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BRONZE AGE SETTLEMENT RESEARCH IN THE SOUTHERN BORSOD REGION

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The BORBAS (Borsod Region Bronze Age Settlements) research project that has been ongoing since 2012 in the Southern Borsod Plain and Bükk Foothills regions is aimed at examining the internal structure of Middle Bronze Age settlements and the use of space within these settlements, as well as the status of the settlements in the region and their relationship with one another. The research program is the joint work of the University of Miskolc, the Herman Ottó Museum in Miskolc and the University of Cologne. The objective is to examine all the known settlements according to an identical protocol, primarily with non-invasive techniques, and through the comparison of these data to answer questions about their settlement and social history.

THE BORBAS PROJECT

The BORBAS (Borsod Region Bronze Age Settlements) Project began in 2012 as the joint work of the University of Miskolc, the Herman Ottó Museum in Miskolc and the University of Cologne. The goal of the project is to get to know the internal structure of Early and Middle Bronze Age settlements in the area under study, to locate homesteads, to examine the functions of the internal units of the settlements and to compare the patterns of architecture and utilization amongst the individual parts. The next level is the evaluation of the status of the settlements within the region and the examination of their economic and social networks. In the long term, we would like to integrate the settlement history data of this micro-region into the Hatvan and Füzesabony cultures, as well as the broader historical context of the Bronze Age. The research is being performed primarily through the use of a set of non-invasive examination techniques.

ELEMENTS OF THE SET OF NON-INVASIVE RESEARCH TECHNIQUES[4]

1. Geodesic survey, as a result of which a 3D terrain model is generated of the given area. This provides the professional data that is the basis for mapping. Prior to 2013 the data necessary for the model were compiled by traditional surveys on the ground, and following this by using a photographic 3D procedure (*Fig. 1*).
2. Aerial photography. On the one hand we collect, evaluate and compare archival aerial images and pictures taken using remote-controlled processes that are related to Bronze Age settlements, and on the other hand through the subsequent processing of oblique aerial photographs taken for archaeological or personal reasons we produce orthophotographs in which the surface features can be identified in a coordinate corrected manner (*Fig. 2*).

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4 P. Fischl, Klára – Kienlin, Tobias L.– Tugya, Beáta: Bronze Age settlement research in North-Eastern Hungary (Bronzkori településkutatások Északkelet-Magyarországon). *Archeometria Műhely* XII (2015)/2, 117–134. (Last accessed: 18.5.2016)

3. Geophysical surveying. If possible a geomagnetic geophysical investigation is performed on the entire surface of the site using a Foerster-type *Sensys* magnetometer (grid line spacing: 0.5 m; sampling frequency: 0.05 cm). The pictorial presentation of the results occurs on a +/- 10 nT greyscale. The geophysical research and the archaeological evaluation of the magnetogram is performed by the University of Cologne team (*Fig. 3*).
4. Systematic collection of surface finds. The largest area possible of the Bronze Age settlements is examined with this method in a grid system of 5x5 meter squares. All of the surface finds that can be discovered in the squares are collected. The ceramics are separated from the animal bone, shell and slag finds, stone materials and remains of daub. The ceramics finds are counted and weighed and then the data are recorded in a table on the basis of type and decoration. The field walk grid is recorded using a GPS system, through which the statistical data can be immediately represented visually. Different experts process the animal bone finds, stone materials and metal finds. The systematic collection of finds and the statistical analysis of the find materials take place with the collaboration of archaeology students at the University of Miskolc (*Fig. 4*).
5. Systematic investigations with metal detectors. Due to the time factors, searching for finds with instrumentation is only performed on those parts of the archaeological sites that are geomorphologically frequented and considered more intensively used due to the concentration of ceramic fragments. During the systematic research, the investigations are not just performed in one direction, the areas that have already been covered are reexamined at right angles to the previous rows. In the second direction, a search head with different detection parameters is used. The locations of the archaeological finds discovered are recorded with satellite positioning equipment, and the areas covered are also recorded in the GPS tracklog mode. The effective depth of the metal detector is 30 cm, so the instrumental investigations only affect the upper, plowed level, and this method does not uncover finds that lay in undisturbed layers that have context. The searching for finds with this instrumentation is the work of István Bacskai (*Fig. 5*).
6. Soil coring. The objective of the sampling is on the one hand to discover the thickness of layers (or in the case of ditches, their depth) and the stratigraphic relationships between the various structural parts of the settlements, and on the other hand the gathering of data for environmental reconstruction research (*Fig. 6*).

