

ROCKY TIMES

Archaeological Research on the Area of the Bükkábrány Lignite Mine in the Valley of the Csincse Stream

ANDRÁS KALLI¹ – ESZTER K. TUTKOVICS²

An archaeological research project that was one of the largest of its kind in Hungary took place in recent years on the site of the Bükkábrány Lignite Mine. Since this work was performed in connection with one of the country's most extensive, currently operating mining operations, it had a unique character. Mining takes place continuously at the Bükkábrány Mine on every day of the year, and weather factors that impede archaeological activities do not restrict the functioning of the mine. In conjunction with this, the areas subject to mining in one year reach several dozen hectares. Thus, the archaeological activities must be adapted to the functioning mine in

consideration of both the time to be spent excavating and the size of the areas to be excavated. In recent years all of this has been combined with the fortunate/unfortunate circumstance that the mining has reached a region of the Csincse Stream that is particularly rich in terms of archaeology. Together these conditions have resulted in the necessity to perform excavations alongside the mining during a large portion of the year, amongst varying weather conditions and over an area to be excavated that is of quite an extreme size.

At the same time, the archaeological work performed on the site of the mine has provided unique research opportunities in its own way; it has been possible and necessary not only to research one portion or a path through the sites, but instead over their entire area, and even the sections between archaeological sites in cases where this is justified. Since the archaeological work has been forced to adapt to the fast, large scale progress of the mine, the method of excavation had to be chosen and planned dependent on this, so that as few archaeological finds and as little information as possible would be lost and land up in the scrap heap.³ (Fig. 1.)

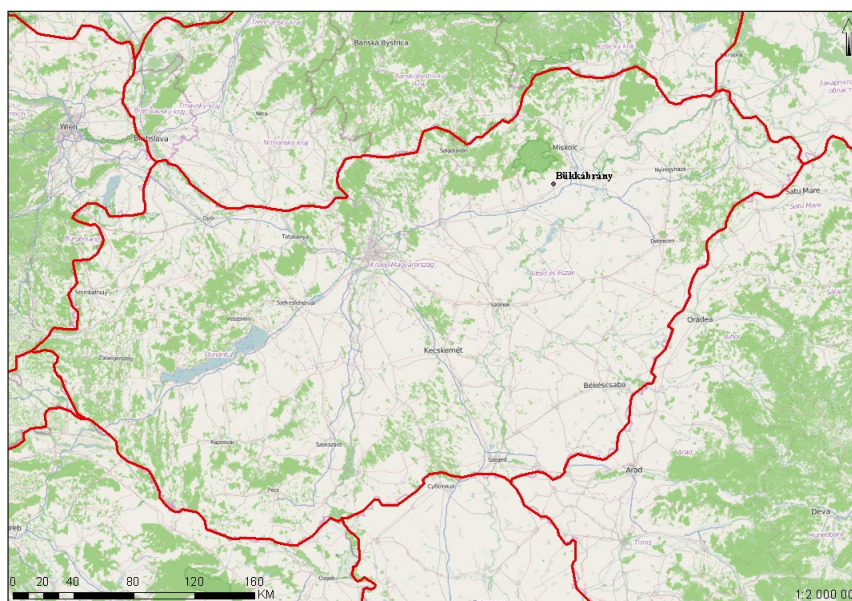


Fig. 1. The location of settlement Bükkábrány

THE NATURAL ENVIRONMENT: THE BORSODI-MEZŐSÉG REGION

The natural environment of the mine and our archaeological work is the Borsodi-Mezőség Micro-Region.

This characteristically plains landscape is located on the Northern Great Hungarian Plain alluvial cone lowlands, forming a transition between the Great Hungarian Plain and the Bükk Mountains. Its natural form

¹ Budavári Ingatlanfejlesztő és Üzemeltető Nonprofit Kft. (Buda Castle Property Development and Management Non-profit Co.), Nyíregyháza, andraskalli2@gmail.com

² Budavári Ingatlanfejlesztő és Üzemeltető Nonprofit Kft. (Buda Castle Property Development and Management Non-profit Co.), Nyíregyháza, tutieszter@gmail.com

³ The excavations continue presently, but now on the eastern bank of the Csincse Stream, in an area further from the stream valley and in a less intensive region.

has been shaped by the combined work of the streams coming from the Bükk Mountains, the Tisza River and the wind. The streams and the Tisza River have deposited a thick layer of alluvium, which the wind has piled up into layers of sand and loess soil. The terrain in the northern area of the Borsodi-Mezőség Region is an undulating lowland, which is divided by the low ridges and slopes of the foothills as well as wide valleys and natural levees indicating the northwest to southeast direction of flow of the streams arriving from the Bükk Mountains. The central section of the micro-region is a gently undulating lowland, and its southern section is a non-flooding lowland.⁴

Our research site and at the same time the defining watercourse of the Borsodi-Mezőség Region is the former Csincse Stream. The former rate of flow of this stream originating from the foothills of the Southern Bükk Mountains near Kisgyőr and fed by abundant karst springs is indicated by the fact that a water mill operated on it at Hársány. Flood regulation work began on it in the 1950s, in which they cut off its meanders and dredged its bed. By 1960 the Csincse Belt Canal was no longer a natural watercourse, and since then it has been registered as a man-made body of water. The function of the Csincse Belt Canal is, amongst others, to lead away the ground water pumped from the Bükkábrány lignite mine.⁵

The natural vegetation of the Borsodi-Mezőség Region is made up of forest steppe that is also characteristic of the Great Hungarian Plain, riparian forest accompanying the watercourses in the large floodplains, and oak forests and plains forest groves as well as sandy and loess grasslands in the drier areas. As a result of the flooding of the Tisza River and various other watercourses, swamps and marshes have been created by the remaining water in lower-lying areas.

