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CREMATION GRAVES IN THE BRONZE AGE

The osteological finds from cremation graves are of immense value for the anthropologist. They form an important source of information on the ethnic, morphological and evolutionary relations among the central-European populations of the Bronze Age.

There are no uniform views in the contemporary anthropology as to the method and results of the analysis of the cremation grave materials. While in most inhumation burials the results of the evaluation of the basic anthropological characteristics (determination of the sex and age of the individual) are accepted thanks to the aboundance of the objectively investigable determining characters, in case of cremation remains we meet with reactions of various grades — beginning with the view that these remains contain almost no information and ending with opinions holding that the remains of cremation burials contain information almost as valuable as the inhumation burials. Some discuss whether it is possible or not to determine the anthropological type of the cremated individuals and to what extent can we compare the cremation materials coming from the prehistoric periods with presentday cremation materials, whether during the process of cremation the bones change their dimensions and shape, etc.

The information obtained through anthropological analysis of the cremation materials is very scarce compared with the data obtained from skeletal burials. It is caused basically by the degree of preservation of these materials and by their amount. The experience from modern crematories shows according to Dokládal (1970) that the average weight of the cremated human remains varies between 2500—3000 g. The weight of the prehistoric cremation burials is in most cases less than half of the above value. We know that the degree of the preservation of the remains was influenced by a host of known and unknown factors. Naturally we must consider the influence of water, soil acids, roots of plants, destruction through tilling the earth and construction work on the burial sites. We are more interested, however, in the primary influences directly connected with the burial rite proper. The intensity of burning of the pyre and the duration of the cremation process greatly influenced the perfectness of burning and the decomposition of bones, i.e. the amount of preserved fragments. Probably great losses occured on collecting the bones into the urns. Chochol (1958) and Stloukal (1968) point out the importance of thoroughness on collecting the ashes from the cremation site and this thoroughness might had been incidental or intentional. It was connected with the tribal customs, religion and social standing of the deceased.

Chochol (1958), Malinowski (1964), Wrzosek and Godycki (1962) admit that there were also so-called partial or symbolic burials, when only parts of the skeleton were put into the urn.

Stloukal (1961, 1968) draws our attention to the connection between the size of the urns and between the amount of remains. He found a difference between the size of the urns and character of the burned bones at the Tišnov burial site, where beginning with the earliest Lusatian phase up to the latest Silesian phase the size of the urns was gradually decreasing — to one-third of their original size. The smaller urns then contained a smaller amount of bones.

Small losses occur also on lifting the burials and on rinsing the content of the urns with water.

On balancing all these negative factors we must put up with the fact that the amount of bones in the prehistoric cremation burials cannot be used as a guide-line for determining the robusticity of the deceased, neither can it be decisive for determining its sex or age.

There is close connection between the degree of cremation and the colour of the bones, but on evaluating a cremation burial these two factors do not qualify each other. The hue of the bones is not influenced only by the time during which they were subjected to the influence of the fire — it has been greatly influenced also by the chemical composition of the soil around the grave and also by the presence of bronze and iron implements.

Malinowski (1964) attaches great importance also to the iron-content of the haemoglobin, which can influence chiefly the colour of the flat bones containing the hematopoietic medulla.

More reliable is the determination of the degree of cremation according to the colour of the bones at the break. Stloukal (1968), however, points out that it is very problematic to determin the degree of cremation according to the amount of charred organic substance with regards to Gejvall's experience with present-day cremations. After perfect cremation in electric furnaces Gejvall found (1963) that some bones have blue-black hue at the break, which corresponds to imperfectly cremated bones according to the scale used in the practice. This phenomenon can be probably explained by the fact that the individual parts of the body do not burn at the same time and at the same rate.

The uneven cremation of bones in the cremation burials is attributed to various causes. Malinowski (1967) holds that some bones are imperfectly burned due to their peripheral position in the pyre. He explains the imperfect burning of cranial bones, namely of the temporal pyramids through the protective influence of the brain. Dzierzykray-Rogalski (1961), Malinowski (1964) and Wiercińska (1965) emphasize among other factors also the influence of the robusticity of the bones and of the amount of subcutaneous fat on the degree of cremation — the bones of the trunk are usually more perfectly burned, since they are surrounded by a comparalively large amount of fats in the abdominal integument and on the back.

