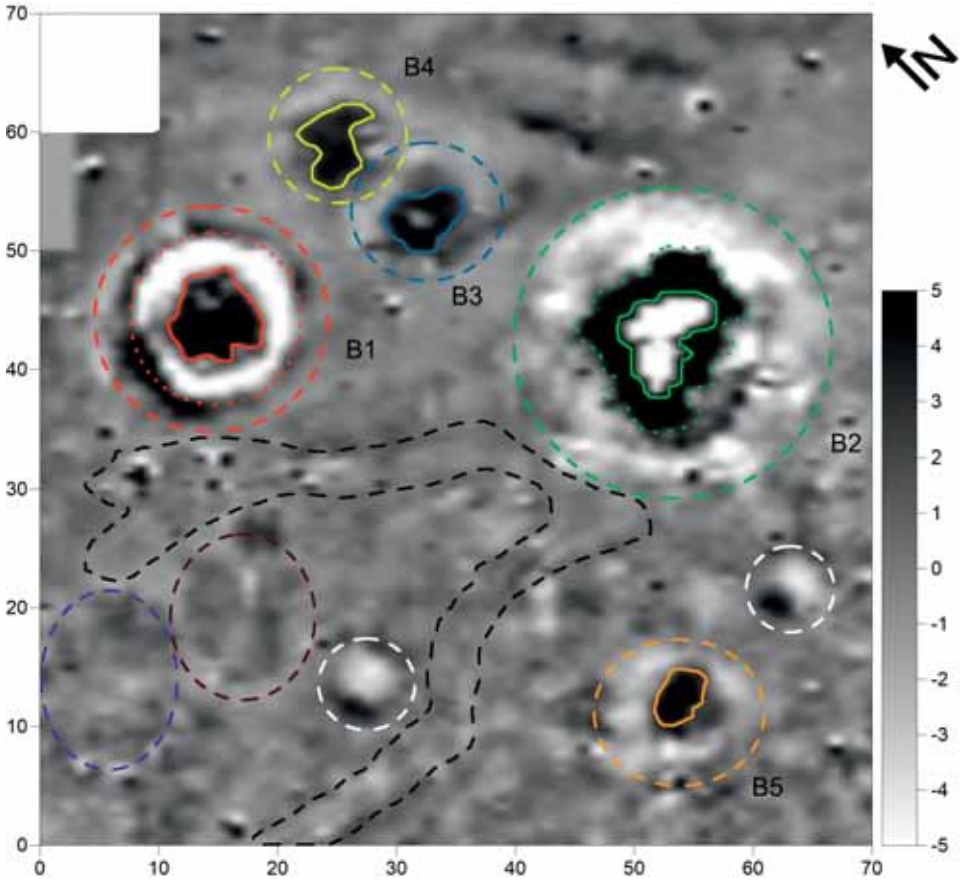



**Fig. IV.285.** Resulting image of magnetometric prospection of barrows no. 1-5 belonging to barrow group II on the cemetery in Bukivna (see Fig. IV.278)



All these anomalies are reflecting a huge, well preserved barrow with a diameter above 10 m and height reaching 3 m (no. 1). The irregular outer ring of positive magnetisation is most probably resulting from subsidence of topsoil from the barrow's steep slopes at foot of the embankment, thus it is a post-depositional effect rather than anthropogenic. On the other hand, the circular outline of inner, negative anomaly is potentially revealing an internal feature circumscribing the proper extent of the mound. Its degree of magnetisation stands in sharp contrast to the anomaly it is enclosing. The latter is characterized by a level of magnetisation reaching 5nT and presumably signifies an accumulation of iron-oxide rich material connected with a grave structure or former construction element. Nonetheless, one should be aware of the difficulties in magnetometric prospection of objects with a large landform, meaning that it is possible to capture only anomalies emitted by its uppermost layers.

NE from the above described tumulus are located two other mounds (no. 3 and 4), situated so close to each other that visually they seem to be connected by their embankments. Nonetheless, it is fairly easy to distinguish between zones of increased (inner part) and decreased (outer part) magnetisation, as in many other cases described in the presented study. Magnetometric prospection revealed that in fact these are two separate monuments that might not have been concurrently erected (Fig. IV.286). If that is the case, the barrow that was formed later (possibly the southern one) partly overlapped the younger mound with its embankment. However, this issue will stay unsolved until more data is at hand. Both barrows have similar, round outlines and sizes not exceeding 10 m in diameter and less than 1 m in height. Moreover, they seem to reflect a similar structure of magnetisation with a centrally located positive peak being surrounded by a halo of negative values delimiting the embankment. In both cases the internal peaks have irregular shapes with values of magnetisation not dropping below 3nT level. The southern mound also yielded a signal with magnetisation value around 0nT, located inside the positive peak. Overall, extensive signals with a high rate of magnetisation presumably indicate concentrations of features, such as burials and grave structures accompanying them. However, proper interpretation of the latter demands more detailed data to be acquired.

Further in the SE direction there is located probably the largest mound (no. 2) belonging to the II group which, unfortunately, has been partly excavated in the past, leaving two deep trenches in the central part. The mound is well visible on the resulting image due to an approximately oval-shaped anomaly comprising negative values, locally reaching a lower maximum of the gradient (Fig. IV.286). This anomaly sufficiently distinguishes the object from its context, generally characterized by a level of magnetisation around 0nT, and helps to delimit the spatial

**Fig. IV.286.** Resulting image of magnetometric prospection of barrows no. 1-5 belonging to barrow group II on the cemetery in Bukivna with highlighted anomalies discussed in the text.

--- approximate spatial extent of positive anomaly surrounding barrow no. 1 and potentially signifying subsided soil from upper layers of the embankment
··· approximate spatial extent of negative, ring-shaped anomaly, indicating outer limits of barrow no. 1
— approximate spatial extent of positive anomaly, potentially indicating an internal feature of barrow no. 1
--- approximate spatial extent of negative anomaly signifying outer limits of barrow no. 3
··· approximate spatial extent of positive anomaly, potentially indicating an internal feature of barrow no. 3
— approximate spatial extent of negative anomaly signifying outer limits of barrow no. 4
--- approximate spatial extent of positive anomaly, potentially indicating an internal feature of barrow no. 4
— approximate spatial extent of negative anomaly signifying outer limits of barrow no. 2
--- approximate spatial extent of positive anomaly, potentially indicating an internal feature of barrow no. 2
··· approximate spatial extent of negative anomaly, generated by excavation trenches located in the central part of the barrow no. 1
— approximate spatial extent of negative anomaly signifying outer limits of barrow no. 5
--- approximate spatial extent of positive anomaly, potentially indicating an internal feature of barrow no. 5
— approximate spatial extent of positive anomaly, potentially indicating residue of the first hypothetical barrow
--- approximate spatial extent of positive anomaly, potentially indicating residue of the second hypothetical barrow
--- two, abnormally polarized and extensive anomalies probably of anthropogenic origin
--- approximate spatial extent of anomalies generated by current forest roads passing in the vicinity of surveyed barrows

extent of the landform. Furthermore, it shows that the soil creating the embankment has lower magnetic susceptibility than the topsoil in the vicinity. Perhaps this phenomenon, observed also in other barrows, stems from the gravitational outflow of ferromagnetic minerals from the upper layers, causing impoverishment in compounds responsible for strengthening magnetic response. This assumption seems plausible, if one would compare the extent of negative halos of various smaller and bigger mounds surveyed in the course of the project, with the latter almost always revealing a more pronounced anomaly of the discussed type. Nevertheless, proper explanation of this phenomenon should be reinforced with specialist studies, involving evaluation of the magnetic susceptibility of soil samples from embankments and their contexts. In the middle part of barrow no. 2 there is situated an extensive, positive peak of magnetisation with an irregular outline, inside which are discernible two interconnected negative maxima. The latter are emitted by the aforementioned trenches, dug deeply in the embankment, causing significant disturbance of the magnetic field. In light of this factor, proper interpretation of positive peaks surrounding the trenches is problematic. On the one hand this signal may come from the remaining, undestroyed part of the underground feature filled with highly magnetic material, belonging to internal structure of the mound. On the other hand, such a feature could have a weaker response in the past, but was eventually enhanced in terms of magnetisation by deposition of the soil, dug out from the trenches, at their brims. As in the case of the barrow no. 1, one cannot be sure, if the magnetometer fully captured the internal structure of this huge mound or only its uppermost part.

The fifth of the surveyed barrows in this part of group II (no. 5) is located in the southernmost section of the prospected area. It is definitely least prominent and, thus, barely visible in the terrain. Nonetheless, one can discern another characteristic and frequently reoccurring set of anomalies, with an outer halo of negative values enclosing a zone of increased magnetisation (Fig. IV.286). The positive peak, this time, is slightly displaced NW from the centre and has roughly an oval shape, thus possibly indicating the position of the grave structure. The SE part of the barrow's inner zone seems less magnetically susceptible, but still the level of magnetisation reaches positive values in opposition to the generally negative rim. The latter is slightly blurred and also extended in NW and SE directions, while its other sections are clearer. Perhaps this distortion is created by some post-depositional factors, causing levelling of the embankment. If so, these are the places where one should expect deposition of weakly magnetic soil from the mound's outer mantle.

Aside from monuments with prominent landforms, it is possible to distinguish two other anomalies, overlapping with slight elevations that are potentially indicating other barrows. They are both located in the extreme W corner of the surveyed area and are characterized by irregularly oval zones of increased magnetisation, reaching a level of 3nT, encircled by narrow strips of negative values up to approximately -3nT (Fig. IV.286). Although the outlines of these anomalies are not sharp, they sufficiently contrast with the ambience. Changes of the gradient are not so radical as in the case of other barrows belonging to the group, however spatial distribution and shapes of the anomalies are quite similar. Their lower magnetisation probably stems from the fact that they are strongly levelled. Despite this, they retained some magnetic properties typical for tumuli. Verification of the presented notion to distinguish two more mounds should be based on more in-depth study, presumably including drillings and test excavations.

Other anomalies depicted on the resulting image document different features that are not connected directly with prehistoric mounds. Among these signals located in the space between the mounds, it is worth noticing round, identically polarized anomalies with large a negative maximum placed eastwards from the smaller positive peak (Fig. IV.286). Neither overlapp with any significant elevations or depressions of terrain, but are quite extensive. Similar, abnormal orientation of dipoles point to the anthropogenic character of their sources, however their precise interpretation requires a more thorough survey. It should be not excluded that chronologically they belong to the time when the cemetery was used, however a lack of marked landform prevents from treating them as other mounds. Other interesting anomalies include the residues of old forest roads and multiple, and small, dipolar signals with pronounced maxima of magnetisation, especially concentrated at the SW side of the barrow no. 1 that are most probably emitted by modern iron objects.

The geophysical survey in the vicinity of Bukivna, conducted in April 2015, covered a deforested part of the slope of the ridge located W from the village, separated from the latter by a valley of the local stream (**Fig. IV.287**). The surveyed area, measuring 0.24 ha, was divided into six grids, each with a dimension of 20 × 20 m. The lack of trees facilitated the conduct of magnetometric measurements. Nevertheless, the

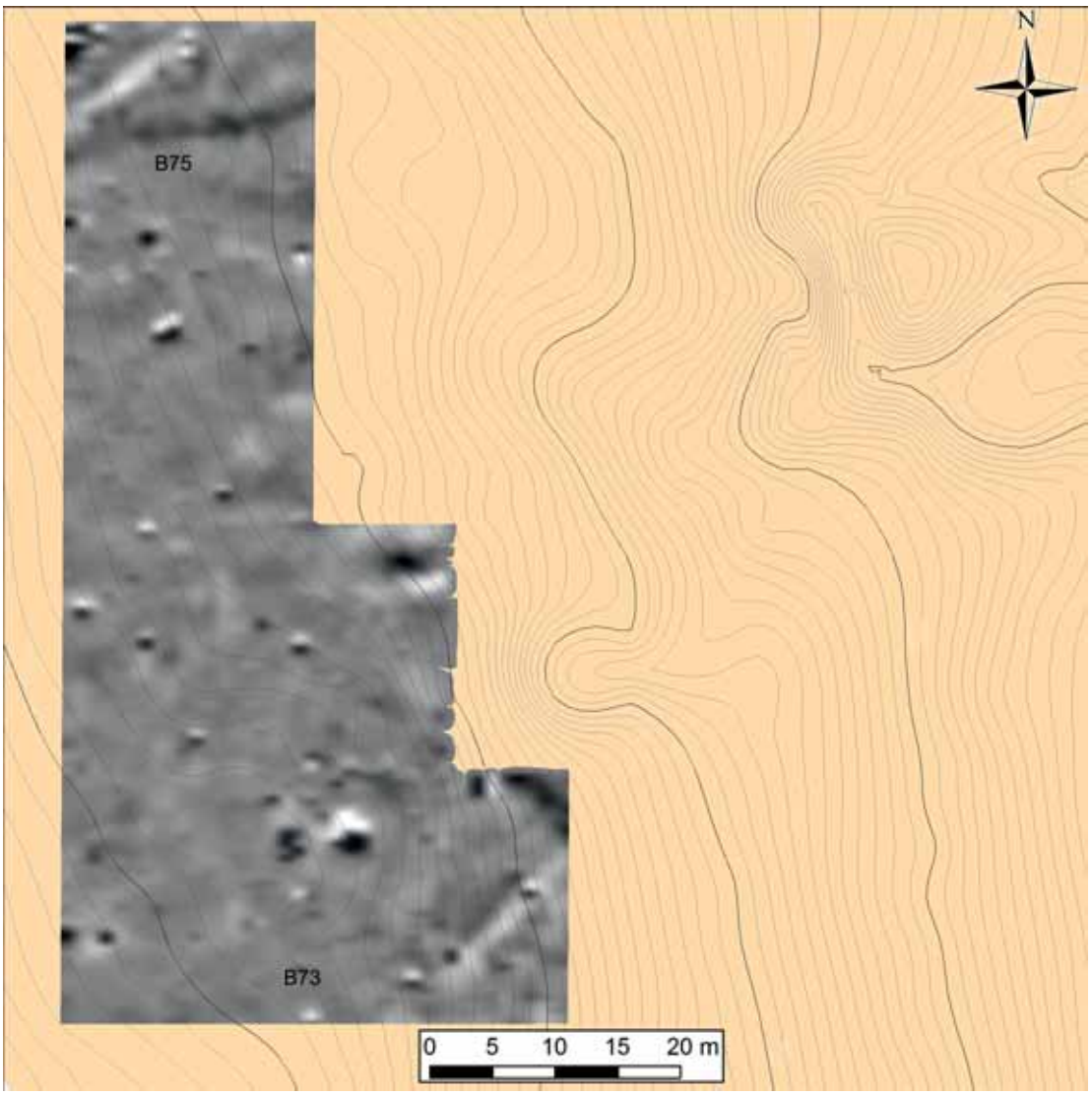



**Fig. IV.287.** Deforested part of the eastern slope of the ridge located west from the Bukivna village. Measured area against the hypsometric plan

terrain in this place is characterized by a significant drop in height in the eastern direction and abounds with ravines and landslides, inaccessible for the survey. Thus, it resulted in the absence of measurements for the easternmost part of the slope, as seen by a light grey strip oriented along a N – S axis.

Within the extent of the delineated survey area there are located the residues of two barrows excavated ca. 80 years ago (no. 73 and 75), out of which one was entirely captured on the resulting image of magnetometry (southern part), while the second (extremely northern part) cannot be distinguished. The latter stems from the fact that it has been completely excavated in the past and subsequent environmental factors caused the disappearance of its potential remains. Apart from a single barrow, the results of the measurements depict natural, as well as anthropogenic elements of the landscape (**Fig. IV.288**).

In the northernmost and easternmost sectors there were captured anomalies of a distinctly raised magnetic response in relation to the context, which have a narrow and elongated shaped, oriented W – E in the first case and NW – SE in the other (**Fig. IV.289**). The induced character of the anomalies (normally oriented dipoles) and their outline suggest that they may be features filled with material of increased magnetic susceptibility. In their closest vicinity anomalies were registered with a similar spatial structure, however indicating lower magnetisation in relation to the context. Both of them have a SW – NE orientation. Presently it is difficult to pinpoint their potential source, nevertheless they

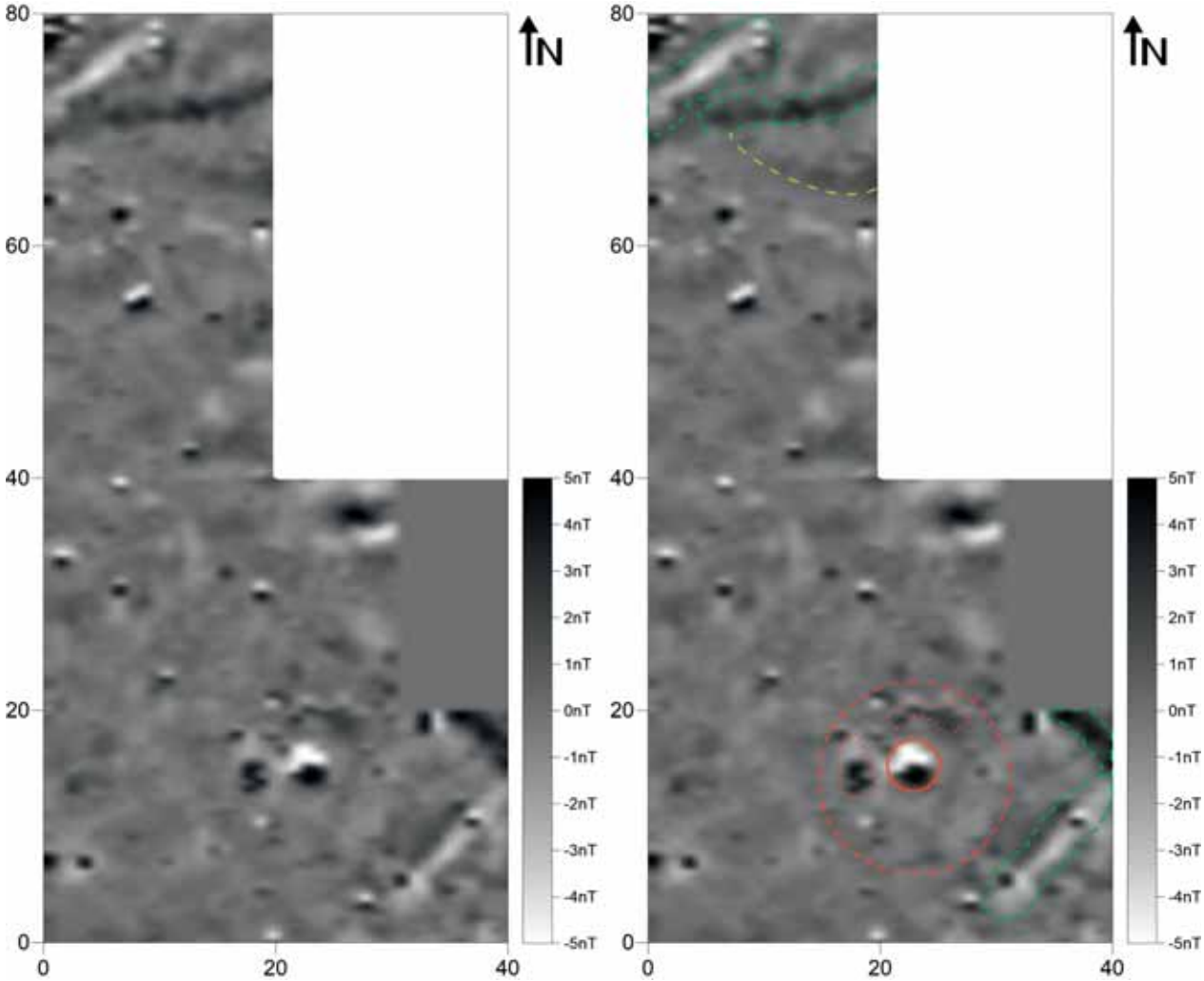



**Fig. IV.288** (left). Resulting image of magnetometric survey on the eastern slope of the ridge located west from the Bukivna village (measuring grid: 20 × 20 m; see Fig. IV.278)

**Fig. IV.289** (right). Fig. IV.289. Resulting image of magnetometric prospection on the eastern slope of the ridge located west from the Bukivna village with highlighted anomalies discussed in the text.

--- approximate spatial extent of negative anomaly surrounding barrow no. 73, indicating its spatial limits

··· approximate spatial extents of two, normally polarised anomalies, potentially indicating an internal feature of barrow no. 73

— approximate spatial extent of strong, dipolar anomaly located in the centre of barrow no. 73

--- approximate southern limit of the elevation on which presumably was located barrow no. 75 before the excavations

--- approximate spatial extent of anomalies presumably indicating natural features of the landscape

all probably belong to the natural features of the landscape comprising, as mentioned before, various ravines and promontories. Apart from these, the terrain abounds with locally occurring, normally polarized anomalies and a few distinct signals with the dipoles structured abnormally, thus indicating residual magnetisation.

Out of two potential monuments present within the survey area, only one (no. 73 located in the southern part) is visible as a slight, barely noticeable elevation (Fig. IV.287). On the other hand, the height plan does not depict any landform that can be attributed to the northern object (no. 75). The former has an approximately circular outline, while the landform of the latter was destroyed due to excavation. Additionally, the northern sector of the surveyed area, where the aforementioned barrow once stood, was later affected by a landslide, creating a large ravine.

Barrow no. 73 is marked by a subtle strip of lowered magnetic responses with an oval shape, especial-

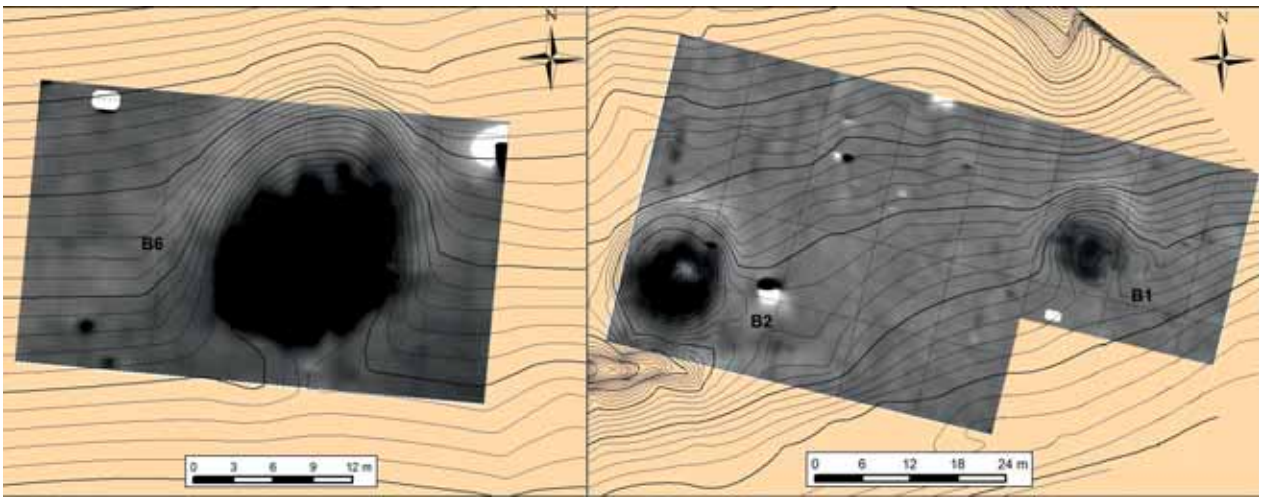



**Fig. IV.290.** Barrow group III. Measured areas against the hypsometric plan. Left – barrow 6/III, right – barrows 2/III and 1/III

ly visible in the eastern section (Fig. IV.289). Inside such an enclosed space there is located a strongly polarized anomaly, approximately marking the centre of the barrow's embankment. On the northern, as well as western side adjacent to it are situated two thin, normally polarised, yet clearly weaker anomalies, probably resulting from induced magnetisation. While the two latter most probably delimit the extent of the embankment, perhaps marked by a feature of the barrow's construction, the distinct signal in the centre, comprising pronounced negative and positive maxima of magnetization, potentially coincides with the core or different structure suspected in the mound's central part. However, one must keep in mind that the strength of magnetization in this place, the highest within the whole area, with a pronounced negative and positive maxima possibly means that the anomaly is emitted by an iron object of modern origin.

On the other hand, no specific anomalies can be attributed to barrow 75. Part of the elevation on which the tumulus was reportedly standing, namely its semi-circular outline, has been captured as a slightly darker, crescent-shaped anomaly (Fig. IV.289). Apart from this single feature, there are no traces of the discussed mound on the resulting image of magnetometric survey.

Between the 9th and 11th of August 2013 a selected group of barrows belonging to the II and III barrow groups of the cemetery in Bukivna were subject to a magnetometric survey. Observations were conducted by the archaeological and geophysical research group of the Department of Geophysics, Institute of Geology of Taras Schevchenko National University of Kyiv (supervisor – Sc.D. K.M. Bondar).[2]

The aim of the survey was to record and identify specific structural traits of construction and distribution of barrows. An additional goal was to define how informative magnetometric survey is for barrow studies, especially in the geological-geomorphological conditions of the Pre-Carpathian area.

Measurements were taken in four segments, two of which were placed within the borders of the II grave group, while two others – within the borders of the III. In total, the surveyed area was ca. 0.54 ha. Since the survey area is located in a forest, it had to be cleared of all the bushes and trees, as well as brushwood. Due to the natural limitation of survey area caused by trees, it was necessary to resign from applying multi-sensor devices.

All segments were marked and geo-referenced by specialists from Ivano-Frankivsk. This report was prepared according to the developed geodesic pickets and is as follows:

- III barrow group: segment ST1-ST8, dimensions: 50 × 40 m and 25 × 25 m; segment ST11-ST14, dimensions: 35 × 21 m (**Fig. IV.290**).
- II barrow group: segment ST104-ST115, dimensions: 27 × 22 m; segment ST102-ST112, dimensions: 55 × 26 m (**Fig. IV.291).**

The barrow's structure is comprised of embankment built with turf, soil, subsoil and layers laid out

[2] Sc. D. Ksienia M. Bondar is the author of this report.

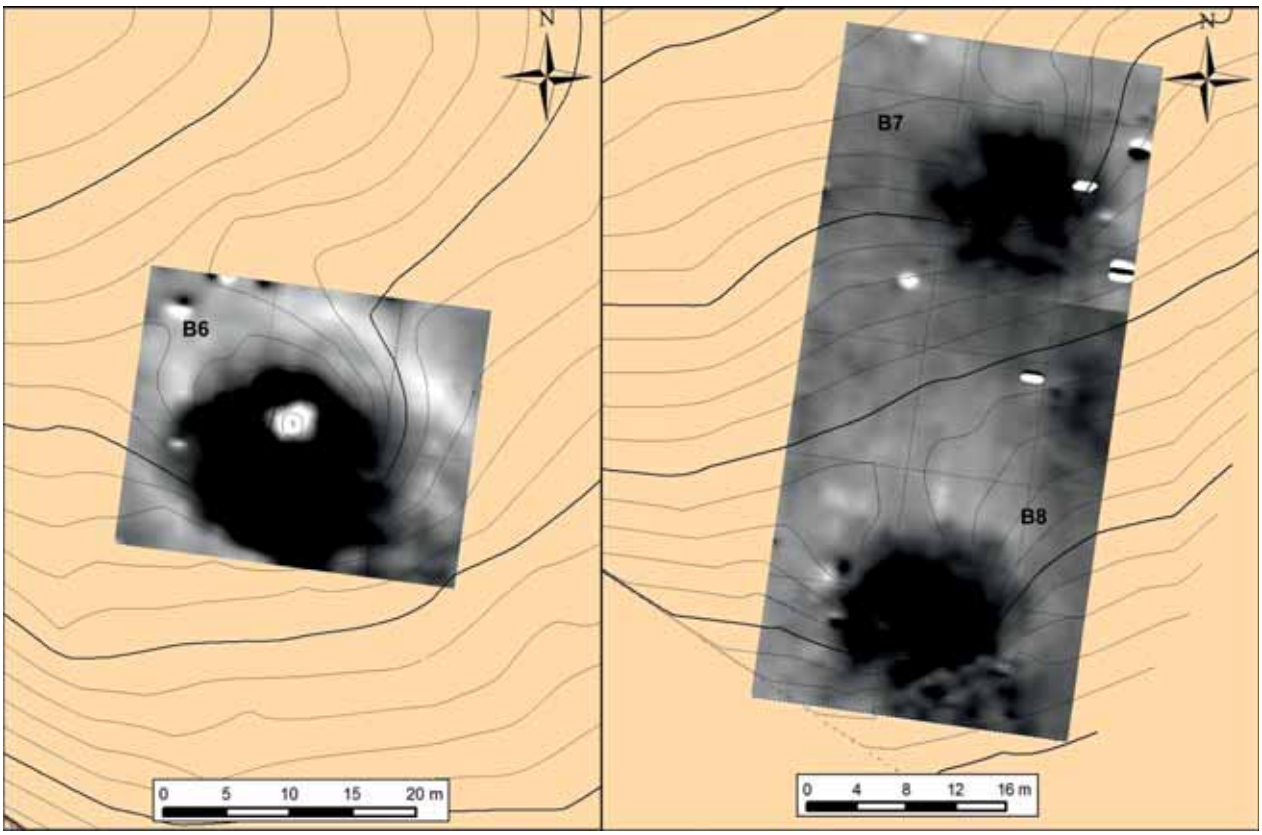



**Fig. IV.291.** Barrow group II. Measured areas against the hypsometric plan. Left – barrow 6/II, right – barrows 7/II and 8/II

with soil (perhaps from time to time stone) blocks. All of the aforementioned layers are characterized by induced magnetization. Its size is estimated by the concentration of ferromagnetic minerals, mainly iron oxides – magnetite and maghemite. The direction of inductive magnetization vector is oriented accordingly to the present-day magnetic field.

Layers are also characterized by a weak, residual magnetization of post-sedimentation nature (*i.e.* grains of magnetic minerals of mechanically re-oriented orientation which runs accordingly to the magnetic field in conditions characterized by higher humidity) or of chemical origins (influenced by physiochemical processes inside the mound, grains increased in size from tiny superparamagnetic to single domain sizes and registered magnetization specific to the time and place of its origins). Due to the fact that there were no significant changes in the direction of the main magnetic field since the Bronze Age, the residual magnetization vector of rudimentary features existing since ca. four thousand years ago in western Ukraine it has practically the same direction, as the present day magnetic field.

Any object, magnetized within the present day magnetic field, creates an anomaly with alternating peaks, of which the negative one (reduction) is located on the northern side. The above mentioned fact implies that lower induction on the northern side of the barrows (blue features on coloured maps) should not be interpreted as ditches. Such an interpretation would be possible if the lower magnetic values generated a circular structure around the whole barrow. All the measured areas include sharp, chaotically distributed anomalies with alternating peaks, which nearly always indicate magnetic rubbish. They will not be mentioned in the following part of the report.

**Segment ST1-ST8 (barrow group III)**

Segment is an 0.26 ha area and is comprised of two barrow mounds of the III group. Anomalies no. 1 and 2 were identified as barrows 2/III and 1/III **(Fig. IV.292; Fig. IV.293).**

Anomaly 1 (barrow 2/III) – isometric, positive anomaly of maximal intensity of 17nT is a clearly visible mound with ca. 10 m long diameter. Its upper part has a 1 m deep cavity, which is responsible

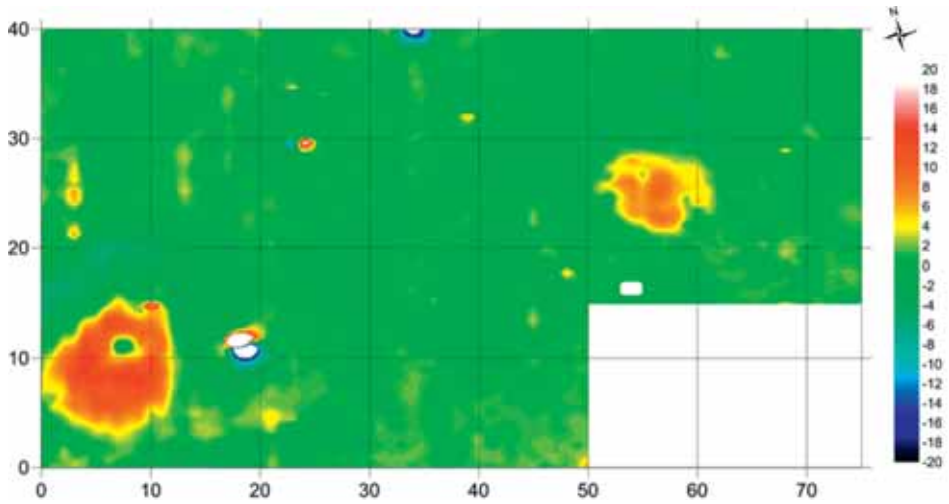



**Fig. IV.292.** Distribution of local magnetic anomalies in segment ST1-ST8 (barrow group III) – dynamics of change in magnetic induction displayed in colour scale +/-20 nT

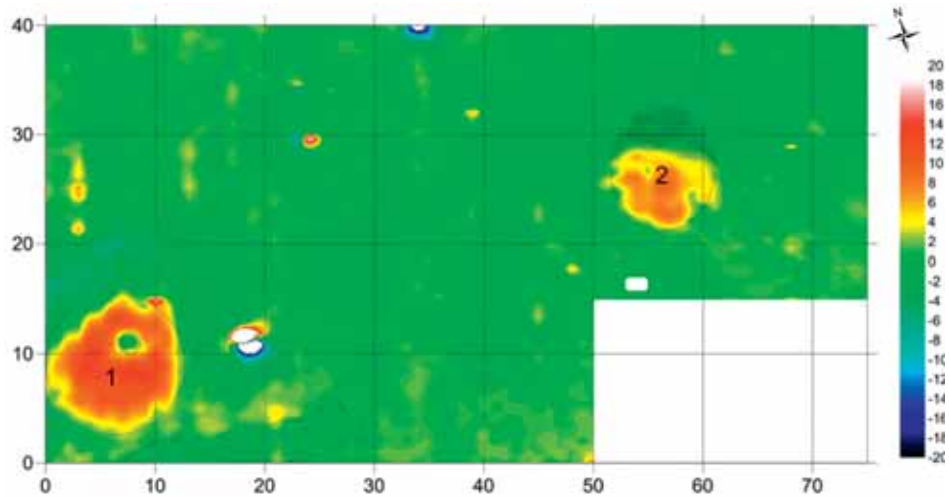



**Fig. IV.293.** Interpretative scheme for segment ST1-ST8 on the basis of a map of local magnetically induced anomalies: 1 = barrow 2/III, 2 = barrow 1/III

for the lower magnetic induction, probably a WWII trench. Anomaly 2 (barrow 1/III) – complex: is comprised of two parts of more or less equal sizes. The maximal intensity of the southern part is 10nT, the northern part is characterized by the background size of the magnetic induction and is discernible due to the semicircle of lower values in the northern part. In the field the barrow is visible as a slight mound. In the past the tumulus may have been asymmetric in shape. The main mound was located on the southern side, the northern one being a lower plateau (Fig. IV.293 – lined area).

Visible to the S of barrow 1/III is a ravine extension, which is characterized by an elongated area of lowered values.

**Segment ST11-ST14**

Surface subject to measurement was an area of 35 × 21 m, and is comprised of a well-defined barrow no 6/III belonging to the III group **(Fig. IV.294)**. The maximal intensity of anomaly is 24nT. The mound has an oval shape, elongated along the NE – SW axis, with a length of 17 m. Along the NW – SE axis the barrow has a width of 12 m.

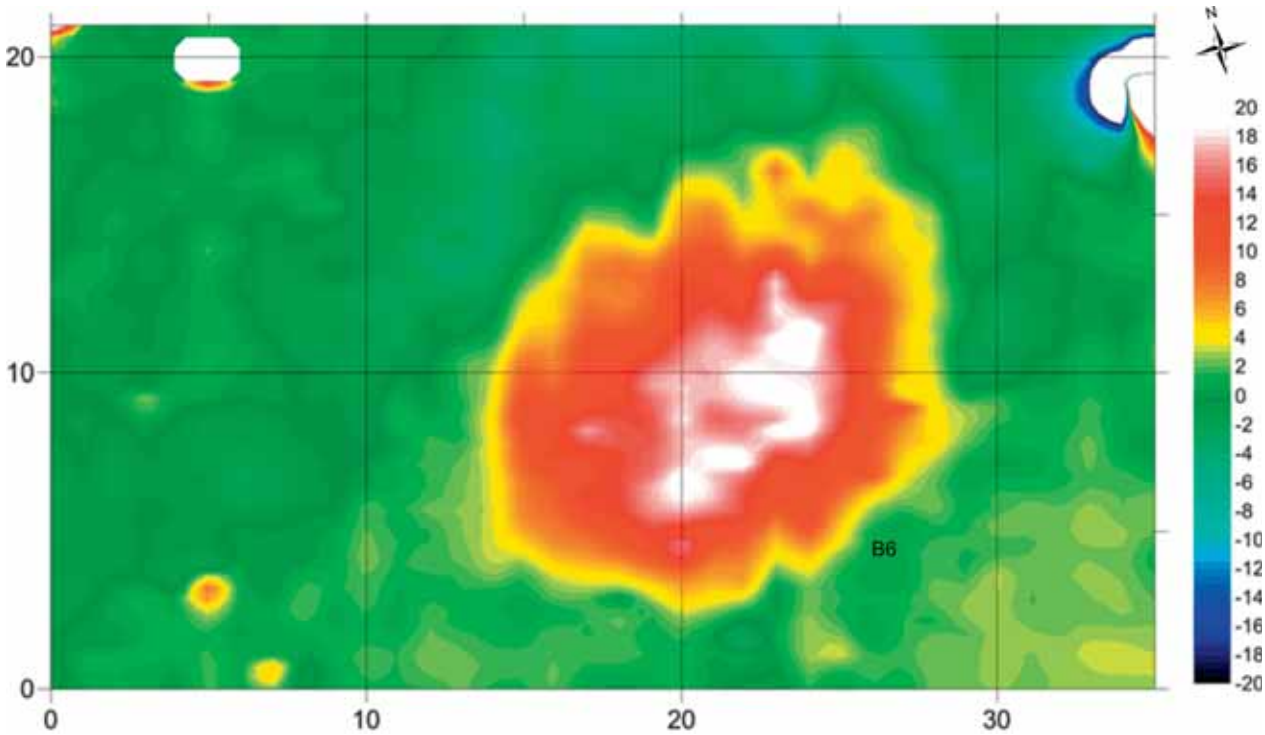



**Fig. IV.294.** Map of local magnetic induction anomalies in segment ST11-ST14 (barrow 6/III) – dynamics of change in magnetic induction displayed in colour scale +/-20nT

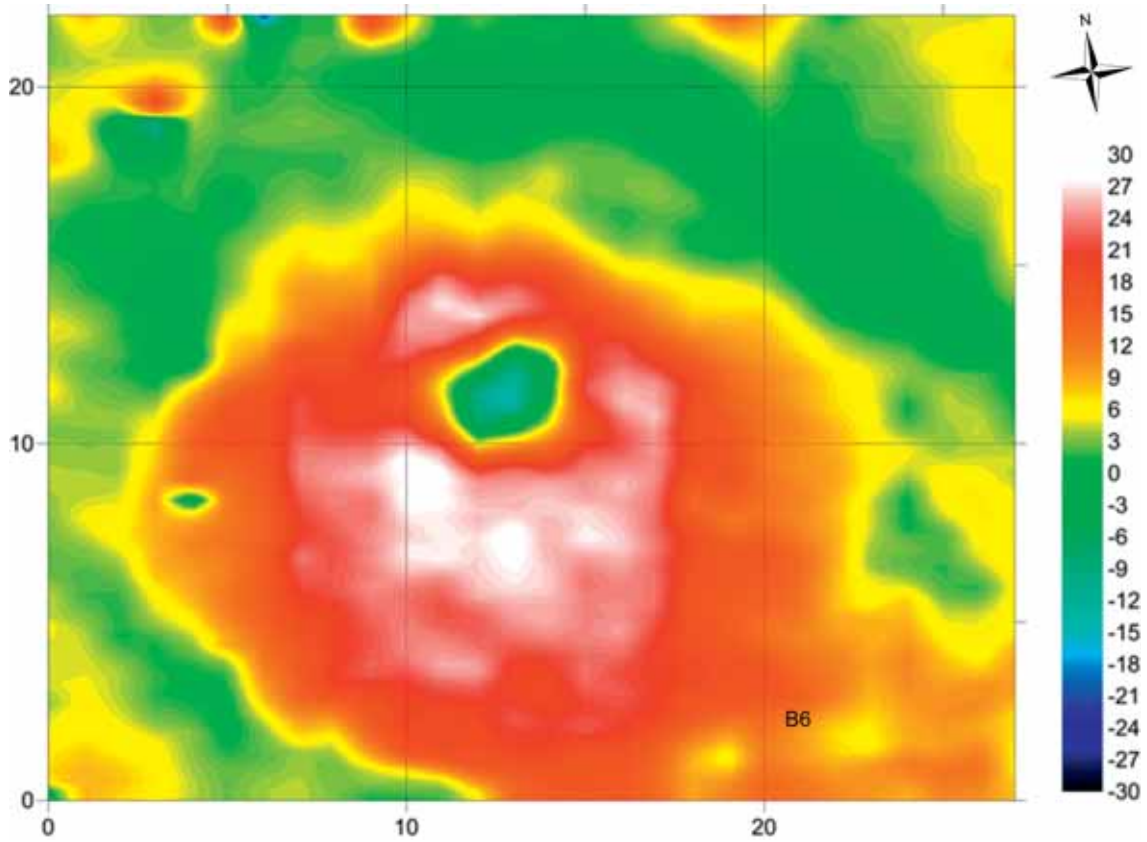



**Fig. IV.295.** Map of local magnetic induction anomalies in segment ST104-ST115 (barrow 6/II) – dynamics of change in magnetic induction displayed in colour scale +/-30nT

**Segment ST104-ST115 (barrow group II)**

The area under study measured 27 × 22 m and is comprised of a well-visible barrow of the II group (**Fig. IV.295**). The maximal intensity of the barrow's anomaly is 32nT. The mound has an isometric form, with a diameter of up to 20 m. In addition, the mound has a cavity, most likely a WWII trench, which is responsible for the well-defined, local anomaly.

The characteristics of the area around the barrow allows to one assume the presence of a ditch or a similar structure, which is responsible for the negative anomaly. However, such an observation is not decisive. The area is too small, it is impossible to recognize the entrance as a normal (undisturbed) magnetic field, which is necessary for properly defining the zero level of magnetic induction. It is possible that the local circular negative anomaly could be a result of an incorrect selection of the level of normal field.

**Segment ST102-ST112 (barrow group II)**

The segment covers an area of 0.14 ha, and consists of two mounds belonging to the II group. Anomalies 1 and 2 which were recognized in this segment were identified as barrows no 7/II and 8/II (**Fig. IV.296; Fig. IV.297**).

Anomaly 1 (barrow 7/II) is an isometric, positive anomaly of maximal intensity of 18nT and a diameter of 15 m. The shape of the positive part of anomaly is interrupted and irregular, which might indicate that

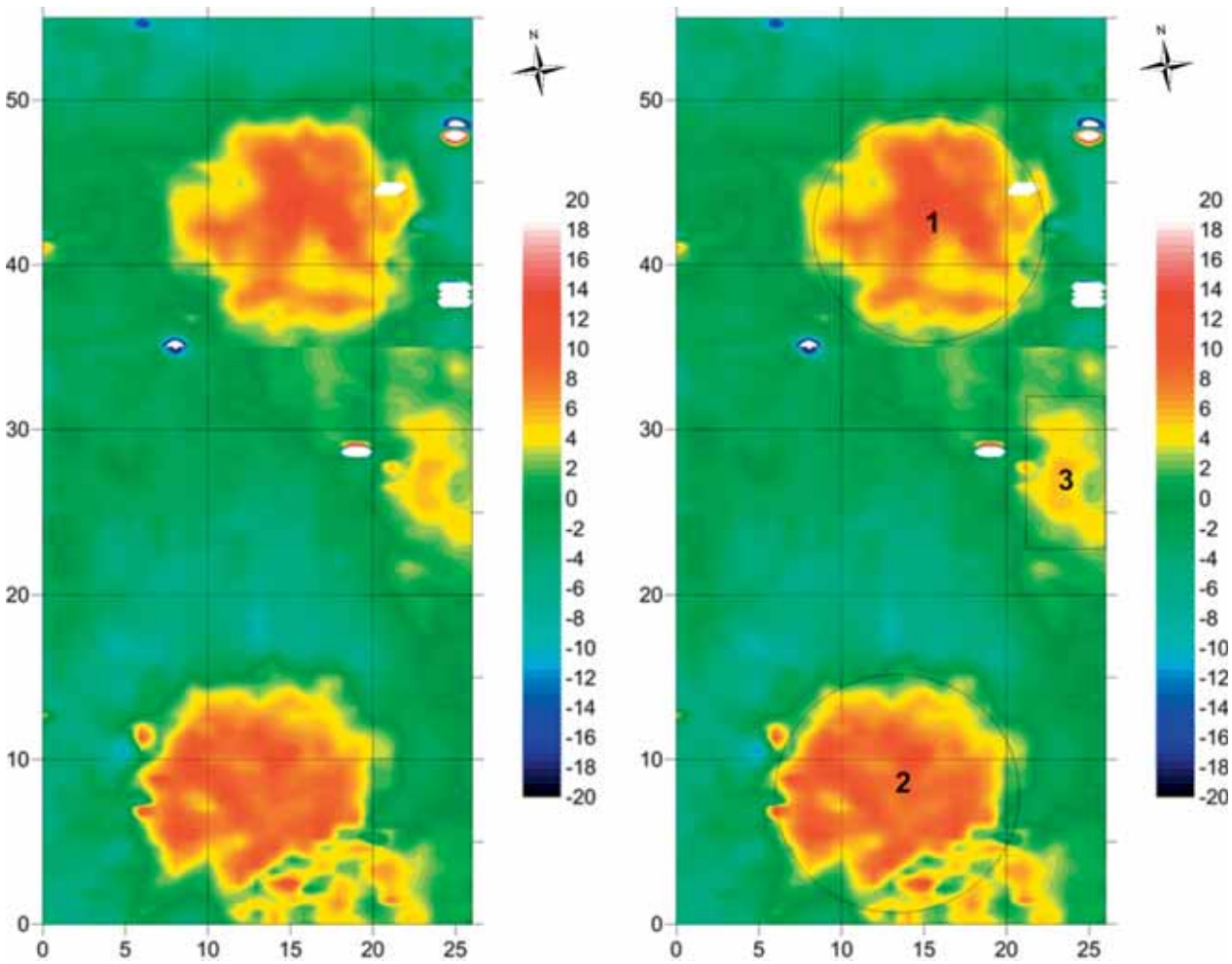



**Fig. IV.296** (left). Distribution of local magnetic anomalies in segment S ST102-ST112 (barrow group III) – dynamics of change in magnetic induction displayed in colour scale +/-20 nT

**Fig. IV.297** (right). Interpretative scheme for segment ST102-ST112 on the basis of a map of local magnetically induced anomalies: 1 = barrow 7/II, 2 = barrow 8/II, 3 = barrow?

it was subject to some kind of earthwork, as a result of which it became destroyed. Anomaly 2 (barrow 8/II) is an isometric, positive anomaly of maximal intensity of 12nT and a diameter of 15 m. Its south-eastern part was destroyed by a forest road.

To the S of barrow 7/II there is a visible area with higher values of magnetic induction (Fig. IV.297). It is highly probable that anomaly no. 3 was caused by a mound, which was accidentally included in the study area.

## D. Archival information

### Bukówna, district of Tłumacz (after Makarowicz 2016)

Barrows in Bukówna were already known in the 19th century. Many mounds were recognized on the fields with 13 unexcavated barrows located on the 'Koszakowce' field and in 'na baryszu' forest (Schneider 1871:390; Janusz 1918:235).

The first excavations were conducted in the 1930's. Their initiator was Dr. Jan Bryk, senior assistant at the Chair of Prehistory at Jan Kazimierz University in Lviv, who became interested in the site after corresponding with Wojciech Komornicki, the owner of the village.[3] During summer of 1931 he excavated six barrows in the southern part of the grouping, the results of which he presented in a brief report published in *„Sprawozdania Polskiej Akademii Umiejętności"* (Bryk 1932, 21-22). Of all the excavated barrows four were located in the forest (in clear-cut logging – nos. 14/1931, 15/1931, 16/1931, 17/1931) and two in the field next to the church (nos. 3/1931 and 4/1931). The extended report was never published[4] with the research documentation being eventually lost. The first plan of the cemetery was composed by J. Bryk, who relied on knowledge provided by W. Komornicki.[5] At this point, 46 barrows were recorded with 13 located on the fields and 26 in the manor forest stretching from Bukivna to Stryhance. According to his report, the barrows were arranged in groups of three, which were either positioned in lines or in a triangles.[6] Five mounds were of unusual size, up to 3 m high and measuring ca. 60 m in diameter (Bryk 1932, 22). Present-day surveys have excluded the presence of such monuments, especially with such a diameter (Makarowicz, Lysenko, Kočkin 2016).

At that time J. Bryk assigned excavated barrows to two time horizons: Bronze Age and the Hallstatt period. According to him, barrows contained from one to several pots, which he interpreted as grave offerings. Cremated bones, deposited in pots or scattered around, were also found. Flint artefacts and sherds were distributed within mounds. Since J. Bryk did not state his excavation method, it is safe to assume that he used the popular, early 20th century method of 'circular' excavation, in which soil is removed from the centre of the mound and then scattered around, thus forming a visible circle.

Finds collected by J. Bryk, later deposited in the Archaeological Museum of Kraków (AMK), were published after the war by R. Rogozińska (1959). Apart from the description of finds, she presented a map pinpointing the localisation of barrows, which shows that barrows in Bukówna were found to the west of the village. Results of the excavations were also discussed by T. Sulimirski in his monumental monography of the Globular Amphorae and Corded Ware cultures to the northeast of the Carpathians (Sulimirski 1968:149-150). In his study he corrected Rogozińska's mistakes regarding inventories of particular barrows.[7]

Excavations in Bukówna were continued by M. Smishko and I. Siwkówna,[8] staff of the Institute of Prehistory at Jan Kazimierz University in Lviv. In autumn 1937 they excavated seven barrows: six (nos. I-VI) in the northern part of the cemetery and one in the southern (no. VII). Their numeration did not follow Bryk's original scheme. Mounds I and II were located in the commune pasture, III and VI in the forest, IV and VII on the fields, V – courtyard of the W. Komornicki manor. A brief report was published in "Z Otchłani Wieków" with their results commented by T. Sulimirski (1968:150). More information about research is provided in M. Smishko's diary, stored at the I. Krypiakevych Institute of Ukrainian Studies in

[3] Correspondence stored in the Archives of the Archaeological Museum of Kraków. We would like to thank Dr. Jacek Górski for providing us with documentation and pre-war finds from Bukówna.

[4] Manuscript stored in the Archives of the Archaeological Museum of Kraków.

[5] The detailed plan with the location of barrows was lost.

[6] Actually the arrangement was first described by W. Komornicki in his letter to J. Bryk from 15.12.1931.

[7] T. Sulimirski was preparing a monograph of the Komarów culture but it was lost during the war (Sulimirski 1968). The referenced monograph contains a few preserved notes about the Bukówna cemetery.

[8] Despite his initial claims, J. Bryk never returned to Bukówna. In 1933 he was elected as a mayor of Kamianka Strumilova (Sytnik 2012).

Lviv.[9] According to his reports, since some barrows contained only nonspecific sherds and flint artefacts, it makes their assignment to the Komarów culture (I, II, V, VII) doubtful. The other three barrows contained vessels as grave goods, while in barrow III there were bronze artefacts found in a wood-and--clay construction (Siwkówna 1938:68f.). At the time it was believed that bronze objects could be associated with the Great Hungarian Plain and were dated to the Bronze Age period II.

## Excavations in 1931

Finds from the first excavation campaign were described by R. Rogozińska (1959). However, there are significant inaccuracies in her report regarding, e.g. the number of vessels recovered and their context, hence the discrepancies in this study. Apart from pottery, only a few characteristic finds were preserved, mostly flint and stone tools. There are no preserved drawings from J. Bryk's excavations.

**Barrow 3/1931** located close to the church, on the field belonging to the Polish school (Bryk 1932:22; 1932a, 2; Rogozińska 1959:99; Sulimirski 1968:149).[10] It was 1 m high (diameter unknown). Nine vessel groups (deposits) were recorded on the subsoil of the mound. These groups were classified by J. Bryk as graves. Some of them 'were surrounded by stones'[11] or marked with a stone placed on top. Sometimes a vessel was covered with a stone. Deposits usually comprised of two to three vessels. In two cases a deposit was comprised of one and five vessels (a smaller pot was placed in a larger one). The mound provided flint artefacts (tools, blades and flakes), which were later lost during the war. The final number of vessels recovered remains unknown (more than 10?).

Only six vessels are stored at the AMK, which according to existing typological schemes (Górski 2007), can be recognized as three vases, two pots and a bowl (**Fig. IV.298-Fig.IV.303**). Vessel typology acc. to Górski 2007; vessel parameter acc. to Kośko 1981.

**Barrow 4/1931** was located in the field close to the church, ca. 20 m to the SW of barrow 3 (Bryk 1932:22; 1932a:2).[12] It was 1 m high (diameter unknown). A ring built of small limestone fragments was found beneath the humus. The author did not include its diameter but, judging by its description, it is possible to assume that it was close to the mound's diameter. It was 130 cm (140 cm) wide, 0.3 m high (Sulimirski 1968:149), with its north-western part destroyed by ploughing with the destruction area start-

[9] We would like to thank the director of theI. Krypiakevych Institute of Ukrainian Studies in Lviv, Prof.Dr. O. Sytnyk for providing us with M. Smishko's diary from 1937.

[10] Plans of the barrows excavated by J. Bryk were not preserved. His reports differ not only in terms of details but also the description of finds. Additional confusion was a result of new signatures and localization of vessels introduced by R. Rogozińska (1959) and different find labels in stored vessels (up to four different ones!). Such errors were partly fixed by T. Sulimirski (1968:149-150). According to his study, barrow 3/1931 had nine 'graves' inside. In order to standardize the description, in the following work only Arabic numerals are used.

[11] On the basis of present study (Makarowicz, Lysenko, Kočkin 2013; 2014) it is possible that they were stone or mixed wood and stone cenotaph constructions, which were found in barrows 1/I/2010, 2/I/2010, 2012 and 7/I/2014.

[12] The original text is unclear ('20 m southwest from the circumference of barrows' – Bryk 1932a:2).

**Fig. IV.298.** Vase, type W22, ornamented on the body with two bands of multiple circumferential wavy incised lines and four short vertical grooves. Rim cut straight; base slightly marked. Temper of crushed stone and flint. Parameters: H – 19.3 cm; R1 – 31.4 cm; R2 – 20.5 cm; R3 – 31 cm; R4 – 11.8 cm

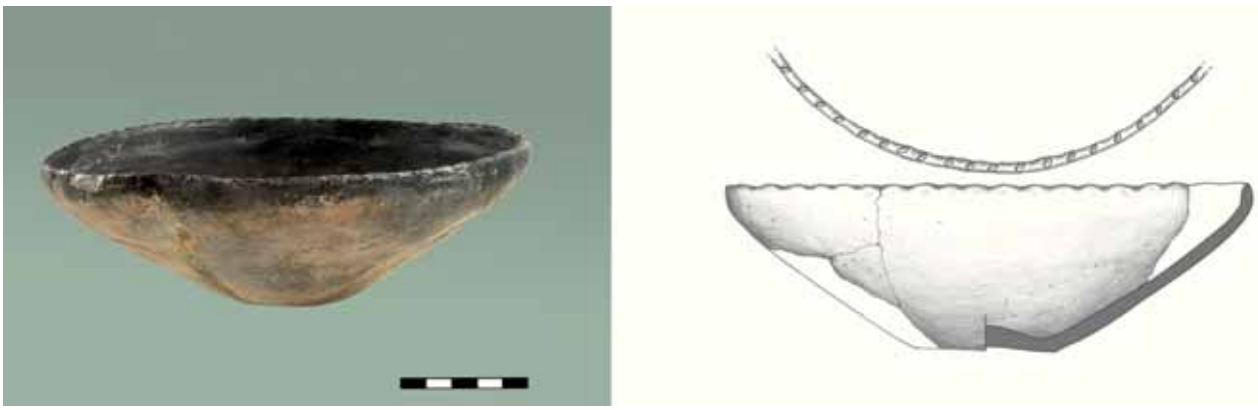


**Fig. IV.299.** Bowl, type M21, rounded, corrugated rim; unmarked base. Temper of crushed stone and flint. H – 6.7 cm; R1 – 20.6 cm; R4 – 5.6 cm

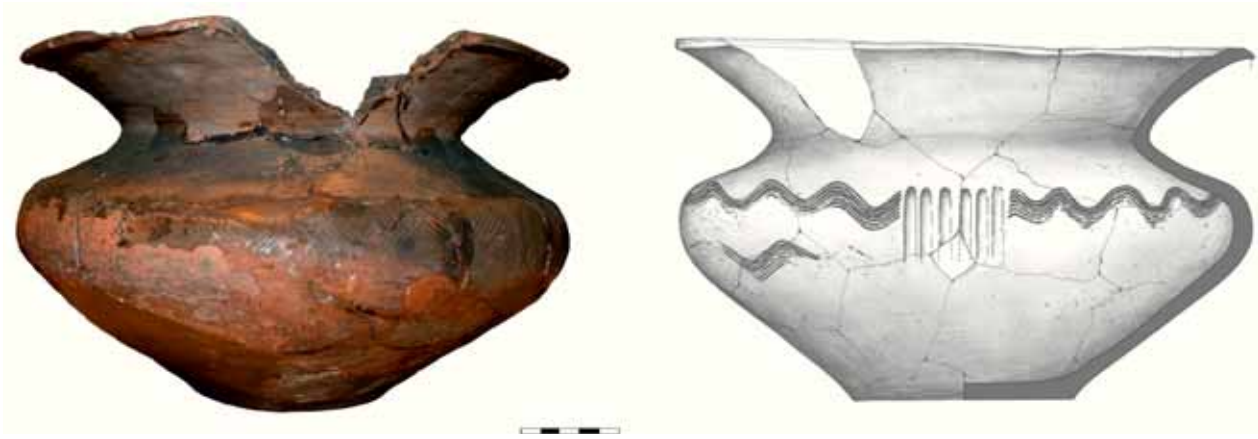


**Fig. IV.300.** Vase, type W22, ornamented on the body with two bands of multiple circumferential wavy incised lines and six short vertical grooves. Pointed rim; base slightly marked. Temper of crushed stone and flint. H – 15 cm; R1 – 28.8 cm; R2 – 21.1 cm; R3 – 26.6 cm; R4 – 8.8 cm

**Fig. IV.301.** Vase, type W22, ornamented on the body with three circumferential incised lines and, underneath, with short circumferential, vertical incised lines. Rounded rim; unmarked base. Temper of crushed stone and flint. H – 7.5 cm; R1 – 10.1 cm; R2 –6.2 cm; R3 – 10.8 cm; R4 – 3.5 cm

**Fig. IV.302.** Pot, type G111, ornamented with the circumferential patterns of triangles, three incised lines and horizontal chevrons. Rounded rim; unmarked base; handles perforated horizontally. Temper of crushed stone and flint. H – 19 cm; R1 – 13 cm; R2 – 11.5 cm; R3 – 14 cm; R4 – 6.8 cm

**Fig. IV.303.** Pot, type G111c, plain. Corrugated and sharp rim; unmarked base. Temper of crushed stone and flint. H – 19.1 cm; R1 – 17.7 cm; R2 – 13.8 cm; R3 – 17.7 cm; R4 – 10.5 cm

ing at 4 m (12 m).[13] A 'hearth' with a 5 m (6 m) diameter was uncovered ca. 3.5 m S of its northern, inner part.[14] According to the author, '10 cremation burials with one urn each' were identified around the hearth but at a varying distance (Bryk 1932:22). The unpublished report provides more reliable, understandable and precise information regarding these finds (Bryk 1932a:2). The investigator mentions seven localizations, in which vessels (or more likely vessel deposits, not graves) were found and four, in which fragments of vessels were collected. Cremated human remains were uncovered on the edge of the hearth (no further information). Such remains were also found

[13] Measurements have two versions. Before the bracket – Bryk (1932), in brackets – Bryk (1932a).

[14] Cf. ref. 12. According to T. Sulimirskithe hearth's diameter exceeded 4m (Sulimirski 1968:149).

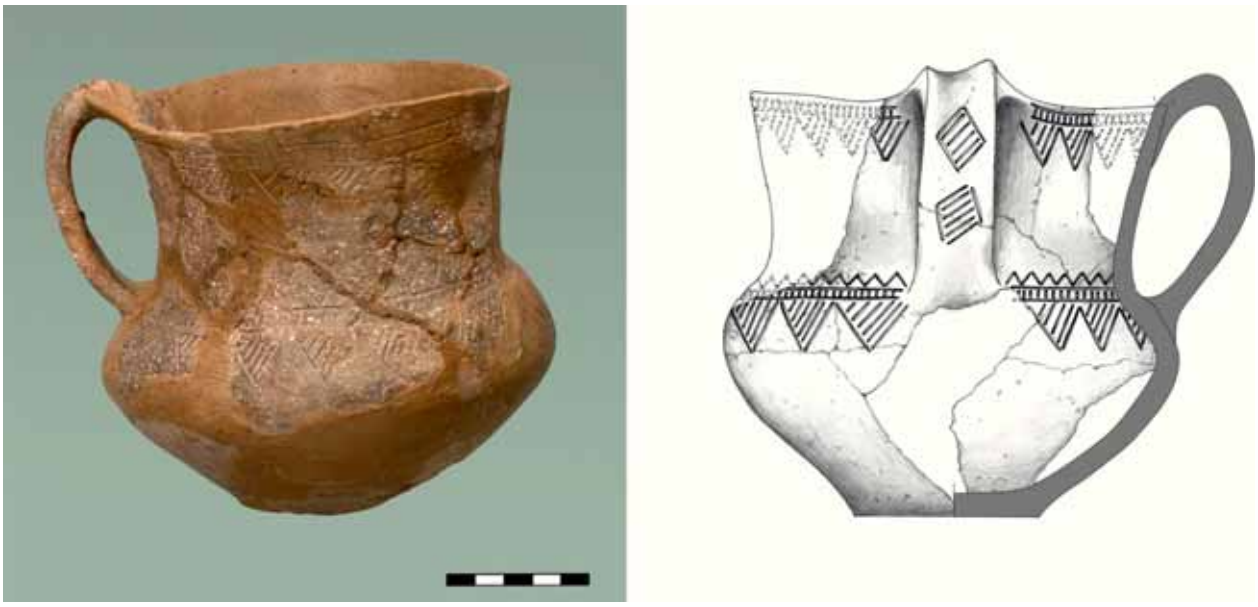


**Fig. IV.304.** Jug, type D21a, ornamented under the rim with a circumferential ladder pattern and hatched triangles, on the body with circumferential incised zigzags, ladders and hatched triangles, on the handle with hatched rhombi. Rim cut straight; base slightly marked; band handle. Temper of crushed stone and flint. H – 15.5 cm; R1 – 15.4 cm; R2 – 13.3 cm; R3 – 16.7 cm; R4 – 6.8 cm

**Fig. IV.305.** Cup, type K22, ornamented on the neck with four circumferential incised lines, on the body, with appliqué bosses rimmed by incised arches. Rim cut straight; unmarked base; band handle. Temper of crushed stone and flint. H – 7.9 cm; R1 – 8.5 cm; R2 – 7.9 cm; R3 – 10.1 cm; R4 – 4.8 cm

inside two vessels deposited in the northern part of the mound (one placed on top of another). Vessel deposits and hearth were located on the subsoil.[15] In the north-western part of the barrow, on the outer part of the stone circle, fragments of a bovid skull were found (sheep or cattle; Sulimirski 1968:149). Fragments of sherds, flints and pebbles were found throughout the mound.

According to R. Rogozińska (1959) 27 vessels or large fragments were recovered from barrow 4/1931. In the storage facilities of AMK there were 24 vessels (eight vases, four cups, bowls and pots, three jugs and one cup), preserved in their entirety or preserved in a state which allowed reconstruction (**Fig. IV.304--Fig. IV.327**).

[15] The author uses the term 'subsoil' but from his description it is obvious that he refers to the original soil level.

**Fig. IV.306.** Cup, type K22, ornamented on the neck and body with circumferential pinholes, two incised lines and hatched triangles. Rim thickened and cut straight; unmarked base. Temper of crushed stone and flint. H – 7 cm; R1 – 8 cm; R2 – 8 cm; R3 – 9.9 cm; R4 – 5.5 cm

**Fig. IV.307.** Vase, type W12, ornamented on the body with short, oblique grooves. Sharp rim; marked base. Temper of crushed stone and flint. H – 12.1 cm; R1 – 17.3 cm; R2 – 16.4 cm; R3 – 20 cm; R4 – 7.2 cm

**Fig. IV.308.** Vase, type W21, ornamented under the rim and on the neck and body with circumferential vertical pinholes and six circumferential incised lines, interrupted by a vertical motif of four short incised lines; below, circumferential pinholes and oblique relief strips. Thickened rim; marked base. Temper of crushed stone and flint. H – 11 cm; R1 – 18.1 cm; R2 – 15.3 cm; R3 – 17.4 cm; R4 – 6.6 cm

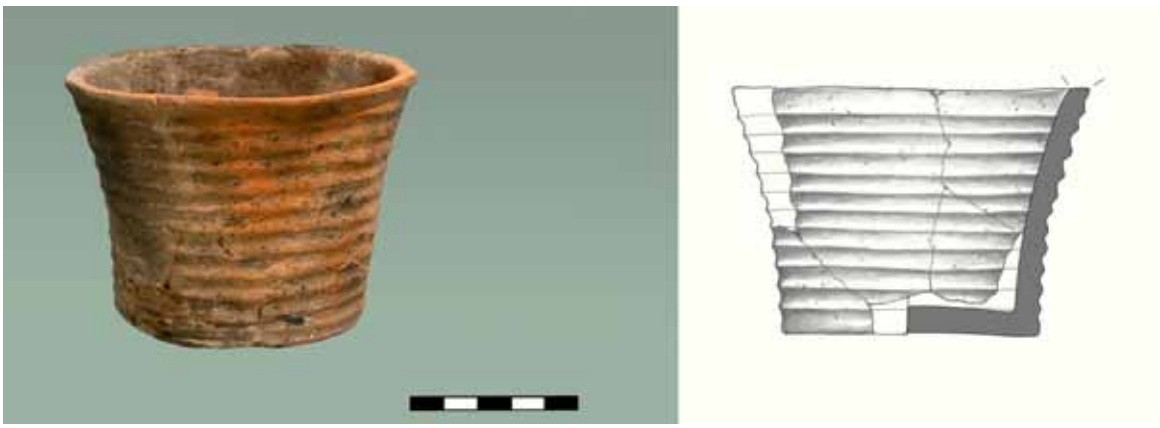


**Fig. IV.309.** Beaker, type P1, ornamented from the rim to base with horizontal relief strips. Rim cut straight; unmarked base. Temper of crushed stone and flint. H – 7.5 cm; R1 – 10.9 cm; R4 – 7.9 cm

**Fig. IV.310.** Beaker, type P1a, ornamented with horizontal relief strips. Rim cut straight; pedestal base. Temper of crushed stone and flint. H – 10.2 cm; R1 – 13.1 cm; R4 – 9.5 cm

**Fig. IV.311.** Bowl, type M21, ornamented under the rim with a circumferential relief strip. Rim cut straight; unmarked base. Temper of crushed stone and flint. H – 8.3 cm; R1 – 17.8 cm; R4 – 7.9 cm.

**Fig. IV.312.** Vase, type W22, ornamented on the body with appliqué bosses. Sharp rim; marked base. Temper of crushed stone and flint. H – 11.5 cm; R1 – 14.5 cm; R2 – 13.4 cm; R3 – 13.5 cm; R4 – 7.8 cm

**Fig. IV.313.** Vase, type W22, ornamented on the neck and body with circumferential pinhole patterns, three incised lines and hatched triangles. Rim cut strait, marked base. Temper of crushed stone and flint. H – 9.7 cm; R1 – 13.2 cm; R2 – 12.6 cm; R3 – 15 cm; R4 – 6.3 cm

**Fig. IV.314.** Pot, type G21, ornamented on the neck and body with circumferential pinhole patterns, three incised lines and hatched triangles. Sharp rim, unmarked base. Temper of crushed stone and flint. H – 15.7 cm; R1 – 12.7 cm; R2 – 11.5 cm; R3 – 13.4 cm; R4 – 8.1 cm

**Fig. IV.315.** Vase, type W12, ornamented under the rim and on the body with two circumferential rows of pinholes and short, vertical grooves. Sharp rim; marked base. Temper of crushed stone and flint. H – 8.6 cm; R1 – 12.4 cm; R2 – 12 cm; R3 – 13.9 cm; R4 – 5.2 cm

**Fig. IV.316.** Vase, type W21, plain. Thickened rim; unmarked base. Temper of crushed stone and flint. H – 6.2 cm; R1 – 10.2 cm; R2 – 9.3 cm; R3 – 10.1 cm; R4 – 6 cm

**Fig. IV.317.** Pot, type G111b, ornamented on the shoulder with two circumferential bands of wedge-shaped pinholes and, below, with three incised lines and hatched triangles. Sharp rim; unmarked base. Temper of crushed stone and flint. H – 18.8 cm; R1 – 15.2 cm; R2 – 14.4 cm; R3 – 17.8 cm; R4 – 8 cm

**Fig. IV.318.** Jug, type D21b, ornamented under the rim with a circumferential incised line and triangular, wedge-shaped impressions, on the body, with two incised lines and wedge-shaped impressions, and along the handle, with two incised lines. Sharp rim; base slightly marked; handle perforated vertically. Temper of crushed stone and flint. H – 13 cm; R1 – 16.7 cm; R2 – 15.2 cm; R3 – 20 cm; R4 – 7.3 cm

**Fig. IV.319.** Pot, type G111c, plain. Sharp rim; base not preserved. Temper of crushed stone and flint. Parameters: H – 18.4 cm; R1 – 12.3 cm; R2 – 11.8 cm; R3 – 15 cm; R4 – 8.4 cm

**Fig. IV.320.** Bowl, type M121, plain. Rim cut straight; base slightly marked. Temper of crushed stone and flint. H – 7 cm; R1 – 14.5 cm; R4 – 6.4 cm

**Fig. IV.321.** Pot, type 111c?, plain. Rounded rim; base not preserved. Temper of crushed stone and flint. H > 15.5 cm; R1 – 14.7 cm; R2 – 14 cm; R3 – 18.1 cm

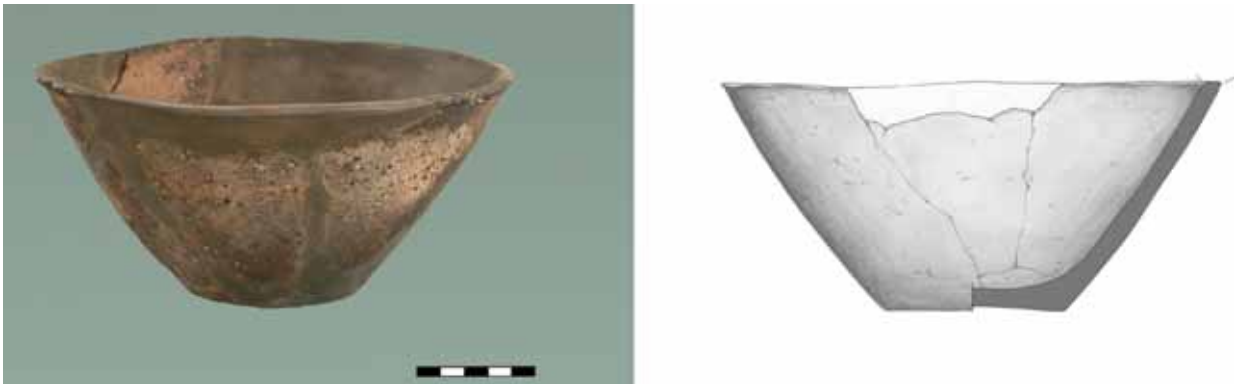


**Fig. IV.322.** Bowl, type M22, plain. Rim cut straight; unmarked base. Temper of crushed stone and flint. H – 10 cm; R1 – 21.5 cm; H4 – 7.8 cm

**Fig. IV.323.** Beaker, type P22, ornamented on the neck and body with circumferential pinholes, and, below, with three incised lines and incised hatched triangles. Rim cut straight; unmarked base. Temper of crushed stone and flint. H – 12.6 cm; R1 – 11.8 cm; R2 – 11 cm; R3 – 12.1 cm; R4 – 6.5 cm

**Fig. IV.324.** Pot? Upper part missing. Ornamented with circumferential incised, hatched triangles; unmarked base. Temper of crushed stone and flint. H – > 18.3 cm; R3 – 20 cm; R4 – 8.7 cm

**Fig. IV.325.** Vase, type W12, ornamented with circumferential pinholes and, below, with two horizontal incised lines and incised, hatched triangles. Rim cut straight; marked base. Temper of crushed stone and flint. H – 11.2 cm; R1 – 14.9 cm; R2 – 14.3 cm; R3 – 16.5 cm; R4 – 7.3 cm

**Fig. IV.326.** Bowl, type M21, plain. Rim cut straight; marked base. Temper of crushed stone and flint. H – 6.2 cm; R1 – 10 cm; R4 – 4.8 cm

**Fig. IV.327.** Vase, type W12, ornamented on the neck and body with three circumferential incised lines and, below, with vertical pinholes. Sharp rim; marked base. Temper of crushed stone and flint. H – 8.2 cm; R1 – 9.8 cm; R2 – 9.3 cm; R3 – 10.5 cm; R4 – 5.2 cm

Deposit 1 from barrow 4/1931 contained a stone axe, while deposit 3 – a flint axe, blade knife and clay spoon. The stone axe was made of menilite shale (**Fig. IV.329**). The blade knife and flint axe was made of local, upper-Dniester, raw material (**Fig. IV.330**). The clay spoon morphology suggests that it was used for metallurgical purposes (**Fig. IV.328**).

**Fig. IV.328.** Clay (casting?) spoon. Length: 8.4 cm; bowl width: 4.5 cm, handle length: 4.0 cm

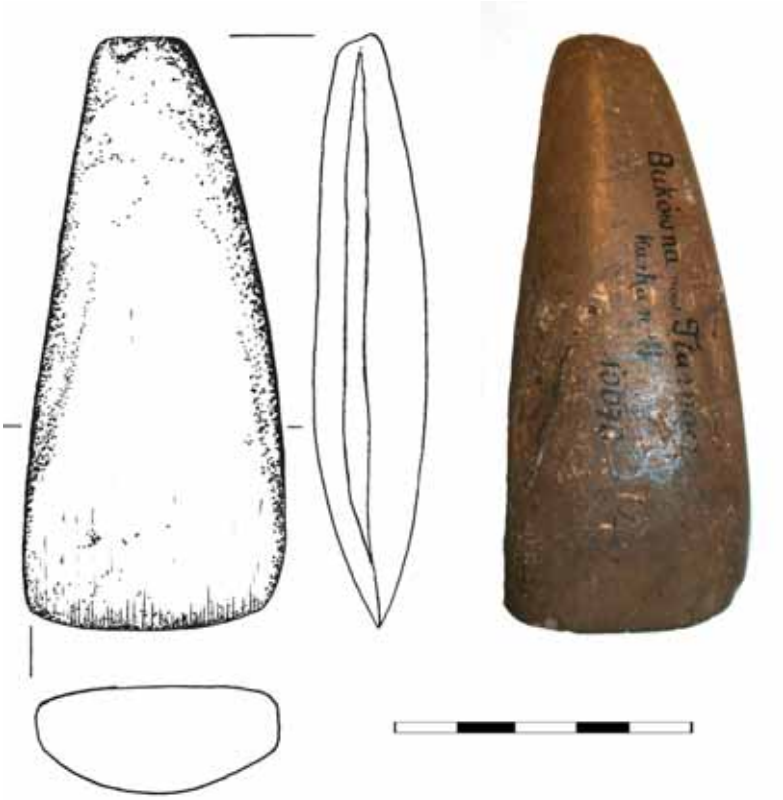


**Fig. IV.329.** Stone axe of menilite shale. Lenticular section; length: 10 cm, butt width: 1.5 cm, cutting edge width: 4.5 cm, thickness: 1.8 cm

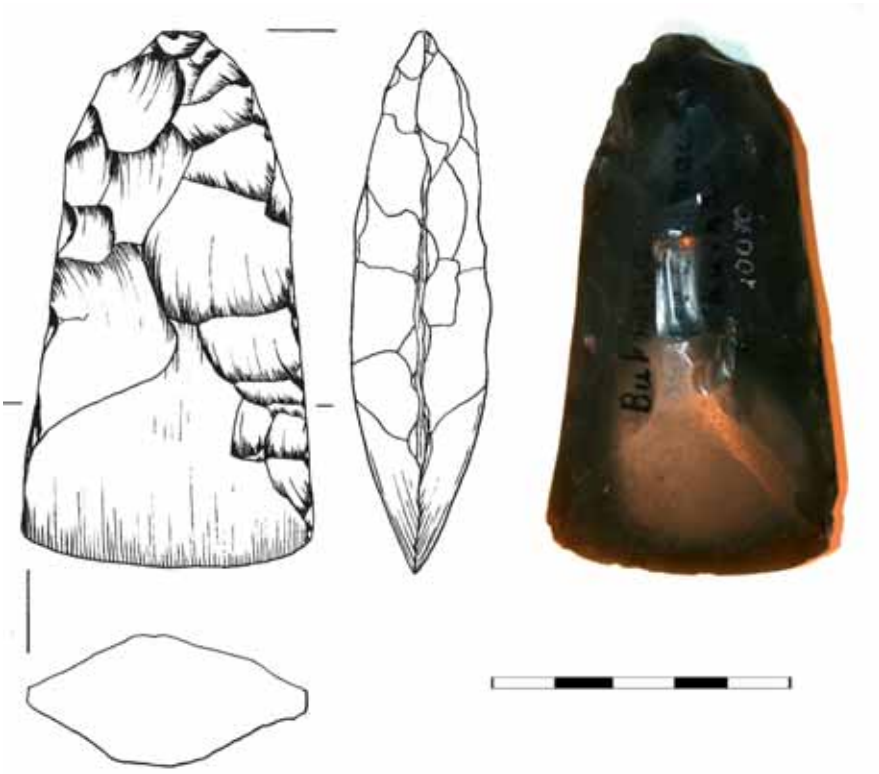


**Fig. IV.330.** Axe of upper-Dniester flint. Lenticular section; length: 9.3 cm, cutting edge width: 5.0 cm, thickness: 2.3 cm

**Fig. IV.331.** Bowl, type M21, ornamented on the body with four circumferential incised lines and, below, with multiple lines forming angles and interrupted by vertical pinholes. Rim cut straight; base slightly marked. Temper of crushed stone and flint. H – 11.8 cm; R1 – 17.8 cm; R3 – 19.8 cm; R4 – 9.4 cm

**Fig. IV.332.** Handless amphora, type A222, ornamented on the body with two appliqué bosses; below, oblique grooves. Rim cut straight; unmarked base. Temper of crushed stone and flint. H – 10.7 cm; R1, R2 – 12 cm; R3 – 16.4 cm; R4 – 8.9 cm

**Fig. IV.333.** Vase, type W21, ornamented on the neck and body with circumferential incised, hatched triangles and, below, with four incised lines and, further below, with oblique flutes. Rim semicircularly cut; marked base. Temper of crushed stone and flint. H – 16.2 cm; R1 – 21.4 cm; R2 – 19.6 cm; R3 – 22.3 cm; R4 – 8.8 cm

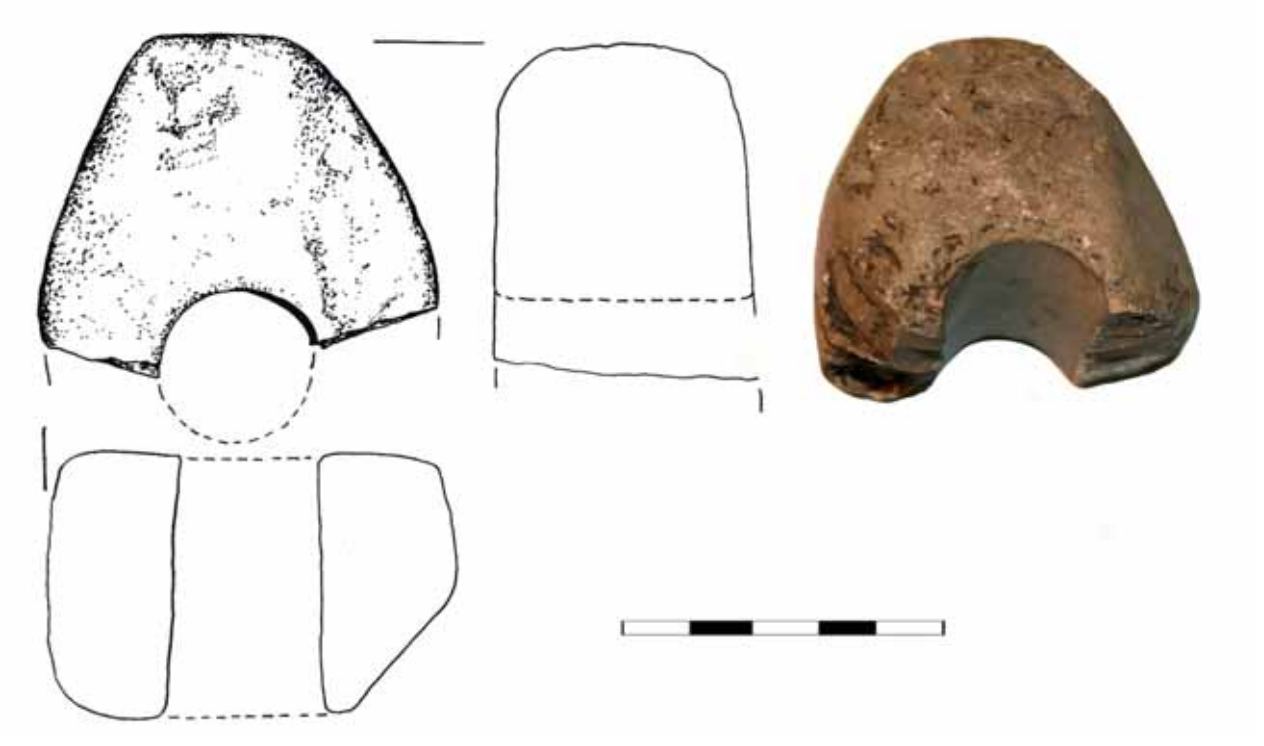


**Fig. IV.334.** Stone battle-axe, broken

**Barrow 15/1931** was discovered in the northern part of the cemetery, in the clear-cut logging. It was 1 m high (diameter unknown). In its central part, at a depth of 0.6 m (0.8 m)[16] was a bowl (**Fig. IV.331**) and a few flint flakes (Bryk 1932:22; 1932a:1).

**Barrow 16(14)/1931**[17] was located in the northern part of the cemetery, on a clear-cut logging. It was 1 m high (diameter unknown). Four vessels were discovered on the soil level (two were preserved – an amphora and a vase; **Fig. IV.332, Fig. IV.333**). Flints and sherds were found throughout the mound (Bryk 1932:22; 1932a:1) and a battle axe. According to other authors, a broken stone battle-axe (**Fig. IV.334**), were found in barrow 14 and a limestone or slate hoe (Rogozińska 1959:103; Sulimirski 1968:149).

**Barrow 17 (16)/1931**[18], was located on a clear-cut logging, in the northern part of the cemetery. It was ca. 1.2 m high (diameter unknown). The excavator recognized two levels of find depositions (Bryk 1932a:2). The upper was 70 cm deep. Four vessels (two preserved – **Fig. IV.335, Fig. IV.336)**, small fragments of pottery, flint and stone tools, as well as pebbles were recovered at this level. 120 cm from the top of the mound, on the natural soil (rather subsoil) was a feature (grave?), in which two animal skeletons were found (smaller and larger animal; species unidentified[19]). They were facing each other with their limbs bent and their heads facing E. Remains of the larger animal were placed on their left side, while the remains of the smaller one placed on their right side. Bones were transported for analysis to the Lwów Academy of Veterinary Medicine but their results (if any) remain unknown.

**Barrow 18 (17)/1931**[20] was situated on the clear-cut logging of the forest. It was 1 m high (diameter unknown). According to J. Bryk it was already 'excavated' (robbed?). In the mound there some flint flakes and fragments of pottery, which technologically resemble the ones deposited in other barrows (Bryk 1932:22; 1932a:2).

[16] Cf. reference 12.
[17] Number 14 according to Bryk 1932:22.
[18] Number 16 according toBryk 1932:22

[19] R. Rogozińska (1959:103) and T. Sulimirski (1968:149) mention young horses.
[20] Number 17 according to Bryk 1932:22.

**Fig. IV.335.** Vase, type W12, ornamented on the neck and body with four incised lines and, below, with multiple incised angles and triangles separated by four pairs of appliqué bosses. Rim with eaves; unmarked base. Temper of crushed stone and flint. H – 9.2 cm; R1, R2 – 14.6 cm; R3 – 16.5 cm; R4 – 7.3 cm

**Fig. IV.336.** Vase, type W22c, ornamented under the rim with two circumferential incised lines with pinholes between them, and on the body, with three circumferential incised lines and incised triangles and multiple angles. Rim cut obliquely, marked base, strap handles. Temper of crushed stone and flint. H – 14.5 cm; R1, R2 – 16.6 cm; R3 – 20.8 cm; R4 – 8.7 cm

## Excavations in 1937

Due to the availability of documentation from later excavations (conducted by M. Śmishko[21] and I. Siwkówna), including drawings and descriptions in the diary, it is possible to reanalyse old data.[22] Archaeological materials were mostly collected in the Lviv Historical Museum and, as a result of moving the collection during and after WWII, were severely damaged with the collection itself left scattered. Part of the ceramic materials were given to other museums, e.g. the Lviv Museum of Religious History or the Museum of Ancient Halych. As a result, a large portion of vessels and other archaeological finds, including anthropological and archaeozoological samples, were lost. Barrows were excavated in quarters with documented profiles, so it is possible to re-interpret past stratigraphic information.

**Barrow I/1937** (**Fig. IV.337**) was located 150 m west of a stream bridge, which was placed along a former road from Bukówna to Miłowanie. In more general terms, the barrow was located on the commune pasture bordering the Bukówna manor forest (Śmiszko 1937:15; Sulimirski 1968:150). Its diameter was 12 m and it was 1.7 m high. During excavations it was possible to identify three construction strata:[23] 0.25 m thick humus layers, a 1 m thick layer of original mound ('loess loam mixed with humus'), and a

[21] Markian Smishko Ukrainian by nationality, wrote the diary in Polish, hence the Polish version of his name.

[22] Barrow descriptions according M. Śmishko's diary.

[23] Stratigraphy in the center of the mound.

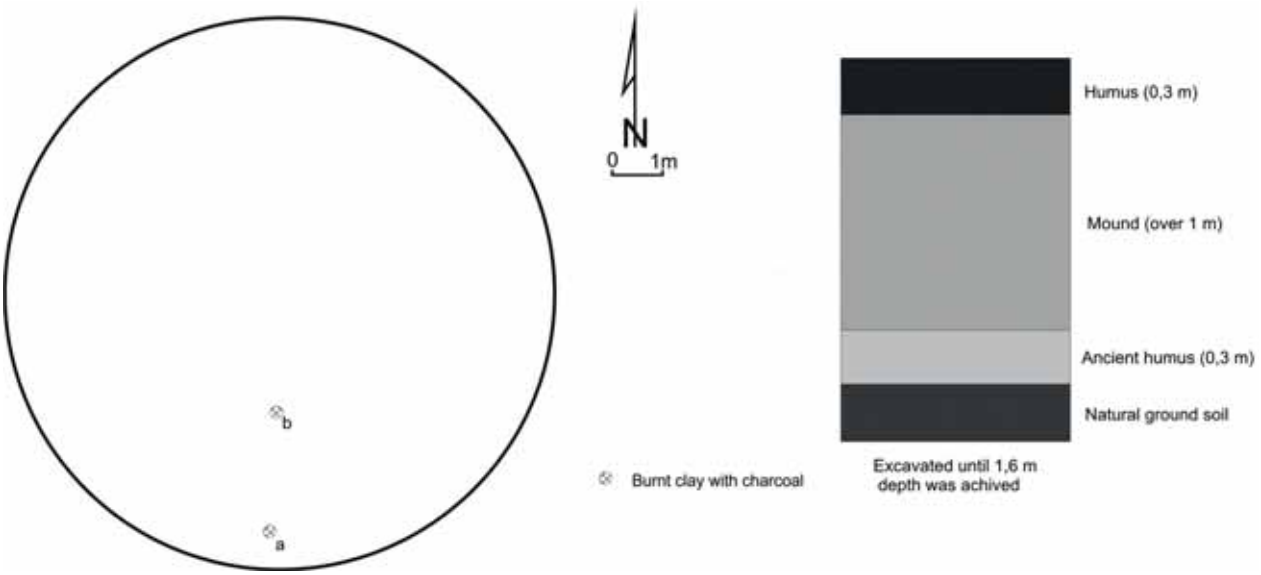



**Fig. IV.337.** Digitalized plan of barrow 1/1937 (excavations of M. Śmiszko and I. Siwkówna)

0.2 m thick subsoil. Natural soil was 0.2 m thick and mixed with humus.[24] The mound was excavated using neighbouring quarters with a 6 m radius, until a depth of 1.6-1.8 m was achieved. In the southern zone of the barrow, at a depth of 60-70 cm, two small hearths (0.25-0.30 m diameter each) paved with small 'limestone slabs' were identified (rather traces of burning with small charcoals and burnt clay) (Śmiszko 1937:15). Several vessel fragments and flint flakes were recovered on the natural soil.

**Barrow II/1937** (**Fig. IV.338**) was located on the pasture neighbouring the forest, ca. 100 m S of barrow I/1937. It was 9-10 m[25] in diameter and 0.5 m high[26] (Śmiszko 1937:16; Sulimirski 1968:150). It was excavated using neighbouring quarters (4.5 m radius). Barrow construction resembled the stratigraphy in barrow I/1937. The humus layer was 0.2 m thick (according to plans its thickness was varying), beneath there was a 0.65 m thick mound layer and then 0.25 m thick subsoil. Small fragments of pottery, flint flakes ('unretouched') and tiny charcoals were found already in the mound. At 0.46 m, on the edge of quarters A and there were some iron objects. The barrow was excavated until a depth of 1.1 m was reached.

**Barrow III/1937** (**Fig. IV.339**) was found in a young forest, ca. 300 m N of barrow I, on the right side of the former road from Bukówna to Miłowanie. The mound was well preserved; 2 m high and measuring 12 m in diameter. It was excavated using neighbouring quarters ('quarters' had a 5.5 m radius), until a depth of 2.1 m from the top of the mound was achieved. The humus was 0.35 m thick. Beneath there was a 1 m thick mound layer, which comprised 'loess loam' mixed with chernozem. Underneath the mound there was a 0.2 m thick subsoil with ancient humus beneath (chernozem?; Śmiszko 1937:17; Sulimirski 1968, 150, Plan 37: 2).[27]

In the southern part of the barrow, at 0.8 m depth, was an irregular, rectangular feature, ca. 3 m long and a 1.5 m wide (pit, grave?). It was 0.3 m deep along the edges and 0.4 m deep in the centre. The feature was filled with red-burnt soil. In its central part there were fragments of burnt bones and tiny charcoals. Bronze objects were found inside: a patinated, 31 cm long disc-headed pin (c; **Fig. IV.340:3**) and a five-coil spiral arm-band (Fig. IV.340:4). A broken, spiral-head of a pin was found 0.5 m to the NW of the feature. On the same depth, a bit further N(e; Fig. IV.339),there was a smaller 10 cm long, corroded spiral-headed pin.

A small vessel (f; Fig. IV.339; Fig. IV.340:5) placed on a small, irregular limestone slab was found in the centre of the barrow on top of the natural soil (cher-

[24] In some descriptions subsoil layers were regarded as natural soil.

[25] Discrepancies in height and diameter between the diary and plans.

[26] A major discrepancy in height between the diary (0.5 m) and plans (1.1 m).

[27] Previous description (cf. stratigraphy of other barrows) and present-day experience suggests that it was still subsoil.

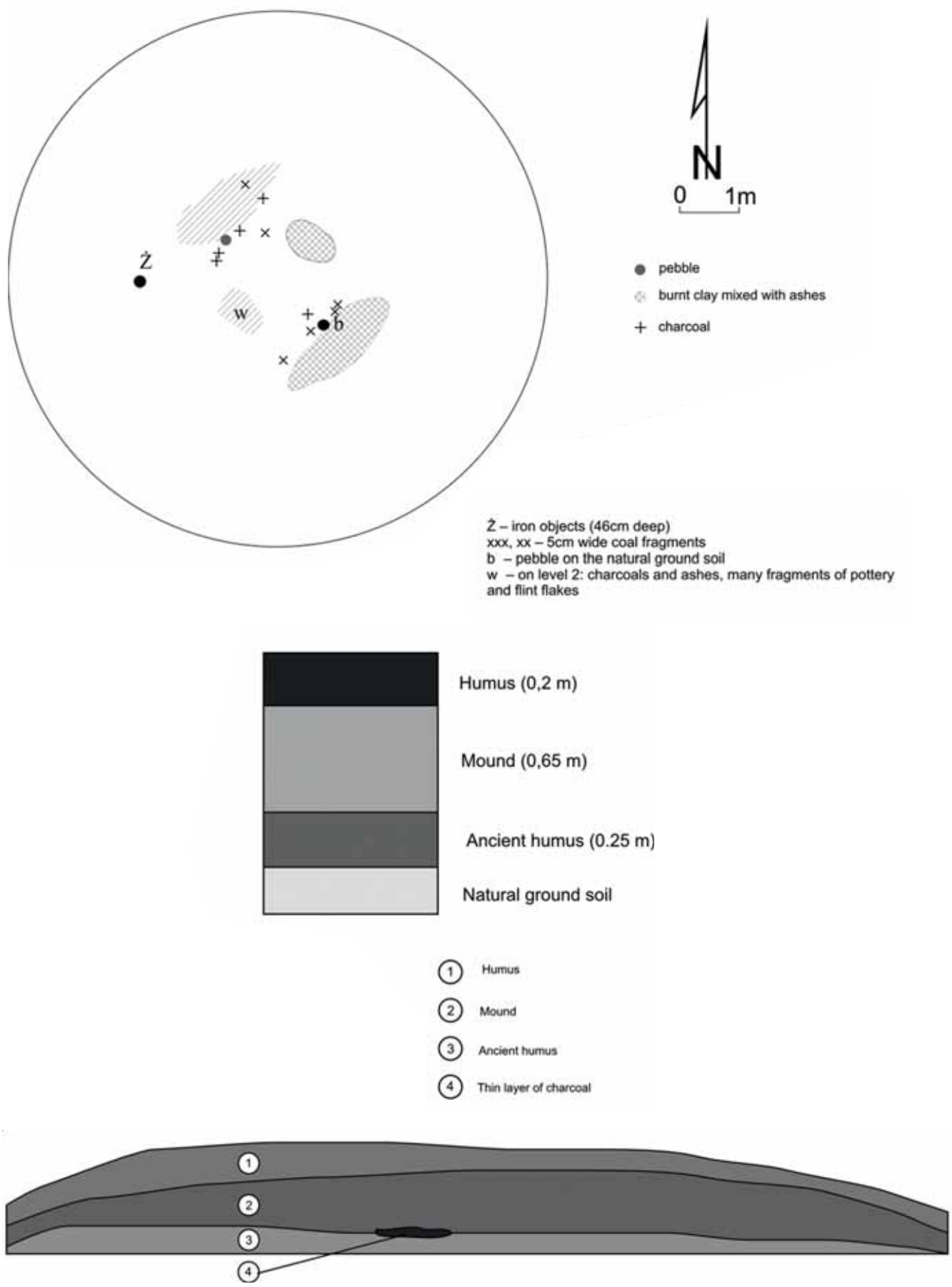
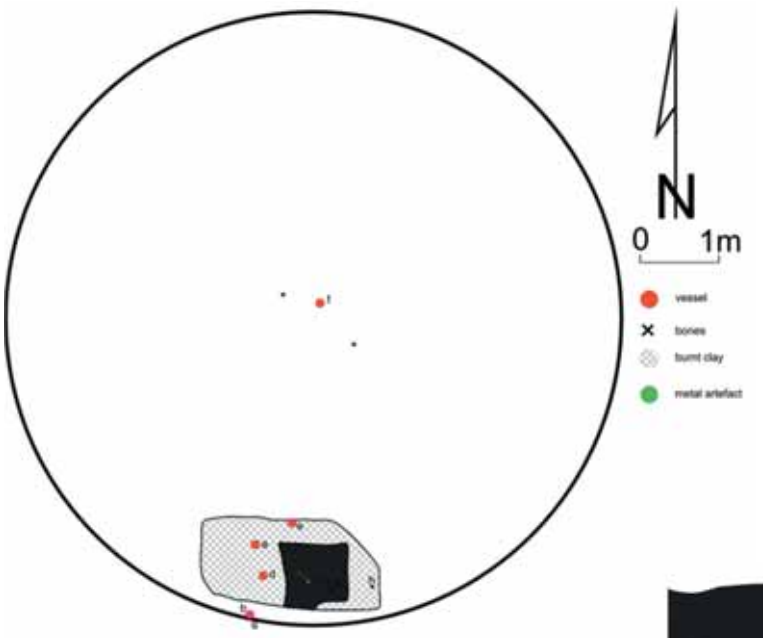



**Fig. IV.338.** Digitalized plan of barrow II/1937 (excavations of M. Śmiszko and I. Siwkówna)




a) Small vessel (bottom) and sherds on the bottom of level 2
Beneath level two clearly burnt soil covering an area of 2 square meters; irregular and quadrate in shape.
b) A cavity at the same depth: burnt clay and few sherds. 15cm in diameter, 10cm deep
c) At the depth of 75cm, among burnt clay, fragments of burnt bones and pyre remains was a bronze pin (31cm long), completely patinated.
d) At the depth of 70cm, among burnt clay, was a whole vessel, slightly crushed. Left of "c" pin was a three-coiled, wire arm-ring. Outer surface was convex, inner surface flat. Both sides finished with small spirals (34cm in diameter, rounded wire, 0,5cm in diameter). 50cm to north-west was a fragment of a spiral-headed pin, shaft was not found.
e) At the same depth as other bronze objects was a spiral-headed pin with a corroded shaft; ca. 10cm long
f) Vessel bottom on top of a limestone slab, depth 1,85m, found in chernozem
Solid line marks the borders of a deep pit, from which came thick, lightly burnt bones and burnt clay. Pit was dug through the humus, reaching to chernozem layer. Surface of the feature and its filling provided many charcoal fragments.40cm deep.
Caution: mound looked as if it comprise of a smaller cap (sic!) made of black soil, on top of which was a layer of loess loam mixed with dark humus.
g) In the adjacent quarter, on top of burnt clay, near the circumference was a vessel base and few sherds

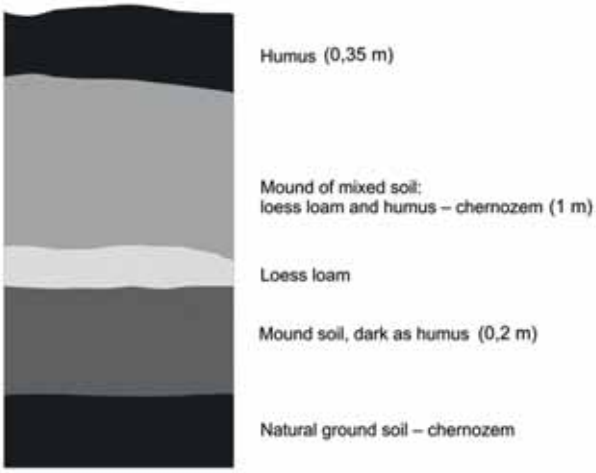



**Fig. IV.339a.** Digitalized plan of barrow III/1937 (excavations of M. Śmiszko and I. Siwkówna)

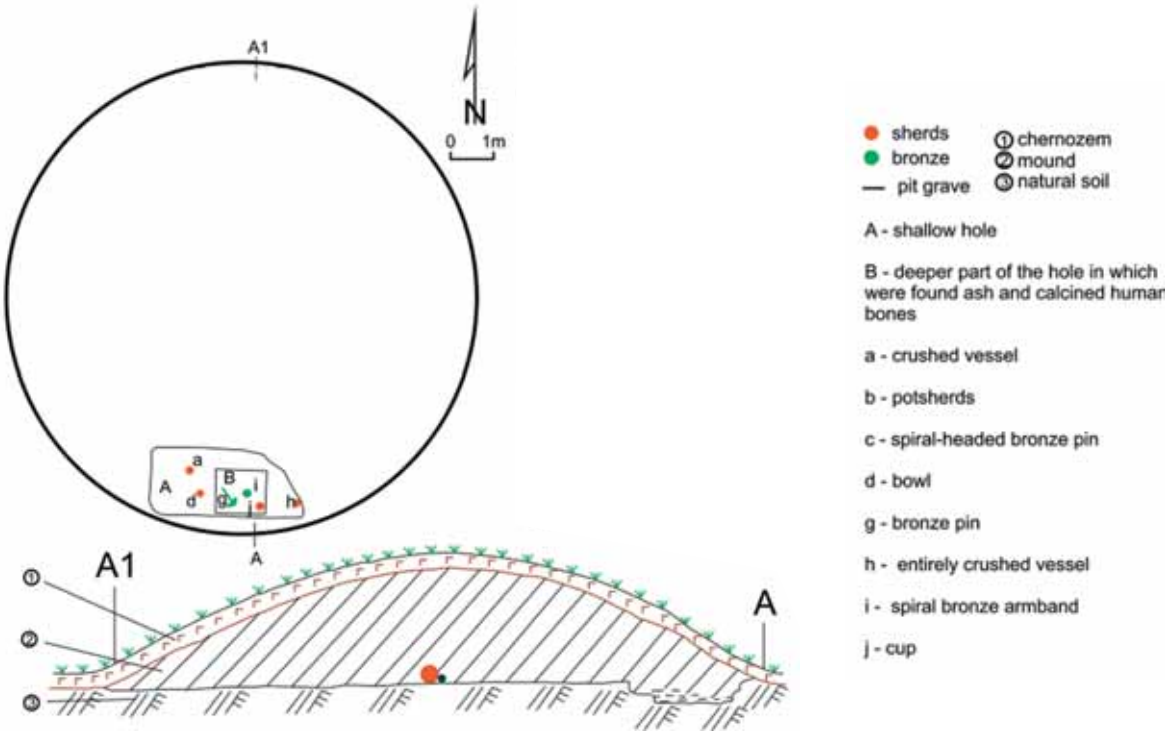



**Fig. IV.339b.** Digitalized plan and cross-section of barrow III/1937 (after Swiesznikow 1967, Fig. 2:3)

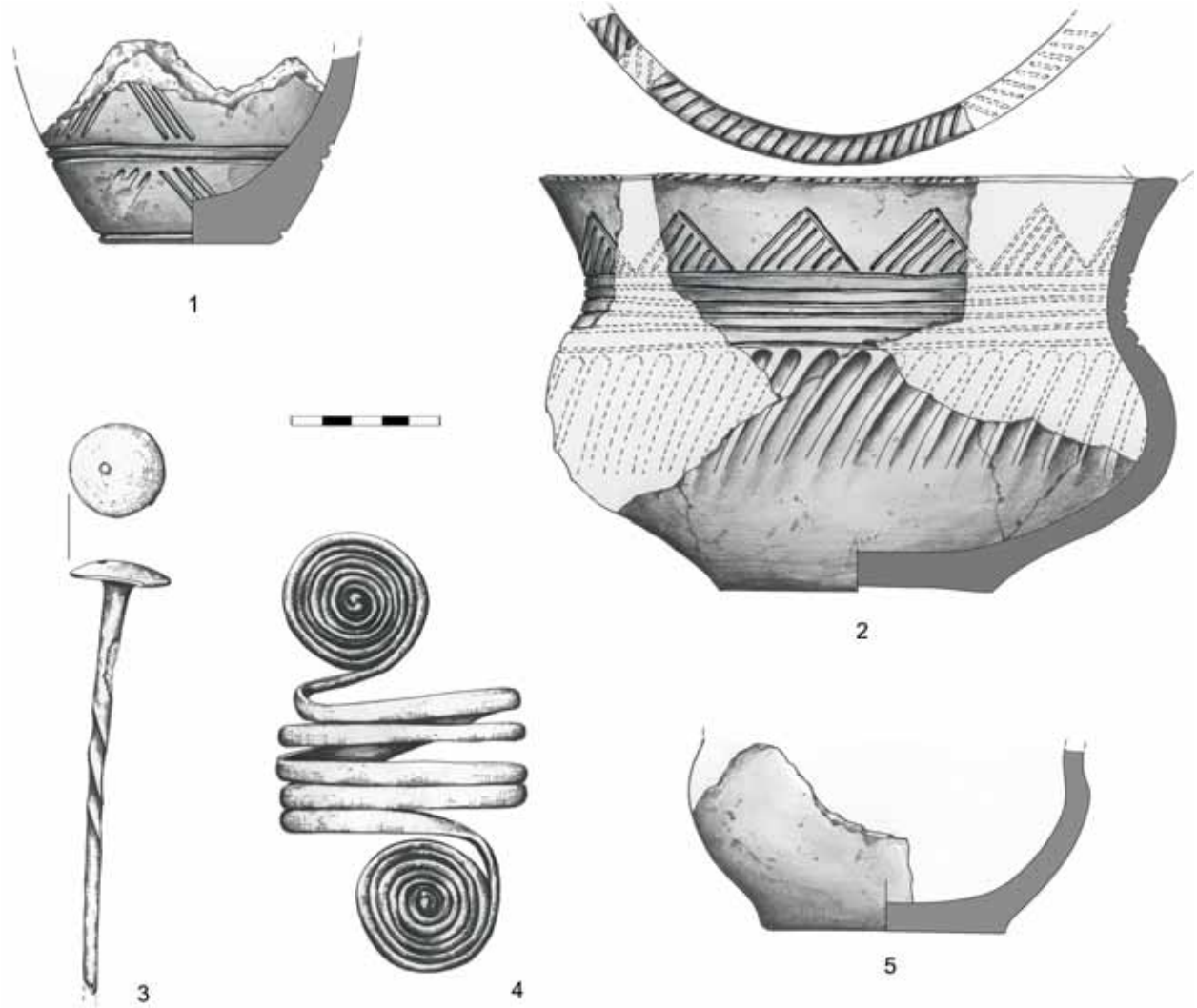
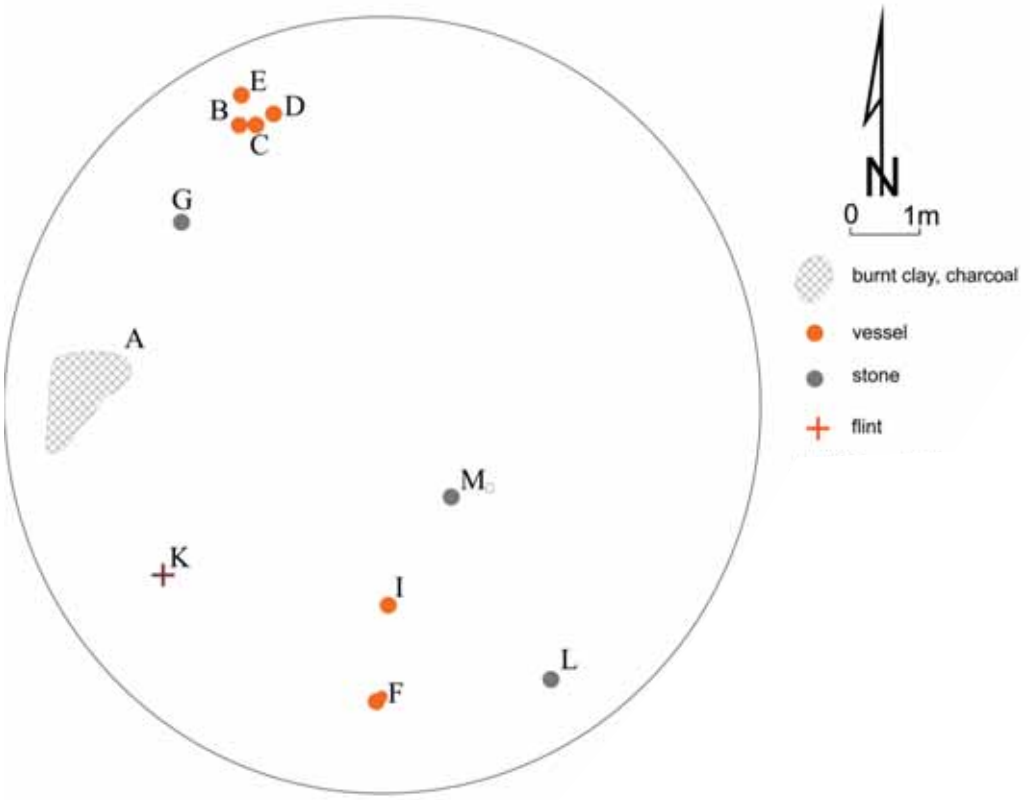



**Fig. IV.340.** 1 – beaker? (only bottom part is preserved), ornamented with the circumferential motifs of multiple angles and, below, two incised lines (the pattern is repeated); unmarked base. R4 – 6.2 cm. 2 – vase, type W21, ornamented on the rim with oblique notches, under the rim, on the neck and body, with circumferential incised hatched triangles, below, with six incised lines, further below, with oblique grooves. Rim thickened and cut straight; marked base. H –14.2 cm; R1 – 21.6 cm; R2 – 18.3 cm; R3 – 21.5 cm; R4 – 9.3 cm. 3 – bronze perforated nail-head pin, twisted, broken. Preserved length: 14.5 cm, head diameter: 3.2 cm. 4 – five-coil bronze arm-band, finished with spiral disks. Length: 15.0 cm, disk diameter: 4.8-5 cm. 5 – vessel type?, unmarked base. R3 – 13.5 cm; R4 – 8.3 cm

**Fig. IV.341.** Beaker, type P1, plain. Rim cut straight, unmarked base. Temper of crushed stone and flint. H – 8.5 cm; R1 – 10.5 cm; R4 – 6.3 cm




A)At 25cm depth, ca. 4m west from the centre of the barrow,
a 5cm thin layer of red, burnt clay, mixed with charcoal and a pit filled with charcoals and red, burnt clay; 20cm deep, 40x60cm wide.
B)50cm deep – vessel turned upside down
C)45cm in a straight line – a bottom of small vessel
D)40cm from vessel "B" – ornamented vessel "D"
E)Tiny vessel, close to the ornamented one
F)3,70m south of the centre – a vessel with a vessel placed inside (depth – 60cm)
G)3,30m from the centre – a pebble (depth – 60cm)
I) 2,30m from the centre – a vessel (depth – 65cm)
K) 2,40m from the centre – flint scrapper (depth – 60cm)
L) 3,80m from the centre – a pebble (depth 60cm)
M) 1,40m from the centre – a pebble (depth – 60cm)

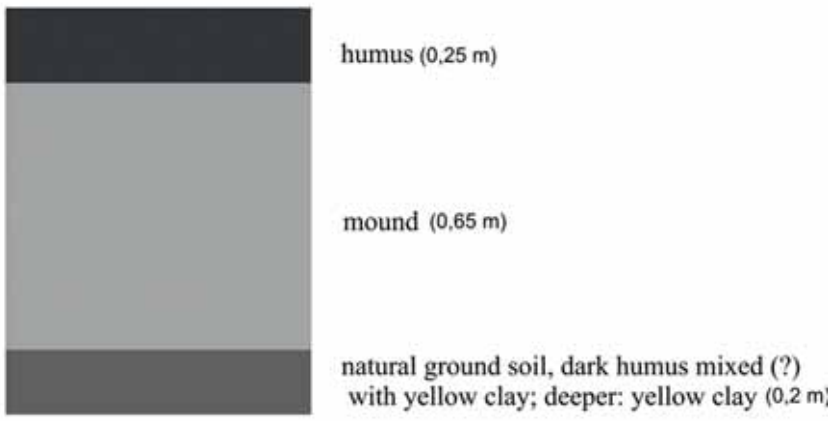



**Fig. IV.342.** Digitalized plan of barrow 1V/1937 (excavations of M. Śmiszko and I. Siwkówna)

nozem). The upper part of the vessel was broken. Similar slabs were found on the same level, closer to the centre (spots marked with crosses – Fig. IV.339). In the southern part of the mound, in the upper part of the feature, there was an additional vessel (d; Fig. IV.339; Fig. IV.340:2). It was completely preserved but crushed by the weight of the soil. Two additional crushed vessels were found in this part of the barrow (h, i; Fig. IV.339; Fig. IV.340:1; **Fig. IV.341**).

Small sherds and flint flakes (some of them unretouched) were found in the mound.[28]

**Barrow IV/1937** (**Fig. IV.342**) was located to the N of the grange, on top of a hill close to a field crossroad. According to the author's account it was one of the few partially visible or completely destroyed barrows aligned on top of the hill, N of the grange (forester's lodge), on W. Komornicki's field. The barrow was severely ploughed, had a diameter of 12 m and was 1.1 m high. It was partially excavated (10 m diameter with a profile). The upper part comprised a 0.25 m thick humus, beneath which was the mound (0,65 m thick), subsoil (0.2 m thick) consisting of chernozem mixed with yellow clay, and deeper – natural soil comprised of yellow clay (Śmiszko 1937:19f; Sulimirski 1968:150, Plan 37: 1).

In the western part of the barrow, at a depth of ca. 0.25 m a dark, burnt soil mixed with charcoal was found. Close to it was an oval pit 0,6 m long, 0,4 m wide and 0.25 m deep, which was filled with red burnt clay and charcoal.

Around 3.7-4,0 m to the SE of the centre was a group of vessels (B, C, D, E), of which: one was turned upside down (B), the second was crushed (C),

[28] Information about unretouched flint tools is a re-occurring theme of barrow descriptions. In the light of present-day research, it is suggested that only part of the assemblage was left unretouched.

**Fig. IV.343.** Amphora, type A111, ornamented circumferentially under the rim with circular impressions, on the neck, with three incised lines, on the body, with vertical grooves. Rounded, thickened rim, base slightly marked, handles perforated horizontally. Temper of crushed stone and flint. H – 12 cm; R1, R2 – 15.3 cm; R3 – 18.3 cm; R4 – 8 cm

**Fig. IV.344.** Bowl, type M121, plain. Rim semicircularly cut; marked base. Temper of crushed stone and flint. H – 9,3 cm; R1 – 21,3 cm; R4 – 7,8 cm

**Fig. IV.345.** Beaker, type P1, ornamented on the whole surface with three circumferential incised lines (three times), below, with multiple angles (twice), at the base, with groups of vertical short strokes. Rim cut straight; unmarked base. Temper of crushed stone and flint. H – 8.9 cm; R1 – 11.5 cm; R4 – 9.4 cm

**Fig. IV.346.** Vase, type W21, ornamented on the neck with five circumferential incised lines, on the body, with incised oblique lines. Rim cut straight, with eaves; marked base. Temper of crushed stone and flint. H – 7.8 cm; R1 – 12.1 cm; R2 – 11.5 cm; R3 – 12.6 cm; R4 – 6.8 cm

**Fig. IV.347.** Vase, type W21, plain. Rim cut straight, thickened. Temper of crushed stone and flint. H – 12.5 cm; R1 – 20.8 cm; R2 – 18 cm; R3 – 20 cm; R4 – R4 – 8.4 cm

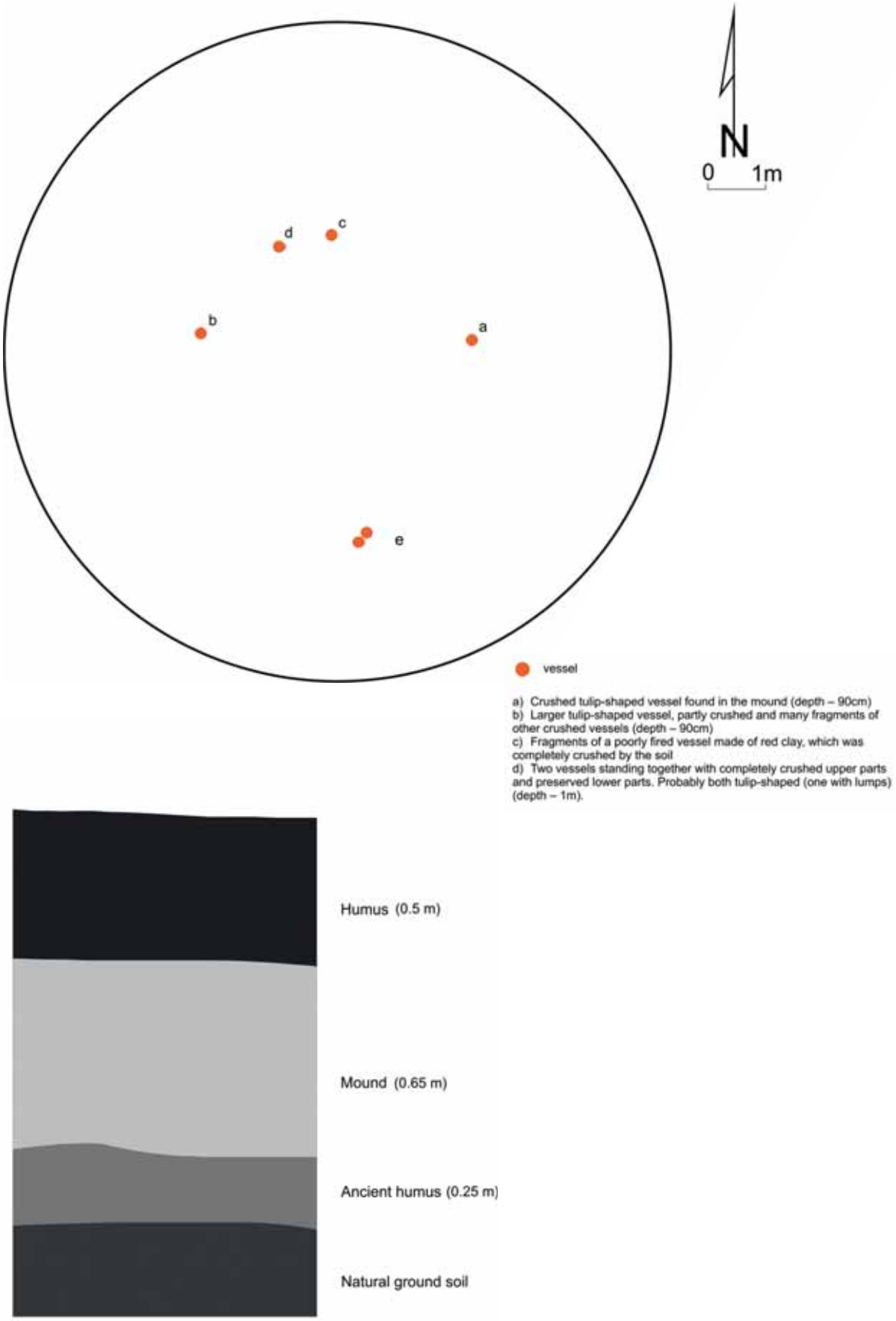



**Fig. IV.348.** Digitalized plan of barrow VI/1937 (excavations of M. Śmiszko and I. Siwkówna)

and the rest was preserved (**Fig. IV.343-Fig. IV.346**). 3.7 m to the S of the centre, 0,6 m deep, was another vessel, turned upside down with a stone (pebble) placed on top of it. At the same depth, 2.4 m away from the centre there was a flint scrapper (K). 3.3 m from the centre and a vessel (G) 0.65 m deep (**Fig. IV.347**). Stone pebbles G (b)?, L, M were recorded at a depth of 0.6 m around the centre but at a varying distance from it –G (b)? – 3.3 m, L – 3.8 m, M – 1.4 m. Thanks to present-day research it is possible to say that the uncovered construction is a stone cenotaph.

Pottery fragments and flint objects ('unretouched') were found in the mound.

**Barrow V/1937** (no plan) was in the court of W. Komornicki's manor. It had an oval shape and measured 12 × 10 m. It was excavated with the 'circular' method, with a 9 m long diameter, until a depth of 1.7 m was reached. The humus was 0.65 m thick, with a 1.5 m thick mound layer. The finds were comprised of 'nonspecific' flint flakes and charcoal (Śmiszko 1937:21; Sulimirski 1968: 150). It is difficult to classify it as a barrow of the Komarów culture.

**Barrow VI/1937** (**Fig. IV.348**) was part of the linear structure located on top of a hill in the forest, just next to the forest road leading from the church in Bukówna to W. Komornicki's manor (Śmiszko 1937:23; Sulimirski 1968, 150, Plan 38: 3). If counted from the crossroads on the road from Bukówna to Miłowanie, it was the fourth in line.[29] The well-preserved mound was 1.5 m high and 11.5 m in diameter. It was excavated using the 'circular' method with a single cross-section in the centre of the barrow.

Stratigraphy was as follows: a 0.5 m thick humus, followed by a 0.65 m thick mound, beneath which was a 0.25 m thick subsoil with a black 'shining' natural soil at the bottom (chernozem; Śmiszko 1937:23f.).

Six vessels were recovered from the barrow. They were located in different parts of the monument but at a more or less stable depth of 0.9-1 m from the top of the barrow. They were partially crushed by soil weight. A partially crushed tulip-shaped vessel (a) was found at 0.9 m **(Fig. IV.349)**. A morphologically similar but larger vessel was found at the same depth but only its lower part was preserved (b). Fragments of an S-shaped vessel (c) were also found. Macroscopic examination showed that it was burnt at a lower temperature, which eventually caused the vessel to crush. Additionally, at 1 m deep there was a small, handled vessel (d) with a variety of knobs placed on its body **(Fig. IV.350)**. Finally, two neighbouring tulip-shaped

[29] Excavators did not recognize smaller barrows in this region; if counted from the crossroads of the field road leading from the church to the manor and the road from Bukivna to Milovanie – it was the tenth barrow.

**Fig. IV.349.** Beaker, type P22, plain. Rim cut straight; unmarked base. Temper of crushed stone and flint. H – 18 cm; R1 – 17.8 cm; R2 – 16.4 cm; R3 – 17.4 cm; R4 – 9.1 cm

**Fig. IV.350.** Cup, type K22, ornamented on the neck with two grooves and on the body with three appliqué bosses rimmed with grooves. Rim cut straight; base slightly marked. Temper of crushed stone and flint. H – 14.6 cm; R1 – 18.9 cm; R2 – 16.9 cm; R3 – 21.4 cm; R4 – 8.4 cm

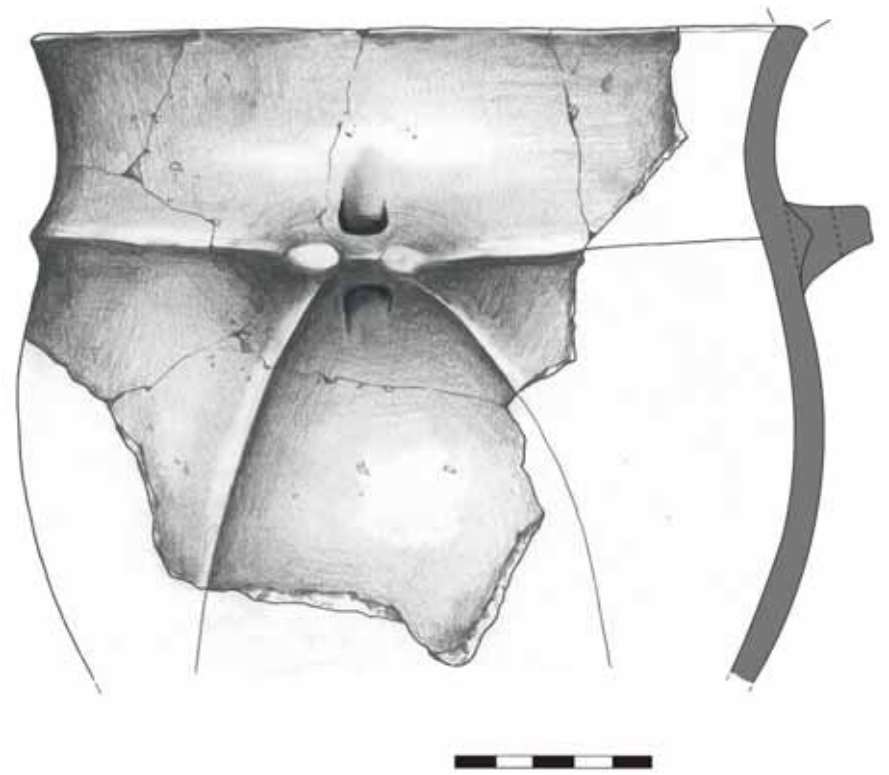


**Fig. IV.351.** Pot, type G111, ornamented on the body with a circumferential relief strip. Rim cut straight, with a handle placed on it from which relief whiskers droop. Handle perforated vertically; base not preserved. Temper of crushed stone and flint. H – 17> cm; R1 – 19.6 cm; R2 – 18.3 cm; R3 – 20.5 cm

vessels (e) were found **(Fig. IV.351)**. Only the lower parts of the vessels were preserved. No charcoals were recognized ('clean mound').

**Barrow VII/1937 (Fig. IV.352)** was situated in the field, close to the forest, in the vicinity of Bryndal's farm, 200 m NW of the church. It stood on the slope of a small hill on which other barrows could be seen as well (besides those excavated by Bryk, three unexplored ones).

The stratigraphic structure of the mound was very similar to that of other barrows. The height of its mound reached approx. 0.6 m. It was excavated using the 'circular' method (diameter: 11 m) with a single cross-section in the centre of the barrow (1 m

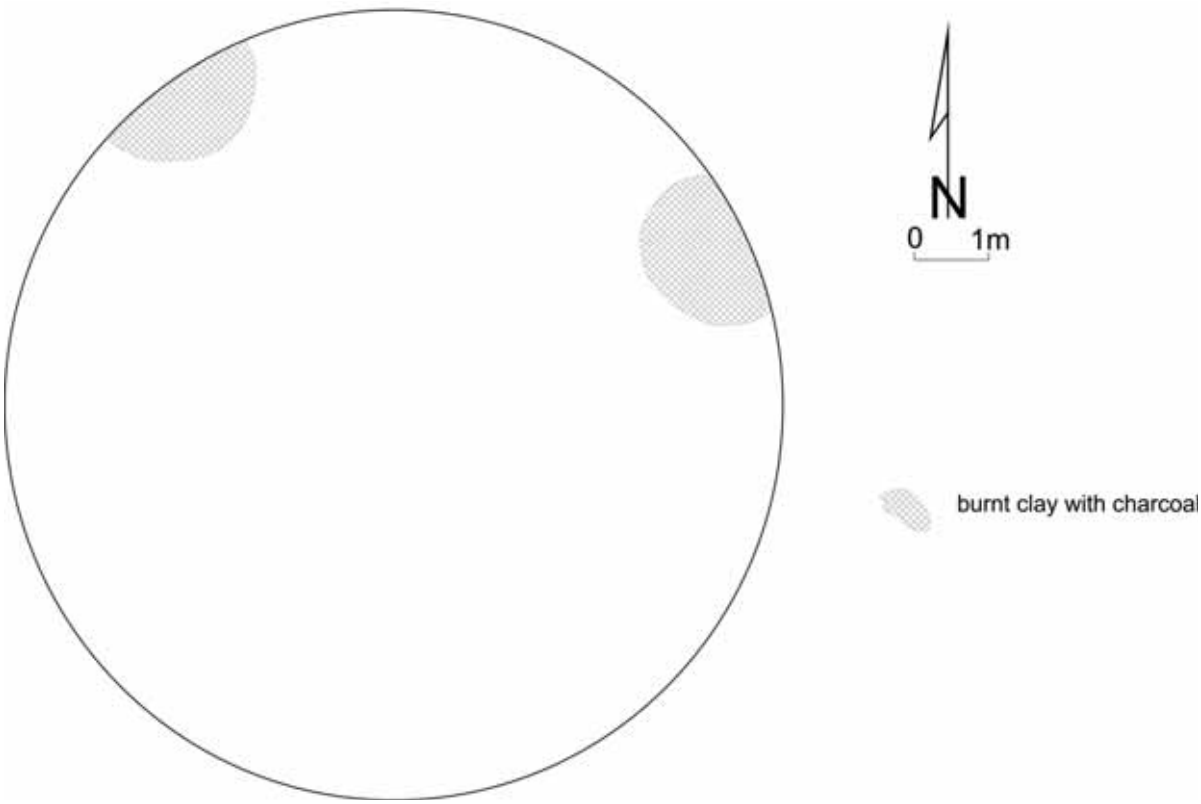



**Fig. IV.352.** Digitalized plan of barrow VII/1937 (excavations of M. Śmiszko and I. Siwkówna)

in diameter). The barrow was explored to the natural soil level (loess), to a depth of 1.25 m from the top of the mound. A few flint flakes and small sherds were found. On the NW border of the barrow, at a depth of 0.3 m, an oval hearth was exposed, which covered 2 sq. m. The second hearth of a similar size was uncovered near the NE edge of the mound, at a depth of 0.85 m (Śmiszko 1937:24).

## E. Geophysical survey in Milovanie (Bukivna-Milovanie)

From March 12th to 18th 2016 the archaeological team from the Institute of Prehistory, Adam Mickiewicz University in Poznań, conducted a non-invasive geophysical prospection with a gradiometer on the cemetery near Milovanie in the vicinity of Bukivna. Barrows subjected to the survey are distributed over a large area, where they form linear concentrations. Places occupied by these groups of barrows are characterized by a different land use. While some of them are located inside a forest overgrowing most part of the site, the others can be found on recently deforested parcels of land. Two mounds situated on arable field are exceptional, those within the administrative limits of the village Milovanie.

Prospection was carried out inside a spatial extent of 35 grids, each with dimensions of 20 × 20 m, divided into several measuring surfaces that together covered an area of 1.4 ha. The adjacent grids created frameworks that included single monuments or whole groups of mounds. The area of the survey comprised of following three measuring surface:

**E.1.** Forested area (barrow group I – the main group) – measuring area comprised 19 grids covering an area of 0.76 ha **(Fig. IV.353)**.

**E.2.** Deforested area (barrow group) – it was divided into two further measuring area **(Fig. IV.354)**:
- **a.** Southern group – ten grids covering an area of 0.4 ha.
- **b.** Northern group – five grids covering an area of 0.2 ha.

**E.3**. Arable field – one grid covering an area of 0.04 ha.

The survey was carried out with an accuracy of 0.1nT, with samples taken every 0.25 m, along

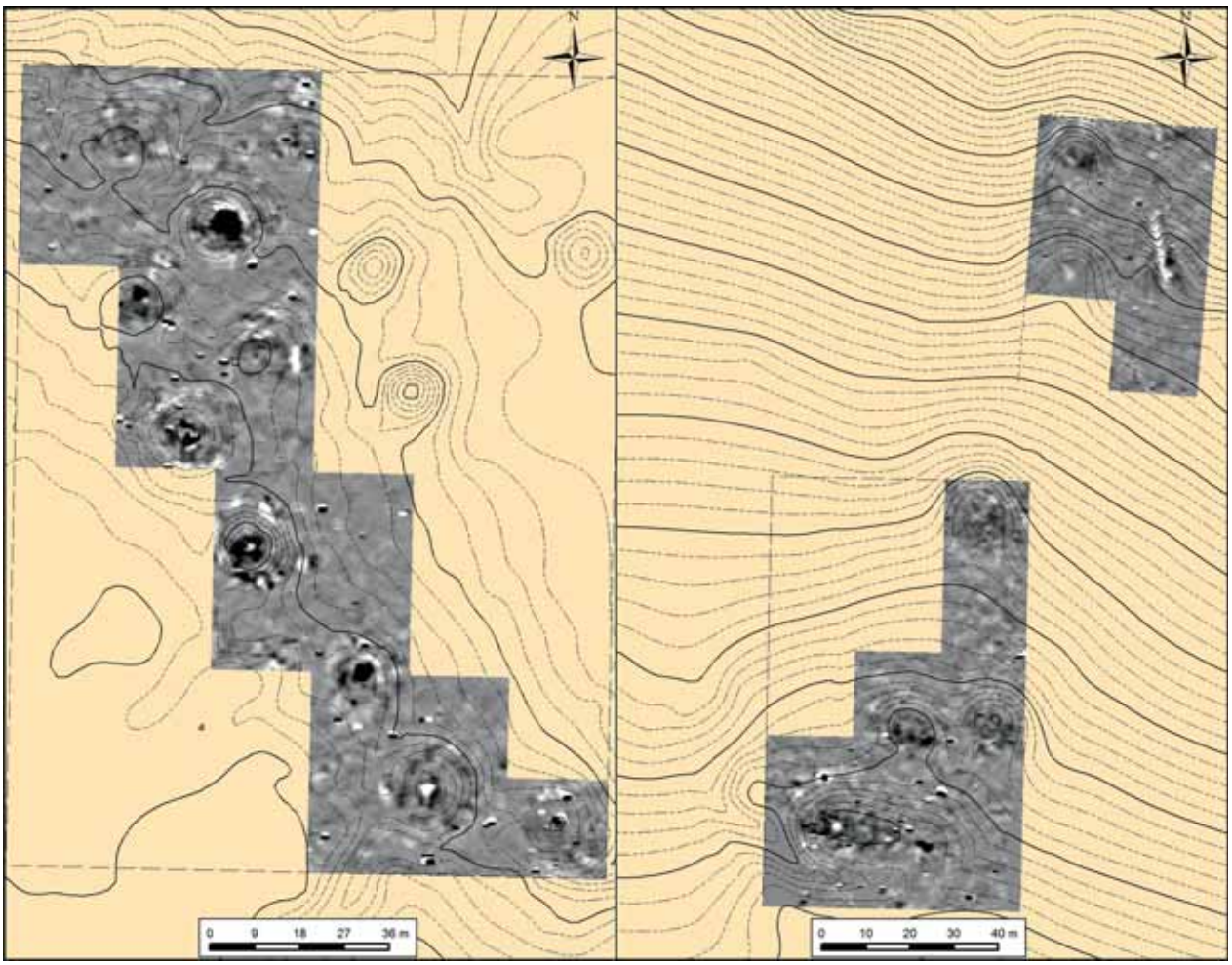



**Fig. IV.353** (left). Barrow group I (main group). Measured area against the hypsometric plan

**Fig. IV.354** (right). Barrow group III. Northern and southern measured areas against the hypsometric plan

transects separated by 1 m, in total taking 56 000 measurements, minus fragments of grids inaccessible for the method due to obstacles, mainly in the form of large trees present on the transect line.

## E.1. Forested area

The survey began with measurements of the barrows located inside the forest neighbouring with the village Milovanie from the N and village Roshniv from the E. This area was selected to magnetometric prospection on the basis of the presence of numerous embankments, possibly representing prehistoric mounds that were discovered during the preceding field reconnaissance. The subsequently established framework of grids covered the largest concentration of mounds belonging to barrow group I together with some context. Monuments, captured within this measuring surface, are predominantly distributed in two rows, stretching along a SE – NW axis.

The surveyed area is mostly overgrown with a moderately dense deciduous forest that often hampered the progress of the prospection. Especially younger trees presently growing on some embankments formed a significant obstacle that slowed down the operator of the magnetometer or necessitated omission of some measurements.

The preceding field reconnaissance allowed one to observe varying sizes of the mounds, their shapes, predominantly resembling an oval, and various levels of preservation. Most of the embankments revealed trenches or dig-ins left after amateurish excavations that took place in the last decades, as witnessed by objects, mainly litter (cans, bottles etc.), left there by supposed treasure hunters. In several cases embankments were damaged by forest roads passing in their close vicinity, thus levelling them. One of these roads

is still being used, which explains the presence of large amounts of litter left along it. A significant level of anthropopression can be noticed at the site in the form of traces of fire used for grubbing, as well as single fireplaces presumably left by woodcutters.

Data acquired through the survey reveals the complex character of magnetisation in the discussed place, both in terms of the shape and intensity of anomalies (**Fig. IV.355**). Similarities of results, obtained in the course of geophysical survey, to images of magnetisation recorded over other barrows included in the project, allow one to consider the aforementioned landforms as sepulchral objects. In total, ten monuments can be identified according to the height model created for the site (Fig. IV.353). Responses recorded in several places reached the lower and upper thresholds of the applied magnetometer (respectively -3000 and 3000nT). These are visible as anomalies with a pronounced dipolar structure, with sometimes abnormally oriented dipoles that most probably are emitted by objects containing an iron compound and subjected to thermo-magnetisation. These sources of magnetisation can be regarded as modern, e.g. litter or other remains accidentally or purposely left by people visiting or working in the forest. A detailed description of obtained results is given below.

The barrow located furthest in a SE direction (no. 258) is situated in the SE corner of the measuring surface (**Fig. IV.356**). On the resulting image it can be discerned through a zone of increased magnetic response in comparison to the context, shaped like an inverted eight and locally surrounded by a strip of negative values of the gradient. Albeit not clearly visible on the hypsometric model, one can still see how the positive anomaly signifying an embankment is elongated in a E direction, exceeding the limits of the measuring surface. Nearby, approximately 115 m of the W – E axis on the grid framework, there is a distinct narrowing of the positive anomaly, here enclosed by two arc-shaped negative maxima placed on the N and S sides. Hence, it is possible to separate the landform into two parts: western and eastern.

The western part of the object (captured entirely on the resulting image) is marked by a roughly circular anomaly with a diameter of 10-12 m, whereas the eastern part (continuing outside the measuring surface) is corresponding in shape, but is much larger with a diameter reaching about 18 m. The former is further surrounded by a halo of negative magnetisation, described by values around -3/-4nT on the southern, -2nT on the western and -5nT on the northern side. This ring-like anomaly can be traced in an E direction where it encloses the remaining part of the positive anomaly, hence it can be regarded as the most peripheral part of the tumulus, created with soil emasculated from ferrous minerals.

Circumscribed by this negative anomaly is the inner part, comprising material with a higher magnetic susceptibility that gave the response of *circa* 1-2nT, slightly exceeding the level of magnetisation typical for the ambient. Moreover, in the central part a few strong, dipolar signals with varying orientation and spatial extent of dipoles are visible. These anomalies are most probably emitted by features or materials rich in ferrous minerals and of modern origin.

The eastern part of the barrow has a similar spatial structure of magnetisation, consisting of a positively magnetic and circular-shaped inner part, surrounded by a halo of negative values. While its easternmost section was not captured on the image, the western part seems to be almost similar in terms of spatial structure and intensity of magnetisation. One can notice a 5 m-long, arc-shaped anomaly, comprising an extensive positive maximum (3 – 4nT) with an adjacent negative peak situated at its northern side. Its shape corresponds with the outline of the barrow, thus it potentially reflects the original limit of the embankment. Additionally, within the interior of the embankment it is possible to notice a feature made of material with a higher magnetic susceptibility that again has an arc-shape, but this time it does not correspond to the outline of the landform. Nevertheless, this linear signal can signify some internal element of the barrow, built there before the earthen embankment was heaped.

Another mound (no. 259) there is a NW from above described barrow (Fig. IV.356). It reveals a well visible, but rather complex structure, comprising many anomalies. A strip of negative responses (-3/-4nT), delimiting the spatial extent of the embankment, seems to possess an almost rectangular outline, reaching almost 20 m in diameter. Thus, the circumscribed inner part consists of seven anomalies, distributed along the edges of the embankment which potentially reflect the internal features of the barrow's construction. They all reveal a level of magnetisation reaching *circa* 3nT and normal orientation of dipoles, hence indicating induced magnetisation, however their source is difficult to specify. Almost in the centre of the mound there is a single anomaly with a high magnetic response, comprising abnormally oriented dipoles reaching maxima of the gradient. The residual, thermoremanent type of magnetisation can be attributed to this signal, however

its source more probably is of modern origin, than chronologically concurrent with the barrow.

The third mound (no. 260), visible in the lower part of the picture, is included within two adjacent grids (Fig. IV.356). The spatial structure of magnetisation in this place resembles the case of the mound 258, with anomalies signifying the embankment being elongated along a N – S axis. Similar to the latter, magnetometric measurements revealed here a an extensive , 8-shaped zone characterised by significant and rapid changes of the gradient in comparison to the context. Also the landform of the mound on the height plan seems to be stretched in a S direction (Fig. IV.353). It mostly comprises negative values that reach their maximum along the verge, creating a familiar outline, while the centre is occupied by frequent positive peaks of magnetisation. Moreover, in the inner part of the embankment, along the aforementioned negative halo, one can observe a row of positive values, corresponding in its outline to the aforementioned symbol of eight that is most pronounced in the N section of the tumulus, while in the S part it gets weaker and blurred. The two discussed linear anomalies may belong to a single feature delimiting the spatial extent of the barrow. On the basis of the narrowing of the anomaly close to the 40 m mark of the N – S axis of the grid framework, the mound can be separated into two adjacent parts: N and S.

The S section has a roughly circular outline and diameter of approximately 9 m. In its centre a single, small anomaly of induced magnetisation was registered with a pronounced positive peak of magnetisation reaching 4 – 5nT. Apart from it, there are two other distinct signals located within the spatial extent of the mound, close to its southern rim, however they reflect a strong residual magnetisation with abnormal orientation of dipoles. Therefore they can be attributed to iron objects of modern origin, rather than structural features of the mound, as in the case of the former anomaly. All these anomalies are situated within a zone characterised by a decreased level of magnetisation in respect to the context. Maximal values are concentrated along the edges, where they take the form of a circle. On its eastern and western sides there are additionally cumulated positive responses that may result from a surrounding ditch or other feature characterised by increased magnetic susceptibility.

The northern part of the embankment again is visible thanks to a distinct rim of negative values, encircling a magnetically diverse middle section. Judging by the extent of the negative anomaly, this barrow measures around 15 m in diameter along the W – E axis. On the other hand one can notice that its northern border is less clear than the western or eastern. In fact the former is abundant with locally occurring peaks, resulting both from induced and residual magnetisation that disrupt the oval shape of the negative anomaly. Towards the S, it is possible to see a large anomaly consisting of an extensive positive peak, reaching 5nT, surrounded from the N by a smaller negative maximum. This normal orientation of dipoles, as well as central position of the discussed signal, speak for its anthropogenic origin, most probably connected with an internal feature of the mound, such as burnt remains of the grave or similar accumulation of material with an increased magnetic susceptibility. Further SW there is a smaller peak of positive response, but assuming by its polarisation, it can also reflect an internal element of the barrow's structure.

The fourth mound (no. 262), located further NW, is delimited from the S, SW, W and NW by strong signals consisting of pronounced negative peaks, sometimes accompanied by positive maxima placed at different sides of the former (Fig. IV.356). The strength of magnetisation and orientation of dipoles in these places indicate residual magnetisation, rarely emitted by internal features of the barrows, however this time the regular distribution of the discussed signals corresponds with the outline of the embankment (Fig. IV.353), hence they can be attributed to the barrow's structure. These anomalies possibly stem from a deposition of materials rich in iron compound, subjected to thermo-magnetisation, such as stones with ferrous minerals, composed in the form of a ring encircling the mound's centre. From the E and NE, the middle section is surrounded by a less distinct strip of negative values, followed on the inner side by a similarly distributed, thin arc of positive responses.

Moving towards the southern part of the embankment, one can notice strongly polarised anomalies delimiting its spatial extent. One of them is elongated in a W – E direction and has a pronounced positive maximum placed on the northern side of the negative one. Whereas similar symbols, albeit with less distinct positive peaks, were recorded along the verge of the barrow and most probably stem from its internal features, this signal corresponds with the excavation trench that disrupted stratigraphy and now emits this specific signal.

The middle section of the barrow is, first of all, discernible through an irregularly shaped anomaly, consisting of an extensive positive peak, surrounded

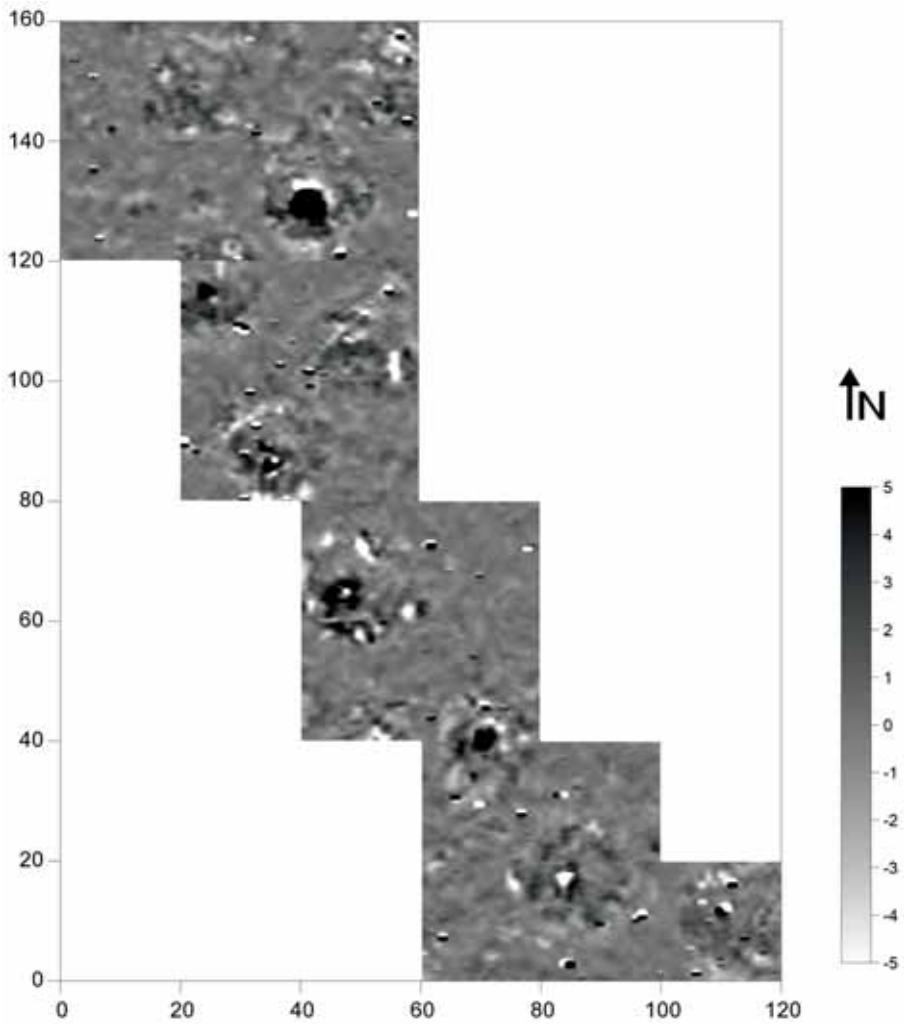
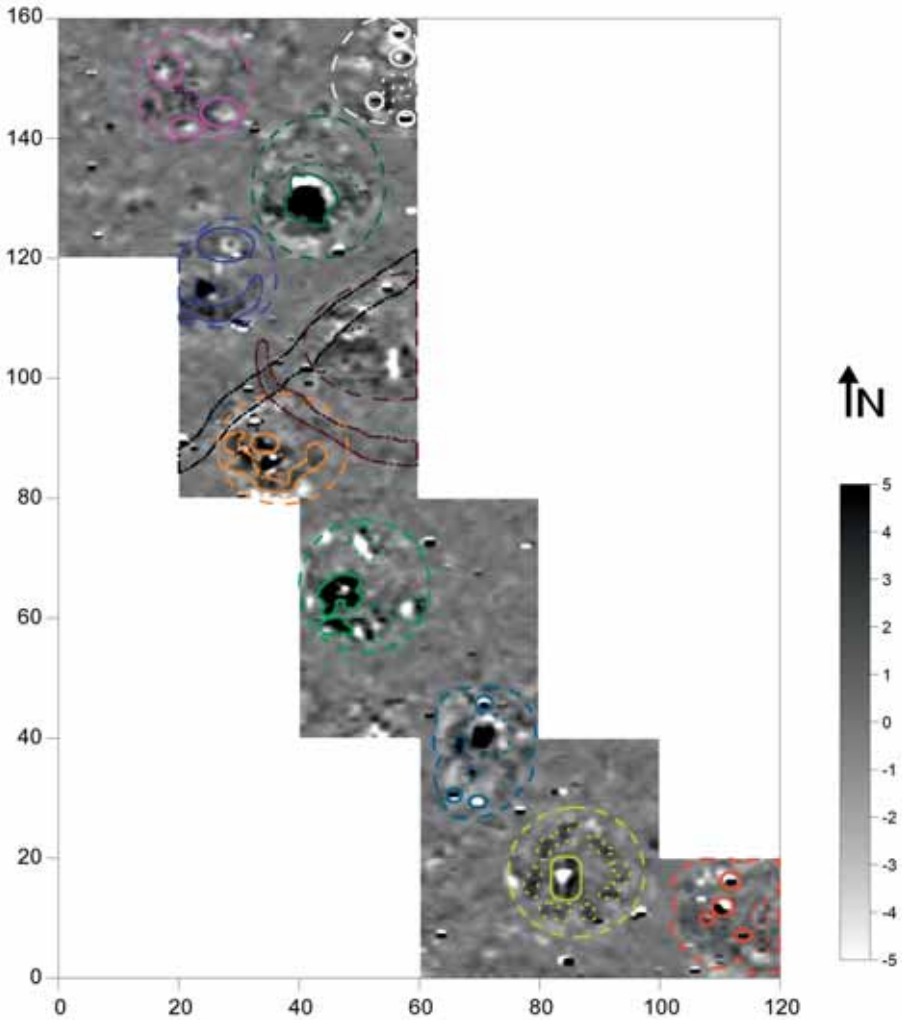



**Fig. IV.355.** Resulting image of magnetometric prospection on barrow group I (no. 263, 275-277, 279, 259, 258, 26010, 261, 262) belonging to the site near Milovanie (gradiometer Bartington Fluxgate Grad 601-1; measuring grid: 20 × 20 m; sampling density per transect spacing: 0,25 × 1,0 m, interpolated up to 0,25 × 0,5 m; real values of magnetic field gradient compressed in greyscale to the range -5 – +5nT)

**Fig. IV.356.** Resulting image of magnetometric prospection on barrow group I (no. 263, 275-277, 279, 259, 258, 260, 261, 262) belonging to the site near Milovanie with highlighted anomalies discussed in the text.

--- approximate spatial extent of negative anomaly signifying outer limits of barrow no. 258
··· arc-shaped anomaly potentially indicating an internal feature in the E part of barrow no. 258
— anomalies most probably indicating modern iron objects buried or left on the surface of barrow no. 258
--- approximate spatial extent of negative anomaly signifying outer limits of barrow no. 259
··· series of positive peaks potentially indicating internal features distributed along the edges of barrow no. 259
— anomalies reflecting centrally located trench left after excavations of barrow no. 259
--- approximate spatial extent of the eight-shaped, dipolar anomaly signifying outer limits of barrow no. 260
··· normally polarised anomalies, potentially indicating internal features of barrow no. 260
— anomalies most probably indicating modern iron objects buried or left on the surface of barrow no. 260
--- approximate spatial extent of negative anomaly signifying outer limits of barrow no. 262
··· anomalies potentially indicating internal elements of barrow no. 262 with high amount of ferrous content, e.g. stones
-·- anomaly reflecting excavation trench in the S part of barrow no. 262
— anomalies potentially indicating centrally located internal feature of barrow no. 262, enclosing small trench left after excavations
--- approximate spatial extent of negative anomaly signifying outer limits of barrow no. 263
— anomaly reflecting centrally located trench left after excavations of barrow no. 263
··· anomaly potentially indicating centrally located, internal feature of barrow no. 263




series of positive peaks potentially indicating internal features distributed along the S and W edges of barrow no. 263
approximate spatial extent of negative anomaly signifying outer limits of barrow no. 261
anomaly potentially indicating centrally located, internal feature of barrow no. 261
anomaly indicating an arc-shaped feature, corresponding with the outline of barrow no. 261
anomalies reflecting forest road passing through the site and crossing embankments of barrows no. 263 and 261
exemplary anomalies emitted by modern litter with iron compound, left along the forest road
approximate spatial extent of negative anomaly signifying outer limits of barrow no. 277
extensive, positive anomaly potentially an indicating internal feature of barrow no. 277, enclosing small trench left after excavations
anomaly potentially indicating centrally located, internal feature of barrow no. 277
series of positive peaks potentially indicating internal features distributed along the S and E edges of barrow no. 277
approximate spatial extent of negative anomaly signifying outer limits of barrow no. 276
central section of barrow no. 276 as delimited by strips of positive values, potentially indicating an internal feature
extensive, normally polarised anomaly, potentially indicating large internal feature of barrow no. 276
approximate spatial extent of the concentration of anomalies reflecting embankment of barrow no. 279
two positive peaks of magnetisation potentially reflecting internal features of barrow no. 279
three, abnormally polarised anomalies of undefined sources and origins
approximate spatial extent of the concentration of anomalies reflecting embankment of barrow no. 275
four variously polarised dipolar anomalies most probably reflecting iron objects of modern origin buried inside or left on the surface of barrow no. 275
series of five positive signals distributed in a rectangular outline, potentially indicating an internal structure of barrow no. 275

from the N by a barely recognizable negative maximum. The whole anomaly seems to adjoin the SW rim of the embankment, as visible on the basis of an abnormally polarised signal. Furthermore, it encloses a small peak of negative magnetisation that stems from a trench left after amateurish excavations of the discussed mound.

The fifth mound (no. 263), situated in line with those previously described, is further NW (Fig. IV.356). In its close vicinity runs a presently used forest road, manifested by strong dipolar anomalies stretching in line from SW to NE. These anomalies, recorded in the context on the N and W side of the embankment, as well as within the spatial extent of the mound, are most probably emitted by modern iron objects and bricks – pieces of litter left here by people while moving in the road. The road itself is not well visible through changes of magnetic field gradient, however it has affected the barrow's state of preservation, causing some damage to its embankment. It continues its course in a NW direction, where it passes through another tumulus (no. 261).

The mound can be distinguished due to a distinct halo of negative values, especially pronounced in the northern and southern parts (around -4/-5nT). In the remaining sections this anomaly is still visible, however the magnetisation level is visibly weaker. Most probably it is emitted by a feature measuring about 14 m in diameter and characterized by lower magnetic susceptibility circumscribing the internal part of the mound.

The aforementioned negative anomaly encloses a zone of diverse magnetisation with two distinct positive peaks of magnetisation (reaching 5nT) and adjoining smaller negative maxima (from -2 to -5nT). The first has an "S" shape and stems from the excavation trench, while the other one, located further S, does not overlap with any trace of damage to the embankment, hence it might reflect an internal feature. Weaker anomalies, with a normal orientation of dipoles, were revealed in a western and southern direction. These have clearly an induced character of magnetisation, resulting from deposition of material with higher magnetic susceptibility than soil predominantly forming the embankment. All the discussed anomalies are located closely to each other, presumably representing a concentration of burial structures, such as graves and accompanying features.

The sixth mound (no. 261) is situated NE from the previously described (Fig. IV.356). Magnetometric prospection covered the largest part of the embankment with the exclusion of the easternmost fringe, exceeding the limits of the surveyed area. Despite its low height, the mound is well visible on the figure, where it significantly contrasts with the magnetic field of the ambient. From the N and W it is delimited with a narrow strip of negative values (reaching *circa* -2nT of the gradient) that, however, has a rather irregular shape, not resembling the circular or oval outline of the barrow. This characteristic may stem from the fact that local forest roads pass through the NW and N sections of the embankment, presumably causing disturbances of the original spatial structure of magnetisation. Its prolonged use could lead to levelling and deformation of the embankment, as seen on the basis of the height plan (Fig. IV.353). As mentioned before, along the road (visible within the scope of the discussed barrow as a thin, white anomaly, stretching from SW to NE) frequent deposits of modern litter were observed, which produce strong, dipolar signals detected by a magnetometer, present also in the top of the mound.

In the mound's centre, slightly SE from the forest road, there was discovered a large, oval-shaped, elongated W – E anomaly that stretches across about 8 m. The distinct positive maximum is surrounded by a halo of negative responses, thus revealing normal polarisation pointing to induced magnetisation. The values of both peaks reach maximal levels of the gradient only in some places, whereas mostly they range around -3/+3nT. The absence of any traces of damage to the embankment's structures allows one to interpret the aforementioned anomaly as a residue of the internal feature of the barrow. Furthermore, in the S section one can notice several locally occurring positive responses that potentially can be connected with the structure described before. The long stretch of maximal negative values, stretching along a N – S axis, results from the omission of measurements due to an obstacle formed by trees growing there in a deep trench left after excavations.

About 10 m in a W and SW direction from the barrow's centre, there was detected a crescent-shaped row of increased magnetisation (reaching 2nT). It seems to surround the embankment of the mound, no. 261, although it also overlaps with the NE section of barrow no. 263, therefore it is difficult to decide to which sepulchral object the feature emitting the discussed signal belongs. Most probably it is the effect of induced magnetisation caused by an accumulation of material with increased magnetic susceptibility, while its regular shape suggests anthropogenic origin. Nonetheless, the functional interpretation of this feature as a circular row, as known from the other sites, is undermined by the fact that no depression of terrain was proven here by the height plan, nor the

isolines running parallel to the outline of the anomaly (Fig. IV.353). Verification of this issue has to be carried out therefore with the use of other methods.

In the close vicinity, around 10 m NW from the previously described barrow, are located another two mounds. The one situated more to the S (no. 277) is circumscribed by a thin, round strip of negative values (-2 – -3nT on the gradient), blurred at the W side, immediately after which starts a zone of diverse magnetisation indicating the embankment. The eastern section of the barrow's rim could not be revealed, due to the limits of the surveyed area.

In the N part of the monument there was detected a roughly square-shaped anomaly, comprising negative values reaching about -4nT. It lies within an oval zone of positive magnetisation, hence the strong contrast between the two. The white peak most probably results from a modern trench left after partial excavation of the barrow, whereas the positive zone, corresponding by its outline with the shape of the embankment, represents an undisturbed section. The strip of negative responses, appearing nearby the former, stems from the omission of measurements in order to avoid trees.

Most distinct signals can be distinguished slightly S from the previously discussed anomalies, where they spatially overlap peak with the peak of the embankment. Among them, the most pronounced is a triangle-shaped positive peak of magnetisation, reaching 5nT. Adjacent to it is a small negative peak, situated at its SE side. Along the southern rim of the embankment spot-like positive signals are distributed that run parallel to the negative anomaly circumscribing the barrow. It seems plausible to suggest that they result from deposition of a material with increased magnetic susceptibility at this highest part of the object, thus potentially depicting underground structures connected with the burial.

