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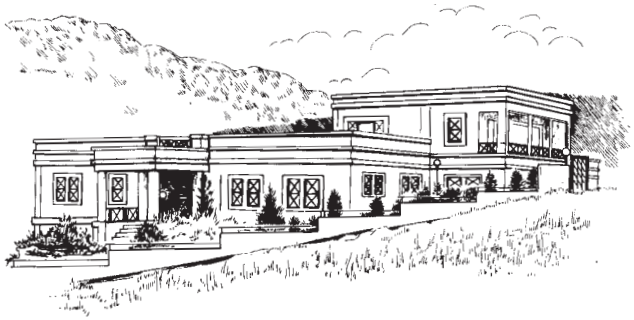

Tracing the Funerary Ritual at Kephala Petras through the Evidence of the Human Skeletal Remains

Sotiria Kiorpe

Excavations in the cemetery of Kephala Petras have been conducted since 2004 and continue to reveal interesting and unique aspects of the Early and Middle Minoan funerary behavior. The cemetery lies on the Kephala hill, which neighbors the palace of Petras, and consists of 26 house tombs identified up to this point and a rock shelter (Tsipopoulou 2017, 20; 2018). Its continuous use from the Early Minoan (EM) I to Middle Minoan (MM) IIB periods provides archaeologists with the opportunity to study a "mortuary stratigraphy" that spans more than 1,000 years.

Some preliminary results will be presented together with observations on the EM–MM evidence on the manipulation of the deceased in the Kephala Petras cemetery. Work on the human remains in the cemetery started with the on-site participation in the excavation of Sevi Triantaphyllou and her team from the Aristotle University of Thessaloniki, and it continues to date (Fig. 1). My work has focused on the study of House Tomb 5, which developed into a master's thesis (Kiorpe 2016) and has continued with a Ph.D. dissertation entitled "Mortuary Practices in Eastern Crete in the 3rd and Early 2nd Millennia BC: Bioarchaeological Analysis of the Human Skeletal Remains from the Kephala Petras Cemetery at Siteia" supervised by Triantaphyllou. The aims of the dissertation will be threefold: (1) to reconstruct the biological profile of the population buried in the cemetery (demographic synthesis and health and diet patterns); (2) to systematically study the spatial distribution and taphonomy of the remains, which, in addition to the macroscopic osteological study, will shed light on the stages of the mortuary ritual and the variable ways of manipulating the deceased; and (3) to examine probable inter-cemetery differentiations and similarities in the funerary behavior over time, which could indicate different social, political, and ideological claims.

Figure 1. Anna Karligioti excavating human skeletal remains in House Tomb 11 at Petras in 2018. Photo M. Beeler.

Material and Methodology

Human skeletal remains were found in all the excavated house tombs, although each tomb displays certain particularities regarding the number of rooms that were used for the deposition of the remains and the mode of deposition. The majority of the skeletal material is found dispersed and commingled, often situated along the walls of the rooms, while a few cases of primary burials were attested either inside burial containers, in pits, or immediately on top of the tomb floor (Fig. 2).

The documentation of the primary articulated burials follows the established guidelines for the recording of complete skeletons (Buikstra and Ubelaker, eds., 1994; White, Black, and Folkens 2011), whereas a different methodology was employed for the recording of the commingled and disarticulated remains. In more detail, the macroscopic study of the diagnostic bone fragments, namely the ones that preserve adequate anatomical traits for identification and attribution to an anatomical side, was

Figure 2. House Tomb 1, Room 10: primary burial with evidence of secondary manipulation. Notice the piling of the postcranial skeleton and the still-articulated knee joint. Photo courtesy Petras Excavations Archive.

performed following international methodological standards for the study of fragmented skeletal assemblages (Outram et al. 2005; Osterholtz, Baustian, and Martin 2014), and it was adjusted to the recording scheme proposed by Triantaphyllou (2010, 2017) in a series of studies including the skeletal material from the rock shelter and House Tomb 2. All skeletal elements were subdivided into several anatomical zones according to the adaptation of the zonation method by Christopher Knüsel and Alan Outram (2004) that was initially applied to the study of faunal assemblages (Dobney and Rielly 1988). The zonation method not only allows a more accurate estimation of the minimum number of individuals (MNI) based on the duplication of skeletal parts in a given assemblage, but it also facilitates the measurement of skeletal completeness and fragmentation values by recording the minimum number of elements (MNE) per skeletal part (for more details on the use of the aforementioned quantitative variables, see Lyman 2008). In relation to the present research, the author followed the zonation system proposed by N. Papakonstantinou (pers. comm.) in her doctoral research at Aristotle University of Thessaloniki by modifying the anatomical zones suggested by Knüsel and Outram (2004) in order to corroborate with the fragmentation patterns observed in skeletal assemblages from the prehistoric Aegean.

Apart from the employment of anatomical zones according to the zonation method, each bone element was labelled with an individual inventory number and was entered in a database (Filemaker Pro 2016 Advanced). The archaeological parameters included information about the context of the area where the bones were located (room number, stratum, locus, and associated excavation and group number) and the taphonomic changes observed in the skeletal assemblage. Macroscopic visual investigation of the taphonomy of the remains reveals the morphology and type of the breaks as well as all possible alterations observed on bone surfaces such as weathering, abrasion, and discoloration (for an analytical discussion of the entire range of taphonomic alterations, their morphology, and causes, see Fernández-Jalvo and Andrews 2016). Along with the observation of the taphonomic alterations on bone surfaces, the present study, drawing upon recent research, will attempt to identify the extrinsic and intrinsic factors that affect the preservation of the bones and determine the taphonomic picture of the skeletal assemblages (Andrews and Bello 2006; Stodder 2008; Booth 2016). Additional aids to the understanding of the taphonomic processes are the formulation of a completeness and fragmentation index and the search for conjoining specimens within the same layer or among separate layers located either in one room or within the rooms of a single tomb. The latter procedure helps in isolating possible acts and in identifying circulation patterns. Anthropological parameters are recorded such as information on anatomical identification and siding, age, sex, metric and non-metric traits, as well as pathological changes. Age and sex estimation will be carried out, when possible, by combining a number of skeletal indicators. Similarly, the recognition of pathological lesions will be based on the existence of multiple criteria, although certain limitations due to the commingled nature of the assemblage need to be taken into account (Waldron 2009; White, Black, and Folkens 2011, 379–421).

The Funerary Ritual: Taphonomic and Osteological Observations

The Petras community appears to have buried its dead immediately after death because there is no skeletal evidence that suggests prior exposure of the corpse either to the elements or to scavenging animals. Despite the absence of pre-burial exposure, the high degree of fragmentation that has been documented in this assemblage indicates the existence of post-burial interference with the human remains (Triantaphyllou 2009, 2016, 2017; Triantaphyllou, Kiorpe, and Tsipopoulou 2017). Three categories of evidence are employed in order to understand the degree and the ways in which the living community was interacting with their dead: (1) the estimation of the MNI and the representation of anatomical elements; (2) the record of taphonomic and osteological evidence, which suggests practices such as the manipulation of bodies or body parts in different stages of decomposition; and (3) the observation of thermal alterations on the skeletal remains.

The assessment of the MNI in commingled skeletal deposits provides information on the synthesis of the group that was accommodated in the tomb, while the estimation of bone representation (BRI = bone representation index) could help in identifying the processes after deposition (Andrews and Bello 2006). Certain secondary activities, like clearance and arrangement of bones in piles or other formations, have been attested for the Petras house tombs throughout the excavation. The BRI for House

Tombs 2 and 5, however, suggests that the removal of elements was also taking place. This conclusion comes from the fact that the number of recorded bones is considerably low in relation to the estimated MNI (Triantaphyllou 2017, 277–278; Triantaphyllou, Kiorpe, and Tsipopoulou 2017, 292–293). For example, in House Tomb 5, where the MNI is 56 individuals, all anatomical groups are significantly underrepresented. The graph in Figure 3 shows the actual number of bones recorded in the assemblage in comparison to the expected number for a minimum number of 56 individuals, assuming that they were once deposited as complete skeletons. Despite the observed variation in the numbers of the MNI, all anatomical elements were present in the assemblage suggesting the absence of any selection strategies regarding the secondary deposition, arrangement, and removal of the bones. In addition to the BRI, the study of the spatial distribution of the remains inside each house tomb may indicate the differential use of the burial space. The majority of the skeletal remains in House Tomb 5 was recovered from Rooms 2, 9, and 10, whereas Rooms 1, 3, and 12 exhibited low numbers of skeletal remains. This may further suggest that certain rooms served for the initial deposition of the dead (temporary repositories), and they were subsequently cleaned or emptied with the volume of the material to be transferred to the rooms that acted as ossuaries (Triantaphyllou, Kiorpe, and Tsipopoulou 2017, 293–294; forthcoming). A similar picture is obtained from the study of House Tomb 2, where Rooms 3 and 9 were used as temporary repositories for human bodies and Rooms 1 and 2 as ossuaries for the "storage" of defleshed human remains (Triantaphyllou 2017, 278–279). Differences in use are not only noticed between the rooms of a tomb but also among separate but synchronous house tombs as illustrated by the Early Minoan phase of the cemetery. House Tomb 17, for instance, is comprised of three rooms, of which the smallest were used for the secondary deposition of dry remains, while the largest was found empty apart from a primary contracted burial. When the tomb was abandoned, the burial as well as the defleshed remains were left intact (Tsipopoulou 2017; Kiorpe, forthcoming). In contrast to the respect shown with the burial assemblage of House Tomb 17, House Tomb 12 was emptied and was filled with stones, an act that was interpreted as a symbolic "killing" of the building, whereas House Tomb 15 was left with a limited amount of remains after its clearance and abandonment (Tsipopoulou 2017).

