Transformations in the Carpathian Basin around 1600 B.C.

Klára P. Fischl, Viktória Kiss, Gabriella Kulcsár and Vajk Szeverényi

Zusammenfassung

Um die Zeit des Vulkanausbruchs von Thera fanden wichtige Veränderungen im Karpatenbecken statt. Diese sogenannte Koszider Epoche korrespondiert mit der letzten Phase der mittleren Bronzezeit in der ungarischen Terminologie und stellt den Übergang zur späten Bronzezeit dar. Die Untersuchung dieser Epoche hat sich bisher als kontrovers erwiesen – sowohl unter ungarischen als auch mitteleuropäischen Wissenschaftlern. Erst in den letzten Jahren ist diese Epoche nicht mehr als kurzer Zeitraum, mit der ein bestimmtes historisches Ereignis verbunden werden kann, interpretiert worden. Vielmehr sieht man sie nun als eine länger dauernde Periode an, welche die Blütezeit der mittleren Bronzezeit im Karpatenbecken markiert und die mit einschneidenden Veränderungen endet.

Die Hauptelemente dieses Wandels sind allerdings noch unklar. Unser Ziel ist es, den Wandel durch den Vergleich verschiedener Aspekte dreier aufeinanderfolgender Phasen zu untersuchen. Am Ende sollen einige neue Erwägungen stehen, die die bisherigen Interpretationen dieser Veränderungen erweitern können.

Summary

Around the time of the Thera eruption important transformations occurred in the Carpathian Basin. This is the so-called Koszider Period, which corresponds to the last phase of the Middle Bronze Age (MBA) in the Hungarian terminology and represents a transition to the Late Bronze Age. The assessment of the period has been controversial among both Hungarian and central European scholars. In the past few years this period has been interpreted not as a short »horizon« connected to a specific historical event, but as a longer period that represented the heyday of the MBA in the Carpathian Basin, which ended with significant transformations. The main elements of this transformation, however, are still unclear. Our aim is to investigate this transformation through the comparison of several aspects of three subsequent phases and to amend the previously offered interpretations of the changes with a few new considerations.

Introduction

Around the time of the Thera eruption important transformations occurred in the Carpathian Basin, today covering Hungary and parts of Austria, Slovakia, the Ukraine, Romania, Serbia and Croatia (Fig. 1). This is the so-called Koszider Period, which corresponds to the last phase of the Middle Bronze Age (MBA) according to the Hungarian terminology, and represents a transition to the Late Bronze Age (LBA). The assessment of the period has been controversial among both Hungarian and central European scholars.

The eponymous bronze hoards that had been found in the uppermost layers of the tell settlement of Dunaújváros-Kosziderpadlás were published by A. Mozsolics and I. Bóna in the 1950s together with other hoards of similar composition. The burial of the hoards – based on the traditional concept of culture and then dated to 1350 B.C. – was connected to the attack of the mobile pastoralist warriors of the »Tumulus Culture« from southern Germany, whose appearance brought an end to the flourishing »Tell Cultures« of the Danube and Tisza regions[1]. Accordingly, the Koszider Period was considered a short, war-ridden and turbulent phase.

In the past few years this period has been interpreted not as a short »horizon« connected to a specific historical event, but as a longer period that represented the heyday of the MBA in the Carpathian Basin, which ended with significant transformations (Bóna 1992; Bóna 1992a). The main elements of this transformation, however, are still unclear. Our aim below is to investigate this transformation through the comparison of several aspects of three subsequent phases – the classic phase of the MBA (Reinecke Bronzezeit [hereafter: RB] A2b–c; ca. 1800–1600 B.C.), its final phase, the Koszider Period (RB B; ca. 1600–1500/1450 B.C.) and the beginning of the LBA, the classic Tumulus Grave Period (RB C1–C2; ca. 1500/1450–1300 B.C.) – and to amend the previously offered interpretations of the changes with a few new considerations.

The Early and Middle Bronze Age background

At the beginning of the Early Bronze Age (EBA) in Hungary (2800/2700–2600/2500 B.C.) ceramic styles delineate communication networks covering large areas within the whole Carpathian Basin with two main groups characterized by

1 Mozsolics 1957; Bóna 1958; Mozsolics 1967.

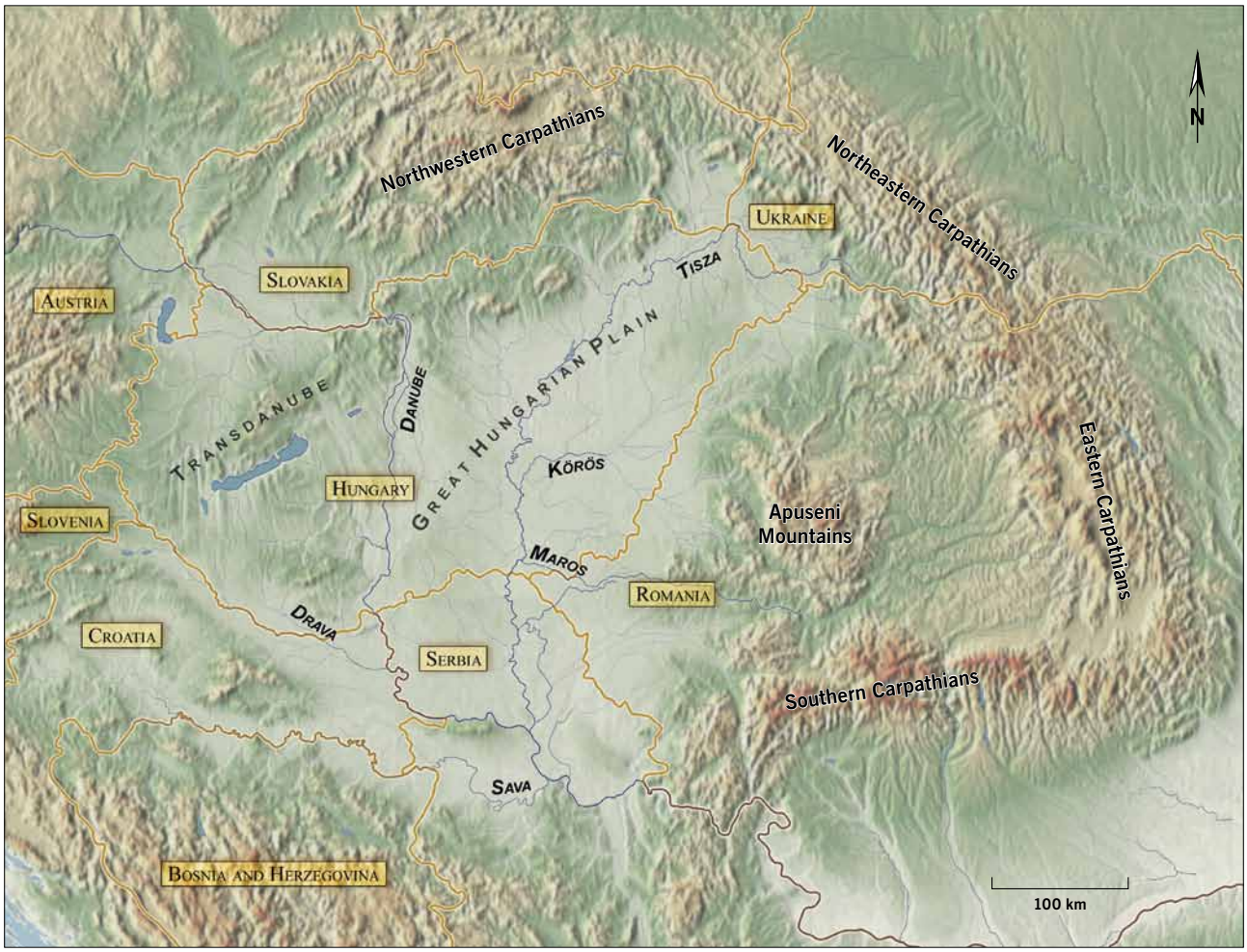

Fig. 1 The Carpathian Basin with modern state borders and major rivers and mountains.

the Makó-Kosihy-Čaka and Late Vučedol/Somogyvár-Vinkovci ceramic styles[2]. With a few exceptions, the settlement pattern of this phase indicates little social stratification, with not much differentiation between the larger centres and the smaller or larger open settlements.

