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BIOLOGICAL RECONSTRUCTION OF THE BRONZE AGE FÜZESABONY- AND TUMULUS GRAVE CULTURE POPULATIONS

Ph.D. Thesis

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Introduction

Communities along the Danube and the Great Hungarian Plain were living relatively undisturbed in the Early and Middle Bronze Age (Kovács 1977). In the late period of the Middle Bronze Age, in the Koszider Period, the previous regionality of the material culture was reduced, and changes were also seen in the former strict burial rite (P. Fischl 1999). According to the archaeological research in the beginning of the Late Bronze Age, a relatively unified material culture appeared in several areas of the Carpathian Basin: the Carpathian Tumulus Grave culture (Csányi 2003). In connection with the appearance of the Tumulus Grave culture we cannot know exactly, based on the actual research results, whether the groups of the culture are the surviving groups of the local populations, indicating an inland continuous progression with changing material culture (taken from the material culture of further areas) or changes due to migrations. When new communities occupied the areas between the rivers Danube and Tisza or the Middle and Upper Tisza region, did they partly or completely persecute the local population or did they mix with them? The examination of the anthropological findings from the Middle and Late Bronze Age in the areas mentioned above, the overview of the formerly published findings, and the systematic comparative examination of the available data may give answers to these questions.

Materials

The examined materials were the following:

- Füzesabony culture: *Füzesabony, Füzesabony-Pusztaszikszó, Gelej-Kanális-dűlő, Golop, Hernádkak, Megyaszó and Tiszapalkonya-Erőmű, Tiszafüred-Majoroshalom cemetery sections B-D.*
- Tumulus Grave culture: *Budapest XXII. ker. Nagytétény, Jánoshida-Berek, Mezőcsát-Hörcsögös, Rákóczifalva-Bivaly-tó Bagi Föld I. 1. lh., Rákóczifalva-Kastélydomb*[1]*, Szurdokpüspöki-Hosszú-dűlő, Tiszafüred-Majoroshalom cemetery sections C-E, Tiszakeszi-Szódadomb.*

I have examined further anthropological materials from the cemeteries of the populations of several other archaeological cultures from the Bronze Age in order to get a more complete comparative dataset. These are the following: Bell Beaker Culture, Early Bronze Age: *Szigetszentmiklós-Üdülősor*; Nagyrév culture, Early Bronze Age: *Rákóczifalva-Kastélydomb*; Gáta-Wieselburg culture, Early and Middle Bronze Age: *Iván, Oroszvár, Petőháza-Ikvamente, Szakony*; Encrusted Pottery Culture, Early and Middle Bronze Age: *Almásfüzitő-Nagykolónia, Bonyhád-Biogáz üzem*[2]*, Szekszárd-Obi Parkoló*; Vatya culture, Middle Bronze Age: *Gerjen-Várad, Kiskunfélegyháza Csányi tanya, Százhalombatta-Belső Újföldek*;

[1]The findings can be found in the collection of the Department of Biological Anthropology at the University of Szeged. I am thankful to Antónia Marcsik and Gyula Farkas to let me examine these finds from the Bronze Age.

[2] The graves with skeletal material in Bonyhád are generally classified into the Kisapostag culture by the archeological research. However, according to the opinion of the excavating archaeologist, in Bonyhád the justification of Kisapostag-culture name can be queried because of the obvious continuity of the Bonyhád findings. Therefore, these findings are in actuality the early graves of the population of the Encrusted Pottery Culture (further information: Szabó-Hajdu 2011).

