Petras, Siteia
The Pre- and Proto-palatial cemetery in context

Acts of a two-day conference held at the Danish Institute at Athens, 14-15 February 2015

Edited by
Metaxia Tsipopoulou

Monographs of the Danish Institute at Athens
Volume 21
This volume is dedicated to all those individuals who participated over the years in the excavation, conservation, study, site development and publication of the results.

This lofty vision for Petras and its region was made possible by their hard work, dedication and support.
Contents

11 List of Contributors

15 Preface

19 Abbreviations

21 Works Cited

55 Greetings from Rune Frederiksen
Director Emeritus of the Danish Institute at Athens

56 Greetings from Kristina Winther-Jacobsen
Director of the Danish Institute at Athens

57 Documenting sociopolitical changes in Pre- and Proto-palatial Petras:
The house tomb cemetery
Metaxia Tsipopoulou

103 The Tripartite Façade at the Petras cemetery
Philip P. Betancourt, Metaxia Tsipopoulou and Miriam Clinton

111 Ceremonial Area 1: Identity and dating of a special ritual space
in the Petras cemetery
Metaxia Tsipopoulou

131 Pottery fabrics and recipes in the later Pre- and Proto-palatial period at Petras:
The petrographic evidence from House Tomb 2 and Ceremonial Area 1
Eleni Nodarou

143 Further seals from the cemetery at Petras
Olga Krzyszkowska
<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>159</td>
<td>Variability and differentiation: A first look at the stone vase assemblage in the Petras cemetery</td>
<td>Maria Relaki &amp; Christina Tsoraki</td>
</tr>
<tr>
<td>179</td>
<td>The Petras 'Sphinx'? An essay on hybridity</td>
<td>Anna Simandiraki-Grimshaw</td>
</tr>
<tr>
<td>195</td>
<td>The use of querns and other ground stone hand tools in Early to Middle Minoan mortuary practices at Petras</td>
<td>Heidi M. C. Dierckx</td>
</tr>
<tr>
<td>203</td>
<td>Special silver alloys from the Pre- and Proto-palatial cemetery of Petras, Crete</td>
<td>Alessandra Giumlia-Mair, Philip P. Betancourt, Susan C. Ferrence, &amp; James D. Muhly</td>
</tr>
<tr>
<td>215</td>
<td>An intriguing set of discs from the Protopalatial tombs at Petras</td>
<td>Thomas M. Brogan &amp; Alessandra Giumlia-Mair</td>
</tr>
<tr>
<td>225</td>
<td>The plant remains of the house tombs at Petras: Acts of destruction, transformation and preservation</td>
<td>Evi Margaritis</td>
</tr>
<tr>
<td>237</td>
<td>Feeding the dead, toasting the living? The view from faunal remains</td>
<td>Valasia Isaakidou</td>
</tr>
<tr>
<td>245</td>
<td>Male bonding and remembering the ancestors? The Late Minoan III reoccupation and use of the Kephala-Petras Cemetery Area</td>
<td>David W. Rupp</td>
</tr>
<tr>
<td>269</td>
<td>The sea in the afterlife of the Minoans: The shell material from Petras cemetery in context</td>
<td>Tatiana Theodoropoulou</td>
</tr>
<tr>
<td>271</td>
<td>'Όσο ψηλά και αν ανεβείς λέξη μην πεις μεγάλη 'πο χώμα σε ἐφτιάξε ο θεός κι εκεία γυρίζεις πάλι'</td>
<td>Cretan mantinada for death</td>
</tr>
<tr>
<td>291</td>
<td>House Tomb 5: A preliminary analysis of the human skeletal remains</td>
<td>Sevasti Triantaphyllou, Sotiria Kiorpe &amp; Metaxia Tsipopoulou</td>
</tr>
</tbody>
</table>
301  Compare and contrast: The house tomb at Myrtos-Pyrgos  
   Gerald Cadogan

311  Mortuary practices, the ideology of death and social organization of the Siteia area: 
      The Petras cemetery within its broader funerary landscape  
   Yiannis Papadatos

325  Mobility patterns and cultural identities in Pre- and Proto-palatial central 
      and eastern Crete  
   Efthy mia Nikita, Sevi Triantaphyllou, Metaxia Tsipopoulou, Diamantis Panagiotopoulos, 
   Lefteris Platon

341  Pezoules Kephala, Zakros. I. Form of the tombs and burial habits  
   Lefteris Platon

355  Pezoules Kephala, Zakros. II. The chronological and evaluative position of the finds 
      in the framework of the life of the neighboring settlement  
   Lefteris Platon & Maria Tsiboukaki

369  Funerary practices at Sissi: The treatment of the body in the house tombs  
   Ilse Schoep, Isabelle Crevecoeur, Aurore Schmitt & Peter Tomkins

385  Funerary ritual and social structure in the Old Palace period:  
      A multifarious liaison  
   Giorgos Vavouranakis

399  East Cretan networks in the Middle Bronze Age  
   Carl Knappett & Cristina Ichim

413  Final discussion  
   Chaired by Colin F. Macdonald

425  Final remarks: Some comments on the Pre- and Proto-palatial cemetery 
      and the Late Minoan IIIC settlement of Petras Kephala  
   Donald C. Haggis

437  Index
The conference participants gathered in the courtyard of the Danish Institute at Athens 15 February 2015
List of Contributors

