NOÉMI BELJAK PAŽINOVÁ – JÁN BELJAK

ARCHAEOLOGICAL INVESTIGATION ON THE HIGH-PRESSURE GAS INTERCONNECTION PIPELINE SK-HU IN 2013

LIFE IN EARLY TIMES

or

THE WORLD OF PREHISTORIC COMMUNITIES IN KIAROV

NITRA 2014
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The zoomorphic sculpture Barney in shape of a dog’s head was found during the archaeological investigation of the prehistoric settlement (Lengyel culture, stage I) in Kiarov - Veľké ortovisko in 2013.
Aerial view of the village Kiarov, in front right Vysoký vrch hill, in the background Ipeľ river with high water level
CONTENT

1 Introduction 6
2 Archaeological research along the route of the gas pipeline 8
3 Archaeological survey near the route of the gas pipeline 15
4 Prehistoric settlement of the cadastre of Kiarov 18
  4.1 The site of Pod brestmi 19
  4.2 The site of Veľké ortovisko 21
  4.3 The site of Šimonovské ortovisko 26
  4.4 The site of Nad Kiarovskou pustatinou 30
  4.5 Evaluation of the settlement in Kiarov 33
5 Life in the Lengyel settlement 39
  5.1 Houses and farm buildings 40
  5.2 Economy 44
  5.3 Material culture 46
  5.4 Spiritual world 55
6 Conclusion 62
Epilogue 66

Notes and references
1 INTRODUCTION

The archaeological research on the construction site of the high-pressure gas pipeline DN 800 Slovak Republic – Hungary was carried out from February to September 2013. The very first stage of the investigation was done in 2013 as a precaution in form of a non-destructive survey of the gas pipeline’s projected route. The line construction used by Eustream crossed the area of Slovakia with 18.6 km of its length through the cadastral areas of nine – villages – Veľké Zlievce, Malé Zlievce, Glabušovce, Zombor, Olováry, Kiarov, Želovce, Záhorce, Slovenské Ďarmoty in the district of Veľký Kríš (Fig. 1).

The archaeological research was carried out by the Institute of Archaeology of the Slovak Academy of Sciences, Zvolen branch. It was led by J. Beljak in cooperation with L. Samu, based on the decision of the Regional Monuments Board in Banská Bystrica (BB 10/459-2/1564/BRE from 10 March 2010).¹

Fig. 1 Route of the gas pipeline SK/HU with marked discovered sites (A-D) in the cadastral area of Kiarov
Four prehistoric sites were identified in the course of the investigation following the groundworks related to the removal of topsoil within the route of the high-pressure gas pipeline in the northern part of the cadastral area of Kiarov. Part-time workers from Kiarov and Želovce participated in the works during the sites’ investigation. The total area searched by means of archaeological research was 154.6 m² and 49 settlement features were documented. The sites were positioned by N. Beljak Pažinová from the Department of Archaeology of the Faculty of Arts of the Constantine the Philosopher University (CPU) in Nitra, who also processed the discovered material culture and evaluated the structure of the settlement.

The presented publication is a result of processing the archaeological research along the route of the high-pressure gas pipeline Slovakia - Hungary in 2013 and the information value of the preserved prehistoric archaeological material from the discovered sites in Kiarov. Although it was not possible to search whole settlements, the range of searched features and intensity of occurrence of finds (pottery; animal bones and products; daub; lithic raw materials, etc.) point at the existence of homesteads with skilled craftsmen.

The work also includes a list of known sites and an analysis of the archaeological settlement of the region of the Ipeľ Basin and its surroundings. Besides basic evaluation and cultural setting of the features and finds, we also intend to present a historical reconstruction of everyday life of prehistoric communities living in the Kiarov’s area in the past. This makes a good base for solving the topic of prehistoric settlement in the area of the Ipeľ Basin. The aim of the publication is to widen the knowledge of archaeological sources (settlement features, material culture) and contemporary economic activities and not least the expressions of prehistoric society’s religiousness.

The text part is complemented with graphs, plates and numerous figures (photographs of the archaeological investigation and finds, drawn pictures of features and finds) made and edited by the authors or technicians E. Bakytová from the Institute of Archaeology of SAS in Nitra and D. Zeleňáková from the Department of Archaeology of the Faculty of Arts CPU in Nitra.

The summarizing final part is an evaluation of the presented archaeological sources and their role in the interpretation of the possible way of life in prehistory. The conclusion, however, is not a synthesis, it is a contribution to the discussion about possibilities and limits of the interpretation of the picture we have created on the life in the past.
2 ARCHAEOLOGICAL RESEARCH ALONG THE ROUTE OF THE GAS PIPELINE

The line construction of the high-pressure gas pipeline DN 800 Slovak Republic – Hungary with total length (in Slovakia) of 18.6 km runs in the Ipeľ Basin, through the cadastral areas of nine villages in the district of Veľký Krtiš. Eustream is the construction’s investor.

The construction of the interconnecting gas pipeline is important for economies of both countries and solves the problem of safety in gas supplies for Slovakia and Hungary. The aim of the construction is to set new priorities in the gas supplies directed from the west to the east of Europe and vice versa, as well as in the north-south direction.

The lengths of parts of the interconnecting gas pipeline in individual cadastral areas in Slovakia are as follows: Veľké Zlievce – 1200 m, Malé Zlievce – 1600 m, Olováry – 2400 m, Glabušovce – 1450 m, Zombor – 900 m, Kiarov – 3700 m, Želovce – 2900 m, Záhorce – 4000 m, Slovenské Ďarmoty – 650 m.

The route of the interconnecting gas pipeline (Fig. 2) runs through the farmland from its connection to the input-output object of the compressor station in Velké Zlievce southwards and east of the village of Malé Zlievce, where it crosses the state road from Bušince to Malé Zlievce, stream of the Stracinský potok and the railroad from Bušince to Malé Zlievce. Next to the site of Potôčik, it crosses the state road from Malé Zlievce to Olováry, bends southwards and continues through the farmland between the villages of Olováry and Glabušovce. Then the route continues across a wavy terrain, through fields and pastures to the forest above the site of Dievčenský kríž, while crossing the Kostoliansky and Koniarsky streams, the state road from Kiarov to Želovce and the Vrbovský potok stream. After crossing the forest, it goes down to the village of Želovce and crosses the stream called Krtiš, some nameless streams and an asphalt road. Later, the route of the gas pipeline runs along the Krtiš, passing the villages of Želovce and Záhorce from south-east, crosses a nameless stream, the Záhorský potok stream and the state road from Záhorce to Selešťany. Further, the object of the routing block valve is situated. The further route of the gas pipeline crosses the Krtiš and ends by the Ipeľ river crossing the border between Slovakia and Hungary in the cadastral area of Slovenské Ďarmoty.
Fig. 2 Route of the high-pressure gas interconnection pipeline SK/HU within the cadastral areas of nine villages.
The working strip within the whole construction site was used to distribute tubes and install the pipeline. The removal of the topsoil (Fig. 3, 4) was done in those parts of the route, where it crosses farmland. Trees were cut in the forests, where the stumps were removed and the terrain was smoothed. The maximum width of the working strip was 25-35 m in the parts with removed topsoil and 15-17 m in the parts with forests.

Within the whole construction, the gas pipeline was embedded in a trench min. 1.8 m deep and min. 1.2 m wide (Fig. 5). Then, the pipeline was covered in the trench by the dug out soil.

Crossing the water streams with the gas pipeline was done by putting the pipeline under the riverbed and loading it to prevent it being washed up. As for crossing the Ipel’ river and Krtíš stream, the pipeline was embedded 3 m under the riverbeds.

The construction included installation of an optical fibre cable in a conduit along the whole route – from the compressor station in Veľké Zlievce to the end of the Slovak part of the gas pipeline at crossing the Ipel’ river. After the gas pipeline had been embedded and loaded, the conduit with the optical fibre cable was embedded approx. 3 m from the pipeline, within its protection zone. The trench was max 0.9 m deep and 0.7 m wide.
Fig. 4 Aerial photo of the topsoil removal along the route of the high-pressure gas pipeline SK-HU from the compressor station in Veľké Zlievce.
The archaeological research was carried out from February to September 2013 in the following stages:

**Stage 1** – *a non-destructive survey* – after the construction had been surveyed but before the earthworks started, a non-destructive archaeological research was carried out in form of field prospection (the first independent non-destructive field survey on the sites of the projected route of the interconnecting gas pipeline was carried out as early as in 2010).

**Stage 2** – *continuous monitoring of earthworks* – monitoring the topsoil removal done by machines, digging out the trenches, embedding the pipeline tubes and digging out the trench for the optical fibre cable. The topsoil in the working strip was moved to one side, where it was temporarily stored until the earthworks were finished. After the pipeline was embedded, the trench was filled and the remaining soil was spread in the working strip. No dug out soil was carried away nor moved. During this phase, recent finds of metals (horseshoes, nails) were found, as well as plastics and sherds dated to the second half of the 20th century. Thus, we do not register them as archaeological finds.