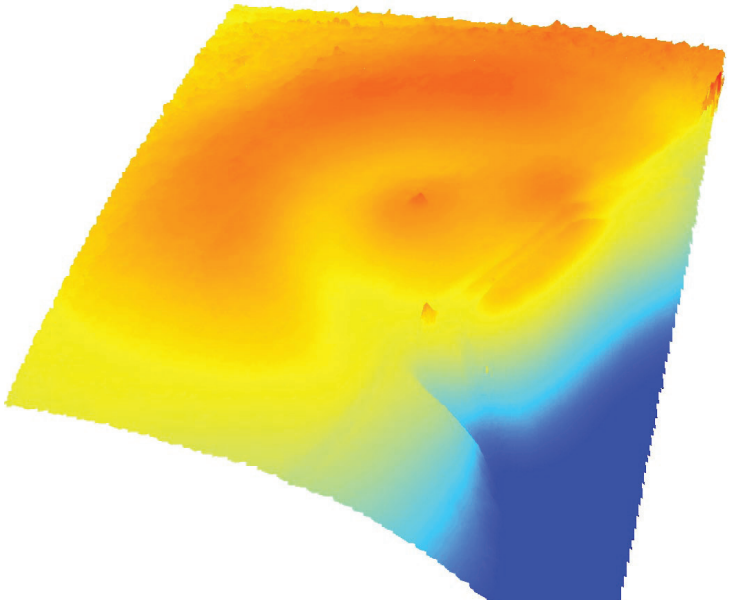

Fig. 1: Tard-Tatárdomb 3D relief model generated from oblique aerial photographs

Fig. 2: Tard-Tatárdomb Bronze Age settlement with the Bükk Hills in the background