The mound neighbouring with the former from NE (no. 276) can be easily discerned thanks to the clear ring of negative values encircling the inner part, in the centre of which there was detected an extensive peak of positive magnetisation (Fig. IV.356). The former anomaly allows for a fairly precise delimitation of the barrow's embankment, as it overlaps with isohipses seen on the height plan (Fig. IV.353). Along its inner side runs a similar stretch of positive values, thus both of them can be interpreted as a residue of a feature composed of material with increased magnetic susceptibility, purposefully deposited in the form of a ditch or ring. Inside the space enclosed by the aforementioned anomaly, an arc-shaped series of positive values was detected that seemingly divides the embankment into more peripheral sectors on one hand, and those centrally located (closer to the embankment's peak) on the other. It is possibly the result of intentional construction, however one has to consider their post-depositional origin (e.g. stemming from present vegetation overgrowing the embankment or activity of animals).

Of greater interest is the previously mentioned distinct, irregularly-oval anomaly, comprising an extensive positive peak (real values of magnetisation reaching 20nT) and a much smaller negative one, contiguous to the former's N side, hence indicating normal polarisation. It is about 7 m in diameter, thus making it the largest signal of such type noted at the cemetery. It should be strongly considered as the residue of an internal feature, perhaps a burnt structure used for housing the burial.

Near the NW outskirts of the surveyed area, magnetometric prospection captured another barrow (no. 279), this time with less clearly defined spatial limits. It emerges from the magnetic field of the ambient as an accumulation of locally occurring peaks of negative and positive magnetisation that do not create any regular pattern (Fig. IV.356).

The outline of the negative anomaly, which in previous cases helped to delimit the extent of the barrow's embankments, is invisible this time, apart from northern and southern sections. Although the values of magnetisation in these places are located on the gradient below 0nT, their spatial distribution does not always correspond with the course of isohipses, as seen on the height plan (Fig. IV.353). They seem to be rather negative peaks of dipolar anomalies, not forming together a continuous series along the verge of the barrow. Similar signals can also be discerned in other parts of the mound.

The biggest accumulation of positive values can be noticed in the S sector of the embankment. They are accompanied by other negative peaks, but do not resemble any regularly-shaped feature and rarely exceed the level of 3nT. Consequently, it can be stated that they are rather emitted by loosely deposited layers of material with increased magnetic susceptibility, mixed with soil with a low response, forming the bulk of the embankment. Among them one should pay attention to the s-shaped anomaly in the central section, as well as the oval signal in the W part, both emitting the highest values of magnetisation (about 4nT on the gradient). These may reflect underground features connected with construction elements of the barrow, however their irregularity prevents one from formula in more detailed interpretations. On the other hand, the discussed anomalies can be also a prod-

uct of post-depositional factors, as well as vegetation growth and animal activity.

In the scope of the barrow there were detected three abnormally polarised anomalies, the first situated approximately in the W, and the others in the S part. All of them surpass the other signals with their strength of magnetisation, while the orientation of dipoles prompts one to treat them as the effects of residual magnetisation. Although their sources might be connected with the original construction of the mound, modern origins should not be excluded.

The last tumulus belonging to the group I on the cemetery in Milovanie that was included in prospection (no. 275) is in the NE corner of the surveyed area. Similarly to the previously discussed mound, this object also does not possess a pronounced, negative anomaly symbolising its contour, or the anomalies that are emitted in the place where the height plan shows elevation interpreted as an object's landform, creating a regular pattern (Fig. IV.353). Moreover, due to the spatial limitations of the grid framework, it was not possible to entirely capture the barrow on the image.

In the scope of the assumed embankment, visible as an accumulation of negative peaks, outlined by less distinct positive responses, there are located four, variously oriented dipolar anomalies. They are placed in a series stretching from S to N. Some of them are characterised by real values of the gradient reaching -20/28nT, thus indicating residual magnetisation and hence, should be attributed to modern metal elements.

Another anomaly worth pointing out is situated in the centre of the embankment, near its peak and resembles five closely located, but rather small positive peaks (approximately 3 – 4nT) that together form a roughly rectangular outline. Among all detected signals, these are most likely to be a residue of some internal feature of the barrow originally raised there in connection with a burial.

## E.2. Deforested area

The second measuring surface has been located on the recently deforested area near the village in Milovanie, several hundred metres from the previously described group of monuments. It covered barrow group III of mounds belonging to the cemetery (Fig. IV.354). Due to the land clearing, the survey could be conducted more efficiently in a shorter time span. Some obstacles present in the discussed place were holes created by roots of fallen trees, ravines and other depressions of terrain, as well as the bigger barrows, when approaching their steep slopes.

Other factors that affected the results of the survey were frequently appearing metal elements, such as tools and litter left by woodcutters and pieces of machines, all of which create strong signals of residual magnetisation, easily captured by a magnetometer. They are present on the resulting image, sometimes causing serious disturbances of magnetic field and, by the strength and scale of the anomalies, making it difficult to identify weakly magnetised prehistoric relicts connected with the cemetery. To at least partially avoid these problems, the archaeological team cleared surfaces of the grids from any visible metal objects.

Another trace of modern activity on the site are fireplaces, which cause chemical reactions that lead to an increase of magnetic susceptibility of soil compounds in their vicinity. The remains of such events can produce magnetic fields that are indistinguishable from anomalies of prehistoric origin. Finally, through the southern part of the surveyed area there is a forest road used by trucks transporting the wood, which stretches almost throughout all grids form the S to the N.

As mentioned before, the whole deforested area has been divided into two prospected concentrations of mounds: **(a)** southern and **(b)** northern.

In the case of the first prospected grid in the southern area, visible in the SW corner of the resulting image (**Fig. IV.357**), the concentration of cut wood did not allow one to begin the measurements along the initial transects. It was decided therefore to reduce the gird by nine transects, beginning from its western part. The same factor necessitated the omission of the last three transects in the third prospected grid situated in the SE corner of the resulting image (Fig. IV.357).

**a. Southern group**

The southern part of the barrow group III comprises three embankments, still visible in the terrain and situated in line approximately along a SW – NE axis (Fig. IV.357). All of the included barrows revealed a distinct structure of magnetisation, prominent against the background of the magnetic field emitted by the context, which is characterized by a low magnetic response (*circa* -1 – 1nT). Thanks to the latter, all the mounds can be easily distinguished (**Fig. IV.358**).

Beginning with the description of the resulting image from the S, it is possible to notice an extensive accumulation of anomalies stretching from

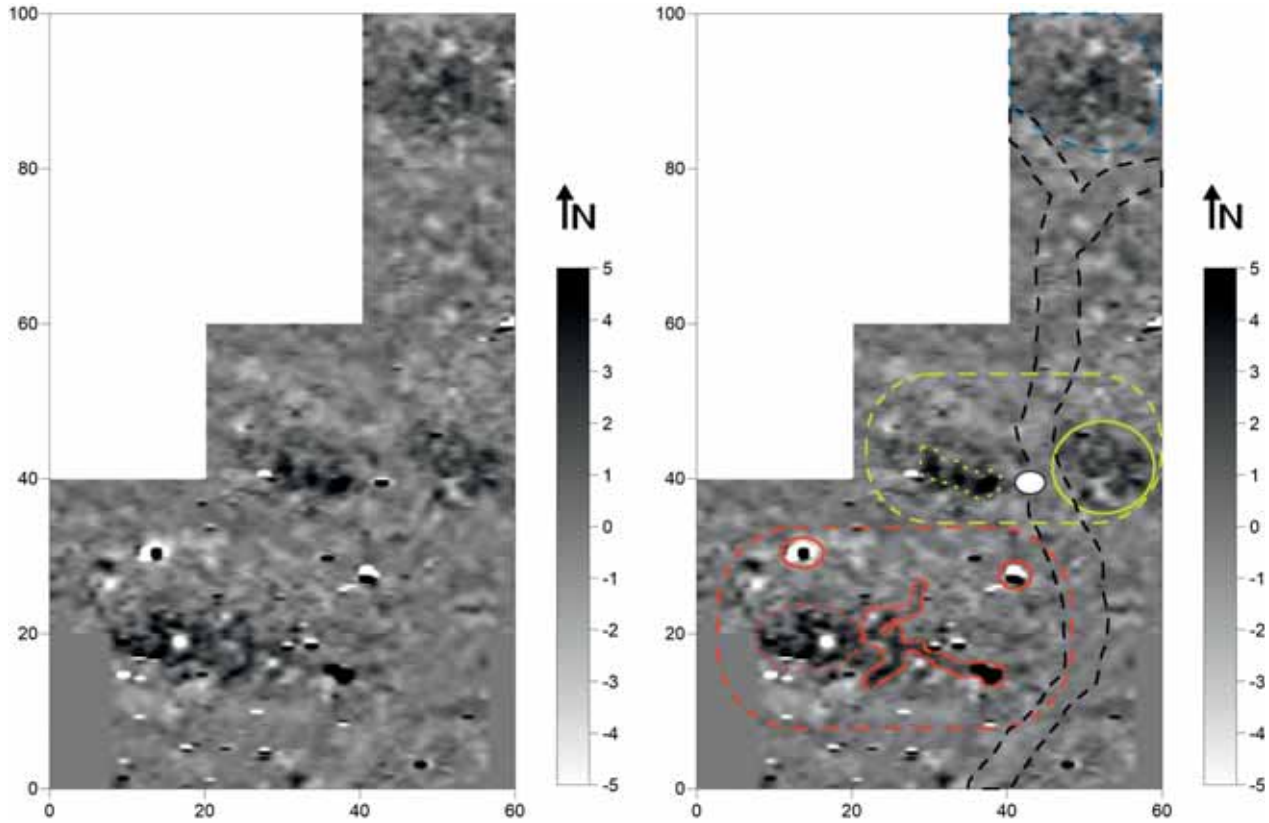



**Fig. IV.357** (left). Resulting image of magnetometric prospection on the southern part of barrow group III (no. 296-300) belonging to the site near Milovanie (see Fig. IV.355)

**Fig. IV.358** (right). Resulting image of magnetometric prospection on the southern part of barrow group III (no. 296-300) belonging to the site near Milovanie with highlighted anomalies discussed in the text.

- approximate spatial extent of barrow no. 299, delimited on the basis of negative anomaly circumscribing the embankment and isohipses from the height plan
- large concentration of anomalies potentially indicating internal features in the W part of barrow no. 299
- criss-crossing linear anomalies and an extensive positive peak connected with them, potentially indicating internal features in central and E section of barrow no. 299
- anomalies most probably indicating modern iron objects or remains of fireplaces left on the surface of barrow no. 258
- approximate spatial extents of barrows no. 297 and 298, delimited on the basis of negative anomaly circumscribing the embankments and isohipses from the height plan
- three aligned positive peaks of magnetisation, potentially indicating internal features in barrow no. 297
- concentration of occupying climax of barrow no. 298, potentially indicating internal features
- approximate spatial extent of the dirt road passing through the site and crossing embankments of barrows no. 297 and 298
- exemplary anomaly emitted by modern litter with an iron compound, left along the dirt road
- approximate spatial extent of negative anomaly signifying outer limits of barrow no. 296

W to E, spatially corresponding with the landform of barrow 299 (Fig. IV.358; Fig. IV.354). The extent of the embankment can be delimited thanks to the oval-shaped strip of negative values, best visible on the northern and southern side. The course of this anomaly runs parallel to isohipses, although its westernmost extension was not documented, due to the previously explained omission of some transects. As a result, one can carefully circumscribe the limits of the mound, stating that it is about 30 m in diameter along the W – E axis and 20 m in diameter from S to N. This unusually large size of the embankment compels one to reconsider its character: whether it is a single monument, purposefully built in specific

form and volume, or a landform in fact that comprises two closely located, but independent mounds, which subsequently became indistinguishable due to post-depositional factors? The discussed problem has already appeared in the context of two prospected cemeteries: in Bukivna and Podgorodie, where similar structures were tentatively named as "double barrows". However, the absence of two opposite peaks makes mound 299 resemble more barrow 122 from the latter site. Nonetheless, in the light of more frequently appearing sepulchral objects of this kind, perhaps the firstly suggested interpretation is correct.

Magnetometric prospection alone does not offer enough observations into the object's internal structure to verify hypotheses regarding the barrow's formation. The inner part of the embankment, enclosed by the aforementioned ring-like negative anomaly, is abundant in numerous signals contrasting with the magnetic field of the ambient. One cannot escape the impression that positive responses are mainly concentrated in the W section of the mound – a remark that can potentially indicate the presence of two different sepulchral objects. Moreover, this accumulation of signals overlaps with the maximal elevation of the embankment. Apart from these locally occurring peaks of magnetisation, there is no distinct anomaly that could be interpreted as a border or feature dividing the landform into two parts. Hence, the conclusion of this issue has to wait until a more detailed study of the barrow's internal structure and stratigraphy becomes available.

A more detailed consideration of anomalies in the W section of the mound allows one to distinguish possible underground features or residues of construction elements belonging to the original structure of the tumulus. Positive peaks of magnetisation present in this fragment of the image predominantly have a crescent or oval shape and values of magnetisation rarely reaching 5nT. Adjacent to them are barely recognizable negative maxima, mostly appearing on the N side of the former. Overall, the depicted anomalies do not create any regular structure, but are spread around an intense peak of negative magnetisation, situated at the highest point of the embankment. A correct characterisation of the results is also hampered by frequently occurring, strong dipolar signals, especially prominent along the S rim of the barrow. Their abnormal polarisation most probably reveals a modern origin of the sources, which can include iron elements.

Further E from the discussed concentration of anomalies are present other indications of a higher magnetic susceptibility of some features located underneath the topsoil. It is possible to discern two zig-zag, crisscrossing strips of positive responses, characterized by values around 3 – 4nT of the gradient. Their extensions are visible in the N and E sections of the mound, with the latter finished with an extensive, well visible positive peak in an oval shape. The absence of an intense negative maximum allows one to consider this signal as the effect of induced magnetisation, emitted by a deposit of materials with high magnetic susceptibility, potentially connected with internal structures. On the other hand, the large feature in the eastern part seems to be quite distant from the peak of the barrow, so it can represent a secondary interment (that seems especially plausible, if the E part is in fact an independent mound) or residue of yet a different event.

Along the N edge of the landform there are located two strongly polarised anomalies with a normal orientation of dipoles that reach maximal values of the gradient, though they have a varying spatial extent. Both most probably stem from thermoremanent magnetisation, although it is difficult to suggest their sources. On the one hand they are located within the spatial scope of the barrow and do not resemble any other signals present on the image (oval-shaped with equally sized and intense maxima). On the other, their prominently dipolar structure and intensity rarely has counterparts in magnetisation of archaeological features detected inside the mounds. A correct interpretation of these features requires the use of other methods, although one should bear in mind the information about fireplaces and litter spotted on the ground at the time of the survey.

North of the previously described embankment there is a similar object, yet strongly affected by post-depositional factors that probably led to the deformation of the original shape of the landform. On the resulting image, one can spot two closely located concentrations of anomalies, dominated by positive responses and separated by a strip of uniform, much lower values of the gradient about -2nT (Fig. IV.358). In the field, the place occupied by these anomalies takes the form of a single elevation, elongated along a W – E axis, cut in the middle by a dirt road, used for the transport of cut wood by trucks. Examination of the height model created for the area gives a more detailed overview of differences in elevation between the barrows and their surroundings (Fig. IV.354). It is possible to notice two neighbouring peaks overlapping with concentrations of positive responses, connected together with their lower layers of the embankment. Again, the question arises, if this landform should be considered as "double barrow", this

time resembling more the case from the cemetery in Bukivna, or in fact are these two, closely situated, but independent monuments?

Although the height models is very helpful to distinguish between the two presumed barrows, one has to realise that the aforementioned dirt road may have significantly altered their original state, thus influencing our perspective. If it is to be assumed that we are dealing with a single object, more akin to the one in the southern part of the surveyed area, then the prolonged use of the road could lead to the levelling of the embankment in its middle section, artificially creating the impression of two separate peaks. Moreover, prehistoric features located in this part do create anomalies, which could have been destroyed, hence losing magnetic properties. On the other hand, if these are two separate mounds (named on the height plan as barrows 297 – western and 298 – eastern), then the discussed road has a secondary importance in the following evaluation.

Moving to the description of magnetic field anomalies, one can notice three, irregularly-shaped, positive signals with values ranging from 3 to 5nT, placed within the W concentration. They are surrounded by a zone of lower responses, varying from -1 to 2nT on the gradient. The entire zone is enclosed by an oval strip of negative responses, less pronounced on the SW side of the embankment, which is parallel to the course of isohipses on the height plan (Fig. IV.354). The three, abovementioned positive peaks seem to be a result of induced magnetisation and the regularity of their distribution within the scope of elevation's peak points to their anthropogenic character, most probably related to the event of the barrow's creation.

Directly E from the discussed accumulation of anomalies passes the dirt road that, as was mentioned before, can be discerned through an approximately 5 to 10 m wide strip of negative values, separating peaks and anomalies corresponding with them. Within the space occupied by the road, roughly between both elevations, is placed a strong, dipolar anomaly with peaks reaching maximal levels of the gradient. Its strength of magnetisation, as well as regularity of the dipoles suggest that it is emitted by a modern iron object, presumably left there during the transport of wood.

The second concentration of anomalies, located on the other side of the road and overlapping with the second elevation (barrow 298), is characterized by a more complex spatial pattern of anomaly distribution (Fig. IV.358). Moreover, it is difficult to circumscribe the extent of the mound, because the usual circular strip of negative values that appears is less clear in this case. Therefore, in order to assess the shape and size of the monument, one should solely rely on the height plan (Fig. IV.354). The centre of the elevation reveals increased magnetic susceptibility with values of the gradient reaching 4nT. Positive responses seem to align in zig-zag lines, divided by patches of lower values, however overall they do not create any regular composition. Nevertheless, they potentially are connected with underground features remaining after the burial.

The third barrow (no. 296) present in the discussed measuring surface is in its northern extremity (Fig. IV.358). The barrow's embankment is clearly visible on the hypsometric plan (Fig. IV.354), while on the resulting image of magnetometry it emerges from the context as an irregularly-shaped zone of increased magnetic response. From the S, E and N it seems to be enclosed by a halo of negative values (-2/-3nT), whereas the continuation of this anomaly in the W section was not captured on the image due to the limitations of the measuring grid.

Inside such a delimited zone a few, rather small and irregular, positive, as well as negative peaks were detected, surrounded by generally raised values of the gradient (above 0nT). Overall, it can be suggested that the barrow's embankment was heaped with soil and acquired a slightly increased magnetic susceptibility, revealing many traces of induced magnetisation. The question arises whether these properties stem solely from natural processes, or if there was also contribution of anthropogenic factors involved in the construction of the mound? At the moment it is difficult to distinguish any regular pattern of anomalies that could be interpreted as a feature of the barrow's internal structure.

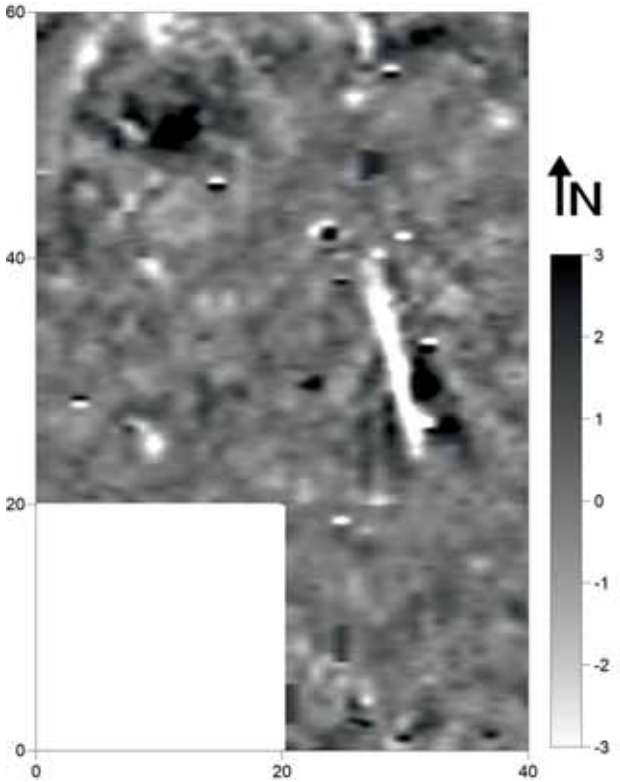
**b. Northern group**

Northern section of barrow group III comprises three objects of presumably prehistoric provenance. In order to more efficiently depict the changes of magnetic field illustrating monuments, it was decided to compress the real values of measurements to -3 – 3nT range, hence narrowing the greyscale (**Fig. IV.359**). Nonetheless, the general impression stemming from examination of the results, is that of less clearly manifested embankments in the context of magnetic field values typical for the ambient.

The first barrow (no. 295), seen on the height plan as a low elevation with horseshoe-shaped isolines (Fig. IV.354), on the resulting image of magnetometry is in the S part (**Fig. IV.360**). Although there is little diversification of the magnetic field gradient in

this place, the tumulus can be discerned by a semi-circular row of negative values, followed by a similarly shaped positive signal, both showing a level of magnetisation slightly exceeding 0nT. The latter are most pronounced in the E and N sections, especially on the inner side. In the centre of such a circumscribed circular zone there is a wave-shaped anomaly with a more extensive negative peak placed on the northern side of the positive one. The signal seems to possess a linear extension in a SW direction, where it eventually meets a circular negative anomaly delimiting the spatial extent of the mound. It seems plausible to suggest that due to their regularity and induced type of mangnetisation, both anomalies reflect the internal structure of the barrow, although specification of these sources requires more detailed study.

Moreover, S from the centrally located, dipolar anomaly there was detected a negative peak with a roughly oval outline that possibly represents modern interference into the embankment, e.g. an excavation trench. Another signal, stemming from more recent activity of humans in the discussed area is discern-



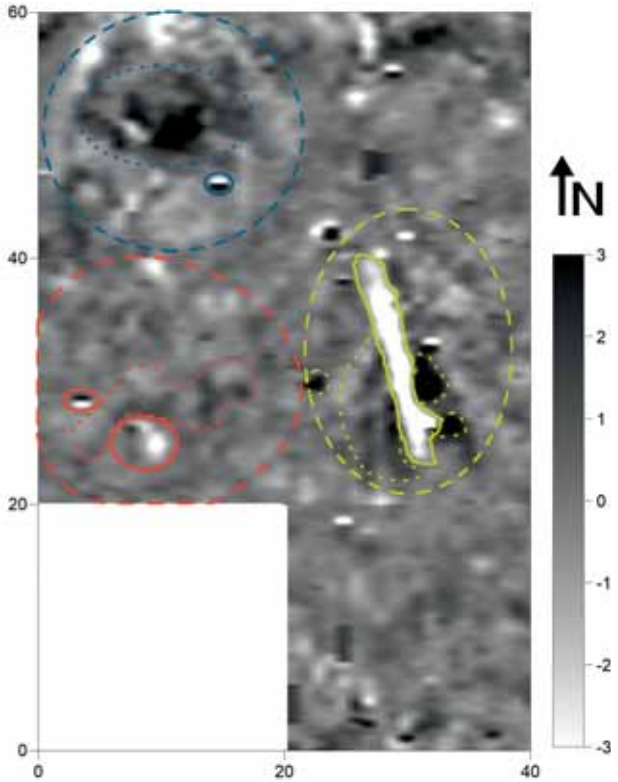




**Fig. IV.359** (left). Resulting image of magnetometric prospection on the northern part of barrow group III (no. 294, 295 and 295A) belonging to the site near Milovanie (see Fig. IV.356)

**Fig. IV.360** (right). Resulting image of magnetometric prospection on the northern part of barrow group III (no. 294, 295 and 295A) belonging to the site near Milovanie with highlighted anomalies discussed in the text.

--- approximate spatial extent of negative anomaly signifying outer limits of barrow no. 295
··· wave-shaped anomaly potentially indicating an internal feature in the central part of barrow no. 295
— anomalies most probably indicating traces of modern interferences into barrow's no. 295 structure, e.g. excavation trenches and iron objects
--- approximate spatial extent of concentration of anomalies signifying destroyed barrow no. 295A
— negative anomaly reflecting trench cutting through the entire embankment destroyed barrow no. 295A
··· normally polarised anomalies, potentially indicating internal features left intact during excavations of barrow no. 295A
--- approximate spatial extent of negative anomaly signifying outer limits of barrow no. 294
··· large concentration of anomalies, including an extensive, centrally located positive peak, potentially indicating internal features of barrow no. 294
— anomaly most probably indicating modern iron object buried or left on the surface of barrow no. 294

ible W from the central anomaly and has the form of two equally shaped and adjacent maxima of magnetisation. It reveals a residual magnetisation, most probably emitted by a piece of iron left there by forest workers.

East from the previously described mound there is another, considerably levelled barrow no. 295A (Fig. IV.360). Spatial limits, discerned through changes of magnetic field, can be circumscribed only in the context of the northern section, where the crescent--shaped strip of positive values (*ca.* 1nT) is emerging from a weakly magnetic ambient (responses predominantly below 0nT). This kind of magnetisation surrounding the inner part of barrow rarely appears in the results of magnetometry, as opposed to a more frequent negative anomaly of similar shape and suggests the intentional establishment of a feature, such as a ditch, later filled with material of greater magnetic susceptibility in comparison to topsoil in its vicinity. However, in this case the structure is incomplete, because it lacks continuation on the southern side and does not overlap with the course of isohipses on the height plan (Fig. IV.354). Hence, proper classification of its source is impeded.

The results of measurements obtained on the inner side of the aforementioned structure do not differ significantly from the context, apart from about a 15 m-long and several meter-wide strip of maximal negative responses stretching approximately from SW to NE. This anomaly can be identified as a deep trench, left after excavations conducted by unknown autochthons, which cuts through the embankment. Adjacent to it are locally appearing positive peaks, especially pronounced and extensive on its SW side. These could be the result of deposition of material dug out from the internal part of mound, enriched with ferrous compound, causing increased magnetic susceptibility. On the other hand there is a chance that some of the original features located under the earthen mantle stayed untouched and are still detectable thanks to the properties described above.

In this context, one should pay attention to much smaller, but similarly intense positive maximum observable in the W section of the barrow, away from the trench. Other signals revealed on the W side of the trench seem to have a linear shape, running from N to S, departing from the course of the trench. Among them, the northernmost one seems to coincide with the centre of the mound, as determined by the diameter of its crescent shaped structure, and furthermore, is surrounded on its N and W side by a negative maximum, hence creating a dipolar, roughly oval anomaly, resembling the one distinguished within the previously described barrow. Therefore the scale of damage to the preservation state of the discussed mound should be verified and the sources of anomalies visible on the resulting image.

The third mound captured within the scope of the surveyed area (no. 294) is in its NW corner (Fig. IV.360). The barrow on the height plan is visible thanks to horseshoe-shaped isolines, depicting a slight elevation of terrain (Fig. IV.354). Its spatial extent, at best can be delimited on the basis of an arc-shaped anomaly of decreased values of magnetisation (reaching -3nT), surrounding centre of the embankment from the W, N and E. Its contour corresponds spatially with the course of isohipses. On its inner side there are parallel stretched positive responses (about 2nT) that together with negative maxima indicate normal polarisation, whereas the values of the gradient indicate induced magnetisation. The southern section lacks such a clearly defined structure, however the continuation of negative responses is visible also there, where it expands in width taking the form of a crescent.

In the middle of such an enclosed space one large anomaly with a level of magnetisation reaching 3nT is distinguishable, surrounded by smaller positive peaks. The central position and lack of a strong negative peak, indicate an induced type of magnetisation and may speak for the anthropogenic origin of a feature generating it. This could be a centrally located grave with construction being subjected to fire, hence increasing its magnetic susceptibility.

The adjacent positive signals possibly reveal other features or construction elements, created with similar material. They are much smaller and have a less regular shape. Most prominent among them are two anomalies (2 – 3nT) located W from the centre, running parallel to each other approximately along a NW – SE axis. They are separated by a distinct negative peak with an oval contour (reaching -3nT). Perhaps all these signals are generated by a single feature, subjected to thermoremanent magnetisation in the course of an act of firing and consequently, high temperature. Similarly shaped, but less magnetically positive (about 2nT) signal was the recorder on the NE side of the centre, where it is followed by an analogically structured series of negative responses. Overall, the discussed barrow seems to possess a complex internal structure, resulting in many anomalies contrasting with the magnetic field values typical for the surrounding context.

A single anomaly, for which modern origin can be attested with large probability, is situated in the SE section of the embankment and consists of equally

shaped and sized maxima of magnetisation, normally oriented along a N – S axis. Potentially, it is emitted by an object with a high ferrous content, accidentally left there in recent times.

## E.3. Arable field

In the case of the last surveyed measuring zone only a single grid with 20 × 20 m dimensions was applied (**Fig. IV.361**). In this area, located several hundred meters from the current cemetery belonging to the village Milovanie, two landforms subsequently interpreted as prehistoric barrows, were registered during field reconnaissance. The measuring grid was established so as to cover the locations of both objects. Depiction of obtained data does not allow one to distinguish any anomalies of magnetic field potentially emitted by barrow embankments or any structures placed inside them. The entire picture is covered by very strongly polarised anomalies, with dipoles reaching maxima of a gradient that most probably stems from recent agricultural works taking place in the field. Presumably, these signals of modern origin have completely covered any anomalies emitted by prehistoric relicts.

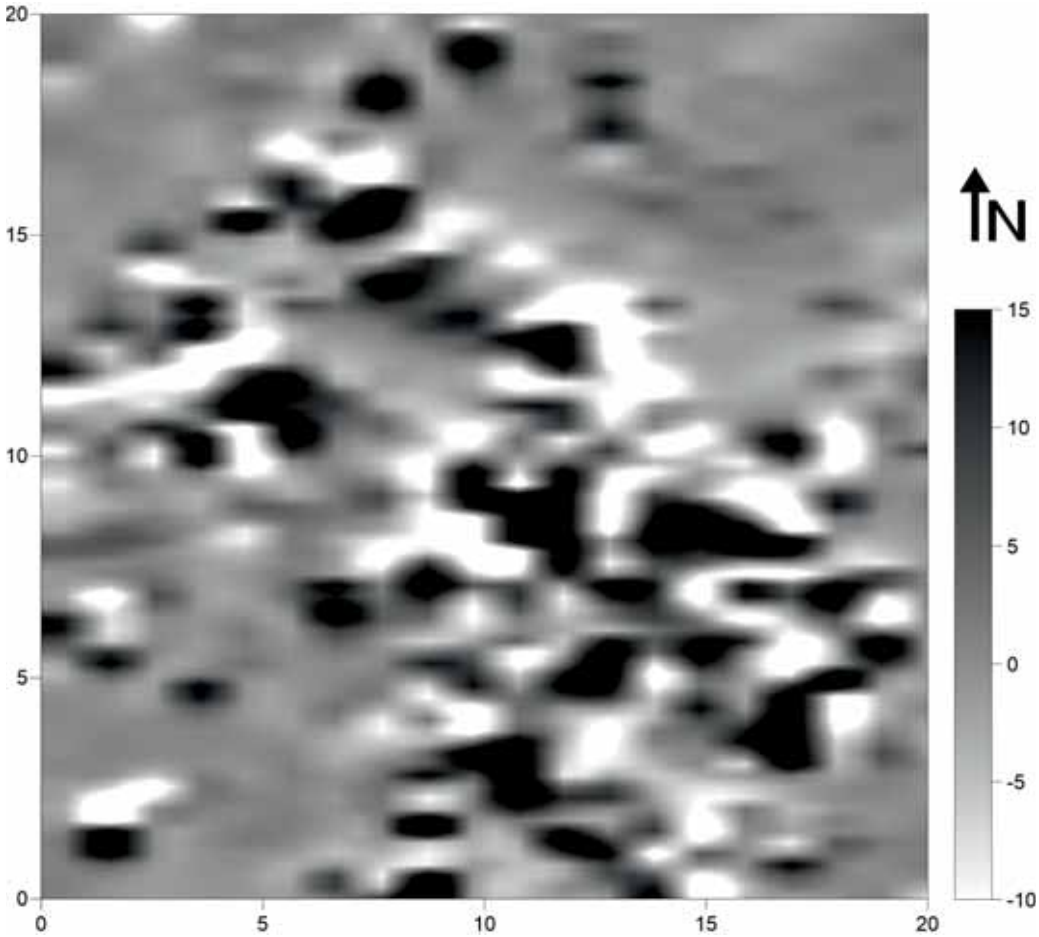



**Fig. IV.361.** Resulting image of magnetometric survey on arable field nearby village Milovanie

# V. Cemetery in Daszawa/Dashava (Fig. V.1)

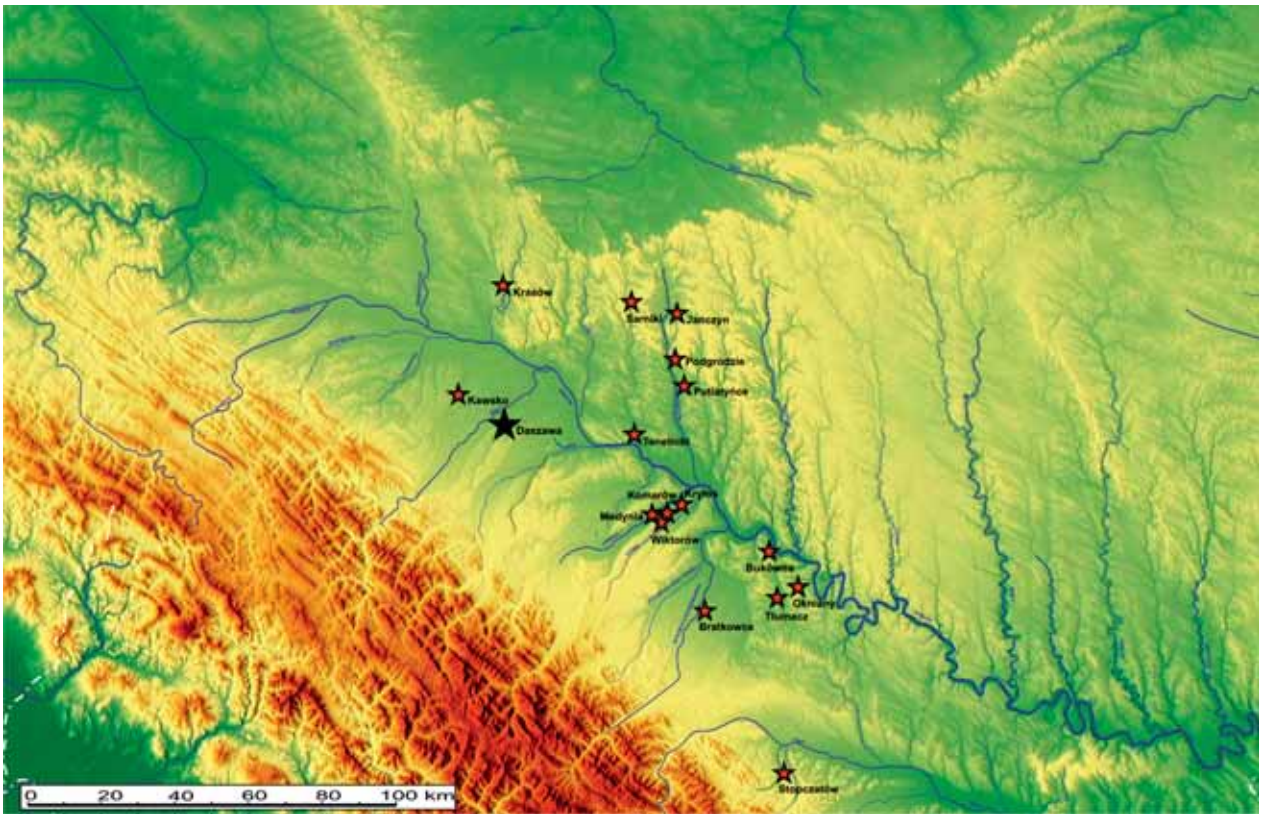



**Fig. V.1.** Location of the cemetery in Dashava in relation to other barrow necropolises

## A. Geographical description

The cemetery in Dashava is located in the Stryi interfluve, *i.e.* between the Bereznitsa, which flows along the eastern part of the basin and the Sukiel, a tributary of the Svitsa.

Barrows were identified on the plateau of the Morshino Upland. In its southern part, their height is within a 320-380 m.a.s.l. interval. Monuments were found in its northern, lower part. The ordinates of the upland height correspond to the second, in terms of height, morphological level of the Fore-Carpathian Plateau. In this particular area, it is the highest level developed by denudation processes, which was later covered with gravel and loess. Recent research has shown that loess accumulation was a tripartite proc-

ess, happening in the pleniglacial period (Łanczont, Bogucki 2007). Loess was blown from the W to the E, which is indicated by the decreasing grain size of dust sediments in its deposition areas towards the E.

Most of the barrows are located around 310-334 m.a.s.l. ordinates. These heights correspond to the elevation of Loieva in the northern part of the Morshino Upland (VI morphological level). All of the analysed barrows are located in the vicinity of second and third degree waterways (Krekhivka, Mahliniec). River valleys have clear, fluvial terraces. Of significance are the Pleistocene fluvial V-II and Holocene terraces developed in the valleys of Dniester tributaries. The lowest terrace I and the floodplain, located in the river valley, were formed during the Vistulian glaciation and in the Holocene. In the Svitsa valley there are three Pleistocene terraces. Their foundations are comprised of boulder-gravel-sand alluviums. Terrace V is located 50-70 m above the river bed, terrace VI of the Middle Pleistocene – 35-50 m, terrace III – 35-25 m, and terrace II – 8-15 m over the river bed. The two last ones originate from the Upper Pleistocene, whilst terrace I, 2.5-4 m above the river bed, is from the Holocene (Gębica *et al.* 2016).

Springs and smaller rivers, which flow to the Bereznitsa River, originate from the plateau of the Morshino Upland, e.g. Krekhivka and Mahliniec, the latter being the tributary of the Krekhivka. These rivers flow through deep, loess ravines. Upland edges are characterised by the presence of highly developed erosion forms (ravines). This area is „defined" by the lower part of the Stryi, which flows into Stryi-Zhydachiv Basin, one of the two formations of the Upper Dniester Basin (together with the Sambir Ba-

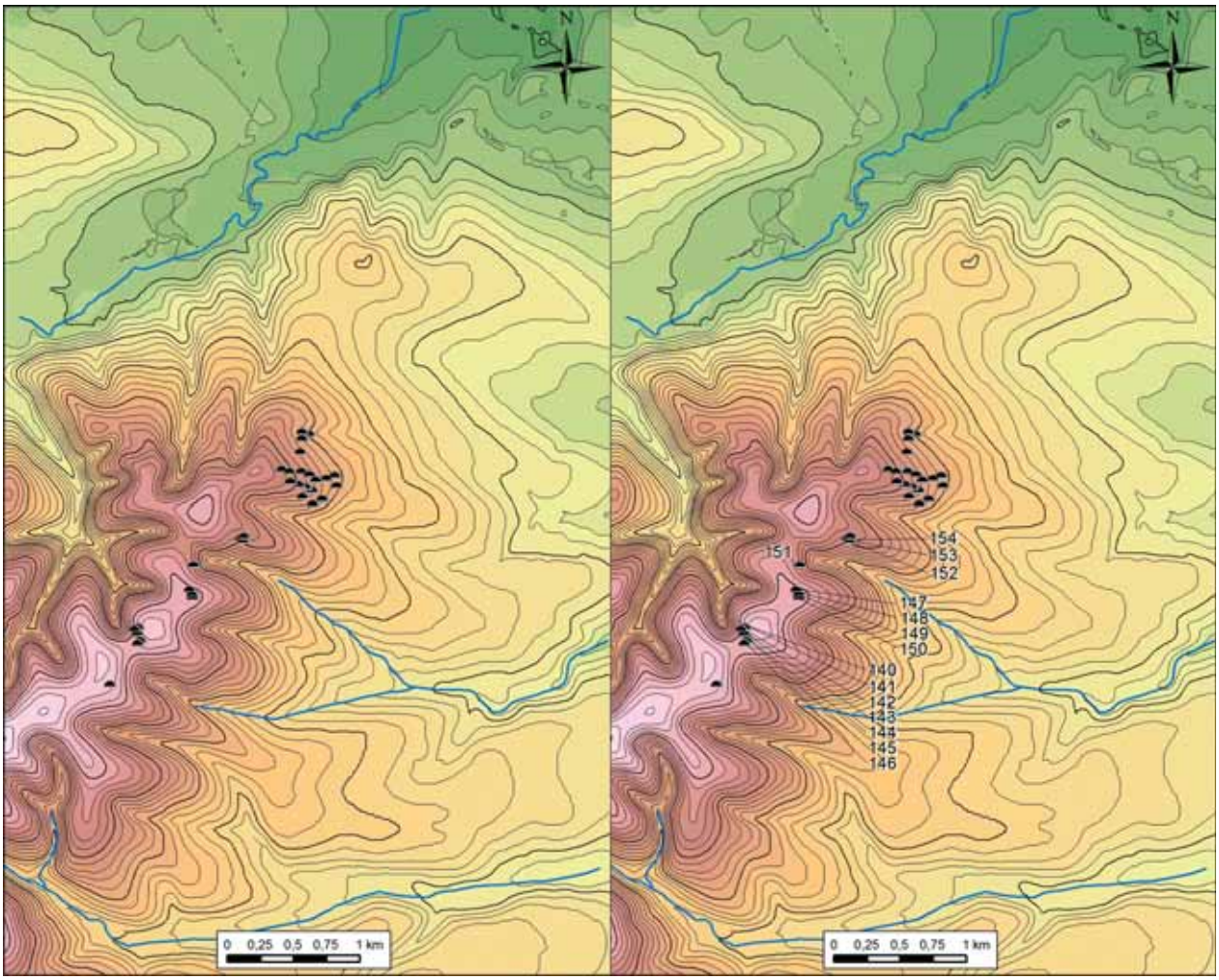



**Fig. V.2** (left). Digital Elevation Model of the barrow cemetery in Dashava

**Fig. V.3** (right). Digital Elevation Model of the barrow cemetery in Dashava with the numbering of barrows

sin) (Kravchuk 1999). I t was formed, as well as other basins in the area, as result of tectonic processes. While flowing through the basin, the Stryi develops a multi-river bed system, which indicates a "wilding" character of the river as it is caused by the amount of transported material, together with a slighter river fall in the basin.

Differences in relative elevation in the area, between the upland parts and bottoms of the river basin are highest in the southern part and measure up to 60 m.

## B. Spatial arrangement of the cemetery

Field-walking prospection provided evidence for 35 barrows in a linear-group arrangement on top of the ridge and on north-eastern slopes of the NE – SW oriented elevation **(Fig. V.2; Fig. V.3; Fig. V.4)**. These concentrations represent a few isolated groups located within a 2.5 km distance. Height differences between the highest and the lowest placed barrows are ca. 24 m (310-334 m.a.s.l.). In the NW there is a concentration of 19 monuments (unexcavated mounds – on the map without numbers – Fig. V.3), arranged in clusters and contained within a (N – S: E – W) 0.7 × 0.5 km area. To the SE of it, at a distance of 0.5 km there is a group comprising three barrows (nos. 152-154). To the SW, ca. 400 m away, there is a single tumulus (no. 151), and 180 m S of it – a group of four monuments, aligned along the NW – SE axis (nos. 147-150), stretched along a distance of 80 m. Further SE, ca. 450 m away, are seven mounds arranged linearly at a distance of 140 m, along the N – S axis (nos. 140-146, **Fig. V.5**). The last, unexcavated barrow, was identified 300 m SE of the aforementioned mound group.

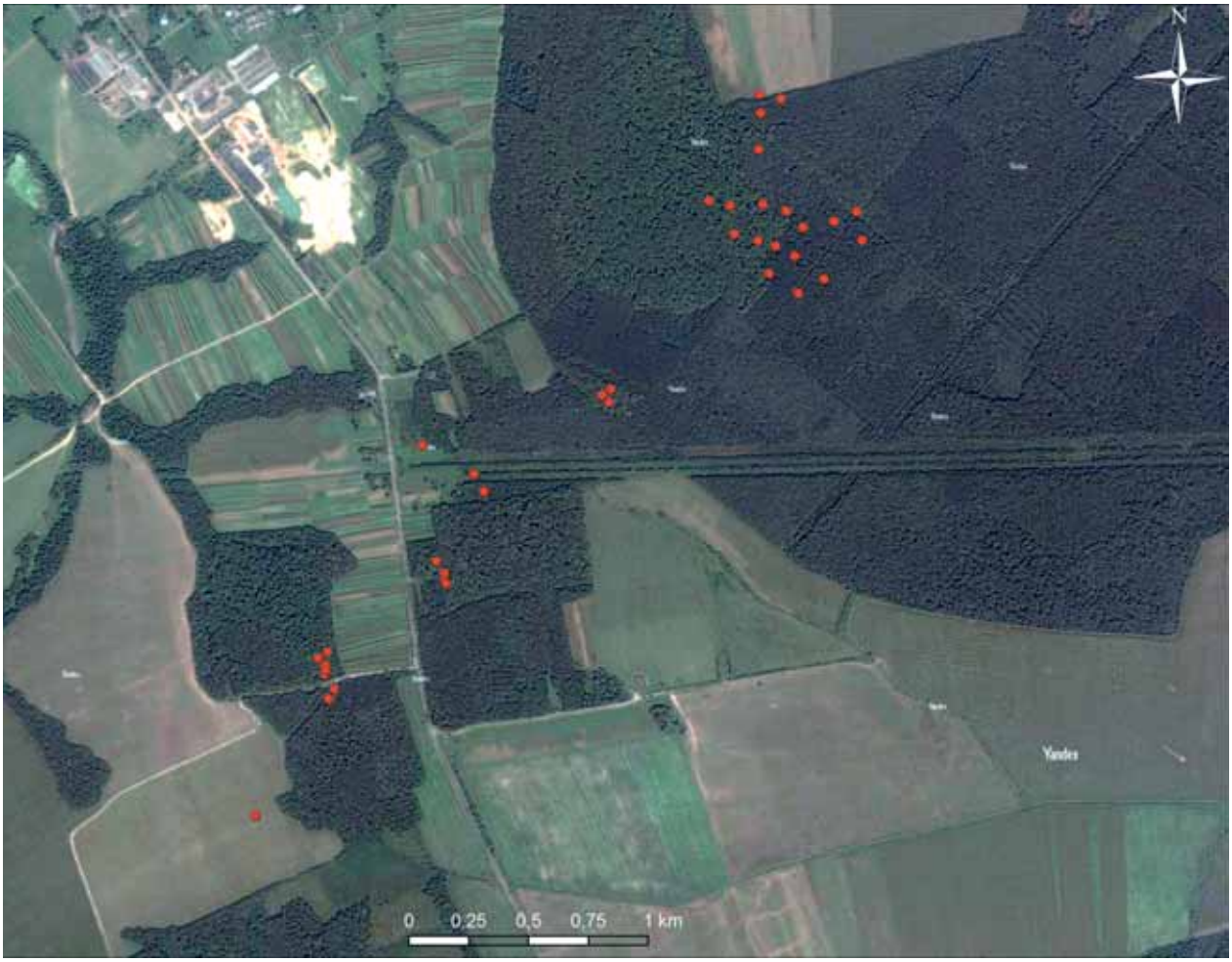



**Fig. V.4.** Dashava. Location of the cemetery using satellite imagery (Yandex)

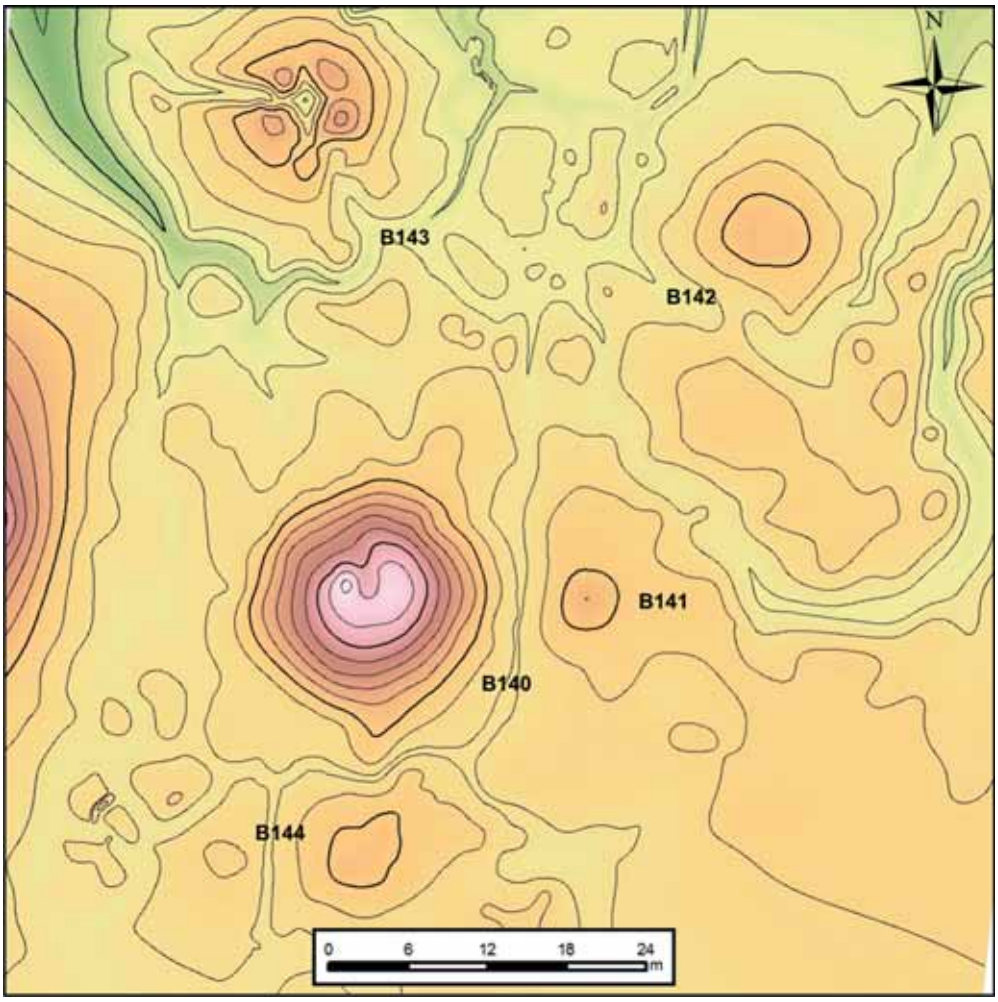



**Fig. V.5.** Dashava. Spatial arrangement of the central part of the southern barrow group

**Fig. V.6.** Barrow 140. View from the E

## C. Description of the barrows (only central part of the cemetery)

**Barrow 140** (**Fig. V.6, Fig. V.7**) was found in the southern part of the necropolis, in a beech forest, among a group of seven barrows, at 332.5 m.a.s.l. It is located 20 m SE of barrow 144, and 8 m N of mound 141. Geographic coordinates: N – 49°14'617"; E – 024°00'814". Circular in shape, 24 m in diameter, 2 m high. Evidence of a shallow, plundering dig in the centre.

**Barrow 141 (Fig. V.8**) is situated in the central part of the seven barrow group, at 332.5 m.a.s.l., 6 m E of barrow 142. Geographic coordinates: N – 49°14'605"; E – 024°00'810". Circular in shape, 13 m in diameter, 0.4 m high.

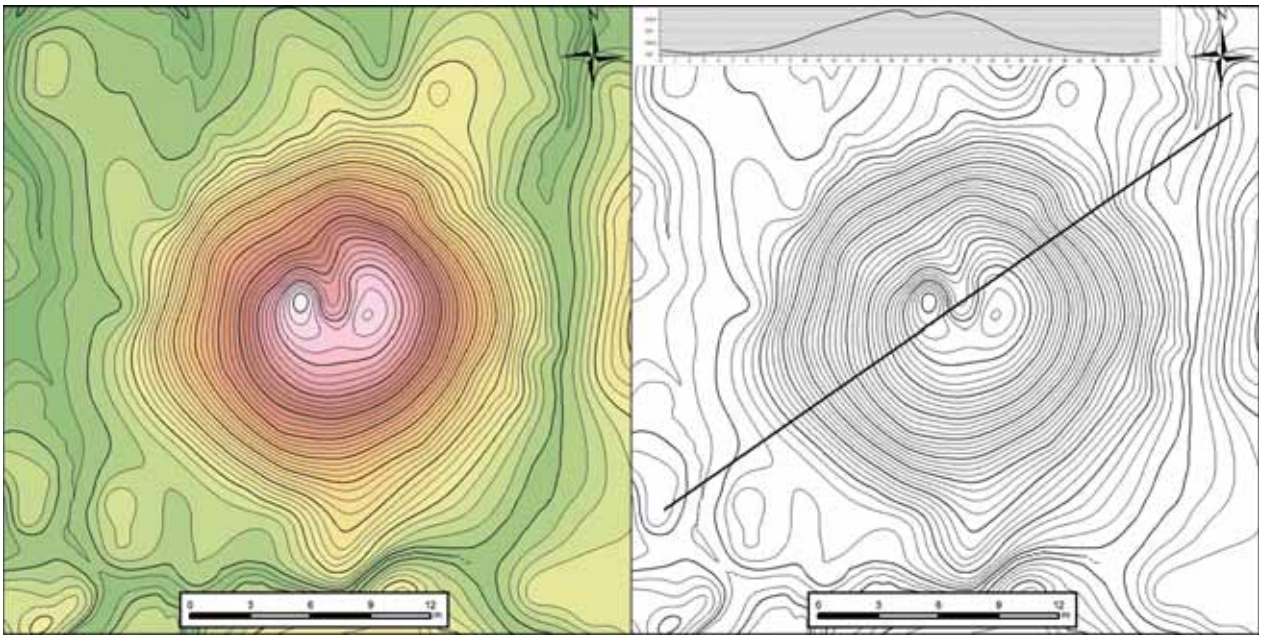


**Fig. V.7.** Barrow 140. Hypsometric plan and cross-section

**Fig. V.8.** Barrow 141. View from the SW

**Barrow 142 (Fig. V.9 Fig. V.10)** was identified 30 m NE of barrow 140, at 333 m.a.s.l. Geographic coordinates N – 49°14'610"; E – 024°00'813". Circular in shape, 13 m in diameter, 0.5 m high.

**Fig. V.9.** Barrow 142. View from the W

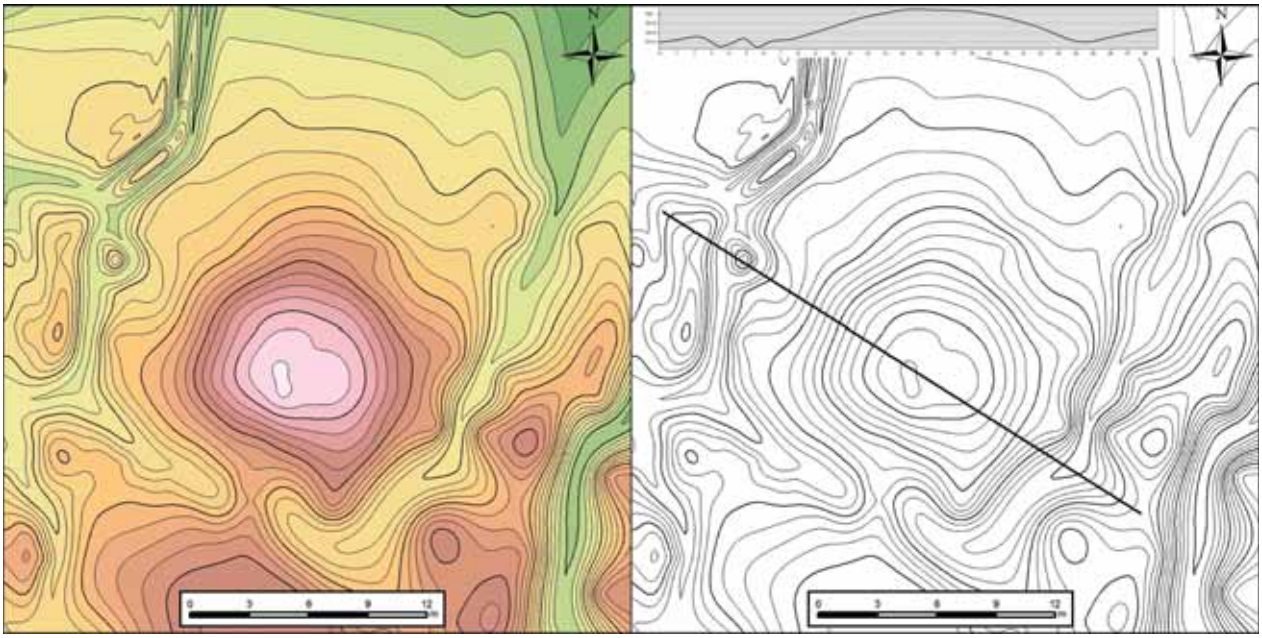


**Fig. V.10.** Barrow 142. Hypsometric plan and cross-section

**Barrow 143 (Fig. V.11, Fig. V.12)** – outermost of seven barrows – located 22 m N of barrow 140, at 333 m.a.s.l. Geographic coordinates: N – 49°14'637"; E – 024°00'818". Circular in shape, 23 m in diameter, 1.2 m high. Extensive plundering digs in the barrow.

**Fig. V.11.** Barrow 143. View from the W

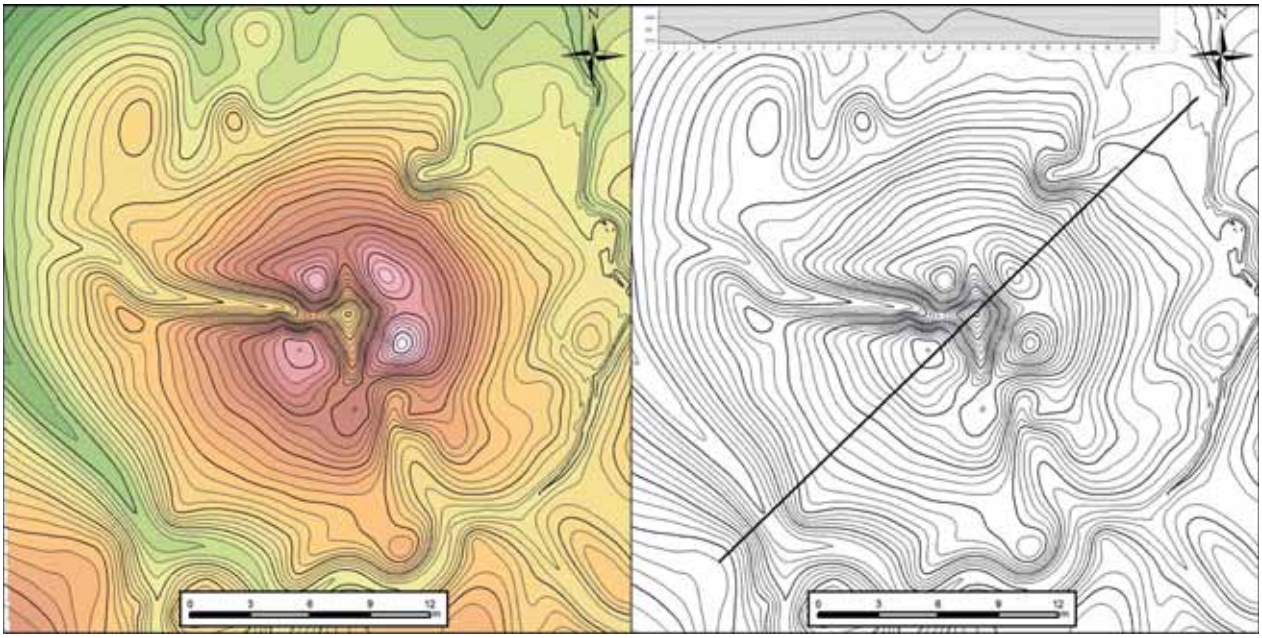


**Fig. V.12.** Barrow 143. Hypsometric plan and cross-section

**Barrow 144 (Fig. V.13, Fig. V.14)** – in the northern part of the aforementioned group, 7 m S of barrow 140, at 331.5 m.a.s.l. Geographic coordinates: N – 49°14'628"; E – 024°00'797". Circular in shape, 14 m in diameter, 0.5 m high.

**Fig. V.13.** Barrow 144. View from the E

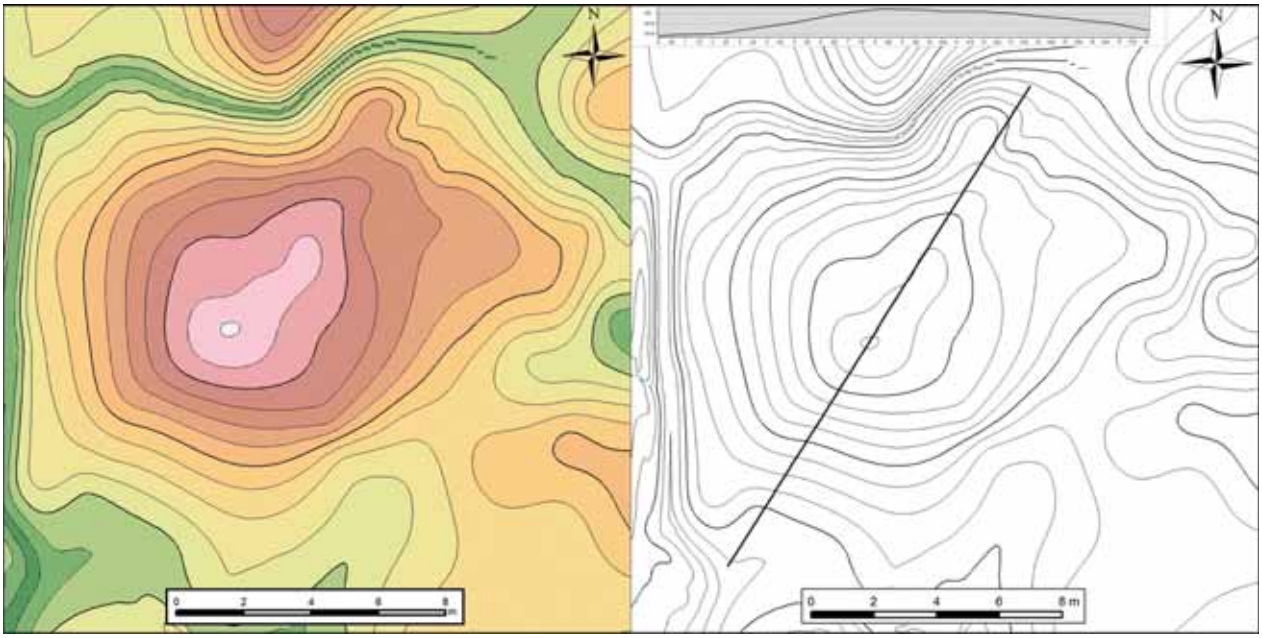



**Fig. V.14.** Barrow 144. Hypsometric plan and cross-section

**Barrow 145 (Fig. V.15, Fig. V.16)** – located in the southern part of the group, 15 m W of barrow 146, at 332.5 m.a.s.l. Geographic coordinates: N – 49°14'582"; E – 024°00'833". Circular in shape, 18 m in diameter, 1.8 m high.

**Fig. V.15.** Barrow 145. View from the NE

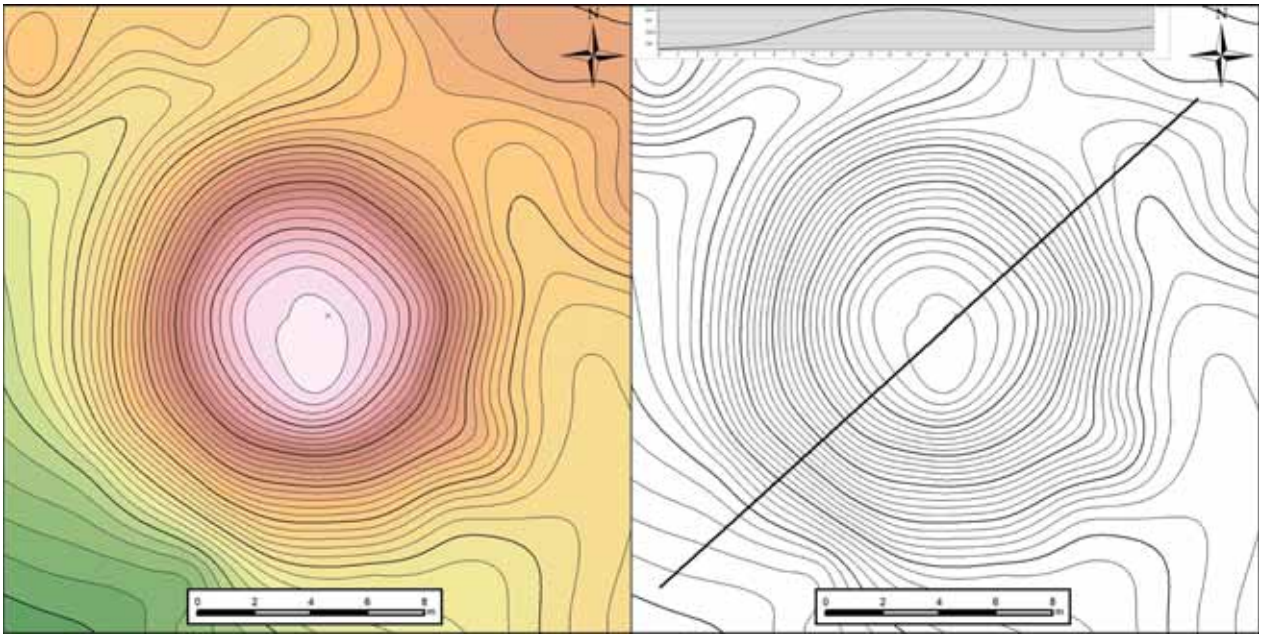


**Fig. V.16.** Barrow 145. Hypsometric plan and cross-section

**Barrow 146 (Fig. V.17, Fig. V.18)** is situated in the southern border of the group, 15 m E of barrow 145, at 332 m.a.s.l. Geographic coordinates: N – 49°14'569"; E – 024°00'820". Circular in shape, 11 m in diameter, 0.3 m high. Subjected to geophysical prospection.

**Fig. V.17.** Barrow 146. View from the S

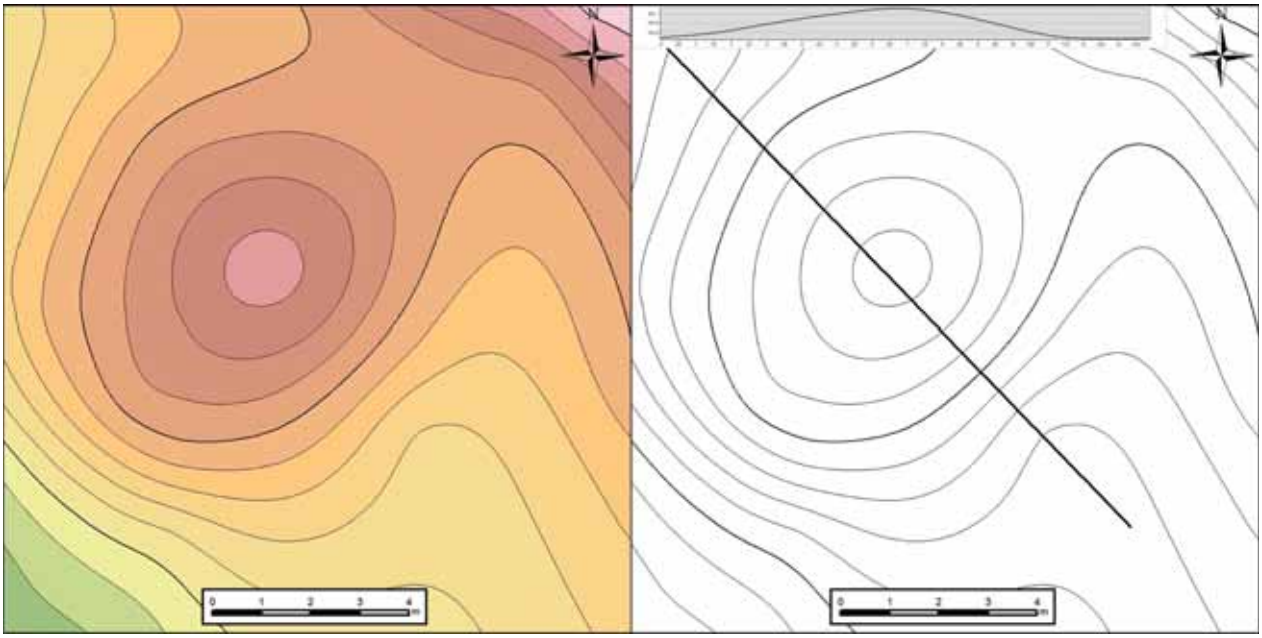


**Fig. V.18.** Barrow 145. Hypsometric plan and cross-section

**Barrow 147 (Fig. V.19)** – recognised in the southern part of the four barrow group, 15 m NW of barrow 148, at 331 m.a.s.l. Geographic coordinates: N – 49°14'747"; E – 024°01'080". Circular in shape, 21 m in diameter, 2.5 m high.

**Barrow 148 (Fig. V.20)** – identified on the southern edge of the group, 15 m SE of barrow 147, at 331 m.a.s.l. Geographic coordinates: N – 49°14'737"; E – 024°01'085". Circular in shape, 14 m in diameter, 1 m high.

**Fig. V.19.** Barrow 147. View from the NE

**Fig. V.20.** Barrow 148. View from the E

**Fig. V.21.** Barrow 149. View from the NW

**Fig. V.22.** Barrow 150. View from the W

**Barrow 149 (Fig. V.21)** – located in the four barrow group, 8 m N of barrow 147, at 331 m.a.s.l. Geographic coordinates: N – 49°14'753"; E – 024°01'081". Circular in shape, 13 m in diameter, 0.6 m high.

**Barrow 150 (Fig. V.22)** – recognised on the northern edge of the group, 45 m NW of barrow 149, at 331 m.a.s.l. Geographic coordinates: N – 49°14'770"; E – 024°01'062". Circular in shape, 13 m in diameter, 0.4 m high.

**Barrow 151 (Fig. V.23)** – identified to the N of four barrow group, 180 m NE of barrow 150, at 323.5 m.a.s.l. Geographic coordinates: N – 49°14'941"; E – 024°01'032". Circular in shape, 10 m in diameter, 3 m high. Mound covered with high vegetation and bushes.

**Barrow 152 (Fig. V.24)** – part of three mound group, located 400 m NE of barrow 151, at 322 m.a.s.l. It is located on a forest clearance, between barrows 153 and 154, ca. 25 m from the first and within a similar distance to the SE of the latter. Geographic coordinates: N – 49°15'014"; E – 024°01'436". Circular in shape, 19 m in diameter, 1 m high. Mound covered with high vegetation and bushes.

**Barrow 153 (Fig. V.25)** – located in the aforementioned group of barrows, 25 m SE of barrow 152, at 321 m.a.s.l. Geographic coordinates: N – 49°15'004"; E – 024°01'452". Circular in shape, 18 m in diameter, 0.8 m high. Mound covered with high vegetation and bushes.

**Barrow 154 (Fig. V.26)** – northernmost barrow of the three mound group. Located 25 m NE of barrow 152, at 323 m.a.s.l. Geographic coordinates: N – 49°15'023"; E – 024°01'455". Circular in shape, 20 m in diameter, 0.5 m high. Mound covered with high vegetation and bushes.

**Fig. V.23.** Barrow 151. View from the W

**Fig. V.24.** Barrow 152. View from the SE

**Fig. V.25.** Barrow 153. View from the N

**Fig. V.26.** Barrow 154. View from the S

## D. Geophysical survey

In April 2015 two barrows (no. 142 and 146) from the cemetery in Dashava were surveyed with the magnetometric method **(Fig. V.27, Fig. V.28)**. They were included in two separate measuring areas. The first, surveyed barrow 146, is located on the northern side of the forest road through the necropolis, just nearby another large mound. The tumulus was registered in the scope of a single grid with dimensions of 20 × 20 m, in total covering an area of 0.04 ha. Due to its relatively small size, it is barely visible in the terrain. Moreover, the monument has been undercut by paths running in its close vicinity, which most probably contributed to the lowering of its embankment. Despite the absence of any traces of previous excavations, it bears other marks of recent human activity. They include remains of fireplaces and abundant litter left on its surface and in the area surrounding it. Some of these were not possible to remove form the survey's extent, therefore they affected the results of the measurements (**Fig. V.29**).

The outline of the discussed monument is almost invisible on the resulting image. The barrow can be distinguished only by an irregular, but relatively wide anomaly, with a magnetic field gradient stretching from 2 to 4nT (**Fig. V.30**). It largely coincides with the central part of the mound and can be interpreted as a result of induced magnetisation. (Fig. V.27). It is surrounded on the outer side by an irregular strip of lower values of the magnetisation (-1 – -2nT) that most probably signify the limits of the mound's embankment (Fig. V.30 and Fig. V.27). Within such a delimited extent of the barrow there are located three roughly oval-shaped anomalies with dimensions reaching 1.5 × 0.5 m, oriented with their longer diameter along a W – E axis (Fig. V.30). One of them is composed entirely of negative values reaching a -5nT level and symbolises a feature with significantly lower magnetic susceptibility than the rest of the barrow. The remaining two signals manifest normal polarization (the broader, positive maximum situated on the southern side of the smaller, negative peak), however, in comparison to previously mentioned anomalies,

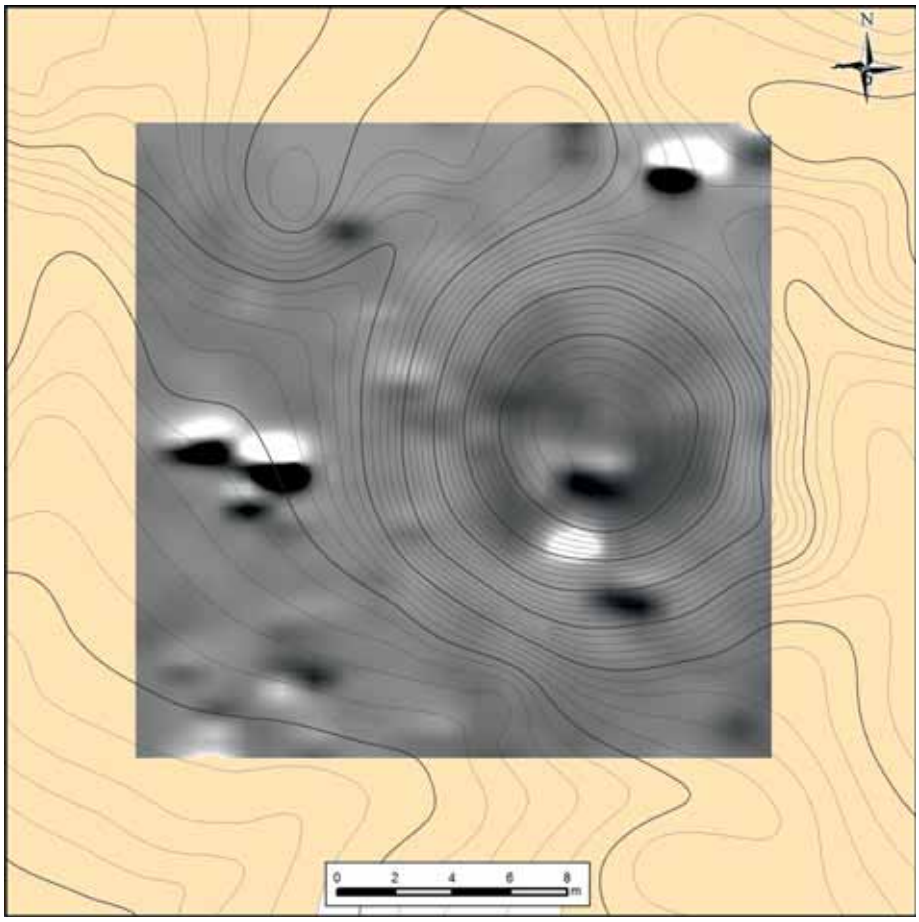



**Fig. V.27.** Dashava, barrow 146. Position of geophysical survey

the values of measurement are noticeably higher, reaching 4 – 5nT. Orientation of the dipoles, as well as the significantly smaller size of negative maximum indicates that they may be emitted by archaeological features, buried under the layer of earthen embankment. Nevertheless, the aforementioned abundance of modern litter on the site forces one to consider also a non-prehistoric origin of the sources of these anomalies (on the barrow's surface there were observed, among others, bricks and spots of ash). Other pieces of litter, also elements of metal, were spread in the barrow's context, which is documented by strongly polarized anomalies in the western and north-eastern parts of the survey's area. Therefore, a large degree of caution has to be retained while interpreting the described results of the prospection.

The second barrow (no. 142) is located on the southern side of the forest road, at some distance from the mound discussed before. It did not possess any visible destruction marks, however its surface was densely overgrown by trees (Fig. V.28). Due to the small size of the monument, it was sufficient to establish only two grids, each with dimensions of 10 × 10 m (0,02 ha). Moreover, it was also possible

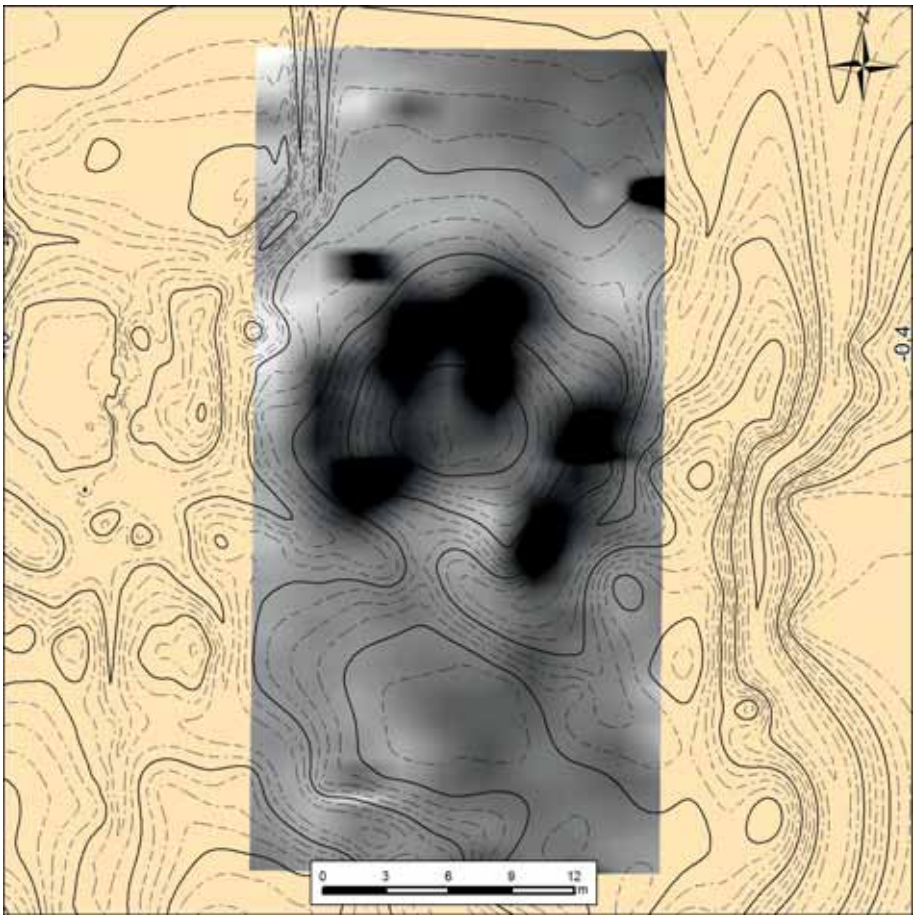



**Fig. V.28.** Dashava, barrow 142. Position of geophysical survey

**Fig. V.30.** Resulting image of magnetometric survey of barrow no. 146 on the site in Dashava with highlighted anomalies discussed in the text.

--- approximate spatial extent of negative anomaly signifying outer limits of the barrow

··· approximate spatial extent of positive anomaly signifying barrow's centre

single anomaly of negative magnetisation situated within the limits of the embankment

two normally dipolar anomalies situated within the limits of the embankment

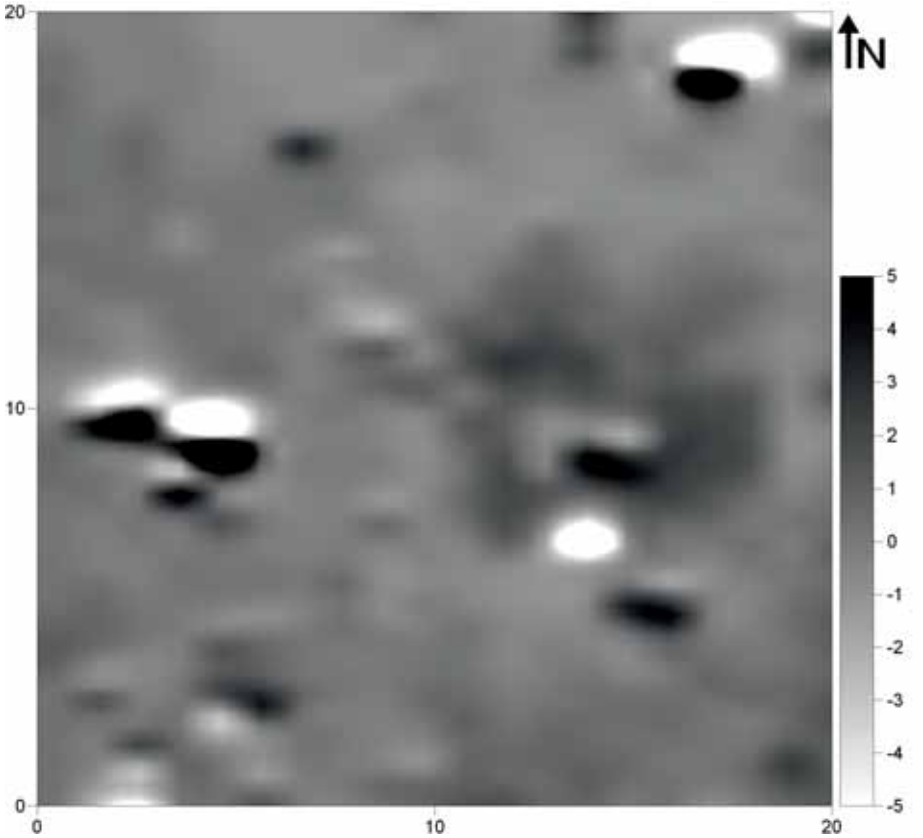
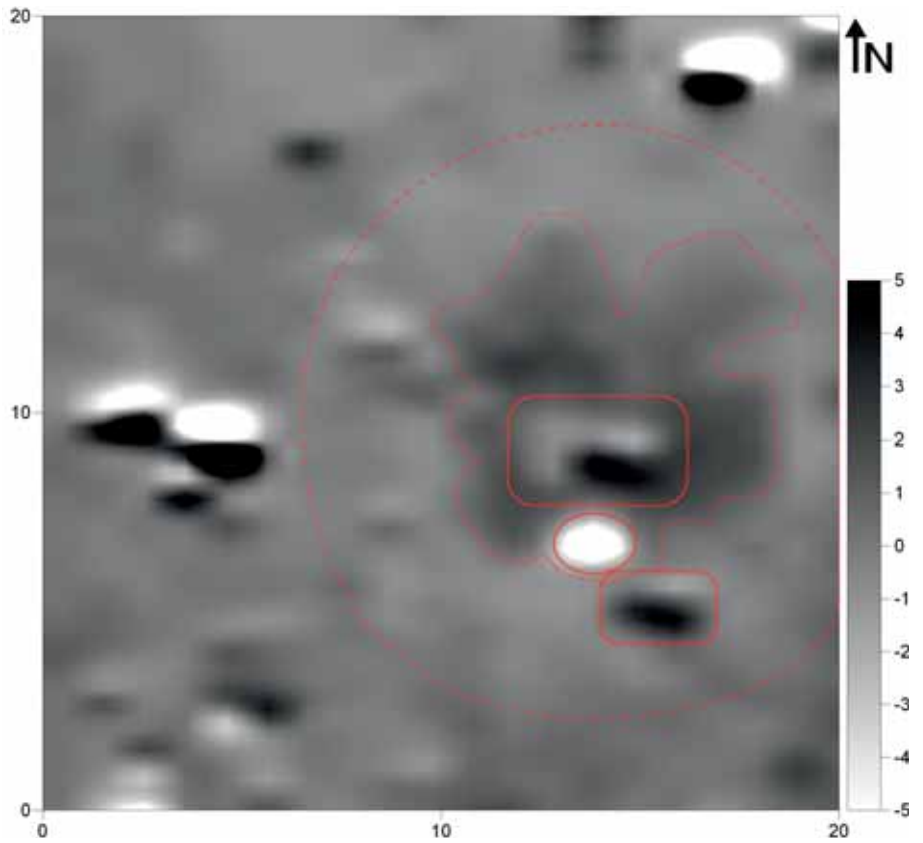
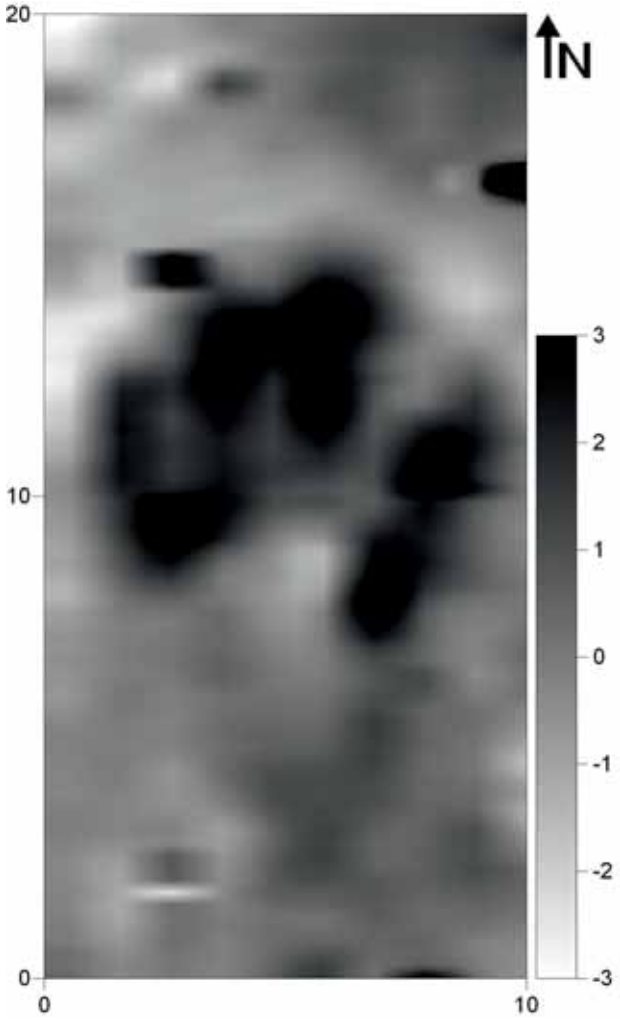



**Fig. V.29.** Resulting image of magnetometric survey of barrow no. 146 on the site in Dashava (gradiometer Bartington Fluxgate Grad 601-1; measuring grid: 20 × 20 m; sampling density per transect spacing: 0.25 × 1 m, interpolated up to 0.25 × 0.5 m; real values of magnetic field gradient compressed in greyscale to the range -5 – +5nT)





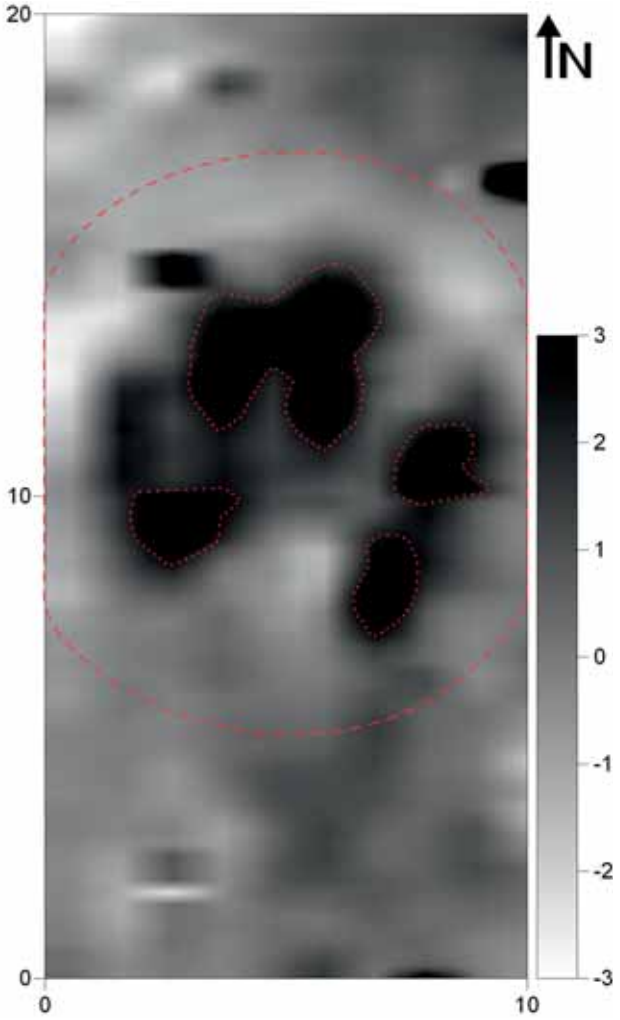




**Fig. V.31** (left). Resulting image of magnetometric survey of barrow no. 142 from the site in Dashava (see Fig. V.29)

**Fig. V.32** (right). Resulting image of magnetometric survey of barrow no. 142 from the site in Dashava with highlighted anomalies discussed in the text.
--- approximate spatial extent of negative anomaly signifying outer limits of the barrow
··· approximate spatial extent of positive anomalies potentially emitted by features located in the barrow's centre

to partly capture the context of the mound, clearly contrasting with the magnetic field values registered over the embankment (**Fig. V.31**). The context itself does not reveal significant deviations from the stable value of the magnetic field (ca. 1nT). The embankment, on the other hand, shows approximately four distinct anomalies with an irregular shape (**Fig. V.32**). All four indicate a level of 5nT and can be associated with induced magnetisation. Although, one can distinguish them separately, it is still possible that they are emanations of a single source. From the image it seems clear that they are divided merely by narrow strips of lower magnetic responses, similar in values to the barrow's circumference. The extent of all four anomalies, if combined, covers much of the embankment. They can be generated either by one, irregularly spaced layer of material with high magnetic susceptibility (e.g. ash, charcoal and other remains of combustion), or four, deeply buried, but highly magnetic features (e.g. grave with an inventory placed inside a specific structure). Despite such uncertainties, the strong contrast with the context, as observed through the magnetic field gradient, allows one to consider the discussed anomalies as effects of anthropogenic activity, connected with the barrow. The whole object can be outlined with a circular strip of negative values, locally reaching the level of -3nT (Fig. V.32).

## E. Archival information

### Daszawa, district of Stryj (after Sulimirski 1968:130-131)

*Over forty barrow-graves are situated on a high elevation to the south of the village: they are in groups varying from a few to over a dozen. They are connected with the burial mounds situated in the woods of the neighbouring villages of Jeseptycze and Oleksice. They are from 20 to 30 m in diameter, and from 50 cm to 3 m in height. The mounds situated on cultivated land or clearings have been much ploughed. In 1930, a flint battle-axe of the Fatyanovo type, 20 cm long and made of a greenish stone, was ploughed up in one of the mounds situated on the clearing. This was deposited in the Prehistoric Institute of the University of Lwów.*

*In 1932, I excavated*[1] *two barrow-graves situated on the border of Jeseptycze village, in a cultivated field of the Basiówka hamlet. These barrow-graves were part of a group of twelve, one of which was in the Jeseptycze area. Two other barrow-graves of this group had been destroyed, one during the erection of a house, the other having been cut across during the installation of a water-pipe.*

*Barrow-grave I. 22 m in diameter, 70 cm high. Crossed by a field road, the mound occurred 20 cm below the forest humus: it was grey at first, while it became increasingly dark at a greater depth and particularly in the centre. Fossil humus at ancient ground level was found under the mound, 70 cm in depth. It was blackish in colour in the lower layers, gradually becoming virgin soil. Several scattered, non-typical potsherds brick-red in colour, some lumps of ochre and one flint flake were found some 5 m from the centre, on the ancient level and some 90 cm in depth from the summit of the barrow-grave.*

*Barrow-grave II. This was situated 35 m south-east of the other, much ploughed over, 18 m in diameter, 50 cm in height. Its cross-section was similar to the other. After removal of the mound and at a depth of about 65 cm, three objects were found lying together in the centre of the grave and on the ancient surface: these were a totally crushed tulip-shaped vessel on its side, a bowl with two small lugs (***Fig. V.33;** *Sulimirski 1968, Plate 17:7) and a cup, also totally crushed. A handful of charcoal was*

[1] T. Sulimirski.

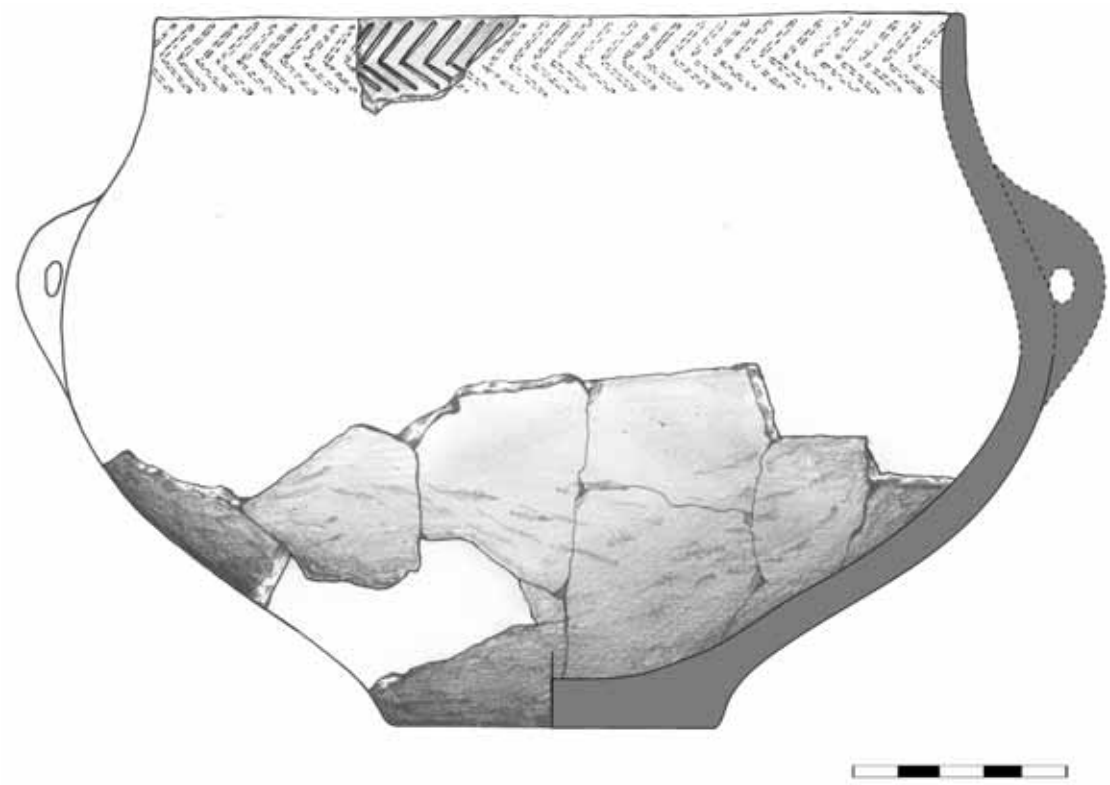


**Fig. V.33.** Amphora, type A112, preserved in fragments. Ornamented under the rim with herringbone motifs. Rounded rim; marked base (the vessel represents rather Corded Ware culture). H – 17 cm, R1 – 19.2 cm, R2 – 19.3 cm, R3 – 23.5 cm, R4 – 7.8 cm

*found about 2 m from these, on the same level, while traces of a hearth about 60 cm in diameter were found about 2 m to the north of the objects. The earth here was calcined, with ash and charcoal dust in it, with a small flint flake nearby. The grave must have been situated somewhere in the area between the objects and the charcoal lump: the burial had been placed in the ancient earth without a shaft being dug. However no traces of skeleton were found.*

*The tulip-shaped vessel was 26 cm high, its lower diameter 19 cm. It had an reverted rim, a flat bottom, without ornament, made of clay with a large admixture of sand. The bowl (Sulimirski 1968, Plate 17:7) was 14 cm high, with body diameter 19,5 cm, having two perforated lugs on the body, placed opposite each other, and an incised chevron ornament under the rim. It was not possible to reconstruct it. All were made in the same way, were insufficiently baked and brittle.*

# VI. Cemetery in Janczyn/Ivanivka (Fig. VI.1)

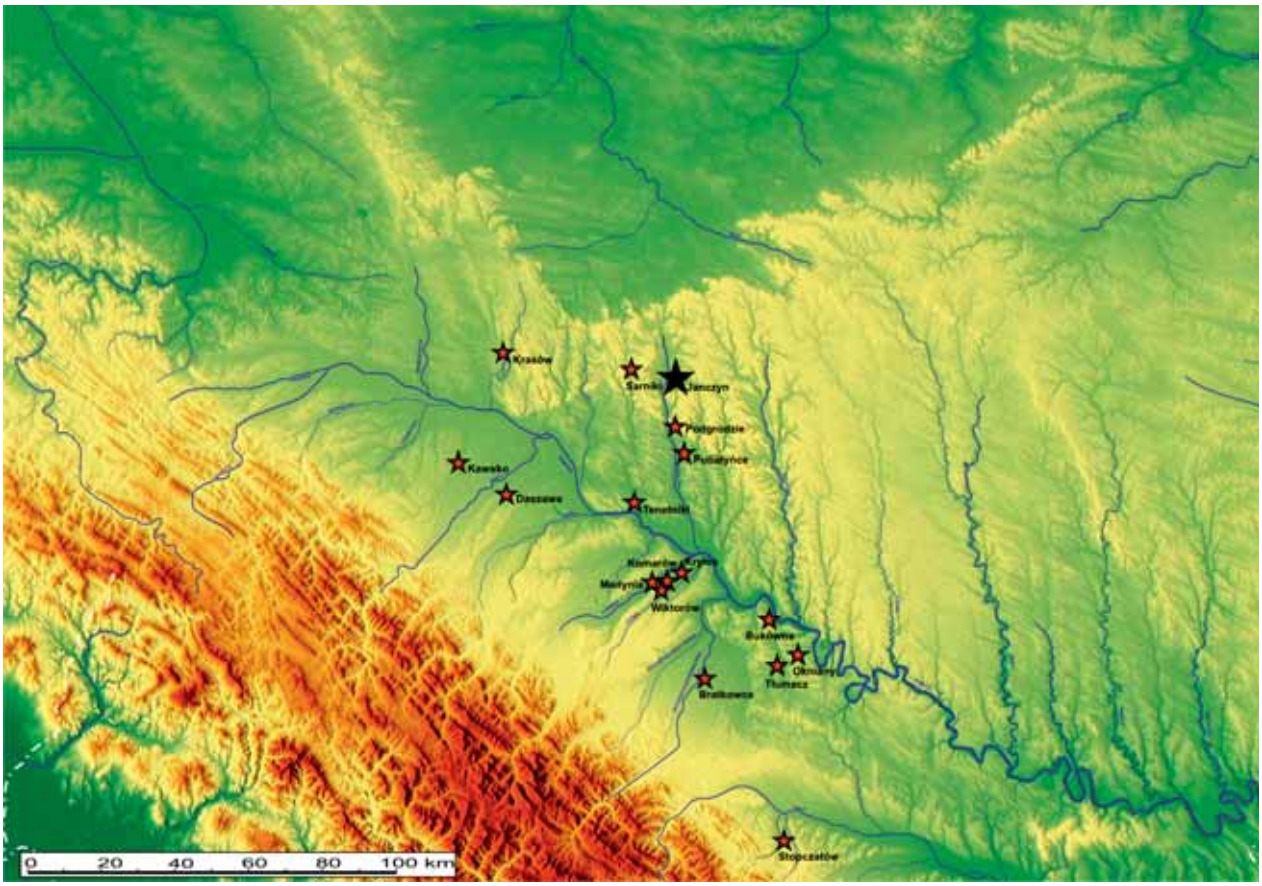



**Fig. VI.1.** Location of the cemetery in Janczyn in relation to other barrow necropolises

## A. Geographical description

The barrow cemetery is located on the Podolian Upland, in the Hnyla Lypa valley, the left tributary of the Dniester. On the left side of the river, in its upper course, there were two barrows located within a short distance from each other. Gnila Lypa is an 87 km-long river, which originates from the Holohory hills, with Kamula as its highest point (Czeppe *et al.* 1969).

The borders of the Podolian Upland are as follows: Boh to the south-east, the Dniester valley to south-west, the Dnieper Lowland to the south-east, with the Holohory hills in the NW (Holohory Kremenetske

ridge), which divides Podolia from Volhynia with a high slope.

Western Podolia is an anticline, located on a bedrock comprising archaic crystalline rocks (granites and gneisses), covered with sheets of younger sediments, including sedimentary rocks of the Silurian, Devonian, Upper Jurassic, Cretaceous (containing phosphorites) and Neogene, which were later covered by loess. The area, where barrows were identified, is the south-eastern part of the upland – Opillie – is a highly differentiated region, which is mainly caused by fluvial processes. The area is divided into hummocks and smaller patches, generates the hilly character of the landscape. Such a landscape is visible until the mouth of Zolota Lypa River. The Dniester and its tributaries flow through either deeply cut valleys – gorges, or, in more flat areas, are of a meandering character, generating numerous curves (Huhman *et al.* 2004). An additional trait of the Dniester valley and its tributaries, including Hnyla Lypa and Bolotna rivers, are moors, presently drained and transformed into meadows.

The edges of valleys are characterised by a well-developed network of ravines, including younger, narrowed, as well as older ones, of the 'balki' type. Deep gorges were formed in the Pleistocene, as a result of rivers moving into a slowly elevating fold. Depending on the depth of river cuts, their cross-sections unravel granite rocks, as well as fairly more common chalk deposits with numerous fossils. Another trait of Podolia are karst formations, associated with Senon marls (vicinity of Zlochiv) or Miocene grypsum (along the Dniester).

The two analysed barrows were located over a small Bolotna tributary, which itself is a tributary of Hnyla Lypa. Height ordinates, where the barrows are

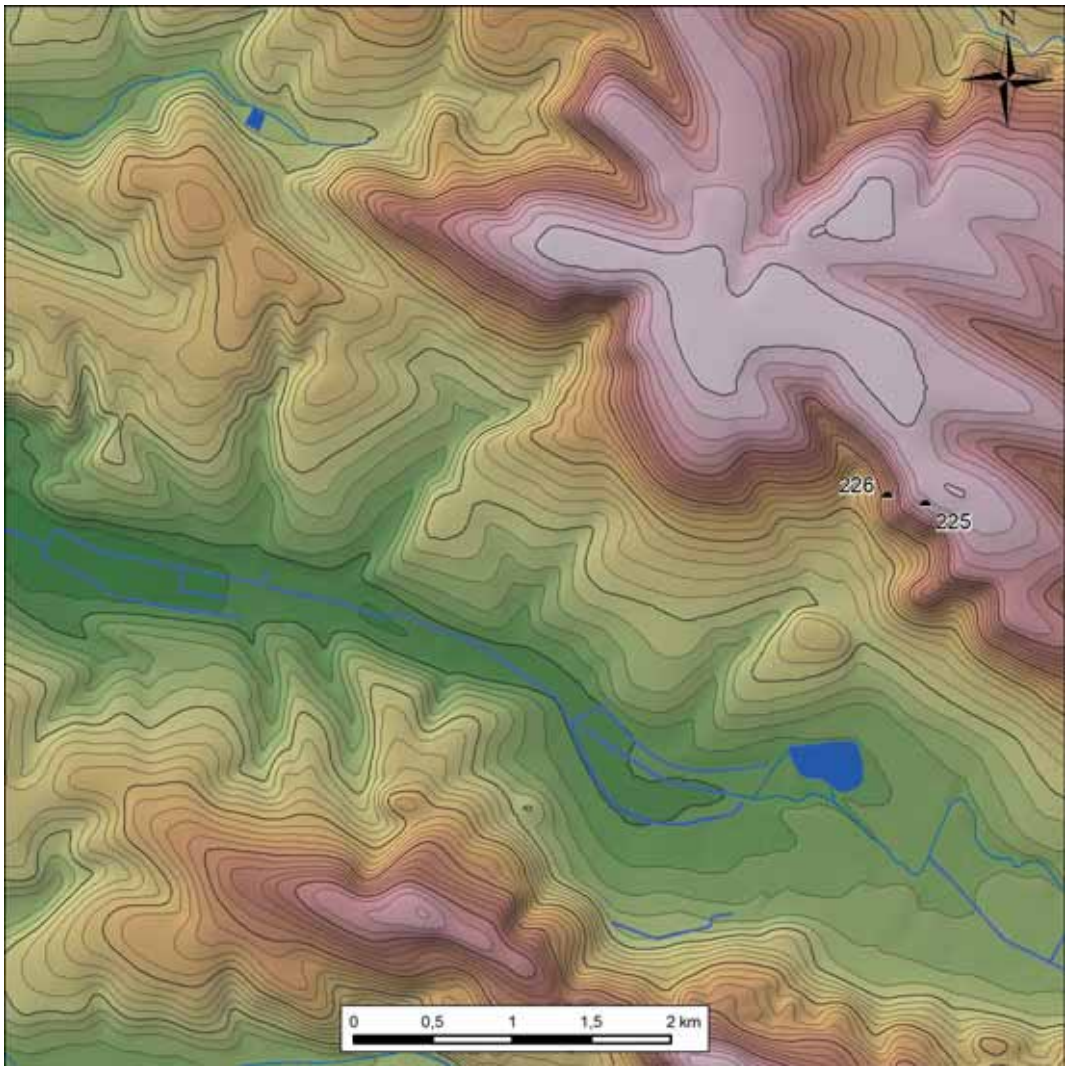



**Fig. VI.2.** Digital Elevation Model of the barrow cemetery in Ivanivka (Janczyn)


**Fig. VI.3.** Ivanivka. Location of the cemetery using satellite imagery (Yandex)

found, are around 400 m.a.s.l. The whole analysed area fits the interval of 271-400 m.a.s.l. The lowest values were notified on the floodplain. One of the barrows was located on the flat of a hillside, the second on the slope declining towards the tributary of the Bolotna River. The inclination of the slope in the area is 0.35°on the plateaus, with up to 17° on usually steep slopes of river valleys, cut into the loess cover.

## B. Spatial arrangement of the cemetery

Two barrows were documented on site (nos. 225 and 226), ca. 220 m from each other (**Fig. VI.2, Fig. VI.3**). The first one was located on a plateau of a hilly area, while the second was on a slope leading to a tributary of the Bolotna. Due to its state of preservation, as well as dense vegetation, no digital plan was developed.

## C. Description of the barrows

**Barrow 225 (Fig. VI.4)** was located 220 m E of barrow 226, at 391 m.a.s.l. Geographic coordinates: N – 49°33'792"; E – 024°40'631". Heavily ploughed, covered with trees, with a shrine on top of the barrow. Oval shape, 14 × 6 m, 1 m high.

**Barrow 226 (Fig. VI.5)** was situated 220 m W of mound 225, at 358 m.a.s.l. Geographic coordinates: N – 49°33'810"; E – 024°40'502". Circular shape, 10 m diameter, 0.5 m high. Covered with thick bushes.

## D. Archival information (After Sulimirski 1968: 130)

### Janczyn, district of Przemyślany

*A barrow-grave on the 'Mohyłki'field was excavated in 1933 by Dr J. Pasternak (Pasternak 1936, 172f). It was 26 m in diameter, much ploughed over. At a depth*

*of 16 cm in the centre of the mound, two skeletons in an extended position, both badly damaged by ploughing were uncovered. They lay parallel to each other at a distance of 2 m. Near the feet of the left skeleton (male) stood a handled cup 7,6 cm high, 10 cm in diameter, with slanting fluting on the body, and near the head of the other (female) was an undecorated cup, 12,5 cm high, 12,5 cm in diameter, with a narrow neck. Both were of the Komarów culture.*

The materials have never been published.

**Fig. VI.4.** Barrow 225. View from the SE (left) and S (right)

**Fig. VI.5.** Barrow 226. View from the NE

# VII. Cemetery in Kawsko/Kavsko (Fig. VII.1)

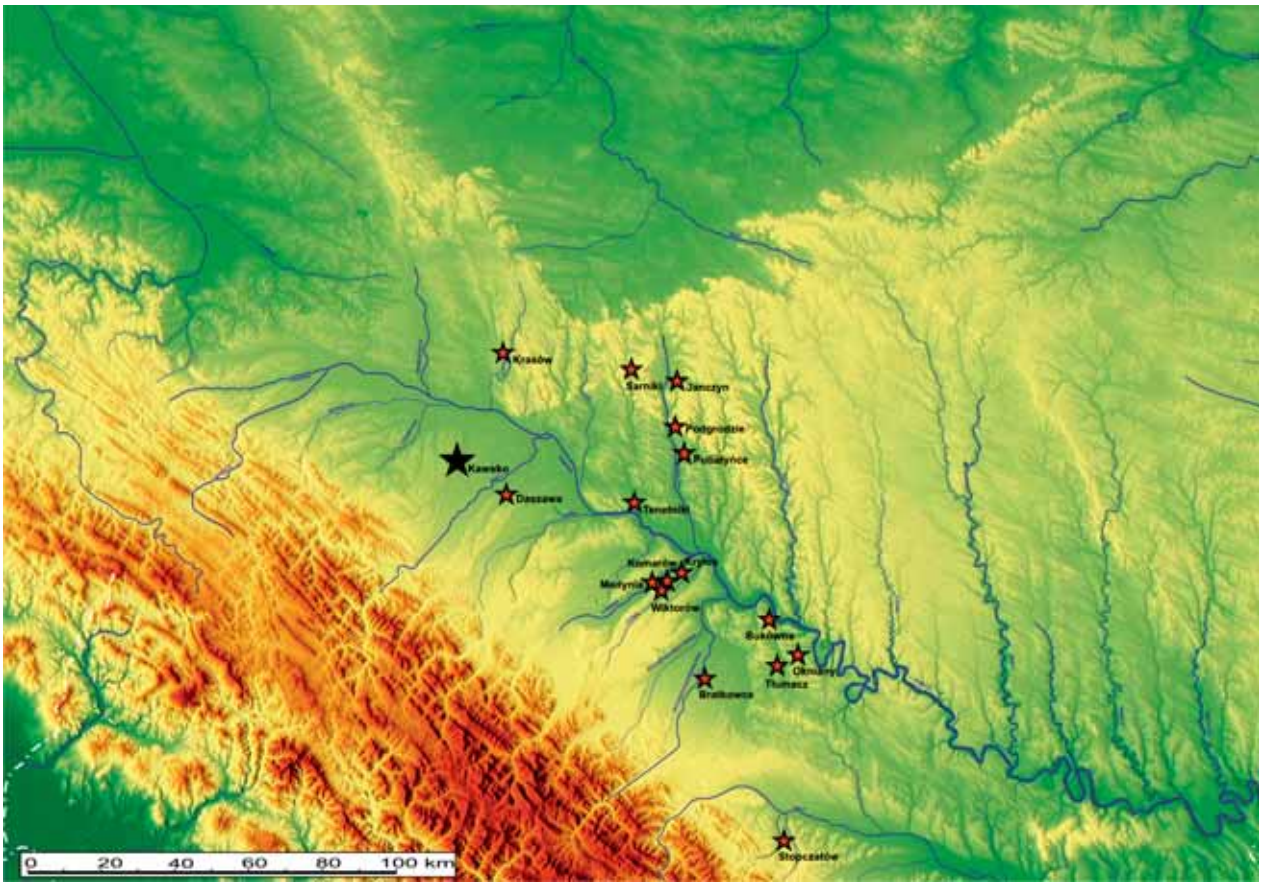



**Fig. VII.1.** Location of the cemetery in Kawsko in relation to other barrow necropolises

## A. Geographical description

The necropolis in Kavsko is situated on the Drohobych Upland. The relief of the discussed region was established by the processes of accumulation, denudation and erosion. The area is limited from the west by the upper flow of the Dniester and from the east by the Stryi. Moreover, the upland can be divided into two minor ones: the Pidbuzska and Kolodnitsa Uplands. The border between these two units is created by the Tysmenytsa River. A concentration of barrows was recorded within the area of the latter one. The highest altitudes for the Drohobych Upland are observable in its central part

(417 m.a.s.l.), which falls in direction to the Dniester and Stryi.

Relative heights in the discussed area between the hills are app. 100 m, while in the proximity of the Dniester are around 70 m. The average length of slopes ranges between 200 to 400 m.

On the fragment of the Kolodnitsa Upland on which the barrows are located the altitudes varies between 276 m – 306 m.a.s.l. Two of the recorded mounds lies on a wide gentle slope that falls to the valley. They are elevated at 298 m and 295 m.a.s.l. The other two tumuli are situated unusually – inside a wide valley of the Kolodnitsa River on altitudes of 277-278 m.a.s.l. These four tumuli are separated by a steep scarp of the valley. With a modicum of generalization it is possible to conclude that these mounuments form a linear arrangement on a W – SE axis.

Characteristic for this area is its significant defragmentation by the Bytrytsa Pidbuzska, Tysmenytsa, Kolodnitsa, Stupnitsa and other smaller tributaries. Inside the valleys of a wide ravine character there occurs a systems of terraces. The upland level is relevant to the VI terrace, which is at the level of the Loyeva (Gębica, Jacyszyn 2012; Gębica 2013). It is a denudative-accumulative platform. In close proximity of the mountains these features can be described as pediments. The following levels that are present in the river valleys are the V and IV terraces. They were established by erosion and accumulation processes. The vast areas of the Kolodnitsa valley and its tributaries comprise wetlands that presently are meliorated and transformed into meadows and pastures. It is hard to unambiguously recreate the hydrological situation of this region in the times that the barrows

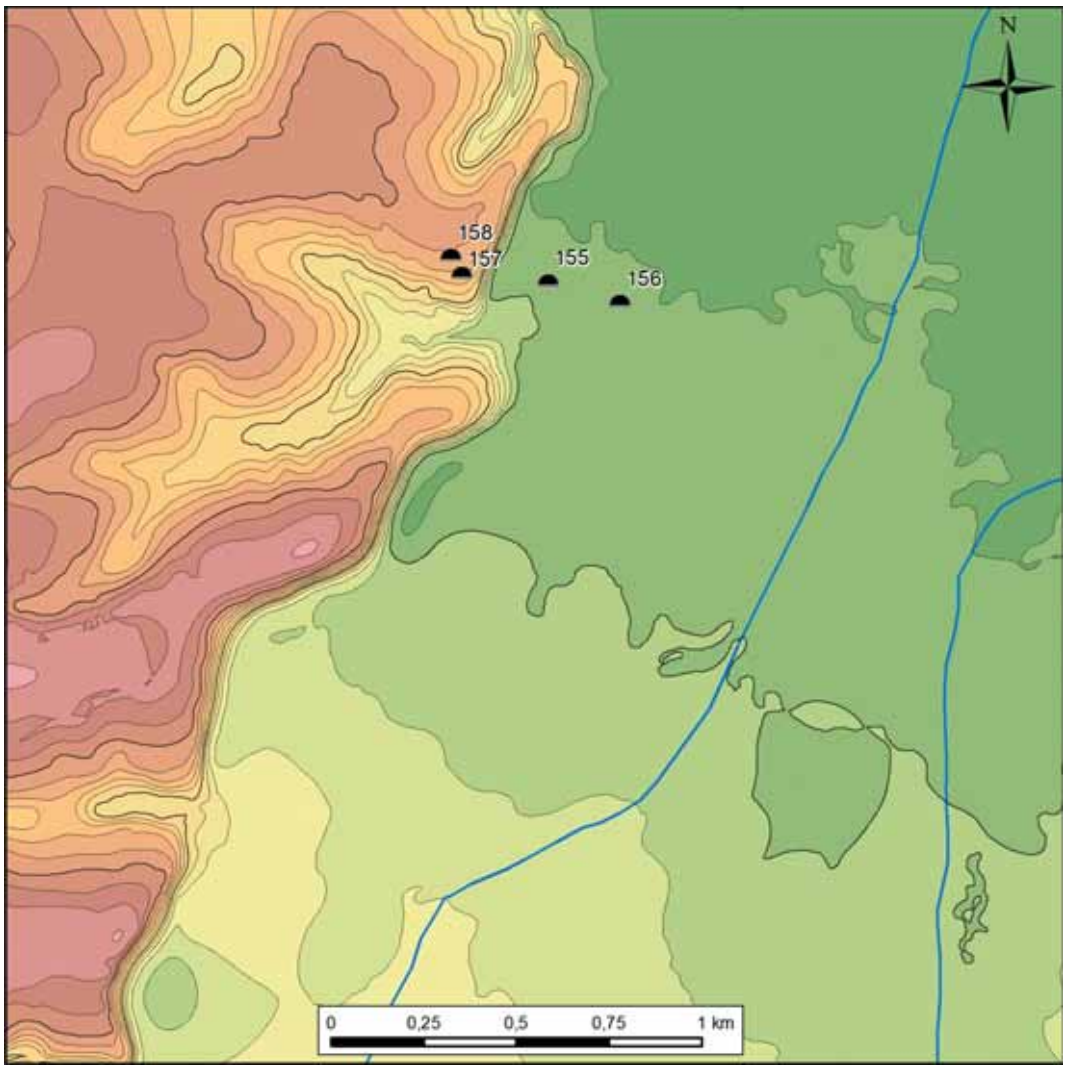



**Fig. VII.2.** Digital Elevation Model of the barrow cemetery in Kavsko with the numbering of barrows (barrow no 229 outside the map – see Fig. VII.3)


**Fig. VII.3.** Kavsko. Location of the cemetery using satellite imagery (Yandex)

were erected. The research of the Stryi Valley (Gębica, Jacyszyn 2012; Gębica 2013) indicates humid conditions and the presence of flood sediments between 2300 and 2100 BP. The earlier stage of humidity corresponds to the period of 5600 – 5400 BP. Perhaps a relative aridity and stability of climate between these two stages created conditions optimal for the establishment of barrows in the lower parts of the valleys.

## B. Spatial arrangement of the cemetery

Five barrows (nos. 155-158 and 229) were recorded during fieldwork **(Fig. VII.2, Fig. VII.3)**. They were located along a W – E axis, over a 1 km long distance. Two of them (no. 155 and 156) are on a field and were nearly completely leveled in the 1950s, while two others are in a forest on top of a plateau (no. 157 and 158).

## C. Description of the barrows

**Barrow? 155 (Fig. VII.4)** – remains found on a field, 200 m E of barrow 157 and 150 m NW from the remains of tumulus 156, at 279 m.a.s.l. Geographic coordinates: N – 49°20'895"; E – 023°48'602". The darker soil patch was ca. 18 m in diameter.

**Barrow? 156 (Fig. VII.5)** – remains found E of the four-barrow group, 150 m SE of barrow 155, at 278 m.a.s.l. Geographic coordinates: N – 49°20'850"; E – 023°48'752". The darker soil patch was ca. 20 m in diameter.

**Barrow 157 (Fig. VII.6, Fig. VII.7)** was in the forest, 60 m E of the edge of the hill, 40 m W of tumulus 158, at 296 m.a.sl. Geographic coordinates: N – 49°20'925"; E – 023°48'416". Circular in shape, 17 m in diameter, 0.4 m high. Subject to geophysical survey.

**Barrow 158 (Fig. VII.8, Fig. VII.9)** located in a forest, 100 m E of the edge of the hill, 40 m E of barrow 157, at 294.5 m.a.s.l. Geographic coordinates:

**Fig. VII.4.** Barrow? 155 (relics). View from the S

**Fig. VII.5.** Barrow? 156 (relics). View from the SW

**Fig. VII.6.** Barrow 157. View from the SE

N – 49°20'925"; E – 023°48'416". Circular in shape, 16 m in diameter, 0.4 m high. Subject to geophysical survey.

**Barrow 229 (Fig. VII.10)** located on a field, ca. 600 m NE of the barrow 157, at 306 m.a.s.l. Geographic coordinates: N – 49°21'060"; E – 023°48'222". Circular in shape, 10 m in diameter, 0.7 m high.

## D. Geophysical survey

In April 2015 two barrows from the archaeological site in Kavsko were subjected to geophysical survey with a gradiometer (**Fig. VII.11**). They are located on the northern side of the forest road, on a wooded elevation forming a part of the Stryi River valley. Both monuments are fairly well visible in the terrain and did not reveal, at the time of the survey, any traces of interference in their structure. They were included in the framework of two independent grids with dimensions of 20 × 20 m each, thus giving a total measured surface of 0.08 ha.

The first mound (no. 157), situated further in the western direction, closer to the forest road, has a distinct round outline, easily distinguishable on the resulting image (**Fig. VII.12**). It is separated from the context by the circular anomaly, characterized by a slightly lowered magnetization, which encloses a surface where measured values of magnetic field are generally higher (**Fig. VII.13**). These values, located within the limits of the barrow's embankment, however, are not unified in terms of magnetic field gradient, which is manifested by scattered positive and negative peaks of magnetisation. Most of the positive values are concentrated on the northern side of the barrow, where they take the shape of an oval elongated along a NW – SE axis.

On the other hand, most of the negative peaks were registered in the southern half of the embankment, where sometimes they are interconnected in a linear form. All the mentioned anomalies have most probably an induced character, therefore letting one to believe that they result from the barrow's internal structure, consisting mainly of earth with a slightly raised magnetic susceptibility. As opposed to it, there is a single anomaly located within the limits of the embankment that reveals a particularly high level of magnetization, more typical for modern or even contemporary relicts. It has a normal orientation of dipoles, however the negative peak is almost as extensive as the positive one. Although there were no metal pieces spotted within the surveyed area, one

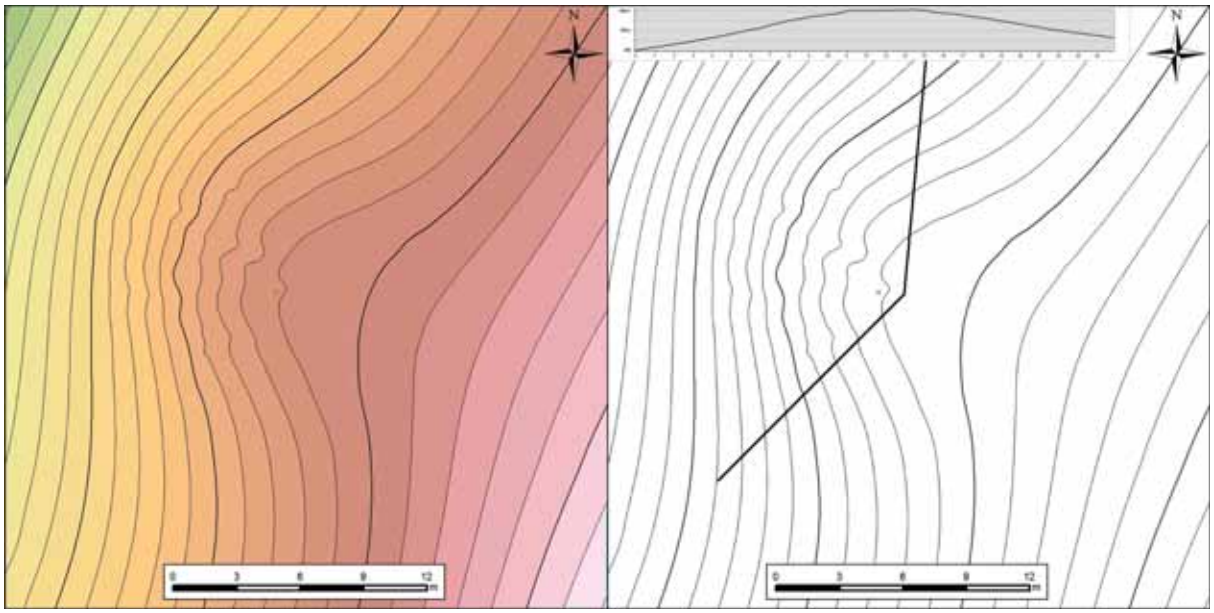


**Fig. VII.7.** Barrow 157. Hypsometric plan and cross-section

**Fig. VII.8.** Barrow 158. View from the SE

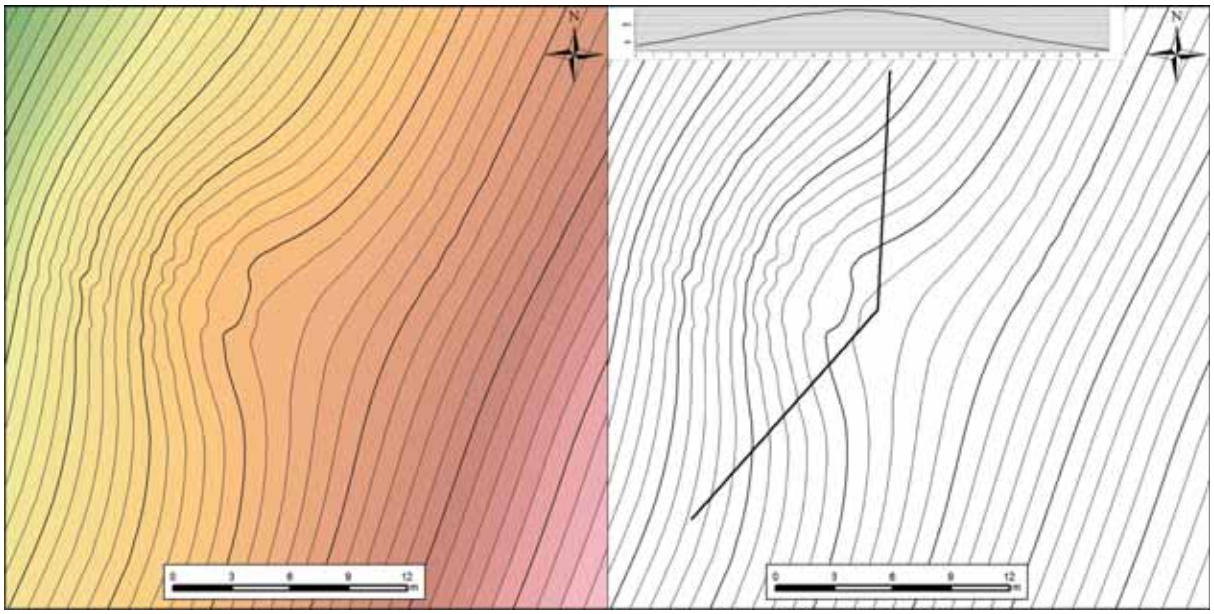


**Fig. VII.9.** Barrow 158. Hypsometric plan and cross-section

**Fig. VII.10.** Barrow 229. View from the N

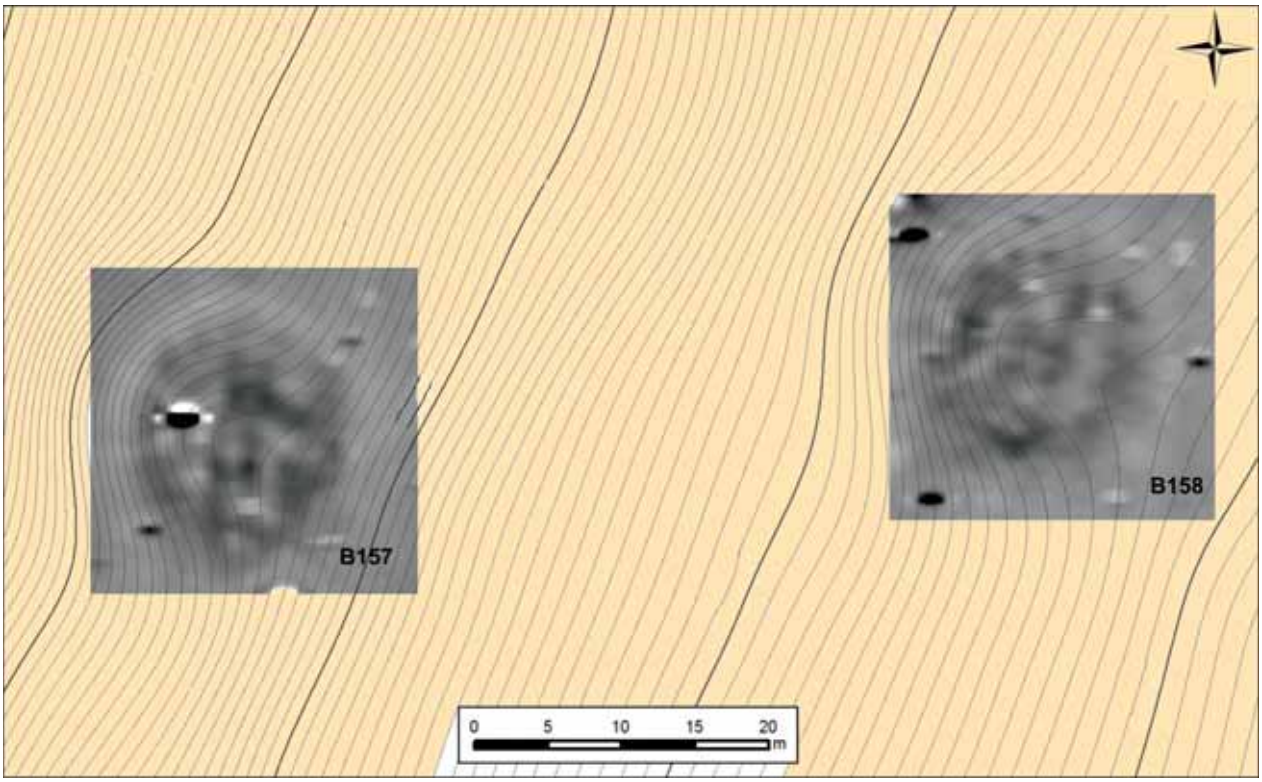
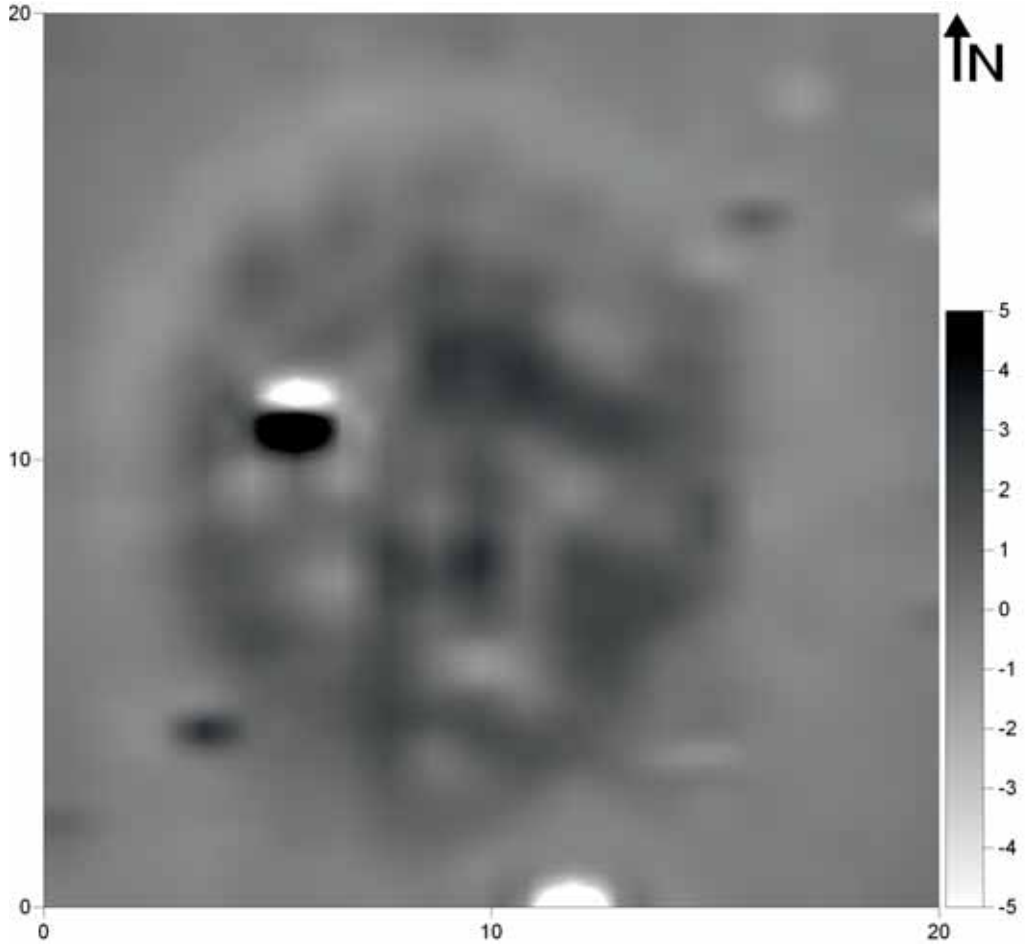



**Fig. VII.11.** Kavsko. Position of geophysical survey

**Fig. VII.12** (up). Resulting image of magnetometric survey of barrow no. 157 on the site in Kavsko (gradiometer Bartington Fluxgate Grad 601-1; measuring grid: 20 × 20 m; sampling density per transect spacing: 0.25 × 1 m, interpolated up to 0.25 × 0.5 m; real values of the magnetic field gradient compressed in the greyscale to the range -5 – +5nT)

**Fig. VII.13** (down). Resulting image of magnetometric survey of barrow no. 157 on the site in Kavsko with highlighted anomalies discussed in the text.

--- approximate spatial extent of negative anomaly signifying outer limits of the barrow
··· approximate spatial extent of the largest concentration of positive values of magnetisation within the embankment
-·- approximate spatial extent of the largest concentration of negative values of magnetisation within the embankment
— strong dipolar anomaly probably indicating a modern iron object buried in the topsoil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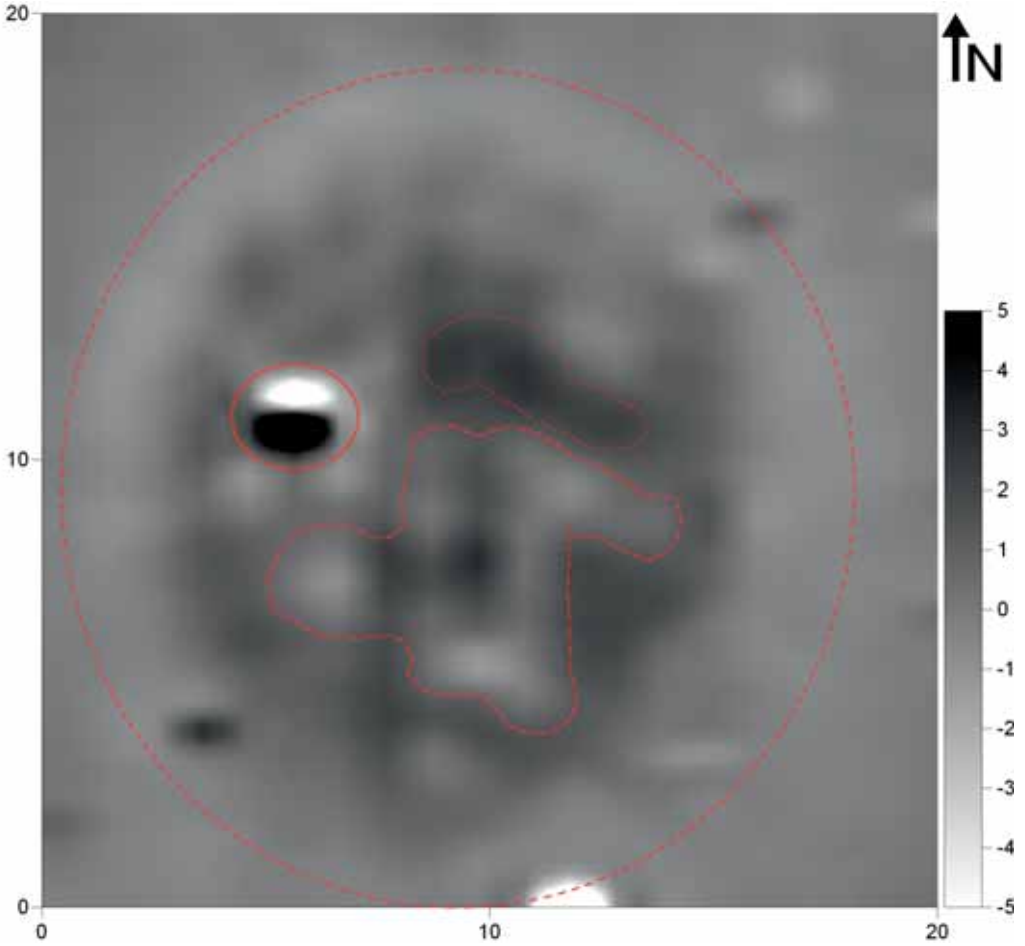
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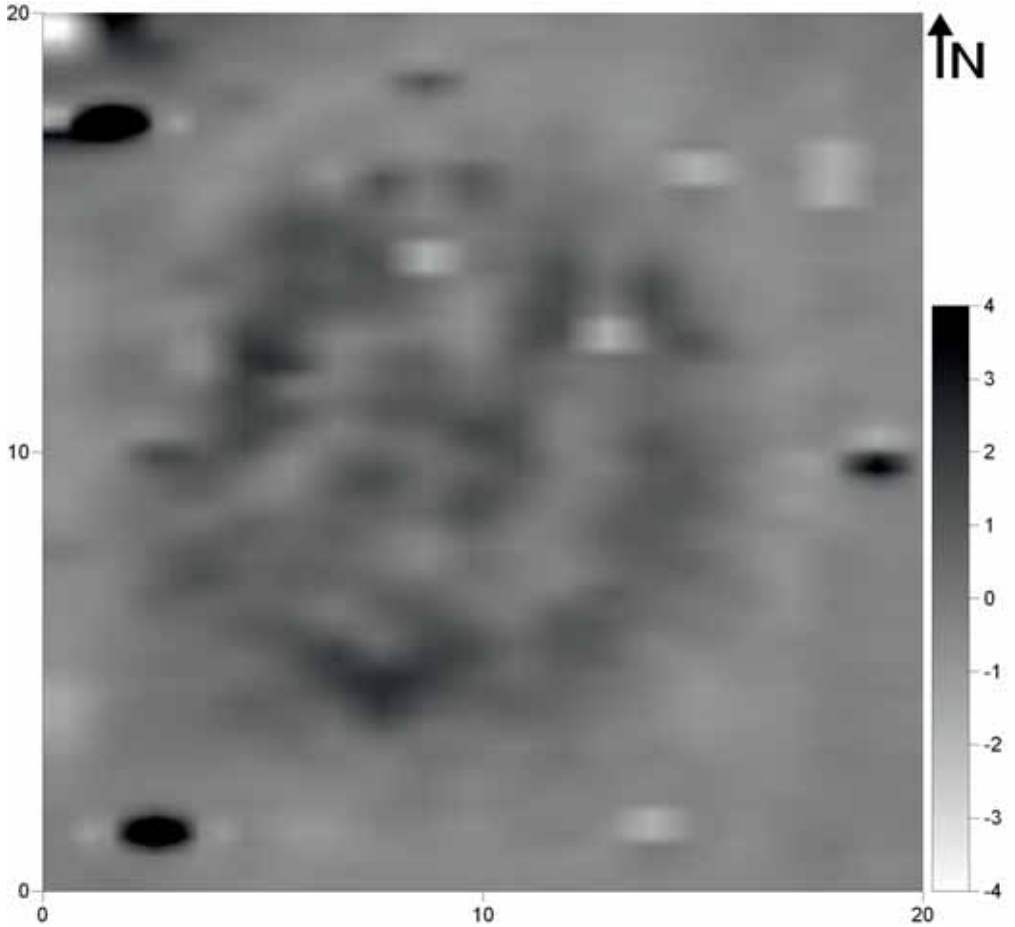
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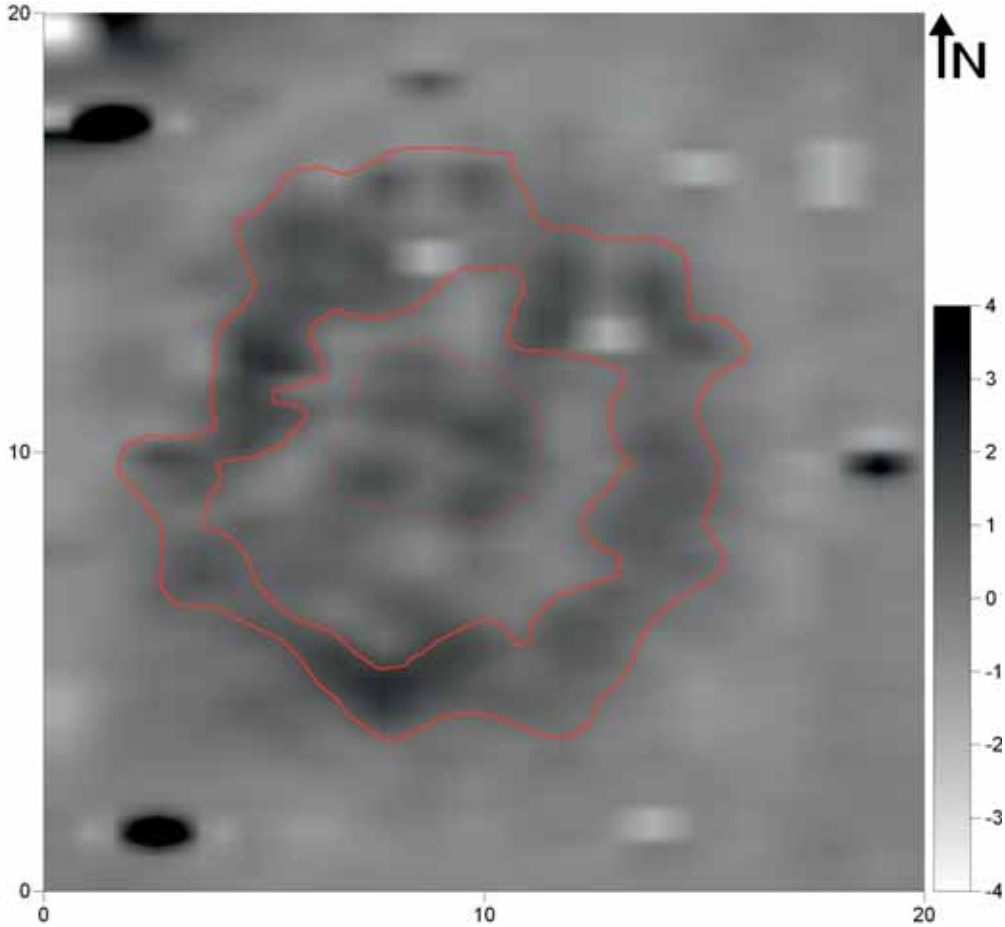
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has to recognize the possibility of their presence underneath the top soil.

In respect to the above described barrow, the second surveyed mound (no. 158) on the site in Kavsko is situated slightly further to the NE. It is characterized by a similar size, as well as state of preservation as the former one. Again it was possible to successfully capture the extent of the embankment, although in this case it was necessary to omit some measurements due to the trees overgrowing the embankment, as visible by light grey strips along the N – S axis. The mound, in terms of the magnetic field gradient, does not manifest itself distinctly from the context (**Fig. VII.14**). The single feature that allows to distinguish it is, most of all, a circular anomaly with a higher magnetic response than the surroundings, as well as the inner part of the barrow (**Fig. VII.15)**. This anomaly, however, is not unified in its magnetic field values, which in some places are higher than in the other. Also in the mound's centre there is present a circularly-shaped signal with a positive degree of magnetization, as opposed to the strip of negative responses surrounding it. Perhaps in this case the survey led to the discovery of the specific internal structure of the tumulus, comprising a ring composed of material with higher magnetic susceptibility (e.g. ambient ditch), enclosing a centrally situated feature (e.g. grave placed inside a cavity or specific structure). Such a hypothesis is supported by the induced character of polarization of the abovementioned anomalies and the range of gradient values not exceeding the maxima (-5 – 5nT). Nonetheless, these are merely propositions that should be verified with a more in-depth study.

## E. Archival information

### Kavsko, district of Medenice (After Sulimirski 1968:132-133)

*In 1956-7, six mounds situated in swampy meadows, scattered over an area of 1 square kilometre, in the wide valley of the Stupnica, were excavated by K.V. Bernyakovyč (Berniakovych 1959). Shallow holes, irregularly oval or round in plan, from 50 cm to 2,9 m in diameter, 10 to 23 cm deep, were uncovered on the ancient surface under the mounds; they were filled in with ashes, charcoal mixed with earth, and potsherds, sometimes various implements were found in them. Several dark patches of various size, round or oval in plan, from 45 × 148 cm to 60 ×195 cm in diameter, were distinguished on the ancient surface. No traces of any skeleton were found in the mounds but in one (no. 5) a cremation burial was uncovered in a hole. Remains found in the mounds were of two types. In each mound flint axes, lenticular in cross-section, stone 'hammer-axes' or battle-axes, and vessels, entire or in sherds, etc., were excavated which did not differ in any respect from the usual grave-goods of the Sub-Carpathian barrow-graves. In addition to these, potsherds, flint implements, quern stones, etc., which do not form part of the usual endowment of burial mounds, were excavated here.*

*The above mounds are considered by Bernyakovyč and Sviešnikov (Sveshnikov 1958) to be the remains of a settlement, or rather traces of seasonal encampments on pasture grounds. However, I do not share these views, and am inclined to regard them as burial' mounds perhaps of a similar nature to those excavated by me at Koropuż or Stojańce. The absence of skeletons is no evidence against these views: this is a phenomenon attested in most Sub-Carpathian barrow-graves; the acidity of the soil resulted in the complete decomposition of all bones except those which were, at least partly, calcined. Pottery excavated in these mounds has never been found in the remains of undisputed settlements and flint axes and stone battle-axes represent typical grave-goods of the Sub-Carpathian barrow-graves. The fact that in one mound (no. 5) a burial was actually uncovered also points to the character of these relics. Patches of charcoal and small holes were found by me in the ancient surface in several barrow-graves I excavated, e.g. at Rakowa, where the size of the mounds leaves no room for doubts as to their sepulchral purpose.*

*In the description below, particulars concerning the mounds investigated and objects excavated are taken from the brief reports published so far; Mr I. K. Sviešni-*

**Fig. VII.14.** (up). Resulting image of magnetometric survey of barrow no. 158 on the site in Kavsko (see Fig. VII.12)

**Fig. VII.15.** (down) Resulting image of magnetometric survey of barrow no. 158 on the site in Kavsko with highlighted anomalies discussed in the text.

— approximate spatial extent of a ring-like structure with high magnetic response surrounding the barrow's centre

··· approximate spatial extent of the concentration of positive values of magnetic field in the barrow's centre

*kov has very kindly supplemented them in some details in his correspondence with me.*

*Mound 1. 18-20 m in diameter, 86 cm high. Three 'hearthholes' and a few patches strewn with charcoal were uncovered on the ancient surface. A stone battle-axe of type x-1, a stone mace-head, three flint axes, eight flint implements (knives and scrapers), twenty-two flint flakes, flint core, two 'querns' and fifty-seven potsherds were excavated. Of the latter, a cord-decorated bowl with a flat base has been reconstructed. According to a sketch plan of this mound, kindly shown me by Mr Sviešnikov, all these remains were found on two levels: those in the north-western part of the area lay at a depth of 40-60 cm, probably on the ancient surface, whereas those further east lay at a depth of 80-100 cm. Their distribution is somewhat confusing, but the distance between the axes, battle-axe and concentrations of potsherds seems to suggest that there were at least two graves about four metres apart, both orientated SW – NE, one on the ancient surface, the other some 40 cm deeper.*

*Mound 2. 13-14 m in diameter, 64 cm high. Nine 'hearthholes' and traces of a large hearth were uncovered. Holes reached to a depth of about 90 cm whereas the hearth extended to a depth of 40 cm, evidently over the ancient surface. On the same level lay two vessels, but the third and a few concentrations of potsherds lay a little deeper. The objects excavated were: one stone battle-axe, two flint axes, six flint knives, scrapers, etc., two flint cores, nineteen flint flakes, one fragment of saddle-quern, seventy-one potsherds and three vessels. Besides, seven trapezoid points were found which differed in no respect from Tardenoisian arrow-points; they are, however, considered to be inlays of composite sickles, as they all have the edge shinning, evidence that they were used for a purpose other than an arrow-head. The vessels were: (a) a wide, low cord-decorated bowl with a rounded base similar to that from barrow-grave VIII at Kołpiec (Sulimirski 1968, Fig. 12:14); (b) a flask-shaped vessel with a flat base and a cylindrical cord-decorated neck (Sulimirski 1968, Fig. 12:15); (c) a flat based, undecorated vessel, apparently a deep bowl, the upper part of which is missing.*

*Mound 3. 22,5 by 24 m in diameter, 60 cm high. One 'hearth-pit' and traces of two hearths on the ancient surface were uncovered. The following objects were excavated: flint dagger (Plate 11:4), flint axe, two flint knives and seven other flint implements, three flint cores, thirty flint flakes, three trapezoid 'arrow-points' (or parts of a composite sickle), fragment of a saddle-quern, one Vessel and forty-nine potsherds. The vessel was a small undecorated cup.*

*Mound 4. 14 m in diameter, 48 cm high. One 'hearth-pit' and traces of four hearths were uncovered. The objects excavated were: a broken flint knife and ten other flint implements, one flint core, thirty flint flakes, five trapezoid 'arrowpoints' (inlays), two vessels and 172 potsherds. One of the vessels was a wide deep bowl (***Fig. VII.16:1***; Sulimirski 1968, Fig. 29:1) with*

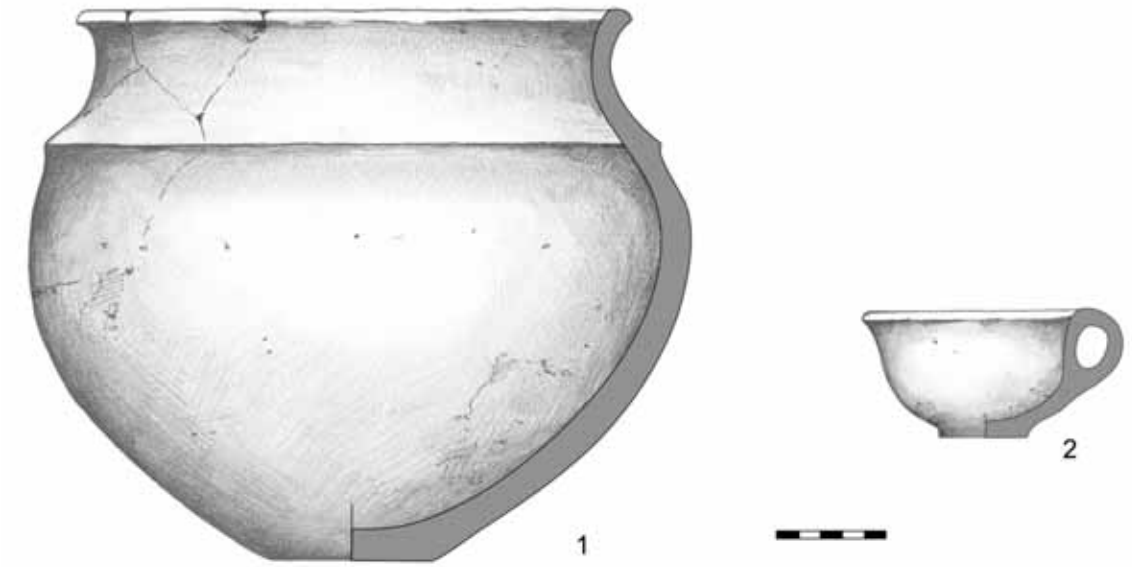



**Fig. VII.16.** 1. Pot, type G112, ornamented on the neck with a horizontal relief strip. Rounded rim, base slightly marked. H – 17.6 cm, R1 – 19.2 cm, R2 – 18 cm, R3 – 23.8 cm, R4 – 7.5 cm. 2. Cup, type K1, plain. Rounded rim; marked base, strap handle. H – 5 cm, R1 – 12 cm, R4 – 3 cm

*a rounded body, everted rim, and a flat base; its only decoration was a raised band round the upper part of the body. The other Vessel was an undecorated small handled wide-mouthed cup with a narrow base, calling to mind Únětice types (***Fig. VII.16:2***; Sulimirski 1968, Fig. 29:4).*

*Mound 5. 12 m in diameter, 45 cm high. Four patches were uncovered consisting of cinders, and also a shaft, 4.45 by 3.7 m wide, filled in with ashes, charcoal and calcined human bones. The latter is said to have been a secondary cremation burial, which does not seem convincing. Cremation took place on the spot and the bones were not completely calcined. Fragments of the skull (of a person 30-35 years of age) lay in the southern part of the shaft. Some 90 cm north of the shaft, at a depth of 25 cm on the ancient surface, was found a decorated handled cup typical of the Komarów culture (***Fig. VII.17:2***; Sulimirski 1968, Fig. 29:5). Other objects excavated were: nine flint implements, one saddle-quern, one flint flake, two vessels and eighty-six potsherds. One of the vessels was a deep undecorated beaker or bowl (***Fig. VII.17:1***; Sulimirski 1968, Fig. 29:2) similar to that from mound 4, but somewhat smaller, a beaker with a flat rim, decorated with a raised band around the neck (***Fig. VII.17:3***; Sulimirski 1968, Fig. 29:6).*

*Mound 6. 14 m in diameter, 25 cm high. No hearths were found under the mound: the following objects were excavated: two flint knives, five flint flakes, a cylindrical single handled, cord-decorated cup (Sulimirski 1968, Fig. 12:11), typical of the late stage of the Corded Ware culture, and eighteen potsherds of some other vessels.*

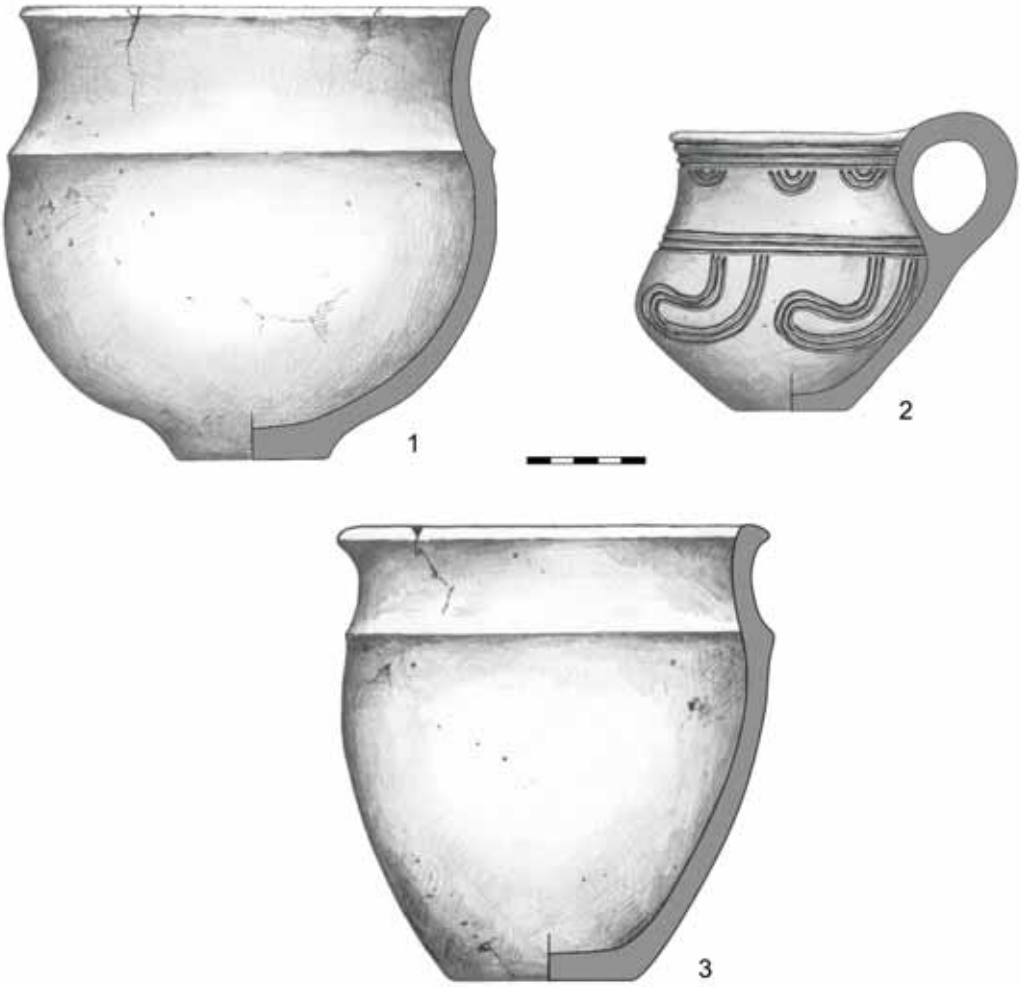



**Fig. VII.17.** 1. Pot, type G112, ornamented on the neck with a horizontal relief strip. Rounded rim, marked base. H – 18.2 cm, R1 – 18.6 cm, R2 – 17 cm, R3 – 19 cm, R4 – 6.1 cm. 2. Cup, type K22, ornamented under the rim with three horizontal incised lines from which concentric, circumferentially incised arches droop (six, sets of three), on the body — with three horizontal incised lines and circumferential incised arches drooping from them (five, sets of three), tilted left. H – 14.4 cm, R1 – 12 cm, R2 – 11.6 cm, R3 – 16 cm, R4 – 5.1 cm. 3. Pot, type G112, ornamented on the neck with a horizontal relief strip. Rounded rim; base slightly marked. H – 12.2 cm, R1 – 16 cm, R2 – 14.4 cm, R3 – 15.1 cm, R4 – 8 cm

# VIII. Cemetery in Komarów/Komariv and Medynia/Medynia (Fig. VIII.1)

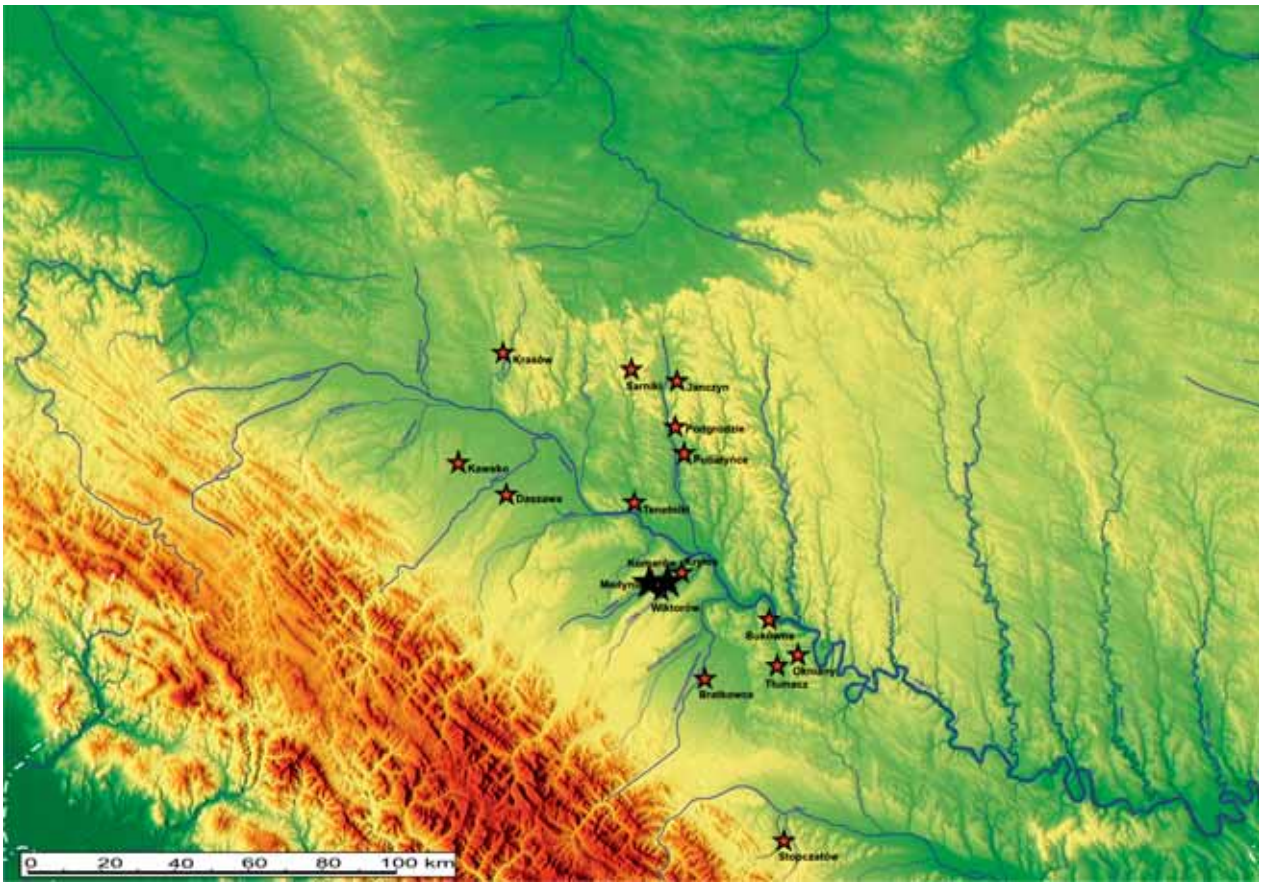



**Fig. VIII.1.** Location of the cemetery in Komariv and Medynia in relation to other barrow necropolises

## A. Geographical description (Komariv, Krylos, Viktoriv, Medynia)

Barrow cemeteries in Komariv, Krylos, Viktoriv and Medynia are situated on the Prilukvinska Upland. This unit spreads between the Lymnitsa River on the west and Bystrytsa of Solotvyno on the east. The area was formed by tectonic uplifts predominant on the one hand and a denudation processes that occurred during the Pliocene and Pleistocene on the other. The latter one resulted in covering the vast area of upland with detritus sediments such as clays, loams of

yellowish-grey colour (Miocene, Pliocene) or gravels (Pleistocene). Due to the high degree of sloping between the steeper Carpathian part of the Upland and flatter Dniester part, the area was divided into two subareas: the Krasno Upland (from the hill of Krasno – 589 m.a.s.l.) in the south and Halych-Uhryniv Upland in the north. In the first area there is located the highest morphological level, that gives the name to the Upland – the Krasno level (second highest peak is Zeleny Yar – 515 m.a.s.l).