**Stage 3** – *rescue excavation* – was carried out in the northern part of the Kiarov cadastral area. One by one, four sites were identified (Fig. 6): Pod brestmi, Veľké ortovisko, Šimonovské ortovisko and Nad Kiarovskou pustatinou.
First finds along the route of the gas pipeline were discovered on 24 April 2013 in the lower part of a gentle slope in the site of Pod brestmi (route part: 10.6-10.8 km). The second site (Veľké ortovisko) in the section between 10.5-10.3 km was identified on 6 May 2013. The third site of Šimonovské ortovisko (route part: 9.7-9.6 km) was discovered on 7 May 2013. The features on the site of Nad Kiarovskou pustatinou (route section: 7.6-7.8 km) were observed on 28 May 2013.

The investigation on the discovered sites comprised of a destructive excavation (excavations of features, realisation of exploratory sondages), geodetic survey of the investigation area and features, and drawn and photographic documentation.

Limits of the features could be clearly identified in the light-brown clay (sites A, B and D) and loess-sandy subsoil (site C). Emerging archaeological features were cleaned and the eastern half of them was documented first. Then, after the profile had been documented, the features were completely removed, down to the sterile subsoil. In the places, where it was not possible to identify the area / limits of a feature, 0.5 m wide test pits (sections) were dug; their length depended on the identified terrain situation.

The most – eleven – sections (A-K) were dug on the site of Pod brestmi, and four test pits were situated on the site of Šimonovské ortovisko (A-D) (Fig. 7).
One independent test pit (Fig. 8) was opened on a slightly elevated spot east of the site of Veľké ortovisko. Finally, seven (A-G) test pits were dug on the fourth site of Nad Kiarovskou pustati-nou. There, two rather shallow features (D1-D2) were identified in trench C, after the area had been cleaned.

While a trench for embedding the pipeline was being dug, another feature (B6) was discovered on the site of Veľké ortovisko and two features (C18 and C19) on the site of Šimonovské ortovisko. No other features nor finds were identified at excavation of the furrow for the optical fibre cable.

From April to July 2013, 49 settlement features (pits) in total were studied and 26 test pits were dug in four sites in the cadastral area of Kiarov. More than 16,800 archaeological finds come from the excavation.
The area of the Ipeľ Basin is rich in archaeological sites. Several sites from various historical periods (Fig. 9) occur here, on a rather small area. Many of them were only searched by surface investigations or short-term rescue excavations limited by the area and time. Individual finds were reported accidentally. The exceptions include e.g. the investigation of the Slavic-Avaric burial ground in Želovce – the site of Fingó2, which is the

**Fig. 9 Archaeological sites near the high-pressure gas pipeline.**

A-D newly found sites along the route of the gas pipeline (the red line) in the cadastral area of Kiarov: A – the site of Pod brestmi, B – the site of Veľké ortovisko, C – the site of Šimonovské ortovisko, D – the site of Nad Kiarovskou pustatinou. The sites near the interconnecting gas pipeline in the cadastral areas of villages: 1 Bušince, 2-7 Čelovce, 8-13 Kiarov, 14-24 Kováčovce, 25 Nenince, 26 Nová Ves, 27-29 Olováry, 30-37 Sklabiná, 38-42 Vrbovka, 43-45 Záhorce, 46-50 Želovce
largest burial ground (869 graves) in the second half of the 7th to the 8th centuries in Slovakia.

The Ipeľ Basin is a depression amongst the mountains in the central part of the Ipeľ river basin with the maximum altitude of 390 m near Modrý Kameň and the minimum altitude of 128 m on the Ipeľ river plain near Ipeľské Predmostie. The Ipeľ river, running along its southern and eastern edges and making a state border, has created a wide flat alluvial plain with several meanders, marshes and oxbow lakes. The rest of the surface is hilly, divided into a system of low and wide ridges by a thick net of valleys. As for settlement, it is an ideal region with suitable climate, soils and water sources. It means that it was very popular since the Upper Paleolithic, when an upland settlement was founded (35 000 BC) on the site of Hradište, a hill near Kováčovce (Fig. 10). Another settlement was probably founded on Vysoký vrch hill near Kiarov. In the era of first peasants, i.e. the Neolithic (5 500 - 4 000 BC), mostly Linear Culture settlements were known, e.g. in Vinica, Sklabiná, Slovenské Žarmoty - Malý Iliašov and Želovce. In the era of first smiths and metal founders (Copper Age – 4 000 - 2 200 BC), settlement of the Baden Culture is known in Čebovce and Slovenské Žarmoty - Iliašov, where the settlement continued to the Early Bronze Age (2 200 - 1 500 BC). The late Bronze Age settlement (1 100 - 700 BC) by the Kyjatice and Piliny cultures was recorded in Slovenské Žarmoty. It continued to the Early Iron Age (700 - 450 BC). A hill fort from the Bronze Age was discovered in Malé Zlievce-Várhegy. The settlement of the region in the end of the Late Iron Age – La Tène period (in Slovenské Žarmoty and also in Čebovce, Kirt, Ipeľské Predmostie, Kiarov, Kováčovce - Peťov) is followed by sporadic settlement in the first centuries AD – the Roman period (in Slovenské Žarmoty - JRD, Veľká Čalomija, Đurkovce, Záhorce). The above mentioned burial ground in Želovce is an important site from the Avar Khaganate (7th - 8th centuries). Settlement was also recorded in Kováčovce - Páta and Nagy Szek. The depot (treasure) from the 9th century from Čebovce comes from the Late Middle Ages, as well as the settlements (9th - 10th centuries) from Čeláre, Kirt, Kiarov, Koláre, Kováčovce, Slovenské Žarmoty, Sklabiná, Vinica, Vrbovka and Želovce. The intensity of the region settlement is definitely getting thicker by the High Middle Ages, when the written sources bring first notices of villages (from the 13th century).
First archaeological finds from the area of the Ipeľ Basin were collected as early as in the 19th century, mostly by amateur collectors, fans and several experts who accumulated and partly processed the archaeological sources. They include e.g. Baron E. Nyáry (he collected especially prehistoric material in the regions of Hont, Novohrad / Nógrád and Gemen), J. Luňaček (he was interested in fossils, collected archaeological material mainly near Modrý Kameň and Horné Strháre), M. Algöver (he published mostly ceramic urns – probably from the Bronze Age – found near Slovenské Ďarmoty), etc.

Several sites (e.g. Kováčovce - Hradište) or archaeological finds (e.g. from the villages of Kirť, Olováry) are mentioned in the beginning of the 20th century by L. Márton in his work Nógrád Vármegye őskora (Prehistory of the Novohrad / Nógrád County). The importance of the Ipeľ river for transport was also understood by another investigator P. Florek, who summarized all the then known knowledge of the prehistoric settlement in Slovakia.

Activity of Š. Janšák is especially important. He surveyed and modelled many hill forts in the region and studied the settlements near Šahy and Modrý Kameň, from Salka to Kováčovce.

The most sites in the region were discovered and recorded by A. Petrovský-Šichman and his colleagues. They studied the area from Šahy to Kováčovce in 1955. Approximately 400 km² in the central Ipeľ river basin were systematically surveyed.

Another researcher who carried out numerous investigations was J. Bárta. He was interested in the Paleolithic and positively identified several places of settlement within the Ipeľ Basin.

A complex work on prehistoric settlement in Southern and Central Slovakia was published by G. Baláša, who also carried out numerous researches and field surveys in the area.

Targeted surveying activities, often with positive results, were carried in the region out in the 1970s.

We must not forget to mention the rescue excavations in Slovenské Ďarmoty - Iliašov, Čelovce – Beluj, Koláre – dvor JRD, Velké Zlievce – church, Vinica – Konopiská, and, of course, the castle in Modrý Kameň, where the archaeological investigation was restarted in 2013.

New finds and information on the settlement were also brought by the latest researches carried out after 2010 within the project of the Institute of Archaeology of SAS in Nitra, The Centre for Investigation of the Earliest History of the Central Danube River Basin.
During the construction of the gas pipeline, four prehistoric settlements were identified in the north to northwestern parts of Kiarov’s cadastral area. First three sites were 1.2 km far from each other (Fig. 11). The last site of Nad Kiarovskou pustatinou was more than 2 km far from other sites and it was situated on a hill peak plateau (altitude 198).

As for the relief type, from the morphological-morphometrical point of view, the sites of the identified settlement were situated in the area with strongly broken uplands. All four sites were situated in different altitudes and morphological categories. Differences among the sites were also found in the soil type and substrate (Table 1).

Table 1 Basic characteristics of the identified archaeological sites
4.1 The site of Pod brestmi

The site Pod brestmi (Fig. 12) represents the area with rather flat land relief on the foot of a gentle slope. After the topsoil had been removed, several dark stains emerged in the yellow-brown clay subsoil, on the area of approx. 45 x 25 m.

From the total of 13 features and 14 sections (Fig. 13), archaeological material was only found in four pits (features A6, A14, A24 and A29). The richest, largest and deepest was the refuse pit A6 (Fig. 14). Nearby, three or four small post-holes were found (features A7, A8, A9, A11). Other features (A14, A24, A29) were rather shallow (max. 0.2 m) oval or irregular pits. The southwestern part of feature A14 was falling almost vertically down to the basin-shaped bottom, 0.17 m deep. It is possible that this is a post-hole, too.