Urnfield culture, Late Bronze Age: *Maglód, 1. lh.*; Piliny culture, Late Bronze Age: *Gelej-Kanális-dűlő*; Kyjatice culture, Late Bronze Age: *Mezőcsát-Hörcsögös;* Noua culture, Late Bronze Age: *Uzon-Kupántag (Ozun, Románia).*[3]

Methods

The morphological sex was determined by the method of Éry et al. (1963). The age at death of the subadults were estimated according to Schour and Massler (1941), Stloukal and Hanáková (1978) and Ferembach et al. (1979). The age estimation of adults was carried out on the basis of Todd (1920), Meindl and Lovejoy (1985) and Işcan et al. (1984). 26 measurements of the skull and 43 measurements of the long bones were measured according to Martin's method (Martin and Saller 1957). The estimation of stature was carried out on the basis of Pearson-Rösing (Rösing 1988) and Bernert (2008). The calculation of stature was based on the maximum length of humerus, radius, femur and the entire length of the tibia. The demographic analysis was carried out by the methods of Acsádi and Nemeskéri (1970). The anatomical variations and the morphological traits were examined based on Finnegan and Rubison (1984), Farkas (1973), and Bodzsár and Zsákai (2004). In the course of the statictical comparison of the demographic results the number of cases in the different age groups, which can be found in the mortality tables, were compared with the values of the Bronze Age populations lived in different regions with the help of Chi-squared (χ^2) test (5% significance level). In pursuance of the craniometric comparative examinations, I characterized the population with the mean of 10 measurements of the skull in males and females. Before applying the comparative methods I standardized the skull measurements with the average standard deviations of Thoma (1985). Similarly with the systematic cluster analysis of Fóthi and Fóthi (1990, 1992), I applied more distance calculation methods in the course of the comparison. However, contrary to the method of Fóthi and Fóthi I did not execute the cluster analysis of the distance matrices. In pursuance of the comparison I took the direct distance values between the examined series as a basis with the use of the Euclidean distance, the Chebyshev distance, the Mahalanobis distance, the Pearson correlation matrix and the Penrose distance.

I used the IBM SPSS 19.0 statistical program for the calculation of the Euclidean distance, the Chebyshev distance and the Pearson correlation distance, the http://maplepark.com/~drf5n/cgi-bin/dist.cgi website for the calculation of the Mahalanobis distance and the Microsoft Office Excel 2007 program for the calculation of the Penrose distance. Combining the different methods I executed several complementary and verifying examinations. I accepted just those results which occurred as a tendency in most of the examinations (Fóthi és Fóthi 1990, 1992). I analyzed the limit of the significant similarity at

[3] I examined the materials excavated in *Gelej-Kanális-dűlő, Hernádkak, Megyaszó, Tiszapalkonya-Erőmű, Rákóczifalva-Bivaly-tó Bagi Föld I. 1., Tiszakeszi-Szódadomb* and *Maglód 1.* with Ivett Kővári, the ashes excavated in *Uzon-Kupántang* with Ivett Kővári and Erzsébet Fóthi and the materials excavated in *Budapest XXII. ker. Nagytétény* and *Szurdokpüspöki-Hosszú-dűlő* with Kitti Köhler. Erzsébet Fóthi, Kitti Köhler and Ivett Kővári contributed to the usage of the data, why I am really grateful.

0.1, 0.5 and 1% significance level in every distance calculating method. With the use of the methods above I compared the populations of two different periods of the Tiszafüred cemetery with each other and with other Bronze Age populations who lived in the Carpathian Basin and its surroundings. I also tried to find the parallels of the pooled samples of the Füzesabony culture and the Tumulus Grave culture in the Great Hungarian Plain. The pooled samples resulted in datasets with a bigger number of cases, which allowed me to draw secure conclusions for the populations of larger areas. Moreover, with this method the values of the smaller samples could also be used in the comparison.

Objectives

I was looking for answers for the following questions in my dissertation:

- What kind of anthropological image characterizes the populations of the Füzesabony culture in the Middle Bronze Age and the Tumulus Grave culture in the Late Bronze Age?
- Was there a biological interaction between the populations of the Füzesabony culture and the Tumulus Grave culture?
- Is there a biological connection that can be detected between the Vatya populations living along the Danube and between the rivers Danube and Tisza in the Middle Bronze Age and the Tumulus Grave Culture in the Late Bronze Age?
- Can we observe a significant difference – concerning their anthropological physiognomy – between the populations of the Tumulus Grave culture living in different regions of the Carpathian Basin? If yes, for what reason?

