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THE MYCENAEAN SITE OF KASTROULI, PHOKIS, GREECE: SECOND EXCAVATION SEASON, JULY 2017

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ABSTRACT

The paper presents the preliminary results of the excavations of 2017 season at the Mycenaean site of Kastrouli, Phokis. It attempts as well a preliminary interpretation of the data obtained during the 2016 season, now based on the first results of the still ongoing archaeometric research. During the second season of excavation a circular feature in the eastern side of the fortification wall has been investigated, and a second gate with its access ramp has been located, in addition to the gate already known on the western side. On the E-SE side of the fortified area some walls and foundations visible on the surface led to the excavation of the Building 1, which has been destroyed by fire. Further, a very long wall belonging to a large building (Building 2), or possibly to a complex of buildings, has been cleaned and documented on the southern terrace of the fortified area. Finally, two large holes dug by looters, one close to the Western gate and the other close to the Tomb A, have been examined and refilled with soil.

KEYWORDS: Kastrouli, Late Helladic III, Mycenaean, dig, ceramics, excavation, fortification, gate, settlement, looting

1. INTRODUCTION

The second season of archaeological excavation and archaeometric research took place in Kastrouli, near the village of Desfina, between July 19 and August 1, 2017 (for the results of the first season, see Sideris et al. 2017). The Project of the Department of Mediterranean Studies of the University of the Aegean was led by Prof. Ioannis Liritzis as PI for the University and director of the archaeometric part, and Dr. Athanasios Sideris as co-PI and director of the archaeological excavation. The geophysical research was led by Prof. Grigoris Tsokas (Geology Dept, Geophysics Lab, Aristotelean University of Thessaloniki), the geo-reference system laid out by Prof. Andreas Georgopoulos (National Technical University of Athens), and in situ preliminary XRF and RAMAN non-destructive analysis of ceramics and clay samples by Prof. Theodoros Ganetsos (West Attica University). Drone photography (Fig. 1) was provided by PhD candidate Demetris Stefanakis (University of the Aegean, Dept of Environment), while Anthoula Tsaroucha has been following the project on behalf of the Ephorate of Antiquities of Phokis. In the excavation participated, as well, students from the University of the Aegean and from various universities of Australia, England, Switzerland, Netherlands, and USA. The research focused primarily on three spots: the so-called “Eastern Circle” and the Buildings 1 (partly excavated) and 2 (only one wall cleaned) on the southern and south-eastern terraces of the fortified area (Figs. 2-3).



Figure 1. Documenting Kastrouli with drone.



Figure 2. Kastrouli with the three spots of interest during the 2017 season.

2. LOOTING INTERVENTIONS

Before even we started our excavation we have been informed about looting activities on the vicinity of the trenches excavated during the 2016 season. According to the testimony of a colleague archaeologist who visited the site in the end of May 2017, there was no sign of looting activity at that moment. By mid June 2017, however, we have been informed by a local inhabitant that digging occurred in our site. Therefore, the illegal digging must have happened in the short period of two weeks between the two reports. There have been two interventions. The first was an irregular roughly circular trench of 1.2 m diameter and 1.8 m depth, located inside the fortification wall, 3 m northwards from the Western Gate (Fig. 4). Near the spot there was fixed on the soil a small tube that we have used for geo-reference marking, and this may have triggered the curiosity of the looters. From the trench and the excavated soil we collected a few plain and non-diagnostic pottery sherds. In all probability there were no antiquities in this spot and the looters abandoned it and moved southwards. After documentation we refilled the trench with the soil excavated from it and still around its rim. The second illegal digging occurred 3 m eastwards from the Tomb A (Fig. 5). At this spot we have excavated in 2016 some fine pottery sherds around the fireplace of a building, the full extend of which has not yet been established (Sideris et al. 2017, 280-281, figs. 24-27). The looters partly removed the plastic foil and the thin layer of soil, with which we have covered the excavated area, and they dug a hole 1 m across and 80 cm deep. Their activity shuffled two stones of the wall of this building (Building 3), but it is unlikely that there was any substantial find. This area was already meticulously

studied, measured, and documented by photography and drawing during the past season. The plastic foil was removed in its entirety since, pierced as it was, it didn't provide any protection, and we filled the looters' trench with its own soil. The general im-

age refers to circumstantial "curiosity diggers" rather than to experienced "professional looters". The cover and the fencing of the nearby Tomb A did not show any sign of infringement.

