Bringing Down the Iron Curtain

Paradigmatic change in research on the Bronze Age in Central and Eastern Europe?

edited by

Klara Šabatová, Laura Dietrich, Oliver Dietrich, Anthony Harding and Viktória Kiss

Archaeopress Archaeology

Archaeopress Publishing Ltd
Summertown Pavilion
18-24 Middle Way
Summertown
Oxford OX2 7LG

www.archaeopress.com

ISBN 978-1-78969-454-3
ISBN 9978-1-78969-455-0 (e-Pdf)

Typeset by Šárka Trávníčková

Printed in England by Severn, Gloucester

This book is available direct from Archaeopress or from our website www.archaeopress.com

Contents

‘Europe without walls’: new directions of Bronze Age research in Hungary*

Viktória Kiss – Gabriella Kulcsár

KEYWORDS: CARPATHIAN BASIN, BRONZE AGE, SETTLEMENT STUDIES, BRONZE METALLURGY, BIOARCHAEOLOGY

This paper points to trends over the last 25 years in Hungarian Bronze Age studies, focusing mainly on the 1000 years of the Early and Middle Bronze Age, between 2600/2500–1500/1450 BC. Several recent projects on the Late Bronze Age are also mentioned. We summarize data of ongoing studies concerning settlements and landscape, bronze metallurgy, bioarchaeological and network analysis, as well as chronology and mobility patterns, that provide a more complex picture of the regional and temporal dynamics of the 3rd and 2nd millennia BC in the Carpathian Basin.

Introduction

After the political borders came down, the relationships between scholars were transformed as well. The first great attempt to summarize the results of Hungarian Bronze Age research after 1989 on an international platform was the travelling exhibition on Bronze Age tell settlements in the Great Hungarian Plain, presented in several city museums in Germany and France at the beginning of the 1990s. This was a good opportunity for the authors of the exhibition catalogue to collect the results of Bronze Age studies of the last decades before the fall of the Iron Curtain. Though the catalogue only showed glimpses of the rich material of Bronze Age tell settlements, it became a handbook of the Hungarian Early and Middle Bronze Age, not only because of the nice colour photos of significant finds but also because of the very important collection of data on the absolute chronology (Meier-Arendt 1992). After that, several important national and international projects began in our region.

Referring to the topic of the Istanbul session, we will point to trends over the last 25 years in Hungarian Bronze Age studies, focusing mainly on the 1000 years of the Early and Middle Bronze Age, between 2600/2500–1500/1450 BC. We will also mention several recent projects on the Late Bronze Age. Our four main topics are: chronology, settlement and landscape studies, metallurgy, network analysis and mobility.

Chronology

The absolute and relative chronology of the region’s Bronze Age has been overhauled in the last decade. The traditional three periods of the Bronze Age remained (Bóna 1992), but acceptance of radiocarbon dating has considerably extended the Early Bronze Age.

For the start of the European Bronze Age there is still some controversy in terms of its relative chronology. In the Carpathian Basin, for example, Hungarian and Romanian prehistorians emphasize the region’s mediating role and tend to take an intermediate position compared to Bulgarian research, which dates the beginning of the Bronze Age to the mid-4th millennium BC, when multi-layered settlements appeared, and Central European research, which assigns the onset of the Bronze Age, after the Bell Beaker period, to around 2200 BC (Fig. 1).

The end of the Baden period indeed signals the end of an epoch in the eastern part of Central Europe and there is no clear continuity to the next peri-

Absolute dates (BC)	Bulgaria	Hungary	Central Europe
2200/2100 2300	EBA III	EBA 2	Reinecke Bz A1 Reinecke Bz A0
2600/2500	EBA II	EBA 1 Transitional period	Eneolithic
2900/2800 3500/3400	EBA I	Late Copper Age	Late Neolithic

Fig. 1: The beginnings of the Bronze Age in south-eastern and central Europe (after P. Fischl *et al.* 2013, Abb. 1a).

*The manuscript was finalised in 2016.

od. Although the transformation was gradual in the earlier 3rd millennium and did not proceed at the same rhythm across the Carpathian Basin, as shown by the overlapping radiocarbon dates (Horváth 2012), the process itself was irreversible. Between 2800/2700 and 2600/2500 BC ceramic styles delineate communication networks covering large areas within the whole Carpathian Basin with two main groups characterized by the Makó–Kosihy-Čaka and late Vučedol/Somogyvár–Vinkovci ceramic styles (Kulcsár 2009). According to recent studies, this last mentioned phase between 2800/2700 and 2600/2500 BC is called the Transitional period (Kulcsár and Szeverényi 2013). From the end of this phase until the time of the Koszider period, the Early and the Middle Bronze Age thus spans over a millennium, instead of the earlier six hundred years of the short chronology, from 2500/2400 until 1500/1450 BC (P. Fischl *et al.* 2013a).