A rather large dark brown stain with the size of 28 x 8 m occurred in the southwestern part of the searched area, overlapping the limit of the gas pipeline’s working strip. It was studied by means of seven longitudinal sections (A-G) with various lengths but the same width of 0.5 m and depth of 0.2 m.
Only one flake from section D was found in the whole area of the dark layer. It is a darker, probably geological layer. The same can be said about the dark coloured layer studied by sections in the western part of the area without any archaeological finds.

Generally, we can say that the site of Pod brestmi had monocultural settlement with features respecting each other. The only exception was feature A14; however, the find situation and the content of the feature do not allow to separate the possible post-hole from the shallow basin-shaped feature.

The common feature of the pits is their small depth (between 0.1 to 0.23 m). Only post hole A11 was deeper (0.3 m), as well as feature A6 (Fig. 15) with an irregular bottom with max. depth of 0.78 m.

Less than 500 artefacts came from the site of Pod brestmi. Animal bones were not present in the area. The site is dated back to the older stage of the Lengyel Culture.

Fig. 14 Excavation of feature A6 on the site of Pod brestmi

Fig. 15 Western profile and ground plan of refuse pit A6 on the site of Pod brestmi
4.2 The site of Veľké ortovisko

As for the number of finds, the settlement documented on the site of Veľké ortovisko was the richest with its total of 15 features (Fig. 16). Four of them (features B3, B8, B16, B18) did not contain any archaeological material.

The site was investigated within the area of 50 x 25 m. The subsoil comprised yellow loess (clay). Features were situated on a rather steep convex slope with eastern exposure.

Features can be divided, according to their shapes (Graph 1A), as follows:

- **T1** – Slightly oval to round pits with more or less flat to basin-shaped profiles: B1, B4, B5, B10;
- **T2** – Shallow, slightly oval to round pits: B2, B3, B12, B16;
- **T3** – Irregular large pits (with steps): B7, B8, B11, B15;
- **T4** – Oval pits with more or less bath-shaped profiles and flat bottoms: B6;
- **T5** – Post-holes: B9(?), B18.

As for their depth (Graph 1B), the features can be divided as follows:

- **H1** – shallow pits (≤ 0.25 m): B2, B3, B12, B16, B18;
- **H2** – medium deep pits (> 0.25 ≤ 0.5 m): B5, B8;
- **H3** – deep pits (> 0.5 ≤ 1.0 m): B1, B4, B6, B9, B10;
- **H4** – extremely deep pits (>1.0 m): B7, B11, B15.

![Fig. 16 Plan of the archaeological site Veľké ortovisko](image-url)
Feature B15 (Fig. 17) was extremely rich and large. The most lithic and clay artefacts (more than 8,500 pcs) come from its material content. The feature was situated in the lower part of the slope. The fill and shape suggest its possible design and maybe its original construction. Partly burnt daub (destroyed walls?) was found in the feature. On its bottom (approx. in the middle), a recessed bottom of a post-hole can be supposed (Fig. 18). Compact black or even sooty soil – clay-humus layer mixed with charcoal and daub – was found in several places in the fill. The construction which was built here was probably burnt in a fire.

The studied feature could be the lower part (cellar?) of a surface structure. The daub found in the fill might come from its walls or ceiling. This hypothesis will be proved (or disproved) after a thorough analysis of the marks left by the construction elements on larger daub pieces (more than 560 fragments in total) from the interior.
Unfortunately, we cannot say exactly how the underground part of the construction was entered (from the above-ground part only, or from the then surface). The relation of the feature to the nearby post-hole B18 is also questionable.

As for the feature’s function, we can take a workshop for making / finishing chipped stone implements into consideration, as a larger collection of mostly obsidian and radiolarite flakes (almost 500 fragments) come from it.

The amount of chipped stone implements was also recorded all over the area. They were all small (2-3 cm) or even tiny shapes (less than 1.5 cm). Larger lumps of raw materials occurred only sporadically. They might have got to the site like this and then were produced (chipped) somewhere else. Obsidian and radiolarite were frequent goods and travelled several tens or even hundreds of kilometres before they arrived to the consumers.
Fig. 19 Documentation of feature B15 on the site of Veľké ortovisko

Fig. 20 Excavation on the site of Veľké ortovisko (view from the west). Vysoký vrch hill in the background, on the right
The site of Veľké ortovisko had monocultural settlement and settlement pits respected each other. It can be definitely dated to the Early Lengyel stage, which is represented by red paint and engraved decoration on pottery. Anthropomorphic and zoomorphic sculptures also come from the site. More than 12,800 finds in total were collected on the site.

Approx. 110 m east of the Veľké ortovisko site, on the northern edge of the high-pressure gas pipeline’s working strip, a distinct oblong dark stain was observed in the yellow loess subsoil. The spot was searched by means of a large section (5 m long x 1 m wide x 0.4 m deep). The layer contained a smaller amount of finds (62 pieces): pottery, stone implements, small pieces of daub. As it was not possible to identify the lines of the features, we interprete the find situation as a cultural layer of the older classical Lengyel culture stage. No other features nor finds were discovered in the immediate surroundings, within the defined investigation area.

More than 12,800 archaeological finds, which is the largest number within the route of the SK-HU high-pressure gas pipeline, were found on the site of Veľké ortovisko. The most precious finds include fragments of animal or human sculptures and richly decorated thin-walled cups. The cups are a typical shape of the first stage of the Lengyel culture.
4.3 The site of Šimonovské ortovisko

The site is situated on a slight terrace (Fig. 24), approx. 0.8 km from the site of Velké ortovisko. Subsoil comprises of yellow clay-sandy loess. Nineteen features were discovered on the area of 88 x 25 m and four test pits (sections) were dug (Fig. 22). No archaeological material was found in features C3, C11, C12, nor the sections. Almost 3,500 finds were discovered on the site.

The character of the site itself was different from the previous sites. Besides numerous pottery fragments, the site stands out with a high number of animal bones which were, in some cases, touched by fire – their colour varied from dark brown (approx. 400°C), but mostly black (approx. 500°C), to blue-gray, rarely even white (approx 600°C).

Several animal bones (from features C2, C6, C9, C14, C19) were processed. Originally, they were used as needles, awls, scrapers, pointed parts of tools, etc.

Feature C1 on this site was unique (Fig. 23). It was a pear-shaped storage pit with low cylindric mouth, 1.08 m deep. It is the only storage pit documented during the whole archaeological investigation along the route of the high-pressure gas pipeline

Typologically (Graph 2A), the features could be divided into the following groups:

- **T1** – Slightly oval to round pits with more or less flat to basin-shaped profiles: C5, C11, C13, C14, C17, C18, C19;
- **T2** – Slightly oval to round shallow pits: C3, C10, C12, C15;
- **T3** – Irregular large pits: C7, C16;
- **T6** – Round pits with conic profiles and rounded bottoms: C2, C4, C6, C8, C9;

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**Fig. 22** Plan of the archaeological site Šimonovské ortovisko
**Graph 2** Shares of types (A) and depths (B) of pits on the site of Šimonovské ortovisko

T7 – Storage pit (narrow funnel-shaped mouth, widened oval lower part): C1;

As for their depth (Graph 2B), the features can be divided into the following groups:

**H1** – shallow pits (≤ 0.25 m): C3, C10, C11, C12, C13, C15, C17;

**H2** – medium deep pits (> 0.25 ≤ 0.5 m): C2, C4, C5, C6, C7, C8, C14, C16;

**H3** – deep pits (> 0.5 ≤ 1.0 m): C9, C18, C19;

**H4** – extremely deep pits (>1.0 m): C1.

**Fig. 23** Ground plan and profile of feature C1 on the site of Šimonovské ortovisko
Most features on the site respected each other (Fig. 25); however, in two cases, superposition of features can be observed (features C11 and C17; features C14 and C16).

As for chronology, we must say that even though several features show typical characteristics of the Lengyel culture (storage jars with horizontal horn-terminalled handles, red-painted pot-shaped vessels, wide open bowls, non-perforated hemispherical, round and vertically prolonged knobs and lugs, etc.), in some cases elements and shapes untypical for the Lengyel culture appear (mostly in features C1, C6 and C9).

Thus, the site is provisionally dated to the younger stage of the Lengyel culture; however, more precise dating will be possible after we confront it with other finds of contemporary cultures in the region (mainly the neighbouring Hungarian part, where more and more prehistoric - Late Neolithic - sites were discovered). We must also compare the material with the area of Tisza river basin, whose people had busy contacts with the communities of the central Ipeľ river basin. It is documented e.g. by frequent occurrence of an important goods – obsidian, whose deposits are located in the volcanic mountains (e.g. Vihorlat).

Copper occurred in two features on the site of Šimonovské ortovisko. In feature C4 it was a copper bead, in feature C6, they were small copper fragments (remains?). In feature C6, even a restorable clay nozzle was discovered used for blowing air when smelting of metals.

**Fig. 24** Excavation on the site of Šimonovské ortovisko (view from the east). Vysoký vrch hill in the background
Fig. 25 Profiles, ground plans and photo documentation of features C4 (left) and C8 (right) on the site of Šimonovské ortovisko. A – animal bones, B – pottery, C – stones, D – charcoal; 1 – black-brown sandy fill, 2 – dark brown layer
The last settlement was documented in the northeastern corner of Kiarov’s cadastral area, on the site of Nad Kiarovskou pustatinou (Fig. 26, 29).