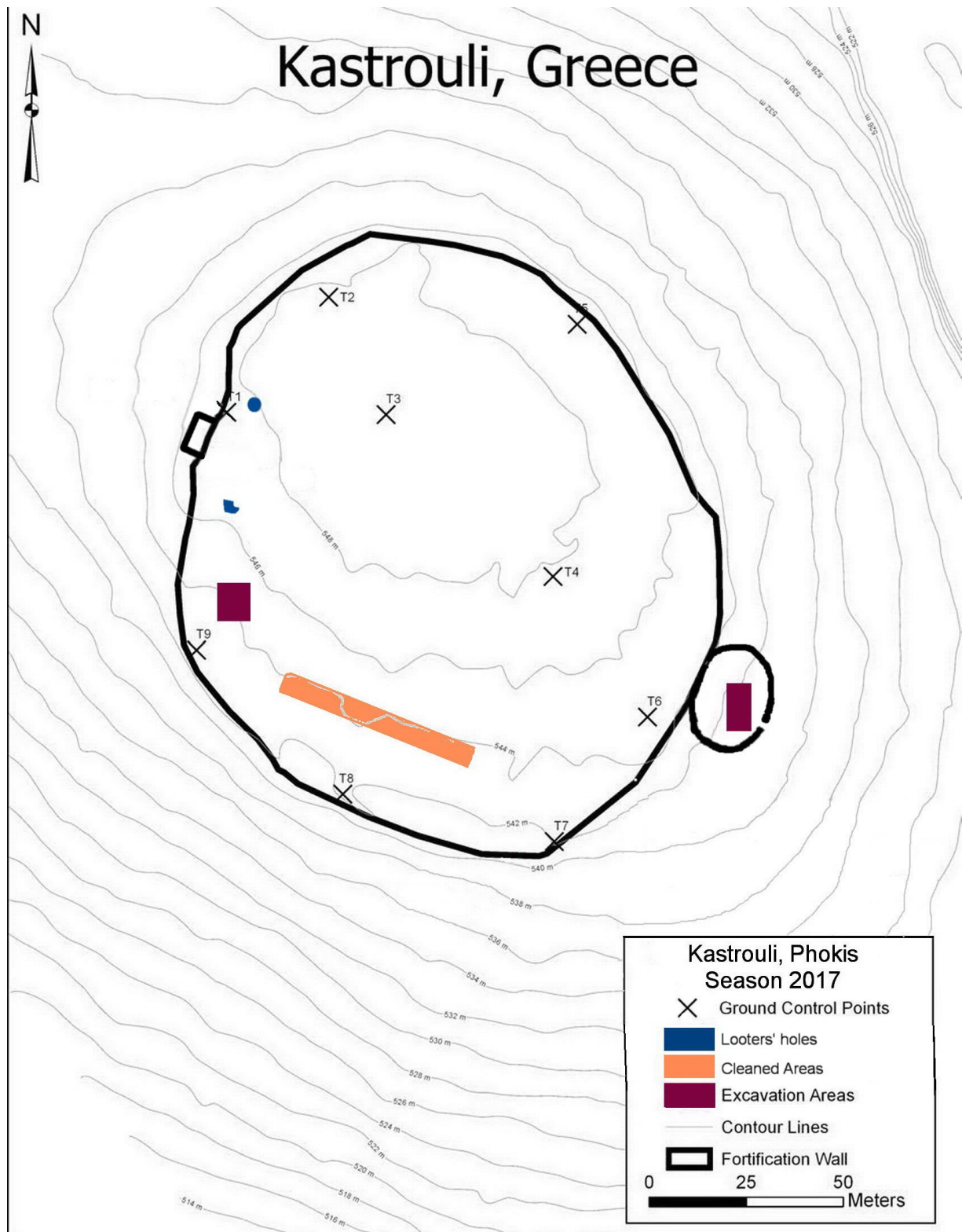


Figure 3. Topographic map of Kastrouli with all spots of intervention during the 2017 season. Map by A. Sideris after Levy et. al. 2018, fig. 9.37.



Figure 4. The first looters' hole.



Figure 5. The second looters' hole.

3. TRENCH IN THE EASTERN CIRCLE

"Eastern Circle" we called provisionally the round structure osculating the eastern side of the fortification wall. As we will see further it is as well part of the fortification, but its function and significance were initially not clear. On the Google and balloon photography only its circular shape was evident, outlined by vegetation; the stone wall structure under the vegetation was however invisible (Fig. 3). The geophysical prospecting effectuated in the interior of the Eastern Circle during the 2016 season revealed an oblong anomaly with N-S direction and in estimated depth of 1.5 m (Fig. 6). We cleaned this spot from low vegetation and removed a pile of stones 1.2 m high, before starting the excavation.