During the Early Bronze Age (between 2500/2400 and 2000/1900 BC), we can observe a transformation that probably grew out of the contact of a southern (Balkan) and a north-western and central European (Bell Beaker) network within the Carpathian Basin. After this period, from 2000 BC on, new stylistic units appear along the Danube and to the East, and develop continuously into the Middle Bronze Age pottery styles. This indicates the emergence of smaller groups that communicated their identities with new, increasingly distinct ceramic styles. One of the major features of the period is the formation of tell settlements that were inhabited for many centuries along the Danube and Tisza and their tributaries. These settlements imply increased sedentism and intensive agriculture, as well as a new attitude towards territoriality, the emergence of a new relationship with the past, and of new rituals, primarily that of deliberate house-burning. Within this period, the date of the end phase of the Middle Bronze Age, the Koszider Period, remains somewhat uncertain. The first series of radiocarbon dates are scattered between 1800 and 1400 BC, with most of them around 1700–1500 BC (Raczky *et al.* 1992). There are even fewer dates from Tumulus Period contexts from Hungary. These dates correspond to the Koszider Period; the overlapping radiocarbon dates suggest a gradual transformation across the Carpathian Basin (P. Fischl *et al.* 2013a). However, these pre-AMS dates had large standard deviations, and beyond the name of the site neither their proper context nor the material they were associated with were published. With the help of several ongoing projects the currently used absolute chronology can be refined with the application of AMS radiocarbon dating of some 100 new samples collected from human remains and recently excavated settlements.

Settlement studies

Settlement research continued in two directions in the last 25 years: thanks to rescue excavations preceding motorway construction we have new information concerning smaller and larger Bronze Age single-layer settlements. The goals of national and international systematic excavations have been to investigate tell settlements (e. g. at Százhalombatta and Túrkeve; Csányi and Tárnoki 2003, 2013; Vicze 2005, 2013; Vicze *et al.* 2014; this volume), or microregions.

Several microregional projects e. g. the Benta Valley project in the hinterland of Százhalombatta, or the BAKOTA project in the Körös region, were based on the results of Hungarian Archaeological Topography programme of the Hungarian Academy of Sciences (Horváth *et al.* 1979; Dinnyés *et al.* 1986; Jankovich *et al.* 1989; Earle and Kristiansen 2010; Earle *et al.* 2012, 2014; Duffy 2014). Nowadays there are several other microregional programs without previous MRT work, as the BORBAS and Berettyó projects in north-east Hungary, and the Kakucs Archaeological Excavation (KEX) project in the left side of the Danube in Central Hungary (Dani and P. Fischl 2009; Dani 2012; P. Fischl and Kienlin 2013; Kulcsár *et al.* 2014) (Fig. 2).

The aim of these microregional settlements research programs is to analyse the complexity of the social and political organization of the 1000 years of the Early and Middle Bronze Age. What kind of differences can be observed between the various settlement types within a microregion? Can we observe increasing social differences through increasing settlement hierarchy? What kind of impact did economic changes have on demography? Analyses focus on regional settlement patterns, excavations at central settlements, and at non-central villages. Based on household data of these sites we can compare the range of production and consumption, storage, craft and ritual activities, associated with central against non-central settlements. For example, evidence of bronze-working is known primarily from fortified, central and tell settlements. Nevertheless, features implying metalworking activities have recently been unearthed from single-layered settlements as well (Bátora 2009: 209–210; Szeverényi and Kulcsár 2012; P. Fischl *et al.* 2013b). Researchers have also sought answers to the question of whether the fortified tells and single layer settlements can be taken to indicate the presence of chiefdom-type polities in the area (Earle and Kristiansen 2010; Kienlin 2012; Kristiansen and Earle 2015). In this connection the Benta project also

