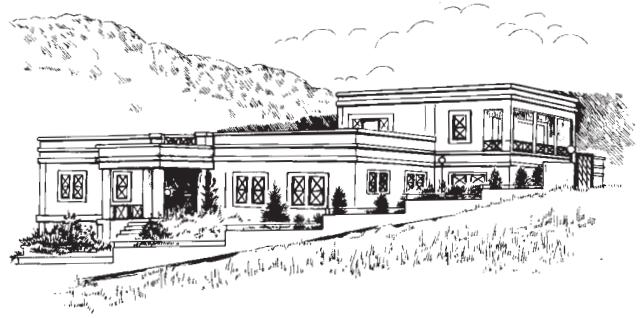


# KENTRO

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## ON FISH BONES, SEASHELLS, FISHERMEN, AND SEASIDE LIVING AT LATE MINOAN IB MOCHLOS

Dimitra Mylona

During every summer of the last three decades at Mochlos, dozens of soil samples were collected, water-sieved, and sorted (Figs. 1, 2). This was part of the archaeo-environmental program of the excavation. Combined with the standard practice of hand collection during the excavation, it led to the accumulation of a very large amount of bio-archaeological finds (carbonized seeds, wood charcoal, bones of mammals, fish, birds, and microfauna, and also marine mollusks). Remains of fish and shellfish, particularly numerous and varied, were found in almost every context. This situation presented a number of intriguing questions regarding the nature and organization of fishing at Mochlos in Bronze Age (BA) Crete, the contribution of fishing to the economy, the social dimension and implications of fishing and fish eating, and the potential of marine creatures as vehicles for symbolic thought. This paper is based on aspects of a full-scale analysis of the animal remains from the Neopalatial strata at Mochlos, which is to be published in the next volume (IV) on the Neopalatial settlement. Here I will examine the way fishing and shellfish gathering was organized in Bronze Age Crete.

### The Material: Fish Bones and Seashells

The Late Minoan (LM) IB phase at Mochlos is archaeologically visible in a large number of buildings, open spaces, and streets of the settlement (Fig. 3). Excavation of the LM IB strata produced 852 fish bones, 5,865 marine mollusks, and several

thousands of mammal remains. The fish bones belong to at least 13 families and many more species and genera, and they range in size from less than 8–10 cm in length for the smaller taxa (e.g., *Chromis chromis*, or damsel fish; Centrarchidae, or picarels) to almost a meter long for the largest of them (e.g., *Epinephelus* sp., or grouper; *Dentex dentex*, or common dentex). The marine

mollusks are as varied as the fish, belonging to 59 families and several species within each of them. Some of the mollusks, such as limpets (*Patella* sp.), monodonts (*Phorcus* sp., previously known as *Monodonta* sp.), and purple shellfish (*Hexaplex trunculus*) are present with several hundred individuals; others, such as spiny oyster (*Spondylus gaederopus*), triton (*Charonia* sp.), bearded ark (*Barbatia barbata*), or small *Pisania striata* and *Columbela rustica* are fairly common, with dozens of individuals scattered across the settlement. Finally, many of the seashells are represented by a few individuals only. This impressive taxonomic variety comes in stark contrast with the limited variation of the ter-

restrial animals (both mammals and birds), among which cattle and dog are scarce, large game animals (deer and wild goat) are absent altogether, and small ones (hare, birds) are scarce as well.

Fish bone preservation is variable. There is a scatter of broken, eroded, and heavily damaged fish bones all over the settlement. These are mostly otoliths and vertebrae of small fish (Fig. 4). They form a type of “background noise” in most BA settlements on Crete (Rose 1994), and they appear to be food remains



Figure 1. Water flotation at Mochlos. Jeff Soles remembers: “Julie Hansen set up our water flotation system in 1989 (powered by automobile batteries); Doug Faulmann painted an octopus on the barrel, and numerous students used it until we moved to the Study Center.” Photo courtesy Mochlos Excavation Project.



Figure 2. Sorting of residue, one of the by-products of water flotation. Residues contain many types of archaeological materials: wood charcoal fragments; carbonized seeds; small bones of mammals, fish, and birds; microfaunal remains; and various small objects such as microliths, beads, and fine pottery fragments. Photo M. Nilsson.

that found their way into the archaeological sediments through processes of discard, trampling, sweeping, and random reworking of soils. In certain buildings and rooms and on some of the successive floors within them, however, there have been found concentrations of fish bones of a very different nature. These are whole, well-preserved bones, anatomically variable and from a variety of large fish (Fig. 5). They do not appear to have gone through the attritional processes described above.

The marine mollusks followed different taphonomical paths (Fig. 6). Because of their hardness, they usually survive in

reasonably good shape despite trampling, weathering, and burial, among other forces, and unless they had been removed from the living spaces as waste, they accumulate in archaeological deposits as taxonomically rich assemblages with a variety of shells of different origin (from rocky, sandy, and muddy substrates). At Mochlos, however, certain concentrations stood out due to density and consisting of a few edible species, mostly limpets and monodonts. In addition, some of the marine mollusks were modified on site and used for purposes other than culinary. Concentrations of crushed purple shells (*Hexaplex trunculus*), for example, which probably originated from a purple dye workshop in the broader area, ended up in the settlement as construction raw material, while several perforated seashells were apparently elements of composite jewelry.

### Fishing Grounds and Fishing Technology

Not all fish and marine mollusks have the same environmental requirements and habits. For instance, groupers prefer rocky sea bottoms and hide in crevices, while flatfish are found in sandy environments, and picarels swim in mid-water, forming small or larger schools. The fishermen need to take these facts into account and use fishing tools and methods that take advantage of them. The fish bones and seashells that are found in excavations are the leftovers of successful fishing efforts, thus providing clues to the fishing grounds and fishing technology used by ancient fishermen.

At LM IB Mochlos, the majority of fish and marine mollusks are creatures of the shore. Picarels, bogues, damselfish, and

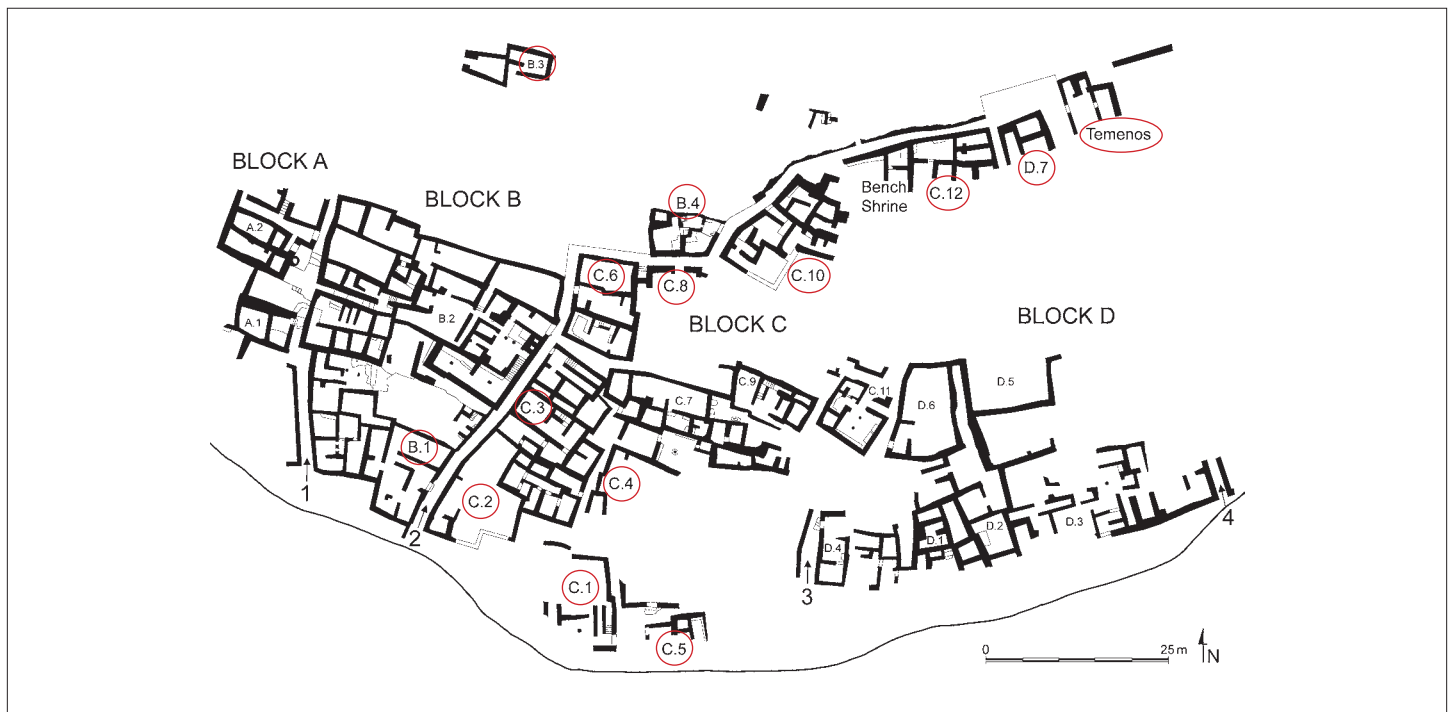


Figure 3. Site plan of Neopalatial Mochlos. The buildings that produced animal remains, including fish bones and seashells, are marked with red circles. Plan D. Faulmann.





Figure 4. Bones and otoliths of small fish from Mochlos. Photo Ch. Papanikolopoulos.

combers are all found in shallow water in small or larger schools, along with young individuals of fish that normally grow to much larger sizes, such as parrot fish (*Sparisoma cretense*), pandoras (*Pagellus erythrinus*), and other sea breams (Sparidae). These use the shallow, warm, protected waters of the shore as nurseries. This combination of species forms the bulk of the fishbone assemblages not only at Mochlos, but also at other BA sites on Crete and in the Southern Aegean more generally (Rose 1994; Mylona 2000, 2014). Their capture can be done with relatively simple means, such as a cast net or other small nets, either from the shore or from a boat (Rose 1994; Powell 1996). Harvesting of the shallows by simple or even rudimentary technology is also reflected on the majority of the marine mollusks. Limpets, monodonts, sea urchins, and certiths, among other shells, can all be gathered from the rocks of the shore by simple hand picking or with simple tools such as a knife or an empty limpet shell (for an ethnographic account, see Leukadites 1941). These may leave visible traces on some of the shells, especially the limpets, in the form of “nicking” marks on their lip. No swimming or diving skills are required for this type of fishing and shellfish gathering.