In the second half of the EBA (2500/2400–2000/1900 B.C.), we can observe a transformation that probably grew out of the contact of a southern, Balkan and a northwestern and central European (Bell Beaker) network within the Carpathian Basin; the exact process, however, still remains unknown. In place of – and partly beside – the previous two large stylistic units, new ones covering smaller areas appear along the Danube and to the east, and develop continuously into the MBA (RB A2; from 2000/1900 B.C.) (Fig. 2)[3]. West of this region we encounter the Transdanubian Encrusted Ware in the MBA (Kiss 2003; Kiss 2012). Even more to the west communities belonged to the wider Aunjetitz circle (Gáta/Wieselburg, Unterwölbling) and the southeast Alpine regional groups[4]. All 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 rivers and their tributaries[5]. These settlements imply increased sedentism and intensive agriculture on the one hand, and a new attitude towards territoriality, the emergence of a new relationship with the past, traditions and ancestors, and of new rituals – primarily that of deliberate house burning[6] – on the other.

It is important to note, however, that within the distribution area of the so-called »Tell Cultures« tell settlements themselves are not present everywhere. According to P. Sümegi's results, on the macro level, tells emerged in areas with a sub-Mediterranean climate and an alluvial environment with mosaic patterning (Sümegi/Bodor 2000). For example, in the case of the sites characterized by Hatvan style material it is striking that tells characteristically do not occur north of the Pannonian forest steppe vegetation zone (Fig. 3). This indicates that tell settlements are important, but not exclusive features of the cultural and social units of the period. The often fortified tells along the Danube and to the east, and the fortified hilltop settlements in the central

2 Bóna 1992; Kulcsár 2009; Reményi 2009.
3 Hatvan, Maros, Vatin/Vattina, Vatya, Füzesabony, Gyulavarsánd styles: Bóna 1975; Bóna 1992.
4 Bóna 1975; Neugebauer 1994; Krenn-Leeb 2006.
5 Sherratt 1993; Gogâltan 2002; O'Shea 2011.
6 Stevanović 1997; Chapman 1999; Szeverényi 2004.

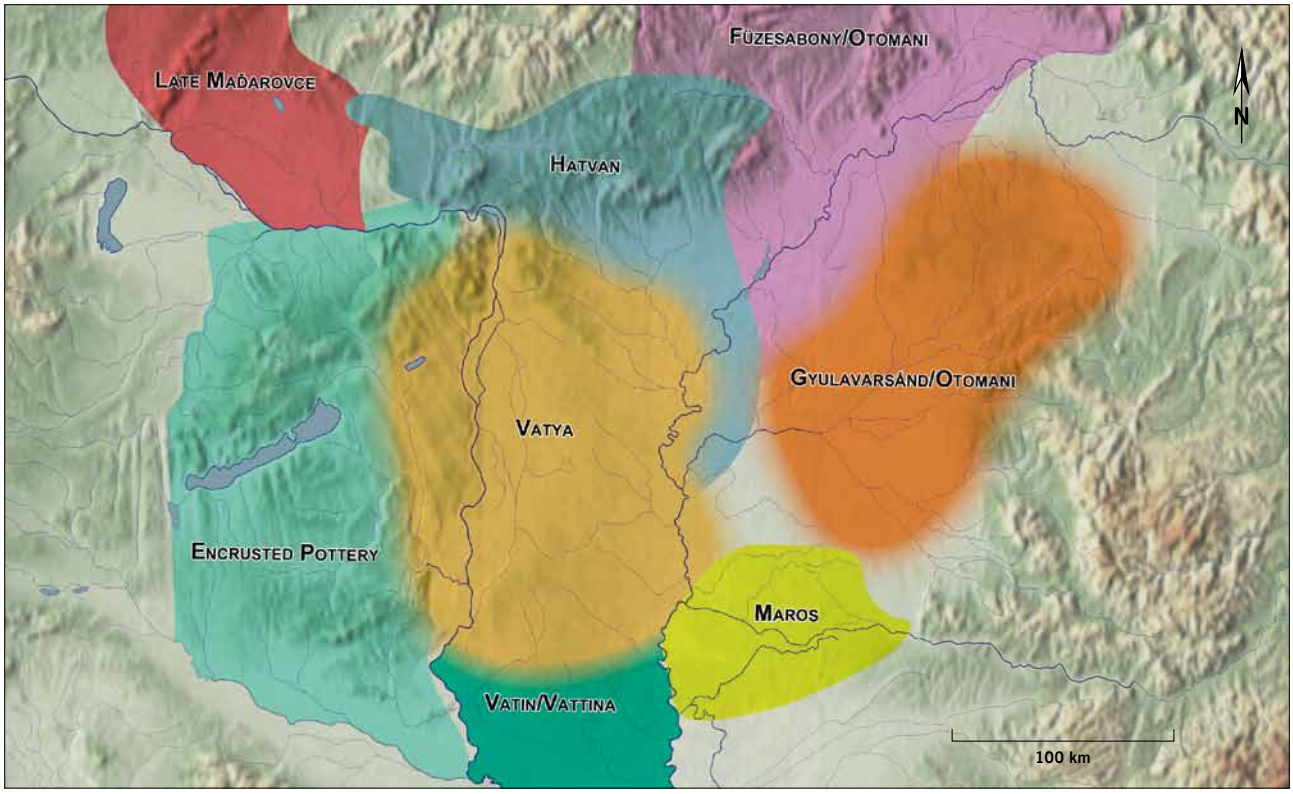

Fig. 2 Distribution of Middle Bronze Age (MBA) ceramic styles in the Carpathian Basin.

part of Transdanubia – where tells are missing – are usually interpreted as chiefly centres, surrounded by larger single layer settlements and smaller satellite settlements. It remains debated whether this three-level settlement hierarchy, probably integrating a few thousand individuals, can be taken to indicate the presence of chiefdom type polities in the area[7].

Typochronology and absolute dates

One of the most salient phenomena in the youngest layers of tell settlements is that the borders between previously more distinct pottery styles become blurred, and generally pottery becomes more uniform. There are a number of possible explanations for this: perhaps the different local identities communicated through distinct ceramic styles became more open and inclusive, causing a change in stylistic features and the gradual dissolution of differences. Another possible reason is the increase of the intensity of contacts between MBA communities, which may be connected to the widening of regional and interregional exchange networks through which raw materials and exotic items were acquired. Another general characteristic of the period is the lavish and varied decoration on pottery observed in every local style (Fig. 4).

In this period new jewellery, weapon and tool types make their appearance that are summed up by research under the label Koszider metallurgy (Fig. 5). In Austria and Germany, the emergence of this new type of jewellery was connected to the appearance of elements from the Carpathian Basin. In Hungary, however, the new metal types were connected to the appearance of a new ceramic style that was thought to arrive from the western part of central Europe through the migration of the »Tumulus Grave Culture«[8]. The best explanation for this paradigm change that can be observed in a number of regions may be the emergence of a new communication network throughout most of central Europe, whose point of origin is still unknown, perhaps can never be known, or should be considered »multi-centred«.