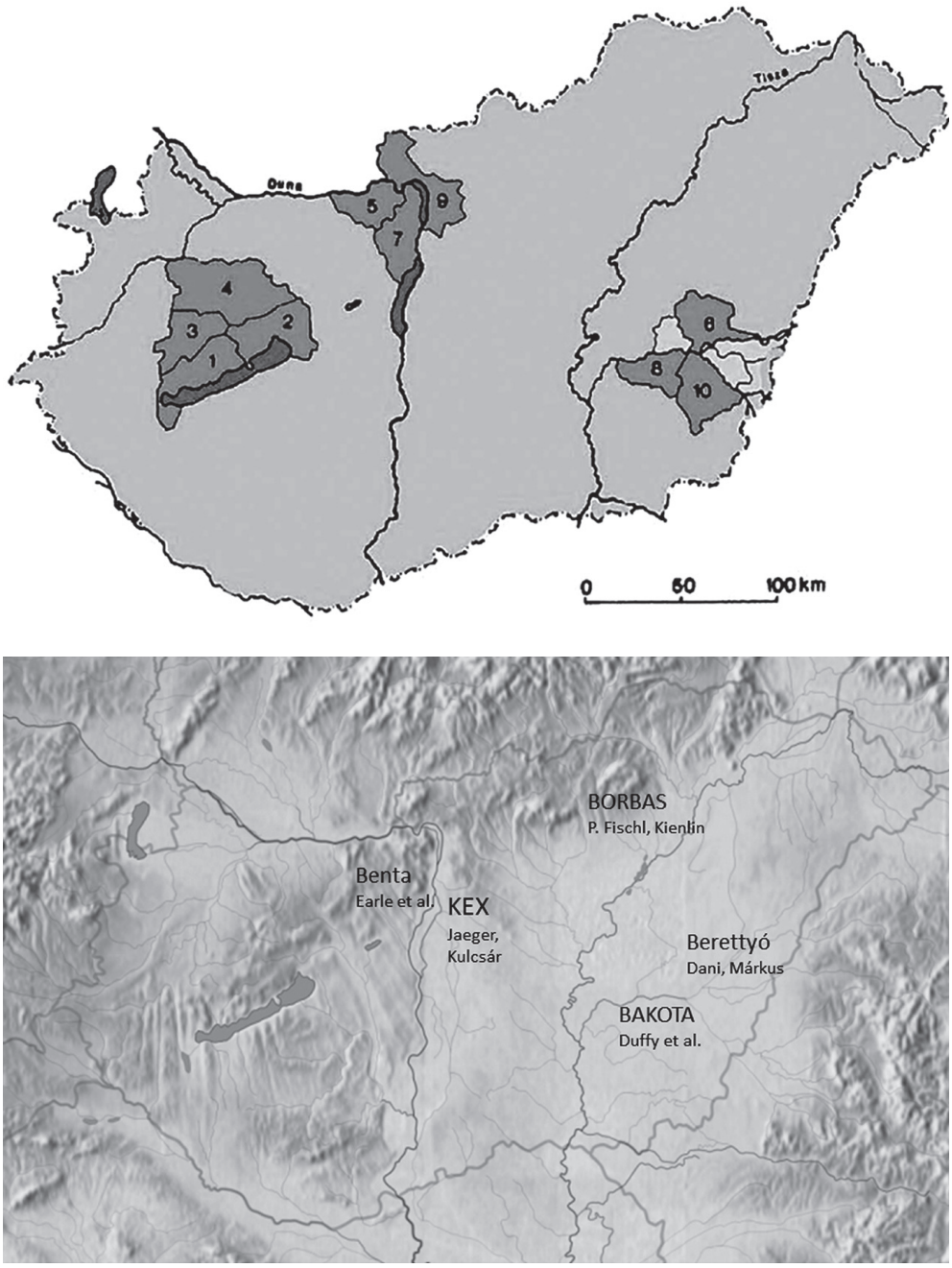

Fig. 2: a – Map with regional works of Hungarian Archaeological Topography (after Bánffy and Raczky 2010); b – Bronze Age micro-regional research projects in Hungary until 2014.

integrates ceramic technological studies to understand economic changes and pottery traditions of the Bronze Age (Earle *et al.* 2011). The results suggest that specialization can be assumed not only in the end phase (in the Koszider period) but in the emergence of the Middle Bronze Age as well. Beside specialization, however, the movement of pottery was very localised and did not appear to be connected to a centralized market system.

Metallurgy

The appearance of bronze metallurgy fundamentally re-arranged the socio-economic organization of communities across Europe during the Bronze Age. The new technology, know-how and raw materials led to the formation of new networks and increased inequality. How did the new technology emerge? It has been suggested recently that some metallurgical products, especially Bányabükk, Fajsz

and Kozarac type copper shaft-hole axes, can be dated to an earlier period than traditionally defined, the period preceding the Early Bronze Age. This axe type is evidence not only for the spread of a new type of metal weapon or tool, but also of a technological innovation (Hansen 2009; Dani 2013; Szeverényi 2013).

Another dynamically developing direction of Hungarian prehistoric archaeology seeks answers for the question of raw material supply and production techniques of the flourishing Middle Bronze Age metallurgy, the Tolnanémedi type hoards in western Hungary, or the Apa–Hajdúsámson metallurgical tradition in the eastern part of the Carpathian Basin (Kiss 2009; Dani *et al.* 2013; Pernicka 2013; Török *et al.* 2015). Recent non-destructive neutron radiography, prompt gamma-ray neutron activation and time-of-flight neutron diffraction studies, as well as destructive raw material sampling and microstructure analysis of Middle and Late Bronze Age finds, shed light on the raw material types and technological choices of the period (Kiss *et al.* 2013, 2015). Use wear analysis is also an important method for revealing important details of function and object biography (Mödlinger 2011, 2013).

A very important recent project concerns heritage protection and the thorough study of Late Bronze Age hoards, in cooperation with collectors and metal detectorists (Szabó 2012, 2013).

Study of complex networks and mobility

Interregional interactions expanded considerably during the Early Bronze Age of the Carpathian Basin, and new networks were built in new directions that contributed significantly to the later developments of the Bronze Age in Hungary. According to the preliminary analysis of the Early Bronze Age we may say that major shifts can be noted in the interaction networks of the central regions of the Carpathian Basin during the 3rd millennium BC, specifically during the roughly 500 years preceding the onset of the Bronze Age. In the Early Bronze Age (between 2500/2400 and 2000 BC), we can observe a transformation that probably grew out of the contact of a southern, Balkan, and a north--western and central European network within the Carpathian Basin. From this time onward, contact with the north-west and the south assumed a greater importance, with the Danube acting as the main axis of communication. The background of these connections, an invisible world of concepts, ideas and innovations, can be revealed through thorough analyses, in which network studies play a key role.