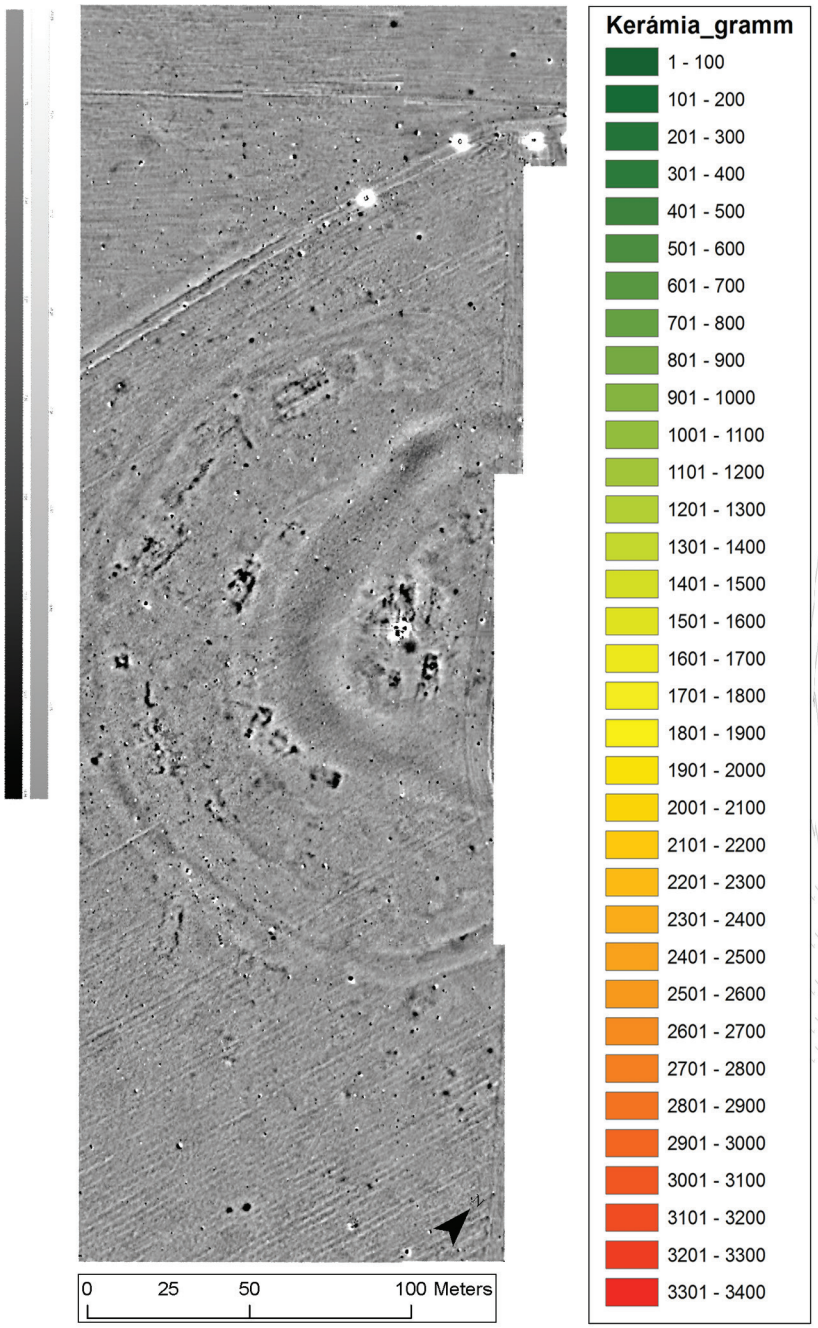

Fig. 3: Grayscale image of the geophysical survey of Tard-Tatárdomb

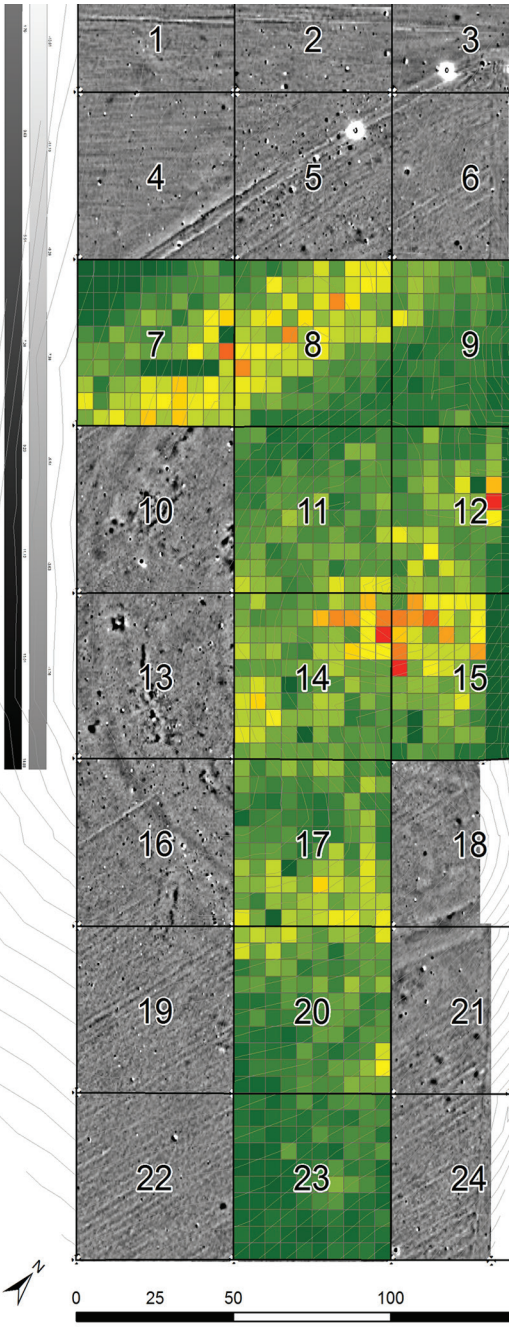

Fig. 4: Distribution according to weight of finds from the Tard-Tatárdomb site

7. Archaeozoological processing. The animal bone and shell materials gathered during the systematic collection of surface finds are evaluated archaeozoologically. The recording of bone size is performed according to Driesch 1976 and the determination of the age of death of the domestic animals is performed according to Schmid 1972. The archaeozoological analyses for the project are performed by Beáta Tugya (*Fig. 7*).
8. Analysis of metals. The analysis of metal objects discovered is performed by the LISA (Complex Laboratory of Image and Structure Analysis) laboratory at the University of Miskolc and the ARGUM (Archaeometallurgical Research Group of the University of Miskolc) work group. The investigations of elemental composition and manufacturing techniques on the objects examined are performed with optical microscopes (Zeiss AxioImager) and SEM-EDX (AMRAY 1830I scanning electron microscope equipped with an energy dispersive X-ray analyzer) methods.