Within the framework of the radiocarbon-based high chronology, the MBA in Hungary is placed between ca. 2000 B. C. and 1500 B. C. Within this period the date of the end phase of the MBA, the Koszider Period (RB A2c–RB B) remains somewhat uncertain. The first – and up till this day the largest – series of radiocarbon dates scatter between 1800 B. C. and 1400 B. C., with most of them around 1700–1500 B. C. (Raczky et al. 1992). These were, however, pre-AMS dates with large standard deviations, and beyond the name of the site neither their proper context nor the material they were associated with were published (Fig. 6). New radiocarbon measurements from the period (e. g. from Mošorin-Feudvar, Nagyrozvágy-Pap-domb, Százhalombatta-Földvár, Včelince)[9] reinforce this date, although some dates from apparently Koszider Period contexts seem to be earlier than expected (ca. 1800–1600 B. C.), which warns us that we

7 Sherratt 1987; Sherratt 1993; Sherratt 1994; Kristiansen 1998; Duffy 2010; Earle/Kristiansen 2010.

8 Mozsolics 1957; Bóna 1958; Hänsel 1968; Bóna 1992a; see also Benkovsky-Pivovarová 1996; David 2002; Blischke 2002.

9 Görsdorf 1992; Roeder 1992; Görsdorf et al. 2004; Koós 2009; Koós 2010; Uhnér 2010.

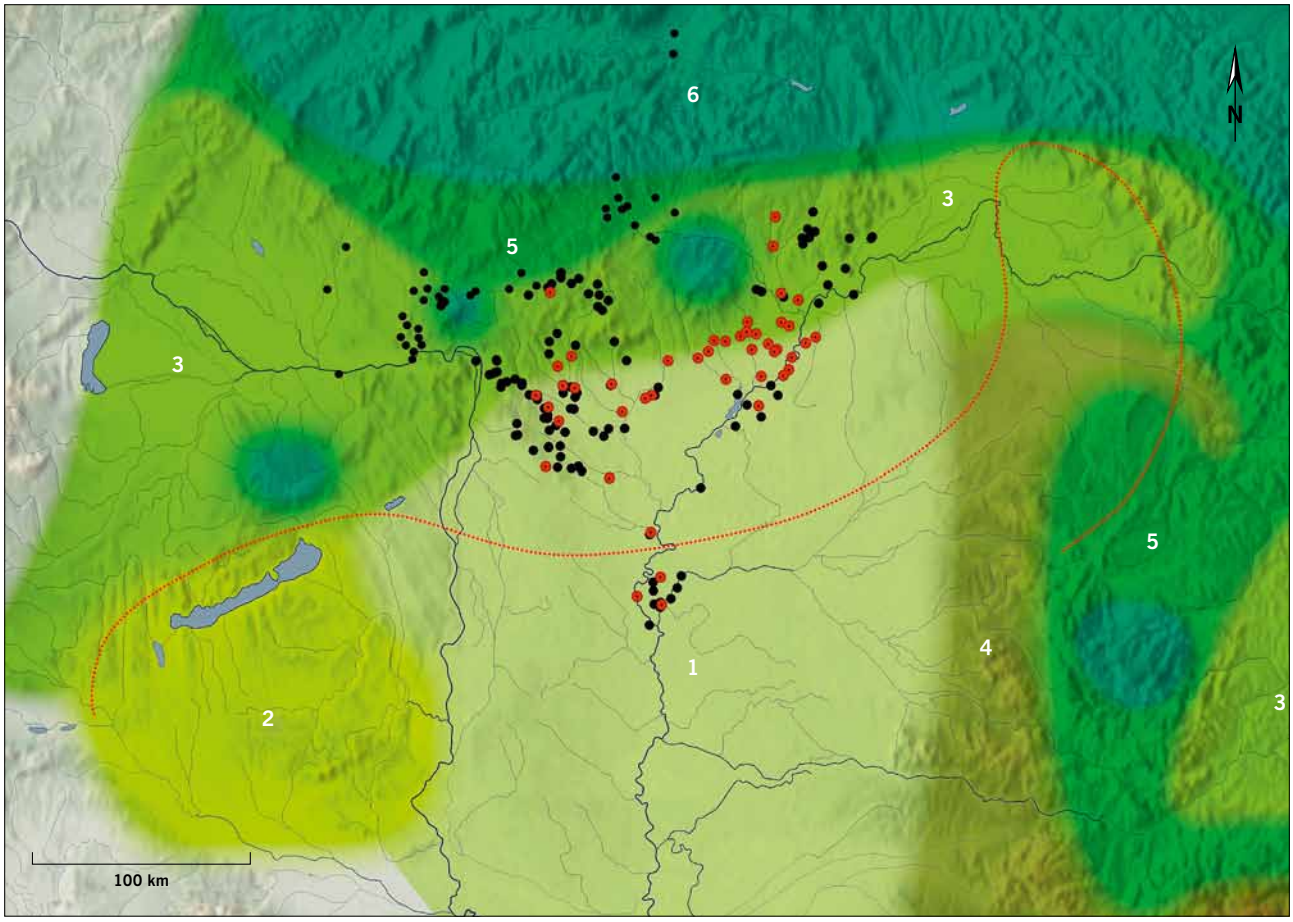

Fig. 3 Correlation between tell settlements (●) and other sites (●) characterized by Hatvan style material and the vegetation zones of the Carpathian Basin. **1** Pannonian forest steppe region; **2** Submediterranean oak forest region; **3** Mixed zone between the Submediterranean and Central European forest region; **4** Balkan oak forest region; **5** Central European oak forest region; **6** Beech and coniferous forest; - - - Northern distribution of *Tilia tomantosa* (silver lime).

may have to rethink solely typology-based chronologies in the future. There are even less dates from Tumulus Grave Period contexts from Hungary. An Early Tumulus Grave Period burial at Nagydém-Középrépáspuszta (Grave 1A) yielded similar dates (Fig. 6; Ilon 1998–1999; Ilon 2005). Dates from the younger Tumulus Grave periods settlement from Németbánya start around 1400 B.C., thus these are beyond the scope of this study (Ilon 1996).

According to new radiocarbon dates from southern Germany, early Tumulus Grave assemblages, which correspond to the Koszider Period in Hungary, were dated after Bayesian analysis to ca. 1550–1450 B.C. The south German RB C1–C2 phase (ca. 1450–1400 B.C. and 1400–1300 B.C.; Müller/Lohrke 2009) corresponds to the first phase of the LBA, the classic Tumulus Grave Period in Hungary.

Settlement and subsistence patterns

During the MBA the settlement structure of the polities in the Carpathian Basin developed continuously from the above-mentioned EBA antecedents. However, a number of important transformations did occur, which indicate significant social and economic changes.

Based on the available data, during the MBA the extent of tell settlements increased at many sites, and often the ditch surrounding the settlement was filled up and its area was built over (Fig. 7; e.g. at Ároktő, Carei, Bakonszeg, Nižná Myšľa, Polgár-Kiscsőszhalom, Sălacea)[10]. Life on numerous tell settlements ended already before the Koszider Period (e.g. Bölcske, Nagykőrös, Gomba), while others continued to be occupied in the Koszider Period[11], or rarely even into the Late Bronze Age (e.g. Včelince, Nižná Myšľa, Pecica). At the same time, a few tell or tell-like settlements (e.g. Solymár, Alpár, Mende) or »horizontal« settlements (Buják, Nagyrozvágy) were founded in the Koszider Period[12].

It is a general problem in the research on the central part of the Carpathian Basin that sites beyond the above-mentioned, well-known tell settlements are hardly known or have been excavated. The almost complete lack of proper radiocarbon dates also warns us to refrain from the analysis of the number and extent of settlements according to chron-

10 Sz. Máthé 1988; Sz. Máthé 1992; Bóna 1992; Németi/Molnár 2002, 16–17; Olexa 2003, Tab. V; Dani et al. 2003, 94–96; Molnár/Imecs 2006, 48; 53; P. Fischl 2006; P. Fischl 2012; Duffy 2010.

11 E.g. Tószeg D, Jászdózsa 1–3, Százhalombatta 1–3, Košice-Barca, Dunaújváros-Kosziderpadlás 1–2, Baracs 1–2/3, Tiszafüred, Túrkeve.

12 Bóna 1992; Koós 2003; Reményi 2005; Tárnoki 2010.

Fig. 4 Koszider style pottery. **1** Túrkeve-Terehalom; **2** Csanytelek; **3–4** Buják; **5** Százhalombatta-Földvár.

ological phases, especially in the case of field surveys. Thus, only tendencies can be delineated in a few better studied microregions in Hungary.

According to the results of systematic surveys in Békés County (SE Hungary), in the Körös River region the size of a few settlements increased in the MBA Gyulavarsánd (Otomani II) period, compared to the Ottomány (Otomani I) period at the end of the EBA. At the same time the number of sites increased by 24 %[13]. The situation could be examined in more detail in the Eriu Valley and the Carei Plain (NW Romania), where the number of settlements increased significantly during the MBA, but decreased in its final, Koszider Period (Molnár/Imecs 2006, Pl. 4; 6; 8; for dates see Németi/Molnár 2002, 32–33).