Beside movement of ideas, studies of human mobility also have a long tradition in interpreting the observed changes in the archaeological record. The close of the Copper Age and the onset of the Early Bronze Age in the Carpathian Basin was explained by the arrival of population groups from the east (Pit-grave/Yamnaya culture) and from the west (Bell Beaker groups), who also brought with them the technology and know-how of bronze metallurgy which gave the period its name (Patay 1938: 32–34). Following the start of palaeoenvironmental studies during the 1990s, the probable impact of the changes in the region's climate and vegetation, as well as the possible socio-economic transformations in their wake, were considered as potential factors stimulating changes in settlement patterns, such as the abandonment of the flourishing Middle Bronze Age tell settlements, or for explaining the widespread distribution of ceramic styles or vessel types (such as bell beakers and bowls with interior decoration) and funerary rites (kurgans or tumuli) across vast territories of Europe (Sherratt 1991; Heyd 2007). However, the possibility of migrations should not be automatically rejected, especially in view of the later, Migration period and early

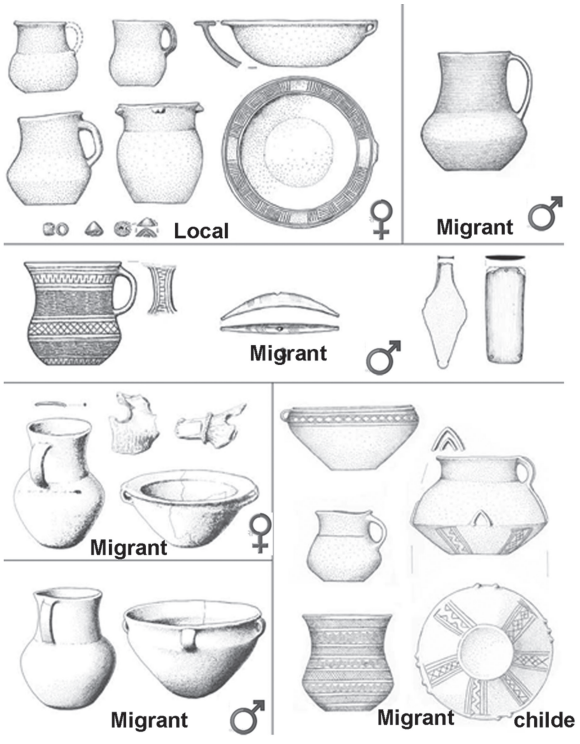

Fig. 3: Sr isotope results and grave assemblages of Bell Beaker individuals from Budapest region, 1. Budapest–Békásmegyer Grave 193, 2. Budapest–Békásmegyer Grave 445, 3. Budapest–Békásmegyer Grave 432a, 4. Szigetszentmiklós–Üdülősor Grave 1, 5. Szigetszentmiklós–Üdülősor Grave 13, 6. Szigetszentmiklós–II. Vízcsőárok Grave 3 (modified after Kulcsár 2011).

Fig. 4: Cooperation network of Bronze Age projects of the Institute of Archeology, Research Centre for the Humanities, Hungarian Academy of Sciences around 2014.

medieval history of the Carpathian Basin and recent aDNA data (Alt *et al.* 2014; Szécsényi-Nagy *et al.* 2015). Migration is indeed an important social strategy, often used both individually and by communities to solve their problems and better their situation. A basic question remains: Who moved: people, objects or ideas?

Two recent case studies provide interesting data regarding mobility. The first is connected to the Yamnaya communities. The tradition of erecting burial mounds is a widespread phenomenon in south-east Europe during the Late Copper Age and Early Bronze Age, not restricted to one archaeological culture. The kurgan burials of eastern Hungary have provided a wealth of exciting new information (Pető and Barczi 2011, Horváth *et al.* 2013). The radiocarbon dates for the Sárrétudvari kurgan gave a date in the 4th/3rd millennium cal BC and indicated three distinct burial phases. The stable isotope analyses yielded some surprising results. As it turned out, the earliest burials were of individuals who grew up in the Sárrétudvari area, because there was nothing to prove that they had been immigrants. In contrast, recent analyses indicated that the individuals interred in the later burials had grown up in a higher-lying, wetter region. The parallels of the grave pottery suggested a possible connection with the Livezile/Ampoiţa group living in the nearby Apuşeni Mountains in Transylvania. An international research team argued for a potential connection to the sites under discussion, in the knowledge that no comparative skeletal remains from Transylvania were available at that time (Gerling *et al.* 2012). According to more recent research, the stable isotope analyses once again yielded some surprising results. Six human individuals from four Transylvanian sites were selected for $^{87}Sr/^{86}Sr$ and $\delta^{18}O$ isotopic analyses. Although the data set is far too small to gain answers on a statistically significant basis, in the light of this complementary data set it can be assumed that the isotopic outliers from Sárrétudvari-Őrhalom do not agree with the results from the selected Transylvanian sample sites. So our questions remain unanswered (Gerling and Ciugudean 2013).

Another case study is the Bell Beaker population in central Hungary. Bohemian and German samples indicate the presence of women arriving from as far away as 200 km, suggesting a practice of exogamous marriage. In the light of stable isotope analyses of samples from six burials from the Budapest region, the results show a complex picture of locals and incomers (Fig. 3), including non-local men and women (Price *et al.* 2004; Kulcsár 2011). Our new

research project continues these analyses, focusing on communities in whose case the traditional explanation for the widespread distribution of a particular ceramic style or funerary rite was the appearance of new ('foreign') population groups, as in case of Bell Beaker and Tumulus cultures (P. Fischl *et al.* 2015; Kiss 2016; Kiss *et al.* in press).