What sets the LM IB fish assemblage from Mochlos apart from most other Bronze Age sites on Crete is the considerable amount of bones from larger fish—such as groupers (*Epinephelus* sp.), common dentex (*Dentex dentex*), red porgy (*Pagrus pagrus*), striped sea bream (*Lithognathus mormyrus*), common pandora (*Pagellus erythrinus*), parrot fish (*Sparisoma cretense*), and mullets (Mugilidae)—which are found concentrated in certain contexts. Most of these fish are fully grown individuals, some having reached the maximum size for their species. Like the smaller fish in the assemblage, they are inshore species, which can be caught near the shore, from sandy or rocky bottoms, or sea bottoms covered with *Poseidonia* seaweeds. Most are bottom dwellers, a fact that has implications on the way they were caught. Unlike the smaller fish in the assemblage, however, these are found in somewhat deeper waters, or alternatively in waters that are not regularly exploited. For these very large fish, harpoons or hooks and lines (of various configurations) are the more suitable catching method, although some of them could occasionally be caught by net (for this type of fishing technology in the Bronze Age, see Rose 1994; Powell



Figure 5. Bones of the large fish from Mochlos. Photo Ch. Papanikolopoulos.



Figure 6. A typical sample of marine mollusks from Neopalatial Mochlos. Photo Ch. Papanikolopoulos.

1996; for an ethnographic account, see Leukadites 1941; for a technical account, see von Brandt 1972).

The molluscan assemblage from LM IB Mochlos provides additional evidence for the exploitation of deeper waters and/or the use of more elaborate technology and fishing skills. Purple shellfish (*Hexaplex trunculus*) are common at Mochlos, and some of their shells possibly originate from the purple dye industry in the area (e.g., Apostolakou et al., forthcoming). Although this species is often found in shallow waters, its systematic exploitation required specialized fishing techniques and possibly diving (Ruscillo 2005). The same is true for the triton shells (*Charonia* sp.), which are also common at Mochlos. These edible species were frequently used for other purposes, and they too were part of a systematic capture and modification process (for triton shell modification workshops, see Apostolakou et al. 2014; Sanavia 2014). Other shellfish, such as the spiny oyster, which live cemented on underwater rocks, require diving and underwater hacking to be dislodged from the rock.

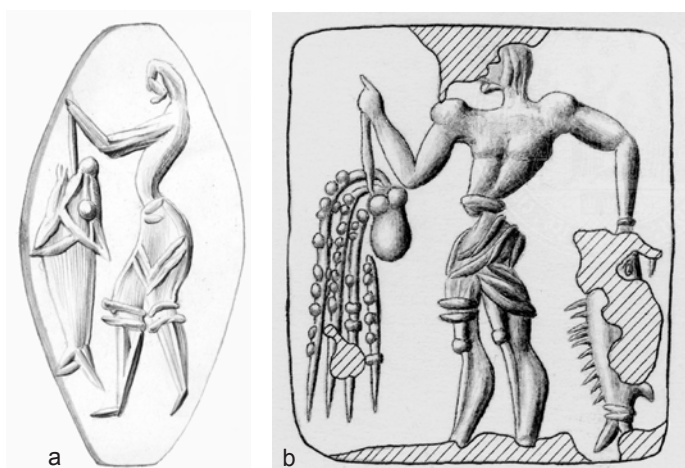


Figure 7. Fishermen and their catch: a) CMS VII, no. 88.1; b) CMS VI, no. 183.1.

Harvesting of fish and mollusks in deeper water requires a more elaborate tool kit and higher levels of dexterity by the fishers: the use of a boat, the ability to manufacture, maintain, and use complex tools, and the skill and knowledge to access these underwater invisible resources. Perhaps this accumulated special knowledge is what makes the fishermen and their catch of large fish and mollusks in Figure 7 a theme suitable to be engraved on seals.

From the fishermen's tool kit, only a narrow range of durable elements survive, namely metal fishhooks, lead weights, perforated stones that functioned as weights, and pumice floaters (Rose 1994; Powell 1996). In Neopalatial Mochlos a single bronze fishhook has been recovered from the LM IB floor of Room 1.7 in House 3, a space used for food preparation. Another bronze fishhook and some unmodified perforated stone weights, most probably related to fishing, have been recovered in both the Artisans' Quarters and at the Chalinomouri farmstead (Soles 2004). On rare occasions, organic parts of the Bronze Age fishing tools are preserved. Traces of the fishing line are often preserved on fishhooks in an oxidized form (Powell 1996, 160, and several examples in her catalog of hooks, 138–158), and at Akrotiri on Thera, a bundled net has been found preserved in volcanic ash (Moulherat, Spantidaki, and Tzachili 2004; see also Mylona 2000). The scarcity of fishing-related finds in the excavated part of the settlement could suggest that the fishermen's neighborhood, where we would expect a more intense presence of fishing-related material remains, has not yet been located.

Certain fish resources, however, such as the migratory fish (tunas, bonitoes, and pelamids) or the fish from brackish waters of coastal lagoons and estuaries, are seriously underexploited despite the fact that the relevant technology was available at the time to the fishermen and a few taxa that are typical of those habitats are attested at Mochlos (Mylona 2014).

## Conclusions

The above observations and interpretations lead to the suggestions that at Mochlos there were two types of exploitation of marine resources in place. One type was a generalized, low-technology harvesting of small fish and mollusks from shallow water, which was probably done by anyone on site. The other type of exploitation was a more professional way of fishing that required specialized knowledge and dexterity and enabled the fishermen to access the depths to capture large fish and shellfish. The scenes on the two seals aptly illustrate the issue (Fig. 7). This specialized fishing possibly provided raw materials for further processing.

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## STRATIGRAPHIC EXCAVATIONS AT AZORIA IN 2016 THE LATE MINOAN IIIC, PROTOARCHAIC, AND FINAL NEOLITHIC OCCUPATION

*Donald C. Haggis, Margaret S. Mook, and Tristan Carter*

Excavation at Azoria in 2016 continued to recover evidence of occupation prior to the establishment of the Archaic urban center. Our work confirms and refines our picture of the settlement history derived from the results of earlier work (Haggis and Mook 2011, 2013, 2014, 2015). The site was occupied in Late Minoan (LM) IIIC, with remains of a substantial settlement extending across the entire excavated area of the South Acropolis—buildings, habitation surfaces, and residual debris are recovered in stratigraphic soundings beneath Protoarchaic (late 8th and 7th c. B.C.) and Archaic (late 7th–early 5th c. B.C.) levels. While we cannot yet reconstruct the details of settlement structure, the ubiquity and preservation of the remains demonstrate that the 12th-century settlement was extensive. Moreover, the conditions of abandonment and patterns of later reoccupation show clearly that the Late Minoan IIIC settlement would have been an enduring and visible material presence in the landscape for some three centuries following its abandonment.

In 2006, the discovery of Protogeometric burials in the final use phase of a LM IIIC tholos tomb on the southwest slope initially suggested continuing use of the cemetery, but in recent excavations indications of contemporary or later Early Iron Age (EIA) reoccupation have not appeared in stratified contexts with architectural remains. It is not until the early Protoarchaic phase (late 8th and early 7th centuries) that there is solid evidence for new buildings on the site. In earlier publications we characterized this temporal and stratigraphic gap as a true or cumulative palimpsest (Bailey 2006): that is to say, EIA contexts were there originally, but they were subsequently disturbed or even obliterated in at least two phases of building in the 7th century. Our

view on this has changed since we reopened excavation in 2013. Recent work is revealing a pattern of sporadic construction in the late 8th to early 7th centuries, evidently remains of a long-term reoccupation of selected areas of the site, spanning the duration of the 7th century. The earliest of these Protoarchaic deposits do contain Late Geometric and earlier material, which could indicate residual debris from 8th century occupation; the foundation terminus ad quem date of the constructions; or a temporal palimpsest, that is, objects curated and contained in early 7th-century spaces.

An interesting pattern characterizing the Protoarchaic or pre-urban reoccupation phase at Azoria is the construction of buildings contiguous to still-standing and visible ruins of the earlier LM IIIC constructions (Haggis and Mook 2015). The observable habitation hiatus during a large part of the Early Iron Age thus remains an interesting taphonomic problem in reconstructing the settlement history of the Kavousi region and the phase transition that marks the establishment of the urban zone at the end of the 7th century.

### The Late Minoan IIIC Settlement

Late Minoan IIIC architectural remains have been exposed along the entire west slope from the area of the bench sanctuary in the north (Trench D600) to the southwest part of the slope where a large wall and associated occupation surfaces were exposed in Trenches B4800, B5000, and B5300 in the south (Haggis and Mook 2015). Excavation in 2016 now shows that the Protoarchaic and Archaic buildings were placed directly on top of these LM IIIC buildings, in some cases filling the exposed interior spaces of these earlier structures, and in others, obliterating much of the



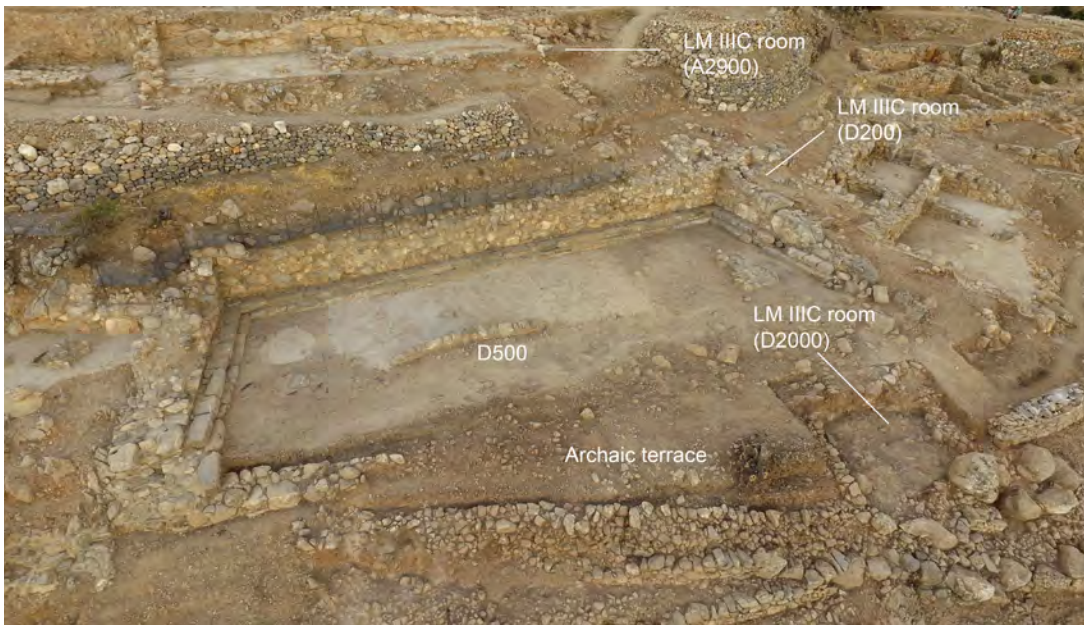


Figure 1. Aerial view of the Archaic Monumental Civic Building terrace, from the west, indicating LM IIIC remains in Trenches A2900, D200, and D2000. Photo D. Faulmann.