The study of the osteological material from House Tombs 2 and 5 revealed a great variability in the character of the depositions and in the modes of manipulation and disposal of the deceased (Kiorpe 2016; Triantaphyllou 2016, 2017; Triantaphyllou, Kiorpe, and Tsipopoulou 2017). The main form of disposal in the two house tombs was the secondary deposition of disarticulated and dry human remains (Fig. 4). The discovery of some semi-articulated body parts (Fig. 5), however—namely elements that preserved their tendons and soft tissues

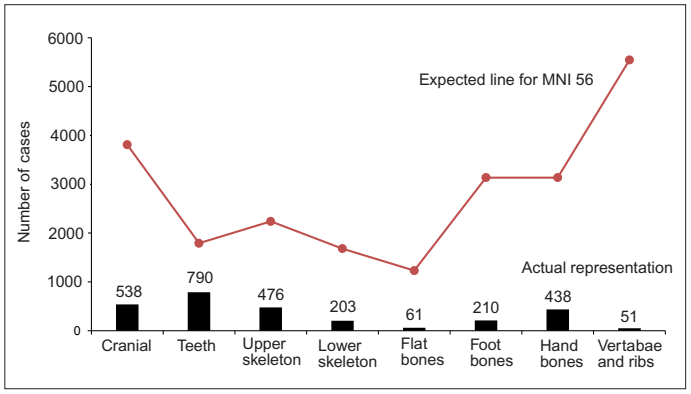

Figure 3. Actual bone representation of the human skeletal remains from House Tomb 5 at Kephala Petras. The red line indicates the expected number of skeletal elements for a minimum number of individuals (MNI) at 56.

when manipulated—indicates that the secondary deposition was not limited to completely skeletonized remains. This gives a temporal and multi-sensorial insight into the funerary rituals because the discovery of semi-articulated body parts among dry and commingled remains may indicate frequent visits to the tombs as well as the manipulation of remains that were still in the process of decomposition. Similarly, House Tombs 4, 10, and 15 were mainly used for the secondary deposition of dry human remains, while a few cases of semi-articulated body parts have been identified in the first two (pers. obs.).

Post-burial manipulation was also applied to primary burials in the Petras cemetery (Triantaphyllou 2016, 2017). More specifically, three cases of primary burials that were secondarily manipulated have been discovered in House Tomb 2. The burials were placed inside funerary containers, and they exhibited evidence of manipulation in the form of removal or relocation of certain bones, which were either in dry or "fresh" condition when handled. Part of the manipulation was probably caused by practical reasons such as the reuse of some containers for other burials. Moreover, in House Tomb 2, apart from disarticulated remains and secondarily manipulated primary burials, an intact primary burial also was found (Triantaphyllou 2017, 279). Until recently, primary burials were only documented for House Tomb 2, but during the past three years the ongoing excavation revealed more cases of primary articulated skeletons either inside the house tombs (e.g., House Tomb 1 dated to MM IB and House Tomb 17 dated to EM II) or below House Tomb 2 in stratigraphically earlier layers of use (EM II–MM IA; Tsipopoulou 2018). The primary burials are found in different contexts, and, although not studied yet, they display slight to major differences regarding the position of the body and the degree of post-burial manipulation.

Differences were also observed in the practice of fumigation because House Tombs 2–5 and 10 produced evidence in favor of this practice, while the rest gave no such trace, although the excavation of the cemetery is ongoing, so this may change. In

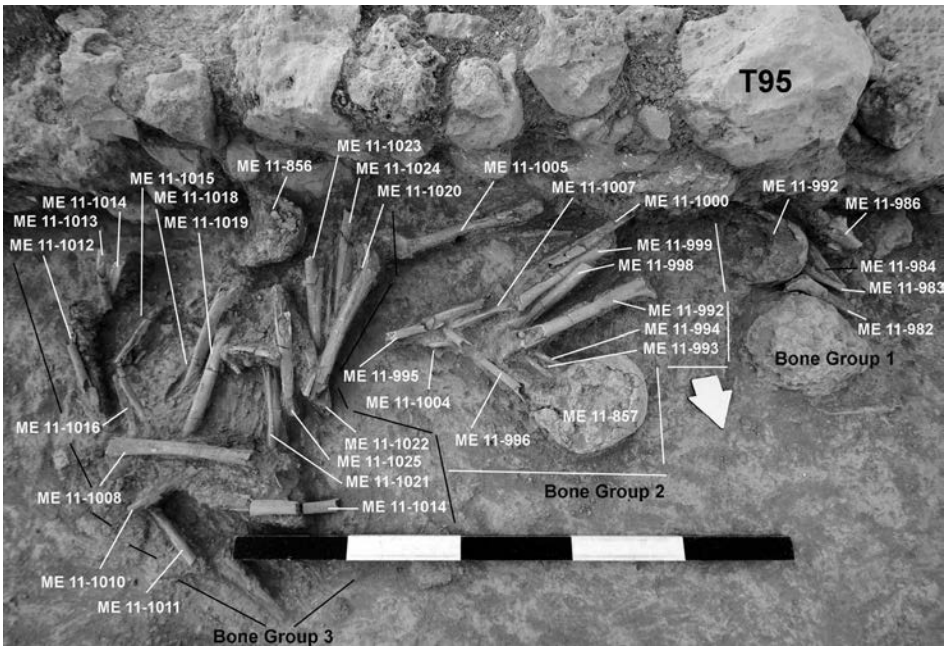

Figure 4. House Tomb 5, Room 9: commingled remains manipulated in dry condition. Photo courtesy Petras Excavation Archive.

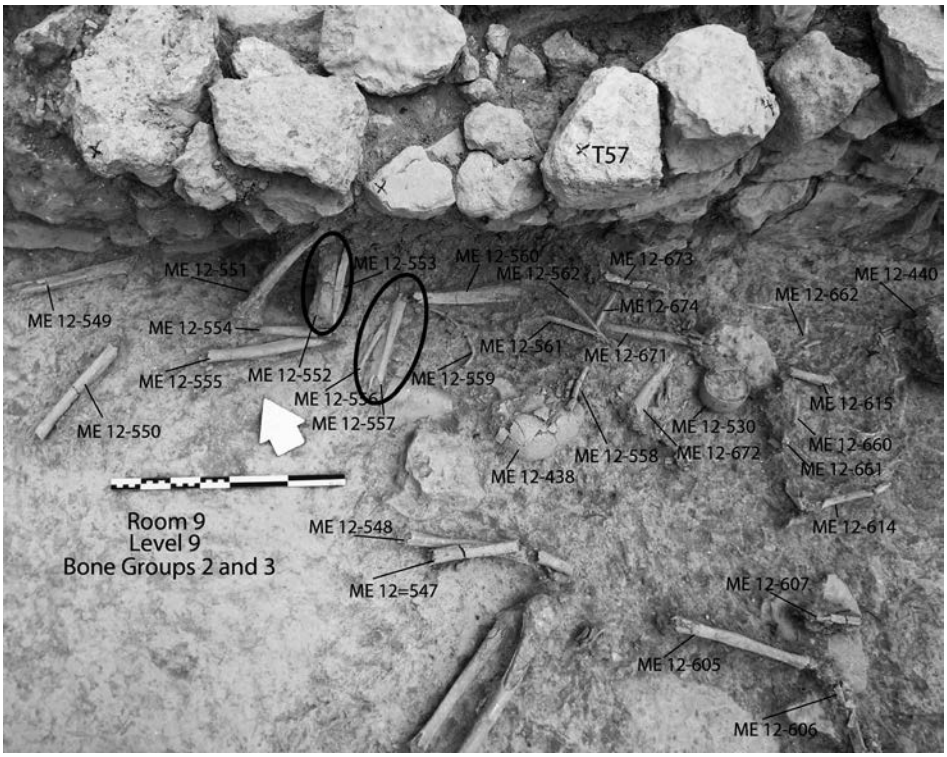

Figure 5. House Tomb 5, Room 9. Two cases of articulated body parts: left ulna and radius (ME 12-552 and ME 12-553) and left tibia and fibula (ME 12-556 and ME 12-557). Photo courtesy Petras Excavations Archive.

relation to the volume of the excavated material, however, only a small percentage of the Petras skeletal remains exhibited heat-induced alterations such as discoloration, cracking, warping, and erosion of the periosteal surface. These alterations vary both in numbers and in the degree of expression among different house tombs (Triantaphyllou 2012, 2016, 2017; Triantaphyllou, Kiorpe, and Tsipopoulou 2017; Kiorpe, forthcoming). Variations in heat-induced alterations of bones indicate that the remains were in different stages of decomposition when exposed to fire. Apart from the aforementioned variations, the present study was able to identify differentiation in the amount, type, and spatial distribution of the burned remains. For example, House Tomb 5 (Rooms 1–3 and 9) provided the highest numbers of burned diagnostic remains, while House Tomb 4 (particularly Room 1) and House Tomb 10 gave only a few tiny (the majority was less than 5 mm) and mostly undiagnostic burned fragments. It is worth mentioning that these fragments were mainly recovered from sorting the heavy residue. Moreover, the absence of any archaeological evidence to indicate the lighting of fire inside the tombs or within the area of the cemetery (e.g., burned soil, fragments of charcoal, burned pottery or other material) suggests that the skeletal remains were exposed to fire at a place outside the cemetery. The picture obtained so far therefore is that of an intentional but irregular practice, which was probably part of a separate ritual. The exact timing of this ritual is yet unknown, but it was probably enacted a certain amount of time after the initial internment and when the bodies were in different states of decomposition according to the variations observed in the thermal alterations of the bones.

Comments

To date, evidence shows that the Minoan people of Petras performed a complex and multi-staged funerary ritual in which they seemed to have fairly continuous contact and interference with the dead (Triantaphyllou 2016). During these episodes of interference, the skeletal remains (some of them still articulated) were not only cleaned, swept aside, and arranged in piles, but they were also transferred to different rooms (Kiorpe 2016, 117–118) or other sheltered areas of the cemetery (e.g., the rock shelter). In

addition to these practices, a few remains, probably the ones that were not completely decomposed, were exposed to fire in order to accelerate their skeletonization.