In central Hungary, in the valley of the Benta, a tributary of the Danube, within a 50 km² microregion, the increase of the size of a few sites can be demonstrated in the MBA; e. g. the tell settlement of Százhalombatta-Földvár increased from 2 ha in the EBA Nagyrév period to 5,5 ha. Here the central settlements are 5,5–12 ha large, while the smaller ones are 2–3 ha large. At the same time, the number of settlements doubled (five in the Nagyrév period, 13 in the MBA Vatya period; Artursson 2010; Earle/Kolb 2010). A similar increase in the number and size of settlements could be observed on the left bank of the Danube as well during preliminary surveys in the Kakucs region (Szeverényi/Kulcsár 2012).

In the distribution area of Transdanubian Encrusted Ware we can also see an increase in the number of sites: based on the results of systematic surveys in Veszprém County (west Hungary), 23 EBA Kisapostag period and 52 MBA Encrusted Ware period settlements are known[14]. We have much less information on the changes in the size of the sites. At Kaposvár, Route 61, Site 1 a 1,5 ha large area was excavated where 30 features belonged to the Kisapostag period, while 180 to the Encrusted Ware period (Kiss/Somogyi 2004). At the same time, of the 9 fortified hilltop sites known from the classical MBA phase only six were still inhabited in the Koszider Period[15].

An opposite dynamic can be observed in the Borsod Plain (northeast Hungary), where the MBA settlement network with Füzesabony style material (RB A2) was much sparser than the precedent network characterized with Hatvan style material (RB A1: P. Fischl/Rebenda 2010, Fig. 2; P. Fischl/Rebenda 2012). Around the end of RB A2 and within the Koszider Period we cannot refine further this picture. Most MBA tell settlements (e. g. Ároktő) can be placed to the classic phase of the period, and it seems that not many remain occupied in the Koszider Period, as opposed to the appearance of Streda nad Bodrogom type material in the Bodrogköz area to the northeast (e. g. Nagyrozvágy). It is conceivable, however, that in this region other ceramic forms are characteristic for the final phase of Füzesabony type material.

Based on the above-described cases it seems that the increase of the size and number of settlements in the MBA indicates demographic growth. In the final phase of the MBA beside the lower number of continuing settlements we can also count with the foundation of new ones, thus it is hard to determine whether we can actually observe settlement nucleation, which would indicate the movement of people into the larger centres and the presence of centralized chiefdoms (Earle/Kolb 2010, 69–78). The picture is further refined by other data indicating a restructuring of settled areas, e. g. the depopulation of the Körösszög region in the southeast, or the settlement of the piedmonts of mid-altitude

13 Ecsedy et al. 1982; Jankovich et al. 1989; Jankovich et al. 1998; Duffy 2010.

14 Bakay et al. 1966; Bakay et al. 1970; Éri et al. 1969; Dax et al. 1972.

15 Süttő-Nagysánctető, Veszprém-Várhegy, Somogyvár-Kupavárhegy, Harc-Várhegy, Kölesd-Csonthegy, Dunaszekcső-Várhegy: e. g. Honti 1994; Kovács 1994; Kiss 2012.

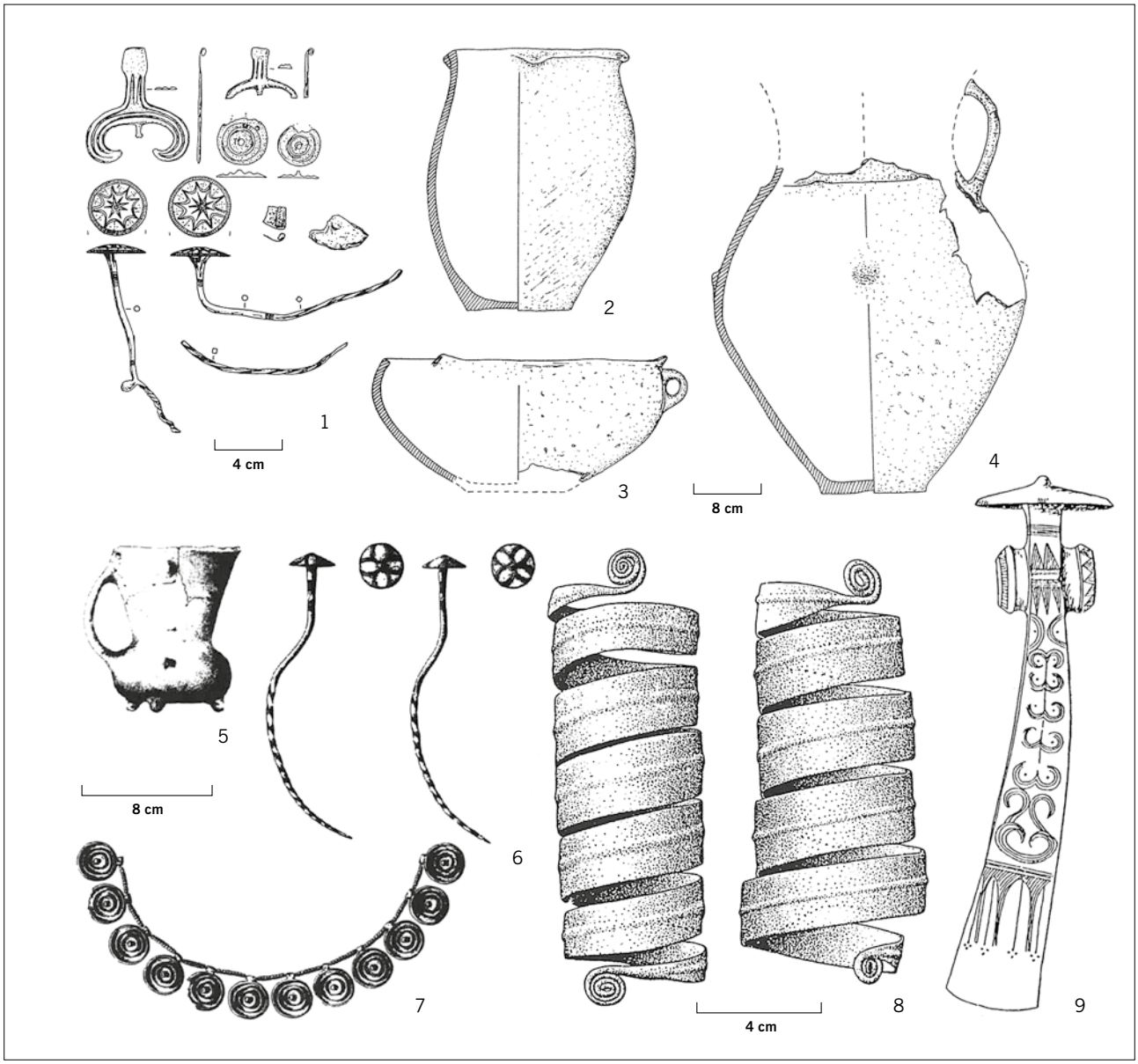

Fig. 5 Koszider type metal finds. **1–4** Dunaújváros-Dunadűlő, Grave 854a; **5–7** Győr-Ménfőcsanak, Grave 1060; **8** Dunaújváros-Kosziderpadlás, Hoard III; **9** Letkés.

mountains (a movement towards higher areas or towards copper sources? Comp. Duffy 2010; P. Fischl/Reményi 2013). Nevertheless, obvious differences certainly existed between the often fortified, multilayered, densely inhabited tell settlements and smaller and larger open settlements, that may reflect significant social differentiation in terms of access to wealth, social status and ritual knowledge. These differences seem to have reached their peak during the final phase of the MBA, around 1600–1500/1450 B.C.

At the beginning of the LBA the number of settlements in all the above-mentioned regions is lower than in the previous phase. In southeast Hungary, according to the results of the survey in Békés County, we have 13 sites with Tumulus Grave and five with Hajdúbagos (Otomani IV/Cehăluț) type material, which indicates a strong population decrease after the Koszider Period[16]. A survey in 1999–2000 in the vicinity of Kelebia in the southern Great Hungarian Plain identified 27 MBA settlements, while the number of Tumulus Grave period sites was only two (Sánta 2010).

In Veszprém County (west Hungary) we have data on 25 Tumulus Grave Period sites, which is also a significant decrease compared to the 52 MBA settlements[17]. In the Little Balaton area we can also detect a fall in the number of sites: after 15 MBA settlements only three remain in the early phase of the LBA (Kiss/Kulcsár 2007).