Figure 2. Aerial view of Trench D2000 and detail of LM IIIC room. Photo D. Faulmann.

standing architecture, though leaving residues of pottery or traces of occupation surfaces and segments of walls intact.

An excellent example of the condition of the LM IIIC settlement and its incorporation into the Archaic topography was recovered in the southwestern corner of the main hall (Trench D500) of the Archaic Monumental Civic Building (Fig. 1). Work in 2016 extended the excavation area to the west of the hall (D2000), exposing a complex series of terrace walls and stepped ramp leading from the north and culminating at the entrance to the Archaic building. Excavation within the fill of the uppermost terrace revealed an intact room of Late Minoan IIIC date (D2000).

The room has a cut-bedrock socle (0.90–1.10 m high) forming the east wall—indeed the projected line of the west wall of the main hall (D500) of the Monumental Civic Building reused

this same bedrock socle as its foundation (Figs. 1, 2). The north wall of the room was built of dolomite and *sideropetra* fieldstones, and it is preserved to 1.0 m at its highest point in the northeast corner where it is built against the bedrock socle. The north wall is extant to some 3.0 m in length (east–west), which is the approximate east–west dimensions of the space of the room: some 3.5–4.0 m wide and about 10.5 m square in area. The south wall is unfortunately not well preserved—it is some two courses high, and it is extant to about 1.5 m in length. The upper courses of the walls would have been leveled for the construction of the Archaic terrace, and a large boulder, presumably fallen from the southern part of the west wall of the main hall of the Monumental Civic Building, destroyed the east wall of the LM IIIC room.

The well-preserved floor (Fig. 2) was constructed of yellow and greenish-gray phyllite clay, and it contained fragments of cups, deep bowls, pithoi, and cooking pots (Figs. 3, 4). It is obvious that the building continued to the south through a doorway in the south wall. Excavations in this area—the adjacent trench D200 (Fig. 1)—revealed considerable amounts of LM IIIC pottery but no extant architecture or apparently in-situ deposits. Farther up the slope to the east, however, excavation in 2004 had exposed a number of segments of LM IIIC walls, indicating the continuation of the settlement along this slope.

Immediately to the east and upslope from the Monumental Civic Building, a sounding excavated in Trench A2900 (Fig. 1) revealed a dolomite boulder wall, extending for about two meters to the south where it forms a corner with a two-meter segment of an east–west wall defining the southern limits of another LM IIIC room. The actual dimensions of the room are not known. The LM IIIC pottery includes blob cups, deep bowls, and other characteristic shapes (Fig. 5). The Archaic room A3100 of the



Figure 3. Late Minoan IIIC cup (16-0064), deep bowl body (16-0065), and cooking dish (16-0063) from Locus D2008. Deep bowl base (16-0137) and krater base (16-0134) from Locus D2015. Photo Ch. Papanikolopoulos.

Communal Dining Building was bedded deeply into this terrace, with the foundations of its south wall (A3104) reaching the Late Minoan IIIC occupation level (Fig. 6). The LM IIIC floor surface confined by the surviving east and south walls is preserved only about 2.0 m to the west where the slope is extremely eroded. The south wall is preserved to two courses of dolomite boulders, with individual larger stones spanning the width of the wall—a style of building typical of LM IIIC constructions at the site. The east wall is poorly preserved, and one large boulder (ca. 1.0 x 0.75 m) forming a substantial part of the segment has tipped to the west.

The architectural remains—normally individual rooms are well preserved—indicate a series of houses extending from the peak and south slope of the South Acropolis in the east, across the west slope, and at least as far as the area later occupied by the Southwest Buildings. While architectural indications are plentiful, the data is as yet insufficient to begin forming a picture of the structure or pattern of the settlement—that is, the organization of space and the groupings of domestic units. It appears, however, that both the LM IIIC bench sanctuary and cemetery were situated to be contiguous to the zones of habitation.



Figure 4. Late Minoan IIIC pithos sherds: 16-0135 and 16-0136 from Locus D2015; 16-0138 from Locus D2013. Photo Ch. Papanikolopoulos.

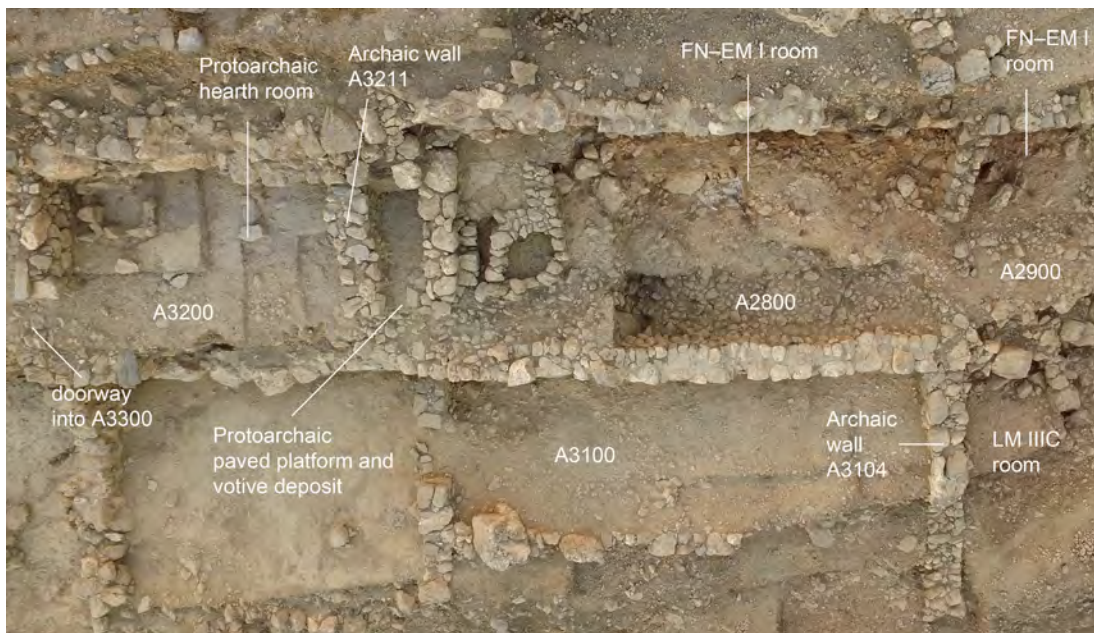


Figure 5. Late Minoan IIIC blob cup rim (16-0147) and deep bowl base (16-0148) from Locus A2908. Photo Ch. Papanikolopoulos.

### Protoarchaic Structures in Trench A3200 and the Stratigraphic Transition and Transformations from Early Iron Age to Archaic Periods

Evidence for the pre-urban occupation, spanning the latter 8th and 7th centuries, comes primarily from two areas of the site. The first, in the southwest area, is the large Protoarchaic Building (“Early Iron Age–Orientalizing Building” in earlier reports), which had been substantially buried by the late 7th-century renovation and rebuilding of the site (Haggis and Mook 2011, 2013). The Protoarchaic Building forms a self-contained unit, consisting of a dining hall, store room, two food processing rooms, and a pottery kiln (Haggis and Mook 2013, 2014, 2015). What is more, the





*Figure 6. Aerial view from the west of the third terrace of the Communal Dining Building indicating: the Protoarchaic room in Trench A3200, the LM IIIC room in Trench A2900, and the FN-EM I room in Trench A2800. Photo D. Faulmann.*

building incorporated LM IIIC remains into its construction—the LM IIIC to PG tholos tomb was architecturally integrated into the design of the Protoarchaic Building. The depositional assemblages from this building—especially the pyre deposit from Trench B3000 and the pottery from the hearth room (B4100) and the kiln room (B4000)—suggest not routine domestic activities, but communal feasting, including hearth-pyre sacrifices, and inferentially, commensal rituals associated with an ancestral tomb (Haggis and Mook 2011, 2015). The building not only incorporated the tholos tomb in its southeastern corner, but it also abuts a substantial LM IIIC building at its southern end (B5000, B5300).

In 2016, another locus of Protoarchaic activity, analogous in function, was uncovered on the upper west slope (A2800, A3200, A3300; Fig. 6). Underlying a suite of Archaic rooms used for storage and food processing within the Communal Dining Building, we recovered the remains of a four-room building of 7th century date, with a spatial organization and architectural form similar to that of the later Archaic structure—several of the walls of the earlier building were reused into the Archaic period on the terrace—but evidently of different function. The northernmost room, at the northern end of A3300, exposed in 2015, contained an assemblage of drinking wares, including a krater and deep cups (Haggis and Mook 2015, 20–21, figs. 8–11). It was a pantry or closet of sorts that had been abandoned, but left intact in the Archaic rebuilding.

The results of sondages conducted along this terrace in 2016 demonstrate that the pantry belongs to a much larger complex. The floor surface of the Protoarchaic room in A3300, south of the pantry, appears to have been reused into the 6th century, thus effectively obliterating evidence of its original function. The adjoining room to the south (A3200), however, had a series of

well-stratified surfaces. At the southern end of the room, excavation exposed the Protoarchaic clay floor, which has a series of six schist paving stones at its western edge extending out from under the Archaic wall (Fig. 6). The floor was well preserved across the space of the sondage, and it had an ash deposit on the surface at its eastern end—the full eastern extent of the floor could not be exposed because of the overhanging Archaic spine wall on the east. On the west side of the floor and a little to the north of the paved surface, there was a deposit of terracotta figurines, perhaps originally placed or displayed on the pavers, or perhaps on a structure built against the original south wall of the room, now obscured by the Archaic south wall.

The votive deposit consisted of nine terracotta animal figurine fragments (Fig. 7): three bull figurines nearly intact, two other quadruped body fragments, a bovine figurine head, a bull horn fragment, and two quadruped leg fragments. Since none of the fragments join with any of the whole or nearly complete bovine fragments, it is likely that there are at least seven, but probably eight different bull figurines represented, clustered on the surface and in the occupation debris above the floor and next to the pavers. Two of the figurines extended underneath the later Archaic wall A3211, suggesting the continuation of the deposit to the north, though no figurines were found at the 7th century level on the north side of the Archaic wall. The pottery associated with the figurine deposit and the ash in the east consists of fine drinking and pouring vessels.

In soundings excavated to the north of the Archaic wall, we recovered the continuation of the 7th-century floor, though neither the paving stones nor the votive deposit continued into the north area of the room (Fig. 6). While we have not excavated the full extent of the space of the Protoarchaic phase, having left



Figure 7. Bull figurines from Protoarchaic votive deposit in Trench A3200. Photo Ch. Papanikolopoulos.



the Archaic floor and oven in situ in the northeast quadrant, we were able to excavate into the center of the room, exposing a clay hearth. The hearth is a rough oval, without curbing stones, about 0.60 m wide and over 0.70 m long. It is composed of hard-packed phyllite clay, discolored red in parts, and with gray and blackish ashy soil around its south and west sides. Two schist pavers and a *sideropetra* block were constructed directly on top of the center of the hearth, rather precisely, in a subsequent 7th-century-phase resurfacing of the floor.