The deforestation of previous centuries, intensive pasturing, regulation of the Tisza River and other watercourses and the draining of wetlands has transformed the former natural landscape and flora. The woodlands that were once characteristic can only be found in patches today. There are cultivated fields now where the forests, wetlands and grasslands used to be. Alkaline plains have been created in a portion of the Borsodi-Mezőség Region due to the regulation of rivers and extensive grazing. These areas are still used presently for pasturing. Since the climate of the region and its current form are similar to the Hortobágy Region it is also called the



Fig. 2. Satellite image of the past natural flow of stream Csincse on the territory of the mine

⁴ Marosi, Sándor – Szilárd, Jenő (eds.): *Magyarország tájféldrajza II. A tiszai Alföld (Regional Geography of Hungary II. The Tisza River Plain)* (Budapest: Akadémiai Kiadó, 1969), 184–187; Tózsá, István: *Mezőkeresztes–Emőd térségének földrajzi környezete és terhelhetősége (Geographic Environment and Carrying Capacity of the Mezőkeresztes–Emőd Region)*. In: *Észak- és Kelet-Magyarországi Földrajzi Évkönyv 1 (Geographic Annual of Northern and Eastern Hungary 1)*. Földrajzi Tanulmányok dr. Frisnyák Sándor hatvanadik születésnapja tiszteletére (Geographic Essays in Honor of the 60th Birthday of Dr. Sándor Frisnyák), eds. Simon, István – Boros, László (Miskolc–Nyíregyháza: TIT Borsod megyei Szervezete-Bessenyei György Tanárképző Főiskola, 1994), 197–208; Takács, László – Kovács, Zsolt: *Hejőbába története (History of Hejőbába)* (Miskolc: Hejőbába Község Önkormányzata, 2002), 17–19, 25; Dövényi, Zoltán (ed.): *Magyarország kistájainak katasztere (Survey of Hungarian Micro-Regions)* (Budapest: MTA Földrajztudományi Kutatóintézet, 2010), 210–212.

⁵ <https://docs.google.com/document/d/1I--uuC09YI37TJSWgSIzyEDzNsVLXlqaXlw7hG-P8tA/preview> (most recent download: 30 April 2017); http://evizig.hu/JVK/Bukk_es_Borsodi_Mezoseg_2-3-1.pdf; (most recent download: 30 April 2017) [http://vpf.vizugy.hu/reg/ovf/doc/2-8%20Bukk%20es%20Borsodi%20mezosegi%20alegys%20JVK%20vitaanyag%20\(EMVIZIG\).pdf](http://vpf.vizugy.hu/reg/ovf/doc/2-8%20Bukk%20es%20Borsodi%20mezosegi%20alegys%20JVK%20vitaanyag%20(EMVIZIG).pdf) (most recent download: 30 April 2017)

Little Hortobágy.⁶ Our archaeological work also took place on this undulating lowland area on the outskirts of Csincse, Vatta and Bükkábrány, in the wide valley and on the high banks of the Csincse Stream as well as in its wider surroundings. This area was once covered with oak forests, plains forest groves and, in the floodplains of the Csincse Stream, wetlands.

From an archaeological viewpoint the most significant parts of the area under study are the high craggy banks that accompany the Csincse Stream on the east and west. In this section, the Csincse Stream flowing out of the slopes of the Southern Bükk Mountains has formed high banks rising 5-6 meters above the surroundings and the flood plain in certain areas, and these are interspersed with mounds of sand and loess. On these high banks, but in particular on the loess mounds and sand hills, human habitation can be documented from essentially every archaeological period. (Fig. 2.)

LIGNITE MINING AT BÜKKÁBRÁNY

Amongst the useful mineral deposits in the Borsodi-Mezőség area, the most important is the lignite found in the northern part of the micro-region.⁷ The lignite beds were discovered on the basis of geological research and exploratory drilling performed in the 1960s and 1970s. On the basis of the test holes performed between 1962 and 1969 along the path of Route 3 on the outskirts of the towns Bükkábrány, Vatta, Csincse, Emőd, Mezőkeresztes and Mezőnyárád, it was determined that there was more than a half billion tons of lignite that could be mined in the area. The mining of the lignite began in 1985 with the setting up of the strip mine, which in 1989 was included in the supply of fuel for the Mátra Power Plant operating next to Visonta. The Bükkábrány lignite yield from the mine found here today represents the basis of the fuel for the power plant in Visonta (4 million tons) and the source of coal needed for residential use (200 thousand tons).

At Bükkábrány the lignite yield comes from surface mining. In accordance with strip mining technology, the overburden layer (clay, mud, sand, etc.) located above the lignite beds is first removed, and this material is then used to refill the areas that have already been mined. The layers of spoil are removed using bucket-wheel excavators, and then the waste materials are disposed of with spoil transportation equipment. In practice this occurs through bucket-wheel excavators removing the overlying layers in a stepped manner, revealing the lignite that is found 60-100 meters deep. Depending on its structure and size, the first level, the humus and other layers below it, are removed by the world's largest compact bucket-wheel excavator. The machine produces its yield at an output of 6,700 cubic meters per hour. Its annual capacity is 12 million cubic meters. Its full weight is 1,650 tons and it has a 28 m long crane arm, on the end of which is found a 12 m diameter bucket wheel equipped with 16 buckets.⁸

Three years prior to the production of coal from an area to be mined it is drained of water, during which 25 million m³ of water is pumped away from the yield area annually. The ground water is raised to the surface using submersible pump wells, and then is led to the Csincse Canal through drainage ditches or plastic conduits.⁹

In cases where it was justified, we examined the areas where the drainage wells were to be located and the paths of the drainage ditches to be dug. However, the majority of the archaeological activities took place prior to actual mining, so that it would be possible to investigate the sites standing in the path of the mining machinery.