With the degree of cremation is connected also the size of the preserved bone fragments. Chochol (1958, 1962), Malinowski (1967), Stloukal (1961, 1968, 1969) and Weiner (1951) agree that after the cremation the skeletal remains formed much bigger fragments than those found in the urns. This can be proved also by the present-day cremation practice. It is very probable that the bones were crushed so as to fit the size of the urn. We know from experience that the overall robusticity of the skeleton influences the size of the fragments of the cremation remains a great deal, the burials of children have been preserved as a rule in smaller fragments, the parts of the skeletons of adults with stronger compact matter and massif structure appear in larger fragments.

Other problem discussed at present is the influence of the cremation on the size and shape of the individual components of the skeleton. Fetter (1963), Gejvall (1947, 1950) and Chochol (1956) hold that the process of cremation does not change substantially neither the size nor the shape of the bones. The compact long bones and bones of the neurocranium crack and get twisted to a certain degree, but these changes do not render impossible the morphological evaluation of the cremation burials.

According to the results of the research of Dokládal (1963, 1970), Müller (1964) and Schaefer (1961) from present-day cremations the heads of the long bones diminish due to the high temperatures by 1—5 per cent — according to Dokládal (1970) by as much as 10 per cent. Anderson (1957) arrived at similar conclusions on cremating experimentally animal bones, recording their diminishing by 3—11 per cent.

Recently this problem has been more extensively studied by the Polish anthropologists Strzalko, Piontek and Malinowski (1974). The above authors realized various tests with cremating macerated human bones at the temperature of 1000 °C. The bones were measured both before and after the cremation and it was found that some dimensions decreased by 1—9 mm.

The method of the anthropological analysis of the cremation burials consists in the first phase in the anatomic classification of the individual fragments and in their evaluation with the help of morphologico-metrical criteria. The amount of fragments that can be processed in this way is much lower than the amount of those that cannot be identified — e.g. the small fragments of the spongy bone of the ends of the long bones, the compact bone and the crushed material forming a substantial part of each cremation burial. The most frequently preserved fragments are parts of the calva, ribs and vertebrae, teeth, temporal pyramids, smaller or larger fragments of the ends of long bones, parts of the facial skeleton, pelvis, mandible and maxilla.

The analysis can reveal whether the urn contains the remains of one, two or more individuals — whether it is a multiple burial. Sometimes it is rather difficult to find out this fact, especially if the urn contains only remains of adults or only children remains. Then we must rely on a mere accident whether we shall find two or more identical skeletal components. It is easier to distinguish the bones of adults from those of children. Sometimes there are differences in the hue of the bones, in the thickness of the neurocranial bones and of the compact bone of long bones. These characters are however, not decisive.

It is rather difficult to determine the sex of the cremated individuals. It depends on the preservation of the bones carrying the sexual characters. In most cases we have to limit ourselves to stating

that the characters — if there are any — are quantitatively and qualitatively insufficient for determining the sex of the given remains.

Some metric data can serve as supplementary characters. Gejvall (1948) studied the difference in the thickness of the wall of the neurocranium, in the diameter of caput humeri and in the thickness of the compact bone of some of the long bones, between males and females. Hajniš (1960) studied for the same reason the thickness of the cranial bones. Both authors found sexual differences, but only in the peripheral values. It means that their method cannot be used in most cases.

On determining the age, similarly as the sex, we must find certain parts of the skeleton, whose morphology can serve as proof of certain age of the individual. In the burials of children it is usually easier to determine the age of the remains than in adults. Child remains often contain epiphyses of the long bones and permanent teeth at various development stages. The thickness of the neurocranium bones and the compact bone of the postcranial skeleton are supplementary characteristics of child burials.

The determination of the age in the adults is a more complicated matter. We know that the obliteration of the cranial sutures can serve as a clue for determining the age of the deceased individual, but perhaps this is the only aid. Most authors study the complex of the fragments with sutures as a whole, considering the state of obliteration only generally.

Other characters of the skeleton indicating the age of the individual are not reliable in the case of the cremation burials. The fragmentary material does not enable us to establish the senile changes, not to mention that only a very low percentage of the prehistoric populations lived to the age when these changes fully appear on the skeleton.

In view of all these adverse circumstances most anthropologists use very wide age brackets — 20 to 40 years (adult), 40—60 (mature), and over 60 (senile).