The Protoarchaic remains underlying the rooms on the third terrace of the Communal Dining Building originally formed a four-room complex. Although we cannot reconstruct the original systemic assemblages of Trench A3300, because of the height of the bedrock and continuous use of the floor surface, we do know that the northernmost room was a pantry or closet containing fine drinking wares including a krater and a number of deep cups. Connected by a doorway was Trench A3200 (Fig. 6), which had a central hearth, a votive deposit of bull figurines, an ash deposit, and a paved feature or platform at its southern end. The use of the adjoining room to the south (A2800) is yet uncertain because of preservation and a circular feature that occupied the surviving part of the room. The building's hearth and deposits suggest formal and communal ritualized functions, rather than activities normally associated with residential food storage, preparation, and consumption.

The pottery assemblages contemporary with the hearth and votive deposit consist principally of fine-ware drinking and pouring vessels. Furthermore, the pottery recovered from the floor surface across Trenches A2800 and A3200 is consistent with and comparable to the forms represented in the pantry in Trench A3300. While a few pithos and cooking pot fragments were recovered from Trench A3200, the majority of vessels represented belong to cups, skyphoi, kotylai, jugs, amphorae, kraters, kalathoi, lasanas, and lekanes of early 7th-century date. There is also pottery of LM IIIC date (deep bowls) that might have been recycled for use in Protoarchaic contexts. The lasana—a stand for large cooking vessels and round-bottom chytras—is an interesting form, associated

with 7th- and 6th-century contexts on the site, but it is absent from Late Archaic kitchen deposits. It could be that such implements were used primarily in formal, communal and ceremonial contexts.

The combined commensal and votive activities in the building accord well with ritual contexts known from Early Iron Age contexts on Crete, which in general follow material patterns of cult buildings such as the so-called hearth temples or house temples, evidently in use from the Protogeometric to Protoarchaic periods. The discovery of this series of rooms underlying this third terrace of the Communal Dining Building is thus important; along with the Protoarchaic Building on the southwest slope, the evidence suggests a Protoarchaic phase of reoccupation at Azoria, centered on LM IIIC remains, and clearly demonstrates communal and ritual functions anticipating the expansion and elaboration of the civic complex in the Archaic period.

### The Final Neolithic II to Early Minoan I Building (Trenches A2800–A2900)

Another goal of work at Azoria has been to reconstruct the earlier prehistory of the settlement, principally occupation in the Final Neolithic (FN) period, which, like the LM IIIC, is widely distributed across the site. Early FN remains are well-stratified in deposits underlying the eastern and southern areas of the Archaic Service Building, especially rooms B700, B800, B1200, and B1700 (Haggis et al. 2007). In 2016, stratified Neolithic remains came to light in another area of the site, on the upper west slope of the South Acropolis. Here, in a sounding on the third terrace of the Communal Dining Building (A2800, A2900), FN remains were recovered beneath the cobble fill layer which formed the foundation of the Archaic surface (Figs. 6, 8, 9). The floor surface, made of hard-packed and well-consolidated yellowish phyllite clay, was preserved to a width of 2.3 m on the south, narrowing to about 0.90–1.00 m on the north (Fig. 8). The floor was unfortunately destroyed along the west side by the foundation trench for the west wall of the Archaic room.

The preserved FN floor surface and the extant north (A2851), south (A2919), and east (A2852) walls allow us to establish the full length of the room (6.30 m north–south) and a minimum width of 2.30 m, making it a substantial space, at least 14.50 m<sup>2</sup> in area (Fig. 8). The east wall was evidently built against the bedrock that ascends up the slope to the east. The north and south walls have two faces preserved, suggesting that there were originally rooms on either side of Trench A2800. Indeed, traces of a floor surface were also recovered on the south side of the south wall in Trench A2900 (Fig. 10 illustrates a selection of the FN–Early Minoan [EM] I pottery), suggesting the existence of a building complex—an agglomerative and rectilinear plan of multiple interconnected rooms along the terrace—rather than an open settlement plan that is characteristic not only of FN but also EM I sites such as Debla and Elenes (Haggis 1996, 658–659). Papadatos (2012, 76) has also commented on the appearance of

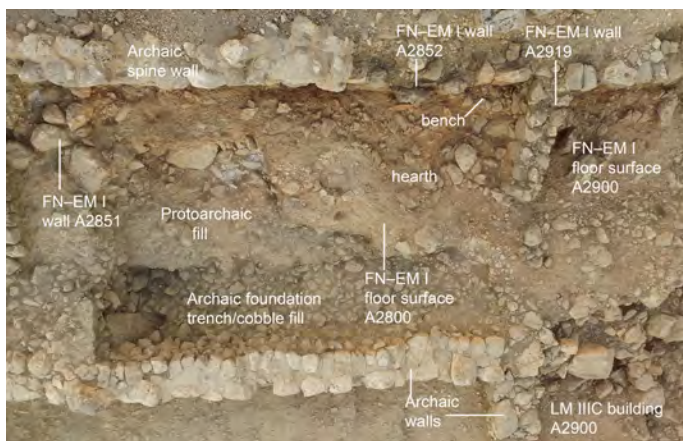


Figure 8. Final Neolithic to EM I building in Trench A2800. Photo D. Faulmann.



Figure 9. Detail of the FN-EM I building in Trench A2800. Photo D. Haggis.

complex agglomerative plans in EM IA, suggesting details of the organization and use of space in transitional settlements in FN-EM I.

The south wall (A2919) is the best preserved, standing to about 1.10 m in height; it is 0.50 m wide and 1.90 m long and ends in an upright slab that formed the east jamb for a doorway apparently connecting rooms in Trenches A2800 and A2900 (Figs. 8, 9). The wall consists of dolomite boulders and upright slabs in the foundations, with a superstructure of smaller dolomite fieldstones. Its southern face is preserved to three courses of medium-sized dolomite fieldstones, and the interstices were filled with small cobbles and gravel. The use of large stones at wall ends and for the faces, and rubble fill for the wall core, is typical of EM I architecture at Debla and Kalo Chorio and elsewhere (Haggis 1996, 659). The rough orthostatic or upright-slab construction is found in the EM IB oval building at Mesorachi in eastern Crete where slabs are used at the wall ends forming the entrance and also in a large bin (Sofianou and Brogan 2016).

The long well-preserved east wall (A2852) is visible in the scarp underneath the line of the later Archaic spine wall, and it uses the same orthostatic construction technique, consisting entirely of large slab-like dolomite boulders (Fig. 9). Where the dimensions and shapes of the stones are visible, the wall appears to have been constructed with eight large upright stones, about 0.70–0.80 m in height, that were turned so a flat and fairly even facet of the boulder forms the wall face. Smaller stones were then fitted to regularize the uneven tops of the dolomite boulders, presumably in order to accommodate regular upper courses of the wall. This kind of slab or rough-orthostatic construction for the foundations is distinctive, with elements apparent also in the north face of the south wall as mentioned above. The mode of construction and indeed the thickness (0.50 m) of the north and south walls are characteristic of EM I architecture.

There is a small, roughly built, dolomite stone bench in the southeast corner of the room that measures just under one meter long, 0.30 high, and 0.36 m deep. Located about 0.70 m from the east wall in the south half of the room is a circular hearth bedded with yellowish-brown phyllite clay and curbed with 16 cobble-sized fieldstones (Figs. 8, 9). The irregular circle is about 80 cm in diameter with an opening (40 cm wide) to the southwest, evidently for cleaning. Traces of carbon and reddish discoloration of the phyllite silt (indicating contact with heat) were found within and around the area of the hearth. Although the area of the preserved surface was intensively sampled for soil, we recovered only tiny fragments of wood charcoal, evidently residues of fuel used in the room, but no seed remains.

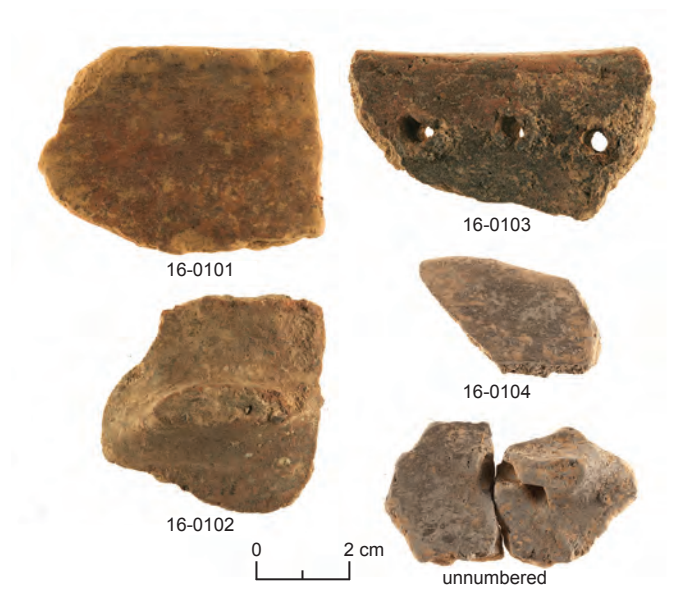


Figure 10. Final Neolithic to EM I pottery: bowl rim (16-0101) from Locus A2918, cheese pot rim (16-0103) from Locus A2917, strap handle (16-0102) from A2918, and two fragments of bluish-gray ware including a chalice or bowl rim (16-0104) and handle attachment (unnumbered) from Locus A2918. Photo Ch. Papanikolopoulos.



The pottery from the floor dates to late Final Neolithic (Fig. 11; Nowicki 2002; 2014, 8–9, 67–70; Tomkins 2007, 41–44). The vessels have thick walls and a thick dark reddish-brown slip that is wiped, lightly burnished, or roughly smoothed. The shapes include everted-rim and S-shaped bowls and collared and S-shaped jars, often with rounded bottoms (Figs. 12, 13). There are also fragments of “cheese pot” (Figs. 14, 15) vessels with a row of holes piercing the wall, often parallel with and below the rim—some rims have depressions or incomplete perforations (Tomkins 2007, 44; Papadatos 2008, 265, 268, 270; Nowicki 2014, 291–292). One example has an internal ledge or slab handle (no. 16-0094; Figs. 14, 15). While there are significant differences in the range of shapes and fabrics constituting the assemblages of the early FN from the Service Building and this A2800 deposit, it is perhaps important to emphasize the absence of cheese pots in the former (Haggis et al. 2007, 707). In general, this late FN pottery is characterized by fabrics that are harder, with more rock inclusions (especially phyllite-quartzite) and less organic material, than the fabrics of pottery from the earlier FN remains at Azoria. Moreover, the presence of bluish-gray calcareous ware sherds (Figs. 10, 16), a gray ware chalice or bowl rim (Fig. 10), a granodiorite tripod cooking pot (Fig. 17), and a pinkish-buff jar with a horizontal rib



Figure 11. Matina Tzari mending late FN pottery from the floor of Trench A2800 (she is holding 16-0091). Photo M. Mook.