PHILIP P. BETANCOURT
Department of Art History, Temple University
2100 North 13th Street, Suite 2101, Philadelphia, PA 19122, USA
ppbcourt1@aol.com

SUSAN C. FERRENCE
Director of Publications, INSTAP Academic Press
2133 Arch St., Ste. 301, Philadelphia, PA 19103, USA
susanferrence@instappress.com

THOMAS M. BROGAN
Director, INSTAP Study Center for Eastern Crete
Pacheia Ammos, GR-72200 Ierapetra, Crete, Greece
tombrogan@instapstudycenter.net

ALESSANDRA GIUMLIA-MAIR
AGM Archeoanalisi
Via E. Toti 8, I – 39012, Merano (BZ), Italy
Via della Costa 4, I – 39012, Merano (BZ), Italy
giumlia@yahoo.it

DONALD C. HAGGIS
Nicholas A. Cassas Term Professor of Greek Studies,
Department of Classics, University of South Carolina at Chapel Hill
212 Murphey Hall, CB 3145, Chapel Hill, NC 27599-3145
dchaggis@email.unc.edu

GERALD CADOGAN
British School at Athens
3 The Old Rickyard, Moreton Pinkney, Daventry, NN11 3TL, United Kingdom
geraldcadogan2@gmail.com

VALASIA ISAAKIDOU
36 Beaumont Street, Oxford, Oxfordshire, OX1 2PG, United Kingdom
valasia.isaakidou@arch.ox.ac.uk

MIRIAM G. CLINTON
Assistant Professor of Art and Art History, Digital Mapping Specialist, Publication Team INSTAP
Department of Art and Art History, Rhodes College,
2000 North Parkway, Memphis, TN 38112, USA
miriam.clinton@gmail.com

ISABELLE CREVECOEUR
Université de Bordeaux, Pessac, France
UMR 5199 PACEA, CNRS
Isabelle.crevecoeur@u-bordeaux.fr

HEIDI M.C. DIERCKX
Associate Professor of Classical Studies, Elmira College
One Park Place, Elmira, NY 14901, USA
hdierckx@elmira.edu

CRISTINA ICHIM
PhD Student, Institute of Archaeology, University College London, United Kingdom
Institute of Archaeology, University College London,
31-34 Gordon Square, London, WC1H 0PY, United Kingdom
ichimcris@gmail.com
KATERINA BOUKALA-KARKAGIANI  
PhD Student, Department of History and Archaeology, National and Kapodistrian University of Athens  
Fotomara 18, GR-11743, Athens, Greece  
kmpoukala@hotmail.com

SOTIRIA KIORPE  
Graduate Student, Aristotle University of Thessaloniki  
GR-54124, Thessaloniki, Greece  
skiorpe@hist.auth.gr

CARL KNAPPETT  
Department of Art, University of Toronto, Canada  
Department of Art, 6063 Sidney Smith Hall, 100 St. George St., Toronto, M5S 3G3, Ontario, Canada  
carl.knappett@utoronto.ca

GARIFALIA KOSTOPOULOU  
Petras Excavations Project  
Pasifae St. 10, GR-72100, Hagios Nikolaos, Crete, Greece  
garifaliakost@yahoo.gr

OLGA KRZYSZKOWSKA  
Deputy Director, Institute of Classical Studies  
Senate House, Malet Street, London, WC1E 7HU, United Kingdom  
olgak2001@outlook.com

COLIN F. MACDONALD  
British School at Athens  
Chersiphronos 8, GR-11631, Athens  
Colin.f.macdonald@gmail.com

EVI MARGARITIS  
Assistant Professor, Science and Technology in Archaeology Research Center (STARC), The Cyprus Institute  
Guy Ourisson Building – Athalassa Campus, P.O. Box 27456, 1645 Nicosia, Cyprus  
evimargaritis@gmail.com

JAMES D. MUHLY  
Professor Emeritus, University of Pennsylvania  
American School of Classical Studies at Athens  
St. 54, GR-10676, Athens, Greece  
jimmuhly@yahoo.com

EFTHYMIA NIKITA  
Assistant Professor, Science and Technology in Archaeology Research Center (STARC), The Cyprus Institute  
20 Konstantinou Kavafi Street, 2121, Aglantzia, Nicosia, Cyprus  
efi.nikita@gmail.com

ELENI NODAROU  
INSTAP Study Center for Eastern Crete  
Pacheia Ammos, GR-72200 Ierapetra, Crete, Greece  
enodarou@yahoo.gr

DIAMANTIS PANAGIOTOPoulos  
Director, Institute of Classical Archaeology, Heidelberg University  
Karl Jaspers Centre, Voßstraße, Building 4400, 69115, Heidelberg, Germany  
diamantis.panagiotopoulos@zaw.uni-heidelberg.de

YANNIS PAPADATOS  
Associate Professor of Prehistoric Archaeology  
Department of History, Archaeology and History of Art, National and Kapodistrian University of Athens, School of Philosophy, University Campus, Zographou, GR-15784, Greece  
gpapadat@arch.uoa.gr

LEFTERIS PLATON  
Assistant Professor of Prehistoric Archaeology  
Department of History, Archaeology and History of Art, National and Kapodistrian University of Athens, School of Philosophy, University Campus, Zographou, GR-15784, Greece  
eplaton@arch.uoa.gr
ADRIANOS PSYCHAS
Graduate Student, Department of History and Archaeology, National and Kapodistrian University of Athens
New Tyrins, GR-21100, Nafplio, Greece
adriano_naf@hotmail.com