Two rather shallow (max. 0.34 m deep) features with slightly oval to round ground plans (Fig. 27) and max. diameter of about 1.4 m were found on the top of the hill, in the altitude 198. The subsoil contained clay-soil loess.

Several sections were carried out near the features (section A – 2.3 x 3.6 m; section B – 2.6 x 2.9 m; section C – 7 x 3 m; section D – 2.3 x 3.2 m; section E – 2 x 3 m; section F – 2.2 x 3.3 m; section G – 2.5 x 3.5 m) with the aim to identify other potential archaeological situations (Fig. 28). Depth of the sections reached 0.4-0.45 m. However, no other finds nor features were discovered.

An amount of 134 finds come from the site, mostly thick-walled coarse pottery, less stone implements, animal bones, antlers.

Features can be dated to the Late Pre-history (Copper Age / Bronze Age). Based on the storage jars with horizontal horn-terminalled handles, we cannot exclude the possibility of the collection belonging to the Lengyel cultural sphere.

Fig. 26 Plan of the archaeological site Nad Kiarovskou pustatinou
The site of *Nad Kiarovskou pustatinou* could be a place for only a short-term campsite of a small group of prospectors.

**Fig. 27** Profiles and ground plans of features D1 (left) and D2 (right) on the site of Nad Kiarovskou pustatinou

**Fig. 28** Geodetic survey of the features (left) and research sections (right) on the site of Nad Kiarovskou pustatinou
Fig. 29: Views of the route of the high-pressure gas pipeline from the site of Nad Kirovskou pustationou westwards.
4.5 Evaluation of the settlement in Kiarov

The archaeological research on the four sites in the cadastral area of Kiarov has brought knowledge of an unusually rich settlement in the region at the end of the Neolithic, or the turn of the Neolithic and Aeneolithic (Copper Age). The total area of features searched by means of archaeological investigation was 154.6 m² (Graph 3) and more than 16,800 finds were discovered (Graph 4).

**Graph 3** Share of archaeological investigation on individual settled sites in the cadastral area of Kiarov (Pod brestmi: 47.8 m²; Veľké ortovisko: 52.8 m²; Šimonovské ortovisko: 52 m²; Nad Kiarovskou pustatinou: 2.6 m²)

**Graph 4** Intensity of occurrence of selected find types on individual settled sites in the cadastral area of Kiarov

- whorl
- stones
- stone grinders
- stone pads
- chipped implements
- daub
- antler
- animal teeth
- animal bones
- pottery
The discovered material culture suggests intense settlement in the northern part of the cadastral area of Kiarov in the first stage of the classical Lengyel culture on the sites of Pod brestmi and Veľké ortovisko. The site of Šimonovské ortovisko has brought, along with the typical shapes of the Lengyel culture, some untraditional products (a clay nozzle, a cup with a lug, etc.) which widened the range of the known prehistoric finds from the area of the central Ipel’ river basin. On one hand, they may show contacts with the Polgár cultural sphere in the Tisza river basin or the neighbouring area in the north of Hungary. On the other hand, it is possible that the finds belong to the era of first smiths and metal founders of the Copper Age or Early Bronze Age. Non-numerous finds from the site of Nad Kiarovskou pustatinou are similar; the site is provisionally dated to the Late Prehistory (Copper Age / Bronze Age).

The size of the investigated areas with features and the intensity of occurrence of finds (pottery, small objects, animal bones and products, daub, lithic implements and raw materials, etc.) shows, in first three sites, that there were peasant settlements with skilled craftsmen producing not only common kitchenware, but also clay products of unusual shapes and zoomorphic, as well as anthropomorphic sculptures. Rare finds of spindle whorls and loom weights, show the production of textiles, stone pads and grinders say something about how food was prepared; found animal bones confirm hunting, working with wood suggest stone implements (chisels, axes), contacts of the inhabitants with the neighbouring or remote communities are documented by the found lithic raw material (mainly obsidian, radiolarite) and products made of it (e.g. flakes suitable for cutting could have been used in e.g. sickles).

None of the investigated sites allowed us to study houses or funeral features. Nevertheless, we know from the analogous sites of the Lengyel culture that in the surroundings (maybe even the immediate surroundings), some other settlement finds are situated, possibly also burial zones.

Possible existence of a sacral space near the investigated sites is suggested by the vegetation signs visible in the terrain. Supposed places in the northern part of Kiarov’s cadastral area where circular enclosures – roundels were situated, were already discovered by J. Pavúk and V. Karlovský on satellite images (oral information).

Large round structures – roundels are typical of the Lengyel culture. They were multifunctional (a gathering place, calendar, marketplace, sanctuary, ...) and at least one of them was probably situated in the cadastral area of Kiarov.
We can notice on the orthophotomap of the landscape (Fig. 30) that in cases of potential structures B and C we speak about rather small structures with diameters up to 40-45 m. On the other hand, the circle marked with letter A, situated northwest of the investigated sites in the site of Špania dolina, is a larger structure with the diameter of about 140 m.

Existence of structure B can be excluded today, as right in this area, the site of Šimonovské ortovisko was investigated. Other vegetation signs (A and C) must be checked by a surface prospection and, ideally, also other non-destructive methods of archaeological research, e.g. geophysical survey. The aerial survey / photo coverage in March 2014 did not confirm their existence.

Besides the above mentioned structures, we cannot exclude the fourth possible position of a large round structure (the blue circle on the orthophotomap) – southeast of the investigated sites, less than 500 m far, in a gentle slope. There, vegetation signs suggesting a circular feature could be observed from the main road from Želovce to Kiarov.
The searched Lengyel sites in the northern part of Kiarov’s cadastral area prove frequent use of this space in course of several generations. To define the exact existence and mutual connections of individual sites, we will need complex analyses of the archaeological and archaeobiological material from the typological, chronological and functional points of view. Nevertheless, we can confirm today that the whole region was popular and preferred at least in the period of the old classical horizon of the culture, which is documented by the analogous finds from the immediate surroundings (Fig. 31).

First Lengyel finds from Kiarov were identified by J. Böhm as early as in 1972 and 1974 on the site of Sziget (152.4 m above sea level). Four skeleton graves (with no additions) were disturbed here and also settlement finds dated to the first classical Lengyel stage were reported. This site is situated south of the village, less than 1 km from the Ipel’ river’s right bank. Sziget lies in about 2.8 km airline distance from the investigated sites of Pod brestmi and Velké ortovisko in the northern part of the cadastral area.

Another skeleton grave of the Lengyel culture was identified on the site of Za tehelňou, situated west of the village of Slovenské Ďarmoty. The grave of a crou-
ched body lying on its left side in the
W-E direction included (Fig. 32): a thin-
walled cup, small tray with a spout, thin-walled decorated vessel with a
spout, decorated fragments of another
thin-walled vessel, stone axe-hammer
made of serpentinite, quartzite flat
trapezoid-shaped axe and a blade made
of Jurassic-Krakow flint22. The supposed
position of the burial is in about 10 km
airline distance from the sites of Pod
brestmi and Veľké ortovisko, which we
were investigating.

The last site of the early classical
Lengyel culture (Lengyel IB) in the
central Ipeľ river basin is situated in the
cadastral area of Koláre, on the grounds
of the former cooperative north of the
village. The site is about 2 km far from
the site of Slovenské Ďarmoty - Za te-
helňou. The rescue research here was
carried out by J. Lichardus in 196223 and
in 1972 by J. Pavúk24. Several settlement
features with rich find assemblages25
were identified on the site. The larger
(min. 5.6 x 5.0 m) recessed feature 1/72
with a number of obsidian flakes stands
out. It was probably a workshop for
obsidian processing where flakes were
made and processed for further use in
tools (e.g. sickles, knives, etc.). Chipped
stone implements from the site were
studied more in detail by M. Kacza-
nowska26 from Poland.

Fig. 32 Selection of finds from the Lengyel culture grave with a crouched body in Slovenské Ďarmoty - Za tehelňou. 1 – stone axe; 2-4 fragments of a pot-neck and body;
5 – decorated cup; 6 – bowl with a spout
(according to Nevizánsky/Ožďáni 1984, fig. 2, 3; edited)
Fig. 33 Reddish, crudely made, thick-walled pot decorated with round and saddle-like knobs from Kiarov - Velké ortovisko (feature B15)
The Lengyel culture is an important culture of the Late Neolithic (Late Stone Age) and beginning of the Aeneolithic (Copper Age) in the 5th millennium BC (Fig. 34) in Central Europe. The primary territory of the culture is situated on the area of the today’s southwest and south of Slovakia and Transdanubia. In this environment, are the most significant expressions of this culture from the beginning of its forming to its extinction in the Copper Age.

The name of the Lengyel culture is derived from the eponymous site of Lengyel in the southern Transdanubia (Tolna County), which was studied by a priest, Mór Wosinsky at the end of the 19th century. Since then, the Lengyel ware gradually appeared in the wide area of Central Europe. Slovakia entered the history of investigation of the Lengyel culture in the 1930s, when the existence of the culture was confirmed in works of first authors. Since that time, more and more investigators have become interested in this culture.