Furthermore, my other aim was to examine as many series from the anthropological findings of the Bronze Age cemeteries in Hungary as I could, in order to increase the number of series taken into account as comparative materials in my dissertation.

Results and conclusions

According to the opinion of Zoffmann (2009) the origin of the population of the Füzesabony culture can be ascertained neither with the sample of Middle Bronze Age Tiszafüred nor with the pooled Füzesabony sample based on the presently examined and publicated anthropological findings with the help of craniometric comparative methods. However, we can consider, as a new result of the present dissertation, the numerous data derived from the comparison of the Middle and Late Bronze Age population of Tiszafüred, and the pooled populations of the Füzesabony culture and the Great Hungarian plain's Tumulus Grave culture (previously known as Egyek group).

– We can manifest neither unequivocal similarity nor unequivocal difference between the demographic parameters of the examined Middle and Late Bronze Age populations. So these parameters changed not with the periods but with the sites/groups.

– We can consider significant difference in the sexual dimorphism of the anatomical characteristics of the skulls and the skeletons neither between the Middle and Late Bronze

Age Tiszafüred populations nor between the other cemeteries of the two mentioned period (aside from the Gelej series).

– Considering the morphological results, more individuals can be observed with narrow and long (ellipsoid) skulls and with angular orbits in the pooled population of the Late Bronze Age Tiszafüred culture and the Great Hungarian plain's Tumulus Grave culture, than in the former Tiszafüred population and in the pooled Füzesabony sample.

– Considering the chraniometric data, the skull is more often low, long and narrow with lower capacity in the examined Late Bronze Age individuals than in those who lived in the Middle Bronze Age.

– We can detect more individuals with low or very low orbits in the Late Bronze Age Tiszafüred population than in the Middle Bronze Age Tiszafüred population, and it is also observable, although less specifically, in the pooled Füzesabony culture and the Great Hungarian plain's Tumulus Grave culture.

– We cannot define significant difference in the mean estimated height between the Middle and Late Bronze Age Tiszafüred population and the pooled Füzesabony culture and the Great Hungarian plain's Tumulus Grave culture.

– The mean estimated height values of the Middle and Late Bronze Age Tiszafüred populations and the pooled Füzesabony and Tumulus Grave culture also exceed the values of the Tápé population from the Tumulus Grave culture (Farkas 1975, Farkas and Lipták 1975) and the Bronze Age sample collected by Éry (1998).

Comparing the craniometric data with statistical methods several conclusions can be drawn concerning the continuity between the Füzesabony and Tumulus Grave populations, and in general about the Middle and Late Bronze Age populations of the Carpathian Basin.

– Considering the craniometric data, connection can be observed between the Füzesabony culture and the pooled samples from the Great Hungarian plain's Tumulus Grave culture. This result suggests that based on larger areas, the Middle Bronze Age population could have survived to the Late Bronze Age.

– The results concerning the continuity between the Middle and Late Bronze Age Tiszafüred populations must be circumspectly treated, as in the latter series the number of cases one particular skull measurement could be completed was only four, and the examination could only be completed for males. The results of the comparative study based on craniometric examinations do not confirm the continuity between the Middle Bronze Age and Late Bronze Age populations lived in Tiszafüred.

– The groups that lived in the area of Füzesabony culture were heterogeneous in terms of their craniometric characteristics, which are clearly indicated by the results of the comparative study.

– The results related to the end of Middle Bronze Age Vatya and Maros-Perjámos series can be considered as new and important results concerning the objectives of this dissertation (from the results of several series from the Carpathian Basin and its surroundings involved in

the comparative study). With the help of these results we can get closer to solving the problem of the appearance of groups from the Tumulus Grave culture in the Koszider period.

– The Late Bronze Age Tiszafüred population and the pooled samples from the Great Hungarian plain's Tumulus Grave culture signify the analogy of Csanytelek-Palé and the Vatya male series.

– The individuals who lived in the Koszider period and who were buried with skeletal burial rites into biritual Vatya cemeteries were, based on these results, biologically rather heterogeneous.