Better preserved materials can give us valuable information of the stature of the deceased. Müller (1958), Gralla (1964) and Strzalko (1966) worked out a method of determining the body height on the basis of correlations between the dimensions of the heads of the femur, humerus and radius and the length of these bones. Strzalko, Piontek and Malinowski (1974), taking into account the diminishing of the heads of the long bones during the cremation, have worked out tables for determining the body height from the dimensions of the caput femoris, caput humeri and capitulum radii, calculating with decreased dimensions (a decrease of up to 10 per cent).

One of the most controversial questions is the determination of the anthropological type. In special cases of well-preserved Lusatian burials it was attempted by Chochol (1961). Malinowski (1974) tried to reconstruct the facial skeleton, paying special attention to the shape of the orbits and to the character of the apertura piriformis. At the same time he stresses that these characters can be used only in exceptional cases and most of the cremation material will practically never contribute to the solution of ethnogenetic problems.

The Czechoslovak anthropology has been paying systematic attention to human cremation remains in the recent 25 years. The following brief survey contains only the most important anthropologically evaluated cremation materials from the Bronze Age.

Chochol started to study the cremation burials very early and in 1953 he published the results of the analysis of the Lusatian burials from Hrušov near Mladá Boleslav. The 7 studied burials have been found to contain the remains of 9 individuals — three women and six children.

The analysis of the Platěnice-culture burials from Skalice near Jaroměř was realized in 1956. The 7 burials contained the remains of 10 individuals, 5 women, 2 men and 2 children.

The Lusatian material from Hradisko near Kroměříž, processed in 1958, represents 14 burials with the remains of 16 individuals. Specified 8 females, 1 male and 6 children.

The results of the analysis of Lusatian burials from Ústí nad Labem-Střekov and Žírovice near Cheb were published in 1961. The 55 burials in Ústí nad Labem contained the remains of 64 individuals — 13 females, 6 males, 14 adults of indefinable sex, 25 children and 6 finds of indefinable sex and age. The 26 burials in Žírovice comprised the remains of 27 individuals — 5 females, 5 children, 11 adults of indefinable sex and 6 finds of indefinable sex and age.

The Lusatian material from Opatovice nad Labem described in 1962 contains 9 burials with the remains of 11 individuals — 3 females, 1 male and 7 children. The later material from Opatovice belonging to the Silesian-Platěnice phase is somewhat more numerous. The 16 processed burials contained the bones of 18 individuals — 2 females, 7 children and 8 adults of indefinable sex.

The 60 Late Bronze Age burials from Nynice near Plzeň contained the remains of 60 individuals, 7 females, 5 males, 5 adolescents, 24 adults of indefinable sex and 19 indefinable burials. The results of this analysis were processed and published in 1969. Stloukal processed in 1968 746 Lusatian and 249 Platěnice burials from Moravičany near Mohelnice. He has specified 800 individuals from the Lusatian burials, 74 females, 33 males and 344 children. In the Platěnice material 260 individuals have been identified, 7 of them females, 5 males and 47 children.

The Lusatian and Silesian burials from Tišnov enabled the identification of altogether 14 individuals — of 4 females, 1 man, 8 children and 1 adult of indefinable sex. The results of this analysis were published in 1961.

From Rájec near Šumperk come 3 Lusatian and 42 Silesian burials with the bones of altogether 45 people. Identified have been 25 adults and 13 children. The material was studied in 1975.

Out of the 82 Velatice burials from Oblekovice 69 have been anthropologically evaluated. The results of this analysis were publised in 1963. 52 adults — out of them 11 females, 2 males and 17 children have been identified.

The material of the Piliny burial site in Barca, east Slovakia, was processed by Hanáková in 1961. The 42 burials contained the remains of 42 individuals, of 15 females, 9 males and 12 children.

Hanáková studied also the 7 Lusatian burials from Kluky near Nymburk in 1968. She identified the remains of 8 individuals — of 5 adults and 3 children.

The research of the cremation cemeteries is of great importance for the anthropology of the Bronze Age. Many of them have been studied and processed from the anthropological viewpoint. Though we know that the quality of these finds will never match that of the inhumation burials, they nevertheless contain valuable information of demographic character. Let us hope that the newly arising methods, some of them experimentally tested, like e.g. the above method of determining the body height, will contribute in the future to the study of the body characters of the Bronze Age Populations.

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