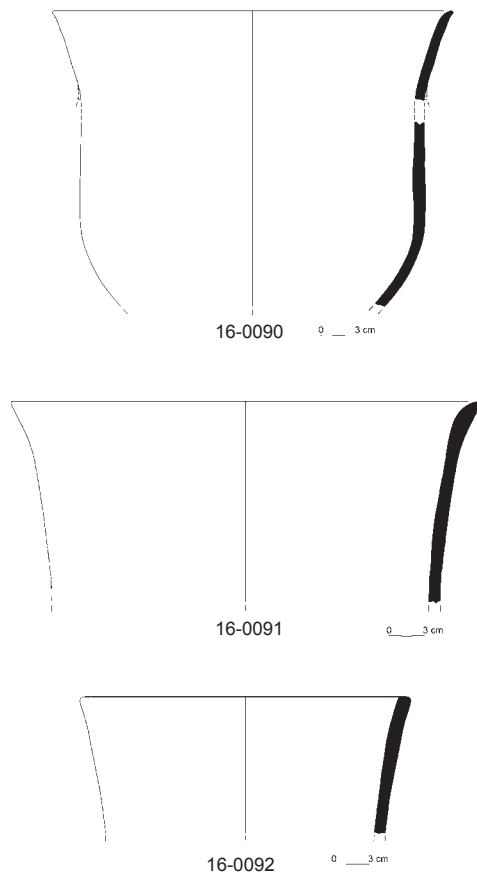


Figure 12. Late FN pottery from Locus A2815. Drawing D. Faulmann.



Figure 13. Late FN pottery from Locus A2815; exterior on left and interior on right. Photo Ch. Papanikolopoulos.

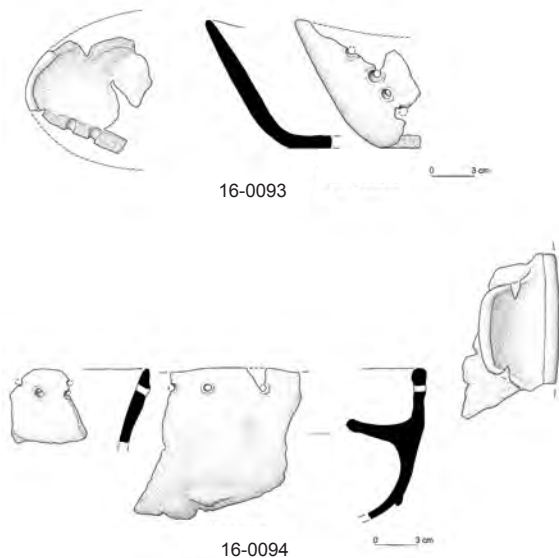


Figure 14. Late FN cheese pots from Locus A2815. Drawing D. Faulmann.

(Fig. 16) indicate an EM IA or transitional FN–EM IA date for the deposit. The distinctive jar fragment (Fig. 16:16-0121) has the orangish-pink phyllite-quartzite fabric and buff slip characteristic of dark-on-light wares of EM I (Haggis 1996, 663, 668, fig. 19; Betancourt 2008, 51). The application of plastic ribs on jars, pyxides, and pithoi is found in EM I (Haggis 1996, 674; Betancourt 2008, 82). The tripod cooking pot (Fig. 17), with round-section feet and incurving rim, is a type more at home in EM IB–II (cf. Warren 1972, 123–125, 178–179; Betancourt 2008, 70–71; Haggis 2012, 143); the example from Azoria might allow us to push the date of these distinctly Minoan vessels earlier than evidence from published contexts would suggest. While there are clear indications of EM I in the assemblage, there are no examples of dark-gray burnished wares and pattern burnished or black burnished wares.

Four chipped stone artifacts were found on the northern part of the floor (A2815): two pieces of black chert (a notched flake [no. 16-1084] and a blade-like flake [no. 16-1230]), a notched flake of a fine-grained brown chert (Fig. 18:16-1056), and a blade of obsidian measuring 3.7 cm in length (Fig. 18:16-1057). All four implements had traces of use-wear. The chert is likely local, the black medium-quality resource being the dominant raw material from the previously published early FN I assemblages (Haggis et al. 2007), while the obsidian is almost certainly Melian based on its visual characteristics. Obsidian, generally found in FN and early EM I on Crete, is absent in the early FN stone assemblages recovered so far from Azoria (Haggis et al. 2007, 682, 689–693, 706). The presence of obsidian in Trench A2800 is thus significant, suggesting the community's engagement with supra-regional exchange networks, likely articulated



Figure 15. Late FN cheese pots from Locus A2815; exterior on left and interior on right. Photo Ch. Papanikolopoulos.

through coastal populations, such as Kephala-Petras, whose lithic assemblage was obsidian-rich (Papadatos 2008, 270–271; 2012, 76). Technologically, it is difficult to tell whether the obsidian blade is an example of good quality percussion knapping, a mode of production we associate with the LN and FN I in Crete, or pressure-flaking, a technique that seems to have been introduced to Crete in FN II (cf. Papadatos 2008, 270). Handfuls of obsidian blades and exhausted cores that clearly derive from a pressure tradition are now documented from Azoria (2013–2016 seasons), material that may well be associated with residual Bronze Age activity on the site.

As we have reported elsewhere, Final Neolithic pottery is found in a number of samples from excavated areas across the site, with early FN remains appearing concentrated (or most visible stratigraphically and architecturally) underneath the south end of the Service Building (B700, B800, B1200, B1700) and farther down the slope in Trenches B4700 and B4800. The pottery, chipped stone, and architectural forms in Trench A2800 are however distinctly different from those of these evidently earlier FN structures. The new finds from the building in Trenches A2800 and A2900 and an occupation surface recovered within D200 suggest the establishment of a new settlement extending across the upper west slope of the peak in the transition from FN to early EM I. A goal of continuing excavation at Azoria in 2017 is to explore the chronological and cultural relationship between these FN I and FN II–EM IA settlement phases.

## Acknowledgments

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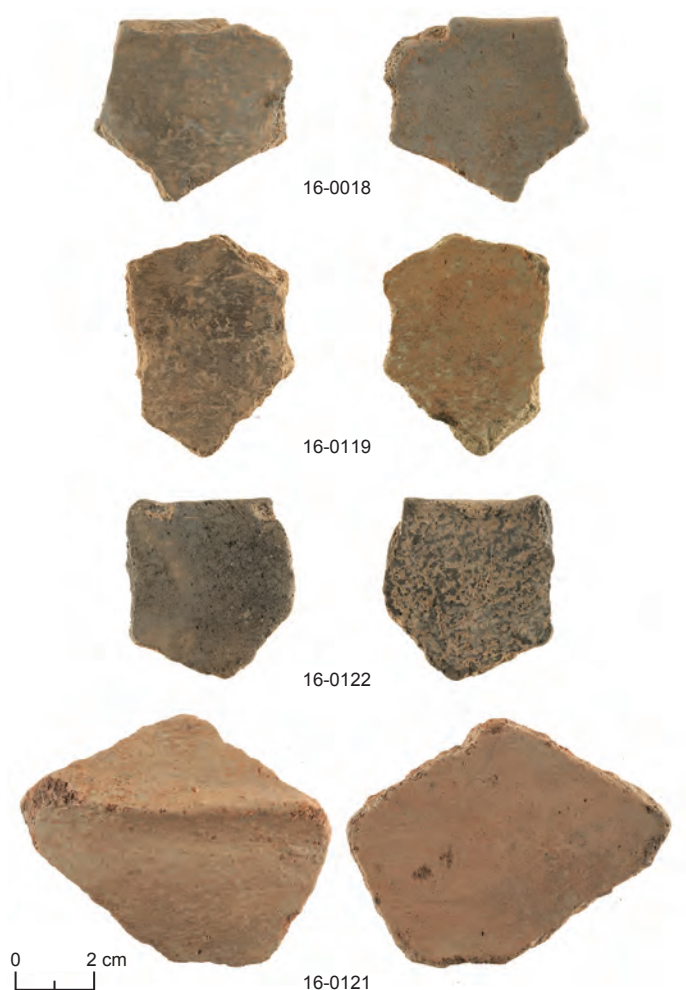


Figure 16. Late FN-EM IA pottery: 16-0118 and 16-0119 from Locus A2813; 16-0122 and 16-0121 from Locus A2850; exterior on left and interior on right. Photo Ch. Papanikolopoulos.

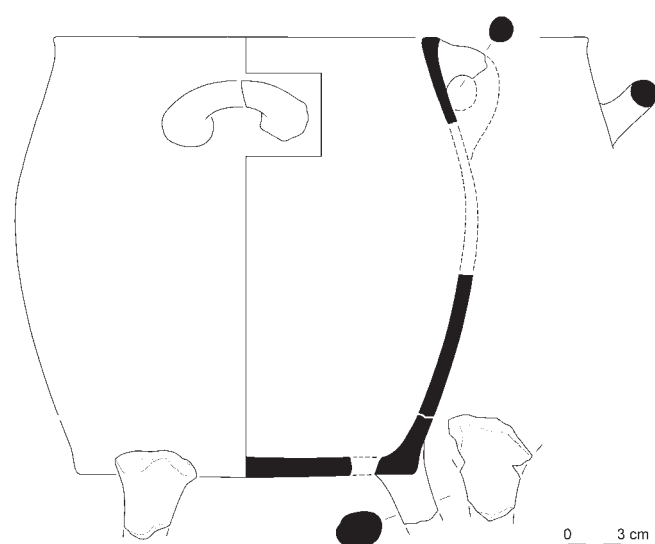


Figure 17. EM tripod cooking pot (16-0047) from Locus A2814. Drawing D. Faulmann.

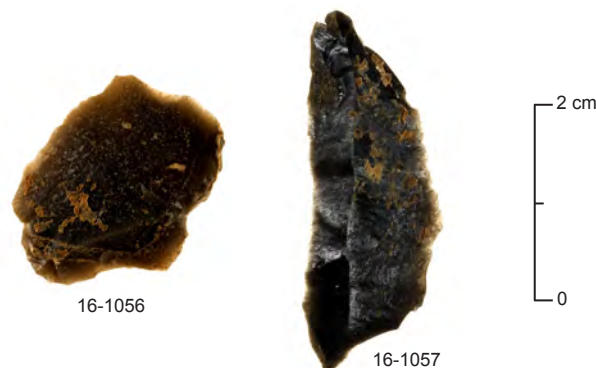


Figure 18. Notched chert flake (left) and obsidian blade (right). Photo Ch. Papanikolopoulos.

