EM/MM Human Skeletal Remains from East Crete: The Kephala Petras Rock Shelter, Siteia, and the Livari Tholos Tomb, Skiadi

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Introduction

In May and June 2009, the study of two important EM/MM human bone assemblages started to take place at the INSTAP Study Center for East Crete: the Kephala Petras rock shelter, which is located in northeastern Crete and was excavated in 2006 by Metaxia Tsipopoulou (Director of the National Archives of Monuments, and the 24th Ephorate of Prehistoric and Classical Antiquities, Hagios Nikolaos; see Tsipopoulou, unpublished manuscript 2007), and the Livari tholos tomb, which is located in southeastern Crete and was excavated in 2007 by Chryssa Sofianou (24th Ephorate of Prehistoric and Classical Antiquities) and Yiannis Papadatos (Univ. of Athens; see Papadatos, unpublished manuscript 2009). The study of the human bones was assisted by Eleftheria Tsichli, MA, University of Thessaloniki, and Natassa Kalogirou, MA candidate, Southampton University, UK (Figure 1). The human bone material was initially cleaned with soft brushes and water and sorted in accordance to major anatomical units: cranial bones, mandibles/maxillae/teeth, clavicles/scapulae, humeri, ulnae, radii, hand/foot bones, vertebrae, ribs, os coxae, femora, tibiae, fibulae, patellae, and unidentified bone fragments. The study of the skeletal material, which is in progress for both skeletal assemblages, started to take place by anatomical units in order to search for joins between different stratigraphic units.

Figure 1. Natassa Kalogirou sorting bones from the Livari tholos tomb.

Previous Studies of Human Skeletal Remains in Crete

Although there are a large number of excavated Minoan burial assemblages, there is a remarkable lack of studies of the human remains from them. This is partly due to the state of preservation of the human bones, and, to a certain degree, the treatment of the deceased, which often involving multiple reopenings of the tomb as well as repeated removals of the human bone material. Moreover, most of the tombs' excavations either took place many years ago when the systematic collection of the human material was very limited, or they have suffered badly from modern looting, resulting in the complete disturbance of the burial context. It is only recently that Tholos Tomb Gamma in Archanes (Triantaphyllou 2005) and the two tholoi tombs of Moni Odigitria in the Mesara Plain (Triantaphyllou, forthcoming) offered the opportunity for a thorough study of the human remains, suggesting the potential for recording and interpreting skeletal remains from similar contexts recovered in a commingled state of disposal.

Earlier work on prehistoric skeletal assemblages has been on the Early and Middle Minoan periods—EM/MM IIB at the Hagios Charalambos Cave, Lasithi (Betancourt, Davaras, and Stravopodi 2008); EM I/MM II at Pseira (Arnott 2003); MM I at Pezoules Kephala Kato Zakro (Becker 1975); and MM III at Knossos (Carr 1960)—and the Late Minoan period, such as LM III Chania (Hallager and McGeorge 1992). McGeorge has

contributed mainly to the study of human remains on Crete by using a purely physical anthropological approach with limited reference to aspects related to the treatment of the deceased. Much of her work, therefore, has focused on the discussion of broad thematic topics such as the stature or the mean life expectancy of the Minoans (McGeorge 1988, 1989). More recently, she is responsible for a number of ongoing projects, e.g., the study of the EM Hagia Photia cemetery population and the EM–MM Hagios Charalambos burial cave (Betancourt et al. 2008, 578–594), which await final publication. The latter project presents many similarities to the Kephala Petras rock shelter in regard to the disposal of the human remains and the type of grave goods. Additionally, studies such as chemical analyses with special focus on stable isotope analysis of carbon and nitrogen for the reconstruction of Minoan diet (Tzedakis and Martlew 1999) and a strontium analysis for the exploration of the biological affinities of Cretan populations during the Bronze Age (Nafplioti 2007, 2008) have been applied to Minoan skeletal assemblages.