⁶ Takács, László – Kovács, Zsolt: *Hejőpapi története (History of Hejőpapi)* (Miskolc: Hejőpapi Község Önkormányzata, 2001), 23–25; Dövényi, Zoltán (ed.): *Magyarország kistájainak katasztere (Survey of Hungarian Micro-Regions)* (Budapest: MTA Földrajztudományi Kutatóintézet, 2010), 212.

⁷ Takács, László – Kovács, Zsolt: *Hejőbába története (History of Hejőbába)* (Miskolc: Hejőbába Község Önkormányzata, 2002), 17; Dövényi, Zoltán (ed.): *Magyarország kistájainak katasztere (Survey of Hungarian Micro-Regions)* (Budapest: MTA Földrajztudományi Kutatóintézet, 2010), 211.

⁸ <http://www.mert.hu/hu/banyaszat>; http://energiaakademia.lapunk.hu/tarhely/energiaakademia/dokumentumok/201412/matrai_eromu.pdf; ftp://ftp.energia.bme.hu/pub/Energetikai%20aktualitasok/2013-14-02/05/2014_0306_eszk_honlapra.pdf (most recent download: 30 April 2017)

⁹ We have presented the details of the mining activities to provide a picture of the scale of the mining operation.

ARCHAEOLOGICAL RESEARCH BETWEEN 2011 AND 2016

The preventive archaeological excavations performed on the territory of the Bükkábrány lignite mine are significantly different from the similarly large-scale preventive excavations performed on rights of way. At Bükkábrány – due to the character of the project – the entire area of the archaeological site is being mined and is being destroyed along with its natural environment. Therefore, after the excavations there is no possibility for any kind of on-site examinations or sampling. Due to this, it is necessary to identify the sites as precisely and deliberately as possible, and then begin the test excavations as soon as possible. However, with the urgent tempo of the project it is not always possible to maintain the pace to the proper extent. (*Fig. 3.*)



Fig. 3. Detail of an excavated site, under exploitation (site XII/A) (photo credits: András Kalli)

The archaeological research has been ongoing at the mine since 2007 under the direction of the Herman Ottó Museum in Miskolc. The year 2011 represented a turning point in many respects: this was when the work reached the valley of the former Csincse Stream, and an area of almost 400 hectares was designated for mining in the following years. During the field walks, archaeological sites of varying intensity but for the most part of large size were identified with a total area of over 160 hectares.¹⁰ Following the test excavations, their size did not prove to be too extensive and without exception it was justified to continuously expand the individual work areas so that the archaeological features could be included with proper certainty. During the excavations it became clear in several cases that the sites that were identified during the field walks were not always organically separated from one another.

¹⁰ We must note the unfortunate circumstance that the area had been under an expropriation procedure prior to the field walks, thus certain sections were entirely unable to be examined. This was when the Bükkábrány-Bánya sites VIII-XVI were identified (HOM RégAd 4996–2011).

Site Designation and Year of Excavation	Archaeological Periods Discovered and Their Character	Size of the Excavated area (m ²)	Number of Features
IV (2011)	Late Bronze Age (cemetery) Migration Period (settlement)	4,532	58
VII (2011–2012)	Middle Neolithic Period – ALBK (settlement) Roman Imperial Period – Sarmatian (settlement)	30,080	502
XI (2012–2014)	Middle Neolithic Period – ALBK (settlement) Early Copper Age – Tiszapolgár Culture (cemetery) Middle Copper Age – Bodrogkeresztúr Culture (cemetery) Middle Copper Age – Hunyadihalom Culture (settlement) Late Iron Age – Celtic (settlement) Roman Imperial Period – Sarmatian (settlement and cemetery)	130,982	3,645
XII (2014–2015)	Middle Neolithic Period – ALBK (settlement) Middle Copper Age – Hunyadihalom Culture (settlement) Late Copper Age – Baden Culture (settlement) Late Iron Age – Celtic (settlement) Roman Imperial Period – Sarmatian (settlement and cemetery)	91,561	3,275
X (2015–2016)	Middle Neolithic Period – ALBK (settlement) Early/Middle Bronze Age (settlement)	12,879	167
XVI–Végrézsű (2015)	Middle Neolithic Period – ALBK (settlement) Late Copper Age – Baden Culture (settlement) Late Iron Age – Celtic (settlement) Roman Imperial Period – Sarmatian (settlement and cemetery)	10,829	712
XVI (2015–2016)	Middle Neolithic Period – ALBK (settlement) Late Copper Age – Baden Culture (settlement) Late Iron Age – Celtic (settlement) Roman Imperial Period – Sarmatian (settlement and cemetery)	40,325	720
XV (2016–)	Middle Neolithic Period – ALBK (settlement) Early Bronze Age – Makó Culture (settlement) Roman Imperial Period – Sarmatian (settlement)	15,986	702

The excavations were complemented by examinations with metal detectors on a daily basis, which were aimed at clearing up the extent of the sites prior to test excavations,¹¹ and the configuration of the test pits aided the research through the collection of metal finds turning up in the humus layer that was

¹¹ The Bükkábrány-Bánya site XVI was expanded to the southwest with a section of more than a hectare in 2015. In this work area designated XVI–Végrézsű a very intensive Sarmatian settlement that was particularly abundant in metal finds and a Sarmatian cemetery consisting of 44 graves were uncovered. The area had been completely inaccessible during previous field walks.

removed.¹² In certain cases the tight timeframe put such pressure on the excavations that the archaeological features endangered by the impending mining had to be ranked with the aid of metal detectors. Metal detector investigations in this kind of pressure situation saved the finds from a Sarmatian metal processing workshop from the mining operations.¹³

The special nature of the archaeological excavations performed at the Bükkábrány mine is certainly inherent in the fact that in the areas to be mined there is an opportunity to investigate entire settlements and cemeteries, so the entire structure of these archaeological features can be understood in their full complexity.