The initial trench, 1 m wide and 4 m long, very soon, in only 20 cm of depth, reached the natural bedrock. We enlarged the trench eastwards into a full square of 4 x 4 m. Furthermore, we added two new trenches extending 1 m westwards and 4 m southwards from the main square. However, we reached almost everywhere the natural bedrock in depths between 15 and 30 cm. The very few collected sherds were all plain, non-diagnostic and found on the topsoil. Only in the central-eastern area of the square we reached a thick layer of tightly packed

gravel and rubble in depths of 20 to 45 cm, which rendered the digging very difficult. Below this layer there was red soil mixed with rubble, which grew denser with the depth (Fig. 7). At 1.1 m depth we stopped digging without encountering the slightest sign of human induced disturbance of the natural subsoil. The trench was refilled with its original content just under the rim, so that its outline would remain visible, since we came to the conclusion that the anomaly registered earlier in geophysics must have been of natural character.

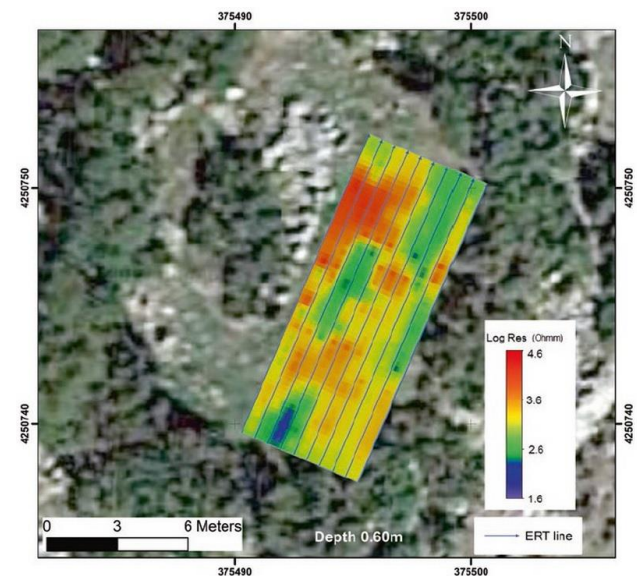


Figure 6. Resistivity distribution at the depth of 2.60 m for the area of the "Eastern Circle". (by Prof G. Tsokas and his team).



Figure 7. The trench in the "Eastern Circle".

4. THE EASTERN FORTIFIED PRECINCT AND THE EASTERN GATE

The research inside the Eastern Circle despite been fruitless itself it had an important side effect. As we have been searching for an easier access of the excavating team to this particular spot, we examined carefully the entire circular structure and the removal of a single small bush was enough to reveal a second entrance to the fortified area, besides the one

already known on its west side. The new entrance, which henceforth we call Eastern Gate, it is placed diametrically opposite to the Western Gate. Its presence proved of particular significance for the understanding and re-interpretation of what we called conventionally thus far “Eastern Circle”, because we didn’t know its function or relation to the main fortification.

It seems however that this structure, which we call henceforth Eastern Fortified Precinct, is not a secondary construction, nor a chance adjunction, but an integral part of the main fortification, with which it is organically, morphologically and functionally connected. Besides, the trench conducted in its interior removed all suspicions that the circular feature could have had any funerary use. The precinct, which is located on the E-SE periphery of the main wall, has not a perfectly circular plan, but rather an ellipsoid one 21 m long on the N-S axis and 17.5 m wide on the E-W axis. It is noteworthy that the ratio of width to length of the Eastern Fortified Precinct plan is the same with that of the main fortification plan (1:1.2). On the eastern outer side of the precinct, which remains better visible because the other sides are covered by relatively thick vegetation, one may observe the same “cyclopean” stone blocks, of which are made as well the better preserved sections of the main fortification.

The Eastern Gate is 1.7 m wide and its stone threshold is almost entirely preserved. Its northern anta is formed by a stone block measuring 1.53 x 0.54 x 1.22 m (l., w., h., **Fig. 8**). To the gate leads an inclined plane forming a ramp in the N-S direction, with length 7.5 m and width 2.9 m at its middle, and 2.6 m at its lower edge (**Fig. 9**). Just in front of the gate there is an almost square plateau (2.5 x 2.3 m) bringing the entire length of the accession ramp to 10 m. The ramp makes use of a natural rock, which fulfils the function of a retaining wall on its outer side. The altitude difference between the start of the ramp and the threshold of the gate is 2.3 m.