Methodology

The recording system followed the standards for recording commingled skeletal remains that was set for the two tholos tombs at Moni Odigitria (Triantaphyllou, forthcoming). In particular, each bone fragment was recorded according to typical anatomical features based on the standard anatomical units set for disarticulated skeletal assemblages established by Lyman (1994) and slightly adjusted according to internationally accepted standards for recording commingled human remains (Outram et al. 2005) in order to avoid duplication of anatomical units. Long bones, for example, were segmented into five different zones: proximal end, proximal 1/3, middle 1/3, distal 1/3, and distal end. Archaeological information related to trench number, level, and stratigraphical unit, as well as biological parameters such as taphonomy (erosion, encrusting, burning), completeness of skeletal elements, fragmentation, siding, age, sex, pathological conditions, and metric and non metric traits were entered into an Access database.

Preliminary Results

In total, 2,220 fragments—almost one-third of the identified and recordable human bone material recovered from the Kephala Petras rock shelter—of femora (3 crates), tibiae (2 crates), fibulae and patellae (1 crate), and another 1,078 fragments of femora, humeri, and ulnae from the Livari tholos tomb were marked, given an inventory number, and systematically recorded and measured. It is worth mentioning here the total numbers of other EM/MM assemblages of commingled skeletal remains recently studied. In the Moni Odigitria tholos tombs, the human skeletal material consists of a total of 3,630 and 1,461 identified bone and tooth fragments from Tholoi A and B, respectively (Triantaphyllou, forthcoming). In Archanes, Tholos Tomb Gamma produced only 72 post-cranial fragments (Triantaphyllou 2005, 68), while the recently published report of the Hagios Charalambos Cave makes reference to 11,000 entire or fragmentary bones identified so far (Betancourt et al. 2008, 580).

The study and analysis of commingled human remains differs from that of individual articulated skeletons involved in single episodes of primary burial. Both skeletal assemblages coming from multiple burials and commingled bone remains—such as those from the Kephala Petras rock shelter and the Livari tholos tomb—offer a unique opportunity to shed some light on issues related to the treatment of the deceased and the practices associated with the burial, re-burial, and multiple use of the disposal area. They also help identify the biological parameters of the case-study populations, such as the demographic picture (i.e., minimum number of individuals buried, sex, and age groups), health, dietary status, physiological stress factors, and the type of physical activities practiced during life.

In particular, issues which will be explored extensively in the Kephala Petras rock shelter and the Livari tholos tomb and have been partly seen throughout the first stage of investigation include:

A. *The character of the deposition of the human skeletal remains, whether primary or secondary.* Preliminary work on the material as well as careful observation of the photographic archives reveals that the skeletal remains of both the rock shelter and the tholos tomb represent mainly products of secondary treatment. Taphonomic factors related to disarticulation during cleaning of the primary disposal area at the Kephala Petras rock shelter and to extreme fragmentation at the

Figure 2. Bone fragments with evidence of burning and trampling from the Livari tholos tomb.