Prehistory; and the University of North Carolina at Chapel Hill: the Department of Classics, the College of Arts and Sciences, the James Penrose Harland Fund, and the Azoria Project Fund.

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## TEN YEARS OF KENNESAW OSTEOLOGY AT THE KENTRO

*Susan Kirkpatrick Smith*

The Osteological Field School held every season at the INSTAP Study Center for East Crete saw its largest number of students to date in May 2016. I was able to bring a total of seven current students from Kennesaw State University in Kennesaw, Georgia, to gain experience in the analysis of human remains from an archaeological context (Fig. 1). The students were joined by Chelsey Schrock, a recent KSU anthropology program graduate who returned to the Kentro for a second year with the field school to serve as the assistant field school director and to begin looking for a project for her MA degree, which she will begin to pursue this fall at the University of Sheffield.

The project we are currently researching during the field school is different from most other projects at the INSTAP Study Center, both for the nature of our material, human remains, and the time period from which they came. Since 2013 the field school has been working on the analysis of remains from a large Roman cemetery in Ierapetra. The cemetery was excavated by Vili Apostolakou, the director of the 24th Ephorate of Prehistoric and Classical Antiquities at the time. We are fortunate to have this project supported by INSTAP-SCEC, and my students have gained invaluable experience from their time in Crete.

The overarching goal of this project is to explore and explain how life for people living in Crete changed as the Roman Empire controlled the island. The tombs date to the 1st–3rd centuries A.D., well after Crete’s entry into the empire in the 1st century B.C. To date, there has been no study of a large scale Roman cemetery from Crete. This project will provide a great deal of new information



Figure 1. Susan Kirkpatrick Smith (far left) and some of the 2016 field school students working on the human skeletal remains from the Roman cemetery in Ierapetra. From left to right: Chelsey Schrock (assistant field school director), Eden Ryan, Jesi Montoya, Nacerima Brannon, Caitlin Olsen, and Desiree Smith-Plourd. Photo E. Huffman.

about an important part of the island’s history that has not been documented as well as the renowned prehistoric Minoan period.

Previous field school students have given professional presentations at the American Association of Physical Anthropologists, the Georgia Academy of Science, and the Kennesaw State University Symposium of Student Scholars on dental pathologies, sex estimation using long bone dimensions, and osteobiographies of specific individuals. More research will be presented in the



spring of 2017 on the dental evidence of childhood stress and on stature and skeletal robusticity. The data we have gathered at the field school has also given other students at KSU the opportunity to assist with data analysis. Four students have participated in this research and have given professional presentations of their work at local and state-wide conferences. The fieldschool research has also resulted in two publications (Vogeikoff-Brogan, Kirkpatrick Smith, and Apostolakou 2009–2010; Kirkpatrick Smith 2013), one of which includes an illustration created by one of the field school students (Kirkpatrick Smith 2013).

After 10 years of offering this field school to a total of 26 students, I can see the large impact it has had on their lives and careers (Fig. 2). Two have completed MA degrees with a focus on osteology, and a third is beginning her graduate degree program in the fall 2016. Seven students have given professional presentations, and another three are preparing their research to submit conference abstracts this semester. One student contributed an illustration of a comparison of male and female pelvis structure to one of my published articles. Two students have served as assistant field school directors during their second time at the field school, and another is already slated to serve in that capacity for the 2017 field season.

I look forward to the next 10 years of work at the Kentro and my contribution to training the next generation of osteologists with an interest in the Mediterranean world.

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Figure 2. Susan Kirkpatrick Smith working with field school students Laura Lund and Danna Simonis on the analysis of a juvenile skeleton in 2010. Photo E. Huffman.

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# A NEW STUDY OF THE SHRINE OF EILEITHYIA, MINOAN GODDESS OF CHILDBIRTH AND MOTHERHOOD

*Philip P. Betancourt*

Eileithyia, one of the Minoan goddesses whose name survived into later history, had several shrines in Crete. The one at the ancient town of Inatos on the southeastern coast of the island was excavated in 1962 by Nicholas Platon and Costis Davaras as a rescue excavation after it was discovered by looters. A volume with color photographs of the highlights of the shrine has recently been published (*Ελευθία Χαριστήριον: Το ιερό σπήλαιο της Ειλειθυίας στον Τσούτσουρο*, edited by Athanasia Kanta and Costis Davaras). A new study of the objects from this shrine has just begun under the supervision of Philip Betancourt. Over a thousand of the minor offerings to the goddess have been

moved temporarily to the INSTAP Study Center from the Herakleion Museum for study, drawing, and photography. The metals and the other more important objects will be studied later in the Herakleion Museum.

The shrine, located inside a small cave within the modern town, was active from the Minoan period until Roman times, and many gifts were presented to the goddess in the hope of having a healthy baby. An inscription from the later years of the shrine identifies the goddess by name, leaving no doubts about her identification. The cave was relatively small, consisting of only one room with a spring of water at its lower part.



Figure 1. Three tiny vases are among the group of over 200 Minoan miniatures presented to the goddess: (a) a miniature amphora (INA 4, HM P32746), (b) a tripod cooking pot only 4 cm high (INA 24, HM P32832), and (c) a small model of an oil lamp of the type used in Cyprus and the Levant but not in Crete, called a saucer lamp (INA 31, HM P13378). The amphora and the lamp model were manufactured especially as votives. They were pierced below the rim before firing so that they could be hung as offerings in the shrine. Perhaps the cave had a tree or some other means to display the miniature models to visitors. Photo Herakleion Museum.



Figure 2. Over 40 clay and bronze double axes were offered in the shrine. This unusual example (INA 153, HM 13282) is made of clay and then painted with geometric designs. It comes from the Late Geometric to Early Archaic period. Photo Herakleion Museum.



Figure 3. A Protogeometric sculpture of an embracing couple attached inside a kalathos (INA 100) is a good example of the simplified style used for clay figurines in Greece during the Iron Age. Photo Herakleion Museum.



Figure 4. A figurine of a baby inside its crib (INA 118) is an uncommon subject matter for Cretan sculptures. It illustrates the appropriate nature of many of the offerings to a goddess in the hope of a healthy baby. Archaic period. Photo Herakleion Museum.

Preliminary study and cataloging of the offerings in the spring of 2016 has already resulted in many new conclusions about the nature of this worship. The earliest objects in the cave come from the Early Minoan period. The earliest history is very poorly

preserved, and perhaps at its earliest use the cave was only visited for water. By the beginning of the Middle Bronze Age, the cave was definitely a shrine. Both full-sized and miniature pieces of pottery were favorite offerings from the second millennium B.C., beginning in the Middle Minoan period (Fig. 1). By LM I, the worshippers were also presenting Eileithyia with bronze sculptures, a stone offering table, and many other gifts. Miniature figurines of the Goddess with Upraised Arms along with the tubular stands called “snake tubes” were offered to her in the closing years of the Late Bronze Age.

The worship of the goddess continued into the Iron Age (Figs. 2–4). A large group of Protogeometric figurines contributes substantial amounts of new information about the simplified sculptural styles used in Crete during the Iron Age. Among the subjects are pregnant women, embracing couples (Fig. 3), preparations for childbirth, boat models, a child in its crib (Fig. 4), and many other images. The shrine finally went out of existence in the Late Roman period. Roman lamps were some of the last offerings left in the cave.



## THE NEW RETHYMNON MUSEUM INSTAP DIGS DEEP INTO CRETAN PREHISTORY

*Thomas F. Strasser and Eleni Panagopoulou*

The new archaeological museum in Rethymnon opened in May, and its first vitrine exhibits artifacts from a project funded by the Institute for Aegean Prehistory: The Plakias Mesolithic Survey (Figs. 1, 2). These are the oldest artifacts found on the island, and they are the first discoveries from an American project to be displayed in western Crete (Fig. 2). Housed in the Church of St. Francis, the exhibit displays the premier finds from the Rethymnon region, and it will function as a temporary museum until the new one is finished. The museum staff has carefully documented and expertly presented important archaeological material that spans the Stone Age to the Byzantine period.

The Plakias Mesolithic Survey (2008–2009) was not a traditional intensive survey with systematic field walking. Instead, the project focused on searching for pre-Neolithic stone tools. The team targeted well-watered areas with south-facing limestone caves. In other words, the team looked at places where hunter-gatherers would go and where their artifacts might be preserved. The project was an immediate success, finding Mesolithic artifacts on the first day, and within a week it unexpectedly discovered Lower Palaeolithic tools. Since Arthur Evans's era, such finds had been mentioned, but quickly dismissed. These tools are difficult to recognize, and understanding the geological setting is paramount. With the help of lithic specialists Curtis Runnels and Priscilla Murray, along with the geologists Karl Wegmann, Panayiotis Karkanas, and Floyd McCoy, the experts joined forces on the project in order to discover and contextualize the lithic artifacts.

The initial vitrine in the museum houses the survey's finds. The display case is well lit with informative descriptions of all three periods of the Stone Age (Neolithic finds are in the subsequent display case). This is the first display of Mesolithic and Palaeolithic finds from Crete, and it is consequently of enormous importance to the island's history. The bottom row of tools comprises the Mesolithic artifacts (ca. 10,000–7000 B.C.) from various sites such as Schoinaria, Damnoni, and Ammoudi (Fig. 2). They include denticulates, microliths, spines, and borers made of local chert and quartz. The top two rows have the much larger Lower Palaeolithic tools of the Acheulean type (1.7 Mya–100,000 B.P.), such as quartz bifaces (hand axes), a core, and a cleaver. Though Mesolithic finds were the target of the project and were not completely unexpected because similar discoveries



*Figure 1. Co-director of the project, Thomas Strasser, with artifacts from the Plakias Mesolithic Survey on display in the Rethymnon Archaeological Museum. Photo D. Karambas.*



*Figure 2. The vitrine of Plakias survey material in the Rethymnon Archaeological Museum: Lower Paleolithic hand axes, core, and cleaver (top and middle rows); Mesolithic artifacts (bottom row). Photo T. Strasser.*

were recently made on other Mediterranean islands, the Acheulean industry was a surprise. The lithics not only deepen Cretan history, but also change immensely our understanding of the history of seafaring in the Mediterranean, making Crete comparable to the Indonesian island of Flores where lithics of such a great age were found. Crete, like Flores, has been an island throughout hominin evolution. This opens a new and exciting chapter in Cretan archaeology for future archaeologists to expand our understanding of these early periods. None of this work could be done without the backing of the Institute for Aegean Prehistory, which provided both generous funding and material support.

## Study Center Fellowship News

### Congratulations to the Seager Fellowship Recipient

Aikaterini Boukala-Karkagiani will hold the 2016–2017 Richard Seager Doctoral Fellowship. She is a student at the National and Kapodistrian University at Athens, and her dissertation is titled “The Prepalatial Period at Petras, Siteia, through the Study of Undisturbed Ceramic Contexts.” We wish her all the best with her work. She will report on her progress in the fall 2017 Kentro newsletter.