The period of the classical Lengyel culture in Slovakia is characterized by three development stages (Lengyel I-III). The end of the classical Lengyel culture falls within the period of a significant cold climate change with global impact on the economy and social organization of the Neolithic people. From this moment, we speak of the beginning of the Aeneolithic. The final stage of the Lengyel culture is called Epilengyel.
The settled way of life generated by growing cereals and keeping animals from the beginning of the Neolithic brought the origins of architecture, changes in work tools and new working habits (branches of production). Long droughts during the Lengyel culture caused drying of rivers and streams and made people move to the brown earth soils in the slightly hilly terrain\textsuperscript{32}, which is evident also in the case of location of the settlements in the cadastral area of Kiarov. There, people found better conditions for farming and life in general.

Innovations in the Lengyel culture are reflected in the architecture of houses, which is related to new technological solutions and construction processes. Archaeological documents show that the Lengyel farmers lived in family groups and built their earthen-wooden houses within the settlements in spatially independent smaller groups.

We have little information on the construction within the Lengyel culture settlements (\textbf{Fig. 35}). We are limited by the possibilities of rescue excavations which rarely allow us to follow the spatial relations within the studied site. It was not different on the sites in Kiarov. Neither there housing constructions were found. Refuse pits prevail on the sites.

\textbf{Fig. 35} Settlements of the Lengyel culture in Slovakia with documented house ground plans: 1 Branč, 2 Brodzany, 3 Bučany, 4 Budmerice, 5 Bratislava - Devínska Kobyla, 6 Chynorany, 7 Jelšovce, 8 Kiarov, 9 Komjatice, 10 Nitra, 11 Nitriansky Hrádok, 12 Ružindol - Borová, 13 Santovka, 14 Svodín, 15 Žlkovce. Green: classical Lengyel culture, red: Epilengyel; circle: above-ground structures, square: individual recessed structures
The only evidence of above-ground structures in most settlements are preserved post-holes and foundation troughs. Thus, it is very difficult to interpret the interior equipment and construction details. Two-space buildings with one (central) transverse wall are typical of the Lengyel settlements, sometimes occur also three-space buildings. In the houses were daubed ceilings. The weight of the saddle roof was lying on the side walls. Lengyel buildings did not have rows of supporting posts in their interiors. There was maximum one supporting stake in the room. The interior equipment is not known, although it definitely included a heating (cooking) device.

Besides two- or more-spaced buildings, small one-space posted structures occur on the Lengyel settlements, too. They can be divided into two groups: above-ground and recessed. In case of the above-ground types, the bearing posts are situated either in the corners of the buildings, sometimes also in the middle of longer walls. Several post-holes were identified on the sites of Kiarov (Pod brestmi, Veľké ortovisko), however, they were not regularly spread in any of the cases. It was thus not possible to confirm the existence of above-ground structures in the investigated areas of the settlements. In spite of that, we can assume that some pits were roofed to be protected from bad weather or that there were above-ground structures of large recessed features, e.g. in the case of feature A6 on the site of Pod brestmi (nearby post-holes indicate its existence). There was one definitely built near feature B15 on the site of Veľké ortovisko. These structures were probably not used as houses. They could have been used as production workshops, or temporary or special farm buildings, warehouses, granaries, etc. The housing area of the settlements in Kiarov was probably situated north or south of the investigated route of the high-pressure gas pipeline, in the area not touched by the excavation.

The analysis of the fill of the large irregular square feature B15 (with min. one post-hole in the central part) in Kiarov-Velké ortovisko showed, that the investigated situation represents burnt destroyed remains of a ceiling and peripheral walls of a house with wooden structure built using cleaved construction elements (planks) and daub. The bearing peripheral walls comprised a construction made of wattle. Traces of the construction elements can be seen in daub (remains of clay spread on the walls of buildings and structures). They are very frequent in the fill of feature B15 (Fig. 36).
We do not have enough evidence so far about clear fencing or possible delimitation of the settlement space. In the area of Slovakia, the only site with confirmed palisade fencing of a Lengyel settlement and proved existence of an independent space delimited by a palisade (for the elite?) was found in the settlement of Žlkovce in the Váh river basin. Delimitation of the contemporary settlements by wooden fencing (palisade) or a rather deep ditch is confirmed mostly in neighbouring countries.

We know round areas limited by pointed ditches, often combined with a palisade, in several sites of the Lengyel culture in Slovakia. They were recorded in a simple form (Ø 30-120 m), with a double ditch (Ø 60-240 m), even triple or sixfold ditches occurred (Fig. 37). These circular enclosures, usually called roundels, have several entrances. If there is an even number of them, they are situated symmetrically opposite each other. The number and design of the entrances varies – there are simple entrances marked only by a space in the palisade or ditch, and there are also long entrance corridors (up to 10 m long) and wooden gate-like entrances within the palisade.

Roundels are part of Lengyel settlement or their settled spaces and they are situated either in lowland terrains near water streams on mostly loess
Fig. 37  Examples of existing types of roundels in Slovakia: 1 Bajtava, 2 Cífer, 3 Golianovo, 4 Ružindol-Borová, 5 Podhoryany-Mechenice, 6 Horné Otrokovce, 7 Bučany, 8 Prašník, 9 Svodín, 10 Žitavce, 11 Hostovce (according to Kuzma 2005, Fig. 14; no scale; edited)

Fig. 38  Reconstruction of the roundel in Svodín
Author: P. Demján, 2011

terraces, or they are found on gentle slopes.

Development of those wooden-clay structures evolved from simple small shapes to larger, more massive structures which were probably used by several settlements. This means that people from the wider surroundings helped to build them. It is doubtless now that each large old Lengyel (central) settlement had an independent round structure (Fig. 38) at its disposal; it is a sign of power of the settlement’s leaders (elite). It seems that several central settlements had the economic funds to provide the construction and maintenance of roundels.

The function of those buildings, however, remains a mystery. They probably served combined social -
sacral purposes and were used as gathering places for several communities. We can neither exclude the use of roundels for economic (re-distribution centre of the region), military (defence), information - astronomical (a calendar), or entertainment (game areas) purposes. We assume that at least one roundel existed in the northern part of the cadastral area of Kiarov (Fig. 30) maybe also in visual contact with some sites.
The economy of the Lengyel culture was based on domestic animals, hunting of game and growing crops. Food was largely complemented by gathered wild growing crops and plants. We can also count in the gradual specialization of production, as farming, hunting, building and other everyday activities (textile production, food preparation, etc.) required products of crafts (pottery, lithic and bone work tools, spindle whorls, loom weights, grinding stones, religious / cultic objects, etc.).

The environment of the settlements consisted mostly of deciduous or mixed forests. Throughout the Lengyel culture, oak is the most frequent. It belongs to durable and hard woods suitable for use in construction. Other species include maple, ash, elm, hornbeam, willow, poplar. Wood was used for constructing buildings and houses, making furniture and other equipment, tools, etc.

As for wild growing species in the Lengyel sites, we most often come across remains of field weeds and ruderals commonly occurring in fields as weeds or near human dwellings. They suggest that the fields were cultivated for a long time. Moreover, plant species from the original forests and shrubby growth are very rare among the finds.

Part of the settlements’ economy was focused on gathering fruit and nuts from the surroundings. We have evidence of acorns, dogwood, glossy buckthorn, maloideae, hazelnuts and blackthorn. As for grown plants, we have recorded carbonized remains of grains of einkorn and emmer wheat which was the main grown plant in the Lengyel culture in Slovakia. Occasionnally, spelt and barley occurred. Leguminous plants are represented by lentils, peas and a textile plant (flax).

Although the growing was intense, the sown fields were small. The grains were gathered approx. in the middle of the stalk. Part of the harvest might have been cut low. A rather poor range of weeds indicates a high level of care of the grain fields (weed control) or selective gathering – gathering of grain corns by hand, or selective cutting with sickle.

The evidence of farming includes the existence of ceilings of houses and farm buildings – granaries. We also have farm tools or their remains, as well as finds of grinding stones used for grinding grains (Fig. 39).

The knowledge of economy of the Lengyel people follows from analyses of animal bones discovered on settlements. On the sites of the older classical Lengyel culture, including the sites of Kiarov - Velké ortovisko and Kiarov - Pod brestmi, bones from wild animals
Animal bones and archaeo-botanic material from the individual Kiarov sites are being processed. During the investigation, parts of earth fills from several features were taken to be flotated in laboratory conditions. Botanic remains will be analyzed. The material makes more than 95 kg of sediment altogether. Animal bones and antlers, comprising almost a tenth of all finds, are being gradually analyzed to determine their species and ages.

Dog bones are very rare on the sites but use of dogs at hunting, guarding (also in form of building sacrifices) and accompanying to the other world is beyond doubt. In some sites, dog bones bore signs of cutting so we must also consider consumption of dog meat.

The evidence of hunting and breeding does not only include bone remains. It also includes the existence of various bone and antler tools. We must not forget the clay zoomorphic sculpture, zoomorphic lid handles and animal-shaped vessels preserved in many Lengyel sites. One of the most beautiful figural sculptures from Kiarov - Veľké ortovisko is the head and part of the neck of „Barney“ the dog which became the mascot and symbol of the archaeological research of the Lengyel culture settlements in Kiarov.