At the same time there are areas that were inhabited for the first time in this phase. During the systematic survey of the vicinity of the village of Zákányszék (5000 ha) near Sze-

16 Ecsedy et al. 1982; Jankovich et al. 1989; Jankovich et al. 1998.

17 Bakay et al. 1966; Éri et al. 1969; Torma 1969, 98 and Fig. 1, 3–4; Bakay et al. 1970; Dax et al. 1972.

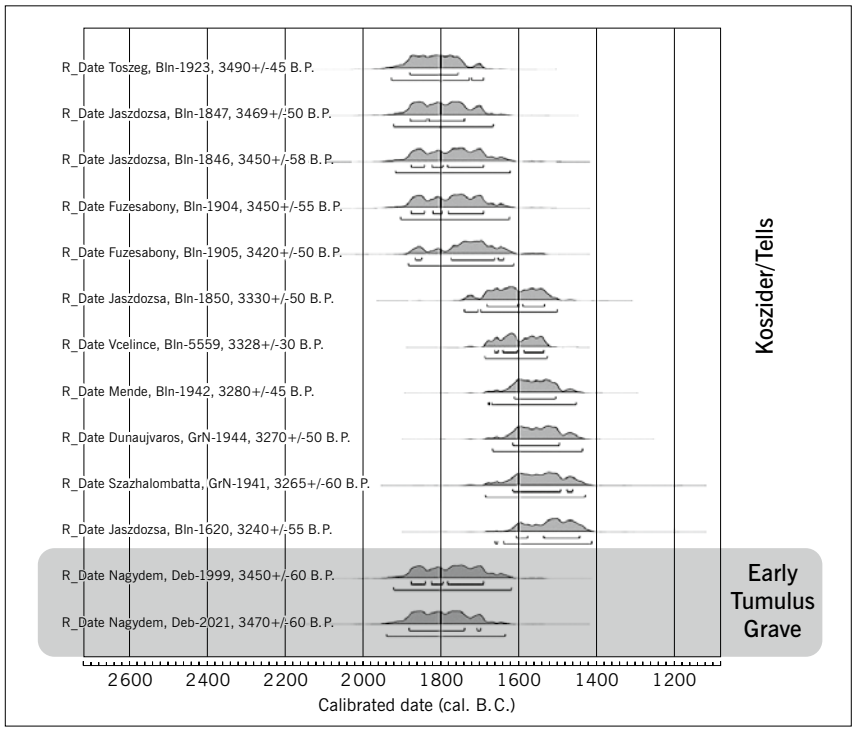

Fig. 6 Calibrated radiocarbon dates from Koszider Period and Early Tumulus Grave Period contexts.

ged in southeast Hungary, only very few possibly MBA sherds were found. From the Early Tumulus Grave Period on, however, ten smaller or larger hamlets were discovered. Among these, the size of Zákányszék-Homokkultúra MGTSZ, dated to RB B–C1, is ca. 5 ha, with a number of much smaller find scatters in its vicinity that were not larger than ca. 10 m in diameter (Sánta 2004, 54; 57 Fig. 1; Sánta 2010, 523 Fig. 6). Based on these, early LBA communities appeared in the southeastern part of the sand dunes of the Kiskunság region, which remained uninhabited during the MBA (V. Szabó 1999, 62–63; Sánta 2009, 267). The size of the settlement at Domaszék-Börcsök-tanya is also larger than 2 ha, although here the occupied area seems to have shifted horizontally during the RB B–C1 periods (Sánta 2009).

In the Tumulus Grave Period, the new settlement patterns without signs of long-term occupation seem to reflect a different social and economic organization, a different perspective on the landscape and probably a different legitimization of power. Obvious major centres like tells and hilltop sites disappear, and give way to a network of open settlements. Some differences between their sizes do exist that may indicate social differences as well. Generally we are faced with a more decentralized network of polities, possibly without high-ranking chiefs achieving large-scale political integration (Kristiansen 1998; Kristiansen 2007).

Another important source of information regarding settlement structure and social changes are changes in house sizes. At the tell settlements of the Great Hungarian Plain house sizes fluctuate between 50 m² and 70 m² and houses usually have two rooms[18]. From Transdanubia, from the distribution area of Encrusted Ware we know the remains of similar above-ground, timber-framed houses (e. g. Dör, Veszprém-Kádárta; Kiss 2012).

Although data on house sizes remains insufficient, it seems that there is a change from a uniform pattern in the MBA to variability in the early LBA. While there does not seem to be much difference in average house sizes, early and classical Tumulus Period buildings seem to show more variety[19]. This may reflect a change from the more structured social space of the tell settlements, where apparently social differences were not communicated through differences in house sizes, or perhaps the more decentralized polities used larger, communal buildings as well.

The internal chronology of the settlement patterns of the LBA Tumulus Grave Period still requires more elaboration (Csányi 2003; Sánta 2010). The open settlements with early Tumulus Grave type material that appeared at the end of the MBA seem to complement the already existing settlement pattern, first in western Transdanubia and in the southern part of the Great Hungarian Plain. Archaeobotanical and archaeozoological studies that investigate lifestyle and subsistence[20] do not indicate major changes which contradicts the topos of the »pastoralist Tumulus Grave Culture«, although the available evidence may not be adequate for a proper comparative study. While some tendencies certainly show this direction, the difference between the MBA and LBA settlement and subsistence pattern may not be as clear cut as previously suggested (e. g. Kristiansen 1998, 376–384; 412 Fig. 224).

18 E.g. Százhalombatta-Földvár: 5 m × (?) 10–11 m; Túrkeve-Terehalom: 6 m × 11,6 m; Mošorin-Feudvar: 5 m × 9,5 m): Csányi/Tárnoki 1992; Csányi/Tárnoki 2013; P. Fischl 2006, 147–148; Hänsel/Medović 2004; Sørensen 2010; Vicze 2013.

19 E.g. Kóny: 4–7 m × 8–10 m; Domaszék: 3,5 m × 7 m; Gelsesziget: 10 m × 20 m; Dunakeszi-Székesdűlő: 5–7 m × 16–23 m; Öföldeák-Gencshát: 8 m × 25–30 m: M. Egry 2002; Horváth et al. 2003, 8–9; Bondár/Kiss 2007, 12; Sánta 2009; Sánta 2010, 515–516; Kiss 2011.