The differences in height in this part of the highland in relation to the river valleys range between 160-180 m (Kravchuk 1999). However the most extensive surface in the Upland takes the Loieva level (VI terrace). The differences in height in this area between the hills and the valleys reach 140-150 m. In turn in the Lymnitsa valley, it is possible to distinguish terrace levels V and IV. A substantial part of these features has a structural genesis.

The Halych-Uhryniv Upland is generally lower, covered to a high degree with detritus sediments. Absolute heights reaches here 300-340 m and the relative ranges between 50-100 m. It has the character of a structural threshold that is covered by clays and loam. Inside these sediments the Lymnitsa, Lukva, Lukvitsa rivers and their tributaries cut their way. In particular, the left tributaries of the Lukva can be seen to be eroding the hill ridge.

The area that is a base ground for the barrow cemeteries lies at altitudes from 222 to 337 m.a.s.l. The mounds in Komariv and Medynia were documented along the axis of the structural threshold of the upland. The altitude of the highland in this part rises from north to south from 300 to 369 m.a.s.l. Most of the tumuli occur on the ridge line. Singular barrows are located on the slope that falls in the Lukva direction or eventually on the bench terraces (small concentration of mounds between Krylos and Komariv).

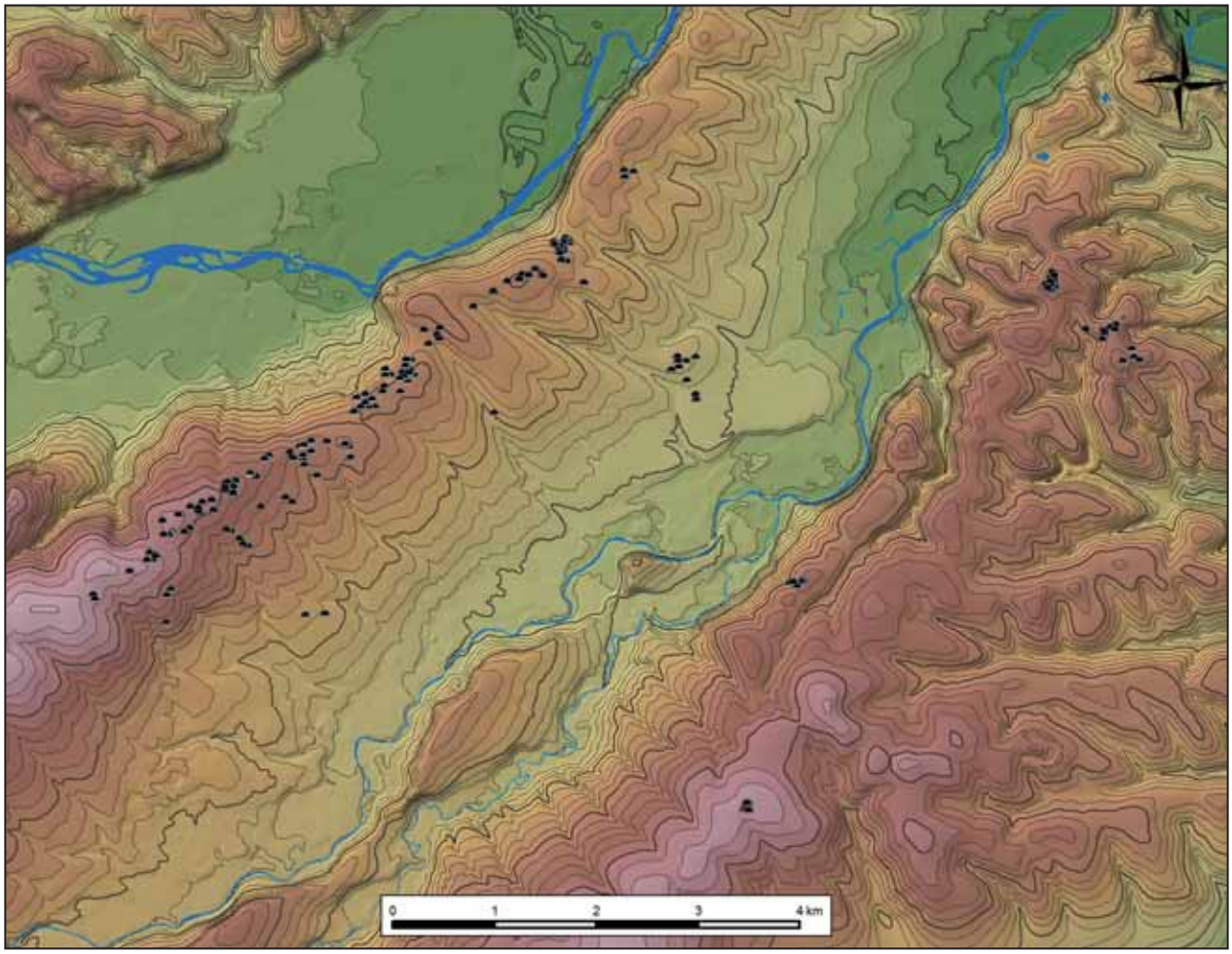



**Fig. VIII.2.** Digital Elevation Model of barrow cemeteries in Komariv, Krylos, Medynia and Viktoriv

The other two sites in Krylos and Viktoriv lie on the right side of the Lukva and Lukvitsa rivers.

Barrows occur in the highest parts of the perches that were formed by fragmentation of the ridge by small valleys. The lowest site, placed on an altitude of 260-310 m.a.s.l. is Krylos (vicinity of a farmstead) and of the cemetery in Krylos-Tyndyk. The second, low elevated, is the Krylos-Glinna at 316-317 m.a.s.l. and Viktoriv at 330 m.a.s.l. The characteristic for this concentration of mounds that lies on the right side of the Lukva is their lack of linear arrangement. They consist mostly of more or less concentrated groupings. This could result from the presence of fragmented ridges into singular hilltops. In the case of Komariv it seems that these specific geomorphological conditions comprises a long and narrow ridge of structural genetics that is not seen in other Precarpathian areas. It lies between the steep valleys of the Lymnitsa and Lukva, which favoured in a unique way the funeral practices of barrow cultures such as the Komarów and Corded Ware.

## B. Spatial arrangement of the cemetery

Forty four-barrows were recorded during field surveys in 2014 at the eponymous site of the Komarów culture **(Fig. VIII.2, Fig. VIII.3**, **Fig. VIII.4)**. They were located in a beech forest. Most tumuli were excavated in the 1930s with just a handful of them – usually smaller – left preserved. No barrows were observed in the fields surrounding the Komariv forest. Most of the mounds are conical in shape, with their upper part removed and flattened. This shape is a result of past excavation methods (only the central part of the barrow was excavated; afterwards it would be filled with loose soil, thus forming a

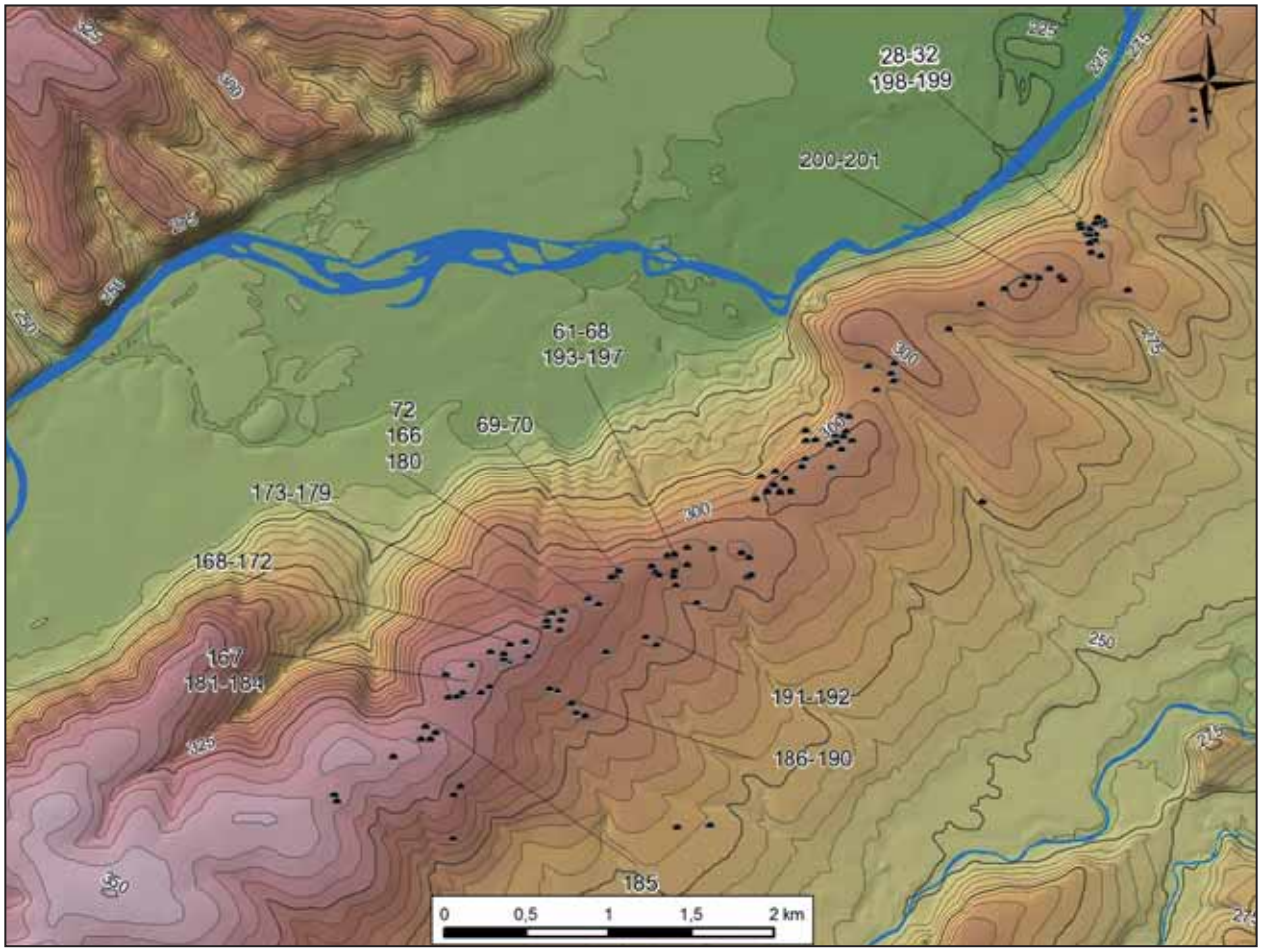



**Fig. VIII.3.** Digital Elevation Model of the barrow cemetery in Komariv with the numbering of barrows (excluding numbers 28-32 and 198-201 see Chapter X)

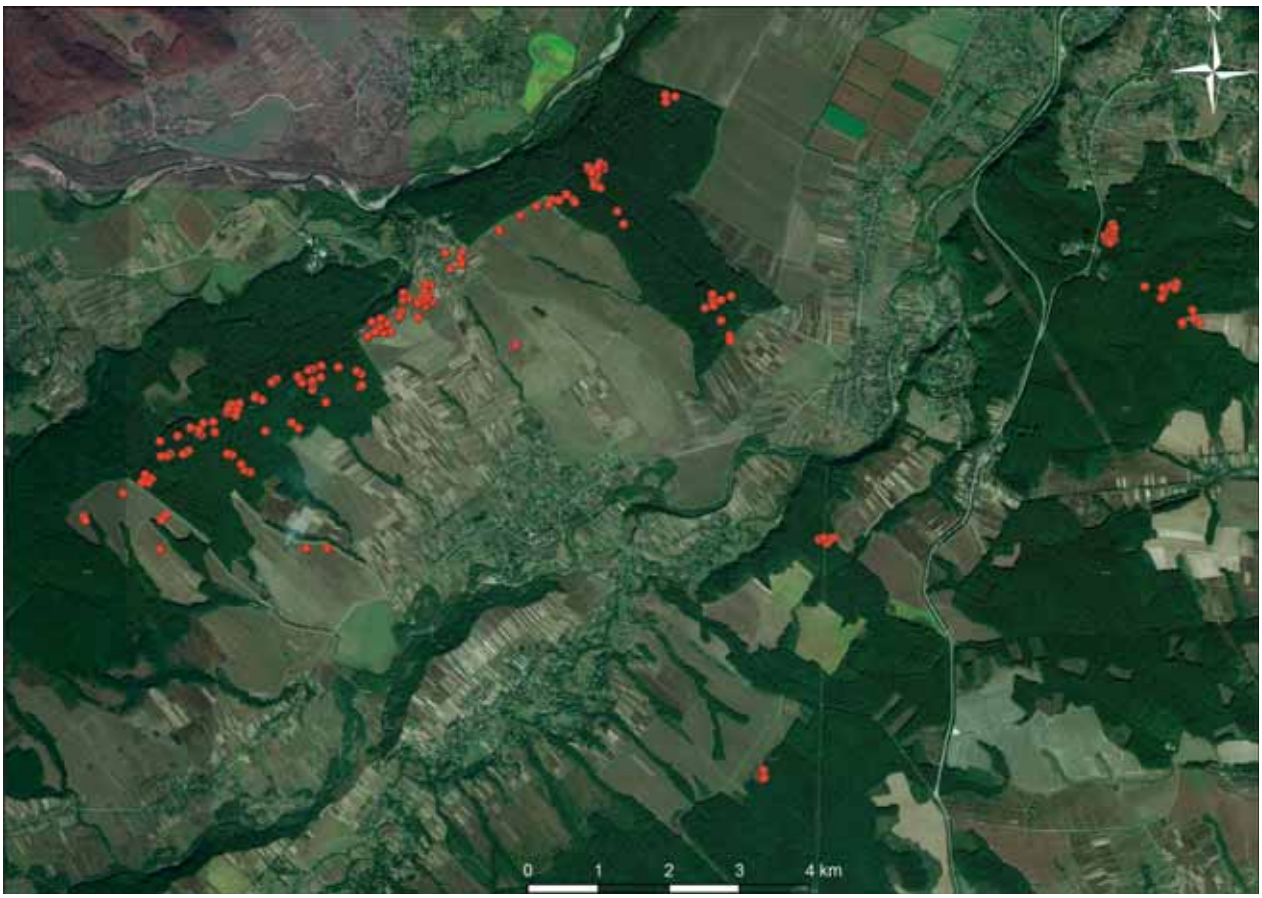



**Fig. VIII.4.** Komariv, Krylos, Medynia and Viktoriv. Location of the cemeteries using satellite imagery (Yandex). See Fig. VIII.3 – comment

characteristic flat-top barrows or shallow 'craters'). The map of site comprises information provided by T. Sulimirski (1968), thus presenting pre-war excavations conducted by him and J. Grabowski, as well as presently recognised monuments. Due to differences in scale and inaccuracies of pre-war maps, only some of the barrows are overlapping, thus making the original count difficult (80-100?; see also Derzhavnii reyestr…).

The cemetery is located on a watershed between Lukva and Lymnitsa, both right tributaries of the Dniester. They cover higher, flattened parts of hills arranged along a WE – SW axis, thus covering a 6.8 km-long distance from Krylos (NE) to Bryn (SW). This concentration is located roughly at 300-330 m.a.s.l. Barrows form numerous linear and linear-group structures, set from a few to a several metres apart. The main line of barrows is located on top of a flattened hill (NW – SE orientation) and especially in its southern part is characterised by shorter linear arrangements, 0.5-1 km-long, which cover the SE slope of the hill and, in total, comprising a few barrows.

Within the main linear structure, arranged along the NE – SW axis, there was a cluster comprising six-barrows (nos. 28-32, 198, 199; starting from the NE), which administratively is part of Krylos (cf. Krylos--Dibrova cemetery).

## C. Description of the barrows

**Barrow 61 (Fig. VIII.5, Fig. VIII.6)** – excavated in the 1930s (no. 25) – is situated in the central part of the cemetery in the uppermost part of the plateau, at 305 m.a.s.l., 55 m SE of barrow 62 (no. 26). Geographic coordinates: N – 49°05'160"; E – 024°37'482". Circular in shape, 28 m in diameter, 1 m high. Barrow with a flattened top, extensive side dig-ins.

**Barrow 62 (Fig. VIII.7, Fig. VIII.8)** – excavated in the 1930s (no. 26) – is located in the central part of the cemetery, at 306.5 m.a.s.l., 55 m NW of barrow 61 (no. 25). Geographic coordinates: N – 49°05'167"; E – 024°37'447". Circular in shape, 25 m in diameter, 1 m high. Flattened top.

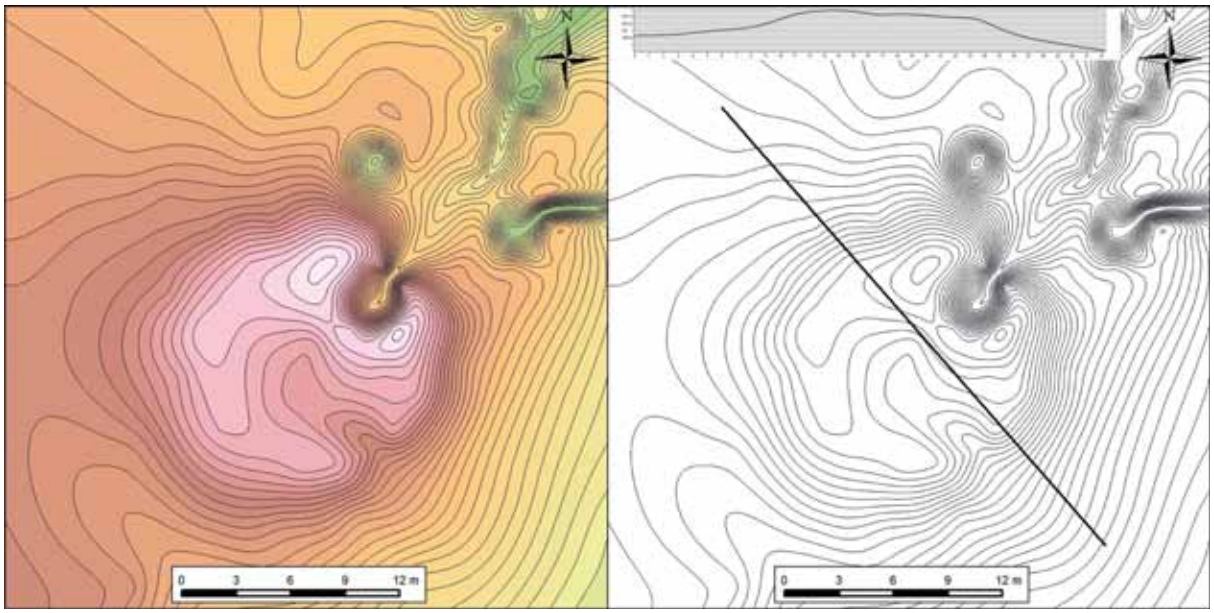



**Fig. VIII.5.** Barrow 61. Hypsometric plan and cross-section

**Fig. VIII.6.** Barrow 61. View from the NW

**Fig. VIII.7.** Barrow 62. View from the N

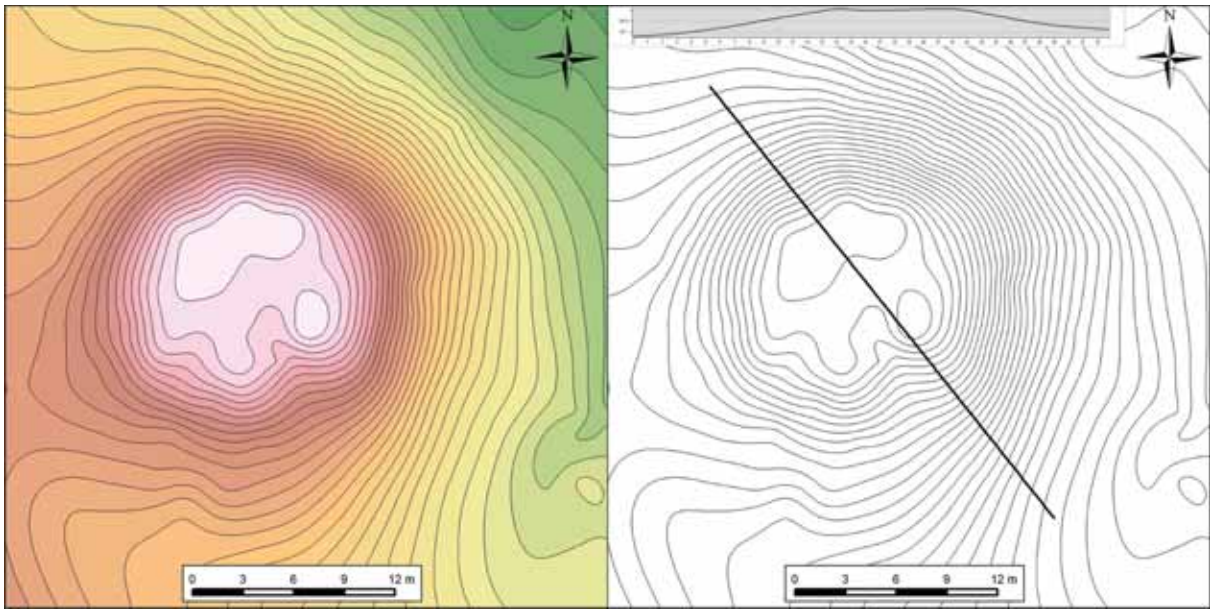



**Fig. VIII.8.** Barrow 62. Hypsometric plan and cross-section

**Barrow 63 (Fig. VIII.9, Fig. VIII.10)** was found in the central part of the cemetery, at 303 m.a.s.l., 100 m S of barrow 62, 21 m SW of barrow 65. Geographic coordinates: N – 49°05'091"; E – 024°37'471". Circular in shape, 16 m in diameter, 0.5 m high. Subject to geophysical survey.

**Fig. VIII.9.** Barrow 63. View from the SW

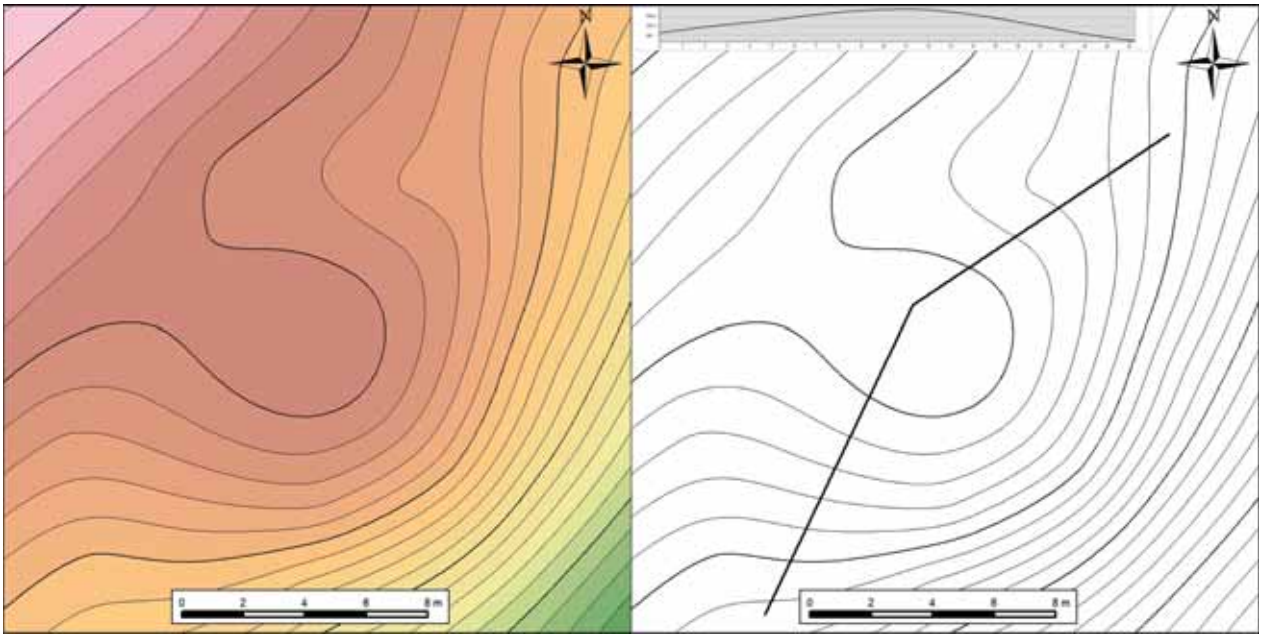



**Fig. VIII.10.** Barrow 63. Hypsometric plan and cross-section

**Barrow 64 (Fig. VIII.11)** – excavated in the 1930s (no. 35) – is situated in the central part of the cemetery, at 305 m.a.s.l., 170 m W of barrow 62 (no. 26). Geographic coordinates: N – 49°05'194"; E – 024°37'306". Circular in shape, 30 m in diameter, 1 m high. Flattened top.

**Barrow 65 (Fig. VIII.12, Fig. VIII.13)** is located in the central part of the necropolis, at 303.5 m.a.s.l., 21 m NE of barrow 63. Geographic coordinates: N – 49°05'103"; E – 024°37'488". Circular in shape, 20 m in diameter, 0.5 m high. Flattened top (excavated in the 1930s?). Subject to geophysical survey.

**Fig. VIII.11.** Barrow 64. View from the E

**Fig. VIII.12.** Barrow 65. View from the E

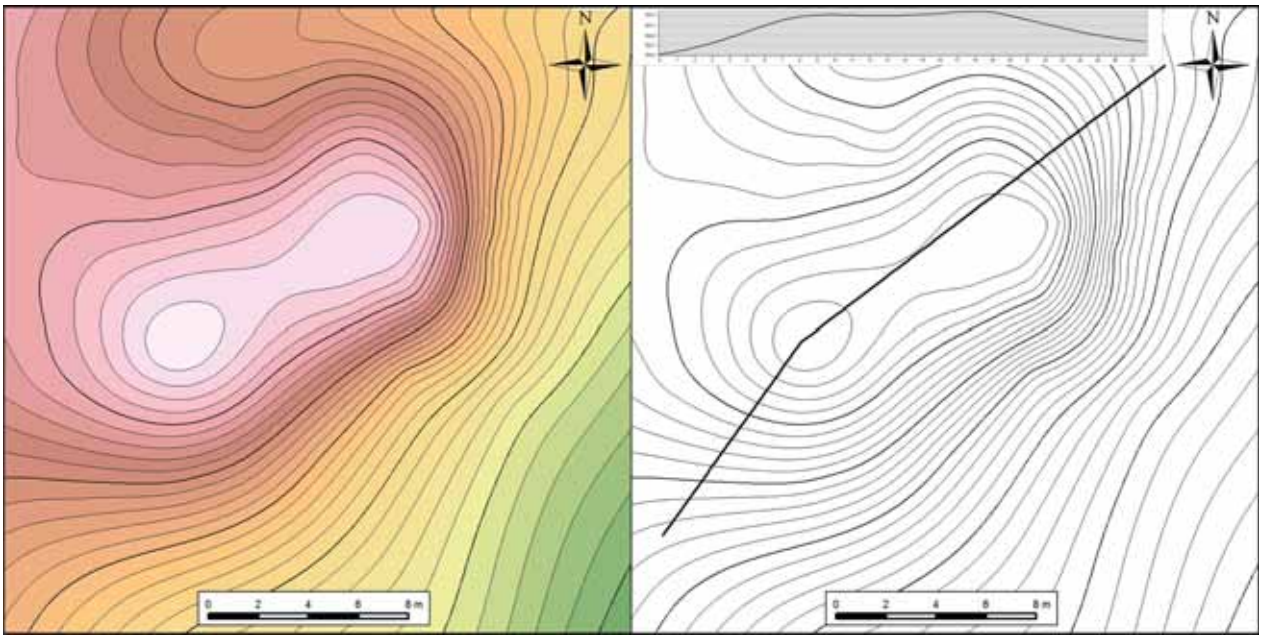



**Fig. VIII.13.** Barrow 65. Hypsometric plan and cross-section

**Barrow 66 (Fig. VIII.14)** – excavated in the 1930s (no. 34) – is located in the central part of the cemetery, at 309 m.a.s.l., 22 m S of barrow 67 (no. 33). Geographic coordinates: N – 49°05'110"; E – 024°37'106". Circular in shape, 25 m in diameter, 0.5 m high. Flattened top, extensive dig-in the central part of the mound. A road passes through the barrow.

**Barrow 67 (Fig. VIII.15)** – excavated in the 1930s (no. 33) – is situated in the central part of the cemetery, at 310 m.a.s.l., 22 m N of barrow 66 (no. 34). Geographic coordinates: N – 49°05'127"; E – 024°37'108". Circular in shape, 25 m in diameter, 0.6 m high. Flattened top. A road passes through the barrow.

**Barrow 68 (Fig. VIII.16)** – excavated in the 1930s (no. 38) – was recorded in the central part of the cemetery, at the edge of the forest, next to a field road. It is located at 311 m.a.s.l., 40 m NW of barrow 193. Geographic coordinates: N – 49°05'148"; E – 024°36'997". An extensive dig-in – trench is visible. Circular in shape, 18 m in diameter, 1.5 m high.

**Barrow 69 (Fig. VIII.17)** is located in the central part of the cemetery, at 312 m.a.s.l., in a group of three barrows, 27 m NE of barrow 70 (no. 49). Geographic coordinates: N – 49°05'136"; E – 024°36'833". Circular in shape, 10 m in diameter, 0.4 m high.

**Fig. VIII.14.** Barrow 66. View from the W

**Fig. VIII.15.** Barrow 67. View from the SW

**Fig. VIII.16.** Barrow 68. View from the NW

**Fig. VIII.17.** Barrow 69. View from the SW

**Barrow 70 (Fig. VIII.18)** – excavated in the 1930s (no. 49) – is situated in the central part of the cemetery at 313.5 m.a.s.l., in a group of three barrows, 27 m SW of barrow 69 and 13 m E of barrow 71. Geographic coordinates: N – 49°05'120"; E – 024°36'811". Circular in shape, 12 m in diameter, 0.7 m high.

**Fig. VIII.18.** Barrow 70. View from the W

**Barrow 71 (Fig. VIII.19)** was recorded in the central part of the cemetery, at 313.5 m.a.s.l., in a group of three barrows, 13 m W of tumulus 70. Geographic coordinates: N – 49°05'118"; E – 024°36'795". Circular in shape, 10 m in diameter, 0.5 m high.

**Fig. VIII.19.** Barrow 71. View from the E

**Barrow 72 (Fig. VIII.20, Fig. VIII.21)** – excavated in the 1930s (?), located in the south-central part of the necropolis, at 319 m.a.s.l., in a group of three barrows, 55 m NW of monument 166 and 14 m S of barrow 180. Geographic coordinates: N – 49°05'042"; E – 024°36'669". Circular in shape, 25 m in diameter, 1 m high. Flattened top. Subject to geophysical survey.

**Fig. VIII.20.** Barrow 72. View from the SE

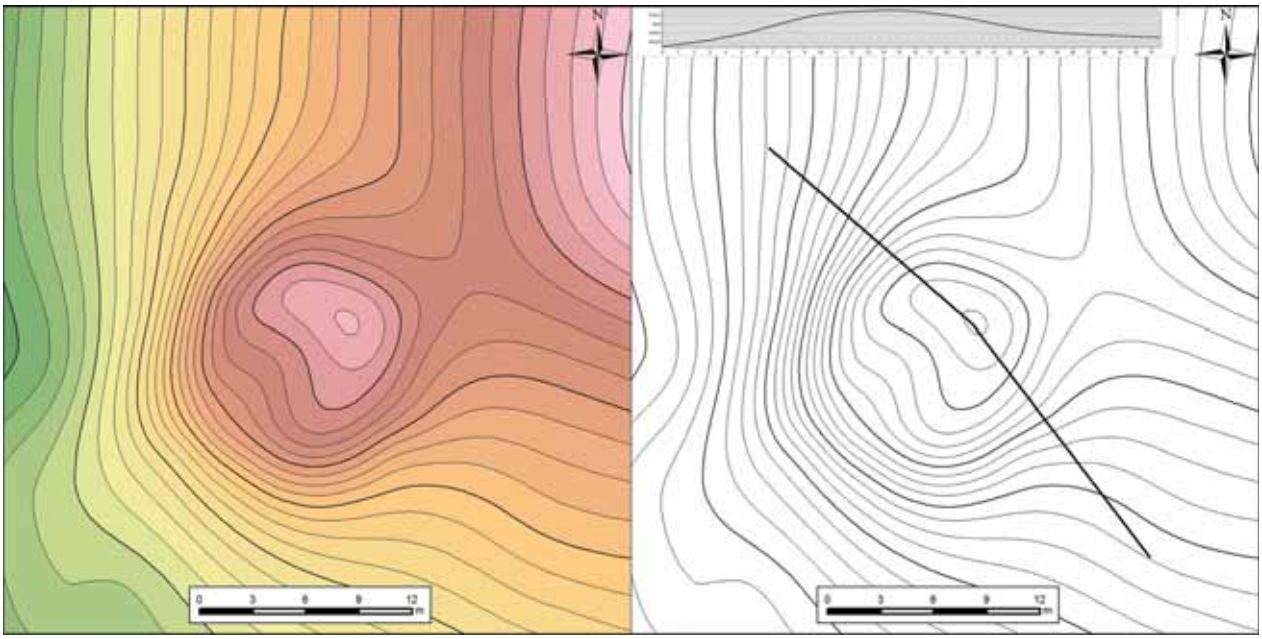


**Fig. VIII.21.** Barrow 72. Hypsometric plan and cross-section

**Barrow 166 (Fig. VIII.22, Fig. VIII.23)** – excavated in the 1930s (?) – is located in the south-central part of the necropolis, at 317.5 m.a.s.l., in a group of three barrows, 55 m SE of barrow 72 and 60 m SE of tumulus 180. Geographic coordinates: N – 49°05'030"; E – 024°36'846". Circular in shape, 12 m in diameter, 0.7 m high.

**Fig. VIII.22.** Barrow 166. View from the SW

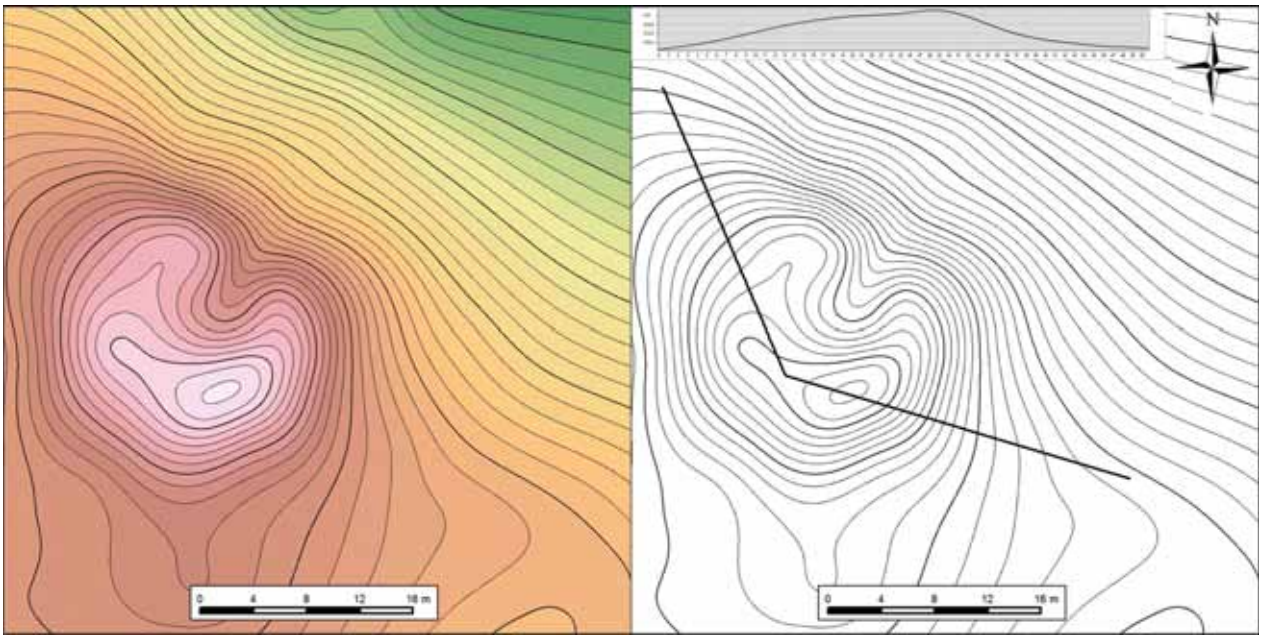



**Fig. VIII.23.** Barrow 166. Hypsometric plan and cross-section

**Barrow 167 (Fig. VIII.24)** – excavated in the 1930s (?) – was recorded in the southern part of the cemetery, at 330.5 m.a.s.l., 140 m NNW of a group of four-barrows (181-184). Geographic coordinates: N – 49°04'824"; E – 024°35'944". Circular in shape, 18 m in diameter, 0.7 m high. Flattened top.

**Barrow 168 (Fig. VIII.25)** – excavated in the 1930s – was discovered in the southern part of the cemetery, at 329 m.a.s.l., 70 m W of barrow 172. Geographic coordinates: N – 49°04'891"; E – 024°36'176". Circular in shape, 28 m in diameter, 4.5 m high. Extensive dig-in on top.

**Barrow 169 (VIII.26**) was documented in the southern part of the cemetery, at 326.5 m.a.s.l., 20 m SE of tumuli 170 and 171. Geographic coordinates: N – 49°04'855"; E – 024°36'260". Circular in shape, 15 m in diameter, 0.3 m high.

**Barrow 170 (Fig. VIII.27)** is located in the southern part of the cemetery, 327.5 m.a.s.l, within a group of monuments, 20 m NW of barrow 169 and 3 m NW of barrow 171. Geographic coordinates: N – 49°04'864"; E – 024°36'238". Circular in shape, 17 m in diameter, 1.2 m high.

**Fig. VIII.24.** Barrow 167. View from the SW

**Fig. VIII.25.** Barrow 168. View from the SW

**Fig. VIII.26.** Barrow 169. View from the S

**Fig. VIII.27.** Barrow 170. View from the W

**Barrow 171 (Fig. VIII.28)** was erected in the southern part of the cemetery, at 327.5 m.a.s.l., 3 m NE of barrow 170, 22 m S of barrow 172. Geographic coordinates: N – 49°04'863"; E – 024°36'242". Circular in shape, 15 m in diameter, 0.3 m high.

**Barrow 172 (Fig. VIII.29)** was recorded in the southern part of the cemetery, at 328.5 m.a.s.l., within a concentration of a few barrows. It is located 22 m N of barrows 171 and 172. Geographic coordinates: N – 49°04'882"; E – 024°36'244". Circular in shape, 19 m in diameter, 1 m high.

**Barrow 173 (Fig. VIII.30)** – excavated in the 1930s – is located in the southern part of the cemetery, at 324 m.a.s.l., on the southern edge of a six-monument concentration forming a linear structure oriented along the NNE – SSW axis, 12 m SW of barrow 174. Geographic coordinates: N – 49°04'963"; E – 024°36'451". Circular in shape, 36 m in diameter, 1 m high (initially ca. 2m). Flattened top.

**Barrow 174 (Fig. VIII.31)** – excavated in the 1930s – was recorded in the southern part of the cemetery, at 324 m.a.s.l., on the southern edge of a concentration of six-barrows forming a linear structure arranged along the NNE – SSW axis, 12 m NE of barrow 173. Geographic coordinates: N – 49°04'966"; E – 024°36'465". Circular in shape, 35 m in diameter, 1.3 m high (initially ca. 2 m). Visible dig-in in the central part.

**Fig. VIII.28.** Barrow 171. View from the SE

**Fig. VIII.29.** Barrow 172. View from the E

**Fig. VIII.30.** Barrow 173. View from the SW

**Fig. VIII.31.** Barrow 174. View from the E

**Barrow 175 (Fig. VIII.32)** – excavated in the 1930s (no. 35) – is situated in the southern part of the necropolis, at 322.5 m.a.s.l., within the concentration of six-barrows forming a linear arrangement aligned along the NNE – SSW axis, from the W connecting with barrow 174. Geographic coordinates: N – 49°04'986"; E – 024°36'463". Circular in shape, 12 m in diameter, 0.5 m high, flattened top.

**Barrow 176 (Fig. VIII.33)** – excavated in the 1930s – recorded in the southern part of the cemetery, at 322.5 m.a.s.l., in the centre of six-barrow concentration forming a linear structure arranged along the NNE – SSW axis, 3 m N of barrow 175. Geographic coordinates: N – 49°04'986"; E – 024°36'467". Circular in shape, 7 m in diameter, 0.4 m high.

**Barrow 177 (Fig. VIII.34)** was erected in the southern part of the cemetery, at 322.5 m.a.s.l., in the centre of the six-barrow alignment arranged along the NNE – SSW axis, 2 m W of barrow 176. Geographic coordinates: N – 49°04'983"; E – 024°36'464". Circular in shape, 5 m in diameter, 0.3 m high.

**Barrow 178 (Fig. VIII.35)** – excavated in the 1930s – located in the southern part of the necropolis, at 320 m.a.s.l., on the northern edge of the six-barrow concentration arranged along the NNE – SSW axis, 20 m SW of barrow 179. Geographic coordinates: N – 49°05'005"; E – 024°36'473". Circular in shape, 21 m in diameter, 0.4 m high. Flattened top.

**Fig. VIII.32.** Barrow 175. View from the NW

**Fig. VIII.33.** Barrow 176. View from the SE

**Fig. VIII.34.** Barrow 177. View from the S

**Fig. VIII.35.** Barrow 178. View from the E

**Barrow 179 (Fig. VIII.36)** is located in the southern part of the cemetery, at 321 m.a.s.l., on the northern edge of a six-barrow concentration forming a linear structure arranged along the NNE – SSW axis, 20 m NE of barrow 178. Geographic coordinates: N – 49°05'008"; E – 024°36'491". Circular in shape, 20 m in diameter, 0.3 m high.

**Barrow 180 (Fig. VIII.37)** is situated in the south-central part of the cemetery, at 318,5 m.a.s.l., on the northern edge of a six-monument concentration forming a linear structure arranged along the NNE – SSW axis, 12 m N of barrow 72. Geographic coordinates: N – 49°05'050"; E – 024°36'673". Circular in shape, 20 m in diameter, 0.5 m high.

**Barrow 181 (Fig. VIII.38)** was recorded in the southern part of the cemetery, at 330,5 m.a.s.l., on the eastern edge of the four-barrow concentration forming a linear structure arranged along the NE – SW axis, 20 m NE of barrow 182. Geographic coordinates: N – 49°04'761"; E – 024°36'023". Circular in shape, 18 m in diameter, 0.5 m high.

**Barrow 182 (Fig. VIII.39)** was discovered in the southern part of the cemetery, at 330 m.a.s.l., within a four-barrow concentration forming a linear structure along the NE – SW axis, 20 m SW of barrow 181, 7 m E of barrow 183. Geographic coordinates: N – 49°04'750"; E – 024°36'005". Circular in shape, 16 m in diameter, 0.5 m high.

**Fig. VIII.36.** Barrow 179. View from the N

**Fig. VIII.37.** Barrow 180. View from the N

**Fig. VIII.38.** Barrow 181. View from the SE

**Fig. VIII.39.** Barrow 182. View from the SE

**Fig. VIII.40.** Barrow 183. View from the NW

**Barrow 183 (Fig. VIII.40)** – excavated in the 1930s – was documented in the southern part of the cemetery, at 330 m.a.s.l., within a four-barrow concentration arranged along the NE – SW axis, 7 m W of barrow 182. Geographic coordinates: N – 49°04'749"; E – 024°35'993". Circular in shape, 31 m in diameter, 1 m high (initial – ca. 2.5 m).

**Fig. VIII.41.** Barrow 184. View from the SW

**Barrow 184 (Fig. VIII.41)** was discovered in the southern part of the necropolis, at 329.5 m.a.s.l., on the western edge of the four-tumulus concentration forming a linear structure arranged along the NE – SW axis, 35 m W of barrow 183. Geographic coordinates: N – 49°04'748"; E – 024°35'953". Circular in shape, 10 m in diameter, 0.5 m high. Densely covered with bushes, numerous visible dig-ins in the mound.

**Fig. VIII.42.** Barrow 185. View from the S

**Barrow 185 (Fig. VIII.42)** – excavated in the 1930s – was found in the southern part of the cemetery, at 331 m.a.s.l., within the four-barrow concentration (the ones excavated before the war – barrows nos. 39, 40, 57 – were completely excavated), 60 m SE of barrow 40 and 45 m NE of tumulus 39. Geographic coordinates: N – 49°04'637"; E – 024°35'882". Circular in shape, 8 m in diameter, 0.4 m high. An extensive dig-in visible in the centre of the mound.

**Barrow 186 (Fig. VIII.43, Fig. VIII.44)** was recorded in the southern part of the cemetery, at 304.5 m.a.s.l., on the edge of the linear concentration of monuments arranged along the SE – NW axis, which retracts from the main alignment and comprises five barrows erected on a 275 m-long distance. The barrow is located 48 m SE of barrow 187, Geographic coordinates: N – 49°04'669"; E – 024°35'882". Circular in shape, 15 m in diameter, 0.5 m high. A field road crosses the mound on top.

**Fig. VIII.43.** Barrow 186. View from the SE

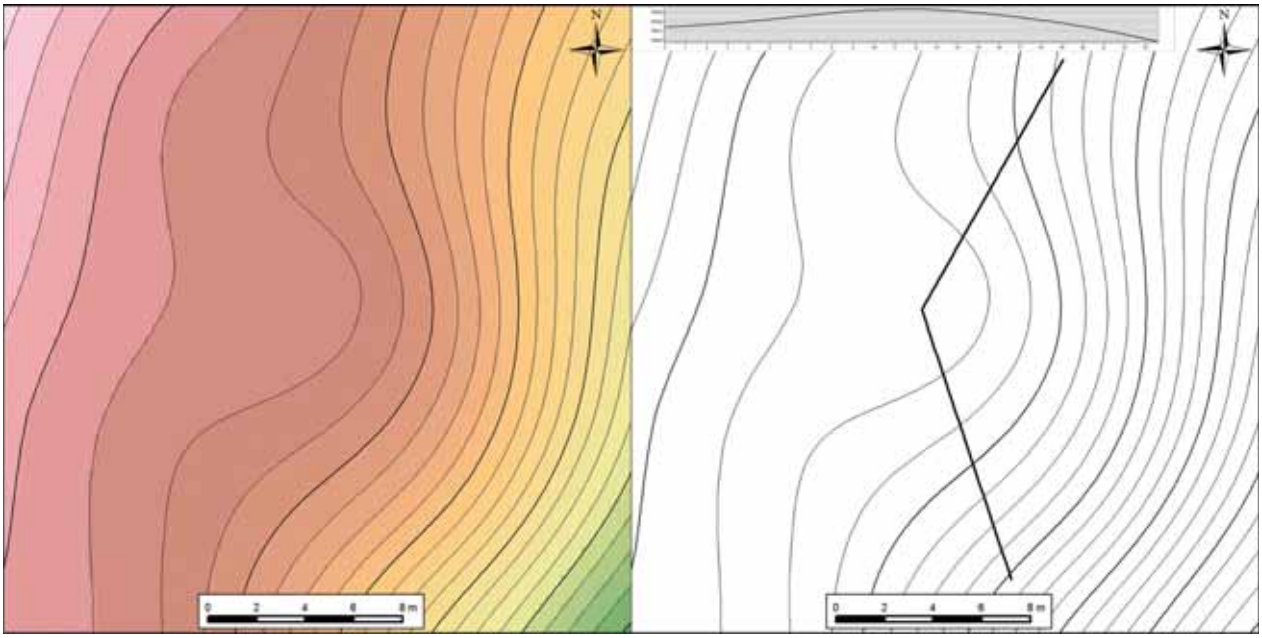



**Fig. VIII.44.** Barrow 186. Hypsometric plan and cross-section

**Barrow 187 (Fig. VIII.45, Fig. VIII.46)** was recorded in the southern part of the cemetery, at 306 m.a.s.l., on the southern edge of the aforementioned barrow concentration arranged along a SE – NW axis. The mound is located 48 m NW of barrow 186. Geographic coordinates: N – 49°04'679"; E – 024°36'588". Circular in shape, 15 m in diameter, 0.5 m high. Subject to geophysical survey.

**Fig. VIII.45.** Barrow 187. View from the E

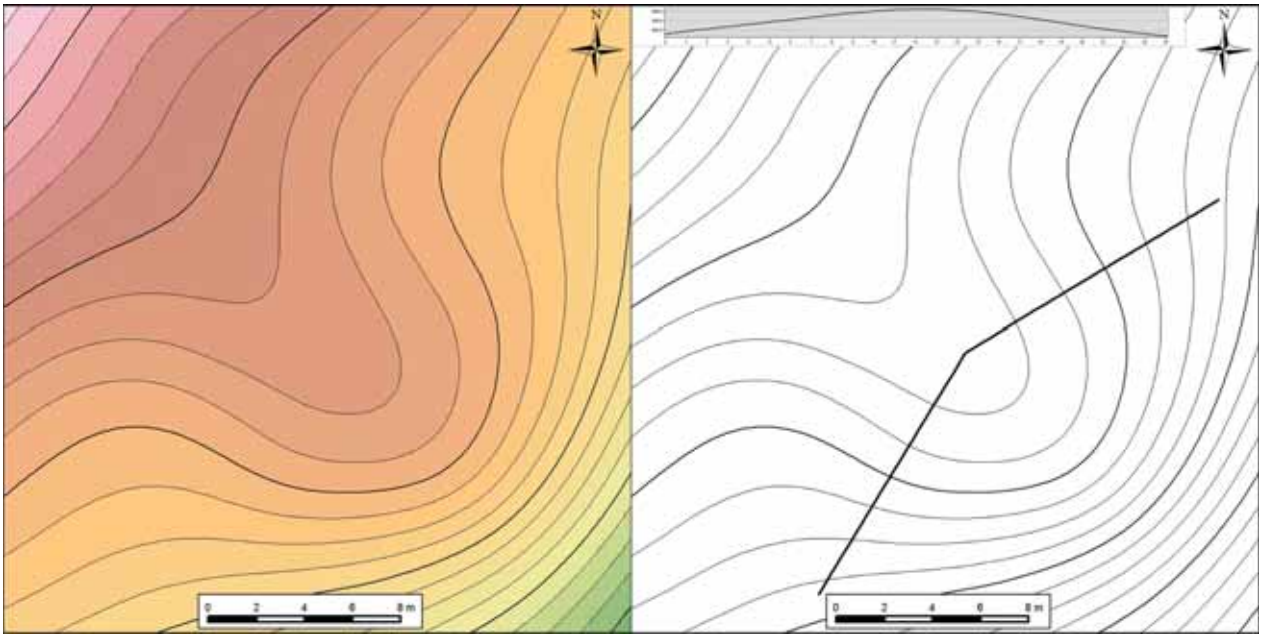



**Fig. VIII.46.** Barrow 187. Hypsometric plan and cross-section

**Barrow 188 (Fig. VIII.47, Fig. VIII.48)** was discovered in the southern part of the cemetery, at 308.5 m.a.s.l., within the linear arrangement of the barrow aligned along the SE – NW axis, which retracts from the main cemetery alignment. The barrow is located 60 m NW of mound 187 and 110 m SE of barrow 189. Geographic coordinates: N – 49°04'710"; E – 024°36'565". Circular in shape, 22 m in diameter, 0.4 m high. Subject to geophysical survey.

**Fig. VIII.47.** Barrow 188. View from the NE

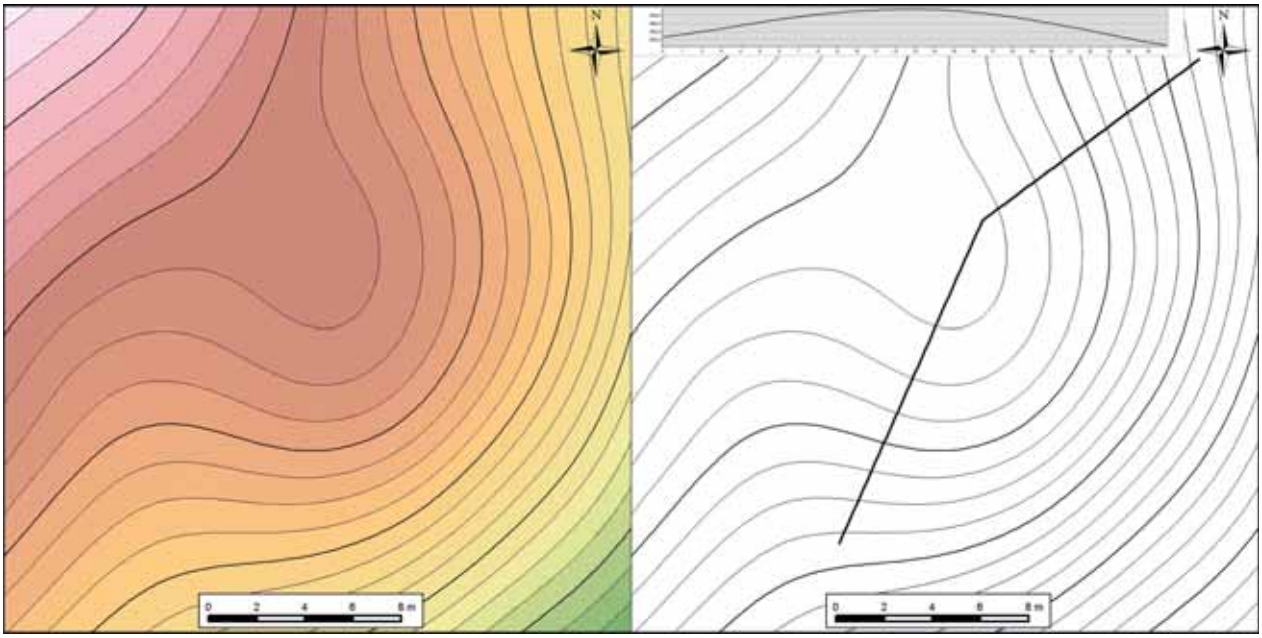



**Fig. VIII.48.** Barrow 188. Hypsometric plan and cross-section

**Barrow 189 (Fig. VIII.49, Fig. VIII.50, Fig. VIII.51)** – excavated in the 1930s – was recorded in the southern part of the cemetery, at 314 m.a.s.l., in the northern portion of the linear arrangement of barrows aligned along the SE – NW axis, which retracts from the main alignment of the cemetery. The barrow is located 110 m NW of barrow 188 and 3 m NE of tumulus 190. Geographic coordinates: N – 49°04'755"; E – 024°36'496". Circular in shape, 23 m in diameter, 1 m high, flattened top of the mound.

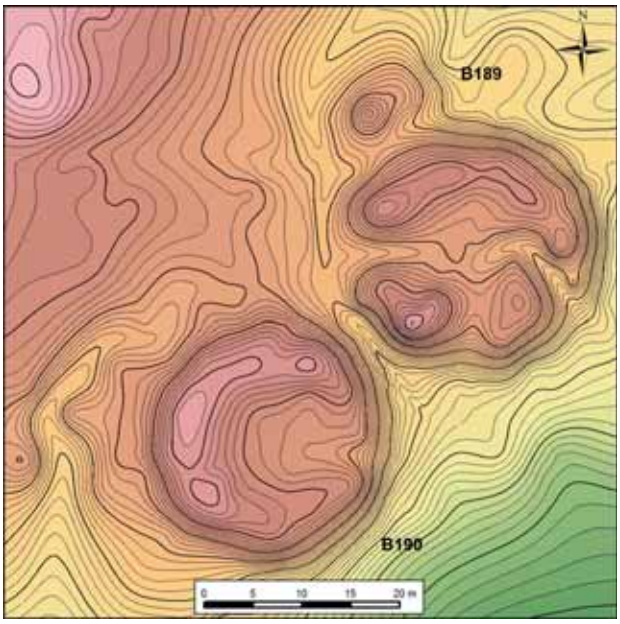



**Fig. VIII.49.** Location of barrows 189 and 190

**Fig. VIII.50.** Barrow 189. View from the S

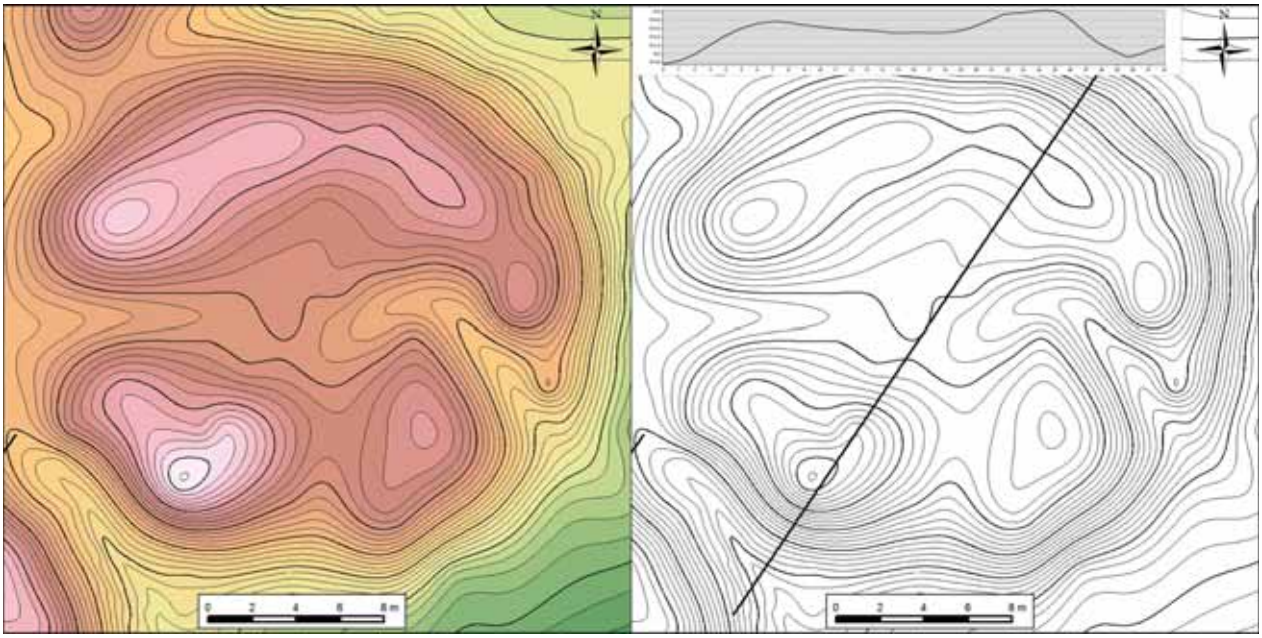



**Fig. VIII.51.** Barrow 189. Hypsometric plan and cross-section

**Barrow 190 (Fig. VIII.49, Fig. VIII.52, Fig. VIII.53)** – excavated in the 1930s – was documented in the southern part of the cemetery, at 314.5 m.a.s.l., on the northern edge of the linear arrangement of barrows aligned along a SE – NW axis, which retracts from the main alignment of the cemetery. It is situated 3 m SW of barrow 189. Geographic coordinates: N – 49°04'760"; E – 024°36'460". Circular in shape, 24 m in diameter, 1.2 m high, flattened top of the mound.

**Fig. VIII.52.** Barrow 190. View from the N

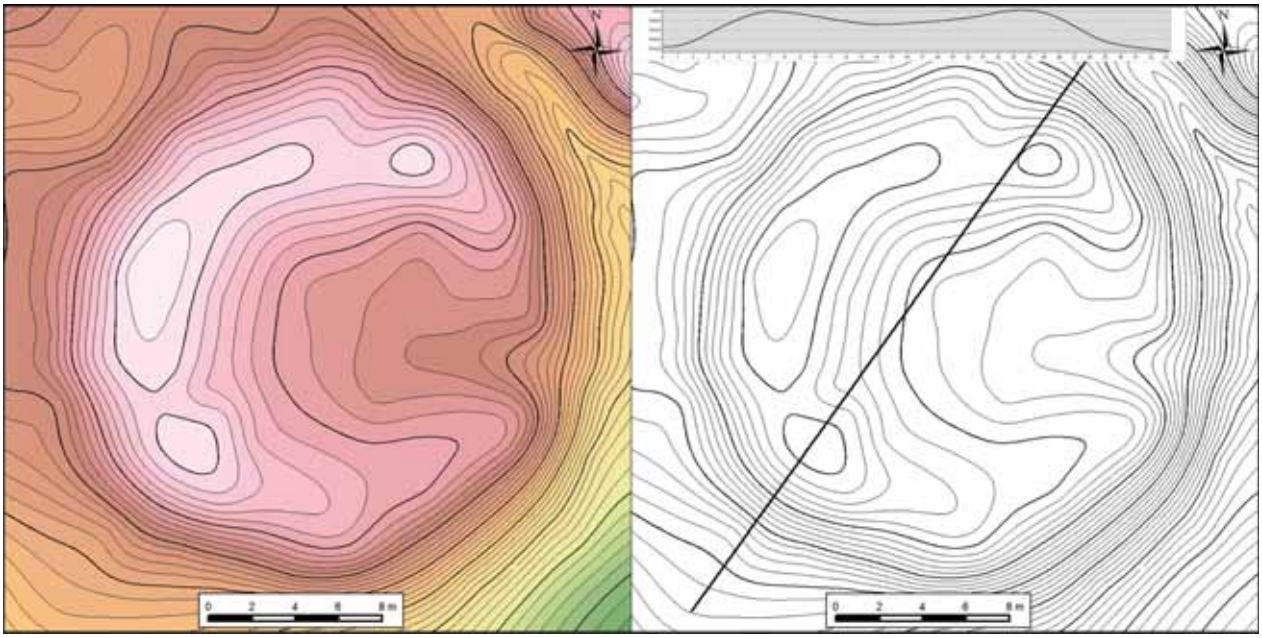


**Fig. VIII.53.** Barrow 190. Hypsometric plan and cross-section

**Barrow 191 (Fig. VIII.54)** – excavated in the 1930s – was recorded in the south-central part of the cemetery, at 307 m.a.s.l., ca. 300 m SE of the main barrow alignment situated along the hill ridge (NE – SW axis), 70 m NW of barrow 192 (they prolong the line formed by tumuli 180 and 166). Geographic coordinates: N – 49°04'916"; E – 024°36'951". Circular in shape, 29 m in diameter, 0.7 m high. Flattened top of the mound.

**Barrow 192 (Fig. VIII.55)** – excavated in the 1930s – is located in the south-central part of the necropolis, at 3045 m.a.s.l., 70 m SE of barrow 191. Geographic coordinates: N – 49°04'888"; E – 024°37'003". Circular in shape, 25 m in diameter, 1 m high (initially 2.25 m). Mound flattened on top.

**Barrow 193 (Fig. VIII.56)** – excavated in the 1930s – was recorded in the central part of the cemetery, at 310.5 m.a.s.l., within a linear arrangement of three monuments aligned along the NW – SE axis. It is situated 27 m NW of barrow 194 and 40 m SE of tumulus 068 (no. 48). Geographic coordinates: N – 49°05'127"; E – 024°37'003". Circular in shape, 40 m in diameter, 0.8 m high (initially 2 m). Mound flattened on top.

**Barrow 194 (Fig. VIII.57)** – excavated in the 1930s – was documented in the central part of the ceme-

**Fig. VIII.54.** Barrow 191. View from the SE

**Fig. VIII.55.** Barrow 192. View from the SE

**Fig. VIII.56.** Barrow 193. View from the W

**Fig. VIII.57.** Barrow 194. View from the SE

tery, at 310 m.a.s.l., on the SE edge of the linear arrangement of three monuments, oriented along the NW – SE axis. It is situated 27 m SE of barrow 194. Geographic coordinates: N – 49°05'116"; E – 024°37'031". Circular in shape, 37 m in diameter, 0.5 m high (initially 1-1.5 m). Mound flattened on top.

**Barrow 195 (Fig. VIII.58)** is located in the central part of the cemetery at 306 m.a.s.l., on the southern edge of the linear arrangement comprising three tumuli, arranged along a N – S axis. It is situated 55 m S of barrow 66 (no. 34). Densely covered with young bushes. Geographic coordinates: N – 49°05'079"; E – 024°37'111". Circular in shape, 26 m in diameter, 0.5 m high.

**Barrow 196 (Fig. VIII.59)** was recorded in the central part of the necropolis, at 300.5 m.a.s.l., 150 m SE of barrow 195. Geographic coordinates: N – 49°05'018"; E – 024°37'211". Oval shape, 9 × 8 m, 0.6 m high.

**Barrow 197 (Fig. VIII.60)** – excavated in the 1930s – was documented in the central part of the cemetery, at 308.5 m.a.s.l., within a group of a few monuments. It is located 100 m N of barrow 67 (no. 33) and 25 m E of a pre-war excavated barrow 32. Geographic coordinates: N – 49°05'183"; E – 024°37'114". Circular in shape, 26 m in diameter, 0.7 m high (initially 1.5 m). Mound flattened at the top.

**Fig. VIII.58.** Barrow 195. View from the N

**Fig. VIII.59.** Barrow 196. View from the SE

**Fig. VIII.60.** Barrow 197. View from the E

## D. Geophysical survey

In May 2014 the archaeological team from Adam Mickiewicz University in Poznań undertook the first of two consecutive non-invasive geophysical prospections with a magnetometer on the barrow cemetery in Komariv. During the preceding field reconnaissance it was possible to register and document the state of preservation of seven mounds. Two of them, designated with numbers 63 and 65, were consequently subjected to magnetometric measurements. The main reasons behind this decision were: the neighbouring location of both monuments, their relatively small size and density of vegetation cover, allowing for unhindered movement between the trees. The two discussed mounds are located from each other by a distance of around 50 m and separated by a forest road (**Fig. VIII.61**).

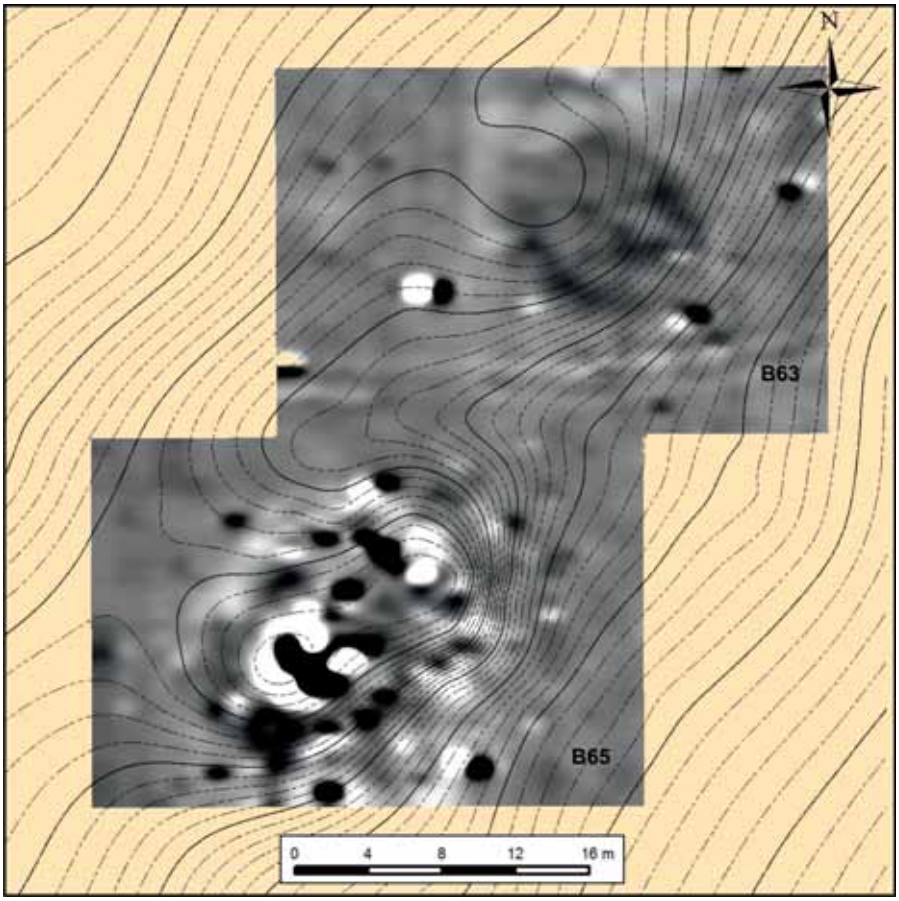
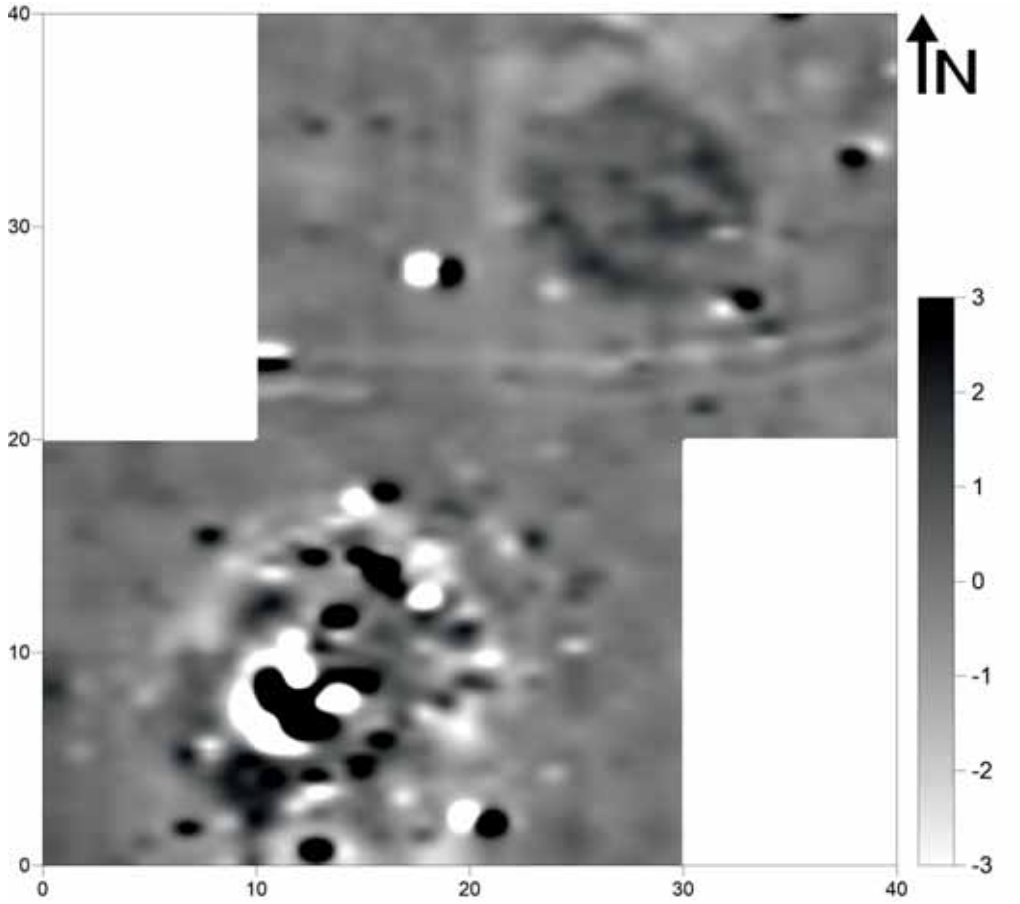



**Fig. VIII.61.** Komariv. Position of geophysical survey in 2014

**Fig. VIII.62** (up). Resulting image of magnetometric survey of barrows no. 63 and 65 on the site Komariv (gradiometer Bartington Fluxgate Grad 601-1; measuring grid: 10 × 10 m; sampling density per transect spacing: 0.25 × 1 m, interpolated up to 0.25 × 0.5 m; real values of the magnetic field gradient compressed in the greyscale to the range -3 – +3 nT)

**Fig. VIII.63** (down). Resulting image of magnetometric survey of barrows no. 63 and 65 on the site Komariv with highlighted anomalies discussed in the text.

--- approximate spatial extent of negative anomaly potentially signifying outer limits of barrow no. 63
··· approximate spatial extent of the series of positive anomalies potentially reflecting on internal feature enclosing barrow's no. 63 centre
— strong, abnormally dipolar anomaly located in the centre of barrow no. 63
--- approximate spatial extent of negative anomaly potentially signifying outer limits of barrow no. 65
··· approximate spatial extent of positive potentially reflecting an internal feature enclosing barrow's no. 65 centre
— normally polarised anomaly located in the centre of barrow no. 65
--- anomaly reflecting current forest road passing in the vicinity of surveyed barrows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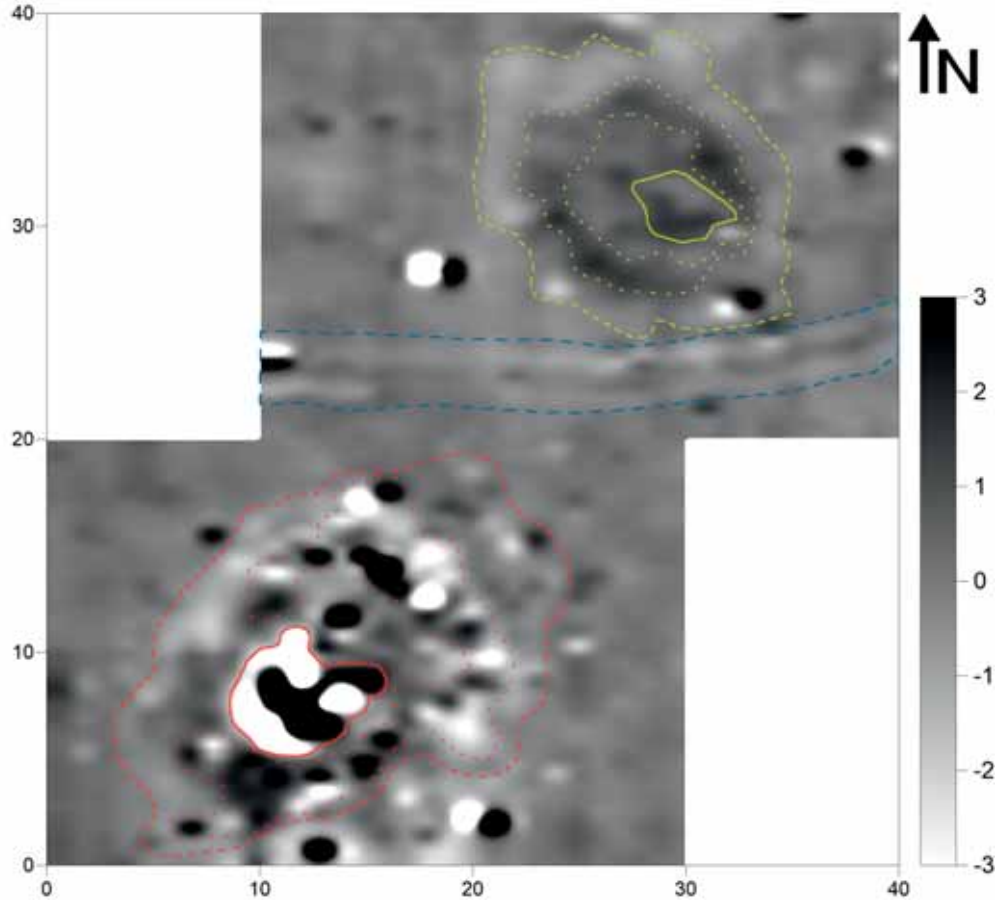
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Given the adjacent position of the barrows, it was possible to include them in the framework of a single measuring area. It comprised of twelve grids, each with dimensions of 10 × 10 m. In total the surveyed area measures 0.12 ha. In order to enhance the visibility of lower signals, that have primary importance for following description, and to emphasize the contrast between the anomalies, it was decided to narrow the span of greyscale to 3 – -3nT range.

A geophysical survey of barrows 63 and 65 revealed the complex internal structure of the first mound and confirmed the previously uncertain anthropogenic and sepulchral character of the second (**Fig. VIII.62**). On the basis of visual inspection of the tumuli, it could be concluded that barrow 63 has a more prominent and bigger embankment, whereas the other object is only slightly rising above the ambient. At the time of the survey, neither of the mounds possessed any traces of serious damage and their gentle slopes lent themselves to magnetometric prospection.

Barrow 63 is located in the SW part of the surveyed area and measures around 15 m in diameter. Its outer limits can be vaguely circumscribed by a strip of irregularly distributed low magnetic responses that contrast with the value of magnetic field typical for the context (around 0nT) (**Fig. VIII.63**). This anomaly is stretched along a NE – SW axis and its contour is most pronounced on the NW and SE sides of the barrow. Nevertheless, its other section seems blurred and intermingled with locally appearing higher responses. The abovementioned circumference of the embankment is followed by a parallel distributed series of independent strong anomalies, sometimes with an evidently dipolar structure. The described feature gives a much better idea of the possible spatial extent of the embankment, yet it seems to be interrupted on the W side. This arrangement of anomalies encloses a central section of the embankment with a slightly increased degree of magnetisation, in the middle of which is situated an abnormally polarized signal reaching maxima of magnetisation gradient observed for the site.

Interpretation of the results obtained for barrow 63 should be proceeded with carefully, accepting that at least part of the anomalies are not emitted by sources of prehistoric origins. One of the most problematic issues is a proper delimitation of the southern limit of the embankment. When looking at the resulting image with transposed contour lines reflecting height, one can see that a roughly oval elevation, interpreted as a barrow, coincides with the biggest concentration of anomalies (Fig. VIII.61). On the other hand, two strongly polarised anomalies, surrounded by a zone with a significantly lowered value of the gradient, seems to fall outside the elevation. Nonetheless, they are still located quite close to the other anomalies which have a similar level of magnetisation. At the present state of research it seems more advisable to rely on height measurements, however one should not rule out the possibility that the embankment in fact is extended in the southern direction.

With a certain level of probability the oval series of anomalies likely delimiting the actual spatial extent of the barrow can be regarded as a residue of a structural element built at the time of mound's construction. Its location on the brink of the embankment indicates an intentional act that can be associated with encircling the barrow's centre with stone or a wooden ring. In several instances, particularly at the southern section, one can notice an abnormal polarization of anomalies on the outskirts of the embankment. They potentially reveal a thermoremanent magnetisation that can be attributed to stones with a high content of iron oxides, whose domains at the event of firing and subsequent cooling became ordered, hence producing a strong magnetic field.

The general absence of similar concentrations of such anomalies leads to the conclusion that these rocks, of varied geological genesis as shown by orientation of polarization, were purposefully brought and accumulated beneath the earthen embankment. On the other hand, less intense and normally polarized anomalies can be the effect of firing or decay of organic matter, for example wood, that increased the magnetic susceptibility of soil at the outskirts causing induced magnetisation. Such an interpretation seems plausible, especially for the northern section of the rim, where a positive peak, irregularly oval and stretched along a NW – SE axis, was registered. In the light of the absence of destruction traces, the previously mentioned extensive and particularly intense anomaly in the barrow's centre can be emitted by yet another structural element composed of material rich in iron content. Nevertheless, doubts about the prehistoric origins of its source are cast by unique polarization that can only be produced by an object with a non-spherical shape. Perhaps, one is facing here an iron piece buried shallowly in the topsoil. Clarification of these questions can be only achieved by careful examination of the barrow's internal part with drilling or test trenches, however one can also consider the use of other non-invasive methods.

On the basis of magnetometry results the internal structure of barrow 65, located in the NE part

of the survey's area, can be described as much simpler than that of the previously discussed mound (Fig. VIII.62). Despite this, one can observe its embankment clearly distinguishing itself from the context, thanks to an oval strip of negative values encircling the space characterized by a higher level of magnetisation (Fig. VIII.63). Parallel to the oval anomaly there runs a similar signal but one comprising of positive readings, especially visible in the SW and NE section, where the values reach the level of 2nT. Consequently, it can be suspected that mound 65 includes some element, characterized be an increased magnetic susceptibility that is located along its outskirts. However, the much less pronounced character of this anomaly, in comparison to tumulus 63, does not allow one to pinpoint its sources. Perhaps, one should consider the origins of the negative signal as stemming from purely pedologic reasons, explained by the washing of ferromagnetic minerals from upper soil layers. Apart from these anomalies, one can also discern a normally polarized signal at the barrow's centre, which can possibly indicate a feature connected with a grave. Although the anomaly is too weak and irregular to suggest more specific interpretation, it seems that, together with the positive oval anomaly, it should be attributed to induced magnetisation.

Aside from the barrows, the magnetometer registered also several strong, dipolar anomalies indicating most probably iron items appearing in the context, as well as capturing the current forest road running between the mounds.

Summing up, it seems that the presented magnetometric survey brought interesting results, which can be very useful in further studies of sepulchral objects at the cemetery in Komariv. Of particular importance might be a comparison of images obtained with magnetometry with the plans and descriptions of monuments from the site excavated in the past. Such a comparative analysis could help to verify the sources of anomalies registered over the embankments.

In April 2015 four other barrows from the necropolis in Komariv were subjected to geophysical survey conducted by means of the magnetometric method. They were included in the framework of four independent measuring areas, localised in different, quite distant parts of the forest overgrowing the site. All the surfaces combined to measure 0.21 ha. In the case of two barrows (no. 171 and 187) the absence of dense

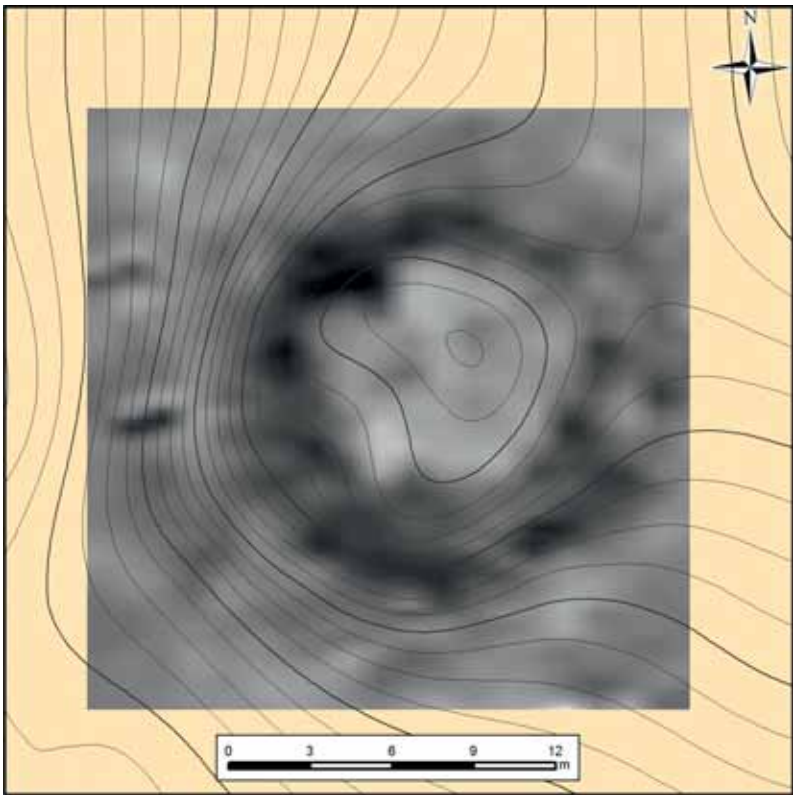



**Fig. VIII.64.** Komariv. Position of geophysical survey in 2015 (barrow 72)

natural coverage on the one hand and their small size on the other, led to the decision to increase sampling profiles up to one transect per 0.5 m, instead of 1 m spaced transects used for the other two surveyed mounds – no. 72 and 188 **(Fig. VIII.64, Fig. VIII.65, Fig. VIII.66)**.

The first of the monuments selected for the survey is designated with 72. Despite distinct traces of destruction the embankment in the form of an extensive and deep excavation trench in the central section, the mound possessed a significantly large part intact. It allowed one to believe that it still could be suitable for magnetometric prospection. The surveyed area was set within a single grid measuring 20 × 20 m. Depicting the resulting data the visualized current extent of the embankment that, in terms of magnetic field gradient, contrasts significantly with the context (**Fig. VIII.67**). Differences in this context are distinct, even though the context also reveals increased magnetic susceptibility. The barrow manifests itself as a broad circular anomaly with a magnetization level reaching 5nT, enclosing in the shape of the letter C of the middle part from N, W and S, while a narrow gap is visible in the E section (**Fig. VIII.68**). Such a surrounded centre of the barrow, containing the aforementioned trench, is characterized by low magnetic response.

The striking contrast between the inner and the outer part of the mound raises some questions concerning the origins of magnetisation in these parts. It seems probable that the highly magnetic circumference, apparently undisturbed by the excavations, might be an effect of deposition of the earth and remaining content from the barrow's centre at its verge. Perhaps rich in magnetically susceptible compounds, in the course of post-deposition processes, it has

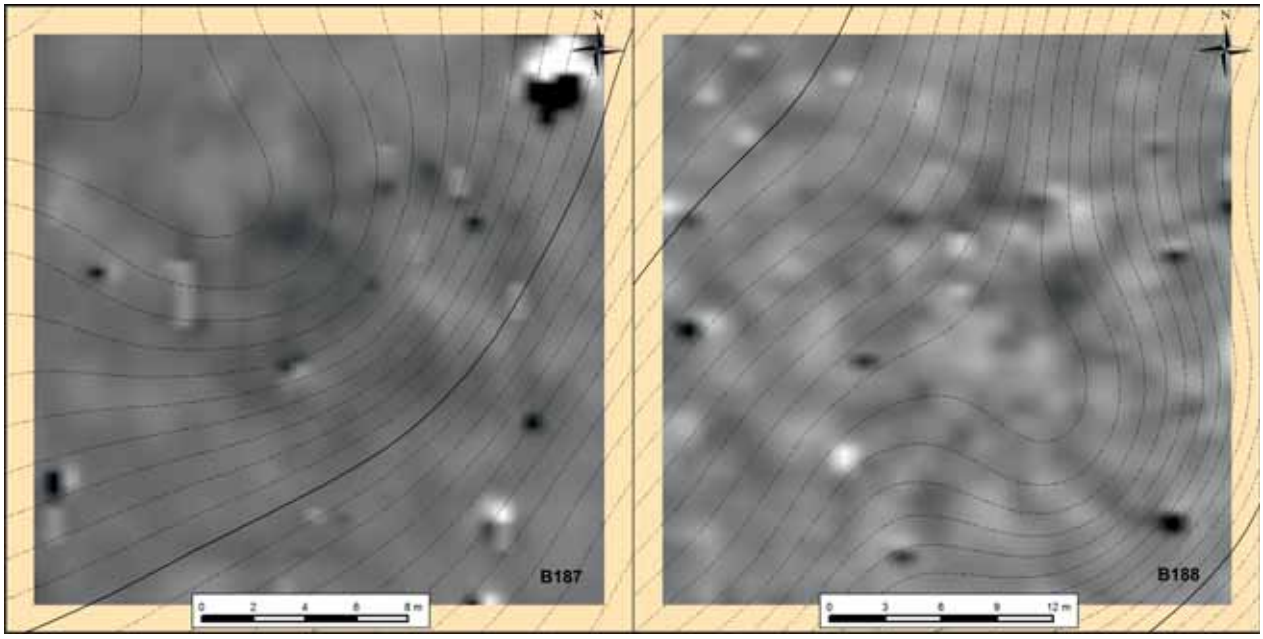


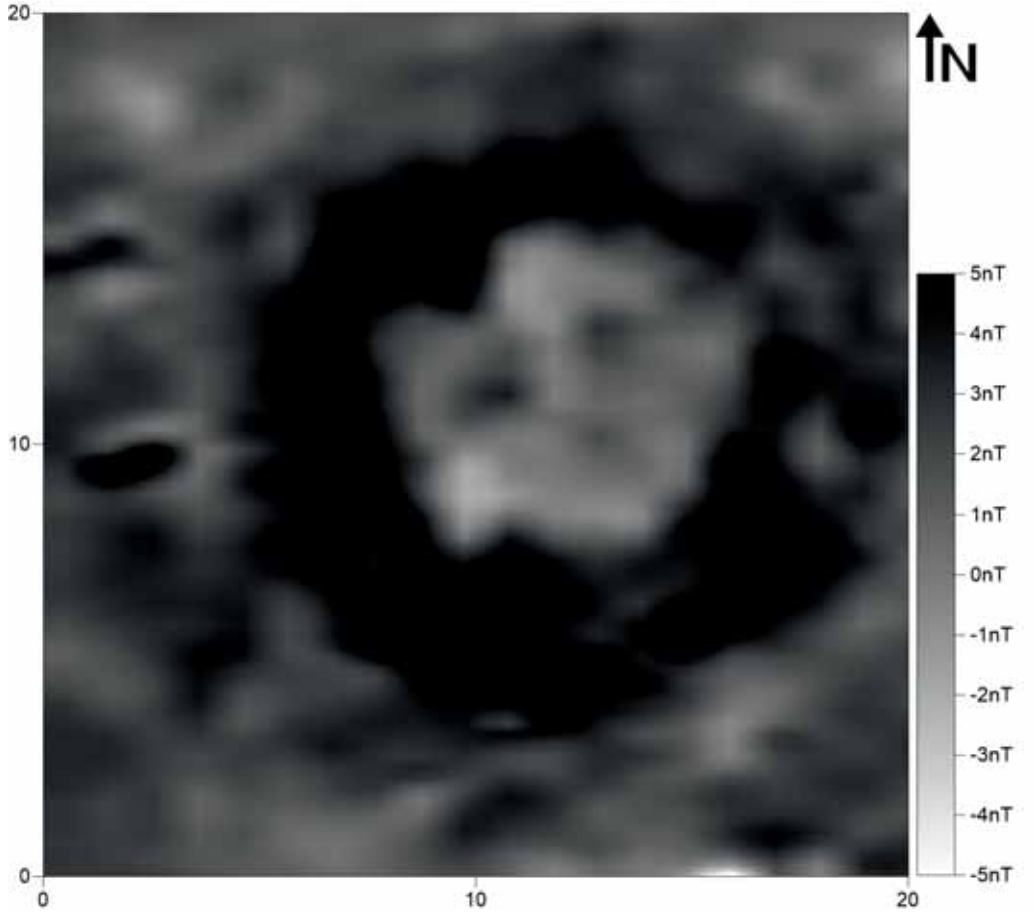

**Fig. VIII.65** (left). Komariv. Position of geophysical survey in 2015 (barrow 187)

**Fig. VIII.66** (right). Komariv. Position of geophysical survey in 2015 (barrow 188)

**Fig. VIII.67** (up). Resulting image of magnetometric survey of barrow no. 72 on the site in Komariv (see Fig. VIII.62)

**Fig. VIII.68** (down). Resulting image of magnetometric survey of barrow no. 72 on the site in Komarów with highlighted anomalies discussed in the text.

--- approximate spatial extent of the circular, positive anomaly signifying a rim of the embankment and enclosing excavated centre of the barrow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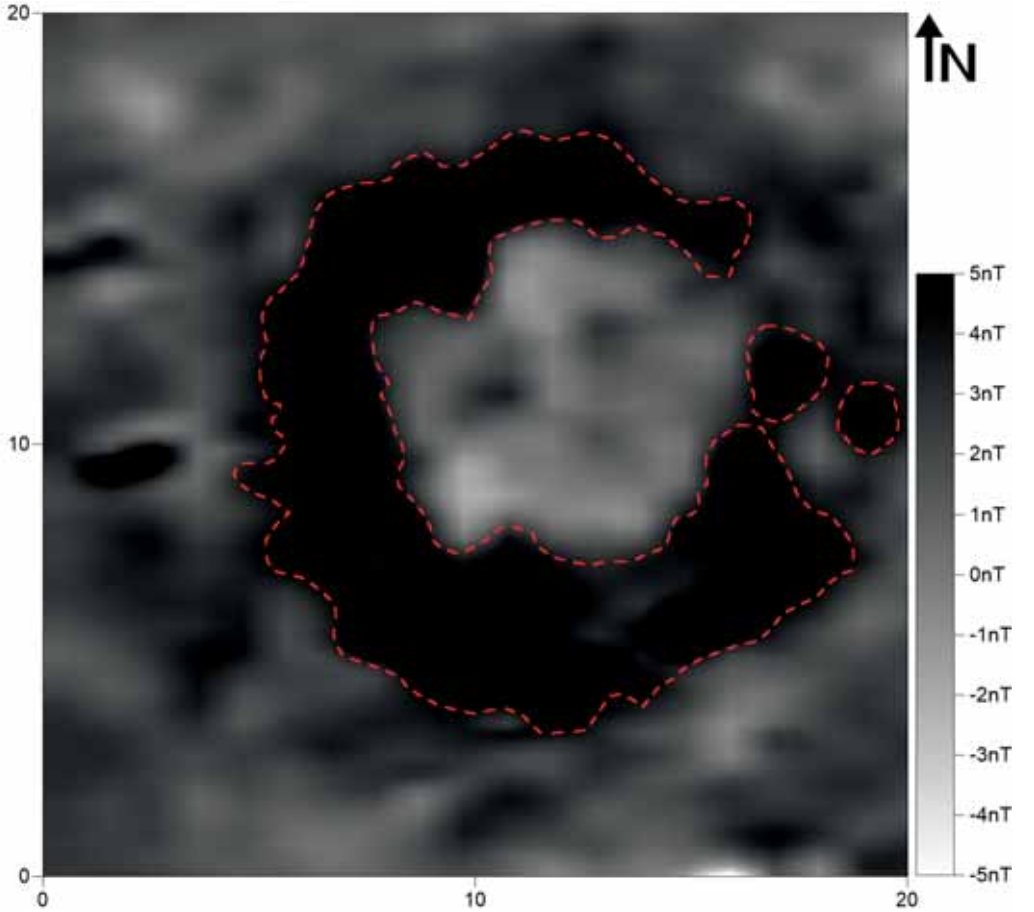
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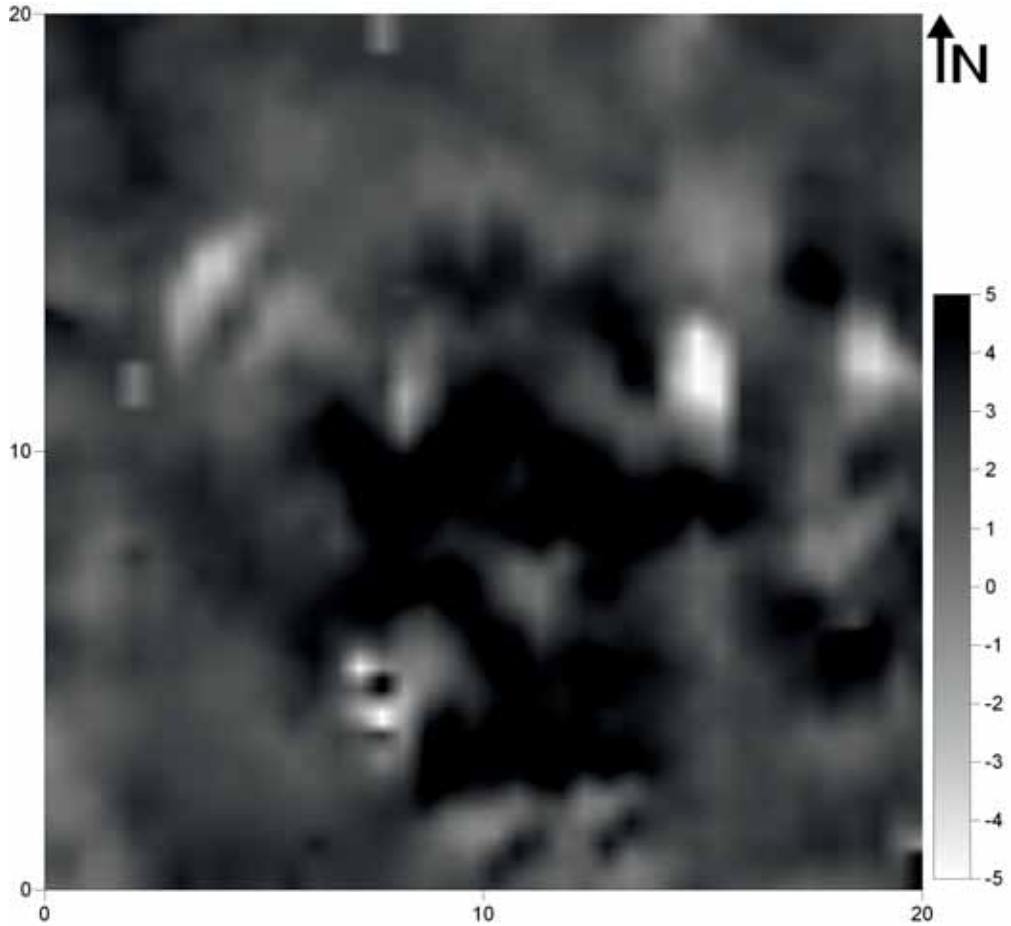
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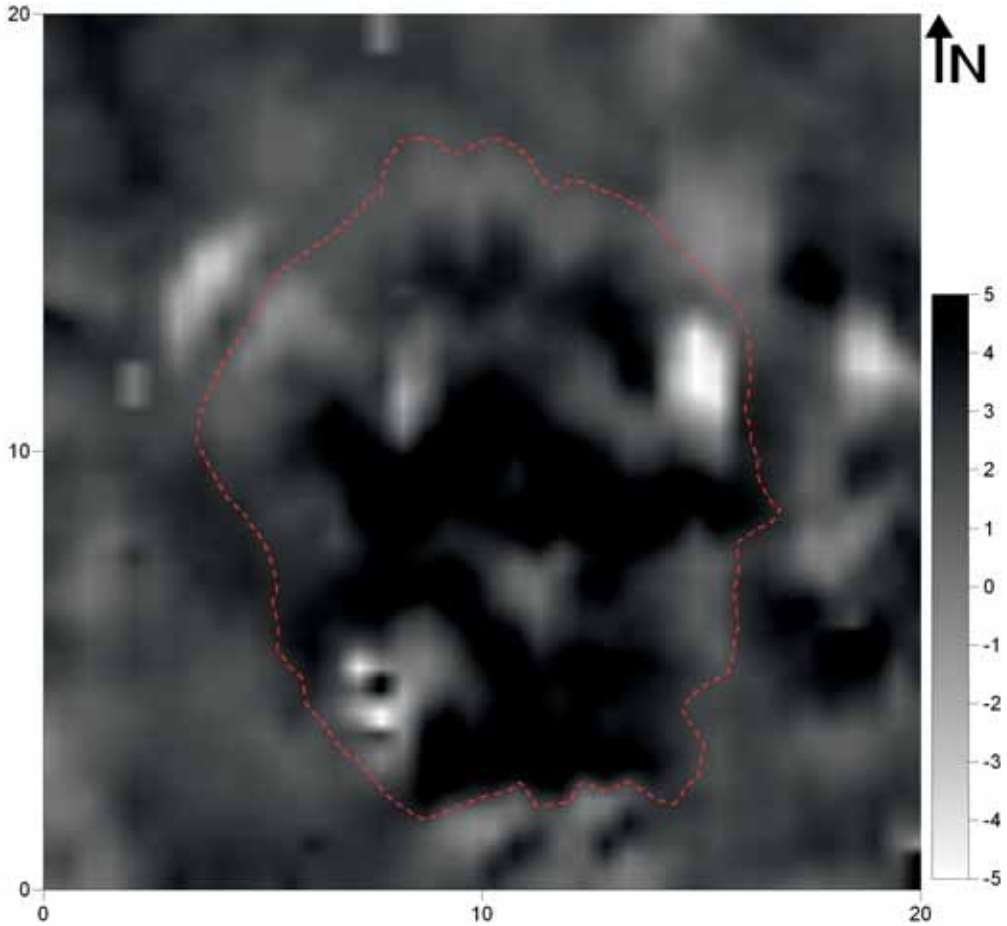
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been subjected to induced magnetization leading to its high detectability. Nevertheless, one has to consider also the possibility that the conduct of the survey with a hand-held gradiometer over such a landform, characterized by frequent changes of elevation, has caused uneven sampling and, therefore, a highly differentiated magnetic field gradient. If, on the other hand, the outer rim of the barrow has not been excavated, nor covered with the soil from its central part, it is possible that it conceals a highly magnetic material connected with the barrow's internal structure. Verification of the above listed hypotheses should be carried out with the use of other archaeological methods.

The second monument surveyed on the site in 2015 (no. 171), as mentioned before, necessitated a slightly different methodology of sampling. It was suspected that densification of the profiles' spacing from 1 m to 0.5 m will enhance the anomalies representing the barrow's mantel, the latter barely visible in the terrain. The tumulus was included within a single grid, with length and width measuring 20 m. Unfortunately, the acquired data does not allow to unambiguously delimit the spatial extent of the embankment, despite capturing several strong and extensive, but irregularly shaped anomalies over the barrow's climax (**Fig. VIII.69**). These signals (**Fig. VIII.70**), in terms of their structure, have W – E elongated positive peaks of magnetisation placed on the southern side of smaller negative peaks. Nevertheless, they do not lend themselves to a clear interpretation regarding their sources. Possible causes of such a state might be post-depositional factors, influencing the original order of the layers inside the embankment. Assuming that the discussed anomalies, with magnetisation level reaching -/+5nT, is a conglomeration of several, independently-sourced signals, one can expect the features with increased magnetic susceptibility to be buried under the top soil. On the other hand, if the anomalies are emitted by a single source, then perhaps it is more plausible to say that the barrow's mantel covers e.g. an irregularly distributed layer of highly magnetic material. It is worth noting that during the survey no modern "litter" has been observed on the mound's surface.

The procedure of densification of the sampling profiles was repeated in the case of barrow 187. This time it was also possible to include the object within the measuring surface comprising a single grid with dimensions of 20 × 20 m. Due to forestation, it was necessary to omit some measurements, as visible by white strips extending along a N – S axis. The resulting image (**Fig. VIII.71**) helps to define the extent of magnetic field generated by the mound to an even lesser degree than in the previous case (barrow 171). The image is dominated by irregularly spaced anomalies with a minimally increased level of magnetization, divided by zones of negative values. Locally there are visible magnetic peaks, mostly characterized by abnormally oriented dipoles. Moreover, the series of small positive signals is distributed along the arc in the eastern part of the surveyed area, along the crescent-shaped strip of slightly increased values of magnetisation (**Fig. VIII.72**).

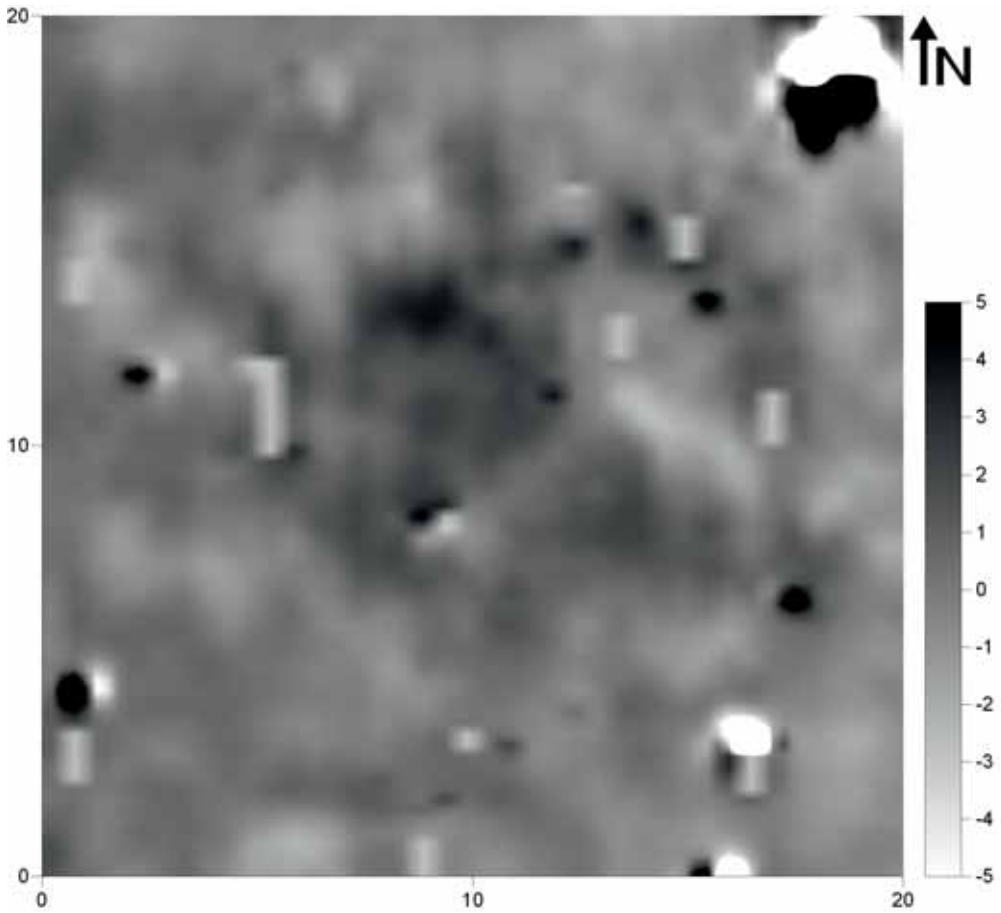
Consequently, it is possible to cautiously suggest that the latter indicates the eastern outer limit of the mound's embankment that additionally is outlined with features generating residual magnetization (e.g. stones with ferrous minerals – remains of a stone ring encircling the mound?). In the subsequent description the most important is, however, a roughly rectangular anomaly situated in the centre of the picture. It is approximately oriented with its longer side along a NW – SE axis and measures ca. 2.5 × 1.5 m. The highest degree of magnetization can be observed in the northern corner of the anomaly, while the remaining part is definitely less magnetically susceptible. Although, the presented picture seems to be incomplete, it is this anomaly that most probably is connected to a potential grave structure, usually expected in the barrow's centre.

The last tumulus from the Komariv cemetery surveyed in 2015 (no. 188) delivered arguably the least conclusive results (**Fig. VIII.73**). The discussed object possesses an extensive embankment that, however, only slightly rises above the ambient. For this

**Fig. VIII.69** (up). Resulting image of magnetometric survey of barrow no. 171 on the site in Komariv (see Fig. VIII.62)

**Fig. VIII.70** (down). Resulting image of magnetometric survey of barrow no. 171 on the site in Komariv with highlighted anomalies discussed in the text.

--- approximate spatial extent of the accumulation of strong anomalies located over the climax of the barrow's embankment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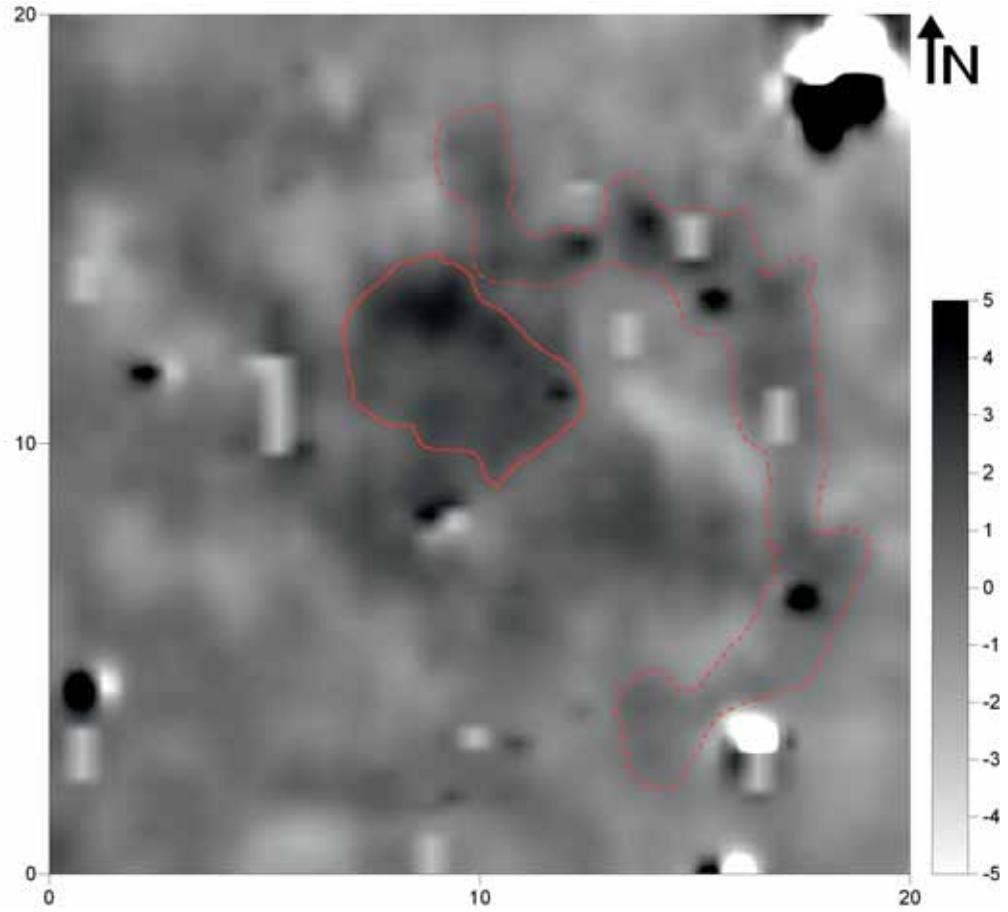
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reason, it was necessary to create a measuring surface comprising nine grids, each with dimensions of 10 × 10 m, thus creating a quadrangular survey area with the side-length measuring 30 m. The analysis of the data acquired during the prospection is, in the best case, an effort to decide, whether the weakly magnetized middle part of the surveyed area illustrates the low embankment of the barrow (**Fig. VIII.74**). The accumulation of anomalies in this part of the image, subtly emerging from a generally more magnetically susceptible context, does not have a clear outline. For this last trait it is possible to find an explanation in the barrow's state of preservation, seemingly retaining only a low embankment, smoothly turning into the surrounding surface. There are also locally noticeable peaks of positive magneti-

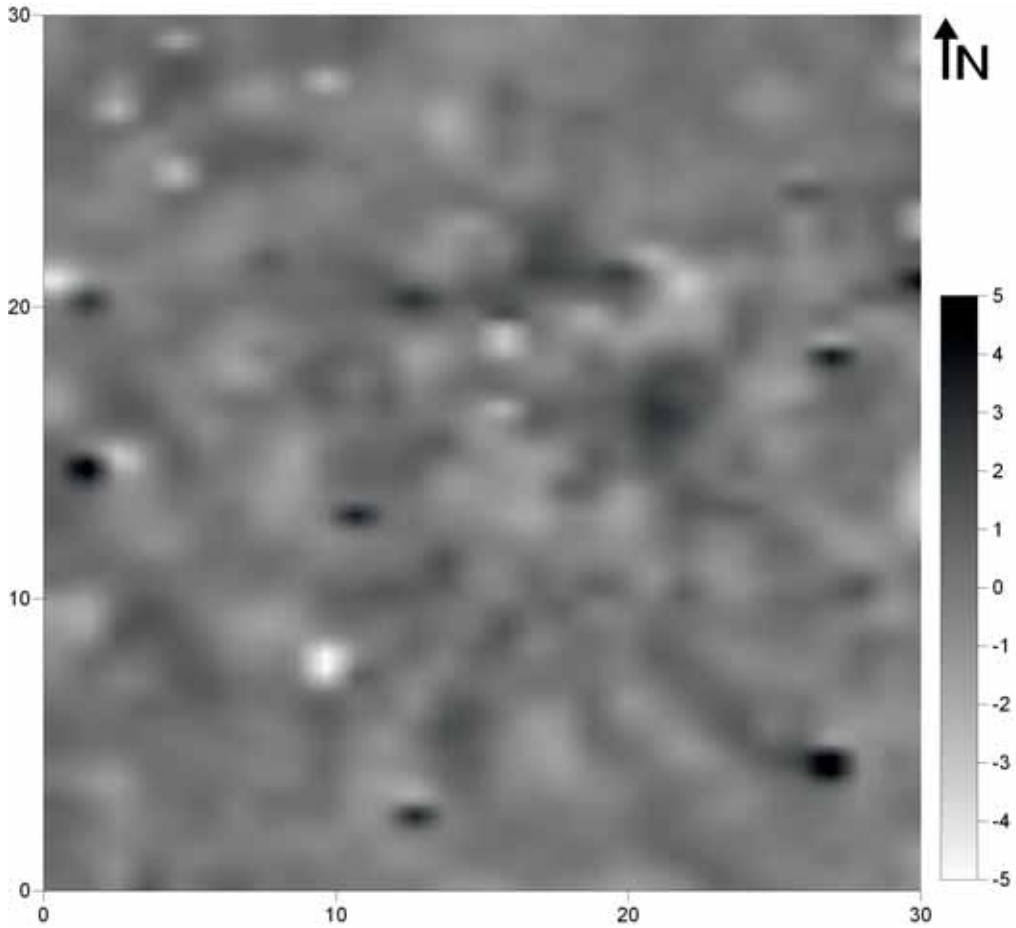



**Fig. VIII.73.** Resulting image of magnetometric survey of barrow no. 188 on the site in Komariv (gradiometer Bartington Fluxgate Grad 601-1; measuring grid: 10 × 10 m; sampling density per transect spacing: 0.25 × 1 m, interpolated up to 0.25 × 0.5 m; real values of magnetic field gradient compressed in greyscale to the range -5 – +5nT)

**Fig. VIII.71** (up). Resulting image of magnetometric survey of barrow no. 187 on the site in Komariv (see Fig. VIII.62)

**Fig. VIII.72** (down). Resulting image of magnetometric survey of barrow no. 187 on the site in Komariv with highlighted anomalies discussed in the text.

--- approximate spatial extent of the strip of positive values of magnetisation potentially delimiting an eastern part of the mound

— approximate spatial extent of a roughly rectangular anomaly in the barrow's centre, potentially indicating a grave structure

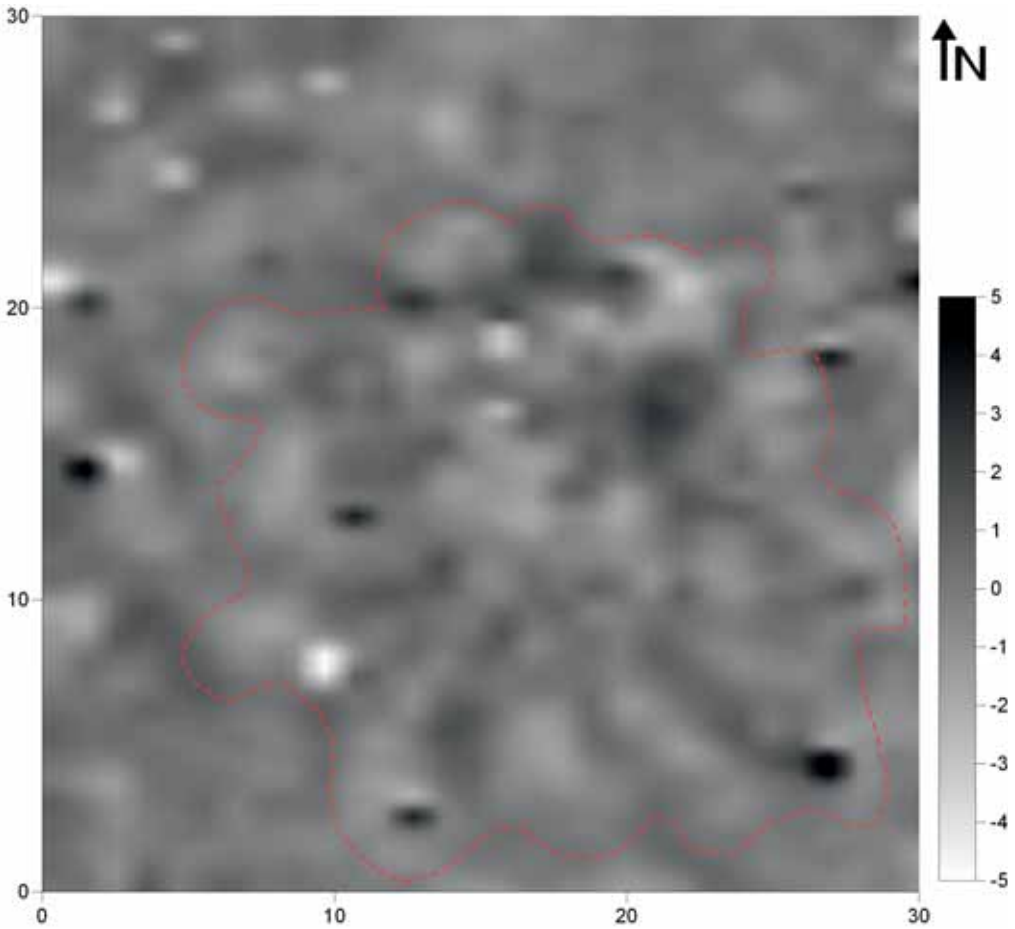



**Fig. VIII.74.** Resulting image of magnetometric survey of barrow no. 188 on the site in Komariv with highlighted anomalies discussed in the text.
--- approximate spatial extent of negative anomaly potentially signifying the barrow's embankment

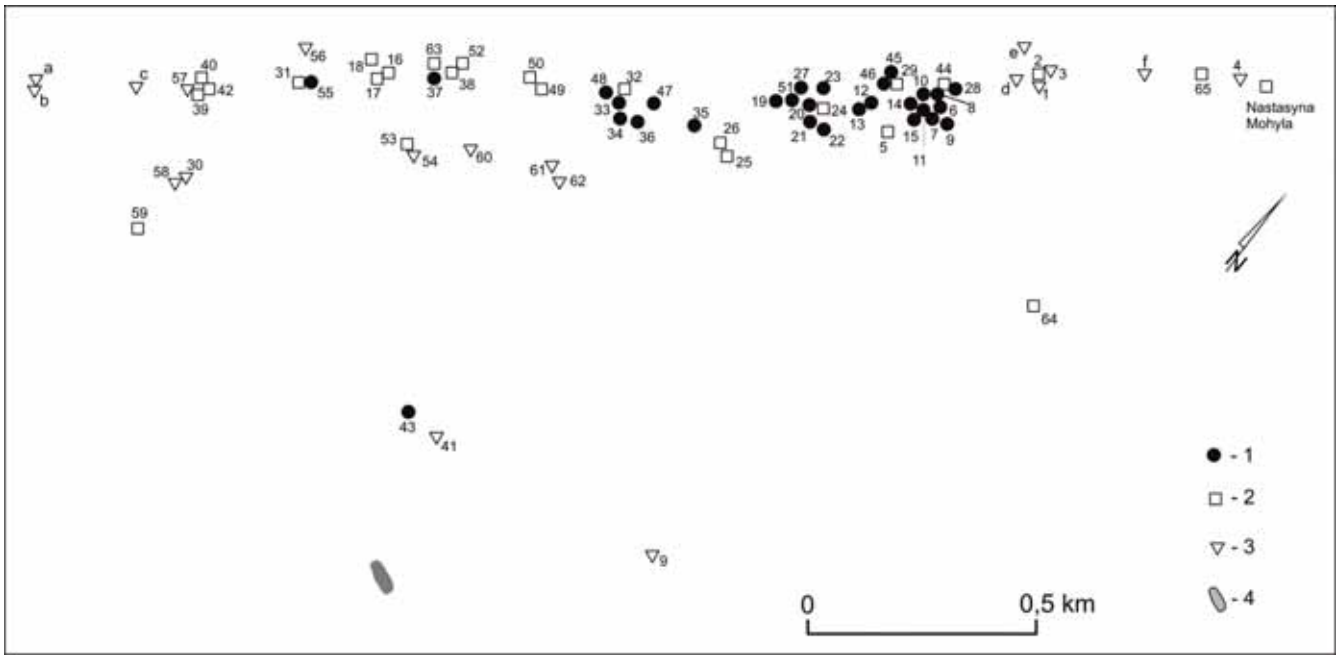



**Fig. VIII.75.** Simplified plan of the barrow cemetery in Komarów. 1 – Komarów culture barrow, 2 – Corded Ware culture barrow, 3 – other barrow, 4 – Komarów culture settlement (after Sulimirski 1968, Plan 1; Makarowicz 2010, Fig. 4.21)

zation, which, nevertheless, cannot be convincingly connected with the barrow, since they do not reveal any regular distribution.

## E. Archival information

### Komarów, district of Stanisławów (after Sulimirski 1968: 105-119)

*A fairly high ridge of hills runs west of the village in a SW – NE direction, forming the water-shed between the rivers Łukwa and Łomnica, tributaries of the Dniester which terminates a few kilometres further to the NE, in the Dniester valley. For the most part, these hills are covered with woods in which clearings occur in some areas: hamlets have been established in these clearings. Numerous barrow-graves are situated along a fairly narrow belt on the summit of these hills and these are part of several villages. A total of sixty eight barrow-graves occur in the main line of graves in an area belonging to Komarów village. This line is about 2.5 km long (**Fig. VIII.75**). Two of the barrow-graves (nos. 63 and 'e') are in fact a little over the border and in the territory of two neighbouring villages. Four more barrow-graves occurred somewhat lower down, in the hills nearer Komarów village.*

*As a rule, the barrow-graves on the hill-top were in groups of two or four, though some groups of six to ten mounds also occur. The belt along which they were distributed was about 50 m wide, extending to 250 m at the widest part of the hilltop. The distance between individual groups did not exceed 150 m.*

*Four barrow-graves in this cemetery, near the Kryłos border at the eastern end of the hill, were investigated in 1886 by T. Ziemięcki (Ziemięcki 1887). I carried out[1] a control investigation of three of these (nos. 2, 3, 4) in 1936, identifying them by the description. Sixty-two barrow-graves in this cemetery were investigated in 1934-6 by the present writer and Dr Grabowski, the then Director of the 'Pokuckie Muzeum', Stanisławów, with the assistance of Miss I. Siwek and Mr K. Żurowski, then students of the Prehistoric Institute, Lwów University, the latter at present Professor of Prehistoric Archaeology at the University of Poznań. Six barrow-graves in this cemetery, marked 'a'-'f' on the plan, were not investigated. At the same time, Dr J. Pasternak was excavating a barrow-grave known as the 'Nastasyna Mohyła' which formed part of this cemetery but was situated in the area of the neighbouring village of Kryłos (no. 48), 50 m east of barrow-grave 4. In addition, two barrow-graves in fields situated lower down (nos. 41 and 64) were investigated by us, while' Dr Pasternak investigated another (no. 43). One ('g') was not investigated. Only brief notes (Sulimirski 1936; 1939; Pasternak 1936) were published: full details were prepared for the printer but did not survive the war.*

*Numeration of the barrow-graves investigated starts at no. 5, since this was included in the numeration of the barrow-graves excavated by T. Ziemięcki. The material Ziemięcki excavated was deposited in the Archaeological Museum, Cracow, while that deriving from our excavations went partly to the Pokuckie Muzeum, Stanisławów and partly to the Prehistoric Institute of Lwów University.*

*The large extent of the Komarów cemetery and the formation of the terrain indicate that it does not constitute a single entity. The dead buried in the Komarów cemetery barrow-graves must have belonged to several family groups, perhaps clans, and they probably dwelled in separate hamlets not far from their burial place. One of these settlements uncovered in the 'Dworzyska' field lay nearer the western end of the Komarów cemetery, and was within easy reach and access. Despite a search, however, it proved impossible to discover the sites of other settlements particularly of the settlement which had been inhabited by those buried in the central part of the cemetery, in graves of the Bronze Age. The distance as the crow flies from these barrow-graves to the settlement in the 'Dworzyska' field was over 3 km, and deep ravines between the barrow-graves and the settlement increased this distance considerably. It follows from this that those buried in these barrow-graves were not inhabitants of the settlement we discovered.*

*Most of the skeletons had undergone entire disintegration, and only the positions and arrangements of the objects found indicated the site where the grave must have been. Traces of the skeleton were preserved only in exceptional cases. The arrangement and number of objects found made it likely that each mound had usually contained one burial, though several mounds contained two, undoubtedly those of a man and woman, coeval. Secondary burials were very rare, and occurred only in two groups (nos. 28, 33, 34, 37, 38); these derived from the Late Bronze or Early Iron Age, and had been dug in Neolithic or Middle Bronze Age barrow-graves.*

*The orientation of the graves was usually W – E or NW – SE, occasionally NE – SW and one only (no. 47) was N – S. The heads were placed to the west as a rule. The dimensions of graves and arrangement of objects show that the dead were buried in a somewhat contracted position. A certain number of the graves, several of these Neolithic, were cremation burials. Cremation took place on the spot, as a rule the calcined bones were not moved and the mound was erected upon them and the fragments of pyre. The orientation of the cremation burials did not differ from that of the inhumation burials.*

[1] T. Sulimirski.

*The graves were almost invariably in the centre or near the centre of the mounds. In some Neolithic graves, the dead were lying in shallow shafts, but they were usually placed on the ancient level, particularly in later periods. They were generally placed on oak logs, though traces in some barrow-graves appear to indicate that the dead had been lying in a kind of wooden box.*

*All the Komarów graves contained a large quantity of charcoal, scattered in lumps throughout the area of the mound and often in the mound itself. Traces of burned hearths round the graves were often found, this indicating the importance of fire in the burial rite.*

*Single river pebbles (or sometimes several), deliberately arranged, were found in the barrow-graves of the Komarów period. In barrow-grave 11, five pebbles marked the boundary of the grave. Larger accumulations of stones occurred less frequently. Two larger accumulations in barrow-grave 20 formed something not unlike a stone surround: the grave area in barrow-grave 45 was marked' by large pebbles, while the dead body in barrow-grave 48 had been lying on a layer of carefully arranged stones. The stone construction in barrow-grave 14 was unique, though its date could not be established owing to the absence of grave goods.*

*Flint flakes, sometimes in large quantities, were found in all barrow-graves no matter what their date. Odd potsherds were also found in many graves, though not deriving from vessels in the grave. The potsherds were usually very small. Lumps of ochre were found in some Neolithic graves, while lumps of calcined earth dust were used in others instead of ochre.*

*One or two vessels were found in the Neolithic graves, though pottery was often absent. Provisions for the journey after death were undoubtedly given to the dead on platters of wood or other organic material. The quantity of clay vessels increased in later graves. The finding of broken incomplete vessels in some Bronze Age barrow-graves, particularly cremation burials (e.g. nos. 34, 47) and found next to complete vessels, is curious.*

*The Komarów barrow-graves were not coeval. In addition to the barrow-graves containing typically Neolithic grave goods, barrow-graves of the Middle and Late Bronze Ages also occurred here, containing highly characteristic pottery and other grave goods. The latter belonged to the culture named 'Komarów culture', by the present writer, after this cemetery.*

*The Neolithic barrow-graves were scattered, sometimes in groups varying from two or three in number, or sometimes singly, across the entire area occupied by the cemetery. However, the Komarów period barrow-graves were only found in the centre of the cemetery, where they formed two larger groups in the 'Lis' field, each containing about ten graves. A few Komarów graves dating from the Late Bronze Age, were at the west of those referred to above. These were mainly secondary burials in the Neolithic and Middle Bronze Age barrow-graves. The distribution of the barrow-graves investigated in individual groups is shown in Table 1 (see also: Sulimirski 1968, Plan 1).*

*A closer study of the relative position of barrow-graves of different periods revealed that those of the Komarów type were always grouped around a Neolithic, or Early Bronze Age barrow; the latter usually lay on the eastern periphery of the group concerned, and the 'Komarów' graves were placed west of it.*

*Table 1. Groups of barrow-graves at the cemetery of Komarów and their date (Sulimirski 1968, Table 26)*

| Group | | Neolithic and Early Bronze Age | Komarów culture | Not specified |
|---|---|---|---|---|
| A | | 39, 40, 42 | | 57 |
| B | | 59 | | 30,58 |
| C | a | 31 | 55 | 56 |
| | a | 16, 17, 18 | | |
| | c | 37, 38, 52, 63 | 37/s, 38/s | |
| | d | 49, 50 | | |
| D | a | 53 | | 54 |
| | b | | | 60 |
| | c | | | 61, 62 |
| E | a | 32 | 33, 33/s, 34, 34/s, 36, 47, 48 | |
| | b | 25, 26 | 35 | |
| F | a | 24 | 19, 20, 21, 22, 23, 37, 51 | |
| | b | 29 | 45, 46 | |
| | c | 44 | 6, 7, 8, 9, 10, 11, 14, 15, 28 | |
| | d | 5 | 12, 13 | |
| G | a | 2 | | 1, 3 |
| | b | 65 | | 4 |
| H | | 64 | | |
| J | | | 43 | 41 |
| Total | | 25 | 28 + 4 secondary | 12 |

*This chronological arrangement is clearly visible in the easternmost group of barrow-graves of the Komarów period (group F-c), which adjoined the Late Neolithic, or Early Bronze Age barrow 44. Close to its eastern side lies barrow 28 of period II, but all other mounds were south or south-west of it. The nearest were barrow-graves 8 and 6, situated close to each other, both richly furnished, and dating from the very end of period I. A little further south, in the same row, lay barrow 9 likewise of period I. Close to these, to the south-west, were barrow-graves 10 and 7, forming the second row, both of period II. West of these, on the perimeter of the group, were barrow-graves 11, 14, I 5, all of period III.*

*The arrangement was similar in the neighbouring group F-b, which was initiated by the Neolithic, or Early Bronze Age barrow-grave 29, situated on the eastern periphery of the group. West of it lay barrow-grave 46 of Komarów period II, and close to it, a little further north, was barrow-grave 45 of period III; another pair of barrow-graves was south of the above: barrow 12 of period II was nearer to the Neolithic mound, the other, no. 13 of period III, was behind it to the south. The Neolithic or Early Bronze Age barrow 24 of the next group F-a lay likewise on the eastern periphery of the group. Close to it was barrow 21 of Komarów period I, and mound 27, a little later in date, of the transitional stage from periods I to II, lay a little apart to the north-west. Near by, north of barrow-grave 24, was barrow 23 of period II, and barrow 19 of period III lay on the western periphery of the group; on the other hand, another barrow of period III (no. 20) was placed in the centre of the group.*

*The position in the next group E-a differs in that the Neolithic or Early Bronze Age barrow-grave lies on the northern periphery of the group instead of on the eastern, but otherwise the distribution of barrow-graves exhibits the same patterns. Barrow-grave 34 (original grave) of the transitional stage between periods I and II, lies south-east of the Neolithic mound. East of it was barrow-grave 36 of period II. Barrow-grave 48, of period III, was raised on the western periphery of the group. Barrow-grave 33 of period IV was placed in the centre, close to the Neolithic mound, and so also was the secondary burial of the same period in barrow 34. Finally, barrow 47 of period IV lay a little outside the group, on its western side.*

*Below is given the description of all barrow-graves excavated at Komarów. The following section contains a list of all vessels found in these barrows; their measurements and other particulars are also indicated. (…)*

*The excavation of the entire barrow-grave cemetery at Komarów gave results such as had been expected before investigations began. It emerges from these results that the custom of erecting mounds over graves prevailed in this area from the Neolithic to the start of the Early Iron Age. Continuity in the use of the cemetery was also established, showing continuity of settlement in this region.*

## Description of Barrow-graves

*Barrow-grave 1 formed part of a group of three mounds (nos. 1-3) all excavated by T. Ziemięcki, in 1886. It was 24 m in diameter, 1.5-2 m high. It was cut across with a trench 8 m long, 1.6 m wide and 2.6 m deep. Only one flint was found at a depth of 1.05 m.*

*Barrow-grave 2 (**Fig. VIII.76**). 14 m in diameter, 40 cm high, originally higher. T. Ziemięcki found there only a flint knife. I excavated it again in 1936. In the cen-*

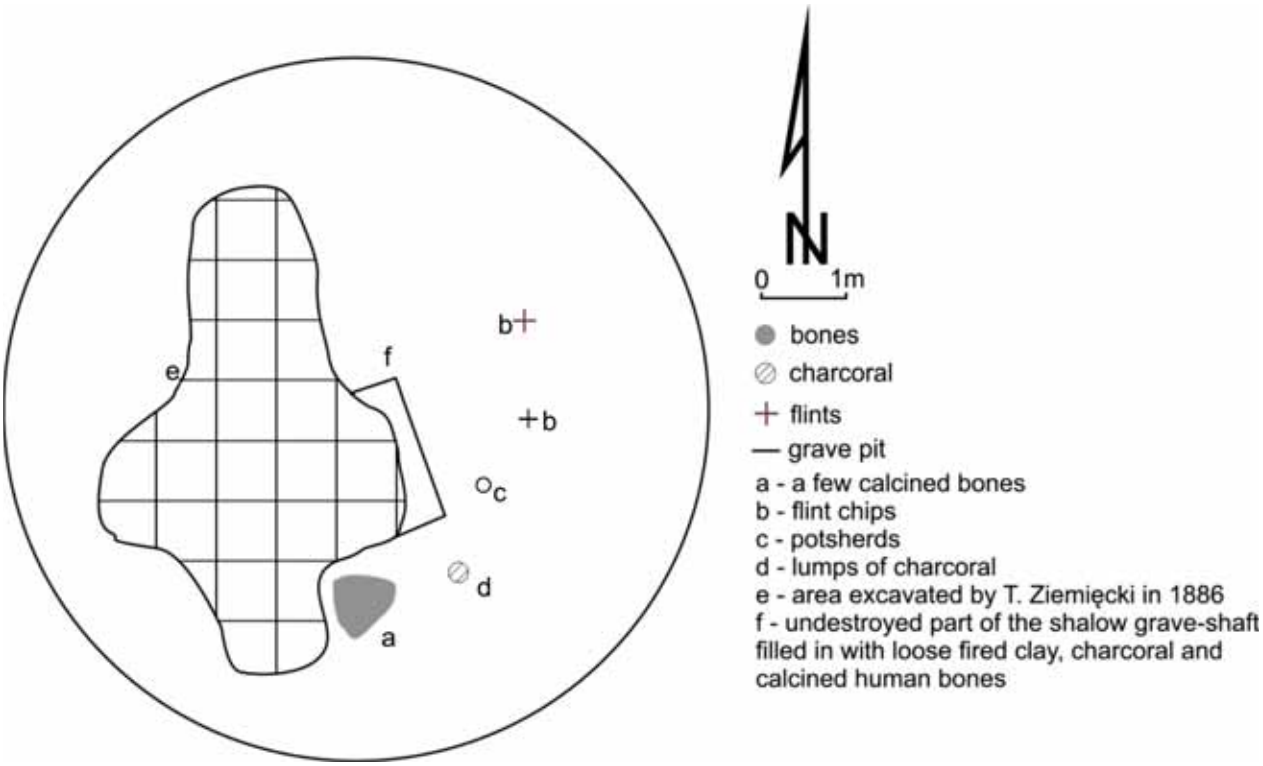



**Fig. VIII.76.** Digitalized plan of barrow 2 (Sulimirski 1968, Plan 16:1)

*tre the grave-shaft was uncovered (f), dug about 20 cm into the ancient surface, orientated NW – SE, about 1.8 m long. More than half of it had been destroyed by the trench dug by T. Ziemięcki. It was filled in with loose red fired clay, charcoal and calcined human bones. In a few places on the ancient surface around the grave were found a few flint flakes (b), lumps of charcoal and a single potsherd. This last was of Tripolyan 'D-ware' type, thick-walled, and bore traces of red paint. South of the grave a few calcined bones lay on the ancient surface (a).*

*Barrow-grave 3. 14 m in diameter, 40 cm high. Nothing was found in it by T. Ziemięcki. It was excavated by me again in 1936. On the ancient surface, NE of the centre, a few flint flakes and one potsherd were found. The sherd was of Tripolyan 'D-ware' type and did not differ from pottery excavated in the settlement on the 'Dworzysko' field.*

*Barrow-grave 4. Situated close to the border with Kryłos, about 50 m west of the barrow-grave there excavated by J. Pasternak, dating from the Early Bronze Age. It was 16 m in diameter, 50 cm high. According to T. Ziemięcki, in the southern part of the area excavated a vessel 'filled in with ashes' which disintegrated was found. Inside was a flint and near it lay a 'pointed' flint. I excavated this mound in 1936. Only two small potsherds were found, which originated from the vessel mentioned by T. Ziemięcki. This was a small beaker, its body hemispheric, undecorated.*

*Barrow-grave 5. Excavated by me in 1934, and one of the larger mounds, situated on a clearing. It was 18 m in diameter, 1 m high. In its mound a few very small potsherds, flint flakes and three trimmed implements were excavated. On the ancient surface, about 1.5-2 m E of the centre, two vessels stood, both very brittle, crushed; (a) a larger amphora with two lugs and (b) a beaker or bowl. The latter had a high neck, and an everted rim. Its decoration consisted of incised fishbone patterns on the body and a few horizontal rows of short oblique, alternating incisions on the neck. Drawings of both went astray during World War II and I was unable to recover them. Recently, the drawing of the bowl has been published by J. Machnik (Machnik 1966, Pl. XLV:C3). Close to these vessels lay an axe (Sulimirski 1968, Fig. 16:11) made of black flint of 'Bug' variety, its cross-section being an irregular quadrangle.*

*The cross-section of this mound was as follows: 30 cm grey arable soil, then about 50 cm of mound earth, grey in colour, darker in its lower part nearer to the centre. It lay on the ancient fossil humus nearly black in colour, which at a depth of 30 cm (1.1 m from the top of the mound) became increasingly brownish, and at a depth of about 1.7 m from the top of the mound the pure yellow subsoil appeared. The same sequence of layers has been attested in all mounds excavated at Komarów.*

*Barrow-grave 6 formed part of a larger group of mounds situated on a clearing. It was 19 m in diameter, 70 cm high (**Fig. VIII.77**). In the centre of the surface covered by the mound, contours of the ancient grave pit (were uncovered, about 2 by 1 m in area, orientated nearly E – W. It was only 25 cm deep.*

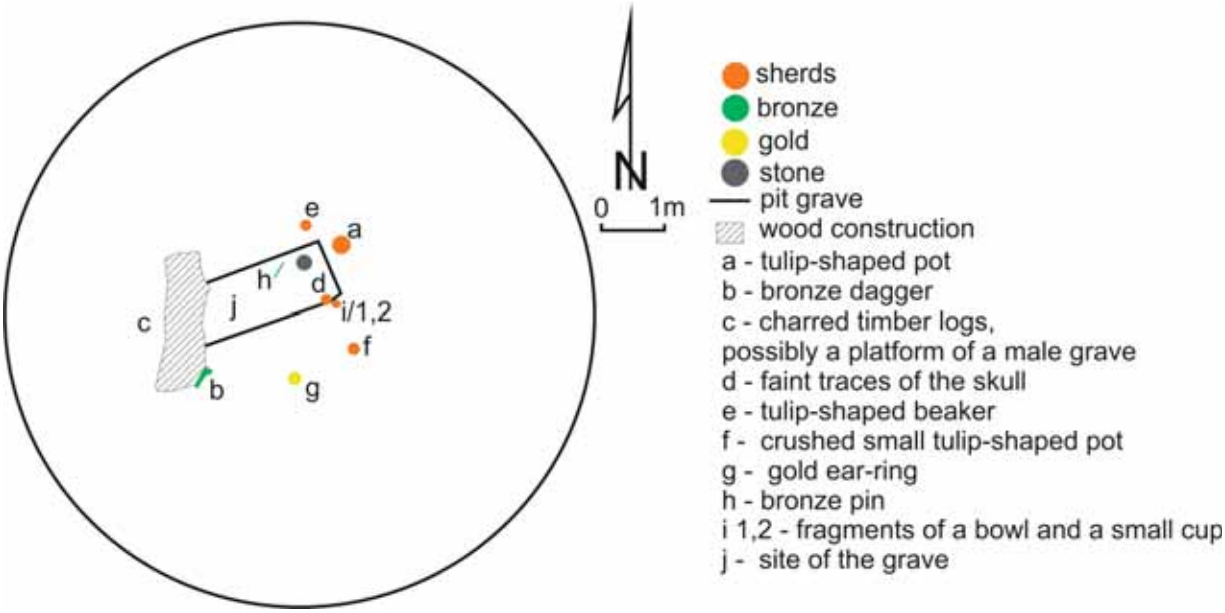



**Fig. VIII.77.** Digitalized plan of barrow 6 (Sulimirski 1968, Plan 12:1)

*On its bottom lay the skeleton, head to E, of which only slight traces, mainly of the skull (d) were discernible. In the SE corner near the head stood a cup and a bowl (i-1, 2) (**Fig. VIII.78**; Sulimirski 1964; 1968, Plate 16:6); the latter had a slanting fluted decoration on the body, but it disintegrated: it was similar to that from barrow-grave 11/a-2. On the chest of the skeleton lay a bronze pin (h) (**Fig. VIII.79:1**; Sulimirski 1968, Fig. 26:7), and along the eastern side of the grave outside it, stood three vessels: a tulip-shaped pot (a); a smaller beaker (e) (**Fig. VIII.80**; Sulimirski 1968, Plate 16:2) with a raised band on the neck covered with a row of punctures below its incised ornament; a small tulip-shaped pot (f) which disintegrated. Along the*

**Fig. VIII.78.** Bowl, type M21, plain. Rounded rim; unmarked base. Temper of crushed stone and flint. H – 5.5 cm, R1 – 7.5 cm, R3 – 8.5 cm, R4 – 4 cm

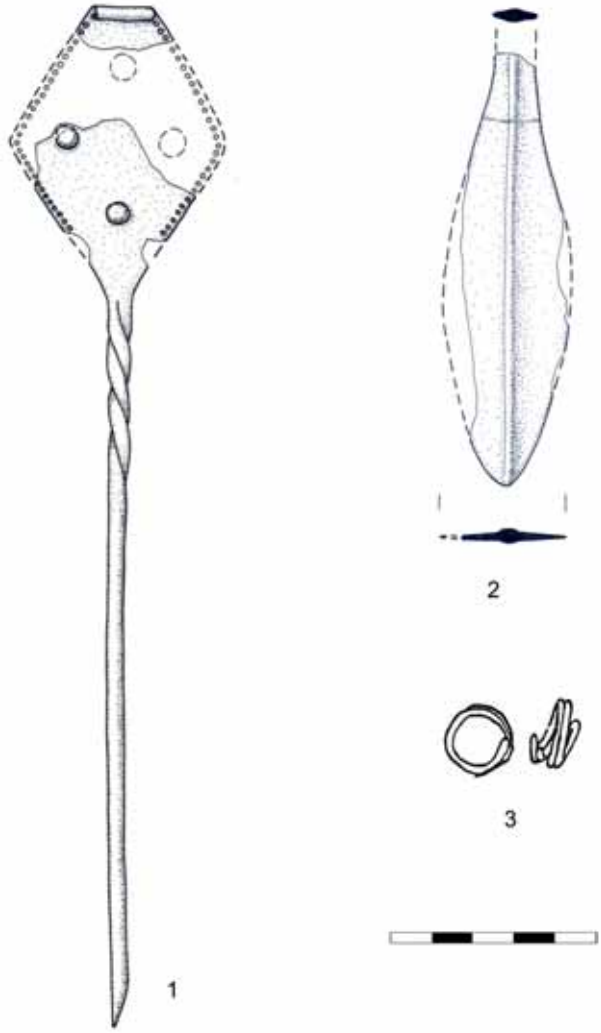



**Fig. VIII.79.** 1 – twisted bronze pin with a rhomboid head, preserved in part, head ornamented with circumferential perforations, in the middle, four extruded points – bosses. Length: 24.7, head length: 7.2 cm, head width: 5.2 cm, wire thickness: 0.3-0.4 cm; 2 – bronze dagger with a central rib, reconstructed. Length: 10.5 cm, width: 3.2 cm, thickness: 0.3-0.4 cm; 3 – gold wire ring or earring (ear wrap), diameter: 1.6 cm, thickness: 0.2 cm

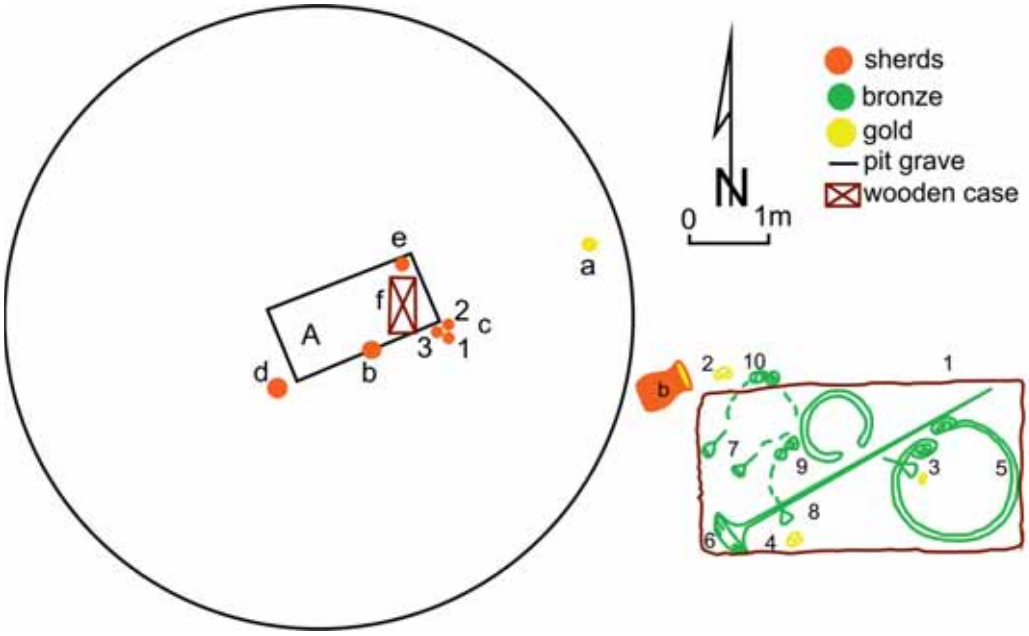
**Fig. VIII.80.** Beaker, type P21, circumferentially ornamented: under the rim – with wedge-shaped pinholes, on the neck – with four incised lines, on the body – with a relief strip with circular pinholes, below, with groups of five oblique incised lines, forming multiple angles. Sharp rim; base slightly marked. Temper of crushed stone and flint. H – 14.5 cm, R1 – 12.5 cm, R2 – 11 cm, R3 – 13.5 cm, R4 – 8 cm

*western side of the grave lay almost completely decayed timber logs (c), covering an area about 2 m long, 50 cm wide, possibly the platform of another (male?) grave. On the southern end of the logs a small bronze dagger in a wooden sheath (b) (**Fig. VIII.79:2**; Sulimirski 1968, Fig. 26:9) was found, and about 2 m E of it lay a small gold earring (g) (**Fig. VIII.79:3**; Sulimirski 1968, Fig. 26:8).*

*Barrow-grave 7 was 16 m in diameter, 40 cm high, ploughed up. About 1 m S of the centre, on the ancient surface, a vessel was found (a), and nearly 2 m NW of it lay a flint scraper (b). Both objects marked the site of the grave, the skeleton of which had completely decayed.*

*Barrow-grave 8 (**Fig. VIII.81**; Sulimirski 1968, Plan 12:2) belonged to a group of three mounds including nos. 6 and 7 described above. It was 16 m in diameter, 40 cm high, almost completely ploughed up, the grave being partly ruined.*

*The grave was in the centre, orientated nearly SW – NE. It was well marked by loose earth which filled in a shallow hole dug in the ancient surface. On its three corners stood six vessels. One of these was an undecorated tulip-shaped beaker (b) (**Fig. VIII.82**; Sulimirski 1968, Plate 16:1); two others were two handled cups, one of which (d) almost completely destroyed by the plough, was similar to that from barrow-grave 12/b, and the other (e) (**Fig. VIII.83**; Sulimirski 1968, Plate 16:10) was decorated with four protuberances on the body encircled by semi-circular grooves. Three other vessels stood in the eastern corner: a small decorated goblet (c-1) (**Fig. VIII.84**; Sulimirski 1968, Plate 16:8), a small cup (c-2) and small bowl (c-3) (**Fig. VIII.85**; **Fig. VIII.86**; Sulimirski 1968, Plate 16:7) both undecorated. In the eastern part of the grave, on its bottom lay an oak box (f) (Fig. VIII.81; Seidl 1935) which contained several bronze and gold personal ornaments. One gold pendant (a) (**Fig. VIII.87**) was found about 2 m E of the grave, in the arable soil, evidently displaced by the plough. Bronze ornaments in the box were (**Fig. VIII.88**; Sulimirski 1968, Fig. 26:1-6): a pin, 37 cm long, with a round perforated massive head, 4.5 cm in diameter; the pin was round in its upper part, square and torqued in the lower half (Fig. VIII.88:1); a massive bracelet 7.7 cm in diameter, made of a bar round in section, 1.5 cm thick, its wide open terminals thinner, the surface covered with several groups of deep-cast grooves (Fig. VIII.88:4); a torque made of a round bar, 6 mm thick, 14.2 cm in diameter, the terminals wound in spirals (Fig. VIII.88:3); and finally, two identical sets of head, or ear, ornaments consisting of several tubular beads made of bronze wire, of two rings each, 2 cm in diameter, with their terminals wound in spirals, each consisting of two bell-shaped pendants, with a long tubular shaft to which a small gold pendant was attached,*




A - the grave
a - gold ear-pendant
b - tulip-shaped beaker
c 1 - a small goblet
c 2,3 - two small cups
d,e - handled cup
f - wodden box with jewellery

1 - wooden box
2 - larger gold ear-pedant
3,4 - small gold ear-pendants
5 - necklace
6 - pin
7,8 - bell-shaped pendants
9,10 - double spiral ornaments

**Fig. VIII.81.** Digitalized plan of barrow 8 (Sulimirski 1968, Plan 12:2)

**Fig. VIII.82.** Pot, type G112, plain. Thickened rim, cut straight, unmarked base. Temper of crushed stone and flint. H – 13 cm, R1 – 12.5 cm, R2 – 11 cm, R3 – 13.5 cm, R4 – 7.5 cm

**Fig. VIII.83.** Cup, type K22, ornamented on the handle with four vertical grooves, on the body – with circumferential circular pinholes, below – with four appliqué bosses rimmed with three arched grooves at the top. Rim cut straight; unmarked base. Temper of crushed stone and flint. H – 10.5 cm, R1 – 10 cm, R2 – 9 cm, R3 – 12 cm, R4 – 5.5 cm

**Fig. VIII.84.** Beaker, type P22a, ornamented on the body with circumferential ladder pattern, below – with angular patterns. Rounded rim; pedestal base. Temper of crushed stone and flint. H – 5.5 cm, R1 – 7 cm, R2 – 4.5 cm, R4 – 5 cm (photo: Sulimirski 1968, Plate 16:8)

**Fig. VIII.85.** Bowl, type M21, plain. Rounded rim; unmarked base. Temper of crushed stone and flint. H – 5.5 cm, R1 – 7 cm, R3 – 7.5 cm, R4 – 4 cm

**Fig. VIII.86.** Bowl, type M21, plain. Thickened, rounded rim; marked base. Temper of crushed stone and flint. H – 5 cm, R1 – 8.5 cm, R4 – 3.5 cm

**Fig. VIII.87.** Sheet-gold pendant; dimensions: 2.8 cm × 2.1 cm

**Fig. VIII.89.** Elements of decomposed necklace (see Fig. VIII.88:2)

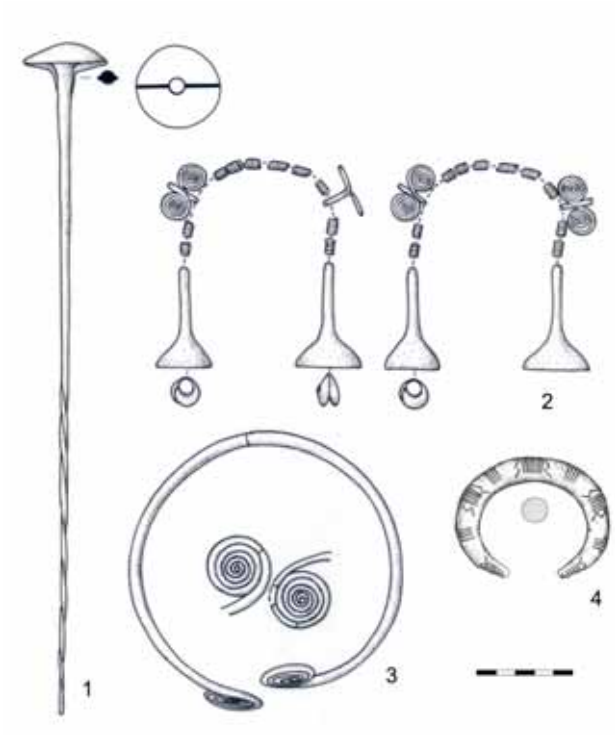



**Fig. VIII.88.** Contents of an oak chest: 1 – twisted bronze pin with a perforated nail-head. Length: 37.0 cm, head diameter: 4.3 cm, wire diameter: 0.25-0.6 cm; 2 – multi-element necklace or sets of head, or ear (reconstruction), consisting of bronze *salta leone* coils, four bronze rings with spiral disks, four bronze trumpet pendants and three gold pendants. Object is damaged; 3 – bronze torque ending in spiral disks, diameter: 14.2 cm, wire round in profile, 0.6-0.7 cm in diameter; 4 – bronze bracelet with tapering ends, ornamented with the patterns of parallel lines and angles, dimensions: 7.7 cm × 6.2 cm, width: 0.5-1.3 cm

*1.6 cm in diameter (Fig. VIII.88:2;* ***Fig. VIII.89****). The fourth gold pendant was of the same type but larger, 5 cm high. All these objects were well arranged in the box, the pin lying diagonally.*

*Barrow-grave 9 (****Fig. VIII.90****; Sulimirski 1968, Plan 12:3). 17 m in diameter, 60 cm high, ploughed up. Five vessels found on the ancient surface east of the centre probably marked the site of the burial, orientated S – N, the skeleton of which had completely decayed.*

*Three of the vessels were in the northern end of the grave, i.e. an undecorated bowl (a-1) (****Fig. VIII.91****; Sulimirski 1968, Plate 16:13), a decorated cup (a-3) (****Fig. VIII.92****; Sulimirski 1968, Plate 16:9), and a tulip-shaped cup (a-2) (****Fig. VIII.93****; Sulimirski 1968, Plate 16:5). On the eastern side was a bowl similar to that above (b) (****Fig. VIII.94****), and at the southern end was a beaker (c) (****Fig. VIII.95****; Sulimirski 1968, Fig. 28:7) decorated with horizontal grooves and herring-bone patterns.*