Cattle (60-70%) was the most frequent domesticated animal on the sites of the Lengyel culture in Slovakia. Pig is the second most common (13-30%). It is followed by sheep / goat (6-12%). Domestic animals with secondary use (milk, wool, yokes) were killed as adults, while e.g. pigs were killed before their first, max. second winter.

The evidence of fishing in the Lengyel culture is provided by bone hooks and harpoons which could also be used to catch mammals (e.g. beavers).
5.3 Material culture

The Lengyel culture brought several innovations in the material culture which are typical and make it easily distinguishable in the wide area of (not only) Central Europe. Firstly, it is unique earthenware. Its most typical representative in the older Lengyel period is thin-walled pottery (mainly cups and bowls) with rich red and yellow painted and engraved decoration (Fig. 40). The whole chronological division (relative chronology) of the culture is based on the development of pottery shapes and ornaments.

Fig. 40 Thin-walled decorated pottery of stage Lengyel I from Kiarov - Velké ortovisko
The Lényel culture earthenware consists of pot-shaped and vase-shaped vessels, less frequently slim bottles with long necks. Bowls of variable shapes – shallow, oval and wide open (Fig. 42: 3, 9) – were often used. They were often made on long or short hollow pedestalls (Fig. 42: 6). Storage jars with horizontal horn-terminated handles (Fig. 41) used for hanging or better manipulation with the vessels are typical of the Lényel culture, as well as are mushroom-shaped vessels with distinct shoulders or bulges.

The range of earthenware includes other utility shapes – lids (Fig. 42: 7) and ladles which were present in each Lényel household. Thin-walled, richly decorated cups with S-shaped profiles were used as prestigious, fine tableware.

Engraved and painted ornaments (red, yellow, less commonly white colour) with various decorative elements (engraved spirals, arcs, meandres, linear patterns made of two or three lines) are characteristic of the early Lényel culture. Decorated edges (saw-toothed, cut) of common kitchenware (pots) also occur. We often find functional relief applications on the vessels – spherical, semispherical, conic, tongue-shaped knobs and lugs, handles, plastic strips. Later, amphora-shaped vessels with handles on necks and knobs on vessel-bodies (bulges) appear.

The great homogeneity of numerous pottery shapes of the Lényel culture is the evidence of the advanced level of the pottery technology. Ceramic mass was prepared very carefully and the unwanted admixtures or grains were removed in advance. Hard-burnt vessels’ walls were often medium thick (half-thick-walled) – from 0.5-1 cm, with visible effort to smoothen the surface. The wall of thin-walled cups was often only a few millimetres (0.2-0.3 cm) thick.

The colour of the vessels’ surface was of various brown, grey and yellow shades. Cups, bowls on pedestals and probably some other shapes were made of min. two parts. At the end of the production process (before burning) the parts were put together and the vessels gained their final shapes. Pottery was shaped mainly by hand, using the technique of rolls attached to each other. Use of rotating pottery baseli at making individual shapes (thin-walled cups and bowls) has been considered for a long time\textsuperscript{52}. Vessels were burnt in open fire at the temperature between 700 and 900°C\textsuperscript{53}. 

![](image)

*Fig. 41 Storage jar with horn-terminated handle (feature B15)*
Fig. 42 Vessels of the Lengyel culture from Kiarov - Veľké ortovisko
The value assigned to the pottery is documented by a few attempts to repair the damaged parts, e.g. we have recorded repairing holes on some sherds from Kiarov - Velké ortovisko (Fig. 43). The holes were used to prevent cracks or reinforce the vessels by means of a linen string or bast fibre passing through the holes. It was a method of repairing less damaged vessels which could thus be used for a longer time and did not have to be disposed of or replaced by a new product.

The unique find of a clay nozzle (Fig. 44) came from feature C6 in Kiarov - Šimonovské ortovisko. It is a 7.8 cm long hollow object in shape of a truncated circular cone with a cylindrical passage running through it. Its weight is 82 g. It was found in four fragments which can be assembled to make a complete object.

Clay nozzles are important part of metal founding. Copper melts at temperature higher than 1000°C so special devices with constant supply of oxygen sent to the melting devices by windbags are used. Mouthpieces or nozzles were used on blowers – bellows were used to maintain the high temperature necessary for melting the metal in melting pots. Clay nozzles of the Lengyel culture are not known from Slovakia, however, they were found in the neighbouring cultures (Zlota and Funnel Beaker in Poland)\textsuperscript{54} and e.g. Late Copper Age cultures (Boleráz group)\textsuperscript{55}.

Fig. 43 Fragments of vessels’ bodies with repairing holes

Fig. 44 Clay nozzle from feature C6 from Kiarov - Šimonovské ortovisko
Painted decoration was in the early Lengyel stage applied after burning to the engraved surface. Knobs and lugs were fixed to the finished product. Pottery products were undoubtedly produced by experienced hands, thus we have to consider a specialized production.

Natural paints\textsuperscript{56} were applied to decorate the surface of Lengyel vessels. Hematite was used to gain red pigment and in case of yellow decoration, jarosit\textsuperscript{60} was the main mineral component. To obtain white paint, chalk, calcium compounds, kaolin, lime or crushed shells, conches or eggshells were used\textsuperscript{58}.

Other clay products of the Lengyel culture include disc-shaped items, spindle whorls, weights and various small finds (including miniature vessels), whose function is still not clear. In case of spindle whorls and weights on the sites, we can say that they are clear evidence of weaving or textile production.

As for the clay discs (diameter max. 10 cm and 3-4 cm thick) with a small hole (Fig. 45) approx. in the middle, their use or function is not unambiguous. They might be related to manipulation with fire or some activity by fire\textsuperscript{59}. Other functions cannot be excluded either (e.g. weights for fishing nets, etc.)

Miniature shapes are also common, although not very frequent on the Lengyel sites. Some were found in Kiarov (Fig. 42: 1, 2). They are considered toys but their use in other, maybe cultic sphere\textsuperscript{60} (at rituals) is more likely.

Decoration of vessels’s surface had two meanings: functional - technical (relief elements, roughening, etc.) which provided protection of the vessel’s content from breaking and for better manipulation. It probably also had symbolic - aesthetic meaning which provided symbolic protection of the content and identified the owner or his family, the donor or the donee.

\textbf{Fig. 45}  
Clay discs from Kiarov - Veľké ortovisko (feature B15)
Studying other than pottery material, mainly the lithic industry, is an important part of learning about the Lengyel culture. The stone implements largely contribute to solutions to the questions related to the origin of specialized crafts, long-distance contacts and also makes a good basis for studying the settlement waste disposal, as the stones are not as easily fragmented as e.g. pottery products.

Local sources of raw materials (mostly limnosilicite and radiolarite) from nearer or farther areas were used on individual Lengyel sites. Foreign sources were also documented.

As for the imported raw materials in the Lengyel sites in Slovakia, Jurassic flint from Lesser Poland is the most important (the primary source of the silicite of sub-Krakow Jurassic is south of Krakow). Obsidian (volcanic glass) comes from the Tokaj Hills or east Zemplín, Bakony radiolarite of the Szentgál and Tevel types was brought from northern Transdanubia, menelite is from the Mátra Mountains, etc.

The production process itself started mainly with finding the suitable raw material. Most often, it was a focused prospection by a small specialized group of people who, if necessary, also mined the raw material. It was then adjusted by hits to make preparatory blades and flakes. Final products were later obtained from such material (blades, small blades or flakes) and they were used to make other products (scrapers of all kinds, drills, choppers, side scrapers, microstyluses, retouchers, points, splintered pieces, ...) or combined tools (sickles, chisel-scrapers). The production of semifinished and final products took place in the settlements, probably in specialized spaces (workshops).

![Fig. 46 Radiolarit from Kiarov - Veľké ortovisko (feature B15)](image_url)
Over 600 fragments of chipped stone implements come from Kiarov - Veľké ortovisko. Small obsidian flakes (Fig. 47) and radiolarite (Fig. 46) prevailed. They were accumulated mostly in the fill of feature B15 which is thus considered a workshop building specialized in adjusting and production of chipped tools.

We must not leave out the ground and other stone implements which are not as numerous on the sites as the chipped stone industry but it is still of the same importance for studying the economy of the Lengyel communities. Flat axes and chisels (Fig. 48) were the most numerous ground stone tools in Kiarov. They were embedded in special handles and used for fine carving. They were made from metamorphic rocks like serpentinite, amphibolite. One chisel from Kiarov was made from radiolarite.

Processed stone tools, made of andesite and quartzite, were found in Kiarov - Veľké ortovisko, a grindstone, and millstone and a quernstone were found in Kiarov - Pod brestmi.

Fig. 47 Obsidian from Kiarov - Veľké ortovisko (feature B15)

Fig. 48 Stone axes (1,4,5) and small chisels (2,3) from Kiarov - Veľké ortovisko
We have recorded only small collections of bone and antler implements, since such sources decompose fastly. The preserved shapes are mainly pointed bone objects including needles (Fig. 49: 6) and awls (Fig. 49: 1-3), made of ribs or middle parts of bones (diaphysis). Their tips were adjusted for making holes in raw materials of various quality. Cut off antler points had multi-purpose use as they have a shape of a pointed tool without any major surface finish (Fig. 49: 7).