MARIA RELAKI
Associate Lecturer, The Open University, United Kingdom
29 Smeeton Road, Kibworth Beauchamp, Leicestershire LE8 0LG, United Kingdom
m.relaki@open.ac.uk

DAVID W. RUPP
Director, Canadian Institute in Greece
Voulgaroktonou 68, GR-11473, Athens, Greece
drupp@brocku.ca

AUKORE SCHMITT
Aix Marseille Université, Marseille, France
UMR 7268 ADES, CNRS
Aurore.Schmitt@univmed.fr

ILSE SCHOEP
Department of Archaeology, Catholic University Leuven
PB 3313, 3000 Leuven, Belgium
Ilse.Schoep@arts.kuleuven.be

ANNA SIMANDIRAKI-GRIMSHAW
Humboldt-Universität zu Berlin, Herman von Helmholtz – Centre for Cultural Techniques
Unter den Linden 6, Room 3029, D-10099, Berlin, Germany
pytna@yahoo.co.uk

TATIANA THEODOROPOULOU
Wiener Laboratory for Archaeological Science of the ASCSA
Souidias 54, GR-10676, Athens, Greece
tatheod@hotmail.com

PETER TOMKINS
University of Sheffield, Department of Archaeology
Northgate House, West Street Sheffield S1 4ET, United Kingdom
pdtomkins@yahoo.co.uk

SEVASTI TRIANTAPHYLLOU
Associate Professor in Prehistoric Archaeology and Osteoarchaeology
Department of History and Archaeology, Aristotle University of Thessaloniki, GR-54124, Thessaloniki, Greece
strianta@hist.auth.gr

MARIA TSIBOUKAKI
PhD Candidate, Department of History and Archaeology, National and Kapodistrian University of Athens
L. Porfira 10, Iraklio, GR-14122, Athens, Greece
mariatsiboukaki@gmail.com

METAXIA TSIPOPOULOU
Director Emerita, Hellenic Ministry of Culture, National Archive of Monuments, Director of the Petras Excavations
Voulgaroktonou 68, GR-11473, Athens, Greece
mtsipopoulou@yahoo.gr

CHRISTINA TSORAKI
Faculty of Archaeology, Leiden University, Laboratory for Material Culture Studies
Einsteinweg 2, 2333 CC Leiden, The Netherlands
c.tsoraki@arch.leidenuniv.nl

GIORGOS VAVOURANAKIS
Associate Professor of Prehistoric Archaeology: Theoretical Archaeology
Department of History, Archaeology and History of Art, National and Kapodistrian University of Athens, School of Philosophy, University Campus, Zographou, GR-15784, Greece
gvavour@arch.uoa.gr
Abbreviations

**Archaeological periods**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBA</td>
<td>Early Bronze Age</td>
</tr>
<tr>
<td>EH</td>
<td>Early Helladic</td>
</tr>
<tr>
<td>EM</td>
<td>Early Minoan</td>
</tr>
<tr>
<td>FN</td>
<td>Final Neolithic</td>
</tr>
<tr>
<td>LH</td>
<td>Late Helladic</td>
</tr>
<tr>
<td>LM</td>
<td>Late Minoan</td>
</tr>
<tr>
<td>LN</td>
<td>Late Neolithic</td>
</tr>
<tr>
<td>LBA</td>
<td>Late Bronze Age</td>
</tr>
<tr>
<td>MBA</td>
<td>Middle Bronze Age</td>
</tr>
<tr>
<td>MH</td>
<td>Middle Helladic</td>
</tr>
<tr>
<td>MM</td>
<td>Middle Minoan</td>
</tr>
<tr>
<td>MN</td>
<td>Middle Neolithic</td>
</tr>
</tbody>
</table>

**Petras Area**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>HT</td>
<td>House Tomb</td>
</tr>
<tr>
<td>R</td>
<td>Room</td>
</tr>
<tr>
<td>L</td>
<td>Lakkos</td>
</tr>
<tr>
<td>P</td>
<td>Petras</td>
</tr>
<tr>
<td>PTSK</td>
<td>Petras Cemetery</td>
</tr>
</tbody>
</table>

**Other**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTSOU</td>
<td>Petras Rock Shelter</td>
</tr>
<tr>
<td>Σ-palace</td>
<td>Stratigraphical trenches of the palace</td>
</tr>
<tr>
<td>W</td>
<td>Wall</td>
</tr>
<tr>
<td>A.S.L.</td>
<td>Above Sea Level</td>
</tr>
<tr>
<td>diam.</td>
<td>diameter</td>
</tr>
<tr>
<td>gr</td>
<td>gram</td>
</tr>
<tr>
<td>h</td>
<td>height</td>
</tr>
<tr>
<td>kg</td>
<td>kilogram</td>
</tr>
<tr>
<td>w</td>
<td>width</td>
</tr>
<tr>
<td>wt</td>
<td>weight</td>
</tr>
<tr>
<td>th</td>
<td>thickness</td>
</tr>
<tr>
<td>lt</td>
<td>liter</td>
</tr>
<tr>
<td>MMD</td>
<td>Mean Measure of Divergence</td>
</tr>
<tr>
<td>MNI</td>
<td>Minimum Number of Individuals</td>
</tr>
<tr>
<td>NISP</td>
<td>Number of Identifiable Specimens</td>
</tr>
<tr>
<td>SM</td>
<td>Archaeological Museum, Siteia</td>
</tr>
<tr>
<td>vol.</td>
<td>volume</td>
</tr>
</tbody>
</table>