All of these acts of manipulation are often seen as vehicles for the symbolic transformation of the dead into ancestors through the creation of commingled and collective assemblages. Notions of collectivity as well as other social, political, or ideological claims were continuously challenged, reinvented, and reestablished both by the aforementioned acts and the acts that took place during funerary or secular rituals enacted in the area of the cemetery (for an analytical discussion, see Triantaphyllou, Kiorpe, and Tsipopoulou, forthcoming). Future work will attempt to trace the Petras complex funerary behavior by adopting a bottom-up approach, which will focus on the individual study of each house tomb and the unfolding of its "biography."

Acknowledgments

I wish to express my gratitude to my supervisor, Sevi Triantaphyllou, for the continuous support and guidance; to the director of the Petras Excavations, Metaxia Tsipopoulou, for providing the excavation notebooks and information about the archaeological context; to the Ephorate of Antiquities of Lasithi and in particular, the director, Chryssa Sofianou, for helping enormously with the permits for the transportation of the material to the INSTAP SCEC; and to the director of INSTAP SCEC, Thomas Brogan, as well as the staff of the Center, particularly Eleanor Huffman for assisting with practical matters. Also, I would like to thank INSTAP for the generous financial support through grants awarded to Sevi Triantaphyllou for the processing of the skeletal material and the Onassis Public Benefit Foundation for funding my Ph.D. dissertation.

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Study Center Fellowship News

Support the Seager Fellowship

Next fall we will be celebrating the 10th anniversary of the establishment of the Richard Seager Doctoral Fellowship. We are so grateful to all of you who have donated to this cause. The Seager Fellowship was created with the goal of providing funds for doctoral candidates to use the resources at the INSTAP Study Center to help bring their dissertations closer to completion. With your help, we can reach our goal of $4,000 for the 2019 fellowship. Our 2018 recipient, Luke Kaiser, reports on his work in this issue of the newsletter (see p. 19).

Support the Hawes Fellowship

We are pleased to announce that the Hawes Post-Doctoral Fellowship for Gender Studies will be offered again in 2019 to a qualified applicant. The Harriet Boyd Hawes Fellowship was established in 2016 with the goal of incorporating gender studies in Aegean Bronze Age archaeology to highlight various aspects of ancient life that have not yet received sufficient attention. The 2018 fellowship recipient, Florence Gaigernot-Driessen, has written an article about her research for this issue of our newsletter (see p. 9). This fellowship is open to those in the fields of Anthropology, Art History, Ancient History, or Classics. The recipient of the 2019 fellowship will use the Study Center's resources to aid his or her research. The Hawes Fellowship was founded with the generous support of the Ms. Foundation. With your help, we can reach our goal of $3,000 for another fellowship in 2020.

Donations

Please send your checks to Elizabeth Shank in Philadelphia (see p. 24). They should be made out to the INSTAP Study Center for East Crete, with either "Seager Fellowship" or "Hawes Fellowship" written on the memo line. If you would like to donate in euros through direct deposit, please contact Eleanor Huffman (eleanorhuffman@instapstudycenter.net). You may also donate online (http://www.instapstudycenter.net/general-information/donate.html).

Reconstructing Mochlos in the Late Minoan IB Period

Angela M. Ratigan

Over the past two years, the Mochlos Archaeological Project and the Gerda Henkel Foundation in Düsseldorf have supported the development of virtual reconstructions of several buildings dating to the Late Minoan IB period at Mochlos. Belonging to the interdisciplinary field of virtual archaeology, this digital project is comprised of a series of four exploratory case studies that evaluate claims about the unique affordances of three-dimensional (3D) reconstruction and digital visualization. These case studies are part of the author's dissertation, presently underway under the supervision of Diamantis Panagiotopoulos at the Institute for Classical Archaeology at Ruprecht-Karls-Universität, Heidelberg. While the whole of the settlement will be modelled in due course, the first step is a critical appraisal of the advantages and limitations of 3D reconstruction.

While Paul Reilly coined the term "virtual archaeology" decades ago (1991, 133), only more recently others have positioned computer applications in visualization in terms of a theoretical framework (Frischer and Dakouri-Hild, eds., 2008). What remains to be seen is how virtual reconstruction might affect knowledge-formation and hypothesis-testing vis-à-vis the Minoan built environment. In a volume dedicated to the funerary customs at Phourni, Archanes, K. Papadopoulos (2010) took a step in this direction, virtually reconstructing Tholos Gamma and Burial Building 19 and dedicating much effort to simulate lighting elements and affects. As a result, he raised a number of interesting questions about the significance and meaning of light for the ancient users of these spaces. The work at Mochlos is part of this broader interest in exploring what might be learned within virtual reconstructions, but it focuses on three houses and one ritual space.

The primary evidence supporting the Mochlos reconstructions is found in the forthcoming *Mochlos* IV, and therefore the publication of reconstructions will follow the publication of that volume. In the meantime, this brief article is a report on some general considerations governing the virtual reconstructions at Mochlos. The notion of reconstructing an ancient building is complicated by a number of considerations—ideological and practical—from our institutional valuation of the original and the romantic attachment to ruins and age-value (Riegl 1903, 22) to the varying and sometimes poor state of preservation of these ruins. The enterprise of virtual reconstruction shares many of the same philosophical and ethical concerns relating to the conservation and preservation of cultural heritage, but these virtual reconstructions do not harm physical remains (Stanley-Price 2009, 43). This is one of the great benefits of virtual archaeology. Depending on the building, one could produce a single reconstruction or a range of reconstructions, from the conservative to the speculative, and in this process of developing the possibilities, we can consider the most likely appearance of that Minoan building from the series.

Implementing Best Practices

Because of the relatively recent development of the field and its exponential growth in such a short time, several cultural heritage institutions have issued treatises and principles governing the development and use of these media. The "Seville Principles" (http://smartheritage.com/seville-principles/seville-principles), building on the successes of the more general "London Charter" (www.londoncharter.org), outline a set of best practices geared specifically toward virtual archaeology. The seven principles are: (1) interdisciplinarity, (2) purpose, (3) complementarity, (4) authenticity, (5) historical rigor, (6) efficiency, (7) scientific transparency, and (8) training and evaluation. The Mochlos virtual reconstruction project is dedicated to adapting these principles.

As visual arguments in themselves, the reconstructions are rigorous in their attachment to and critical engagement with the archaeological interpretations formulated by Mochlos co-director Jeffrey Soles and all the specialists involved in the study of excavated finds to be published in *Mochlos* IVA and IVB, while also relying on feedback from the chief artist and architect, Douglas Faulmann, at the INSTAP Study Center. The reconstructions serve a number of purposes such as re-aggregating finds and facilitating the perception of latent properties or potential patterns of recurrence within the archaeological record. This is only possible after complete study of the stratigraphy and finds, otherwise one might erroneously restore objects within a room when they belonged to different stories or even to different phases of occupation. A few spaces have been selected for this kind of aggregation, and the study has yielded novel observations.

Scientific transparency is of particular importance to the project, given the degree to which conjecture and comparanda are required to fill lacunae in the archaeological record. Uncertainty is embedded within the 3D digital reconstruction models, so the dissertation developed a series of tables of conjectural values to accompany every model. This is particularly necessary for buildings of poor preservation, such as House C.1, which was overbuilt in later periods and partially excavated in 1908 by Richard Seager (1909). Additionally, the south facade had been destroyed by the winter waves and winds prior to the beginning of the Greek-American

excavations in 1989 (Soles and Davaras 1992). The extent of the house cannot be known for certain, but the dissertation discusses several potential reconstructions as a complement to the official reconstructions featured in *Mochlos* IVA.

Many archaeological publications feature site plans and facade drawings that contribute valuable information to discussions of materials and construction, the diffusion of architectural styles, and the distribution of finds, among other items. A 3D reconstruction complements and builds upon this paradigm; it can make possible innumerable views that take a more subjective, embodied perspective and allow us to consider other factors that may have effected experience within a building and/or a site, for instance color, light, views of certain special buildings from windows or rooftops of houses, and a sense of confinement or openness. Figure 1 is an example of the power of these reconstructions to communicate how these buildings may have been experienced in the past. While there is conjecture involved, it is based on the data collected from the excavation as well as from comparanda at other sites, and these hypothetical values are communicated in tables of conjectural values in the doctoral project. Figure 1 was created in AutoCAD and 3D Studio Max. Rendered in a realistic visual style for this brief article, it illustrates what it might have been like to walk south along Avenue 2 from the northeastern corner of House C.3, with Building B.2 (blocked in for the time being) bounding the west side of the street. The ability to render such views allows for a more evocative and subjective understanding of the space.

Precisely how these observations will be valued by other archaeologists remains to be seen, although recent work indicates that dynamism and exploration are of increasing interest to specialists of Bronze Age architecture (Letesson and Knappett, eds., 2017, 10–14). Given the systematic excavation and the rich interpretations that characterize the work conducted over the past 30 years at Mochlos by Soles and Costis Davaras, the site represents an ideal data set and a unique opportunity to explore the potential of virtual archaeology vis-à-vis the Minoan built environment. Returning to Reilly's inauguration of the term "virtual archaeology," he defines the model as "a replica, the notion that something can act as a surrogate or replacement for an original" (1991, 133). The virtual reconstructions at Mochlos are certainly not viewed as replicas, and they cannot substitute the original buildings, but we consider them as exploratory space in which the data set is externalized and interpretations are instantiated, and modern users experience the simulation of a Minoan built environment.

Aside from the advantages outlined above, the project is also dedicated to public education and garnering interest and support for Crete's cultural heritage. The virtual reconstructions can prime visitors for understanding what is a complex site by making these three-dimensional models remotely manipulable online. The long-term goal is to reconstruct the entire site as it would have appeared at some moment in Late Minoan IB and to make the digital model interactive and didactic.