Networks are also important factors in modern archaeological research. Cooperation between researchers in the countries of Central Europe (Fig. 4) has provided new perspectives in understanding prehistoric social contacts, and the Bronze Age 'Europe without walls'. Ongoing studies concerning settlement, bronze metallurgy, bioarchaeological and network analysis, provide a more complex picture of the regional and temporal dynamics of the 3rd and 2nd millennia BC in the Carpathian Basin.

References

Alt, K. W., Knipper, C., Peters, D., Müller, W., Maurer, A.-F., Kollig, I., Nicklisch, N., Müller, Ch., Karimnia, S., Brandt, G., Roth, Ch. Rosner, M., Mende, B., Schöne, B., Vida, T. and von Freeden, U. 2014. Lombards on the Move – An Integrative Study of the Migration Period Cemetery at Szólád, Hungary. *PLOS ONE* 9(11): e110793.

Bánffy E. and Raczky, P. 2010. The crisis and changes in cultural heritage legislation in Hungary: cul-de-sac or solution? In N. Schlanger and K. Aitchison (eds), *Archaeology and the global economic crisis. Multiple impacts, possible solutions*. Tervuren, ACE/Culture Lab Editions.

Bátora, J. 2009. Metallurgy and Early Bronze Age Fortifed Settlements in Slovakia. *Slovenská archeológia* 57: 195–219.

Bóna, I. 1992. Bronzezeitliche Tell-Kulturen in Ungarn. In W. Meier-Arendt (Hrsg.), *Bronzezeit in Ungarn. Forschungen in Tell-Siedlungen an Donau und Theiss*: 9–42. Frankfurt am Main, Main Museum für Vor- und Frühgeschichte Frankfurt.

Csányi, M. and Tárnoki, J. 2003. The Middle Bronze Age population of the Berettyó–Körös region: the Gyulavarsánd culture. In Zs. Visy (ed.), *Hungarian Archaeology at the Turn of the Millennium:* 145–148. Budapest, Ministry of National Cultural Heritage.

Csányi, M. and Tárnoki, J. 2013. A Dinner Set from a Bronze Age House in Level 2 of the Túrkeve-Terehalom Settlement. In A. Anders, G. Kulcsár, G. Kalla, V. Kiss and G. V. Szabó (eds), *Moments in Time. Papers Presented to Pál Raczky on His 60th Birthday*. Prehistoric Studies I: 707–723. Budapest, Prehistoric Society.

Dani J. 2012. Fortified Tell Settlements from the Middle Bronze Age in the Hungarian Reach of the Berettyó Valley. In M. Jaeger, J. Czebreszuk and K. P. Fischl (eds), *Enclosed Space – Open Society. Contact and Exchange in the Context of Bronze Age Fortified Settlements in Central Europe*. Studien zur Archäologie in Ostmitteleuropa 9: 27–37. Bonn, Rudolf Habelt GmbH.

Dani, J. 2013. The Significance of Metallurgy at the Beginning of the Third Millennium BC in the Carpathian Basin. In V. Heyd, G. Kulcsar and V. Szeverenyi (eds), *Transitions to the Bronze Age. Interregional Interaction and Socio-Cultural Change in the Third Millennium BC Carpathian Basin and Neighbouring Regions*: 203–231. Budapest, Archaeolingua.

Dani, J. and P. Fischl, K. 2009. A Berettyó-videk középső bronzkori telljei. Topográfiai megközelítés (Die mittelbronzezeitlichen Tellsiedlungen des Berettyó-Gebiets. Eine topographische Ubersicht). *Tisicum* 19: 103–118.

Dani, J., Török, Zs., Csedreki, L., Kertész, Zs. and Szikszai, Z. 2013. A hajdúsámsoni kincs PIXE vizsgálatának tanulságai. Lessons of PIXE analysis of the Hajdúsámson treasure. *Gesta* 12: 30–47.

Dinnyés, I., Kővári, K., Lovag, Zs., Tettamanti, S., Topál, J. and Torma, I. 1986. *Magyarország régészeti topográfiája 7. Pest megye régészeti topográfiája. Budai és szentendrei járás.* Hungarian Archaeological Topography 7. Budapest.

Duffy, P. 2014. *Complexity and Autonomy in Bronze Age Europe. Assessing Cultural Developments in Eastern Hungary*. Budapest, Archaeolingua.

Earle, T. K. and Kristiansen, K. (eds) 2010. *Organizing Bronze Age Societies. The Mediterranean, Central Europe, and Scandinavia Compared*. Cambridge, Cambridge University Press.

Earle, T., Kreiter, A. Klehm, C., Ferguson, J. and Vicze, M. 2011. Bronze Age ceramic economy: the Benta valley, Hungary. *European Journal of Archaeology* 14: 419–440.

Earle, T., Kiss, V., Kulcsár, G., Szeverényi, V., Polányi T., Czebreszuk, J., Jaeger, M. and Pospieszny, Ł. 2012. Bronze Age Landscapes in the Benta Valley. *Hungarian Archaeology* 2012/4.

Earle, T., Kiss, V., Kulcsár, G., Kiss, V., Serlegi V. and Szeverényi, V. 2014. Recent Results from the Bronze Age into the Benta Valley. *Hungarian Archaeology* 2014/2.