At the current stage of research it was not possible to locate the communication point between the Eastern Fortified Precinct and the main fortification. The small entrance or passage to the main fortification is either covered by fallen stones of the main wall (if it was located directly opposite the Eastern Gate) or obscured by removed stones (if it was located in the SW side of the precinct). All these new elements concerning the fortification request a reevaluation of the data and eventually the formulation of a new interpretative hypothesis. In front of the Western Gate there is a rectangular structure, which thus far was interpreted as a tower of a later period (Classical?). The absence, however, of later pottery from this area, as well as the existence of the Eastern Gate in a

diametrically opposite location, with an ellipsoid precinct contemporaneous to the main fortification, raises the question if the supposed Classical (?) tower of the Western Gate is not just another fortified precinct of the Mycenaean period. Further investigation of both gates and their adjacent structures would be necessary to clarify their precise dating and function. Besides, the OSL obtained dates indicate that repairs on the main fortification wall have occurred at least in one or possibly two later phases (see below subchapters 8-9).

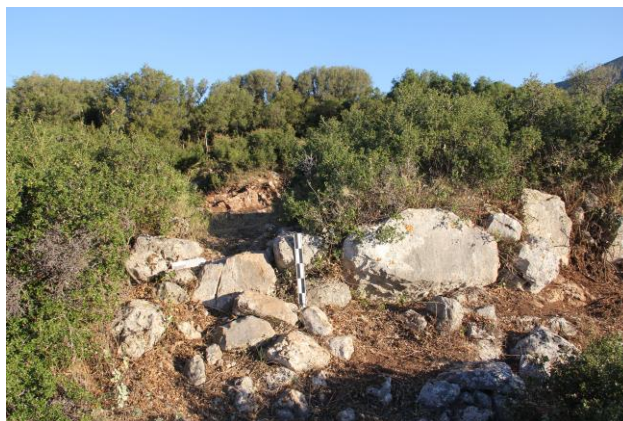


Figure 8. The Eastern Gate and part of the Eastern Fortification Precinct.



Figure 9. The ramp of accession to the Eastern Gate.

5. BUILDING 2

Remains of a long wall were visible on the central and western parts of the Southern Terrace, which we attributed to a building labelled Building 2, since a Building 1 was already under investigation a little further westwards (see following subchapter). After cleaning it became obvious that it was an almost uninterrupted row of single stone blocks (dimensions: length 50-90 cm and width 35-70 cm), with E-W direction, most probably the foundation of a wall belonging to one or more buildings (**Fig. 10**). Its entire length could be measured to 37.7 m, but the 6 westernmost metres are not in straight line (**Fig. 11**). They form an angle of approximately 170° and at the angle

point starts at least one transversal wall, with direction N-S, the northern outline of which disappears in the slight inclination of the soil surface. At least two more transversal walls are visible at their start and vanish northwards: one starts approximately in the middle of the long wall, and the other at 6 m from its eastern edge. Piles of stones, mostly on the northern side of the long wall give the impression that parts of the structures have been demolished and their stones amassed in piles during the ploughing and cultivation of the terrace, possibly in modern times. In the area northwards of the long wall we collected several sherds of large vases, perhaps amphorae and pithoi, and a few sherds of fine pottery, mostly from cups. This strengthened the idea, conceived already by the terrain configuration, that the interior of the Building 2 (or more buildings) lays on the north of the long wall. Close to the eastern edge of the latter we found two sherds with reparation holes, and a handle, the cross section of which is a square with rounded angles and concave sides. Some 15 m on the north of the western end of the long wall we collected a fragmentary mortar of greenish volcanic stone (dimensions: 22 x 17 x 8 cm). A similar mortar but entirely preserved (60 x 34 x 14 cm) has been collected from the easternmost end of the Southern Terrace.



Figure 10. The long wall of the Building(s) 2.



Figure 11. The easternmost section of the long wall of the Building(s) 2.

According to the geophysical survey conducted in the Southern Terrace during 2016 there should be yet another long wall placed 2.5-3 m southwards of the one cleaned and documented during this season (Fig. 12). This element, which remains to be confirmed by excavation, combined with the here above reported transversal walls, strengthens the hypothesis that the long wall is not a retaining feature, but part of a bigger building or possibly of a complex of more than one buildings.