Fig. 5: Triangular daggers from István Bacskai's systematic investigations with metal detector: Mezőcsát-Laposhalom, Tiszabábolna-Fehérló tanya and Tiszakeszi-Szódadomb

Fig. 6: Core sample from the central section of the Mezőcsát-Laposhalom settlement

9. The results of the aforementioned investigations are stored in a GPS system, where there is an opportunity to compare the individual elements visually, project them over one another layer by layer and evaluate the data (*Fig. 8*).

RESEARCH AREA AND TIME FRAMEWORK

The area examined is the Borsod Plain and the Bükk Foothills region in the period between 2200 and 1500 BC (*Fig. 9*). According to classical archaeological cultural classifications the region examined was part of the settlement area of the Hatvan and then the Füzesabony cultures. According to our current knowledge, during the period of the transformation from the Early Bronze Age to the Middle Bronze Age (ca. 2000/1900 BC) in the micro-region examined, the Hatvan material culture[5] was replaced by communities characterized by the Füzesabony ceramic style.[6] However, the production of Hatvan style ceramics did not disappear, but remained in use primarily in the areas to the west of the Eger Stream, and the communities using the two styles of ceramics were regional neighbors of one another.[7] The communities using the Füzesabony ceramic style did, however, develop their habitations on the sites of earlier Hatvan settlements for the most part, so in this area the layers containing Hatvan style ceramics are overlaid by layers of Füzesabony style ceramics in the great majority of cases. Due to this, the settlements were utilized for a long time—for as much as the entire period under study—and therefore multilayered, so-called tell settlements were created.

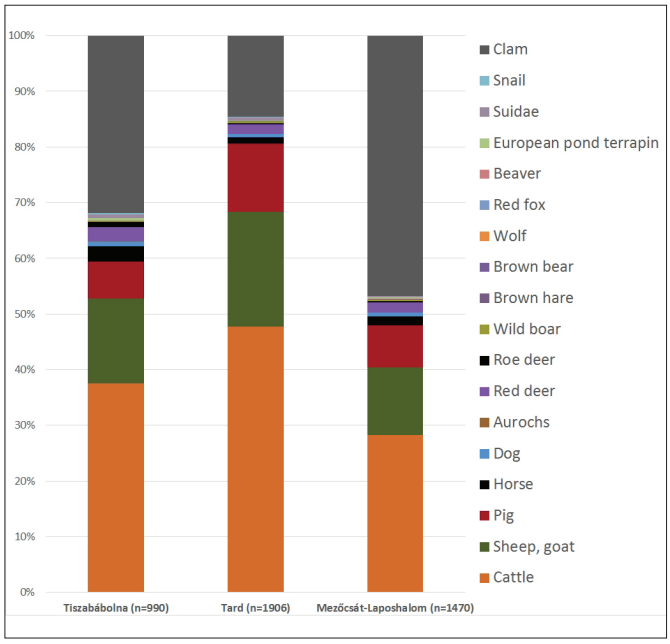

Fig. 7: Comparative analysis of the animal bone materials from Tiszabábolna-Fehérló tanya, Tard-Tatárdomb and Mezőcsát-Laposhalom

[5] Kalicz, Nándor: *Die Frühbronzezeit in Nordost-Ungarn. Abriss der Geschichte des 19.–16. Jahrhunderts v. u. Z.* Archaeologia Hungarica 45 (Budapest: Akadémiai kiadó, 1968).

[6] Bóna, István: *Mittlere Bronzezeit Ungarns und ihre südöstlichen Beziehungen.* Archaeologia Hungarica 49 (Budapest: Akadémiai Kiadó, 1975).

[7] Koós, Judit: Bronzezeitliche Siedlungsforschungen in Nordostungarn. *Budapest Régiségei* 36 (2002), 221–233.

TELL

Tell is a word of Arabic origin that means hill. In European archaeology this term indicates hills or mounds where there are remains indicating former settlements. According to the definition of Florin Gogâltan a tell is an artificial mound that has been created over time through the remnants of human activity.[8] They are created when due to the physical geographical, economic and historical factors of a community, or due to a particular way of thought, the same, well-defined area is inhabited for a long time. For these multilayered settlements to develop it is necessary that habitations are established, demolished after use and then rebuilt in the same place, which leads to the inevitable aggregation of the remains of everyday life. In other words, there may have been many reasons why the same location was inhabited for a long time—even as long as several hundred years (*Fig. 10*). As a result of this, multilayered settlements were created, where the remains of houses with wattle-and-daub walls (plastered floors, infill and demolition) created a series of levels similar to a layer cake.