20 See Vörös 1998–1999; Bökönyi 1992; Choyke/Bartosiewicz 1999/2000; Gyulai 2010; Vretemark 2010.

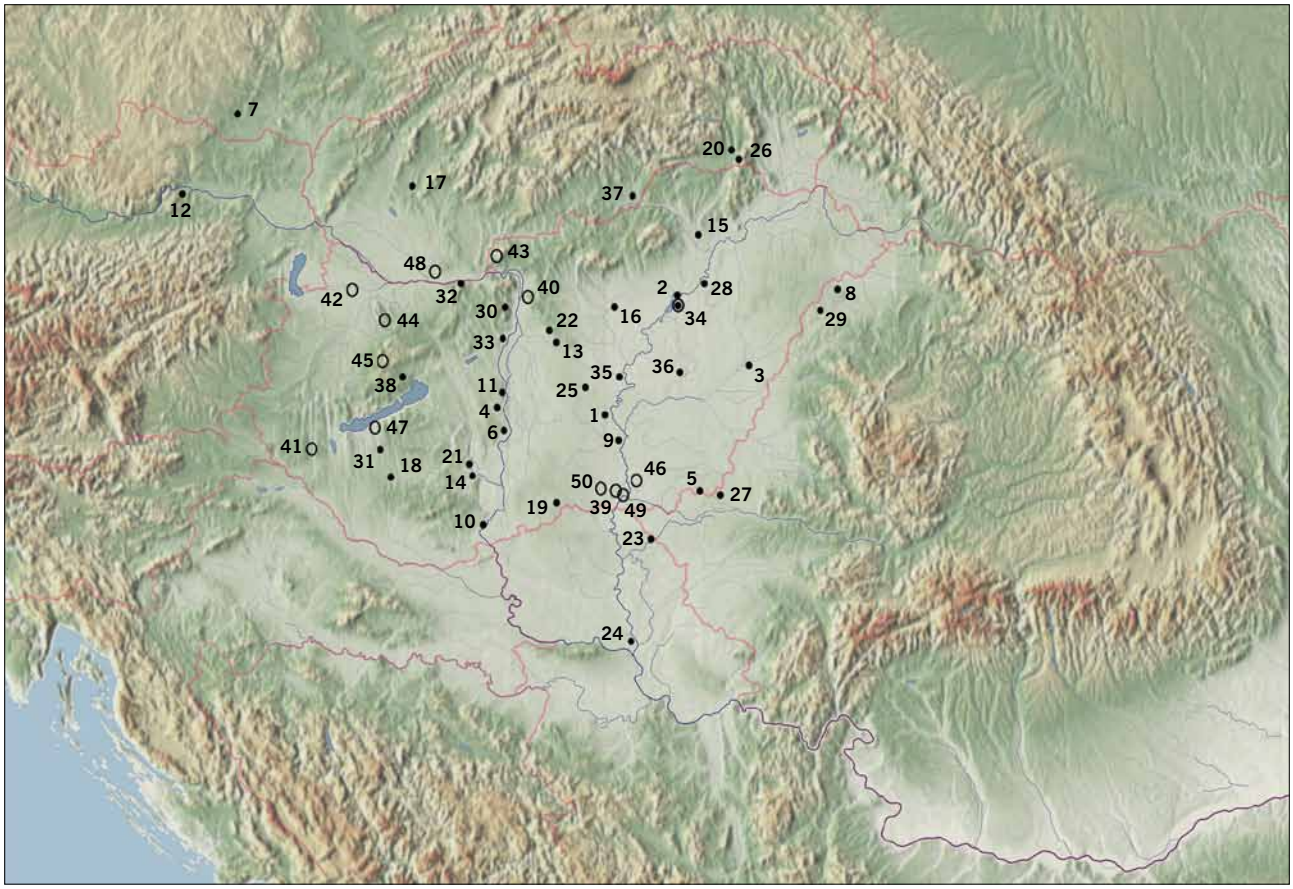

Fig. 7 Bronze Age sites mentioned in the text (**black dots** Middle Bronze Age; **circles** Tumulus Grave Period; **black dot with circle** both periods). **1** Alpár; **2** Áróktő; **3** Bakonszeg; **4** Baracs; **5** Battonya; **6** Bölcske; **7** Borotice; **8** Carei/Nagykároly; **9** Csanytelek; **10** Dunaszekcső; **11** Dunaújváros; **12** Franzhausen; **13** Gomba; **14** Harc; **15** Hernádkak; **16** Jászdózsa; **17** Jelšovce; **18** Kaposvár; **19** Kelebia; **20** Košice-Barca/Kassa-Bárca; **21** Kölesd; **22** Mende; **23** Mokrin; **24** Mošorin/Mozsor; **25** Nagykőrös; **26** Nižná Myšľa/Alsómislye; **27** Pecica/Pécska; **28** Polgár-Kiscsőszhalom; **29** Sălacea/Szalacs; **30** Solymár; **31** Somogyvár; **32** Süttő; **33** Százhalombatta; **34** Tiszafüred; **35** Tószeg; **36** Túrkeve; **37** Včelince/Méhi; **38** Veszprém; **39** Domaszék; **40** Dunakeszi; **41** Gelsesziget; **42** Kóny; **43** Letkés; **44** Nagydém; **45** Németbánya; **46** Öföldeák; **47** Ordacsehi; **48** Svätý Peter/Dolný Peter/Alsószentpéter; **49** Tápé; **50** Zákányszék.

Burial rites

During the Early and Middle Bronze Age among communities using the same ceramic styles, burial rites do seem to be more or less uniform: cremation is characteristically associated with the distribution areas of the Vatya, Hatvan and Transdanubian Encrusted Ware styles, while inhumation is dominant in the areas associated with Füzesabony (Otomani II) and Maros styles. However, it can be observed that in certain periods and areas a larger variety of burial rites occurs (e. g. Gyulavarsánd/Otomani II–III: inhumations, urn graves and scattered cremation burials). In the Koszider Period, burial rites become more varied even in communities previously characterized by a uniform rite, and biritual cemeteries become more frequent. In the Kelebia and Csanytelek cemeteries, characterized with Late Vatya style ceramics, inhumation burials also occur (Lőrinczy/Trogmayer 1995), and in the distribution area of the Füzesabony style previously unknown cremations appear as well (e. g. at Polgár-Kenderföld, Streda nad Bodrogom). Although the treatment of the body changed, the practice of providing grave-goods continued in the same manner: e. g. in the cemetery of Streda nad Bodrogom the position of vessels in cremation burials is identical to that in inhumation burials (Sørensen/Rebay-Salisbury 2008, 56 Fig. 4).

In the Tumulus Grave Period a new element, the burial mound appears. Its occurrence in the Carpathian Basin was connected to the immigration of the »Tumulus Grave people« from southern Germany (Mozsolics 1957; Bóna 1958). However, based on the most recent data on the earliest appearance of mounds (e. g. at Borotice, Franzhausen and Jelšovce) it seems that this burial rite – together with the use of a specific ceramic style – spread from the area of modern-day western Slovakia, Austria, and Moravia to the east (Svätý Peter/Dolný Peter/Alsószentpéter) and west[21].

The Middle Bronze Age cemeteries with their graves richly furnished with jewellery in female burials and weapons in the male ones (e. g. Mokrin, Battonya, Hernádkak) seem to indicate a more stratified society (e. g. Bösel 2008; see however O'Shea 1996). The warrior graves of the early and classic Tumulus Grave Period (e. g. Letkés: Bóna 1975; Kovács 1996) may indicate a continuity with this pattern,

21 Stuchlík 1992; Neugebauer 1994; Bátora 2004.

beside the transformation of the burial tradition (Blischke 2002). However, in the somewhat later Tápé cemetery the burials seem to be more uniform, indicating a change perhaps towards a more egalitarian social structure (Bösel 2008).

Based on the physical anthropological analysis of skeletal material from some of the cemeteries, mostly an internal restructuring can be observed in the Koszider Period. There is only limited evidence pointing to the income of new human groups from the west/northwest, and the heterogeneity of the LBA population of the Tumulus Grave area was certainly significant. The results of physical anthropological analyses seem to support the view based on the archaeological material that the continuity of the population was considerable and MBA groups contributed to a great extent to the development of the LBA ones[22]. The regional heterogeneity of the physical anthropological make-up of Tumulus Grave Period communities is probably a result of this[23].

Metallurgy and metal depositions

The Carpathian Basin was an important metallurgical centre throughout the Bronze Age with important copper and gold resources in Transylvania and eastern Slovakia. After the relative poverty of metal objects in the Late Copper Age, production seems to increase again in the mid third millennium B. C., as shown primarily by the manufacture of shaft-hole axes and a few jewellery and tool types. The number of »stray finds« that can be interpreted as single-item depositions is rather large, especially in the case of shaft-hole axes. There seems to be a hiatus in hoarding practices during the final phase of the EBA and the beginning of the MBA, and the small amount of known metal objects – primarily jewellery, rarely weapons or tools – mostly come from graves.

During the MBA the quantity, quality and variety of metal finds increased significantly. After 2000 B. C. classic 4–10 % tin bronzes became common (Liversage 1994, 77–78). From the classic phase of the period the number of hoards also increased, which however was not accompanied by the disappearance or lack of metal in graves. Between ca. 1800 B. C. and 1600 B. C. we can distinguish two large groups of hoards both geographically and regarding their composition. The area west of the Danube is characterized by the so-called Tolnanémedi type hoards, in which mostly jewellery, especially various types of pendants dominate, while weapons, tools and gold objects are rather rare[24]. The jewellery types in the hoards are identical to those known from graves. All this may indicate a less dominant role of the warrior elite than observed in the eastern part of the basin.

Hajdúsámson type hoards are known primarily east of the Danube in the Tisza region and western Transylvania (Mozsolics 1967; David 2002) and are characterized more by weapons and gold objects; indeed, there are quite a few depositions that contain exclusively these classes of objects, and mixed hoards containing tools and jewellery as well are rarer (Polányi 2008). The weapons are usually richly decorated with engraved spiral and geometric motifs, which we may interpret as the increased material and symbolic elaboration of a warrior elite identity. Some of the weapon hoards contain only one or two items, which may represent the weapon set of a leading warrior, while others contain numerous weapons. These may be connected to rituals involving groups of warriors, for example the creation of alliances or the deposition of weapons after victorious battles.