The form of the English language for the native speakers (British or American) was the author's choice. For the non-native speakers the American form was used.
Bibliographic Abbreviations

AAA – Archaiologika Analekta Athinon
ActaPalaeobot – Acta Palaiobotanica
AJA – American Journal of Archaeology
AJPA – American Journal of Physical Anthropology
AJS – American Journal of Sociology
AmHumBiol – American Journal of Human Biology
AR – Archaeological Reports
Arachne – (on-line access to the CMS, with corrected information and enhanced illustrations) http://arachne.uni-koeln.de/drupal/?q=de/node/access date March 2016.
ArchDelt – Archaeologikon Deltion
ArchEph – Archaeologike Ephemeris
ASAtene – Annuario della Scuola Archeologica Italiana di Atene
BAR-IS – British Archaeological Reports, International Series
BCH – Bulletin se correspondence hellénique
BICS – Bulletin of the Institute of Classical Studies of the University of London
BSA – Annual of the British School at Athens
CMS – Corpus der minoischen und mykenischen Siegel, Berlin 1964-2000, Mainz 2002-
CretChron – Kretika Chronika
EtCret – Études Crétoises
JAS – Journal of Archaeological Science
JMA – Journal of Mediterranean Archaeology
Kento – Kentro: The Newsletter of the INSTAP Study Center for East Crete
MA – Monumenti Antichi
OJA – Oxford Journal of Archaeology
Prakt – Praktika tes en Athenais Archaeologikes Etaireias
SIMA – Studies in Mediterranean Archaeology
SMEA – Studi Micenei ed Egeo-Anatolici


Boyd, M.J. 2016. "Becoming Mycenaean? The living, the dead and the ancestors in the transformation of society in second millennium BC southern Greece", in Death rituals, social order and the archaeology of immortality in the ancient world. 'Death shall have no dominion', C. Renfrew, M.J. Boyd & I. Morley (eds.), Cambridge, 200-220.


Cadogan, G. 2013a. "Myrtos and Malia: Middle Minoan 'entente cordiale'? Or unitary state?", Creta Antica 14, 105-121.


Doumas, C. 1977. Early Bronze Age Burial Habits in the Cyclades (SIMA XLVIII), Gothenburg.


Duday, H. & M. Guillon 2006. "Understanding the circumstances of decomposition when the body is skeletonized", in Forensic Anthropology and Medicine. Complementary Sciences. From Recovery to Cause of


Hamilakis, Y. 1998. “Eating the dead: mortuary feasting and the politics of memory in the Aegean Bronze Age societies”, in Cemetery and society in the Aegean
Bronze Age, K. Branigan (ed.), Sheffield Studies in Archaeology 1, Sheffield, 115-132.


Hankey, V. 1986. "Pyrgos: the communal tomb in Pyrgos IV (Late Minoan I)", BICS 33, 135-137.


Hutton, P.H. 1993. History as an Art of Memory, Hanover.


Irish, J.D. 2006. “Who were the ancient Egyptians? Dental affinities among Neolithic through Postdysnastic peoples”, *AJPA* 129, 529-543.


Isaakidou, V. in press. “Kamilari Cemetery. The animal remains”, in *La Necropoli di tombe a tholos di Kamilari (Phaistos)*, L. Girella & I. Caloi (eds.).


Knappett, C., M. Pomadère, A. Gardeisen, T. Gomrée, T. Theodoropoulou & P. Westlake, with M.E. Alberti, H. Procopiou, V. Thomas & E. Morero in press. Deux dépôts MM IIA dans le secteur Pi de Malia, BCH.


Margaritis, E. forthcoming a. "Seeds for food, seeds for crafts? The Archaeobotanical remains of the site of Pelka at P. Ammos".

Margaritis, E. forthcoming b. "The plant remains from Late Minoan Mochlos".


Marinatos, S. 1929. “Πρωτομινωικός τάφος παρά το χωρίον Κράσι Πεδιάδος”, *ArchDelt* 12, 102-141.


Moutafi, I. 2015. Towards a social bioarchaeology of the Mycenaean period: A multidisciplinary analysis of funerary remains from the Late Helladic chamber tomb cemetery of Voudeni, Achaea, Greece, Unpublished Ph.D. dissertation, University of Sheffield.


Panagiotopoulos, D. forthcoming. “Μινωική Κοιμάσα: Ανασυνθέτοντας την ιστορία ενός μεθόριου κέντρου της νότιας Κρήτης”.


Petruso, K. M. 1992. KEOS, Results of Excavations Conducted by the University of Cincinnati under the Auspices of the American School of Classical Studies at Athens VIII. Aya Irini: The Balance Weights. An Analysis of Weight Measurement in Prehistoric Crete and the Cycladic Islands, Philipp von Zabern, Mainz on Rhine.
Works Cited


Platon, L. forthcoming. “Πεζούλε Κεφάλα Ζάκρου. Δύο τάφοι της εποχής των πρώτων μινωικών


Platon, N. 1974. Ζάκρος, το νέον μινωϊκόν ανάκτορον, Η εν Αθήναις Αρχαιολογική Εταιρεία, Αρχαίοι Τόποι και Μουσεία της Ελλάδας 5, Αθήναι.


