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Gorice pri Turnišču

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Kazalo

Results of the Anthropological Analysis of Cremated Human Remains

Mario Šlaus

Introduction

During February 2008 the Department of Archaeology of the Croatian Academy of Sciences and Arts received samples of cremated human bones collected from the archaeological site of Gorice in Slovenia. The purpose of this analysis was two-fold: Firstly, to analyse the recovered cremated human remains and, based on the degree of preservation, determine the sex, age, taphonomic characteristics and presence of pathological changes in the recovered remains. The second purpose of this study was to demonstrate the usefulness that such analyses can have in reconstructing the ways of life and cultural practices of archaeological populations. Analyses of cremated human remains from archaeological sites are, unfortunately, rarely performed and even more rarely published. This is due partly to the difficulties associated with this task and partly because of the wrongly perceived impression that these analyses cannot substantially contribute to our knowledge of the ways of life, living conditions, nutritional status and burial practices of archaeological populations. The recovered cremated material from Gorice offers an excellent opportunity to demonstrate the kind of data that can be collected from this type of material and to show what kind of interpretations can be inferred from these data.
The skeletal and cremated material was cleaned and stored in labelled individual containers and transported to the laboratory of the Department of Archaeology of the Croatian Academy of Sciences and Arts in Zagreb. Once the material arrived in Zagreb it was, once again, cleaned under running water with soft brushes, dried and, when possible, reconstructed. For each sample data was collected for the following categories:

1) Sex of the individual
2) Age at death of the individual
3) Presence of pathological conditions in the recovered material
4) Taphonomic characteristics of the recovered remains
5) Presence of associated material or animal remains in the sample

Because of the fragmented nature and incompleteness of the recovered material as many criteria as possible were used to determine sex and age at death of the recovered individuals. Sex was determined based on standard pelvic (Phenice 1969) and cranial morphology (Krogman/Işcan 1986). These criteria generally provide accurate results. From a sample of skeletons of known sex, Meindl *et al*. (1985) report a 3% error rate when both the pelvis and skull were evaluated. When these elements were not preserved sex was determined on the basis of bone robusticity, muscle crest development and long bone length. No attempt was made to estimate the sex of subadult individuals.
Adult age at death was estimated using as many methods as possible including ectocranial suture fusion (Meindl/Lovejoy 1985), pubic symphysis morphology (Brooks/Suchey 1990; Gilbert/McKern 1973; McKern/Stewart 1957; Todd 1920; 1921), auricular surface morphology (Lovejoy *et al*. 1985), and sternal rib end changes (Işcan *et al*. 1984, 1985). Thickness of cortical bone, trabecular density or sparseness, and the presence of degenerative osteoarthritic changes on joint surfaces were also used to determine age at death. In subadults, age at death was estimated using epiphyseal fusion, diaphyseal lengths and widths, and dental development and eruption criteria (McKern/Stewart 1957; Bass 1987; Fazekas/Kósa 1978; Moorrees *et al*. 1963).
The recovered remains were carefully analysed for the presence of pathological conditions. Pathological features were scored using a hierarchical approach that coded lesions descriptively according to the predominant osteoclastic or osteoblastic response as: 1) Bone loss, 2) Bone increase, or 3) Bone loss and bone increase. This general classification refers to the major changes possible in living bone. Following this determination, a second more precise designation was recorded using descriptors that defined the nature of the lesion. For example, pathologies identified as representing bone loss were classified within several subcategories, such as 1) Bone loss owing to resorptive (lytic) lesion, 2) Bone loss owing to porosity (pinpoint to coalesced), 3) Bone loss owing to osteoporosis or osteopenia, or 4) Bone loss caused by benign cortical defect. All lesions were further coded for: 1) Severity (i.e. mild, moderate, severe), 2) State (i.e. active, healing), 3) Extent of involvement (i.e. localized, widespread), and 4) Specific location on the bone. Changes caused by degenerative bone disease were scored for presence, location and severity of hypertrophic bone formation (marginal, lipping, osteophytes), porosity, and eburnation (Ortner/Putschar 1981; Steinbock 1976).
The taphonomic characteristics of each sample were then assessed. Thermal destruction of bone and soft tissue follows predictable and defined patterns. If one assumes that thermal exposure is uniform, fragmentation, warping and fracture patterns on bone are created by differential tissues and tissue depths surrounding bone. Recognition of this patterning, even with extensively burned remains, allows the researcher to track the progression of bone destruction. Tracking thermal destruction may reveal subtle information as to body positioning, thermal shielding and differential or multiple thermal sources.