#### SUPPORT THE SEAGER FELLOWSHIP

The Richard Seager Doctoral Fellowship was created in 2009 with the goal of helping doctoral candidates use the Study Center’s resources to bring their dissertations closer to completion. With your help we can reach our goal of \$4,000 and offer the fellowship to a qualified applicant. To date, nine fellowships have been granted, and we hope that your donations will enable us to offer a 10th fellowship!

### Congratulations to the Hawes Fellowship Recipients

Dr. Caroline Tremereaud and Prof. Julie Hruby are the recipients of the 2016–2017 Harriet Boyd Hawes Post-Doctoral Fellowship for Gender Studies.

Tremereaud’s project is titled “Ten Centuries of Women in History: Archaeological and Iconographical Approaches of Minoan Civilization.” She received her Ph.D. in Archaeology from the University of Paris I Panthéon-Sorbonne in 2014. She is currently a Graduate Research Fellow at the Émilie du Châtelet Institute. Her geographic research areas include Northern and Southern Europe and now the Aegean.

Hruby’s project is titled “Associating Fingerprint Patterns with Age and Sex: A Quantifiable Approach.” She received her Ph.D. in Classics from the University of Cincinnati, and she is now an Assistant Professor of Classics at Dartmouth College in New Hampshire. Her primary region of study is the Aegean, where she is investigating topics of ancient gender and class structures, as well as ancient craft production.

We are excited to learn more about these innovative topics of scholarship in the Aegean, and we wish both recipients all the best with their work. They will each



*Eleni Nodrou (left) and Jerolyn Morrison load the Kentro’s new kiln with experimental petrographic briquettes and Minoan-style vessels. The kiln was generously donated by the Ms. Foundation for Women. Photo S. Ferrence.*

provide a report detailing their progress in the fall 2017 Kentro newsletter.

#### SUPPORT THE HAWES FELLOWSHIP

The Hawes Post-Doctoral Fellowship for Gender Studies was introduced this past year with the goal of incorporating gender studies in Aegean Bronze Age archaeology to highlight aspects of ancient life that have not yet received sufficient attention in Bronze Age Crete. Established with the generous support of the Ms. Foundation for Women, this fellowship is open to those in the fields of Anthropology, Art History, Ancient History, or Classics, and the recipients will use the Study Center’s resources in their research. With your help we can reach our goal of \$3,000–\$6,000 to offer the fellowship to qualified applicants. Two fellowships were granted this year, and we hope that your donations will enable us to continue with this new scholarly endeavor!

### Donations

Please send your checks to Elizabeth Shank in Philadelphia (see p. 24) and write Seager or Hawes Fellowship on the memo line. You may also donate with PayPal by clicking on “Donate Now” at [www.instapstudycenter.net](http://www.instapstudycenter.net). To donate in Euros through direct deposit, contact Eleanor Huffman ([eleonorhuffman@instapstudycenter.net](mailto:eleonorhuffman@instapstudycenter.net)).



## A REPORT ON 2015 WORK SUPPORTED BY THE RICHARD SEAGER FELLOWSHIP

*Georgios Doudalis*

The award of the 2015 Richard Seager Fellowship allowed me to spend one month at the INSTAP Study Center for East Crete working on my PhD dissertation entitled “Middle Minoan Mochlos: A Socio-Cultural Approach to the Settlement during the Protopalatial Period.” Through an examination of the pottery, this project aims to identify how the producers in the settlement were operating within their own community (micro-scale), in relation to nearby settlements (meso-scale), and finally with respect to the dynamics playing out on the rest of the island, following Knappett’s multi-scalar approach (2008) for the interpretation of material culture.

During these four weeks, I had the opportunity to work on a Protopalatial deposit found underneath the southwestern Neopalatial room of the Late Minoan (LM) I House C.12 (Fig. 1). The Neopalatial room made use of the eastern wall belonging to the earlier Middle Minoan (MM) IIA period. This Protopalatial deposit is unique because it yielded three distinctive stratigraphic layers. These layers, from the uppermost and latest level to the lowest and earliest level, represent MM IIB (Level 1), MM IIA (Level 2), and MM IB (Level 3), respectively. Level 1 was a fill, above which was evidence for the later LM I occupation. Level 2 was the main habitation level, yielding hard soil with many small pieces of floor plaster, and Level 3 was the fill above the bedrock clearly differentiated from the layer above. Together these levels provide information about pottery production and consumption in each of the three represented sub-phases of the Protopalatial period. In my time at the Kentro, I completed the study of this deposit, and here I present some of my observations and findings pertaining to local production and consumption strategies in Mochlos during the Protopalatial Period.

The material from the deposit was examined with an eye to three factors: the macroscopic analysis of coarse ware fabrics, the identification of potters’ marks, and the evolution of the carinated cup type. The statistical analysis of the coarse ware pottery serves to identify the extent of local pottery production and consumption and to explore how that relates to the number of imported wares. According to the Neopalatial macroscopic analysis by Barnard (2003), three general types of fabric inclusions are identified as local: phyllite, phyllite mica, and calcite. The Mirabello Fabric, originating in the area of Gournia and Kalo Chorio, is considered to be an import to Mochlos. In Level 1, dated to the MM IIB period, there was a larger percentage of wares made



*Figure 1. The author at work with the Middle Minoan pottery of Mochlos in the stoa at the INSTAP Study Center. Photo M. Tzari.*

of local phyllite fabrics, with fewer imported wares of Mirabello Fabric, even fewer of phyllite mica fabric, and hardly any fabric with calcite (Fig. 2). The variety of vessel types made from phyllite fabric is expansive, consisting of open vessels (conical cups and a variety of bowls) to closed transport and cooking vessels (e.g., jugs, jars, pitchers, cooking pots). The vessels made from Mirabello Fabric were mainly closed transport vessels such as jars, amphorae, jugs, and a pithos sherd. In the phyllite mica and calcite fabrics, only some cooking dishes were present.

In Level 2, which is dated to MM IIA, again the local phyllite fabric dominates the deposit, with fewer Mirabello Fabric sherds, a higher amount of phyllite mica fabric than the MM IIB level above, and very little calcite fabric, though it occurred with greater frequency than Level 1 (Fig. 3). The variation of vessels made from phyllite fabric is much higher than Level 1 including different types of jugs, jars, basins, and a kalathos. There is also greater variety in open vessels, including conical, straight-sided, and carinated cups, along with flaring bowls. The types of vessels produced in Mirabello Fabric are the same as the layer above, while the variety of vessel shapes made in the phyllite mica fabric increased, including cooking dishes, plates, and pots, and bowls, conical cups, and closed vessels like jugs and amphorae. In the calcite fabric, a very small amount of cooking dishes is present in this layer. In Level 3, the amount of local phyllite fabric is high, though a small amount of Mirabello Fabric is

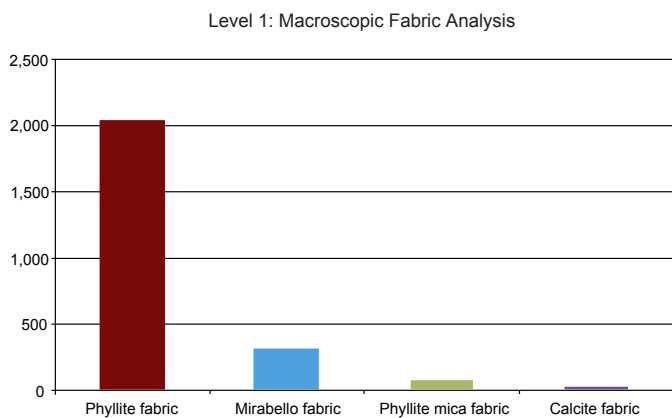


Figure 2. Middle Minoan pottery at Mochlos: macroscopic fabric analysis of Level 1.

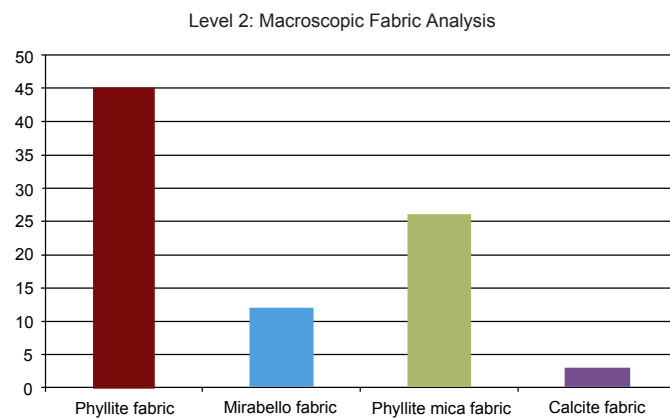


Figure 3. Middle Minoan pottery at Mochlos: macroscopic fabric analysis of Level 2.

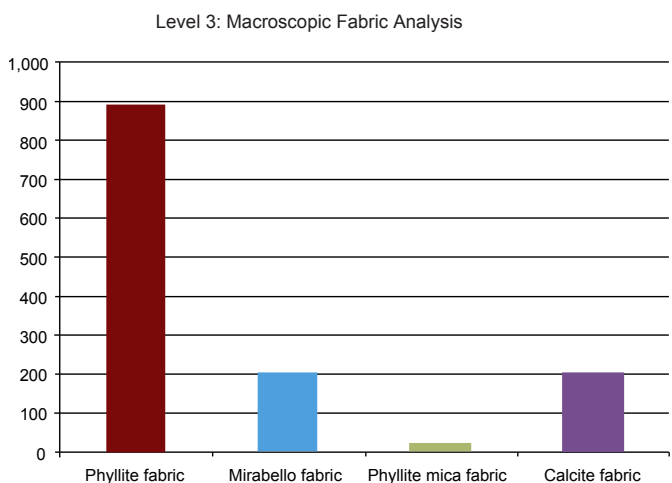


Figure 4. Middle Minoan pottery at Mochlos: macroscopic fabric analysis of Level 3.

present (Fig. 4). The amount of vessels made in the calcite and Mirabello Fabrics is equally large, while the phyllite mica fabric is absent. Not many diagnostic sherds came from this level, but some early sherds with light-on-dark decoration and a fine carinated cup were present.

This macroscopic analysis of the layers suggests that local production dominated the market within the settlement throughout each of the sub-phases, though the variety of vessel shapes increases from MM IB to MM IIA, with a marked standardization and restriction in MM IIB.

The second facet of study focused on the identification of potters' marks, which have parallels with marks in other regions of Crete (Christakis 2014). Potters' marks were present in Levels 1 and 2, though not in the earliest level. Both upper levels yielded examples of two different potters' marks—two parallel lines, and a one-line incision (Fig. 5). A possible third potters' mark came from Level 2; it is similar to the mark featuring two parallel lines, but one of the lines is semi-circular.