In the Koszider Period the composition of hoards changes: the ratio of objects of the various classes (weapons, tools, jewellery, and gold objects) becomes even, as seen primarily in the increase of the frequency of tools (axes and sickles). Mixed hoards containing more classes of objects become more common, although hoards containing exclusively weapons and jewellery are also attested (Szeverényi 2008). The number of objects related to metallurgy increases as well: these include mostly scrap metal and wires collected to be re-melted, so-called tongue-shaped ingots and bronze lumps (Polányi 2008). Pieces or beads of amber now often accompany metal objects in the hoards as well. It is in this phase, when fragmentary objects make their appearance in hoards, whose interpretation (ritual ecstasy, prevention of profane use, re-use as scrap metal) remains questionable (e. g. Nebelsick 1997; Hansen 2005). Some regional differences between east and west can perhaps be detected in this phase as well, since hoards with weapons are somewhat more frequent east of the Danube, but this borderline is not very sharp. An important change is that the objects of the Koszider Period seem to have been manufactured from a different and uniform raw material (Schubert/Schubert 1967; Liversage 1994). At present it is not clear whether the new raw material can be explained by the use of a new source of copper or the change towards uniformity of metallurgical techniques. Compared to the previous period the number of bronze hoards generally increases, which may indicate a wider access to rituals resulting in the deposition of the hoards.

At the beginning of the LBA, in the Tumulus Grave Period, depositional practices show great differences between the eastern and western parts of the Carpathian Basin. In the east, especially in the northeast and in Transylvania, most of the metallurgical products were deposited in the so-called Forró and Ópályi type hoards. Mixed hoards dominate, the combination of weapons and jewellery is common, especially of shaft-hole or shaft-tube axes and handguard spirals. Among weapons axes remain the most frequent, and the number of swords and spears remains low (Mozsolics 1973). These latter characteristics regarding hoard composition indicate strong continuity with the MBA. In the weapon hoards of the following phases, swords and spears were to play the leading role, which indicates significant changes, among others, in the style of warfare. As opposed to the hoards of the eastern Carpathian Basin, metallurgical products are usually deposited in graves in western Hungary (Kőszegi 1988), thus wealth is withdrawn from cir-

22 Kovács 1981; V. Szabó 1999; Csányi 2003.
23 Farkas 1976; Szathmáry 1988; Hajdu 2012.
24 Mozsolics 1967; Bóna 1975; Honti/Kiss 1999–2000; Honti/Kiss 2013; Polányi 2008.

culation through a different social practice. This may indicate a different way of the construction of social statuses and roles, and may point towards the more individualistic use of wealth items as opposed to the more group-oriented hoarding practices.

Exchange networks

The position of the communities of the Carpathian Basin within communication and exchange networks is determined to a great degree by the Danube, which cuts through the basin first in a west-east, and then north-south direction. The river was one of the main arteries of communication connecting central Europe with the Black Sea area. Other routes are provided by the larger tributaries of the Danube and the Tisza (Dráva/Drava, Száva/Sava, Berettyó, Körös/Criș, Maros/Mureș, Hernád/Hornad, etc.), which create a web in the basin and its immediate surroundings. The importance of the rivers as routes is highlighted by the fact that most tell settlements and hilltop sites are located along these rivers, proving the »strikingly riverine orientation« (Sherratt 1993) of the communities living here (see also O'Shea 2011). The passes through the Carpathian Mountains provided connections with the area beyond the basin, and further routes probably followed other rivers: the Danube to the west, the Elbe, the Oder and the Vistula to the north to the Baltic and North Sea, and the Danube, the Morava and the Vardar to the south, towards the Aegean Sea. As a consequence of its location, the Carpathian Basin formed a periphery of the central European, Aegean and steppe interaction zones (Fig. 8a).

In the classical phase of the MBA the regions within the Carpathian Basin were connected by multiple and complex exchange networks as indicated by non-local ceramic finds[25]. Despite these exchanged objects, studies on ceramic technology in various microregions have shown that the vessels were everywhere made locally, and although some form of specialization may have existed, no significant extent of exchange or movement of pottery can be detected within a microregion[26]. In some microregions local metallurgical activity is also certain: according to the latest research, bronze working and considerable local technological experimentation was carried out at even small hamlets in the Körös and Maros regions[27]. Raw materials, especially copper and gold were available in the nearby mountains (Carpathians, Apuseni Mountains), while the origin of tin remains uncertain. Other important regionally available raw materials were timber and salt (Dietrich 2010; Kiss 2011a).

Beside local production, bronze prestige objects seem to have travelled much longer distances. Certain products of the workshops of the eastern Carpathian Basin and Transylvania, for example the Hajdúsámson-Apa type swords – or their imitations – reached central and northern Europe (Vandkilde 1996; Fischl 2012). After sporadic 3rd millennium B.C. antecedents (Czebreszuk 2003) Baltic amber reached the Carpathian Basin in increasingly larger amounts[28]. It seems, however, that it was rarely transported to areas further to the south, to the Balkans at this time (Palavestra 2007).

The extent and significance of the connections towards the south and southeast (the Aegean and Anatolia) remain debated to this day. The best and chronologically correct parallels of bone and antler horse gear decorated with compass-drawn spiral motifs in the Carpathian Basin are known from Anatolia, e.g. Kültepe/Kaneš[29]. Both the route along the Danube to the Black Sea and the southern route along the Morava and Vardar rivers were probably significant, possibly towards Troy in both cases (Sherratt 1993). Some researchers assume unidirectional contacts from Minoan Crete as well (Furmánek 1997; Kristiansen/Larsson 2005). These connections may also be integrated with contacts towards the steppe, as indicated by the spread of socketed spearheads and various horse-gear (Fig. 8b; Sherratt 1993; O'Shea 2011).

In the Koszider Period the changes in central Europe and the Carpathian Basin were somewhat out of rhythm, which is visible in the transformations of long distance contacts as well. In the eastern part of the Carpathian Basin the previous phase develops continuously into the next, and some of the southern and southeastern contacts also remain active. Spiral decorated objects from the Shaft Graves of Mycenae may be a testimony of these[30], just like the Mycenaean type rapiers that appear in the eastern Balkans and the southeastern fringes of the Carpathian Basin, whose date in lack of proper contexts remains uncertain (see e.g. Bader 1990). Northern contacts remain significant, as indicated by the wider distribution in the north of weapon types previously characteristic of the Carpathian Basin (various axes, swords, etc.) (Fig. 8c). At the same time the western part of the Carpathian Basin, together with the other regions of the western part of central Europe, gradually became integrated into the Tumulus Grave network. In opposition of the earlier northwest-southeast axis of communication along the Danube a new N-S oriented series of links was formed between local communities, connected by regular exchange and alliances based on intermarriage[31], which connected northern and central Europe, and the eastern Mediterranean via Italy[32]. It was probably this network that connected Wessex II, Tumulus Grave communities and the early Mycenaeans, as shown by the distribution of Baltic amber, especially the perforated spacers and gold-bound amber objects[33]. From these connections, however, the Carpathian Basin is left out (Fig. 8d), and most of the previously so emphatic »Mycenaean connection« proves to be a myth due to both chronology (Raczky et al. 1992) and the lack of convincing material evidence.

25 E.g. Bóna 1975; Kiss 1998; Kiss 2002.
26 Kreiter 2007; Michelaki 2008; Earle et al. 2011.
27 Papalas 2008; Duffy 2010; O'Shea 2011. See also Bátora 2009 for fortified settlements in Slovakia.
28 Sprincz/Beck 1981; Bátora 1995; Horváth 1998–1999; Marková 2003; Sprincz 2003; Czebreszuk 2007; Kneisel/Müller 2011.
29 Kull 1989; Kristiansen/Larsson 2005; David 2007.
30 Hänsel 1982; Bouzek 1985; Kristiansen/Larsson 2005; see however Dietrich/Dietrich 2011.
31 Wels-Weyrauch 1989; Jockenhövel 1991; Bergerbrant 2005.
32 Sherratt 1993; Kristiansen 1998; Kristiansen/Larsson 2005.
33 Harding/Hughes-Brock 1974; Barfield 1991; Gerloff 1993; Sherratt 1993; Maran 2004.