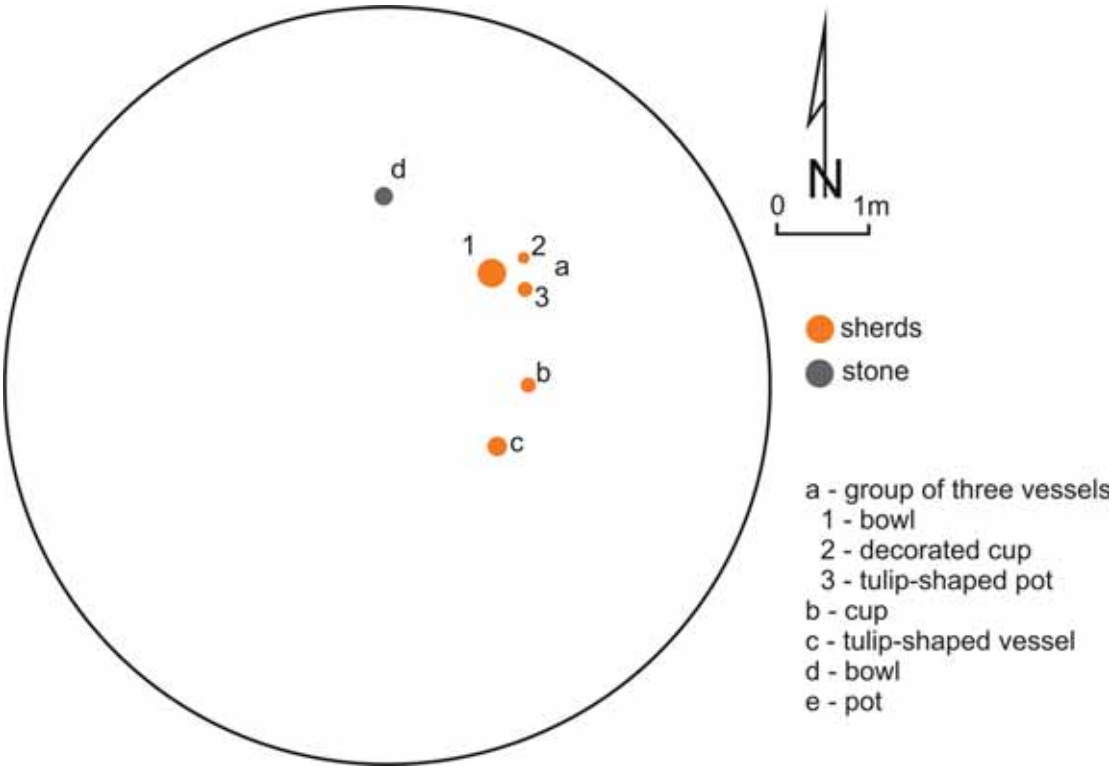



**Fig. VIII.90.** Digitalized plan of barrow 9 (Sulimirski 1968, Plan 12:3)

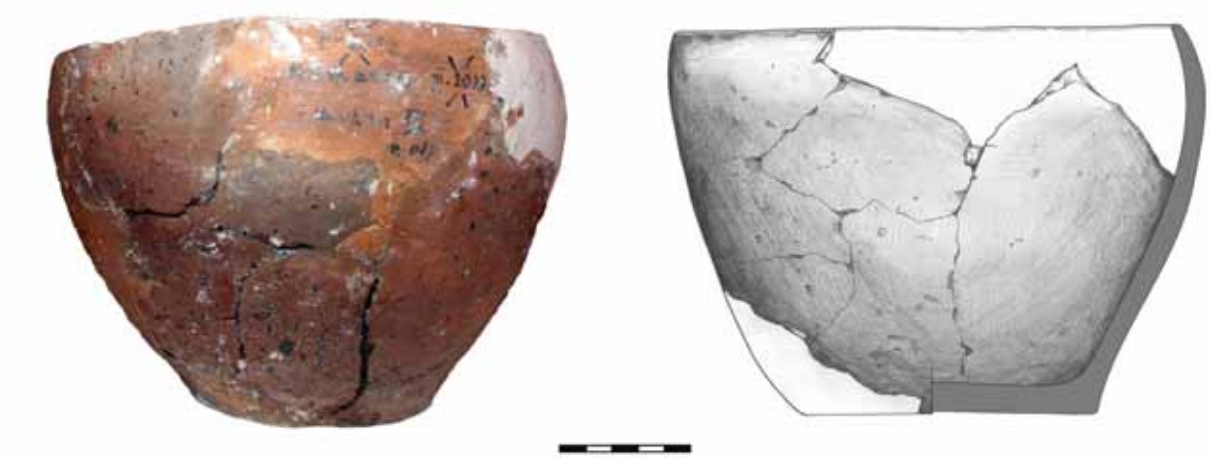


**Fig. VIII.91.** Bowl, type M21, plain. Rounded rim; base slightly marked. Temper of crushed stone and flint. H – 16 cm, R1 – 19 cm, R4 – 12 cm

**Fig. VIII.92.** Bowl, type M21, ornamented under the rim and on the body with two circumferential incised lines, between them —with incised angles, below, vertical pinholes. Rim cut straight; unmarked base. Temper of crushed stone and flint. H – 9.5 cm, R1 – 14.5 cm, R3 – 16.7 cm, R4 – 8 cm

**Fig. VIII.93.** Pot, type G112, plain. Rounded rim; unmarked base. Temper of crushed stone and flint. H – 14 cm, R1 – 13.5 cm, R2 – 12.3 cm, R3 – 14.1 cm, R4 – 7 cm

**Fig. VIII.94.** Beaker, type P22, ornamented under the rim and on the neck with four circumferential incised lines, interrupted by three short, vertical incised lines. Thickened rim, cut straight, base slightly marked. Temper of crushed stone and flint. H – 10.8 cm, R1 – 9.8 cm, R2 – 9.3 cm, R3 – 9.8 cm, R4 – 4 cm

**Fig. VIII.95.** Beaker, type P22, ornamented under the rim and on the body with three horizontal grooves and herring-bone patterns. Temper of crushed stone and flint. H – 12 cm, R1 – 10.5 cm, R2 – 10 cm, R3 – 11 cm, R4 – 6 cm

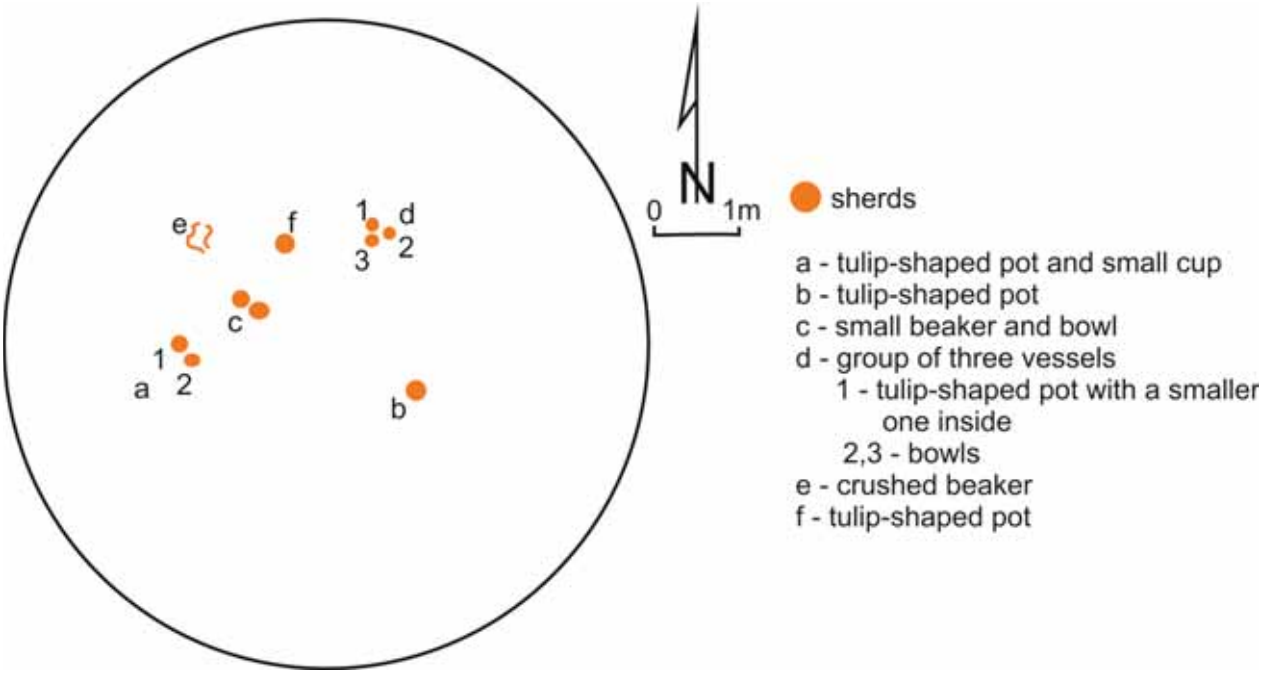



**Fig. VIII.96.** Digitalized plan of barrow 10 (Sulimirski 1968, Plan 12:4)

*Barrow-grave 10 (**Fig. VIII.96**; Sulimirski 1968, Plan 12:4). 16 m in diameter, 40 cm high, ploughed up. Eleven vessels (NW of the centre) placed in a line from SW to NE, evidently marked the site of the burial, about 3 m long, 2 m wide.*

*Two vessels were at the SW end, i.e. a tulip-shaped pot (a-1) (**Fig. VIII.97**; Sulimirski 1968, Plate 18:5) with a raised band, and a small cup (a-2) (**Fig. VIII.98**; Sulimirski 1968, Plate 18:16). East of the latter were two vessels, a small beaker (c-1) (**Fig. VIII.99**; Sulimirski 1968, Plate 18:7) and a bowl (c-2) (**Fig. VIII.100**; Sulimirski 1968, Plate 16:20), and at the NE end a tulip-shaped pot with decorative grooves on its neck (d-1) inside which was found another, smaller pot of the same type (**Fig. VIII.101**; Sulimirski 1968, Plate 18:3), and two bowls (d-2, 3) (**Fig. VIII.102**; Sulimirski 1968, Plate 16:18). Along the northern end a crushed beaker (e) (**Fig. VIII.103:2**; Sulimirski 1968, Fig. 28:5) and a tulip-shaped pot (f) (**Fig. VIII.104**; Sulimirski 1968, Plate 18:8) stood, and about 2 m SE of the vessels above was another tulip-shaped pot (b) (**Fig. VIII.103:1**).*

**Fig. VIII.97.** Pot, type G111, ornamented on the neck with a horizontal cordon. Thickened, cut straight rim; narrow, unmarked base. Temper of crushed stone and flint. H – 29 cm, R1 – 20 cm, R2 – 18 cm, 3 – 20 cm, R4 – 7 cm

**Fig. VIII.98.** Bowl, type M21, plain. Rounded rim; unmarked base. Temper of crushed stone and flint. H – 4 cm, R1 – 7 cm, R4 – 4.4 cm

**Fig. VIII.99.** Beaker, type P22, ornamented on the neck and body with seven circumferential incised lines, below — with patterns of multiple angles (sets of five), between them, five-six vertical pinholes. Rim cut inwards, base slightly marked. Temper of crushed stone and flint. H – 15.5 cm, R1 – 16 cm, R2 – 15 cm, R3 – 15.5 cm, R4 – 8.5 cm

**Fig. VIII.100.** Bowl, type M21, ornamented circumferentially on the whole surface: under the rim – with vertical pinholes, below – with two horizontal incised lines and angles between them, further below – with a pattern of rhomboid mesh. Rim cut straight; unmarked base. Temper of crushed stone and flint. H – 11 cm, R1 – 16.5 cm, R3 – 18.5 cm, R4 – 12 cm

**Fig. VIII.101.** Beaker, type P22, ornamented under the rim, on the neck and on the upper body with circumferential circular pinholes, six circumferential incised lines interrupted by two short, vertical incised lines filled with oblique lines, below – with short, oblique incised lines. Thickened rim, cut in an arc. H – 13.8 cm, R1 – 12.5 cm, R2 – 10.5 cm, R3 – 12.3 cm, R4 – 6.7 cm. (Photo: Sulimirski 1968, Plate 18:3)

**Fig. VIII.102.** Bowl, type M21, plain. Rounded rim; base slightly marked. Temper of crushed stone and flint. H – 12.5 cm, R1 – 21.4 cm, R3 – 20.8 cm, R4 – 9.3 cm

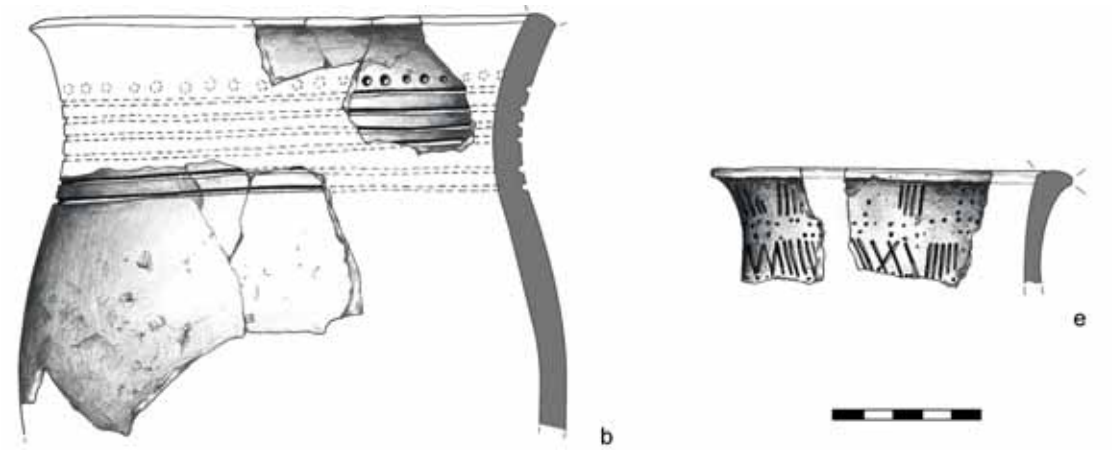



**Fig. VIII.103.** b – beaker, type P22, preserved in fragments, ornamented circumferentially on the neck with circular impressions and six (?) incised lines. R1 – 18.2 cm, R2 – 15.7 cm, R3 – 18.8 cm; e – beaker?, preserved in the upper part, ornamented with vertical and diagonal, short incised lines and a relief strip with circular pinholes. R1 – 12.3 cm

**Fig. VIII.104.** Pot, type G122, plain. Rim cut straight, base slightly marked. Temper of crushed stone and flint. H – 18.5 cm, R1 – 14.7 cm, R2 – 13.5 cm, R3 – 14.6 cm, R4 – 7.4 cm

*Barrow-grave 11 (**Fig. VIII.105**; Sulimirski 1968, Plan 13:2). 16 m in diameter, 40 cm high, much ploughed up which resulted in the upper part of many vessels and part of the grave itself being destroyed or badly damaged. The burial was near the centre on the ancient surface; it covered an area about 3 m long orientated almost NW – SE. The corpse most probably was buried in an extended position and the pyre laid over it. Bones were only partly calcined, those which had survived indicated the position of the burial. Over the whole area lay charcoal, which also formed small concentrations outside the area of the grave proper. The corpse was laid head to NW, as indicated by the remains of the skull.*

*In the NW corner of the grave stood two bowls (a-1, 2) (**Fig. VIII.106**, **Fig. VIII.107**; Sulimirski 1968, Plate 17:1, 10), a larger and a smaller, both with fluted decoration on the body, and further south stood a tulip-shaped pot upside down, the description of which is missing. Near the feet lay two small cups (p-1, 2) (**Fig. VIII.108**, **Fig. VIII.109**; Sulimirski 1968, Plate 18:18), and a larger, handled and decorated cup (p-3) (**Fig. VIII.110:3**; Sulimirski 1968, Plate 17:4). Around the eastern end of the grave lay five pebbles (and within an area 20 cm in diameter lay over one hundred small flint flakes (m) heaped up to 10 cm high, mixed with charcoal; a few potsherds were also found in this heap,*

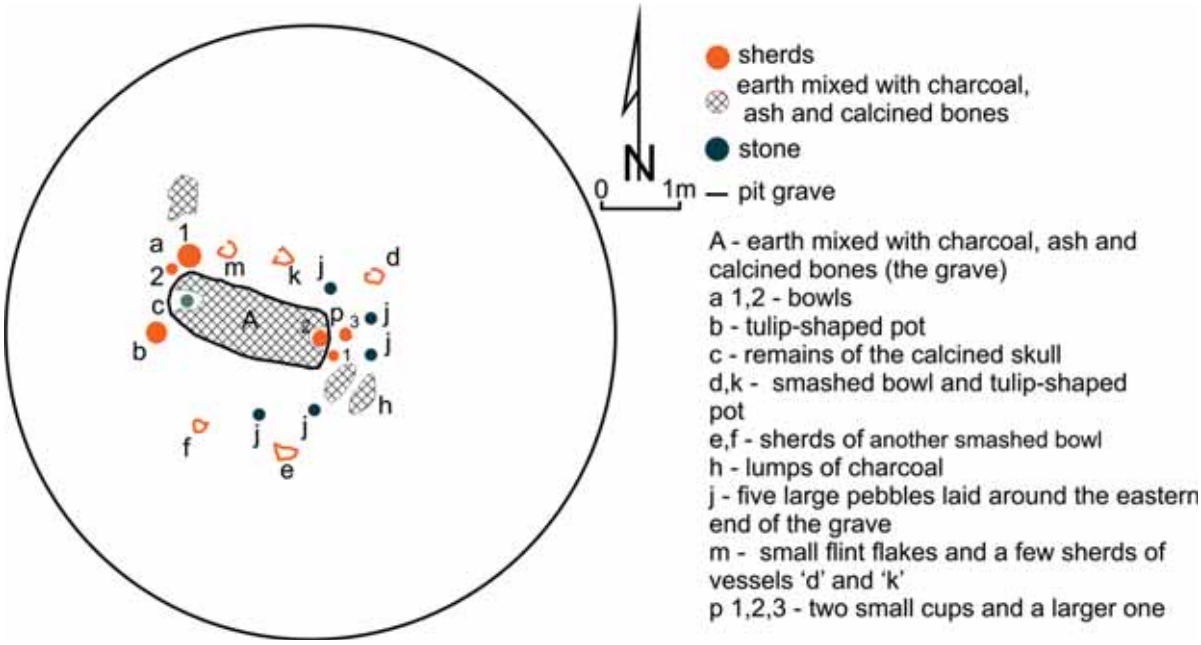



**Fig. VIII.105.** Digitalized plan of barrow 11 (Sulimirski 1968, Plan 13:2)

**Fig. VIII.106.** Vase, type W21, ornamented on the neck with four circumferential incised lines, on the body — with oblique broad grooves. Rim cut semicircularly, marked base. Temper of crushed stone and flint. H – 14.3 cm, R1 – 23.3 cm, R2 – 21.2 cm, R3 – 23 cm, R4 – 12 cm

*which belonged to vessels scattered along the northern side of the grave (d, k, m) i.e. a bowl with a fluted decoration (**Fig. VIII.110:4**; Sulimirski 1968, Fig. 27:5) and a tulip-shaped pot (**Fig. VIII.110:1**; Sulimirski 1968, Fig. 28:2). Along the other, south, side of the grave sherds of a bowl with a fluted decoration were found (e, f), also scattered (**Fig. VIII.110:2**; Sulimirski 1968, Fig. 27:10).*

**Fig. VIII.107.** Vase, type W12, ornamented on the body with two circumferential incised lines, below — with broad, oblique/arched flutes, forming narrow relief strips. Rim slightly thickened and cut straight, unmarked base. Temper of crushed stone and flint. H – 14.5 cm, R1 – 16 cm, R2 – 15.5 cm, R3 – 19 cm, R4 – 8.7 cm

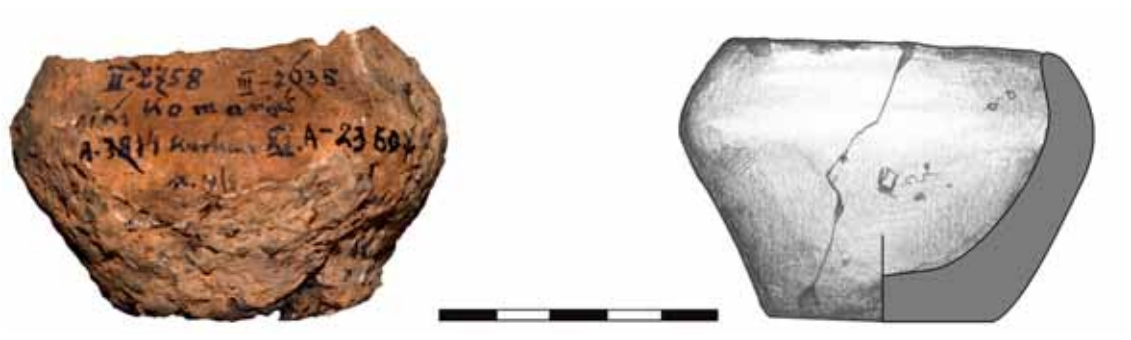


**Fig. VIII.108.** Vase, type W11, miniature, plain. Rounded rim; unmarked base. Temper of crushed stone and flint. H – 4.8 cm, R1 – 6 cm, R3 – 8 cm, R4 – 4 cm

**Fig. VIII.109.** Pot, type G112, miniature, plain. Faceted rim; unmarked base. Temper of crushed stone and flint. H – 5.2 cm, R1 – 6 cm, R2 – 5.5 cm, R3 – 6.3 cm, R4 – 4 cm

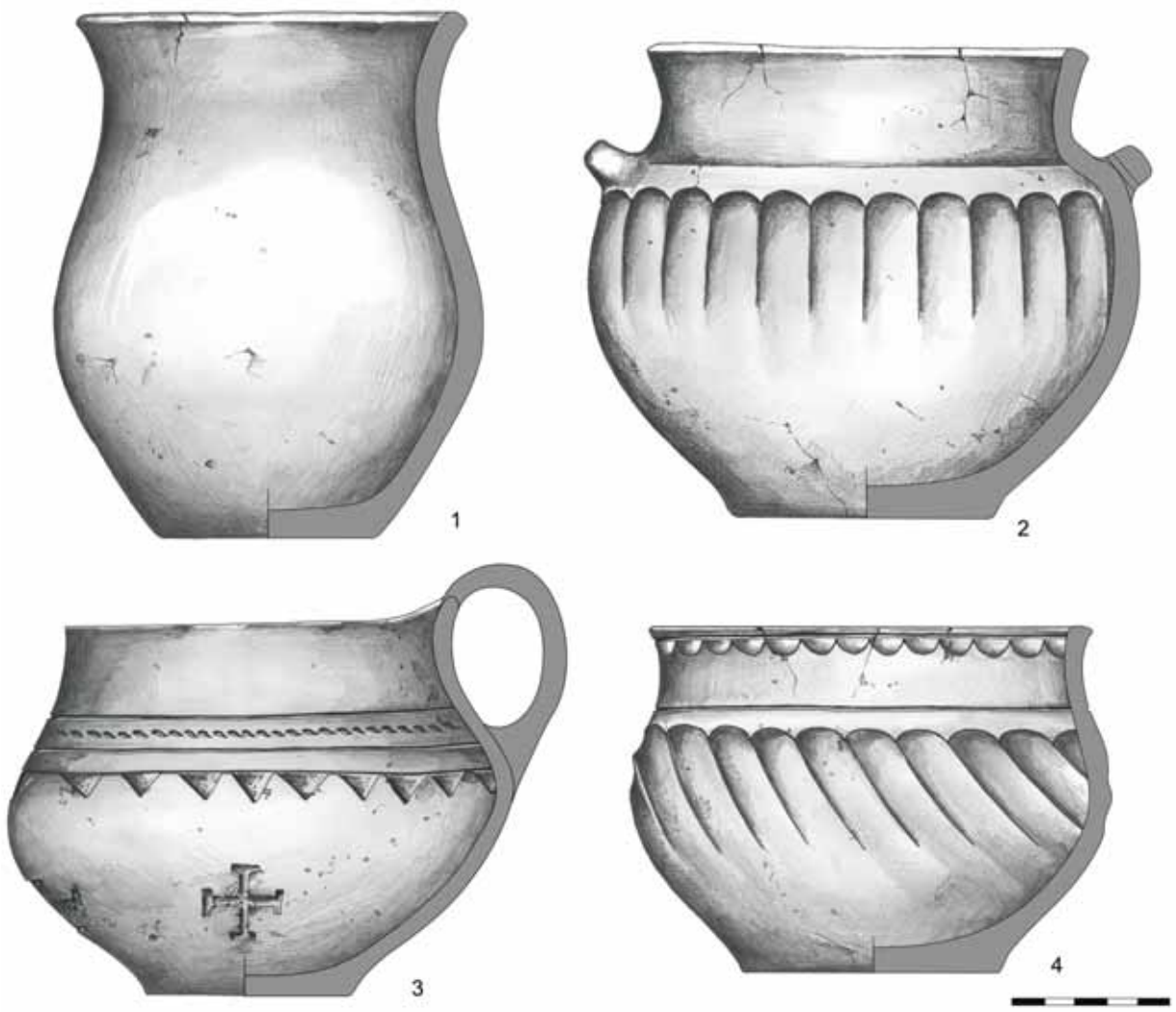



**Fig. VIII.110.** 1 – pot, type G112, slender, plain. Rounded rim; unmarked base. H – 16.8 cm, R1 – 12.5 cm, R2 – 10.5 cm, R3 – 13.5 cm, R4 – 6.5 cm; 2 – amphora, type A111, ornamented on the body with circumferential, vertical, broad flutes. Rounded rim; marked base, handles perforated vertically. H – 16 cm, R1 – 14 cm, R2 – 13 cm, R3 – 17.5 cm, R4 – 8.3 cm; 3 – jug, type D21, ornamented on the body with three circumferential, horizontal incised lines, between the first and second line, there are horizontal, teardrop pinholes, from the third, incised triangles diverge, below – centred Jerusalem cross. Rounded rim, inmarked base. H – 9 cm, R1 – 12.5 cm, R2 – 12.3 cm, R3 – 16.5 cm, R4 – 6.5 cm; 4 – vase, type W22, ornamented circumferentially under the rim with semicircular grooves, on the neck – with a horizontal incised line, below – with broad, oblique flutes. Rim cut straight, marked base. H – 11 cm, R1 – 14 cm, R2 – 13.5 cm, R3 – 15.3 cm, R4 – 8.2 cm

*Barrow-grave 12. 20 m in diameter, 80 cm high. A flint flake was found in the mound, and on the ancient surface, about 1 m S of the centre, lay a crushed tulip-shaped pot with a raised band on the neck. No traces of any skeleton were discerned.*

*Barrow-grave 13 (**Fig. VIII.111**; Sulimirski 1968, Plan 13:4). 15 m in diameter, 30-40 cm high, ploughed up, vessels and the grave partly ruined. South of the centre, on the ancient surface, a layer of almost completely decayed timber logs, or planks in line from W to E, lay over an area 1.7 m long and 1 m wide (h) (**Fig. VIII.112**). One perpendicular log lay at the eastern end of the grave. Under the timber cover a layer of dark, loose earth extended about 5 cm deep. In its western part slight traces of the skeleton were perceptible, in particular of the skull (g), near which lay a lump of fired clay, apparently as substitute for red ochre.*

*Around the grave, mainly in its corners, stood four vessels: a small undecorated cup (a) (**Fig. VIII.113**; Sulimirski 1968, Plate 21:9) on the eastern side; in the NE corner was a decorated, handled cup (b) (**Fig. VIII.114**; Sulimirski 1968, Plate 21:8) with a high, funnel-shaped collar;*

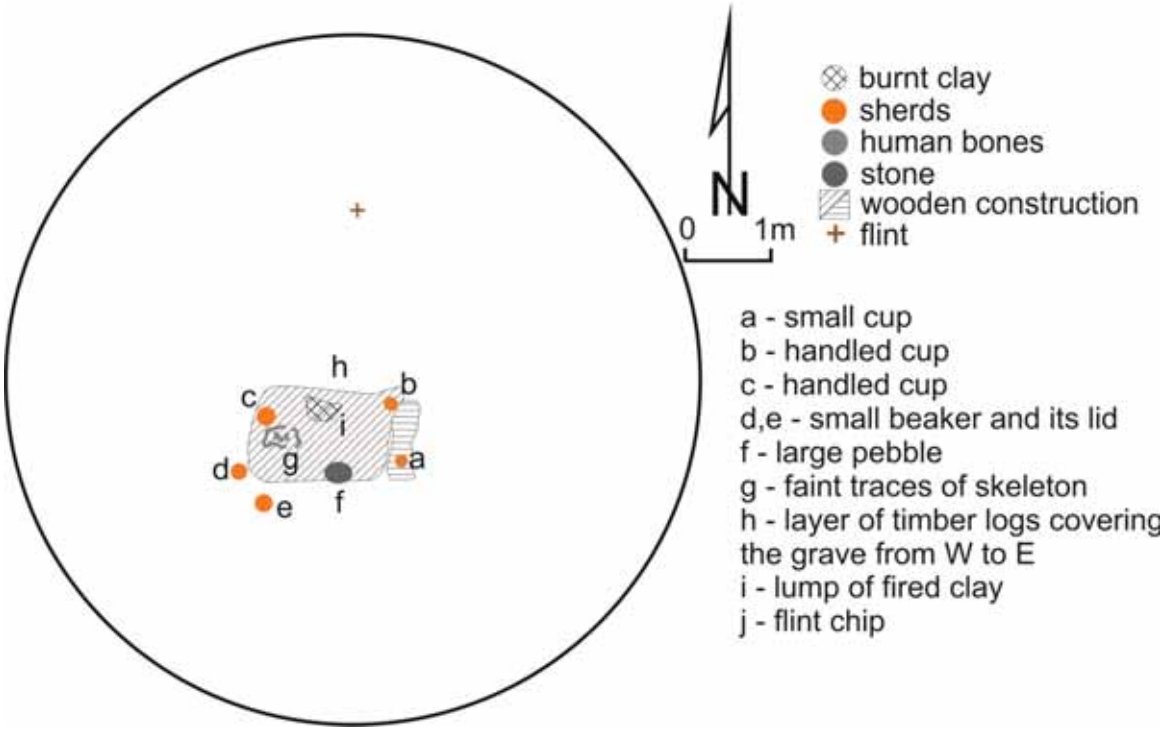



**Fig. VIII.111.** Digitalized plan of barrow 13 (Sulimirski 1968, Plan 13:4)

**Fig. VIII.112.** Barrow 13, remains of timber grave construction. Unpublished photo from the archive of Prof. T. Sulimirski. Courtesy of Prof. Jan Machnik and Dr. Paweł Jarosz, Institute of Archaeology and Ethnology, Polish Academy of Sciences, Cracow

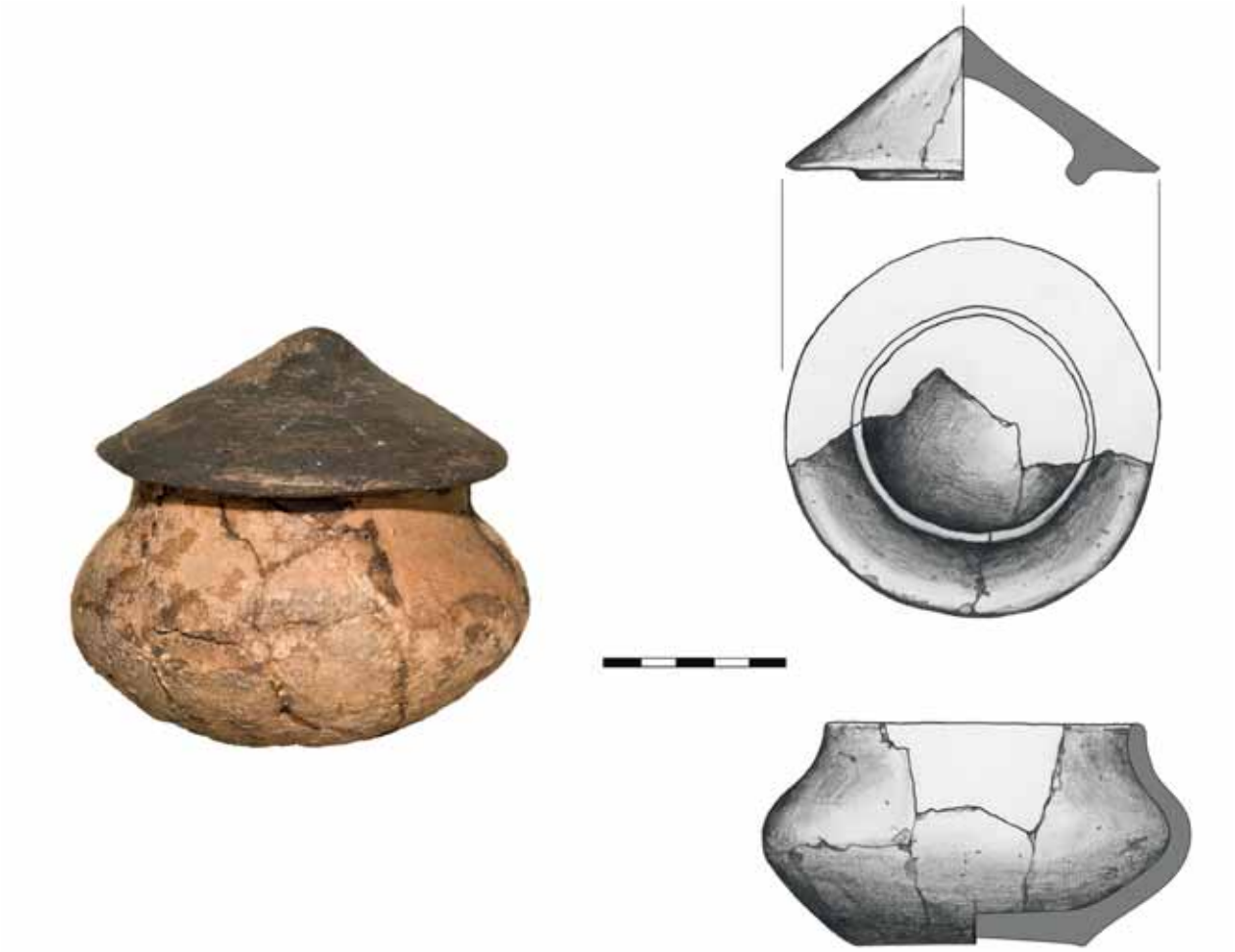


**Fig. VIII.113.** Vase, type W11 with a lid, plain. Rounded rim; unmarked base. Temper of crushed stone and flint. H – 6.2 cm, R1 – 9 cm, R3 – 12 cm, R4 – 6 cm. Lid triangular in profile, diameter: 10.5 cm, height: 4.5 cm

**Fig. VIII.114.** Jug, type D21, ornamented on the neck with three horizontal incised lines, on the body — with groups of slightly oblique incised lines (sets of four), bent towards one another at the top. Rounded rim; unmarked base. Temper of crushed stone and flint. H – 13.5 cm, R1 – 14.4 cm, R2 – 10 cm, R3 – 14.4 cm, R4 – 5.7 cm

**Fig. VIII.115.** Beaker, type P22a, ornamented with horizontal grooves on the whole surface. Rounded rim; pedestal base. Temper of crushed stone and flint. H – 9 cm, R1 – 9.5 cm, R2 – 8.5 cm, R3 – 9.1 cm, R4 – 6 cm

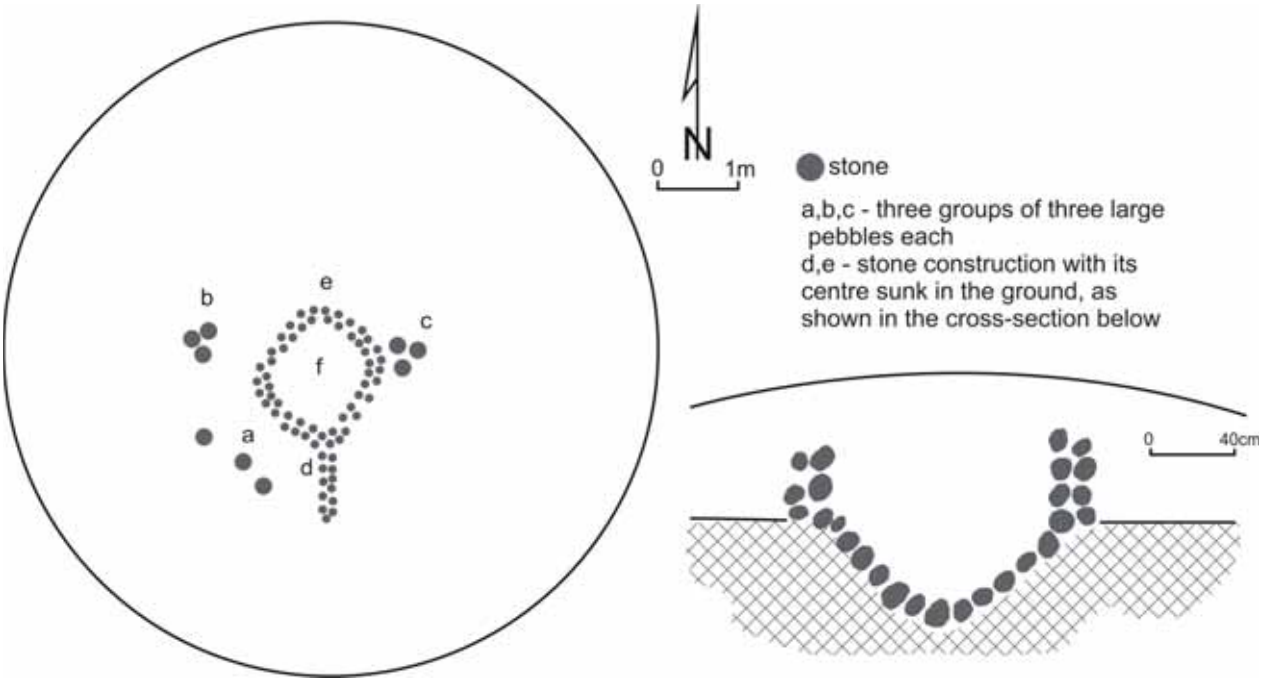



**Fig. VIII.116.** Digitalized plan of barrow 14 (Sulimirski 1968, Plan 13:3)

*in the NW corner another, destroyed, handled cup (c); finally, in the SW corner was a beaker (e) (**Fig. VIII.115**; Sulimirski 1968, Plate 21:10) upside down, with a flat rim and fluted horizontal decoration covering its entire body. Close to it lay its lid*[2] *(d), its surface dark-brown, well-polished (Fig. VIII.113; Sulimirski 1968, Plate 21:11).*

*Barrow-grave 14 (**Fig. VIII.116**; Sulimirski 1968, Plan 13:3). 17 m in diameter, 60-70 cm high. At a depth of 30 cm, in the mound itself, three groups of large pebbles (a, b, c) were found at a distance of about 2 m from each other. Deeper, in the area enclosed by these pebbles, upper stones of a peculiar stone construction appeared. This was a kind of square cist built of small boulders (e) laid in 3-4 layers in two rows, about 40 cm high above the ancient surface, orientated NW – SE, SW – NE, approximately 1.2 by 1.1 m in area. Its cobbled bottom (f) was funnel shaped and sunk about 50 cm in the ground. From the southern corner of the stone construction was a kind of wall built of smaller pebbles laid in two rows, about 25 cm wide, 20 cm high, 80 cm long (d). Nothing was found either in the construction, or around it and beneath it.*

[2] Lid may be also connected with the vessel (a), see Fig. VIII.113.

*Barrow-grave 15. 16 m in diameter, 30 cm high, completely ruined by ploughing. Only a few flints and potsherds were found in the arable soil. The latter belonged to a large red vessel made of clay paste tempered with crushed stones and fired clay, which was probably of a type and size similar to the large vessel from barrow-grave 20.*

*Barrow-grave 16 (**Fig. VIII.117**; Sulimirski 1968, Plan 13:1) belonged to a group of three Neolithic barrow-graves (nos. 17 and 18), near the western end of the cemetery, in the 'Wąski tryb' forest, close to the border of Medynia. It was 12 m in diameter, 60 cm high, NW of the centre; on the ancient surface a layer of timber logs or planks (probably beech) (c) almost completely decayed, was uncovered. They were about 1.8 m long and covered an area 70 cm wide, orientated NW – SE. Nothing was found either around or beneath this layer. Further north, about 2 m from the centre, also on the ancient surface, calcined human bones were found on two heaps, 10-15 cm thick, mixed with cinders, charcoal and fired earth, covering an area 130 by 30 cm, orientated NW – SE (a). No traces of the pyre in which the corpse was cremated were found. In the eastern heap of bones a flint knife, 10 cm long (b) was found and another 8 cm long, lay about 1 m SW of the grave on the ancient surface (e). At the SE end of the area with calcined bones, was a lump of red fired clay, 20 cm in diameter (d).*

*Barrow-grave 17, 16 m in diameter, 80 cm high. In the central part a few lumps of charcoal were found on the ancient surface within an area 2 by 1 m. North of this a flint flake (a), and west of it a large flint blade, probably a knife or dagger (b), 12 cm long, were found on the ancient surface.*

*Barrow-grave 18 (Sulimirski 1968, Plan 15:1). 27 m in diameter, about 2.5 m high. Traces of a pit dug by treasure hunters were well marked in the centre (g). Fortunately they had not reached the grave. About 3 m NE of the centre, at a depth of 60-80 cm (in the mound earth) four flint blades, some of them trimmed, a lump of charcoal and a small lump of red ochre were found (a). The grave was uncovered on the ancient surface at a distance of about 1 m NE of the centre (f). This was a shallow shaft, 1.6 m by 80 cm in area, rectangular in plan, orientated NW – SE, not more than about 25 cm deep. In its western corner were found a few calcined bones and a few more lay scattered along the middle of the shaft, along with a few pieces of charcoal. In the eastern corner of the grave a flint point was found sticking in the side of the shaft (e); this was probably the head of a digging stick. A flint blade, partly trimmed, was found in the western corner of the shaft. West of the grave, on the ancient surface, charcoal was strewn over an area about 2 by 1 m wide (d). Two metres NE of the grave, a few lumps of ochre were found (c) in the mound earth, at a depth of 1.2 m. No pottery was excavated.*

*Barrow-grave 19 formed part of a larger group of mounds situated in the central part of the cemetery. It*

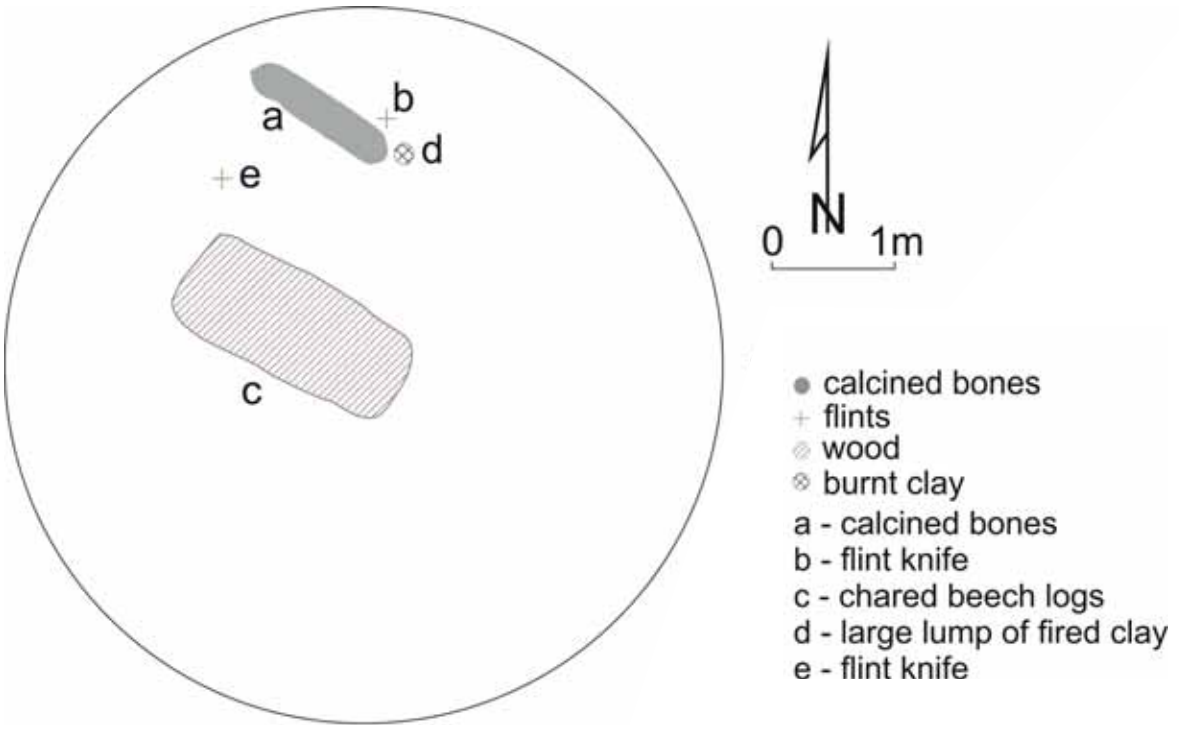



**Fig. VIII.117.** Digitalized plan of barrow 16 (Sulimirski 1968, Plan 13:1)

*was 19 m in diameter, about 50 cm high. A flint knife (a) 8.2 cm long, was found 2 m NE of the centre at a depth of 30 cm. Some odd potsherds lay in a few places in the mound at depths of 20-30 cm. About 2.5 m NE of the centre, at a depth of 25 cm, was an area about 1 m in diameter covered with small lumps of fired clay, over which lay a large potsherd of a large vessel (b). It was of the same type as that found in barrow-grave 20, its slipped walls, 16 mm thick, were reddish in colour.*

*Barrow-grave 20 (**Fig. VIII.18**; Sulimirski 1968, Plan 14:3) was 18 m in diameter, 50 cm high, and had a somewhat complicated structure. In the mound, at a depth of about 15- -20 cm, a few flint flakes (a) and small odd potsherds (b) were found. The ancient surface occurred at a depth of 30 cm from the top of the mound. At about 3.3 m NW of the centre (f), charcoal was found strewn on this level, beneath which the grave-shaft was uncovered, dug 40 cm in the ancient ground (70 cm below the top of the mound). At this depth a layer of almost completely decayed timber logs appeared (f). These were 1.5 m long, 60 cm wide, forming a rectangle orientated NW – SE. This was probably the floor of the grave. The following objects were found on this timber platform: near its eastern end was a handled cylindrical cup (f-2) (Sulimirski 1968, Fig. 29:8) or tankard, near which lay a small stone battle-axe (f-3) (Sulimirski 1968, Fig. 35:15), 9.2 cm long. Near the vessel, and towards the western end, calcined human bones, concentrated chiefly within an area 70 cm long, lay on the platform. In the SE corner, but outside the grave, a flint arrow-head (f-1) was found (Sulimirski 1968, Plate 9:15).*

*On the ancient surface, about 1.5 m W of the above grave, an area 1 m in diameter was uncovered, within which the ground surface was hard, red-fired; this was a hearth from which cinders and charcoal had been removed. In the centre lay a very large vase (j) (Sulimirski 1968, Fig. 29:7) with a flat rim, with four warts on the body, walls partly matt, reddish, partly black, slightly polished, made of tempered clay paste, brittle. Near the vessel lay two pebbles, and a third under it. The vessel had been broken into small pieces.*

*At a distance of 2.5 m SSW of the centre, a concentration of boulders tightly laid in two layers appeared (d), about 1.6 by 1 m in area. The lower layer was dug into the ancient ground, the upper layer reached about 30 cm above the ancient surface. Beneath the boulders were found a few lumps of charcoal. About 1 m S of this one, another concentration of*

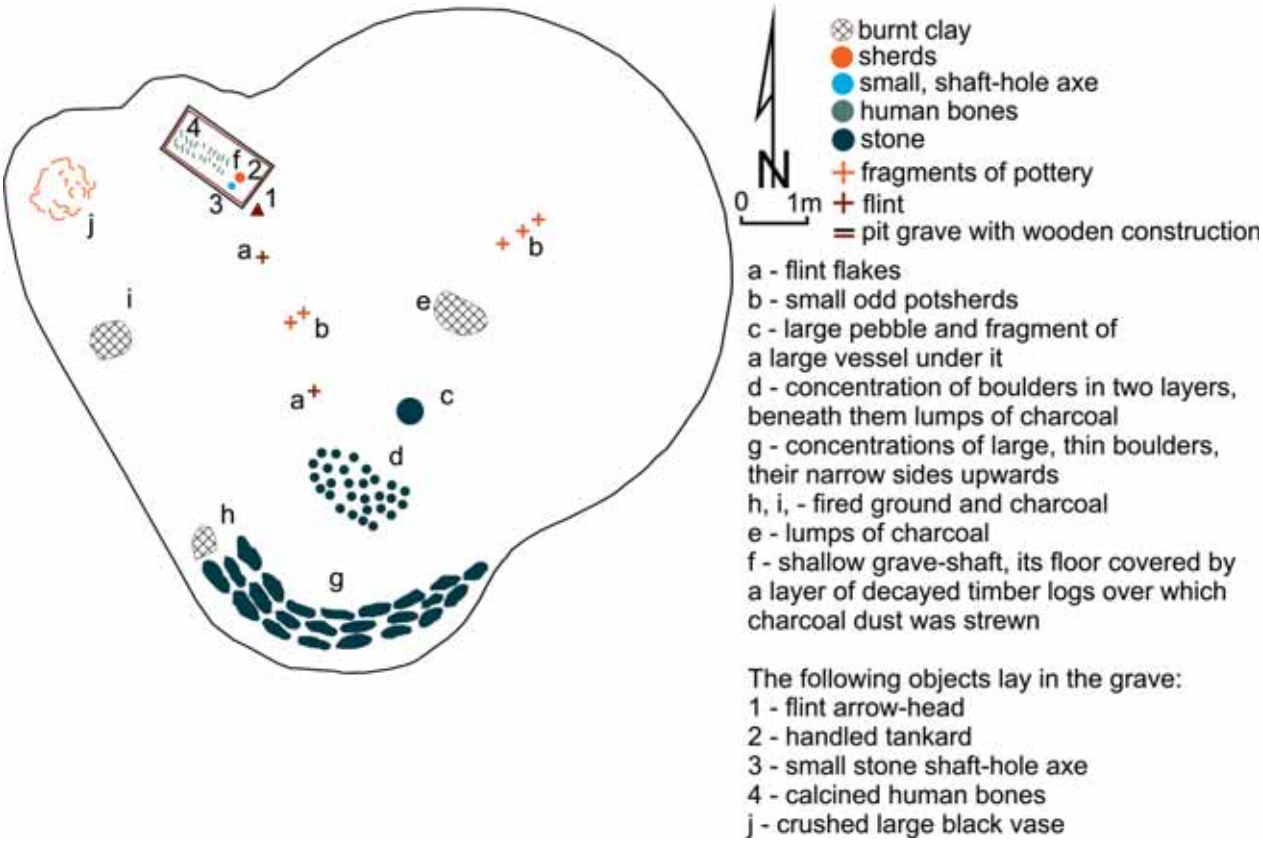



**Fig. VIII.118.** Digitalized plan of barrow 20 (Sulimirski 1968, Plan 14:3)

*stones was uncovered Large, but thin, pebbles laid close to each other with their narrow sides upwards, forming a crescent about 4 m long, 90 cm wide on its western side, thinning out towards its eastern end. Nothing was found here apart from stones, but an area about 50 cm in diameter (h) of fired ground, on which charcoal lay was joined to its western end. A similar area (i) was found halfway between this and that on which lay the large vessel (j).*

*Barrow-grave 21 (**Fig. VIII.119**; Sulimirski 1968, Plan 14:1). 16 m in diameter, 50 cm high. In various points in the mound a few odd potsherds and flint flakes*

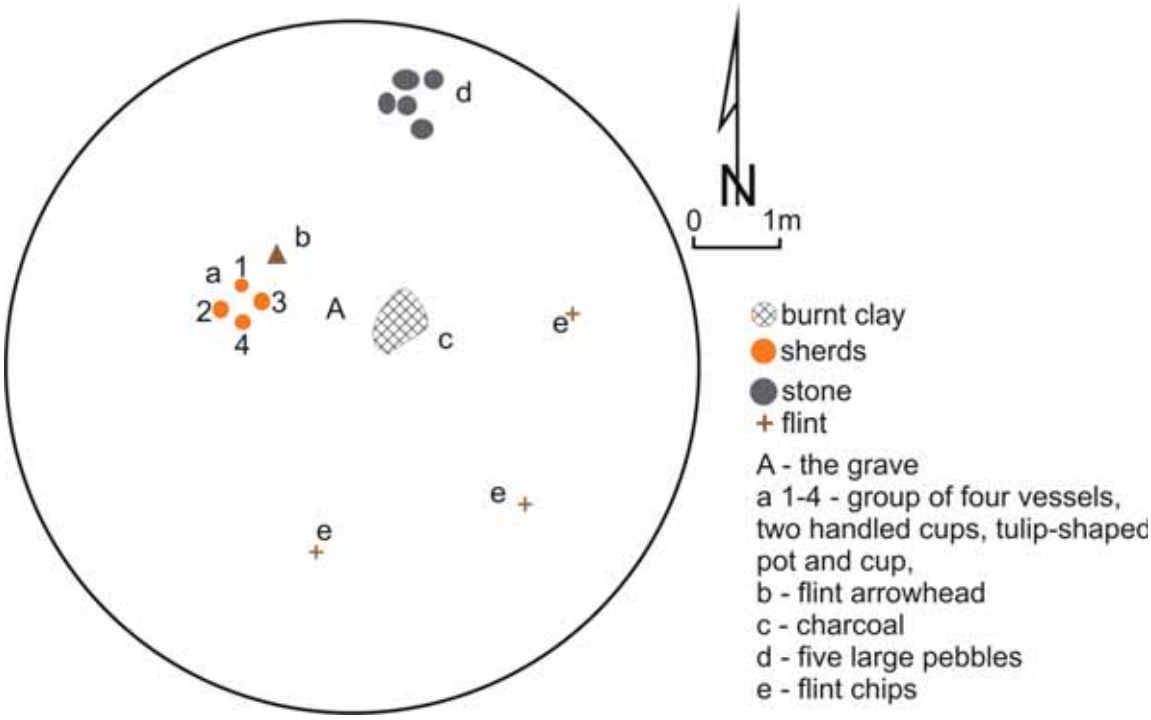



**Fig. VIII.119.** Digitalized plan of barrow 21 (Sulimirski 1968, Plan 14:1)

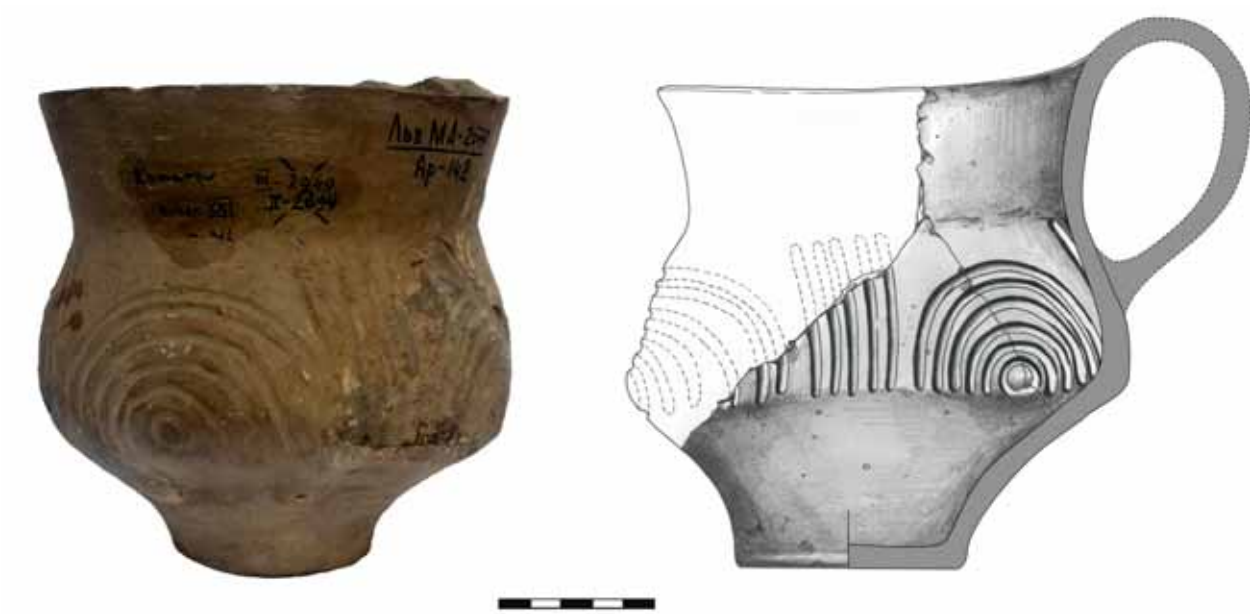


**Fig. VIII.120.** Jug, type D21, ornamented on the body with appliqué bosses rimmed with semicircular incised lines at the top, between them, five vertical lines, slightly arched. Rounded rim; marked base. Temper of crushed stone and flint. H – 16 cm, R1 – 14 cm, R2 – 12.6 cm, R3 – 16.3 cm, R4 – 7.2 cm

*were excavated. About 3 m N of the centre a group of five large pebbles was uncovered (d) which lay within an area 1 m in diameter.*

*The grave (A) (no traces of the skeleton were left) was north of the centre, and marked by grave goods lying on the ancient surface, 40 cm under the top of the mound. They consisted of: two decorated handled cups, one larger (a-1) (**Fig. VIII.120**; Sulimirski 1968, Plate 16:4) than the other (a-2) (**Fig. VIII.121**; Sulimirski 1968, Plate 16:14.), both with four protuberances on the body encircled by semicircular grooves, the larger on a hollow stand, or ring; an undecorated cup with an everted rim (a-4) (**Fig. VIII.122**; Sulimirski 1968, Plate 16:11); a tulip-shaped pot (a-3); a flint arrow-head (Sulimirski 1968, Plate 9:18) 2.5 cm long with a convex base, made of light brown flint, found about 50 cm NE of the group of the above vessels; and finally a handful of charcoal scattered 50 cm NE of this group.*

*Barrow-grave 22. 17 m in diameter, 40 cm high. A few odd potsherds were found in the mound, while an almost completely crushed vessel (b) which disintegrated was lying on the ancient surface, at a depth of 30 cm, about 50 cm NW of the centre.*

*Barrow-grave 23 (**Fig. VIII.123**; Sulimirski 1968, Plan 14:2). 18 m in diameter, 50 cm high. In several points in the mound a few odd potsherds and flint flakes were excavated, and about 1 m SE of the centre, at a depth of 20 cm, just under the arable soil, lay a bone point 14.6 cm long. Two metres SW of the centre a small concentration (a) of potsherds and a lump of ochre lay on the ancient surface, at a depth of 24 cm. Close to it, a little to the NW, another concentration of potsherds (b) was found on the same level. They belonged to a very large broken vessel of a type similar to that from barrow-grave 20 (j). Its walls were about 1 cm thick, reddish on the outside, black inside, and large decorative warts were present on a few sherds. Sherds in concentration 'a' belonged to the same vessel.*

**Fig. VIII.121.** Cup, type K22, ornamented circumferentially on the neck with oblique pinholes, on the body – with appliqué bosses rimmed by three incised arches at the top. Rounded rim; unmarked base. H – 8.5 cm, R1 – 9 cm, R2 – 8.1 cm, R3 – 10.3 cm, R4 – 4.8 cm

**Fig. VIII.122.** Pot, type G112, deformed, plain. Rounded rim; base slightly marked. Temper of crushed stone and flint. H – 9 cm, R1 – 8.5 cm, R2 – 7.2 cm, R3 – 9.3 cm, R4 – 4 cm

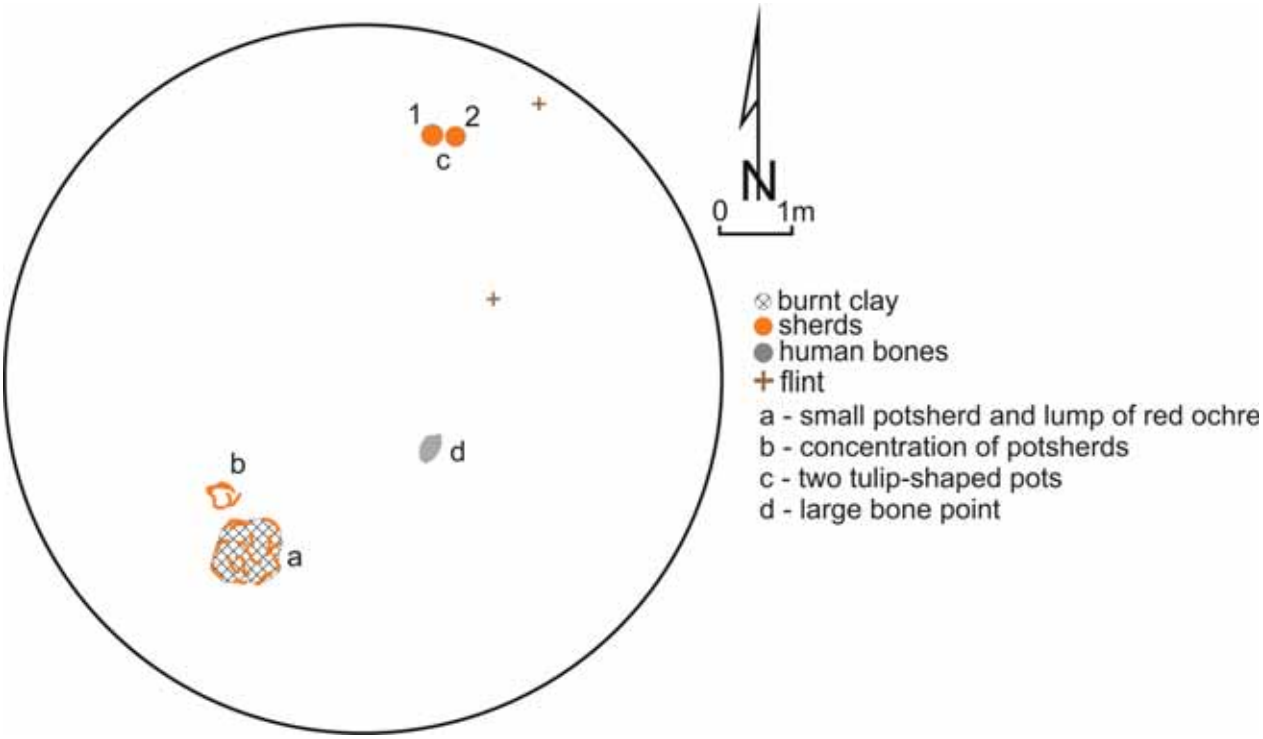



**Fig. VIII.123.** Digitalized plan of barrow 23 (Sulimirski 1968, Plan 14:2)

**Fig. VIII.124.** Pot, type G112, plain. Thickened, rounded rim; unmarked base. Temper of crushed stone and flint. H – 21 cm, R1 – 17.5 cm, R2 – 15.2 cm, R3 – 17 cm, R4 – 10 cm

*At a distance of 3.5 m N of the centre, two tulip-shaped pots (c-1, 2) (**Fig. VIII.124**; Sulimirski 1968, Plate 18:10) were found at a depth of 40 cm, apparently placed in a hole; they probably marked the site of the burial. Both were badly crushed, and only one could be reconstructed.*

*Barrow-grave 24. The mound had been destroyed several years previous to the excavation and its earth used to fill some cavities in the ground near-by. What remained of the mound was investigated, but only a few flint flakes and a flint axe (Sulimirski 1968, Fig. 15:7),*

*evidently displaced, were found. The axe was well-made of black flint, rectangular in section, 7.8 cm long.*

*Barrow-grave 25 belonged to a group of two mounds west of those described above. It was 20 m in diameter, 50 cm high. At a depth of 40 cm, on the ancient surface, several irregular flint blades, some of them worked, flint flakes and a few small odd potsherds, were found all over the area covered by the mound. No traces of the skeleton were found, or of the grave-shaft but the site of the burial was marked by a completely crushed vessel, a cup (a) or beaker, which disintegrated, lying on the ancient surface 1 m NE of the centre, and a stone battle-axe found at the same level close to the centre at a distance of about 1 m from the vessel. The battle-axe, 10 cm long, was made of the lower part of a typical Fatyanovo axe, with a new shaft-hole bored after the original axe had been broken.*

*Barrow-grave 26 was 19 m in diameter, 60 cm high, and belonged to the same group as the above. About 1 m NW of the centre, at a depth of 50 cm, on the ancient surface, lay a charred piece of log, some 50-60 cm long, orientated SW – NE. Near it, but at a level about 15 cm higher, a single potsherd was found (a-2), and another on the ancient level, lay 3.5 m west of the centre (a-1). Both potsherds were of Neolithic character, made of tempered clay paste, reddish on the outside, the paste being dark, or black.*

*Barrow-grave 27 (**Fig. VIII.125**) belonged to the larger group of mounds described before the two above. It was 16 m in diameter, about 40 cm high. In a few places in the mound itself, and under it on the ancient surface, a few odd potsherds and small flint flakes were found. At a distance of about 3 m N of the centre, at a depth of 45-50 cm, an area was uncovered, about 5 by 1 m orientated roughly W – E, on which lay reddish fired clay with charcoal. Both ends of this area (a, b) about 1 m in diameter, had a much larger admixture of charcoal, and in the eastern end a potsherd was found (a). It originated from a large vessel, reddish, surface smoothed.*

*At a distance of nearly 1 m SE of the centre, a tulip-shaped pot was found in a shallow hole (c) (**Fig. VIII.126**; Sulimirski 1968, Plate 18:14.) decorated with nine parallel grooves around the neck. Inside this vessel lay a flat pebble, 16.5 cm long, 9.5 cm wide, 2.5 cm thick, with one end flattened. It was reminiscent of a flint axe and seems to have been chosen because of its shape. Some 25 cm south of the vessel a large boulder lay on the ancient surface, 25 cm long, 12 cm wide, nearly square in section, with its sides deliberately cut to form a cube.*

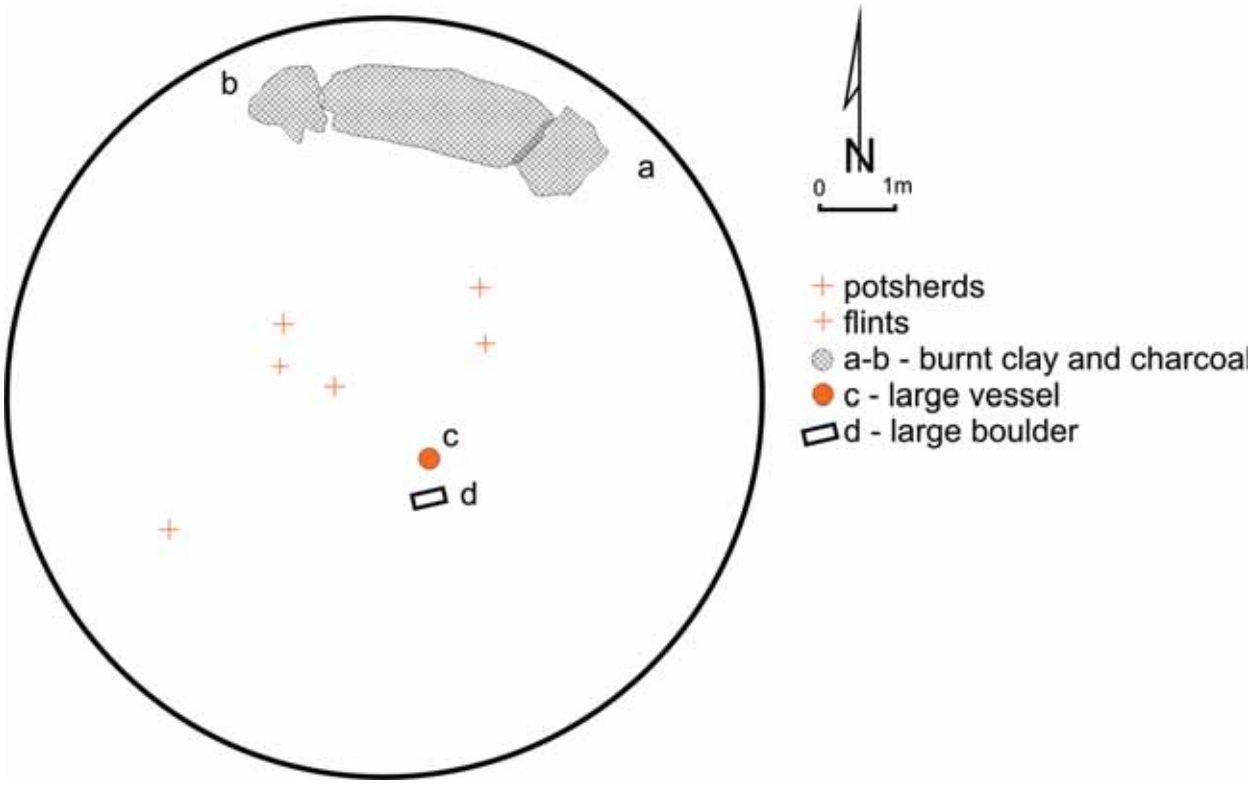



**Fig. VIII.125.** Digitalized plan of barrow 27 (unpublished, archive of T. Sulimirski). Courtesy of Prof. Jan Machnik and Dr. Paweł Jarosz, Institute of Archaeology and Ethnology, Polish Academy of Sciences, Cracow

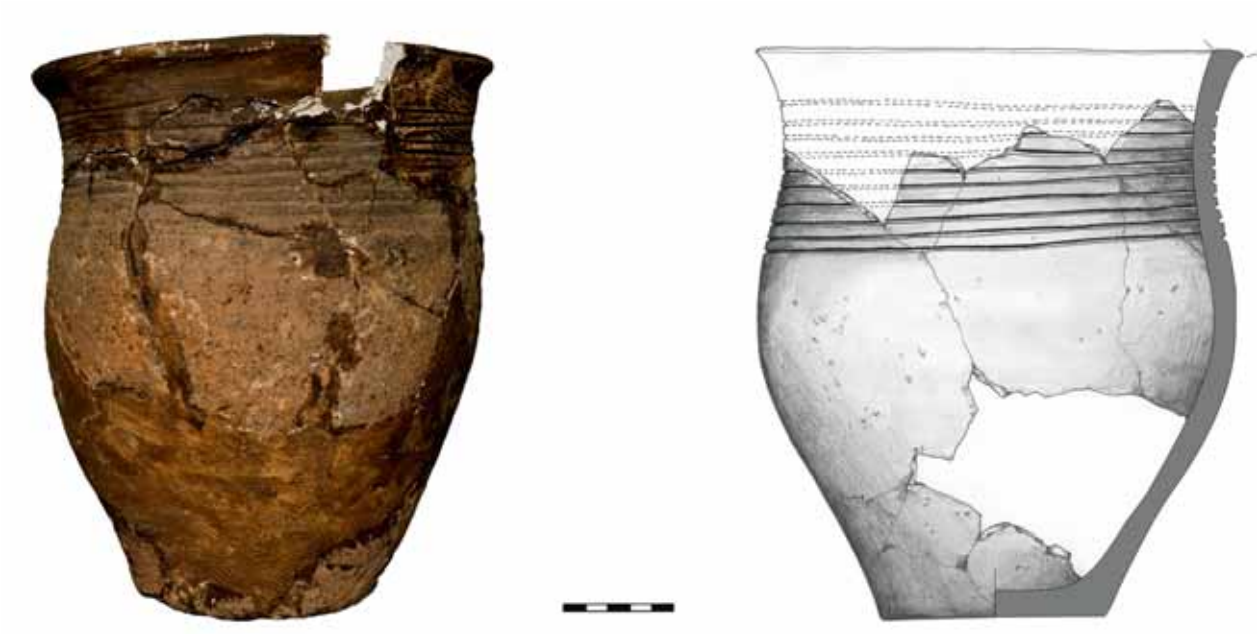


**Fig. VIII.126.** Beaker, type P22, ornamented on the neck and body with ten horizontal incised lines. Thickened rim, cut straight, unmarked base. Temper of crushed stone and flint. H – 25.5 cm, R1 – 21.6 cm, R2 – 19 cm, R3 – 21.4 cm, R4 – 10 cm

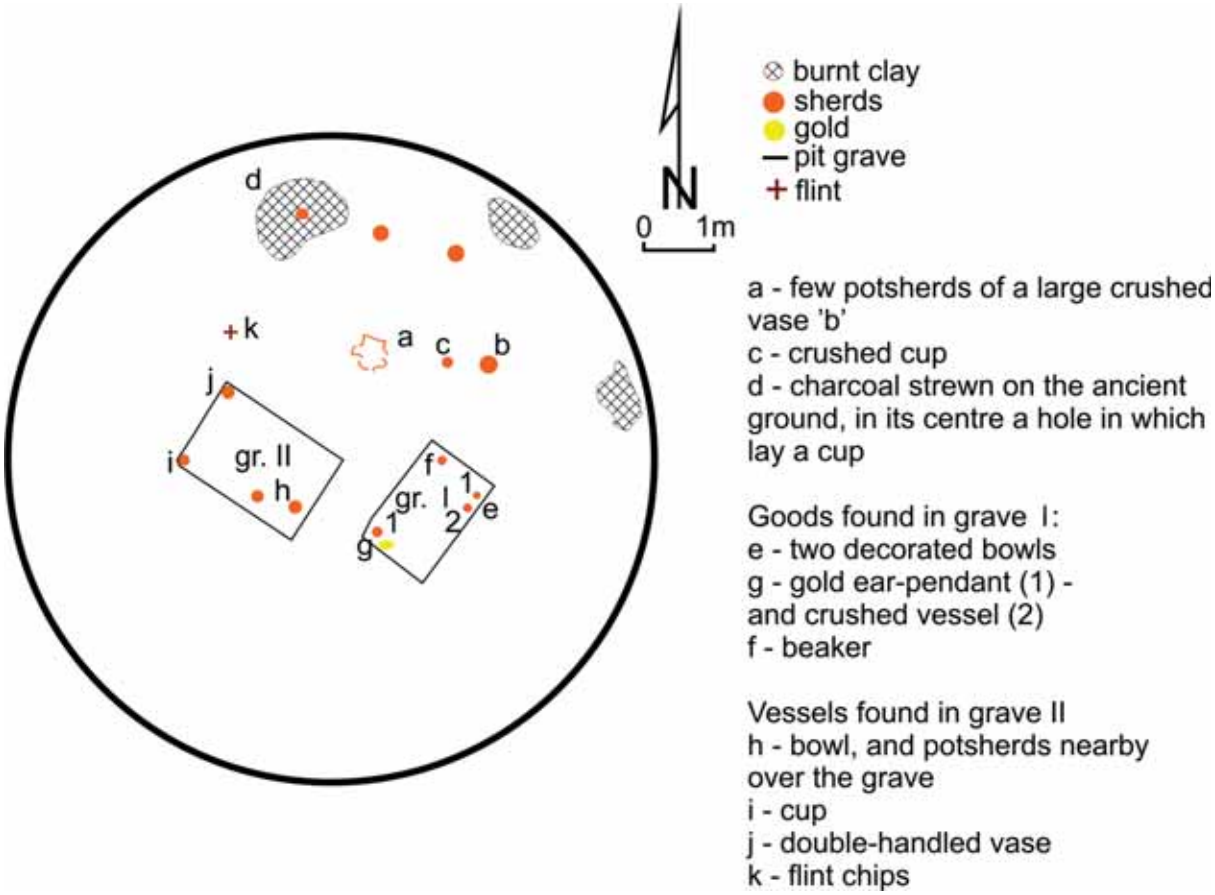



**Fig. VIII.127.** Digitalized plan of barrow 28 (Sulimirski 1968, Plan 15:2)

*Barrow-grave 28 (**Fig. VIII.127**; Sulimirski 1968, Plan 15:2) formed part of another group of mounds. It was 14 m in diameter, 30 cm high, much ploughed up. It lay on the northern slope of the hill.*

*A few odd potsherds and a flint flake were found in the mound or on the ancient surface, mainly in the NE part of the mound. At one point (a) a few potsherds of a large vessel lay. At a depth of 15-20 cm, a little above the ancient surface, near the northern and north-eastern periphery of the area investigated, patches about 1 m in diameter were uncovered over which charcoal dust and lumps were strewn. Under the northern of these (d) (**Fig. VIII.128**; Sulimirski 1968, Fig. 28:11), a straight-sided cup was found in a hole dug about 35 cm in the ancient ground (about 70 cm, from the top of the mound). About 2 m NE of the centre, at a depth of 70 cm, two vessels were found near each other: one was a very large vase (b) partly crushed, its rim flat, with a raised band under it (**Fig. VIII.129:1**; Sulimirski 1968, Fig. 28:8), sherds found in place marked 'a' belonged to the same vessel; the other (c) was an undecorated cup (**Fig. VIII.130**).*

*In the centre two burial sites were uncovered on the ancient surface, both marked by vessels laid in their corners. Grave 1, at a distance of about 1 m SE of the centre, was rectangular in plan, about 2 by 1 m, orientated NE – SW. On its northern side stood an undecorated beaker (f) (**Fig. VIII.129:4**); in its eastern corner lay two small decorated bowls (e) (**Fig. VIII.129:2**; Sulimirski 1968, Fig. 28:9), one of which (e-2) was crushed and disintegrated. In the SW corner lay a gold ear-pendant (**Fig. VIII.131**; Sulimirski 1968, Fig. 26:11) bearing traces of having been repaired in antiquity 3.5 cm long (g) and a crushed vessel (**Fig. VIII.132**). The other grave 11 was perpendicular to this, also about 2 by 1 m in area, orientated NW – SE, situated at a distance of about 60 cm NW of the former. In the southern corner was an undecorated bowl (h) (**Fig. VIII.133**). The western corner was marked by a cup (d) (**Fig. VIII.134**; Sulimirski 1968, Fig. 28:10) oval in section, with sides decorated by horizontal and vertical grooves. The vessel from the northern corner (was a vase with two handles (**Fig. VIII.129:3**; Sulimirski 1968, Plate 17:13) having horizontal grooves on the neck and shaded triangles on the upper part of the body.*

*Barrow-grave 29 (Sulimirski 1968, Plan 15:3). 16 m in diameter, 45 cm high, ploughed up. In a few places on the ancient surface odd potsherds and flint flakes were found, and about 2 m N of the centre lay a small crushed vessel (a) which disintegrated.*

*Barrow-grave 30 (Sulimirski 1968, Plan 16:3) lay on a field situated on a lower hill nearer the village, outside the main cemetery. It was 14 m in diameter, 80 cm high. In the central part of the mound lumps of charcoal appeared just under the arable soil. South of the centre, at a depth of 50-70 cm, charred timber logs or sticks were found heaped, crossing each other, covering an area about 4 by 2 m, orientated SW – NE (a). In a few places, at various depths, odd potsherds were found. They were of a Neolithic character.*

**Fig. VIII.128.** Beaker, type P1, ornamented under the rim and next to the bottom with four horizontal incised lines, on the body — with angular patterns made of incised lines (sets of six). Rim cut straight; unmarked base. Temper of crushed stone and flint. H – 10 cm, R1 – 10.3 cm, R3 – 10 cm, R4 – 7.5 cm

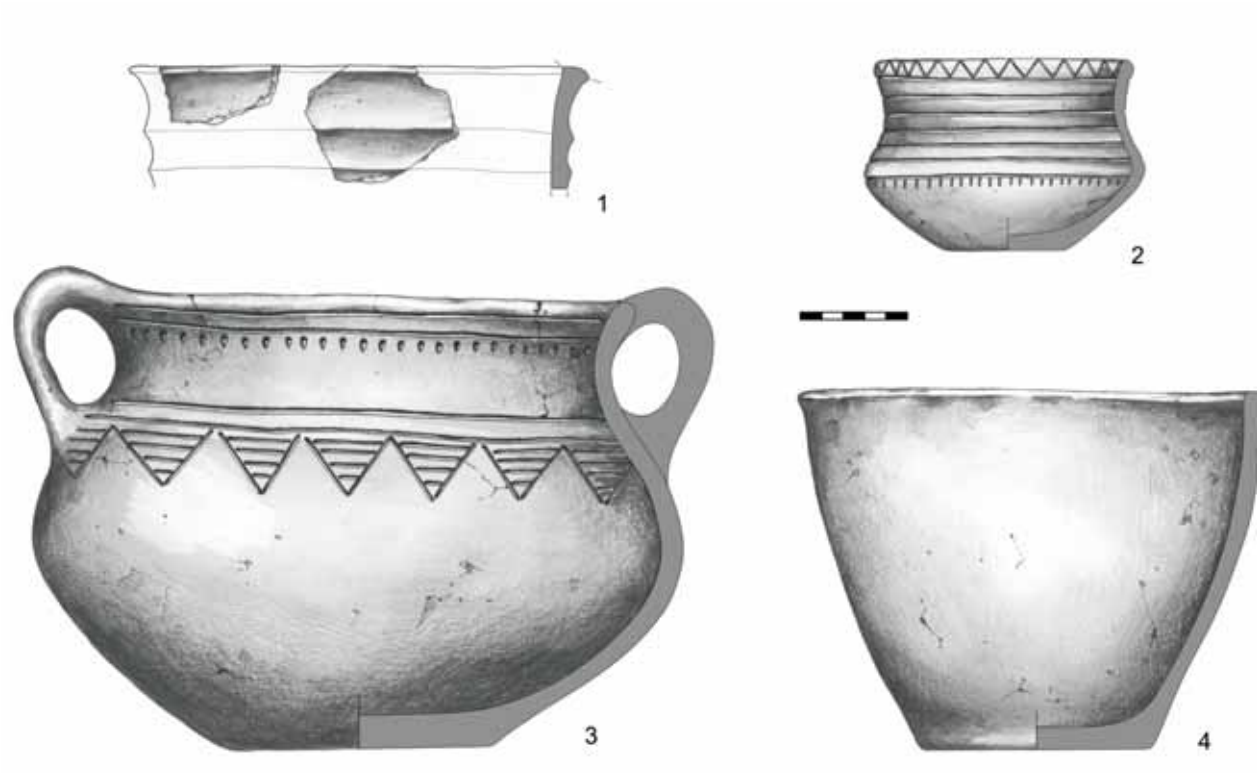



**Fig. VIII.129.** 1 – pot?, preserved in fragments, ornamented on the neck with two horizontal relief strips. Thickened rim, cut semicircularly. R1 – 21.5 cm; 2 – vase, type W22, ornamented circumferentially under the rim with angles, on the neck and body – with seven horizontal incised lines, the lowest one is adjoined by short, vertical pinholes. Rounded rim; unmarked base. H1 – 9 cm, R1 – 12.2 cm, R2 – 11.3 cm, R3 – 13.3 cm, R4 – 5.5 cm; 3 – vase, type W22a, (with strap handles), ornamented under the rim with two horizontal incised lines, below – with vertical pinholes, on the body — with two horizontal incised lines and triangles hatched with horizontal lines, rounded rim, unmarked base. H1 – 21.5 cm, R1 – 25.5 cm, R2 – 23.4 cm, R3 – 30.5 cm, R4 – 11.9 cm; 4 – beaker, type P1, plain. Thickened, rounded rim; unmarked base. H1 – 17 cm, R1 – 22 cm, R4 – 10.7 cm

**Fig. VIII.130.** Beaker, type P1, plain. Rounded rim; base slightly marked. Temper of crushed stone and flint. H – 9 cm, R1 – 8.5 cm, R4 – 4.5 cm

**Fig. VIII.131.** Sheet-gold pendant, made of several pieces joined with rivets, defragmented. Dimensions: 3.5 × 3.2 cm

**Fig. VIII.132.** Vase, type W11, plain. Rim cut straight; unmarked base. Temper of crushed stone and flint. H – 12 cm, R1 – 14.5 cm, R2 – 14.4 cm, R3 – 17 cm, R4 – 8.8 cm

**Fig. VIII.133.** Beaker, type 1, plain. Rounded rim; unmarked base. Temper of crushed stone and flint. H – 11.7 cm, R1 – 15.9 cm, R4 – 7.8 cm

**Fig. VIII.134.** Beaker, type P11, preserved in part, ornamented on the body with oblique incised lines, arranged in sets of six and forming probably angular motifs, at the base — with four horizontal incised lines. Rim cut straight. Temper of crushed stone and flint. H – 9.7 cm, R1 – 10 cm, R4 – 7 cm

*Barrow-grave 31 (Sulimirski 1968, Plan 17:2) was situated in the western part of the cemetery, in a part of the forest known as 'Maliniska', and it formed a group with mound 55. It was 16 m in diameter, 1 m high. Three potsherds were found on the ancient surface in the central part under the mound. About 1.5 m SE of the centre, within an area 1.5 by 1 m on the ancient surface charcoal was strewn in a very thin and uneven layer. On the eastern end of this area stood two vessels, and near the SW corner lay a flint implement 5.5 cm long, damaged by fire. One of the vessels (a-1) was a Thuringian amphora broken into small pieces, many of them being completely crushed. It was made of tempered clay paste and was very slightly baked, very brittle, it could not be reconstructed. The other vessel (a-2) was a beaker (Sulimirski 1968, Fig. 9:2) made of tempered clay paste, very brittle. Both vessels stood on a level slightly lower than that of the charcoal. This was the site of the burial, but no traces of skeleton were noticed.*

*Barrow-grave 32 (Sulimirski 1968, Plan 18). A third of this mound was destroyed by a forest road cut across it. It was 20 m in diameter, 1.8 m high. It formed part of a group of three barrow-graves (nos. 33 and 34), situated in a part of the forest known as 'Mała Sośnina'.*

*At a depth of 70-90 cm, odd potsherds, a flint flake and lumps of charcoal were found, scattered mainly around the central part of the mound. The upper part of a broken hammer made of siliceous slate, 7 cm long, nearly rectangular in section, also lay about 2 m W of the centre (b) (Sulimirski 1968, Fig. 16:24).*

*More remains were found deeper, at a depth of 1.4 to 1.6 m. Odd potsherds lay scattered all over the ancient surface, and in many places small flint flakes and parts of broken implements were lying; among the latter was the edge of an axe. North-west of the centre, an area 2 by 1 m was found covered with densely strewn charcoal (I), and another similar area (II), a little larger, 2.5 by 1 m, lay 2.5 m NE of the centre; both were orientated NW – SE. On the first of these lay two potsherds. These large patches of charcoal marked probably the sites of the burials, but no skeletons were discernible here. At a distance of about 2 m from the second of these patches, on the edge of the destroyed part of the mound, two small, crushed vessels (a) were excavated at a depth of 1.4 cm. Both were undecorated cups, made of tempered clay paste, insufficiently baked, brittle, and both disintegrated.*

*Barrow-grave 33 (**Fig. VIII.135**; Sulimirski 1968, Plan 17:1). 18 m in diameter, about 1.5 m high, situated close to the above. At a depth of 25 cm, under the forest soil, several small potsherds and a few flint flakes were found scattered over the whole mound. In the central part of the mound, in its eastern part, a layer of reddish, fired earth occurred at this depth. It extended over an area oval in plan, 5 by 4 m, orientated N – S, 25 cm thick at its circumference, about 50 cm nearer to its centre. The reddish earth was mixed up with cinders, charcoal, while calcined human bones were also found in it, mainly in its central part.*

*Under this layer lay a group of eight vessels within an area 2.5 by 1.5 m, orientated NNW – SSE (vessels I-X,*

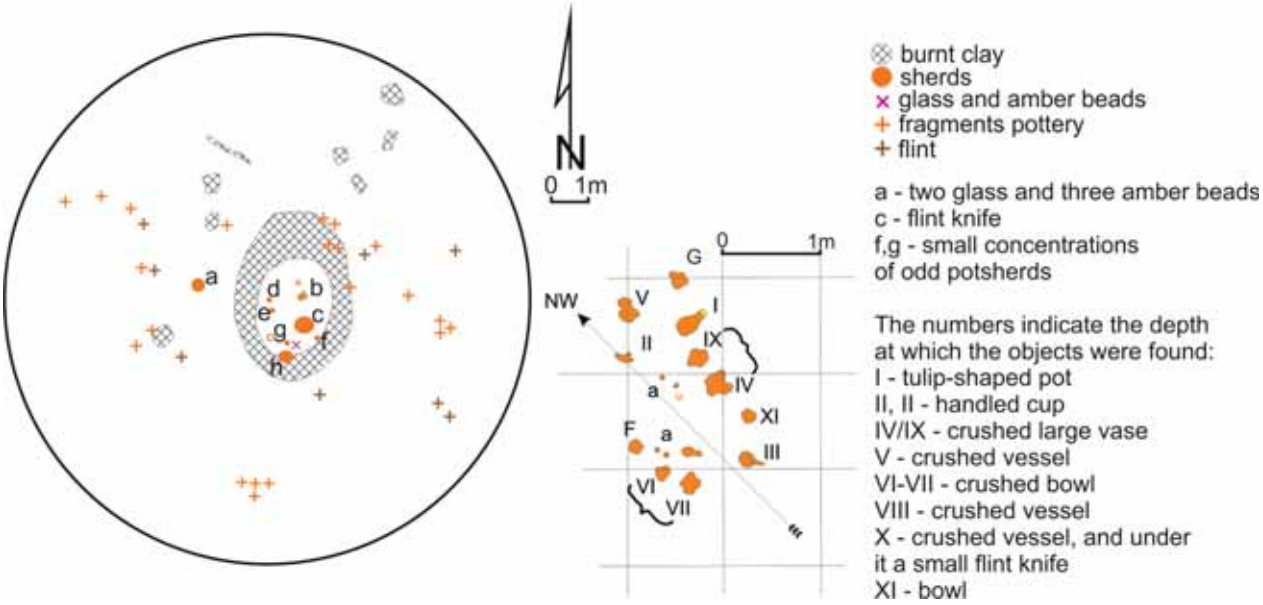



**Fig. VIII.135.** Digitalized plan of barrow 33 (Sulimirski 1968, Plan 17:1)

*XI). Among these were a tulip-shaped pot (**Fig. VIII.136**; Sulimirski 1968, Plate 21:12), bowls (**Fig. VIII.137**; Sulimirski 1968, Plate 21 :15) and two cups, with high pointed handles (**Fig. VIII.138**; **Fig. VIII.139**; Sulimirski 1968, Plate 21:14, 16), typical of the Early Iron Age. On the sherds of a crushed vessel (an urn) (IV/IX) lay many calcined bones, which were also scattered about; among these were found two light-green glass beads, 9.5 mm in diameter, and three amber beads of the same size, two being unperforated (**Fig. VIII.140**; Sulimirski 1968, Plate 21:13). The tulip-shaped vessel and some others, also the glass beads, were deformed by fire. Within this area two small concentrations of small, brittle potsherds also lay (F, G). About 1.5 m west of this group, another crushed vessel was found on the same level, which disintegrated. Under it lay a broken flint blade.*

*Deeper, at a level 80 cm to 1.1 m, apparently on the original surface many potsherds, flint flakes and a few*

**Fig. VIII.136.** Pot, type G112, plain, heat deformed. Rounded rim, marked base. Temper of crushed stone and flint. H – 25.2 cm, R1 – 24.7 cm, R2 – 22.8 cm, R3 – 24.5 cm, R4 – 10 cm

*worked flint implements, lay scattered all over the entire area under the mound, whilst charcoal was also strewn in the northern part of this area in particular. Some of the flints and potsherds lay slightly deeper, up to the depth of 1.2 m from the top of the mound. A flint knife was found at that depth (c) about 3 m NE of the centre.*

*Vessels of the central group were typical, in both shape and make, of the Early Iron Age; vessel 'X', found outside this group, was probably a tulip-shaped pot made with a different technique, typical of the Komarów culture; it had a slip cover. It seems that the Iron Age grave was a secondary burial which had ruined the original Bronze Age (Komarów), or Late Neolithic burial.*

**Fig. VIII.137.** Bowl, type M21a, plain. Sharp-ended rim bent inwards; base slightly marked. Temper of crushed stone and flint. H – 8.5 cm R1 – 18.5 cm, R3 – 21.4 cm, R4 – 10.7 cm

**Fig. VIII.138.** Cup, type K22a, plain. Rounded rim; unmarked base, *ansa lunata* strap handle. Temper of crushed stone and flint. H – 9 cm, R1 – 8.5 cm, R3 – 11.5 cm, R4 – 7.3 cm

**Fig. VIII.139.** Cup, type K22a, plain. Rounded rim; unmarked base, *ansa lunata* strap handle. Temper of crushed stone and flint. H – 7 cm, R1 – 13 cm, R4 – 9.4 cm

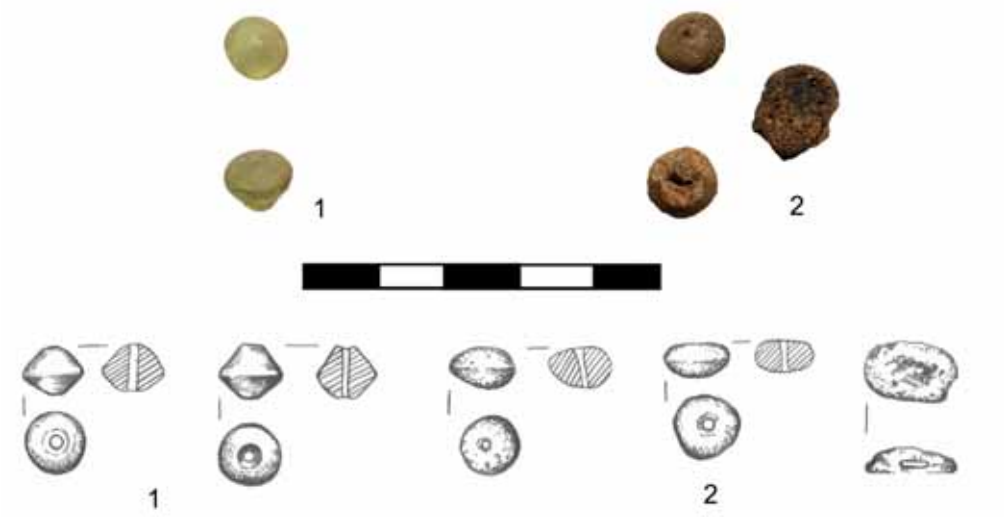



**Fig. VIII.140.** 1 — two light-green glass beads, circular in horizontal section and conical in profile, perforated, 0.95 cm in diameter; 2 — three flat amber beads, two are perforated, circular in horizontal section, 0.8 and 0.9 cm in diameter, while the third is oval, unperforated, 1.3 cm × 0.9 cm

*Barrow-grave 34 (**Fig. VIII.141, Fig. VIII.142**; Sulimirski 1968, Plan 19:2). 14 m in diameter, 60 cm high. Under the forest humus at a depth of 20 cm, many odd pot-sherds and flint flakes and a few damaged trimmed blades were found. At the same level, in the centre of the mound, a concentration of calcined bones was uncovered, about 1.5 m in diameter (d). Many pot-sherds were found in it originating from at least four or*

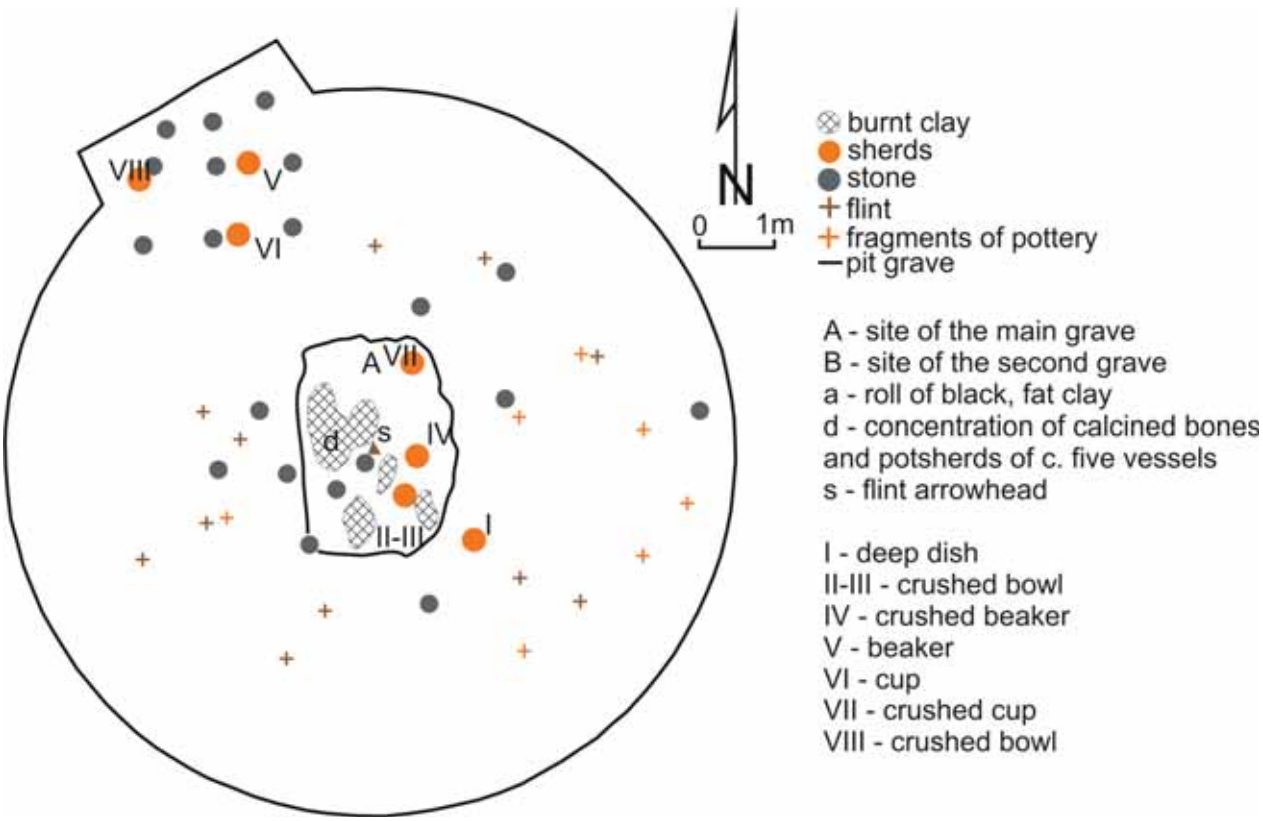



**Fig. VIII.141.** Digitalized plan of barrow 34 (Sulimirski 1968, Plan 19:2)

**Fig. VIII.142.** Barrow 34 during the excavation. Unpublished photo from the archive of Prof. T. Sulimirski. Courtesy of Prof. Jan Machnik and Dr. Paweł Jarosz, Institute of Archaeology and Ethnology, Polish Academy of Sciences, Cracow

*five vessels: a bowl or deep dish with an inverted rim, a large spherical vessel, one or two bowls with an everted rim, and a large dark vessel with fluted decoration. All sherds were damaged by fire, many warped. This was probably a secondary cremation burial.*

*Deeper, at a depth of 70 cm, beneath the above burial, six halved boulders, 20 to 60 cm long, enclosed an area about 1.5 m square. Along its eastern side lay three vessels in one row (II-III, IV, VII), a bowl (**Fig. VIII.143**; Sulimirski 1968, Fig. 31:8), a beaker and a cup, all crushed. About 1 m E of these an undamaged large deep dish (I) with an inverted rim lay in a vertical position. Also in this area, three shallow holes were found, filled with charcoal, and in the NE corner of the area enclosed by the boulders lay a flint arrow-head (s) with its tip broken off (Sulimirski 1968, Plate 9:16). This was undoubtedly the site of the main grave (A) orientated NW – SE, but no traces of skeleton were found.*

*About 2 m NW of this grave, another grave (B) was found. It was marked by similar boulders laid in three rows, enclosing an area about 2 m square. On its western side a shallow hole filled with charcoal was uncovered, with three vessels standing in its southern part; a beaker (**Fig. VIII.144**; Sulimirski 1968, Plate 16:3), a cylindrical cup (Sulimirski 1968, Plate 16:12), both decorated, and a decorated bowl with an everted rim which disintegrated (V, VI, VIII). These vessels were typical of the transitional period from the Early to the Middle Bronze Age period. No traces of skeleton were found.*

*On the ancient surface, at a depth of 60-70 cm, many scattered potsherds and flints were found all over the area covered by the mound. A fragment of the damaged edge of a stone battle-axe was also found and a few scattered pebbles, mainly east of grave A.*

*Barrow-grave 35 (Sulimirski 1968, Plan 22:3). 16 m in diameter, 60 cm high. At a distance of about 4.5 m SE from the centre an undecorated wide beaker or bowl was found under the forest humus, at a depth of 20 cm (a). Close to it, but at a depth of 90 cm, lay a halved boulder (f) in a small hole dug in the ancient ground.*

*About 2 m E of the centre, and again 3 m S of the centre, lumps of charcoal, about 1 cm thick, and lumps of fired clay were found (d), 4.5 m N of the centre was a hole (b), about 50 cm in diameter, dug some 10-20 cm in the ancient ground filled with fired clay, ashes and charcoal, and in another small hole (c), 2 m W of the centre, a lump of ochre was found. About 3.5 m NE of the centre placed NW – SE on the ancient surface lay a charred timber log, 2.5 m long, 40-60 cm wide (e).*

*Barrow-grave 36 (**Fig. VIII.145**; **Fig. VIII.146**; Sulimirski 1968, Plan 22:2). 16 m in diameter, 50-60 cm high. About 1.5 m SE of the centre a boulder was found*

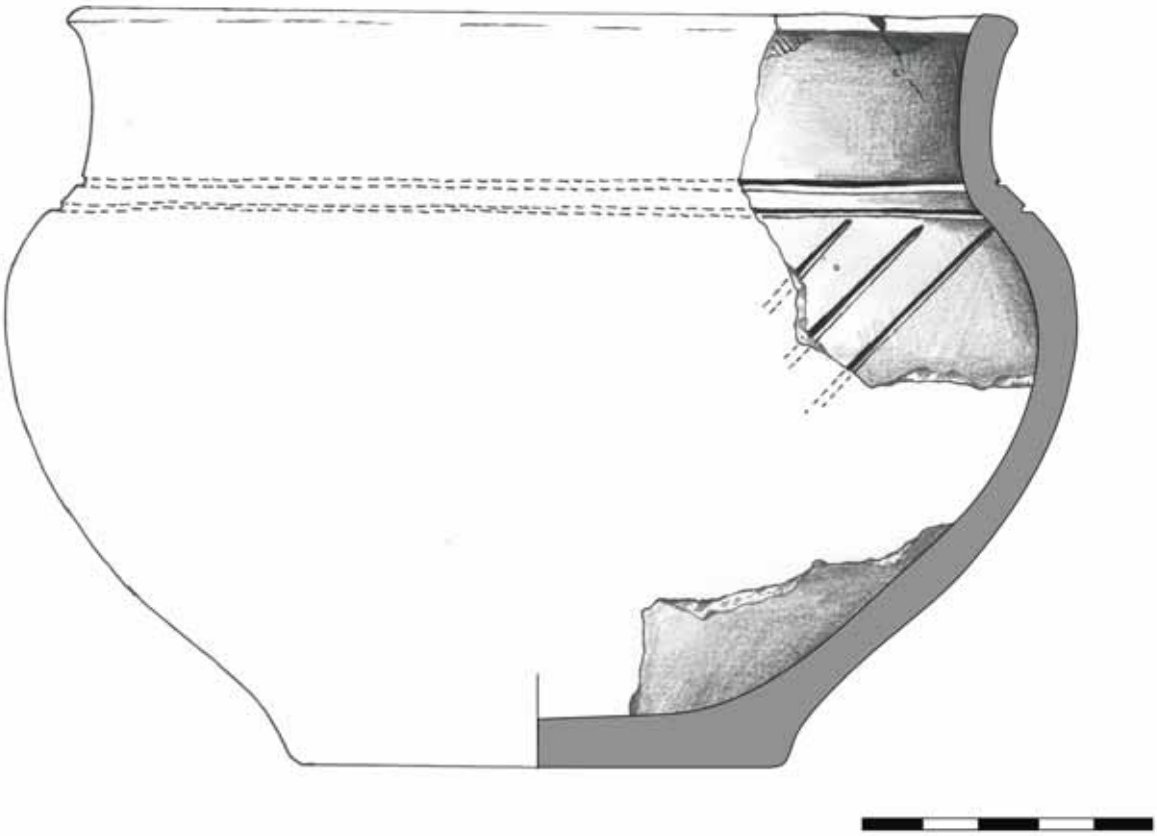


**Fig. VIII.143.** Vase, type W22, preserved in fragments, ornamented on the neck with two horizontal incised lines, below, on the body – with oblique lines. Rounded rim; base slightly marked. H – 13.2 cm, R1 – 16.5 cm, R2 – 15.7 cm, R3 – 18.4 cm, R4 – 8.5 cm

**Fig. VIII.144.** Beaker, type P22, ornamented under the rim with wedge-shaped, vertical impressions, on the neck – with five horizontal incised lines, below, on the body – with obliquely hatched triangles between which appliqué bosses are found. Rim cut straight; base slightly marked. Temper of crushed stone and flint. H – 10.5 cm, R1 – 11 cm, R2 – 10.8 cm, R3 – 11.4 cm, R4 – 7 cm

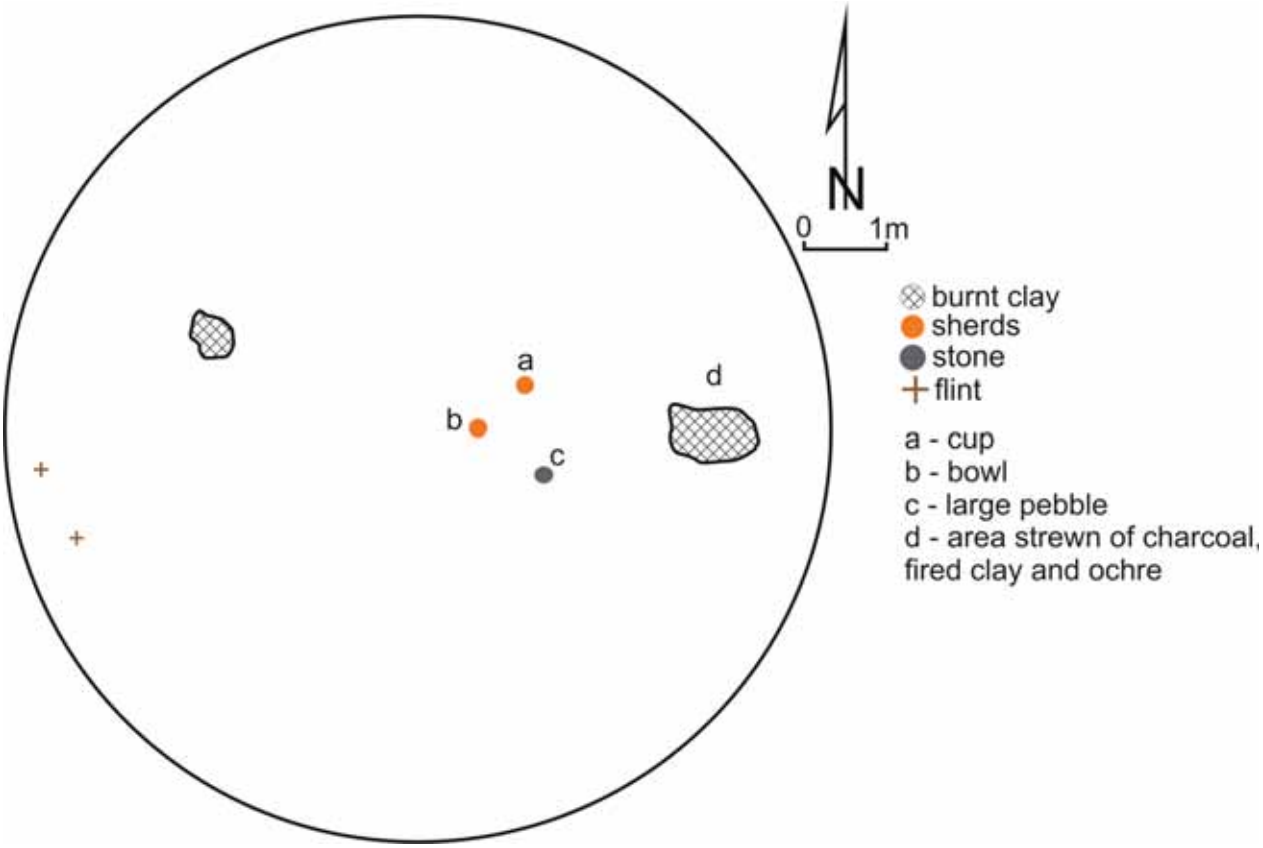



**Fig. VIII.145.** Digitalized plan of barrow 36 (Sulimirski 1968, Plan 22:2)


**Fig. VIII.146.** Barrow 36 during the excavation. Unpublished photo from the archive of Prof. T. Sulimirski. Courtesy of Prof. Jan Machnik and Dr. Paweł Jarosz, Institute of Archaeology and Ethnology, Polish Academy of Sciences, Cracow

*(c) at a depth of 20 cm, just under the forest humus. It marked the site of the burial on the ancient surface, at a depth of about 50-60 cm.*

*At its western end, 1 m NE of the centre of the barrow, lay a decorated bowl (b) (**Fig. VIII.147**; Sulimirski 1968, Plate 17:5), and close to it, somewhat higher (40 cm from the top of the mound) lay an upside-down clepsydra-shaped cup (a) (**Fig. VIII.148**; Sulimirski 1968, Plate 18:19). The vessels probably stood near the head, and the other side of the grave was marked by a large patch of charcoal and red ochre (d) about 10 cm thick, extending 1.5-2 m from the two vessels; however, no traces of skeleton were found.*

*Over the whole ancient surface, covered by the mound, but in particular in its SE part (d), very small pieces of fired clay were strewn. About 4 m W of the centre lay a few small worked flints at the same level.*

*Barrow-grave 37 (**Fig. VIII.149**; Sulimirski 1968, Plan 20). 16 m in diameter, 2.5 m high. At a depth of 40-60 cm from the top of the mound, in the central part of the barrow, charcoal, lumps of fired clay and ashes were strewn more or less densely over an area about 5 by 3 m, orientated S – N. They were concentrated in particular on peripheries of this area. Single calcined human bones were also found within this area, but they formed three larger concentrations (I, II, III) along its eastern side, 2 m long, each about 50 cm in diameter. Two of these lay at a little deeper level, which seems to indicate that the bones were shovelled into small holes about 30-40 cm deep. In the northern part of this area, about 1 m N of the centre of the barrow, the largest concentration of calcined bones (v) was uncovered; it was 1 m long, about 50 cm wide, and consisted solely of animal bones.*

**Fig. VIII.147.** Vase, type W11, ornamented under the rim rim with a circumferential, horizontal incised line and adjacent incised obliquely hatched triangles, on the body – with a ladder motif and adjacent incised obliquely hatched triangles. Rim obliquely cut inwards, base slightly marked. Temper of crushed stone and flint. H – 14.5 cm, R1 – 18.2 cm, R2 – 17.5 cm, R3 – 21 cm, R4 – 8 cm

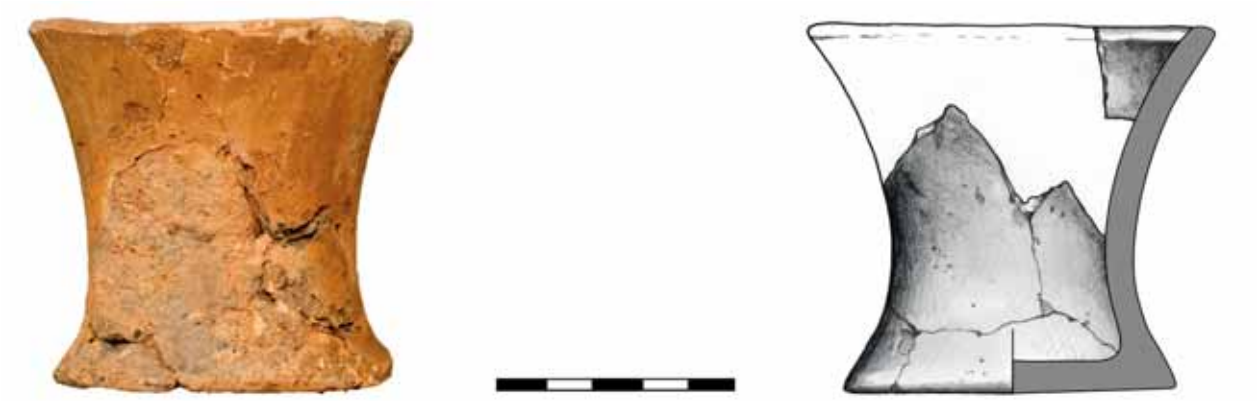


**Fig. VIII.148.** Beaker, type P1a (clepsydra-shaped), plain. Rounded rim; unmarked base. Temper of crushed stone and flint. H – 8 cm R1 – 8.7 cm, R2 – 5 cm, R4 – 7 cm

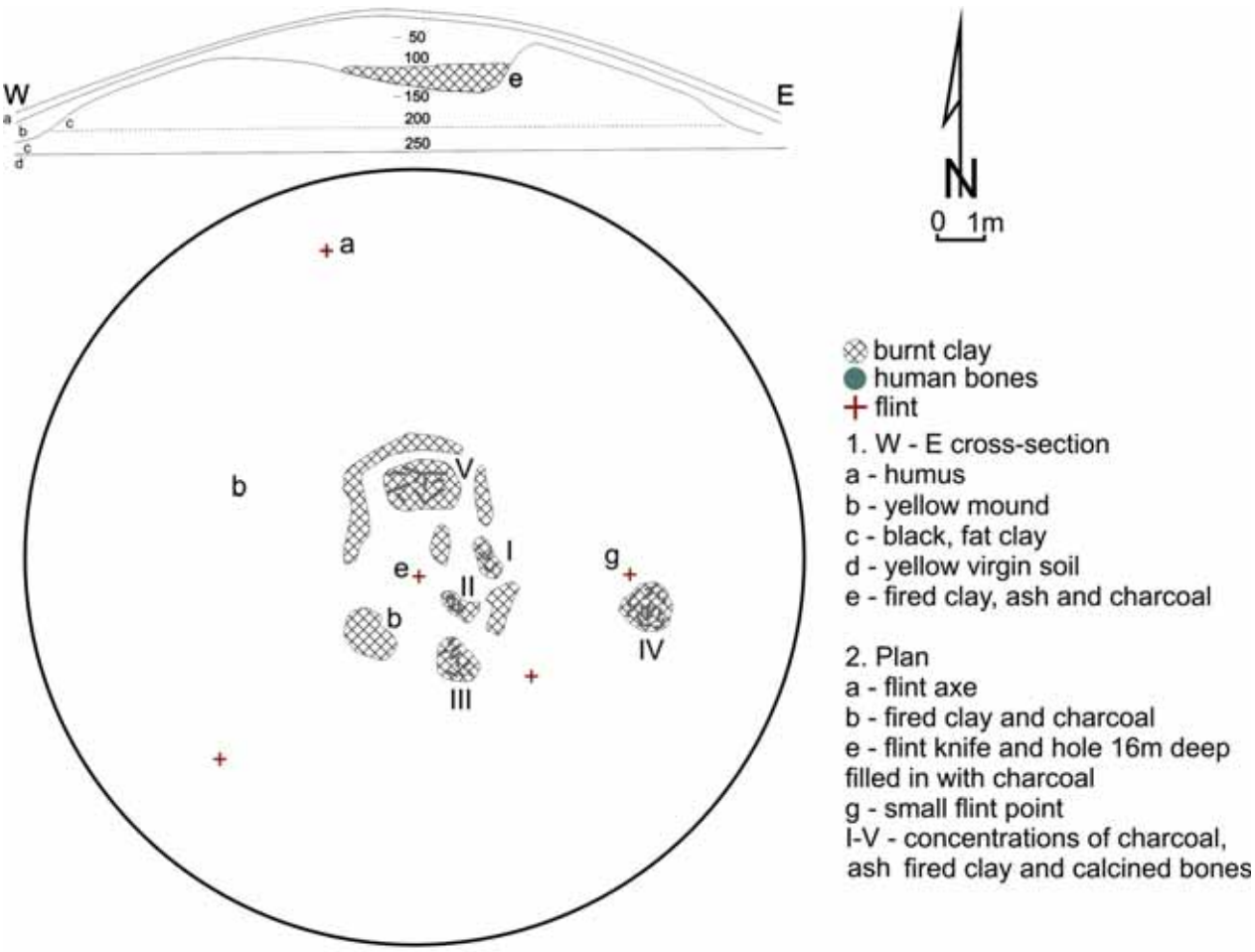



**Fig. VIII.149.** Digitalized plan of barrow 37 (Sulimirski 1968, Plan 20)

*At a distance of 4 m E of the centre, another concentration of calcined bones (IV) was uncovered at a depth of 1 m; it was about 50 cm in diameter. Near it lay a small flint point (g) (Sulimirski 1968, Plate 9:27).*

*At a distance of 7 m N of the centre, on the level 1.4 m below the top of the mound, but actually at a depth of 40 cm, a flint axe (a) irregular (Sulimirski 1968, Fig. 16:27), but somewhat oval in section, 10.5 cm long, was found, and at a distance of 6 m SW of the centre, at about the same level, lay a flint knife and close to it a hole filled in with charcoal, reaching a depth of 1.6 m from the top of the mound, were found (f). Flint flakes and a few worked blades lay at a depth of 1.5-1.9 m around the circumference of the mound in several places. Differing depths in which the various objects mentioned above were found, and also cross-sections of the mound drawn by Dr J. Grabowski who excavated it, suggest that the mound was raised on a small natural elevation. At the first stage a low flat mound was formed, not more than 8 m in diameter, the earth being taken from the area around it. On it the pyre was laid and the corpses probably of three persons at least were cremated along with some animals placed on the northern part of the pyre. After cremation, the calcined bones were shovelled to the various points marked by their concentrations, and a larger mound was raised covering the whole area. This accounts for the flints and the axe at the periphery occurring on a lower level: the earth from this area was used for raising the first elevation.*

*The burial seems to date from the Early Iron Age, although no grave goods were found to confirm this dating. The axe and other flint implements may have belonged, however, to an earlier grave which had been destroyed during the construction of the cremation burial. Perhaps the first, the lower mound, on which the pyre was laid, belonged to the original, Neolithic grave. This seems to be confirmed by the circumstances revealed by the excavation of the next barrow-grave, 38, situated 30 m to the NE.*

*Barrow-grave 38 (Sulimirski 1968, Plan 21). 18 m in diameter, 2 m high. In the centre, at a depth of 80 cm to 1 m, an area 4 m in diameter was uncovered (A) within which charcoal, fired clay and ashes were more or less*

*densely strewn. A flint flake, a number of odd potsherds of a large, reddish vessel with an incised decoration, were found at the same level. About 3 m S of the centre, or 1 m S of the area described above, lay a small concentration of calcined human bones, 50 cm in diameter, at a depth of 70 cm (g).*

*Deeper, at 2 m, 4 m E of the centre, the following objects lay close to each other, possibly in a shallow shaft orientated NW – SE(?): two flint axes (c, d) (Sulimirski 1968, Figs. 15:12; 16:10), 8.5 and 8 cm long, one rectangular, the other nearly oval in section (hybrid type); a flint point 2 cm long (e), perhaps an arrow-head; and a decorated bowl, or wide beaker (a). One metre NW of these lay a well-polished battle-axe (b) of a greenish variety of stone, 12 cm long, of type y-1 (East European) (Sulimirski 1968, Fig. 13:8). These objects apparently marked the site of the grave, the skeleton of which had completely decayed (Sulimirski 1968, Plate 2:4). Several flints and lumps of charcoal were found scattered at the level 160-180 cm, which was probably the original surface of the ground.*

*The Neolithic grave was evidently the original grave; its mound has been re-used and raised higher by a cremation burial of a later period, probably of the Early Iron Age.*

*Barrow-grave 39 (Sulimirski 1968, Plan 19:1) formed part of a group of four mounds with nos. 40, 42 and 57. It was 14-15 m in diameter, 1.4 m high; in its SE part were traces of a trench of World War I.*

*In the northern part, in the mound, a few flint flakes were excavated. In the centre, on the ancient surface, at a depth of 1.2 m, the site of the burial was uncovered. It was apparently orientated N – S. Its southern end was marked by an almost completely decayed timber log, traces of which were clearly visible, about 75 cm long, lying W to E. On its northern side, near the eastern end, stood a decorated bowl (or wide beaker) (a) (Sulimirski 1968, Plate 6:4), and on its western side were four flint arrow-heads (f) (Sulimirski 1968, Plate 9:17, 23, 24, 26) one with the tip broken off, and flint knife, 11 cm long, trimmed along its edges (g). Close to the arrow-heads lay two clay tubes (e-1, e-2) (Sulimirski 1968, Fig. 12:8), one 6-8 cm long, the other a little larger. North of these, along the western side of the supposed grave, lay the upper part of a battle-axe of type y-2, 7 cm long, made of a greenish variety of stone, well polished, its edge missing (d), and somewhat further was a large flint flake reminiscent in shape and size of an axe, 9.5 cm long (c), its edge blunt.*

*At the same level, 3.5 m W of the centre, and 4 m SW of it, patches of scattered charcoal, 50 cms and 1 m in diameter respectively, were uncovered, and in some other places a few flint flakes were found.*

*Barrow-grave 40 (Sulimirski 1968, Plan 22:1) formed part of the above group, the westernmost of this cemetery to be excavated. It was 12 m in diameter, 50 cm high. At 1 m S of the centre, on the ancient level, at about 60 cm from the top of the mound, the grave-shaft was uncovered, marked by charcoal strewn over an area over 1 m square (A). The grave-shaft under the charcoal reached to a depth of 1 m, being dug some 40 cm in the ancient ground. Its size was not established. In the shaft a flint axe of Lindo type (s) (Sulimirski 1968, Fig. 15:16), 10.2 cm long, and a stone battle-axe which perished (t) were excavated. On the ancient surface a few flints (b) were found scattered, and two small potsherds (a) were found at a depth of 20 cm at about 4.5 m S of the centre.*

*Barrow-grave 41 lay on the field called 'Łuniów', at a distance of about 1.5 km S of the cemetery, on the lower part of the mountains, nearer the village. It was 12 m in diameter, 30 cm high, ploughed up. Nothing was found in it.*

*Barrow-grave 42 (Sulimirski 1968, Plan 23:3). One of the group described above, almost completely ploughed up; only its central part, 6 m in diameter, was excavated.*

*The grave was uncovered in the centre (A). This was a shallow shaft undamaged by the plough. Along its eastern side, from SW to NE at a depth of 80 cm, lay an almost completely decayed timber log about 2 m long On its southern end traces of a very short section of a perpendicular log were visible. West of the long beam, at the same depth in the grave itself, lay a flint axe (Sulimirski 1968, Fig. 16:19), 9.5 cm long, nearly rectangular in section, well-polished (d), a large trimmed flint flake, probably a knife (e), 9 cm long, and a flint flake. South-west of the grave, at a level about 20 cm higher, a concentration of charcoal was uncovered (a) about 50 cm in diameter.*

*Barrow-grave 43 lay on the 'Kreczkówka' field, at a distance of about 100 m W of mound 41. It was much ploughed up. All the still visible mound, 6 m in diameter, was investigated by Dr Pasternak in 1935 (Pasternak 1936). His description of this grave was to have been published in my book on the Komarów culture; it perished during the War along with my typescript.*

*According to a draft note which survived, made after the description by Dr J. Pasternak, twelve vessels were excavated in this grave. Under the arable soil, at a depth of 25-30 cm, and all over the whole area investigated traces of a large pyre were well visible: the ground was red-fired to a depth of a few centimetres, and over it lay charcoal, lumps of red clay and ashes. The vessels mentioned above stood in groups around its centre, about 1.5 m in diameter.*

*Only part of a large urn of Villanova type (1) was deposited in the grave; its surface was smoothed, black, but not polished, and it was somewhat lighter inside. In*

*it were calcined bones, among which half a small, very rusty, oval iron ring was found. Next to it was a large dish (2), badly damaged, with a low inverted rim, light grey in colour. Near it lay a smaller bowl (3) of which only the lower part survived. Further down, in a corner, was a medium-sized dish, or bowl (4) with an inverted rim (**Fig. VIII.150**), surrounded by many calcined bones; a crescent-shaped flint saw, or knife, was also found here, badly damaged by fire. At some 50 cm from this vessel, stood two handled cups (5, 6) (**Fig. VIII.151; Fig. VIII.152**) both reddish in colour, one oval in section, with a high pointed handle. At a distance of 50 cm, in another corner, lay a large dish (7), similar in size and shape to dish '4' near which two handled cups were found (8, 9); one had a high pointed handle (**Fig. VIII.153**). Close to these vessels, on the outside, was a hole 50-60 cm in diameter, 25 cm deep, filled in with earth, charcoal and a few lumps of hard baked clay. Between this group of vessels and the urn 'I', stood another urn (10), ovoid in shape, reddish in colour, with a low, slightly everted neck, having four decorative warts on the body (**Fig. VIII.154**). In it calcined bones were found. The position of the two remaining vessels, a medium-sized bowl (11) with a slightly inverted rim, and a similar, but larger vessel (12), has not been established. Both had been broken by the plough and the sherds displaced over a wider area.*

*A 'dark', evidently bronze, bit was found in this mound in 1913 when ploughing. Unfortunately it perished. This barrow-grave dated from the Early Iron Age.*

*Barrow-grave 44 (Sulimirski 1968, Plan 23:2). 19 m in diameter, 40 cm high, ploughed up, so that furrows have spoiled the grave. On the ancient surface at a depth of 35-40 cm a few flint flakes and lumps of charcoal were found at various points in the area covered by the*

**Fig. VIII.150.** Bowl, type M21a, plain. Rounded, inverted rim; pedestal base. Temper of crushed stone and flint. H – 12 cm, R1 – 28 cm, R3 – 29.5 cm, R4 – 11.8 cm

**Fig. VIII.151.** Cup, type K21a, plain. Rounded rim; base slightly marked, *ansa lunata* strap handle. Temper of crushed stone and flint. H – 10.2 cm, R1 – 10 cm, R2 – 9,5 cm, R3 – 11.5 cm, R4 – 7.5 cm

*mound. The grave was in the centre. Within a rectangular area, about 1.5 by 1 m, orientated N – S, loose earth was uncovered which reached some 20 cm below the ancient surface (A) marking a shallow grave-shaft; in the middle of its northern side a large boulder lay on the ancient surface (i); no traces of skeleton were found. Grave goods lay east of the grave on the ancient surface, and the order in which they lay and the distances between them suggest they must have belonged to a burial situated on the ancient ground close to the shaft (B). These grave goods were: a battle-axe of type y-3 (g) made of a greenish variety of stone, 11.5 cm long, which lay close to the NE corner of the shaft a beaker almost completely destroyed by the plough (f), which lay 1 m east of the battle-axe; and a flint axe (d) (Sulimirski 1968, Fig. 16:13) 9 cm long, which lay about 50 cm N of the battle-axe.*

**Fig. VIII.152.** Cup, type K21a, plain. Rounded rim; unmarked base; *ansa lunata* strap handle. Temper of crushed stone and flint. H – 10 cm, R1 – 10.8 cm, R2 – 10.5 cm, R3 – 13.5 cm, R4 – 9.5 cm

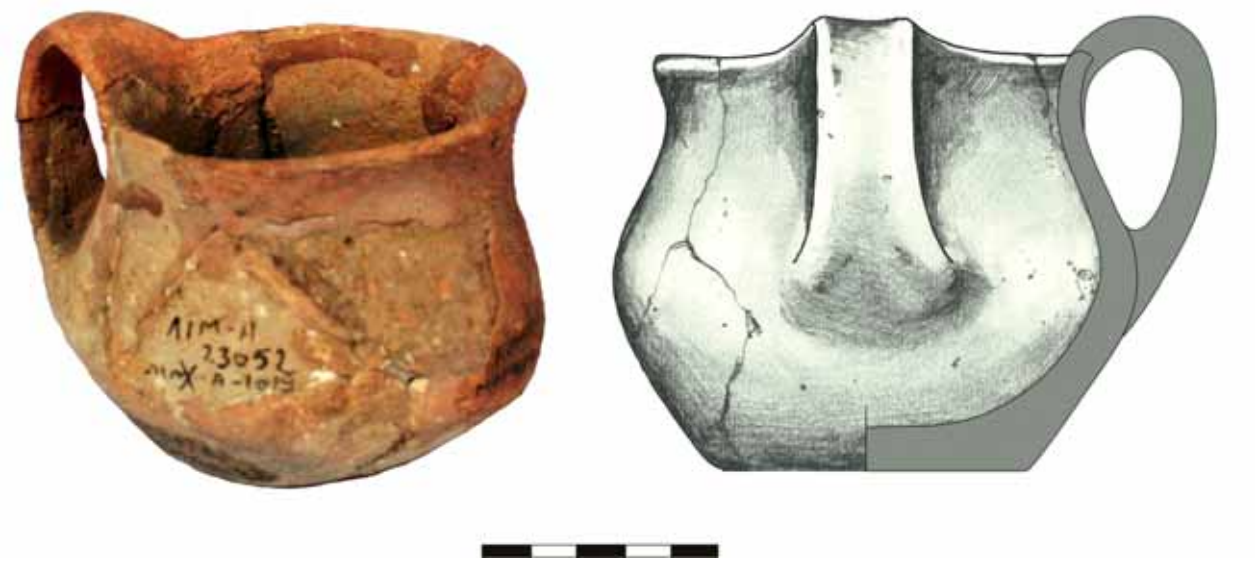


**Fig. VIII.153.** Cup, type K21a, plain. Rounded rim; base slightly marked, *ansa lunata* strap handle. Temper of crushed stone and flint. H – 8.8 cm, R1 – 9.5 cm, R2 – 9 cm, R3 – 11.2 cm, R4 – 6.5 cm

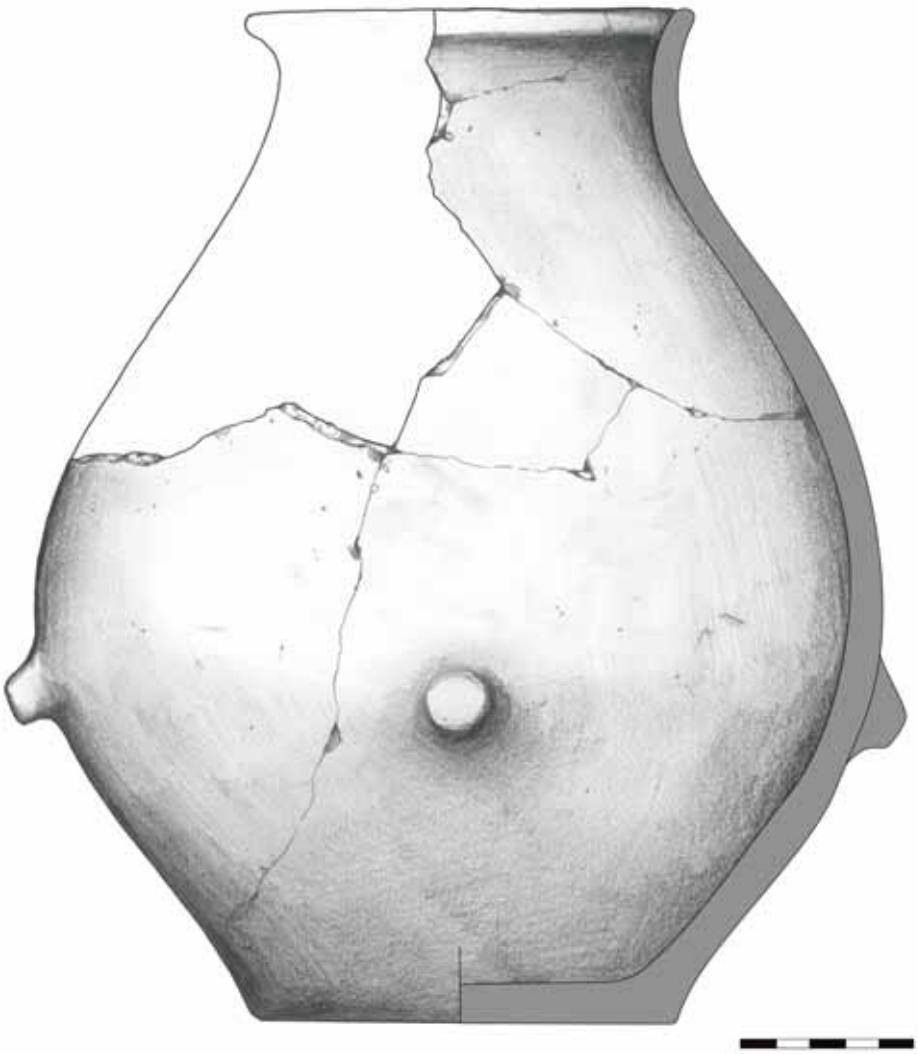
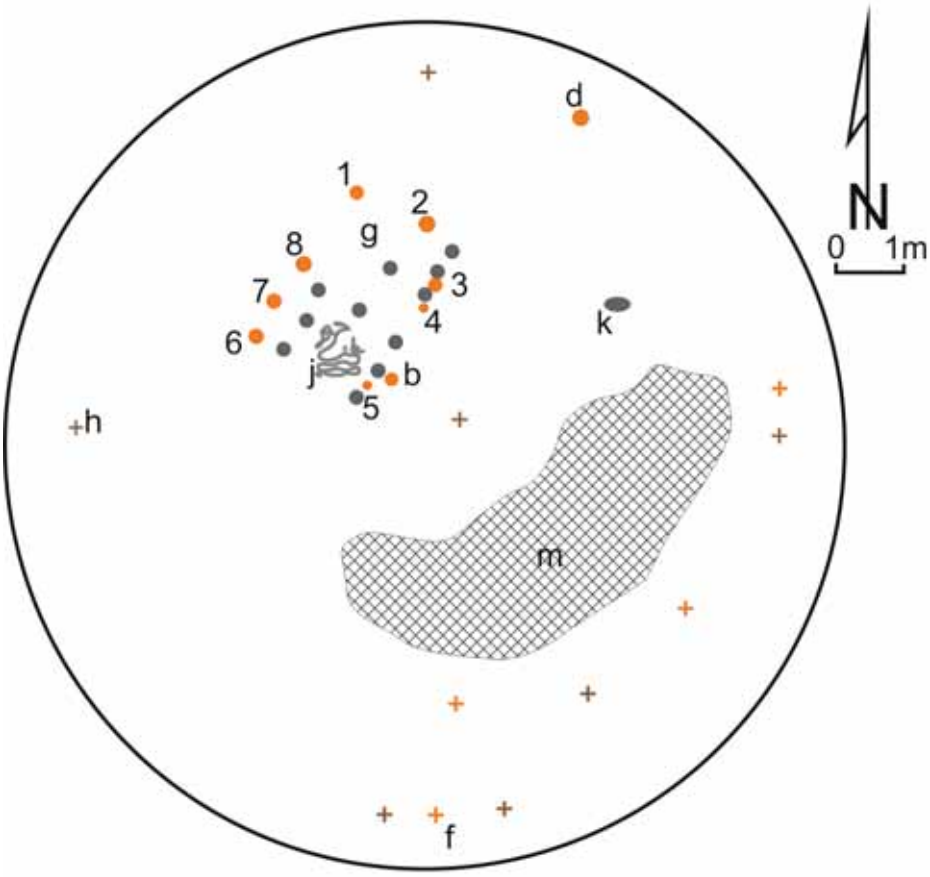


**Fig. VIII.154.** Handless amphora, type A211a, with a cylindrical neck, ornamented on the body with four appliqué bosses, trapezoidal in section. Rounded rim; base slightly marked. H – 29.6 cm, R1 – 13 cm, R2 – 11.8 cm, R3 – 24.9 cm, R4 – 12.2 cm

*Barrow-grave 45 (**Fig. VIII.155**; Sulimirski 1968, Plan 23:1) formed part of a group of three mounds (nos. 29 and 46), 20 m in diameter, 50 cm high, ploughed up, many vessels ruined by the plough. On the ancient surface, at a depth of about 30-40 cm a large cube boulder (k) was found about 3 m NE of the centre. In the mound, and over the whole area under it, were scattered many flint flakes, fragments of broken flint implements, odd potsherds and small pieces of charcoal. They were concentrated especially in an area 3 by 6 m, east and southeast of the centre. Potsherds found here belonged to a few vessels, including a large vase with thick walls (f), reddish in colour, the interior dark, and a decorated bowl, while one sherd was a typical Tripolyan D-ware.*

*The grave was placed on the ancient surface, at a distance of 1.5 m NW of the centre. It was marked by eleven boulders laid in three rows, forming a rectangle 5.5 by 3 m in area, orientated SW – NE. The original number of stones must have been greater but they were probably removed when ploughing. In the SW part of this area lay slightly calcined bones (j) and charcoal. Around the grave, in the row of stones on the SE side, and along the NE and NW sides, but outside the area enclosed by these, nine vessels were found (b, g-1-8); a tenth vessel, a decorated beaker (d) (**Fig. VIII.156:4**; Sulimirski 1968, Fig. 30:5) badly damaged by the plough, lay at the same level about 2 m NE of the grave. Among these vessels was one tulip-shaped pot (g-8) (**Fig. VIII.157**; Sulimirski 1968, Plate 21:5) with a raised band on the neck; a richly decorated, almost cylindrical single-lugged cup (Zapfenbecher) its base decorated (g-6) (**Fig. VIII.158**; Sulimirski 1968, Plate 21:4); a richly decorated bowl*




stone
burnt clay
sherds
human bones
fragments of pottery
flint

b - crushed bowl
d - beaker
f - few large sherds of a large thick-walled vase
g 1-8 - eight vessels:
1 - handled bowl
2 - deep bowl
3,5 - decorated bowls
4 - handled cup
6 - single-lugged mug
7 - undecorated bowl
8 - tulip-shaped pot
h - flint burin
j - calcined human bones
k - large cube boulder
m - area over which lay scattered lumps of charcoal, fragments of broken flint implements and odd potsherds, some of the same type as those further south
f - and one a late Tripolyan ware (d-ware)

**Fig. VIII.155.** Digitalized plan of barrow 45 (Sulimirski 1968, Plan 23:1)

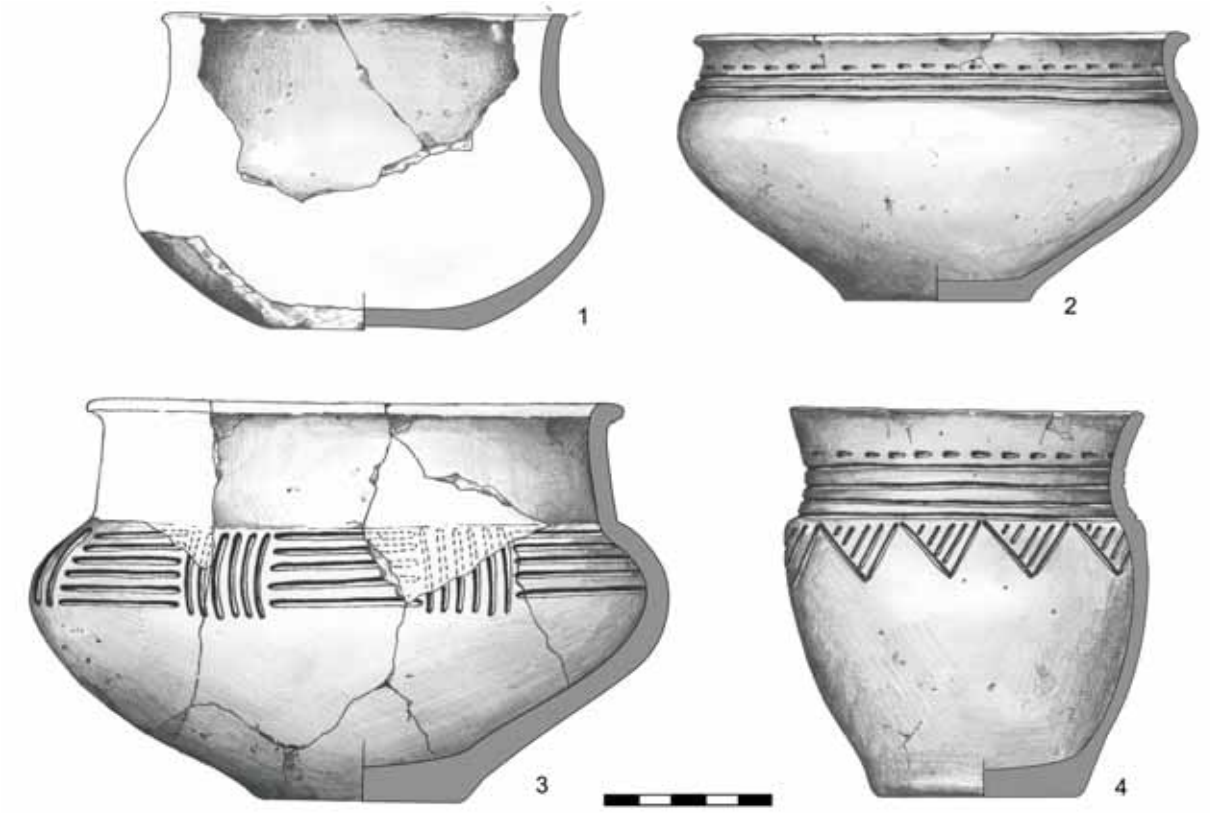



**Fig. VIII.156.** 1 – vase, type W21, plain. Rim cut straight, unmarked base. H – 9.6 cm, R1 – 12.4 cm, R2 – 11.8 cm, R3 – 14.5 cm, R4 – 6 cm; 2 – vase, type W12, ornamented circumferentially on the neck with horizontal pinholes, below – with three horizontal incised lines. Thickened rim cut obliquely outwards; base slightly marked. H – 12.1 cm, R1 – 16.3 cm, R2 – 15.4 cm, R3 – 19.5 cm, R4 – 6 cm; 3 – vase, type W22, ornamented on the body with incised metopic patterns of five horizontal and six vertical lines. Rim with eaves; base slightly marked. H – 12.1 cm, R1 – 16.3 cm, R2 – 15.4 cm, R3 – 19.5 cm, R4 – 6 cm; 4 – beaker, type P22, ornamented circumferentially under the rim with horizontal pinholes, on the neck – with four horizontal incised lines, on the body – with a row of incised triangles adjoining the bottom line and hatched obliquely with incised lines. H – 11.8 cm, R1 – 10.8 cm, R2 – 9.8 cm, R3 – 11 cm, R4 – 6.2 cm

**Fig. VIII.157.** Pot, type G111, ornamented on the neck with a horizontal relief strip. Thickened rim cut obliquely outwards; unmarked base. Temper of crushed stone and flint. H – 21 cm, R1 – 14.5 cm, R2 – 12.6 cm, R3 – 14.5 cm, R4 – 7.4 cm

*(g-3) (**Fig. VIII.156:3**; Sulimirski 1968, Plate 21:1), a similar one undecorated (g-7) (**Fig. VIII.156:1**; Sulimirski 1968, Plate 21:2) and a third one which disintegrated; a small decorated bowl (g-5) (**Fig. VIII.156:2**; Sulimirski 1968, Fig. 30:3); a decorated handled bowl (g-1) (**Fig. VIII.159**; Sulimirski 1968, Plate 21:6), and a simple undecorated bowl or deep dish with sides widened upwards (g-2) (**Fig. VIII.160**; Sulimirski 1968, Plate 21:7); finally a decorated handled cup (g-4) (**Fig. VIII.161**; Sulimirski 1968, Plate 21:3).*

**Fig. VIII.158.** Beaker type P1a, ornamented on the whole surface and on the base: under the rim — with five horizontal incised lines, between the fourth and fifth line — with a horizontal relief strip on which a vertically perforated (two perforations) handle is found, below — a row of circumferential pipe impressions, incised angular motifs in groups of three oblique lines slanting left or right, further below, two horizontal incised lines under which oblique strokes reaching the base are found; bottom ornamented with a circumferential pattern of pipe impressions and crosses with inscribed angular patterns. Thickened rim; semicircularly cut, unmarked base. Temper of crushed stone and flint. H – 16.8 cm, R1 – 17 cm, R4 – 12.8 cm

**Fig. VIII.159.** Cup, type K22a, ornamented under the rim with incised triangles hatched with oblique lines, on the neck — with four horizontal incised lines, on the body — with oblique, arched strips on which there are incised triangles adjacent to horizontal incised lines. Rim obliquely cut outwards; marked base. Temper of crushed stone and flint. H – 11.5 cm, R1 – 16.7 cm, R2 – 16.4 cm, R3 – 20.6 cm, R4 – 8.3 cm

**Fig. VIII.160.** Bowl, type M21b, plain. Rim cut straight; unmarked base. Temper of crushed stone and flint. H – 8 cm, R1 – 15.5 cm, R4 – 8 cm

**Fig. VIII.161.** Cup, type K22, ornamented on the neck with two horizontal incised lines, the bottom one is interrupted by a flat appliqué boss, from which short oblique lines spread, on the body, circumferential, longer oblique lines. Rounded rim; base slightly marked; *ansa lunata* handle, partly preserved. H – 11 cm, R1 – 13.5 cm, R2 – 12 cm, R3 – 15.5 cm, R4 – 7.6 cm

*Barrow-grave 46 (**Fig. VIII.162**; Sulimirski 1968, Plan 24:1). 18 m in diameter, 55 cm high. A series of vessels mostly decorated, were uncovered on the ancient surface, at a depth of 35 cm, but some were a little deeper, 55 cm from the top of the mound, at a distance of 2 m NW of the centre. They were arranged in two parallel rows, about 1.5 m wide, over 2 m long, orientated NW – SW, marking the site of the burial (G).*

*On the western side were three bowls (A, B, C) (**Fig. VIII.165:4; Fig. VIII:165:3**; Sulimirski 1968, Fig. 27:4, 2), on the eastern side a bowl and two cups (g, h, j) (**Fig. VIII.163**; **Fig. VIII.164; Fig. VIII.166**; Sulimirski 1968, Plate 18:9) and further down a tulip-shaped pot and a bowl (k, l) (**Fig. VIII.165:1; Fig. VIII.165:5**; Sulimirski 1968, Fig. 27:1, 3). A double-handled bowl (F) (**Fig. VIII.167**; Sulimirski 1968, Plate 17:8) which lay between the two rows marked the southern end of the grave (G). North of the grave, a little outside the eastern row, lay another bowl (**Fig. VIII.165:6**; Sulimirski 1968, Fig. 27:9). Two other vessels, a flowerpot-shaped cup with its base decorated (**Fig. VIII.168**; Sulimirski 1968, Plate 18:13) and a tulip-shaped pot (D) (**Fig. VIII.165:1**), lay over 2 m S of the centre, at a depth of 30 cm; they were badly damaged by the plough. This was probably the site of another burial (H) but no traces of skeleton were found.*

*Barrow-grave 47 (**Fig. VIII.169**; Sulimirski 1968, Plan 24:2). 16 m in diameter, 40 cm high, ploughed up. In the arable soil, over the whole central part of the mound (a) loose red fired earth, hard-baked lumps of clay, fragments of broken stones and a few flint flakes were excavated. They were concentrated in particular within an area 3 by 2 m S of the centre (b), where they formed a layer up to 20 cm thick. This lay on the ancient surface over the site of the burial, orientated N – S.*

*The site of the burial was well marked by four holes, 40-50 cm in diameter (d-1-4) , dug into the ancient surface about 50 cm deep. The holes were filled in with*

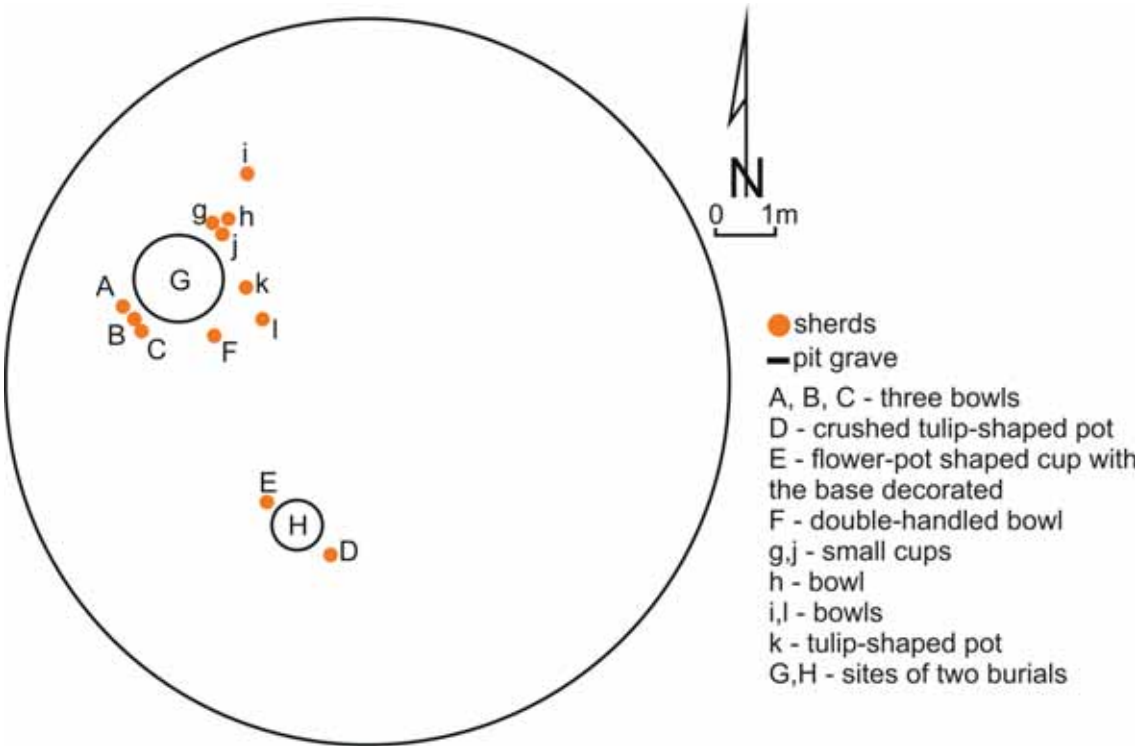



**Fig. VIII.162.** Digitalized plan of barrow 46 (Sulimirski 1968, Plan 24:1)

**Fig. VIII.163.** Beaker, type P22, ornamented on the neck with a horizontal incised ladder motif with oblique rungs. Rim cut straight, base slightly marked. Temper of crushed stone and flint. H – 8.5 cm, R1 – 8.5 cm, R2 – 8 cm, R3 – 8.7 cm, R4 – 5.2 cm

**Fig. VIII.164.** Bowl, type M21, plain. Rim cut straight; unmarked base. Temper of crushed stone and flint. H – 5.5 cm, R1 – 8.1 cm, R3 – 9 cm, R4 – 5.5 cm

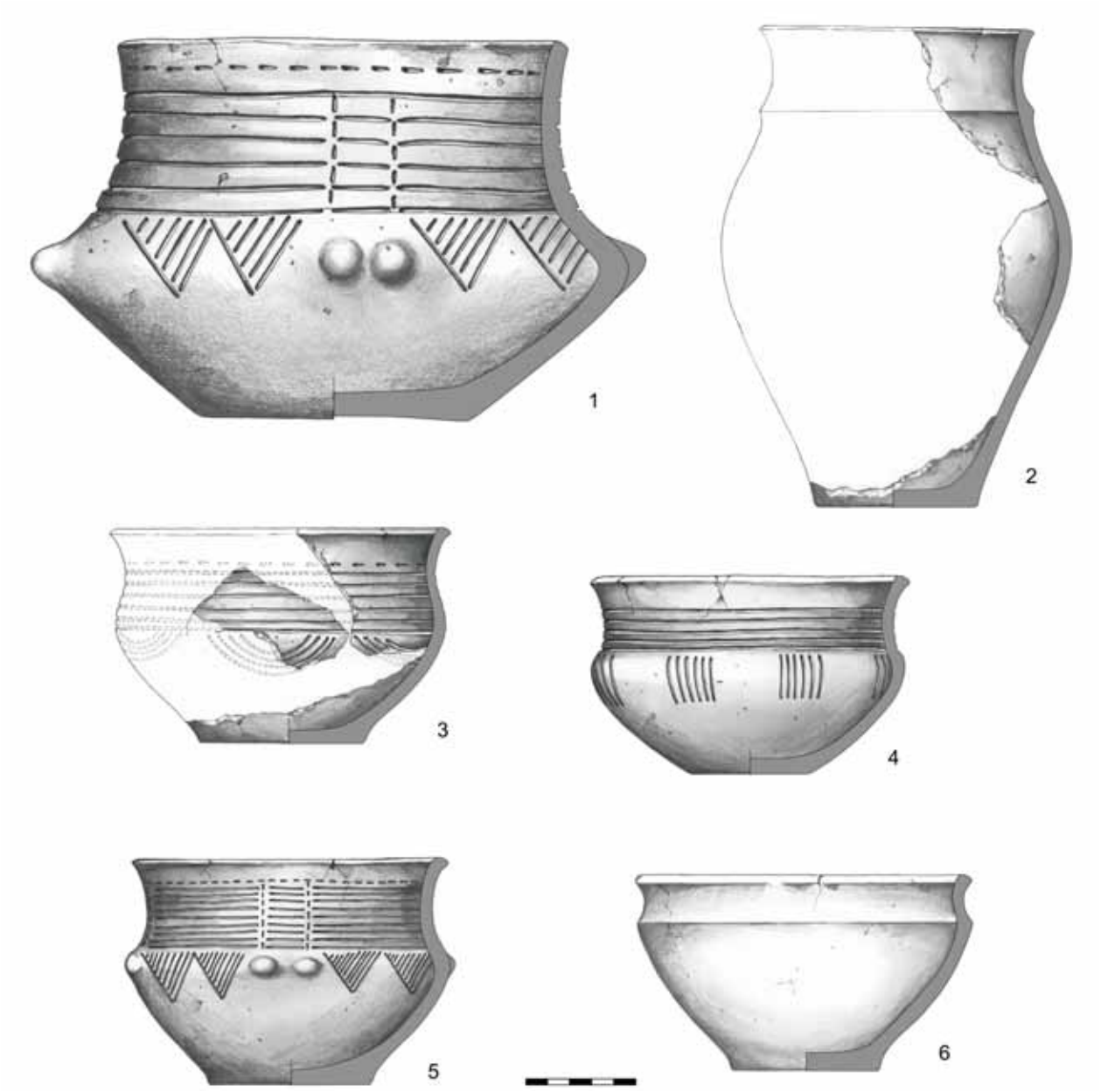



**Fig. VIII.165.** 1 – vase, type W22, ornamented circumferentially under the rim with horizontal pinholes, on the neck and body – with six horizontal incised lines and two vertical rows of pinholes, running across the horizontal lines; at the extension of the pinholes, there are two appliqué bosses and, at the same height, there are incised triangles hatched with oblique lines and adjoining the incised lines from the bottom (the pattern of bosses-triangles is quadruplicated). Rim cut outwards; unmarked base. H – 17.4 cm, R1 – 20.5 cm, R2 – 19.7 cm, R3 – 25 cm, R4 – 12 cm; 2 – pot, type G111, ornamented on the neck with a horizontal relief strip. Rim thickened and obliquely cut outwards, base unmarked. H – 21.4 cm, R1 – 12.5 cm, R2 – 11.3 cm, R3 – 15.8 cm, R4 – 7.3 cm; 3 – vase, type W21, ornamented circumferentially on the neck with horizontal pinholes, on the body – with six horizontal incised lines, below – with groups of concentric arches (sets of four). Rim thickened and cut outwards, base slightly marked. H – 9.7 cm, R1 – 15.5 cm, R2 – 14.2 cm, R3 – 15 cm, R4 – 7.5 cm; 4 – vase, type W21, ornamented on the neck with six horizontal incised lines, on the body – with groups of vertical incised lines in sets of six. Rim thickened and obliquely cut outwards, base unmarked. H – 9 cm, R1 – 14.5 cm, R2 – 13.1 cm, R3 – 14.2 cm, R4 – 5.2 cm; 5 – vase, type W21, ornamented circumferentially under the rim with horizontal pinholes, on the neck and body – with nine horizontal incised lines and two vertical rows of pinholes across the horizontal lines; at the extension of the pinholes there are two appliqué bosses and, at the same height, there are incised triangles hatched with oblique lines and adjoining the incised lines from the bottom (the pattern of bosses-triangles is quadruplicated). Rim cut outwards; marked base. H – 10.2 cm, R1 – 14.3 cm, R2 – 13 cm, R3 – 15 cm, R4 – 7.3 cm; 6 – bowl, type M121, ornamented with a relief strip under the rim. Rim thickened and obliquely cut inwards; marked base. H – 8.7 cm, R1 – 14.6 cm, R2 – 14 cm, R3 – 14.3 cm, R4 – 6.5 cm

**Fig. VIII.166.** Beaker, type P1. plain. Rim cut straight, slightly everted; unmarked base. Temper of crushed stone and flint. H – 7.4 cm R1 – 8 cm, R2 – 7.6 cm, R3 – 7.9 cm, R4 – 6.4 cm

**Fig. VIII.167.** Vase, type W11a (with handles), ornamented on the body with eight horizontal incised lines and adjacent incised triangles obliquely hatched with incised lines. Rounded rim; base slightly marked; strap handles. Temper of crushed stone and flint. H – 14.5 cm, R1 – 16 cm, R3 – 21.8 cm, R4 – 9 cm

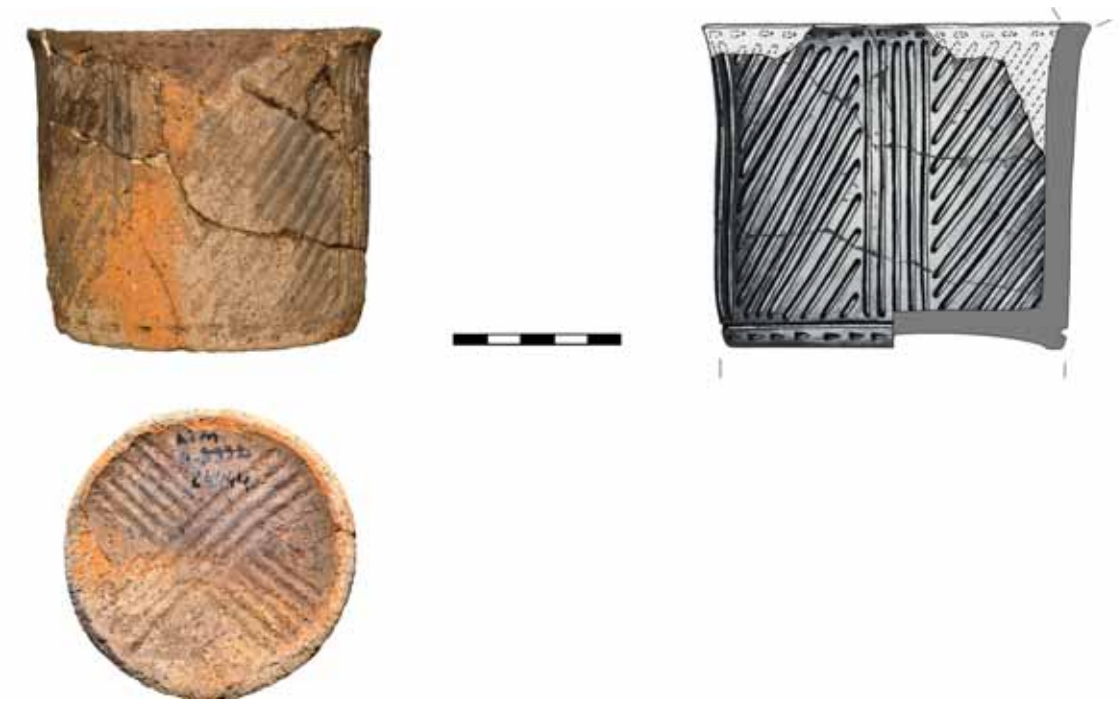


**Fig. VIII.168.** Beaker, type P1, ornamented on the whole surface: at the rim and base — with circumferential, horizontal pinholes separated alternately by five vertical incised lines and groups of oblique incised lines; base ornamented with a cross motif of incised lines (sets of six and four). Rim cut straight and everted; unmarked base. Temper of crushed stone and flint. H – 9.8 cm, R1 – 11.7 cm, R4 – 10.3 cm