P. Fischl, K. and Kienlin, T. L. 2013. Results of a Systematic Survey Programme on the Hatvan Sites of Emőd-Nagyhalom and Tard-Tatardomb in Northern Hungary. *Acta Archaeologica Academiae Scientiarum Hungaricae* 64: 5–32.

P. Fischl, K., Kiss, V., Kulcsár, G. and Szeverényi, V. 2013a. Social, economic and/or population changes in the Carpathian Basin around 1600 BC. In H. Meller, F. Bertemes, K.-R. Bork and R. Risch (eds), *1600 BC – Cultural change in the shadow of the Thera-Eruption?* 4th Archaeological Conference of Central Germany October 14–16, 2011 in Halle (Saale). Tagungen des Landesmuseums für Vorgeschichte Halle 9: 355–371. Halle (Saale), Landesmuseums für Vorgeschichte.

P. Fischl, K., Kiss, V. and Kulcsár, G. 2013b. Specialised Households in the Carpathian Basin during the Early and Middle Bronze Age. In B. Rezi, R. E. Nemeth and S.

Berecki (eds), *Bronze Age Crafts and Craftsmen in the Carpathian Basin:* Proceedings of the International Colloquium from Targu Mures, 5–7 October 2012. Biblioteca Musei Marisiensis, Seria Archaeologica 6: 9–22. Târgu Mureș, Editura MEGA.

P. Fischl, K., Kiss, V., Kulcsár, G. and Szeverényi, V. 2015. Old and new narratives for the Carpathian Basin around 2200 BC. In H. Meller, W. H. Arz, R. Jung and R. Risch (eds), *2200 BC – A climatic breakdown as a cause for the collapse of the old world?* 7th Archaeological Conference of Central Germany. October 23–26, 2014 in Halle (Saale). Tagungen des Landesmuseums für Vorgeschichte Halle 12: 503–524. Halle (Saale), Landesmuseum für Vorgeschichte.

Gerling, C., Bánffy, E., Dani, J., Köhler, K., Kulcsár, G., Pike, A., Szeverényi, V. and Heyd, V. 2012. Immigration and transhumance in the Early Bronze Age Carpathian Basin: the occupants of a kurgan. *Antiquity* 86: 1097–1111.

Gerling C. and Ciugeudean H. 2013. Insights into the Transylvanian Early Bronze Age using Strontium and Oxygen Isotope Analyses – A Pilot Study. In V. Heyd, G. Kulcsar and V. Szeverenyi (eds), *Transitions to the Bronze Age. Interregional Interaction and Socio-Cultural Change in the Third Millennium BC Carpathian Basin and Neighbouring Regions*: 181–202. Budapest, Archaeolingua.

Hansen, S. 2009. Kupfer, Gold und Silber im Schwarzmeerraum während des 5. und 4. Jahrtausend v. Chr. In J. Apakidze, B. Govedarica and B. Hänsel (eds), *Der Schwarzmeerraum von Äneolithikum bis in die Früheisenzeit (5000–500 v. Chr.). Kommunikationsebenen zwischen Kaukasus und Karpaten.* Prähistorische Archäologie in Südosteuropa 25: 11–49. Rahden/Westfalen, Verlag Marie Leidorf GmbH.

Heyd, V. 2007. When the West meets the East: The Eastern Periphery of the Bell Beaker Phenomenon and its Relation with the Aegean Early Bronze Age. In I. Galanaki, I. Galanakis, H. Tomas and R. Laffineur (eds), *Between the Aegean and Baltic Seas: Prehistory across Borders.* Proceedings of the International Conference 'Bronze and Early Iron Age Interconnections and Contemporary Developments between the Aegean and the Region of the Balkan Peninsula, Central and Northern Europe', University of Zagreb/Croatia, 10–14 April 2005. Aegaeum 27: 91–107. Liège, Université.

Horváth, I., H. Kelemen, M. and Torma, I. 1979. *Magyarország régészeti topográfiája 5. Komárom megye régészeti topográfiája. Esztergomi és dorogi járás.* Hungarian Archaeological Topography 5. Budapest.

Horváth, T. 2012. *Networks and Netwars: New perspectives on the Late Copper Age and Early Bronze Age. Typo-chronological relationships of the Boleraz/Baden/Kostolac finds at the site of Balatonőszod-Temetői dűlő, Hungary.* BAR IS 2427. Oxford, Archaeopress.

Horváth, T., Dani, J., Pető, Á., Pospieszy, Ł. and Svingor, É. 2013. Multidisciplinary Contributions to the Study of Pit Grave Culture Kurgans of the Great Hungarian Plain. In V. Heyd, G. Kulcsar and V. Szeverenyi (eds), *Transitions to the Bronze Age. Interregional Interaction and Socio-Cultural Change in the Third Millennium BC Carpathian Basin and Neighbouring Regions*: 153–180. Budapest, Archaeolingua.

Jankovich, D., Makkay, J. and Szőke, B. M. 1989. *Magyarország régészeti topográfiája 8. A szarvasi járás.* Hungarian Archaeological Topography 8. Budapest.