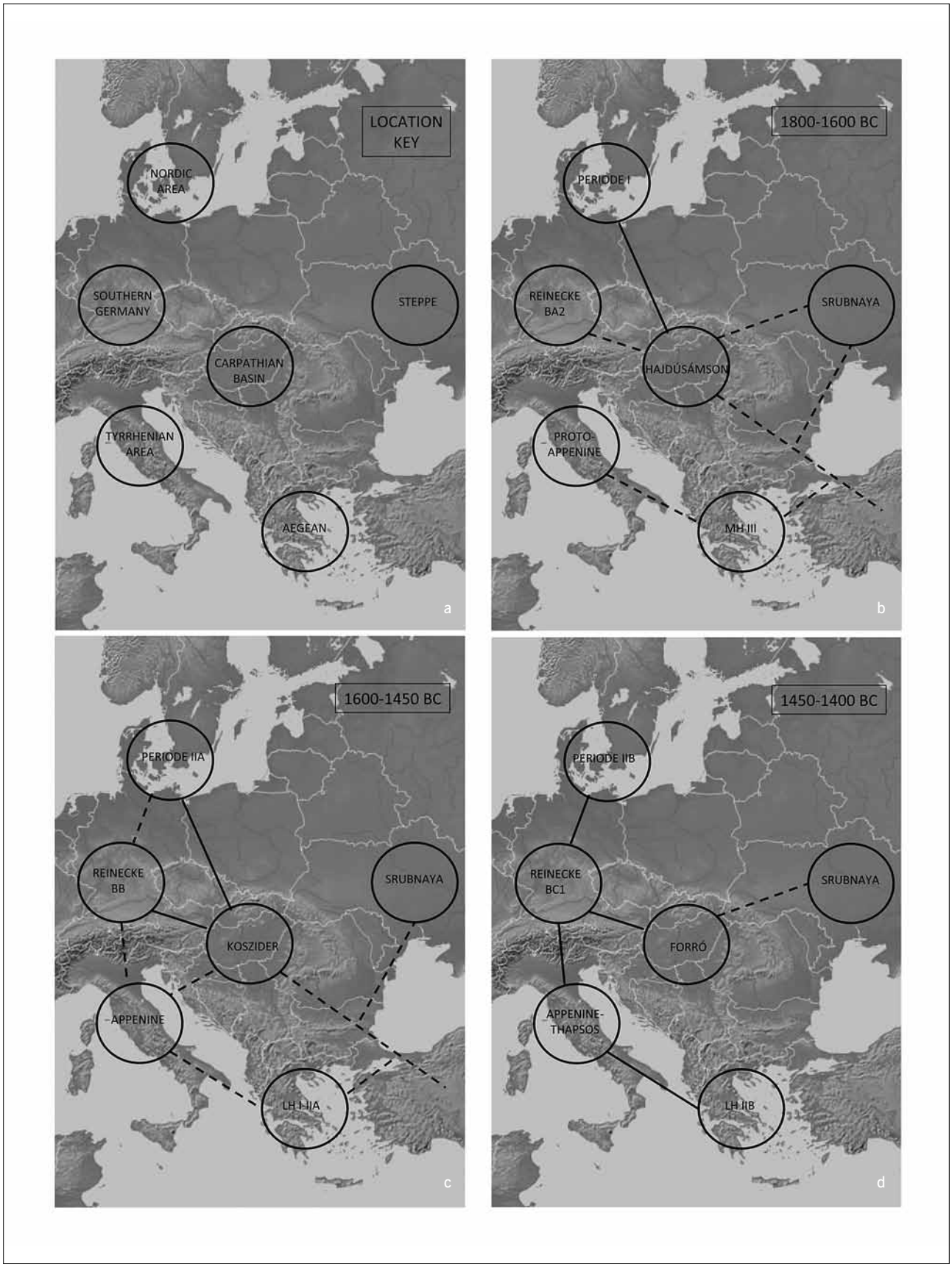

Fig. 8 Changes of interregional interaction between bronzeworking foci between 1800 B. C. and 1400 B. C. **a** location key; **b** 1800–1600 B. C.; **c** 1600–1450 B. C.; **d** 1450–1400 B. C.

Environmental change

Based on the research on Holocene climate (Kordos 1977), the environmental archaeological interpretation of the results and on new data we may establish that the Carpathian Basin shows a mosaic patterning in terms of climatic zones (Fig. 3; Sümegi/Bodor 2000; Sümegi/Bodor 2005). These data suggest that in the central part of the Carpathian Basin both Mediterranean and continental climate had an effect in the 3rd and 2nd millennia B.C. Regional and micro-regional characteristics seem to have determined to a great extent the way the landscape was used.

It is an important observation that the sub-phases of the Sub-Boreal climatic phase coincide with the chronological phases of the Bronze Age. The cooler and wetter climate of the early Sub-Boreal – coeval with the Early Bronze Age – was replaced by a warmer and more favourable climate between 2000 B.C. and 1500/1450 B.C., in the middle Sub-Boreal phase, which may have induced economic growth. The abundant resources exploited through intensive methods induced a demographic growth, as indicated by the above-mentioned increase of the size and number of settlements until the end of the Middle Bronze Age, and at the same time the appearance of cemeteries with hundreds of graves (Reményi 2005).

The beginning of the late Sub-Boreal period (ca. 1500/1450 B.C., the beginning of the Hungarian Late Bronze Age, central European RB C1) brought again climatic deterioration that may have caused a decrease in productivity, which induced stress in societies. In addition to this, demographic growth led to extensive agricultural methods that caused a decrease in, and eventually the running out of, the abundant resources. As a consequence of the increase of precipitation, pasture for grazing animals had to shift from lower lying areas to those previously used as arable land. These transformations of economic structure made necessary the formation of a new economic strategy. A cooler climate may also have set off smaller movements of people, since it created an environment in the Carpathian Basin that fitted well the populations previously occupying the western part of central Europe (Reményi 2005; Sümegi/Bodor 2005).

Conclusion

Around 2000 B.C. the centre of the west and central European interaction sphere was the Aunjetitz area. As a consequence of the economic growth at least partly due to favourable environmental changes this centre shifted to the Upper Tisza region and Transylvania between 1800 B.C. and 1600 B.C. Settlement data indicate a gradual demographic growth, but some restructuring occurred as well. Some tell settlements were abandoned already before the Koszider Period, at other sites habitation continued, and at a few places new settlements were established as well. Thus change was gradual, although its most salient element was the abandonment of the tell settlements at the end of the period, which does provide a break between the Middle and Late Bronze Age. At the end of this transformation a new network of communities emerged. Thus, the changes around 1600 B.C. were part of a continuous process of development and transformation, and represent the apex of the consolidated economic, social and ritual organization of Middle Bronze Age communities. A radical restructuring can be observed only ca. 150 years later, with the expansion of the Tumulus Grave network in the Carpathian Basin.

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Source of figures

1–2 authors
3 based on Sümegi/Bodor 2000 and P. Fischl/Reményi 2013, with modifications
4 **1** after Csányi/Tárnoki 1992, Abb. 119; **2** after Vörös 1997, Kat. 25/IV,g; **3–4** after Tárnoki 2010, Taf. 5,7; Taf. 6,3; **5** after Poroszlai 1992, Abb. 108
5 **1–4** after Vicze 2011, Pl. 216,4–7; **5–7** after Egry 2004, Fig. 6; **8** after David 2002, Pl. 166,4–5; **9** after David 2002, Pl. 49,2
6 after Raczky et al. 1992; Görsdorf et al. 2004; Ilon 2005
7 authors
8 based on Sherratt 1993, with modifications

Addresses

Dr. Klára P. Fischl
University of Miskolc
H-3515 Miskolc-Egyetemváros
fklari@gmail.com

Dr. Viktória Kiss
Academy of Sciences
Institute of Archaeology
Research Centre for the Humanities, Hungarian
Úri u. 49
H-1014 Budapest
kiss.viktoria@btk.mta.hu

Dr. Gabriella Kulcsár
Academy of Sciences
Institute of Archaeology
Research Centre for the Humanities, Hungarian
Úri u. 49
H-1014 Budapest
kulcsar.gabriella@btk.mta.hu

Vajk Szeverényi
Móra Ferenc Múzeum
Roosevelt tér 1
H-6720 Szeged
szvajk@yahoo.com