Figure 1. Reconstructed view at the threshold of House C.3, looking south with general outline of Building B.2 at right. Adapted from Soles and Davaras 1996, 185, 195–196, figures 6, 11, and 12; rendered in 3D Studio Max, visual style: realistic.

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Ladies of Anavlochos: Six Centuries of Female Devotion on a Cretan Mountain

Florence Gaignerot-Driessen

In April 1901, on the advice of Arthur Evans, Harriet Boyd visited Anavlochos (Fotou and Brown 2006, 219), a small mountain range located in the Mirabello region and situated above and northeast of the village of Vrachasi (Lasithi, Crete). She considered excavating the site, but her discovery of Gournia a month later made her change her plans. Anavlochos was then investigated by Pierre Demargne in 1929 for the French School at Athens (Demargne 1931), and several rescue excavations were later carried out by the Ephorate of Antiquities of Lasithi between 2006 and 2014 (Zographaki, Gaignerot-Driessen, and Devolder 2012–2013). In 2017, as part of a 5-year (2017–2021) program of systematic excavations on Anavlochos, a team of the French School at Athens led by the author excavated a votive deposit (Deposit 1), which had been identified in 2016 on the western part of the summit during the survey of the massif (Fig. 1; Gaignerot-Driessen et al. 2017; Gaignerot-Driessen, Judson, and Vlachou, forthcoming). Altogether, 550 fragments of terracotta figures, figurines, and plaques (MNI = 350, mostly moldmade), were recovered from the crevices of an outcrop of bedrock overlooking a small open-air area (Gaignerot-Driessen 2018). Interestingly, almost all of these terracottas depict female figures, and they can be dated from the Protogeometric to the Classical periods. The location of the deposit at quite a distance from the settlement, the context of the finds—which echoes the ritual practices of the later Thesmophoria—and the finds themselves suggest that women may have been directly involved in the deposition of these offerings.

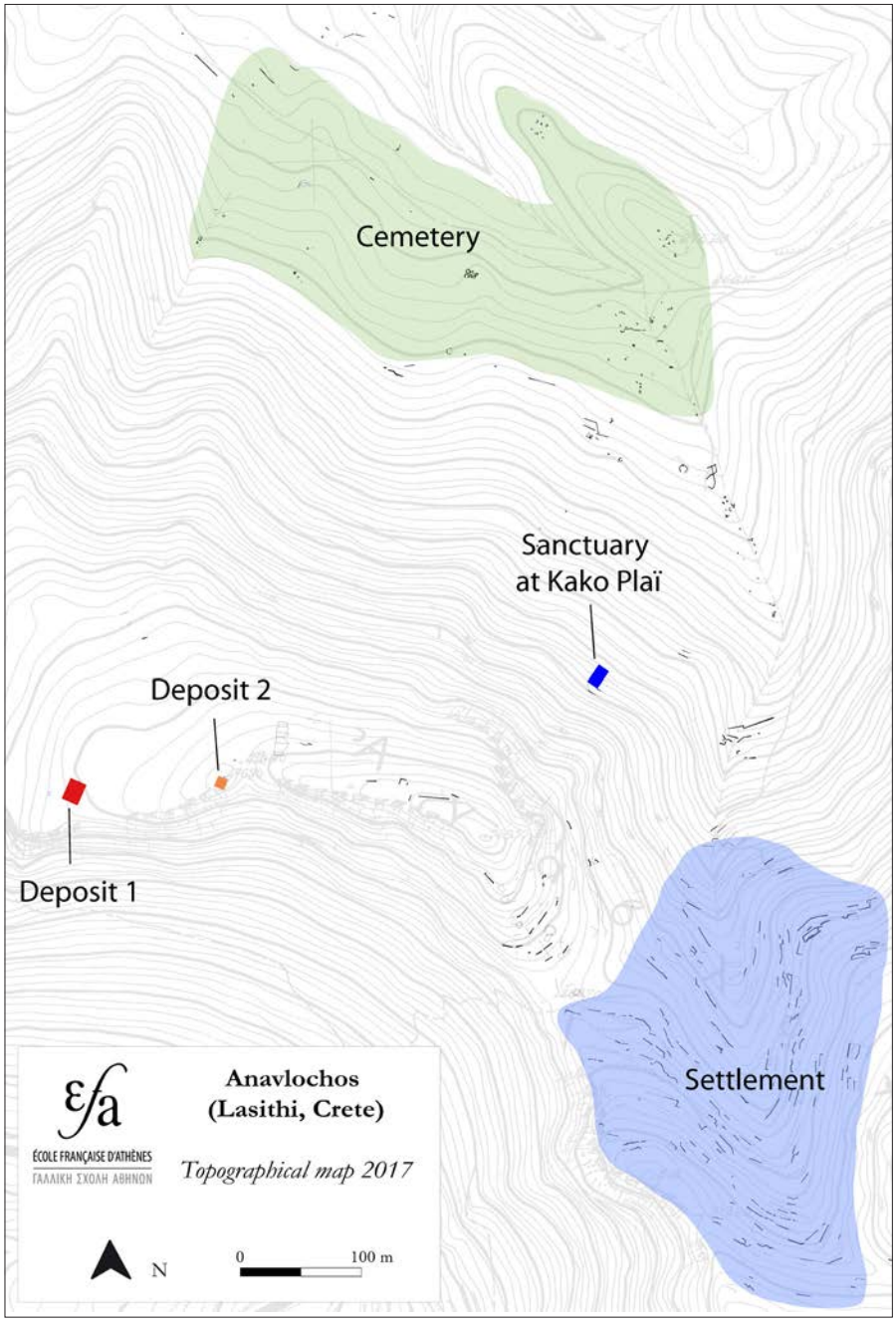

Figure 1. Topographical map of Anavlochos. After Gaignerot-Driessen 2018, 2, fig. 1.

The project supported by the 2018 Harriet Boyd Hawes Fellowship, entitled "Ladies of Anavlochos," intends to examine six centuries of female devotion on a Cretan mountain initially visited by Boyd through the study of this important and diachronic coroplastic assemblage, at multiple contextual scales: that of the find context (Deposit 1), of the site (Anavlochos), of the region (Crete), and of the Mediterranean. Ultimately and

Figure 2. Sphinx plaque 17-03-3116-OB021 (Type 1): (a) in situ (photo R. Machavoine), (b) during conservation (photo F. Gaignerot-Driessen), (c) after conservation (photo Ch. Papanikolopoulos).

more broadly, it aims at reconstructing the role of women in ritual communal practices during a crucial and formative period of transition between the Late Bronze Age and the Early Iron Age.

Thanks to the support of the 2018 Harriet Boyd Hawes Fellowship, the conservation, documentation, and study of the terracottas recovered from Deposit 1 has greatly progressed. Pepi Saridaki has cleaned and mended a large part of the pieces, Chronis Papanikolopoulos has photographed all the material (Fig. 2), Douglas Faulmann and Camille Lemoine have drawn some significant pieces of the assemblage, and the inventory of the fragments has been completed. Further work will include petrographic analyses and a detailed technological study.

As of now some preliminary observations can be proposed, based on an initial examination of the assemblage. So far 19 different types have been recognized. Among these, the most frequently attested are seated kourotrophoi figures (Type 17: 140 examples; Fig. 3), elongated Daedalic plaques representing a woman wearing a high polos (Type 2: 95 examples; Fig. 4:a), square Daedalic plaques depicting a sphinx wearing a polos (Type 1: 72 examples; Fig. 2), and small Daedalic figurines representing a naked woman (Type 3: 26 examples; Fig. 4:b). Most of the terracottas from Deposit 1 find exact or close parallels in the votive deposit from Kako Plaï on Anavlochos itself (Fig. 1), but also at the neighboring sites of Papoura, Smari, Milatos, Dreros, Olous, and Lato, and farther to the east at Praisos and Vamies (Xanthoudides 1918; Demargne 1929, 1930, 1931; Demargne and van Effenterre 1937; van Effenterre 1938; Ducrey and Picard 1969; Chatzi-Vallianou 2000; Zographaki and Farnoux 2010; Pilz 2011; Brun and Duplouy 2014). This find therefore includes Anavlochos in a regional network of cultic practices and of coroplastic production and circulation. The quantity and type of material recovered, as well as the topography of the place and the identification of sections of an ancient path near the deposit during the survey seem to indicate that Deposit 1 may have been the final destination of a sacred road that passed the old bench sanctuary at Kako Plaï (Fig. 1). This sanctuary was brought to light in 2017 and 2018, and it remained in use long after the settlement was abandoned in the beginning of the seventh century B.C.

Figure 3. Seated kourotrophoi figures (Type 17). Photos Ch. Papanikolopoulos.

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Figure 4. Plaque and figurine: (a) fragments 17-03-3108-OB038, -OB127, and -OB134 of a Daedalic plaque (Type 2); (b) figurine 17-03-3108-OB096 (Type 3). Photos Ch. Papanikolopoulos; drawing C. Lemoine.

Meet the New Librarian

Niki Saridaki is the 2018–2019 Library Fellow at the INSTAP Study Center for East Crete. She studied archaeology at the Aristotle University of Thessaloniki, Greece. She has worked as an archaeologist for the Greek Archaeological Service, and she participates as a pottery expert in various research projects on Neolithic and Bronze Age sites in northern Greece and Crete. At a doctoral level, she implemented petrography and pEDXRF analysis in the study of Neolithic ceramic assemblages from central and western Macedonia. The basic aim of her Ph.D. thesis was to investigate pottery technology and mobility during the course of the Neolithic in northern Greece. Last year, Niki was the intern in the petrography laboratory under the supervision of Eleni Nodarou. Her research interests include pottery technology and production, and particularly issues of mobility by craftsmen and/or mobility of technological knowledge.