– These Vatya groups are related neither to Füzesabony nor Maros-Perjámos populations. Hence these results do not confirm the opinion of Lőrinczy and Trogmayer (1995), who stated that these individuals buried with skeletal rite are the members of the Füzesabony or the Maros-Perjámos culture.

– According to the presently examined and published anthropological findings the origin of the individuals buried into Vatya cemeteries with sekeletal burial rite can not be solved with the craniometric comparative methods in spite of the results mentioned above. As for their origin two conceptions now seem probable: a) These skeleton graves are actually the burials of the Vatya population and the appearance of the new ritual is due to cultural changes. In this case the Vatya groups participated in the development of the Late Bronze Age Tiszafüred population and other groups from the Great Hungarian plain's Tumulus Grave culture. So on account of the appearance of the Tumulus Grave culture the groups of Vatya culture migrated into Tiszafüred and into the areas of the later Great Hungarian plain's Tumulus Grave culture. b) The members of early Tumulus Grave groups buried with skeletal rite next to the population lived in the Koszider period, buried into biritual Vatya cemeteries with autochtonous, cremated rite.

– The late Szőreg group has significant connection neither with the formerly published anthropological series nor with the Middle Bronze Age series in this dissertation. Although, we should be cautious with the fact that the statistical comparison based on craniometric measurements could only be completed for females, and the two measurements' number of cases was only four. We should also emphasize that because of the small number of measurable skulls, there were no skulls from the Great Hungarian plain's Tumulus Grave culture included in the comparison of the female series.

Several new conclusions can be drawn from the new results of the craniometric comparative examinations concerning the Tumulus Grave groups.

– The anthropological findings of the biritual cemeteries from the Vatya culture have the closest parallelism with the Late Bronze Age Tiszafüred series and the Great Hungarian plain's Tumulus Grave culture – this was decribed earlier in detail.

– The examined pooled samples of the Tumulus Grave culture in Tiszafüred and in the Great Hungarian Plain have demonstrable significant connection neither with the Tumulus Grave series in Pitten and Tápé nor with any of the Magyarád series in Jelšovce.

– The population of Füzesabony culture could play an important part in the formation of the population of the Great Hungarian plain's Tumulus Grave culture despite the fact that concerning Tiszafüred-Majoroshalom the continuity between the populations of the two periods is not confirmed.

– Concerning the origin of the population of the Great Hungarian plain's Tumulus Grave culture we should take into account cautiously the fact that connections can be observed, although they are pretty distant, with the Early and Middle Bronze Age Unterwölbling series in Gemeinlebarn and in Franzhausen.

– The origin of the Rákóczifalva group of the Tumulus Grave culture cannot be answered presently because of the small number of craniometric data.

– The Maros-Perjámos population could play an important part in the formation of the Late Bronze Age population in Tápé, which is further confirmed with the results of former studies (Farkas 1975, Szathmáry 1988, Kővári 2008, Zoffmann 2009). However, the connection between the females in Tápé and the Aunjenitz population and the changes in the taxonomic rates (Farkas 1975) suggest that, although at a small degree, foreign population could appear in the area.

– Based on the presently published anthropological findings the analogies of the Tumulus Grave culture population in Pitten should not be searched in the Carpathian Basin. Against the opinion of Teschler-Nicola (1984) the former local population could not play an important part in the formation of Pitten population; the presently known series of the autochtonous population do not confirm this hypothesis. Its potential western and northwestern connections cannot be presently examined because of the small number of the published anthropological findings.

– The heterogeneity of the populations living in the different areas of the Tumulus Grave culture was high. The results of the anthropological analysis undoubtedly confirm the formerly published conception based on archaeological findings that the former Middle Bronze Age populations could play an important part in the formation of the Late Bronze Age populations (Kemenczei 1963, Kovács 1981, V. Szabó 1999, Csányi 2003). The different anthropological character of the different areas of the Tumulus Grave groups is considerably due to this heterogeneity. However, we should emphasize, that this does not mean that foreign groups could not appear in the Koszider period and later.

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