Shaw, J. W. forthcoming. “Central ceiling and roof supports in Early Minoan (EM II–MM II) architecture”, BSA.


Works Cited


Triantaphyllou, S. in press. “Managing with death in Prepalatial Crete: The evidence of the human remains”, in From the Foundations to the Legacy of Minoan So-


Histoire de l’art et archéologie de la Grèce antique, University of Texas, Austin, Program in Aegean Scripts and Prehistory, 473-479.


Valamoti, S.M. 2009. “Σπόροι για τους νεκρούς; Αρχαιοβοτανικά δεδομένα από τη Μαυροπηγή Κοζάνη, θέση Φυλλοτσαϊρι”, Αρχαιολογικό Έργο στην Άνω Μακεδονία 1, 245-256.


Walberg, G. 1983. Provincial Middle Minoan Pottery, Mainz am Rhein.
Works Cited


Xanthoudides, S. 1924. The Vaulted Tombs of Mesara. An account of some early cemeteries of Southern Crete (Translated by J. P. Droop), With a preface by Sir Arthur Evans, Liverpool & London.


House Tomb 5: A preliminary analysis of the human skeletal remains

Sevasti Triantaphyllou, Sotiria Kiorpe & Metaxia Tsipopoulou

Abstract

House Tomb 5 consists of twelve rooms which vary in size and content. The majority of the skeletal remains were recovered from Rooms 2, 9 and 10, which are also the largest rooms of the tomb. The macroscopic study of the human bones was conducted in relation to international methodological standards for the study of commingled skeletal assemblages, which were also applied to the skeletal remains from the nearby Rock Shelter and those of House Tomb 2. Taphonomic evidence favours a secondary manipulation of the human remains which, during or after the decomposition of the body, were deposited or transferred in the rooms of the house tomb in semi-or disarticulated form. Moreover, a high degree of fragmentation and evidence of short-term firing on the bones confirm the hypothesis of secondary activities which took place inside the house tomb as well as outside it, at an area not located as yet by the archaeological research. Regarding differentiations in the deposition of the skeletal assemblage, there is not any patterned selection of particular body parts and all age and sex groups are well represented. Pathological conditions observed include a low frequency of osteoarthritis and vertebral arthritis, healed fractures, and periostitis on the long bones, as well as dental disease related probably to a certain degree to the dietary habits of the living population.

Introduction

This paper aims to present the results of the recent study of the human skeletal remains excavated from House Tomb 5 at the Kephala-Petras cemetery. The use of House Tomb 5 extends from the Early Minoan III to the Middle Minoan IA periods (2200-1900 B.C.) and thus covers a period of 300 years. The study of the human remains will add new information on the character of the late Prepalatial burial practices alongside the quality of life of the population group buried in House Tomb 5 during their life course. The house tomb is rectangular in shape and consists of twelve rooms which vary in size and type, with Room 2 being a later addition to the initial plan of the tomb. All the skeletal material excavated in the rooms of the house tomb was in a commingled

---

* We would like to extend warm thanks to the personnel of Lasithi Ephorate of Antiquities, as well as Dr. Tom Brogan, Director of the Institute for Aegean Prehistory in Eastern Crete and Eleanor Huffman for facilitating our study in practical matters. Special thanks go to Professor Phil Betancourt and the Institute for Aegean Prehistory which funded this work.

---

1 Manning 2010, 18-28. Table 2.2.
2 Tsipopoulou this volume, “Documenting sociopolitical change”.

state; not a single primary burial occurred. More than 5,000 bone fragments were studied, out of which 2,974 provided adequate anatomical features necessary for anatomical identification and siding.

The macroscopic study of the diagnostic bone fragments was performed following international methodological standards for the study of commingled skeletal remains, and was adjusted to the recording scheme proposed by Triantaphyllou in a series of studies including the Petras Rock Shelter and the House Tomb 2 skeletal material. Each bone element was labelled with an individual inventory number and, according to a number of archaeological and anthropological parameters, was entered in a Microsoft Access database. The archaeological parameters included information about the context of the area where the bones were located (room number, locus, stratum and associated excavation and group number) and about taphonomic changes observed in the skeletal assemblage (weathering, preservation and discoloration), while the anthropological parameters recorded information on anatomical identification and siding, age, sex, metric and non-metric traits and pathological changes.

Taphonomy and character of the human bone depositions

Regarding the character of the deposition of a skeletal assemblage, taphonomic observations can be highly illustrative. The human skeletal remains from House Tomb 5 do not show any skeletal alterations which would be compatible with pre-burial exposure of the body to external conditions, as for instance cracking and discoloration due to thermal fluctuations and gnawing due to animal activity. Despite the lack of evidence indicating exposure of the deceased, the skeletal remains present a high degree of fragmentation suggesting that secondary activities, such as frequent re-openings and multiple visits, were taking place within the tomb.