Fig. 49 Bone tools (1-6) from Kiarov - Šimonovské ortovisko and antler (7) from Kiarov - Nad Kiarovskou pustatinou

Metal finds were important part of the material culture and, at the same time, they were an important trade goods. Although first copper products (mainly jewels) sporadically occured in the beginning of the Lengyel culture\(^6\), first copper tools do not occur before the Epilengyel\(^6\). In Kiarov, copper was exclusively present on the site of Šimonovské ortovisko in form of one small cylindrical bead (Fig. 50) and a tiny copper fragment. They were discovered in features C4 and C6. Analysis by means of a handheld X-ray fluorescence spectrometre (Delta ED-XRF type)\(^6\) showed that they contain 97-98 % of copper.

Fig. 50 Copper bead from Kiarov - Šimonovské ortovisko (feature C4)
Fig. 51 Torso of an animal sculpture with preserved back with a tail from Kiarov - Velké ortovisko (feature B15)
5.4 Spiritual world

We have very little information on religious concepts, cultic practice and ideology itself in the communities of the Lengyel culture. Variety of ritual concepts is documented by several strangely shaped and unique pottery products and, of course, torsos of human sculptures. The animal sculptures, miniature clay vessels, pendants/amulets, items of unknown functions and other small finds which occur more or less frequently in individual sites of the Lengyel culture complex belong to this category, too.

Human (anthropomorphic) sculptures which only sporadically occur in the area of Slovakia (Fig. 52) attract much attention. Most of them come from Moravia, where more than 1,600 pieces of this kind of source are reported.65

![Fig. 52 Lengyel sites from Slovakia with human sculptures](image)

1 Abrahám, 2 Bánovce n. Bebravou, 3 Bratislava (Záhorská Bystrica, Mlynská dolina), 4 Beladice, 5 Bohdanovce n. Trnavou, 6 Bučany, 7 Budmerice, 8 Horné Otrokovce, 9 Kiarov, 10 Košolná, 11 Nitriansky Hrádok - Zámoček, 12 Pečeňady, 13 Santovka, 14 Svodín, 15 Žlkovce.

Blue color: Protolengyel; yellow color: Lengyel I; red color: Lengyel II; green color: Epilengyel
The newest finds of the Lengyel culture include the human sculpture found in feature B15 in Kiarov, on the site of Veľké ortovisko (Fig. 53). It represents a human torso with horizontally oriented arms without any signs of breast. The head of the sculpture, as well as its upper and lower limbs, are broken off. Traces of red paint are still visible on the find. The sherd itself is brown-orange and it is made of fine-grained material. Size of the sculpture is 4 x 2.4 cm. Weight: 20 g.

Gynecomorphic vessels of the Lengyel culture are also an important source when following the spiritual concepts and ritual practices of communities. Although no complete vessel was recorded in Kiarov, a clay fragment of an unidentified item (Fig. 54, right) resembles a raised arm of the Svodín type vessels with human attributes: arm bent in the elbow shaped as small vessels or fingers, indicated face (eyes, mouth, nose), sexual characteristics (breasts), lower limbs. Raised arms are considered a gesture of adoration; it makes us think that the vessels were used during specific ceremonies and rituals. It is also interesting, that most of those specific vessels are found as grave inventory in mostly children’s graves. In Kiarov, however, it was a find from a settlement pit (workshop?). With regard to the fragmentary state of the find, we cannot exclude any other possible function (handle?).
Zoomorphic sculpture is another kind of source which is rather frequent in settlements and burial complexes. It occurs in various forms. Less frequently, it is separately standing, maybe as an applied sculpture originally placed as a knob, lug or handle on vessels and lids. As for the animal species, we can distinguish mainly pig, dog, goat and sheep. We can also find game, exceptionally duck and possibly horse. Many of the sculptures are very roughly shaped. Thus, it is not possible to identify the animal species.

The category of applied animal sculptures includes two new examples from Kiarov - Veľké ortovisko. The first is a fragment (Fig. 55: A) of an animal head (dog) with relief nose and ears (one is broken), impressed mouth and incised eyes and nostrils. The animal’s neck is decorated by evenly spaced horizontal lines engraved around it. The lower part of the animal’s body is broken off. Besides the engraved and impressed decoration, traces of red paint are visible on the neck and head of the find. The surface itself is brown-orange and the item is finely modelled from a fine-grained material. The size of the sculpture is 2.5 x 3 cm and its weight reaches 12 g.

The second find resembles a fragment of an unidentified animal’s body which could have been originally used as a lid handle (Fig. 55: B). The limbs, hand, tail(?) are broken. Traces of red paint are visible on the surface. The fragment is light orange and it was roughly modelled from a fine-grained material. The size of the item is 4 x 3.5 cm and its weight is 28 g.

Fig. 55 Applied animal sculptures from Kiarov - Veľké ortovisko (feature B15): A - dog head, B - body of an unknown animal
The Lengyel pottery finds include zoomorphic figures with small oval containers on their backs. They could have been used to hold paint, fat, aromatic substances, etc.\textsuperscript{69} A large animal-shaped vessel with min. one small container on its back came from the fill of feature B15 in Kiarov - Veľké ortovisko (Fig. 51, 56). It is a rather large fragment of a sharply profiled back part of an animal-shaped vessel (sculpture?) with relief tail (?) going from the back between the legs. The hind legs are broken off. There is an indicated central oval container, 3.3 cm deep, on the straightly modelled back. Traces of red paint on the surface occur all over the preserved part of the object. The sherd is light brown and it was made of a fine-grained material. The object was modelled very precisely. The preserved fragment is 7 cm tall, 6.5 cm long and 14 cm wide. Its weight is 667.8 g, so it is rather heavy.

\textbf{Fig. 56}

\textit{Torso of an animal sculpture with preserved back with a tail from Kiarov - Veľké ortovisko (feature B15)}

Various types of sources had symbolic, spiritual meaning in the life of the Lengyel communities. The unpreserved ones include tattooing or other forms of body decoration. Important role was definitely played by different amulets, pendants, jewels, little altars, special small containers and many other finds which we come across on the sites and which cannot be precisely identified.
The zoomorphic shapes might also include the lid handle from feature B7 in Kiarov - Velké ortovisko. It is decorated with finely engraved linear ornaments and represents a fairly stylized goat (?) with oval head and little tail. The rich engraved decoration covering the whole object is remarkable.

*Fig. 57*

*The engraved lid handle from Kiarov - Velké ortovisko (feature B7)*

Another peculiar type of finds which played their role more in ritual ceremonies than in households are cubical clay boxes. We distinguish several types and varieties\(^70\). They usually have one small container in the middle and four vertically drilled holes in the corners which were probably used to hang the item. One incomplete hanging vessel was identified in feature C19 in Kiarov - Šimonovské ortovisko (*Fig. 58*). It is a fragment of a slightly narrowing cubical box with smooth undecorated wall. There is one preserved vertical hole in the corner and an indicated semispherical central container, approx. 1.7 cm deep. The sherd is dark brown, the clay contains sporadical admixtures of fine grains. The object is 3 cm tall and its weight is 23 g.

*Fig. 58*

1 – Cubical clay box from Kiarov - Šimonovské ortovisko (feature C19), 2 – cubical box (stray find) from Bánovce nad Bebravou
An untraditional find comes from feature B15 in *Kiarov - Veľké ortovisko* (Fig. 59). It is a fine-grained clay item (diameter of 7.5 cm; weight of 111 g) resembling a four-leaf clover or a star. The artefact was probably perforated which is suggested by a small hole situated in the central part of the body. The find definitelly widens the range of the untypical Lengyel items with unknown functions.

![Clay four-leaf-clover-shaped item from Kiarov - Veľké ortovisko (feature B15)](image)

**Fig. 59** Clay four-leaf-clover-shaped item from Kiarov - Veľké ortovisko (feature B15)

It is beyond doubt that individual kinds of the above mentioned finds belong to those with symbolic meaning. What their function was or what they were used for are the questions we cannot answer responsibly. In cases of the zoomorphic and anthropomorphomic sculptures, and partly vessels, it is clear that their shape was inspired by real figures. The cubical boxes and maybe other unusual objects (Fig. 60) might be small imitations of some cultic or utility items or house equipment.

The anthropomorphic and zoomorphic sculptures have two meanings. On one hand, they were vessels, on the other hand, they represented people and animals or parts of their bodies. Most of the anthropomorphic vessels and sculptures represent women or parts of female bodies. It is clear that women played an important role in the Lengyel communities. Their role was related to rituals and ceremonies. The finds themselves do not need to represent godesses or gods. They could be women who performed the ceremonies.71
Fig. 60
Clay item of unknown function (little altar?, miniature imitation of furniture?, little box?)
from feature B11 in Kiarov - Veľké ortovisko
6 CONCLUSION

The publication contains the results of the archaeological investigation carried out by the Institute of Archaeology of SAS in Nitra, Zvolen branch, in the northern part of the cadastre of Kiarov during the construction of the high-pressure gas pipeline DN 800 Slovakia – Hungary. The construction of the interconnecting gas pipeline was operated by Eustream and passed through the cadastral areas of nine villages in the region of the Ipeľ river basin. The route of the construction passed through the area with rich prehistoric, protohistoric and medieval settlement. Thus, it was not surprising when four prehistoric sites were discovered in Kiarov - Pod brestmi, Kiarov - Veľké ortovisko, Kiarov - Šimonovské ortovisko and Kiarov - Nad Kiarovskou pustatinou. They were all thoroughly investigated along the complete route of the gas pipeline.