Research considers these tell settlements to be central locations of the former communities (handicraft/commercial centers, domiciles of the elite, redistribution points, etc.), to which a network of single-layered, village-like, so-called satellite settlements was linked. This settlement structure divided into two levels, together with a great deal of other data, serves as evidence of the internal

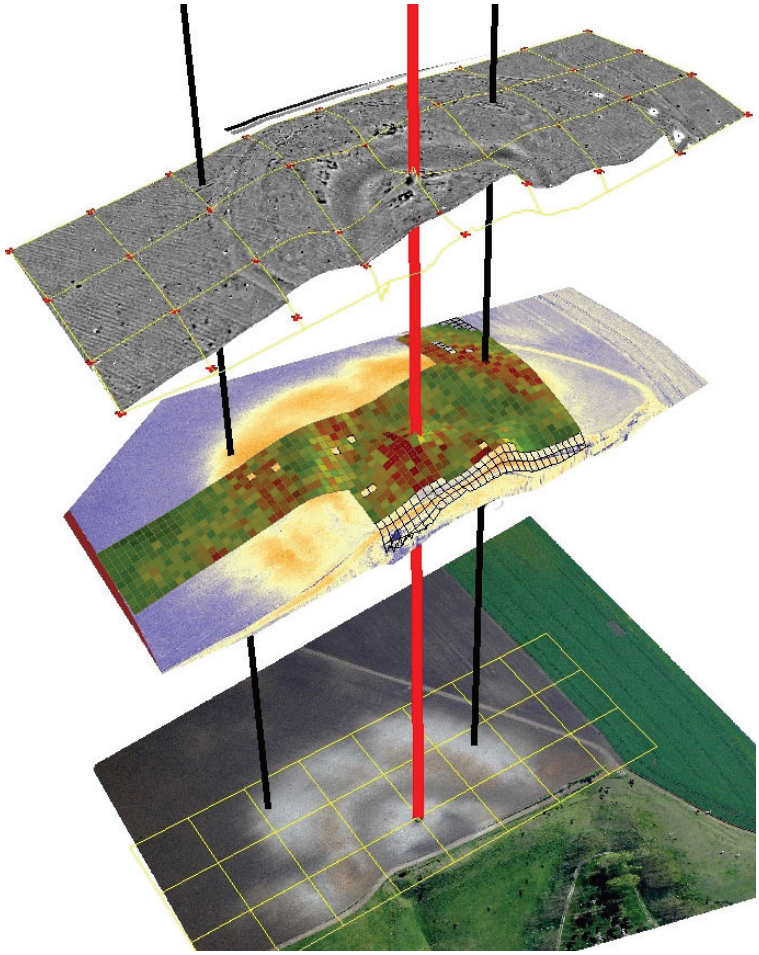

Fig. 8: Possibilities for the comparison of research results compiled through differing methods with the use of GPS: Example: Tard-Tatárdomb