The instances of potters' marks in Level 1 are limited to the handles of closed vessels, but in the preceding MM IIA period represented in Level 2, the marks appear on a variety of vessel types. In Level 2 the marks appear in the interior of the body and handles of cups as well as on the interior of the rim of a bowl (Fig. 6). The use of the same marks in both levels likely indicates the existence of at least two potters' groups active in the area of Mochlos, marking their vessels to distinguish their products in the local markets. The continued use of the marks reflects a strong local tradition; perhaps the potters in the later period inherited the craft from the earlier generation.

The third category of evidence for local manufacture focused on the carinated cup and the evolution of its form (Fig. 7). The earliest Level 3 yielded only one example of the carinated cup type—a tall-rimmed cup with low carination and without distinctive grooves. This type developed in MM IIA into a carinated cup bearing a tall rim and deep, irregular grooves running horizontally around the body of the cup. This is probably a local variation because no other examples of this type appear in any other site in Crete during this period. The appearance of this local form seems to be the first effort of the local workshops to emulate the grooved carinated cup fashion introduced earlier in central Crete (MacGillivray 1998; Macdonald and Knappett 2007). The potters perfected the technique within a short time, and within the same deposit the standard MM II type with a short rim and shallow, regular grooves appears like elsewhere throughout the region (Poursat and Knappett 2005; Nowicki 2008). The earlier Mochlos grooved carinated cups, though not found in the earliest level, may be representative of early MM IIA or the late phase of MM IB, in which the carinated cup without grooves first appears, continuing into the MM IIA period but disappearing by MM IIB when the regional standard dominates the deposit.

These observations about the macroscopic analysis of the fabrics, the potters' marks, and the development of the carinated cup





Figure 5. Middle Minoan II pottery from Mochlos: scuttle (P12598) showing a double line potter's mark on the handle; closed vessel (P12615) showing a single line potter's mark on the handle. Photo M. Tzari.

form a picture of local production and consumption in coarse and fine wares. The appearance of potters' marks in these local coarse wares during MM IIA and MM IIB indicates that the production (and competition) grew more intense. The potters' marks are a response to the growing field of competitors, a kind of marketing method to increase visibility and recognition. This competition is also evidenced in the increase of Mirabello fabric imports. Mochlos households had ties to the broader region and could express their preference for local or imported closed vessels. Finally, the demands of local production can be observed in the production of fine wares such as carinated cups. The development of the carinated cup from MM IB to MM IIB shows that Mochlos workshops were experimenting in new forms introduced by centers such as Knossos (MacGillivray 1998; Macdonald and Knappett 2007), though the cups are adapted with a unique, local flavor before conforming to the Malian MM IIB standard type (Poursat and Knappett 2005).

The wealth of information gleaned from this look at the deposit provides insight into pottery production and consumption in the three sub-phases of the Protopalatial Period in East Crete. The stratified evidence serves as a resource for identifying the sub-phases at other sites. A comprehensive discussion of the deposit will be presented with other Protopalatial deposits from Mochlos in my doctoral dissertation.

I would like to thank INSTAP for granting me the Seager Fellowship. In particular, I am grateful to Jeffrey Soles, Tom Brogan, and Diamantis Panagiotopoulos for their advice and support, and to Douglas Faulmann for his drawings. Many thanks also to conservator Matina Tzari for her excellent work and to Angela Ratigan for her editorial help.

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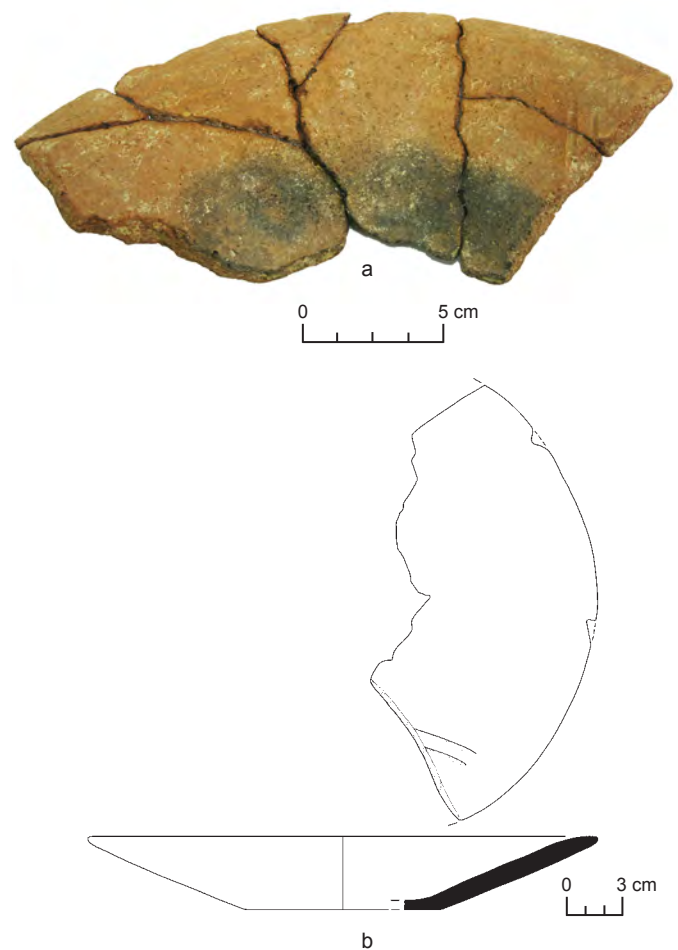


Figure 6. Middle Minoan IIA bowl (P12599) from Mochlos with a potter's mark visible on the interior of the rim. Photo M. Tzari; drawing D. Faulmann.

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Figure 7. Middle Minoan carinated cups from Mochlos: high carination and regular grooves from Level 1 (P12556, MM IIB); irregular grooves from Level 2 (P12566, MM IIA); low carination and no grooves from Level 3 (P12736, MM IB). Photo M. Tzari.

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*Erratum:* in *Kentro* 18 (2015) the byline for “A Report on 2015 Work Supported by the Richard Seager Fellowship” was incorrectly spelled as Paraskevi Stamaki. The correct spelling is Paraskevi Stamataki.

## Library News

Rebecca Hahn earned her BA in Classical and Near Eastern Archaeology from Bryn Mawr College in Bryn Mawr, Pennsylvania, and an MS in Library and Information Science from Pratt Institute in New York, New York. Prior to her fellowship at the Study Center, she worked as a research assistant for Malcolm Wiener in Greenwich, Connecticut, and as a digital asset management assistant at the Morgan Library in New York City.

After researching Bronze Age Crete for several years, she is excited to have the opportunity to explore the island and visit many Minoan sites. As the librarian fellow, she has updated the library catalog and organized the library’s digital collections, and she is currently working on an overhaul of the INSTAP-SCEC website.

### Website News

The Kentro is pleased to announce that its website is under renovation. It will go live in February 2017 with new information, a new mobile-friendly design, a searchable



Rebecca Hahn in the Kentro library. Photo Ch. Papanikolopoulos.

library database, and an electronic option for donations via PayPal (which is currently available). Mark your calendars to explore [www.instapstudycenter.net](http://www.instapstudycenter.net) in the new year!





## Raffle Party: The Kentro Needs a New Truck!

On Saturday, January 7, 2017, the Study Center will host a party in conjunction with the annual meeting of the Archaeological Institute of America (AIA) in Toronto. The party will be held in the Pine Room of the Sheraton Center Toronto Hotel, and we will hold our first ever raffle to raise \$30,000 for a new pickup truck at the Kentro. The prizes are exceptional, including fabulous watercolor paintings by the Study Center's very own artist, Doug Faulmann. The top prize is a commissioned painting! We hope that you can join us in catching up with friends and colleagues and supporting the INSTAP Study Center for East Crete!

The 1996 Mazda pickup truck has been a workhorse for the Kentro and its associated archaeological projects for two decades. Over the years, it has hauled approximately 1,100,000 lbs (550 tons) of equipment, soil samples, and archaeological finds countless times throughout eastern Crete for many different archaeological excavations and research projects: Alatzomouri, Aphrodite's Kephali, Azoria, Bramiana, Chryssi, Chalasmenos, Chrysokamino, Gaidourofias, Gournia, Hagios Charalambos, Kavousi, Knossos, Kommos, Livari Skiadi, Messorachi, Mochlos, Papadiokampos, Pelekita, Petras, Priniatikos Pyrgos, Pseira, and Sissi among others. Some of the truck's more unusual uses has been to transport various animal carcasses for the Kentro's zoological study collection, facilitate the construction of the Kommos apotheca, and convey Minoan Tastes and all its cooking accoutrement to Athens for the Minoan Seminar at the American School of Classical Studies at Athens (ASCSA). As of October 1, 2016, the truck has racked up 272,277 km (169,185 miles) on the odometer. After many years of outstanding service, it is time to put this workhorse out to pasture.

Raffle ticket prices are \$20.00 and \$30.00, and they can be purchased at the party with cash. Purchase as many as you like! The more tickets you have, the greater your chances of winning. If you are unable to attend the Study Center party or the AIA conference, tickets can be purchased in advance through PayPal by going online to [www.instapstudycenter.net](http://www.instapstudycenter.net) and clicking on the "Donate Now" link.



*Vangelis Fiorakis (left) and Costas Lionoudakis (right) with the Mazda pickup truck at Sopata in eastern Crete. Photo M. Eaby.*

The winning tickets will be drawn at the end of the party in Toronto. If you are not present, you will be notified via email.

### Top Prize

A commissioned watercolor by Doug Faulmann (size no larger than A3). You and Doug will work together on the content and composition. Raffle tickets are \$30.00; purchase as many as you like!

### Additional Outstanding Prizes

Raffle tickets are \$20.00; purchase as many as you like!

- Watercolor painting by Doug Faulmann (size no larger than A3), a piece of Crete for your home.
- Set of handmade Minoan-style ogival ceramic cups, excellent for sipping your favorite wine or raki.
- Handmade Minoan-style miniature tripod cooking pot, perfect for holding your Cretan sea salt.
- Red and white wines from Lyrarakis Winery, an award-winning, family owned company in Herakleion, Crete ([www.lyrarakis.com](http://www.lyrarakis.com)).
- Extra virgin olive oil from Kritsa in eastern Crete by the award-winning Greek producer, Gaea in Athens, Greece ([www.gaea.gr](http://www.gaea.gr)).



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# INSTAP STUDY CENTER FOR EAST CRETE

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## CELEBRATION!

In 2017 the INSTAP Study Center for East Crete will celebrate the 20th anniversary of its opening. We are planning a party that will take place in the summer, and we will keep you updated as our plans develop. We hope to share this milestone with as many of our friends and colleagues as possible.



*The Kentro under construction in 1996, view from above the stoa looking northeast toward the back of the Kentro, with the Mira-bello bay in the distance. Photo T. Brogan.*