Kienlin, T. L. 2012. Patterns of Change, or: Perceptions Deceived? Comments on the Interpretation of Late Neolithic and Bronze Age Tell Settlement in the Carpathian Basin. In T. L. Kienlin and A. Zimmermann (eds), *Beyond Elites. Alternatives to Hierarchical Systems in Modelling Social Formations.* International Conference at the Ruhr-Universitat Bochum, Germany, October 22–24, 2009. Universitätsforschungen zur prähistorischen Archäologie 215: 251–310. Bonn, Dr. Rudolf Habelt GmbH.

Kiss, V. 2009. The Life Cycle of Middle Bronze Age Bronze Artefacts from the Western Part of the Carpathian Basin. In T. L. Kienlin and B. Roberts (eds), *Metals and Societies. Studies in Honour of Barbara S. Ottaway.* Universitätsforschungen zur prähistorischen Archäologie 169: 328–335. Bonn, Dr. Rudolf Habelt GmbH.

Kiss, V. 2016. From bones, bronzes and sites to society: Multidisciplinary analysis of human mobility and social changes in Bronze Age Hungary (2500–1500 BC). *The European Archaeologist* 48: 18–21.

Kiss, V., Barkóczy, P. and Vízer, Zs. 2013. A zalaszabari bronzkincs archeometallurgiai vizsgálatának előzetes eredményei. Preliminary results of the archaeometallurgical examination of the Zalaszabar bronze hoard. *Gesta* 12: 72–82.

Kiss, V., Kasztovszky, Zs., Káli, Gy., Maróti, B., Pusztainé Fischl, K., Horváth, E. and Szabó, G. 2015. Non-destructive analyses of bronze artefacts from Bronze Age Hungary using neutron-based methods. *Journal of Anatomical Atomic Spectrometry* 30: 685–693.

Kiss, V., Csányi, M., Dani, J., Endrődi, A., P. Fischl, K., Giblin, J., Hajdu, T., Köhler, K., Kreiter, A., Kulcsár, G., Szabó, G., Szathmári, I. and Szeverényi, V. in press. Changing populations or changing identities in the Bronze Age of the Carpathian Basin? Aims and preliminary results of a recent NKFI project. In G. Kulcsár, G. V. Szabó, V. Kiss and G. Váczi (eds), *State of the Hungarian Bronze Age Research.* Proceedings of the conference held between 17th and 18th of December 2014. Prehistoric Studies II. Budapest, Hungarian Academy of Sciences Research Centre for the Humanities Institute of Archaeology, Eötvös Loránd University Faculty of Humanities Institute of Archaeological Sciences, Prehistoric Society.

Kristiansen, K. and Earle, T. K. 2015. Neolithic versus Bronze Age Social Formations: A political economy approach. In K. Kristiansen, L. Šmejda and J. Turek (eds), *Paradigm Found: Archaeological Theory – Present,*

Past and Future. Essays in Honour of Evžen Neustupný: 234–247. Oxford, Oxbow.

Kulcsár, G. 2009: *The Beginnings of the Bronze Age in the Carpathian Basin. The Makó–Kosihy–Čaka and the Somogyvár–Vinkovci cultures in Hungary.* Varia Archaeologica Hungarica 23. Budapest 2009.

Kulcsár, G. 2011. Untangling the Early Bronze Age in the Middle Danube Valley. In Gy. Kovács and G. Kulcsár (eds), *Ten Thousand Years along the Middle Danube. Life and Early Communities from Prehistory to History.* Varia Archaeologica Hungarica 26: 179–210. Budapest, Archaeolingua.

Kulcsár, G., Jaeger, M., Kiss, V., Márkus, G., Müller, J., Pető, Á., Serlegi, V., Szeverényi, V. and Taylor, N. 2014: The Beginnings of a New Research Program – Kakucs Archaeological Expedition – KEX 1. *Hungarian Archaeology* 2014/4.

Kulcsár, G. and Szeverényi, V. 2013. Transition to the Bronze Age: Issues of Continuity and Discontinuity in the First Half of the Third Millennium BC in the Carpathian Basin. In V. Heyd, G. Kulcsar and V. Szeverenyi (eds), *Transitions to the Bronze Age. Interregional Interaction and Socio-Cultural Change in the Third Millennium BC Carpathian Basin and Neighbouring Regions*: 67–92. Budapest, Archaeolingua.

Meier-Arendt, W. (ed.) 1992. *Bronzezeit in Ungarn. Forschungen in Tell-Siedlungen an Donau und Theiss.* Frankfurt am Main, Main Museum für Vor- und Frühgeschichte Frankfurt.

Mödlinger, M. 2011. Bronze Age Warfare in Eastern Europe: Development, Technology and Usage of Defensive Armour. A short presentation of a forthcoming project. *Bulletin de l'Association pour la Promotion des Recherches sur l'Age du Bronze* 8: 86–88.

Mödlinger, M. 2013. Bronze Age metal defensive armour in Eastern Europe: status symbols and symbolic weapons only? Indications for the usage as weapons. In B. Rezi, R. E. Nemeth and S. Berecki (eds), *Bronze Age Crafts and Craftsmen in the Carpathian Basin*: Proceedings of the International Colloquium from Targu Mures, 5–7 October 2012. Biblioteca Musei Marisiensis, Seria Archaeologica 6: 279–290. Târgu Mureş, Editura MEGA.