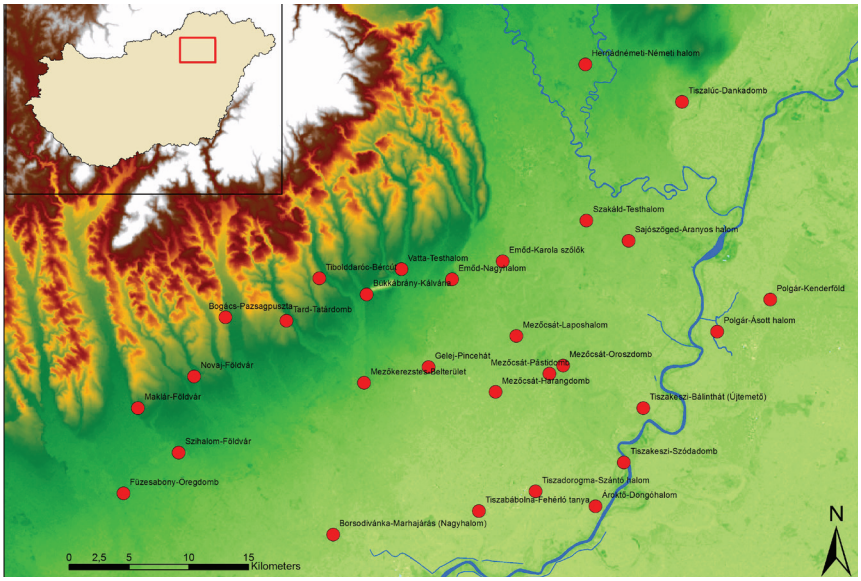

Fig. 9: Bronze Age settlements of the Borsod Plain and the Bükk Foothills zone

[8] Gogâltan, Florin: Die Tells der Bronzezeit im Karpatenbecken. Terminologische Fragen. In: *Interregionale und Kulturelle Beziehungen im Karpatenraum (2. Jahrtausend v. Chr.–1. Jahrtausend n. Chr.). Interferenţe etnice* şi *culturale* în *mileniile I a. Chr.–I. p. Chr. Ethnische und kulturelle Interferenzen im 1. Jahrtausend v. Chr.–1. Jahrtausend n. Chr. 4,* eds. A. Rustoiu – A. Ursuţiu. (Cluj-Napoca: Nereamia Napocae, 2002), 11–45.

stratification of the former communities/societies. Some experts place the communities of archaeological cultures that created the tells in the category of chiefdom societies.[9]

THE INTERNAL STRUCTURE OF THE SETTLEMENTS

The settlements examined during the project cannot, however, be clearly categorized under a unified concept of tell. They were built up according to a specific internal system that followed a strict structure (*Fig. 11*). The interior core of the settlement was surrounded by a deep and wide ditch. The small extent of the area enclosed by the ditch remained under 1 hectare, and the geophysical investigations show the traces of houses within it. On the basis of earlier excavations they were multilayered, but the strata were often no more than 1.5 meter low hillocks in their current surroundings. The area outside the ditch was also inhabited. Here it is possible to observe houses built concentrically along the line of the ditch, usually in two rows. The houses were 4-6×10×12 meters in size, and on the basis of geophysical surveying and excavations they often were divided into two chambers. The external inhabited zone was also situated on a hill, often at a higher level than the highest point of the internal area. According to our hypotheses, there may be several layers of habitation here as well. After another ditch or boundary line the external settlement continues with an area characterized for the most part by pits. On occasion the foundations of houses can also be detected here. The area of the individual settlements is greater than 10 hectares. The concentric structure with sections of identical function is repeated in every settlement in the region under study. At several sites it was observed that settlements developed in the Hatvan period were re-established on the same site with an identical structure but with a larger area in the Füzesabony period.