Moreover, evidence of human interference indicating manipulation of the deceased was revealed from the bone fragments exhibiting thermal alterations. That is, a total of 326 post-cranial and cranial bone fragments showed some kind of discoloration and periosteal texture change, such as warping and erosion. Bone discoloration ranges from black to blue-grey and white, with the latter forming the most abundant group. As far as it concerns the spatial distribution of the burnt remains, these were only found in Rooms 1, 2, 3, 9 and 10, of which Rooms 2 and 9 contributed most of the material. Despite the relatively high number of fragments exhibiting heat induced alterations, the estimated minimum number of individuals derived strictly from the burnt human remains is only six, suggesting that burning was not a common practice at House Tomb 5. Archaeological evidence would further support the above observations since no distinct traces of burning have been found to date in the broader area of the cemetery. It is highly possible therefore that partly defleshed body parts, as indicated by the variety of discolorations and the few cases of severe thermal alterations, were moved away after their initial disposal and were exposed to firing conditions in a place outside the cemetery which has not been located as yet.

Human activity as an extrinsic factor that affected the state of the skeletal remains found in House Tomb 5 can also be detected by the representation of the anatomical elements. Table 1 shows the actual number of the bone elements recorded in the skeletal assemblage compared to the expected representation for a minimum

---

3 Outram et al. 2005; Osterholtz et al. 2014.

5 For a discussion on evidence for ritual burning in Crete see also Triantaphyllou this volume.
number of 56 individuals, assuming that the latter would represent once complete skeletons. The high values of the actual number of the bone elements represented by the upper skeleton and the hand bones conflict with the low numbers recorded for the lower skeleton and the foot bones, whereas other bone groups such as the flat bones, the vertebrae and the ribs are underrepresented in the assemblage. Of particular interest is the uncommonly high occurrence of loose teeth (that is, detached from the bone alveoli), which amounts to 790 mandibular and maxillary teeth.

Thus, the picture obtained from the bone representation index favours the hypothesis of the secondary manipulation of the bodies, the defleshed remnants of which appear to have been intensive-ly removed, mixed and transferred perhaps even within the different rooms of the house tomb. In particular, skeletal remains were found in Rooms 1, 2, 3, 9, 10 and 12; the majority of the material comes from Rooms 2, 9 and 10 which are the largest in the house tomb. Bones from the cranial skeleton are lacking from Rooms 3 and 12, suggesting perhaps that particular burial practices allowed the moving of selected body parts, during or after decomposition, to certain rooms within the house tomb, although any clues regarding the above rooms are very tentative due to the small number of human remains located within them. Table 2 displays the actual representation of the bone categories per room and the minimum number of individuals estimated for each room separately. This picture is similar to that obtained for the house tomb overall: the upper skeleton prevails over the lower skeleton in almost every room, apart from Room 1, while the hand bones occur significantly more frequently than the foot bones. The secondary character of the depositions is also supported by the high number of teeth found detached from their bone alveoli and the low numbers of rib cage bones, vertebrae and flat bones (e.g., ossa coxae and scapulae) represented in each room. The under-representation of the latter bone groups cannot be explained solely as a result of intrinsic factors causing the decay of particular osse-

Table 1. Actual bone representation of the human remains from the Kephala-Petras House Tomb 5; the black line indicates the expected number of skeletal elements for a minimum number of individuals (MNI) at 56.

Table 2. Representation of anatomical units per room; the MNI for each room is also indicated.

6 The Minimum Number of Individuals (MNI) was based on the presence of 45 right petrous parts of the temporal bone, for the adults, and of 11 teeth in various formation stages or post-cranial fragments, for the subadults, which were carefully cross-checked to avoid duplication and over-counting of the same individual.
ous remains, since bones with low bone mineral density belonging to neonates and infants are well-represented in the assemblage. Moreover, if intrinsic factors were responsible for the unequal representation of anatomical bone groups in the burial assemblage, the presence of numerous small bones with low bone density recorded in the assemblage, such as hand and foot bones, cannot be interpreted efficiently.

To sum up, parameters such as the representation of anatomical units and the degree of fragmentation but also the occurrence, although low, of bone fragments clearly affected by firing conditions would be compatible with different stages of secondary manipulation of the human remains. Yet, is it possible to have these stages identified through the macroscopic study of the human remains alone? The physical presence and the active participation in the excavation of trained field osteoarchaeologists, alongside the close parallel scrutiny of the excavation notes and photographs, helped in capturing the various stages of the manipulation of the dead body. Three modes of secondary manipulation can be detected in this assemblage: 1) one case of a semi-articulated body represented by the upper torso found in Room 10, which appears to have been manipulated while it still preserved its soft tissue (Figs. 1a, 2); 2) four

---

7 Bones with low bone density such as vertebrae, ribs, flat bones and small bones cannot effortlessly withstand taphonomic pressures and are more susceptible to decay than other bone groups; for a thorough discussion on extrinsic and intrinsic factors affecting the preservation of bones see Bello et al. 2006, 28-34.
cases of *articulated body parts* (a pair of left ulna and radius and a pair of left tibia and fibula in Room 9 (Fig. 1b), a left clavicle articulated to a left humerus and a right ulna and radius in Room 10); and 3) mixed *commingled remains* deposited in dry condition in all rooms (Fig. 1c). Given that manipulation can be identified in different decomposition stages, the preceding examples would suggest multiple visits to the tomb and the re-arrangement of the remains at different time intervals following the initial interment of the deceased.