Niki Saridaki in the library of the Study Center. Photo Ch. Papanikolopoulos.

An Interview with the 2018 Conservation Interns

Riva Boutylkova, Jemima Cowey, and Rafail Evzonas

Riva: Let's introduce ourselves! Who are we? (Fig. 1)

Jemima: I'm from Australia. I finished studying a few years ago, and since then I've been working in Dubai as a metals conservator. I applied for this internship to boost my ceramics conservation experience.

Riva: I've been studying the conservation of ceramics for the past four years at Antwerp University in Belgium. I don't have much experience with archaeological objects, which is why I applied for this internship.

Rafail: My turn. I graduated from the University of Cyprus, with a specialization in archaeology. I've been on many archaeological excavations in Greece and Cyprus. Now I am attending the post-graduate program of object conservation at Cardiff University.

Riva: Let's answer the first question, how did you get into conservation?

Rafail: For me, the interest came while I was working on the excavations. I kept thinking about how the artifacts we found would be preserved. I wanted to preserve all the data to help archaeologists research and interpret the excavations and also keep the opportunity for someone else in the future to see the same data and find other explanations and interpretations.

Riva: I got interested in conservation in high school. My favorite subjects were chemistry and art; conservation was a perfect combination of the two. For our senior project, we could choose anything to research; I chose pigments used in old paintings. Paintings conservation is the first thing I thought about. When I started my bachelor's degree in the conservation program at Antwerp, I found all these other materials that were really interesting, and I eventually chose to specialize in ceramics conservation.

Jemima: For me it's a bit of a journey. I thought I wanted to major in Japanese and economics. I took a few archaeology subjects and realized that this was my true love. So eventually I completed my undergraduate in ancient world studies, during which time I went on a dig in Israel. I realized that the actual digging part isn't necessarily what I was particularly interested in; it was more all the post-excavation work. I stumbled across the master's program in cultural materials conservation at Melbourne, and it just seemed like a natural fit. A good combination of art history, chemistry, and hand skills. Basically, everything in that one subject, that really appealed to me.

Rafail: Second question, how did you find working at the Study Center?

Riva: Well, I must say this has been a great experience for me. All the people at the Study Center are really friendly, and they know so much. As a person who hasn't studied archaeology at all, I've learned a lot from all the archaeologists, the conservators, and of course the other interns!

Jemima: Yes, definitely. As somebody who's been involved in a few excavations here and there, I found the INSTAP Study Center to be an amazing facility. There are enough resources for

Figure 1. Jemima, Rafail, and Riva (left to right) working in the conservation lab. Photo K. Hall.

Figure 2. Rafail conserving a large ceramic vessel. Photo K. Hall.

everyone, and everyone is collaborating and socializing among all the different disciplines. It was great to take a tour around the center and to be introduced to all these different specialists. To see what they actually do, day-to-day, that was fantastic.

Rafail: Jemima said basically everything. You have all these specialists coming from different disciplines; you have petrography, archaeology, zoology, botany, and much more. And for us it's good because we're conserving all these objects, and we can go to them, and they can give us a lot of information about these objects. That is very nice. You can see that there is a collaboration among all of them. And I also think the conservation lab especially is well organized. We have all the necessary equipment to conserve our materials. (Fig. 2)

Jemima: And just the opportunity to socialize and network with such a broad range of people from all around the world, that's great. Through this, I now have somewhere to stay at Thanksgiving in America. I invited myself!

Rafail: Next question, what did you enjoy the most while working at the Study Center?

Riva: I honestly liked all of it because with every object there's something else you have to do, a new treatment or a different complication that makes it challenging, and you learn a lot from that. Learning how to clean the sherds from the beginning, removing all the soil and encrustations. Working with hydrochloric acid to remove the calcium carbonate crust was especially new for me and pretty cool to see. I worked on some nice objects, little juglets with a beautiful slip decoration. It's very nice to see the end results, especially if the objects came in covered in soil, and you had no idea what it would look like in the end (Fig. 3).

Rafail: The challenge of conserving large objects.

Jemima: Like Rafail said, it was a fantastic opportunity to work on some larger objects, dealing with structural issues to get all these big pieces to hold together. I think the most challenging thing for me was in-painting of the fills, matching the colors. That was a bit of a weakness, and I think I've definitely improved now. I also had the opportunity to mentor another student for two days. That was fun, to have the chance to teach somebody else about conservation.

Riva: You also have to mention the stirrup jar.

Jemima: Definitely my favorite object was the Chryssi stirrup jar. It is a beautiful object, but very difficult to complete. It haunted me for the two months, but I'm very happy with the result. And working in the INSTAP lab was just great, having conservation debates every day about different aspects of our treatments. Kathy Hall was great in terms of allowing us to take initiative to a certain degree with our treatments, while also guiding us to a good result.

Riva: She also really made sure that we got to work on a bunch of different objects, not just the boring easy stuff. We gained a pretty broad range of conservation experience. And let's not forget the X-rays! We got to make X-rays of some objects (Fig. 4), and

Figure 3. Riva sorting pottery from Chryssi. Photo K. Hall.

Figure 4. Jemima using the X-ray machine. Photo K. Hall.

seeing the process of this technique and how it is applied within conservation and archaeology was just really cool and informative. I actually understand how X-rays work now, plus I got to develop film for the first time. You don't get to learn that very often!

Riva: Alright, time for the next question, what was your favorite part of the summer?

Rafail: Eating at the tavernas and drinking raki.

Jemima: Living in Pacheia Ammos was great, but I think the highlight of the week was usually on Friday nights, driving down to Mochlos. Having a drink with the nice sea breeze, swimming to the island and back, having some tasty food in good company.

Riva: Going to Herakleion was also a nice highlight. The museum and Knossos are of course such nice places to visit, and going out in the city was a lot of fun. I also loved going on all the little trips, to all the archaeological sites. It was especially cool to see the sites where our objects are from. We went to Chryssi Island, and that was a great trip! The walk to the excavation site was very long and hot but definitely worth it.

Rafail: Yes, the trips were great. And it's also very nice to be in Pacheia Ammos when you're interested in Minoan archaeological sites; it's central to a lot of sites so you can visit a lot of them.

Jemima: Yes. And how did you fund yourselves?

Rafail: I was pretty lucky when it comes to funding. This is part of my placement for my course, so part of my expenses were funded by my university, so food and a rent room I could afford.

Riva: Well I'm not as lucky. I couldn't get a stipend, so my funding comes mainly from Dutch government loans. Thankfully, Kathy found us some inexpensive housing. We get by.

Jemima: Since finishing work in Dubai, I've managed to line up a few internships in a row. They've all been funded straight out of my savings from Dubai.

Riva: So now what? What are our plans after this?

Jemima: Well, first the short term. I'll be going to Cyprus for a month in August to do a bit of digging and a bit of conservation. I'm working on a dig in Egypt in January–February. After that I hope that I can land something that's similar to the INSTAP Study Center where I can have a collaborative approach to conservation.

Riva: This internship has definitely convinced me to pursue a career in archaeological conservation. Since I just finished my bachelor's, I'm looking out for a master's degree specifically in archaeological conservation. I might already be starting in October, or I'll take a gap year to do some more internships. After that, finding a place like INSTAP would of course be ideal.

Rafail: Right now I have to finish my master's; I have one more year. I would like to engage with archaeological excavations and conserve archaeological materials. I would also like to gain experience in site conservation.

Riva: Perfect. Thank you both for this interview. We all extend our thanks to the INSTAP Study Center for East Crete and all of the staff here for this summer!

It's a Plasterpiece! The Neopalatial Plasters of Gournia

Anne P. Chapin

Until recently, undecorated plaster from Minoan archaeological contexts across Crete received little detailed study, and the plaster from Gournia was no exception. Harriet Boyd Hawes, in her 1908 publication of the 1901–1904 excavations of Gournia, observed that plaster appeared extensively across the site as a construction material, but she did not catalog any pieces (Hawes et al. 1908, 21, 25). She writes, however, that plaster was applied as overlays on stone and brick door jambs, walls, and benches, and it covered the joints and faces of ashlar construction in the palace. It was used in ceiling and roof construction, and to form pavements. These plasters are not readily visible at the site today, so the discovery of significant quantities of plaster in the 2010–2014 excavations (directed by L. Vance Watrous, University of Buffalo) presents an important opportunity to study Minoan architectural plaster in detail. Offered here is a brief introduction to the plasters excavated from the palace.

Of great interest are fragments of decorated plaster offering tables found in MM IIIA contexts in Room 17 of the palace (Figs. 1, 2). This room is situated west of Gournia's public court, and

Figure 1. Fragments from a circular plaster offering table (inv. no. 12.1612a, b). Photo J. Spiller.

Figure 2. Fragment of a rectangular plaster offering table placed on its side (inv. no. 12.1600a). Photo J. Spiller.

it is notable for a large pottery deposit. Three types of tables are identifiable: circular, ovoid, and rectangular. A circular table was painted with red and white decorative bands, and it measured 36 cm in diameter (Fig. 1). An ovoid table was painted with red and white bands, and it has a blunted tear-drop shape. The rectangular table has rounded corners, and it was probably supported by four short, sturdy legs made by molding plaster in shallow ceramic bowls. A gray "silent wave" pattern and areas of pink paint supplement the red and white bands decorating its rim (Fig. 2). The red band is blurred, demonstrating that table's surface was polished while the painted plaster was damp. Such details are generally interpreted as evidence that Minoan artists employed the true (*buon*) fresco technique, when pigment penetrates the damp plaster surface to create a lasting bond between pigment and plaster.