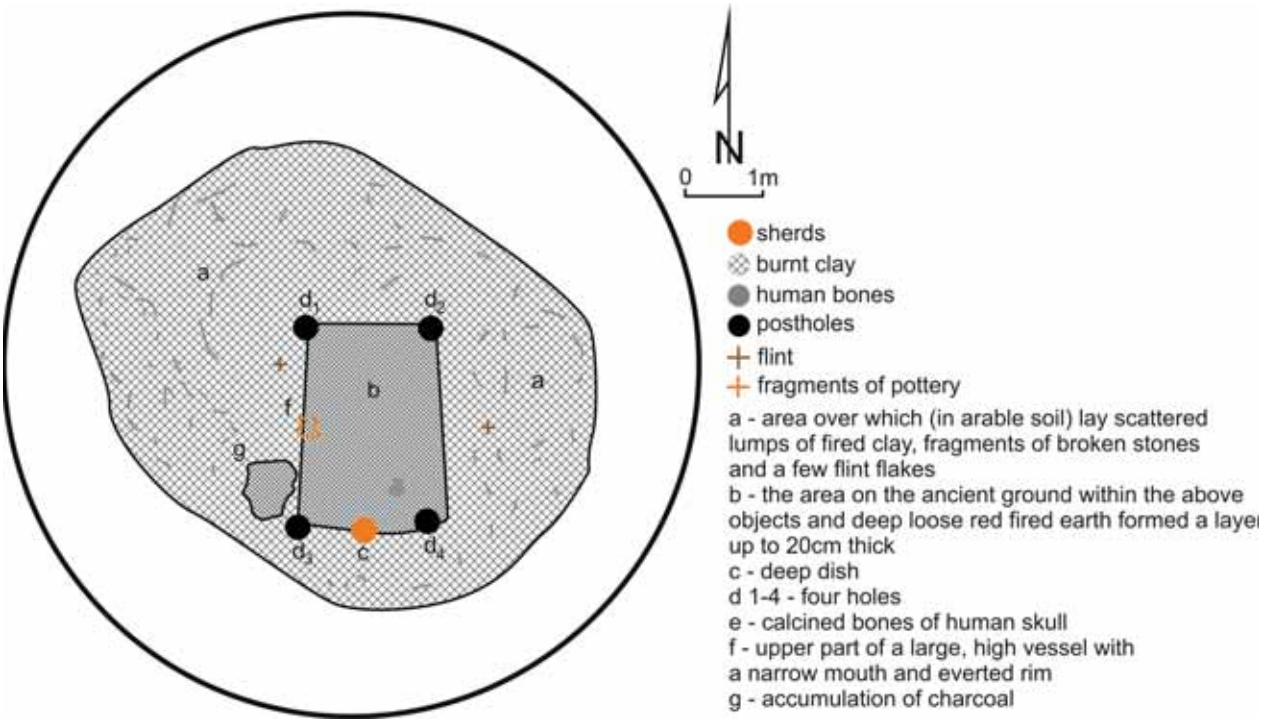



**Fig. VIII.169.** Digitalized plan of barrow 47 (Sulimirski 1968, Plan 24:2)

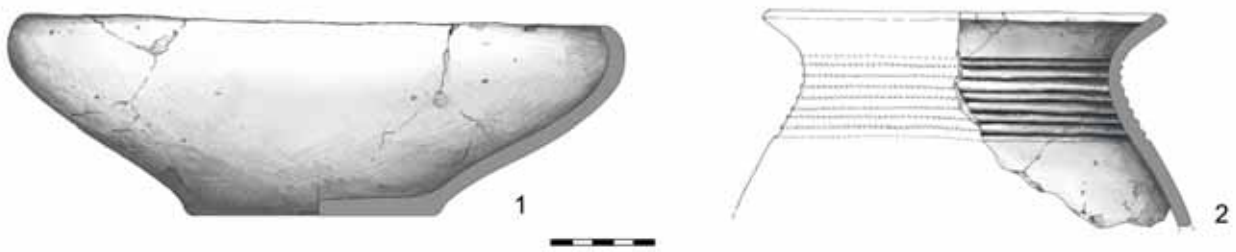



**Fig. VIII.170.** 1 – bowl, type M21, plain. Rounded rim; marked base. H – 9.5 cm, R1 – 28 cm, R3 – 30.5 cm, R4 – 12 cm; 2 – beaker (?) preserved in fragments, ornamented on the neck with eight horizontal grooves. Rounded rim. R1 – 19.5 cm, R2 – 15.5 cm

*fired clay, ashes, charcoal, and a few calcined bones were also found in them, but calcined bones lay mainly over the surface enclosed by the holes, those of the skull being found on its southern end (e). Between two southern holes, on the ancient surface, lay upside down a large deep dish (c) (**Fig. VIII.170:1**; Sulimirski 1968, Fig. 31:7) broken into pieces; the upper part only of a large vessel, its neck covered with parallel fluting (f) (**Fig. VIII.170:2**; Sulimirski 1968, Fig. 31:9) was found in the middle between the two western holes and close to the SW hole lay a larger accumulation of charcoal (g).*

*Barrow-grave 48 (**Fig. VIII.171**; Sulimirski 1968, Plan 24:3). 16 m in diameter, 50 cm high. The site of the burial was uncovered at a depth of 70 cm, about 1 m W of the centre. It covered an area 2-3 (W – E) by 1.9 m (N – S), sunk about 10 cm in the ancient ground. Its northern half (b) was thoroughly cobbled with boulders 20-25 cm in diameter and in the western part with two layers of smaller stones. The southern part (c) encircled by similar boulders, was covered by a large sandstone slab or by a layer of hard cemented sand with the surface well smoothed.*

*Two vessels, a handled cup and a bowl (b-1, 2) (**Fig. VIII.173:1**; Sulimirski 1968, Fig. 30:9) stood at the eastern end of the northern side of the grave, and nearby lay a narrow stone battle-axe (**Fig. VIII.174**; Sulimirski 1968, Fig. 35:13), 12 cm long, well executed,*

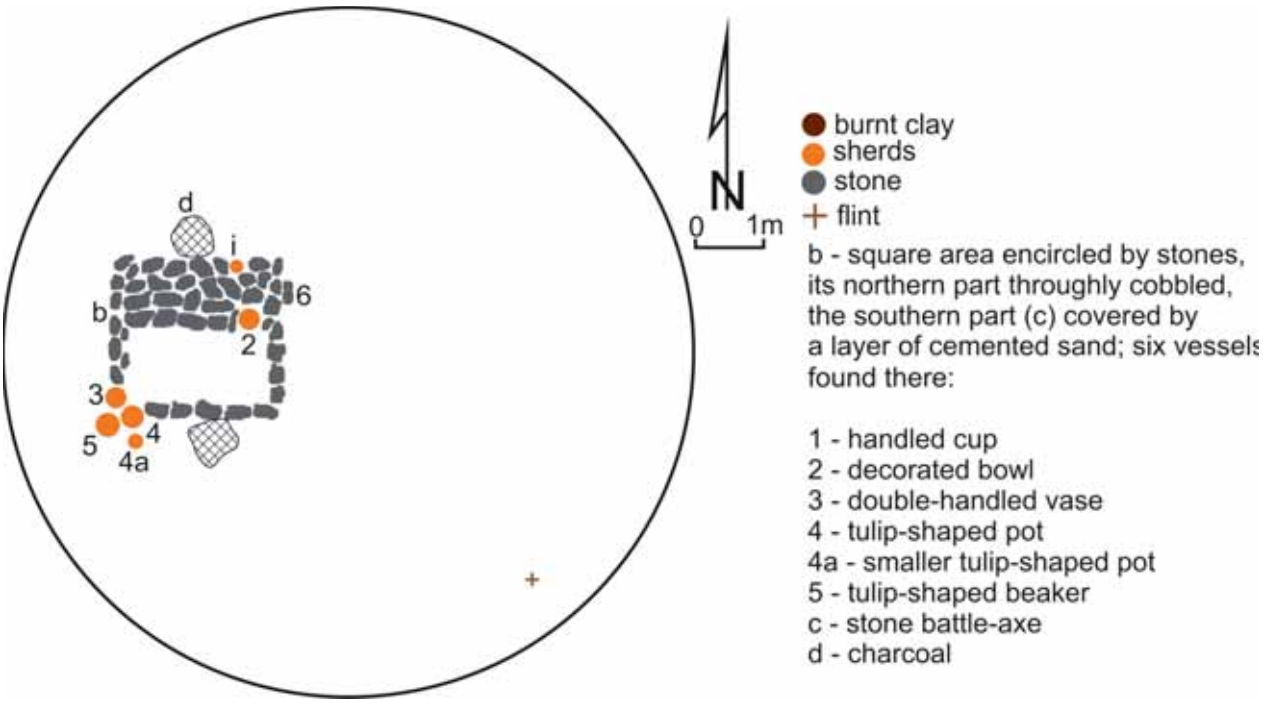



**Fig. VIII.171.** Digitalized plan of barrow 48 (Sulimirski 1968, Plan 24:3)

*of a late type (b-6). In the SW corner were found vessels, three tulip-shaped pots (4a, 4b, 5) (**Fig. VIII.172; Fig. VIII.173:3, 4;** Sulimirski 1968, Fig. 30:2, 7; Plate 19:4), and one two-handled vase (b-3) (**Fig. VIII.173:2**; Sulimirski 1968, Fig. 30:1). In the middle of both northern and southern sides of the grave lay larger accumulations of charcoal (d). This must have been a double burial but no traces of skeletons were found.*

*Barrow-grave 49. 15 m in diameter, 60 cm high. Only a few flint flakes, single lumps of fired clay, very small pieces of charcoal and a few very small odd potsherds were found on the ancient surface, at a depth of 40 cm, scattered over an area 4 m in diameter in the centre of the mound.*

*Barrow-grave 50 (Sulimirski 1968, Plan 25:2) lay close to the above, forming a distinct group with it. It*

**Fig. VIII.172.** Pot, type G112, plain. Rim cut semicircularly; base slightly marked. Temper of crushed stone and flint. H – 14.2 cm, R1 – 12.5 cm, R2 – 11.3 cm, R3 – 12.3 cm, R4 – 7.2 cm

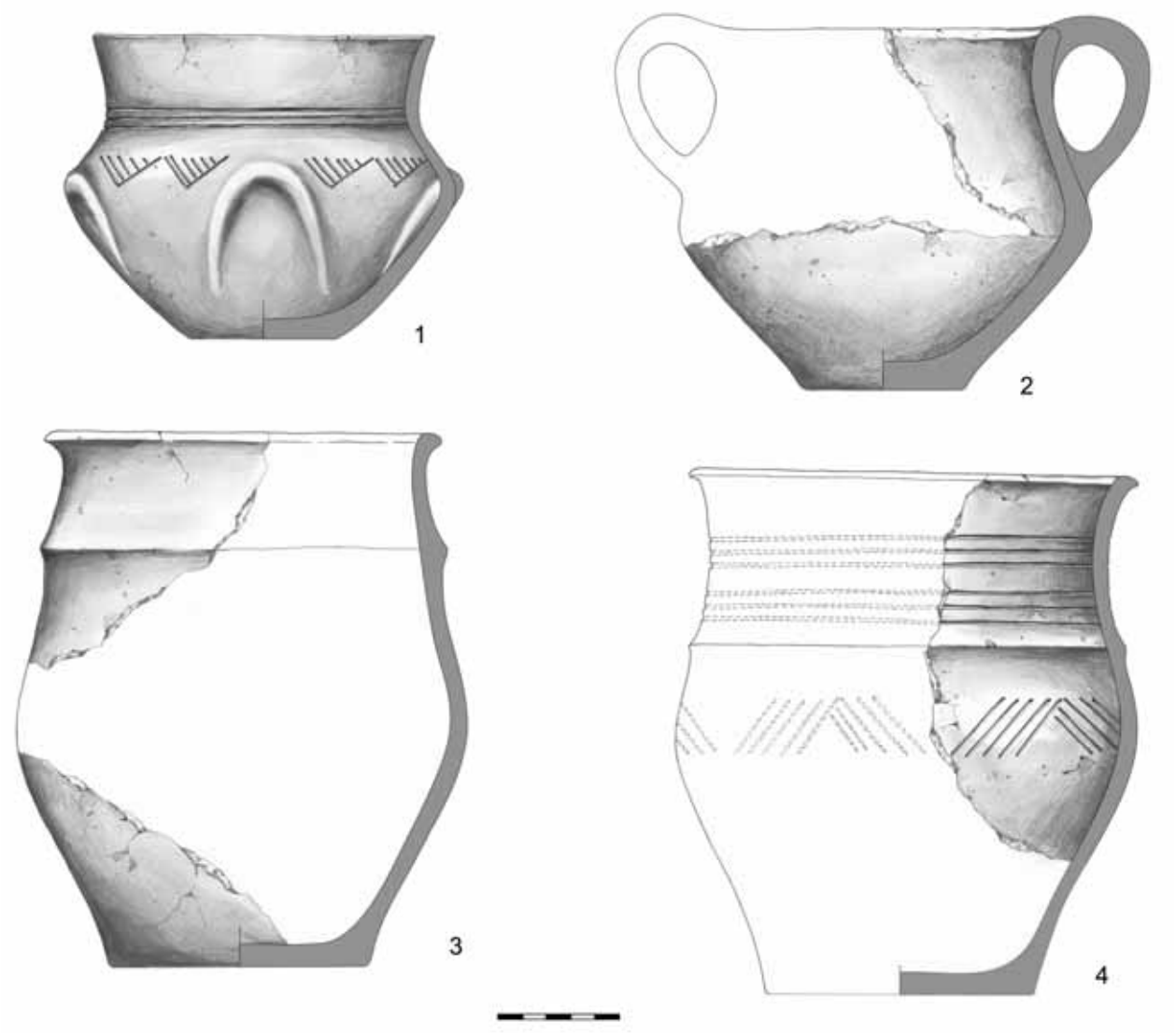



**Fig. VIII.173.** 1 – vase, type W22, ornamented on the neck with three horizontal relief lines, on the body with horizontal incised triangles open at the top and hatched with oblique lines, below – circumferentially – with four horseshoe relief arches. Rounded rim; unmarked base. H – 12.5 cm, R1 – 14 cm, R2 – 13 cm, R3 – 16 cm, R4 – 6 cm; 2 – amphora, type A112a, plain. Rounded rim; base slightly marked; *ansa lunata* handles. H – 15.5 cm, R1 – 14.3 cm, R2 – 13.8 cm, R3 – 17 cm, R4 – 6.5 cm; 3 – pot, type G111, ornamented on the neck with a horizontal relief strip. Thickened and rounded rim; base slightly marked. H – 21.5 cm, R1 – 16.3 cm, R2 – 14.8 cm, R3 – 18.5 cm, R4 – 10.6 cm; 4 – beaker, type P22, ornamented on the neck with six horizontal incised lines, two sets of three lines, on the body – with a horizontal relief strip, below – circumferentially – with short oblique incised lines co-forming angular motifs (sets of five). Rim thickened and obliquely cut outwards, base unmarked. H – 21.5 cm, R1 – 18.5 cm, R2 – 16.3 cm, R3 – 19 cm, R4 – 10.8 cm

**Fig. VIII.174.** Stone shaft-hole axe. Dimensions: 12 cm × 4 cm × 3,5 cm

*was 19 m in diameter, 1 m high. Just under the humus cover, in the centre of the mound, at a depth of 35 cm, lay a flint axe (d) (Sulimirski 1968, Fig. 16:17), 9 cm long, rectangular in section, and a stone battle-axe (e) of type y-2 (Sulimirski 1968, Fig. 13:9), 10 cm long, which seemed to have been in fire. Deeper, at a depth of 70 cm, in the central area (c), about 6.5-7 m in diameter, potsherds (b), lumps of fired clay and small pieces of charcoal were found scattered on the ancient surface. On the southern edge of this area, 4 m S of the centre, small accumulations of calcined human bones (g), a few potsherds of a large vessel (f) and a crushed, large, deep bowl with an inverted rim (Sulimirski 1968, Fig. 31:2) were found. Potsherds found over the whole area (b) and those from its southern edge (f) belonged to the same vessel of unknown shape.*

*About 2 m SE of the centre, eight small boulders were found on the ancient surface forming a circle nearly 1 m in diameter (h) filled in with charcoal; a potsherd of the large vessel mentioned above (bf) was also found here.*

*Barrow-grave 51. 16 m in diameter, 55 cm high, partly destroyed by a field road across it. Only charcoal was found here at a depth of 30-40 cm, 2.5 m south of the centre, thinly scattered over an area 2.5 m long and 50 cm wide. In the mound only three potsherds were excavated, those of a large thick-walled vessel with a black, polished surface, similar to the large jar from barrow-grave 20.*

*Barrow-grave 52 (Sulimirski 1968, Plan 25:1). 16 m in diameter, 85 cm high. Close to the centre, on the top of the mound, just under the humus cover, a large boulder was excavated (a). In the central area under the mound, at a depth of about 70 cm, on the ancient surface, a layer was uncovered, 3.5 by 2 m, orientated NW – SE, of powdered charcoal and larger lumps of charred wood, in which calcined human bones and several broken flint implements were found (b).*

*Barrow-grave 53 (Sulimirski 1968, Plan 26:1) formed a group with no. 54. It was 20 m in diameter, 1 m high. About 2.5 m N of the centre a large boulder was found (d) just under the humus cover. About 3 m E of the centre, at a depth of 40-50 cm, in the mound, charcoal (b) was found scattered over an area about 50 cm in diameter, and a few metres further SW, also in the mound, lay a few pieces of charcoal.*

*On the ancient surface at a depth of 70 cm, about 2.5 m N of the centre, under the boulder, lay a flint scraper, or knife (g) and a handful of charcoal. A similar handful of charcoal lay 2.5 m SE of the centre, on the ancient surface (e), and near by a lump of red ochre (d) and another flint scraper, or knife (f) were excavated at the same level. No traces of skeleton were discerned.*

*Barrow-grave 54. 15 m in diameter, 50 cm high. A large boulder was found just under the upper humus, at a distance of 2 m SE of the centre, and W of the centre a handful of charcoal at the same level. Nothing else was found, either in the mound or under it.*

*Barrow-grave 55 formed part of a group of two, with no. 31. It was 16 m in diameter, 60-65 cm high. On the ancient surface, at a depth of 65 cm an almost completely crushed cup (a) lay at a distance of 2 m N of the centre. Sherds of an incomplete, larger vessel lay at the same level 2 m E of the centre (b), and a deep decorated dish (c) (**Fig. VIII.175**; Sulimirski 1968, Fig. 27:7) lay 2 m S of the centre. No traces of skeleton were found.*

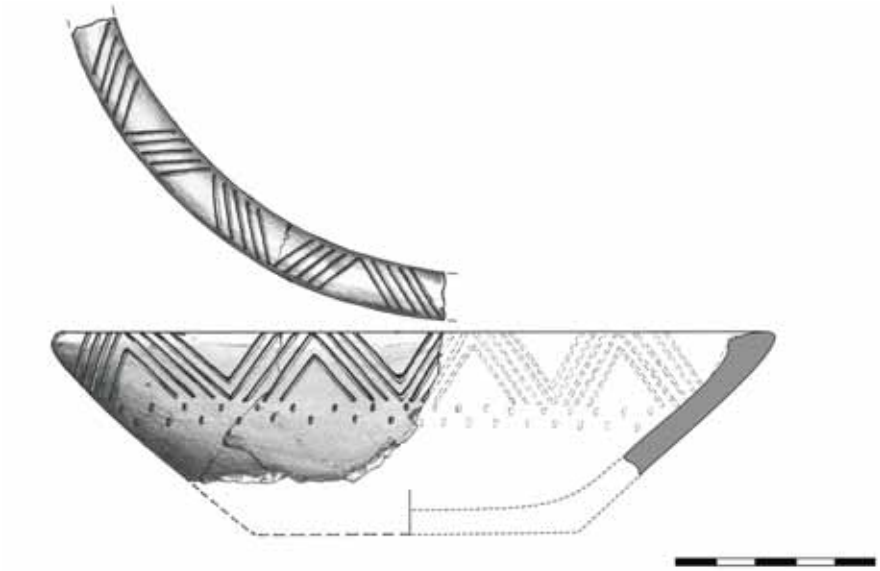


**Fig. VIII.175.** Bowl, type M22, preserved in fragments, ornamented on and under the rim with patterns of multiple incised angles, below — with two circumferential rows of circular pinholes. Rim thickened and obliquely cut inwards. H – 5.1 cm, R1 – 18 cm, R4 – 8 cm

*Barrow-grave 56 was an isolated mound on the border of the forest of Medynia, 16 m in diameter, 45 cm high. Nothing was found in it.*

*Barrow-grave 57 formed part of the westernmost group of mounds investigated in this cemetery, along with nos. 39, 40, 42. It was 15 min diameter, 50 cm high, ploughed up. Only a flint flake and a flint scraper were found, the latter 3 m E of the centre, in the arable soil.*

*Barrow-grave 58 belonged to a group of two, with no. 30, situated outside the cemetery, on a lower part of the hills. It was 15 m in diameter, 35 cm high, much ploughed up. Four metres S of the centre, in the arable soil, a flint flake was found, and at a distance of 1.5 m E of the centre a hole, triangular in plan, was uncovered, dug in the ancient surface. It was about 60-65 cm in diameter, 50 cm deep (80 cm from the top of the mound), and was filled in with charcoal and red fired clay.*

*Barrow-grave 59 (Sulimirski 1968, Plan 27:2) lay some 150 m S of the above group, also outside the cemetery. It was 24 m in diameter, 1 m high, but a large portion of its SW part was eroded by a stream. In the centre, on the top of the mound just under the arable soil, traces of a hearth (a), 1 m in diameter, were uncovered. A layer about 10 cm thick, of fired clay, cinders and charcoal lay here. On the top of the mound, under the arable soil, about 3.5 m SE of the centre a large flint core in the shape of a blunt axe, or hammer (b), was excavated, 9 cm long. On the ancient surface, at a depth of 60 cm, an area 3.5 by 2 m, orientated W – E was uncovered, within which small pieces of charcoal were scattered (f), in its western part particularly. About 2 m N of this, at a level some 10 cm higher (50 cm from the top of the mound) lay a very roughly executed axe made of yellow siliceous slate (c), 10 cm long. Further north, at a distance of 5 m from the centre, on the ancient surface, an area littered with charcoal, about 2 by 1 m in area, was uncovered Finally, 5 m E of the centre, at the same level, a flint flake lay (e). No traces of skeleton were found.*

*Barrow-grave 60. A single mound in the central part of the cemetery. It was 15 m in diameter, 40 cm high. A few small pieces of charcoal were found in the mound, and on the ancient level at a depth of 40 cm, in the centre of the mound, a handful of charcoal lay. Nothing else was found.*

*Barrow-grave 61 (Sulimirski 1968, Plan 26:2) formed a group of two mounds with no. 62. It was 15 m in diameter, 40 cm high. South-east of the centre seven boulders (a), about 10 cm in diameter, were found at a depth of 20 cm, under the forest humus. Five of these formed an irregular circle 2 m in diameter with a sixth boulder in its centre. Under these stones, at a depth of 40 cm, on the ancient surface an area was uncovered nearly rectangular in plan with its corners rounded (c), about 1.6 m by 80 cm, the surface of which was red fired to a depth of 20 cm, 60 cm from the top of the mound. However, no cinders, charcoal etc. were found over it: it had been cleared of any remains of pyre. No grave goods or traces of the skeleton were found. Only about 2 m SW of the above area, at the same level, on the ancient surface, lay a handful of charcoal (b).*

*Barrow-grave 62. Near the above. It was 15 m in diameter, 40 cm high. Nothing was found in it except charcoal which lay on the ancient surface at a depth of 50 cm, 1.5 m SE of the centre, in a layer 1 cm thick, about 1 m long, a few centimetres wide.*

*Barrow-grave 63 (Sulimirski 1968, Plan 26:3) formed part of a group of four mounds (nos. 37, 38, 52) but lay just over the border in the forest of the neighbouring village of Medynia. It was 15 m in diameter, 55 cm high. On the ancient surface, at the depth of 55 cm, close to the centre, an almost completely decayed skeleton in a crouched position, head to W, was uncovered (a). Near its head lay a stone battle-axe (b) (of type y-3), made of a greenish stone, 11 cm long, well-polished, with a flint scraper or burin (c) nearby.*

*Barrow-grave 64 (Sulimirski 1968, Plan 16:2) lay outside» the cemetery, on a slope, at a distance of some 450 m E of the large group of Bronze Age mounds. It was 18 m in diameter, 40 cm high, ploughed up. In various points a few odd potsherds of Neolithic character were found under the arable soil (a); they originated from a medium-sized beaker with thick walls. At a distance of 2 m SE of the centre, the site of the grave (b) was uncovered, 2 m long, orientated SW – NE, which was only 60 cm wide, its SE side being destroyed by a drain-pipe trench. On the NE edge of the grave lay a large lump of charcoal (c). The site of the grave was marked by a much darker earth extending over the area, only a few centimetres thick. No traces of skeleton were found.*

*Barrow-grave 65. This was a single mound about 75 m SW of mound 4, near the border of Kryłos, 15 m in diameter, 40 cm high, ploughed up. Traces of previous excavation in the form of a trench cut across the mound from W to E 2 m wide were uncovered; across the eastern part of the mound ran a drain-pipe trench. The SW corner of the grave was found (b), at the junction of the two, about 1 by 1 m in area. The grave was orientated N – S, and was sunk a few centimetres in the ancient ground surface. In the loose, dark earth which filled the grave, calcined bones lay scattered but no grave-goods. A large flint flake (a) lay on the ancient surface about 1,5 m west of the grave, on the edge of the ancient trench.*

# IX. Cemetery in Krasów/Krasiv (Fig. IX.1)

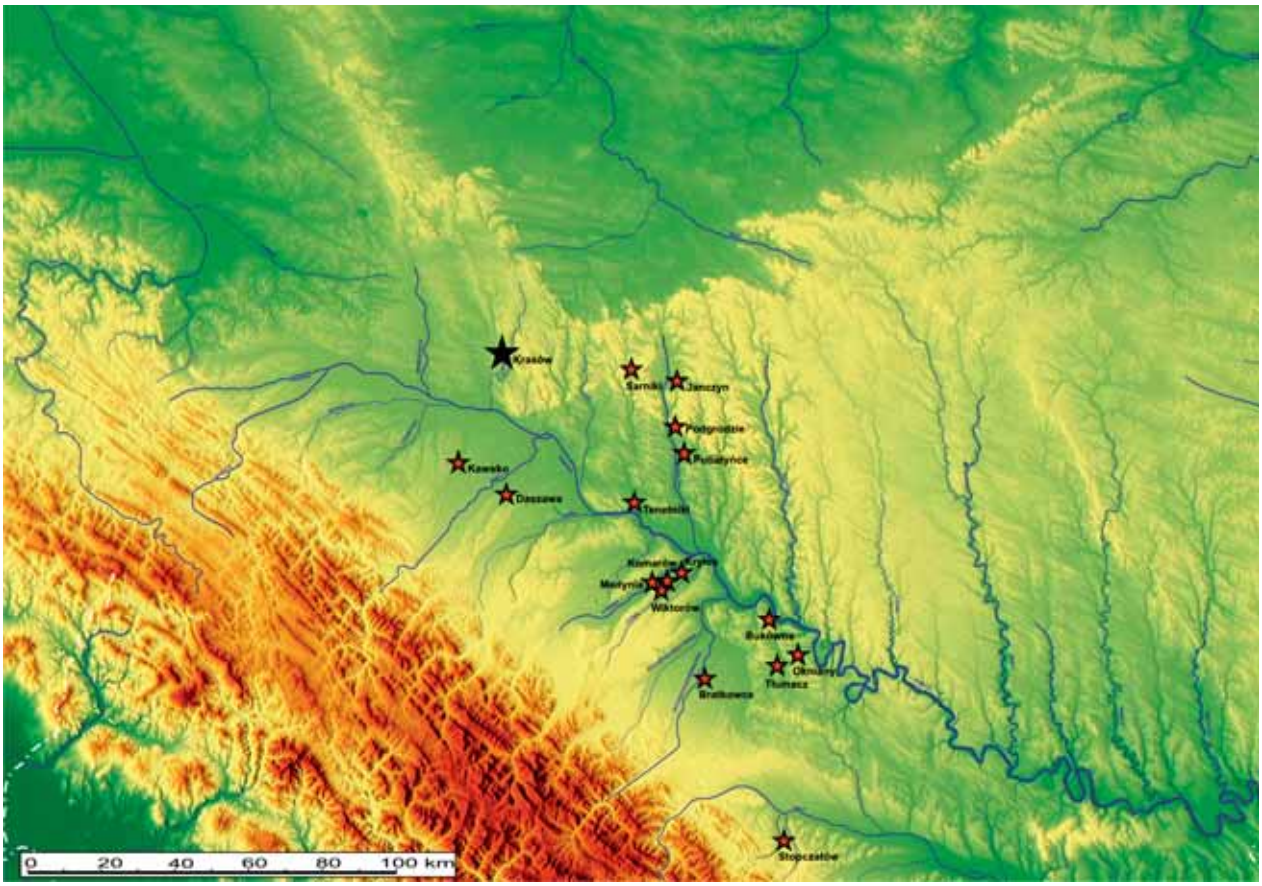



**Fig. IX.1.** Location of the cemetery in Krasiv in relation to other barrow necropolises

## A. Geographical description

The necropolis in Krasiv is located on the right side of the Zubra river, which is a tributary of the Dniester. Both the Zubra, its minor tributaries and other Dniester tributaries have a latitudinal mileage. They segment the plateau into ridges and perches of an elongated, latitudinal axis. The barrows were erected along the Zubra on an altitude of 331 m to 398 m.a.s.l. The difference in relative height of the most prominent lands and the bottom of the valleys ranges between 100-120 m. Rivers flow then inside deep

ravines, which is confirmed by the sloping degree that varies in the uplands to 0.55 degrees and on the slopes up to 15 degrees.

The area where burial mounds are found in terms of geomorphological regionalization belongs to Opillie, which is a south-western part of the Podolian Upland. The Podolian is built in its base ground by crystalline rocks (granites, gneisses) covered by the Paleozoic and Mesozoic sediments, especially the Upper Jurassic and Cretaceous. Among the important features in the Podolian Plateau are the Neogene layers, whose thickness can be estimated at 100-200 m. Inside this feature there occur sands, sandstones and limestones characteristic for a shallow marine environment, as well as gypsums and loams. Above the Neogene layers, there is a loess accumulation of significant thickness in which the rivers dissect the deep valleys (Czeppe *et al*. 1969).

The main characteristic of Opillia is a segmentation due to river erosion. The highest highland reaches its peak at 413 m.a.s.l. It is widely known for its picturesque and mountain-like landscape. Notably, the areas adjacent to the Zubra are known as the Rozdolska Switzerland (Rąkowski 2007). This specific region became unique for its tumulus erectors. Here the barrows create a linear arrangement of latitudinal mileages corresponding to the structural lines of ridges.

The substantial lengths of linear arranged groups of mounds derive from a specified geomorphology of terrain used during the establishment of the cemeteries. Side branches of these linear units occur due to a dense hydrological net that dissects the ridges into minor forms – perches.

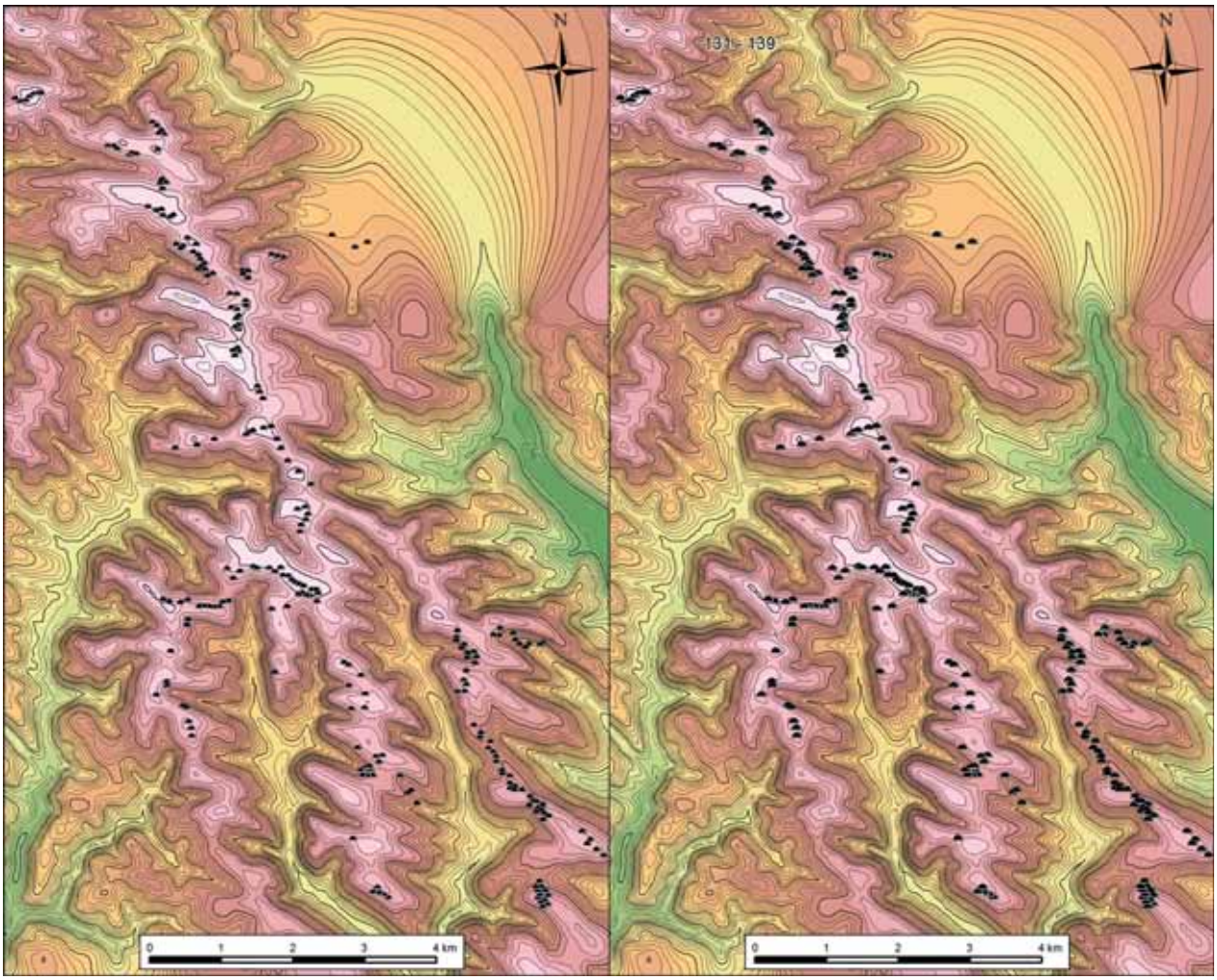



**Fig. IX.2** (left). Digital Elevation Model of the barrow cemetery in Krasiv

**Fig. IX.3** (right). Digital Elevation Model of the barrow cemetery in Krasiv with the numbering of barrows (nothern part of necropolis only)

## B. Spatial arrangement of the cemetery

Among analysed sites the largest concentration of barrows was recorded in Krasiv. In a highly varied terrain there are more than 230 barrows, arranged in smaller and larger groups **(Fig. IX.2, Fig. IX.3, Fig. IX.4)**. They form linear arrangements comprising between several to a dozen barrows, located along flattened hill tops, close to watercourses. Monuments are aligned along NW – SE axis on a 13.5 km distance, also forming shorter lines ("side pathways") comprising between several to many mounds erected within 1.5-3 km long linear structures, situated on flattened hill tops. Only three tumuli are located in the lower parts of the area, outside main alignments. The longest ones are a few kilometres long, while the shortest can be measured in metres. They fit the existing hill morphology. Several barrow excavations in the N of the area have shown that Middle Bronze Age monuments were erected within pre-existing Neolithic alignments.

Only the furthest, NW group of the Krasiv cemetery comprising of nine mounds is described. This is due to the fact that this group was excavated in the1930s. The cluster is located on a plateau and the western slope of a highland and stretches along 400 m forming a linear, "sinusoidal" structure, generally oriented along a W – E axis **(Fig. IX.5)**.

## C. Description of the barrows

**Barrow 131 (Fig. IX.6, Fig. IX.7)** was documented in the NW part of the cemetery, at 400 m.a.s.l., within a nine barrow group, on its W edge, 30 m E of mound 133. Geographic coordinates: N – 49°36'443"; E – 024°04'260". Circular in shape, 27 m in diameter, 0.5 m high. Overgrown by trees and bushes.

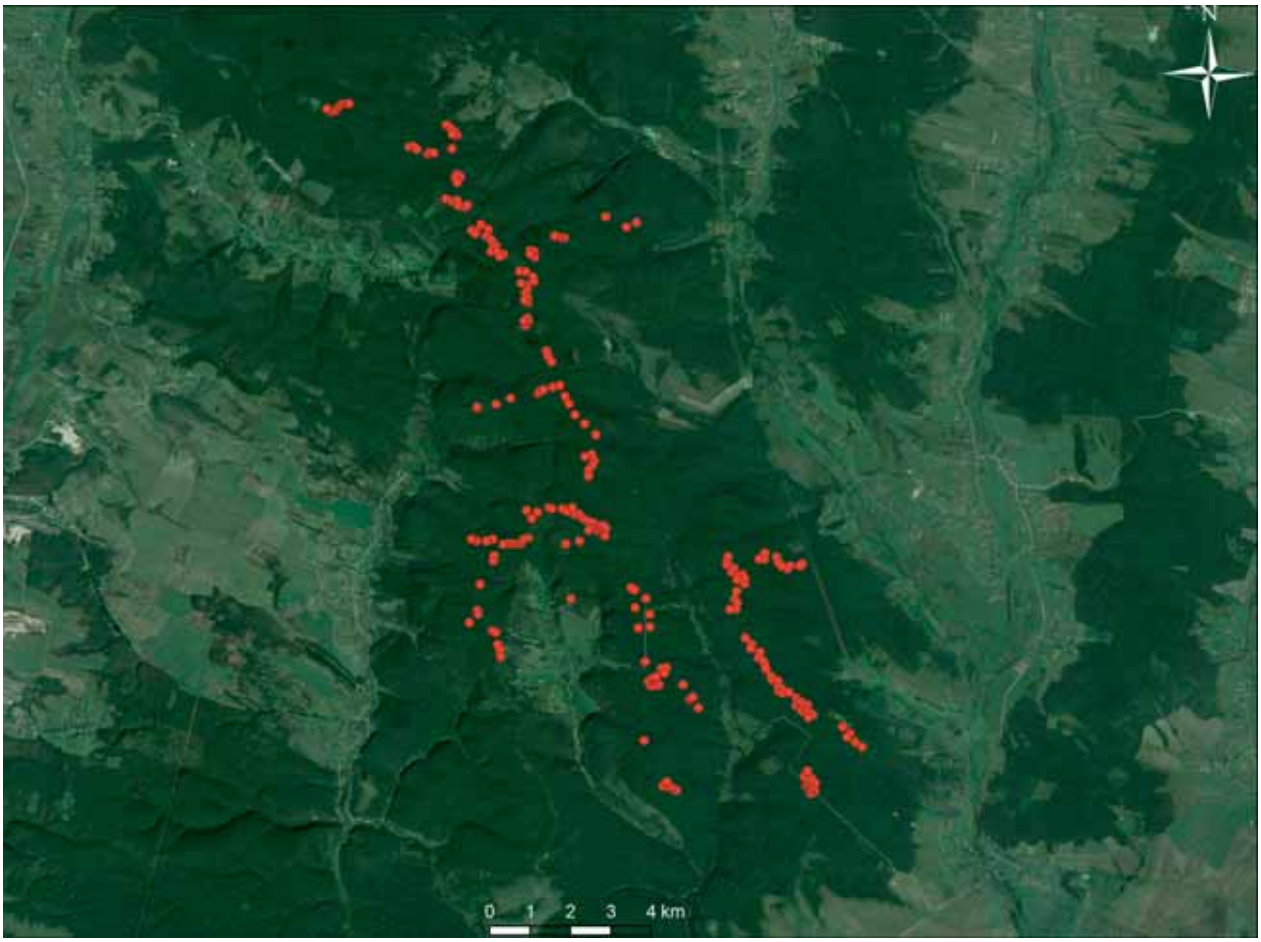



**Fig. IX.4.** Krasiv. Location of the cemetery using satellite imagery (Google)

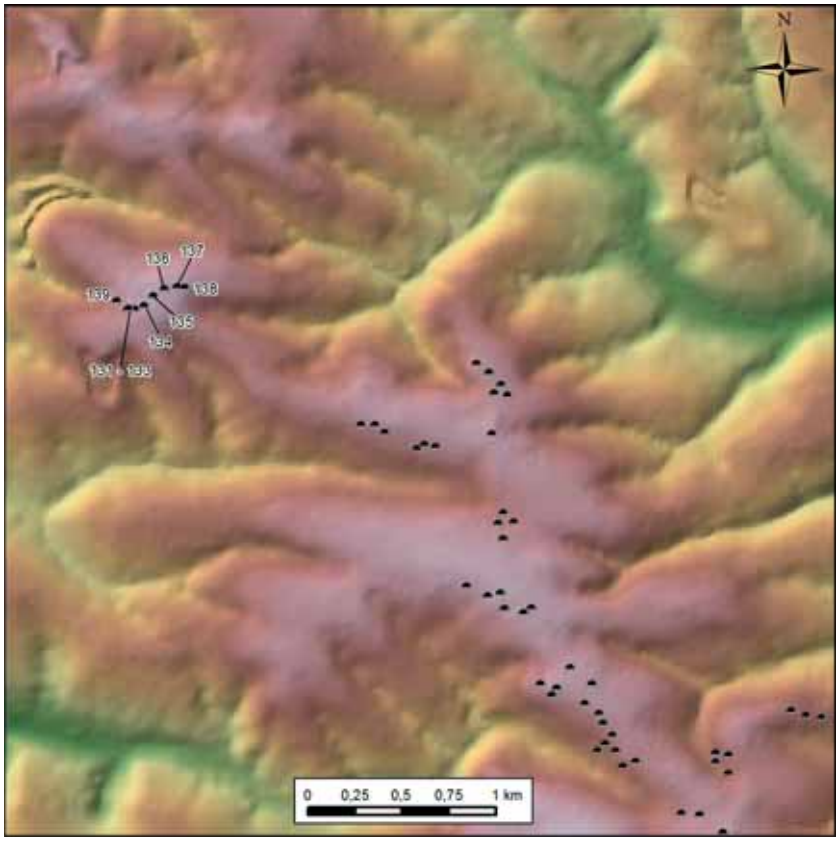
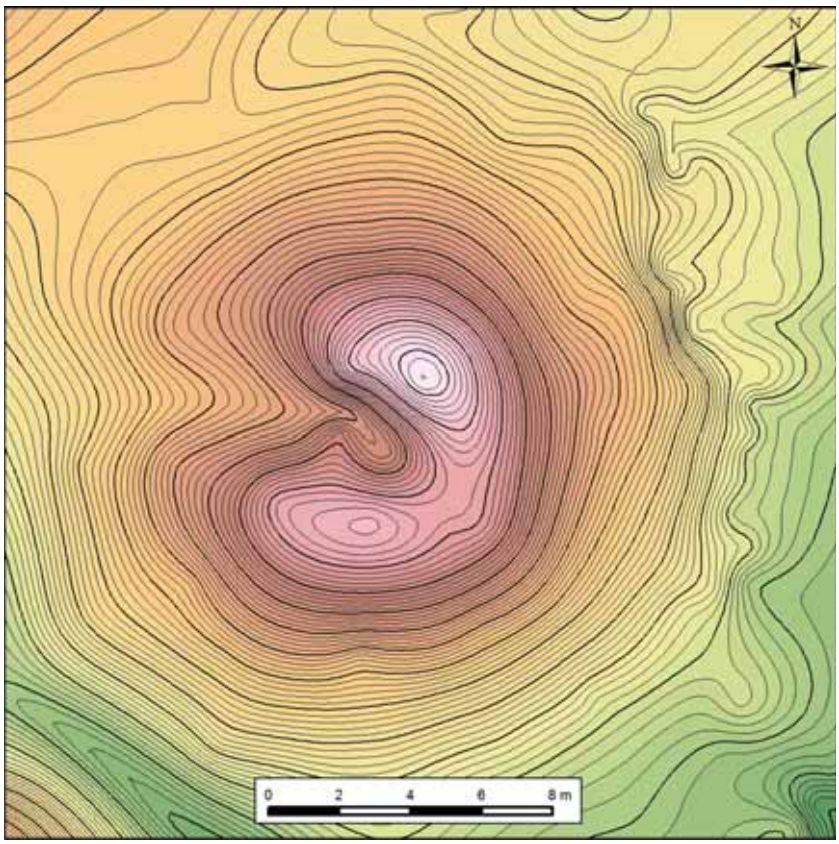



**Fig. IX.5.** Digital Elevation Model of the barrow cemetery in Krasiv with the numbering of barrows (investigated part only)

**Fig. IX.6.** Barrow 131. View from the S



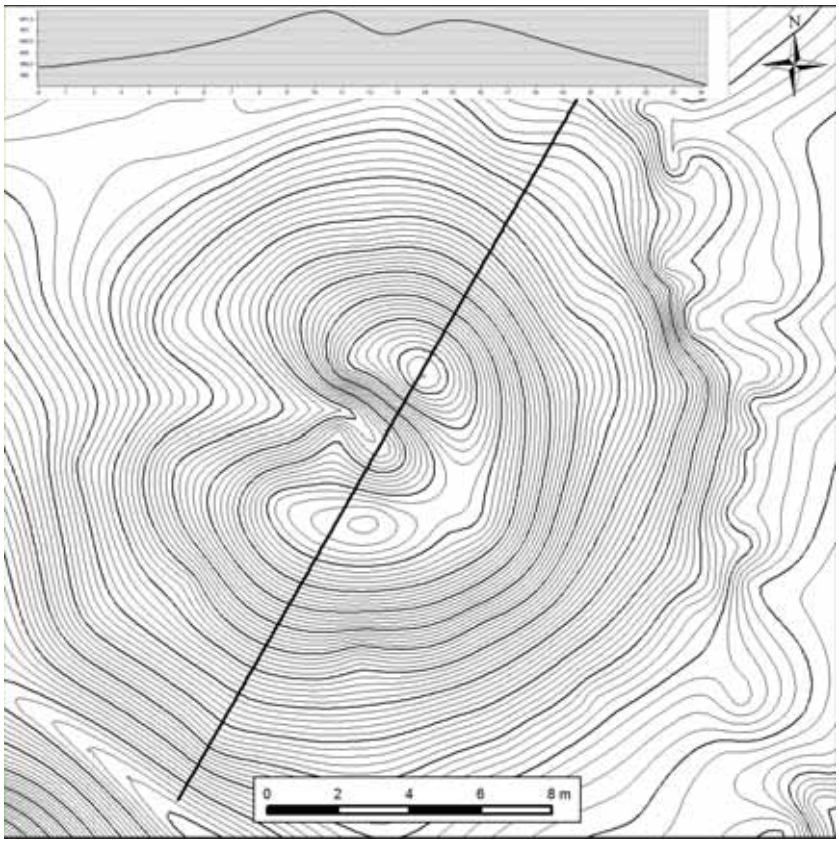




**Fig. IX.7.** Barrow 131. Hypsometric plan and cross-section

**Fig. IX.8.** Barrow 132. View from the S

**Barrow 132 (Fig. IX.8)** is located in the NW part of the cemetery, at 396.5 m.a.s.l., in a group of nine monuments. It is situated in its western part, 65 m SE of mound 139. To the E it connects with barrow 133. Geographic coordinates: N – 49°36'442"; E – 024°04'227". Circular in shape, 14 m in diameter, 1 m high. A triangulation point is located on top of the barrow. Overgrown by trees and bushes.

**Fig. IX.9.** Barrow 133. View from the SE

**Barrow 133 (Fig. IX.9)** – excavated in the 1930s – was recorded in the NW part of the cemetery, at 396.5 m.a.s.l., in the SW edge of the nine tumuli group. It was erected 30 m W of monument 134, from the east it connects with barrow 132. Geographic coordinates: N – 49°36'443"; E – 024°04'233". The diameter of the dig-in measures ca. 6 m. Overgrown by trees and bushes.

**Fig. IX.10.** Barrow 134. View from the S

**Barrow 134 (Fig. IX.10)** was documented in the NW part of the cemetery, at 403 m.a.s.l., in the SW part of the nine barrow cluster. It is located 30 m E of barrow 133, 50 m SW of tumulus 135. Geographic coordinates: N – 49°36'453"; E – 024°04'300". Circular in shape, 17 m in diameter, 0.5 m high. Overgrown by trees and bushes.

**Barrow 135 (Fig. IX.11, Fig. IX.12)** was recorded in the NW part of the cemetery, at 402.5 m.a.s.l., in the central part of the nine monument group. It is situated 50 m NE of barrow 134. Geographic coordinates: N – 49°36'483"; E – 024°04'340". Circular in shape, 14 m in diameter, 0.5 m high. Subject to geophysical survey. Overgrown by trees and bushes.

**Fig. IX.11.** Barrow 135. View from the E

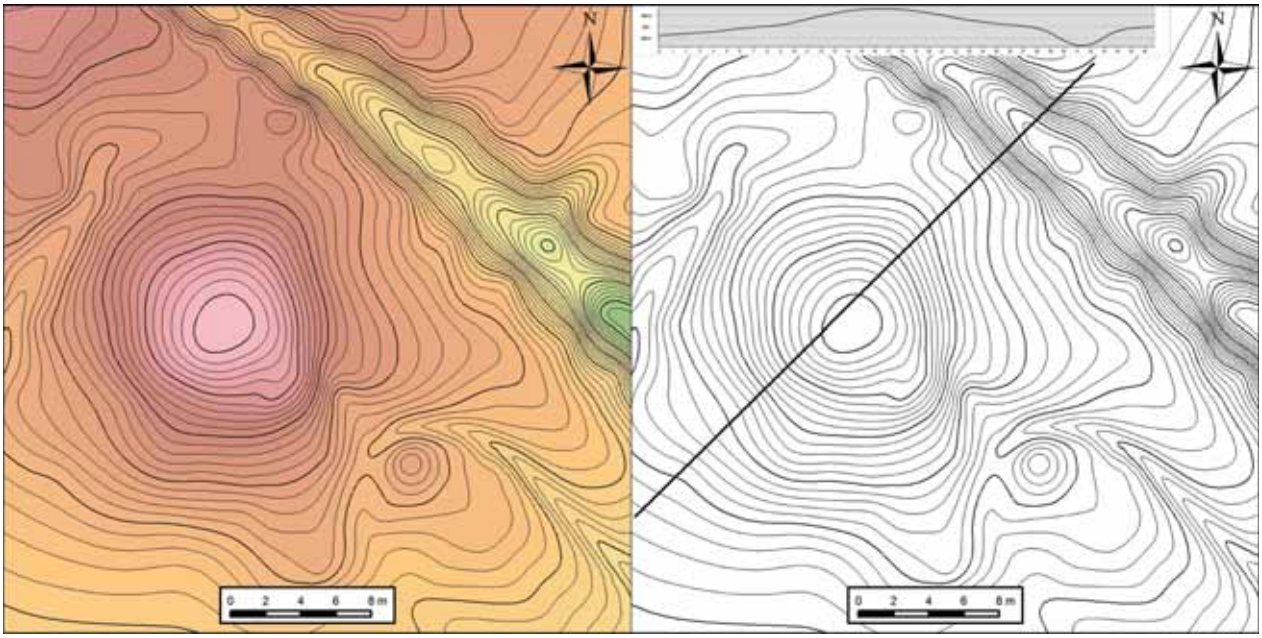



**Fig. IX.12.** Barrow 135. Hypsometric plan and cross-section

**Barrow 136 (Fig. IX.13, Fig. IX.14)** was erected in the NW part of the cemetery, at 400 m.a.s.l., in the central-eastern part of the nine barrow group, 50 m NE of barrow 135 and 60 m W of tumulus 137. Geographic coordinates: N – 49°36'503"; E – 024°04'386". Circular in shape, 12 m in diameter, 0.8 m high. Subject to geophysical survey. Overgrown by trees and bushes.

**Fig. IX.13.** Barrow 136. View from the S

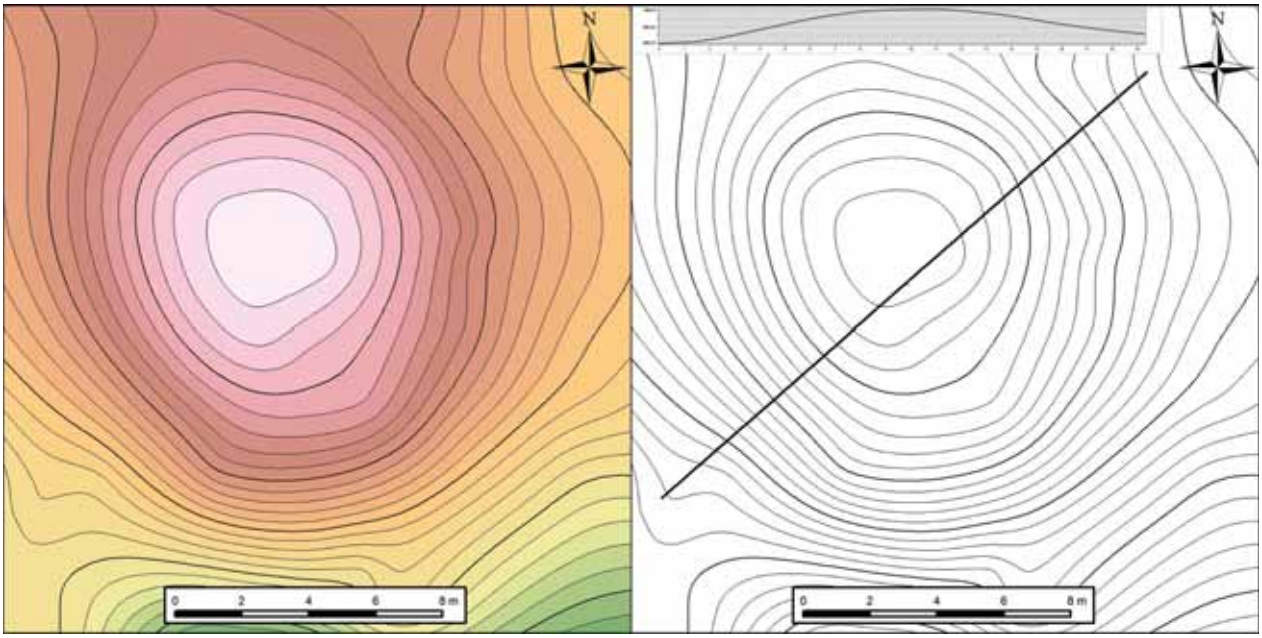



**Fig. IX.14.** Barrow 136. Hypsometric plan and cross-section

**Barrow 137 (Fig. IX.15, Fig. IX.16)** is located in the NW part of the cemetery, at 402 m.a.s.l., in the western part of the nine monument group. It is located 60 m E of barrow 136, 35 m W of the furthest barrow 138. Geographic coordinates: N – 49°36'511"; E – 024°04'443". Circular in shape, 23 m in diameter, 1 m high. Overgrown by trees and bushes.

**Fig. IX.15.** Barrow 137. View from the NW

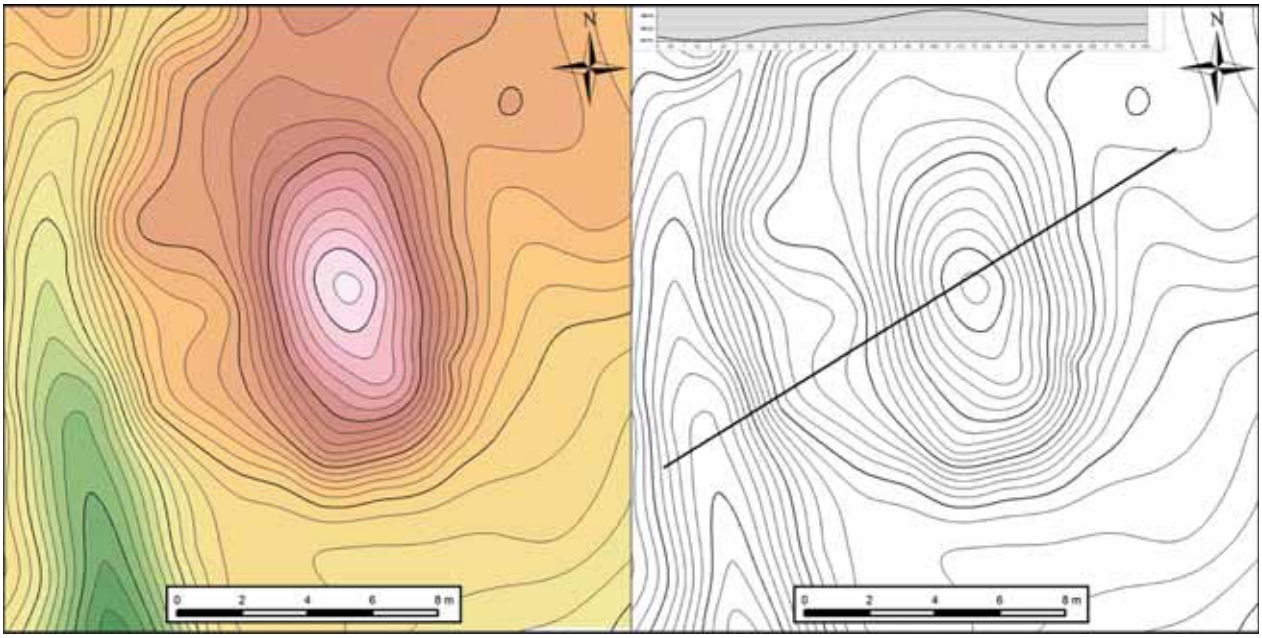



**Fig. IX.16.** Barrow 137. Hypsometric plan and cross-section

**Fig. IX.17.** Barrow 138. View from the NW

**Barrow 139 (Fig. IX.18)** was recorded in the NW part of the cemetery, at 393 m.a.s.l. in the W part of the nine monument group. It is located 65 m NW of tumulus 132. Geographic coordinates: N – 49°36'464"; E – 024°04'177". Circular in shape, 9 m in diameter, 1 m high. Destroyed from the S side by a dirt road. Overgrown by trees and bushes.

**Barrow 138 (Fig. IX.17)** is located in the NW part of the cemetery, at 401 m.a.s.l. in the W part of the nine barrow group. Closest tumulus is 137, lying 35 m east. Geographic coordinates: N – 49°36'510"; E – 024°04'476". Circular in shape, 21 m in diameter, 1 m high. Overgrown by trees and bushes.

**Fig. IX.18.** Barrow 139. View from the W

## D. Geophysical survey

Out of numerous prehistoric barrows present on the site in Krasiv, two were surveyed with the magnetometric method in April 2015. They were selected on the basis of accessibility of terrain, which is predominantly overgrown by dense forest and abounds in steep slopes (**Fig. IX.19**). Chosen monuments belong to the group of rather small mounds, thanks to which it was possible to include them each time in the framework of two grids measuring 10 × 10 m. In total the surveyed area amounted to 0.04 ha. The relatively low natural coverage of selected tumuli, as well as their modest embankments led to the decision to apply 0.5 m measurement profiles in order to increase the sampling and enhance the resolution of resulting images.

In the light of the obtained data the first, surveyed barrow 136, can rather no longer be regarded as a prehistoric monument. The real values of the measurements acquired on its surface in many places reached the threshold registered by the gradiometer (-3000/3000nT). Such readings happen sometimes during surveys on prehistoric sites when there are objects rich in iron compound present on the surface. However their form of accumulation, as in the case of barrow 136, are quite rare and can result only from purposeful deposition of ferrous materials in one place (intentionally reused ancient mound?). Even if a prehistoric landform, such as a barrow, has been excavated, extensive increase of magnetic response exceeding 50nT is not registrable. In order to highlight the contrast of these anomalies with their context, the real range of registered values was compressed to -50 – 50nT in greyscale (**Fig. IX.20**).

The resulting image illustrates a conglomerate of many abnormally polarized anomalies in the shape of an oval, elongated along the W – E axis. Most probably one is dealing here with the accumulation of numerous objects characterized by residual magnetization, oriented with their positive and negative magnetic poles in different directions. Such an intensification of magnetic response is not possible in the case of prehistoric monuments, therefore object 136 should no longer be interpreted as a prehistoric barrow.

At the same time there are no contraindications, as derived from the results of magnetometric survey, to consider object no. 135 as a prehistoric mound. Nevertheless, some doubts can be raised by its oval outline and small size of the embankment, similarly to object 136. Despite the high density of sampling, the discussed barrow is not visible on the resulting

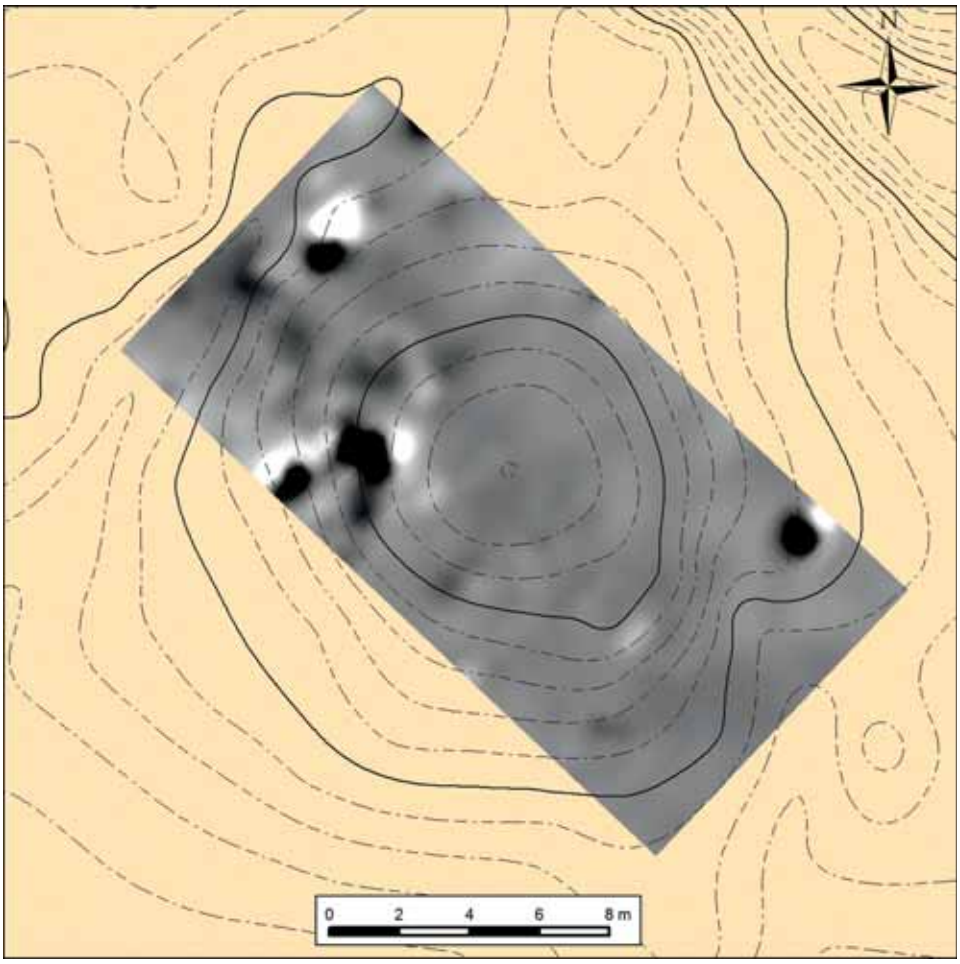



**Fig. IX.19.** Krasiv. Position of geophysical survey (barrow 135)

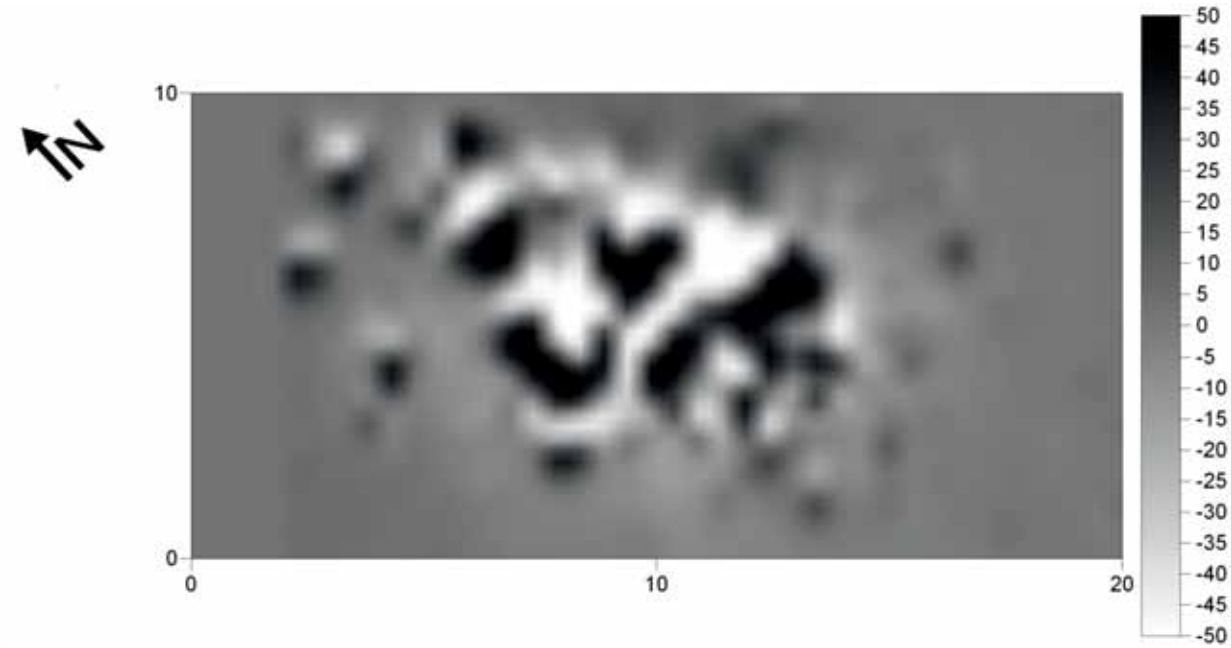



**Fig. IX.20.** Resulting image of magnetometric survey of barrow no. 136 on the site near Krasiv (gradiometer Bartington Fluxgate Grad 601-1; measuring grid 20 × 20 m, sampling density per traverse spacing 0.25 × 0.5 m, interpolated up to 0.25 × 0.25 m; real values of the magnetic field gradient compressed in the greyscale to the range -50 – +50nT)

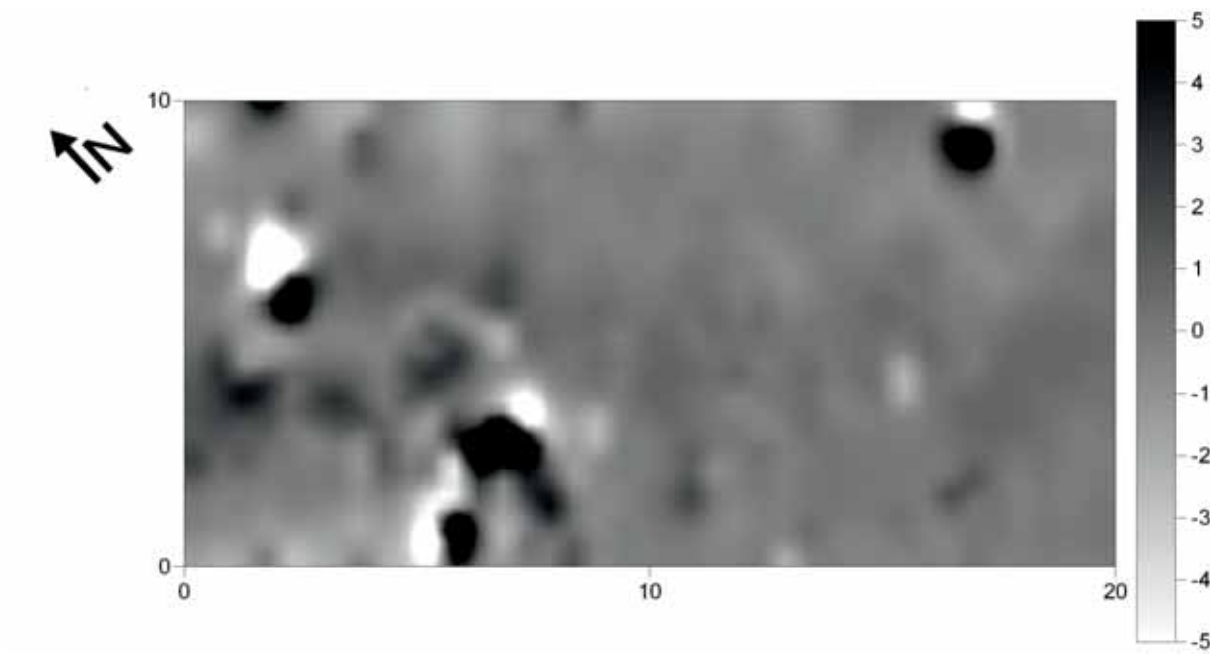



**Fig. IX.21.** Resulting image of magnetometric survey of the barrow no. 135 on the site near Krasiv (gradiometer Bartington Fluxgate Grad 601-1; measuring grid 20 × 20 m, sampling density per traverse spacing 0.25 × 0.5 m, interpolated up to 0.25 × 0.25 m; real values of the magnetic field gradient compressed in the greyscale to the range -5 – +5nT)

image (**Fig. IX.21**). Several strong, abnormally polarized anomalies reveal the presence of metal objects in its vicinity, however they are not concentrated in one place as before. Magnetic response in places where one would expect the barrow to appear are not different from the ones characterizing the context. Thus, more thorough interpretation is impossible in the discussed case.

## E. Archival information

### Krasów, district of Lwów (after Sulimirski 1968:142-143)

*A group of six barrow-graves occur here in the forest near the Miedziaki hamlet (**Fig. IX.22**; Sulimirski 1968, Plan 5:2). They are situated on the summit of a hill all in one line, running W – E for some 360 m. All were excavated by me in 1935-36. Two mounds at the eastern end were Neolithic, all others belonged to the Komarów culture of the Bronze Age. The material was deposited in the Prehistoric Institute of the University of Lwów.*

*Barrow-grave I (Sulimirski 1968, Plan 33:2). This was situated on the western periphery of the group and was 18 m in diameter and 1.2 m high. An area approximately square in shape, with sides 3 m long, dug 30 cm into the ancient ground and orientated SW – NE was uncovered in the centre (A) at a depth of 80-90 cm. Its western corner was covered by a thick layer of charcoal (h), about 1.1 m by 50 cm wide, orientated S – N. Small pieces and lumps of charcoal were likewise scattered over the whole of the central area but particularly along its borders (e, j, f, l). Close, and perpendicular, to the layer of charcoal, south of it and already outside the central shaft, lay a large sandstone slab 1 m long, 40 by 40 cm diameter, its surface fired (a). A few calcined bones were found near the northern corner of the shaft (b). Sherds of a broken Thuringian amphora (Sulimirski 1968, Fig. 9:1) were scattered over the whole area of the central shaft (c, d, g, k, n). There were also two small vessels found: a ribbed beaker (p) (Sulimirski 1968, Fig. 9:3) in the centre, and a small entirely crushed cup (i) near the southern corner. An axe made of siliceous slate also lay in the centre (Sulimirski 1968, Fig. 9:4).*

*The axe above was 11 cm long, almost round in cross-section. The beaker (p) (Sulimirski 1968, Fig. 9:3) its surface covered entirely by horizontal ribs, was 9.5 cm high, 13 cm in diameter, and was very brittle, being made of clay with a large admixture of sand, dark in cross-section and its outer wall covered with a thin layer of brownish slip. The amphora (Sulimirski 1968, Fig. 9:1) was about 31 cm high, 32 cm in diameter, with a row of*

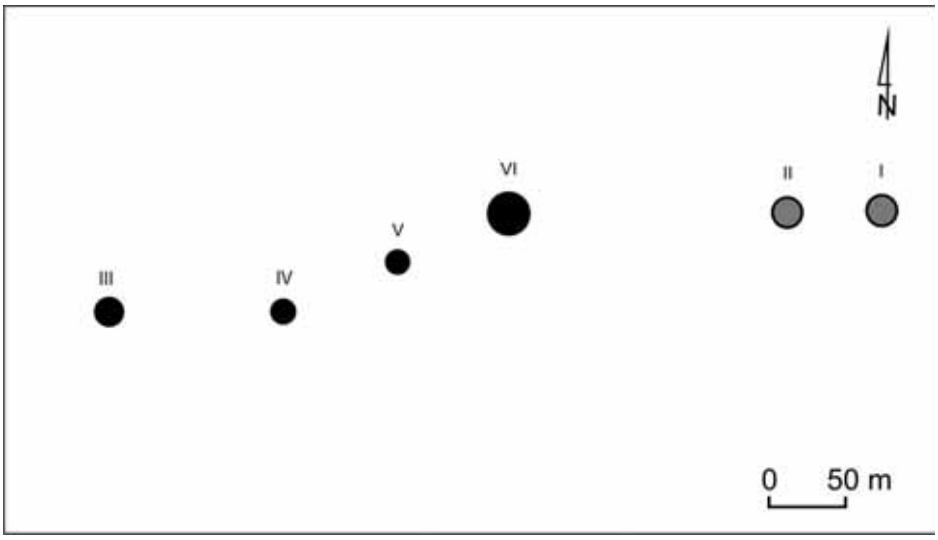



**Fig. IX.22.** Schematic plan of the cemetery in Krasów (Sulimirski 1968, Plan 5:2). Barrows III-VI – Komarów culture

*triangular incisions under the shoulder and on the body, with several repeated vertical stripes linking both rows of incisions and consisting of four parallel grooves. Only a dozen or so fragments of this amphora survived, scattered at various points round the grave, on its bottom, as in other places. The small cup had a rounded bottom, was not baked and could not be extricated.*

*Barrow-grave II (Sulimirski 1968, Plan 33:3). This was about 40 m west of the above, 16 m in diameter, 60 cm high. Its cross-section was similar to the above:*

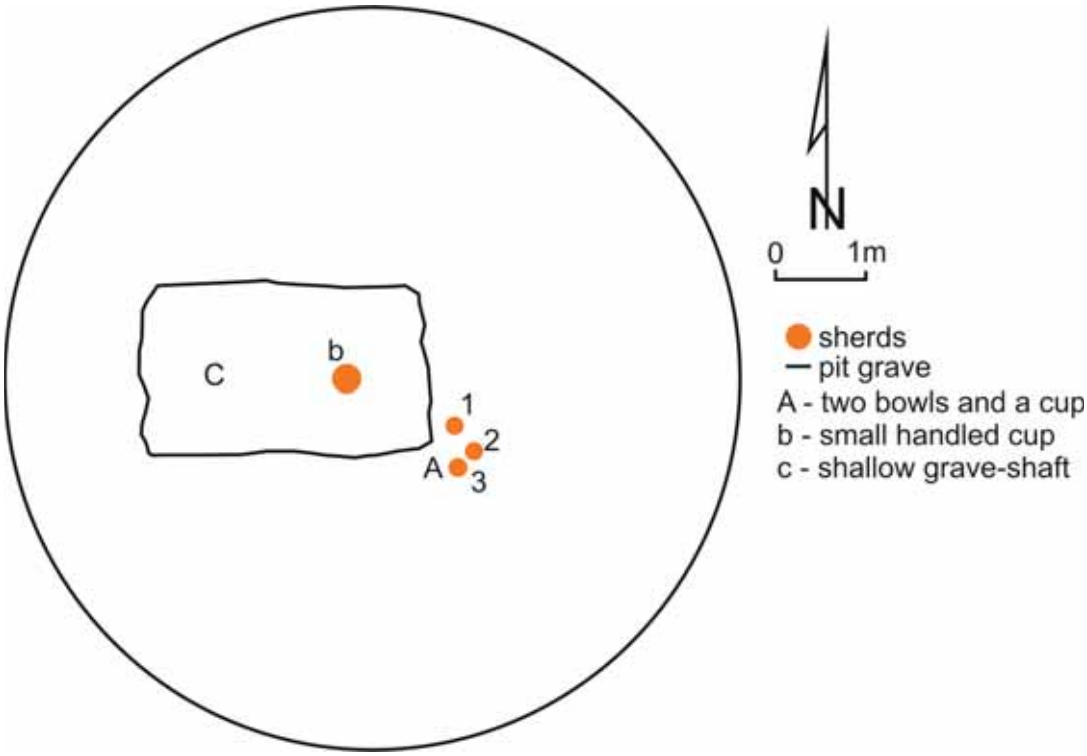



**Fig. IV.23.** Digitalized plan of barrow III (Sulimirski 1968, Plan 33:1)

*a loose dark ash-coloured mound was found under the forest humus 25 cm thick. The ancient level occurred at a depth of about 55 cm. It was formed of hard, beaten earth, black above, with the lower layers gradually giving way to darker brown, then to virgin soil. It was excavated to a depth of 1.2 m where the earth still had a somewhat blackish tinge.*

*A trimmed flint flake (a) and an odd potsherd (b) were found in the mound at a depth of about 40 cm south of the centre. A broken Thuringian amphora (e) (Sulimirski 1968, Plate 4:5) with some fragments lying about 1 m away to the east (c) was found at a depth of 70 cm, most probably in a small, shallow shaft dug about 15-20 cm into the ground, at 2 m west of the centre. A small, well-polished flint axe (f) (Sulimirski 1968, Fig. 16:22) 7.1 cm long was lying near the amphora, with a flint knife 10 cm long, very well made, its edges trimmed (Sulimirski 1968, Fig. 17:9) at 50 cm from it, to the east (g). The Thuringian amphora was 22.5 cm high, 24 cm in diameter, and was decorated with an incised ornament typical of these amphorae. It was not possible to determine the edges of the shaft with any accuracy. The amphora had evidently been standing at its western end, while the flint knife was undoubtedly lying by the hip of the skeleton, which had completely decayed. East of the centre of the mound a lump of charcoal lay on the ancient surface (d).*

*Barrow-grave III (**Fig. IX.23**). This was situated at the western end of the entire group, was 16 m in diameter and 40 cm high. The grave-shaft (C), traces of which were only slight, was in the centre of the mound. It was about 28 by 1.8 m, dug 30 cm into the ground, orientated W – E.*

*A handled cup (b) (Sulimirski 1968, Plate 19:11) 9.5 cm high, 9.8 cm in diameter, not decorated, was found in the centre, near the eastern end at a depth of 60 cm from the top of the mound (**Fig. IX.24**). Two bowls and a small cup (A) (Sulimirski 1968, Plate 19:9) were standing in the SE corner of the shaft, on the ancient level. One bowl (A-1) (**Fig. IX.25**; Sulimirski 1968, Plate 20:10) was 12 cm high, 17.5 cm in diameter, with narrowing outlet, four small parallel grooves encircling it on the shoulder, the bottom very clearly marked. The second (A-2) (**Fig. IX.26**; Sulimirski 1968, Plate 20:8) was 10.3 cm high, 17 cm in diameter, and had a short shoulder, with narrow outlet and six symmetrically placed protuberances on the body, made from within. The cup (A-3) (**Fig. IX.27**; Sulimirski 1968, Plate 19:9) was 3.7 cm high, 6.3 cm in diameter with smooth sides widening towards the top. No traces of skeleton were found.*

*Barrow-grave IV (**Fig. IX.28**). This was situated 92 m east of the above. It was 16 m in diameter, 50 cm high. The handle of a Roman amphora (a) was found immediately under the forest humus on the N side, with a large quantity of fragments of the amphora near it (b). An oval area (e) about 5 by 3.5 m orientated approximately N – S, occurred in the centre of the grave under the mound, at a depth of 40-50 cm. Small lumps of charcoal were found scattered on this area, though they did not form a continuous layer. The shaft (f) about 1 m in diameter, dug 40 cm into the ancient ground i.e. 85--90 cm from the top of the mound, occurred on the N side of this area, about 2 m from centre of the mound. Poorly calcined human bones mixed with charcoal were found at the bottom. They were covered with almost entirely decayed logs. Two smaller shafts of 20 cm diameter were E of this shaft, with entirely calcined posts (d) placed vertically in them. An oval shaft (g) 1 m long, dug 20 cm into the ancient ground was about 1 m SW of the centre, in the SW corner of the above-mentioned area.*

**Fig. IX.24.** Cup, type K22, plain. Rounded rim; unmarked base; strap handle. Temper of crushed stone and flint. H – 10.5 cm, R1 – 10.5 cm, R3 – 12.3 cm, R4 – 5 cm

**Fig. IX.25.** Vase, type W11, ornamented on the neck with four circumferential incised lines. Rounded rim, marked base. Temper of crushed stone and flint. H – 11.5 cm, R1 – 13.3 cm, R2 – 14 cm, R3 – 16.2 cm, R4 – 6 cm

**Fig. IX.26.** Bowl, type M21, ornamented under the rim with a horizontal relief strip and six bosses formed on the strip. Rim cut semicircularly; marked base. Temper of crushed stone and flint. H – 11 cm, R1 – 16.2 cm, R3 – 18 cm, R4 – 8.5 cm

**Fig. IX.27.** Bowl, type M22, plain. Rounded rim, softly marked base. Temper of crushed stone and flint. H – 3.9 cm, R1 – 6.3 cm, R4 – 4 cm

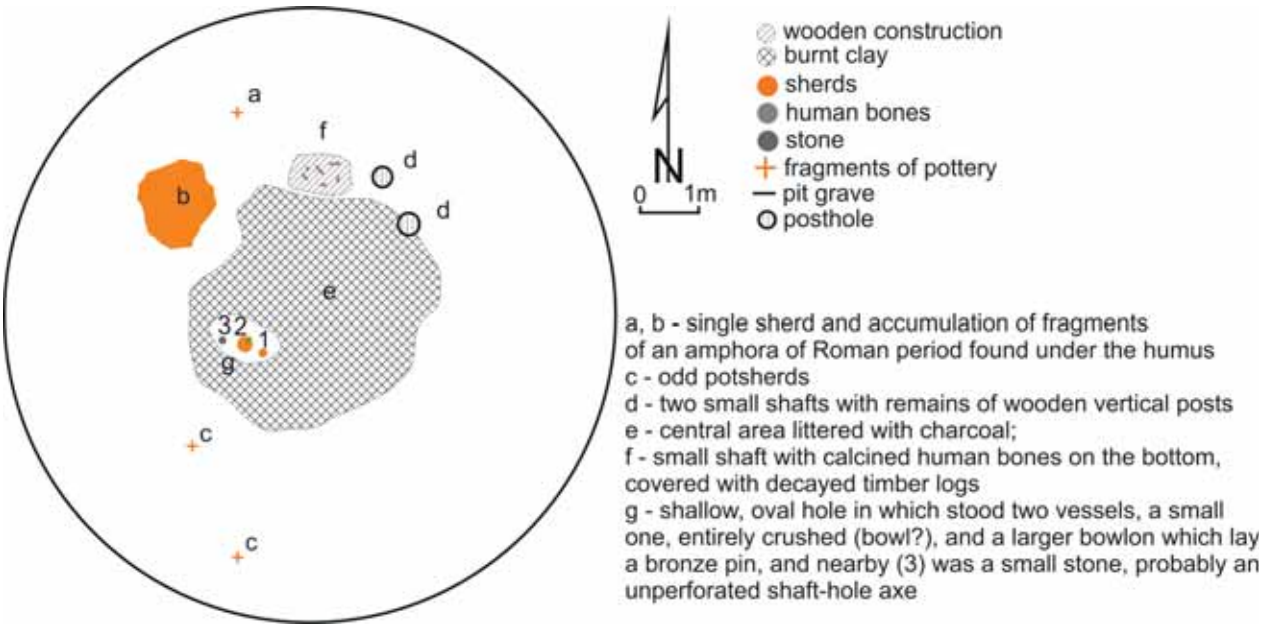



**Fig. IX.28.** Digitalized plan of barrow IV (Sulimirski 1968, Plan 34:2)

*A large bowl, upside down (g-2) (**Fig. IX.29**; Sulimirski 1968, Plate 19:13), was standing in the centre of this oval shaft with a bronze pin (g-4) on its bottom. A small red, entirely crushed and extremely brittle, vessel stood near the bowl: it could not be extricated (g-1). A sandstone whetstone or more probably an unperforated hammer (g-3) (Sulimirski 1968, Fig. 35:16) 10 cm long was on the other side: one side of it was entirely flat, with traces of polishing. The bronze pin (g-4) was 9 cm long, made of circular wire 2.5 cm in diameter, its head enclosed in a spiral shield 16 mm in diameter; it was entirely eaten away by patina and disintegrated. The large bowl (g-2) (Sulimirski 1968, Plate 19:13) was 15 cm high, 26 cm in diameter, with eight parallel grooves round it and fluted ornamentation placed diagonally and wide apart led from them to the upper portion of the body, with groups of incised grooves between and parallel to them.*

*Barrow-grave V (**Fig. IX.30**). This was 62 m ENE of the above, 14 m in diameter, 30 cm high. A large number*

**Fig. IX.29.** Vase, type W21, ornamented on the neck with eight circumferential, horizontal incised lines and fluted ornamentation placed diagonally and wide apart led from them to the upper portion of the body, with groups of incised grooves between and parallel to them. Rim rounded, base marked. Temper of crushed stone and flint. H – 15 cm, R1 – 23.5 cm, R2 – 19.3 cm, R3 – 22.5 cm, R4 – 7 cm

*of scattered small lumps of charcoal were found on the ancient level at a depth of 30-35 cm, after removal of the mound: they were scattered round the centre and to the south of it, about 4.5 m in diameter (d), while some potsherds were found on its southern periphery, about 3 m from the centre and covering an -area about 1.5 m long.*

*The fragments were those of a larger vessel, probably a bowl (b). Two fragments (e), probably of this vessel, were found on the eastern periphery of this area. They were a sand-gritted ware covered with a slip. A handled cup 7 cm high, 9.3 cm in diameter, handle slightly raised above the rim and with four parallel grooves encircling it was found on the NE periphery of this area and 2 m from centre (c) (**Fig. IX.31**). A large handled jug (a-1) (**Fig. IX.32**; Sulimirski 1968, Fig. 30:8) and small cup (a-2) were standing approximately in the centre of the central area. The jug was 20 cm high, 23 cm in diam-*

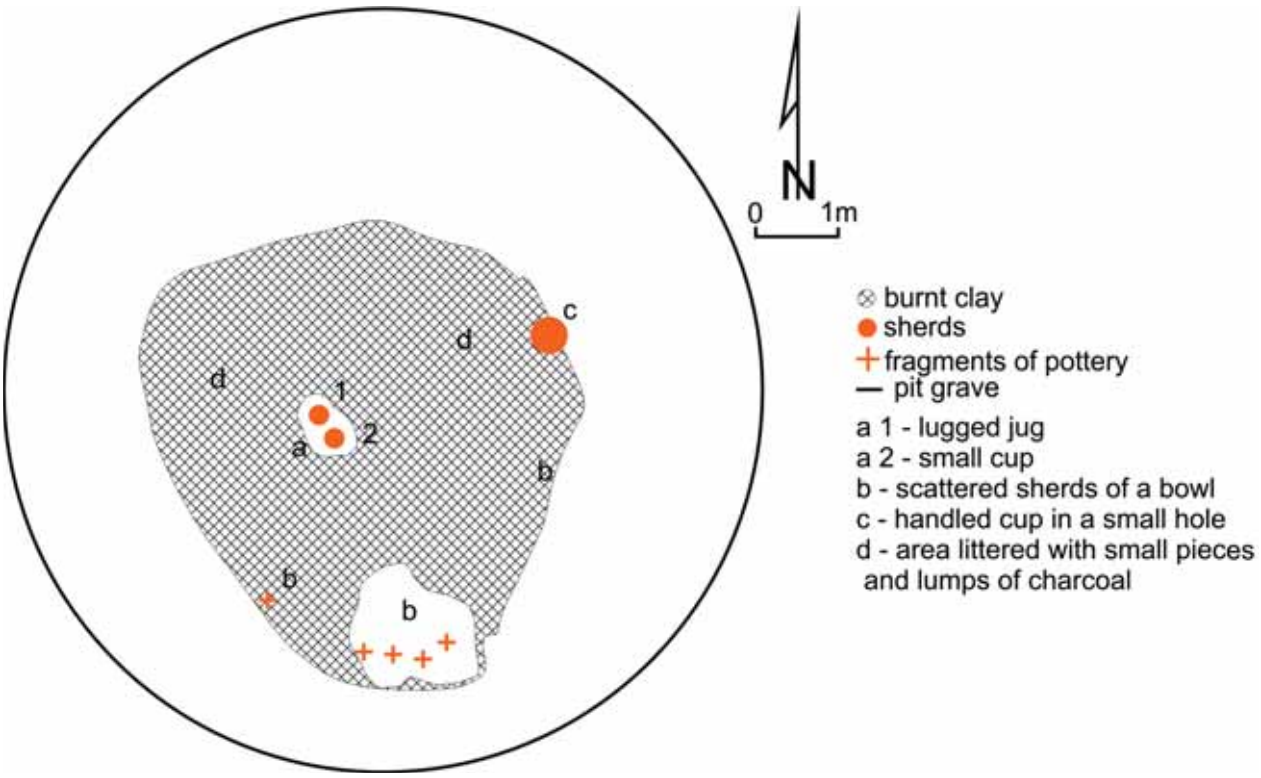



**Fig. IX.30.** Digitalized plan of barrow V (Sulimirski 1968, Plan 34:1)

**Fig. IX.31.** Cup, type K22, ornamented on the neck with four horizontal incised lines. Rounded rim; base slightly marked. Temper of crushed stone and flint. H – 8 cm, R1 – 10.2 cm, R2 – 9.4 cm, R3 – 11 cm, R4 – 5.5 cm

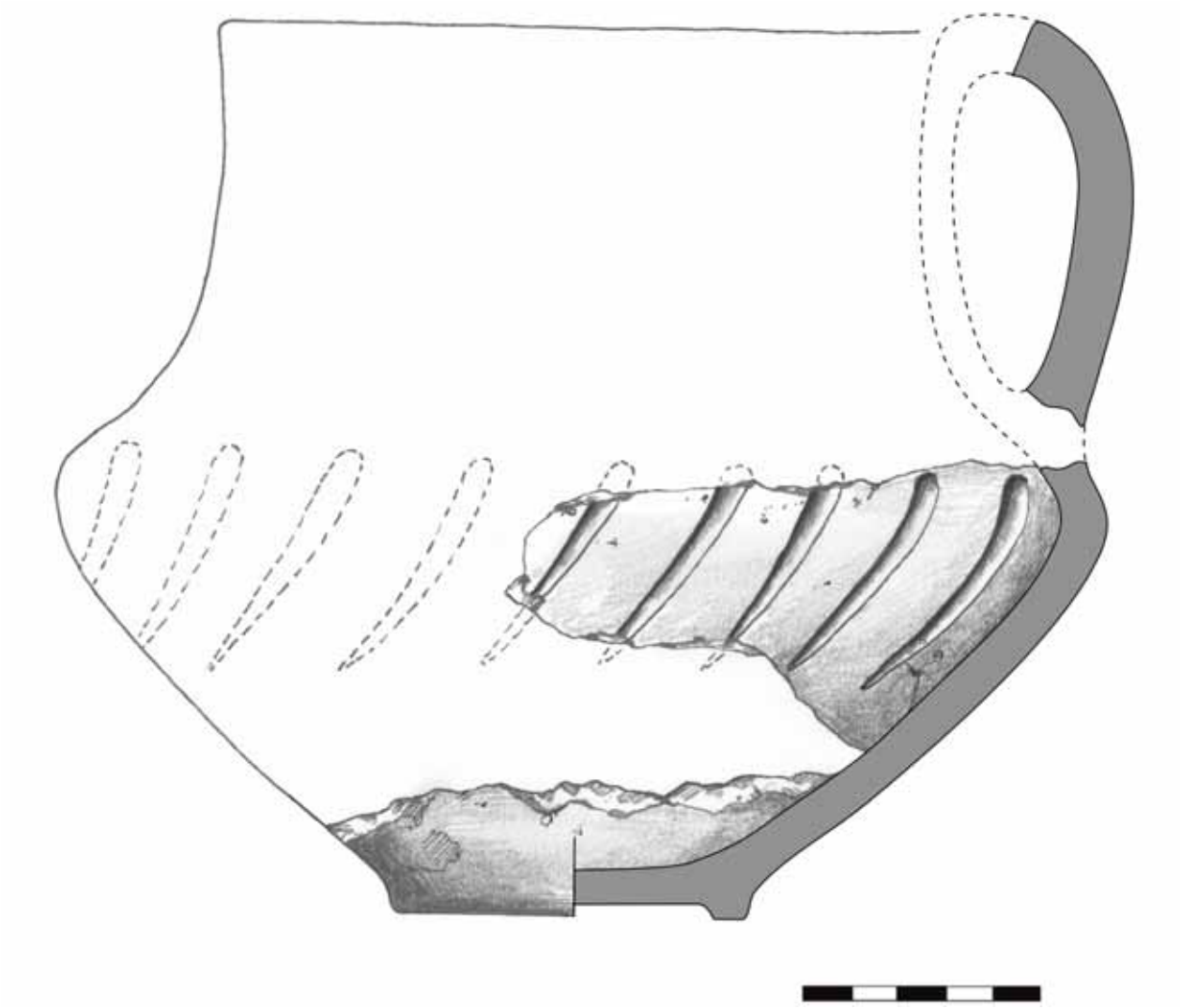


**Fig. IX.32.** Jug, type D21, ornamented on the body with circumferential diagonal grooves. Rounded rim; marked base, handle with raised adges. H – 20 cm, R1 – 16.5 cm, R2 – 16 cm, R3 – 23 cm, R4 – 7.8 cm

*eter, the upper part cylindrical, the bottom concave. The body bore a broad fluting, the handle being rectangular with raised edges. The surface of the vessel was carefully slipped. The cup disintegrated into powder. Both vessels had been grown across by roots of a tree which stood on the mound above them. No traces of skeleton were found.*

*Barrow-grave VI. This was 55 m ENE of the above and 155 m W of Barrow-grave 11, and was 24 m in diameter, 1 m high. It bore traces of excavation by a trench 6 m long, 1.2 m wide, running W – E. A layer of calcined oak logs 50 cm long, 60 cm wide, placed W – E, was found immediately under this trench, 2 m W of the centre at a depth of 60-70 cm.*

# X. Cemetery in Kryłos/Krylos (Fig. X.1)

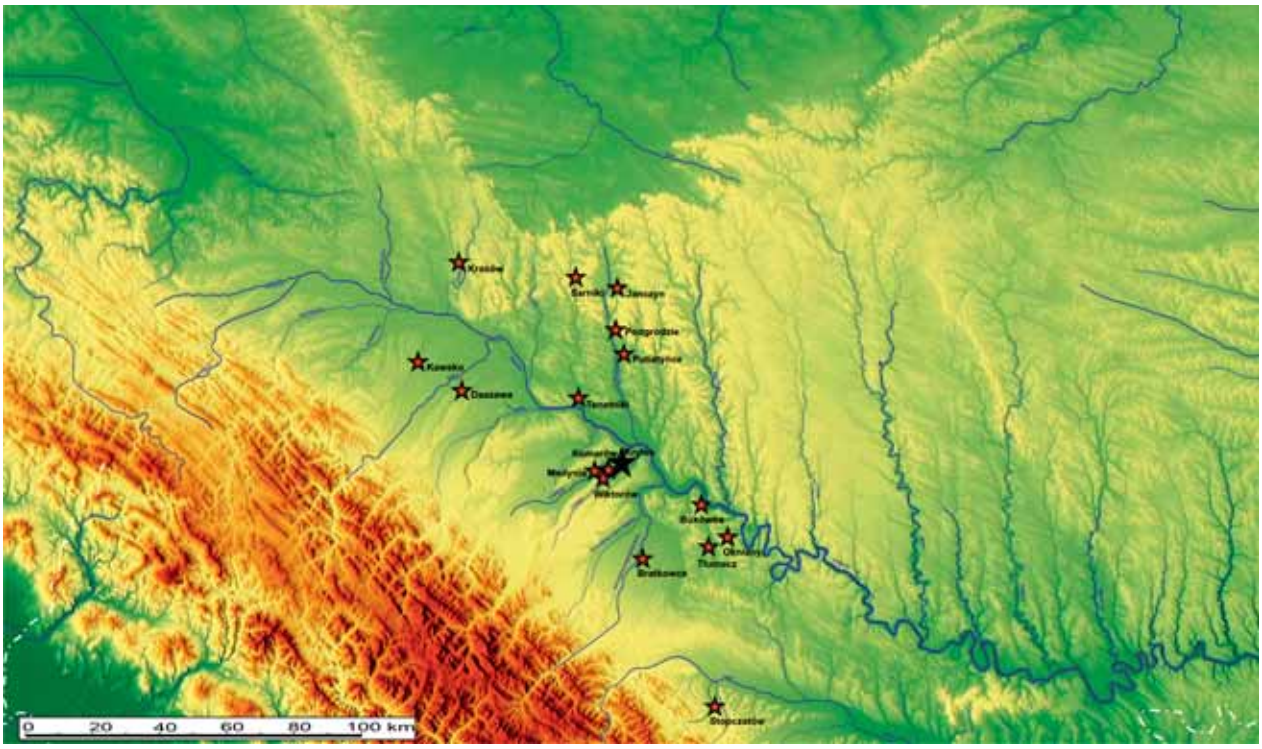



**Fig. X.1.** Location of the cemetery in Krylos in relation to other barrow necropolises

## A. Geographical description (see – Chapter VIII)

## B. Spatial arrangement of the cemetery (Fig. X.2, Fig. X.4)

Krylos is part of a large cemetery starting around Bryn to the W and ending around Krylos in the E. Sometimes it is referred to as portion of the eponymic necropolis in Komariv. Within the administrative borders of Krylos there are some barrow groups (see Derzhavnii reyestr… 2001).

### B1. Kryłos-Dąbrowa/Krylos-Dibrova (Fig. X.3)

The cemetery comprises a barrow group located near Nastashyna Mohyla and the area to the NE of it.

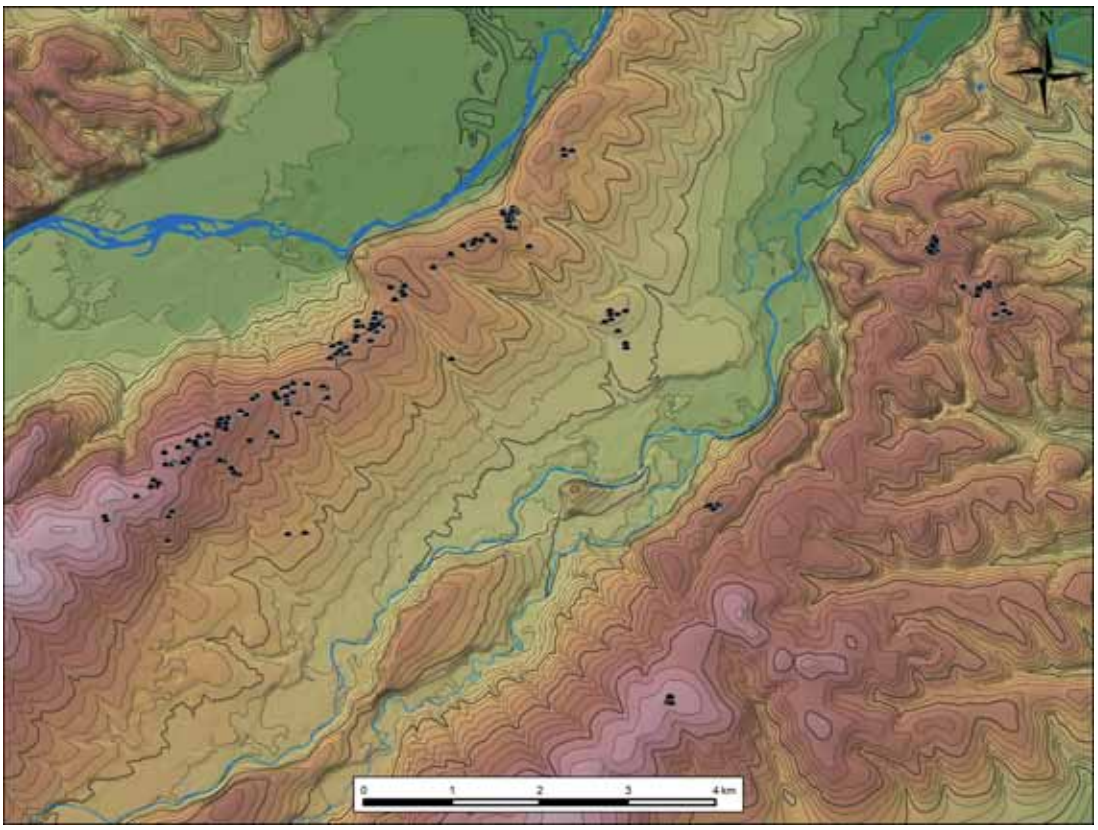



**Fig. X.2.** Digital Elevation Model of barrow cemeteries in Komariv, Krylos, Medynia and Viktoriv

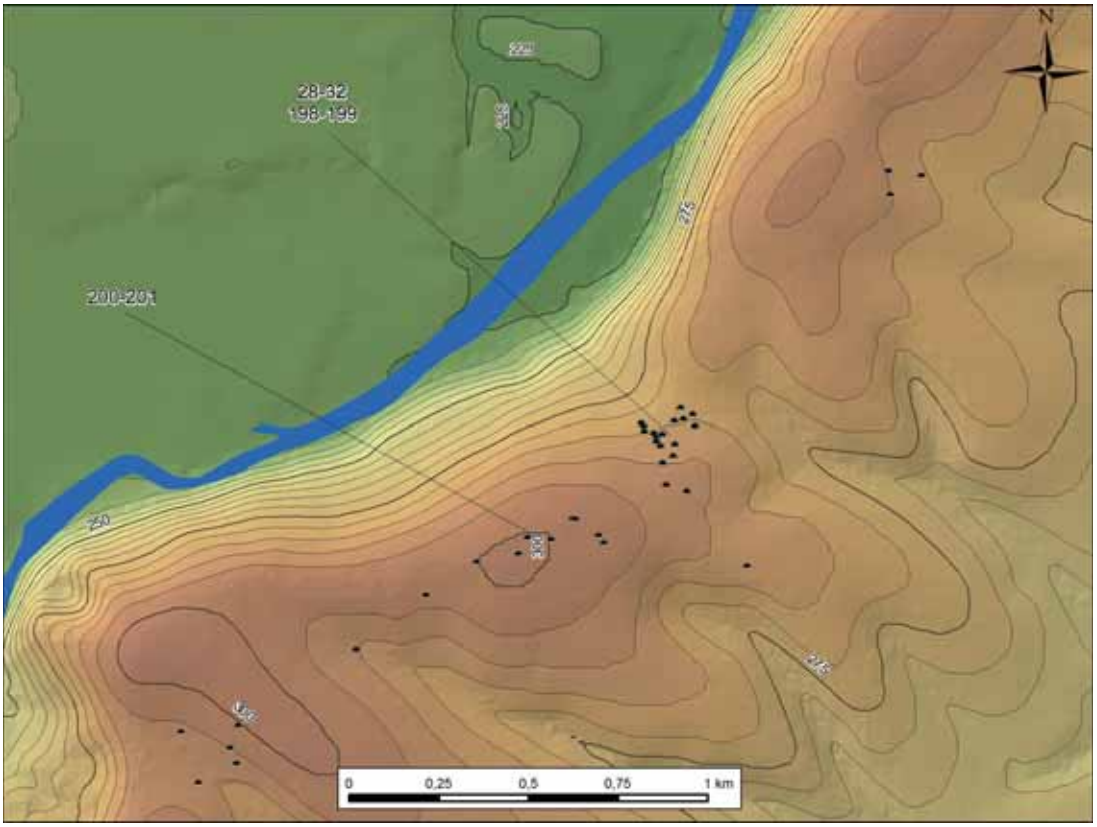



**Fig. X.3.** Digital Elevation Model of the cemetery in Krylos-Dibrova with the numbering of barrows

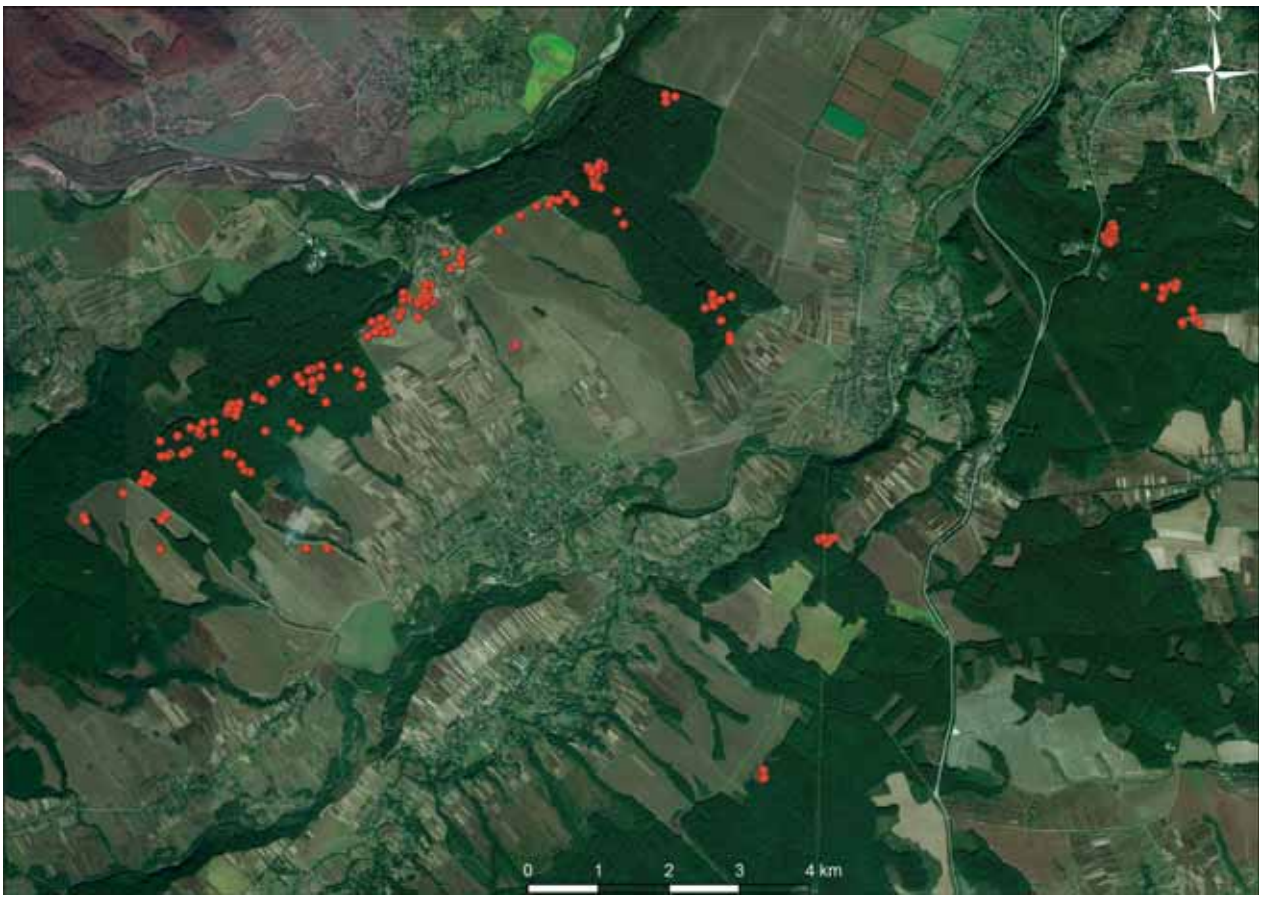



**Fig. X.4.** Komariv, Krylos, Medynia and Viktoriv. Location of cemeteries using satellite imagery (Yandex)

Some tumuli in the area were excavated in the 1930s by Jaroslav Pasternak (Pasternak 1936; Sulimirski 1968:135; see also Swiesznikow 1967). Barrows form two groups: western – in the vicinity of Nastashyna Mohyla (eight monuments) and eastern (nineteen barrows). The distance between the two is 300 m. Due to the conditions in the area (young and dense forest) only seven barrows were studied in detail.

### B.1.1. Spatial arrangement and description of the barrows

**Eastern group**

Tumuli are located on a light NE slope of an extensive hill. They are arranged in linear-group structures in an area of 250 × 160 m (N – S/E – W), apart from a single barrow located 280 m SE of the cluster. The group comprises two barrow concentrations: the first structure is aligned along a NW – SE axis and comprises 13 monuments and a single barrow located further away. Around 35 m NE of the central part is a concentration of five tumuli forming a group arrangement. Three of them are located along a SW – NW line and distances between them measure from 16 to 18 m. Two additional barrows are located NW and SE of the central mound, 25 m away.

**Barrow 28 (Fig. X.5)** was documented in the central part of the linear arrangement, at 288 m.a.s.l., 45 m N of barrow 198 and 27 m S of tumulus 29. Around 40 m E of it there is an another monument (unstudied), while to the NE – three barrows (unstudied) form a line (NE – SW), with 10 m intervals. Geographic coordinates: N – 49°06'160"; E – 024°39'254". Circular in shape, 23 m in diameter, 1.2 m high (initially 2-2.5 m). An extensive dig-in is visible on top. Overgrown by trees and bushes.

**Barrow 29 (Fig. X.6)** is located in the north-central part of the 13 barrow alignment, at 286.5 m.a.s.l., 27 m N of barrow 28. Around 40 m E of it is another mound (unstudied). Geographic coordinates: N – 49°06'178"; E – 024°39'259". Circular in shape, 9 m in diameter, 0.5 m high. Mound destroyed by dig-ins. Densly covered by trees and bushes.

**Fig. X.5.** Barrow 28. View from the NE

**Fig. X.6.** Barrow 29. View from the S

**Fig. X.7.** Barrow 30. View from the S

**Fig. X.8.** Barrow 31. View from the SW

**Fig. X.9.** Barrow 32. View from the SW

**Fig. X.10.** Barrow 198. View from the W

**Barrow 30 (Fig. X.7)** is situated in the northern part of the aforementioned barrow alignmenet, at 284 m.a.s.l., 6 m SE of tumulus 31 and 9 m N of barrow 32. Geographic coordinates: N – 49°06'191"; E – 024°39'218". Circular in shape, 8 m in diameter, 0.5 m high. Mound destroyed by dig-ins.

**Barrow 31 (Fig. X.8)** was erected in the northern part of the described linear alignement, on the NW edge of the barrow group, at 285 m.a.s.l., 6 m NW of barrow 30. Geographic coordinates: N – 49°06'196"; E – 024°39'212". Circular in shape, 9 m in diameter, 0.4 m high. In the central part of the mound is a dig-in.

**Barrow 32 (Fig. X.9)** was recorded in the northern part of the linear arrangement, at 285 m.a.s.l., 9 m S of barrow 30. At a distance of 24 m to SE is the first of three unstudied monuments forming the NW – SE aligned line. Geographic coordinates: N – 49°06'184"; E – 024°39'217". Circular in shape, 13 m in diameter, 0.5 m high. Mound destroyed by dig-ins.

**Barrow 198 (Fig. X.10)** was documented in the S part of the linear arrangement, at 290 m.a.s.l., 45 m S of barrow 28 and 55 m N of tumuli 199. Circa 33 m E of it is an unstudied tumulus. Geographic coordinates: N – 49°06'135"; E – 024°39'257". Circular in shape, 20 m in diameter, 0.5 m high.

**Barrow 199 (Fig. X.11)** was discovered in the S part of the described alignment, at 292 m.a.s.l., 55 m S of barrow 198. 50 m SE of it was an unstudied barrow. Geographic coordinates: N – 49°06'102"; E – 024°39'262". Circular in shape, 20 m in diameter, 0.5 m high. A road crosses the mound.

**Western group**

Three tumuli of the western group were known from pre-war research (nos. 4, 65 and Nastashyna Mohyla; Pasternak 1936; Sulimirski 1968, Plan 1). The rest were located E of the last monument, which was unique in terms of size. Four barrows (unstudied) were found NE and E of mound 201. They formed a 112 m-long linear structure, oriented along a NW – SE axis. Two tumuli were close to each other, ca. 80 m from barrow 201 with the third one ca. 140 m E of it. The fourth one was 150 m to SE of barrow 201.

**Barrow 200/Nastashyna Mohyla (Fig. X.12)** was documented on a hill plateau, at the end of a forest. It is located at 300.5 m.a.s.l., 63 m W of mound 201 and 110 m E/NE of barrow 4, which is part of the Komariv cemetery (Sulimirski 1968:107). Geographic coordinates: N – 49°06'032"; E – 024°38'940". Circular in shape, 30 m in diameter, 4 m high. A central dig-in is visible in the mound – effect of the 1930s excavation (Pasternak 1936).

**Fig. X.11.** Barrow 199. View from the NE

**Fig. X.12.** Barrow 200. View from the S

**Fig. X.13.** Barrow 201. View from the SW

**Barrow 201 (Fig. X.13)** was located 63 m E of monument 200 (Nastashyna Mohyla) at 300 m.a.s.l. Geographic coordinates: N – 49°06'028"; E – 024°38'993". Circular in shape, 20 m in diameter, 1.5 m high (initially ca. 2.5 m). An extensive dig-in visible on top.

## B.2. Kryłos-Glinna I/Krylos-Glinna I (Fig. X.14)

### B.2.1. Spatial arrangement and description of the barrows

The cemetery comprises 12 barrows located on a flattened hill and its slight, NW slope. It is found 1.2 km SE from Lukva – Dniester's left tributary. Barrows are arranged in a linear-group order in an area of 180 × × 80 m (N – S/E – SW). Due to the conditions in the survey area (thick forest) only four monuments were studied (23, 54, 55 and A55). The tumuli are arranged in two linear groups, generally placed along a N – S axis. The longest (150 m) is a line composed of five barrows, situated on the E part of the necropolis. Around 25 m W of it is a second line of monuments comprising of four mounds, located along a 125 m distance. Two of them have been studied – 54 and A55. In the SW part of the necropolis there are three more barrows, including (23 and 54), which create a triangular arrangement.

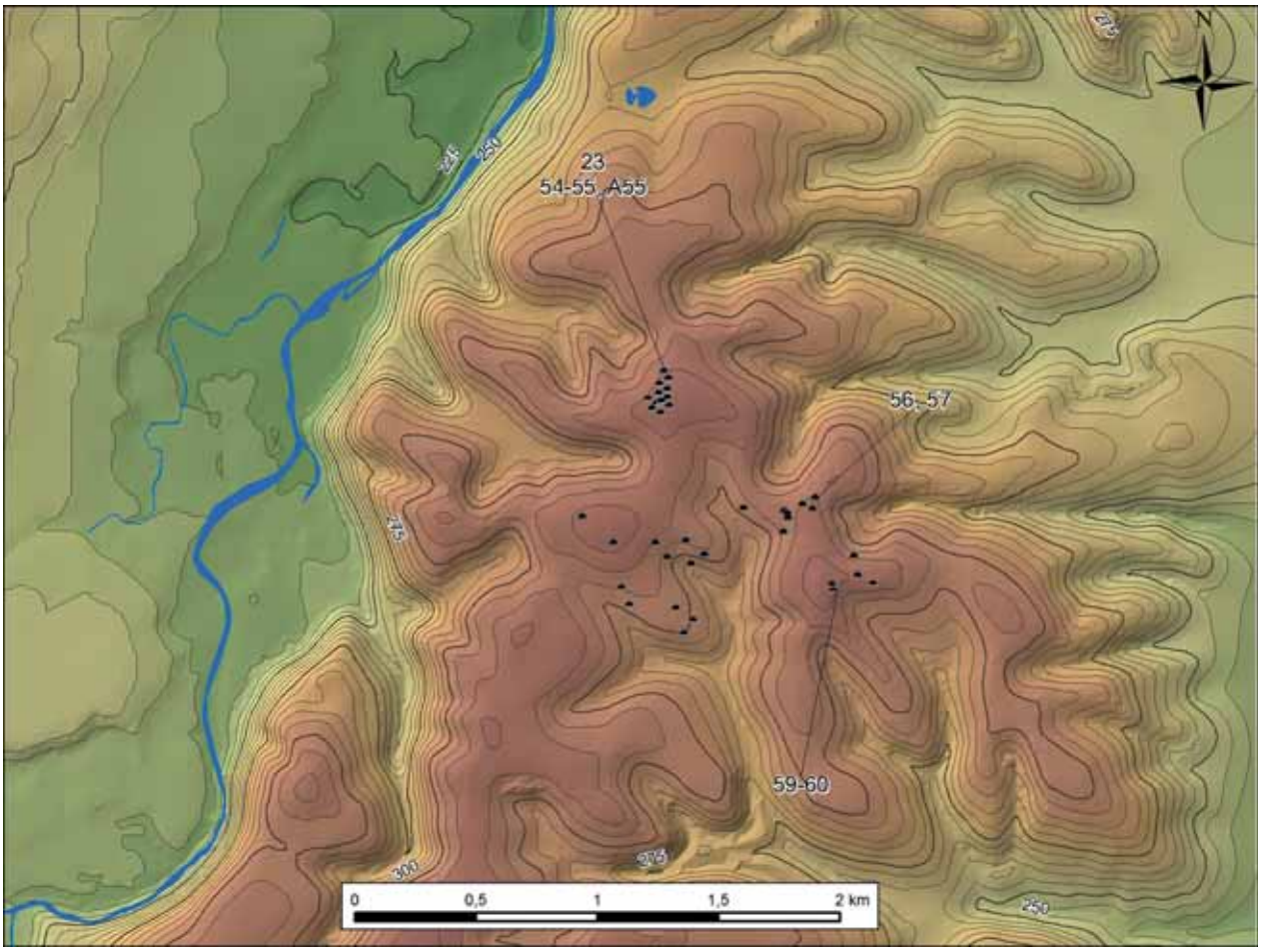



**Fig. X.14.** Digital Elevation Model of the cemetery in Krylos-Glinna I with the numbering of barrows

**Barrow 23 (Fig. X.15, Fig. X.16)** was recorded in the W part of the cemetery, at 317 m.a.s.l., 44 m NW of tumulus 55 and 45 m SW of monument A55. Geographic coordinates: N – 49°05'850"; E – 024°43'160". Circular in shape, 25 m in diameter, 3.5 m high. A dig-in visible on top.

**Fig. X.15.** Barrow 23. View from the E

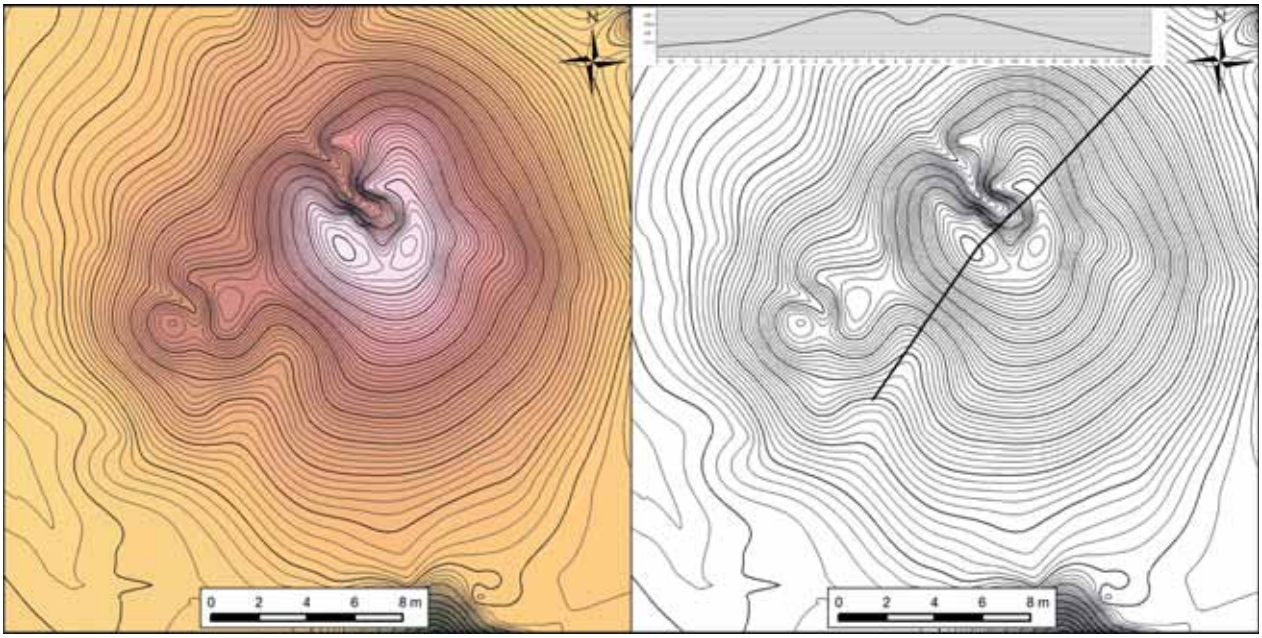



**Fig. X.16.** Barrow 23. Hypsometric plan and cross-section

**Barrow 54 (Fig. X.17, Fig. X.18)** is situated in the S part of the four tumuli arrangement, at 317.5 m.a.s.l., 27 m S/SE of barrow 55. Geographic coordinates: N – 49°05'843"; E – 024°43'204". Circular in shape, 7 m in diameter, 0.6 m high. A dig-in visible on top.

**Fig. X.17.** Barrow 54. View from the W

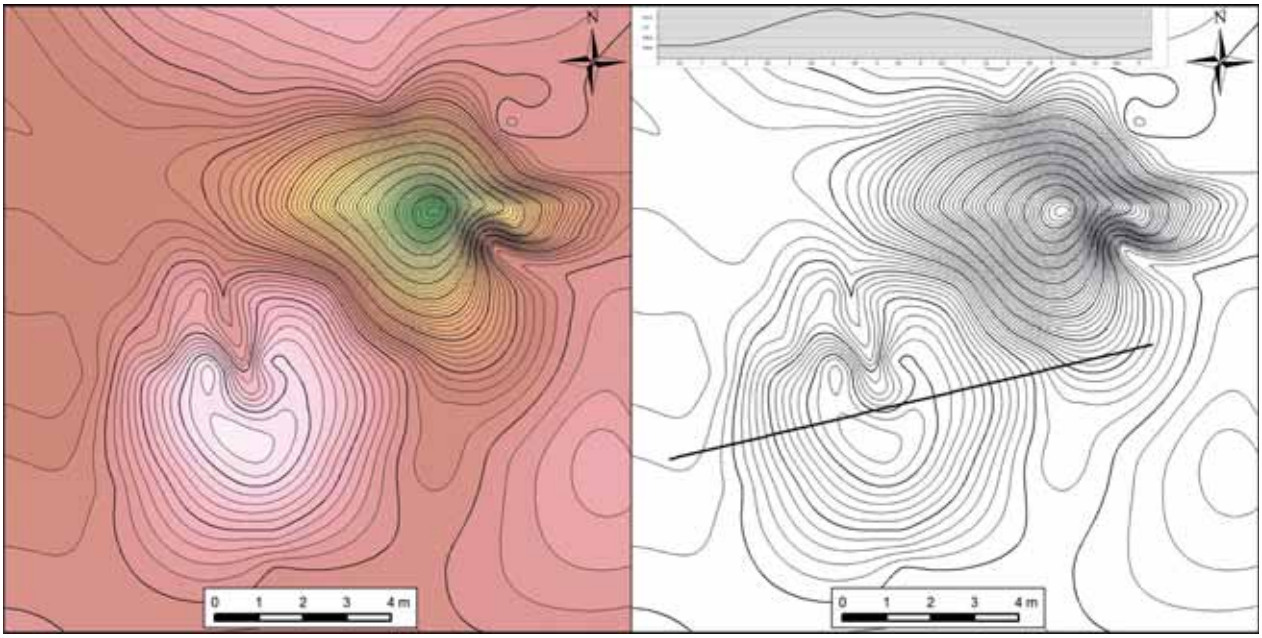



**Fig. X.18.** Barrow 54. Hypsometric plan and cross-section

**Barrow 55 (Fig. X.19, Fig. X.20)** discovered in the SW edge of the cemetery, at 317 m.a.s.l., 44 m SE of barrow 23. Geographic coordinates: N – 49°05'827"; E – 024°43'204". Circular in shape, 10 m in diameter, 1 m high. Dig-ins visible in the mound.

**Fig. X.19.** Barrow 55. View from the E

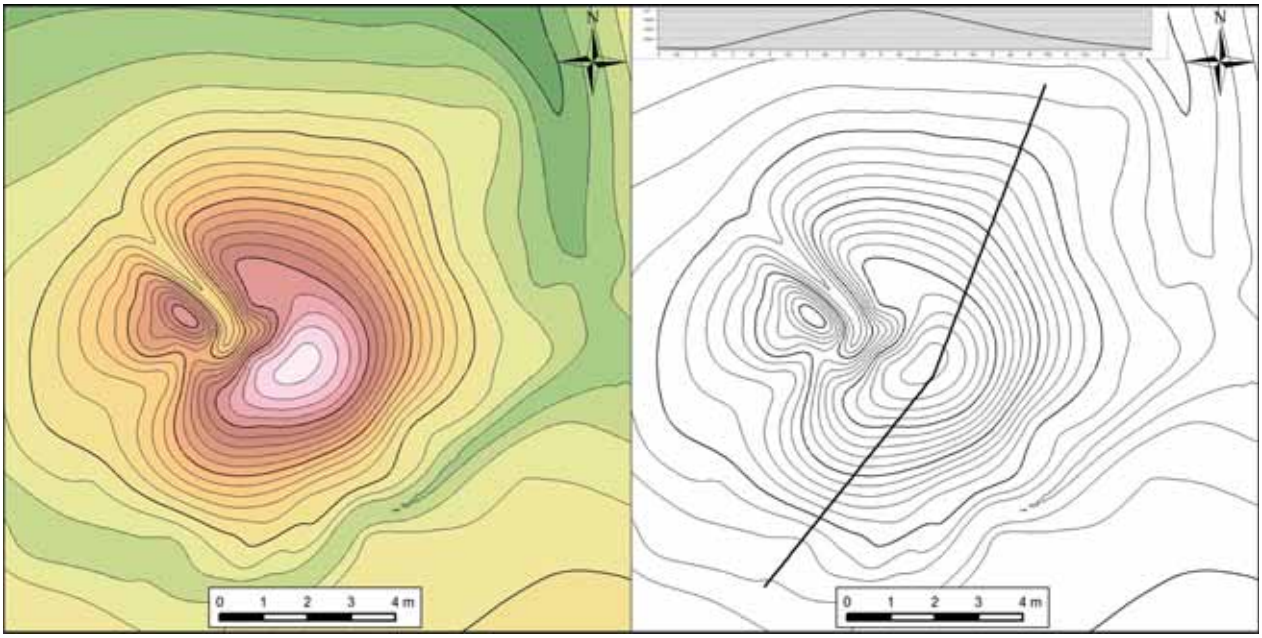



**Fig. X.20.** Barrow 55. Hypsometric plan and cross-section

**Barrow A55 (Fig. X.21, Fig. X.22)** located in the N part of the four tumuli arrangement (and in the central part of the cemetery), at 317 m.a.s.l., 27 m S/SE of kurgan 55. Geographic coordinates: N – 49°05'861"; E – 024°43'173". Circular in shape, 13 m in diameter, 1.4 m high. A dig-in visible on top.

**Fig. X.21.** Barrow A55. View from the W

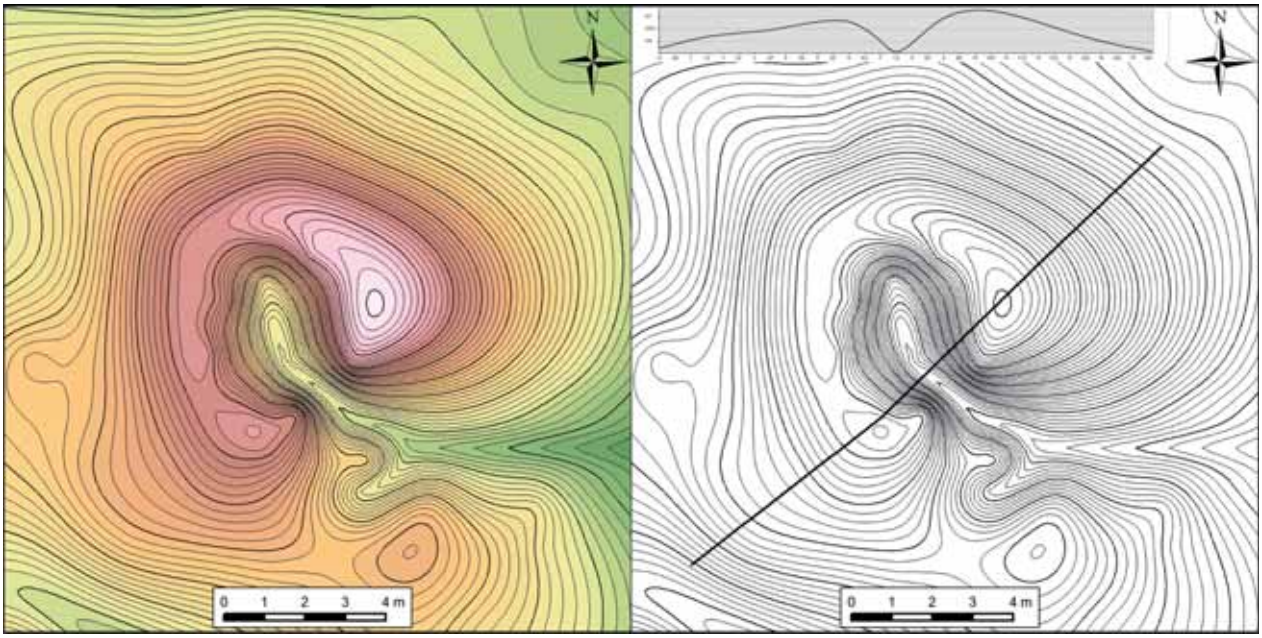



**Fig. X.22.** Barrow A55. Hypsometric plan and cross-section

## B.3. Kryłos-Glinna II/Krylos-Glinna II (Fig. X.23)

### B.3.1. Spatial arrangement and description of the barrows

The cemetery is located ca. 500 m SE of the necropolis in Kryłos-Dąbrowa. It covers the N part of an extensive plateau arranged along a N – S axis; 280 m S of it is a group of barrows defined as Krylos-Glinna III.

The necropolis consists of eight barrows stretched along 300 m in a few concentrations. Two monuments (56 and 57) were surveyed. In the NE part there were three mounds formed a triangular arrangement. The tumuli are set 50 m apart; 80 m to SE of the outermost E barrow is tumulus 57 and to NW and SW of it – two other monuments. The first one is located 27 m away, while the second 55 m. In the W outskirt of the cemetery, 190 m NW of barrow 57 is the last mound.

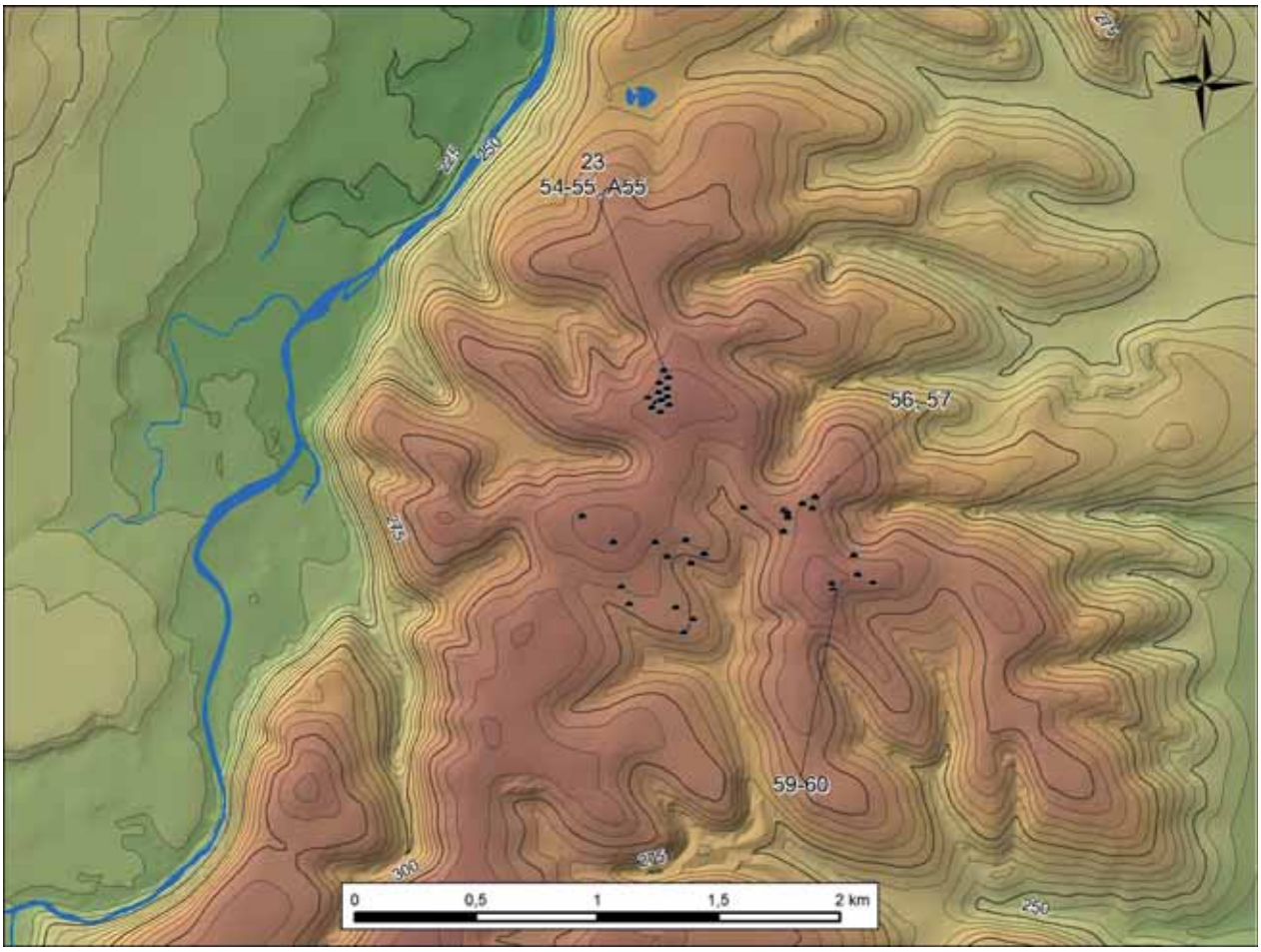



**Fig. X.23.** Digital Elevation Model of the cemetery in Krylos-Glinna II with the numbering of barrows

**Barrow 56 (Fig. X.24, Fig. X.25)** recorded on the W outskirt of the cemetery, at 302.5 m.a.s.l. Geographic coordinates: N – 49°05'598"; E – 024°43'466". Circular in shape, 16 m in diameter, 1.3 m high. Subject to geophysical survey. Dig-ins visible on top of the mound.

**Fig. X.24.** Barrow 56. View from the NE

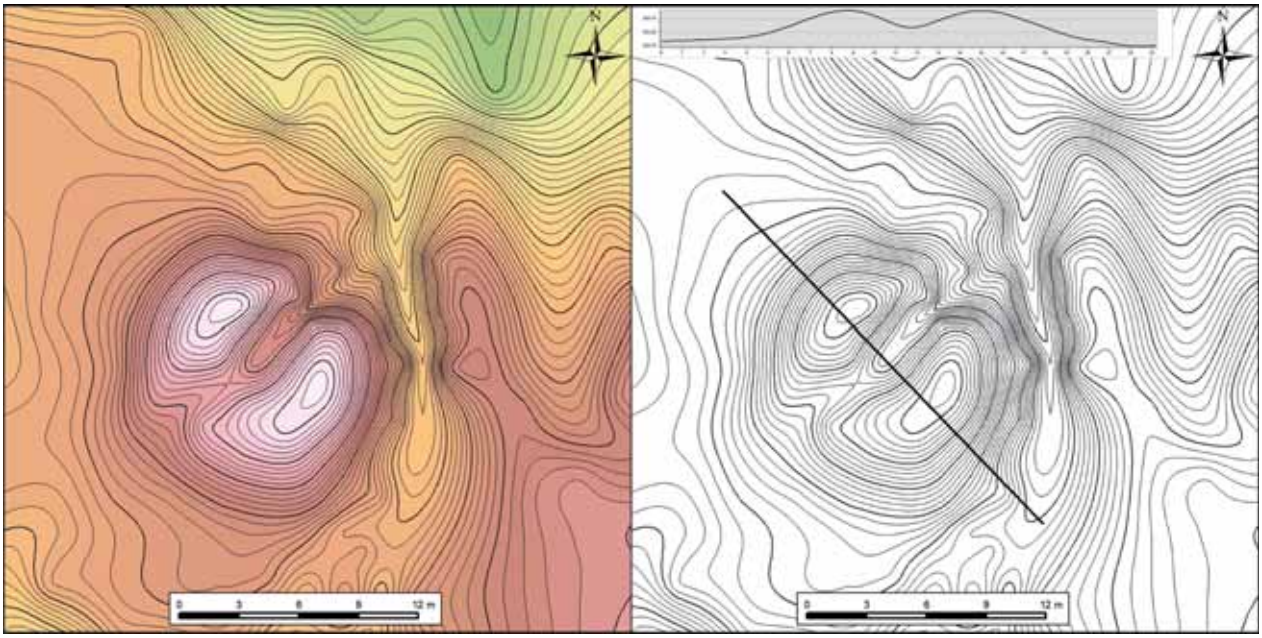


**Fig. X.25.** Barrow 56. Hypsometric plan and cross-section

**Barrow 57 (Fig. X.26, Fig. X.27)** is located in the central part of the necropolis, at 302.5 m.a.s.l. Geographic coordinates: N – 49°05'571"; E – 024°43'615". Circular in shape, 10 m in diameter, 0.5 m high.

**Fig. X.26.** Barrow 57. View from the E

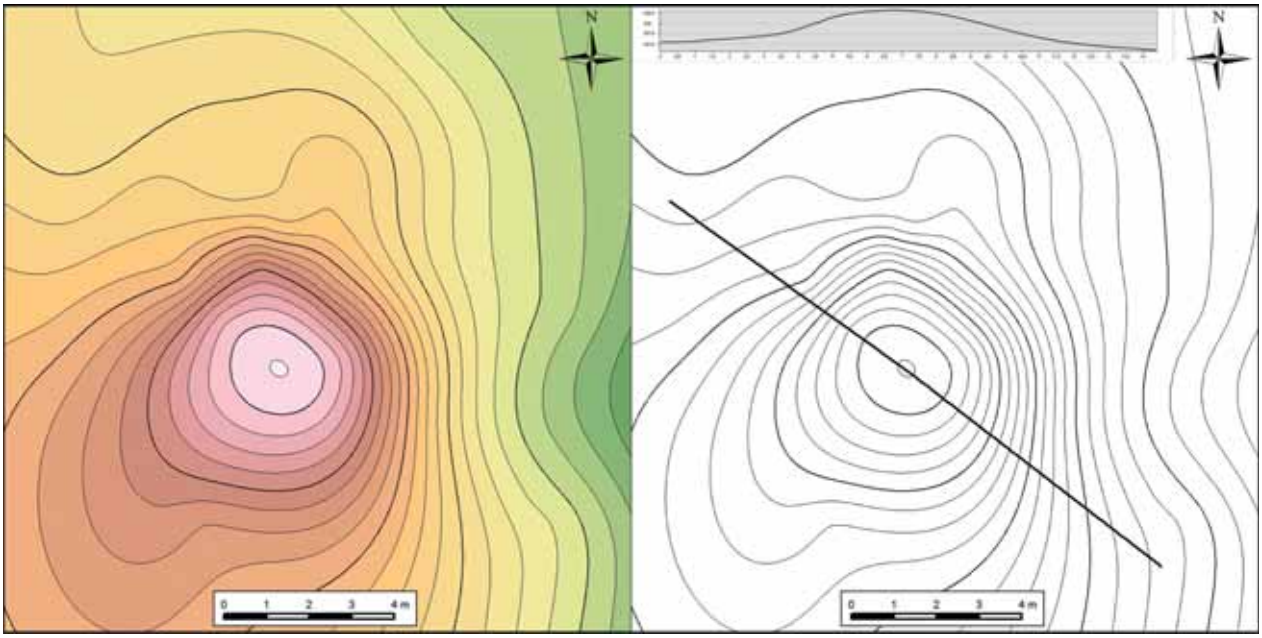



**Fig. X.27.** Barrow 57. Hypsometric plan and cross-section

## B.4. Kryłos-Glinna III/Krylos-Glinna III (Fig. X.28)

### B.4.1. Spatial arrangement and description of the barrows

The cemetery is located 280 m SE of the Krylos-Glinna II necropolis, in the central and eastern part of the same terrain form – an extensive upland. Five barrows in two concentrations were recorded. Due to the unavailability of terrain only two of the tumuli were surveyed (59 and 60). They are situated in the western part of the mound concentration, 17 m apart. In the eastern part of the group there were three barrows, forming a nearly perfect linear arrangement 140 m-long. The monument placed in the center was recorded 110 m NE of mound 60. Two other tumuli were erected: 80 m to the NW and 65 m to SE.

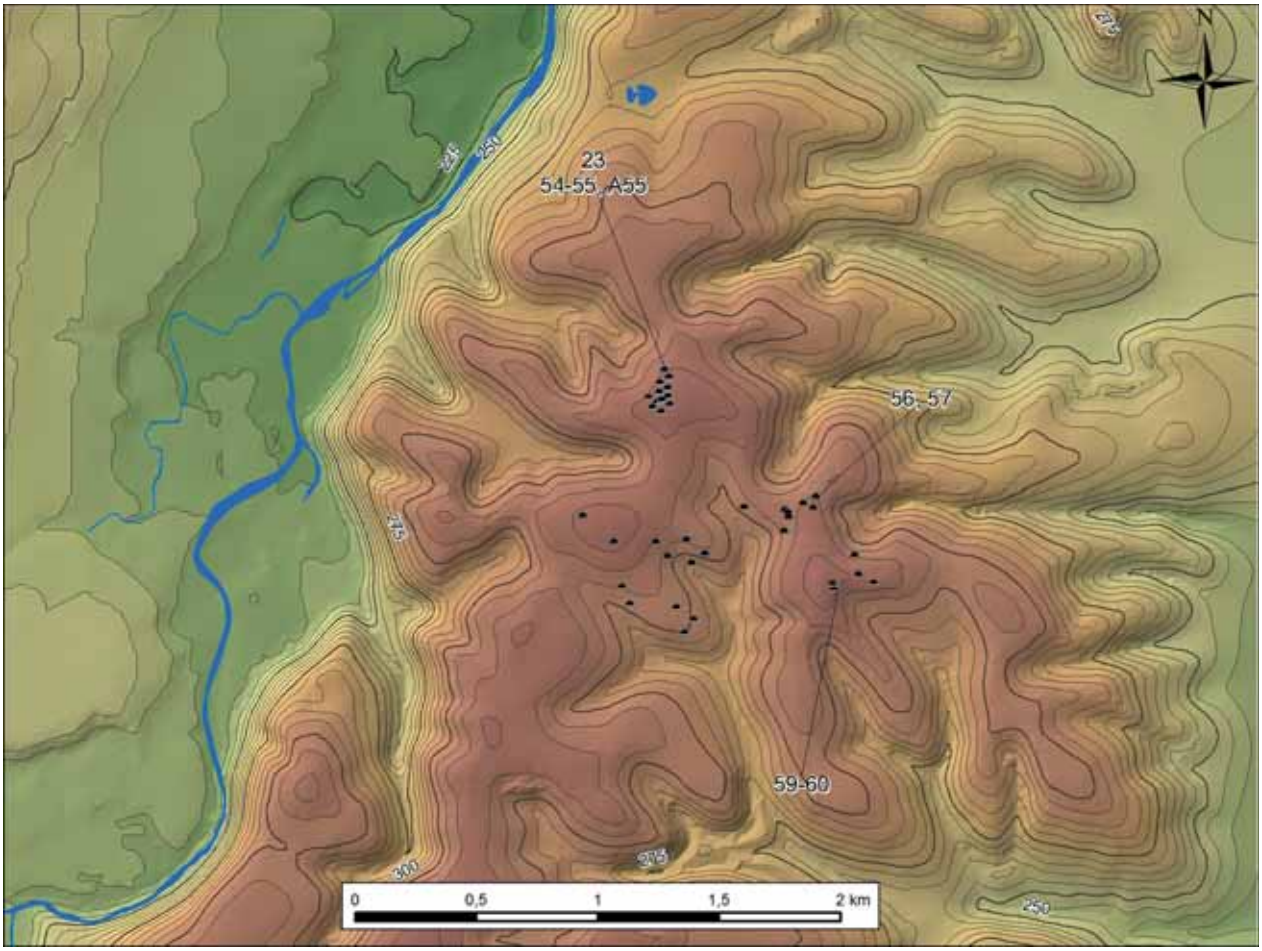



**Fig. X.28.** Digital Elevation Model of the cemetery in Krylos-Glinna III with the numbering of barrows

**Barrow 59 (Fig. X.29, Fig. X.30)** recorded in the western part of the necropolis, at 316.5 m.a.s.l., 17 m SE of barrow 60. Geographic coordinates: N – 49°05'406"; E – 024°43'755". Circular in shape, 10 m in diameter, 1.8 m high.

**Fig. X.29.** Barrow 59. View from the E

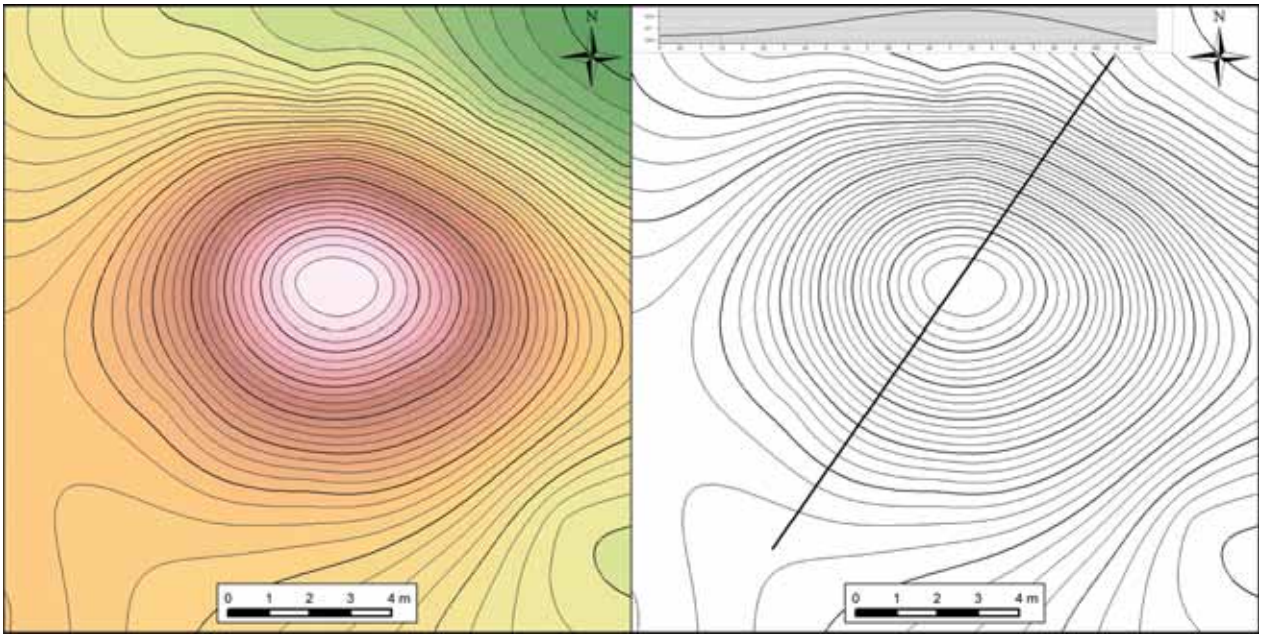



**Fig. X.30.** Barrow 59. Hypsometric plan and cross-section

**Barrow 60 (Fig. X.31, Fig. X.32)** is documented in the western part of the cemetery, at 317 m.a.s.l., 17 m NW of mound 59. Geographic coordinates: N – 49°05'418"; E – 024°43'752". Circular in shape, 11 m in diameter, 0.8 m high.

**Fig. X.31.** Barrow 60. View from the W

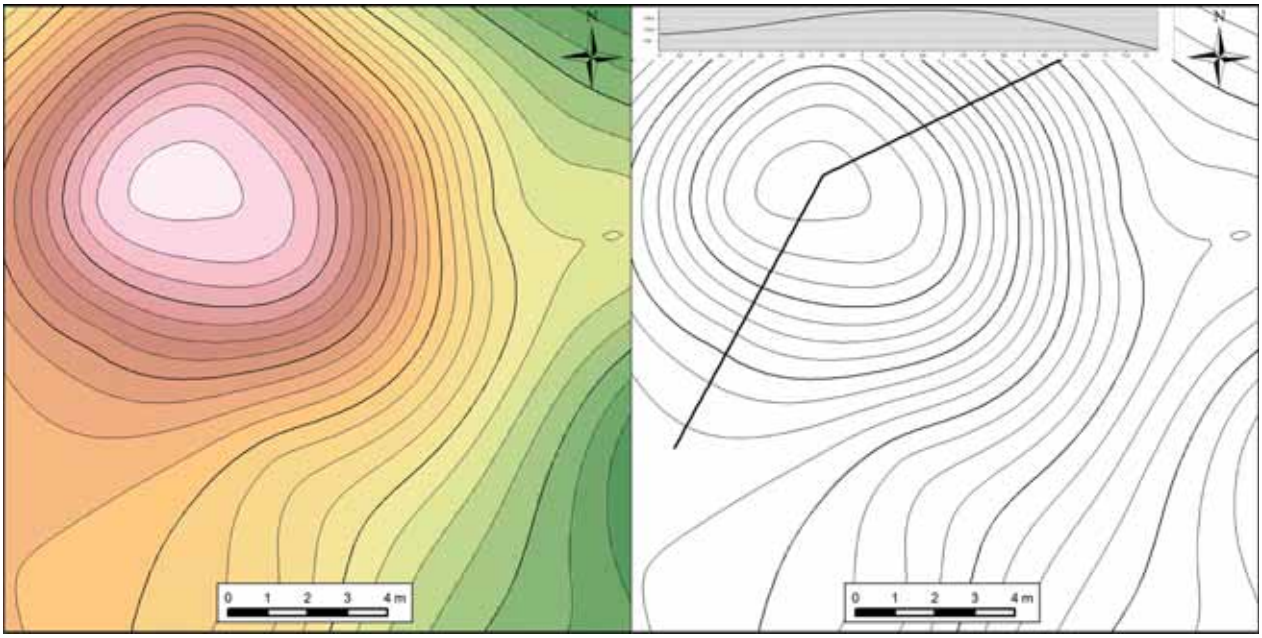



**Fig. X.32.** Barrow 60. Hypsometric plan and cross-section

## B.5. Kryłos-Tyndyk/Krylos-Tyndyk („near the cross") (Fig. X.33)

### B.5.1. Spatial arrangement and description of the barrows

This barrow group, located within the administrative borders of Krylos, comprises six monuments. Barrows are located on the outskirts of a beech forest, on one of the hills aligned along a SW – NE axis, running parallel to the Lukvitsa river – a tributary of the Lukva River – ca. 400 m SE of its riverbed. Four barrows (24, 25, 50, 51) were located close to the plateau of the hill, forming a 110 m long alignment set along the NE – SW axis. Two remaining tumuli were located E of the aforementioned alignment at a 50-70 m distance.

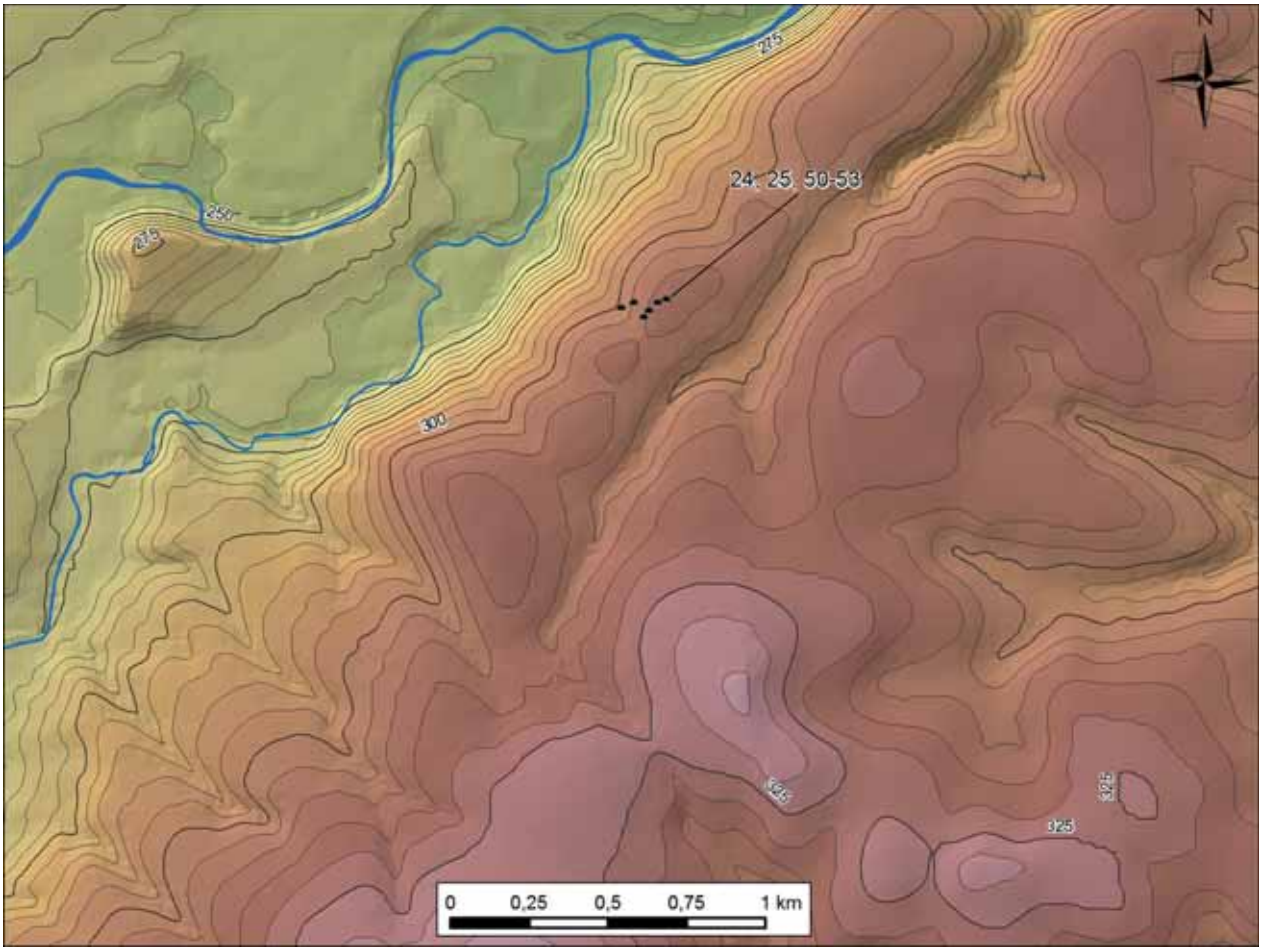



**Fig. X.33.** Digital Elevation Model of the cemetery in Krylos-Tyndyk with the numbering of barrows

**Barrow 24 (Fig. X.34, Fig. X.35)** – excavated with a trench on top – was registered at the NE end of the four-barrow alignment, at 311.5 m.a.s.l., 18 m NE of barrow 25. Geographic coordinates: N – 49°04'342"; E – 024°41'098". Circular in shape, 20 m in diameter, 2 m high. Dig-ins visible on top of the mound.

**Fig. X.34.** Barrow 24. View from the NW

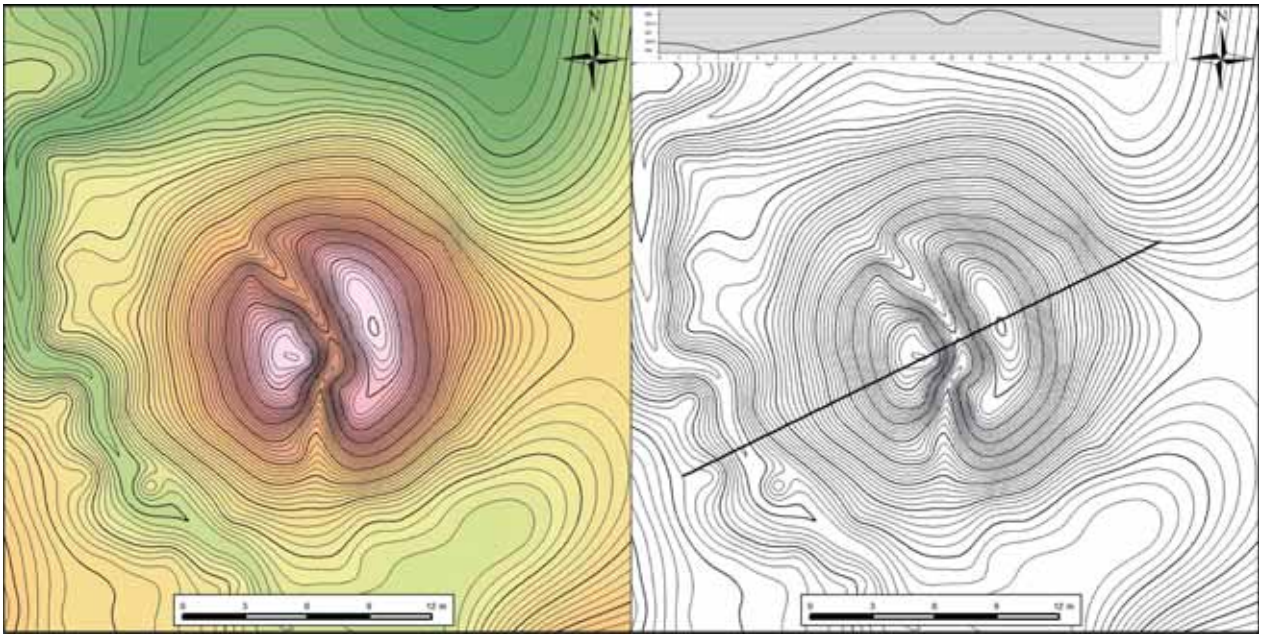


**Fig. X.35.** Barrow 24. Hypsometric plan and cross-section

**Barrow 25 (Fig. X.36, Fig. X.37)** was documented in the NE part of the four-barrow alignment, at 311 m.a.s.l., 18 m SW of barrow 24. Geographic coordinates: N – 49°04'338"; E – 024°41'074". Circular in shape, 19 m in diameter, 0.5 m high. An extensive trench is located on top of the barrow. Subject to geophysical survey.