Livari tholos tomb suggest that removal of the bone material from their original disposal area took place after the remains were skeletonized and turned into dry bones. At the Kephala Petras rock shelter in particular, skeletal elements present an overall complete or almost complete state of preservation often involving intact bones, which can produce stature estimations. This phenomenon would indicate that the human remains did not suffer from additional removal or further deliberate disturbance once placed in the rock shelter. At the Livari tholos tomb, on the other hand, skeletal elements show extreme fragmentation, which was probably caused from the combination of several factors related to the burning of the bones and also to intense trampling during multiple re-openings of the tholos. It is striking to note the high frequency of bones from the tholos that have evidence of burning, evident in the variety in coloration (black, blue/gray, gray, and white), distortion (slight to severe warping), and cracking (both transverse and longitudinal cracks) on the bone surface. Different degrees of alterations to the bone surface would be the result of several factors affecting bone elements during burning, e.g., the state of decomposition of the human remains (skeletonized versus fresh bone), contact with fire (direct or indirect), length of exposure to firing conditions, etc. In many cases it seems that bone parts were still covered with flesh, and the fat and soft tissue facilitated burning at high temperatures. The large number of burned bones recovered in the tomb (more than half of the total number of bones recorded), as well as bone alterations due to burning, appear to be the result of a lengthy and systematic process. Burned bones mostly of smoked black and blue/gray color with minimal severe alterations (e.g., cracking and warping) have been observed in most EM Mesara tholos tombs, but in significantly smaller frequencies, suggesting that they are the result of a hasty and short-term process. For example, Moni Odigitria Tholos Tomb A produced only 295 burned bone fragments out of a total of 6,922, while Tholos B yielded 60 burned examples out of the 2,727 bone fragments recovered. The low frequency of burned bone fragments in the above EM assemblages, as well as the slight character of alterations from firing processes, appear to represent activities associated with the fumigation of the disposal area where the human remains were primarily deposited as opposed to the intentional cremation of human remains, as was probably the case in Livari. Another interesting taphonomic feature demonstrated in the Livari bone fragments is intense trampling revealed either as bone splints with rounded edges or extremely fragmentary long bones regularly broken in transverse or oblique segments with clean edges on both sides of the shaft (Figure 2). Trampling can be associated with breakage of the bone material due primarily to the removal of the skeletal material after being burned and subsequent relocation within the tholos tomb during multiple re-openings of the tholos area. Similarly, extreme fragmentation as well as some trampling on the skeletal material due probably to its transportation into the location of secondary deposition and subsequent multiple re-openings in the tholos area seem to have taken place at Moni Odigitria Tholos A. Instead, in other recently studied EM secondary deposits such as the so-called ossuary of Tholos B at Moni Odigitria (Triantaphyllou, forthcoming), the Hagios Charalambos Cave (Betancourt et al. 2008, 580) and more recently the Kephala Petras rock shelter, as already discussed above, skeletal elements demonstrate an exemplary complete state of preservation

suggesting minimal disturbance of the human remains from intense removal and subsequent trampling.

B. *The occurrence of preferential selection of certain bone categories, e.g., skulls and/or long bones as opposed to small bones that are usually lacking from secondary disposal of human remains*. Preliminary investigation of both assemblages reveals that there is no particular selection of anatomical units, and, therefore, all bone categories are included in the skeletal assemblage including small bones (hand/foot bones, phalanges), vertebrae, and rib fragments. Long bones are overrepresented as they are the norm in commingled assemblages due to robusticity and high resistance to extrinsic factors such as removal during secondary treatment.

C. *Accessibility to the disposal areas of certain age and/or sex categories*. Preliminary investigation shows that all age categories and both sexes were disposed in the Kephala Petras rock shelter while there is a relative underrepresentation of the subadult age categories (-18 years of age) at the Livari tholos tomb. This picture is consistent with the idea that skeletal remains represent population groups linked with family relations rather than population segments based on age and/or sex divisions. Nevertheless, it is interesting to note a similar underrepresentation of the subadult age categories at Moni Odigitria, Tholos B—only four out of sixty-four individuals belonged to subadult age groups—while subadults show a relative good representation at Tholos A at Moni Odigitria and the Hagios Charalambos Cave (Betancourt et al. 2008, 578).

D. *The health and oral status as well as dietary patterns consumed by the case study populations*. Preliminary investigation of the Kephala Petras rock shelter femora, tibiae, and fibulae gave evidence of pathological conditions commonly found in prehistoric assemblages in the Aegean, such as different types of arthritis, long-term healed fractures and nonspecific infections, and, in particular, periostitis on the lower limbs (Figure 3). Musculo-skeletal markers as well as the evidence of trauma and nonspecific infections would be consistent with a population that was actively engaged in physical tasks involving farming/herding, walking in rough terrain, and travelling long distances.

Figure 3. Tibia with evidence of periostitis (non-specific infection) from the Kephala Petras rock shelter.

Recent studies of human skeletal remains from pre-palatial Crete gave new insights on issues related to manipulation of the deceased as well as to biological parameters such as the demographic synthesis, health status, and diet of the case study populations. Primary investigation of certain anatomical units from the Kephala Petras rock shelter and the Livari tholos tomb clearly demonstrated the need towards this direction by providing some interesting information on the character of the two depositions based on taphonomic criteria, the demographic picture, and the health status of the case-study populations.

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