Neopalatial wall plasters were concentrated in Rooms 13–17 of the palace. Most fragments are small and monochrome in color: mostly red and white, but yellow ocher and shades of brown, gray, and black also appear. Egyptian blue is identifiable on a few fragments by its bright blue color and distinctive granules of pigment. No figurative or geometric designs were identified, but some fragments preserve painted bands defined by string lines snapped into damp plaster—another indication that Minoan painters employed true fresco (Fig. 3:a). Flaking paint, however, tells a different story. When plaster is dry, pigments do not bond with the wall; instead, they require organic binders, such as egg or animal glue, to adhere to the surface. Without binders, pigments easily flake, and it is interesting that a number of lime plaster wall fragments from Gournia preserve flaking paint. Perhaps Neopalatial craftsmen began their work while walls were damp, but they were not overly concerned to finish before the plaster dried.

Hawes also described plaster pavements in and around the palace, some of which were comprised of lime plaster mixed with pebbles and identified as "concrete" or "cement" (Hawes et al. 1908, 25), now termed "*tarazza*." New excavations in the Gournia palace produced evidence for LM IB *taraz*za floor pavements in Rooms 13–16 (Fig. 3:b). These pavements are striking for their quality, attractiveness, and durability. Lime plaster was mixed

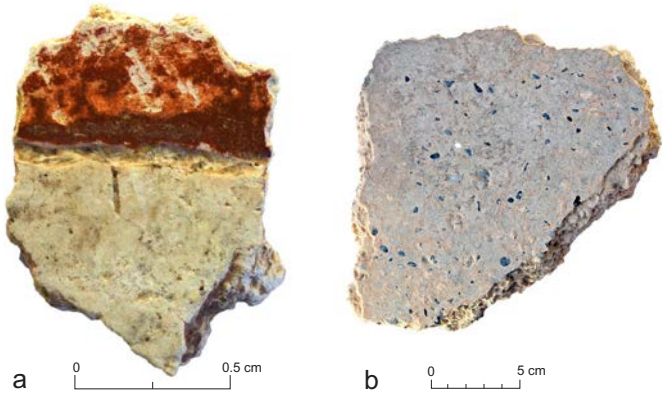

Figure 3. Plaster fragments: (a) wall plaster with string line and flaking paint (inv. no. 12.1774), photo J. Spiller; (b) lime tarazza *plaster floor (inv. no. 11.2455), photo C. Haynes.*

with waterworn pebbles of uniform size and laid in a layer 2–4 cm thick. This was covered with a thin plaster and pebble finishing layer only 0.2 cm thick and was polished smooth to make an attractive, water-resistant paving. Some *tarazza* fragments preserve a supporting mudbrick layer, while others bear the marks of organic materials on their lower surfaces, indicating that the *tarazza* palace plasters served as upper floor pavements. Some floor fragments have distinctly dark gray surfaces, possibly created by the admixture of charcoal ash to the finishing layer, and possibly intended to imitate variegated stones such as conglomerate.

Ceiling and roofing plasters are also identifiable. Some fragments preserve reed impressions from ceilings, and others preserve the imprint of wooden ceiling beams. One large, heavy chunk of plaster may come from the palace's roof; of interest are its multiple layers of plaster mixed with small stones, its preparatory earthen layer, and its smoothly finished, polished upper surface. Similar pieces of roofing plaster preserve the palm prints of plaster workers on their preparatory surfaces, and they suggest that the plaster roof was gobbed into place by the handful (Fig. 4).

Figure 4. Brian Abfel demonstrating the palm prints on a possible roofing plaster fragment (inv. no. 12.1610g). Photo. A. Chapin.

In sum, the new excavations at Gournia yielded different types of plaster from the Neopalatial period, each of which contributes significant information for how plaster was used in elite Minoan architecture. It is hoped that continued study and publication of the Gournia plaster pieces will spark additional interest in the multiple roles of plaster in Minoan civilization.

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Oliver Rackham: His Legacy and the Ancient Trees of Crete

Jennifer Moody

Fifty years ago a tall, lanky, rather shy young Brit walked into the Cretan landscape and fell in love with the trees. Although no one realized it at the time, these historic steps would forever change the face of environmental studies in Crete.

Meet Oliver Rackham, 29 years old and one of the youngest Fellows at Corpus Christi College Cambridge (Fig. 1). His quirky genius and warm heart forged an early and lasting friendship with Peter Warren (the now eminent Minoan archeologist) when they were students at Corpus. And so it was that Oliver came to Crete in July 1968 as the expeditionary botanist on Peter's legendary excavation at Myrtos Phournou Koriphi. That summer Oliver hiked all over the area from Myrtos to Anatoli to Malles and up into the high mountains, where he encountered his first ancient Cretan trees—the impressive prickly oaks (*Quercus coccifera*) of Selakano. Oliver was familiar with ancient woodland and veteran pollards in England, but he did not expect to see them in Crete. He was very impressed!

In 1981, I convinced Oliver to come back to Crete to help me on an archaeological survey of the Chania region that I was doing for my Ph.D. We hit it off, and for the next 34 years we explored the Cretan and other landscapes together. We climbed mountains, hung off cliffs, bivouacked in medieval ruins, and wriggled our way through dense tangles of spiny broom. I drove, and Oliver rode shotgun. Discovery after discovery was made. Adventure after adventure was enjoyed.

Oliver read landscape like you or I might read a book, and as you walked along beside him, he would tell you its story. It might be a place you had visited many times and had thought you knew, but the day you went with Oliver, it was almost as though you had never been there before. He opened your eyes and made you want to notice the tiniest detail.

We had many "in search of" projects to help us grasp Crete's enormous diversity: in search of primroses, in search of the Cretan date palm (*Pheonix theophrasti*), in search of *diktamo* (or dittany, *Origanum dictamnus*), in search of laurisylvan refugia, and so on. But the one that he never tired of was "in search of ancient trees!" And Crete is full of them: olives, planes, cypresses, prickly oaks, sea junipers, pines, and even the island's endemic elm (*Zelkova abelicea*), known in Crete as *ambelitsiá.*

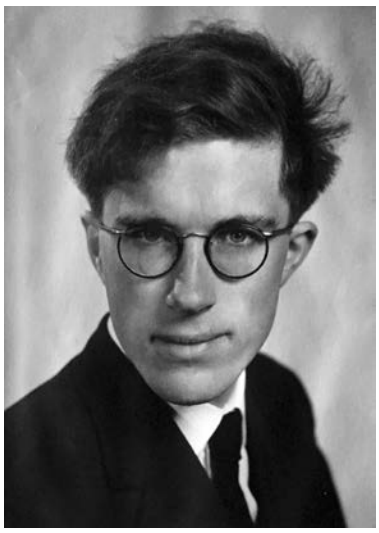

Figure 1. Oliver Rackham in 1964, a young Fellow at Corpus Christi College Cambridge. Photo courtesy archive of Corpus Christi College.

During our years on Crete together, we wrote *The Making of the Cretan Landscape*, and it won the Runciman Book Prize in 1997. Concerned that it was not reaching a wide enough audience, we published a Greek translation in 2004, *Η δημιουργία του Κρητικού τοπίου.* We explore how the interplay of "man" and nature over time formed the Cretan landscape we know and love. We emphasize that it is not a "degraded" landscape but a rich and diverse place filled with ancient trees and meaning.

Oliver endeared himself to the people of Crete, academics and lay people alike, through his actions and his words. His passion for Crete was contagious, and he relayed it through his writings and the many field courses, seminars, and lectures that he gave at the University of Crete, the Natural History Museum of Crete, the Mediterranean Agronomic Institute of Chania (MAICH), the series of International Congresses of Cretan Studies, environmental workshops, conservation rallies, and garden clubs. His death in 2015 caught us all by surprise.

Three years later, during the 50th anniversary of his coming to Crete, a number of events celebrated Oliver and his contributions to environmental research and conservation on the island. Fittingly, two were ancient tree dedications—one in the

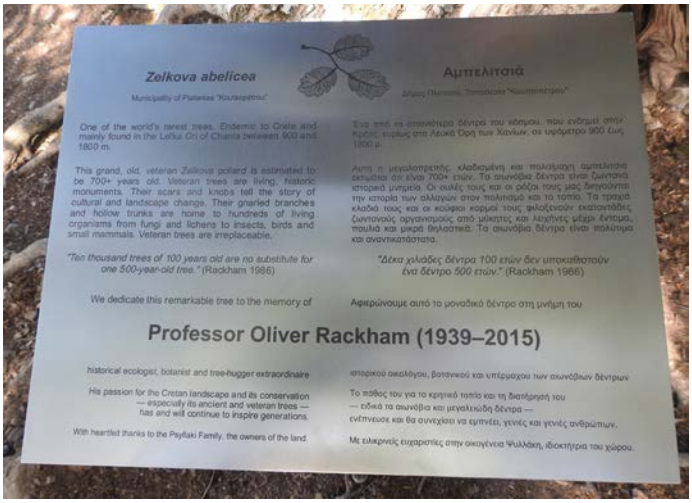

Figure 2. Upper left: in this magical setting, Father Stylianos of Lakkoi blessed the tree and chanted a memorial service for Oliver. Right: looking into the crown of the veteran ambelitsiá now dedicated to Oliver. It has a circumference of ca. 4.3 m and an estimated growth rate of 1 mm/year. This tree was first recorded and photographed by Rackham and Moody in 1983. Lower left: memorial plaque by the tree, made by Rene Starink. Photos K. Stara, C. Orphanoudaki-Kapagioridou, and J. Moody.

White Mountains of Chania and the other in the Dicte Mountains of Lasithi.

The first was the dedication of a magnificent 700-year-old veteran *Zelkova abelicea* (*ambelitsiá*) pollard high in the White Mountains at a place called "Koutsopetro" near the head of the Samaria Gorge overlooking the Omalos Plain of Chania (Fig. 2). It took place on August 6th, and it was organized by the Friends of Oliver Rackham, the Municipality of Platanias, the Samaria National Park Management Body, the Forestry Service of Chania, and MAICH.