In recent years features belonging to numerous archaeological periods have been excavated in the territory of the Bükkábrány lignite mine (*table 1*). The listing and description of each of these is beyond

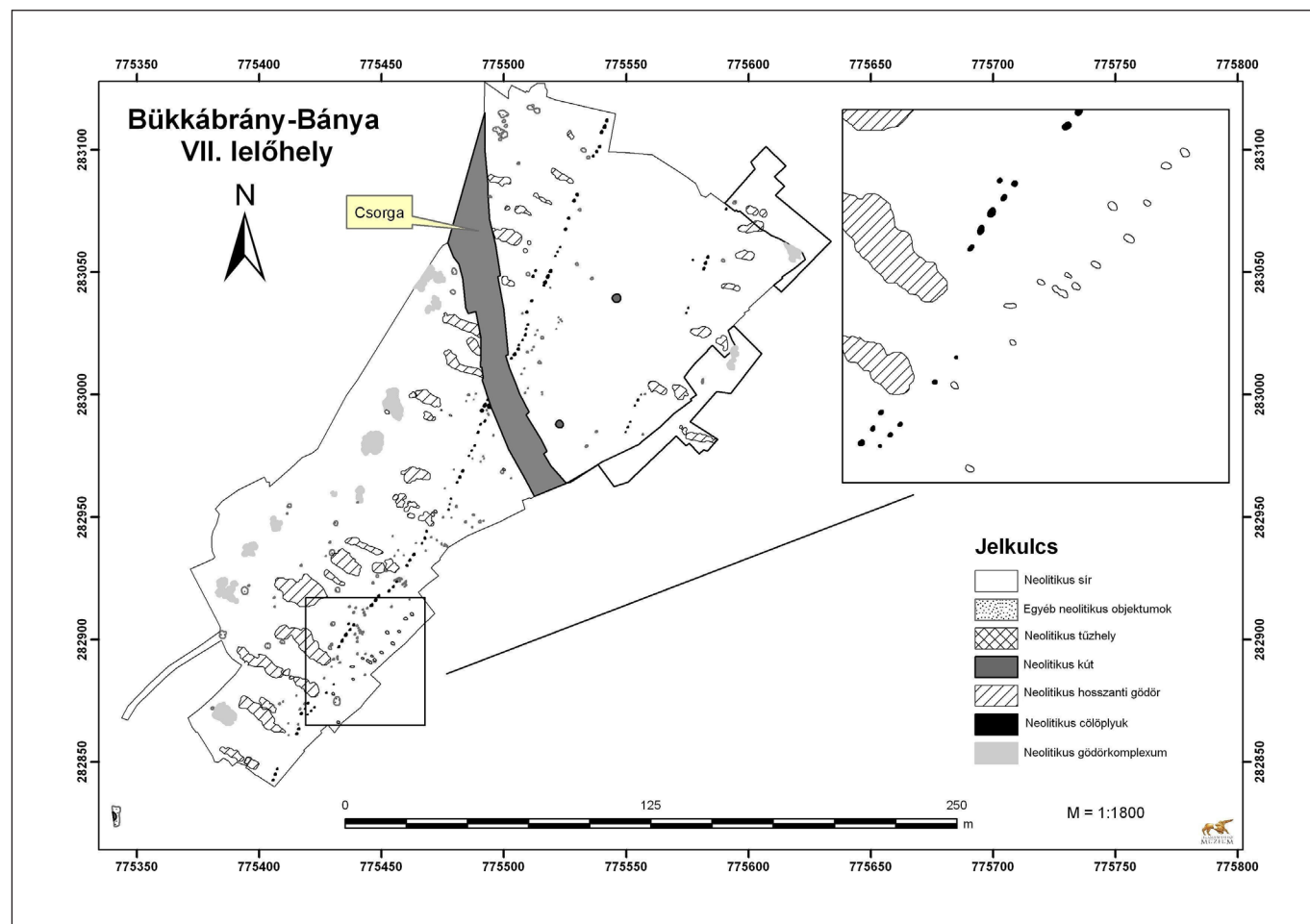


Fig. 4. Map of the middle neolithic settlement excavated on site VII. lelőhelyen feltárt középső neolitikus település térképe (In: Kalli András - K. Tutkovics Eszter: Középső neolitikus és szarmata település Bükkábrány határában. Előzetes jelentés a Bükkábrány-Bánya, VII. lelőhely (Vasúti-dűlő) 2011-ben végzett régészeti feltáráásairól. Régészeti kutatások Magyarországon 2011–2014. Archaeological Investigations in Hungary 2011–2014 (Middle Neolithic and Sarmatian Settlements on the Outskirts of Bükkábrány. Preliminary Report on the Archaeological Excavations Performed in 2011 at Bükkábrány-Bánya site VII [Vasúti-dűlő]). Régészeti kutatások Magyarországon 2011–2014. Archaeological Investigations in Hungary 2011–2014 (2016), 28, Fig. 3.).

¹² For the methods and results of the metal detector examinations on the area of the Bükkábrány lignite mine see: Kalli, András – K. Tutkovics, Eszter: Műszeres lelet- és lelőhelyfelderítés a bükkábrányi lignitbánya területén (Find and Site Detection using Instrumentation on the Area of the Bükkábrány Lignite Mine). In: *Saulusból Paulus. Fémkeresővel a régészek oldalán (From Saul to Paul. Alongside Archaeologists with a Metal Detector)*, eds.: Bálint, Marianna – Szentpéteri, József (Budapest–Hajdúbozsórmény 2017) (at press).

¹³ In work area number XI/A the materials from a Sarmatian Period metal processing workshop were discovered in a few trenches. Unfortunately the workshop was not uncovered, but the implements connected to it came to light in large numbers. These included iron awls, cutting tools, hole punches and two crucibles, as well as chopped up Roman coins and fragments of bronze vessels awaiting processing. The latter may have served as raw materials for the workshop.

the scope of this essay, so instead we will focus on the Middle Neolithic Period and the Roman Imperial Sarmatian Period, since the great majority of the excavated features are from these eras.