The publication presents individual sites of prehistoric settlement with studied features, farm houses and find situations. The presented rich material culture proves the existence of economic activities and spiritual concepts of the skilled craftsmen communities living in the region. Distinct settlement in the sites was recorded in the Late Neolithic. Then, the sites of Pod brestmi, Veľké ortovisko and Šimonovské ortovisko were settled by the people of the classical Lengyel culture (stage Lengyel I) who found their new home there for several generations. The site of Šimonovské ortovisko suggests the continuing settlement. There, finds of ceramic or non-ceramic products untypical (Fig. 61, 62) for the Lengyel culture complex were discovered. It seems that this slightly elevated terrace was settled in the Copper Age. The collection found there belongs to the younger development phase of the Lengyel culture complex.

Like on the site of Nad Kiarovskou pustatinou, we cannot exclude later dating to the Early Bronze Age.

Fig. 61
Small cup with broken lug from feature C9 from Kiarov - Šimonovské ortovisko
The Lengyel culture (cultural complex) is chronologically and territorially extensive and variable culture. Its common (symbolic) identity is demonstrated by variable elements in architecture, economy, burials, material expression. The presented work does not cover all existing sources to the Lengyel culture, however, its aim was to provide a serious basis for understanding the culture and the period of its development. By means of basic review of partial topics (areas) related to the Lengyel culture (architecture of the settlements and types of buildings, economy of the settlements, material culture and spiritual concepts), we intended to explain the period documented by archaeological research and show the rich sources dealing with it. The sources also raise questions leading to solutions and understanding of the Lengyel culture communities living in the Late Neolithic. The Lengyel culture definitely had well working structures and was hierarchically organized.

The investigated sites in the cadastral area of Kiarov do not only confirm the known facts; they also bring new information on economic, settlement and symbolic state of the Lengyel communities.

The settlement structure in the Lengyel culture can be characterized as a system of central (parent) settlements and smaller homesteads which were the connecting element between the central settlements, while specializing in independent activities (control and mining / processing of raw materials). It means that the sites were well-considered and strategically settled.

Settling in the hilly regions or higher situated unflooded areas on gentle slopes or foothills under the forested mountains was typical. It was probably very important to control the surrounding area visually.

The economic life of the Lengyel culture communities lied in farming from the very beginning. The essential part of economy was provided by farm animals, distribution and processing of raw materials, as well as production of items of occasional or everyday use.

The material culture is characterized by distinct pottery and its quality. Besides new and specialized quality shapes (Fig. 63) usually made without organic admixtures (only with sand or, in some thicker shapes, small stones to harden the ceramic material), the Lengyel culture is characterized mainly by thin-walled and richly decorated tableware. Its high technological level suggests work of experts – producers who were responsible for production of the clay utility kitchenware.

The presented kinds and types of the material culture are also an indirect archaeological evidence of various production activities which were part of the Lengyel communities’ everyday life. In some cases, we can assume a special craft activity. Nevertheless, many of
them were probably “only necessary households craft activities”.

The high share of lithic, mostly chipped stone implements on individual sites suggests a developed production and distribution of lithic raw materials. Local sources were used too, but the presence of raw materials from remote places indicates the existence of specialized groups (maybe seasonal) dealing with finding, collecting or mining, primary processing and distribution of raw materials and semi-finished products.

The size of individual communities remains a question. Possible data on demography of the Lengyel population or on the number of people living on individual sites are provided by burial grounds where the type of source allows it. The sporadically recorded Lengyel skeleton graves near Kiarov (Kiarov - Sziget, Slovenské Žarmoty), however, do not allow us to solve the problem reliably. Large, as well as small settlements are typical of the Lengyel culture in our environment. The recorded features (pits) on individual sites themselves do not indicate the number of people nor the social positions of the inhabitants.

We can assume some kind of common symbolic cultural identity among the more remote communities because of the uniformity of the material culture and sacral architecture on a vast area in the early Lengyel period. The technology might have been spread by communication among the groups by means of marriages, exchange, trade, etc.

We must not forget various celebrations, feasts and festivals among individual small settlements or homesteads and central villages. They were an opportunity to gain contacts, confirm the group identity, demonstrate economic and political power. Of course, they also had religious meaning. Numerous untypical vessels, small objects and sculptures played their roles at rituals, ceremonies and acts which were not necessary for the “normal” functioning of the society. Such items were parts of domestic altars and were used at family or community rituals empowering the idea of common interests (rich harvest, growing family, belief in the ancestors).

Fig. 62 Decorated pot bottom from Kiarov - Šimonovské ortovisko (feature C9)
Fig. 63
Pedestal fragments of pedestaled pots (bowls) from Kiarov - Veľké ortovisko
1,3 - feature B15, 2 - feature B10
Reconstruction of history based on the testimony of real archaeological finds and material culture, like in the case of the investigated Lengyel sites in Kiarov, has its limits. The past is not presented as dynamic as it actually was. Our modern thinking is different from the thinking of past societies. Nonetheless, we believe that the presentation of the Lengyel culture settlement in Kiarov, together with the analysis of the period, is important and will bring a new view into the historical interpretation of this archaeological culture known for more than 120 years.

During the research on the gas pipeline interconnection within the area of 91 km in Hungary, were recorded many other sites. Altogether, 59 sites were examined in Hungary; 24 of them were newly discovered. The new sites were found in the hilly terrain of the Novohrad / Nógrád County (35 km long section of the gas pipeline route), where prehistoric settlement from the Neolithic (Lengyel culture), Copper Age (Epilengyel – Ludanice group) and Bronze Age (Hatvan, Kyjatice and Piliny culture) dominated. One Paleolithic campsite was also discovered, as well as part of a settlement from the Migration Period and part of a medieval settlement from 10th-11th centuries. Also four skeleton burials were found from 10th-11th centuries dated according to the denariuses of Stephen I and Andrew I. Sixteen sites which were known from the past were positively investigated in the Pest County (53 km of the gas pipeline route). The investigation completed the data on other seven previously known sites and five sites were newly discovered. The chronological classification of the sites varied from the Copper and Bronze Age, through the La Tène, Roman, Migration periods and Early Middle Ages, to the High Middle Ages. In the final part of the route, in District XVII in Budapest, features from the Bronze Age and Roman Period were confirmed and studied (Sarmatian settlement).

Finally, we would like to thank all the professionals, workers and colleagues who participated in the archaeological excavation in the cadastral area of Kiarov and, with their work and enthusiasm, helped to discover part of our past. Last but not least, we sincerely thank the Eustream company for their professional attitude and support during the whole archaeological research, as well as their support for this publication.

Noémi Beljak Pažinová - Ján Beljak
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Noémi Beljak Pažinová, Assoc. Prof.
Department of Archaeology, Faculty of Arts
Constantine the Philosopher University Nitra
Hodžova 1, SK-949 74 Nitra
e-mail: nbpazinova@ukf.sk
Research project: Ceramic production of Neolithic and Aeneolithic communities in the Middle Danube (VEGA 1/0585/13)

Ján Beljak, Dr.
Archaeological Institute Slovak Academy of Sciences
Zvolen branch
Štúrova 2, SK-960 01 Zvolen
e-mail: beljak@sav.savzv.sk
Research project: Life in the borderland. Settlement structures in the fore-field and hinterland of the Pannonian limes from late La Tène period to the late Antiquity (VEGA 1/0045/14)

Noémi Beljak Pažinová - Ján Beljak

Archaeological Investigation on the high-pressure Gas interconnection Pipeline SK-HU in 2013
Life in Early Times or the World of Prehistoric Communities in Kiarov

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ARCHAEOLOGICAL RESEARCH
The group of prehistoric sites in the cadastral area of Kiarov in the Ipel' river basin in Central Slovakia was explored by the Institute of Archaeology of Slovak Academy of Sciences in Nitra, Zvolen branch, within the construction of the high-pressure gas pipeline DN 800 Slovakia - Hungary in 2013. The construction was conducted by Eustream.

PREHISTORIC SETTLEMENTS
The discovered sites in Kiarov are the evidence of economic activities and spiritual concepts of skilled craftsmen in prehistoric communities in the area of Slovakia.

The aim of this publication is to present the discovered sites in Kiarov and the gained rich material culture. The significant settlement on the sites was recorded mostly in the Lengyel culture.

The intention of the publication is also to show the archaeological potential of the Ipel' river basin and explain the way of life of prehistoric communities in the past.

NOÉMI BELJAK PAŽINOVÁ – JÁN BELJAK
ARCHAEOLOGICAL INVESTIGATION ON THE HIGH-PRESSURE GAS INTERCONNECTION PIPELINE SK-HU IN 2013

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