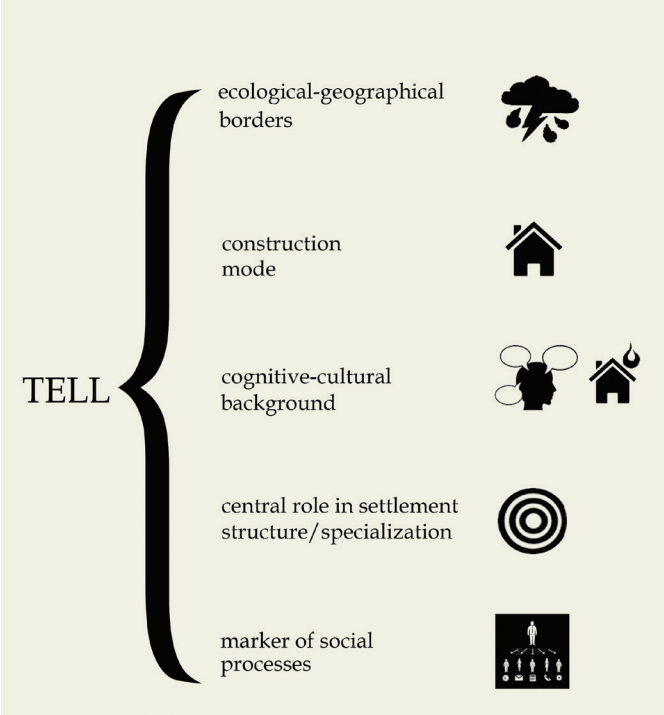

Fig. 10: Factors influencing the creation of tell settlements

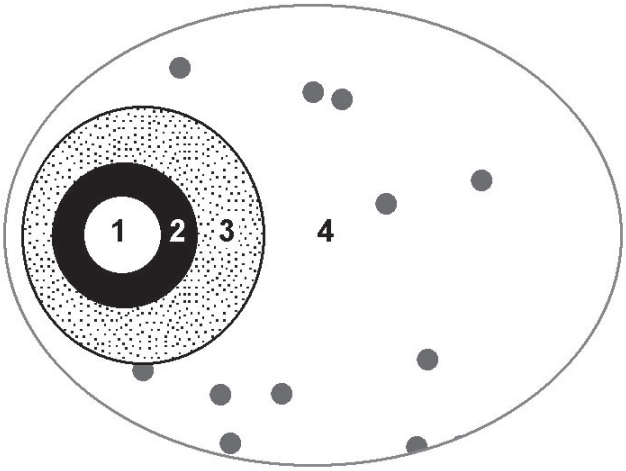

Fig. 11: Schematic drawing of the internal structure of Bronze Age settlements in the Borsod region. 1: Central section; 2: Ditch; 3: External intensively inhabited settlement section; 4: External settlement section with pits

[9] Earle, Timothy – Kristiansen, Kristian (eds.): *Organizing Bronze Age Societies. The Mediterranean, Central Europe, and Scandinavia Compared* (Cambridge: Cambridge University Press, 2010); Szeverényi, Vajk – Kulcsár, Gabriella: Middle Bronze Age Settlement and Society in Central Hungary. In: *Enclosed Space – Open society. Contact and Exchange in the Context of Bronze Age Fortified Settlements in Central Europe*, eds. Jaeger, Mateusz – Czebreszuk, Janusz – P. Fischl, Klára, Studien zur Archäologie in Ostmitteleuropa 9. (Poznań-Bonn: Bogucki Wydawnictwo Naukowe, Poznań, Dr. Rudolf Habelt GmbH, Bonn, 2012), 287–351.

THE LOCATION OF THE SETTLEMENTS IN SPACE

The Bronze Age settlements in the foothills region are situated on the terraces of stream valleys flowing south from the Bükk Hills. In this case the internal structure described above is adapted to the terraces cutting into the valleys and the ditches connect with these, so a semicircular structure is characteristic. In the plains region fully circular structures can be observed next to the streams. Here, in several locations it was shown that the ditches were filled with water in the Bronze Age. The settlements comprise a dense network, and are found on average 5 km from one another. According to our present knowledge there are no other types of settlements between them, so these settlements with a complex structure make up the entire network of settlements. In a few cases there are known burial locations on average 1 km from the settlements. The central section of most of the known settlements, despite the fact that they rise above their surroundings, are only small, flat hillocks. However, in a few cases there are classic tell settlements with thick strata as the internal unit of the complex structure. Settlements of this type with a clear central tell are found at Borsodivánka-Nagyhalom, Szakáld-Testhalom and Hernádnémeti-Németi halom and on the basis of the cross-section drawing of the old excavation at Mezőcsát-Pásti domb. Due to a great deal of erosion in the case of several sites, it is not possible to determine the original height of the settlement, and therefore into which category they have to be placed.

QUESTIONS AND CONCLUSIONS

On the basis of all of this it is not possible in every case to provide answers to the questions important from the perspective of reconstructing the former everyday life and society of the settlements. Who used/lived in the internal core of the settlement protected by a ditch? What was its function? Why was a ditch that took so much work and energy to create dug around this area? Did the ditch have a defensive function or did it play an important role in the regulation of society? What are the differences between the two sizes of settlements? Did the larger ones have some kind of prominent, special or central role in comparison to the smaller population centers, or did they have equal standing in the settlement network? What is the reason why the concentric internal structure was adhered to even in differing environmental circumstances and with the use of differing styles of ceramics? What link is there between the concentric circular motif visible in the planned structure of the settlements and the decorative motifs observed in the ceramic arts of the period under study?[10]

Although it is not necessarily possible to provide adequate answers to these questions, it clearly seems that the generally employed concept of tells can no longer be used for the settlements of this period.

ACKNOWLEDGEMENTS

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[10] P. Fischl, Klára – Kertész, Gabriella: Bronzkori szimbólumok és megnyilvánulásaik, avagy mit mesél nekünk egy bronzkori település szerkezete (Bronze Age Symbols and Their Manifestations, or What Does the Structure of a Bronze Age Settlement Tell Us). *Gesta* 12 (2013), 10–19. (Last accessed: 18.05.2016)

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