Patterning is also dependent upon the pugilistic pose. The pugilistic pose of burned remains is the natural position of thermal induced muscle shrinkage. Despite initial body positioning, the pugilistic posture will influence the subsequent pattern of burning and fracture production. To illustrate the preceding, in the lower extremities, when the body is exposed to uniform thermal exposure, the highest degree of damage will be located in the knee, ankle and shin area. This is because these areas are least protected by muscle and soft tissue from fire. At the same time, the proximal part of the femur, surrounded by the acetabulum and the thick muscles of the upper leg, will be considerably more protected and should, consequently, be more preserved.
Finally, each recovered sample was analysed for the presence of material or animal remains. While animal remains are generally easily differentiated from human remains, in burned and badly fragmented remains this can be difficult. Animal remains were separated from human bone based on the following criteria: 1) Thickness of compact bone in relation to total bone diameter (in humans it tends to be 1/4 the thickness of the total diameter while in other mammals the ratio is 1/3 thickness of the total diameter), 2) Density of trabecular bone (considerably more dense in animal bone than in human), and 3) Muscle crest development (considerably more pronounced in animals than in humans).

Results

Grave 1

Taphonomy: The cremated fragments vary between black and white in colour. The material is moderately fragmented with the largest fragment measuring 41 × 15 mm (Fig. 40).
Sex: Male, based on the robusticity of the preserved fragments and the morphology of the mandible.
Age at death: Estimated age at death is between 20 and 25 years, based on thickness of the cortical and density of the trabecular bone, absence of degenerative changes on the joints, and the morphology of the auricular surface of the ilium.
Pathological features: Not present in the preserved material.
Associated material or animal remains: A small cylindrical fragment of bronze.

40 **Preserved osteological material from grave 1.**

Grave 2

Taphonomy: The cremated fragments are generally white in colour. The material is extremely fragmented with the largest fragment measuring 39 × 13 mm (Fig. 41).
Sex: Most probably female, based on the thickness of the cranium and density of the preserved cortical bone.
Age at death: Estimated age at death is between 25 and 45 years based on the thickness of the cortical and density of the trabecular bone.
Pathological features: Not present in the preserved material.
Associated material or animal remains: Not present in the preserved material.

41 **Preserved osteological material from grave 2.**

Grave 3

No human osteological material is present in Grave 3. This grave contains only the incinerated bones of a red deer (Fig. 42). The recovered animal material is robust and well preserved. None of the recovered fragments shows evidence of processing in the form of cut-marks.

42 **Preserved animal osteological material from grave 3.**

Grave 4

Taphonomy: The cremated fragments are generally white in colour. The material is moderately fragmented with the largest fragment measuring 33 × 20 mm (Fig. 43).
Sex: Most probably female, based on the thickness of the cranium and the density of the cortical bone.
Age at death: Estimated age at death is between 25 and 45 years, based on the thickness of the cortical and density of the trabecular bone, presence of osteoarthritic changes on the joints and antemortem tooth loss.
Pathological features: Moderate osteoarthritis.
Associated material or animal remains: The incinerated fragments of animal bones (Fig. 44). These bones are not sufficiently preserved to allow taxonomic differentiation but their gracile form suggests a young, subadult mammal.

Grave 5

Taphonomy: The cremated fragments are white in colour. The material is moderately fragmented with the largest fragment measuring 52 × 20 mm (Fig. 45).
Sex: Most probably female, based on the thickness of the cranium, density of the cortical bone and the absence of degenerative changes on the major joints.
Age at death: Estimated age at death is between 30 and 40 years, based on thickness of the cortical and density of the trabecular bone, absence of osteoarthritic changes on the joints and antemortem tooth loss.
Pathological features: Not present in the preserved material.
Associated material or animal remains: Not present in the preserved material.

43 Preserved osteological material from grave 4.

44 Incinerated animal bones recovered from grave 4.

45 Incinerated human bones found in grave 5.

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