Patay, P. 1938. *Korai bronzkori kultúrák Magyarországon – Frühbronzezeitliche Kulturen in Ungarn.* Dissertationes Pannonicae II. 13. Budapest, Királyi Magyar Pázmány Péter Tudományegyétem Érem- és Régiségtani Intézete.

Pernicka, E. 2013. Analyses of Early Bronze Age metal objects from the museum Debrecen-Hungary. *Gesta* 12: 48–55.

Pető, Á. and Barczi, A. (eds) 2011. *Kurgan Studies: An Environmental and Archaeological Multiproxy Study of Burial Mounds in the Eurasian Steppe Zone*. BAR IS2238, Oxford, Archaeopress.

Price, T., Knipper, C., Grupe and G. Smrcka, V. 2004. Strontium Isotopes and Prehistoric Human Migration: The Bell Beaker Period in Central Europe. *European Journal of Archaeology* 7: 9–40.

Raczky, P., Hertelendi, E. and Horváth, F. 1992. Zur absoluten Datierung der bronzezeitlichen Tell-Kulturen in Ungarn. In W. Meier-Arendt (ed.), *Bronzezeit in Ungarn. Forschungen in Tell-Siedlungen an Donau und Theiss*: 43–47. Frankfurt am Main.

Sherratt, A. 1991. Sacred and Profane Substances: the Ritual Use of Narcotics in Later Neolithic Europe. In P. Garwood (ed.), *Sacred and Profane*. Proceedings of a Conference on Archaeology, Ritual and Religion, Oxford, 1989: 50–64. Oxford, Oxford Committee for Archaeology.

V. Szabó, G. 2012. In Search of Late Bronze Age Treasures. *Hungarian Archaeology* 2012/4.

V. Szabó, G. 2013. Late Bronze Age Stolen. New Data on the Illegal Acquisition and Trade of Bronze Age Artefacts in the Carpathian Basin. In A. Anders, G. Kulcsár, G. Kalla, V. Kiss and G. V. Szabó (eds), *Moments in Time. Papers Presented to Pál Raczky on His 60th Birthday*. Prehistoric Studies I: 793–815. Budapest, Prehistoric Society.

Szécsényi-Nagy, A., Brandt, G., Keerl, V., Jakucs, J., Haak, W., Möller-Rieker, S., Köhler, K., Mende, B., Fecher, M., Oross, K., Paluch, T., Osztás, A., Kiss, V., Pálfi, Gy., Molnár, E., Sebők, K., Czene, A., Paluch, T., Šlaus, M., Novak, M., Pećina-Šlaus, N., Ősz, B., Voicsek, V., Somogyi, K., Tóth, G., Kromer, B., Bánffy, E. and Alt, K. 2015. Tracing the genetic origin of Europe's first farmers reveals insights into their social organization. *Proceedings of the Royal Society B* 282: 20150339.

Szeverényi, V. 2013. The Earliest Copper Shaft-Hole Axes in the Carpathian Basin: Interaction, Chronology and Transformation of Meaning. In A. Anders, G. Kulcsár, G. Kalla, V. Kiss and G. V. Szabó (eds), *Moments in Time. Papers Presented to Pál Raczky on His 60th Birthday*. Prehistoric Studies I: 661–669. Budapest, Prehistoric Society.

Szeverényi, V. and Kulcsár, G. 2012. Middle Bronze Age Settlement and Society in Central Hungary. In M. Jaeger, J. Czebreszuk and K. P. Fischl, (eds), *Enclosed Space – Open Society. Contact and Exchange in the Context of Bronze Age Fortified Settlements in Central Europe*. Studien zur Archäologie in Ostmitteleuropa 9: 278–352. Bonn, Dr. Rudolf Habelt GmbH.

Török, Zs., Huszánk, R., Csedreki, L., Dani, J., Szoboszlai, Z. and Kertész, Z. 2015. Development of a new in-air micro-PIXE set-up with in-vacuum charge measurements in Atomki. In *Nuclear Instruments and Methods in Physics Research, Section B: Beam Interactions with Materials and Atoms* 362: 167–171.

Vicze, M. 2005. Excavation methods and some preliminary results of the SAX Project. In I. Poroszlai and M. Vicze (eds), *Százhalombatta Archaeological Expedition. Report 2*: 65–80. Százhalombatta, Matrica Museum.

Vicze, M. 2013. Middle Bronze Age Households at Százhalombatta-Földvár. In A. Anders, G. Kulcsár, G. Kalla, V. Kiss and G. V. Szabó (eds), *Moments in Time. Papers Presented to Pál Raczky on His 60th Birthday*. Prehistoric Studies I: 757–769. Budapest, Prehistoric Society.

Vicze, M., Sofaer, J. and Stig Sørensen, M. L. 2014. Glimpsing social organisation – evidence from the Bronze Age tell at Százhalombatta-Földvár. *Hungarian Archaeology* 2014/2.

Viktória Kiss
Institute of Archaeology
Research Centre for the Humanities
Hungarian Academy of Sciences
Budapest, Hungary
kiss.viktoria@btk.mta.hu

Gabriella Kulcsár
Institute of Archaeology
Research Centre for the Humanities
Hungarian Academy of Sciences
Budapest, Hungary
kulcsar.gabriella@btk.mta.hu