**Composition and health patterns of the population buried in House Tomb 5**

In seeking to reconstruct burial practices in Crete, archaeologists are primarily concerned with the size of the population that used the funerary monuments. A number of different estimation methods have been employed by researchers including the minimum number of individuals calculated from the excavated crania, the total count of the associated artefacts and the size of Early Minoan settlements in order to facilitate the discussion regarding the demographic analysis of Early Minoan communities. In regard to the present study, the population unit estimated to have been buried in House Tomb 5 was based on Bintliff’s estimation model. According to this model a household of about five to seven individuals contributes approximately 20 corpses per century. Considering thus that a minimum number of 56 individuals was buried in House Tomb 5 throughout its use in EM III to MM IA – that is a period of ca. 300 years – we can estimate approximately 18.6 skeletons per 100 years. Although certain limitations need to be kept in mind with regard to the use of Bintliff’s estimation model, it is possible that a population unit approximating a conventional type of nuclear family was using House Tomb 5 throughout the course of its history.

Both sexes and individuals from all age categories are represented in the skeletal assemblage. Regarding the age structure of the population, remains belonging to one neonate (0-1 year), four infants (1-6 years), four children (6-12 years) and two juveniles (12-18 years) were recorded alongside those of adults, suggesting an absence of age-related differentiations in the treatment of the dead. Apart from Room 3 which gave relatively few skeletal remains, subadult remains were recorded in almost every room of the house tomb. The determination of sex faced some limitations due to the poor preservation state of morphological features which are necessary for the assessment of sex. However, twelve females and fourteen males that could be identified based on cranial morphology were equally distributed across the rooms of the house tomb. The present results are pertinent to observations made for House Tomb 2 skeletal material concerning the composition of the population, where similarly no indications of sex or age differentiation were found.

The state of health of the population group that used House Tomb 5 seems to be relatively high, since only a few pathological conditions have been attested in the assemblage. In relation to the post-cranial skeleton, vertebral arthritis shows the highest rates (7.9%) with evidence of non-specific infections (e.g., periostitis) on long bones next (1.3%). Furthermore, degenerative arthritic lesions are also present in the joints but in a lower degree than those in the

---


10 Bintliff 1977, 83-84.

11 The explanation for this phenomenon is that in LM IIIC a pit was excavated in the area of Room 3 down to bedrock and refuse, probably from the Rectangular Building, was deposited in it; see “Lakkos A” in Tsipopoulou 2012, 127-129, figs. 13-14 and Rupp this volume.

vertebral column. Apart from the occurrence of arthritis and non-specific infections, the macroscopic study also identified activity-related skeletal indicators such as trauma (0.31%) and musculoskeletal stress markers (0.56%). The latter refer to bone remodelling induced by mechanical stress at the sites of muscle and tendon attachment on the bone, and are often interpreted as an indicator of activity patterns. In contrast to the picture obtained by the post-cranial bone elements, no cranial pathologies are observed in the House Tomb 5 skeletal assemblage, an observation that fits with similar results derived from the study of the skeletal material provided from House Tomb 2 and from the Rock Shelter.13

Oral pathologies have been also recorded in the case study population. In particular 57 of the 790 examined permanent teeth exhibited carious lesions either on the crown or on the root surface, whereas a slightly larger number of teeth (N=78), usually incisors, were diagnosed with calculus. Higher calculus rates were also observed in the study of the House Tomb 2 and Rock Shelter dentition, possibly implying particularities in dietary patterns of the studied populations. However, the most frequent dental pathology observed in the House Tomb 5 dental assemblage is the occurrence of ante mortem tooth loss (AMTL; 35.6%), namely the loss of teeth prior to death due to inflammation of the periodontal tissue around the root apex, often caused by periodontal disease or coronal caries.14 In addition to pre-mortem loss of teeth, a few cases of periapical abscesses (3.39%), also indicative of inflammation, were recognised in maxillary and mandibular alveolar processes. Both ante-mortem tooth loss and periapical abscesses can be caused by caries in combination with dental wear, indicating a considerable intake of carbohydrates. When compared to the other studied Petras assemblages, House Tomb 5 provided the only cases of dental abscesses while it also displayed considerably higher levels of ante mortem tooth loss. House Tomb 2 and the Rock Shelter, on the other hand, showed evidence of metabolic stress episodes such as enamel hypoplasia that were missing from the skeletal material of House Tomb 5. The preceding differences may to a certain degree relate either to sample limitations or they may indicate differences in diet. Future analysis of the total skeletal remains from the Petras house tombs is necessary in order to reach to secure conclusions.

Conclusions

The study of the human remains points towards a multi-stage funerary ritual that included repeated visits to the tomb and constant contact with the skeletal remains of the dead. The use of the rooms appears to differ in some aspects ranging from rooms which were either empty or filled with only a few human remains, serving perhaps as the initial disposal areas of the deceased, and others which were accommodating considerable depositions of human remains, serving thus as ossuaries. The rooms in which human remains were deposited exhibited no differentiations in the representation of age and sex groups and in the character of manipulation of the dead. The documentation of three modes of secondary manipulation in different decomposition stages, and of a high degree of fragmentation, affirms the hypothesis of secondary activities taking place in the house tombs. In particular the dead buried in House Tomb 5 were disturbed and probably distributed, relocated and manipulated according to ritual and organizational requirements which aimed at the breakdown of personal histories and the prominence of a communal identity. The persistence in seeking a communal frame of redefining the self may also have led to the use of fire as a breaking mechanism against individuality, since the latter was expressed in the still recognizable human remains. The funerary behaviour of the Petras community gives the

13 Triantaphyllou 2012, 165-166.
impression of a complex and multi-layered mortuary ritual with an extended liminal phase, which asked for, strangely to us, contact with the decomposing body and a successive damnatio memoriae of the individual for the sake of the community and/or the lineage.\textsuperscript{15}

\textsuperscript{15} For a thorough discussion of Early Minoan funerary practices see Triantaphyllou this volume; Legarra Herreo 2014.
Discussion

Tsipopoulou: The difference in pathology between House Tombs 2 and 5 – does it have something to do with the fact that at least two of the occupants of House Tomb 2 were males over 45 years old?