**Fig. X.36.** Barrow 25. View from the SW

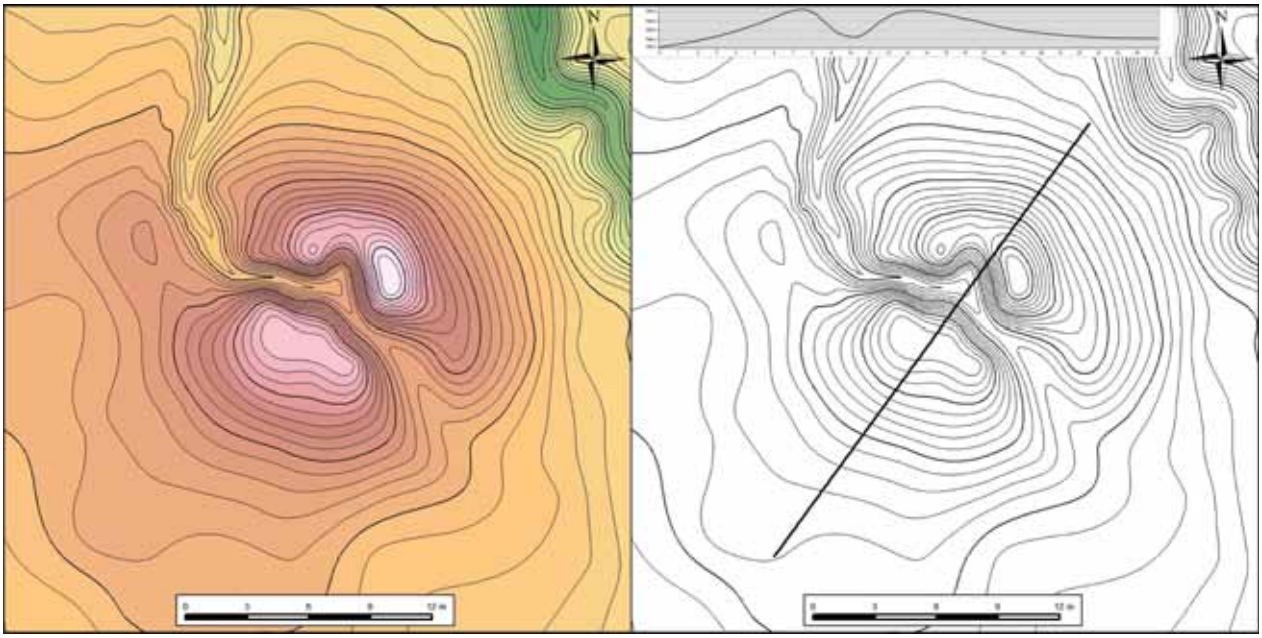


**Fig. X.37.** Barrow 25. Hypsometric plan and cross-section

**Fig. X.38.** Barrow 50. View from the SE

**Fig. X.39.** Barrow 51. View from the S

**Fig. X.40.** Barrow 52. View from the S

**Fig. X.41.** Barrow 53. View from the NW

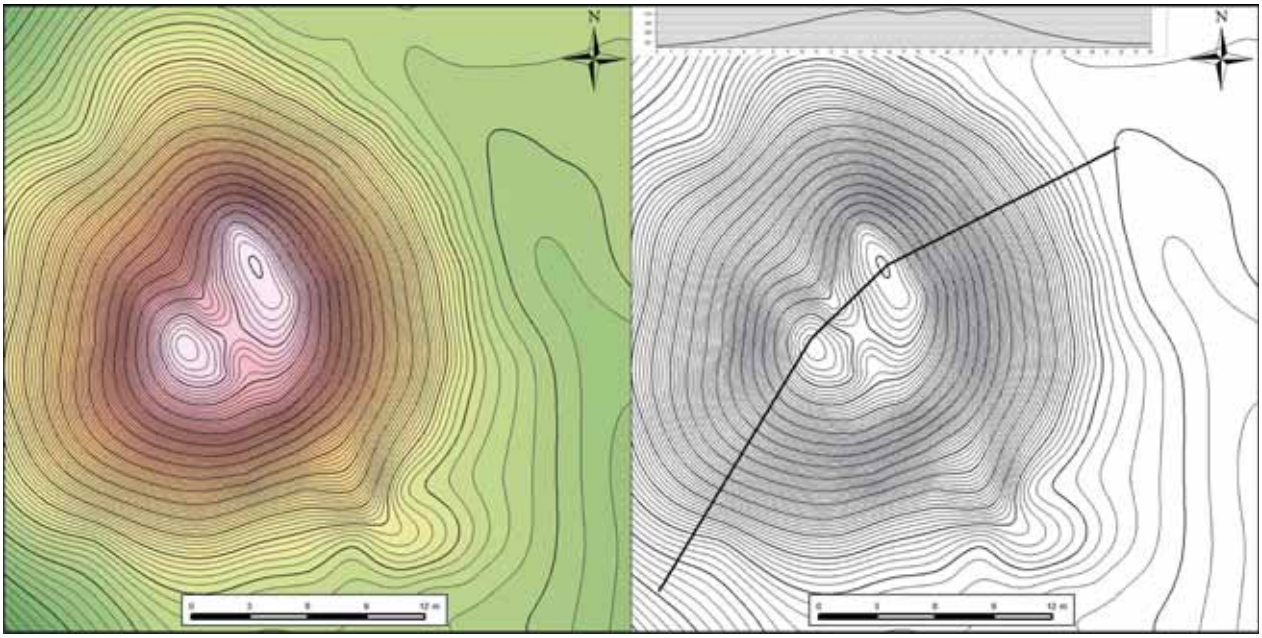



**Fig. X.42.** Barrow 53. Hypsometric plan and cross-section

**Barrow 50 (Fig. X.38)** is located in the SW part of the four-barrow alignment, at 310.5 m.a.s.l., ca. 27 m SW of monument 25 and 20 m NE of tumulus 51. Geographic coordinates: N – 49°04'324"; E – 024°41'051". Circular shape, 17 m in diameter, 2 m high. An extensive trench (7.5 × 2.5 m, 0.7 m deep) is located on top of the barrow.

**Barrow 51 (Fig. X.39)** was recorded on the SW end of the aforementioned four-barrow alignment, at 309 m.a.s.l., 20 m SW of tumulus 50. Geographic coordinates: N – 49°04'313"; E – 024°41'036". Circular in shape, 15 m in diameter, 0,5 m high. Dig-ins are visible in the mound. Densely covered by trees and bushes.

**Barrow 52 (Fig. X.40)** was erected on the SW part of the cemetery, at 302 m.a.s.l., 34 m SW of tumulus 53. Geographic coordinates: N – 49°04'331"; E – 024°40'979". Circular in shape, 25 m in diameter, 3 m high. Dig-ins visible in the mound. Subject to geophysical survey.

**Barrow 53 (Fig. X.41, Fig. X.42)** is situated in the SW part of the necropolis, at 305.5 m.a.s.l., 34 m SW of monument 52. Geographic coordinates: N – 49°04'339"; E – 024°41'013". Circular in shape, 27 m in diameter, 3.5 m high. Dig-ins visible on top of the mound.

## B.6. Kryłos/Krylos – vicinity of a farmstead (Fig. X.43)

### B.6.1. Spatial arrangement and description of the barrows

The cemetery is located ca. 1.5 km of Krylos-Dibrova, on a flattened hill and its light, southern slope, It comprises 10 barrows (four of which were studied in detail 202-204 and 250), which form two perpendicular alignments The line set along the NW – SE axis consists of six tumuli and is 470 m long. Four monuments form the NE – SW alignment, in total 270 m long. Both alignments intersect at barrow 203.

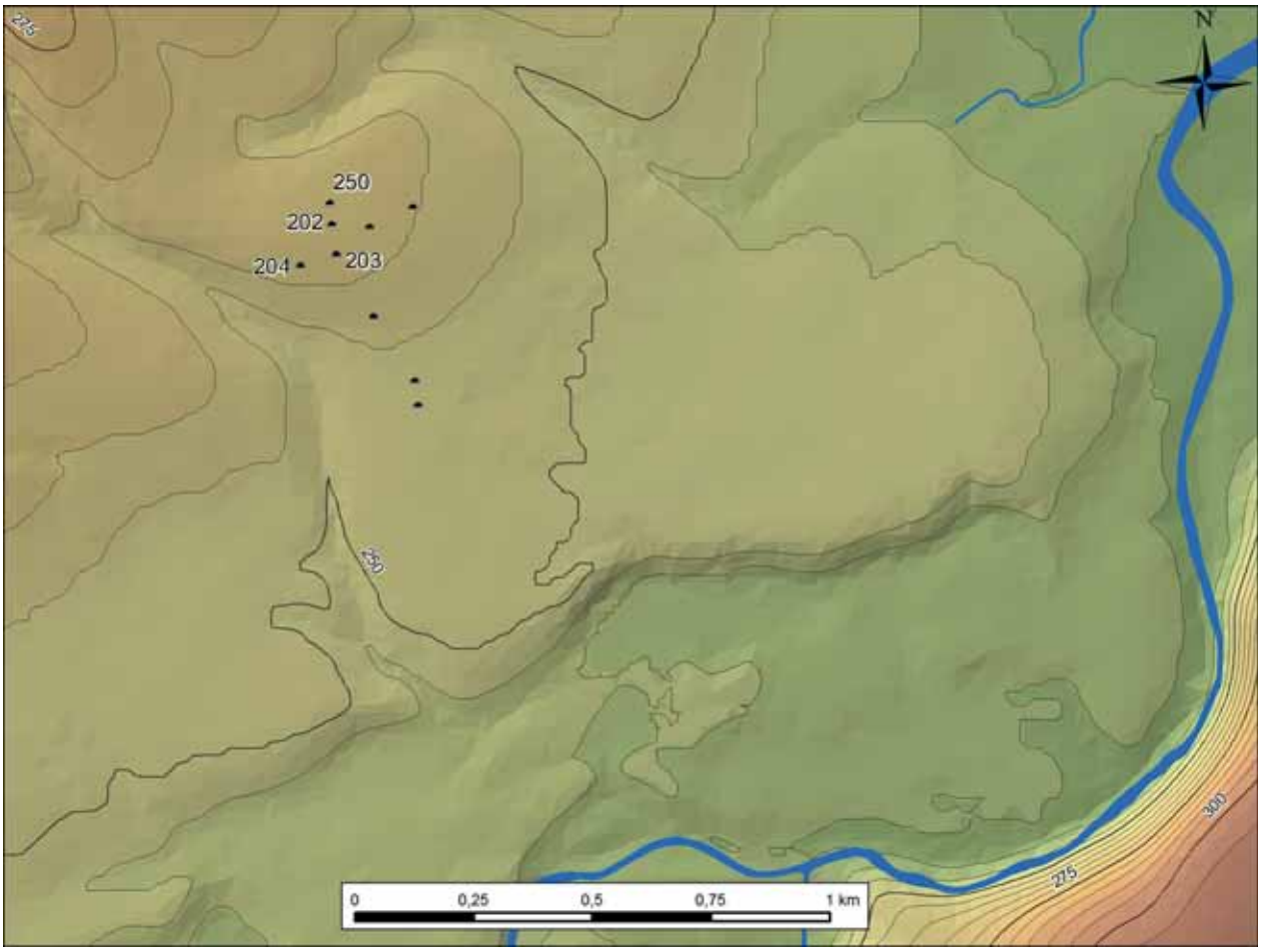



**Fig. X.43.** Digital Elevation Model of the cemetery in Krylos – vicinity of a farmstead with the numbering of barrows

**Fig. X.44.** Barrow 202. View from the NE

**Fig. X.45.** Barrow 203. View from the E

**Fig. X.46.** Barrow 204. View from the SW

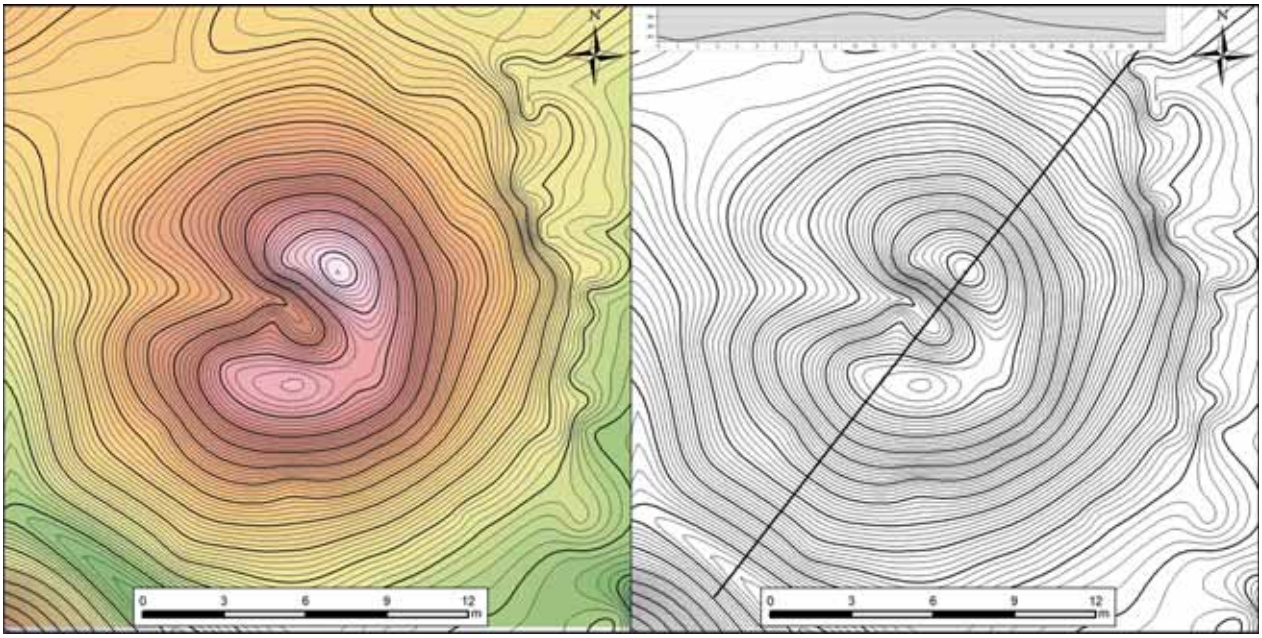



**Fig. X.47.** Barrow 204. Hypsometric plan and cross-section

**Barrow 202 (Fig. X.44)** is located in the N part of the longer alignment, close to the road, 55 m NE of tumulus 203, at 262.5 m.a.s.l. 40 m N of the alignment is an additional mound (not studied). Geographic coordinates: N – 49°05'535"; E – 024°40'165". Circular in shape, 12 m in diameter, 0.5 m high. Mound has a visible dig-in.

**Barrow 203 (Fig. X.45)** is situated in the northern part of the longer alignment and in the southern part of the second one, 55 m SW of tumulus 202, 70 m NE of barrow 205, at 262 m.a.s.l. The unstudied monument is located 90 m NE of it, and 100 m further in this direction is another unstudied mound, Geographic coordinates: N – 49°05'501"; E – 024°40'171". Circular in shape, 26 m in diameter, 1 m high.

**Barrow 204 (Fig. X.46, Fig. X.47)** was documented on the SE end of the shorter alignment 70 m SW of monument 204, at 261.5 m.a.s.l. Geographic coordinates: Circular in shape, 27 m in diameter, 0.7 m high. In the centre of the mound is an extensive dig-in. Subject to geophysical survey.

**Barrow 250 (Fig. X.48)** was recorded 45 m NE of tumulus 202, at 261.5 m.a.s.l. Geographic coordinates: N – 49°05'909"; E – 024°39'485". Circular in shape, 25 m in diameter, 1.5 m high (initially ca. 2.5 m). Barrow excavated with a trench in the centre of the mound.

**Fig. X.48.** Barrow 250. View from the N

## C. Geophysical survey

A geophysical survey with a magnetometer at the cemetery near Krylos was conducted in May 2014. The distribution of barrows does not have a concentrated, monocentric layout, but creates several isolated groups, comprising of two to four mounds. These clusters, scattered inside an extensive forest, are separated from each other by large distances, hence the division of the cemetery into two sites: Krylos-Tyndyk and Krylos-Glinna I. Moreover, within the groupings itself barrows are rarely situated in their immediate proximity. Usually, they are distanced from one another by at least 50 m. The presented characteristic of the site necessitated a certain strategy of survey, according to which only four monuments from two clusters were subjected to magnetometric prospection.

In consequence the surveyed area is divided into four independent measuring areas (**Fig. X.49 – Fig. X.52**). Mounds were selected for the prospection on the basis of relatively low density of vegetation cover overgrowing them and size, meaning that the largest barrows were rejected. Nevertheless, these characteristics did not always go hand in hand. For instance, two of the four selected barrows (Krylos-Tyndyk, barrow 25 and Krylos-Glinna I, barrow 54) are small in size, thus lending themselves for the prospection, however at the time of the survey were densely overgrown by shrubs and young trees, and possessed partly filled trenches left after illegal excavations. The two remaining tumuli have bigger embankments, but at the same time are located inside incompact deciduous (Krylos-Tyndyk, barrow 52) or pine forest (Krylos-Glinna I, barrow 23). Hence, despite the presence of excavations traces, both mounds were selected for the survey.

As mentioned earlier, the magnetometric survey on the cemetery near Krylos was carried out within four separate measuring surfaces, each covering a single barrow. Each of them consisted of grids with dimensions of 10 × 10 m. The first of surveyed mounds (Krylos-Tyndyk, barrow 25) was included in the scope of four grids, together forming a square surface with the side measuring 20 m (total area of 0.04 ha). The second mound (Krylos-Tyndyk, barrow 52) was covered with an irregular framework of eight grids, covering an area of 0.08 ha. The third one (Krylos-Glinna I, barrow 54) was small enough to fit it inside a single grid occupying an area of 100 $m^2$. The last prospected barrow (Krylos-Glinna I, barrow 23 was included in the same grid framework as the first of the listed objects. The survey was carried out along transects separated from each other by a distance of 1 m.

Barrow 25, localised on the site in Krylos-Tyndyk, has a diameter of *circa* 18 m, however its embankment is not characterized by much height. Further-

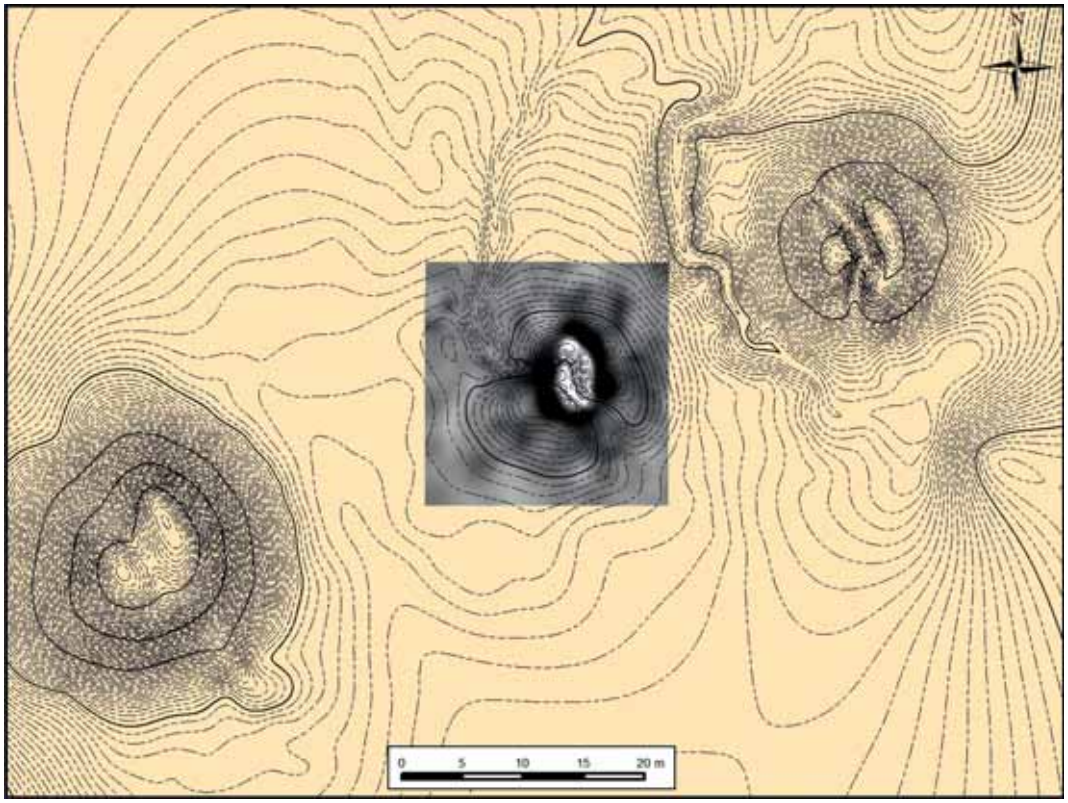



**Fig. X.49.** Krylos-Tyndyk. Position of geophysical survey (barrow 25)

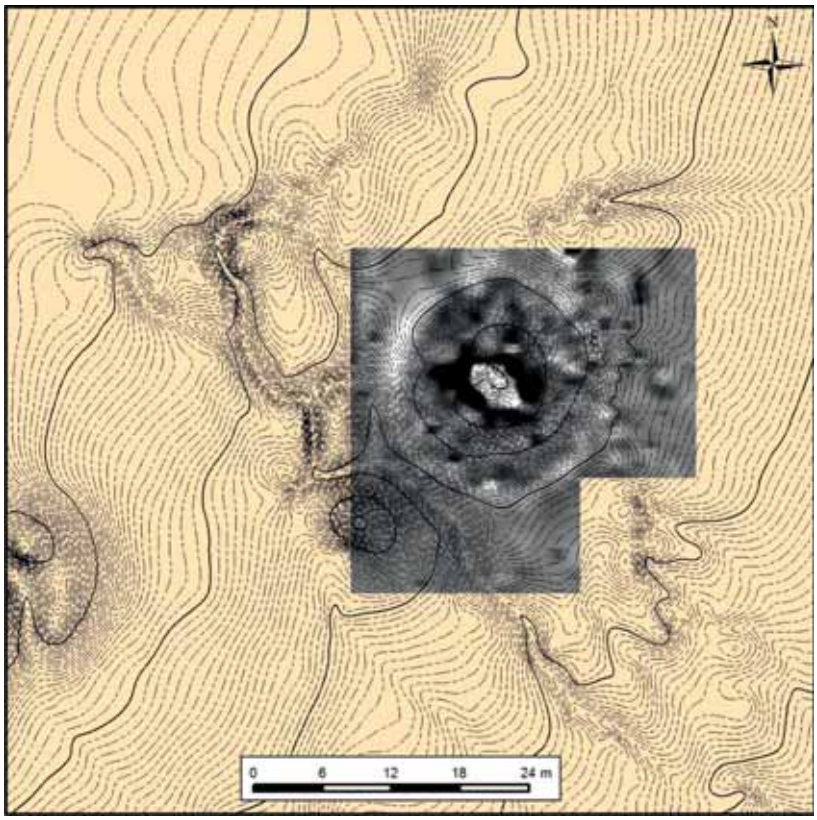
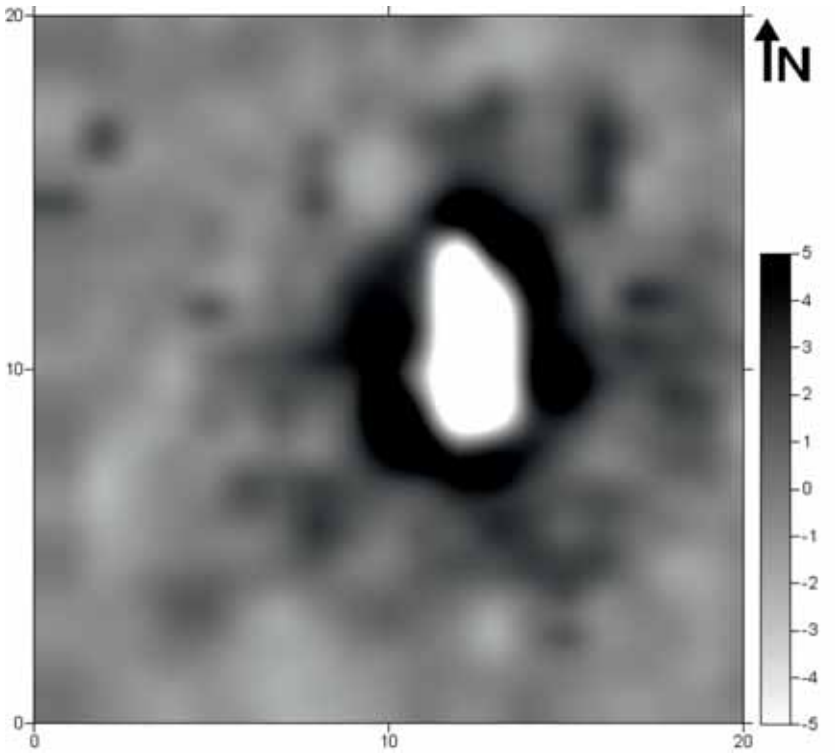



**Fig. X.50.** Krylos-Tyndyk. Position of geophysical survey (barrow 52)



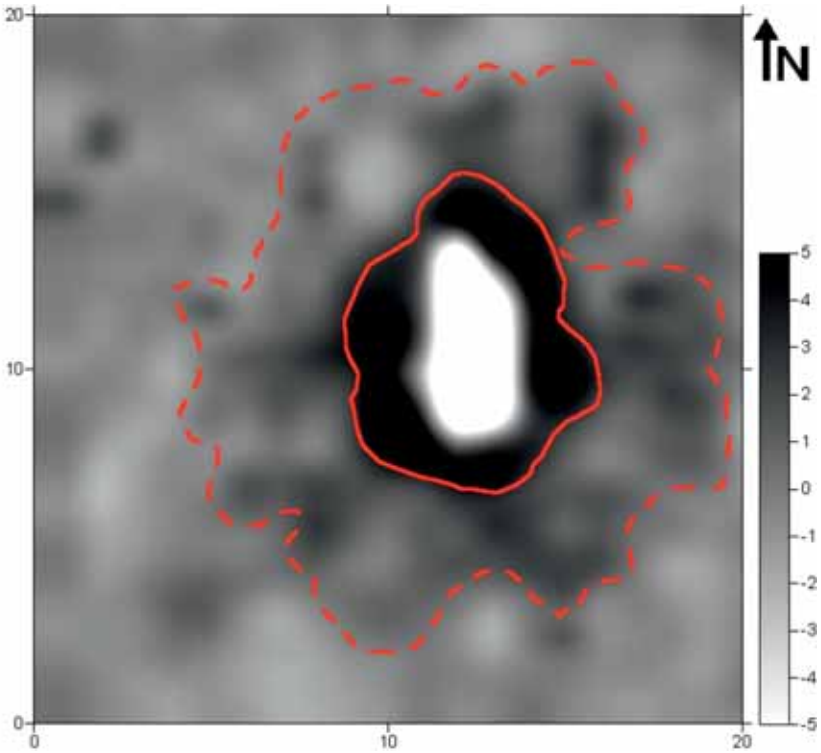
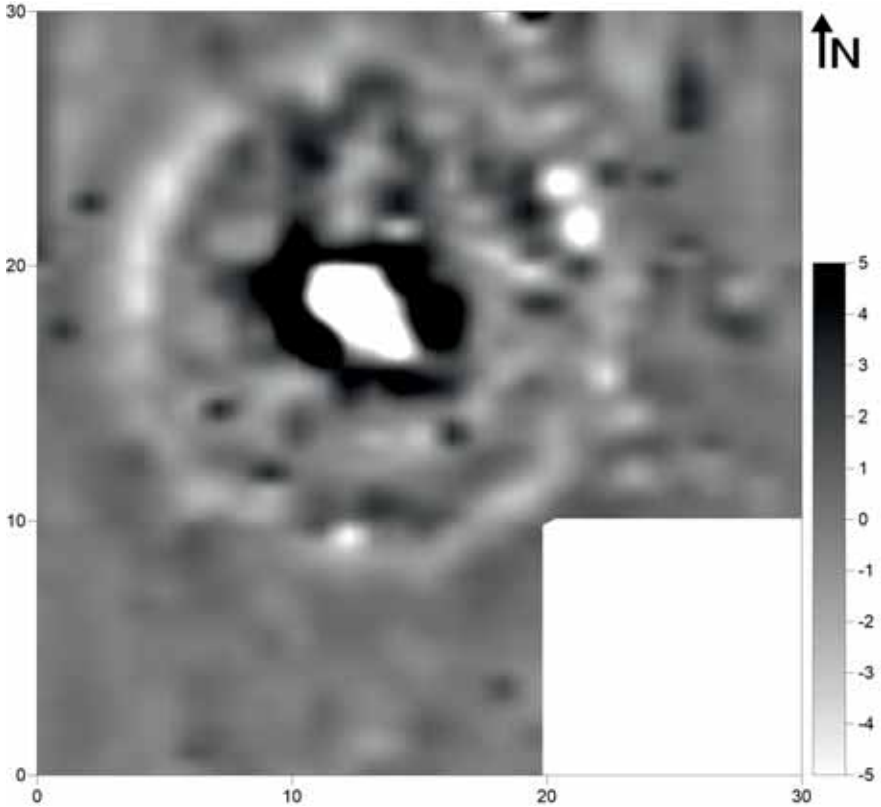




**Fig. X. 51** (up). Resulting image of magnetometric survey of barrow no. 25 on the site in Krylos-Tyndyk (gradiometer Bartington Fluxgate Grad 601-1; measuring grid: 10 × 10 m; sampling density per transect spacing: 0.25 × 1.0 m, interpolated up to 0.25 × 0.5 m; real values of magnetic field gradient compressed in greyscale to the range -5 – +5nT)

**Fig. X. 52** (down). Resulting image of magnetometric survey of barrow no. 25 on the site in Krylos-Tyndyk with highlighted anomalies discussed in the text.

--- approximate spatial extent of anomalies potentially signifying the barrow

— strong dipolar anomaly indicating a modern trench in the central part, resulting from excavations of the barrow



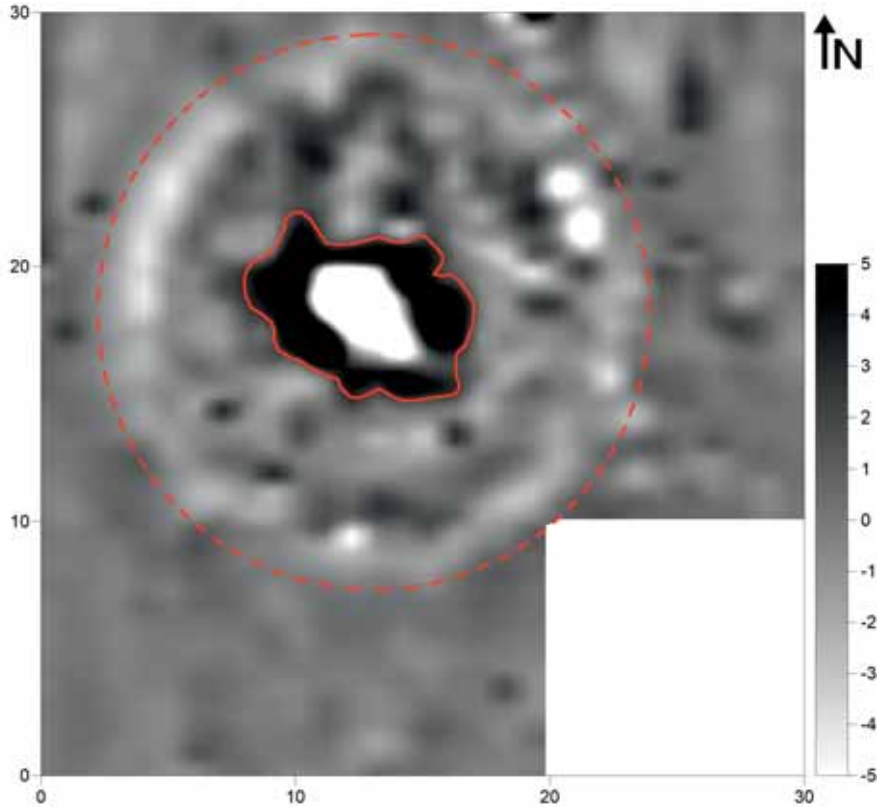




**Fig. X. 53** (up). Resulting image of magnetometric survey of barrow no. 52 on the site in Krylos-Tyndyk (see Fig. X.51)

**Fig. X. 54** (down). Resulting image of magnetometric survey of barrow no. 52 on the site in Krylos-Tyndyk with highlighted anomalies discussed in the text.

--- approximate spatial extent of negative anomaly signifying outer limits of the barrow

— strong dipolar anomaly indicating a modern trench in the central part, resulting from excavations of the barrow

more, its state of preservation has been affected by overgrowing trees which upon falling have left holes in the places where roots were penetrating the subsoil. Finally, it bears traces of excavations in the form of a deep trench situated in the central part. Described features caused the prospection to be hampered from the methodological point of view, while the obtained results are distorted by the effects of post-depositional factors (Fig. X.51).

On the basis of the resulting image of the magnetometric survey it is impossible to clearly distinguish the limits of the embankment. The gradient of the magnetic field seems to be generally similar across the whole surface subjected to measurements. The barrow is visible only thanks to spots of increased magnetisation, that are nonetheless blurred and do not reveal any regular layout (Fig. X.52). A single signal that stands apart from the context is a huge abnormally polarized anomaly in the middle that can be surely attributed to the oval trench elongated along a N – S axis. The bright inner part of this signal symbolizes the place from which the soil was removed and deposited at the banks of the trench visible as a dark rim of the anomaly. At the current stage it is difficult to suggest any conclusions regarding the internal structure of the barrow.

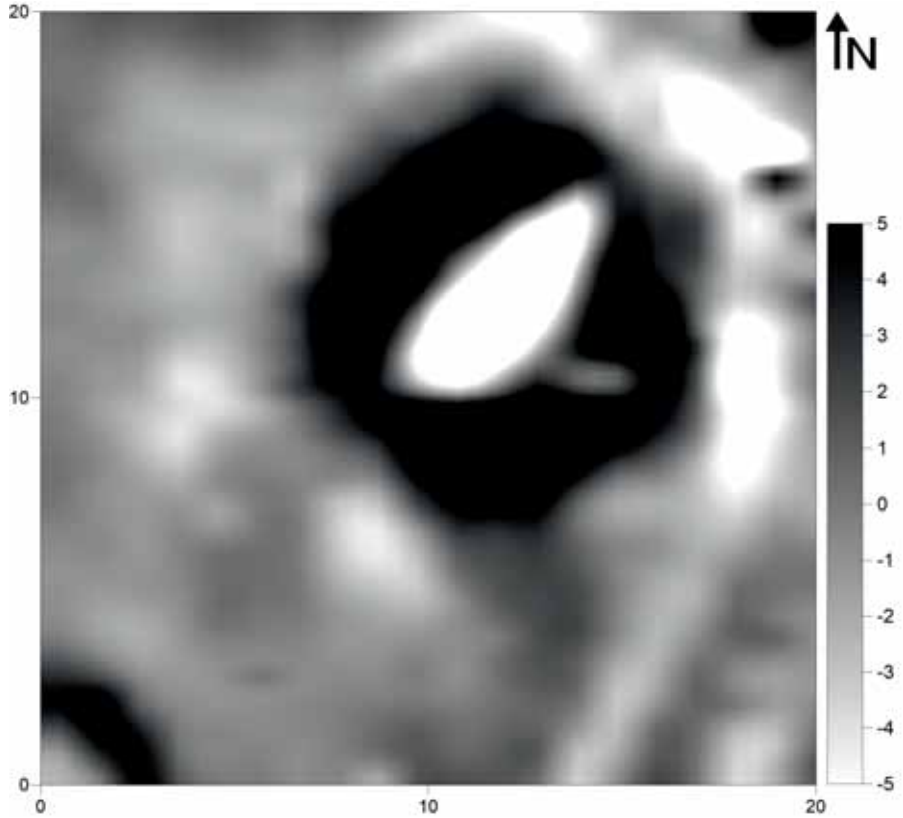
The second monument subjected to the survey (Krylos-Tyndyk, barrow 52) is characterized by a better state of preservation in comparison to above described object. However, its high embankment with steep slopes has hindered the movement along transects and resulted in uneven sampling. The inclination of the slopes made it difficult to start and finish the transect at the same places along the borders of adjacent grids, as depicted by divergences of anomalies in a W – E direction (**Fig. X.53**). A noticeable circular strip of negative values of magnetic field, typically occurring by mounds large in size, is delimiting the actual extent of the embankment (**Fig. X.54**). It surrounds the inner part of the barrow, more varied in terms of magnetic field gradient and is abundant in locally occurring dipolar anomalies.

One can infer from the image that material forming the embankment is diversified in magnetic susceptibility. Nonetheless, it should be remembered that consecutive values along transects were registered at different height levels and consequently are emitted by various layers. For that reason interpreting the sources of individual anomalies as belonging to the same structures is burdened with a high risk of error and in-depth analysis should be postponed until more information about the discussed object will be at hand. Apart from that, one can also distinguish an anomaly emitted by a centrally placed excavation trench, revealing itself in the same way as in the case of barrow 24 from the same group.

Barrow 23 located on the site in Krylos-Glinna I resembles, by its resulting image, mound 25 from the site in Krylos-Tyndyk (**Fig. X.55**). Problems with circumscribing the spatial extent of the embankment occur again, however this time one can notice a bright halo symbolizing a zone of decreased magnetic susceptibility (**Fig. X.56**). Its contour is indistinct and in the SE section of surveyed area it overlaps the longitudinal anomaly with a similar level of magnetisation that runs along a NE – SW axis, indicating a neighbouring forest road. Not without importance is the height of the embankment that impeded the survey, leading to divergences of transects at the edges of grids. The image is dominated by a strong, abnormally dipolar signal elongated along a NE – SW axis that again can be interpreted as a trench left after excavations of the barrow's central part. The pointed anomaly is so extensive that it effectively obscures any weaker anomalies that may result from features buried inside the embankment.

Ultimately the surveyed barrow (Krylos-Glinna I, barrow 54) is among the smallest barrows inspected with a magnetometer in the course of fieldworks. It rises slightly above the ambient and its embankment is covered by holes created by animals, as well as falling trees. Despite these factors, it is well visible on the resulting image of magnetometry (**Fig. X.57**). Its circumference can be defined thanks to the circular strip of negative values enclosing a magnetically stronger centre of the embankment (**Fig. X.58**). Thus one can infer that the material forming the barrow is more susceptible than soil in its context. Additionally, a weaker signal, most probably belonging to an excavation trench, can be distinguished at the centre. It reveals a magnetically less susceptible subsoil forming the internal layers of the embankment that contrasts with the topsoil creating the outer mantle. Apart from these general observations, it is not possible to pinpoint any underground features connected with the burial or internal construction of the barrow.

Summing up the description of the magnetometric survey on the cemetery near Krylos, one should pay attention to a series of factors that affected the quality of the obtained results. These stem, in the first place, from differences in size of the barrows that range from small and barely visible, to large mounds with steep slopes. Secondly, the images document a considerably worsened state of preservation of monuments in comparison with mounds form other



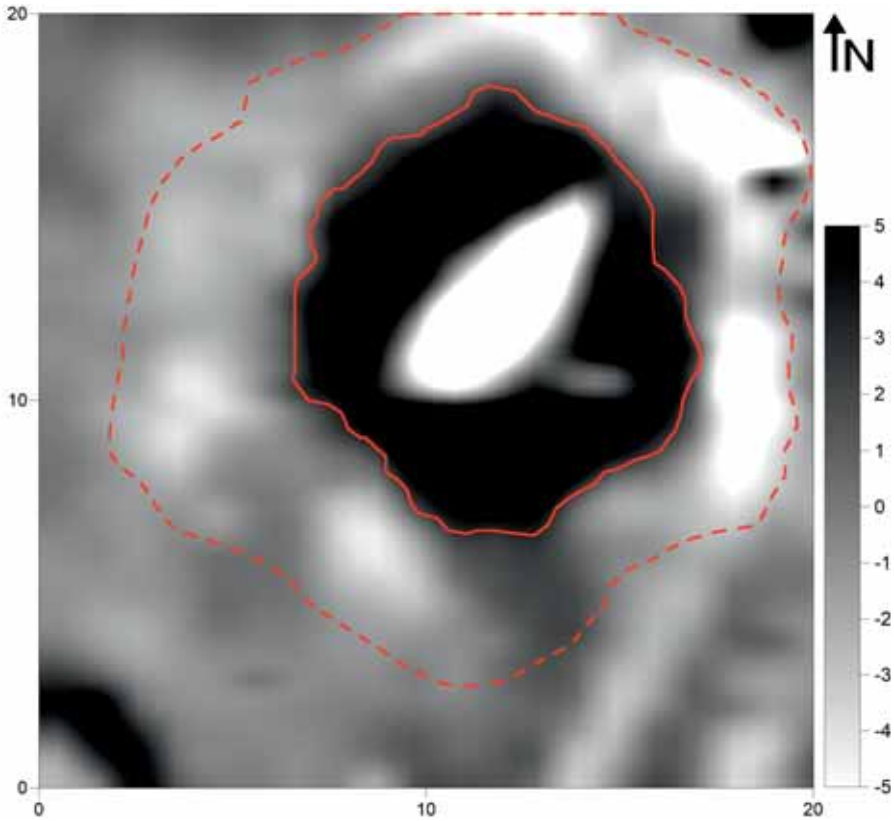
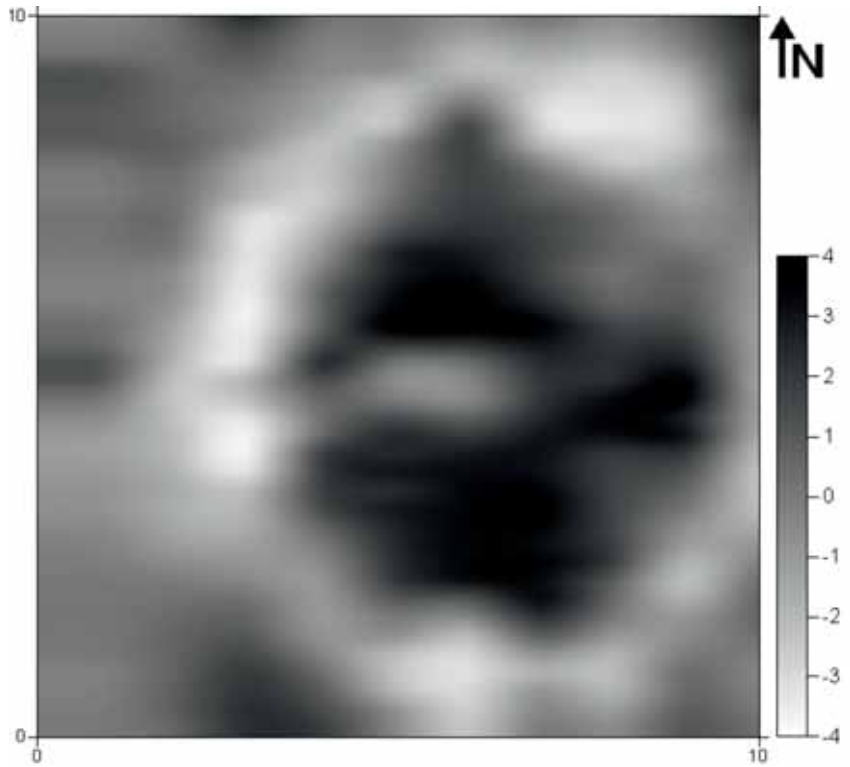




**Fig. X. 55** (up). Resulting image of magnetometric survey of barrow no. 23 on the site in Krylos-Glinna I (see Fig. X.51)

**Fig. X. 56** (down). Resulting image of magnetometric survey of barrow no. 23 on the site in Kryłos-Glinna I with highlighted anomalies discussed in the text.

--- approximate spatial extent of negative anomaly signifying outer limits of the barrow

— strong dipolar anomaly indicating a modern trench in the central part, resulting from excavations of the barrow



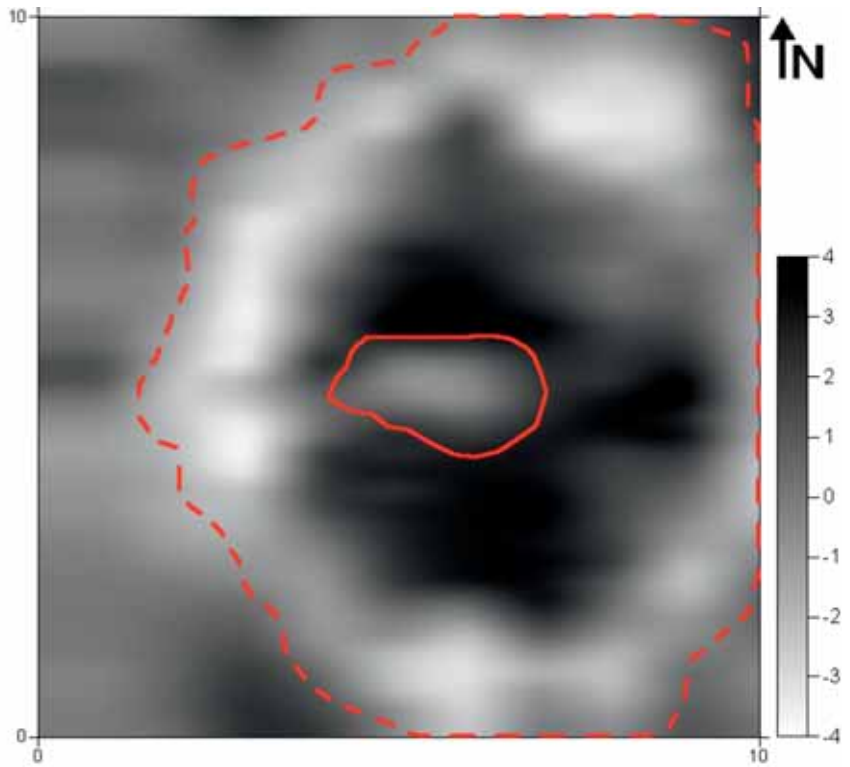




**Fig. X. 57** (up). Resulting image of magnetometric survey of barrow no. 54 on the site in Krylos-Glinna I (gradiometer Bartington Fluxgate Grad 601-1; measuring grid: 10 × 10 m; sampling density per transect spacing: 0.25 × 1.0 m, interpolated up to 0.25 × 0.5 m; real values of magnetic field gradient compressed in greyscale to the range -4 – +4nT)

**Fig. X. 58** (down). Resulting image of magnetometric survey of barrow no. 54 on the site in Kryłos-Glinna I with highlighted anomalies discussed in the text.

--- approximate spatial extent of negative anomaly signifying outer limits of the barrow

— strong dipolar anomaly indicating a modern trench in the central part, resulting from excavations of the barrow

cemeteries surveyed by the team. Each of prospected barrow has a centrally situated trench and frequently possesses other minor traces of damage. The latter have seriously disturbed the measurement, making the distinction of other anomalies sometimes impossible. Other problems stem from the difficulties in surveying archaeological objects with a large landform not lending itself to magnetometry. Nevertheless, it should be mentioned that even barrows with smaller embankments did not reveal complex internal structures. Perhaps this observation indicates the specificity of mounds on the cemetery near Krylos where sepulchral objects could have been built solely with the use of soil obtained from the vicinity. Such an interpretation needs to be verified in course of future research of the site.

## D. Archival information

### Krylos, district of Stanisławów (after Sulimirski 1968:135-136)

*A large number of barrow-graves occur in various parts of the fields. There were over twelve in the 'Nad Bidunem forest, some of which were excavated in 1883-86 by Dr I. Szaraniewicz (Szaraniewicz 1883:3; 1886:88). The following description is derived from published material, in the order of their excavation.*

*Barrow-grave 1. Excavated in 1883 and designated as '10a'. Under the mound an area 14 by 15 m in extent was cobbled. The pebbles were missing at two points, where it had perhaps been at some time excavated. In this mound were found a portion of a flint knife, fragments of broken red and black vessels and an object 'shaped like a button', black in colour, like 'petrified lava'. Szaraniewicz provided a plan of the pebble arrangement which he considered to be the foundation of a construction of some kind.*

*Barrow-grave 2. This was excavated in 1883 as no. 11, and was the largest (4 m high). It was composed of black earth with white streaks. The black earth ceased at 3 m deep and gave way to yellow, hard, beaten clay. Nothing was found except for small pieces of red brick and a flint arrow-head.*

*Barrow-grave 3. This was excavated in 1883 as no. 10c. It was also cobbled. It was cut across by a diagonal trench. It consisted of clay mixed with black earth to a depth of 1.4 m then yellow clay appeared. Nothing was found except some small fragments of pottery.*

*Barrow-grave 4. Situated in the 'Na Czahniowie' wood, this was excavated in 1884 by a diagonal trench. A large number of river pebbles were found here, lying at random through the entire mound. The earth uncovered in the walls of the mound excavation was black, as though 'brought from else-where and had streaks which appeared to be a mixture of earth and ash (in fact degradate chernozem). It contained many holes (almost certainly those of hamsters). Virgin soil occurred at a depth of 2 m. The description does not refer to any findings.*

*The objects deriving from Szaraniewicz excavation were deposited in the Lviv Narodnyi Dom and Instytyt Stauropigianski. It has only been possible to identify the flint knife 8.5 cm long, almost certainly deriving from barrow-grave I.*

*Barrow-grave A. In 1883, T. Ziemięcki (Ziemięcki 1884:93; 1887:52, Janusz 1918:216) excavated a mound situated in the earthwork and called it the 'Hałyczyna Mohyła'. It was 36 m in diameter, 2.5 m high. A few scattered fragments of pottery, charcoal and one small bone were found in the upper portions of the mound at a depth of 1.9 m. The description states that a 'lenticular layer of sand' 30 cm deep was found just over the virgin soil: this was presumably traces of the grave-shaft, which Ziemięcki failed to observe, dug in the ancient level and extending to the virgin soil.*

*In 1935 and 1936 Dr J. Pasternak (Pasternak 1936, note 35; 1937, note 16) excavated six mounds here, providing only a brief note on them.*

*Barrow-grave I. In the 'Dubrowa' forest. A skeleton strewn with red ochre.*

*Barrow-grave II. Situated as above. A cremation burial of the Bronze Age.*

*Barrow-grave III. In the 'Glinna' forest. Cremation burial. Corded Ware and a bronze pin with a spiral head (three windings).*

*Barrow-grave IV. 'Stawiska' field. Inhumation burial of the Early Bronze Age.*

*Barrow-grave V. Inhumation burial of the Early Iron Age. A large yellow bead of glassy paste with blue eyes in a white ring.*

*Barrow-grave VI called 'Nastasyna Mohyła', situated in the 'Dubrova' forest close to the border of Komarów, investigated in 1936. This was 30 m in diameter, 3.5 m high. In the mound were found charcoal, lumps of fired clay and small odd potsherds, some of which had an incised ornament. In the eastern part of the mound, at a depth of 1.12 m, two horse leg-bones and five horse teeth were excavated, but no skull was found.*

*At a depth of 2 m, 3.7 m S of the centre, a human skeleton lay on a layer of oak planks, of which only slight traces were left: It was also covered with a black layer, the nature of which could not be established. The skeleton lay on its back, legs contracted towards the left side. Near the feet, three fairly small hearths were uncovered;*

*they formed a regular triangle. Near the skeleton several grave goods were excavated (Sulimirski 1968, Fig. 11:1): (1) part of a thin bronze torque, 14.5 cm long the wire 4 mm thick on the neck; (2) fragments of two lead spiral bands, 1.5 cm in diameter; (3) a beaker near the feet, 14.5 cm high, 13-14 cm in diameter with an incised chevron decoration on its high neck; (4) a diorite battle-axe, 12.5 cm long, of y-2 type, which lay near the left elbow; (5) a flint axe, rectangular in section, 10 cm long, found near the beaker; (6) three flint arrow-heads, one of these thick and of an unusual form; one arrowhead was found near the ribs, the other in the hip bones; (7) five flint flakes were found near the flint axe.*

Komarów culture records have not been published.

# XI. Cemetery in Okniany/Vikniany (Fig. XI.1)

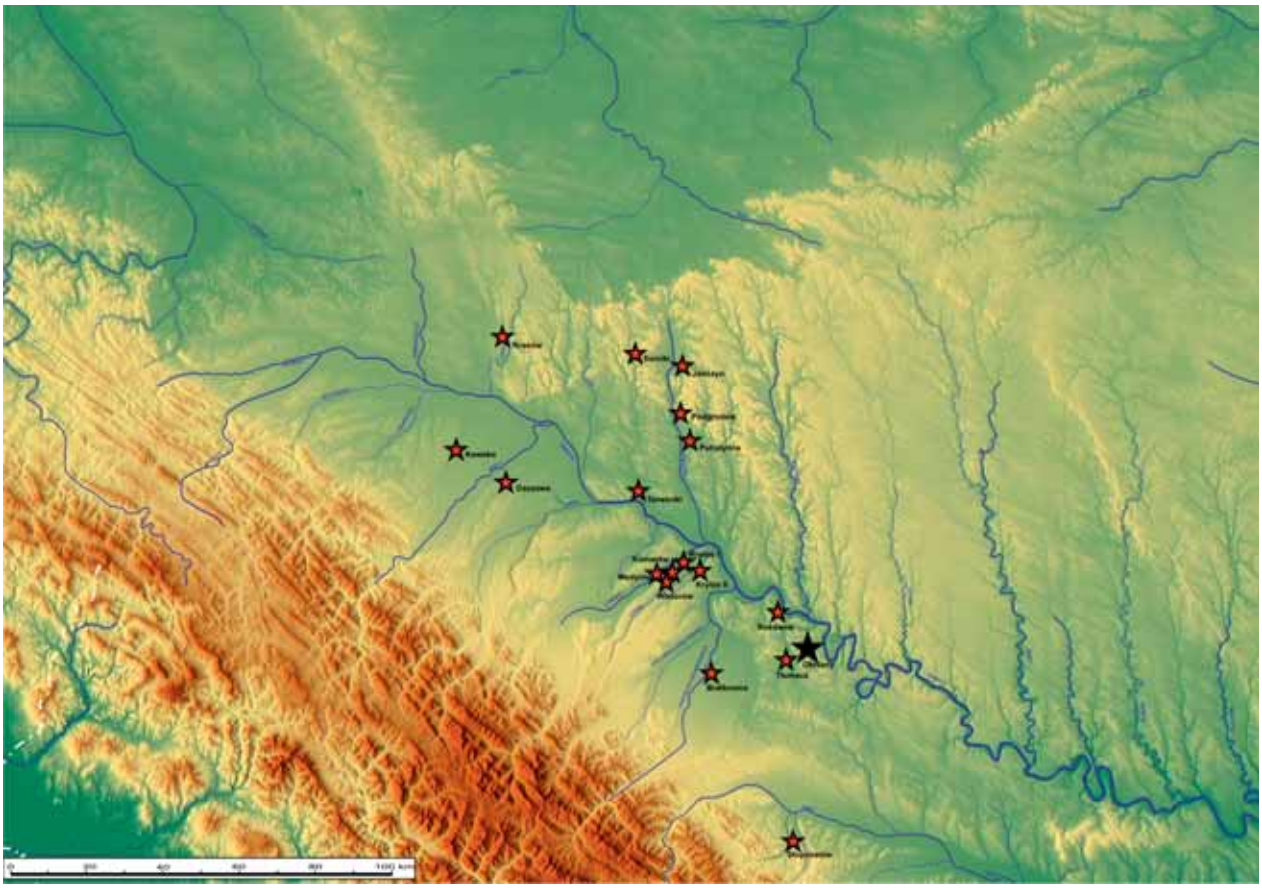
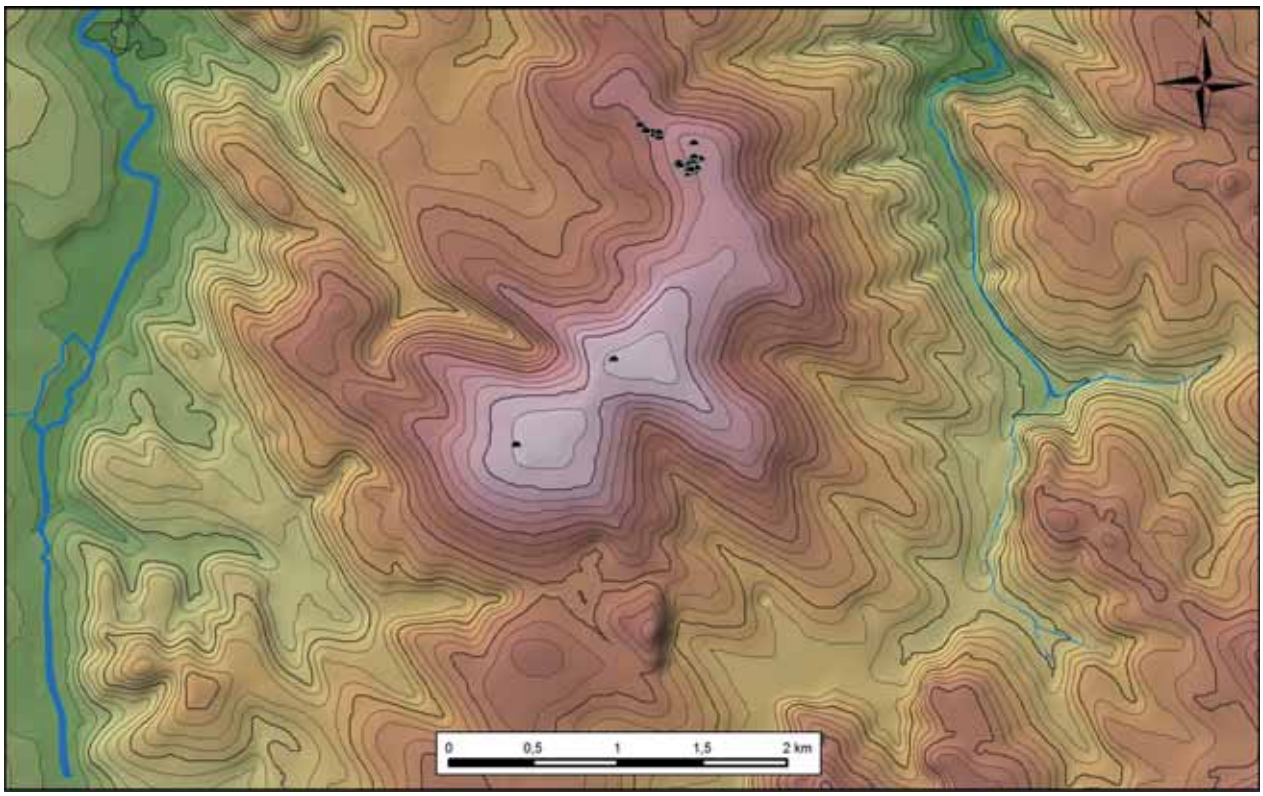


**Fig. XI.1.** Location of the cemetery in Vikniany in relation to other barrow necropolises

## A. Geographical description (Vikniany and Tlumach)

The cemeteries in Vikniany and Tlumach are situated on the left bank of the Dniester. They are located in 1-1.5 km from each other. Geomorphologically the area belongs to the Podolian Upland which on the described part is a hilly-ridge landscape. It is defragmented by the right tributaries of the Dniester. The highest elevation are the Chartove Gory ranges (also known as Belahory) elongated on latitudinal axis. Adjacent from the west is the Tlumach river and from



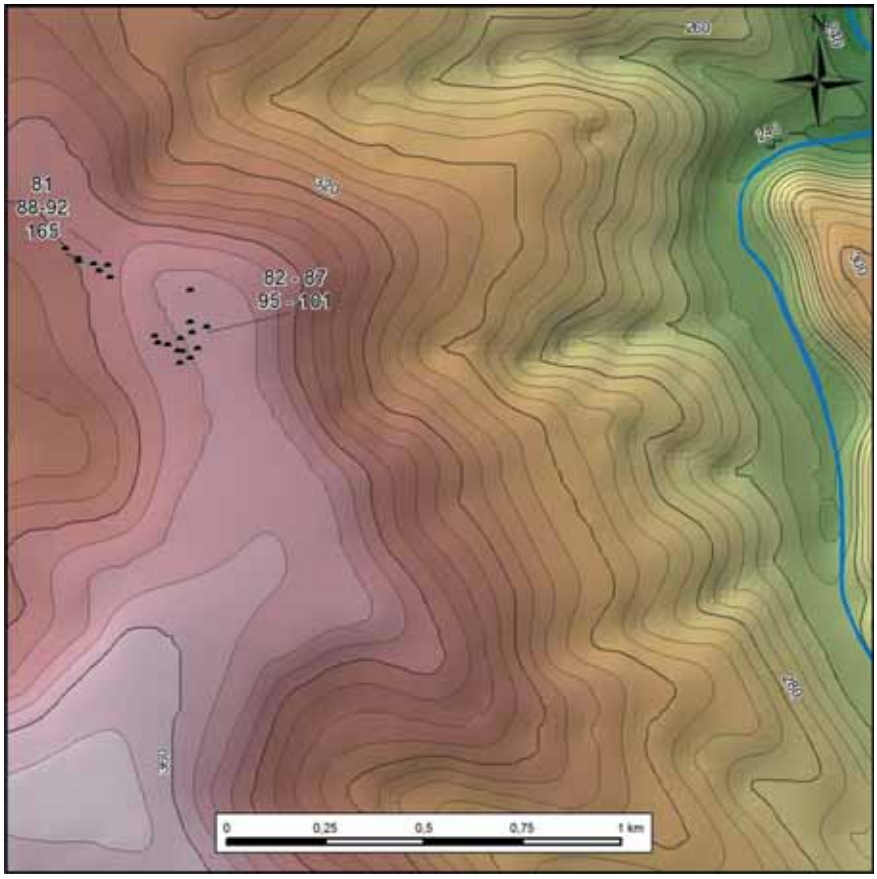




**Fig. XI.2** (up). Digital Elevation Model of the cemetery in Vikniany

**Fig. XI.3** (down). Digital Elevation Model of the cemetery in Vikniany with the numbering of barrows

the E a small tributary of the Dniester – Solonytsa that has its springs in Okno/Vikno (the Vikniany is related to these springs) and after 4 km it joins the Dniester. These rivers are characterized by large declines and erosion capability.

As for the entire region of the Podolian Upland the base ground consists of granites and gneisses that lie under younger rocks. In terms of stratigraphy, the Mesozoic, Upper Jurassic and Cretacious rocks are significant. The Neogene was important in the geological development of the area when in a shallow marine environment, sands, sandstones, limestones, gypsums and loams were created and deposited. The thickness of this layer is estimated to 100-200 m. On top of this unit deposits of loess are present.

Of particular note in this area are the so called "wertelapy" or "howdy". They are a depressions created by karst processes in the gypsum base ground. Water has been dissolving these rocks, creating a vaccum that further causes them to collapse and results in a funnel-like depression 6-10 m deep and similar in diameter. Sometimes larger forms occur. These depressions are very common in the area of Tlumach and Vikniany.

Slow tectonic uplifting movements are characteristic for the entire Podolian region. The results of these processes are observable in the river valleys. From Nizhniv the canyon stage of the Dniester begins and has its origins mainly in the Pleistocene. In the thresholds of the valleys a net of young, narrow and deep ravines are present, as well as the older of the Balki type. Depending on the deepness of the ravines there are bedrock outcrops such as granites but mainly Cretaceous limestones with numerous coral fossils.

Necropolises in Vikniany and Tlumach lie on the hummock between the two tributaries of the Dniester. The hummock is lower and narrower in its northern part while being wider and higher in the southern where the two barrows were recorded. The difference in height of valley bottoms and summits of the hills is in the range of 243 to 359 m.a.s.l. The burial mounds in the area of Tlumach are elevated at an average of 359 m.a.s.l., whereas the barrows in Vi-


**Fig. XI.4.** Vikniany. Location of the cemetery using satellite imagery (Yandex)

kniany at 340-345 m.a.s.l. The slope here varies from 0.32 degrees in the valley plains and flat summit, to nearly 12 degrees on the narrow and fragmented slopes of valley ravines.

## B. Spatial arrangement and description of the barrows

The cemetery in Vikniany comprises two barrow groups erected on top of a hill, which forms part of a watershed between the Tlumach river in the W and unnamed watercourses in the E **(Fig. XI:2, Fig. XI:3, Fig. XI:4)**. Monument concentrations are located ca. 3 km E of the Tlumach river bed. The first one comprises seven tumuli (nos. 81, 88-92, 165) located linearly along the NW – SE axis, in total measuring 150 m. The second cluster, comprising 13 mounds (nos. 82-87, 95-101) is characterized by a denser arrangement with shorter linear barrow structures usually set along the NW – SE and NW – SE axes.

**Fig. XI.5.** Barrow 81. View from the S

### Barrow group I

**Barrow 81 (Fig. XI.5; Fig. XI.6)** is located along a dirt road, on the edge of a forest, on a slight W slope. It was erected at 340 m.a.s.l., 35 m NE of tumulus 92. Geographic coordinates: N – 48°52'635"; E – 025°03'618". Circular in shape, 15 m in diameter, 0.5 m high. Subject to geophysical survey.

**Barrow 88 (Fig. XI.7)** was registered in the central part of the aforementioned group, 75 m SE of barrow 82, between monuments 89 (SE) and 165 (W), 15 m away from the former and 25 m from the latter. It was erected at 341.5 m.a.s.l. Geographic coordinates: N – 48°52'615"; E – 025°03'677". Circular in shape, 15 m in diameter, 0.5 m high.

**Barrow 89 (Fig. XI.8)** was documented in the SE part of the described barrow group, at 341.5 m, 25 m NW of barrow 90 and 15 m SW of mound 91. Geographic coordinates: N – 48°52'606"; E – 025°03'688". Circular in shape, 15 m in diameter, 0.5 m high.

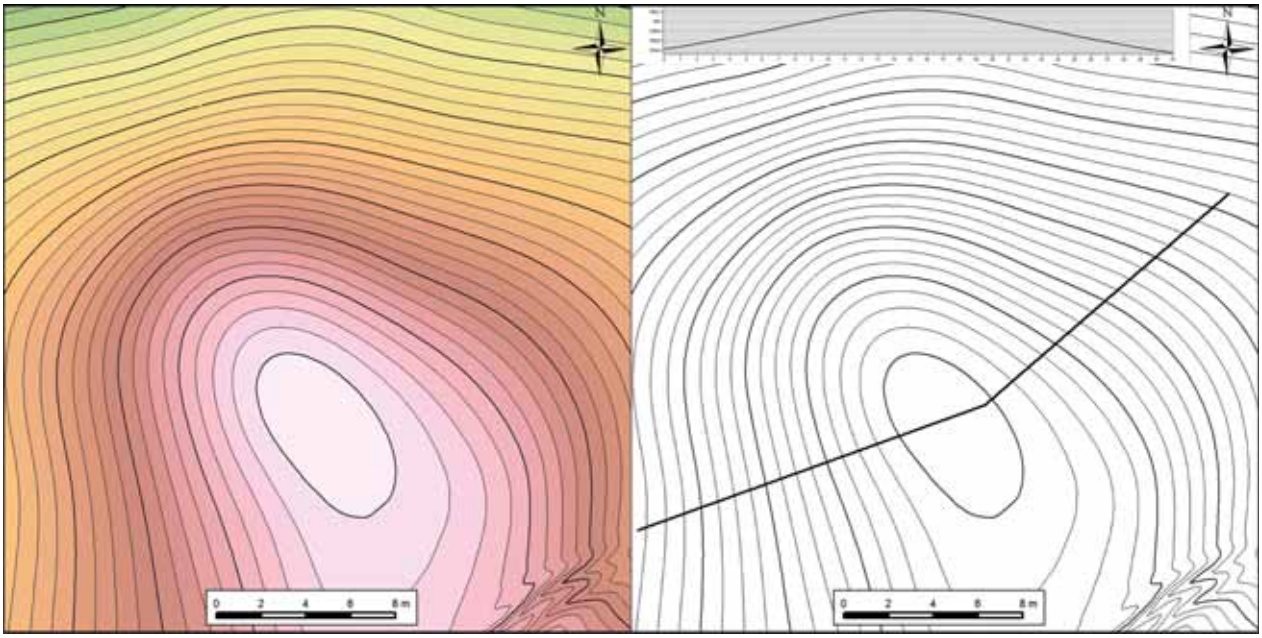


**Fig. XI.6.** Barrow 81. Hypsometric plan and cross-section

**Fig. XI.7.** Barrow 88. View from the S

**Fig. XI.8.** Barrow 89. View from the SW

**Fig. XI.9.** Barrow 90. View from the W

**Fig. XI.10.** Barrow 91. View from the E

**Barrow 90 (Fig. XI.9)** is situated in the SE part of the group, 25 m SE of tumulus 89 and 23 m S of barrow 91 at 343.5 m.a.s.l. Geographic coordinates: N – 48°52'597"; E – 025°03'712". Circular in shape, 25 m in diameter, 1.5 m high.

**Barrow 91 (Fig. XI.10)** – excavated in the 1930s – was recorded in the NE edge of the group, 25 m NE of barrow 89 and 23 m N of barrow 90, at 343.5 m.a.s.l. Geographic coordinates: N – 48°52'614"; E – 025°03'707". Visible circular dig-in measuring 10 m in diameter, 0.4 m high.

**Barrow 92 (Fig. XI.11)** was documented in the NW part of the group, at 340 m.a.s.l., 35 m SE of barrow 91 and 5 m NW of barrow 165. Geographic coordinates: N – 48°52'622"; E – 025°03'645". Circular in shape, 15 m in diameter, 0.5 m high.

**Fig. XI.11.** Barrow 92. View from the SW

**Barrow 165 (Fig. XI.12)** was recorded in the north-central part of the aforementioned concentration, at 340.5 m.a.s.l., 5 m SE of barrow 92. Geographic coordinates: N – 48°52'618"; E – 025°03'646". Circular in shape, 13 m in diameter, 0.4 m high.

## Barrow group II

**Barrow 82 (Fig. XI.13, Fig. XI.14)** is located on the S part of the group, on a slight south-western exposed slope, at 349 m.a.s.l. Together with barrows 83 and 84 it forms a NE – SW oriented alignment. The mound is situated 20 m SW of tumulus 83. Geographic coordinates: N – 48°52'482"; E – 025°03'862". Circular in shape, 12 m in diameter, 1 m high.

**Barrow 83 (Fig. XI.15)** – excavated in the 1930s? – was discovered on the SE edge of the barrow group, at 349.5 m.a.s.l., between monuments 82 and 84, 20 m NE of the former and 24 m SW of the latter. Geographic coordinates: N – 48°52'489"; E – 025°03'880". Circular in shape, initially measuring 10 m in diameter. Regular, numerous dig-ins visible.

**Barrow 84 (Fig. XI.16)** – excavated in the 1930s? – recognised in the central-eastern edge of the group, at 350 m.a.s.l., on the E edge of linear arrangement

**Fig. XI.12.** Barrow 165. View from the S

**Fig. XI.13.** Barrow 82. View from the SW

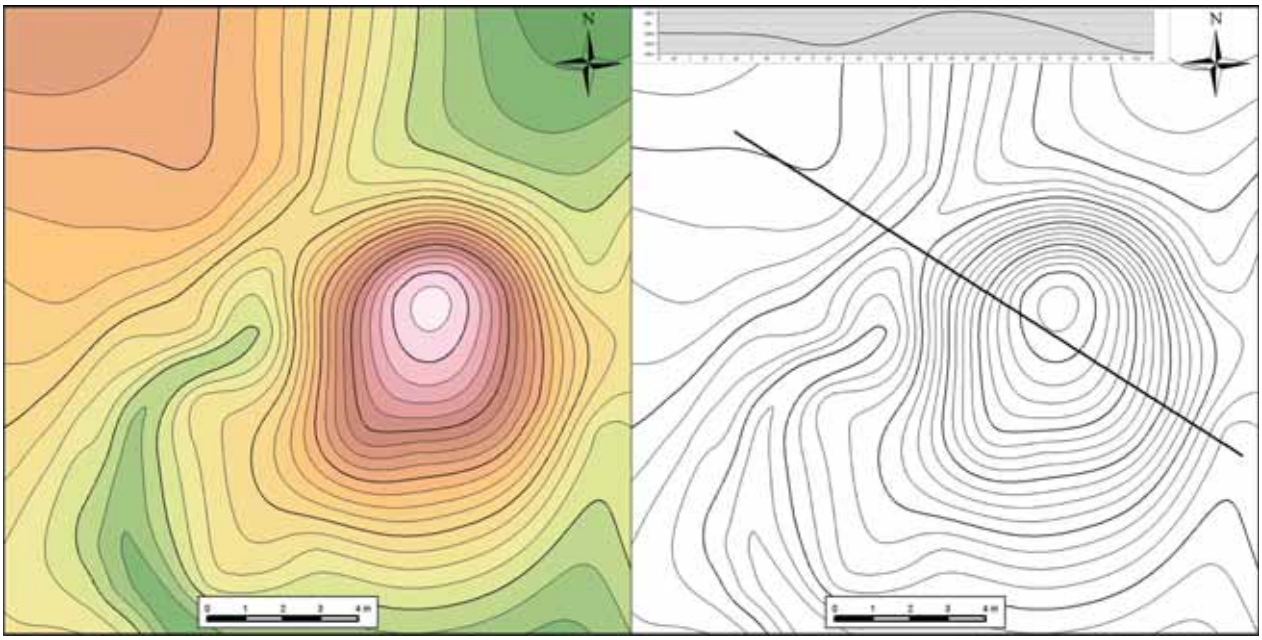



**Fig. XI.14.** Barrow 82. Hypsometric plan and cross-section

**Fig. XI.15.** Barrow 83. View from the SE

**Fig. XI.16.** Barrow 84. View from the NW

of three barrows, 24 m NE of barrow 83. Geographic coordinates: N – 48°52'503"; E – 025°03'897". Completely explored.

**Barrow 85 (Fig. XI.17, Fig. XI.18)** – excavated in the 1930s? – was documented in the central-western part of the concentration, at 349 m.a.s.l., on the SE edge of the group. Together with barrows 97-99 it was part of a linear arrangement oriented along a NW – SE axis. It is located 12 m E of barrow 96 and 25 m SE of barrow 97. Geographic coordinates: N – 48°52'507"; E – 025°03'836". Circular in shape, 26 m in diameter, 2.5 m high. A large, regular dig-in was visible in the mound. Subject to geophysical survey.

**Fig. XI.17.** Barrow 85. View from the E

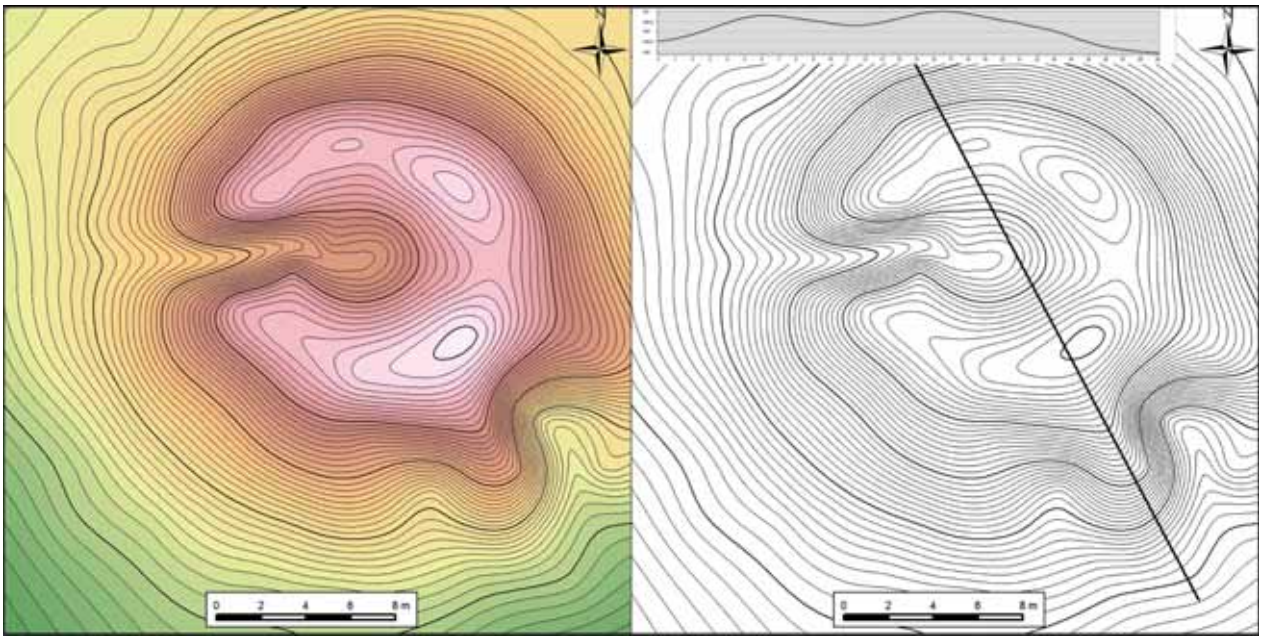


**Fig. XI.18.** Barrow 85. Hypsometric plan and cross-section

**Barrow 86 (Fig. XI.19)** – excavated in the 1930s? – it is situated in the S part of the barrow concentration, at 349.5 m.a.s.l. It is located 3 m W of barrow 87 and 20 m SE of barrow 85. Geographic coordinates: N – 48°52'499"; E – 025°03'857". Circular in shape, 12 m in diameter, 1 m high. A clearly visible dig-in measuring 4 m in diameter was found on the mound.

**Barrow 87 (Fig. XI.20)** – excavated in the 1930s – documented in the S part of barrow cluster, at 349.5 m.a.s.l. It is located 3 m E of barrow 86 and 14 m NW of barrow 83. Geographic coordinates: N – 48°52'498"; E – 025°03'866". Completely excavated. Initially it could have been over 10 m in diameter.

**Barrow 95 (Fig. XI.21)** – excavated in the 1930s? – situated in the W part of the concentration, at 348.5 m.a.s.l. It is located 14 m NW of barrow 96. Geographic coordinates: N – 48°52'519"; E – 025°03'808". Circular in shape, 20 m in diameter, 0.5 m high. Two dig-ins visible.

**Barrow 96 (Fig. XI.22)** was discovered in the W part of the barrow concentration, at 348 m.a.s.l. It is situated 14 m SE of barrow 95 and 17 m W of barrow 85. Geographic coordinates: N – 48°52'509"; E – 025°03'815". Circular in shape, 10 m in diameter, 0.4 m high. Densely covered with bushes.

**Barrow 97 (Fig. XI.23)** was documented in the central part of the concentration, at 350 m.a.s.l. Together with barrows 85, 98 and 99 it creates a linear arrangement set along the NE – SW axis. It is located 25 m NE of barrow 85 and 20 m SW of barrow 98. Geographic coordinates: N – 48°52'516"; E – 025°03'863". Circular in shape, 20 m in diameter, 0.8 m high. A dig-in visible in the E sector of the barrow.

**Barrow 98 (Fig. XI.24)** is located in the central-eastern part of the concentration, at 350.5 m.a.s.l. Together with monuments 85, 97 and 99 it forms a linear structure arranged along a NE – SW axis (second barrow from the E). It is located between tumuli 97 and 99, 20 m NE of the former and 26 m SE of

**Fig. XI.19.** Barrow 86. View from the E

**Fig. XI.20.** Barrow 87. View from the S

**Fig. XI.21.** Barrow 95. View from the NW

**Fig. XI.22.** Barrow 96. View from the SE

**Fig. XI.23.** Barrow 97. View from the E

**Fig. XI.24.** Barrow 98. View from the NW

**Fig. XI.25.** Barrow 99. View from the S

**Fig. XI.26.** Barrow 100. View from the SE

the latter. Geographic coordinates: N – 48°52'524"; E – 025°03'885". Circular in shape, 8 m in diameter, 0.3 m high.

**Barrow 99 (Fig. XI.25)** was recorded in the E part of the concentration, at 351 m.a.s.l. It is situated on the E edge of the linear arrangement, arranged along the NE – SW axis, 26 m NW of barrow 198. Geographic coordinates: N – 48°52'533"; E – 025°03'915". Circular in shape, 20 m in diameter, 0.4 m high. A visible dig-in.

**Barrow 100 (Fig. XI.26)** was found in the N part of the concentration, at 350.5 m.a.s.l., 24 m NE of barrow 98 and 35 m NW of tumulus 90. Geographic coordinates: N – 48°52'533"; E – 025°03'915". Circular in shape, 8 m in diameter, 0.3 m high. A visible dig-in.

**Barrow 101 (Fig. XI.27)** was recorded in the N part of the concentration, away from other monuments, at 350.5 m.a.s.l., 68 m N of barrow 100. Geographic coordinates: N – 48°52'582"; E – 025°03'880". Circular in shape, 10 m in diameter, 0.3 m high. A visible dig-in.

**Fig. XI.27.** Barrow 101. View from the S

## C. Geophysical survey

In April 2015, out of many barrows located on the site in Vikniany, two (no. 81 and 85) were subjected to a magnetometric survey. They were selected on the basis of their good state of preservation and size, especially the height of the embankment allowing for its efficient measuring together with the context. Monuments were surveyed within two separate areas (**Fig. XI.28, Fig. XI.29)**. The first of them comprised six grids with a dimension of 10 × 10 m, while the second four. In total surveyed area covers 0.1 ha.

The resulting image for barrow 81 reveals, in respect to the context, little differentiation of magnetic field gradient emitted in the place where the barrow stands (**Fig. XI.30**, Fig. XI.28). Values predominantly are stretched in the range from -1 to 1nT, while the outline of the embankment can be distinguished solely on the basis of a thin and roughly rectangular anomaly, characterized by a level of magnetization reaching 2nT, nonetheless with a faded southern section (**Fig. XI.31**). Inside such an outlined area is also present an irregularly-shaped anomaly with a positive peak of magnetisation reaching about 4nT, that is however difficult to interpret. On the other hand, within the surveyed area there were identified frequent signals in the form of a normally or abnormally oriented but always very intensive dipoles (indicating residual magnetization), that are especially concentrated in a NW grid. Most probably this is some concentration of objects enriched with ferrous content, thus emitting their own distinct magnetic field. At this point it is worth noting that the discussed barrow was adjacent from the west to the forest road, along which one could spot large amounts of litter, likely causing the aforementioned signals.

The second surveyed barrow (no. 85) does not have a clearly defined outline either, however in this case the embankment seemingly was heaped from material characterized by a greater magnetic susceptibility than its surroundings (**Fig. XI.32;** Fig. XI.29). While the edge of the embankment, in terms of magnetization gradient, smoothly turns into the context, the inner part can be distinguished by an irregularly-shaped anomaly that is slightly elongated along a W – E axis and branched out towards the north (**Fig. XI.33**). The level of magnetization is clearly reaching a positive maximum of 5nT, however it is not unified for the whole extent of this signal. Although the unique shape is hard to explain, one can assume that the middle part of the tumulus is filled with mixed-earth material with increased magnetic

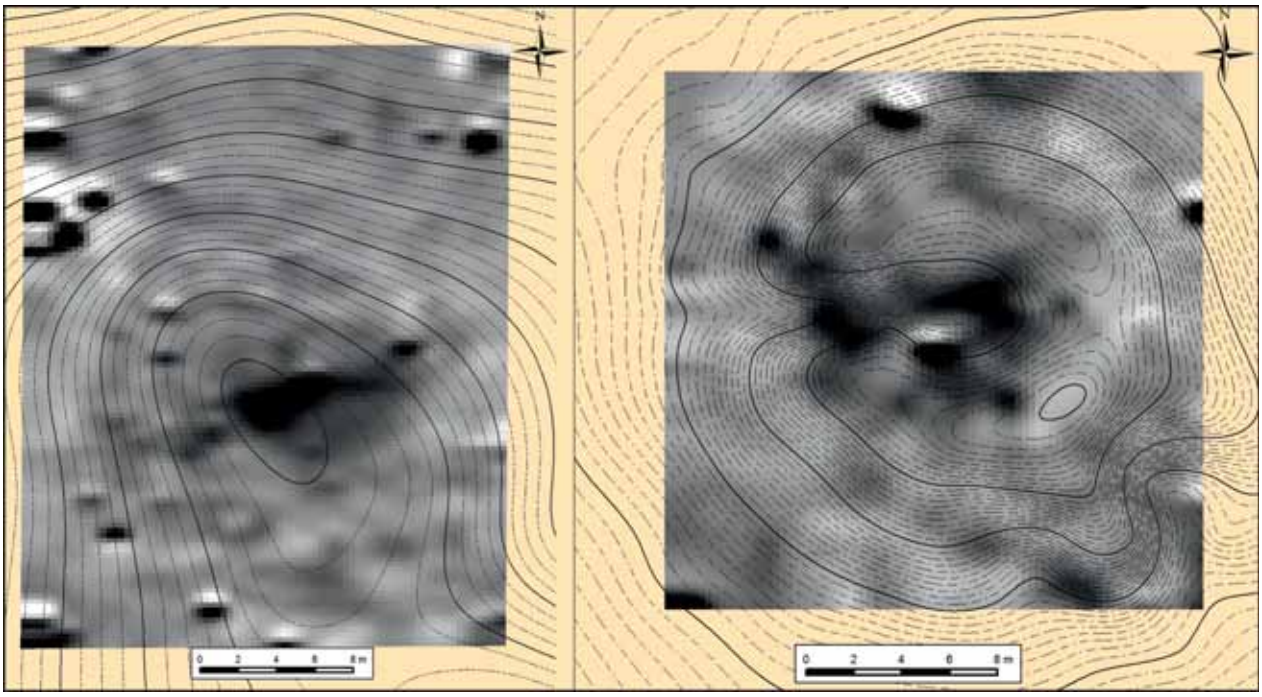
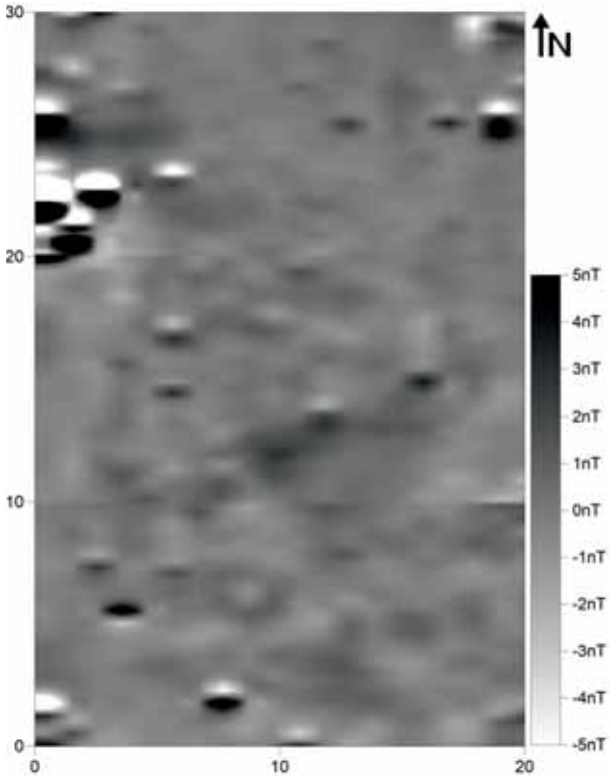


**Fig. XI.28** (left). Vikniany. Position of geophysical survey (barrow 81)

**Fig. XI.29** (right). Vikniany. Position of geophysical survey (barrow 85)



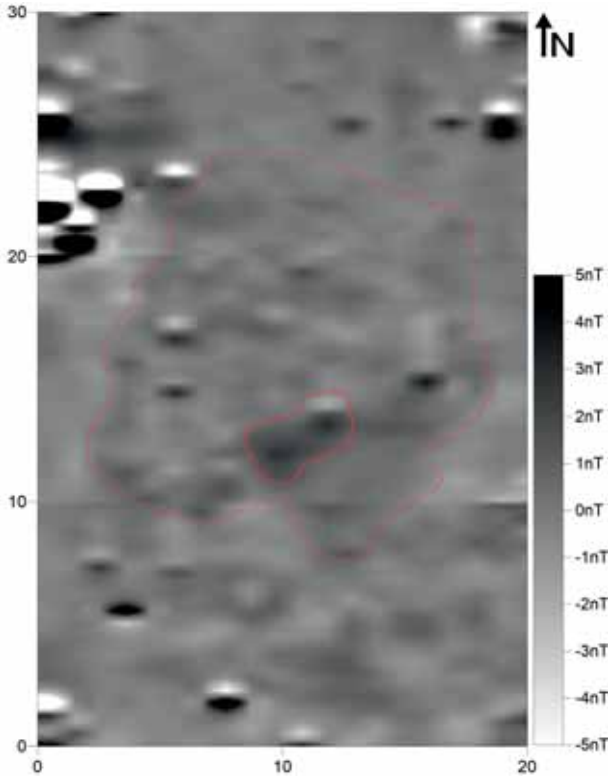




**Fig. XI.30** (left). Resulting image of magnetometric survey of barrow no. 81 on the site in Vikniany (gradiometer Bartington Fluxgate Grad 601-1; measuring grid: 10 × 10 m; sampling density per transect spacing: 0.25 × 1 m, interpolated up to 0.25 × 0.5 m; real values of magnetic field gradient compressed in greyscale to the range -5 – +5nT)

**Fig. XI.31** (right). Resulting image of magnetometric survey of barrow no. 81 on the site in Vikniany with highlighted anomalies discussed in the text.
--- approximate spatial extent of positive anomaly enclosing the inner part of the barrow
— weak dipolar anomaly located in the central part of the barrow

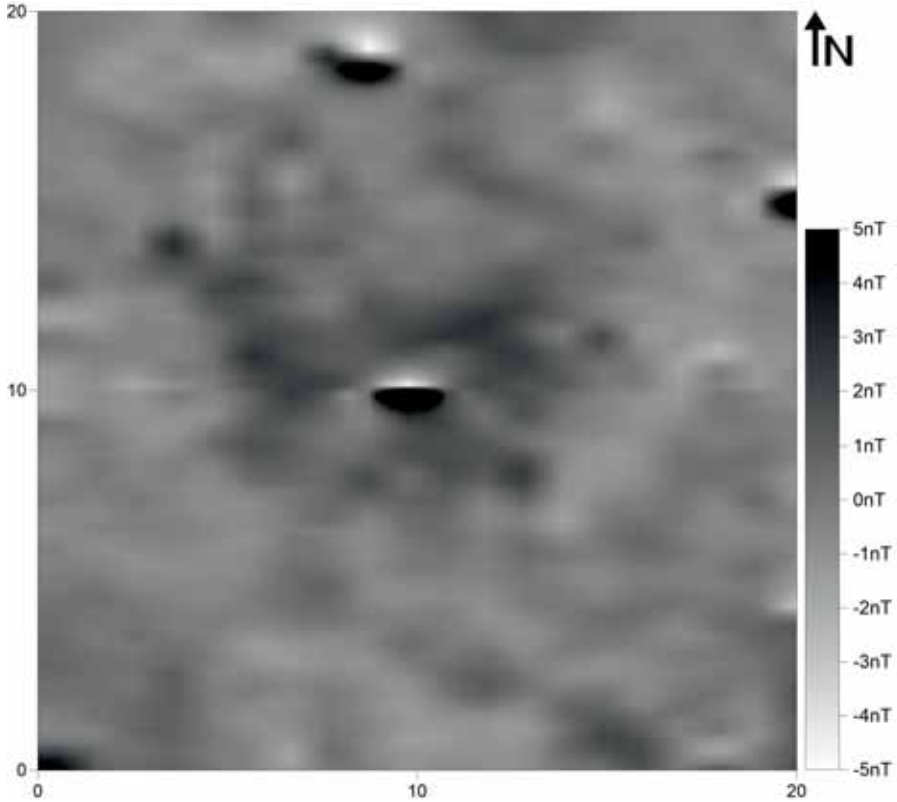
susceptibility, thus resulting in a visibly induced magnetization. In the central, as well as the northern part of the area there were registered strong signals with pronounced polarization. They are easily discernible against the context and it seems that their sources are rich in ferrous components prone to residual magnetisation. Most probably they are emitted by features of modern origin, such as e.g. fireplaces.

## D. Archival information

### Okniany, district of Tłumacz (after Sulimirski 1968:152-153)

*A score of barrow-graves were well visible situated in the forest and on its adjoining fields. One of these (I) was excavated by me in 1934, the other (II) by Miss I. Siwek at the same time. The objects excavated were given to the Prehistoric Institute of the University of Lwów.*

*Barrow-grave I (Sulimirski 1968, Plan 38:2). This lay in the 'Rososz' forest, and was about 22 m in diameter, about 2 m high. Near the centre, on top of the mound, a battle-axe (d) of type x-4 (Sulimirski 1968, Fig. 13:7) was found, made of granite 10.5 cm long. In the central part, under the mound on the ancient surface, the grave shaft (A) was uncovered. It lay NE of the centre, and was about 70 cm deep in the ancient ground which consisted of chernozem. In a few places only did it reach the yellow subsoil beneath the chernozem and the contours of the shaft were therefore very difficult to establish. The shaft was some 3 by 2 m wide, orientated SE – NW. No traces of skeleton were found in it; only a few large flint flakes (e), some trimmed, lay on the bottom. Over the shaft, probably on its timber cover, a number of grave goods*



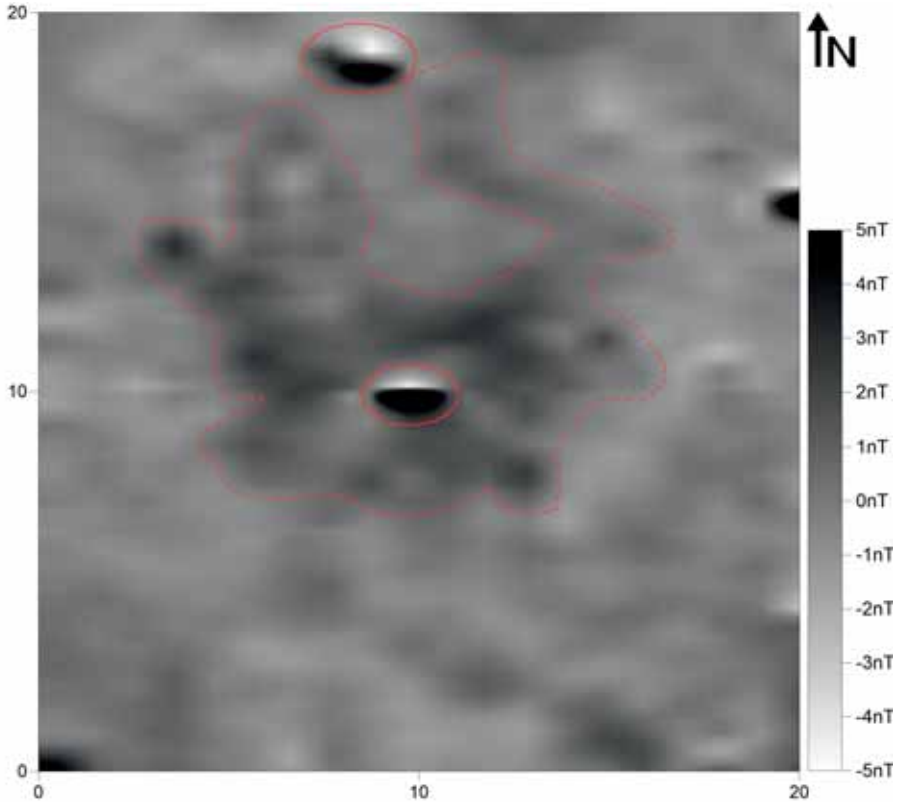




**Fig. XI.32** (up). Resulting image of magnetometric survey of barrow no. 85 on the site in Vikniany (see Fig. XI.30)

**Fig. XI.33** (down). Resulting image of magnetometric survey of barrow no. 85 on the site in Vikniany with highlighted anomalies discussed in the text.

--- approximate spatial extent of the large positive anomaly located within the embankment

— strong, normally dipolar anomalies probably indicating modern features rich in ferrous content and subjected to residual magnetisation

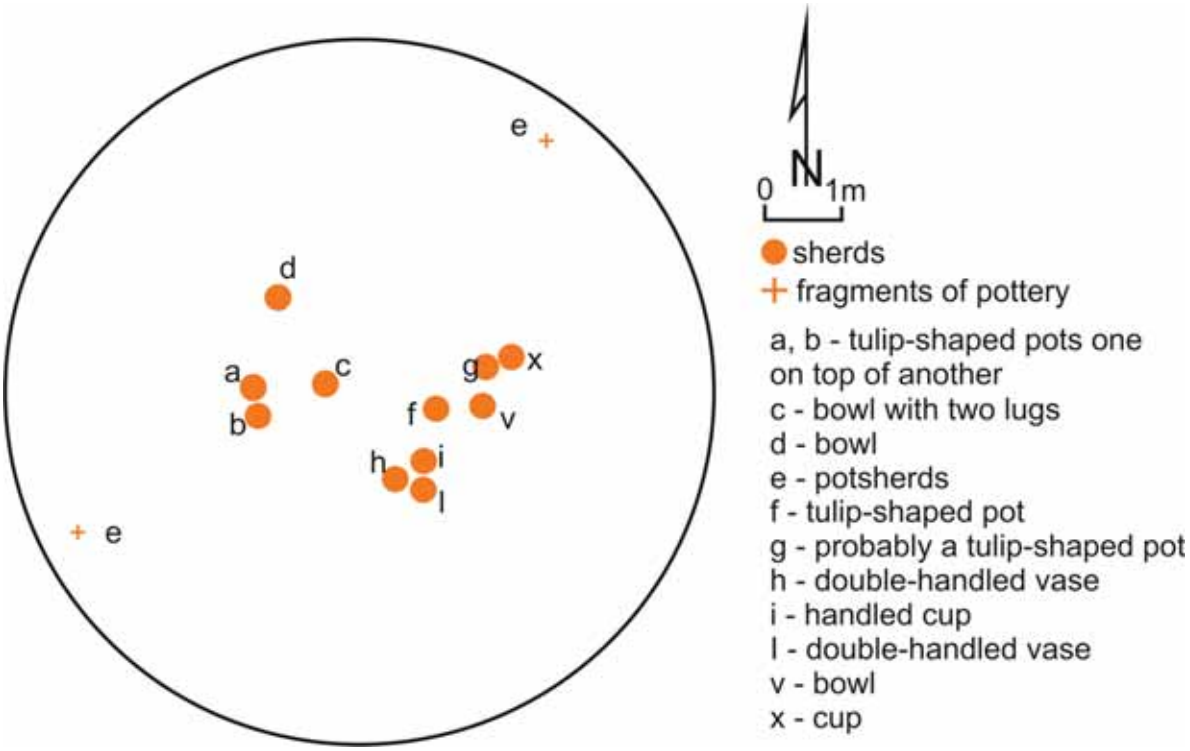



**Fig. XI.34.** Digitalized plan of barrow II (Sulimirski 1968, Plan 38:1)

*were excavated; in the eastern part, at a distance of over 1 m from each other stood two vessels, a cord-decorated single-lugged cup (a) (Zapfenbecher) (Sulimirski 1968, Plate 9:14) 16 cm high, 13.5 cm in diameter, reddish in colour, insufficiently baked, brittle, and an entirely crushed smaller vessel (b) probably a cup, dark in colour, which disintegrated. In the centre lay a small battle-axe well made of a greenish variety of stone (c) of type y-3 7 cm long. Two other battle-axes were close to each other on the western side of this area; one of these (j-2) of type x-2 (Sulimirski 1968, Fig. 13:4) 10 cm long, was well made and polished, of a greenish variety of stone, the other (j-1) of type x-4 9 cm long, was of a dark variety of stone (granite P) unfinished, unpolished.*

*Outside the grave, about 2 m NW of it, three larger limestones (g) lay on the ancient surface, and about 1.5 m W of these a flint point (k) was found. At a distance of about 2 m SW of the grave, a few boulders lay on the ancient surface forming a single line (h) and 2 m S of these, on the same level, a flint arrow-head (f) was found. A few large flint flakes were found in various parts of the mound.*

*Barrow-grave II (**Fig XI.34**; Sulimirski 1968, Plan 38:1). Situated in the 'Kamienne Laski' forest, 20 m in diameter, 2 m high. In the upper part of the mound many odd flints were found. The mound reached to a depth of some 1.30-1.40 cm, and lay on the ancient brownish, degraded chernozem, 60-70 cm thick, which gradually became yellow loess.*

*Eleven vessels were excavated which formed two well-distinguished groups, both sunk a little in the ancient ground. One group, evidently grave goods of one burial, consisted of four vessels: a bowl with two small lugs (c) (**Fig. XI.35**; Sulimirski 1968, Plate 16:16) which lay some 50 cm west of the centre of the mound; at a distance of 1.2 m north of it lay a bowl (d) (**Fig. XI.36**; Sulimirski 1968, either Plate 16:15 or 18:15) and 60-70 cm west of the bowl 'c' stood two tulip-shaped pots (a, b) one on the top of another (**Fig. XI.37:1**, **Fig. XI.38**; Sulimirski 1968, Fig. 28:3; Plate 18:6). The other group of buried vessels apparently the site of the second burial, lay east of the centre; at about 2 m east of vessel 'c' lay vessel 'g', probably a tulip-shaped pot, of which only the lower part survived, the upper part having disintegrated (**Fig. XI.39**). South of it lay a bowl 'v' (**Fig. XI.40**; Sulimirski 1968, either Plate 16:15 or 18:15) and a large tulip-shaped pot 'f' (**Fig. XI.41**; Sulimirski 1968, Plate 18:4) 50 cm west of it. At a distance of 1 m south-west of vessel 'v' was a group of three vessels: a double-handled vase 'h' (**Fig. XI.42**; Sulimirski 1968, Plate 17:11), a handled cup 'i' (**Fig. XI.43**; Sulimirski 1968, Plate 17:9), and another double-handled vase 'l' (**Fig. XI.37:2**; Sulimirski 1968,*

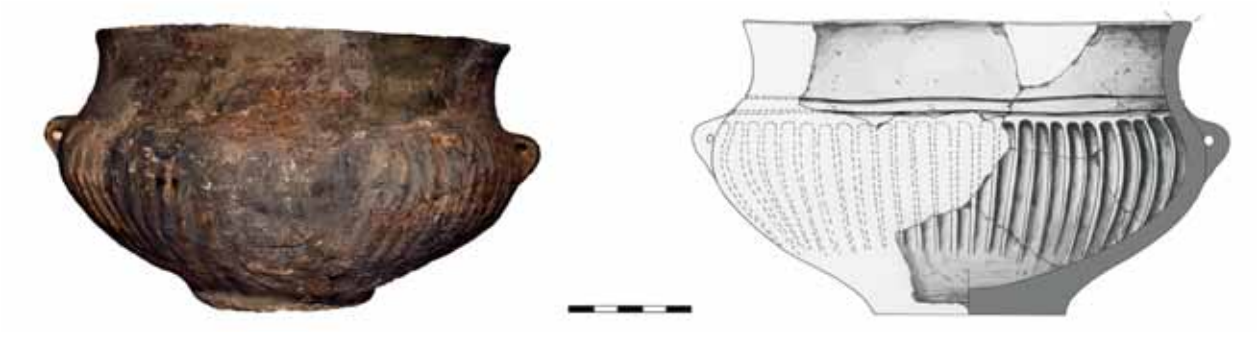


**Fig. XI.35.** Vase, type W22b, ornamented on the body with two horizontal incised lines, below, circumferentially — with broad, vertical grooves. Thickened rim cut straight; marked base; horizontally perforated handles. Temper of crushed stone and flint. H – 12 cm, R1 – 18.4 cm, R2 – 17.4 cm, R3 – 20.3 cm, R4 – 7.8 cm

**Fig. XI.36.** Bowl, type M21, circumferentially ornamented under the rim with wedge-like, vertical pinholes, below — with three horizontal incised lines, on the body — with vertical, wedge-shaped incised lines. Rim cut straight; unmarked base. Temper of crushed stone and flint. H – 8.6 cm, R1 – 15 cm, R3 – 17 cm, R4 – 8 cm


**Fig. XI.37.** 1 – pot, type G111, ornamented on the neck with a horizontal relief strip and, placed on it, an oblique appliqué boss ('bung'). Rim cut straight; marked base. H – 18.2 cm, R1 – 13.6 cm, R2 – 13.4 cm, R3 – 16 cm, R4 – 8,5 cm. 2 – vase, type W22c (with handles), ornamented under the rim with a horizontal incised line, on the body – with two horizontal incised lines from which incised triangles, hatched with oblique incised lines, droop. Rounded rim; unmarked base; *ansa lunata* handles. H – 13 cm, R1 – 13.5 cm, R2 – 12.2 cm, R3 – 16.5 cm, R4 – 7.3 cm

**Fig. XI.38.** Pot, type G111, ornamented on the neck with a horizontal relief strip. Rounded rim; unmarked base. Temper of crushed stone and flint. H – 11 cm, R1 – 10.5 cm, R2 – 9.5 cm, R3 – 10.5 cm, R4 – 6 cm

*Fig. 28:1). A few potsherds were found outside these groups (e). Three arrow-heads were excavated as well as pottery but their site has not been marked on the plan in the report. Two of these were typically triangular with slightly concave bases, the third one was made of a thick triangular blade (Sulimirski 1968, Plate 9:20, 21, 30).*

*The tulip-shaped pot 'a' (Sulimirski 1968, Fig. 28:3) 19 cm high, 16.5 cm in diameter, was reddish in colour, very brittle, its decoration consisted of a low raised band around the upper part of the body, with four oblong slanting bosses placed on it at regular intervals. The other tulip-shaped pot 'b' was 12.5 cm high, 11.5 cm in diameter, provided with a similar low raised band. The third and largest tulip-shaped pot 'f' (Sulimirski 1968, Plate 18:4) was 25.4 cm high, 20 cm in diameter, the rim flat, brownish in colour, provided with a raised band on the lower part of the neck. The bowl 'c' (Sulimirski 1968, Plate 16:16) 12.5 cm high, 20 cm in diameter, had two horizontal grooves on the junction of the neck and the body, and two horizontally perforated lugs. The body covered with vertical fluting. Vessel 'g' was probably a small tulip-shaped pot, of which only the base, 5 cm in diameter, survived. It was very brittle, like the other vessels, and like them was made of strongly tempered clay paste. The vase 'h' (Sulimirski 1968, Plate 17:11) was 13.7 cm high, 19 by 20 cm in diameter, provided with two large handles. The neck covered with two parallel grooves and a punctuated line between. A similar band ran round the base of the neck, while below it, on the upper part of the body, was a row of triangles cut out on the surface. The second double-handled vase 'l' of which only a number of sherds survived, was 13 cm*

**Fig. XI.39.** Vessel (pot?) preserved in fragments, plain. Unmarked base. Temper of crushed stone and flint. R4 – 5.5 cm

*high, 16.5 cm in diameter (Sulimirski 1968, Fig. 28:I). Two horizontal grooves marked the junction of the neck and the body, and a row of shaded triangles was placed below them on the upper part of the body. The handled cup 'i' (Sulimirski 1968, Plate 17:9) 6.7 cm high (8.7 with the handle) 9.3 cm in diameter, was undecorated, greyish-brown in colour. The cup 'x' (**Fig. XI.44**; Sulimirski 1968, Plate 18:17) 4 cm high, 55 cm in diameter, was undecorated.*

*Markings of the two remaining vessels are missing, and none can therefore be identified either with vessel 'd' of the western group, or vessel 'v' of the eastern group. One of these (Sulimirski 1968, Plate 16:15) was a carinated bowl, 8 cm high, 16 cm in diameter, the rim flat; it had three horizontal grooves on the neck with a band of vertical incisions over them. The body was covered with slanting incisions. The other (Sulimirski 1968, Plate 18:15) was an undecorated pot with a wide flat base, straight walls slightly widening upwards, 9.5 cm high, 12 cm in diameter.*

*The arrow-heads were 3 and 3.5 cm long, the third being a pointed flint flake, 3.5 cm long.*

**Fig. XI.40.** Beaker, type P1, plain. Rim cut straight; base slightly marked. Temper of crushed stone and flint. H – 12 cm, R1 – 15 cm, R4 – 8.5 cm

**Fig. XI.41.** Pot, type G111, ornamented on the neck with a horizontal relief strip. Rim thickened and rounded; base slightly marked. Temper of crushed stone and flint. H – 25.3 cm, R1 – 18.3 cm, R2 – 16.3 cm, R3 – 19.2 cm, R4 – 9.1 cm

**Fig. XI.42.** Vase, type W22c (with handles), ornamented under the rim and on the body with two horizontal incised lines with pinholes between them, below the second pair of lines, there runs a circumferential row of triangular impressions. Rounded rim; base slightly marked, *ansa lunata* strap handles. Temper of crushed stone and flint. H – 15.2 cm, R1, R2 – 16.5 cm, R3 – 23 cm, R4 – 9 cm

**Fig. XI.43.** Cup, type K22, plain. Rounded rim; marked base; *ansa lunata* handle. Temper of crushed stone and flint. H – 6.5 cm, R1 – 7.8 cm, R2 – 7.3 cm, R3 – 9.6 cm, R4 – 4.5 cm

**Fig. XI.44.** Bowl, type M21, plain. Rim cut straight; unmarked base. Temper of crushed stone and flint. H – 5 cm, R1 – 6.1 cm, R4 – 3.9 cm

# XII. Cemetery in Podgrodzie/Pidgorodie (Fig. XII.1)

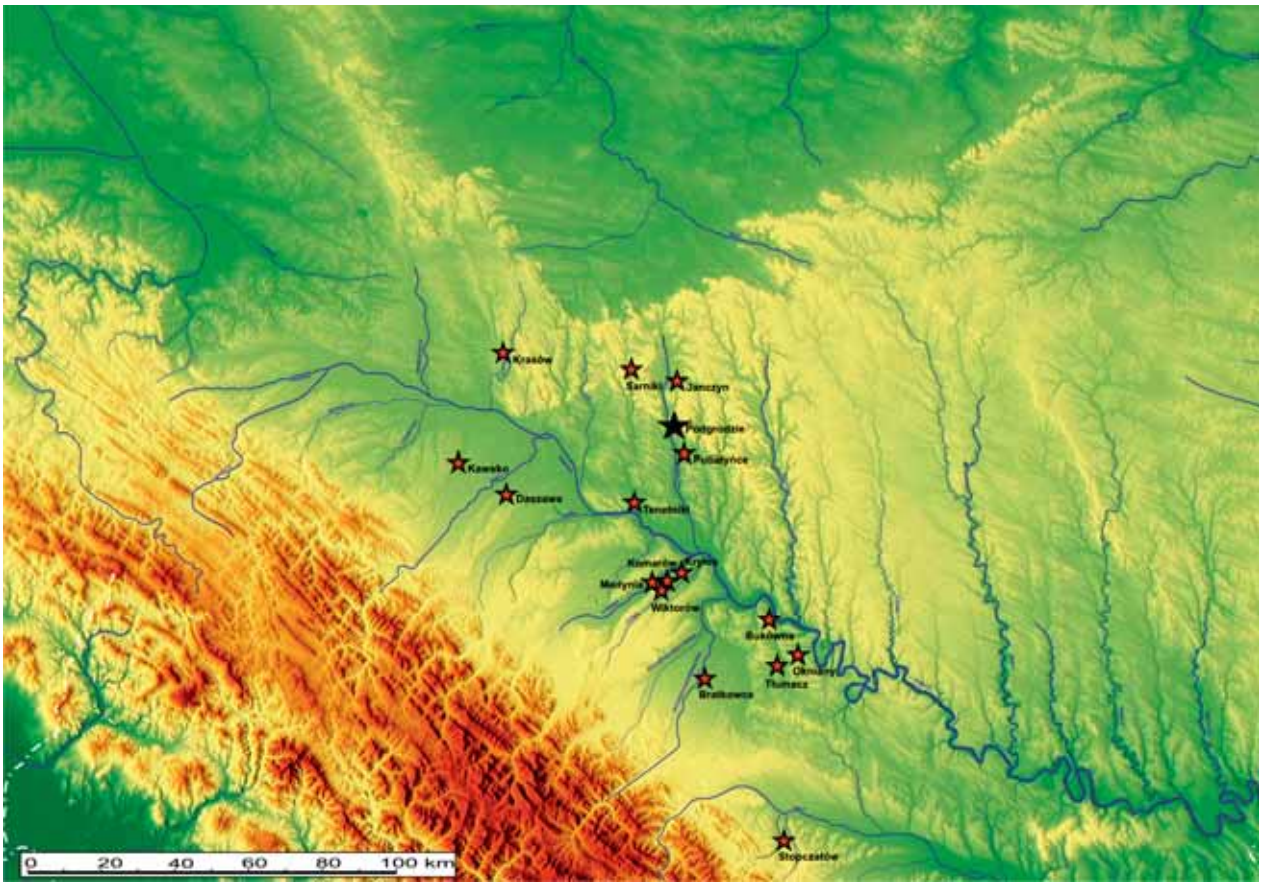



**Fig. XII.1.** Location of the cemetery in Pidgorodie in relation to other barrow necropolises

## A. Geographical description

The cemetery in Pidgorodie lies in the middle course of the Gnila Lypa River, which is a left tributary of the Dniestr. This area is a western part of the Podolian Upland, known also as the Opillia (Opole) Upland. The Opillia spreads from the Vereshchytsa river on west to the Zolota Lypa river in the east and is segmented into six minor sub-regions. The discussed archaeological site is situated in the Rohatyn Opillia (Gudowski 2016, Rąkowski 2006). Average altitudes for this area varies between 350-400 m.a.s.l. and highest points reaches approximately 470 m.a.s.l.

The baseground of Opillia is built by cretaceous margls, that due to the erosion processes created a hilly landscape. Surface in vast areas is covered by loess that allowed the development of chernozem. In the regions between the rivers a ridges and perches were formed. These features are surrounded by deeply cut valleys of Gnila Lypa and its tributaries. Orientation of the ridges and perches depends on the local hydrological net configuration.

On the discussed area that is a ground for the cemetery occurs a high rate of hypsometrical differences in height. Lowest values were recorded in the valleys bottom – 249 m.a.s.l. and the highest in the summits of the ridges – 428,5 m.a.s.l. The differences in relative height are estimated to 179 m.

Rivers of this region shows a tendency for bottom erosion that is an effect of slow uplifts that alternates Podillian Plate and a loess vulnerability for erosion processes. In the edge zones of the valleys it is possible to observe also a developed net of ravines both young and narrow as well as older of Balki type.

Spatial distribution of barrows corresponds to the structural orientation of ridges and hills. The most prominent mounuments are located in the southern part of the grouping in Pidgorodie (on average height of 428 m.a.s.l.). Following mounds creates a linear arrangements into north-eastern direction and after crossing a small valley they create a larger concentration without any spatial system. The latter one lies both on southern slope of the following ridge as well as on the summit. The lowest located tumulus was located at 250 m.a.s.l. within a small valley between first and the second group.

Morphometrical variety of the area is represented in the sloping of the surfaces. The most flat are the valleys bottoms and the summits of the ridges. The sloping do not exceeds 0.39 degree. Nevertheless the largest sloping was recorded in the thresholds of the valleys and ridges where they reaches 20 degrees. Within these narrow walls are observable the carbonate rocks of the lower base ground of Opillia Upland.

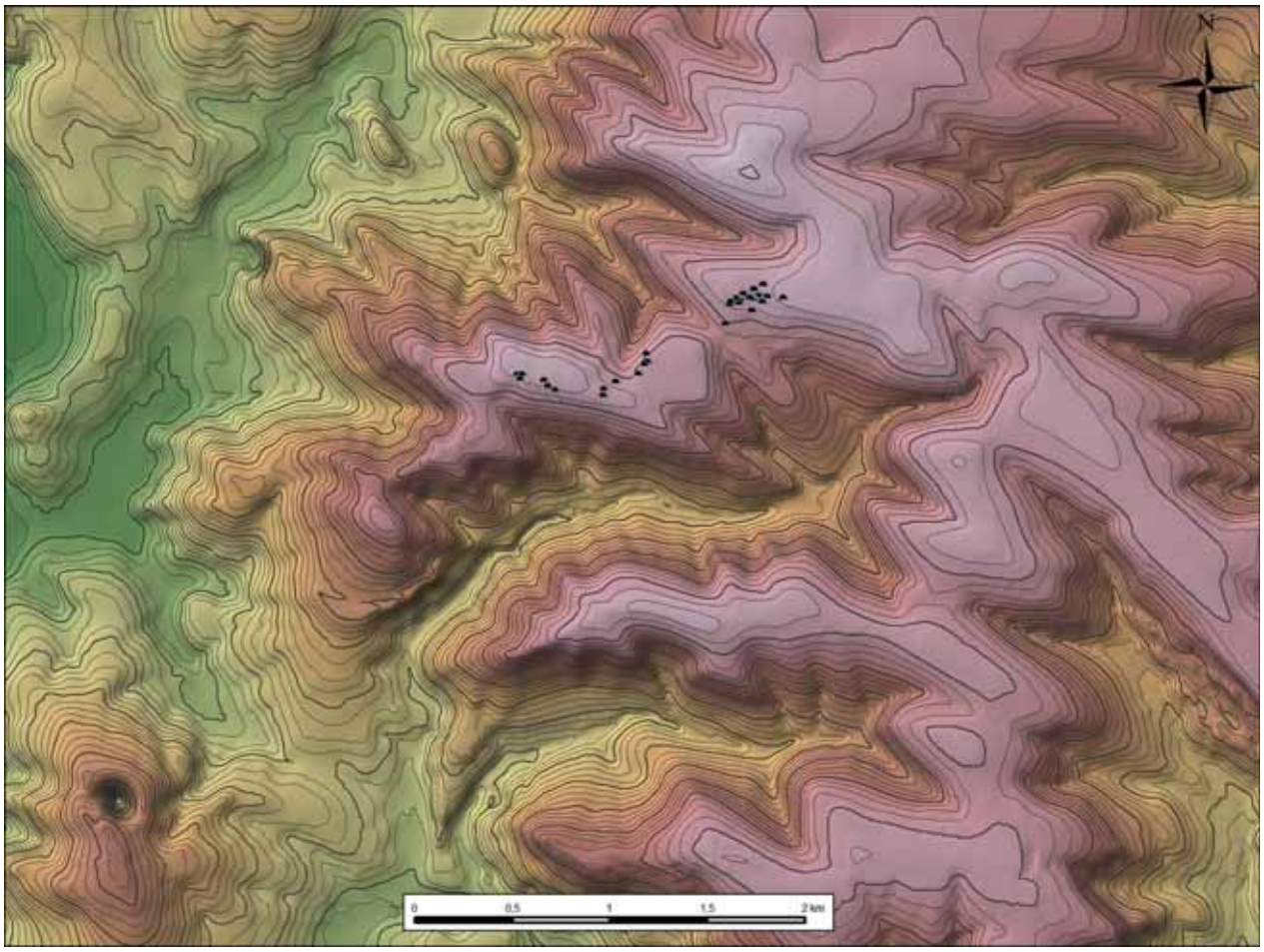



**Fig. XII.2.** Digital Elevation Model of the barrow cemetery in Pidgorodie

## B. Spatial arrangement of the cemetery

The cemetery in Pidgorodie is composed of 35 barrows distributed in two groups: south-western and north-eastern. The former can be further divided into two sub-groups and within those, smaller concentrations of tumuli are observable (**Fig. XII.2 – Fig. XII.4**).

The first sub-group comprises seven tumuli arranged linearly on a WNW – ESE axis and are spread over 200 m. Three monuments (nos. 108, 110, 111; **Fig. XII.5**) constitute the W section and are 100 m apart from a group that consists of four barrows (nos. 112, 120, 121, 227). The distance between the easternmost barrow 227 and mound 119 located on the SW edge of the alignment measures 240 m.

The second sub-group comprises seven monuments erected along a 325 m-long line arranged along the SW – NE axis. Within this cluster there is a concentration of three mounds on its SW corner (nos. 117-119), which is 120 m away from a linear structure consisting of four other tumuli (nos. 113-116).

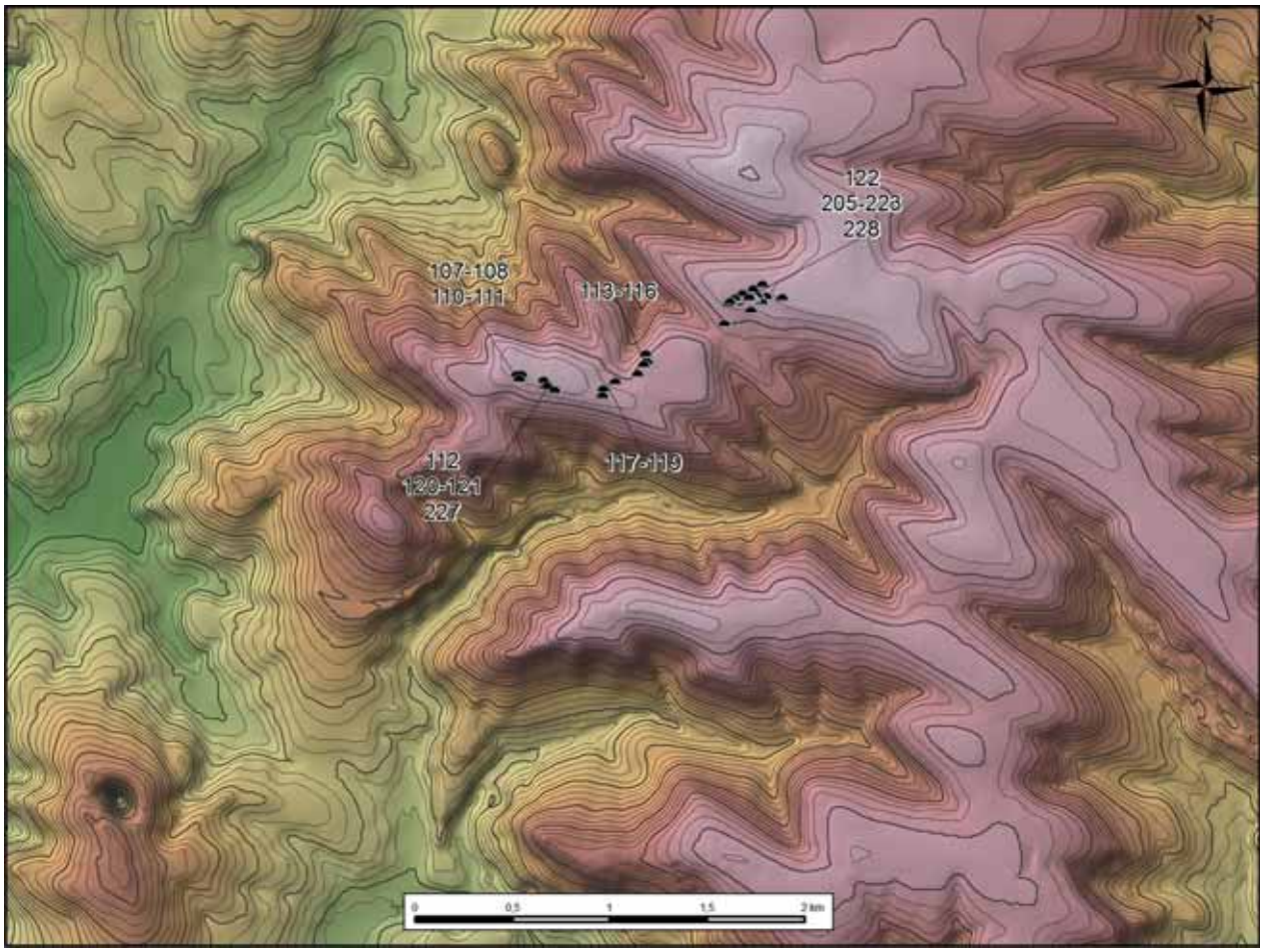



**Fig. XII.3.** Digital Elevation Model of the barrow cemetery in Pidgorodie with numbering of barrows

The second concentration of barrows has a more agglomerated character. It is located 500 m NE of barrow 113, which is located in the eastern part of the first alignment (apart from tumulus 113, which is situated in the E part of the second sub-group of the first concentration, ca. 420 m from barrow 113). The second cluster comprises of 21 monuments, but judging by geomagnetic prospection the initial number of barrows was higher. The concentration covers an area of 300 × 125 m (E – W/N – S). Field work experience shows that linear structures were often overlapping, arranged in different directions or even adjoining each other. One of them, comprised of seven barrows (nos. 215, 217-219, 122, 221, 223), was oriented along

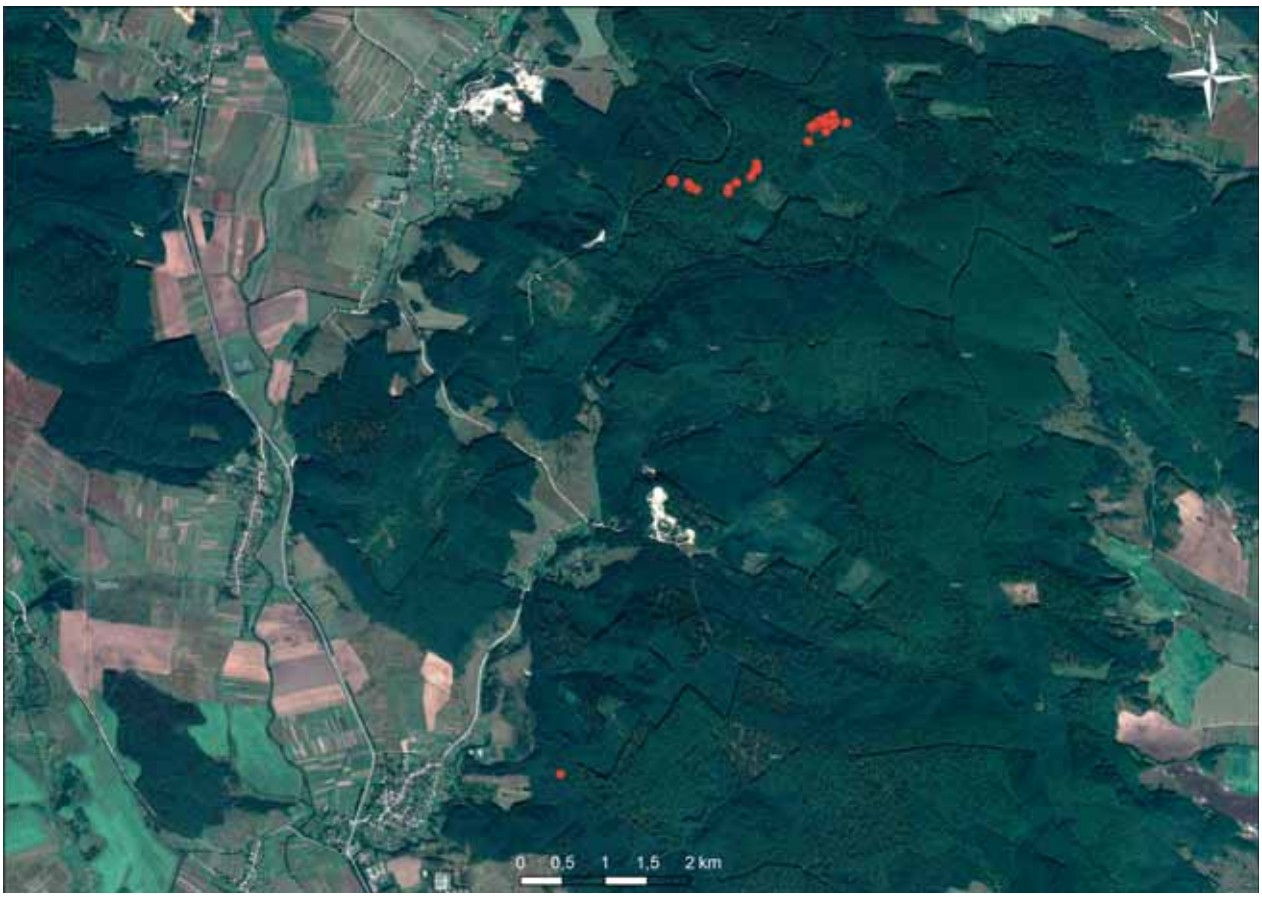



**Fig. XII.4.** Pidgorodie. Location of the cemetery using satellite imagery (Yandex)

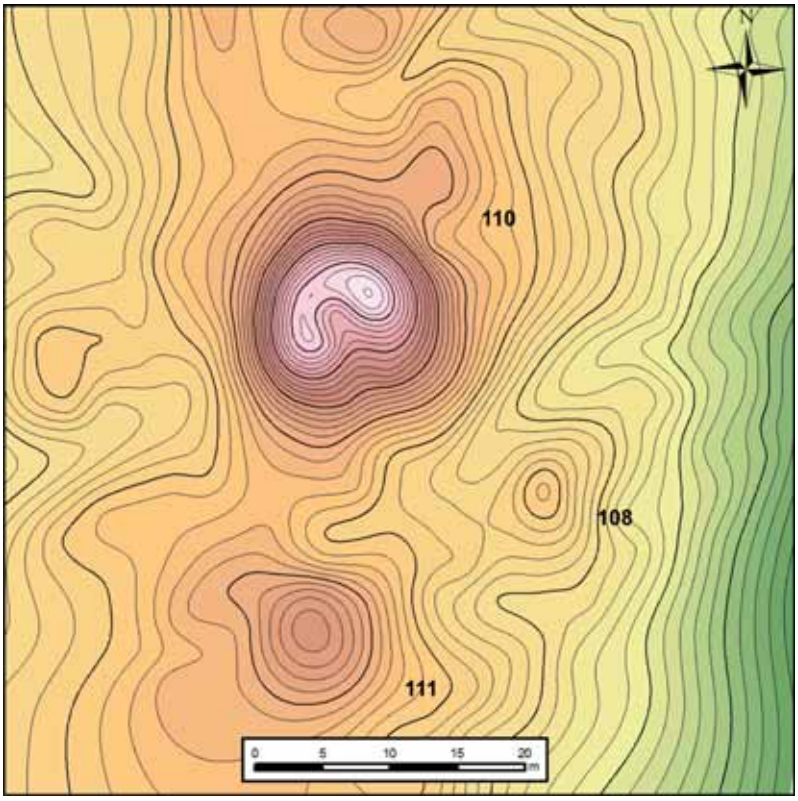



**Fig. XII.5.** Pidgorodie. South-western concentration. Part of the first sub-group

the SW – NE axis and 230 m long. The second line of tumuli – also consisting of seven barrows (212, 216, 228, 209, 206, 207, 205) – was stretched along a 210 m-long distance. Three mounds (nos. 207, 208, 222) are situated along a SW – NE axis at a 110 m distance. This particular linear structure is prolonged SW by tumulus 220, situated 150 m away from barrow 222. A shorter alignment (75 m), with a similar orientation, comprises barrows 213, 214, 216.

## B.1. South-western concentration. First sub-group

**Barrow 108 (Fig. XII.6, Fig. XII.7)** was documented in W part of the described barrow group, at 431.5 m.a.s.l., 16 m SW of tumulus 110 and 11 m NW of mound 111. Geographic coordinates: N – 49°29'052"; E – 024°37'423". Circular in shape, 24 m in diameter, 1.8 m high. A dig-in visible on top of the mound.

**Fig. XII.6.** Barrow 108. View from the W

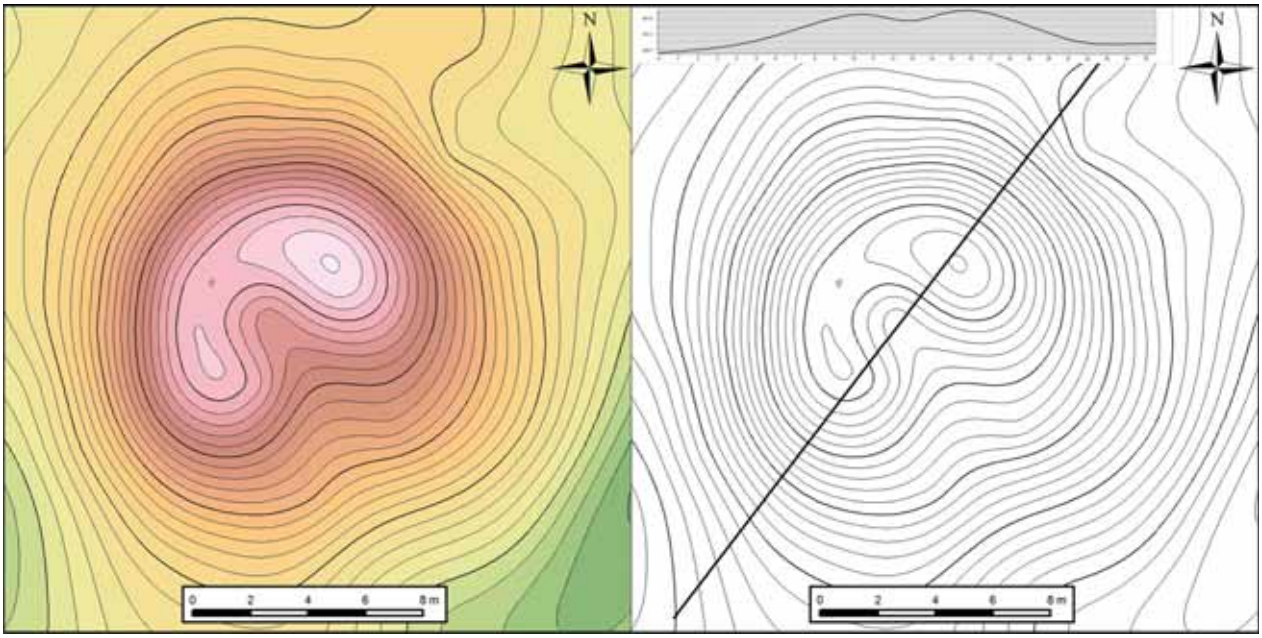



**Fig. XII.7.** Barrow 108. Hypsometric plan and cross-section

**Barrow 110 (Fig. XII.8, Fig. XII.9)** is located in the W part of the aforementioned sub-group, at 432 m.a.s.l., 16 m NE of barrow 107 and 23 m NE of monument 111. Geographic coordinates: N – 49°29'052"; E – 024°37'443". Circular in shape, 11 m in diameter, 0.5 m high.

**Fig. XII.8.** Barrow 110. View from the N

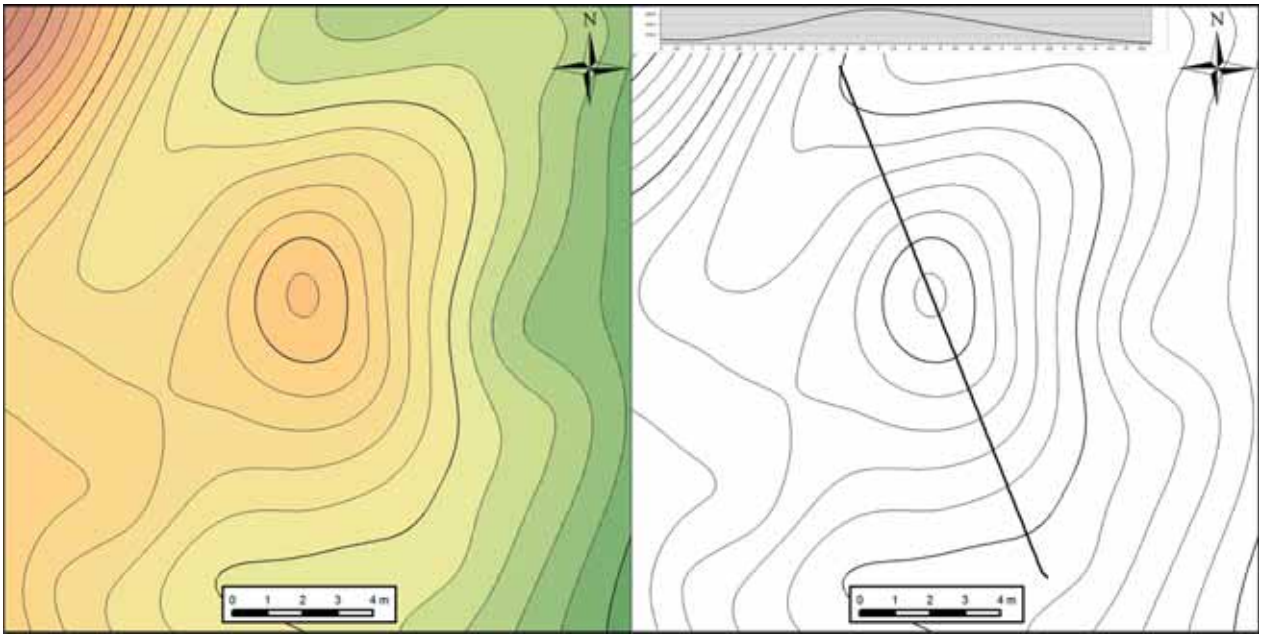



**Fig. XII.9.** Barrow 110. Hypsometric plan and cross-section

**Barrow 111 (Fig. XII.10, Fig. XII.11)** was recorded in the W part of the described sub-group, at 430 m.a.s.l., 16 m SW of mound 110 and 25 m SW of barrow 110. Geographic coordinates: N – 49°29'040"; E – 024°37'436". Circular in shape, 22 m in diameter, 0.5 m high.

**Fig. XII.10.** Barrow 111. View from the N

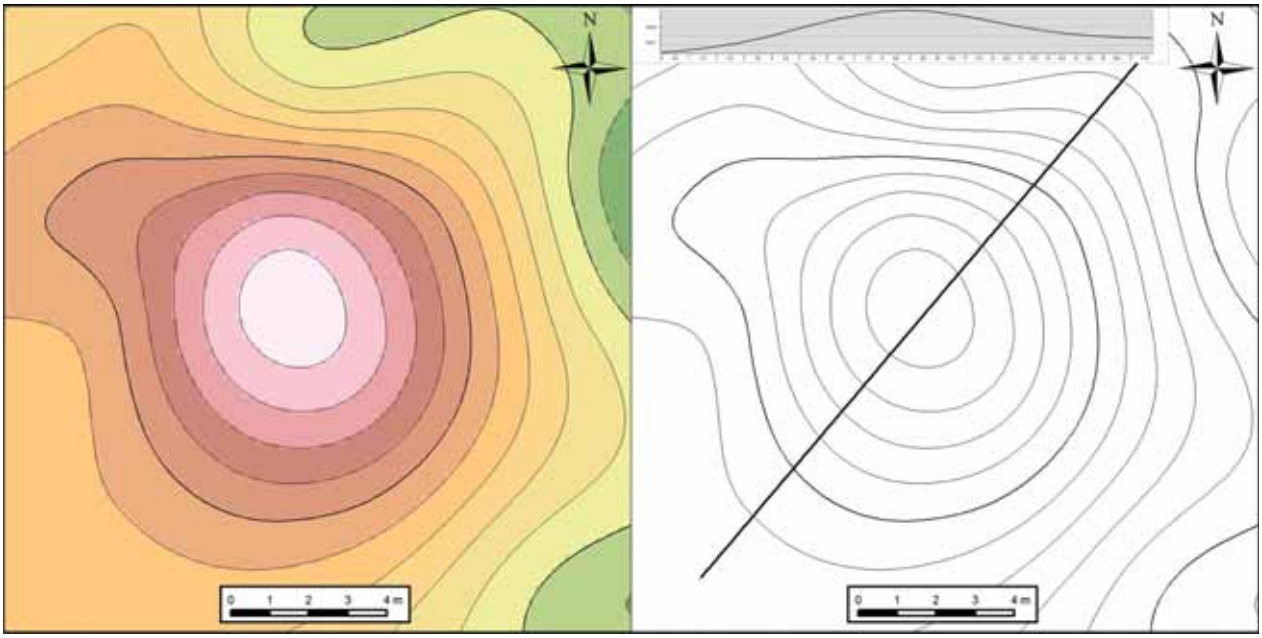



**Fig. XII.11.** Barrow 111. Hypsometric plan and cross-section

**Barrow 112 (Fig. XII.12)** is located in the E part of the sub-group, at 433 m.a.s.l., 125 m E of tumulus 111 and 33 m NW of monuments 120 and 121. Geographic coordinates: N – 49°29'037"; E – 024°37'535". Circular in shape, 13 m in diameter, 0.4 m high. A forest-road lies on top of the mound.

**Barrow 120 (Fig. XII.13)** is situated in the E part of the sub-group, at 431 m.a.s.l., 33 m SE of barrow 112 and 3 m W of tumulus 121. Geographic coordinates: N – 49°29'020"; E – 024°37'544". Circular in shape, 13 m in diameter, 0.7 m high.

**Fig. XII.12.** Barrow 112. View from the N

**Fig. XII.13.** Barrow 120. View from the N

**Barrow 121 (Fig. XII.14)** was recorded in the E part of the sub-group, at 431 m.a.s.l., 33 m SE of monument 112 and 3 m E of barrow 120. Geographic coordinates: N – 49°29'020"; E – 024°37'553". Circular in shape, 12 m in diameter, 0.8 m high.

**Barrow 227 (Fig. XII.15)** was constructed on the E edge of the sub-group, at 430 m.a.s.l. It is located 40 m SE of tumulus 121. Geographic coordinates: N – 49°29'011"; E – 024°37'586". Circular in shape, 20 m in diameter, 0.7 m high.

**Fig. XII.14.** Barrow 121. View from the E

**Fig. XII.15.** Barrow 227. View from the S

## B.2. South-western concentration. Second sub-group (Fig. XII.16)

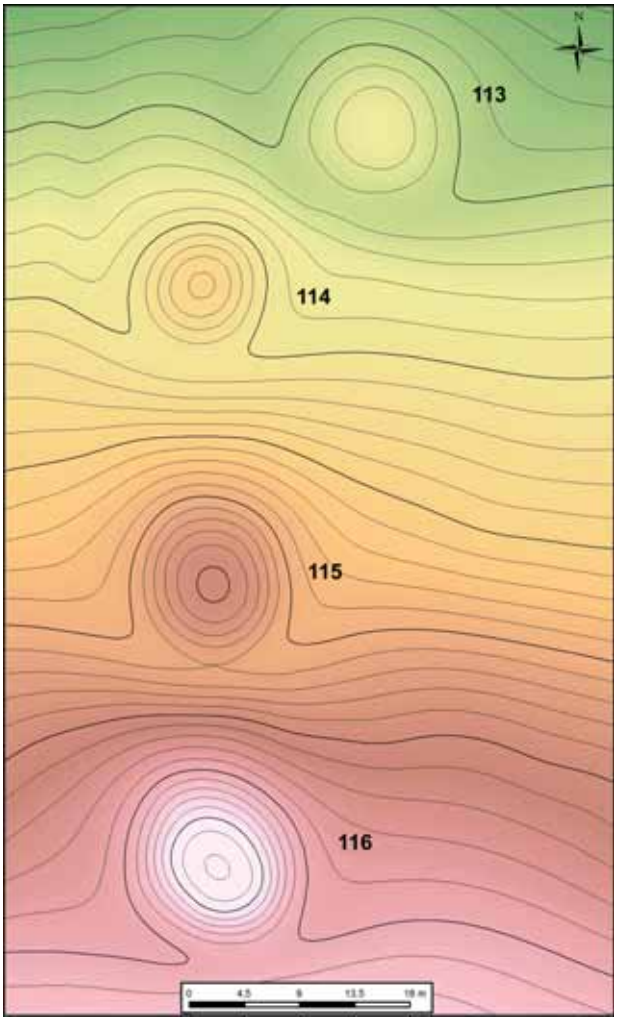



**Fig. XII.16.** Pidgorodie. South-eastern concentration. Part of the second sub-group

**Barrow 113 (Fig. XII.17, Fig. XII.18)** is situated on the NE edge of the sub-group, at 429.5 m.a.s.l., 12 m NE of barrow 114. Geographic coordinates: N – 49°29'119"; E – 024°37'968". Circular in shape, 23 m in diameter, 0.6 m high. Covered with brushwood. Subject to geophysical prospection.

**Fig. XII.17.** Barrow 113. View from the SW

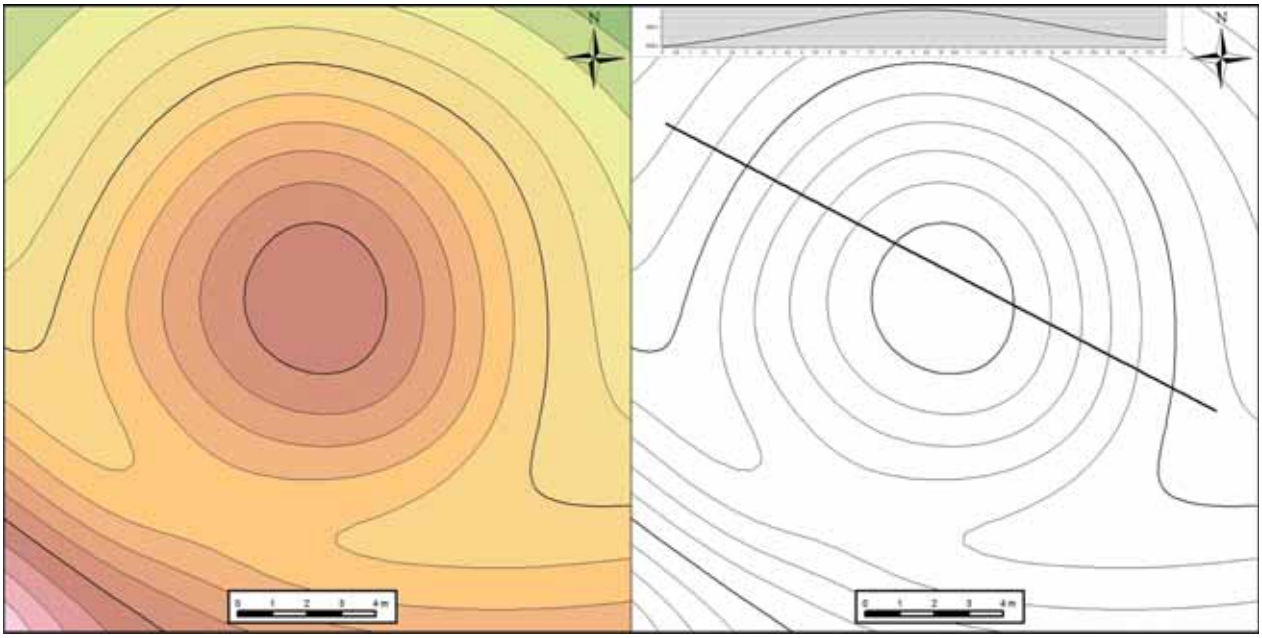


**Fig. XII.18.** Barrow 113. Hypsometric plan and cross-section

**Barrow 114 (Fig. XII.19, Fig. XII.20)** is located on the E edge of the sub-group, at 430 m.a.s.l., between mounds 113 and 115, about 12 m SW of tumulus 115. Geographic coordinates: N – 49°29'099"; E – 024°37'974". Circular in shape, 19 m in diameter, 0.5 m high. Subject to geophysical survey.

**Fig. XII.19.** Barrow 114. View from the E

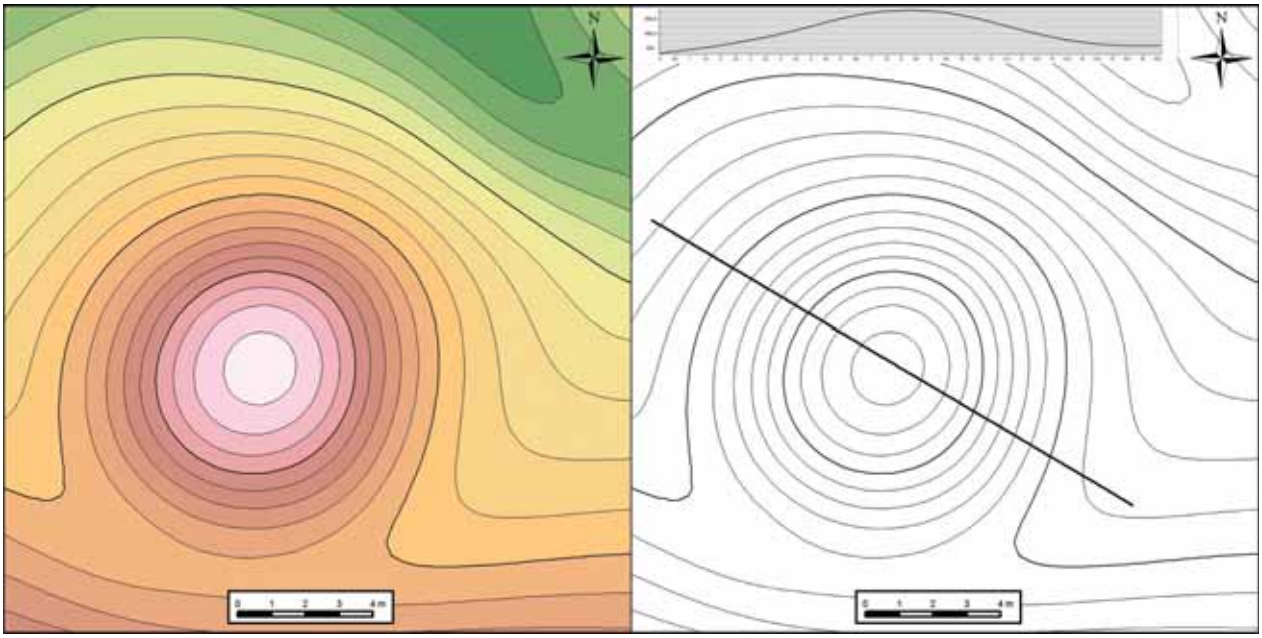



**Fig. XII.20.** Barrow 114. Hypsometric plan and cross-section

**Barrow 115 (Fig. XII.21, Fig. XII.22)** was discovered in the NE part of the described sub-group, at 430.5 m.a.s.l., between mounds 114 and 116, 13 m S of tumulus 114. Geographic coordinates: N – 49°29'090"; E – 024°37'961". Circular in shape, 18 m in diameter, 1 m high. Subject to geophysical survey.

**Fig. XII.21.** Barrow 115. View from the S

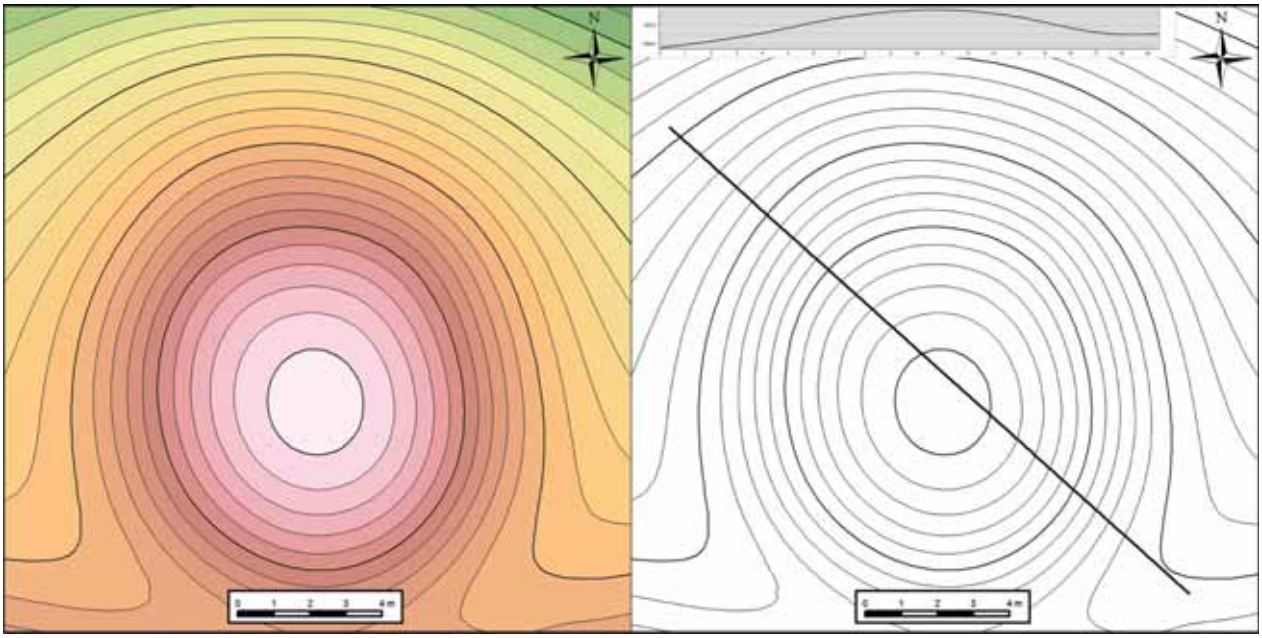


**Fig. XII.22.** Barrow 115. Hypsometric plan and cross-section

**Barrow 116 (Fig. XII.23, Fig. XII.24)** was recorded in the central part of the sub-group, at 432 m.a.s.l., 10 m SW of barrow 115. Geographic coordinates: N – 49°29'065"; E – 024°37'935". Circular in shape, 22 m in diameter, 0.5 m high. A visible dig-in. Barrow subject to geophysical survey.

**Fig. XII.23.** Barrow 116. View from the E

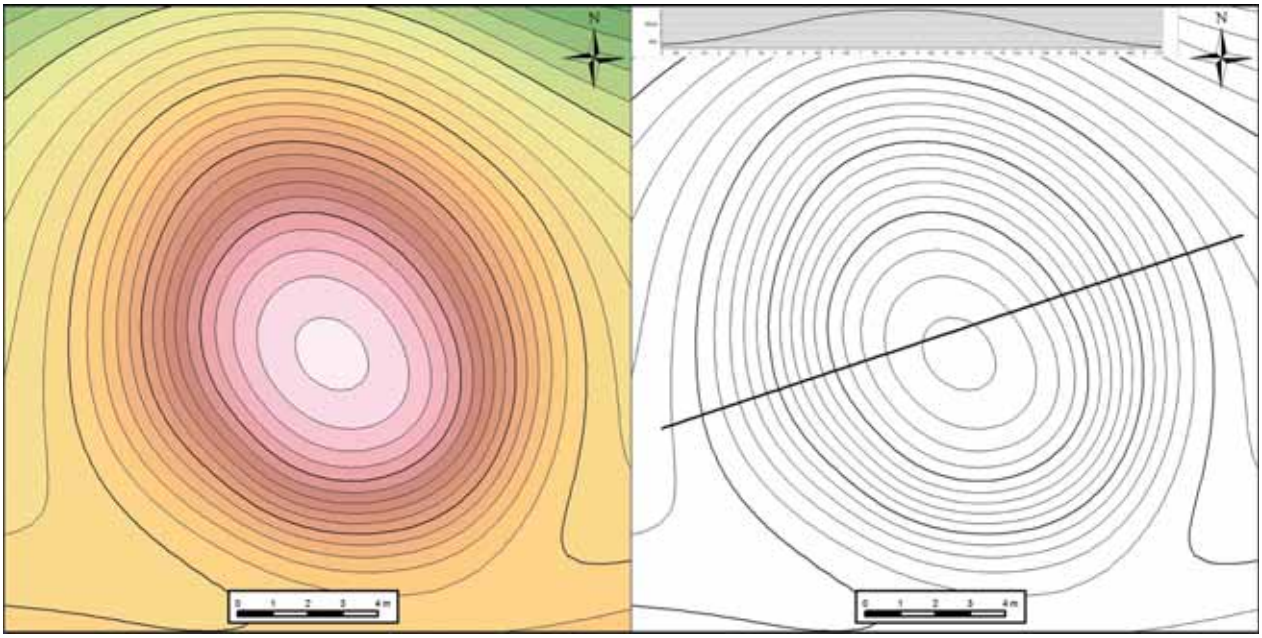


**Fig. XII.24.** Barrow 116. Hypsometric plan and cross-section

**Barrow 117 (Fig. XII.25)** was documented in the W part of the sub-group, at 422.5 m.a.s.l., 120 m SW of mound 116 and 64 m NE of barrow 118. Geographic coordinates: N – 49°29'040"; E – 024°37'840". Circular in shape, 15 m in diameter, 0.7 m high.

**Barrow 118 (Fig. XII.26)** is situated in the W part of the sub-group, at 427.5 m.a.s.l., 65 m SE of tumulus 117 and 27 m N of barrow 119. Geographic coordinates: N – 49°29'019"; E – 024°37'791". Circular in shape, 12 m in diameter, 0.8 m high.

**Fig. XII.25.** Barrow 117. View from the E

**Fig. XII.26.** Barrow 118. View from the SW

**Barrow 119 (Fig. XII.27)** was recorded on the W edge of the described sub-group, at 428 m.a.s.l., 27 m S of tumulus 118. Geographic coordinates: N – 49°29'001"; E – 024°37'788". Circular in shape, 15 m in diameter, 1 m high.