Due to the special character of the archaeological work performed on the area of the mine, it was possible to observe the structures of two settlements from the Middle Neolithic Period that were quite similar to one another and from the same time, the ALBK I period. While the nearly 7,000 year-old settlement at site VII could only be excavated in part, although over a large, continuous area, that of site XI/A was completely excavated.¹⁴ Thanks to the excavations over a large area that resulted in a great number of varied finds, it was possible to get an idea of the internal structure of the individual settlements and the strict and inflexible system of rules from that time that determined this structure. In addition, new observations were able to supplement the image that had been formed about the structure and internal organization of contemporaneous settlements in the area¹⁵ that were already known, but only in smaller sections.

The common characteristic of the two settlements is that in both cases the direction of their seemingly linear structure is accommodated to the direction of the natural prominences upon which they are located. The settlement at site VII was located on the ridge of a low hill running in a southwest-northeast direction, and the settlement excavated at work site XI/A was established on a sandy ridge on the high western bank of the Csincse Stream running in a nearly north-south direction.

The conscious spatial organization characterizing these two settlements, as well as others known from the same period, shows that the units made up of various types of features – pit complexes, linear pits, post holes and burials – were repeated and placed within the settlement exclusively according to a well-defined model. The orientation of the individual features was also very strictly set; the linear pits, the houses

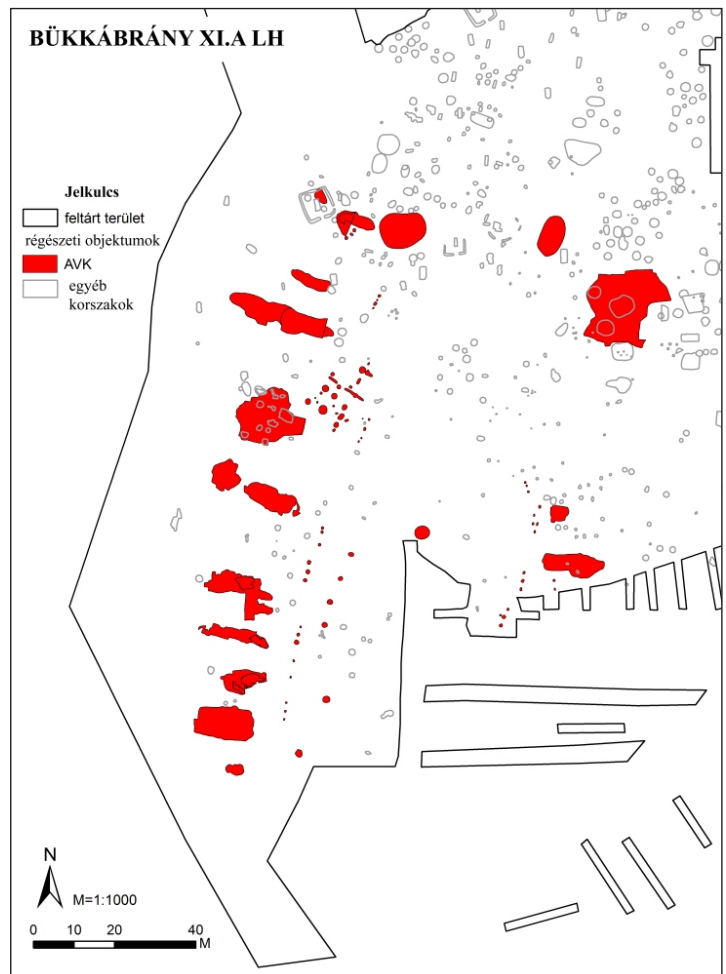


Fig. 5. Map of the middle neolithic settlement excavated on site XI/A. (Credits: András Füzesi)

¹⁴ Kalli, András – K. Tutkovics, Eszter: Középső neolitikus és szarmata település Bükkábrány határában. Előzetes jelentés a Bükkábrány-Bánya, VII. lelőhely (Vasúti-dűlő) 2011-ben végzett régészeti feltárásairól (Middle Neolithic and Sarmatian Settlements on the Outskirts of Bükkábrány. Preliminary Report on the Archaeological Excavations Performed in 2011 at Bükkábrány-Bánya site VII [Vasúti-dűlő]). *Régészeti kutatások Magyarországon 2011–2014. Archaeological Investigations in Hungary 2011–2014* (2016), 18–29.

¹⁵ Domboróczki, László: Településszerkezeti sajátosságok a középső neolitikum időszakából, Heves megye területéről. Characteristics of Settlement Patterns in the Middle Phase of the New Stone Age from the Area of Heves County. In: *MQMOΣ I. Fiatal Őskoros Kutatók I. Összejövetelének konferenciakötete (MQMOΣ I. Conference Publication from the First Young Researchers into Prehistory Meeting)*, eds. Dani, János et al. (Debrecen, 2001), 67–94.

Kalicz, Nándor – Koós, Judit: *Mezőkövesd-Mocsolyás. A neolitikus Szatmárcsoport (AVK I) települése és temetője a Kr. e. 6. évezred második feléből. Mezőkövesd-Mocsolyás. A brief overview of the Szatmár group (ALBK I) in the light of the excavations and the assessment of the site and its finds.* Borsod-Abaúj-Zemplén megye régészeti emlékei 9 (Archaeological Relics of Borsod-Abaúj-Zemplén County 9). (Miskolc, 2014).

indicated by the post holes and the burials all had a uniform southeast-northwest orientation.