Zelkova abelicea is the only tree endemic to Crete. It became isolated from others of its genus during the Miocene, and it is now the subject of an in-depth study (http://www.abelitsia.gr/en/). The tree dedicated to Oliver is part of a remarkable grove of Cretan Zelkovas with more than 30 trees—all pollards—over 200 years old.

The tree dedication was followed by a reception at the Xyloskalo Restaurant where friends and colleagues spoke about Oliver's legacy, character, and continuing impact (Fig. 3): Kalliope Pediaditi Prud'homme (Friends of Oliver Rackham and Université de Toulon), Cliff Cook (videographer), Ilektra Remoundou (MAICH), Giannis Fotakis (Forestry Service), Mariana

Figure 3. Kalliope Pediaditi Prud'homme addressing the 50+ attendees at the Xyloskalo Restaurant. Photo C. Orphanoudaki-Kapagioridou.

Figure 4. Left: the great prickly oak, Selakano 1, as it was on July 5, 1968. Right: Selakano 1 on September 19, 2018. Note the two large branches now missing from the tree. This tree is between 850 and 1,000 years old. Photos O. Rackham and J. Moody.

Figure 5. Left: Selakano 2, a massive prickly oak stool located 40 m upslope from Selakano 1. It is about 1,300 years old. Right: Selakano 3, a huge pollard five minutes away from Selakano 1 by car at a place called "Roussolakos." It is one in a row of five big pollards that probably mark a boundary. It is 650–750 years old. Photos W. Dossett and C. Orphanoudaki-Kapagioridou.

Figure 6. Argyris Pantazis and Pavlos Daskalakis present Jenny Moody with a bottle of olive oil produced from centuries-old trees by the cooperative Eptastikos. Photo C. Orphanoudaki-Kapagioridou.

Figure 7. Oliver Rackham and the awesome prickly oak, Selakano 1, July 2008. Photo J. Moody.

Kavroulaki (Ιστορική, Λαογραφική και Αρχαιολογική Εταιρεία Κρήτης), Toula Triamandili-MaGann (architect), Anaya Sarpaki (archaeologist), Vera Klontza-Jalkova (archaeologist), and Kostas Vomvolakis (attorney).

The second tree dedication included three massive prickly oaks in Selakano, Lasithi on September 16th (Figs. 4, 5). The event was organized by the Cultural Association of Selakano with support from the Municipality of Ierapetra, the Natural History Museum of Crete, and the social cooperative partnership Eptastiktos. It was especially moving because one of the trees, Selakano 1 (Fig. 4), was the exact tree that first inspired Oliver 50 years ago, when he trekked to Selakano in July 1968.

A crowd of about 30 people gathered along the main road into Selakano at the place called "Mandali" to pay their respects to the area's remarkable oaks and to Oliver Rackham. Manos Daskalakis, president of the local cultural association, kicked things off by telling us about the importance of prickly oaks to the local economy. Then short talks were given by Argyris Pantazis (Municipality of Ierapetra; Fig. 6), Pavlos Daskalakis (Eptastikos), Antonis Anipsitakis (Μια Κρήτη), Jerolyn Morrison (Minoan Tastes), and Jenny Moody (University of Texas). After paying our respects to these three amazing prickly oaks, we were treated to a tasty lunch at Pezoulia Taverna in Selakano.

Oliver celebrated ancient and veteran trees wherever he went: Texas, Japan, Crete. His enthusiasm for them and the myriad of organisms that dwelled on, in, and under them was boundless (Fig. 7). He was well-known for saying, "Ten thousand trees of 100 years old are no substitute for one 500-year-old tree" (*History of the Countryside*, 1986). Thus, it is a fitting tribute that these four extraordinary, veteran trees now celebrate his life and work here in Crete—a place he considered "heaven on Earth."

Origin and Practice of Trade at Early Minoan Mochlos: A Report on 2018 Work Supported by the Richard Seager Fellowship

Luke Kaiser

The Minoan system of trade has always been of principal interest to Aegean prehistorians. During the Late Bronze Age the Minoans accessed and distributed diverse materials within the sphere of their influence, materials that originated from as far away as Afghanistan and that also required long distance travel to Egypt (Colburn 2008, 212, table 2; Demand 2011, 131; Soles 2011; Price 2013, 228). The focus of my research, funded by the Seager Fellowship, is to define the development of trade during the Early Minoan (EM) period—using the settlement of Mochlos as a case study—providing the basis on which the trade network grew in later periods. I propose that the EM trade system did not emerge due to the pursuit of prestige goods alone; rather, the residents of Mochlos were searching for and accessing more utilitarian goods, such as obsidian, which were brought to the settlement and benefitted the local society as a whole (Carter 1999, 2004, 2008). This pursuit impacted the social roles of these travelers, evidence for which can be found in the ceramic innovations found within a cistern midden deposit and also in the broader nonceramic diachronic data from the EM town of Mochlos, both of which can illuminate the transformations that took place in the social structure of paramount individuals at that time.

During my Seager Fellowship, I analyzed a ceramic assemblage that was excavated in 2012 at Mochlos. It was found within a cistern located in the northwest sector of the town, and it gradually became a midden during the EM I period (Area D2, Trench 97/9800). Upon analysis, the cistern midden was found to contain stratified ceramics from EM IA to EM IIB. Tom Brogan and Eleni Nodarou preliminarily studied the material and graciously shared it with me for my graduate research. They defined a series of phases (1a–4) that relied on vessel and fabric typologies in relation to the stratigraphy of the cistern. When the phases were confirmed, the data was overlaid onto the traditional EM I–II chronology (Betancourt 2007, 3, fig. 1.2) in order to compare it with data from other Mochlos deposits that will be studied further, and the phases also function as comparanda for other sites in the area of the Gulf of Mirabello that may lack the chronological nuances of the cistern midden. Phase 1a correlated with EM I, Phase 1b with EM IB, Phase 2 with early EM IIA, Phase 3 with late EM IIA, and, finally, Phase 4 was the only phase with EM IIB material but also contained a mix of earlier material. Within these phases, I analyzed the shape and fabric types of accessioned vessels as well as fragmentary sherds in an attempt to understand how the vessels changed through time

(Kaiser 2016). As a result, patterns emerged that define Mochlos' spheres of interaction during the EM period that will be enhanced by future statistical studies of the assemblage.

Firstly, the deposits of Phases 1a and 1b contain a small but impressive number of objects with clear links to the Cyclades. These include definite imports like a finely painted sauceboat (P11169; Fig. 1:a) and several objects with close parallels to the Kampos Group, including a Pyrgos bottle (P12221; Fig. 1:b), a chalice with a bulging stem (P12238; Fig. 1:c), and a globular pyxis and lid (P12239, P12242; Fig. 1:d). Other finds associated with metalworking also exhibit links with the Cyclades, including a stamped tuyère (C1220; Fig. 2; Krzyszkowska 2005, 39–45; Georgakopoulou 2013, 670–671; Wilson 2015). I therefore propose that during EM I Mochlos possessed strong ties with the Cyclades, or, at the very least, it was influenced by Cycladic styles through some form of contact (Davaras and Betancourt 2012).

During Phases 2 and 3, however, these connections with the islands declined or changed in character (Fig. 3). Imports of Cycladic shapes or examples of Cycladic-style pottery made on Crete ceased, and there was an increase in local Mirabello fabrics with metamorphic, granodiorite, and gold mica inclusions, most notably during EM IIA (Kaiser 2016; Brogan, Kaiser and Nodarou, forthcoming). This implies a greater affinity for vessels produced within the Mirabello region. In terms of the vessels, the non-Cretan bowl was replaced entirely by a handleless bowl of a Mirabello fabric. Finally, during Phase 4, we see the deposition of Vasiliki Ware in the cistern midden. Early Minoan IIA thus marked the emergence of an expression of Mirabello culture and intraregional contact at Mochlos that was expressed in this shift toward local fabrics and vessel styles that persisted throughout the EM II period.

Because of the EM I affinity for Cycladicizing vessels at Mochlos, one should determine where the inhabitants developed this interest and how they obtained the knowledge required to the construct vessels in this manner. One possible solution for this scenario has already been posited by Yiannis Papadatos and Peter Tomkins (2013) from their work on the deposits from Kephala Petras. This site, like Mochlos, used almost entirely Melian obsidian with only a few exceptions (Carter 2004; Papadatos and Tomkins 2013). Though the sample size from Kephala Petras weighs less than 2–3 kg, it is significant because it is a Final Neolithic IV deposit, and it contains more material than most sites of this period. Mochlos, however, during EM I–II, possessed an astounding amount of obsidian, with a massive deposit found within the house tombs (Carter 1999, 2004, 2008). Based on the location of the obsidian deposits both at Mochlos and at Kephala Petras, it is clear that the merchant class from East Crete prided itself on its ability to acquire obsidian in the era during which the first evidence of social ranking appeared in Crete, from the Neolithic into the Early Bronze Age (Soles 1988).