Kiorpe: It is possible, but older people are found in House Tomb 5, too. Vertebral arthritis and arthritis at the post-cranial skeleton are indicative of old age, but they may also reveal certain stress levels. The latter could likewise be demonstrated by the musculoskeletal stress markers (MSM), and both arthritis and MSM, when found in a population, should be considered as possible activity indicators. In the end we should not forget that my sample did not include many vertebrae, or at least not as many as the House Tomb 2 assemblage.

Tsipopoulou: Right, in the House Tomb 2 there were also primary burials.

Kyparissi: Since the burials are secondary – maybe you said that yesterday, but I was not here – and you define the building and the whole complex as funerary, even though the burials were secondary, could you explain why they were buried there? What about the primary burials?

Kiorpe: You will have an answer to that question in the next paper. I just presented the preliminary results of the anthropological study of House Tomb 5. The secondary character of the depositions is obvious as we have an overall low representation of anatomical bone groups and under-representation of certain elements, evidence that does not agree with the estimated minimum number of individuals for House Tomb 5. Apart from the low bone representation, the accumulations of bones that have been presented are certainly not in anatomical position or articulated, hence a secondary manipulation is more than suggestive. The question of the character of the depositions is what we have been researching for many years now, and especially the next talk and Sevi Triantaphyllou will be able to give you a fully integrated response to that question.
Κεφάλα Πετράς: η μελέτη των σκελετικών καταλοίπων από το Ταφικό Κτίριο 5

Το Ταφικό Κτίριο 5 παρουσιάζει περισσότερες από μια αρχιτεκτονικές σχέσεις και συνεπικοινωνίας από δώδεκα δωμάτια διαφορετικού μεγέθους με μεγαλύτερα τα δωμάτια 2, 9 και 10, από τα οποία προέρχονται και ο κύριος όγκος του οστεολογικού υλικού. Η μελέτη των ανθρώπινων καταλοίπων ακολουθεί την διεθνή προτεινόμενη μεθοδολογία και βιβλιογραφία για την μελέτη των διάσπαρτων οστών όπως αυτή έχει εφαρμοστεί και στη μελέτη των σκελετικών καταλοίπων του Ταφικού Κτιρίου 2 και της Βραχοσκέπης του ιδίου νεκροταφείου με σκοπό την μεθοδολογική συνφυσία, απαραίτητη για την σύγκριση των ερευνητικών αποτελεσμάτων. Η μελέτη της ταφονομίας των οστών συνηγορεί στο δευτερογενή χαρακτήρα των αποθέσεων καθώς τα οστά έχουν βρεθεί σε μια ανατομική ακολουθία και σε μεγάλο βαθμό θρυμματισμένα πιθανότατα εξαιτία της εναπόθεσθης τους στα στατικό και συνολικό αποτελεσματικό συμβαθμό μορφή. Μπορείται να δεν υπάρχει ιδιαίτερη προτίμηση συγκεκριμένων ανατομικών ομάδων καθώς στο κείμενο των μακρινών οστών, εκπροσώπουν όλες οι ανατομικές ομάδες σε αρκετά μεγάλο ποσοστό. Επιπλέον, μικρό ποσοστό των οστών φαίνεται να έχει υποστεί επίδραση σε χαμηλές κυρίως θρηματικές σύμφωνα με τις μεταβολές που παρατηρούνται στη διάρκεια. Καμία επίσης προτίμηση δεν διακρίνεται στο σχέδιο με τα φύλα και τις ηλικιακές ομάδες, εφόσον έχουν βρεθεί οστά που ανήκουν τόσο σε ενήλικους άντρες και γυναίκες, όσο και σε ανήλικους στάδιους και σε νεογνά. Ψηφιακά με τα επίπεδα υγείας, ήδη παρατηρήθηκε σε σχέδια μικρή συγκέντρωση αρθρίτιδες, αρθροκρασίες κατάγματα οστών και φλεγμονών όπως περιστίτικα κυρίως στα μακρά οστά, άλλα και οδοντικές παθήσεις, τρυγία (πέτρα), τερηδόνα και οδοντικά αποστήματα. Μελλοντική μελέτη των ανθρώπινων καταλοίπων από τα γεράλωσα τοπικά κτήρια του νεκροταφείου θα προσφέρει την δυνατότητα σύγκρισης και παρατήρησης της ανάγκης γενίκειας των τη φυσική διάρκεια χρήσης του εκάστοτε τοπικού κτηρίου, όπως επίσης και τα επίπεδα υγείας των ανθρώπων που χρησιμοποιούσαν το νεκροταφείο του Πετρά.