In the case of both settlements, it was possible to observe a central section, around which the given settlement was organized. These sections were empty areas lacking in features from a Neolithic standpoint, but had wells located at their centers. In the case of site VII, this empty area appeared as a band nearly 50 meters in width with two wells located along its axis, seemingly forming a row. At site XI/A only a single well was discovered, which was in the middle of a central empty area. In the case of both settlements, it was possible to document that the settlement was organized around the well, and the various types of features on the two sides of these central areas appear in the same organization and orientation, but in mirror image, providing further evidence for the conscious modeling of space. (Figs. 4. and 5.)

Another interesting observation was that in a section of both settlements that could be clearly defined, human skeletons that were intact or partial skeletons missing parts were discovered. This phenomenon as well as the location of the skeletons and partial skeletons within the settlement calls for further research. (Fig. 6.)

At least seven separate settlements and five cemeteries within the area of the mine can be linked to the Roman Imperial and Sarmatian periods. The largest cemetery was found in the northern section of sites XI and XII, where 107 graves were excavated, but mining had begun on the central section of the cemetery. 73 burials came to light on a sand ridge directly on the bank of the former Csincse Stream in the southeastern section of site XII. Another 44 were found to the south of these graves, in the XVI-Végrézsű work area. Unfortunately in this case numerous graves may have been destroyed during earlier regulation projects on the Csincse Stream, and there were probably more burials to the north at one time. 27 graves from the cemetery in the XI/A work area were also located on a smaller sandy hill.¹⁶ The smallest cemetery, consisting of 12 graves, was found on the opposite side of the Csincse Stream, on its high eastern bank. (Fig. 7.)



Fig. 6. Full human skeleton excavated in an irregular pose, with a separate skull at the ribs and a vessel, from the neolithic settlement of site XI/A. (photo credits: András Kalli)

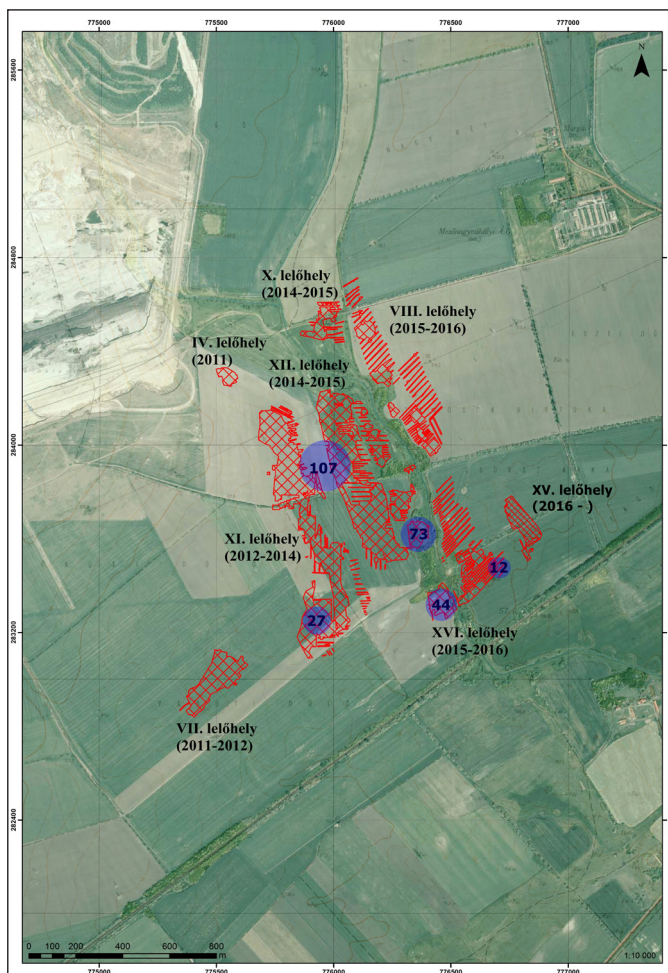


Fig. 7. The quantity of graves from the excavated sites and Sarmatian cemeteries (Credits: Dániel Kiss, Museum Ottó Herman)

¹⁶ K. Tutkovics, Eszter: Szarmata temetkezések a bükkábrányi lignitbánya területén – Bükkábrány-Bánya, XI/A lelőhely szarmata sírjai (Sarmatian Burials within the Territory of the Bükkábrány Lignite Mine – the Sarmatian Graves of Bükkábrány-Bánya Site XI/A). *A Herman Ottó Múzeum Évkönyve (Annual of the Herman Ottó Museum)* LIV (2015), 221–274.



Figs. 8. and 9. Human skeletons in an irregular pose in beehive pits from the Sarmatian era on site XVI-Végrézsű (photo credits: Eszter K. Tutkovics)

In addition to the 44 Sarmatian burials excavated, features from a large Sarmatian settlement were also uncovered in the XVI-Végrézsű work area.¹⁷ The features of the settlement included beehive storage pits, post-framed buildings and smoke pits as well as a well that can be linked to the period. Large amounts of ceramics, both whole vessels and fragments, were found in the pits, and in certain cases the remains of an entire house were placed in these. Amongst the most outstanding features, it is necessary to mention the human remains excavated from the settlement's pits, which we were able to differentiate into two types. For one type it was not possible to surmise any conscious effort in the placement of the corpses, since they were found in refuse pits amongst ceramic and animal bone fragments, often in unnatural positions. For the other type, the skeletons were placed in the pits in an orderly manner in a prostrate position together with items of apparel and everyday use. In a larger pit the skeletons of two adult individuals, a woman and a man, were found. A small bronze fibula was discovered at the right shoulder of the female skeleton, and a spindle-shaped button was found on the right side of her pelvis. The male skeleton – in contrast with the female individual – was laid on his stomach with a pair of bronze bracelets on his right hand and a bronze fibula on his chest, while there was an iron knife mounted on the left side of his pelvis. Directly next to the corpses, in the neighboring pit, the skeleton of a child was found, perhaps a small girl on the basis of the beads found at its neck. Similar features could



Fig. 10. Human skeletons placed in regular order in a beehive pit at site XVI-Végrézsű (photo credits: Eszter K. Tutkovics)

¹⁷ Here we would also like to thank the archaeologist Attila Németh (Herman Ottó Museum) for his work participating in the excavation.

be found at other Sarmatian Period settlements as well, but their precise interpretation requires further research.¹⁸ (Figs. 8–9. and 10.)