**Fig. XII.27.** Barrow 119. View from the NE

## B.3. North-eastern concentration (Fig. XII.28)

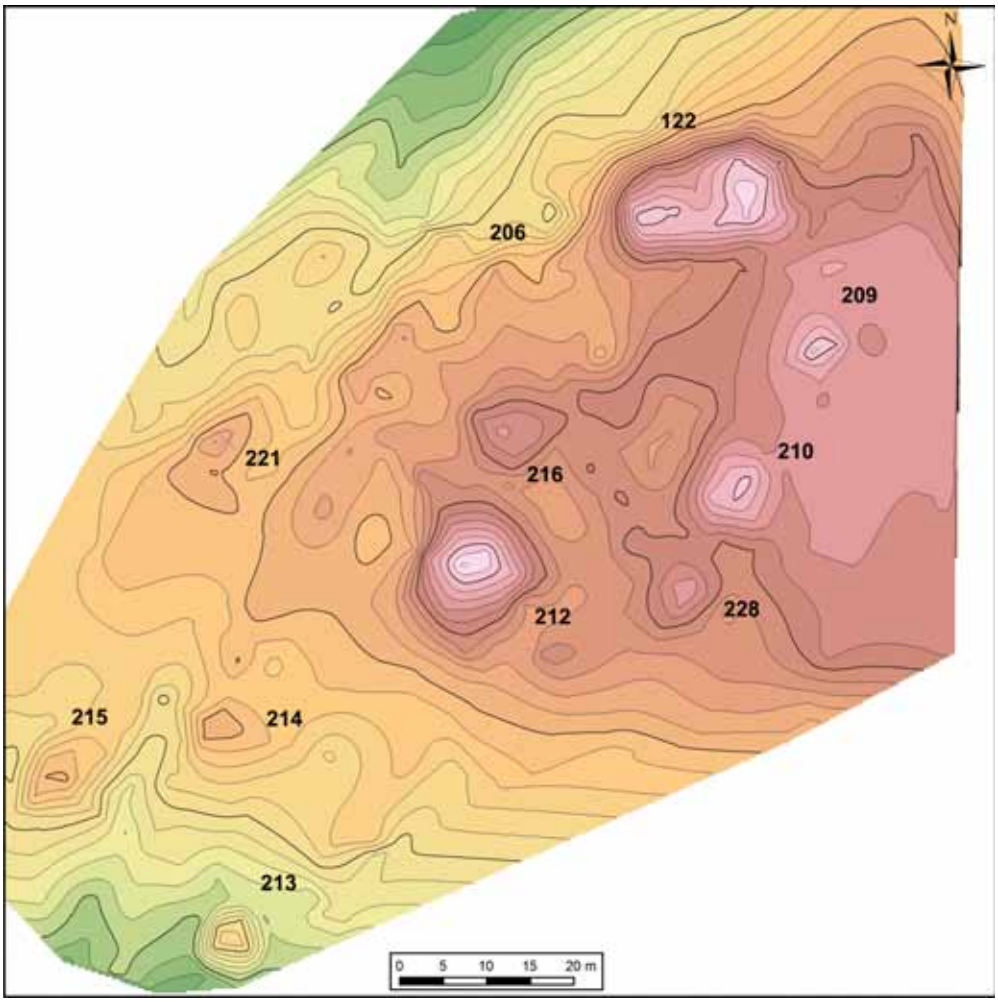



**Fig. XII.28.** Pidgorodie. Part of the north-eastern concentration

**Barrow 122 (Fig. XII.29, Fig. XII.30)** was erected in the N part of the cluster, at 427.5 m.a.s.l. It was located within a seven mound alignment (215, 217-219, 122, 221, 223), oriented along SW – NE axis, between monuments 221 and 223, 60 m NE of the former and 45 m SW of the latter, 10 m E of barrow 206. Geographic coordinates: N – 49°29'309"; E – 024°38'416". Oval-shaped, 24 × 15 m, 1.5 m high. Probably two adjoining barrows. Subject to geophysical survey.

**Fig. XII.29.** Barrow 122. View from the NE

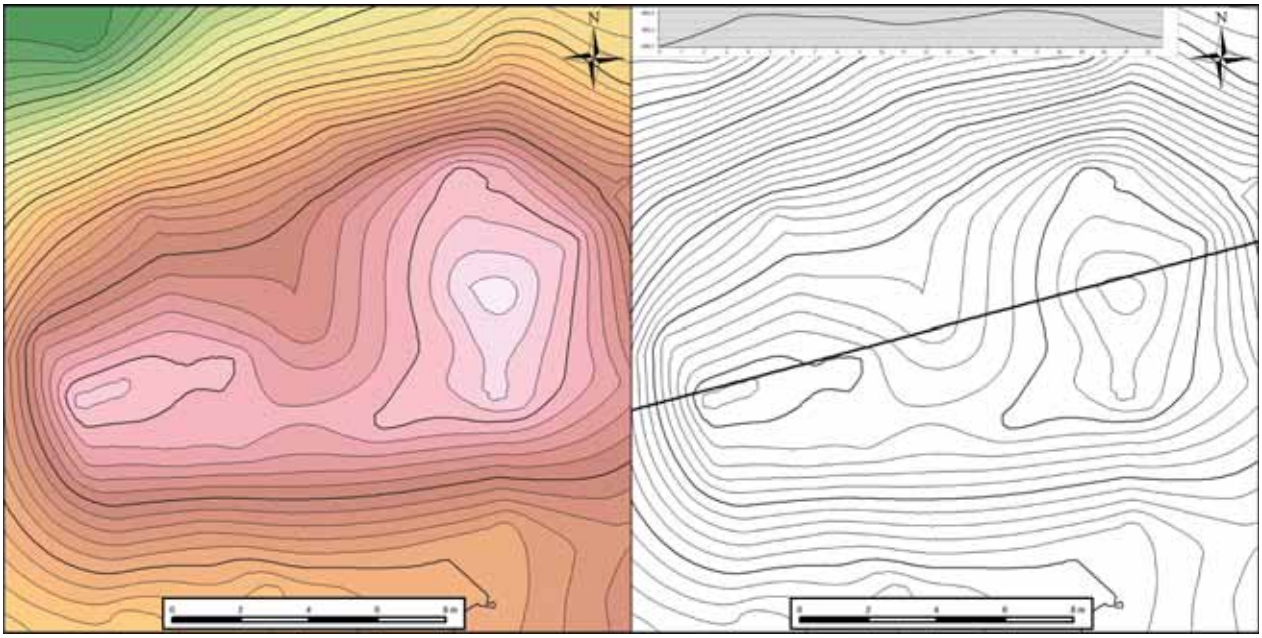


**Fig. XII.30.** Barrow 122. Hypsometric plan and cross-section

**Barrow 205 (Fig. XII.31)** was recorded in the E part of the concentration and within a linear, barrow structure (205, 206, 207, 209, 212, 227, 228), oriented along E-W axis, at 431 m.a.s.l., 150 m E of barrow 207. Geographic coordinates: N – 49°29'289"; E – 024°38'540". Circular in shape, 13 m in diameter, 0.7 m high. Covered by a young bush.

**Barrow 206 (Fig. XII.32, Fig. XII.33)** was documented in the central-eastern part of the aforementioned alignment, at 428 m.a.s.l., between tumuli 122 and 221, 10 m W of the former and 45 m NE of the latter. Geographic coordinates: N – 49°29'289"; E – 024°38'450". Circular in shape, 17 m in diameter, 0.3 m high. Subject to geophysical survey.

**Fig. XII.31.** Barrow 205. View from the N

**Fig. IV.32.** Barrow 206. View from the NW

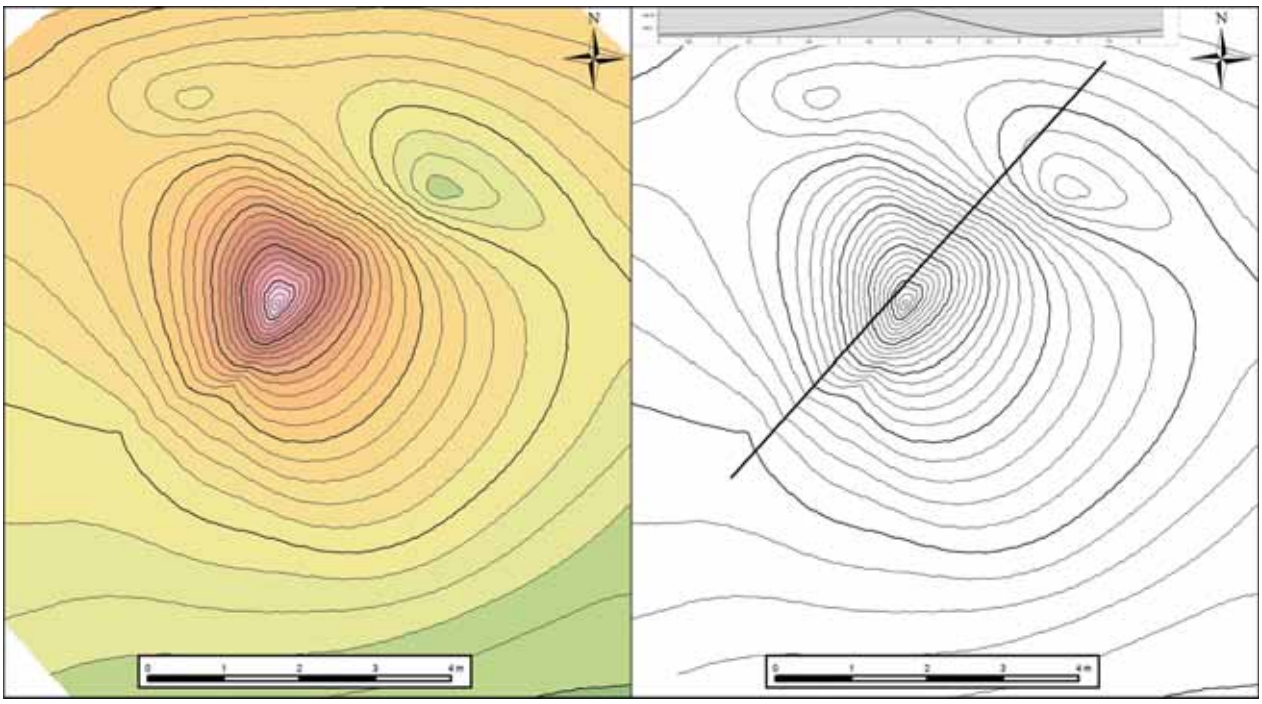



**Fig. XII.33.** Barrow 206. Hypsometric plan and cross-section

**Barrow 207 (Fig. XII.34)** is located in the E section of the concentration, within the described alignment, at 429 m.a.s.l., between monuments 205 and 206, 150 m W from the former and 22 m E of the latter. Geographic coordinates: N – 49°29'291"; E – 024°38'474". Circular in shape, 15 m in diameter, 0.3 m high.

**Barrow 208 (Fig. XII.35)** was erected in the SE part of the concentration, S of the aforementioned alignment, at 427.5 m.a.s.l., 20 m S of mound 206 and 32 m SW of barrow 207. Geographic coordinates: N – 49°29'276"; E – 024°38'453". Circular in shape, 14 m in diameter, 0.6 m high.

**Fig. XII.34.** Barrow 207. View from the S

**Fig. XII.35.** Barrow 208. View from the S

**Barrow 209 (Fig. XII.36, Fig. XII.37)** is located in the central part of the cluster, within the aforementioned alignment, at 427.5 m.a.s.l., between monuments 122 and 210, 13 m SE of the former and 12 m NE of the latter. Geographic coordinates: N – 49°29'292"; E – 024°38'432". Circular in shape, 10 m in diameter, 0.4 m high. Subject to geophysical survey.

**Fig. XII.36.** Barrow 209. View from the N

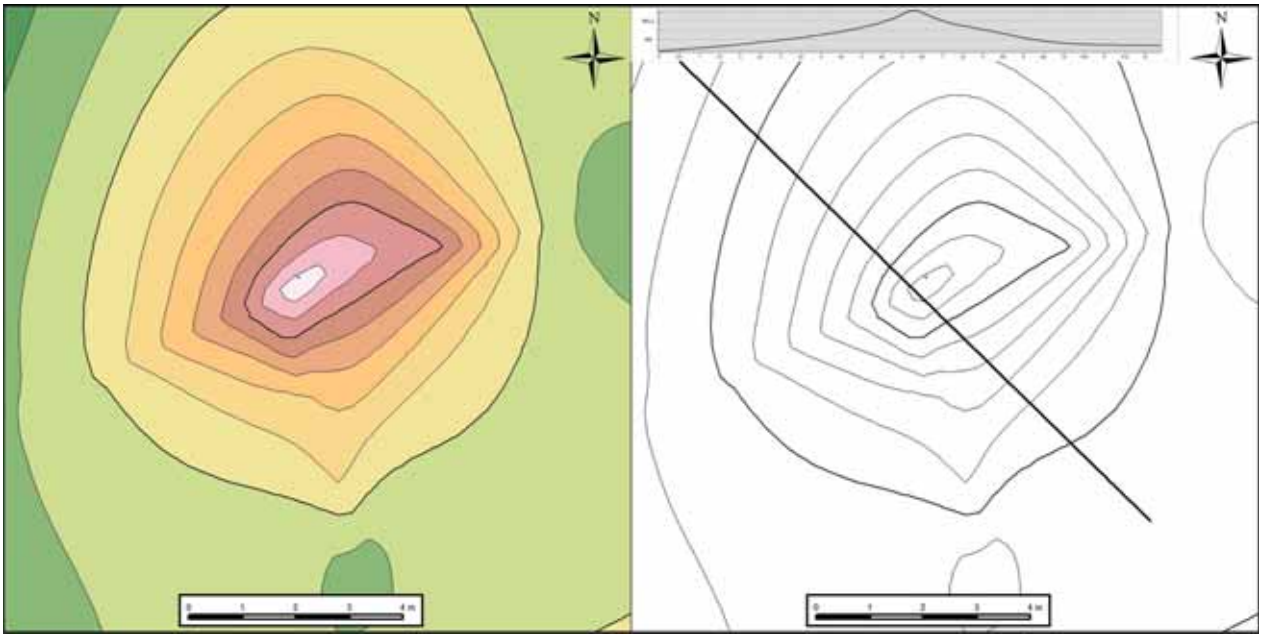



**Fig. XII.37.** Barrow 209. Hypsometric plan and cross-section

**Barrow 210 (Fig. XII.38, Fig. XII.39)** is situated in the central part of the concentration, S of the aforementioned alignment, at 427 m.a.s.l., 12 m SW of kurgan 209, 20 m ESE of barrow 216. Geographic coordinates: N – 49°29'282"; E – 024°38'417". Circular in shape, 14 m in diameter, 0.6 m high. Subject to geophysical survey.

**Fig. XII.38.** Barrow 210. View from the S

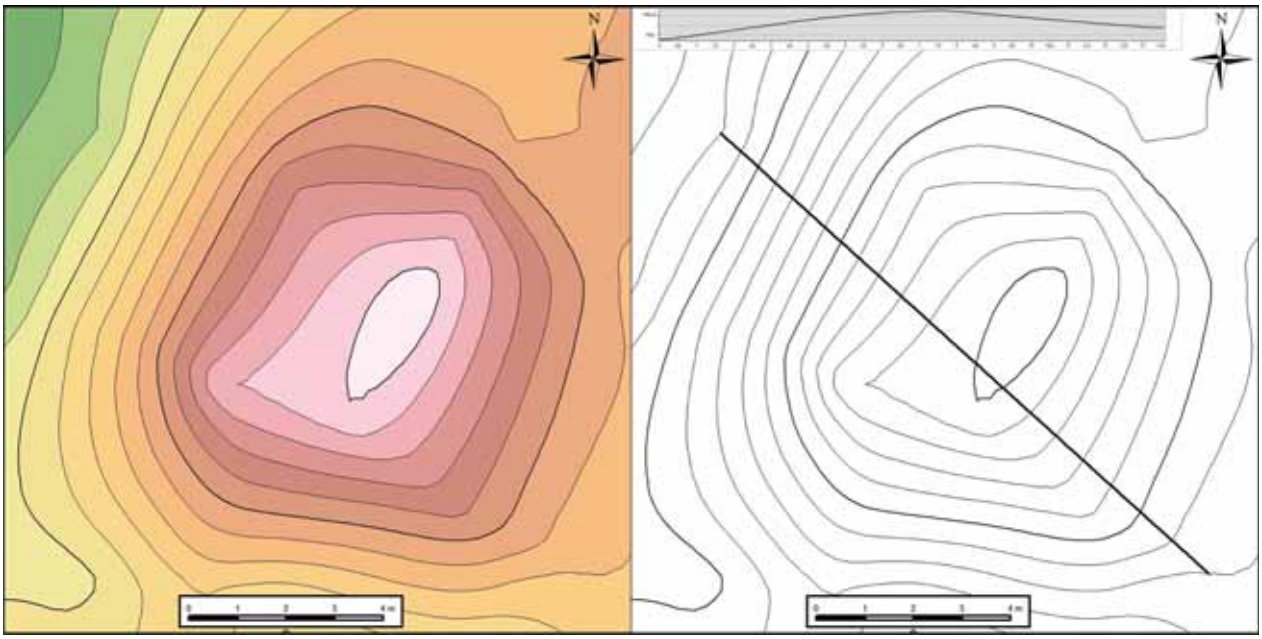



**Fig. XII.39.** Barrow 210. Hypsometric plan and cross-section

**Barrow 211 (Fig. XII.40)** was recorded in the central part of the concentration, S of the described alignment, at 427.5 m.a.s.l., 28 m S of tumulus 228. Geographic coordinates: N – 49°29'287"; E – 024°38'408". Circular in shape, 13 m in diameter, 0.4 m high. Subject to geophysical survey.

**Barrow 212 (Fig. XII.41, Fig. XII.42)** is located in the central part of the cluster, S of the aformentioned seven barrow arrangement, at 428 m.a.s.l., 5 m SSW of mound 216 and 15 m E of tumulus 228. Geographic coordinates: N – 49°29'291"; E – 024°38'390". Circular in shape, 19 m in diameter, 1.5 m high. Destroyed by road from the SW. Subject to geophysical survey.

**Fig. XII.40.** Barrow 211. View from the SW

**Fig. XII.41.** Barrow 212. View from the E

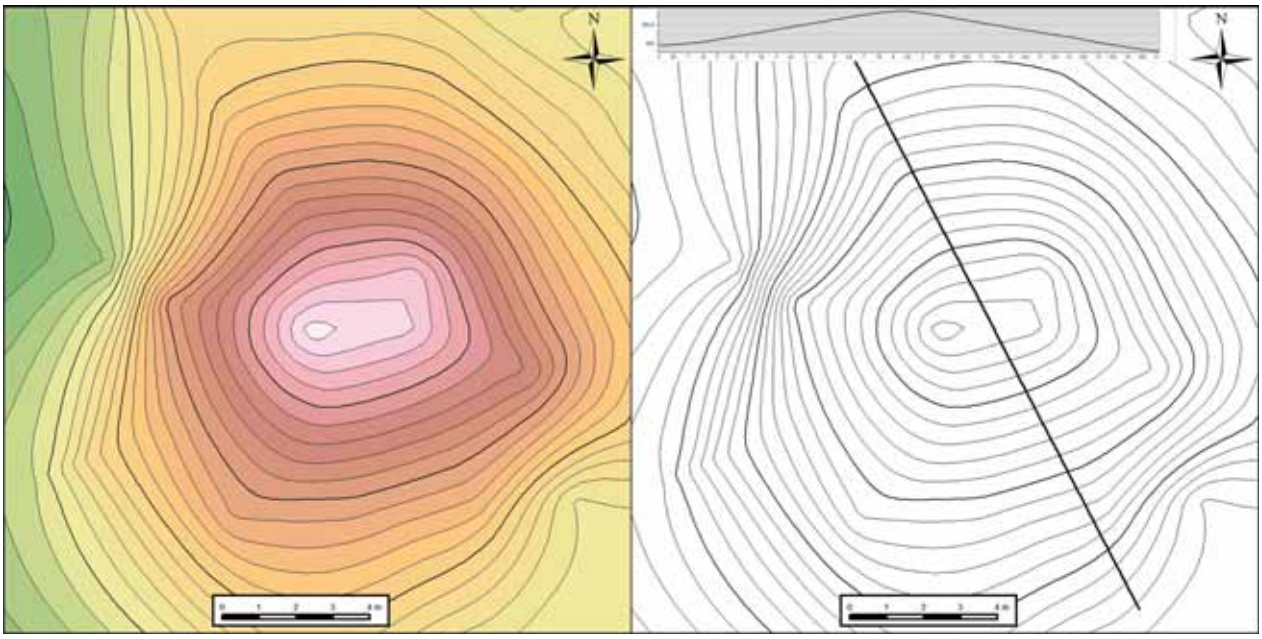



**Fig. XII.42.** Barrow 212. Hypsometric plan and cross-section

**Barrow 213 (Fig. XII.43, Fig. XII.44)** was erected in the SW part of the concentration, within the alignment, at 426,5m, 18 m S of mound 214 and 17 m SE of barrow 215. Geographic coordinates: N – 49°29'282"; E – 024°38'341". Circular in shape, 15 m in diameter, 1 m high.

**Fig. XII.43.** Barrow 213. View from the SW

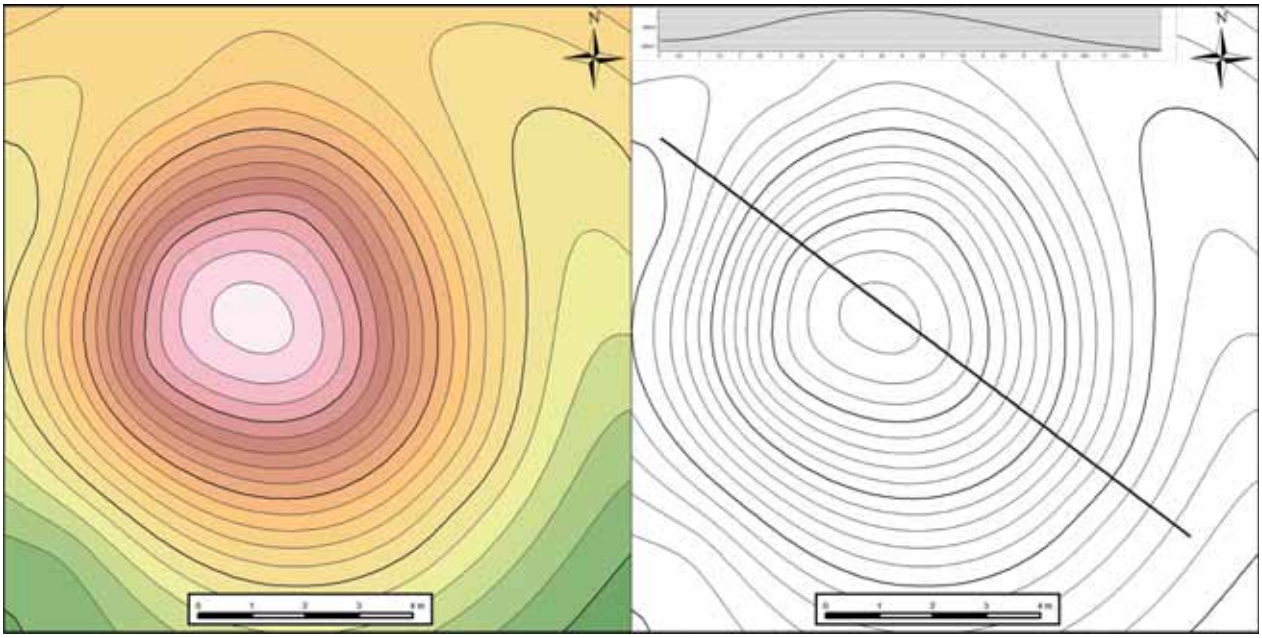


**Fig. XII.44.** Barrow 213. Hypsometric plan and cross-section

**Barrow 214 (Fig. XII.45, Fig. XII.46)** was documented in the SW part of the concentration, at 428 m.a.s.l., between monuments 212 and 215, 25 m SW of the former and 12 m NE of the latter. Geographic coordinates: N – 49°29'278"; E – 024°38'358". Circular in shape, 15 m in diameter, 0.8 m high.

**Fig. XII.45.** Barrow 214. View from the SW

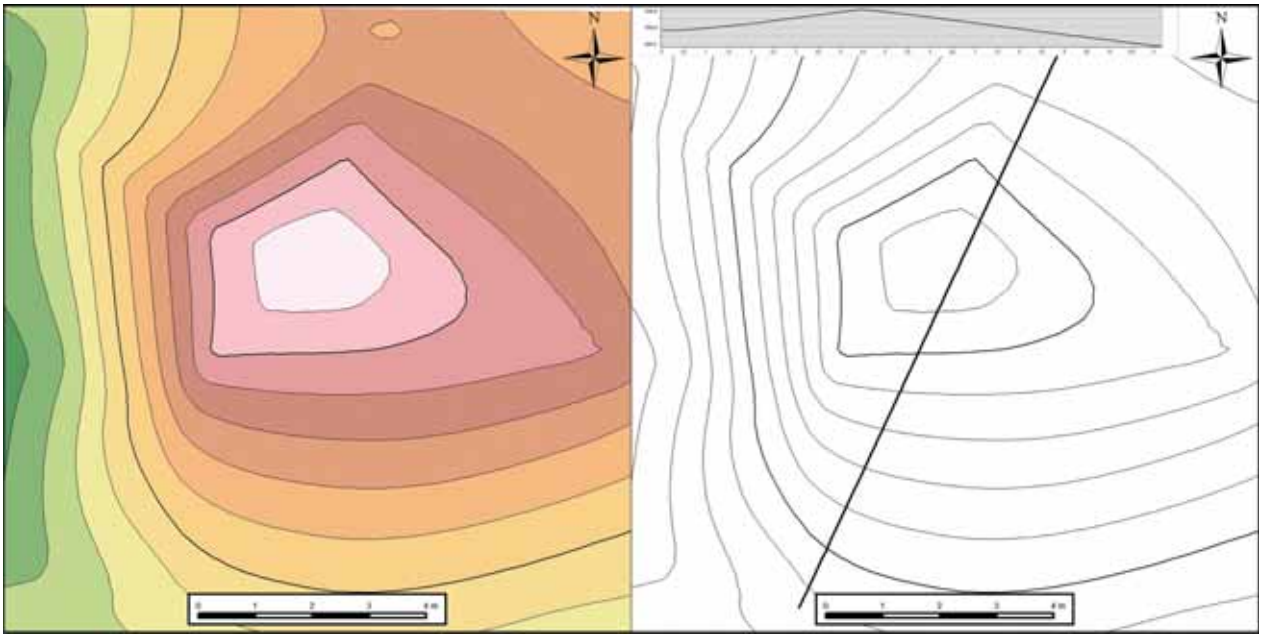



**Fig. XII.46.** Barrow 214. Hypsometric plan and cross-section

**Barrow 215 (Fig. XII.47, Fig. XII.48)** was located in the W part of the cluster, at 428 m.a.s.l., in the W part of the seven barrow linear structure, 15 m W of barrow 214 and 18 m NW of barrow 213. Geographic coordinates: N – 49°29'282"; E – 024°38'341". Circular in shape, 15 m in diameter, 1 m high.

**Fig. XII.47.** Barrow 215. View from the W

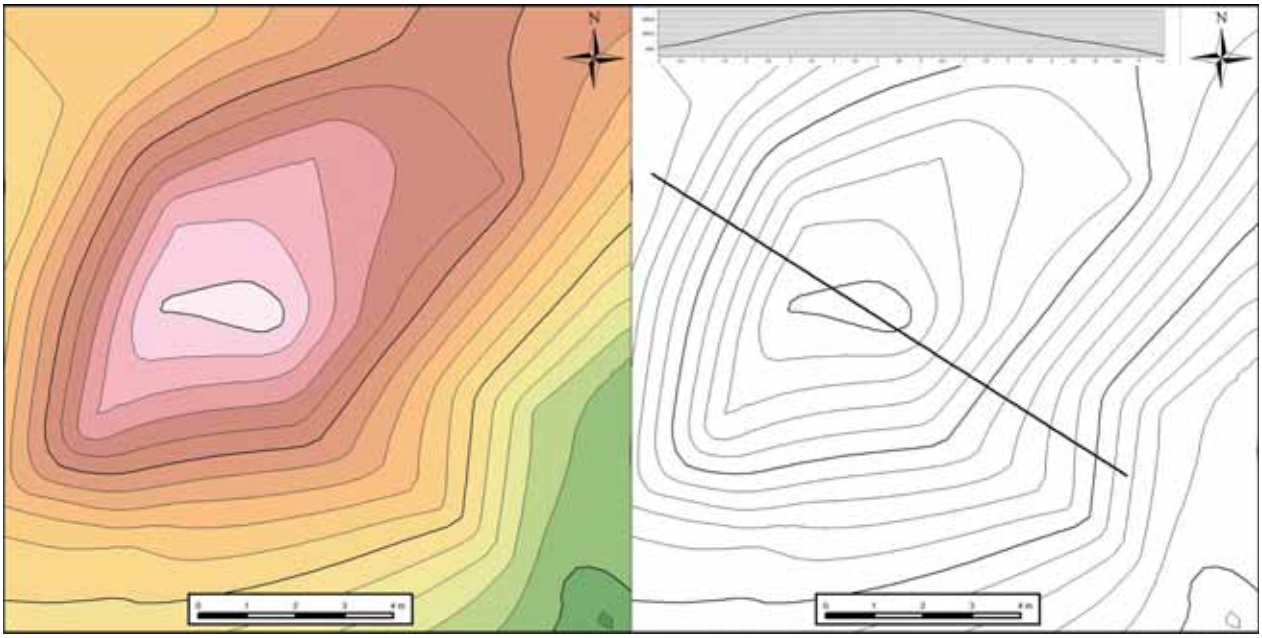



**Fig. XII.48.** Barrow 215. Hypsometric plan and cross-section

**Barrow 216 (Fig. XII.49, Fig. XII.50)** was recorded in the central part of the concentration, at 428 m.a.s.l., 8 m N of barrow 212 and 20 m SW of mound 122. Geographic coordinates: N – 49°29'293"; E – 024°38'391". Circular in shape, 10 m in diameter, 0.5 m high.

**Fig. XII.49.** Barrow 216. View from the SE

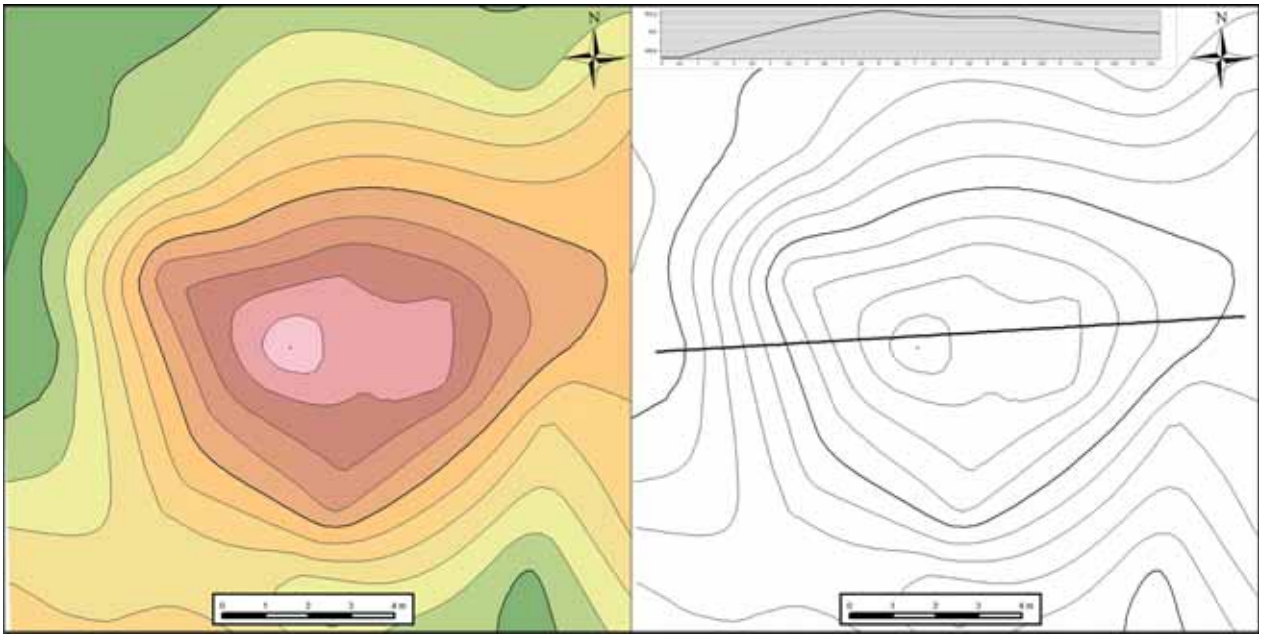



**Fig. XII.50.** Barrow 216. Hypsometric plan and cross-section

**Barrow 217 (Fig. XII.51)** is situated in the SW part of the concentration and within the linear arrangement of seven monuments at the same time, at 426.5 m.a.s.l., 4 m SW of barrow 218, Geographic coordinates: N – 49°29'267"; E – 024°38'316". Circular in shape, 11 m in diameter, 0.6 m high.

**Fig. XII.51.** Barrow 217. View from the S

**Barrow 218 (Fig. XII.52)** was documented at the SW edge of the cluster (and the linear arrangement of seven barrows at the same time), at 426.5 m.a.s.l., between monuments 217 and 219, 4 m NE of the former and 10 m SW of the latter. Geographic coordinates: N – 49°29'264"; E – 024°38'314". Circular in shape, 9 m in diameter, 0.4 m high.

**Fig. XII.52.** Barrow 218. View from the NE

**Barrow 219 (Fig. XII.53)** is located in the W part of the concentration (and the linear arrangement of seven monuments), at 427 m.a.s.l., between tumuli 215 and 218, 4 m SW of barrow 218. Geographic coordinates: N – 49°29'264"; E – 024°38'314". Oval in shape, 13 × 10 m, 0.6 m high.

**Fig. XII.53.** Barrow 219. View from the N

**Barrow 220 (Fig. XII.54)** is situated on the SW edge of the concentration, at 418 m.a.s.l., 150 m SW of mound 222 and 100 m S/SW of barrow 217. Geographic coordinates: N – 49°29'272"; E – 024°38'318". Circular in shape, 11 m in diameter, 0.4 m high.

**Fig. XII.54.** Barrow 220. View from the S

**Barrow 221 (Fig. XII.55, Fig. XII.56)** was recorded in the central-northern part of the cluster (and the linear arrangement of seven barrows), at 428.5 m.a.s.l., between monuments 122 and 215, 60 m SW of the former and 34 m NE from the latter. Geographic coordinates: N – 49°29'296"; E – 024°38'371". Circular in shape, 13 m in diameter, 0.7 m high.

**Fig. XII.55.** Barrow 221. View from the NW

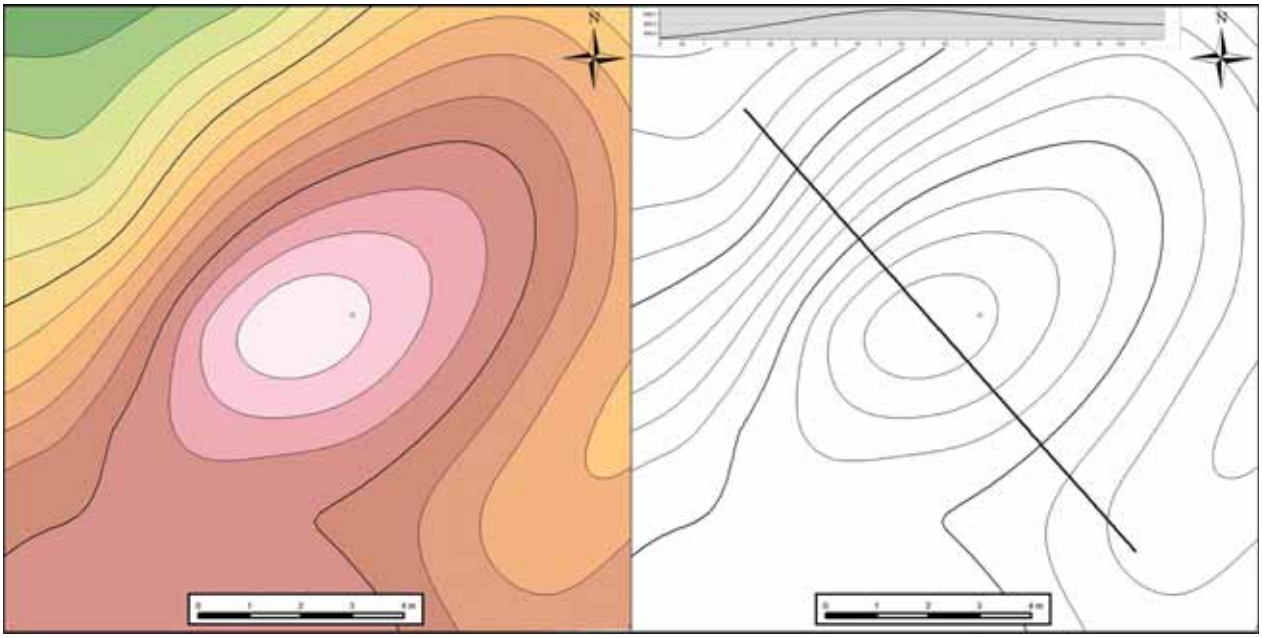


**Fig. XII.56.** Barrow 221. Hypsometric plan and cross-section

**Barrow 222 (Fig. XII.57)** was discovered 60-70 m S of the barrows forming the concentration, at 425 m.a.s.l., 64 m SW of tumulus 208. Geographic coordinates: N – 49°29'251"; E – 024°38'410". Circular in shape, 12 m in diameter, 0.5 m high.

**Barrow 223 (Fig. XII.58)** is located on the N edge of the cluster (and the NE edge of the linear arrangement of seven tumuli), at 428 m.a.s.l., 45 m NE of barrow 122. Geographic coordinates: N – 49°29'296"; E – 024°38'371". Circular in shape, 13 m in diameter, 0.4 m high.

**Fig. XII.57.** Barrow 222. View from the N

**Fig. XII.58.** Barrow 223. View from the N

**Barrow 228 (Fig. XII.59, Fig. XII.60)** is situated in the central part of the concentration, at 427.5 m.a.s.l., 10 m E of mound 212 and 6 m SW of barrow 210. Geographic coordinates: N – 49°29'285"; E – 024°38'400". Circular in shape, 10 m in diameter, 0.6 m high.

**Fig. XII.59.** Barrow 228. View from the S

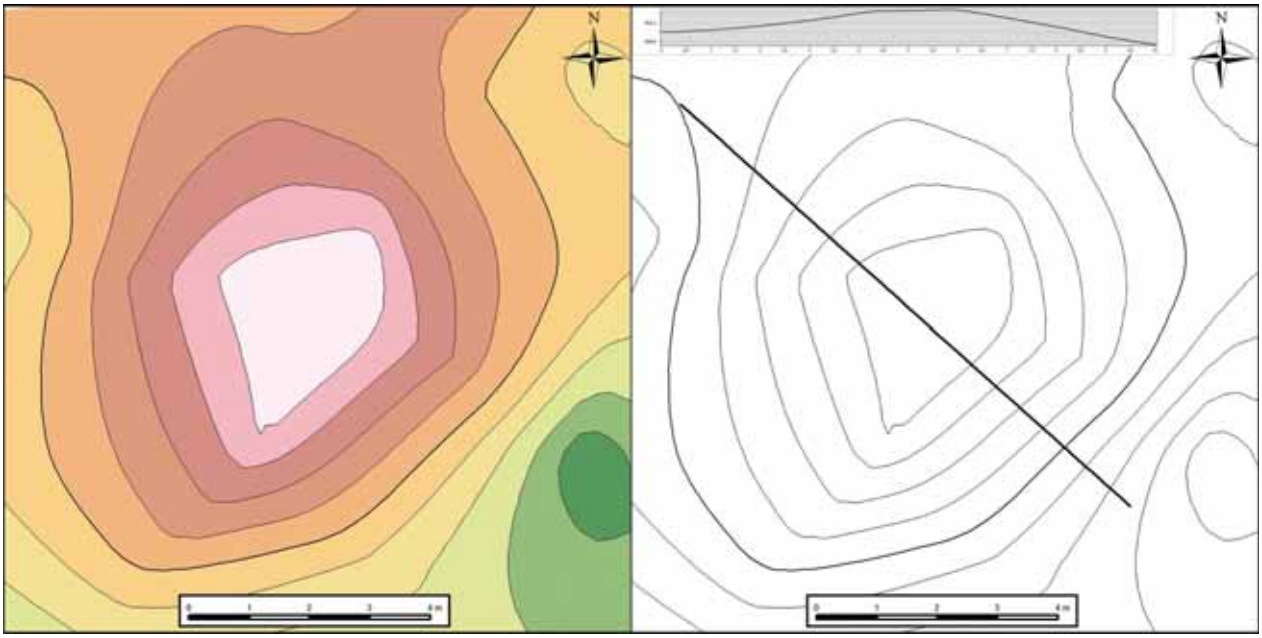



**Fig. XII.60.** Barrow 228. Hypsometric plan and cross-section

## C. Geophysical survey

In terms of area and number of magnetometrically surveyed barrows, the cemetery in Pidgorodie should be considered among the most extensively researched sites. Throughout April 2015 it was possible to register several concentrations of barrows, of which two were included into magnetometric prospection (groups no. I and II) (**Fig. XII.61, Fig. XII.62**). In both instances, grids were not established independently over selected mounds, but whole groupings of barrows were covered with wide measuring surfaces, allowing also for their context to be recorded. For this purpose 20 × 20 m grids were used for setting up the survey's area, while sampling was conducted along profiles spaced 1 m from each other. This last solution was chosen due to dense natural coverage of the site, as well as the large dimensions of the monuments. In total surveyed area measures circa 0.56 ha. In several places, it was necessary to skip few measurements in order to avoid obstacles mainly formed by larger trees, as shown by vertical light grey strips on resulting images.

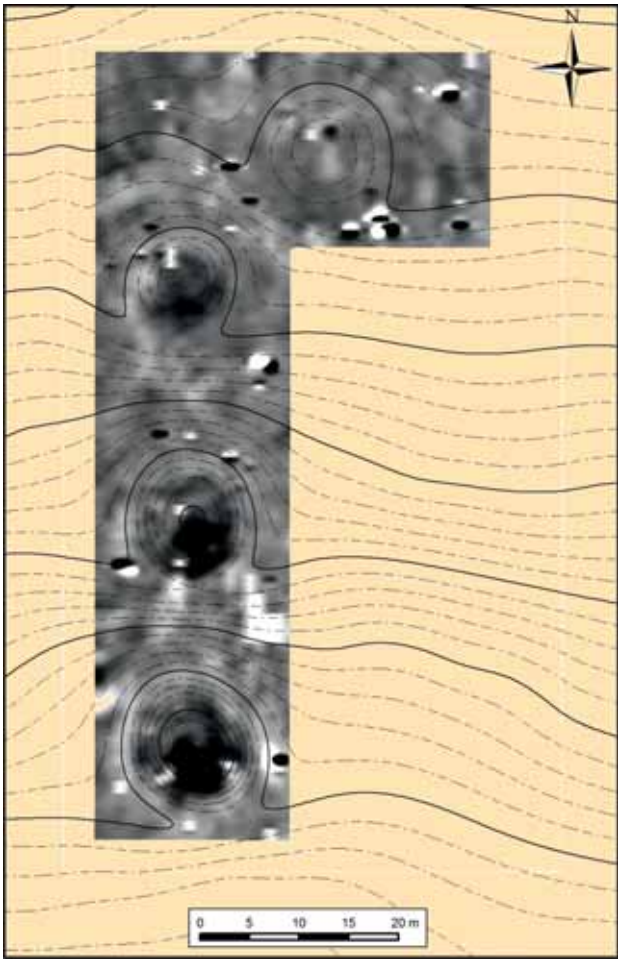



**Fig. XII.61.** Pidgorodie. Position of geophysical survey (south-western concentration)

The firstly surveyed group II (south-western concentration) of barrows is located in the southern part of the site. Inside the framework of grids, three certain and one presumable tumulus were captured (**Fig. XII.63**). Beginning the interpretation of resulting images from the S, one has to pay attention to distinct anomalies, connected with two monuments located in this part. Barrow 116 situated further S is in fact the largest size out of all the objects belonging to the discussed group. The most interesting seems to be a wide, kidney-shaped anomaly registered on the southern side of the embankment's centre (**Fig. XII.64**). The supposedly induced character of magnetization and its highly positive level reaching 5nT, may indicate that it is emitted by some internal structure of the barrow, such as e.g. a grave-pit. Apart from this, the whole embankment reveals increased magnetic susceptibility, probably resulting from the properties of the earthen material from which it was heaped. The outer limit of the barrow can be distinguished, thanks to the circular strip of negative values, enclosing the central anomaly.

Another barrow, located further in a northern direction (no. 115), has a similar spatial distribution of anomalies (Fig. XII.64). Slightly outlying for the barrow's central point, there is a signal of high magnetic response with the diameter of sever meters, that again potentially stems from an element of internal structure of the embankment, such as a grave. The described anomaly is surrounded by a circular zone of positive magnetization values, followed by an external thin halo of negative responses, delimiting the extent of the mound.

The third of the aligned N – S tumuli (no. 114), located northernmost, does not reveal so strong a magnetization, as in case of the former two. Nevertheless, its extent is still discernible on the resulting image (Fig. XII.64). Once again the circular field of increased magnetization is surrounded by a circumference characterized by a rather low magnetic response, however this time a pronounced, strongly magnetic signal is not visible in the barrow's centre. Instead, one can see a patch elongated along the W – E axis of slightly increased magnetization, just beneath the middle section.

Finally, in the NE corner of the survey area there is visible a contour of the fourth barrow (no. 113) that in terms of magnetization level does not resemble the remaining three mounds from the group (Fig. XII.64). The discussed monument, separated from

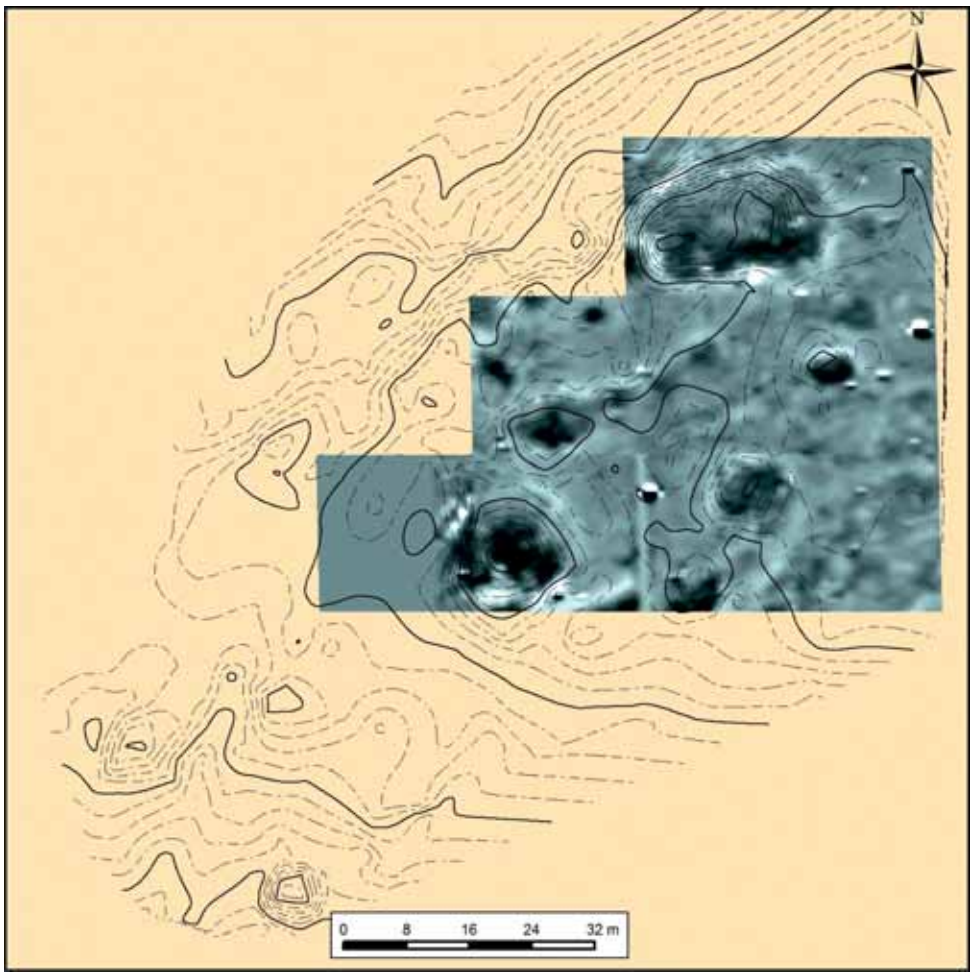


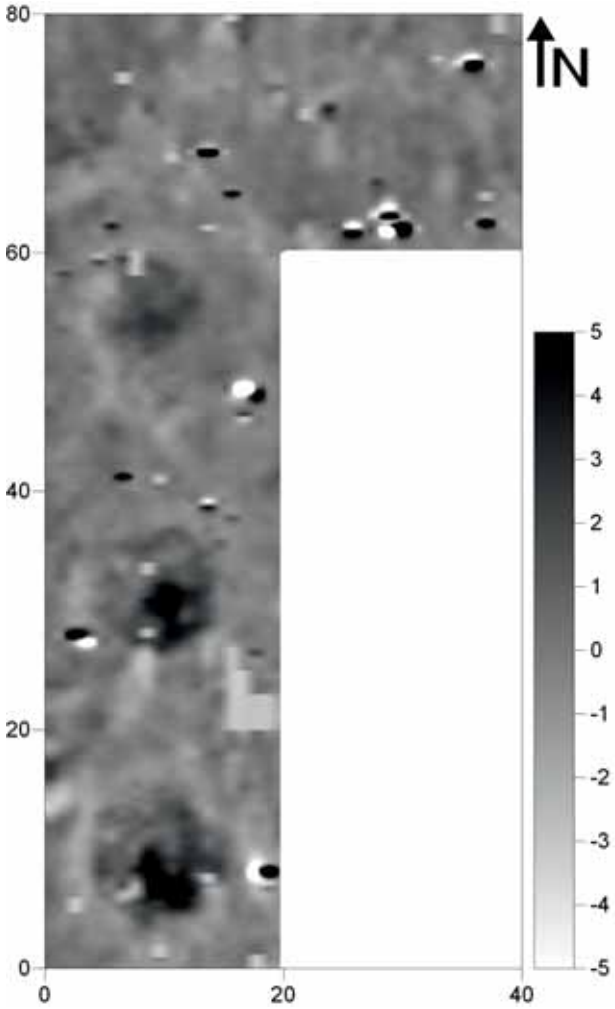

**Fig. XII.62.** Pidgorodie. Position of geophysical survey (north-eastern concentration)

the others by a forest road that probably disturbed the SW section of its embankment, in fact was barely visible in the terrain. On the resulting image it is only discernible thanks to the thin irregular and wide strip of negative signals that surrounds a roughly circular zone that can be interpreted as the embankment. In the centre of this zone one can see a small concentration of negative values, elongated along a N – S axis, in the middle of which is discernible a weak, dipolar signal.

Apart from the above described anomalies connected potentially to prehistoric features, the survey registered also numerous, highly polarized signals distributed all across the area with various orientation of dipoles, resulting from residual magnetization. They are most probably emitted by metal pieces of modern origin, accidentally left on the site.

The secondly surveyed group I (north-eastern concentration) comprises a greater number of monuments, thus enforcing a more extensive grid framework. The resulting image is characterized by a larger degree of complexity in terms of the shapes and distribution of anomalies (**Fig. XII.65**). The observations derived during the reconnaissance allow one to distinguish barrows, even if they are not clearly visible through the anomalies of the magnetic field. Visually, these barrows vary in size, however only a magnetometric prospection revealed their internal differentiation, most probably stemming from the multiple sepulchral structures that they conceal.

Starting the description from the SW one should pay attention to the large mound (no. 216) with a diameter exceeding 15 m (**Fig. XII.66**). Measurements conducted over its embankment showed the presence of an extensive, irregularly shaped anomaly with a high magnetic response, located in the centre. It is surrounded by several other strong signals, together creating a zone of increased magnetic susceptibility, as shown by differences in the spatial differentiation of the gradient. Perhaps one has to consider the presence of a complex structure, e.g. in the type of a tomb made of wood and stone later purposely burnt, leav-



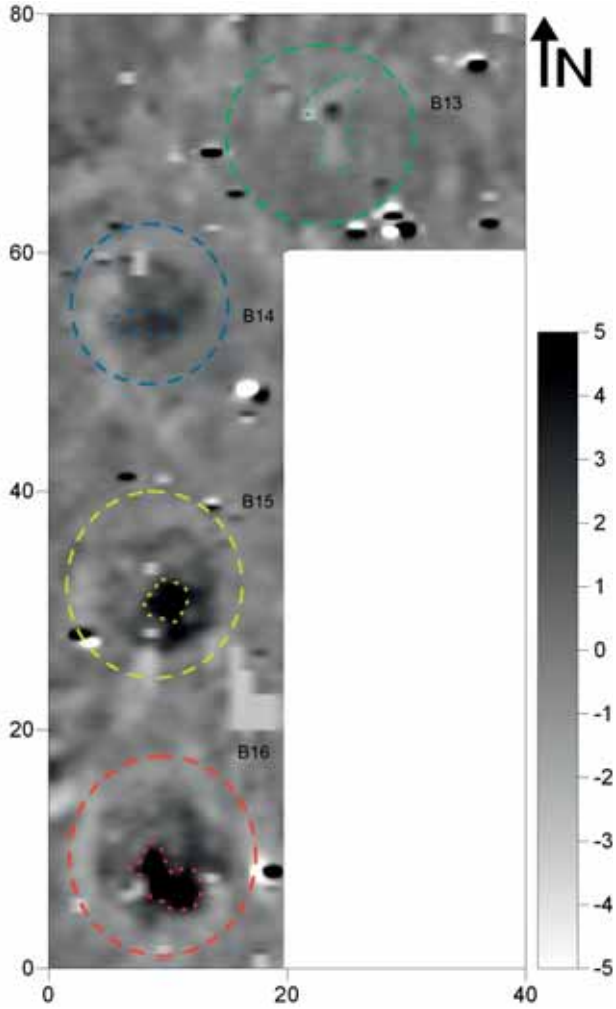




**Fig. XII.63** (left). Resulting image of magnetometric survey on the 2nd group of barrows (barrows no. 113-116) from the site in Pidgorodie (gradiometer Bartington Fluxgate Grad 601-1; measuring grid: 20 × 20 m; sampling density per transect spacing: 0.25 × 1 m, interpolated up to 0.25 × 0.5 m; real values of magnetic field gradient compressed in greyscale to the range -5 – +5nT)

**Fig. XII.64** (right). Resulting image of magnetometric survey on the 2nd group of barrows from the site in Pidgorodie with highlighted anomalies discussed in the text.

--- approximate spatial extent of negative anomaly signifying outer limits of barrow no. 116
··· kidney-shaped anomaly with positive magnetisation level, potentially indicating an internal feature of barrow no. 116
--- approximate spatial extent of negative anomaly signifying outer limits of barrow no. 115
··· roughly circular anomaly with positive magnetisation level, potentially indicating an internal feature of barrow no. 115
--- approximate spatial extent of negative anomaly signifying outer limits of barrow no. 114
··· magnetically positive anomaly elongated along W – E axis, potentially indicating an internal feature of barrow no. 114
--- approximate spatial extent of positive anomaly indicating embankment of barrow no. 113
··· magnetically negative anomaly elongated along N – S axis, potentially indicating an internal feature of barrow no. 113

ing various traces, such as magnetically susceptible layers of ash and charred wood mixed with stones or another materials possessing ferrous compounds. The external limits of the mound are signalized by a halo of negative responses. SE from the discussed object located further on, there is a strongly polarized anomaly that most probably belongs to another, much smaller barrow not included within the scope of the survey, however, it can be seen on the basis of the height model (Fig. XII.62).

In the eastern direction another two mounds are situated, oriented against each other along a NW – SE axis. The first of these (no. 214), located further south, is distinguished merely by an irregular zone of slightly negative responses (Fig. XII.66). The outer limits of the embankment are very difficult to circumscribe, hence it seems more advisable to rely on height measurements in this case (Fig. XII.62). Within such a defined zone another signal is discernible, magnetically more pronounced than the context, reaching a positive maximum of magnetisation. It is possible that this peak, potentially indicating an internal feature of the barrow, has its continuation in a southern direction, outside the area of survey.

Slightly NE from previously described barrow mound (no. 228) is located, more distinct in terms of its magnetic response (Fig. XII.66). It has a significantly different character of anomalies, which include a zone of increased values, encircled form W, N and E by a strip of negative values. From the entire image of the barrow two independent anomalies can be distinguished, probably of induced magnetisation, with positive peaks located in the SW and NE sectors of the embankment. It is difficult to interpret the sources of these signals solely on the basis of the image, however it is plausible to say that they potentially indicate internal structures of the barrow.

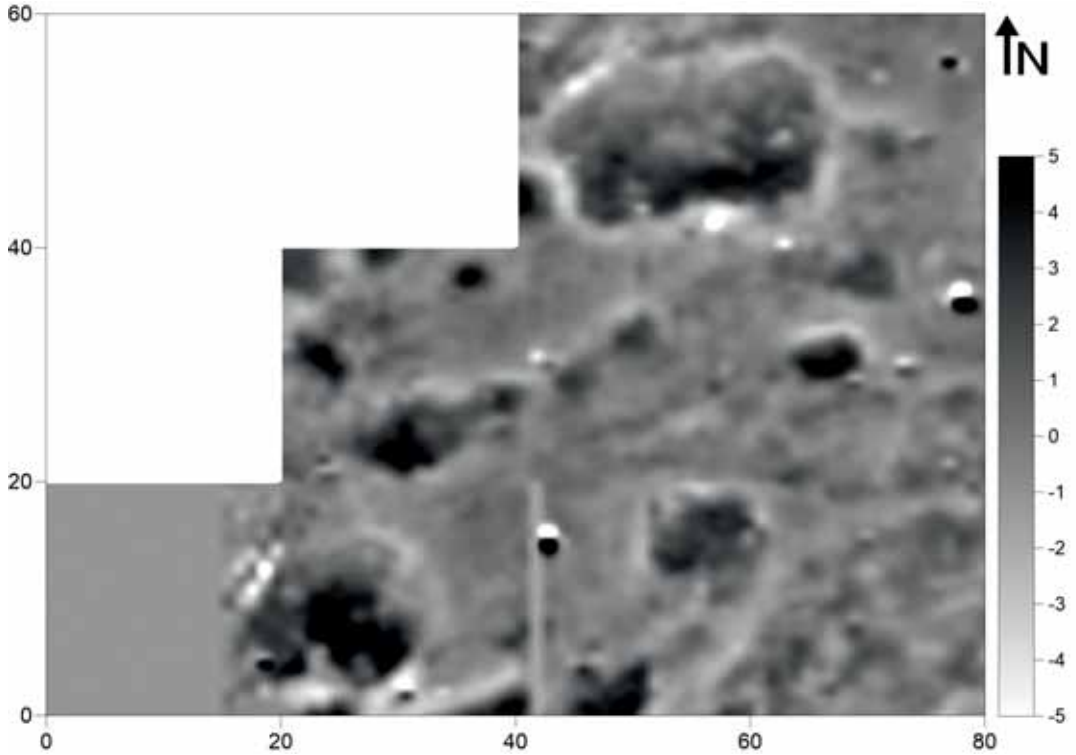
Moving to the next grids, neighbouring with the latter from the north (between 20 and 40 m on geodetic X axis), one can see a series of distinct anomalies that are not always represented in the terrain by a visible landform (Fig. XII.65). Beginning form the western part, it is possible to discern two concentrations of signals with a different level of magnetization, which seemingly may signify two separate mounds. In fact only the southern anomaly (Fig. XII.66) corresponds with ground elevation. Therefore, it can be identified as a barrow (no. 212) that has an irregularly shaped positive maximum of the magnetic field, surrounded by weaker signals, insignificantly contrasting with the context. The aforementioned centrally placed strong anomaly is possibly emitted by a grave structure.

The second accumulation of anomalies, situated NW from the previously described barrow, comprises a kidney-shaped positive maximum of magnetization with a negative peak corresponding in its outline, both surrounded from the NE by several other, much smaller positive signals (Fig. XII.66). Despite the fact that this conglomerate of anomalies does not have a corresponding landform, it should still be taken into consideration as an indication of features potentially connected to the necropolis.

Moreover, northwards from the discussed site four adjacent anomalies are present, possessing roughly circular or oval contours with positive magnetic peaks measuring several meters in diameter, surrounded by strips of negative values (Fig. XII.66). Three of them continue outside the survey area, while one has been captured in its entirety. Considering the large number of anthropogenic objects in the type of graves, located on this small fragment of terrain, it is possible to predict also that the aforementioned four anomalies have a similar character and indicate features connected with human activity in prehistory. A comparison of the resulting image of magnetometry with the height plan of the discussed barrows group (Fig. XII.62) reveals that in close vicinity to the aforementioned four anomalies there is a small elevation of terrain, interpreted as barrow 206. Hence, it seems possible that the two easternmost anomalies are connected with this object. Apart from a funerary function they can also represent pits or remains of fireplaces left from rituals that took place at the cemetery.

In a SE direction from the above described concentration of anomalies another three disturbances of the magnetic field with similar spatial distribution of positive and negative peaks were recorded (Fig. XII.66). They stretch in a line along a SW – NE axis, as though they were an extension of one of the barrows. Similarly to the case discussed in the previous paragraph, the prehistoric origin of these signals can be assumed, with their potential function involving grave structures or other features connected to the necropolis. One has to bear in mind also that this site corresponds with a recession of terrain in the form of a shallow basin absorbing water. In this wet area decaying trunks and branches of trees were dispersed, whose complete removal was not possible. This fact raises the question, whether distinct signals of induced magnetization might not be caused by an accumulation of organic matter and water. The verification of this hypothesis should be conducted with the help of other methods.

Further anomalies corresponding with barrows are located further in the eastern direction (Fig. XII.66).



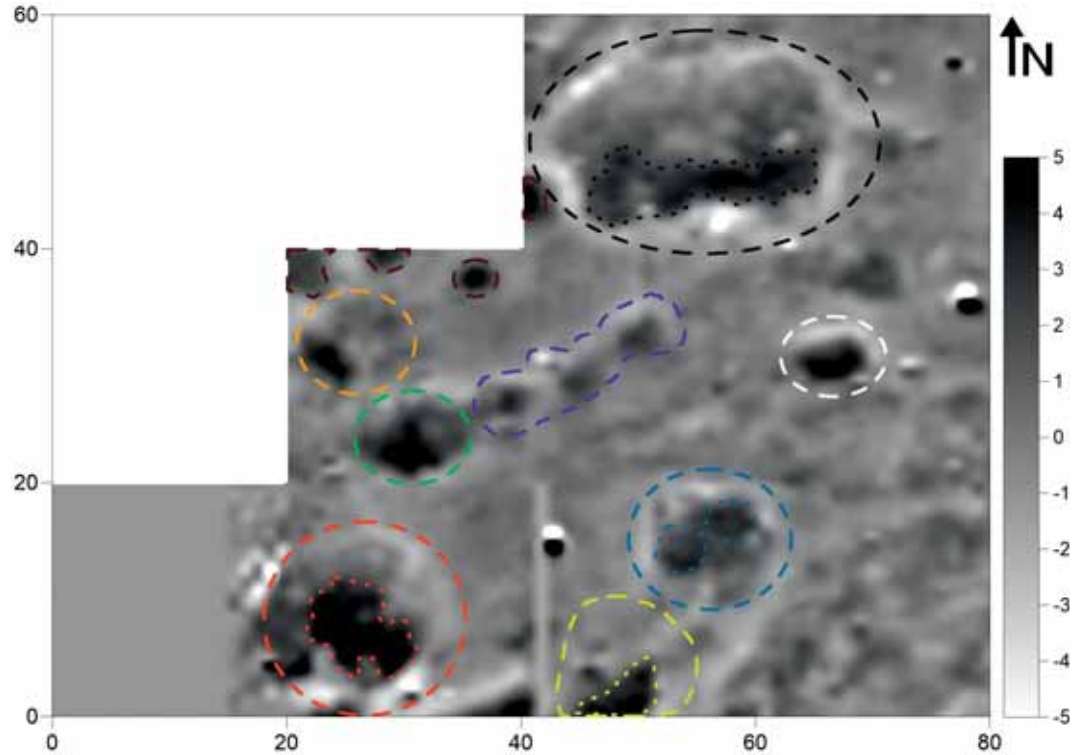




**Fig. XII.65** (up). Resulting image of magnetometric survey on the 1st group of barrows (barrows no. 122, 206, 209, 210, 212, 216, 228) from the site in Pidgorodie (see Fig. XII.63)

**Fig. XII.66** (down). Resulting image of magnetometric survey on the 1st group of barrows (barrows no. 122, 206, 209, 210, 212, 216, 228) from the site in Pidgorodie with highlighted anomalies discussed in the text.

--- approximate spatial extent of negative anomaly signifying outer limits of barrow no. 212
··· approximate spatial extent of positive anomaly, potentially indicating an internal feature of barrow no. 212
--- approximate spatial extent of negative anomaly signifying outer limits of barrow no. 228
··· approximate spatial extent of positive anomaly, potentially indicating an internal feature of barrow no. 228

The first mound (no. 210) is represented by a significantly more intense level of probably induced magnetization – a kidney-shaped positive maximum of magnetization is located on the southern side of the negative peak (normal polarization). Probably this signal comes from the source buried in the central part of the mound, thus producing a clearer response than a magnetically less susceptible earthen mantel and rim. The real spatial extent of the embankment should be therefore delimited on the basis of an elevation model.

The last described set of anomalies is connected to the biggest monument belonging to the discussed group (no. 122). It is characterized by an approximately oval outline of embankment elongated along a E – W axis with two climaxes at the opposing ends (Fig. XII.66). The related anomalies comprise strong positive values of magnetic field in the centre and circumference formed by a strip of negative responses. Despite the fact that the high level of magnetisation, revealed for the whole upper part of the embankment, indicates increased magnetic susceptibility of the material from which the barrow was heaped, the gradient of magnetisation differs from the southern to northern section. In general, the values registered over the former part are closer to the threshold of 5nT. They are concentrated in several places, where they assume oval shapes. The farther away in a northern direction, the strength of magnetization tends to decrease. Interestingly, the western and eastern parts of the embankment are separated by a 5 m wide strip of slightly decreased values in relation to the context.

Perhaps the analysed object is another example of a "double" barrow, already known from the site in Bukivna (barrow group I, tumuli 6 and 7). At the present stage of research, it is difficult to define, whether it is the effect of a purposeful merger of two barrows or because the narrow space between the barrows was filled with earth drifting from the slopes over time? This issue certainly demands further research. It is also worth mentioning that the present grouping of monuments continues in an eastern direction, not reached by the extent of survey area in 2015. Therefore it seems important to renew the survey in the future in order to complete the magnetometric image in this part of the site.

## E. Archival information

### Podgrodzie, district of Stanisławów (after Sulimirski 1968:138)

*In 1936 Dr J. Pasternak (Pasternak 1937:109) excavated a barrow-grave here in which a cremation burial of the Komarów culture was found. No details have been published.*

The materials have never been published.

--- approximate spatial extent of negative anomaly signifying outer limits of barrow no. 210
··· two, roughly circular positive anomalies, potentially indicating internal features of barrow no. 210
--- approximate spatial extent of anomalies indicating an embankment of barrow no. 216
--- approximate spatial extent of anomalies potentially indicating a levelled barrow belonging to with the cemetery
--- four anomalies potentially indicating other features or object connected with the cemetery, including barrow no. 206
--- anomalies corresponding with wet recession of terrain
--- approximate spatial extent of anomalies indicating embankment of barrow no. 209
··· approximate spatial extent of negative anomaly signifying outer limits of barrow no. 122
▬ approximate spatial extent of positive anomaly, potentially indicating an internal feature of barrow no. 122

# XIII. Cemetery in Putiatyńce/Putiatyncy (Fig. XIII.1)

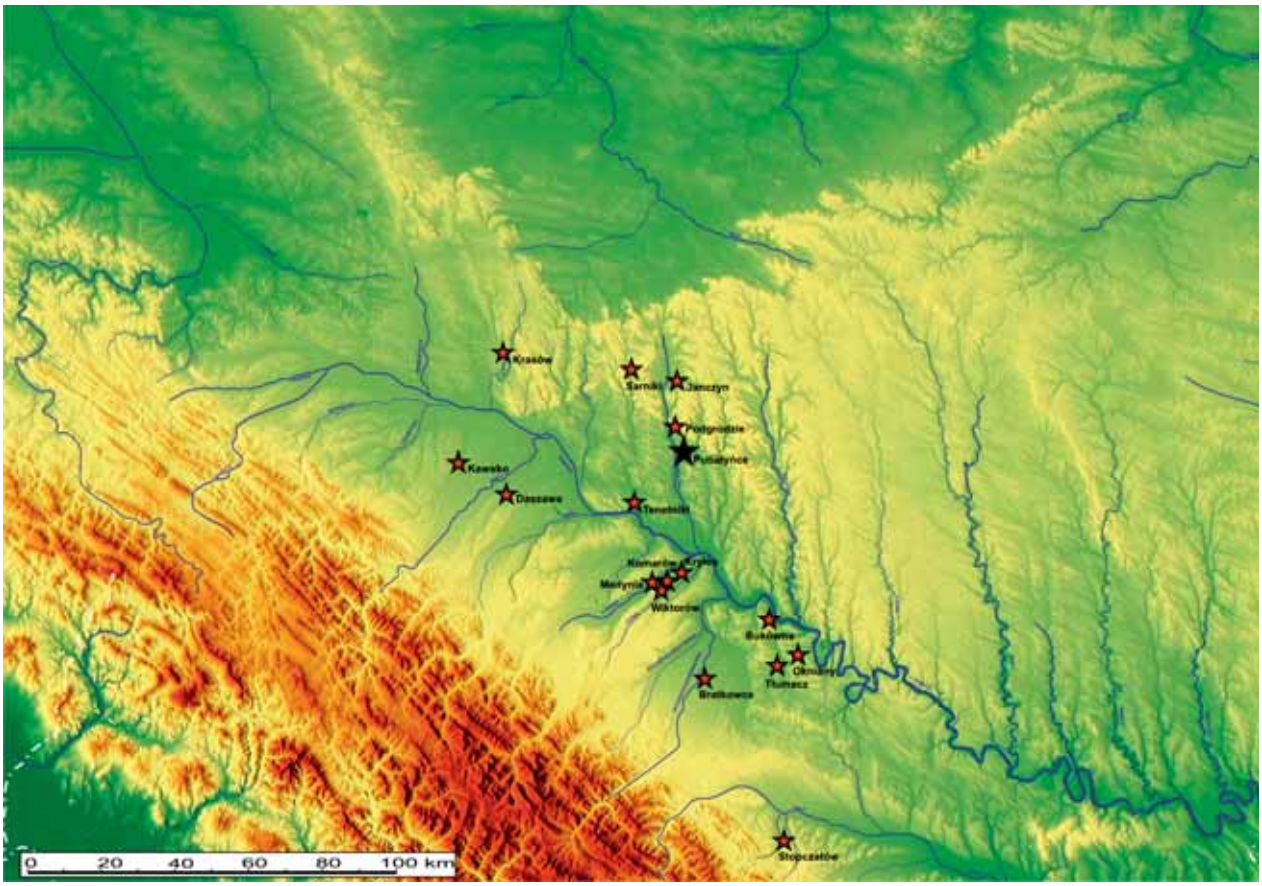



**Fig. XIII.1.** Location of the cemetery in Putiatyncy in relation to other barrow necropolises

## A. Geographical description

The barrow cemetery in Putiatyncy is located in the middle course of the Hnyla Lypa river, on its left bank. It is a wider region of the western Podolian Upland – Opillia Upland. The site is situated east to Rohatyn that corresponds with a minor sub-region of Rohatyn Opillia. This region is highly segmented by rivers, divided into ridges and minor perches that creates a hilly landscape without any significant plateaus. This landscape continues up to the confluence of the Zolota Lypa and the Dniester.

The Dniester and its tributaries flow through both a very deep and narrow valley, or canyons as well as on flatlands creating meanders and river bends (Huhman *et al.* 2004). At the level of the Kozary and Cvitiv the Dniester reaches the vast area of the Halych-Bukachivtsy Basin. The rivers Svirzh and Hnyla Lypa flow to this region from north. The genesis of the Halych-Bukachivtsy Basin is related with the Lower Pleistocene direction of the Dniester course, that in the past flowed in the dead valley oriented on the line of Bortniki – Cherniv – Halych. Until this day it has not been proved exactly when the Dniester changed its course (Gębica *et al.* 2016). In the middle course of the Hnyla Lypa, the river flows through a wide and swampy valley. This is represented by toponyms such as: Hnyla Lypa (rotten linden), Mochary (swamp) or Na Bolotach (on muds).

The cemetery lies on an elongated slope that falls into the south. In the north its culmination is determined by the Chortova Hora hill of 350 m.a.s.l. elevation. This form is a inselberg and is surrounded from the E and NW by a wide depression, namely the Hluboka Dolyna (deep valley). From the south also a depressions occurs that is used by the rivers Stu-

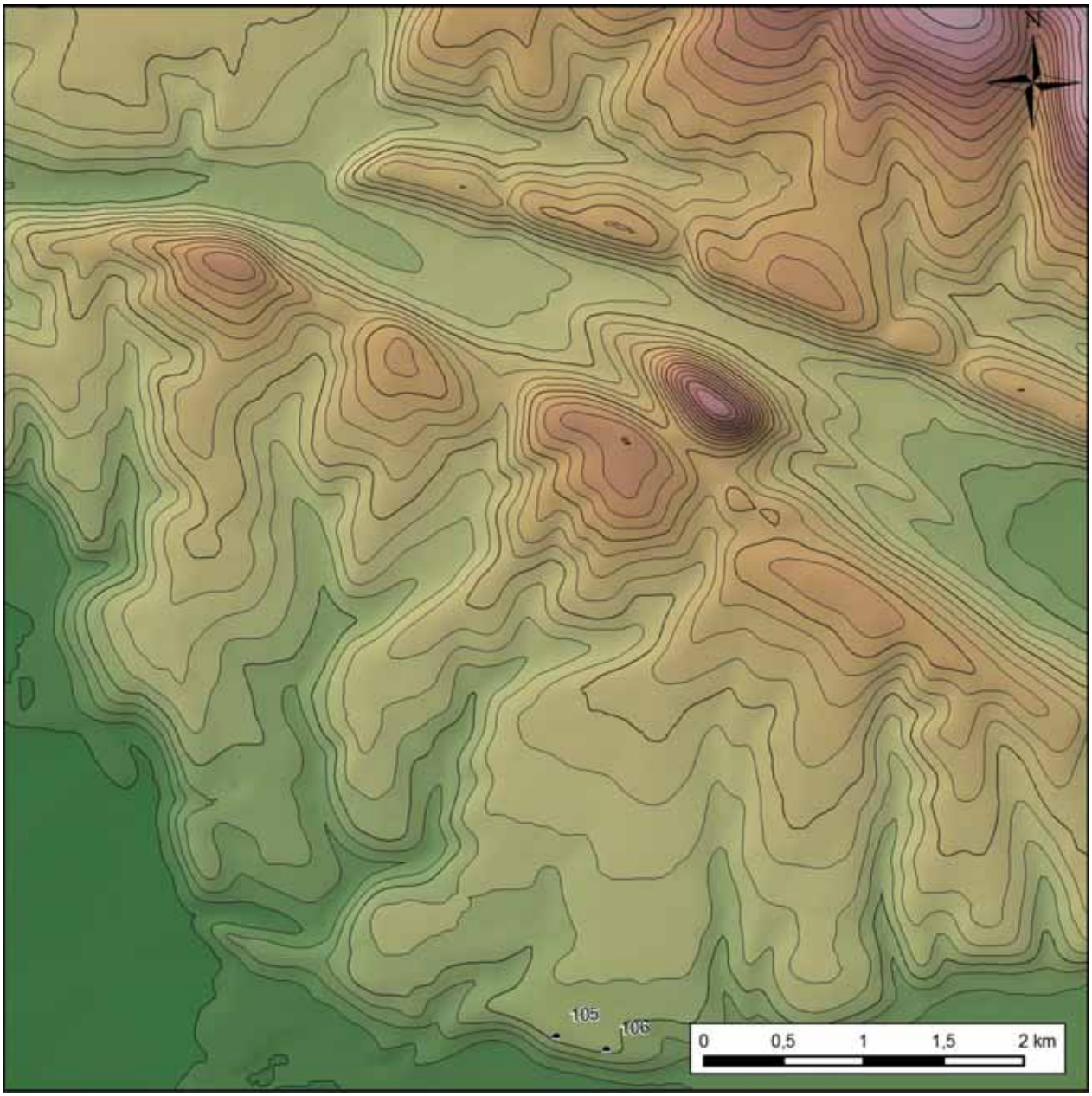



**Fig. XIII.2.** Digital Elevation Model of the barrow cemetery in Putiatyncy

denny Potik and Kutsy Potik. The Hnyla Lypa valley is adjacent from the west.

Barrows are situated on the southern slope over the Studenny Potik River. Average heights for Rohatyn Opillie range between 350-400 m.a.s.l., whereas the most prominent points reaches 470 m.a.s.l.. On the described part of Opillye where funeral mounds occur the heights are relatively lower and range from 237m to 398 m.a.s.l. The difference in height therefore can be estimated to 160 m.

The burial mounds were recorded in the edge zone of the slope on an elevation of 258-260 m.a.s.l. The bottom of the Studenny Potik valley is situated 20 m below this level (242 m.a.s.l.). On the summit of hills and in the valley bottoms the slope is 0.13 degrees, while the largest in the thresholds of the valleys edges, where it is 12.2 degrees.

On these thresholds rocks of older base ground occur, which are marls and limestones of the Cretaceous age, whereas in the Dniester valley there are also Miocene gypsums.

Once wet, the vast valley of the Dniester presently is drained and serves as meadows and pastures.

## B. Spatial arrangement and description of the barrows

A single barrow (104) was registered outside the mapped area. Two others (105 and 106) – destroyed by ploughing – were documented on the S edge of the hill, which slopes steeply to S, where a railroad track is located **(Fig. XIII.2, Fig. XIII.3)**. There were probably monuments on the field but presently, due to intensive agriculture, they are no longer visible (ploughing destruction).

**Barrow 104 (Fig. XIII.4)** is located on top of a hill. Geographic coordinates: N – 49°21'501"; E – 024°40'945". Circular in shape, 30 m in diameter, 3.5 m high. The barrow is inaccessible, covered with bushes and trees.

**Barrow 105 (Fig. XIII.5)** recorded at the S edge of the hill, at 262 m.a.s.l., ca. 300 m W/NW of tumulus 106, ca. 150 m S of the dirt road and 200 m N of the railroad tracks. Geographic coordinates: N – 49°22'720"; E – 024°39'440". Mound destroyed by ploughing?


**Fig. XIII.3.** Putiatyncy. Location of the cemetery using satellite imagery (Yandex)

**Fig. XIII.4.** Barrow 104. View from the S

**Fig. XIII.5.** Barrow 105. View from the SE

**Barrow 106 (Fig. XIII.6, Fig. XIII.7)** documented on the S edge of the hill, at 261 m.a.s.l., ca. 300 m E/SE of mound 105, around 150 m S of the dirt road and 200 m N of the railroad tracks. Geographic coordinates: N – 49°22'692"; E – 024°39'609". Mound destroyed by ploughing. Visible part – 10 m in diameter, 0.4 m high. Subject to geophysical survey.

**Fig. XIII.6.** Barrow 106. View from the SE

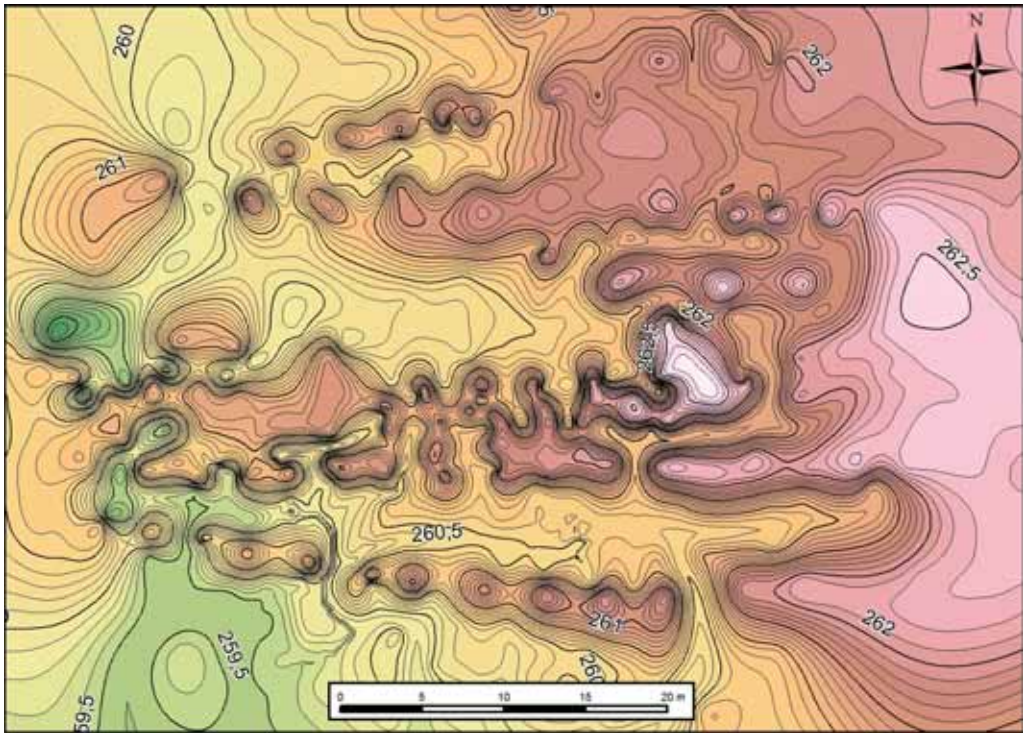



**Fig. XIII.7.** Barrow 106. Hypsometric plan and cross-section

## C. Geophysical survey

In the vicinity of Putiatyncy there presumably was situated, now completely levelled, a barrow cemetery dated to the Bronze Age. The place selected for a magnetometric survey in 2015 is located on the southern edge of a large cultivated field, just over the valley of the local stream. The surface of the field rises in the southern direction and the peak of the elevation is densely overgrown by vegetation. Measurements were conducted within a single grid with dimensions of 20 × 20 m and profiles spaced form each other by 0.5 m. In total the surveyed area equals 0.04 ha (**Fig. XIII.8)**.

The survey's results do not allow one to distinguish magnetic field anomalies potentially indicating the presence of the barrow's relicts (no 105; **Fig. XIII.9**). The captured signals mainly reflect furrows left by a plough. They have approximately a NE – SW orientation and are visible as strips of alternately higher and lower magnetic response. Along the southern edge of the area there were registered several strong, abnormally polarized anomalies of residual magnetization, most probably emitted by metal objects rich in ferrous compound, dragged here by a plough. Among the results, the most interesting are two parallel, linear anomalies with pronounced positive and negative peaks, that together with the aforementioned ploughing marks create a rectangular structure (**Fig. XIII.10**). At present, it is difficult to define the source of such magnetization, however in the light of data, acquired during geophysical re-

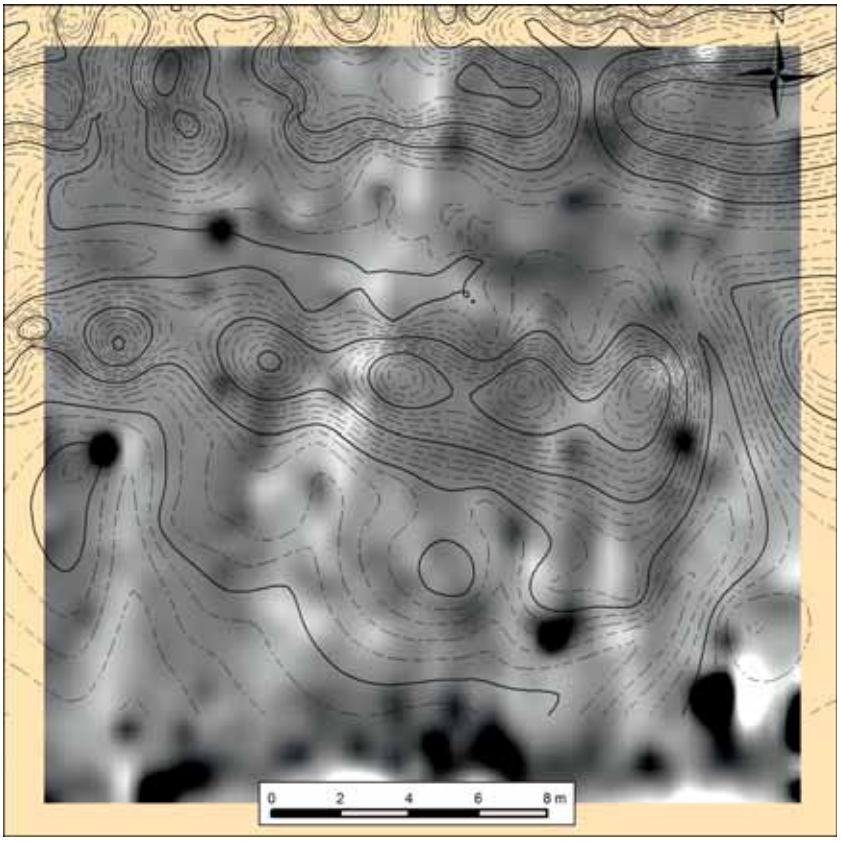
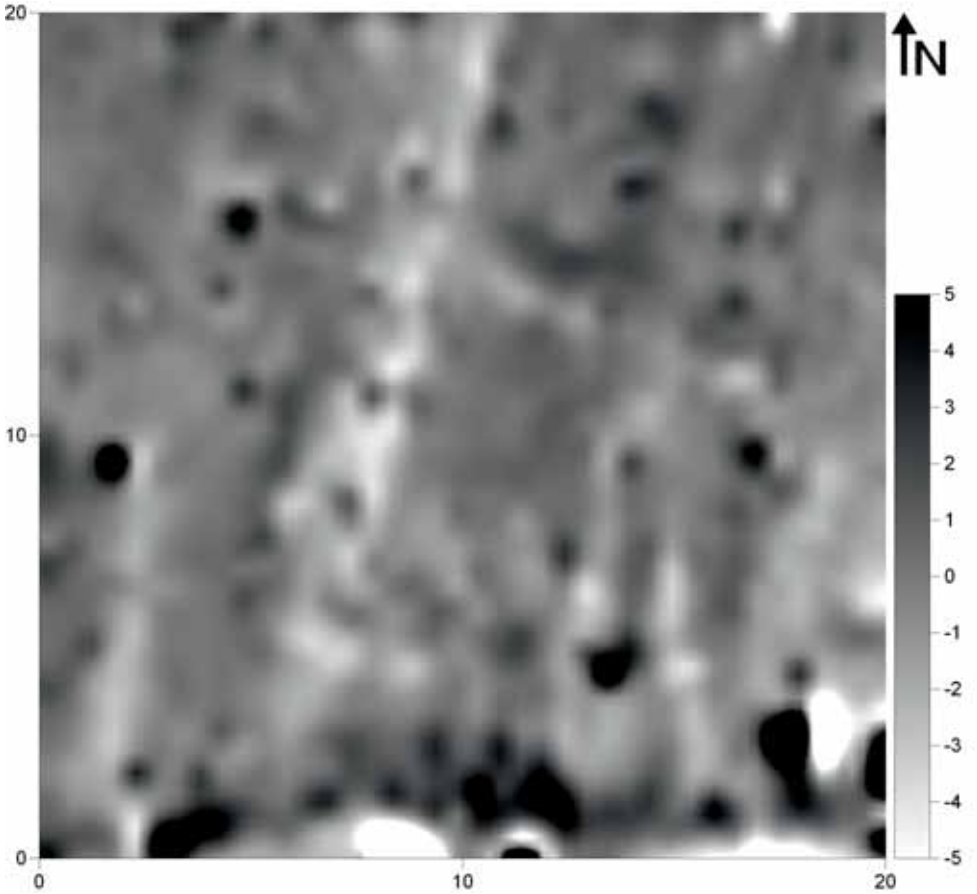



**Fig. XIII.8.** Putiatyncy. Position of geophysical survey (barrow? 105)

**Fig. XIII.9** (up). Resulting image of magnetometric survey on the site near Putiatyncy (gradiometer Bartington Fluxgate Grad 601-1; measuring grid: 20 × 20 m; sampling density per transect spacing 0.25 × 0.5 m, interpolated up to 0.25 × 0.25 m; real values of magnetic field gradient compressed in greyscale to the range -5 – +5nT)

**Fig. XIII.10** (down). Resulting image of magnetometric survey on the site near Putiatyncy with highlighted anomalies discussed in the text.

--- approximate spatial extent of a roughly rectangular feature circumscribed by perpendicular anomalies with pronounced positive and negative maxima of magnetisation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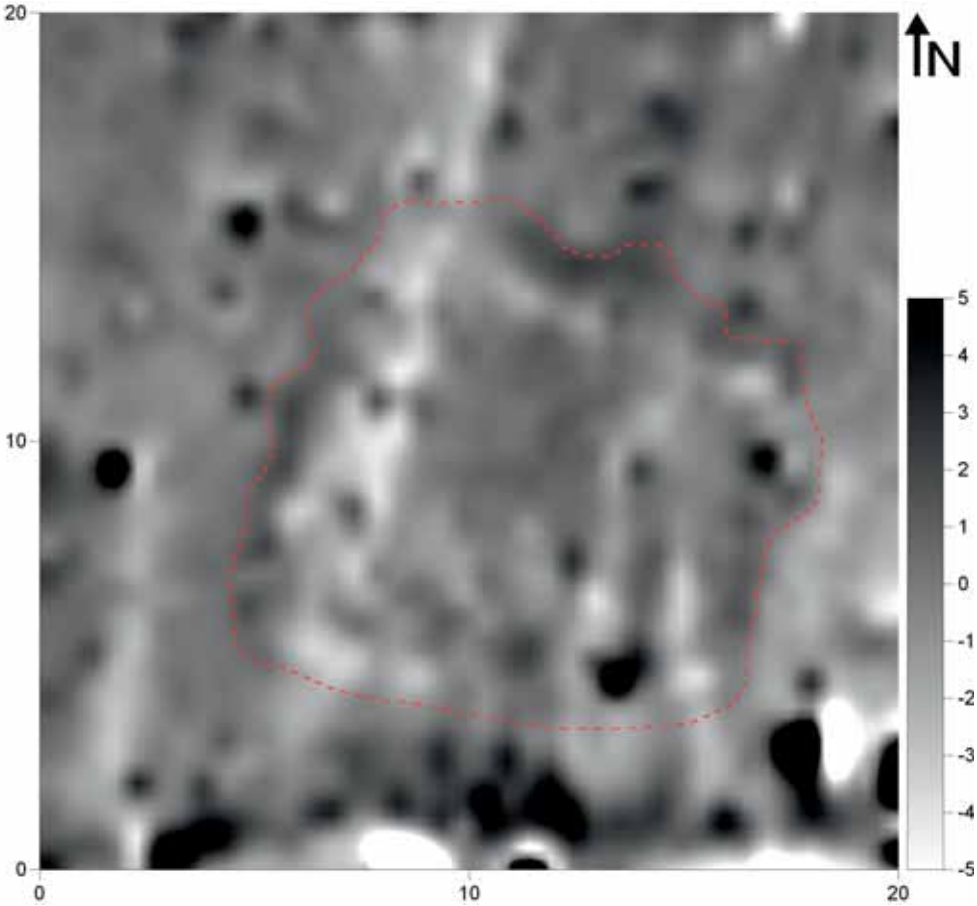
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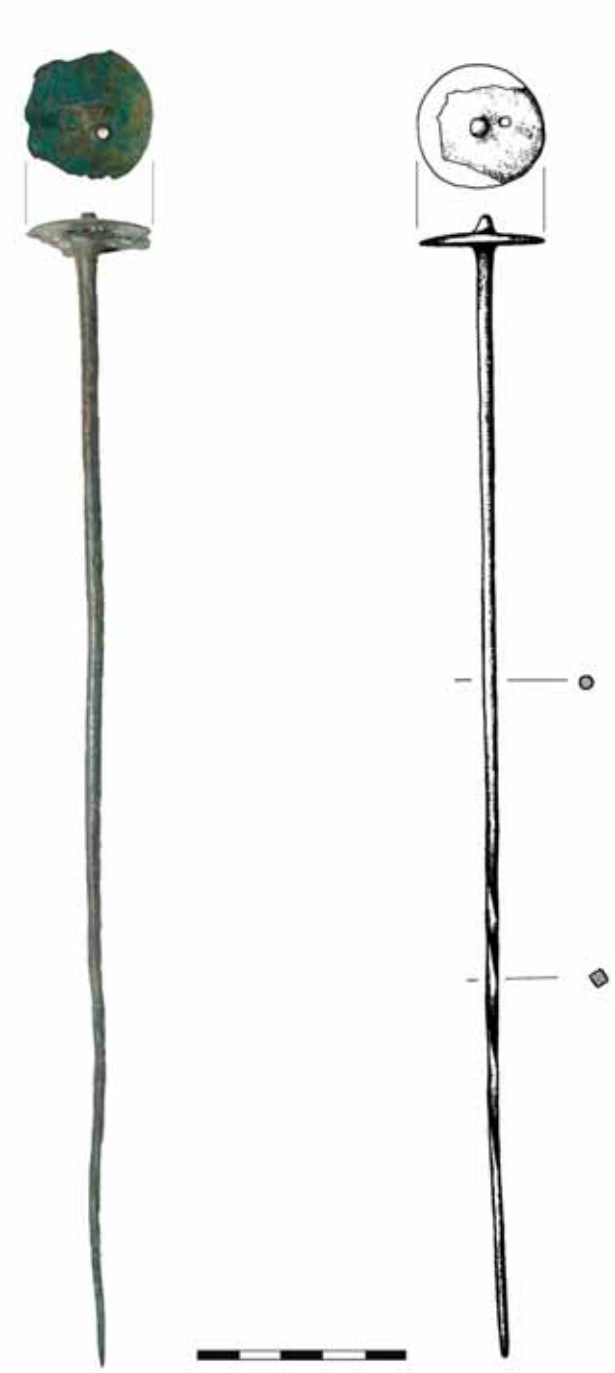


**Fig. XIII.11.** Bronze pin with a nail (hat) head, twisted at the bottom. Round in profile, square at the top, 0.2-0.4 cm thick. Length of pin (without head): 27.5 cm; head circular in horizontal section, 3.0 cm in diameter

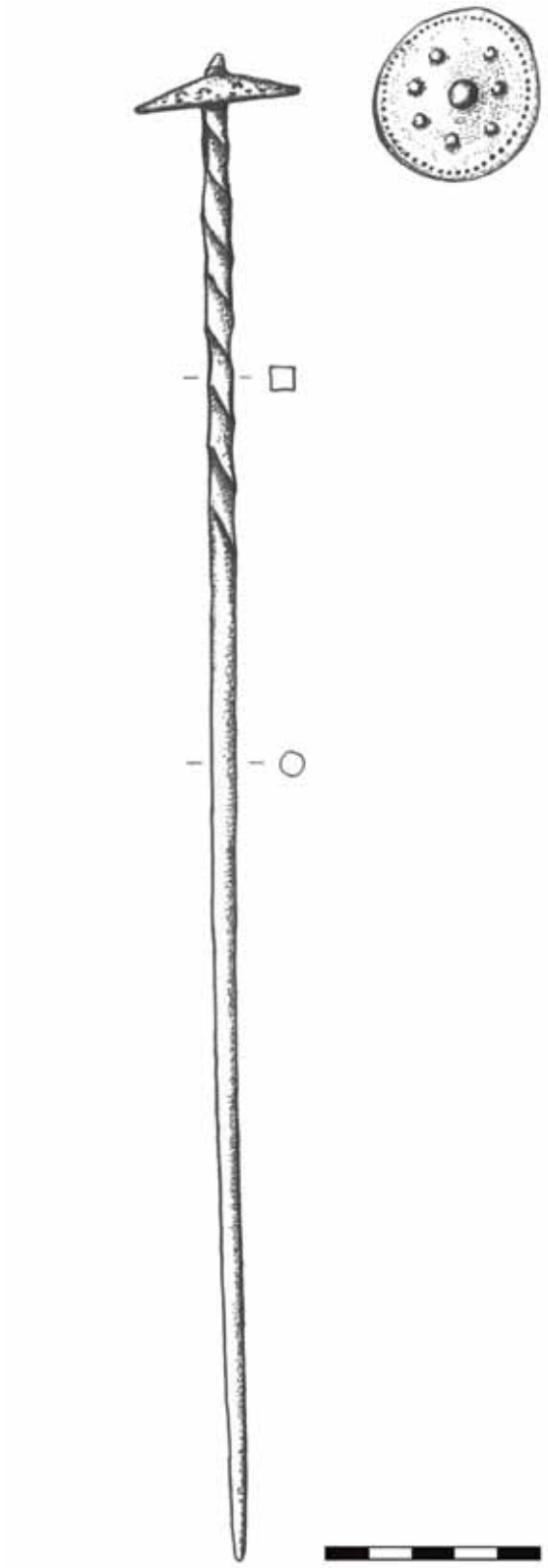


**Fig. XIII.12.** Bronze pin with a nail (hat) head, twisted at the top. Round in profile, square at the top, 0.4-0.6 cm thick. Length of pin (without head): 36.5 cm; head circular in horizontal section, measuring: 4.3 × 4.0 cm, ornamented along its entire circumference with small projections, in the centre – with a larger projection encircled by seven smaller ones

search on the other sites with barrows, it is doubtful that they are remains of a prehistoric mound.

## D. Archival information

### Putiatyńce, district of Rohatyn (after Sulimirski 1968:144; Kozłowski 1928:99, Pl. XIII:2, 3, 12)

*Three bronze pins and a vessel were found in 1896 during the construction of the railway line (Kostrzewski 1922-24:191). They evidently originated from destroyed barrow-graves, a number of which were recorded in that locality. One of the pins was of the 'Cypriot' type of the Early Bronze Age (Sulimirski 1968, Fig. 19:15). Two others (***Fig. XIII.11, Fig. XIII.12***; Sulimirski 1968, Fig. 26:14, I5) and the vessel (***Fig. XIII.13***; Sulimirski 1968, Plate 16:17) were of the Middle Bronze Age Komarów culture. Both were of the same type made of bronze wire, one having the upper part square in section, the heads being formed of a thin, round convex sheet decorated with protuberances and perforated. The vessel in which calcined bones were found had its neck covered with three parallel grooves and the upper part of the body bore hanging shaded triangles. The body had protuberances, one of these with a vertical perforation.*

**Fig. XIII.13.** Vase, type W22, ornamented on the neck with six horizontal incised lines, below, on the body – alternately – with two triangles hatched with oblique incised lines, and double appliqué bosses. Thickened and rounded rim, base slightly marked. H – 9 cm, R1 – 15.5 cm, R2 – 14.2 cm, R3 – 17 cm, R4 – 6.8 cm (photo: Sulimirski 1968, Pl. 16:17; drawings from Swiesznikow 1967, tabl. VII:3)

# XIV. Cemetery in Sarniki/Sirniki (Fig. XIV.1)

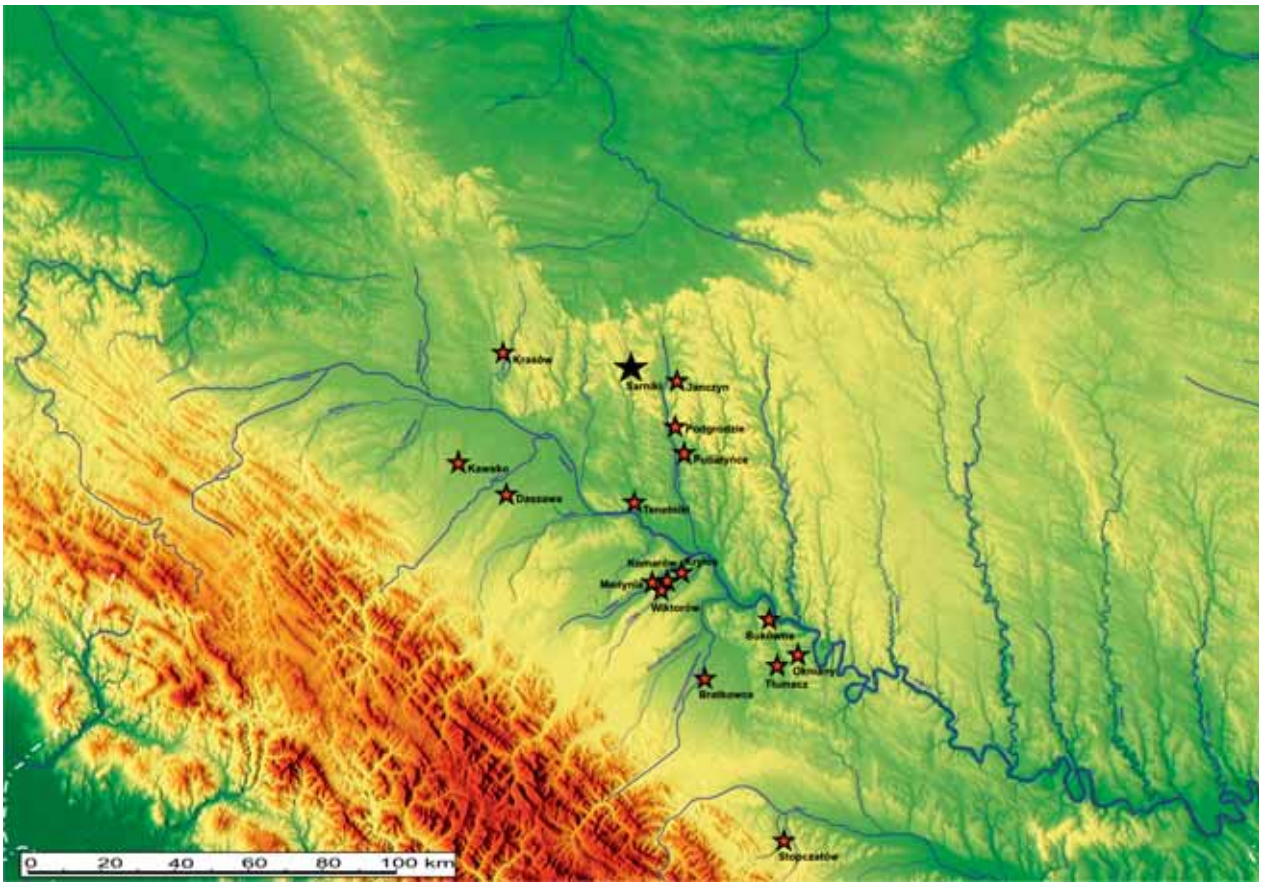



**Fig. XIV.1.** Location of the cemetery in Sarniki in relation to other barrow necropolises

## A. Geographical description

The barrows in Sarniki are located between the Bilyi Potik and Svirzh rivers, which are the left tributaries of the Dniester. The discussed area is a part of the Opillia Upland that is a western segment of the Podolian Upland. The Opillia Upland is characterized by a diversified landscape. It is a region segmented by rivers and elevated over 40 m above the Dniester valley. Its main characteristic is lack of flat summits of the hills. The left tributaries of the Bilyi Potik and right of the Svirzh divide the area into ridges and perches. Nevertheless in the region between these rivers there aren't any distinctive ridges. They were

cut by two river systems of Dniester tributaries closely located to each other.

The prehistoric cemetery is situated on an inselberg of a former ridge which was a watershed. It is characterized by a latitudinal orientation and lies east from the Sirniki village, whereas the perches divided by the tributaries of the Bilyi Potik and Svirzh have a meridian mileage.

The basement of the upland areas has been created mostly by marine sediments of the Cretaceous that comprises marls and limestones. Of importance in the Podolian Upland are the Neogene layers 100-200 m thick. They are dominated by sands, sandstones, limestones and characteristic for shallow marine environments, gypsums and loams. Above the Neogene layers a thick sediment of loess occurs in which rivers cut through (Czeppe *et al*. 1969; Rąkowski 2006). Fragments of sandstones and limestones can be seen as outcrops on the surface and create narrow scarps (Gudowski 2016 [ed.]).

The burial mounds in Sirniki are situated just below the summits of the uplands, mostly on the western part of the watershed. They are elevated on a surface of 400 m.a.s.l. Maximum heights in this area reach 404 m.a.s.l. while the lowest were recorded in the valley's bottoms and were elevated at 295 m.a.s.l. The entire terrain rises slightly into the east. In general the slope in the valleys is 0.02 degree, whereas 20-26 degrees are observable in the thresholds of the valleys. In two places the slope reached 27 and 52 degrees respectively. These are narrow scarps that were created by an erosion of the tributaries of the Bilyi Potik.

## B. Spatial arrangement of the cemetery and description of the barrows

Seven barrows (nos. 123, 125, 126, 127, 128, 129, 130) were observed in the upper, flattened parts of an extensive hill, stretching from the NW to SE. Monuments located on top of the hill are linearly arranged and correspond with the structure of the hill (NW – SE) along a 600 m distance (**Fig. XIV.2, Fig. XIV.3, Fig. XIV.4**).

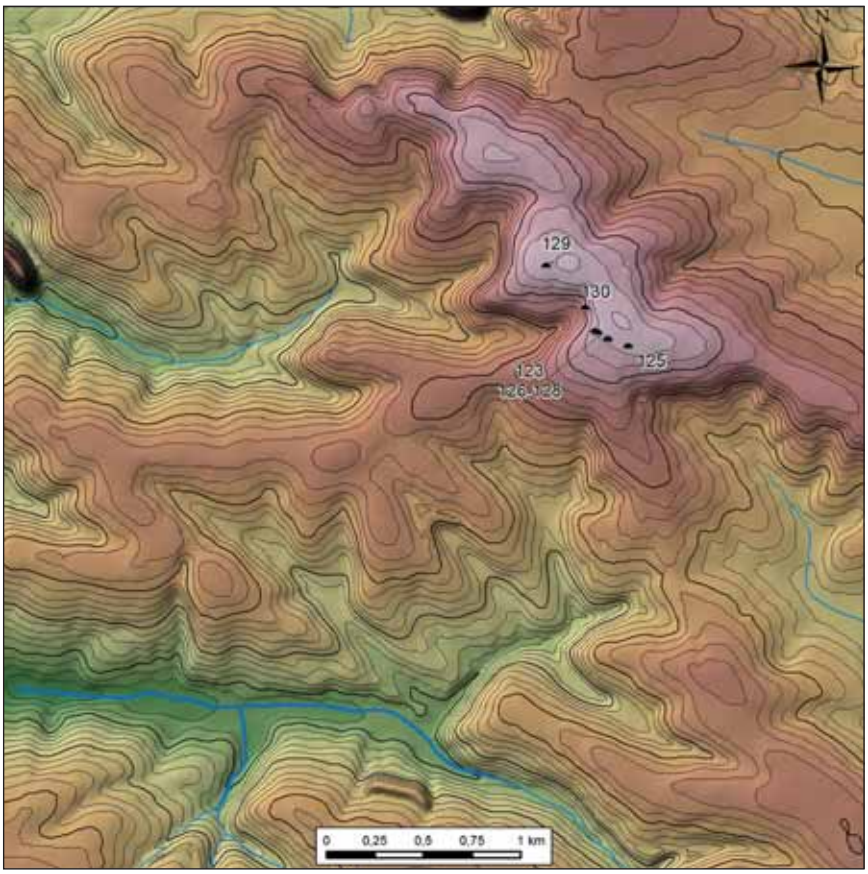



**Fig. XIV.2.** Digital Elevation Model of the barrow cemetery in Sirniki

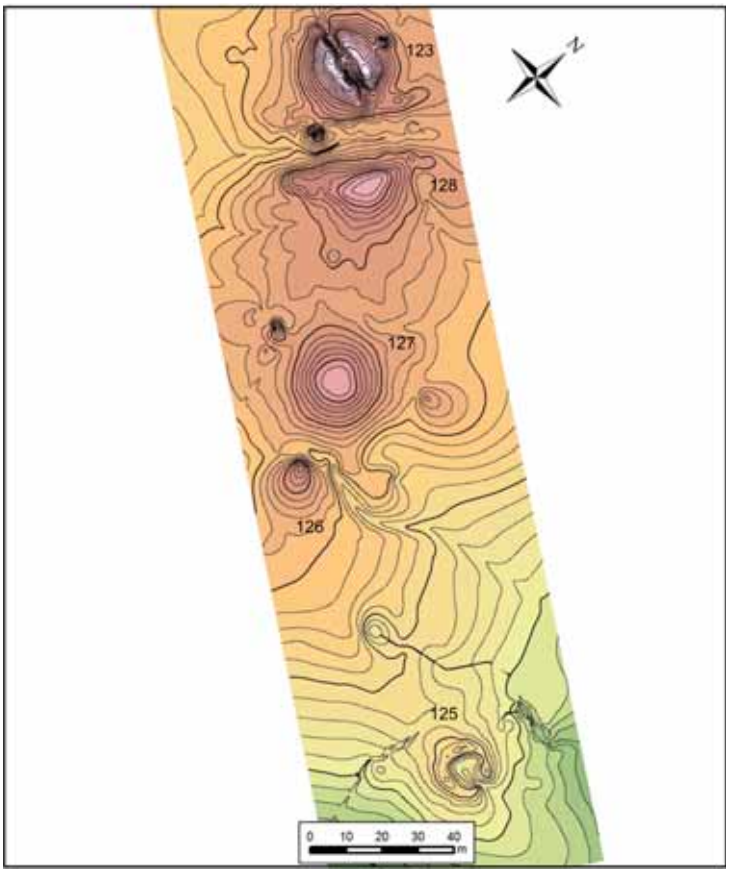



**Fig. XIV.3.** Digital Elevation Model of the barrow cemetery in Sirniki with numbering of barrows (without barrows 129 and 130)


**Fig. XIV.4.** Sirniki. Location of the cemetery using satellite imagery (Yandex)

**Barrow 123 (Fig. XIV.5, Fig. XIV.6)** – excavated in the 1930's (no. 1) – is located in the central part of the aforementioned barrow arrangement, at 422 m, between monuments 130 and 128, 130 m SE of the former and 13 m S of the latter. Geographic coordinates: N – 49°36'570"; E – 024°21'286". Circular in shape, 27 m in diameter, 3 m high. Visible trench from T. Sulimirski's excavations (Sulimirski 1968:146).

**Fig. XIV.5.** Barrow 123. View from the NW

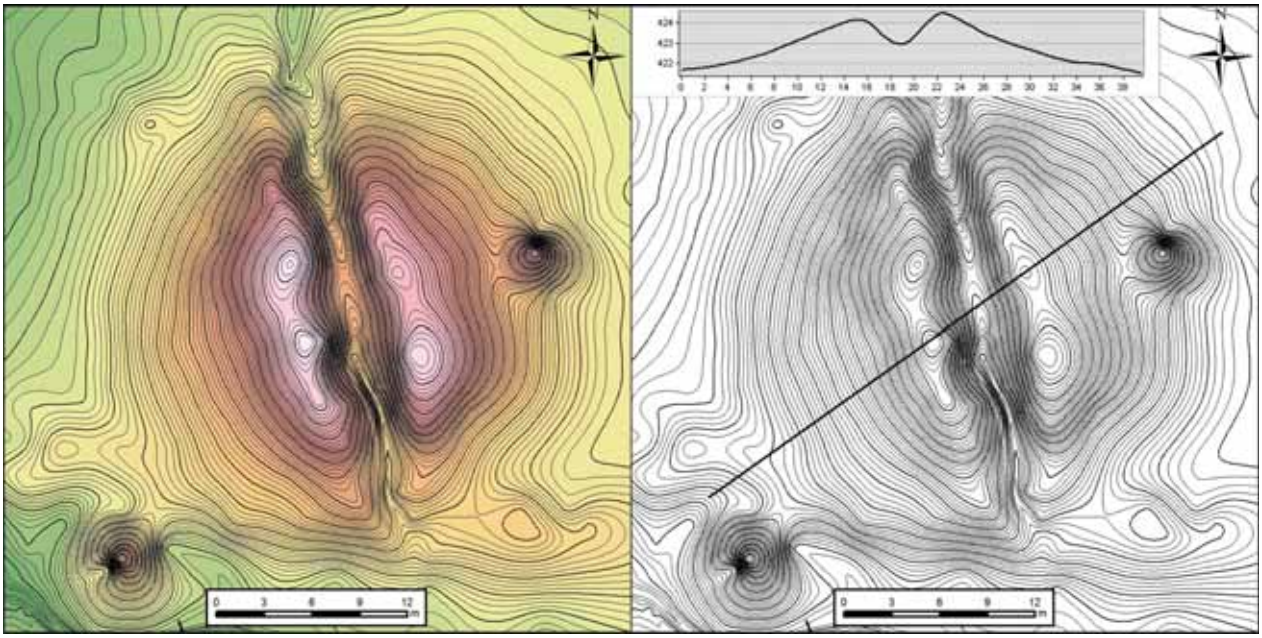


**Fig. XIV.6.** Barrow 123. Hypsometric plan and cross-section

**Barrow 125 (Fig. XIV.7, Fig. XIV.8)** – excavated in the 1930's (no. 2; Sulimirski 1968:146) – located on the SE edge of the barrow arrangement, at 422 m.a.s.l., 80 m S/SE of tumulus 126 and nearly 100 m S of mound 127. Geographic coordinates: N – 49°36'523"; E – 024°21'426". Circular in shape, 17 m in diameter, 1.5 m high. Visible circular dig-in measuring 8-9 m in diameter.

**Fig. XIV.7.** Barrow 125. View from the E

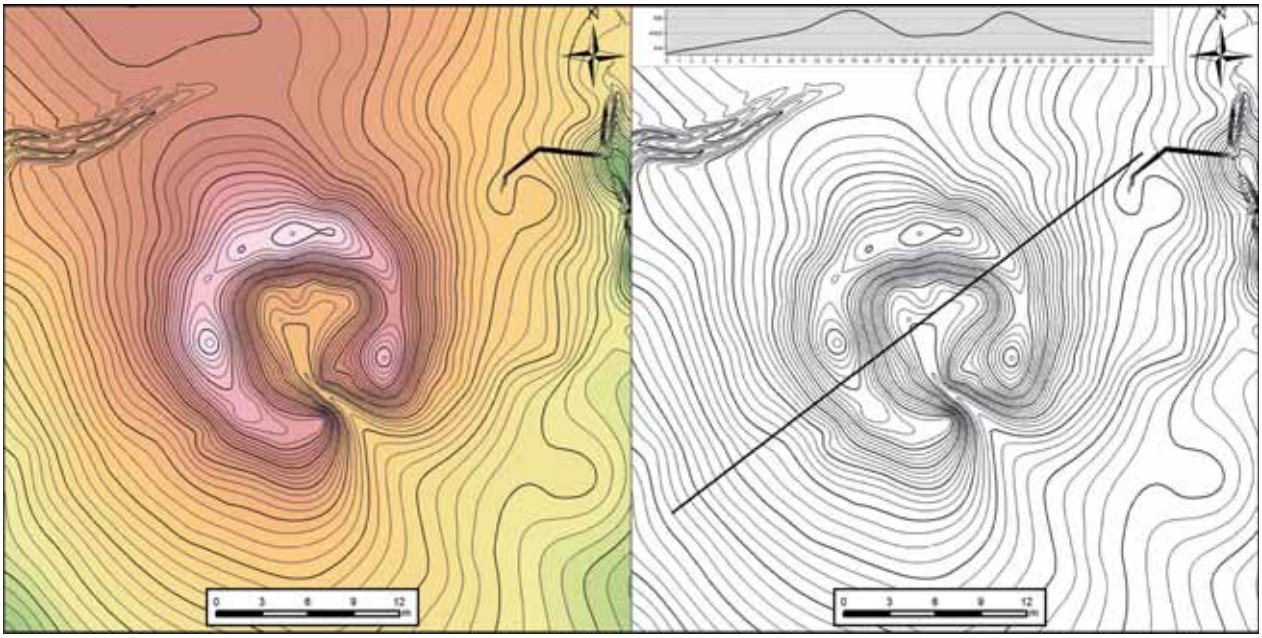


**Fig. XIV.8.** Barrow 125. Hypsometric plan and cross-section

**Barrow 126 (Fig. XIV.9, Fig. XIV.10)** erected on the SE edge of the barrow concentration, at 422 m.a.s.l., 10 m S/SE of mound 127 and nearly 80 m NE of monument 125. Geographic coordinates: N – 49°36'523"; E – 024°21'426". Circular in shape, 17 m in diameter, 1.5 m high. Visible circular dig-in measuring 8-9 m in diameter.

**Fig. XIV.9.** Barrow 126. View from the SE

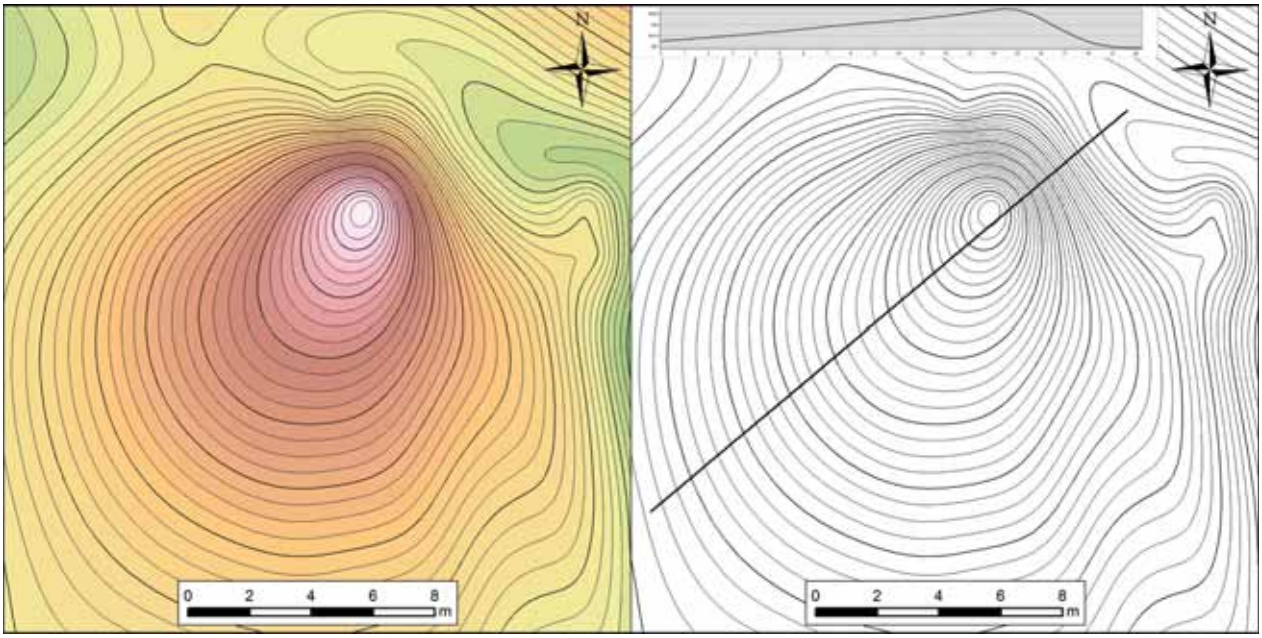



**Fig. XIV.10.** Barrow 126. Hypsometric plan and cross-section

**Barrow 127 (Fig. XIV.11, Fig. XIV.12)** situated in the middle part of the linear arrangement of barrows, at 421.5 m.a.s.l. between monuments 126 and 128, 10 m NE of the former and 35 SW of the latter. Geographic coordinates: N – 49°36'545"; E – 024°21'340". Oval in shape: 26 × 22 m, 1.8 m high.

**Fig. XIV.11.** Barrow 127. View from the SE

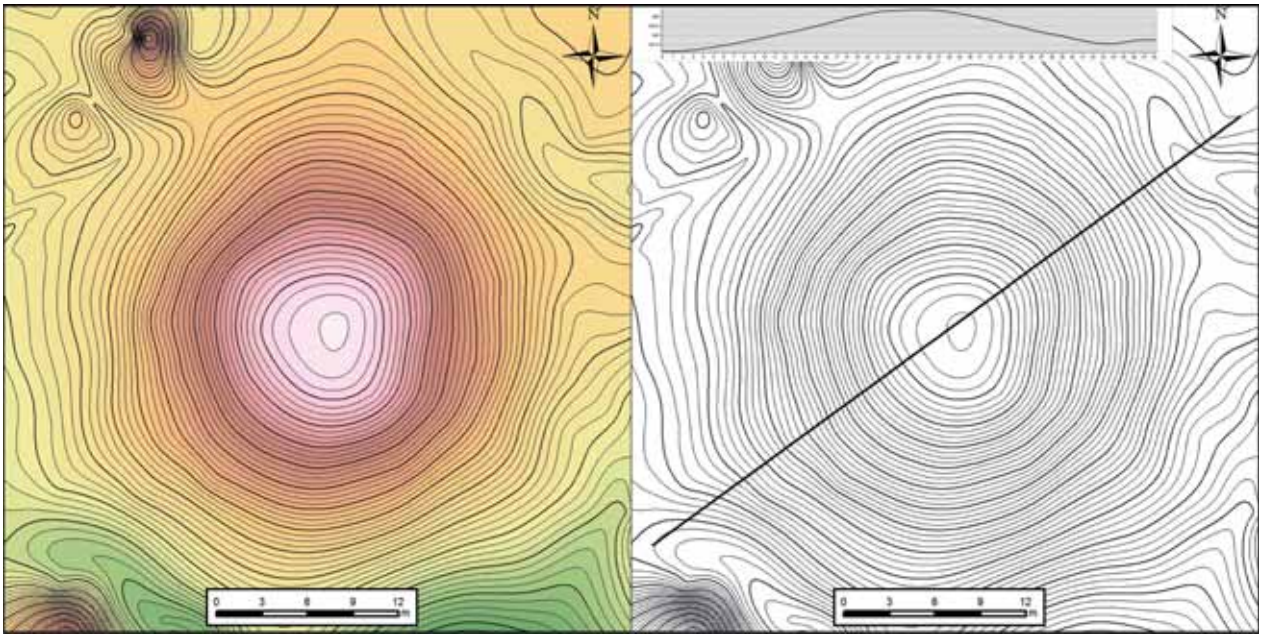



**Fig. XIV.12.** Barrow 127. Hypsometric plan and cross-section

**Barrow 128 (Fig. XIV.13, Fig. XIV.14)** was documented in the central part of the linear arrangement of monuments, at 422 m.a.s.l., between tumuli 123 and 127, 16 m S of the former and 35 m NE of the latter. Geographic coordinates: N – 49°36'564"; E – 024°21'298". Circular in shape, 30 m in diameter, 2 m high.

**Fig. XIV.13.** Barrow 128. View from the NW

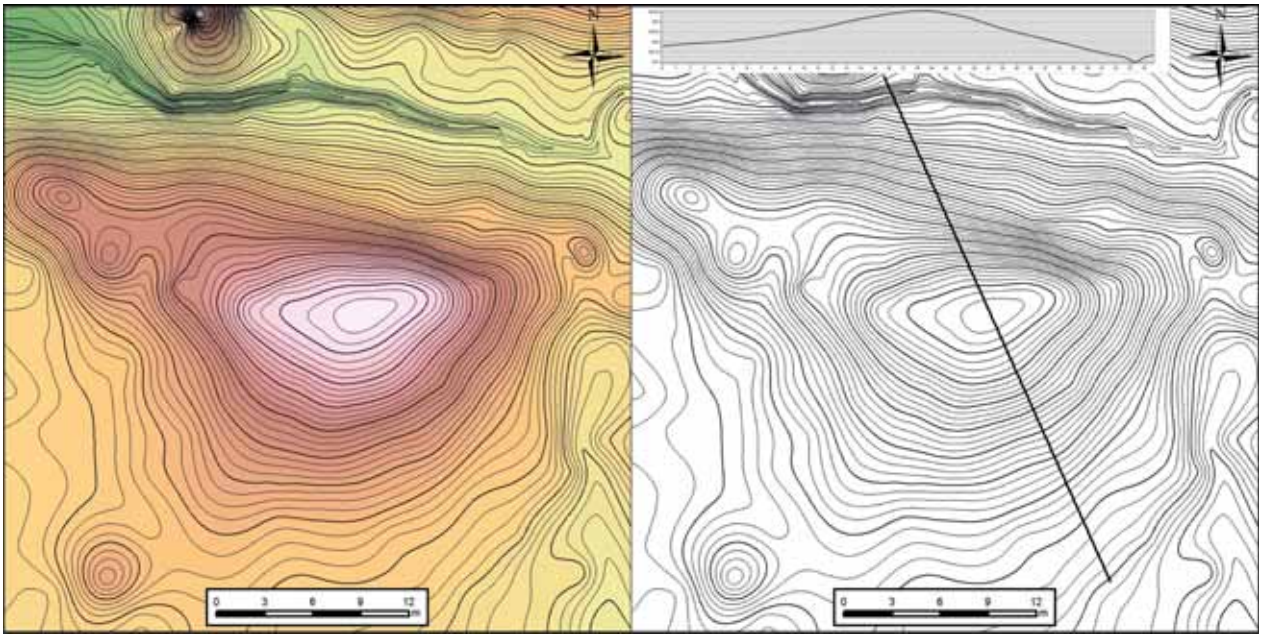


**Fig. XIV.14.** Barrow 128. Hypsometric plan and cross-section

**Barrow 129 (Fig. XIV.15, Fig. XIV.16)** is located NW of the barrow arrangement, at 424.5 m.a.s.l., 280 m NW of mound 130. Geographic coordinates: N – 49°36'758"; E – 024°21'091". Circular in shape, 33 m in diameter, 3 m high.

**Fig. XIV.15.** Barrow 129. View from the SW

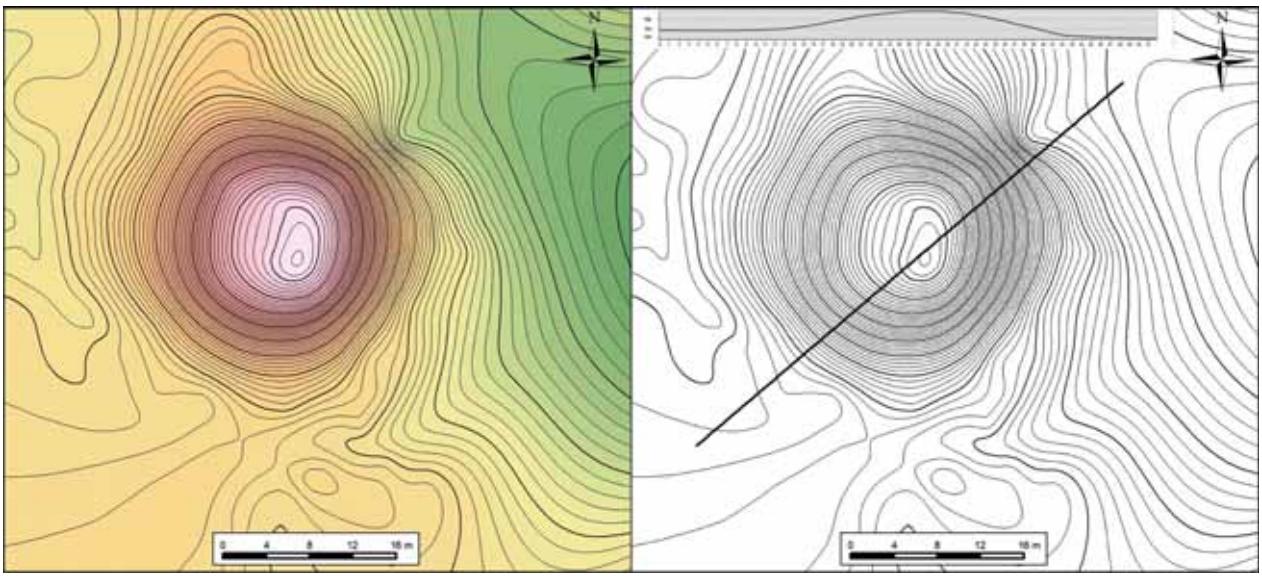


**Fig. XIV.16.** Barrow 129. Hypsometric plan and cross-section

**Barrow 130 (Fig. XIV.17)** – excavated in the 1930's (no. 3; Sulimirski 1968:146) – situated in the middle part of the linear arrangement of monuments, at 414 m.a.s.l., between tumuli 123 and 129, 130 m NW from the former and 280 m SE of the latter. Geographic coordinates: N – 49°36'634"; E – 024°21'249". Circular in shape, 16 m in diameter, 1.5 m high. Visible circular dig-in measuring 7 m in diameter. Subject to geophysical survey.

**Fig. XIV.17.** Barrow 130. View from the N

## C. Geophysical survey

Barrow 129, located on the site in Sirniki, can be regarded as the biggest sepulchral object surveyed magnetometrically in the field season 2015. Measurements were carried out within a quadrangular surface comprising of four 20 × 20 m grids, however dense vegetation allow only for 1 m-spaced profiles. Moreover, trees often were forming obstacles during the passage of the instrument along the transects. Hence, it was necessary to skip some measurements in order to bypass them, as visible by light grey spots on resulting image. In total surveyed area measures 0.16 ha (**Fig. XIV.18**). The significant height of the tumulus, reaching 2 m, caused concerns about the accuracy of sampling. These may stem from incorrect positioning of the gradiometer when moving up and down the slopes and the fact that measurements won't be registering the same stratigraphic layer of the embankment. Nevertheless, the visibly good state of preservation, in comparison to other mounds on the necropolis, leads to its selection for the survey.

The resulting image does not reveal distinct differences in the magnetisation of the embankment and

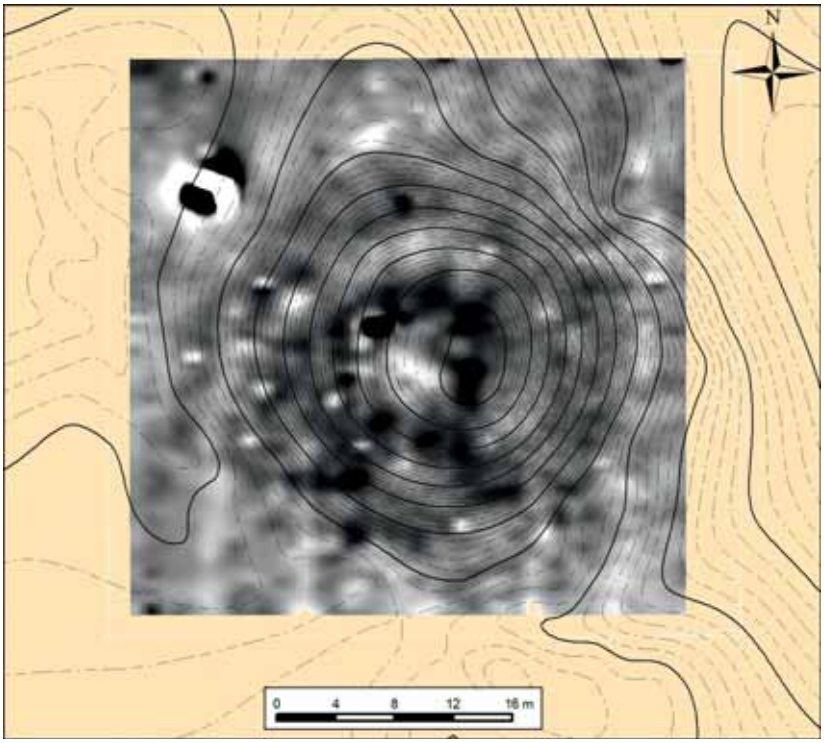



**Fig. XIV.18.** Sirniki. Position of geophysical survey (barrow 129)

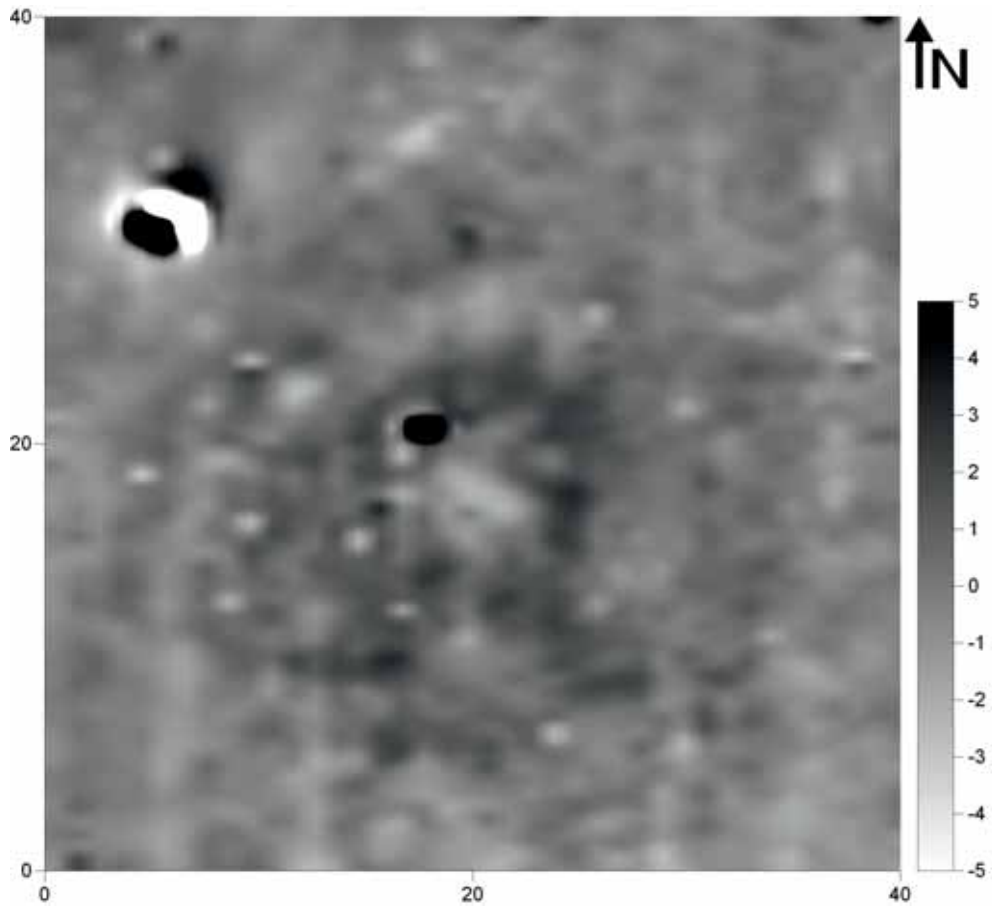



**Fig. XIV.19.** Resulting image of magnetometric survey of the barrow no. 129 on the site in Sirniki (gradiometer Bartington Fluxgate Grad 601-1; measuring grid: 20 × 20 m; sampling density per transect spacing: 0.25 × 1 m, interpolated up to 0.25 × 0,5 m; real values of magnetic field gradient compressed in greyscale to the range -5 – +5nT)

surrounding context (**Fig. XIV.19**). Nonetheless, the spatial limits of the embankment can be distinguished due to the irregularly-shaped zone of higher magnetic susceptibility located in the centre of the area and corresponding with the elevation (**Fig. XIV.20**; Fig. XIV.17). Furthermore, in the NW grid the gradiometer managed to capture a crescent-shaped anomaly, consisting of values below 0nT, however despite its outline it does not correspond with the actual limit of the mound. Perhaps the anomaly illustrates the internal element of the mound's construction, such as ring, or upper soil layer composed of material with very low magnetic susceptibility. From N, NW and W it encircles a roughly rectangular anomaly, also characterized by negative response, which is oriented with a longer side along NW – SE axis.

The two discussed signals are separated by a narrow strip of terrain encircling the central section of the monument and revealing an increased magnetisation. While it is tempting to consider a rectangular anomaly along with surrounding, circular zone of positive values as representation of grave structure, one should remember about the large size of the mound. It is likely that the embankment, with a level of magnetization not differing too much from that of the context, conceals all the internal features with a thick earthen mantle, thus making it impossible to detect their anomalies with a hand-held gradiometer. Nearby the NW edge of the rectangular anomaly a strong signal is visible, characterized by magnetization strength reaching 5nT.

The strong contrast between the two prompts considerations, whether the source of the latter is a highly magnetic feature of the barrow, or, in fact, the effect of a much later event, such as a fireplace on the top of the embankment. Surely a modern origin can be ascribed to the abnormally polarized anomaly, situated in the NW corner of the survey area. Most probably, it is a ferrous object that has been deposited shallowly under the top soil. A thorough rec-

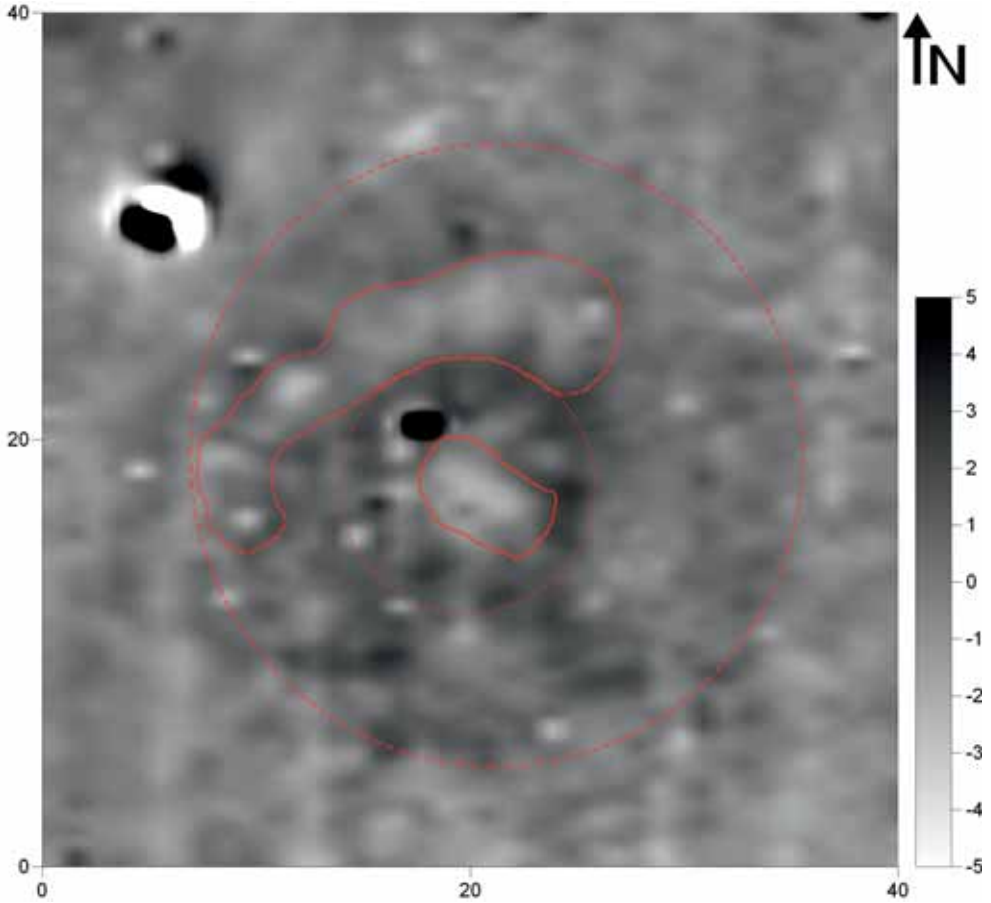



**Fig. XIV.20** (down). Resulting image of magnetometric survey of barrow no. 129 on the site in Sirniki with highlighted anomalies discussed in the text.

--- approximate spatial extent of positive anomaly potentially signifying spatial extent of the barrow

-·- approximate spatial extent of the series of a crescent-shaped negative anomaly potentially reflecting an internal feature of the barrow

··· approximate spatial extent of circular zone with positive level of magnetisation, enclosing the barrow's centre

— rectanular-shaped, negative anomaly located in the centre of the barrow

ognition of the sources of the described anomalies should be conducted by means of other archaeological methods.

## D. Archival information

### Sarniki, district of Bóbrka (after Sulimirski 1968:146-147)

*A group of six barrow-graves in a line running SE – NW for 700 m was situated on the summit of a hill in the 'Kamionki' forest (Sulimirski 1968, Plan 5:1). More barrow-graves on the same hill lay in the territory of the neighbouring villages Łanki Male (to SE) and Żabokruki (to NW). I excavated three of these barrow-graves in 1931 and 1935 (Sulimirski 1935:22), as well as a fourth in the 'Grabowiec' forest. All grave goods were deposited in the Institute of Prehistory of Lwów University.*

*Barrow-grave I (Sulimirski 1968, Plan 36:1) was the largest, situated in the centre of the group and 27 m in diameter, 2.5 m high. It was overgrown with large beech trees so that investigation was restricted to digging across (SE – NW) a trench 3 m wide, widened in the centre to 5 m. A battle-axe of granite, 9.3 cm long, a flat almost triangular bronze dagger (Sulimirski 1968, Fig. 19:23) 9 cm long with no middle rib, bearing three rivet holes, a flint scraper 4.4 cm long were found near the centre of the barrow (a), at a depth of 60 cm in the mound: they were side by side. The grave-shaft, 2 by 1.5 m, rectangular, with rounded corners and orientated W – E was*

*found under the mound, in the centre of the barrow. It was dug some 50 cm into the yellow subsoil and reached to a depth of 3 m from the top of the mound. Nothing was found, nor was it possible to discern any traces of the skeleton.*

*Barrow-grave II. This was the most easterly of the group, and was 20 m in diameter, 50 cm high. Its cross-section was as follows: 20 cm of ashy forest humus, then a dark ash-coloured mound 35 cm deep. Fossil humus occurred under this at a depth of 55 cm and reached to 90 cm depth, being dark, entirely black in places, with a very large number of hamster holes. Below, it gradually gave way to an increasingly yellow colour, with hamster holes. Pure virgin soil occurred at 1.2 m from top of the mound. Nothing was found in this barrow-grave.*

*Barrow-grave III (Sulimirski 1968, Plan 36:2) was situated 80 m NW of barrow-grave I, and was 18 m in diameter, 60 cm high. Its cross-section was similar to that of barrow-grave II. Some scattered lumps of charcoal (e) and several calcined sandstones (h, j) lay near the centre on the ancient surface, irregularly covering an area of about 2 by, 1.5 m, orientated approximately W – E. This was undoubtedly the position of the burial though no traces of skeleton could be discerned. A flint knife (c) (Sulimirski 1968, Fig. 17:10) 9 cm long was lying 3.5-4 m N of this spot, with a flint scraper (f) (Sulimirski 1968, Fig. 17:15) 6 cm long at a distance of 1 m from it, to the SW. Several potsherds (a, d) were found about 2 m W of the grave, also on the ancient surface. They derived from one large vessel, made of grog gritted clay, black inside and the exterior being streaked with red slip.*

*Barrow-grave IV (**Fig. XIV.21**; Sulimirski 1968, Plan 36:3, 3a). This isolated barrow-grave was in the 'Grabowiec' forest, on a hill west of the village. It was 18 m in diameter, 1 m high. Small lumps of charcoal, small single potsherds and flint flakes were found both in the top of the mound and deeper in it. They occurred mainly in a circle about 6 m in diameter around the centre of the mound. The rectangular grave-shaft (A) 1.6 by 1.1 m, orientated NE – SW and dug about 25 cm into the ancient ground was found at 1 m depth, on the ancient level.*

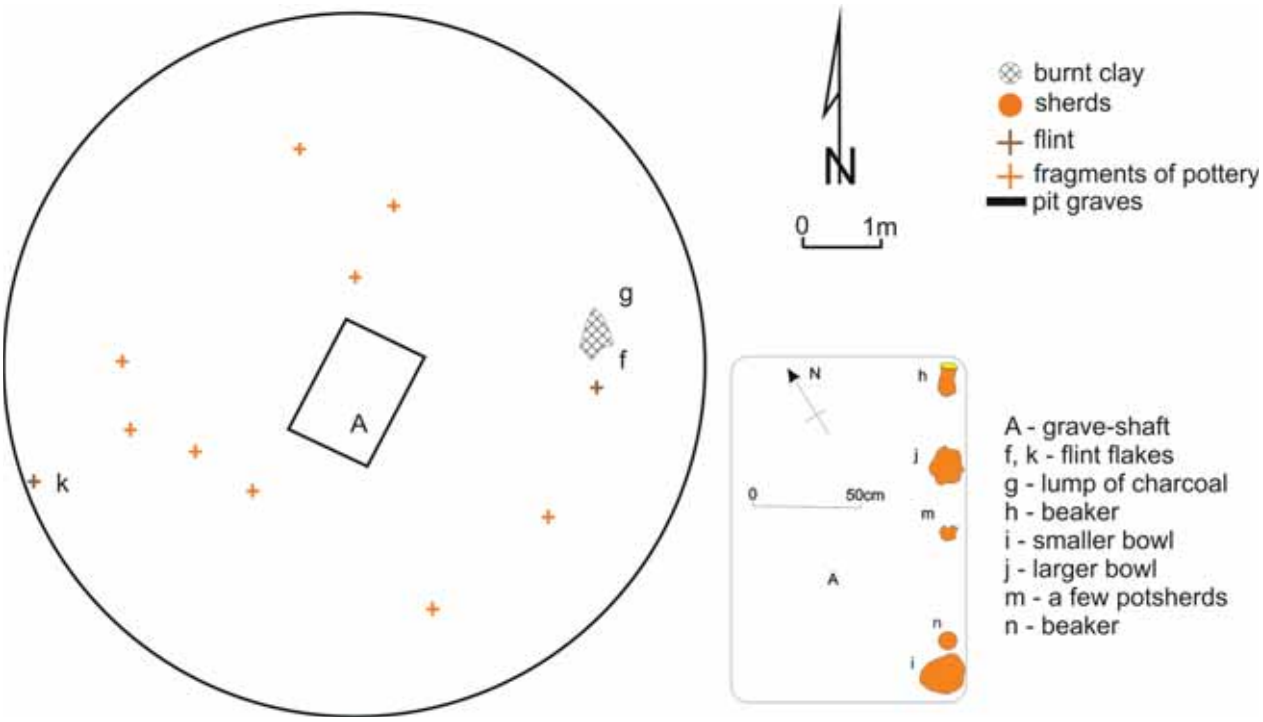



**Fig. XIV.21.** Digitalized plan of barrow IV (Sulimirski 1968, Plan 36:3, 3a)

*Four vessels were standing on its bottom, along the SE wall: these were a tulip-shaped beaker (h) (**Fig. XIV.22**; Sulimirski 1968, Plate 18:1) in the north corner, which was 14.6 cm high, 13 cm in diameter, with five grooves round the shoulder and a raised band; one larger bowl (j) (**Fig. XIV.23**; Sulimirski 1968, Plate 17:3) 12.5 cm high and 19 cm in diameter, with six parallel grooves round the neck and a zigzag line, shaded triangles, oblique im-*

**Fig. XIV.22.** Pot, type G111, ornamented on the neck with six horizontal incised lines and a horizontal relief strip underneath them. Thickened rim, cut outwards, base slightly marked. H – 25.5 cm, R1 – 20.5 cm, R2 – 18.7 cm, R3 – 21.8 cm, R4 – 12 cm (photo: Sulimirski 1968, Plate 18:1)

**Fig. XIV.23.** Vase, type W21, ornamented circumferentially with seven horizontal incised lines, on the body – alternately – with six oblique incised lines, pointing with their tops alternately left or right, between them, three circular impressions arranged horizontally. Thickened rim, cut semicircularly; marked base. Temper of crushed stone and flint. H – 13.5 cm, R1 – 20.8 cm, R2 – 17.5 cm, R3 – 20.5 cm, R4 – 8.7 cm

*pressions and dots immediately on the upper part of the body. A smaller bowl (i) (**Fig. XIV.24**; Sulimirski 1968, Plate 17:6) was standing in the southern corner of the grave: it was 11 cm high, 17.5 cm in diameter, with six parallel grooves on the shoulder and the body covered by deep oblique fluting. The surface was carefully polished, shining in some places. An ornamented beaker (n) (**Fig. XIV.25**; Sulimirski 1968, Plate 18:11) 9.5 cm high, 9.6 cm in diameter was standing near the previous bowl; it was entirely covered with an incised ornament consisting of groups of vertical grooves divided by strips filled with oblique lines. It was carefully made. No skeleton was found, though slight traces warranted the hypothesis that it had been lying head SW.*

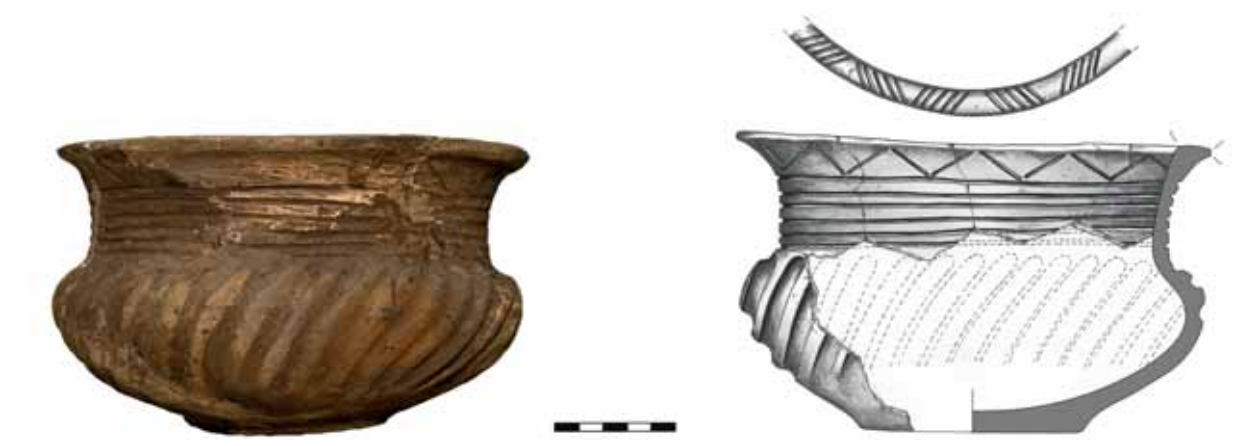


**Fig. XIV.24.** Vase, type W21, ornamented circumferentially with seven horizontal incised lines, on the belly — alternately —with six oblique incised lines, pointing with their tops alternately left or right, between them, three circular impressions arranged horizontally. Thickened lip, cut semicircularly; marked base. H – 25.5 cm, R1 – 20.5 cm, R2 – 18.7 cm, R3 – 21.8 cm, R4 – 12 cm.

**Fig. XIV.25.** Beaker, type P1a, ornamented on the whole surface alternately (top to bottom) and circumferentially with motifs of multiple angles and four horizontal incised lines. The pattern is triplicated; in the upper row, angles are formed from four incised lines; in the other rows — from five. Rounded rim; marked base. H – 11.3 cm, R1 – 11.4 cm, R4 – 8 cm (photo: Sulimirski 1968, Plate 18:11)

# XV. Cemetery in Stopczatów/Stopchativ (Fig. XV.1)

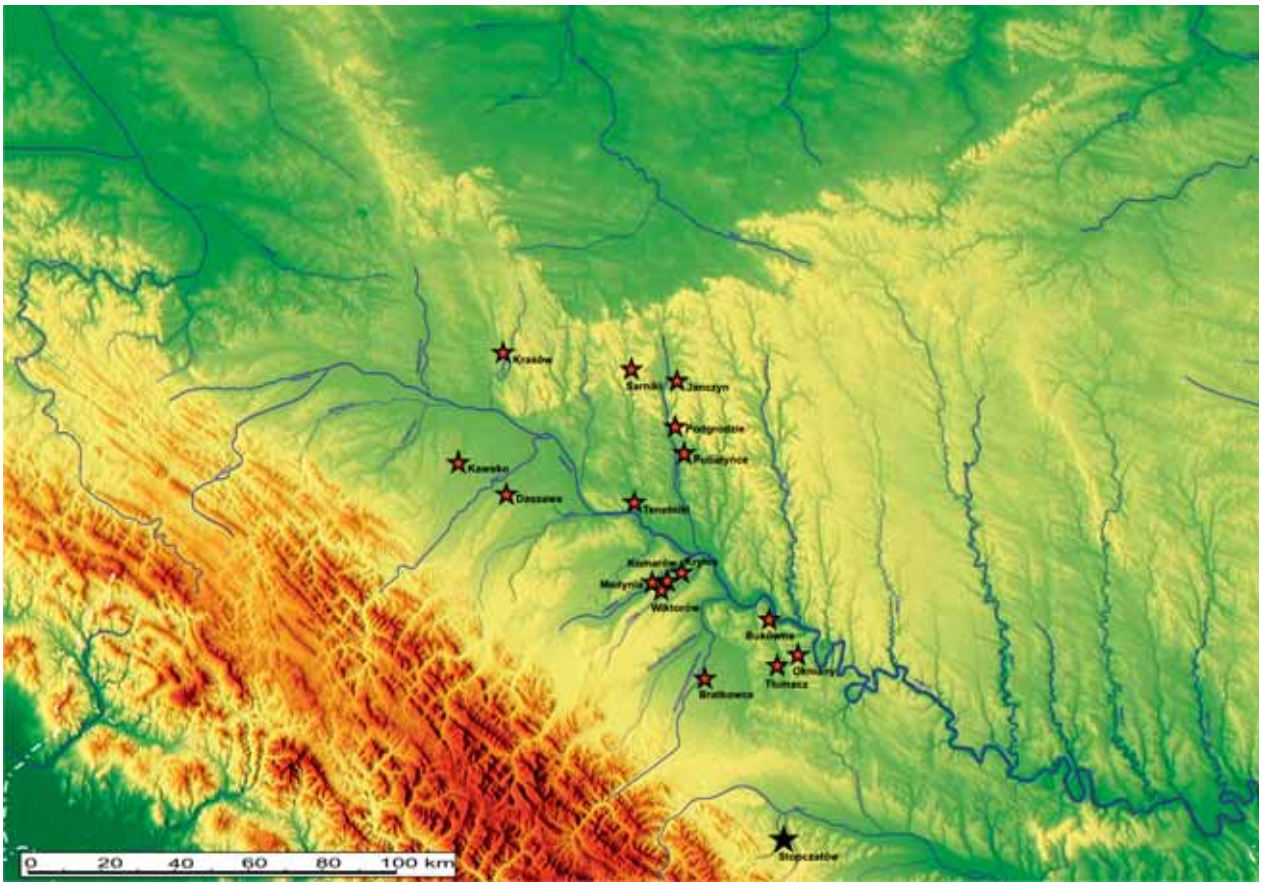



**Fig. XV.1.** Location of the cemetery in Stopczatów in relation to other barrow necropolises

## A. Geographical description

The necropolis in Stopchativ is located near the Luchka river, which is a tributary of the Prut. Luchka and Pistynka (second tributary of Prut located more eastwards) in their lower course, which are approaching each other, forms a wide and swampy valley of latitudinal mileage. The barrows are situated on the bench terrace, in the edge zone of the Luchka valley and its left tributary – the Krasnik River.

The area between the Prut and Luchka is known as the Prut-Luchka Height. It presents a denudation-accumulation or denudation-erosion type of land relief. The highest elevations in this area were recorded

on the Sloboda Runguska Podgirie and in Oslavska Valley that is 400-500 m.a.s.l. and alternate in the direction to the mountains where they exceed 500 m.a.s.l. Relative heights in this region ranges between 100 and 130 m.

In geomorphological terms the entire region can be divided into two minor sub-regions: the Piechenizhinski and Oslavski (Kravchuk 1999). The first is characterized by a domination of the denudation-accumulation level of the Loieva (VI terrace). The thickness of clayish-loamy cover varies between 4 and 6 m. Near the Sloboda Runguska these layers are mixed with the sediments of pediments. In some places the level of terrace VI is covered by diluvium sediments (slope sediments). Their thickness is estimated to 1-1.5 m. The entire region is defragmented into hilly clumps by the Prut and its tributaries. The area between the Prut and Luchka Runguska is more compact and aligned in surface, while more to the east approaching the Luchka Yablonivska river the terrain become more diversified. The main characteristic is the occurrence of numerous inselbergs above the surface. Adjacent to the south in the direction of the Carpathians Mountains a second region of structural background is present – the Oslavska Valley. This area is located on a syncline with infill of pediment sediments. For the upland of the Prut and Luchka the most typical processes are the ground runoffs, linear creep and landslides that are provoked also by tectonic movements of the Carpathians (Kravchuk 1999).

The barrows lie in the lower part of the upland on altitudes of 320 m.a.s.l. The maximum height in the proximity of the mounds is around 422 m.a.s.l. while the bottoms of the valleys are elevated at 300 m.a.s.l. The occurrence of the burial mounds is atyp-

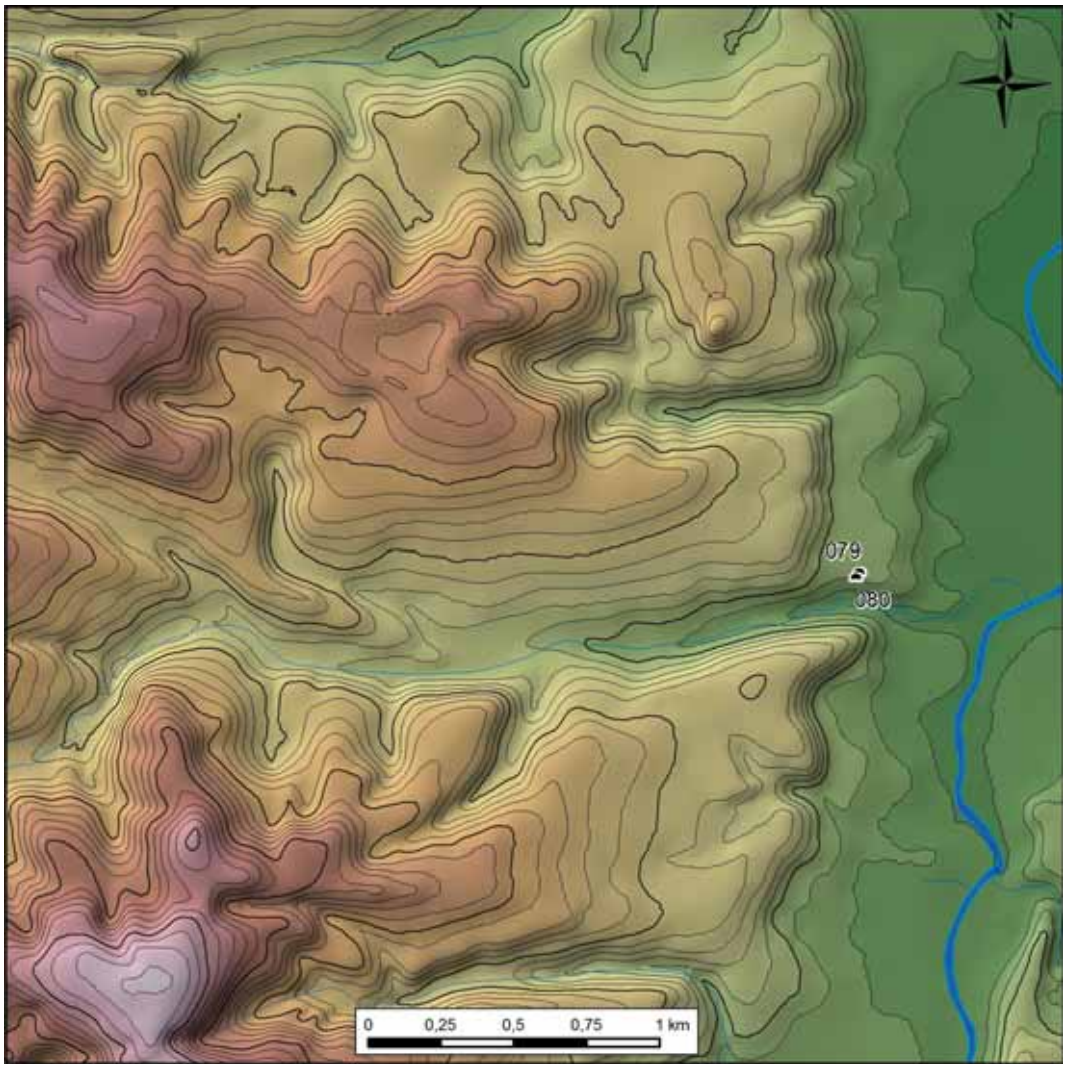



**Fig. XV.2.** Digital Elevation Model of the barrow cemetery in Stopchativ


**Fig. XV.3.** Stopchativ. Location of the cemetery using satellite imagery (Yandex)

ical since they do not lie in the upper parts of the slopes or summits but at a lower slope of the valley elevated 20 m above the bottom. Worthy of notice is that the systems of the Luchka and Pistynka valleys connect near the placement of tumuli. This created a vast lowland of the valley and is used by the aforementioned rivers.