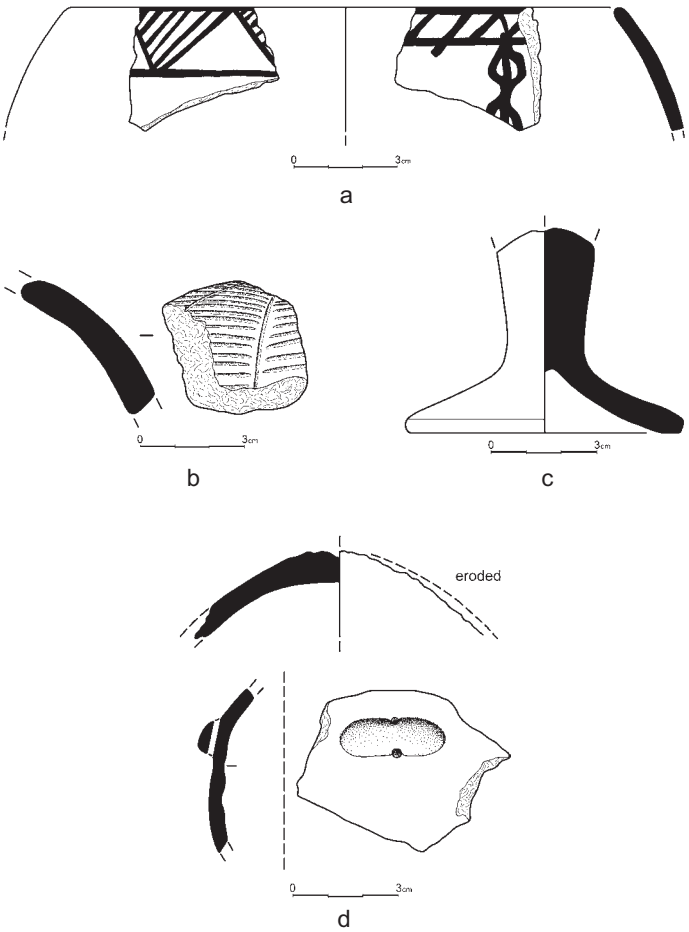

Figure 1. Pottery from Phases 1a and 1b in the cistern midden: (a) finely painted sauceboat (P11169); (b) Pyrgos bottle (P12221); (c) chalice with a bulging stem (P12238); (d) lid and globular pyxis (P12239, P12242). Drawings D. Faulmann.

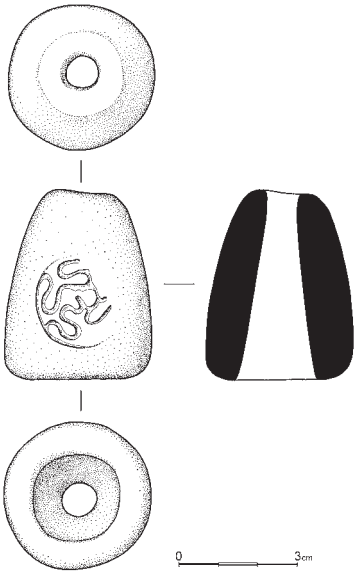

Figure 2. Ceramic stamped tuyère (C1220). Drawing D. Faulmann.

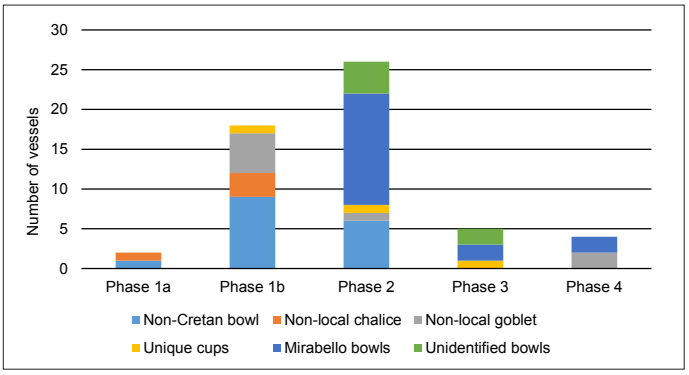

Figure 3. Drinking vessels from the Mochlos cistern midden from EM IA to EM IIB. After Kaiser 2016, 120, table 5.

The acquisition of material culture, such as obsidian, that benefitted not only the elites at Mochlos but also the average inhabitant of the village could have served as the basis for this trade system. With no viable chipped stone sources on Crete, the acquisition of a material capable of performing as well as obsidian within the scope of daily life would have been crucial. Those capable of making this journey therefore eventually developed the identity of merchants as they returned with obsidian for dissemination among the people. This role would have elevated them within society, and they further displayed this identity through ceramic objects such as several boat models that have been found at Mochlos in various contexts (Soles 2012, 194, figs. 21.8, 21.9, 21.11). As they continued to voyage abroad in order to access utilitarian goods, they surely began to come in contact with more prestigious, non-utilitarian objects. The elevation of the paramount individuals of Mochlos thus increased alongside the proliferation of rarified goods, and this was heavily reliant on cooperation among individuals in order to secure their mutual success (Legarra Herrero 2004; Colburn 2008).

In conclusion, though there was certainly some type of social contract in place, which could allow these paramount individuals to interact with each other peacefully, it is clear that cooperation did not always occur. It seems that Mochlos was destroyed at the end of the EM IIB period, resulting in a significant shift in the settlement patterns from the northwestern area of the south-facing slope of the settlement on the islet down to the coastline (Brogan 2013). This could have been the result of Mochlos' paramount individual(s) not fully cooperating with regional peers in an appropriate manner, thus decreasing Mochlos' comparatively high level of social ranking for a site from Prepalatial Crete (Soles 1988). This moment of interruption, however, did not stop Mochlos' involvement in the rapidly developing Minoan trade network. Mochlos quickly recovered and was soon active again in the Middle Minoan period, though the network was clearly and increasingly defined and controlled by multiple Protopalatial centers across the island. The image of the boat continued to exist at Mochlos during the Minoan period, and wall paintings in Egyptian tombs show that Minoan merchants were still traveling around the eastern Mediterranean retracing the journeys of their ancestors well into the second millennium B.C. (Panagiotopoulos 2001). Perhaps some of the Minoans taking the long trip to Egypt were even Mochlos inhabitants themselves. As the trade system, particularly in the Late Minoan period, began to expand farther abroad outside the Aegean, the core of the network still remained within the connections established during the Early Minoan period, stretching from Anatolia through the Cyclades to the southern extent of the Peloponnese. Without the maintenance of these avenues of trade throughout the Bronze Age, the Minoan trade system would not have lasted as long as it did.

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In Memoriam

Mary Ellen Carr Soles, a long-time member of the Mochlos Project, passed away in January after a long illness. She first came to Crete in 1976 to help her husband, Jeffrey, draw a plan of the Mochlos sandstone quarry, and she quickly fell in love with Crete and all things Minoan. After the excavation began in 1989, she worked as a cataloger for 25 years until 2015, when her illness prevented her from returning to Crete, and she contributed to several Mochlos publications, especially *Mochlos* volumes IC and IIC (2004, 2011). In 1982 she was hired as Curator of Ancient Art at the North Carolina Museum of Art in Raleigh and served in that capacity for 28 years. She was responsible for the Greek and Roman collection, where her main interest lay, but also the Egyptian, Mesoamerican, African, and Oceanic collections. She defended the importance of archaeology in an art museum that was primarily dedicated to Renaissance and modern art, but with the help of various donors she was able to expand each collection and make the museum a more inclusive institution that attracts diverse audiences.

In 2003 Mary Ellen launched the Friends of Greek Art, a group of North Carolina citizens of Greek descent, who raised hundreds of thousands of dollars to support the Classical collection. She transformed a minor collection of Greek and Roman antiquities into one of national importance. As an archaeologist and museum curator, she was especially mindful of the damage that the unscrupulous collection of antiquities does to the world's common cultural heritage and was also adamant that the museum follow the guidelines of the 1970 UNESCO Convention on the Means of Prohibiting and Preventing the Illicit Import, Export, and Transfer of Ownership of Cultural Property in all its purchases.

Mary Ellen Soles. Photo courtesy J. Soles.

Mary Ellen Carr was born in Cambridge, Massachusetts, in 1948. She received her undergraduate degree from Manhattanville College and her Ph.D. from Yale University. She first came to Greece as a Yale travelling fellow to study at the American School of Classical Studies at Athens. She excavated at Corinth and wrote her dissertation on statues of Aphrodite at Corinth. As a curator at the NC Museum of Art, she was especially proud of the fact that she was able to locate the head of the museum's Aphrodite Anadyomene in the museum's basement and restore it to the statue, making it the only example of its type with its head still preserved in situ. In November of this year the museum held a special ceremony in Mary Ellen's honor and dedicated the statue in her memory.

Mary Ellen is survived by her husband of 45 years, Jeffrey Soles, her children, John and Abigail, and her three grandchildren, Penelope (age 6), Christopher (age 4), and her namesake, Mary Ellen (15 months).

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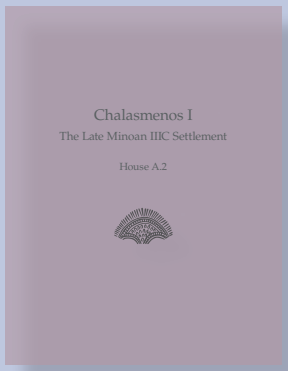

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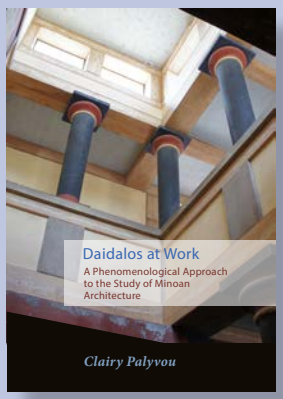

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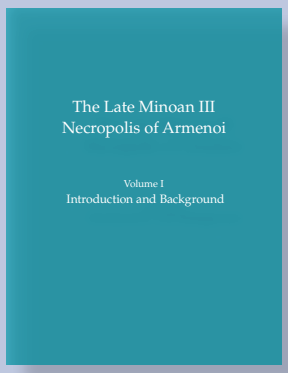

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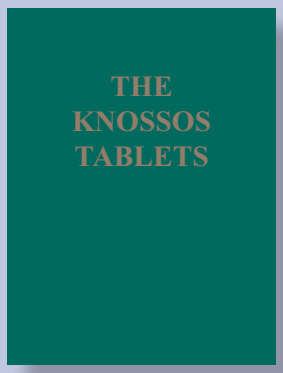

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Congratulations

Angela Ratigan and Georgios Doudalis were married on June 10, 2018, in the Church of the Metamorphosis of the Savior (ιερός ναός της Μεταμόρφωσης του Σωτήρος) in Psachna, Euboea. Photo C. Dupont.