Beyond the features excavated at the Végrézsű site, it is possible to supplement the research at the Bükkábrány mine with further observations. This work area, as was mentioned above, was directly on the bank of the Csincse Stream. During the removal of the humus layer, a former ford in the Csincse Stream that extended into the stream bed like a peninsula and clearly rose above its surroundings was observed. The prominence was bordered on both the north and the south by a deeper section. There were not only features from a Sarmatian settlement here, but also from Middle Neolithic and Celtic settlements, while at the lower area a Sarmatian Period well and scattered post holes were excavated, in addition to an iron lance coming from this section during the removal of the humus layer. The ford without doubt may have been in use during the Celtic Period, as an excavated Iron Age ditch was found on the eastern bank of the stream at the XVI–Végrézsű site. The crossing may have existed in later periods as well, since musket balls were discovered in large numbers on the other bank during the investigations with metal detectors.¹⁹ Not far from the ford on the eastern shore of the stream, investigations with metal detectors provided new results at site XV. In this area a large number of metal finds (coins, jewellery and tools) that can be dated to the Árpád Period were discovered, and on the basis of this the settlement found here can be dated with great certainty to the time of the Mongol invasion. A settlement called Olaszegyház, which was in the area of present-day Csincse and was located along a road, appears in medieval documentary sources and so may be the same as the Árpád Period settlement found at site XV.²⁰ On the basis of all of this, it is possible to hypothesize that it is not just a ford that can be found on this section of the Csincse Stream, but a road

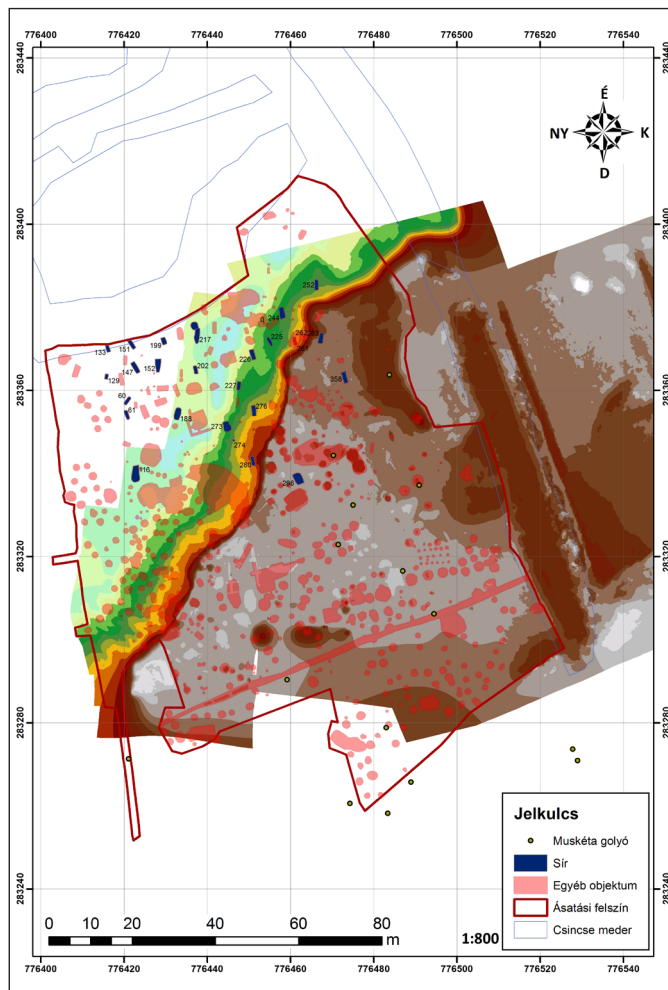


Fig. 11. 3D model of a passing place observed on the site XVI–Végrézsű (Credits: Dániel Kiss, Museum Ottó Herman)

¹⁸ We were able to observe further similar features in the Sarmatian settlements at sites XVI and XV excavated in 2016. On the eastern bank of the Csincse Stream, pits that were part of the settlements were also excavated that contained human remains. In contrast with the features discovered in the XVI–Végrézsű work area, here the deceased were placed in an orderly manner in every case. In one pit an adult male and a female were excavated with the skeleton of a small child between them. For a summary related to the human remains found at the Sarmatian settlements, see: Masek, Zsófia: „Barbárok?” – A rákóczi falvi késő szarmata-hun kori pusztulási horizont értékelése (“Barbarians?” – the Interpretation of the Late Sarmatian-Hun Period Destruction Horizon at Rákóczi falva). In: *Hadak Útján XXIV – A népvándorlás kor fiatal kutatóinak XXIV. konferenciája. Esztergom, 2014. november 4-6 (On the Path to War XXIV – The 24th Conference of Young Researchers into the Migration Period. Esztergom, 4-6 November 2014)*. vol. 1, ed.: Türk, Attila (Budapest–Esztergom 2015), 371–406.

¹⁹ The musket balls presumably are from a 16th century European cavalry unit, so in all likelihood can be connected to a minor operational movement during the Battle of Mezőkeresztes. We owe thanks to Dr. Lajos Négyesi and Dr. József Padányi (National Civil Service University) for the identification of the musket balls.