## B. Spatial arrangement of the cemetery and description of the barrows

Two potential barrows (nos. 79 and 80) were recorded on a hill located on the upper terrace of the Luchka River, 450 m W of the river-bed, ca. 100 m NW of the Kolomyia-Yabloniv road (**Fig. XV.2, Fig. XV.3**). Mounds recorded on the fallow field currently used as a pasture, were heavily levelled. Almost 2 km away from them, beyond the mapped area, were two additional monuments covered with trees.

**Barrow 79 (Fig. XV.4)** was located 20 m NE of a barrow 080, at 321.5 m.a.s.l. Geographic coordinates: N – 48°26'055"; E – 024°59'408". Mound destroyed by ploughing. The visible part – 10 m in diameter, 0.4 m high. Subject to geophysical prospection.

**Fig. XV.4.** Barrow 79. View from the S

**Barrow 80 (Fig. XV.5)** located 20 m SW of tumulus 079, at 321 m.a.s.l. Geographic coordinates: N – 48°26'046"; E – 024°59'399". Tumulus destroyed by ploughing. Visible part – 9 m in diameter, 0.3 m high. Subject to geophysical prospection.

**Fig. XV.5.** Barrow 80. View from the N

## C. Geophysical survey

In April 2015 it was decided to conduct a mangetometric survey on the site in Stopchativ – a former prehistoric cemetery, where some barrows have been excavated at the beginning of the 20th century (Smishko 1960; Sulimirski 1968:153f.). Similarly to the case of Putiatyncy, the survey here was targeted at a detection of any potential remains of monuments, not visible any longer in the terrain. The area subjected to measurements, from the geomorhological point of view, is situated on the terrace of the Luchka river valley, currently used as pasture, hence the open character of the site (**Fig. XV.6**). Despite the apparent accessibility for geophysical survey, terrain in the discussed place abounds in many modern transformations that, due to their character, could significantly affect the quality of the data acquired during prospection. The main obstacle present on the site was energetic installation in the form of pylons made of steel and concrete, thus itself generating an extensive, as well as intensive magnetic field. Moreover, it

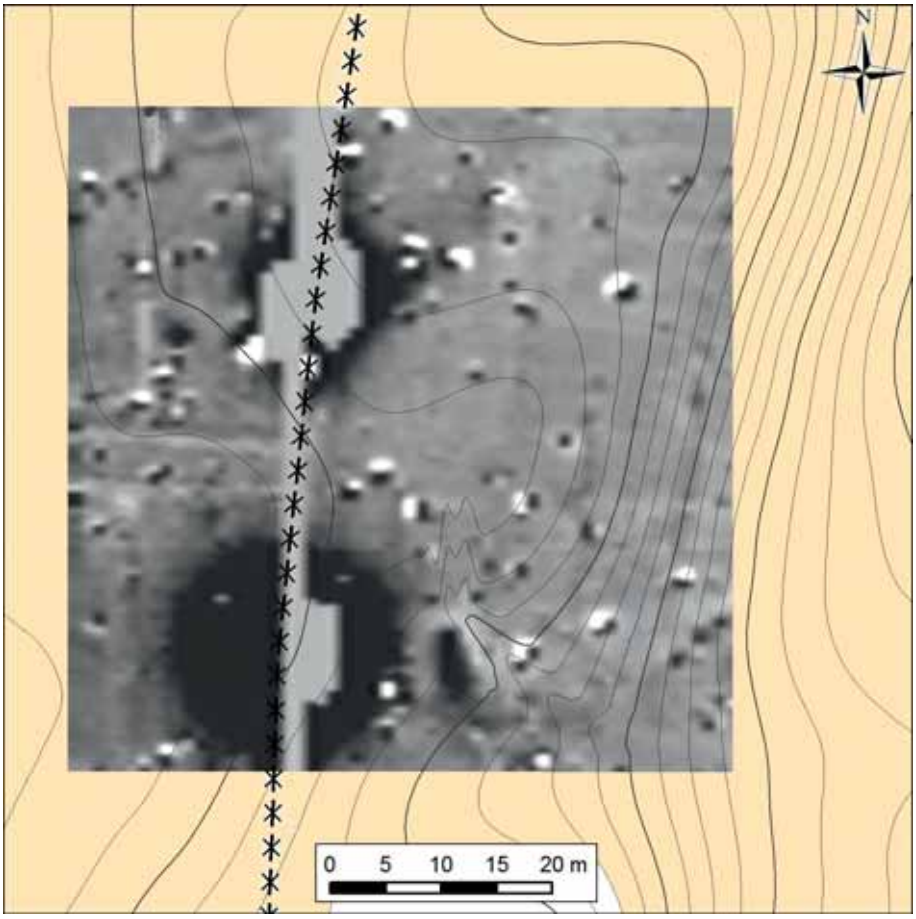



**Fig. XV.6.** Stopchativ. Position of geophysical survey

was expected that underneath the surface of the pasture frequent metal pieces are located, left there in the course of agricultural works or other activities. Considering the above listed constraints, the measurement framework consisting of nine grids, each with dimensions of 20 × 20 m, was established in the form of a square with the side length reaching 60 m. In the total surveyed area covered 0.36 ha.

The results of the survey do not reveal anomalies potentially reflecting the remains of prehistoric barrows (**Fig. XV.7**; Fig. XV.6). The surface of the terrain indicates a level of magnetization on average amounting to 2nT, thus creating a context for strong anomalies emitted by the aforementioned modern elements of the landscape. The latter are clearly discernible in case of pylons, that despite the efforts to distance the gradiometer from them during measurements (grey strips visible on Fig. XV.7 along the 20 m of the horizontal axis), substantially disturbed the image.

Their magnetic fields extend in the diameter of approximately 20 m in case of the first pole located in the southern part and 10 m in case of the other, located further in a northern direction. Furthermore, on the entire area there are scattered sources of residual magnetization, resulting in strongly polarized anomalies with differing orientation of dipoles. These are most probably objects of modern origin, with a high ferrous content. Apart from that, a single anomaly situated on the eastern side of the southern pylon draws attention (**Fig. XV.8**). It is characterized by a positive peak of magnetization, reaching 5nT, surrounded from N, W and E by a thin halo of negative values. With its shape the discussed anomaly resembles a rectangle with rounded corners, oriented with its longer side along a N – S axis.

The origin or substance of the source generating this anomaly is hard to estimate, however one has to note its structural difference from the other signals registered on the site. Perhaps this is an underground feature, containing material with a higher magnetic susceptibility in relation to the context. Nevertheless, it is still unlikely that it is connected to a barrow or its remains.

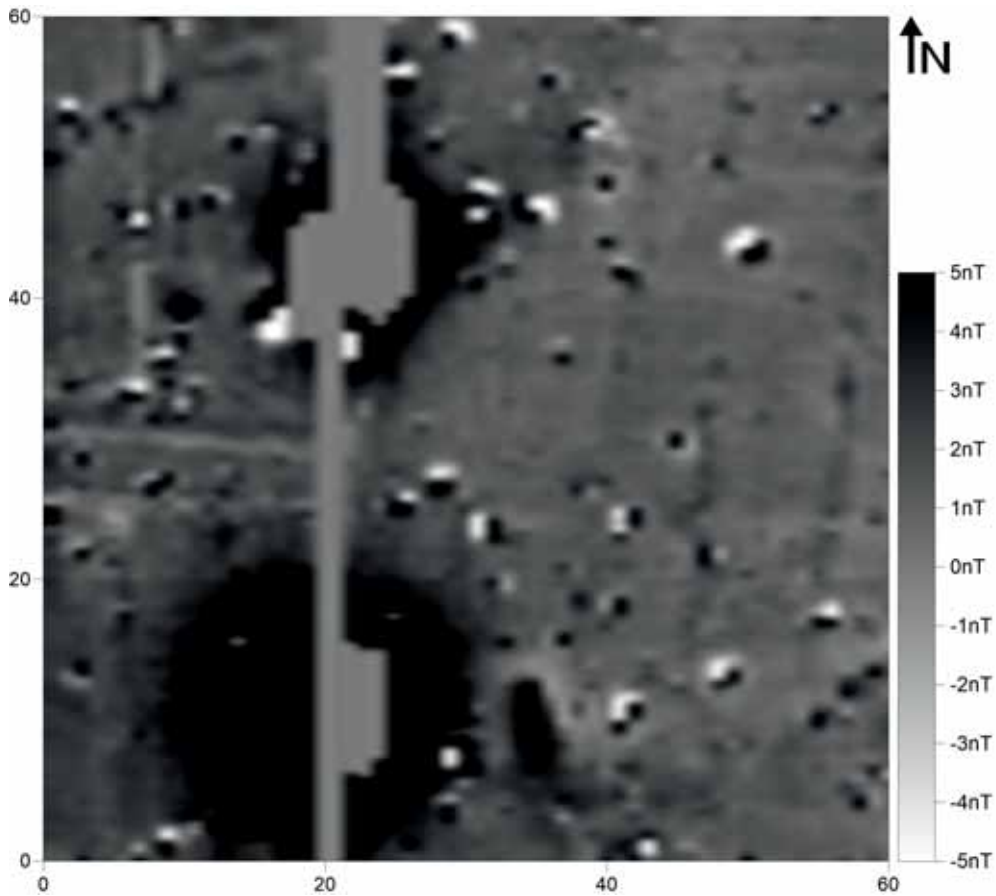



**Fig. XV.7.** Resulting image of magnetometric survey on the site in Stopchativ (gradiometer Bartington Fluxgate Grad 601-1; measuring grid: 20 × 20 m; sampling density per transect spacing: 0.25 × 1 m, interpolated up to 0.25 × 0.5 m; real values of magnetic field gradient compressed in greyscale to the range -5 – +5nT)

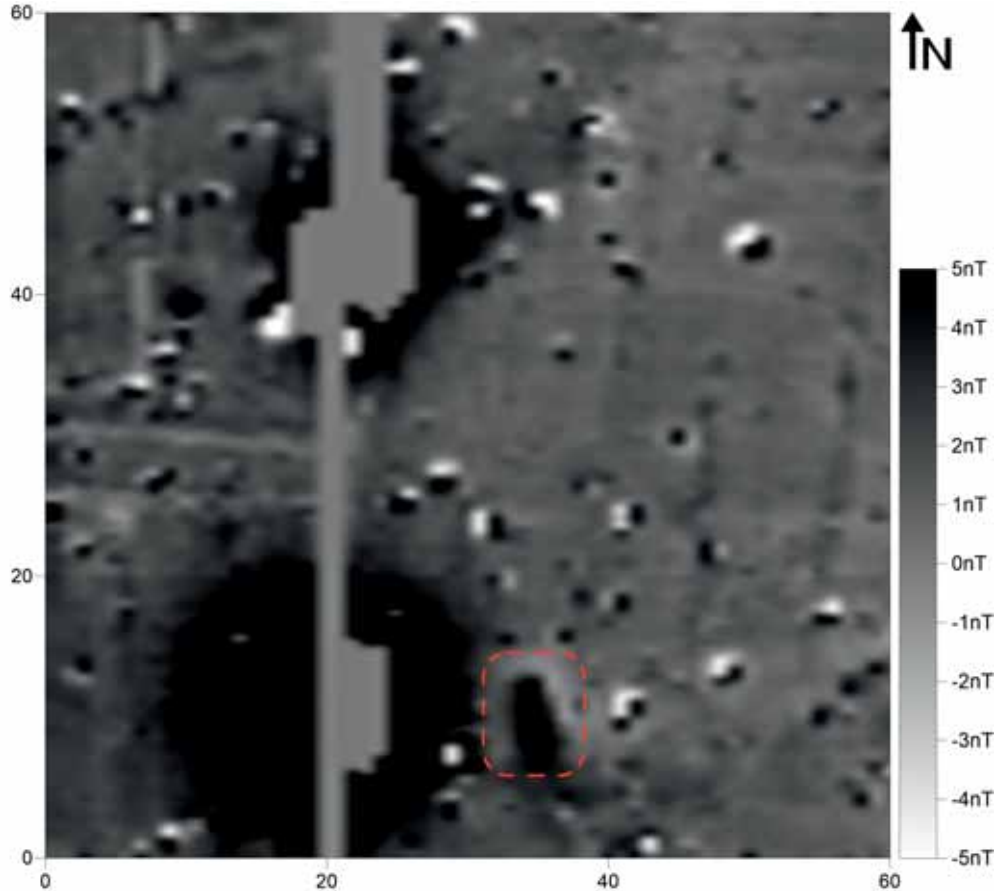



**Fig. XV.8.** Resulting image of magnetometric survey on the site near Stopchativ with highlighted anomaly discussed in the text.

--- approximate spatial extent of normally polarized anomaly with a rectangular shape that indicates an underground feature

## D. Archival information

### Stopczatów, district of Kołomyja (after Sulimirski 1968:153-154)

*A barrow-grave was excavated here in 1936 by Dr M. Śmiszko. It lay on a hill about 100 m NW of the main Kołomyja-Jabłonów road (**Fig. XV.9**; Sulimirski 1968, Plan 40:2).*

*The cross-section was as follows: 40 cm upper humus, with the mound beneath and the ancient level at 80 cm deep, fossil humus below this differing little in colour from the mound and deeper merging into virgin soil composed of diluvial gravel. Traces of an oval hearth 2.5 by 2 m, orientated SW – NE were found 60 cm deep, near the centre of the mound on the southern side (A).*

*Two heaps of calcined human bones with some pottery fragments among them were found on its eastern side (b, c). About 1 m SW of them were two small pits about 35 and 45 cm in diameter, 12 and 14 cm deep, filled with remains of pyre and charcoal, calcined bones and pottery fragments (l, m). A much damaged bronze clasp was lying on the NE periphery of the hearth (f). Groups of charcoal and burned clay about 30 cm in diameter were found NW of the hearth (e) and about 1 m from the centre of the mound, with a heap of charcoal and burned clay about 1 m further away in the same direction, among which half a bronze horse-bit was found (d). A larger fragment of a vessel was found on the SW periphery of the mound (k) under the humus. This grave dated from the sixth century, i.e. the Migration Period (Smishko 1960:27f.).*

*The grave (A) described above was a secondary burial, placed on a barrow-grave of the Middle Bronze Age. Three vessels (i) a small bowl (**Fig. XV.10**; Sulimirski 1968, Plate 20:12) a handled bowl and a handled cup (**Fig. XV.11**; **Fig. XV.12**; Sulimirski 1968, Plate 19:2, 3) were found standing side by side in a small hollow reaching to the gravel 3 m E of the centre. A tulip-shaped vessel (a) (**Fig. XV.14**; Sulimirski 1968, Plate 20:1) was*

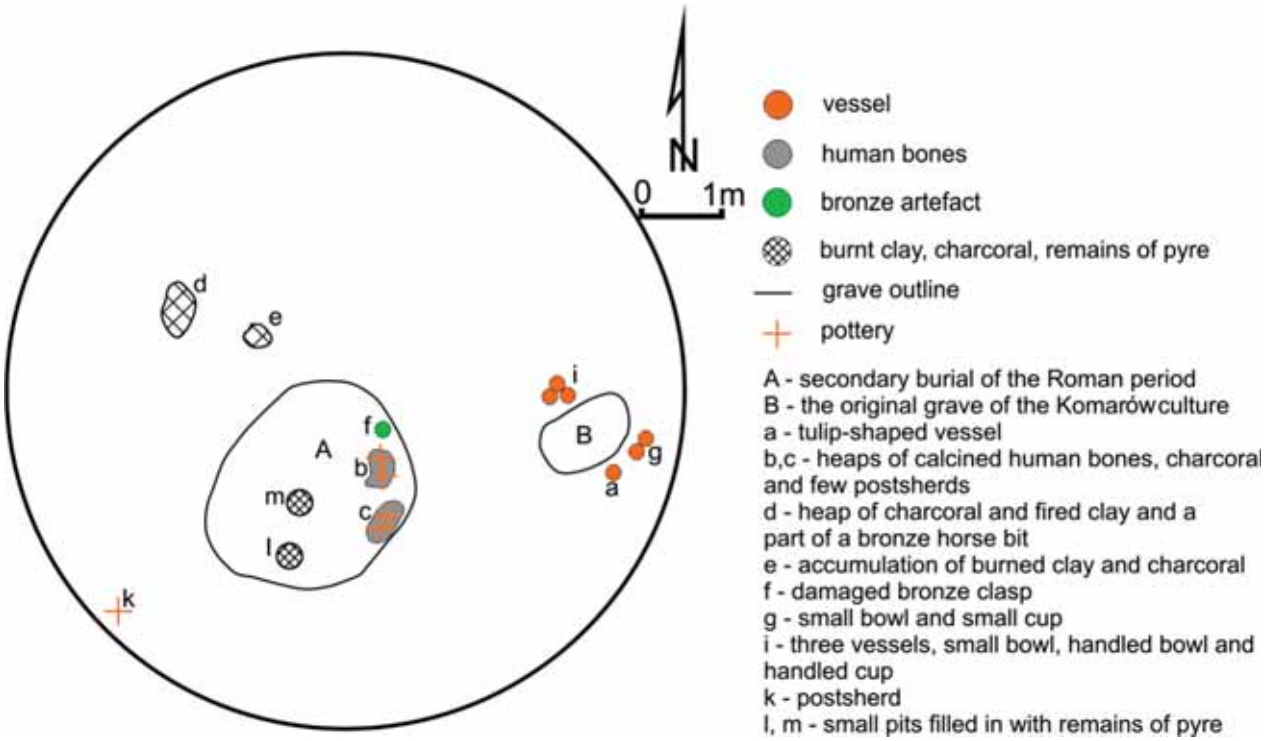



**Fig. XV.9.** Digitalized plan of the barrow (Sulimirski 1968, Plan 40:2)

**Fig. XV.10.** Bowl, type M22, plain. Rounded rim; unmarked base. H – 6.1 cm, R1 – 13.5 cm, R4 – 5.6 cm (photo: Sulimirski 1968, Pl. 20:12)

*about 1 m from them to the SE, lying on its side on the ancient level. Two small vessels, a small bowl and a cup (g) (**Fig. XV.13**; **Fig. XV.15**; Sulimirski 1968, Plate 20:6, 9) were standing in a small hollow penetrating to the gravel. All these vessels were typical of the Komarów culture. This was the site of the original grave (B).*

*The tulip-shaped vessel (a) (Sulimirski 1968, Plate 20:1) was 17.7 cm high, its body diameter 15 cm, the surface very rough, sand and stone gritted ware, poorly baked and brittle. The small bowl (i) (Sulimirski 1968, Plate 20:12) was 5.5 cm high and 13.5 cm in diameter, made in the same way. The handled cup (Sulimirski 1968, Plate 19:3) found by it, was 12 cm high, 15 cm in diameter, covered with a thin layer of slip: it was decorated with four flutings placed horizontally on the neck, with vertical grooves on the upper part of the body. Protuberances symmetrically placed on the curve of the body were each encircled by semicircular double-fluted grooves. Its wide handle 3.5 cm wide was ornamented with three fluted grooves running along it from top to*

**Fig. XV.11.** Cup, type K22, ornamented circumferentially on the body with short, oblique incised lines, below, with groups of incised arches (festoons) in sets of four. Rounded rim; unmarked base. H – 11 cm, R1 – 12.8 cm, R2 – 12.2 cm, R3 – 15.8 cm, R4 – 6.5 cm (photo: Sulimirski 1968, Pl. 19:2)

**Fig. XV.12.** Jug, type D21, ornamented on the neck with horizontal incised lines, on the body — with four appliqué bosses rimmed with three concentric incised circles, between them, vertical incised lines are found. Rounded rim; unmarked base; *ansa lunata* handle. H: 11.5 cm, R1 – 12.5 cm, R2 – 11.5 cm, R3 – 16.8 cm, R4 – 5.5 cm (photo: Sulimirski 1968, Pl. 19:3)

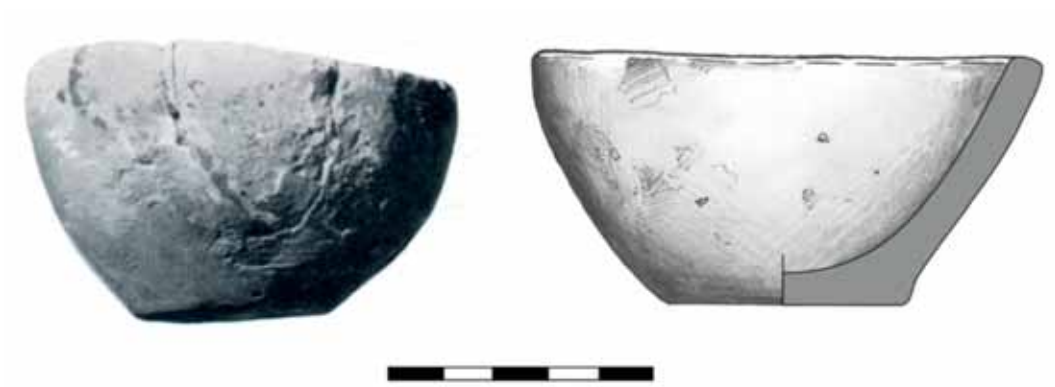


**Fig. XV.13.** Bowl, type G21, plain. Rounded rim; marked base. H – 4.5 cm, R1 – 9.5 cm, R4 – 4.5 cm (photo: Sulimirski 1968, Pl. 20:6)

**Fig. XV.14.** Pot, type G112, plain. Rounded and thickened rim; unmarked base. H – 18.5 cm, R1 – 14.3 cm, R2 – 13 cm, R3 – 16.2 cm, R4 – 7 cm (photo: Sulimirski 1968, Pl. 20:1)

**Fig. XV.15.** Vase, type W11, ornamented on the neck with circumferential, horizontal pinholes, on the body — with groups of arches (festoons), in sets of three, between them — with short vertical incised lines. Rim cut straight; unmarked base. H – 5 cm, R – 7 cm, R2 – 6.9 cm, R3 – 8.8 cm, R4 – 3 cm (photo: Sulimirski 1968, Pl. 20:9)

*bottom. The handled bowl (i) (Sulimirski 1968, Plate 19:2) was 10.5 cm high, 16.5 cm in diameter, made like the cup, the handle projecting above the rim. The ornament consisted of four curves, concentrically placed and repeated seven times on the upper part of the vessel. The second small bowl (g) (Sulimirski 1968, Plate 20:6) was 5 cm high, 9.7 cm in diameter, not ornamented, with a flat rim. The cup (g) (Sulimirski 1968, Plate 20:9) found near it was 5.2 cm high, 9 cm in diameter, very carefully made, covered with brown slip. The neck was narrowed, with an ornamentation of concentric half-circles on the upper part of the body, as on the handled cup (i-3).*

# XVI. Cemetery in Tenetniki/Tenetnyky (Fig. XVI.1)

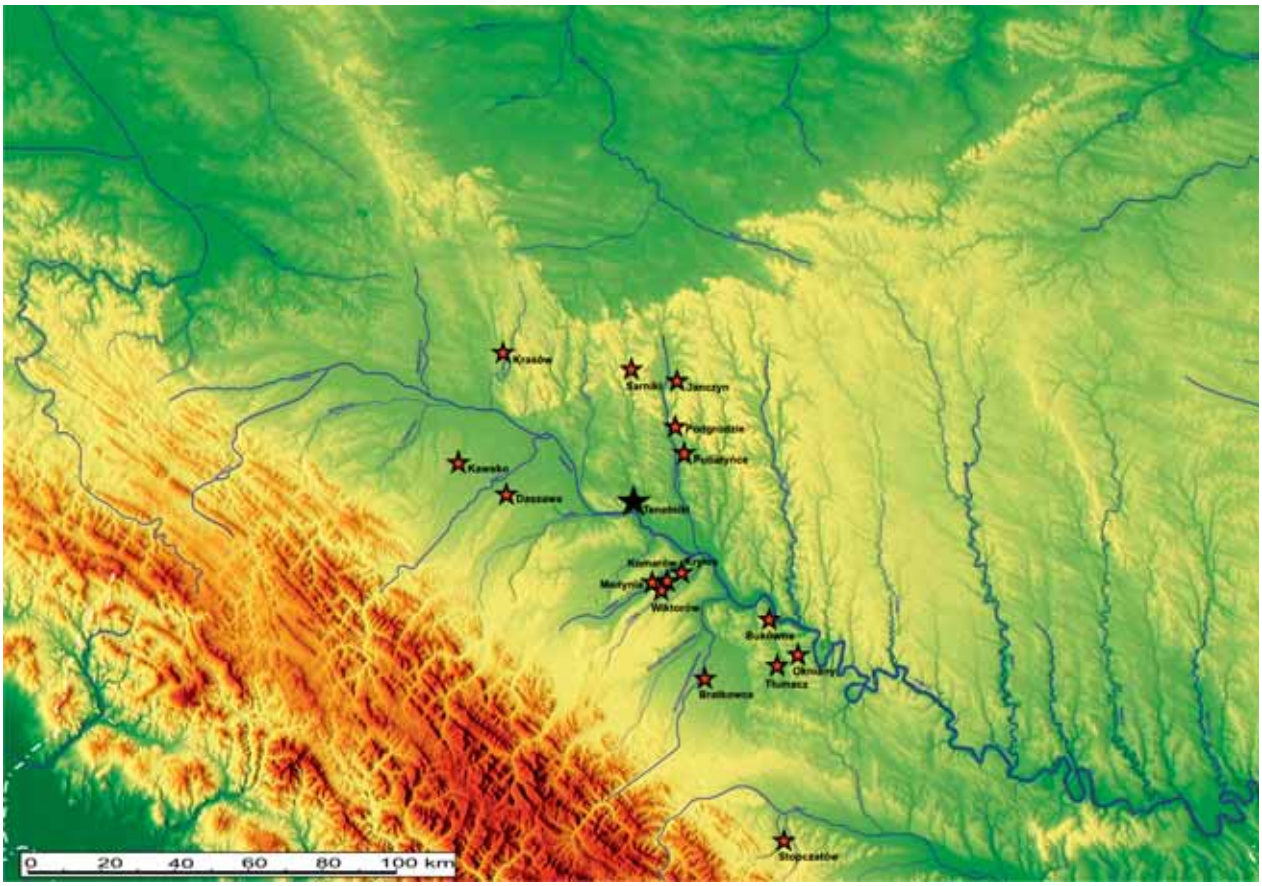



**Fig. XVI.1.** Location of the cemetery in Tenetniki in relation to other barrow necropolises

## A. Geographical description

The burial grounds in Tenetnyky are located near the Dniester in its middle course, on a vast valley known as the Halych-Bukachivtsi Basin. The rivers of this region often have a meandering course as they flow in the wide flat valley bottoms. Valleys are infilled by alluvial terraces of Pleistocene and Holocene age. Enlargement of the Halych-Bukachivtsi Basin begins in the area of the outlet of the Zhuravienski turn (near Kozary and Tsvitiv) and ends at the level of the Nizhniv, where a canyon stage of the Dniester starts. The width of the cirque in the discussed area is between 3.5 and 7 km. Inside there are several preserved ter-

races and alluviums of the Pleistocene and Holocene. According to the stratigraphy of Kravchuk (1999) in the cirque it is possible to distinguish: terrace V of the Lower Pleistocene located 50-70 m above the valley, terrace IV (35-50 m) of the Middle Pleistocene, III terrace (15-25 m), terrace II (8-15 m) of the Upper Pleistocene and Holocene, terrace I elevated 2.5-4 m above the plain. The genesis of the cirque is related with the Lower Pleistocene when the Dniester's course was oriented thorough the Bortniki-Cherniv--Halych line. The reason for changing the course of the Dniester is still unknown at this stage of palaeogeographical research (Gębica, Jacyszyn 2012).

The site in Tenetnyky is located on a terrace V that covers the northern part of the Halych-Bukachivtsi Basin. The bottom of this form buts into the sediments of Miocene and Cretaceous and is filled with alluvium and loess that creates also Pleistocene and Holocene terraces. In the area of the Halych a 16 m of alluvium was drilled (13 m of alluvium and 3 m of sands on the surface). In proximity to the Tenetnyki, on terrace V in a borehole a base ground was recorded. It was built by Miocene sandstones covered by loess sediments (Gębica, Jacyszyn 2012).

Primarily the cemetery comprised 25 monuments, creating an unconsolidated net of barrows. Nevertheless, some of these show a linear arrangement of 4-5 mounds parallel to the threshold of the valley. The hypsometry of the study area is delimited by 224 m.a.s.l. in the valley bottom and rises to 277 m.a.s.l. in the east at the level of 277 m.a.s.l. The average height of the land close to the cemetery is 260-265 m.a.s.l. The relative height shows that the terrace on which the tumuli occurs is elevated 50 m above the valley bottom. The highest slope was recorded in the thresholds of the valley, while on the flat surfaces it ranges around 0.02 degrees.

## B. Spatial arrangement of the cemetery

A survey of the site where G. Ossowski (1890) identified barrows revealed a nearly complete levelling of the area. Formerly it was covered with forest and nowadays it is used as fields and meadows (see Machnik, Pavliv, Petehyryč 2013, 149-151). Potential barrows were identified using geophysical prospection (see: C. Geophysical survey).

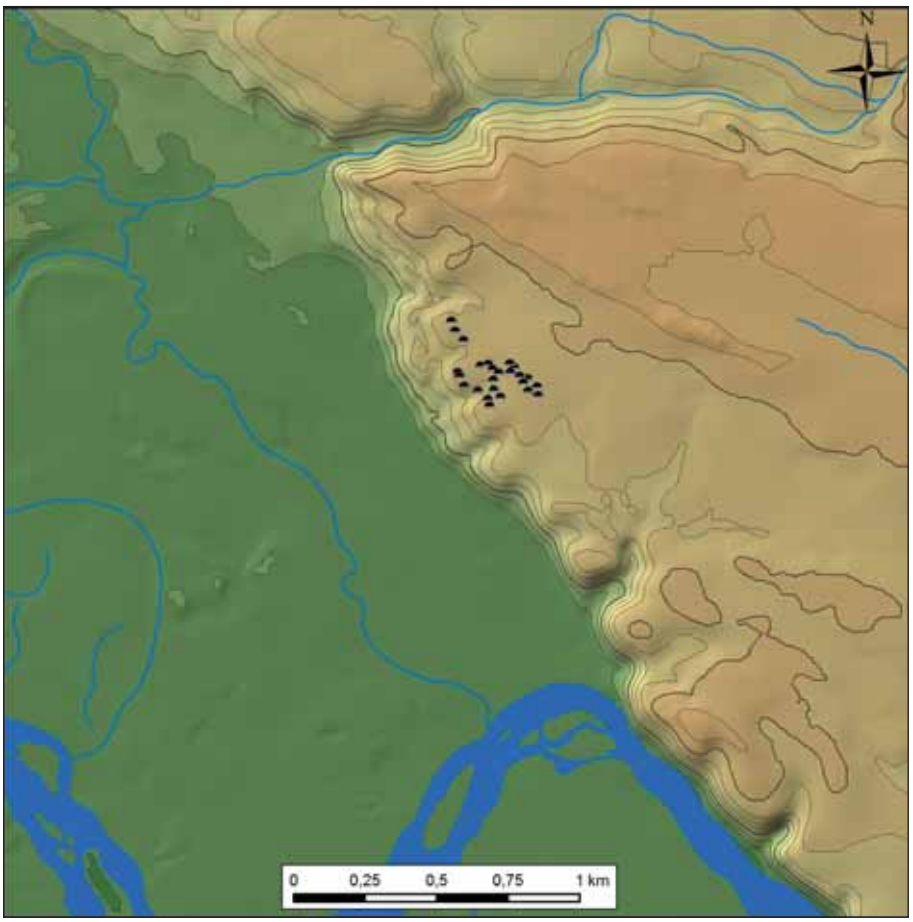
Initially cemetery comprised of 25 barrows erected on a upper Dniester terrace (see also: D. Archival information). They were arranged in linear groups, on an area (N – S/E – W) of 300 × 200 m (**Fig. XVI.2, Fig. XVI.3, Fig. XVI.4**). They can be divided into two concentrations: northern, consisting of three tumuli (nos. 23, 24, 25) arranged along a N – axis, and southern (nos. 1-22), which comprised of linear and linear-group arrangement of barrows. Mounds in the northern group were situated on a low hill. On its northern edge was barrow 25, 30 m S of it barrow 24 and 53 m S, tumulus 23.

The distance between the two concentrations (nos. 23 and 22) was 110 m. Three tumuli (nos. 22, 21, 20) were an extension of the monument line from the northern group. Mound 21 was located 13 m S of barrow 22, while 10 m further S was barrow 20. Mound 18 was located on this extension, precisely 40 m S of tumulus 20. In the central part of the southern concentration were the two biggest barrows: no. 1 – ca. 45 m SE of barrow 20 and mound 2, located 34 m N of it. A smaller barrow, no. 3, was placed 13 m SE of it, and formed a linear arrangement with monuments 4 and 5.

The first monument was situated 6 m S of barrow 3, whilst a second – 7 m S of mound 4. On the SE edge of the concentration, E and S of the described arrangement were nearly linearly arranged barrows, placed along N – S (NW – SE) axis, comprising of five monuments (nos. 6, 8, 9, 11, 12). The length of the concentration was 65 m. Barrow 7 was located 10 m S of barrow 6, mound 9 – 14 m SE of barrow 8. Tumuli 11 and 12 were erected 10 and 7 m S of barrow 9. Two additional mounds were visible to the E. The first one – no. 7 – formed a triangular arrangement with barrows 6 and 8, being ca. 10 m away from them to SE and NE. A similar 'triangular' arrangement was generated by mounds 10, 9 and 11, from which the former was located 8 m to SE and 11 m to NE. In the SE part of the cluster were two barrows – 13 and 14. The first was recognized 18 m SW of mound 12, second – 16 m NE from the latter. In the SE part of

**Fig. XVI.2** (up). Digital Elevation Model of the barrow cemetery in Tenetnyky (see: Ossowski 1890)

**Fig. XVI.3** (down). Digital Elevation Model of the barrow cemetery in Tenetnyky with the numbering of barrows (see: Ossowski 1890)


N
0
0,25
0,5
0,75
1 km

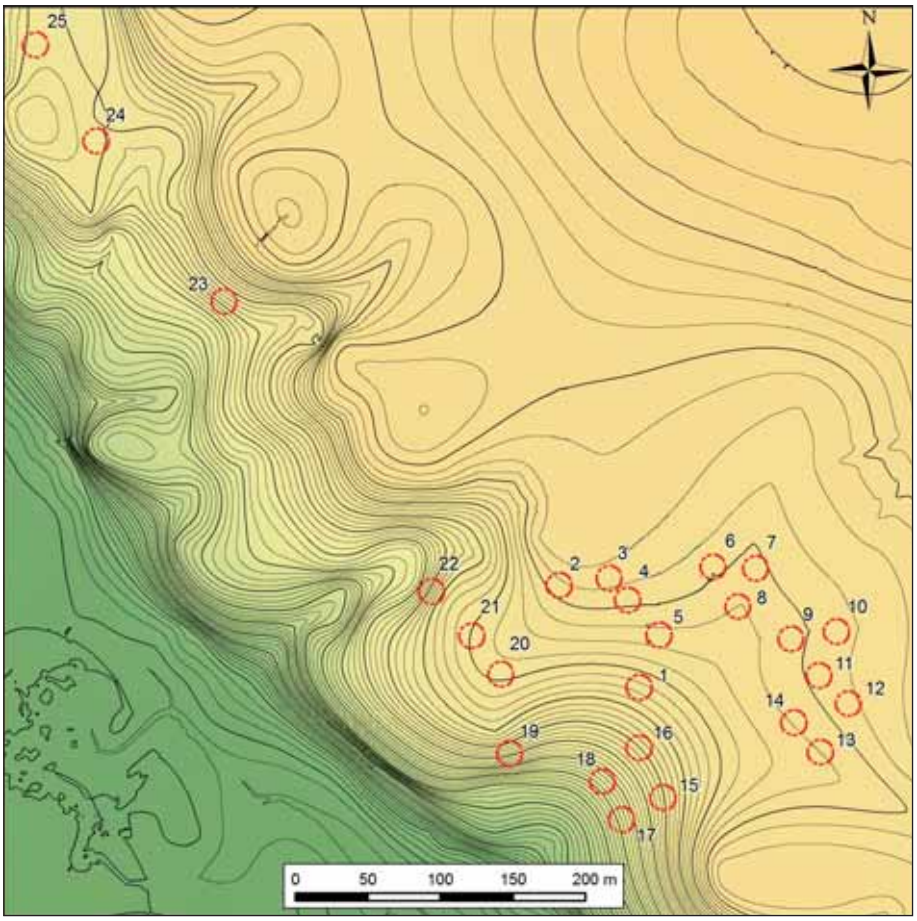

N
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
50
100
150
200 m


**Fig. XVI.4.** Tenetnyky. Location of the cemetery using satellite imagery (Yandex)

the described concentration of barrows were five additional mounds: 15-19. Tumulus 16 was located SW of the large barrow 1, while 8 m S of barrow 16 was mound 15. Object 17 was recorded 18 m SW of barrow 18 and tumulus 19 on the SW edge of the aforementioned concentration of barrows, 45 m W of mound 18 and 34 m NW of monument 17 (see also **Fig. XVI.5, XVI.6**).

**Fig. XVI.5.** View on the site from the NE: barrow? 35 (new) – see: C. Geophysical survey

**Fig. XVI.6.** View on the site from the NW

## C. Geophysical survey

The geophysical survey carried out in the SW part of the area has unravelled anomalies, which can be associated with some of the barrows visible on plans from the 19th century.

A magnetometric survey on the former cemetery in Tenetnyky was conducted in May 2014. According to old reports, on the fields extending on the northern side of Tenetnyky village a large concentration of barrows was found, still visible in the second half of the 19th century. The site was discovered due to the felling of the forest overgrowing these terrains. The situational plan created on that occasion shows that the distribution of barrows had a linear layout, stretched along a SE – NW axis, bordered from one side by a local road and from the other by an escarpment descending towards the Dniester river-bed. At the end of the 20th century field-walking reconnaissance on the site has been led by Prof. J. Machnik (Machnik, Pavliv, Petehyryč 2013). Presently, the terrain of the site is slightly pleated and falls in an eastern direction. Agricultural works carried out at this place most probably caused a levelling of embankments, while intense vegetation in season 2014 greatly hampered the observation of any of their remains. Hence, the magnetometric survey was aimed at a detection of barrow residues, especially traces of any construction features belonging to lower layers that could be left undisturbed by deep ploughing.

The middle section of the site was selected for magnetometric prospection and consequently measuring surface, extending along a SW – NE axis, was established upon it (**Fig. XVI.7**). The created a framework comprised of 27 grids, each with dimensions of 20 × 20 m, in total covering an area of 1.08 ha. In this

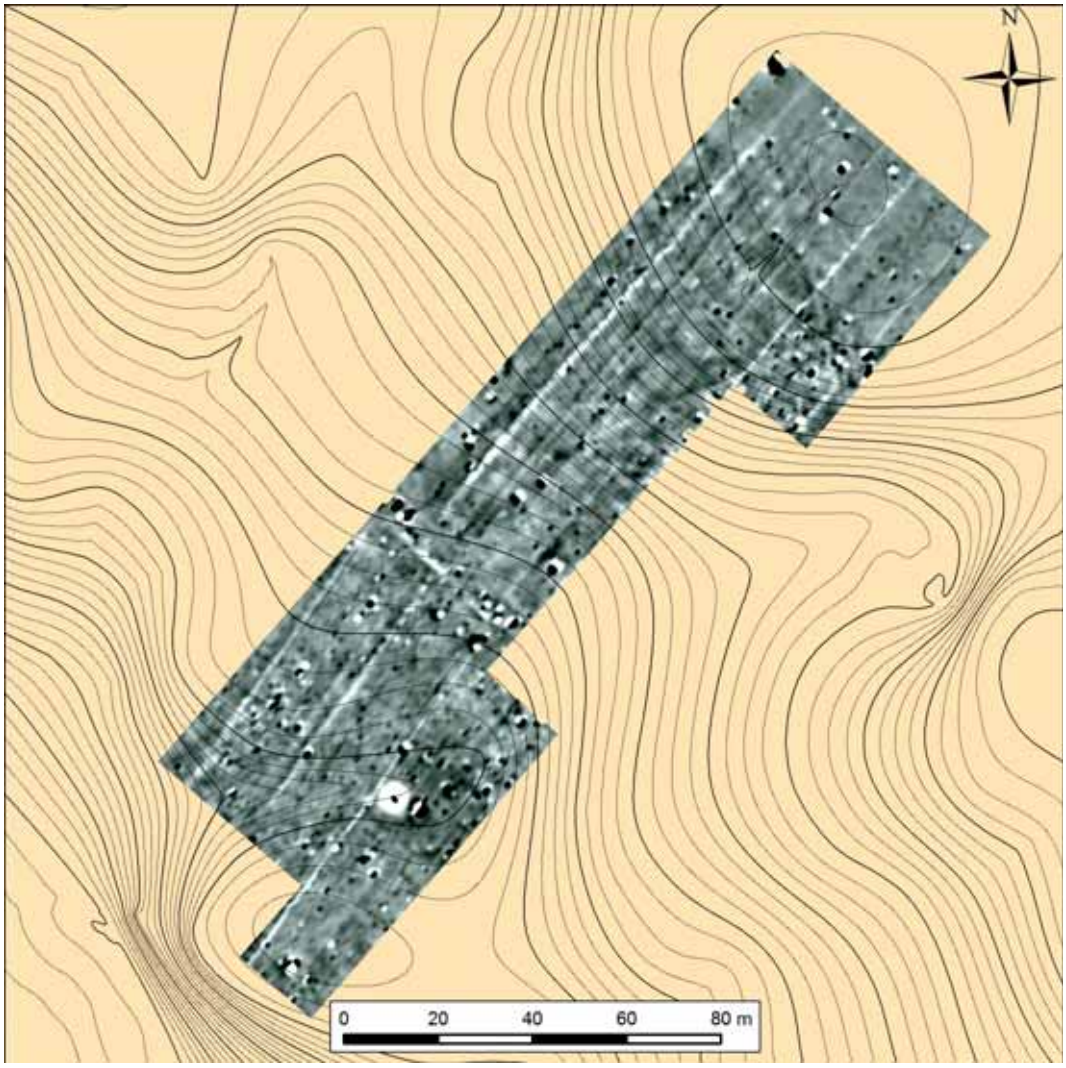



**Fig. XVI.7.** Tenetnyky. Position of geophysical survey

manner the area of the largest suspected concentration of the mound has been crossed by test survey that can be treated as a starting point for future geophysical research on the site.

Extensive measurements with a gradiometer revealed an image of an area subjected to strong anthropogenic pressure that has left its traces in the form of a deeply ploughed terrain, densely covered by magnetic anomalies, most probably of modern origin (**Fig. XVI.8,** Fig. XVI.7). Anomalies caused by plough marks are well visible in the resulting image, where they extend in a NE – SW direction (**Fig. XVI.9**). Strong, abnormally dipolar signals, most probably emitted by iron objects, are dispersed mainly in the SW part of the survey's area, consisting of fields located on both sides of the dirt road.

The particular concentration of these anomalies can be observed within the easternmost grid lying between 160 and 180 m of the framework, where they are arranged in a rectangular structure enclosing a tract of land characterized by an increased magnetic susceptibility. Within such a delimited area there are discernible two very intensive, abnormally dipolar signals, both attributable to iron objects, among which one is most certainly a vertically stuck metal rod. Perhaps this accumulation of high magnetic responses should be considered as the residue of some structure that was located there in the past, but should not be considered as a potential residue of the barrow.

The latter were detected only in the NE section of the surveyed surface. Currently no landform resembling the barrow can be discerned in the field without the use of professional measuring devices that, nonetheless, may prove to be ineffective in the light of intense ploughing of the soil. In comparison to the SW part of the site, where the terrain seems to be more pleated, the NE section is more flat and overgrown by tall grass. Despite these unfavourable circumstances, it was possible to conduct measurements and obtain results that, with large dose of scepticism, can be attributed to destroyed mounds. In order to more effectively depict the discussed anomalies, the lower part of the image was zoomed (**Fig. XVI.10**).

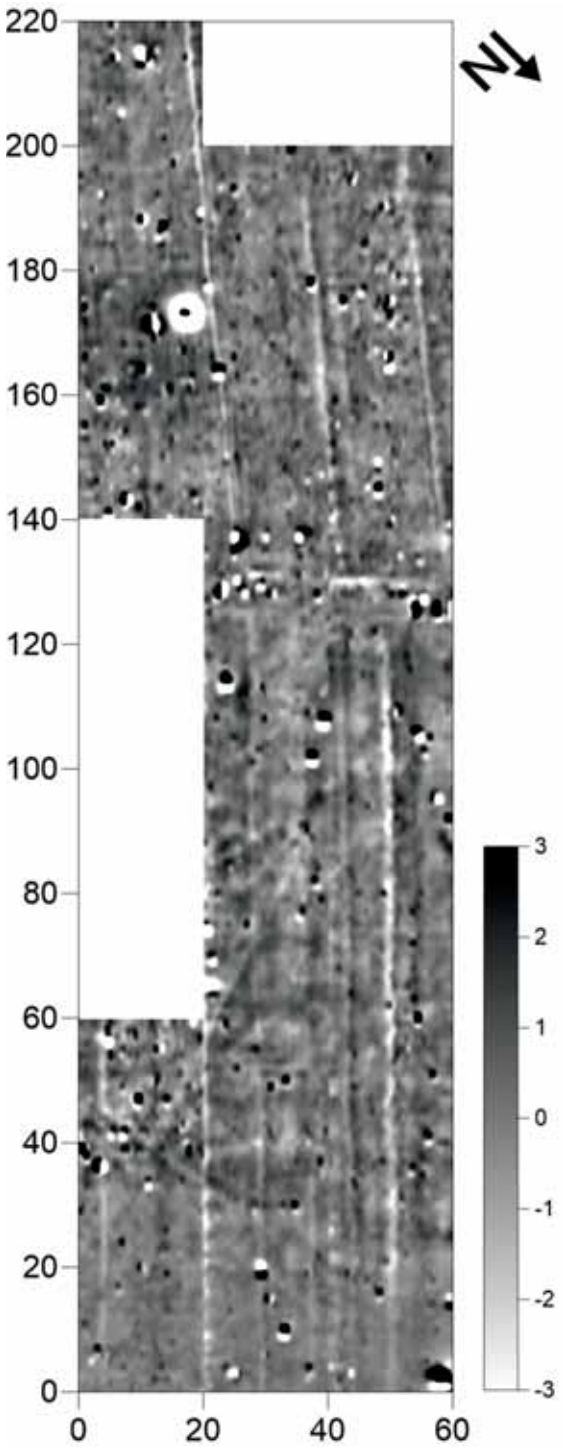
The distinction of anomalies, potentially indicating barrows, was based on the experiences gathered during the analysis of resulting images of magnetometry obtained for other monuments. Thanks to the reappearing schema of magnetisation, generally comprising of a highly magnetic centre surrounded by a ring of lower magnetisation, sometimes accompanied by strong dipolar signals arranged in regular shapes, it was possible to define structures that were going to be searched for on the site in Tenetnyky. Similar layouts of anomalies were found at least in six cases (Fig. XVI.10; **Fig. XVI.11**).

The first of highlighted objects (Fig. XVI.10:1 = barrow 23? according to Ossowski 1890, Fig. XVI.11:23) was localised in the upper part of the delimited area and has a distinct circumference consisting of lower values of magnetisation. In turn, its inner part is definitely more magnetically susceptible, excluding a centrally located negative peak of magnetisation. Attention is drawn by two anomalies placed in the SE part of the object. They resemble oval features, possibly filled with material rich in iron compound and thus, subjected to residual (lower, clearly polarized signal) or induced magnetisation (upper signal).

About ten meters NE from the above described structure there was revealed a crescent-shaped anomaly characterized by an increased magnetic response (Fig. XVI.10:2, Fig. XVI.11:23b). Its continuation was not captured due to a lack of measurements in a southern direction. Nonetheless, one can see another similarly-shaped anomaly, but differently oriented and consisting of negative values enclosing the rest of the object. Together they form an irregular oval, enclosing a roughly circular zone characterised by a predominantly lowered degree of magnetisation. In the middle of this zone there are localised two, abnormally dipolar signals, approximately arranged along a N – S axis and separated by yet a different anomaly with a longitudinal shape crossing the area from east to west. Perhaps the latter stems from a feature of modern origin in the form of ditch or path that disturbed the original structure of the supposed mound.

Such an interpretation is further supported by a continuation of the discussed anomaly in an eastern direction where it meets a magnetically similar, but perpendicularly oriented structure. Taking into account the fact that the surveyed area in the first half of the 19th century was overgrown by forest, it seems plausable to imply the existence of the remains belonging to former routes that were passing through or nearby barrows.

Directly below the aforementioned object there is located another structure possibly connected with the former barrow (Fig. XVI.10:3, Fig. XVI.11:23a). Although it seem less clearly defined than the one previously described, it still has a circular shape of the outer and a magnetically weak anomaly, particularly pronounced in the eastern part. The western section, on the other hand, is enclosed by four distinct peaks of positive magnetisation, presumably belonging to the internal construction of a tumulus. Together all



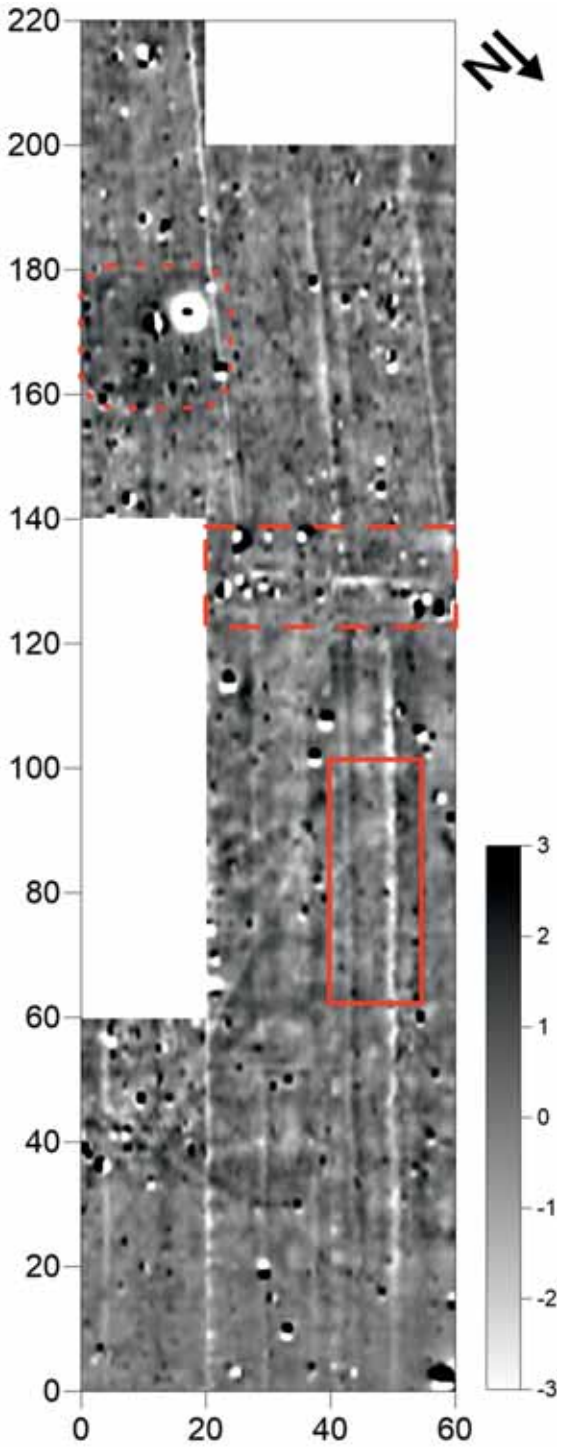




**Fig. XVI.8** (left). Resulting image of magnetometric survey on the site in Tenetnyky (gradiometer Bartington Fluxgate Grad 601-1; measuring grid: 20 × 20 m; sampling density per transect spacing: 0.25 × 1 m, interpolated up to 0.25 × 0,5 m; real values of magnetic field gradient compressed in greyscale to the range -3 – +3nT)

**Fig. XVI.9** (right). Resulting image of magnetometric survey on the site in Tenetnyky with highlighted anomalies discussed in the first part of the text.

— example of strong, linear anomalies with alternatively placed negative and positive peaks, indicating plough marks

--- approximate spatial extent of anomalies reflecting contemporary dirt road crossing the site

··· roughly rectangular tract of land with increased magnetic susceptibility, surrounded by a row of strong, dipolar anomalies, probably reflecting a modern feature

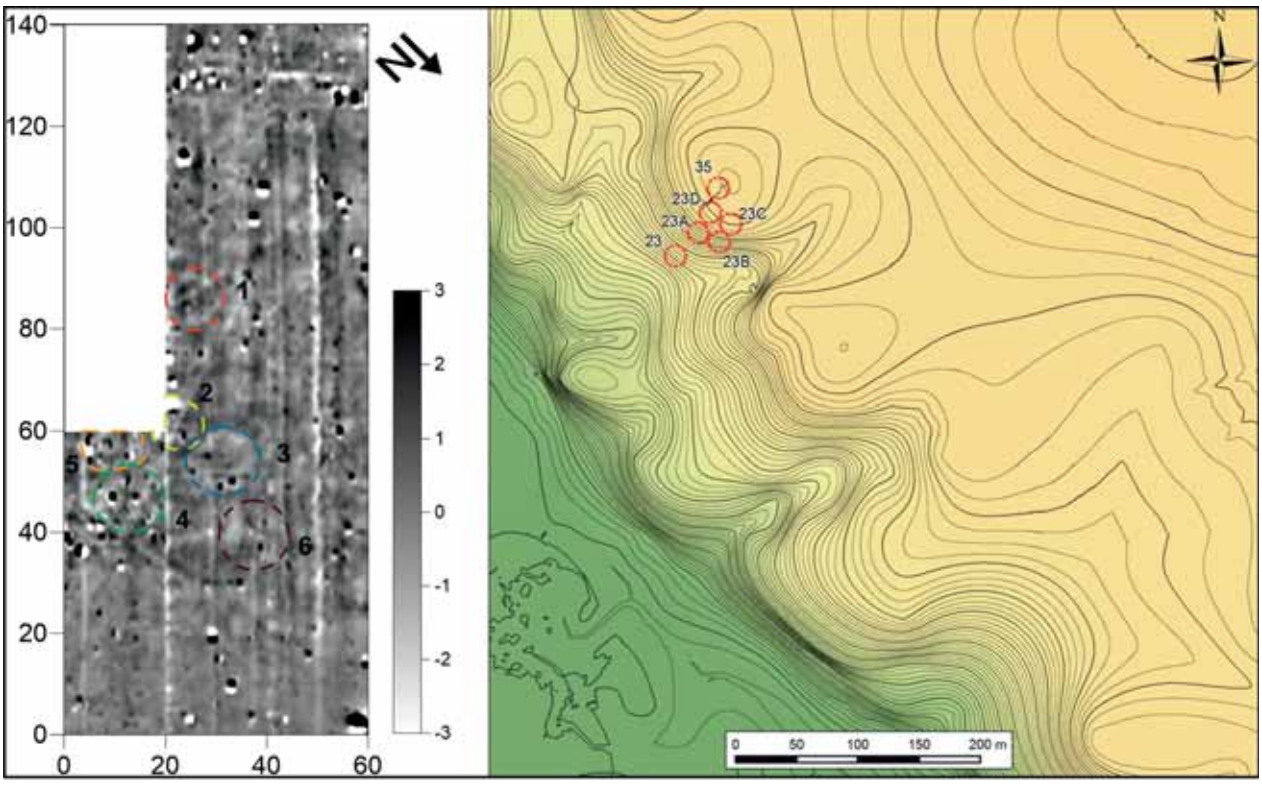



**Fig. XVI.10** (left). Resulting image of magnetometric survey in NE part of the site in Tenetnyky with marked potential residues of former barrows.

--- approximate spatial extent of anomalies marking the residue of potential barrow no. 1
--- approximate spatial extent of anomalies marking the residue of potential barrow no. 2
--- approximate spatial extent of anomalies marking the residue of potential barrow no. 3
--- approximate spatial extent of anomalies marking the residue of potential barrow no. 4
--- approximate spatial extent of anomalies marking the residue of potential barrow no. 5
--- approximate spatial extent of anomalies marking the residue of potential barrow no. 6

**Fig. XVI.11** (right). Digital Elevation Model of the NE part of the cemeteery and location of potential barrows using magnetometric survey

these features surround an area of slightly increased magnetic response, perhaps indicating the inner part of the barrow's embankment.

The area to the east of the previously described object is characterized by rapid and frequent changes of magnetic field gradient. On the basis of anomalies present there, it is possible to distinguish two further objects potentially connected with barrows. The first of these (Fig. XVI.10:4, Fig. XVI.11:23c), situated more to the E, is delimited by a series of small, but clearly polarised anomalies that are arranged in an irregularly circular shape, especially visible in its northern section. It surrounds a zone of lower magnetisation that includes two identical, abnormally polarized anomalies parallel to each other. Among the mentioned features, only the circular row of anomalies on the verge of the object lends itself to interpretation, according to which it may indicate a stone ring. Yet, the picture seems greatly distorted in this place, presumably due to intensive ploughing, but also because of a supposed path, mentioned in the context of the adjacent object. The discussed ring-like structure seems to be most disturbed in its SW section, near the accumulation of anomalies seemingly belonging to another mound.

The latter is similarly disturbed, however possesses a much clearer outline in the form of a circular sequence of anomalies resembling an outer, ring-like structure that continues beyond the scope of the surveyed surface (Fig. XVI.10:5, Fig. XVI.11:23d). Its W and SE sections seem to be more compact, while in the N and NW parts one can distinguish individual elements indicated by dipolar anomalies, emitted by objects with a high ferrous content. This round

feature is surrounded on its external side by a strip of negative values, as in the case of other barrows surveyed with a magnetometer in the course of the project. Both described anomalies enclose a weakly magnetised zone in the middle of which there are located two oval positive peaks of magnetisation, presumably representing a grave structure. Among all the listed objects, the one discussed above has the most prominent manifestation on the resulting image.

The last of the distinguished objects, potentially reflecting the barrow's remains, is situated in the extreme northern part of the surveyed area (Fig. XVI.10:6, Fig. XVI.11:35). It has the least legible outline and does not possess any regular layout of anomalies, thus making its assumed character of

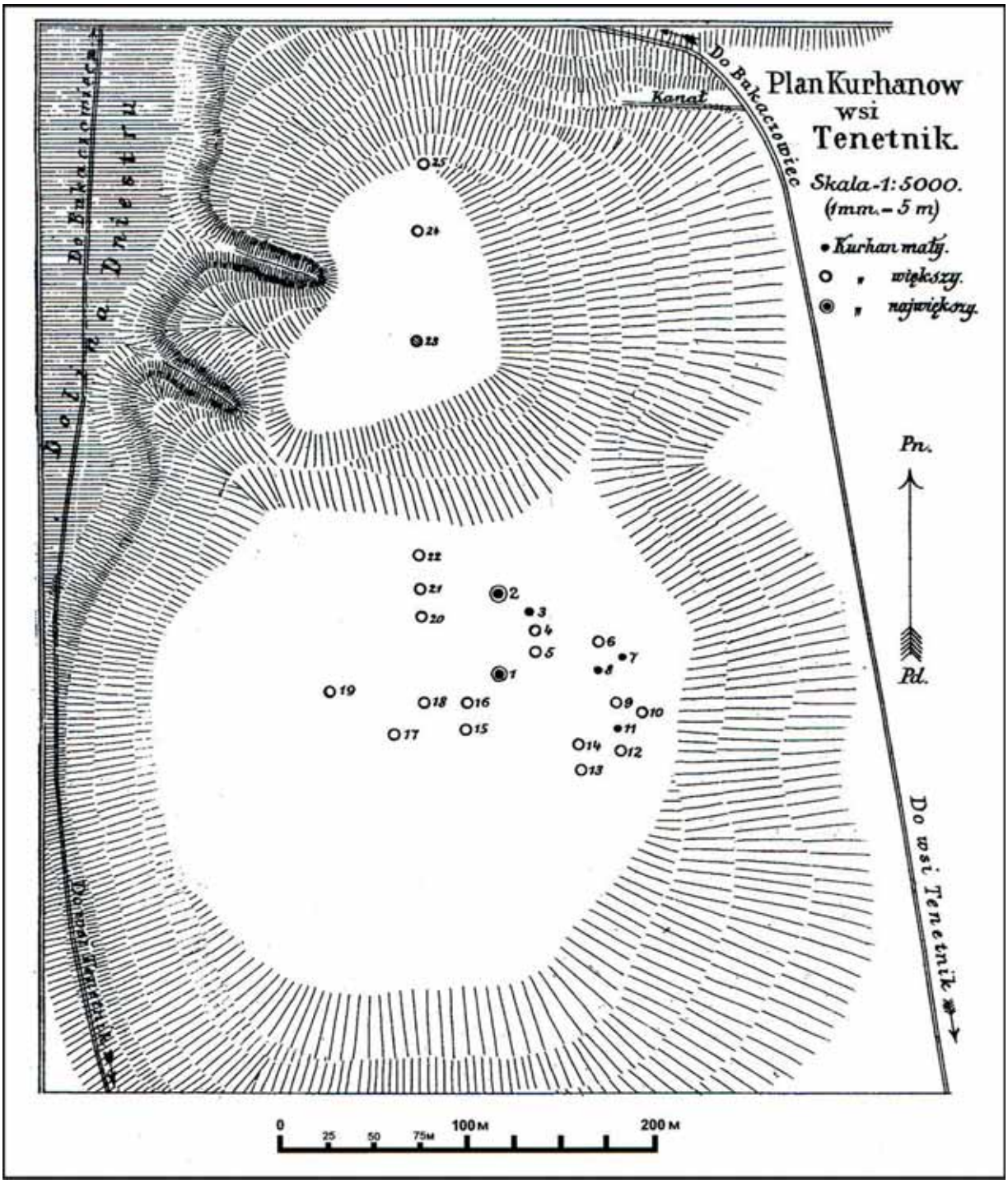



**Fig. XVI.12.** Tenetnyky. Location of barrows discovered by G. Ossowski in 1889 (after Ossowski 1890)

sepulchral structure highly questionable (a new barrow? – 35). The reasons for its distinction as a potential mound is the approximately round circumference consisting of low magnetically negative responses, as in the case of other objects and four weak monopolar positive signals that create together a rectangular arrangement. Any detailed analysis is ruled out due to heavy disruption of the image in this place, probably stemming from agricultural works that destroyed the barrow's embankment.

Summing up the results, once again the specific goal of magnetometric prospection at the site in Tenetnyky should be underlined. As opposed to surveys on other cemeteries with well-preserved monuments, focused on revealing their internal structure, investigations in Tenetnyky were aimed at detecting any remaining features of currently levelled mounds. Consequently, the presented survey should be seen as the first stage of reconnaissance of the discussed site that can be followed by a more detailed study with the help of other methods. The attached images allow one to believe, with a certain dose of scepticism, that magnetometric measurements captured a section of the cemetery that comprises objects arranged in rows stretching from SW to NE. Nonetheless, a large portion of the site still remains undiscovered, hence one should consider proceeding with magnetometric measurement, particularly in a SE direction. In respect to the distinguished anomalies interpreted as barrows, probably test drillings can verify their actual sources.

## D. Archival information

### Tenetniki, district of Rohatyń (after Sulimirski 1968:147)

*A group of barrow-graves up to 1.5 m high occurred on a high elevation between Tenetniki and Bukaczowce (**Fig. XVI.12**). One was excavated c. 1880 during the building of a road, while four others were excavated in 1889 by G. Ossowski (Ossowski 1890:38f; Janusz 1918:196; Rogozińska 1959:112, PL. VIII;5). The material was deposited in the Archaeological Museum, Cracow.*

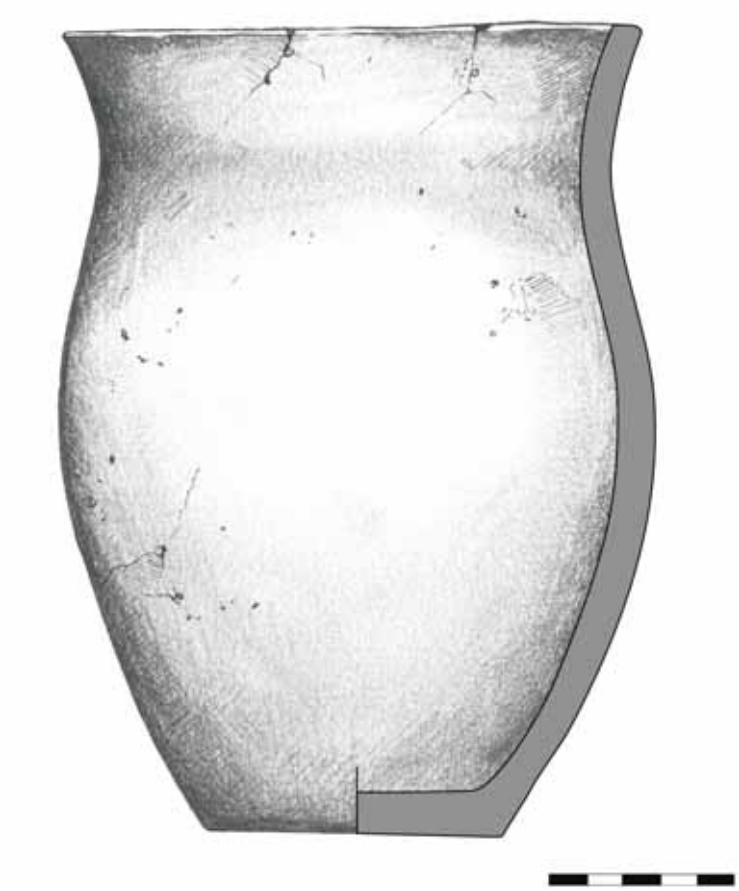


**Fig. XVI.13.** Pot, type G112, plain. Rounded rim; unmarked base. H – 21.3 cm; R1 – 15.5 cm, R2 – 13.5 cm, R3 – 15.8 cm, R4 – 7.8 cm

**Fig. XVI.14.** Jug, type D1, plain. Rounded rim; unmarked base; *ansa lunata* handle. H – 15.7 cm, R1 – 13.5 cm, R2 – 12.8 cm, R3 – 17.5 cm, R4 – 7.3 cm

*Barrow-grave I was the largest of the group, 12 m in diameter, 1.5 m high and dug across for an extent of 6 m wide. Clay vessels containing calcined human bones were found at a depth of 50 cm, at three points near the circumference. One was entirely destroyed, the other two could be reconstructed. One was a tulip-shaped undecorated pot 21.5 cm high, 16.4 cm in diameter, reddish-grey in colour, made of clay with a strong admixture of sand and very brittle (**Fig. XVI.13**). This vessel has not been preserved in any museum collection. The second vessel was an unornamented jug, 17 cm high, 17.7 cm in diameter, dark brown in colour, with the inside black and the surface polished (**Fig. XVI.14**). It had a smooth lug on the body extending to the rim. The third vessel was a similar jug.*

*Barrow-graves II-IV were somewhat smaller in size. Several vessels were found in each, but they were so damaged that they could not be preserved. They were similar in type to the vessel in Barrow-grave I. One vessel only had an ornament consisting of a few short incisions encircling it. Some flint flakes were also found.*

# XVII. Cemetery in Tłumacz/Tlumach (Fig. XVII.1)

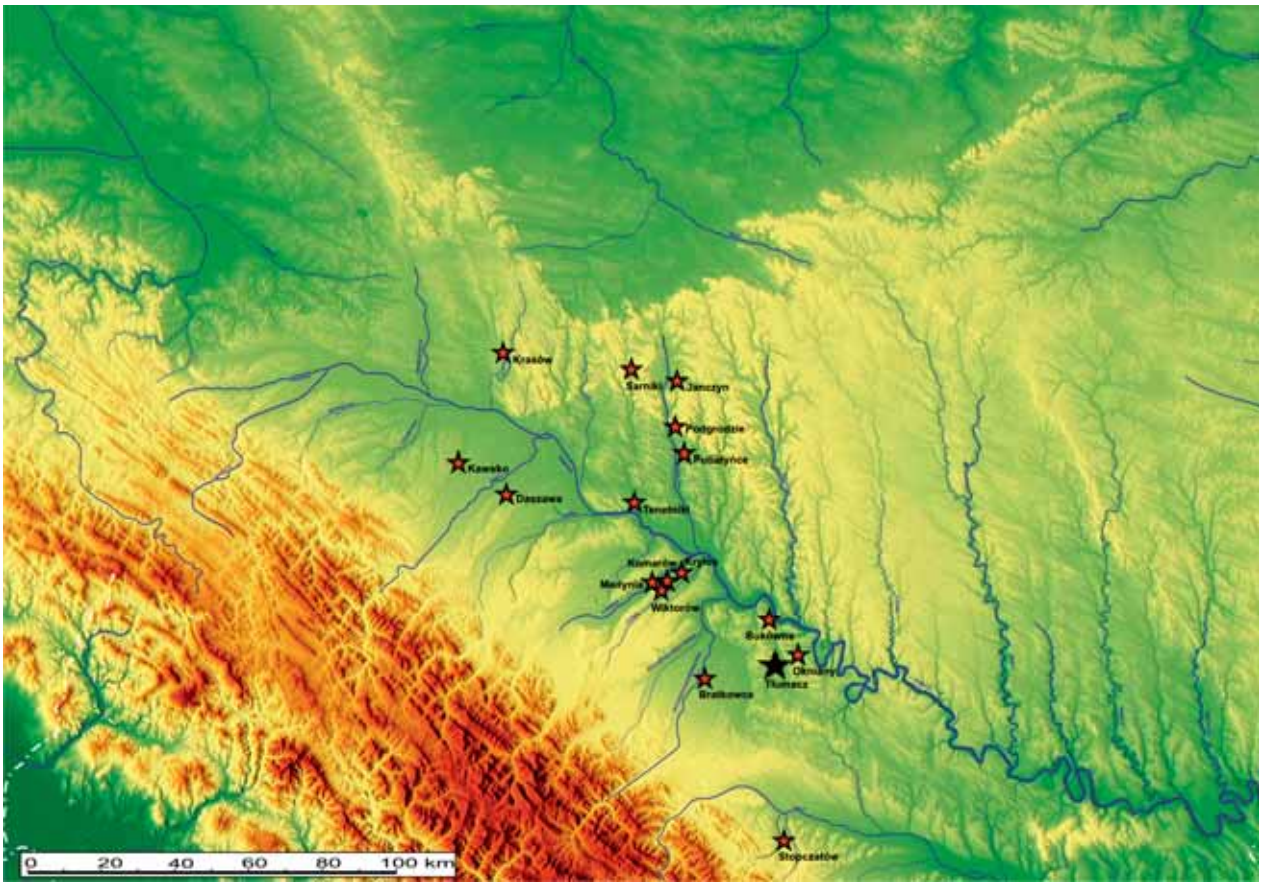



**Fig. XVII.1.** Location of the cemetery in Tlumach in relation to other barrow necropolises

## A. Geographical description (see: Chapter XI)

## B. Spatial arrangement and description of the barrows

Within the administrative borders of the municipality there are two barrows (nos. 15 i 18) located on the same hill as the monuments from Vikniany (in

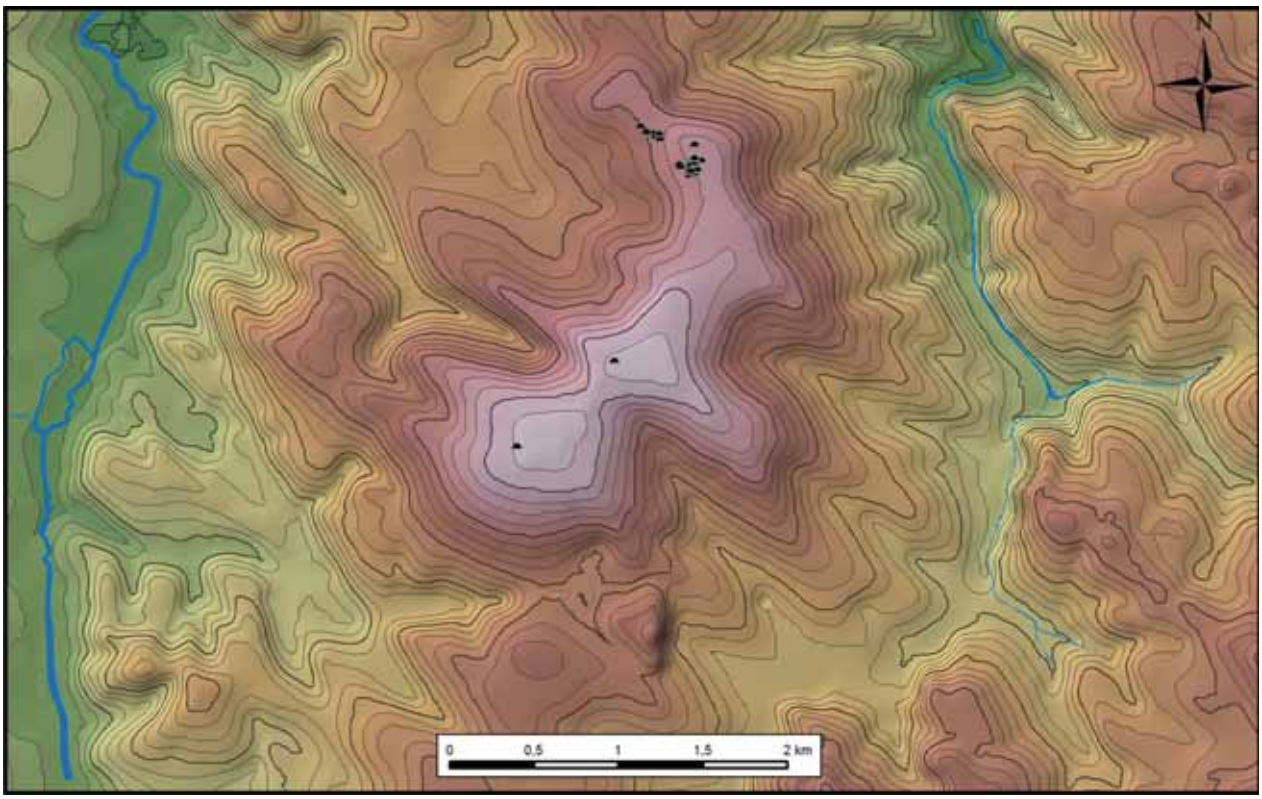



**Fig. XVII.2.** Digital Elevation Model of the barrow cemeteries in Tlumach

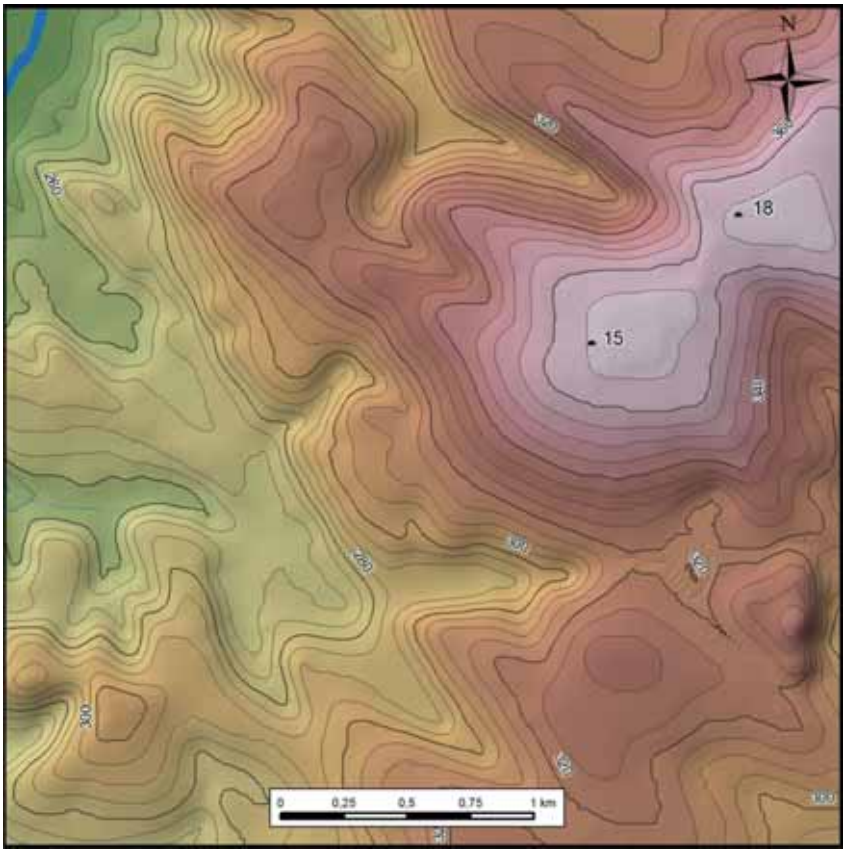



**Fig. XVII.3.** Digital Elevation Model of the barrow cemeteries in Tlumach with the numbering of barrows


**Fig. XVII.4.** Tlumach. Location of the cemetery using satellite imagery (Yandex)

ca. 1.2 km distance). They are situated in the upper, flattened parts of the hill, stretched along a NE – SW axis (**Fig. XVII.2, Fig. XVII.3, Fig. XVII.4**).

**Barrow 15 (Fig. XVII.5, Fig. XVII.7)** located on the field in the SW part of the hill, at 336 m.a.s.l., ca. 770 m SW of barrow 18. Geographic corrdinates: N – 48°51'604"; E – 025°03'055". Mound partially ploughed. Circular in shape, 33 m in diameter, 1.4 m high. Subject to geophysical prospection.

**Barrow 18 (Fig. XVII.6, Fig. XVII.8)** situated in the central part of the hill, in a dense forest, at 336 m.a.s.l., 770 m NE of barrow 15 and 1.2 km SW of

**Fig. XVII.5.** Barrow 15. View from the N

**Fig. XVII.6.** Barrow 18. View from the S

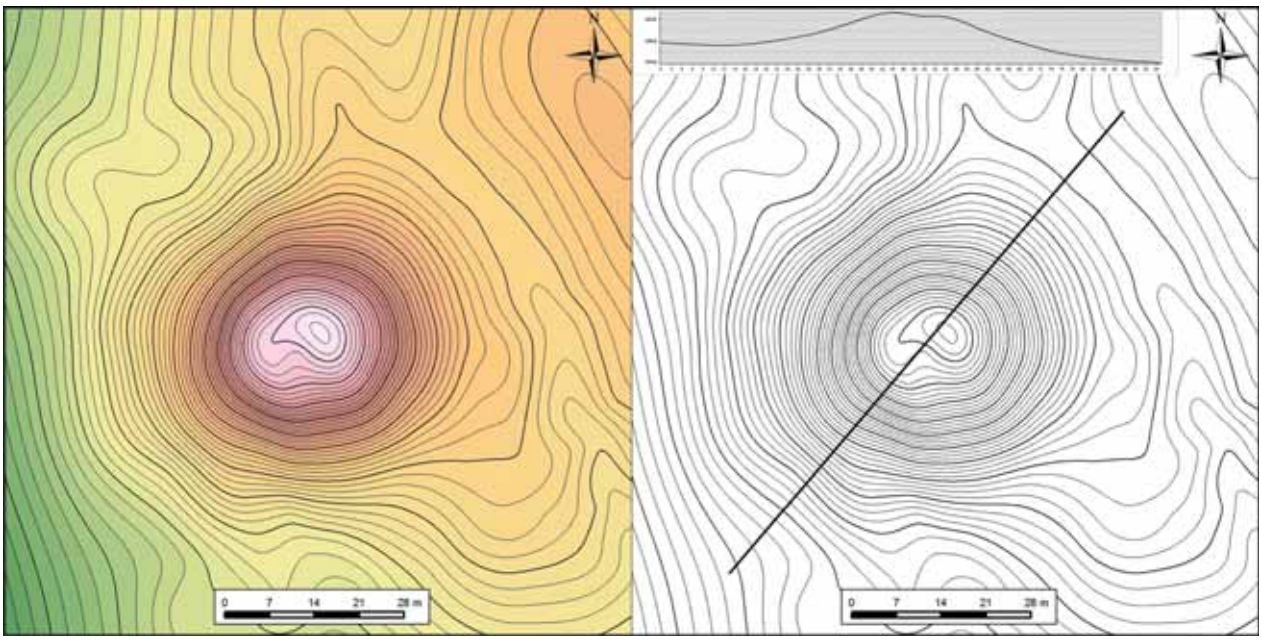



**Fig. XVII.7.** Barrow 15. Hypsometric plan and cross-section

the southern monuments of Vikniany. Geographic coordinates: N – 48°51'885"; E – 025°03'516". Circular in shape, 24 m in diameter, 2.5 m high.

## C. Geophysical survey

A geophysical survey with a magnetometer on the site in Tlumach was conducted in May 2014. Prospection covered a single barrow, designated with number 15, located in the open field, presently used as an agricultural fallow. The discussed mound is large and well preserved, despite the ploughing that has left marks cutting through the topsoil. The slopes of the embankment gently descend toward the ambient, while its top is slightly flattened, perhaps also due to agricultural works. At the feet of the barrow is situated a shallow, but still observable, circular ditch, best preserved in the eastern part (**Fig. XVII.9**).

The surveyed area, in total measuring 0.36 ha, was divided into nine grids with dimensions of 20 × 20 m. Together they created a rectangular framework with the length of the side measuring 60 m. Thanks to the spatial extent of the framework, it was possible to capture the context surrounding the mound.

As a result, magnetometric prospection of the barrow 15 allowed one to circumscribe the spatial extent of the embankment, trace the course of the circular ditch and reveal the internal structure of the mound (**Fig. XVII.10**). Apart from prehistoric features, the survey documented also plough-marks stretching across the entire area along a NW – SE axis, as well as strong dipolar signals emitted most probably by iron objects – remains of agricultural works and litter left on the site. One has to take into account the possibility that some of these anomalies may be connected with relicts of the World War II period, reported by local woodcutters.

Narrowing the values of the registered magnetic field gradient to the range of 5 – -5nT, effectively enhanced the contrast between anomalies emitted by the barrow's embankment and its ambient (**Fig. XVII.11**). In the first place, one should notice the well distinguished rim of the tumulus. At its northern section it can be discerned as a dipolar anomaly, particularly pronounced in the NW quarter of the mound, with positive and negative peaks reaching the maximum values of the gradient. Normal polarization, as well as the regular contour of the anomaly corresponding with the shape of the mound, leads one to the assumption that it indicates a structural feature buried under the earthen mantle. Continuation of the anomaly in the remaining parts of the embankment allows one to believe that its source resembles a ring made of material enriched with iron compounds.

Nevertheless, one cannot escape the impression that the strength of the anomaly in the northern

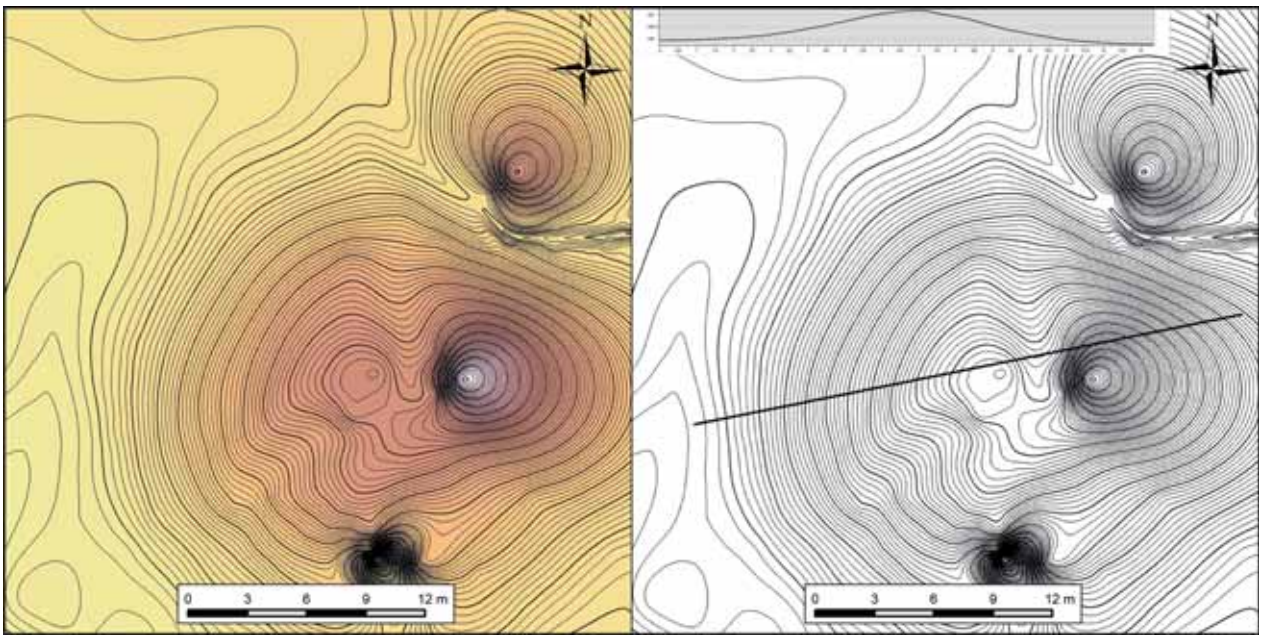



**Fig. XVII.8.** Barrow 18. Hypsometric plan and cross-section

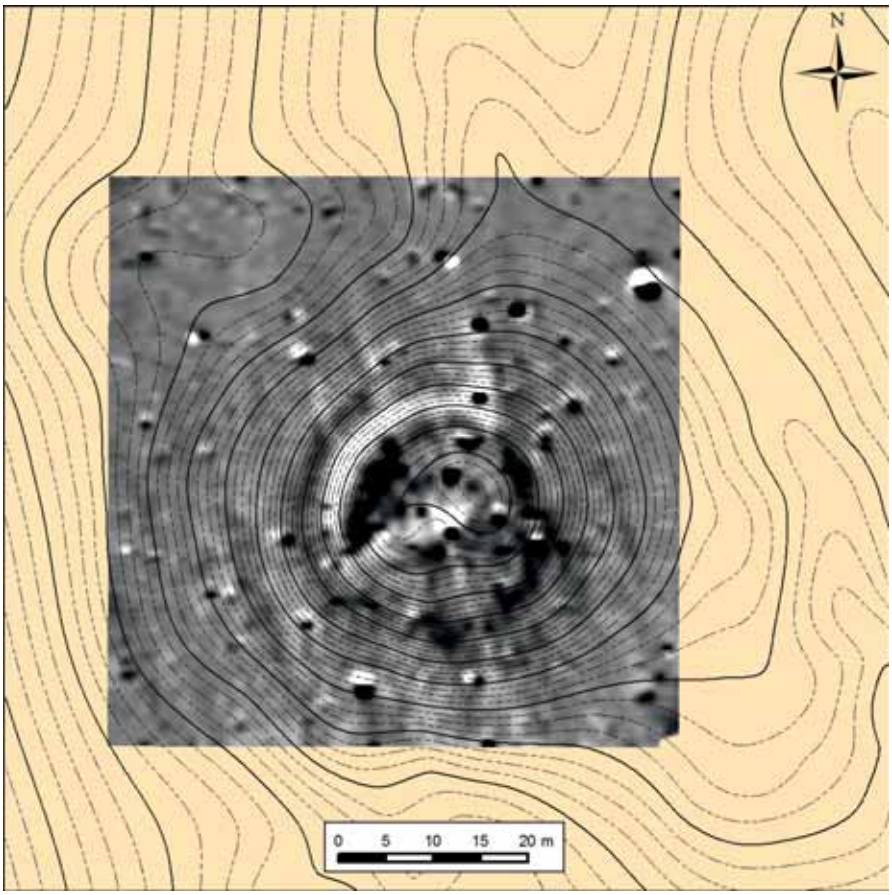



**Fig. XVII.9.** Tlumach. Position of geophysical survey

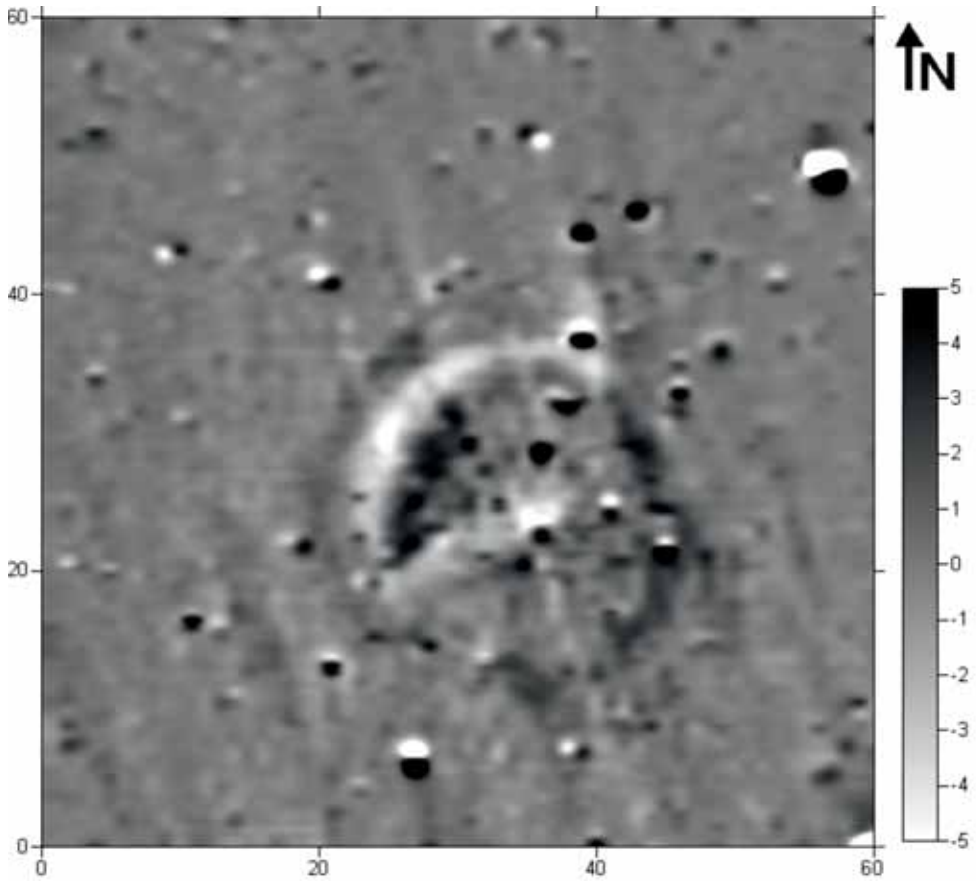



**Fig. XVII.10.** Resulting image of magnetometric survey of barrow no. 15 on the site in Tlumach (gradiometer Bartington Fluxgate Grad 601-1; measuring grid: 10 × 10 m; sampling density per transect spacing: 0.25 × 1 m, interpolated up to 0.25 × 0.5 m; real values of magnetic field gradient compressed in greyscale to the range -5 – +5nT)

section surpasses the magnetization level in southern half. Explanation of this problem can be derived from post-depositional processes that took place on the site after the formation of the monument. In the course of prolonged use of the terrain as an agricultural field, the upper layers of the embankment, including structural elements, where mixed and dragged in a northern direction, corresponding with the course of plough-mark.

Although this interpretation seems plausible in the light of the current use of the site, one should also accept that it may not be the only cause of characteristic magnetisation discussed above. Moreover, also the circular ditch is visible on the resulting image as a strip of slightly increased values at the barrow's circumference. It seems to be more pronounced on the northern side of the embankment, while on the southern side it becomes blurred and distorted. Finally, its eastern section is least legible, despite the fact that the actual condition of the ditch in this place is far better, than in the remaining parts (Fig. XVII.9). In order to enhance the contrast between the anomalies, the greyscale was narrowed to the range of values from -3 to 3nT (**Fig. XVII.12**).

It can be inferred (Fig. XVII.12) that the material filling the ditch has a varying level of magnetisation in its different parts. Again the explanation for this diversity can be suggested in respect to pedological processes and the anthropogenic impact on the site in recent years. Top soil, usually characterized by a higher magnetic susceptibility than subsoil, in the course of ploughing could have been removed from the embankment and deposited inside the norther section of the ditch, when the plough was descending from the slopes of the barrow. On the other hand, although the NW part of the ditch is more legible, it seems narrower in comparison with its other sections. This observation corresponds with the elevation model created for the site (Fig. XVII.9). The southern section, even though it has no clearly de-

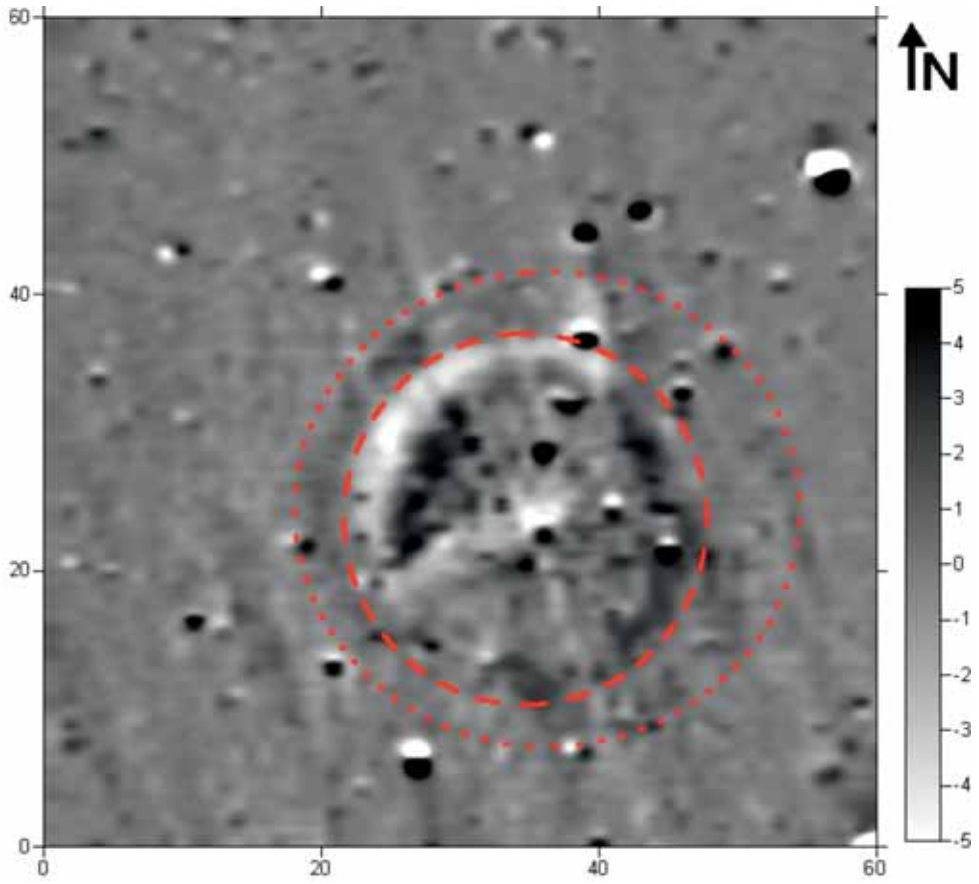



**Fig. XVII.11.** Resulting image of magnetometric survey of barrow no. 15 on the site in Tlumach with highlighted anomalies discussed in the text.

--- approximate spatial extent of anomalies signifying outer limits of the embankment, potentially emitted by a ring-like feature of the barrow's internal structure

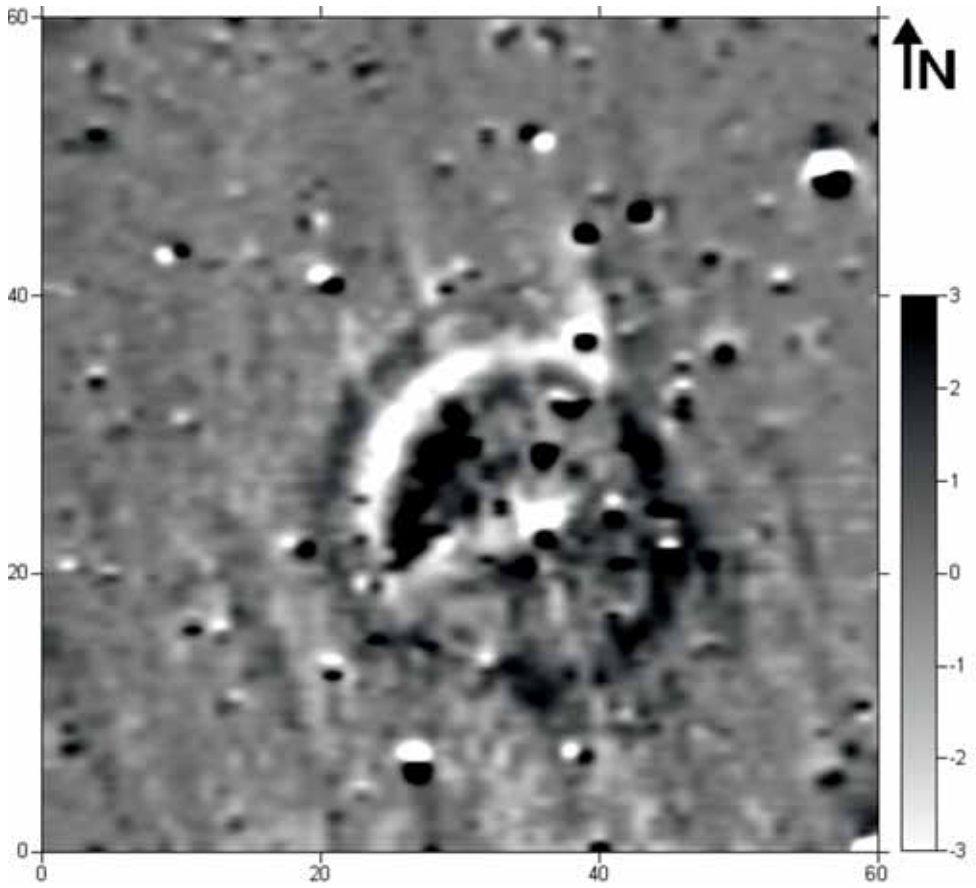
··· approximate outer limit of anomaly reflecting a circular ditch surrounding the embankment

fined border, is wider and diverges up to 10 m from the edge of the barrow. Within the ditch several strong signals are located that can indicate objects that found their way there in the course of post-depositional processes.

The narrower gradient of magnetic field variations allows one to describe more precisely the internal structure of the mound, particularly its central part (**Fig. XVII.13**). The middle point of the embankment is surrounded by an internal ring, comprising of a series of anomalies, potentially emitted by features exposed to induced or thermoremanent magnetisation that were intentionally deposited there during the mound's construction (structures comprising of stones or wood). Several distinct signals with a broader shape may be indications of pits filled with content of higher magnetic susceptibility (ash and charcoal or organic material).

They are all surrounded by an extensive peak of negative magnetisation, symbolized by a white spot in the centre of the monument, which seems to have some sort of continuation in a SW direction where it eventually meets the rim of the embankment. It is difficult to interpret the latter, but it still can be attributed to the original structure inside the mound.

In conclusion, it can be said that magnetometric prospection on barrow 15 resulted in a very diverse image of magnetic field variation, allowing one to distinguish multiple elements belonging to the discussed object. Not without significance is the current state of preservation of the barrow that, due to flattened top and gentle slopes, did not hinder the survey. In order to verify the presented interpretations and make the results precise, one should consider a continuation of archaeological studies in this place.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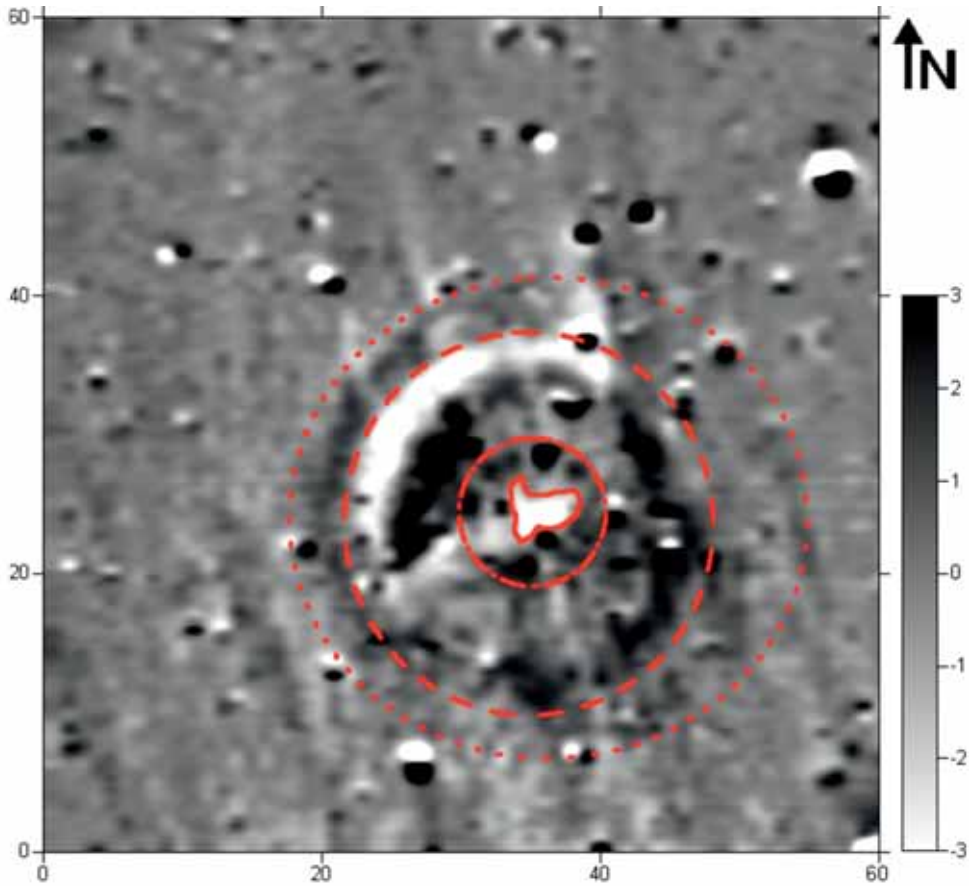
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## D. Archival information

### Tłumacz (after Sulimirski 1968:154)

*In 1878 a barrow-grave was excavated by Dr Lenz (Janusz 1918:242). The following objects found in it were given to the Natur-Historisches Museum in Vienna (nos. 3147-51): calcined human bones, three small flint flakes, a flint knife and two undecorated vessels, both thick-walled, brittle. One was a cup (3147) dark-brown in colour, 7 cm high, wide open, 11.5 cm in diameter, the sides provided with many perforations regularly distributed over the vessels in three rows (3148). This was evidently a cremation burial.*

The materials have never been published

**Fig. XVII.12** (up). Resulting image of magnetometric survey of barrow no. 15 on the site in Tlumach (gradiometer Bartington Fluxgate Grad 601-1; measuring grid: 10 × 10 m; sampling density per transect spacing: 0.25 × 1 m, interpolated up to 0.25 × 0.5 m; real values of magnetic field gradient compressed in greyscale to the range -3 – +3nT)

**Fig. XVII.13** (down). Resulting image of magnetometric survey of barrow no. 15 on the site in Tlumach with highlighted anomalies discussed in the text.

--- approximate spatial extent of anomalies signifying outer limits of the embankment, potentially emitted by a ring-like feature of the barrow's internal structure

··· approximate outer limit of anomaly reflecting a circular ditch surrounding the embankment

-·- approximate spatial extent of circular series of anomalies enclosing the barrow's centre, potentially emitted by a ring-like feature of the barrow's internal structure

— negative peak of magnetisation located in the centre of the barrow

# XVIII. Cemetery in Wiktorów/Viktoriv (Fig. XVIII.1)

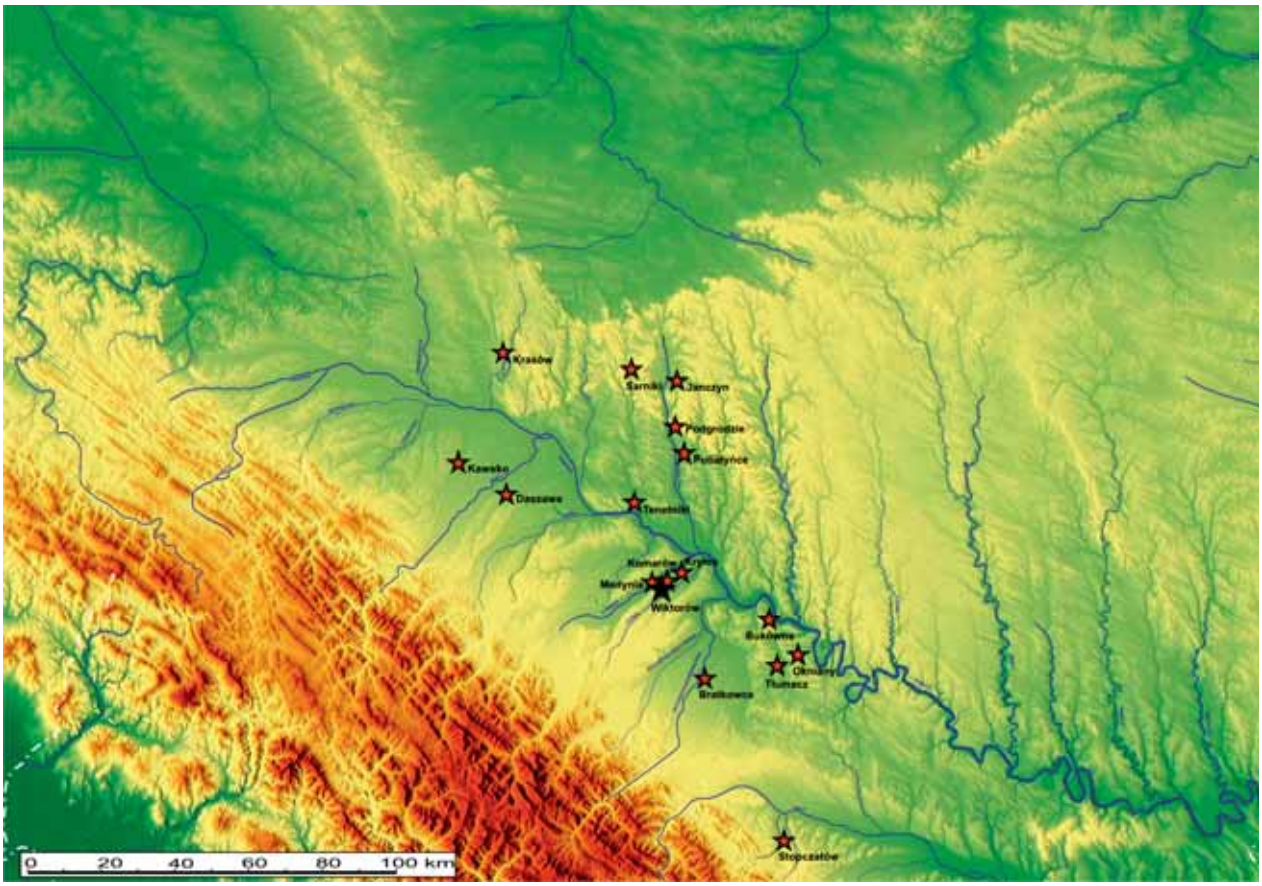
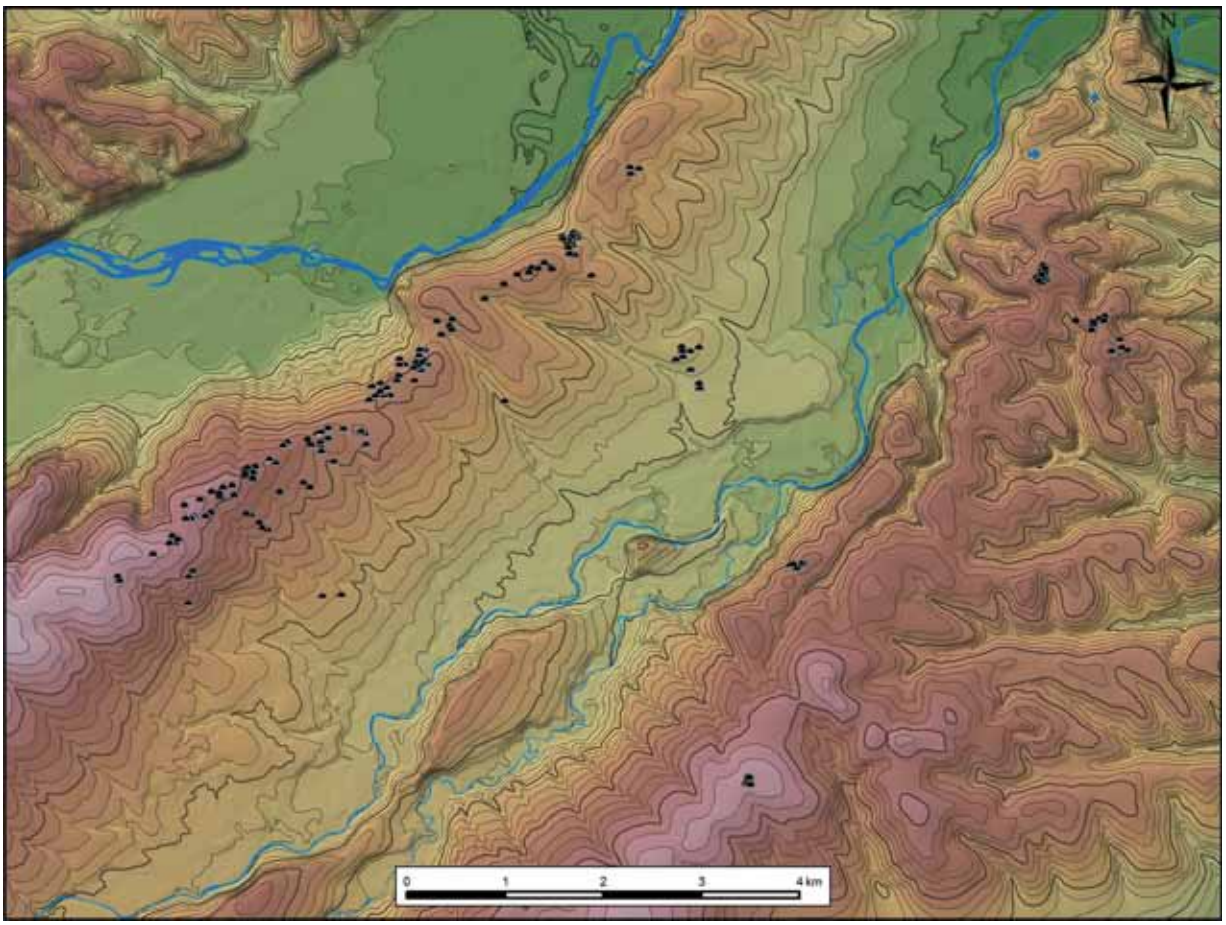



**Fig. XVIII.1.** Location of the cemetery in Viktoriv in relation to other barrow necropolises

## A. Geographical description (see: Chapter VIII)

## B. Spatial arrangement and description of the barrows

The cemetery in Viktoriv is located in the N part of the plateau parallel to the Lukva River and Lukvitsa River Valleys, lying on the NE – SW axis, ca.


N
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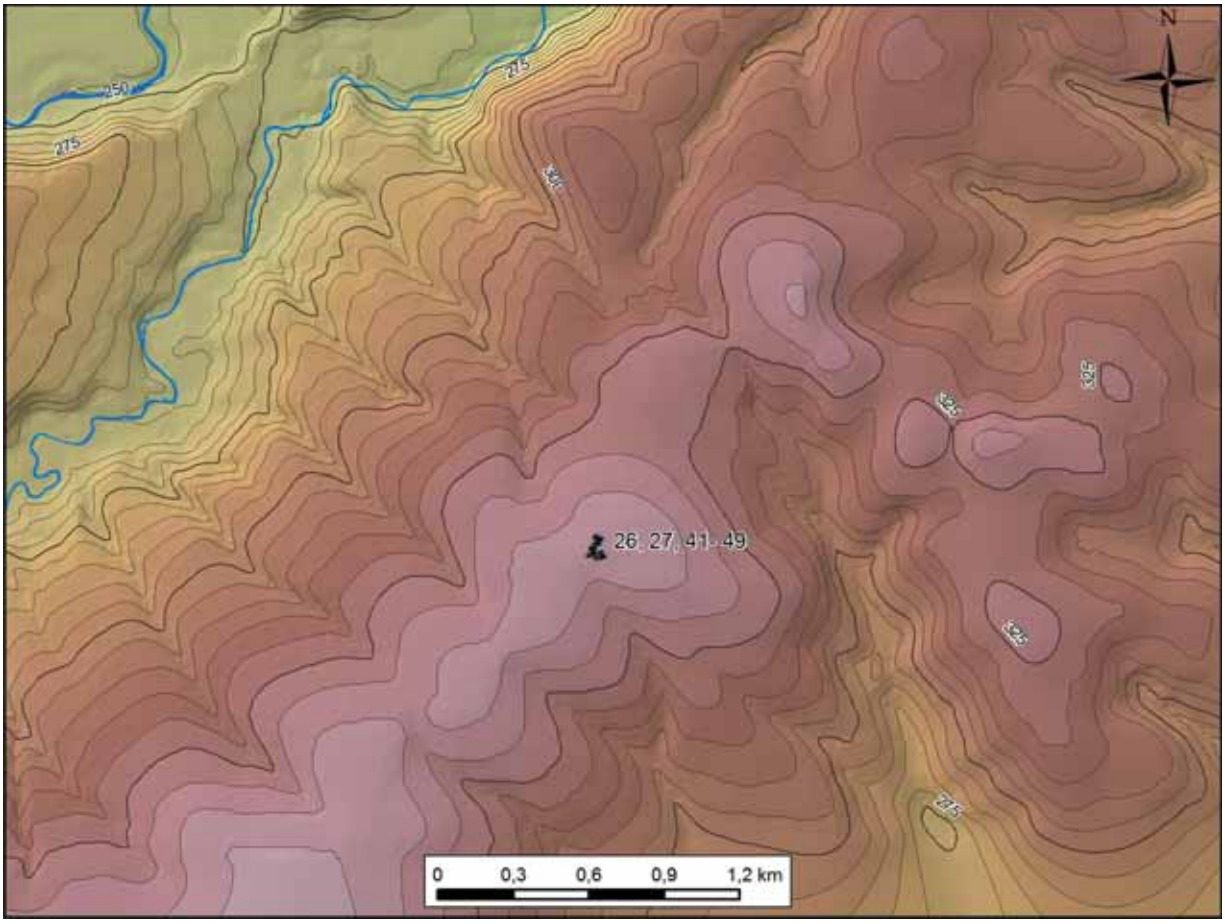
2
3
4 km


N
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275
325
325
325
325
325
275
26. 27. 41. 49.
0
0,3
0,6
0,9
1,2 km

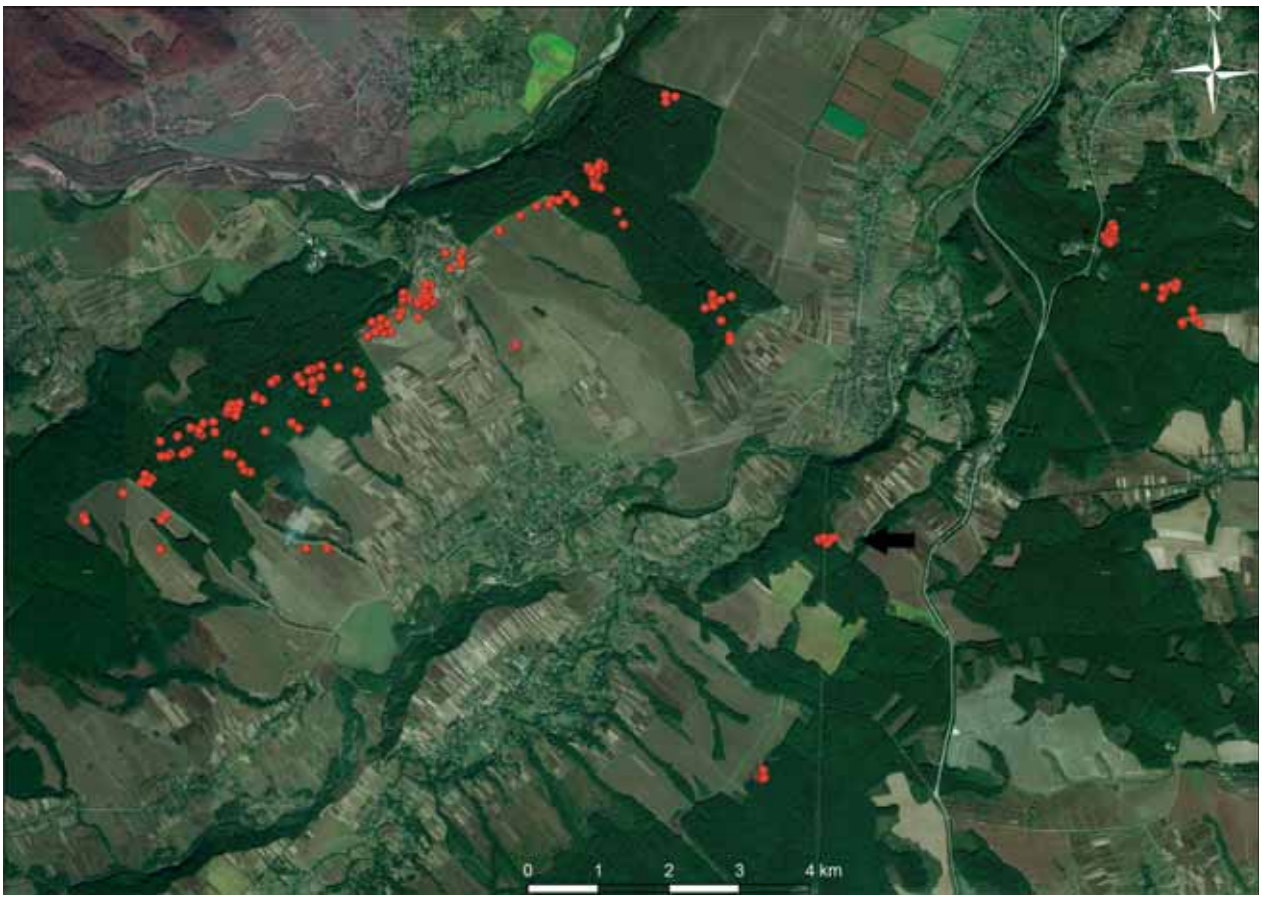


**Fig. XVIII.4.** Viktoriv. Location of the cemetery using satellite imagery (Yandex)

1.9 km from the river-bed of the latter (**Fig. XVIII.2, Fig. XVIII.3, Fig. XVIII.4**). There were 11 barrows documented, most of them in a liner-group arrangement. Eight tumuli (nos. 26, 27, 41, 43-46, 47) are arranged linearly along a NE – SW axis. The line is 85 m long (**Fig. XVIII.5**). Three additional monuments (nos. 42, 47, 49) are located ca. 25 m E of the S part of the aforementioned arrangement, thus creating a triangular form.

**Fig. XVIII.2** (up). Digital Elevation Model of the barrow cemetery in Viktoriv

**Fig. XVIII.3** (down). Digital Elevation Model of the barrow cemetery in Viktoriv with the numbering of barrows

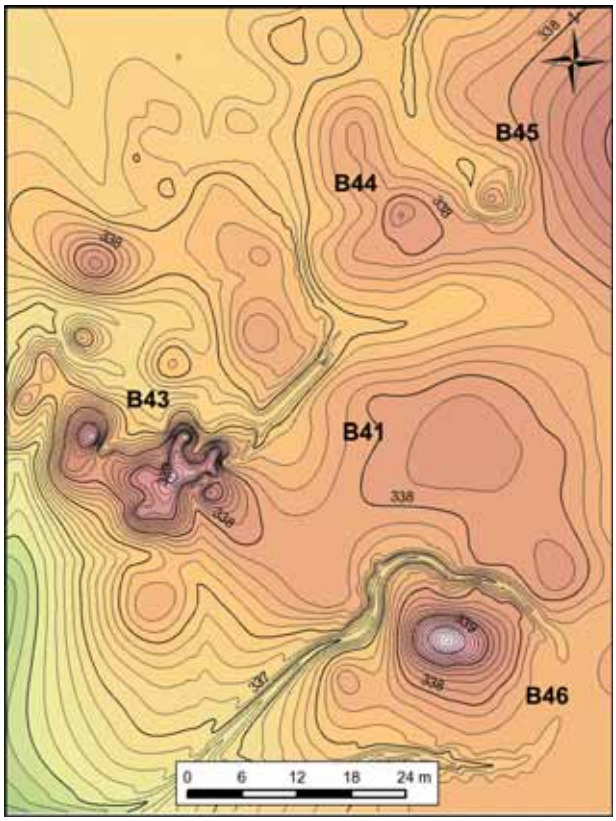


**Fig. XVIII.5.** Viktoriv. Central part of the necropolis

**Barrow 26 (Fig. XVIII.6)** was recorded on the SW edge of the linear arrangement, at 337.5 m.a.s.l., 10 m SW of mound 27. Geographic coordinates: N – 49°03'143"; E – 024°40'520". Circular in shape, 25 m in diameter, 1.3 m high.

**Barrow 27 (Fig. XVIII.7)** erected on the SW edge of a linear arrangement, at 338 m.a.s.l., 10 m NE of tumulus 026. Geographic coordinates: N – 49°03'178"; E – 024°40'556". Circular in shape, 12 m in diameter, 0.4 m high.

**Fig. XVIII.6.** Barrow 26. View from the N

**Fig. XVIII.7.** Barrow 27. View from the SE

**Barrow 41 (Fig. XVIII.8, Fig. XVIII.9)** was discovered in the S part of the aforementioned group of monuments, at 338 m.a.s.l., ca. 15 m N of barrow 27 and 10 m N of tumulus 46. Geographic coordinates: N – 49°03'147"; E – 024°40'531". Circular in shape, 10.5 m in diameter, 0.3 m high. Subject to geophysical survey.

**Fig. XVIII.8.** Barrow 41. View from the NE

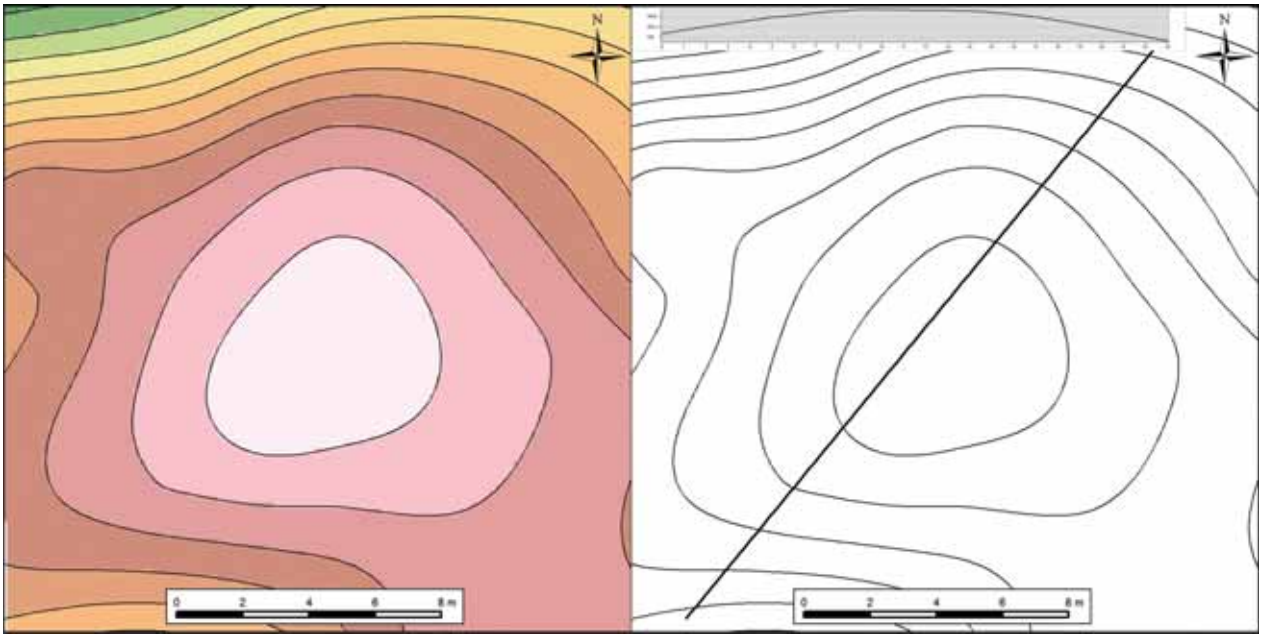


**Fig. XVIII.9.** Barrow 41. Hypsometric plan and cross-section

**Barrow 42 (Fig. XVIII.10)** located on the S part of the necropolis, to the E of the main arrangement of eight tumuli, at 337.5 m.a.s.l., 10 m SW of barrow 49. Geographic coordinates: N – 49°03'143"; E – 024°40'520". Circular in shape, 14 m in diameter, 0.5 m high.

**Fig. XVIII.10.** Barrow 42. View from the W

**Barrow 43 (Fig. XVIII.11, Fig. XVIII.12)** was recorded in the central part of the eight barrow arrangement, at 338 m.a.s.l., 18 m W of kurgan 41 and 21 m NW of mound 46. Geographic coordinates: N – 49°03'158"; E – 024°40'529". Circular in shape, 10.5 m in diameter, 1.2 m high.

**Fig. XVIII.11.** Barrow 43. View from the SE

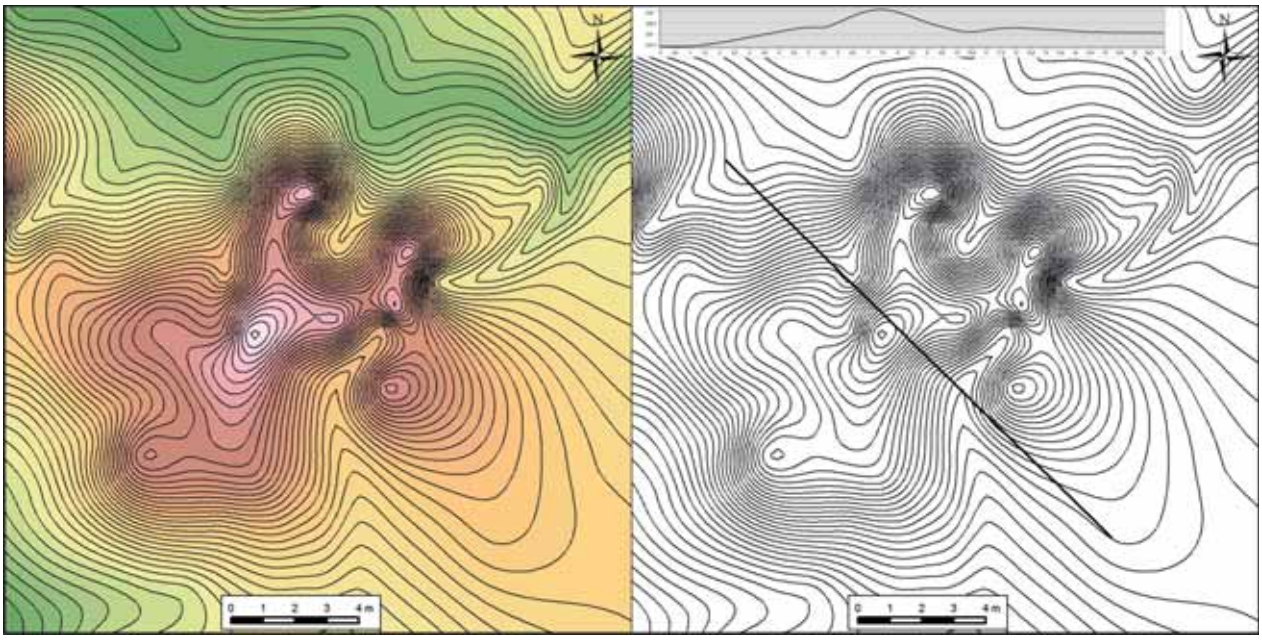


**Fig. XVIII.12.** Barrow 43. Hypsometric plan and cross-section

**Barrow 44 (Fig. XVIII.13, Fig. XVIII.14)** in the central part of the linear arrangement, at 338.5 m.a.s.l., 5 m W/SW of mound 45 and 18 m N of tumulus 41. Geographic coordinates: N – 49°03'166"; E – 024°40'538". Circular in shape, 12 m in diameter, 0.6 m high (originally ca. 2 m). Visible dig-ins.

**Fig. XVIII.13.** Barrow 44. View from the SE

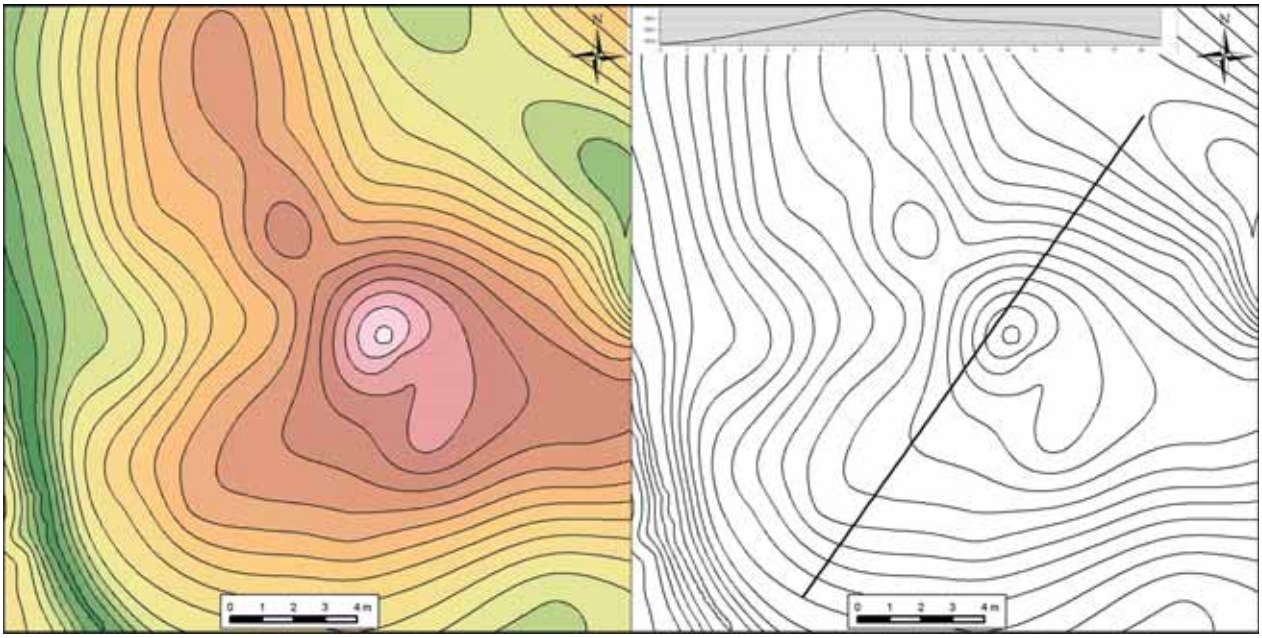


**Fig. XVIII.14.** Barrow 44. Hypsometric plan and cross-section

**Barrow 45 (Fig. XVIII.15, Fig. XVIII.16)** in the N part of the linear arrangement, at 338 m.a.s.l., 5 m E/NE of barrow 44 and 15 m N/NE of tumulus 41. Geographic coordinates: N – 49°03'168"; E – 024°40'545". Circular in shape, 8 m in diameter, 0.4 m high.

**Fig. XVIII.15.** Barrow 45. View from the W

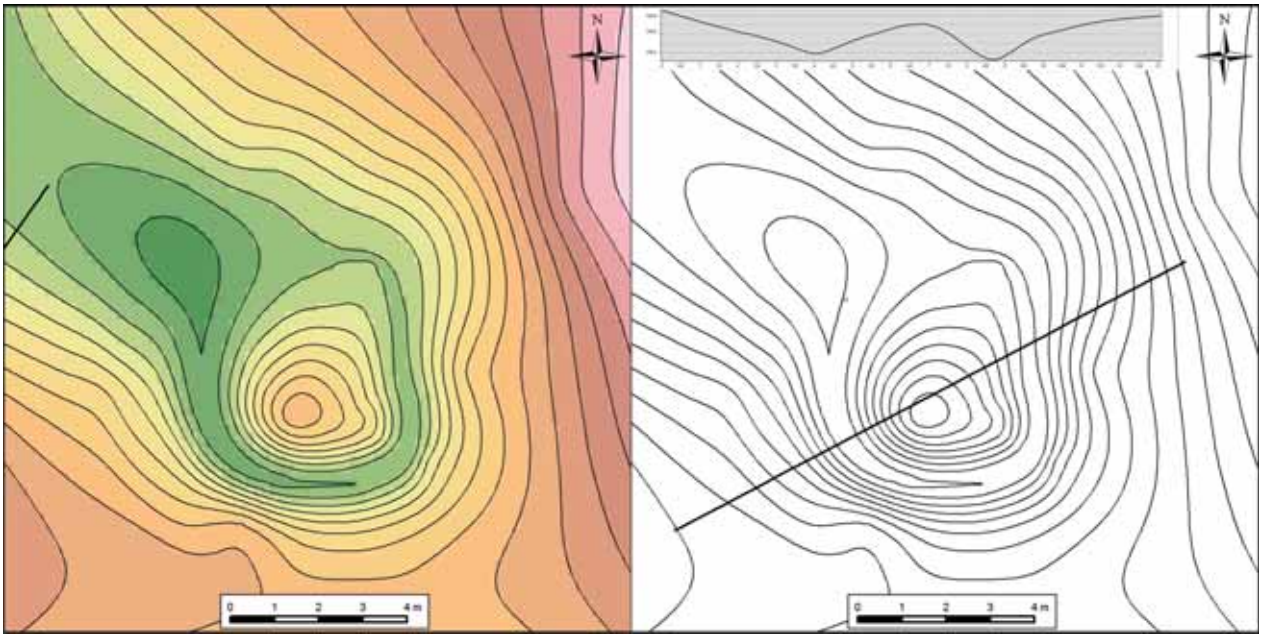


**Fig. XVIII.16.** Barrow 45. Hypsometric plan and cross-section

**Barrow 46 (Fig. XVIII.17, Fig. XVIII.18)** in the N part of the linear arrangement of monuments, at 338 m.a.s.l., 24 m SE of monument 43 and 10 m S of tumulus 41. Geographic coordinates: N – 49°03'181"; E – 024°40'543". Circular in shape, 8 m in diameter, 0.4 m high. Subject to geophysical survey.

**Fig. XVIII.17.** Barrow 46. View from the SW

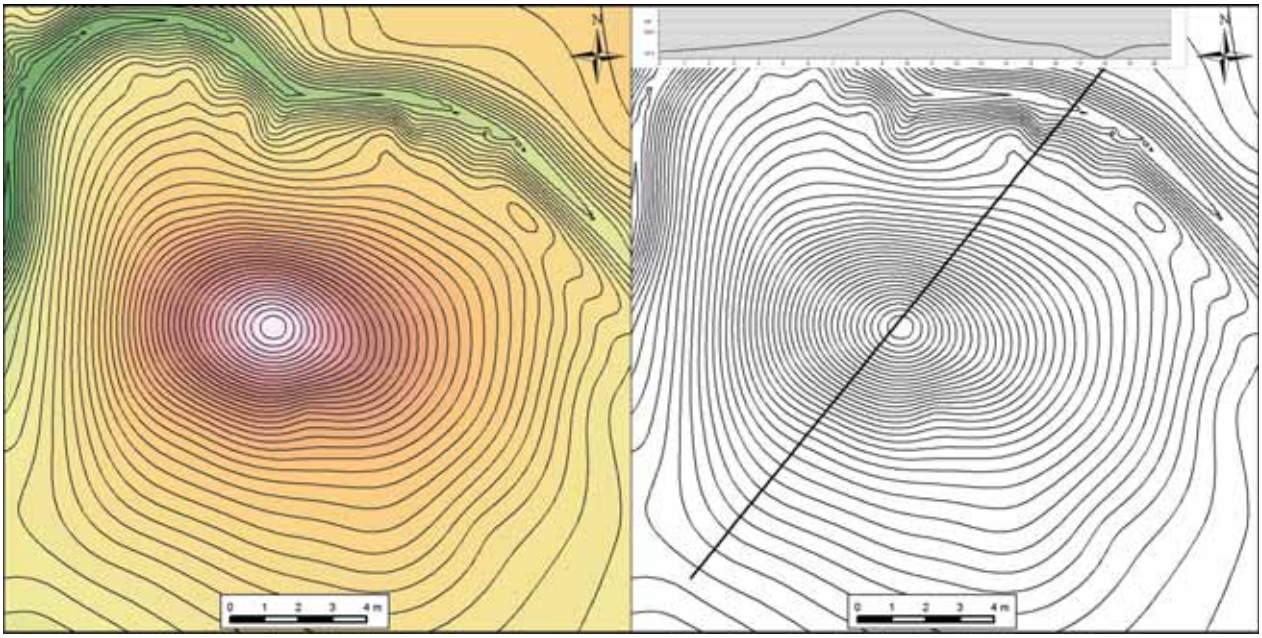


**Fig. XVIII.18.** Barrow 46. Hypsometric plan and cross-section

**Barrow 47 (Fig. XVIII.19)** in NE part of the linear arrangement, at 338 m.a.s.l., 8 m SE of mound 46. Geographic coordinates: N – 49°03'177"; E – 024°40'552". Circulars shape, 14 m in diameter, 1.2 m high.

**Fig. XVIII.19.** Barrow 47. View from the N

**Barrow 48 (Fig. XVIII.20)** in the SE part of the necropolis, at 338 m.a.s.l. 11 m NE of monument 49. Geographic coordinates: N – 49°03'146"; E – 024°40'555". Circular in shape, 14 m in diameter, 0.3 m high.

**Fig. XVIII.20.** Barrow 48. View from the S

**Barrow 49 (Fig. XVIII.21)** on the SE edge of the cemetery, at 337.5 m.a.s.l., 11 m SW of barrow 48. Geographic coordinates: N – 49°03'139"; E – 024°40'559". Circular in shape, 10 m in diameter, 0.3 m high.

**Fig. XVIII.21.** Barrow 49. View from the N

## C. Geophysical survey

A geophysical survey with a magnetometer on the cemetery in Viktoriv was conducted in May 2014. The site is located on the verge of an extensive forest, bordering from its northern side with agricultural fields. Prospection included two neighbouring mounds, densely overgrown with trees (**Fig. XVIII.22**). Both barrows do not reveal any traces of serious damage that could disrupt their internal structures. Furthermore, they are characterized by small embankments, hence the measurements were fairly easy to proceed. The main goal of magnetometry in this place was to circumscribe the spatial extents of monuments and possibly detect any construction elements buried inside them.

Despite the aforementioned dense vegetation cover, it was possible to establish one measuring surface of nine adjacent grids, out of which each one had dimensions of 10 × 10 m. Consequently the surveyed area measures 0.09 ha and is formed into a strip with a width of 20 m and length of 50 m, extending along N – S axis. Inside this framework two barrows are located, designated with no. 41 (northern part) and 46 (southern part) and distanced from each other by approximately 10 m. As a result of the prospection, magnetic field anomalies overlapping with the spatial location of both tumuli were registered. Additionally, part of a signal emitted by another potential mound was revealed (**Fig. XVIII.23**), located eastwards from former two barrows. Densely forested terrain significantly hampered the prospection, preventing a complete measure of some transects, as shown by the vertical green strip in the middle of the image. In several other places, it was necessary to skip a few measure-

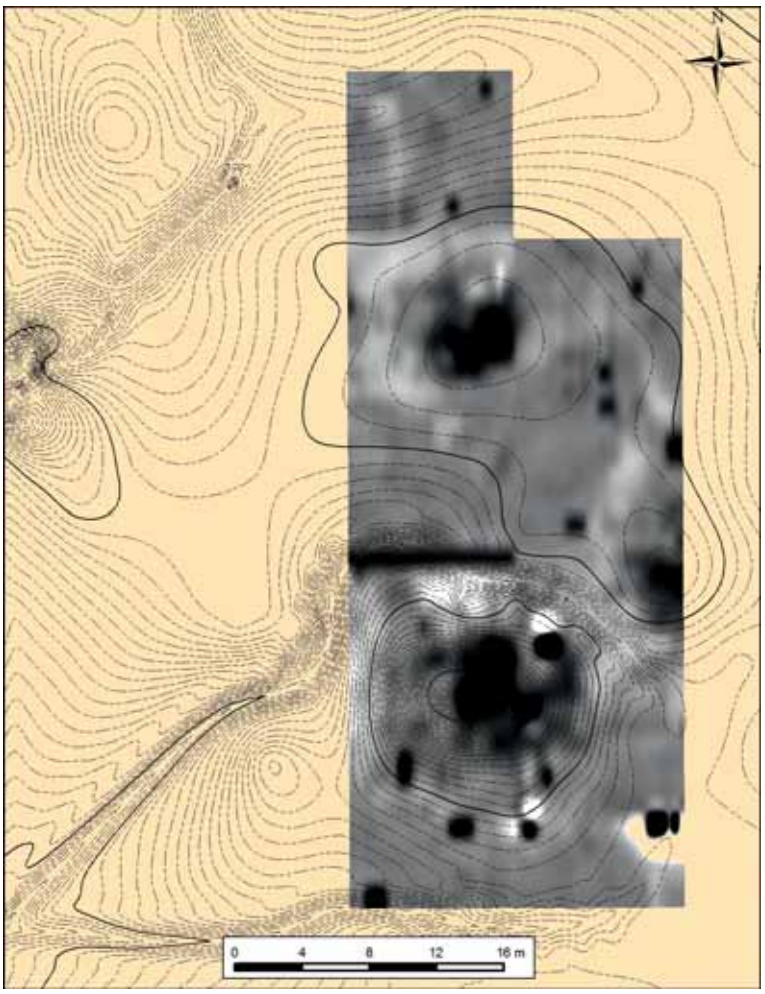


**Fig. XVIII.22.** Viktoriv. Position of geophysical survey

ments in order to avoid obstacles mainly formed by larger trees.

Although the barrows do not seem to have clearly manifested outlines, their spatial extents may be determined by bright halos consisting of negative values of magnetic field gradient, as in the case of other monuments surveyed in the course of the project (**Fig. XVIII.24**). Some of these anomalies are particularly prominent, thus indicating features or layers filled with soil of decreased magnetic susceptibility. In contrast to the latter, stand the middle sections of barrows, which are generally positively magnetized, reaching the upper maximal level of greyscale.

These monopolar peaks take the form of extensive, irregularly shaped zones and are possibly attributed to accumulations of magnetically susceptible material, such as ash and charcoals left after a burnt grave structure. While the discussed anomaly is located centrally in respect to the barrow 41, in the case of barrow 46 it is displaced from the embankment's central point in a NE direction. Moreover, the positive anomaly of the latter mound has some sort of extension in a SE direction, possibly indicating another feature of the same type.

One therefore can consider the discussed zones of increased magnetisation as residues of barrow construction elements, although such an interpretation needs to be verified with the use of other methods. Apart from these clear anomalies, it is difficult to observe other signals potentially connected with features buried inside the mounds. In the vicinity of tumulus 46 two strongly polarized are situated, anomalies that indicate individual objects with high iron content (probably of modern origin), hence emitting residual magnetisation.

Moreover, near the northern edge of barrow 46 an extensive negative peak is situated, slightly elongated along a W – E axis. Interestingly, this anomaly appears in the same place as a disruption of the circular shape of the embankment, as visible on the

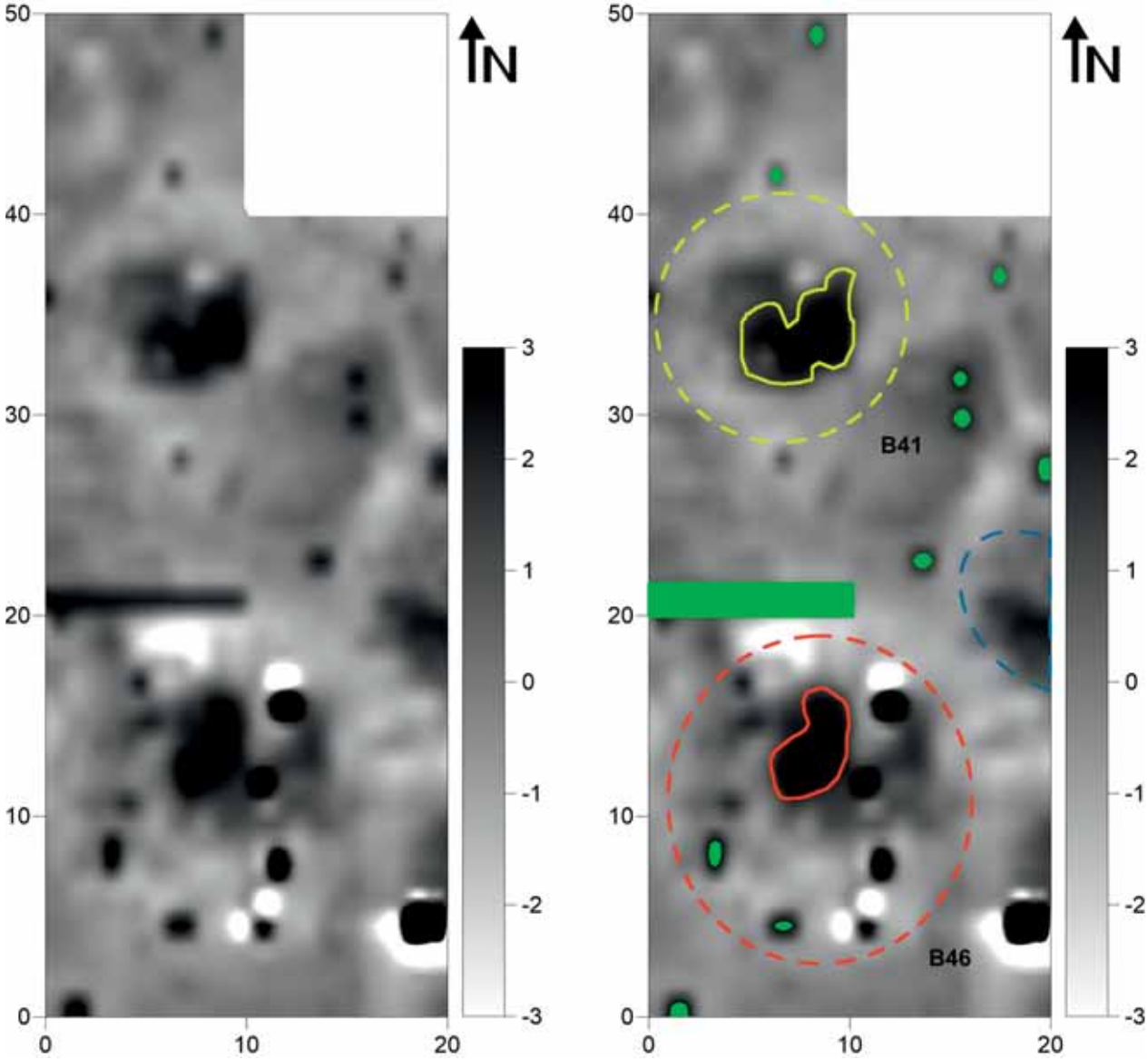


**Fig. XVIII.23** (up). Resulting image of magnetometric survey of barrows no. 41 and 46 on the site in Viktoriv (gradiometer Bartington Fluxgate Grad 601-1; measuring grid: 10 × 10 m; sampling density per transect spacing: 0.25 × 1 m, interpolated up to 0.25 × 0.5 m; real values of magnetic field gradient compressed in greyscale to the range -3 – +3nT)

**Fig. XVIII.24** (down). Resulting image of magnetometry of barrows no. 41 and 46 on the site in Viktoriv with highlighted anomalies discussed in the text.

--- approximate spatial extent of the slightly negative anomaly signifying outer limits of barrow no. 46
— extensive positive peak of magnetisation, potentially indicating an internal feature of barrow no. 46
··· negative anomaly at the rim of barrow no. 46, potentially indicating traces of damage to the embankment
--- approximate spatial extent of the slightly negative anomaly signifying outer limits of barrow no. 41
— extensive positive peak of magnetisation, potentially indicating an internal feature of barrow no. 41
--- approximate spatial extent of anomalies potentially indicating another barrow belonging to the cemetery
● measurements omitted due to vegetation cover the surveyed area

height plan (Fig. XVIII.22). Therefore, it should be treated as a residue of some interference into the barrow's original form. Attention should also be paid to the accumulation of signals with similar spatial distribution, as in the case of barrows discussed before, that is located in the extremely eastern part of the surveyed area. There the crescent-shaped strip of negative values surrounds a zone of increased magnetic susceptibility, hence resembling the other two sepulchral objects located within the surveyed area. Moreover, the aforementioned anomalies correspond with the slight elevation of terrain (Fig. XVIII.22). In the light of these observations, distinction of another mound in this place should be considered.

The final remarks are devoted to the quality of measurements that reflects difficult terrain conditions, which the expedition encountered at the site. Densification of sampling and thus, enhancing the resolution of the image, could bring more detailed results, however, in the face of natural coverage, proved impossible. Nonetheless, the continuation of the survey in a northern and eastern direction can possibly reveal more barrows with low, but still magnetically manifested embankments. It would be interesting also to subject the abovementioned highly magnetic and spatially extensive anomalies, located in the central parts of tumuli 41 and 46, to drilling in order to verify their sources.

## D. Archival information

### Wiktorów, district of Stanisławów (after Sulimirski 1968:138-139)

*A large number of barrow-graves occur here, scattered in various parts of the fields. In 1878, one was excavated by Dr Lenz of Vienna, who found 'several urns and a flint knife' in it. Some years later, several of the graves were excavated by a Mr Pniewski, a local agronomist (Janusz 1918:200).*

*Barrow-grave A. This was excavated jointly by Pniewski and Dr Lenz: it is situated on the 'Huszcza' field. It was excavated to a depth of 1.59 m and potsherds, calcined human bones, charcoal and a flint knife 14 cm long, with another, smaller, were found in it. Dr Lenz removed both knives to Vienna.*

*Barrow-grave B. This was excavated in 1883 and is situated in the 'Huszcza' field. A broken flint knife and two smaller flints found in it were presented to the Archaeological Museum, Cracow (I was unable to identify them).*

*In 1886, T. Ziemięcki (Ziemięcki 1887:53f.; Janusz 1918:220f.) excavated nine barrow-graves situated on the border with Kryłos, in the forest and in the fields. The material was deposited in the Archaeological Museum, Cracow (no. 2694).*

*Barrow-grave 1. This was the largest, being 26 m in diameter, 5 m high. It was excavated by a diagonal trench 7 m long, 2 m wide, 4.5 m deep. A layer of pulverized charcoal mixed with calcined human bones was found about 3 m deep near the eastern periphery of the mound, with some calcined clay and a few potsherds. A flint axe 11.2 cm long (Sulimirski 1968, Fig. 16:15) of a hybrid form, was lying in the centre of this layer, with a flint knife 11 cm long outside the layer of charcoal and bones.*

*Barrow-grave II (**Fig. XVIII.25**, Sulimirski 1968, Plan 27:3). This was situated near the above, 20 m in diameter, 1.15 m high. A trench 1.1 m wide was cut across it. In the middle, at a depth of 1.5 m, heaped calcined human bones were found, among which lay a diorite battle-axe of type 'y-4' (Sulimirski 1968, Fig. 14:2), 9.5 cm long and cracked due to being in a fire, a small bronze ring, and a fragment of a bronze object, probably a bracelet. A little to the west lay a flint axe 8 cm long (Sulimirski 1968, Fig. 16:16) of the hybrid type.*

*In 1934 I investigated this barrow-grave again, by excavating its central part which was 6m in diameter. Traces of the trench dug by Ziemięcki were clearly visible (a) and the site in which calcined human bones lay was identified My excavation showed that the grave was 2 m long, over 1 m wide, orientated W – E, situated near the centre of the mound. The northern side of the grave, about 50 cm wide, was left untouched by the trench (e). In this part, calcined human bones and small lumps of charcoal lay scattered on the bottom of the shallow grave-hole. On the other side of the trench dug by Ziemięcki, at a depth of 35 cm, in the centre of the mound a fine battle-axe of type x-1 (Sulimirski 1968, Fig. 13:1) was found, made of a greenish variety of stone, 10 cm long, and near it was a flint knife, 6.5 cm long (b) (Sulimirski 1968, Fig. 12:4). In the mound earth a few small potsherds undecorated, mainly reddish in colour, were excavated. North of the grave lay a flint burin (d) (Sulimirski 1968, Fig. 12:5). These objects were given to the Archaeological Museum in Cracow (Sulimirski 1935:37, see also Machnik 1960:69f., Pls. I-III). On the southern periphery of the mound heaped pebbles were found within an area 2 by 1 m (c).*

*Barrow-grave III. Nothing was found in this.*

*Barrow-grave IV. This was 18 m in diameter, 1 m high, situated on the border of Kryłos, intersected by a trench 4 m long, 1.5 m wide. A flint knife 11 cm long*

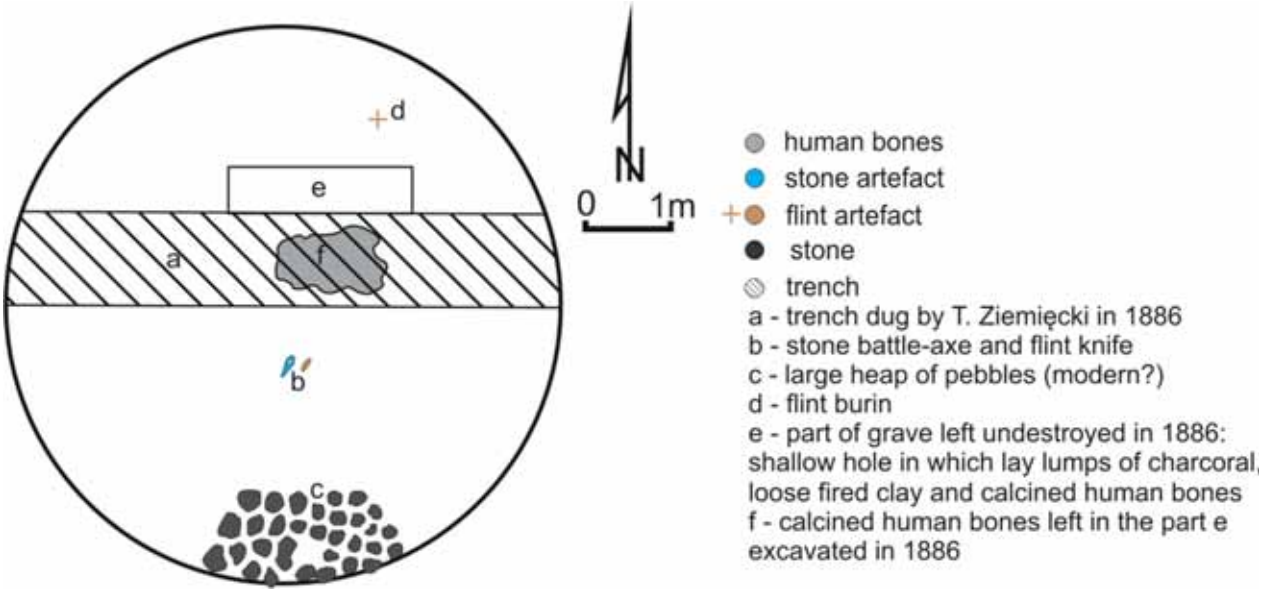


**Fig. XVIII.25.** Digitalized plan of barrow II (Sulimirski 1968, Plan 27:3)

*was found at a depth of 1.66 m in a layer of charcoal, ash and calcined bones.*

*Barrow-graves V-V1. These lay a little further away, while barrow-grave VII, somewhat lower on a slope, was entirely destroyed during the First World War. These barrow-graves were about 20 m in diameter, 1-1.5 m high. A layer of large pebbles was found in both, at a depth of from 1.2 to 2 m, arranged as though in two or three layers. No material or charcoal was found here, as a result of which excavation was stopped without disturbing the pebbles. The construction of these barrow-graves, as is evident from the description was entirely similar to those I found in some Bronze Age Komarów barrow-graves situated some kilometres from the above.*

*Barrow-grave VIII. This was situated beside a road into the forest, much ploughed over, excavated by a trench 4 m long, 1.25 m wide. A broken 'urn' full of 'ashes and human bones' was found at a depth of 1.74 m, in a layer of fat chernozem (probably on the ancient level): a flint knife 6.5 cm long was next to it, and a flint axe (Sulimirski 1968, Fig. 16:18) 8.5 cm long, trapezoid in cross-section, was found near by. The 'urn' was in fact a debased Thuringian amphora (Sulimirski 1968, Plate 5:6) about 30 cm high. It had a very wide opening, with an ornament of parallel lines impressed by cord and ending in two rows of small stamped impressions on the shoulder. No traces of calcined bones or charcoal were found by me at the Museum in the earth deriving from this vessel, which was ash-coloured and resembled dust. It was certainly not a cremation burial.*

*Barrow-grave IX. This was situated in the field 'Na Obszarkach' and was 20 m in diameter. Nothing was found in it.*

*In 1934 I excavated two further barrow-graves (Sulimirski 1935:37). The material was deposited in the Institute of Prehistory in Lwów.*

*Barrow-grave X. Situated in the 'Bandurówka' site, 20 m in diameter, 80 cm high, it had already been excavated, probably by Pniewski as was evident from a trench 4 by 2.5 m in area, orientated S – N. About 1 m NE of the NE corner of this trench, at a depth of 20 cm, a broken flint scraper was found and in the other corner of the trench a few potsherds and a handful of charcoal were excavated on the ancient surface. The potsherds belonged to a larger vessel, reddish in colour, made of a strongly tempered clay paste. A decoration of irregular shallow grooves was visible on these sherds.*

*Barrow-grave XI (Sulimirski 1968, Plan 27:1). Situated in the 'Na Kuciłiwce' forest. This was 18 m in diameter, 1 m high. In the centre, at a depth of 80-90 cm and on the ancient surface, charcoal and loose fired clay and lumps of baked clay appeared scattered over an area about 1.5 m in diameter (a); they were concentrated in particular on the eastern side of this area. On its southern side a fragment of a broken flint axe (b) was found, and near by was a small flint flake (c). In the SE corner of the central area contours of a square pit, 1.2 by 1.1 m were uncovered, probably dug by treasure seekers (d).*

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