²⁰ K. Tutkovics, Eszter – Kalli, András – Bálint, Marianna – Bacskai, István: A megkerült falu. A műszeres leletfelderítés tapasztalatai Bükkábrány-Bánya fejlesztési területén (The Discovered Village. Observations from Scouting for Finds with the Use of Instrumentation at the Bükkábrány-Bánya Development Area). In: *Magyarország Régészeti Topográfiája – Múlt-jelen-jövő (Hungarian Archeological Survey – Past-Present-Future)*, eds.: Benkő, Elek – Bondár, Mária (at press).



Fig. 12. Aerial photo of the site XVI-Végrézsű during the excavation (Credits: Szabolcs Honti, Museum Ottó Herman)

also ran through this area, which may even have existed in times prior to the Middle Ages. A group of finds from a Late Bronze Age depot found near the ford provides indirect support for this. Other Late Bronze Age features did not come to light from the surroundings of the bronze depot, which suggests that it was not within a settlement, but instead far from one, most likely located along a road.²¹ There are depots known from the Late Bronze Age period that were hidden underground alongside roads away from settlements.²² (Figs. 11 and 12.)

With the discovery of the ford in the Csincse Stream, a new light was cast on the excavated sites in the territory of the Bükkábrány lignite mine. The natural geographic conditions provided by the high banks of the stream certainly may have proved to be the most suitable site for human settlement in the nearby region during various archaeological periods. Another exceptional circumstance about this crossing on the stream is that it further enriched the area's diversity and endowments. When performing an interdisciplinary examination of the features of the excavated sites, the existence of the ford must by all means be considered to have played a significant role. It is worthwhile to attempt to discover the differences that may possibly be detected within the archaeological periods that appear the most often – in our case the Roman Imperial Period. Already during the excavations it was obvious that the larger settlements from the Sarmatian Period appeared in the southern section of the mine area, and the finds here were far more abundant both in terms of ceramic materials and metal finds. A precise chronology of the find materials is necessary to make clear connections that exclude all doubt, but even without this, it can be considered a very fortunate circumstance that the archaeological research on the area of the Bükkábrány mine has been supplemented with additional data in addition to the excavations.

²¹ Kalli, András: New findings from the late bronze age in Borsod-Abaúj-Zemplén county. In: *A bronzkor kutatásának helyzete Magyarországon (The Status of Bronze Age Research in Hungary)*, eds.: Kiss, Viktória – Kulcsár, Gabriella – V. Szabó, Gábor – Váczi, Gábor (at press).

²² Windholz-Konrad, Maria: Das Deponierungsareal bei der Rabenwand im steirischen Kainischtal in Österreich. Zum ausgeprägten Hortphänomen entlang der Traun im Alpendurchgang zwischen Zinkenkogel und Hohem Sarstein. In: *Hort und Raum. Aktuelle Forschungen zu bronzezeitlichen Deponierungen in Mitteleuropa. Topoi. Berlin Studies of the Ancient World. Volum 10.*, Hrsg.: Hansen, Svend – Neumann, Daniel – Vachta, Tilmann (Berlin 2012), 117–149.

RECOMMENDED LITERATURE

DOMBORÓCZKI, LÁSZLÓ

Településszerkezeti sajátosságok a középső neolitikum időszakából, Heves megye területéről. Characteristics of Settlement Patterns in the Middle Phase of the New Stone Age from the Area of Heves County. In: *ΜΩΜΟΣ I. Fiatal Őskoros Kutatók I. Őszejövetelének konferenciakötete (ΜΩΜΟΣ I. Conference Publication from the First Young Researchers into Prehistory Meeting)*, eds. Dani, János et al. (Debrecen, 2001), 67–94.

FARAGÓ, NORBERT – K. TUTKOVICS, ESZTER – KALLI, ANDRÁS

Előzetes jelentés Bükkábrány-Bánya, VII. lelőhely pattintott kőanyagáról (Preliminary Report on the Flaked Stone Materials from Bükkábrány-Bánya Site VII). *A Herman Ottó Múzeum Évkönyve (Annual of the Herman Ottó Museum)* LIV (2015), 25–37.

HAVASSY, PÉTER (ED.)

Jazigok, roxolánok, alánok. Szarmaták az Alföldön (Iazyges, Roxolani and Alans. Sarmatians on the Great Hungarian Plain). Gyulai Katalógusok 6 (Gyula Catalogues 6). (1998)

KALICZ, NÁNDOR – KOÓS, JUDIT

Mezőkövesd-Mocsolyás. A neolitikus Szatmárcsoport (AVK I) települése és temetője a Kr. e. 6. évezred második feléből. Mezőkövesd-Mocsolyás. A brief overview of the Szatmár group (ALBK I) in the light of the excavations and the assessment of the site and its finds. Borsod-Abaúj-Zemplén megye régészeti emlékei 9 (Archaeological Relics of Borsod-Abaúj-Zemplén County 9). (Miskolc, 2014).

KALLI, ANDRÁS – K. TUTKOVICS, ESZTER

Középső neolitikus és szarmata település Bükkábrány határában. Előzetes jelentés a Bükkábrány-Bánya, VII. lelőhely (Vasúti-dűlő) 2011-ben végzett régészeti feltárásairól (Middle Neolithic and Sarmatian Settlements on the Outskirts of Bükkábrány. Preliminary Report on the Archaeological Excavations Performed in 2011 at Bükkábrány-Bánya site VII [Vasúti-dűlő]). *Régészeti kutatások Magyarországon 2011–2014. Archaeological Investigations in Hungary 2011–2014* (2016), 18–29.

K. TUTKOVICS, ESZTER

Szarmata temetkezések a bükkábrányi lignitbánya területén – Bükkábrány-Bánya, XI/A lelőhely szarmata sírjai (Sarmatian Burials within the Territory of the Bükkábrány Lignite Mine – the Sarmatian Graves of Bükkábrány-Bánya Site XI/A). *A Herman Ottó Múzeum Évkönyve (Annual of the Herman Ottó Museum)* LIV (2015), 221–274.