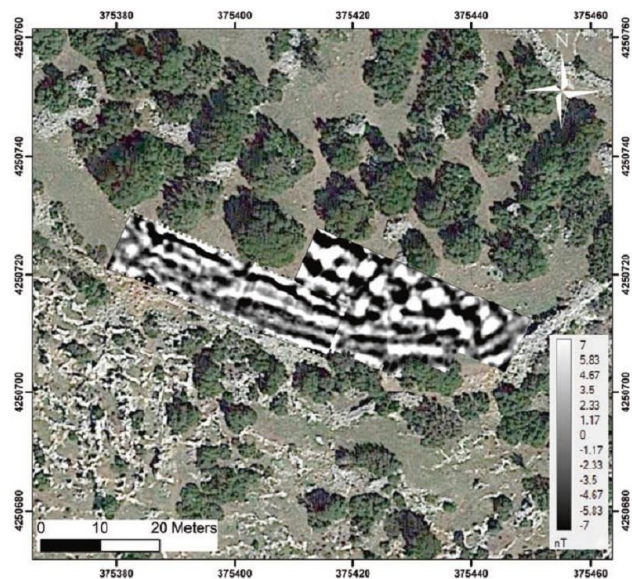


Figure 12. Distribution of the magnetic gradient in the area of the southern terrace. (by Prof. G. Tsokas and his team).

6. BUILDING 1

Stone blocks creating an almost right angle were visible some 10 m from the W-SW part of the fortification wall and 30 m south of the Tomb A. The two walls, or rather their foundations, since there is preserved only one row of stones, seem to belong to a relatively large building, which we labeled Building 1 and excavated partly during 2017. The walls visible, at least in part, already before the excavation are orient-

ed N-W and S-W. If we assume that the Building 1 had a roughly rectangular plan, its other two walls on its eastern half are not visible anymore. The N-E wall has been transformed into a retaining wall of approximate high 1.2 m, while the S-E wall is entirely covered by piles of stones and relatively high vegetation (*Quercus calliprinos* up to 3.5 m) (Fig. 13).

These stone piles, as many others inside the Kastrouli fortification, they did not function as retaining walls. They are simply heaps of stones amassing in irregular intervals the blocks of destroyed walls in order to clean larger surfaces of soil and render them suitable for cultivation. The density and sizes of these stone piles indicate that there have been many buildings inside the fortified area, and they may also hint that not only the foundations of the walls were made of stone, but their lower parts as well.



Figure 13. The Building 1 after cleaning of its S-W and N-W walls.



Figure 14. The entrance of the Building 1.

The S-W wall is 0.6 m wide and approximately 9 m long, since on its southern end is located the entrance of the building, partly cut in the natural bedrock, and a precise measurement is not possible. The entrance is 1.3 m wide and the threshold is composed by the natural rock and two added stones (Fig. 14). The N-W wall is 7.5 m long with an average width of 0.5 m. On its N end joints a modern

retaining wall, which in all probability is erected upon the foundation of the original N-E wall of the building. The S-E wall has not been documented thus far.

During the excavation of 2 m wide trench inside and along the S-W wall, in a depth of barely 15 cm from the surface, we found a destruction layer characterized by high density of charcoal (but no ashes), several pottery sherds, and some small finds, mostly close to the entrance (Fig. 15). On its western part the wall preserved still in their original positions fragments of clay coating 3 cm thick. The clay had an intensive red color, almost no inclusions, but it was very friable (Fig. 16). More fragments of the wall coating have been found on the floor, among the charcoal and soil mixture. Beneath this layer of carbon, pottery sherds, and soil, which measured approximately 15 cm thick, we discovered sections of the latest floor before the destruction, similar in texture and color to the fragments of clay wall coating. The floor, no doubt, was made by pressed soil and the walls had unfired clay coating. Both, however, floor and walls, have suffered very high temperatures during the destruction of the building by fire, a fact that not only led to their baking and consequently to their partial preservation, but it also gave them the characteristic intensive red color. Besides, measurements effectuated in situ, with a portable XRF spectrometer, have shown that the composition of the clay coating of the walls and that of the pressed soil of the floor was the same.



Figure 15. Concentration of charcoal along the S-W wall of Building 1.



Figure 16. Clay coating of the S-W wall.

The layer of charcoal and soil has been found primarily inside the S-W wall. In the northern and eastern areas of the building, however, the charcoal has been found in considerably smaller quantity or it was altogether absent. One plausible explanation for these variations is that the slight inclination of the soil westwards and southwestwards contributed in the washing off and the concentration of the charcoal immediately after the destruction in the areas, where we have found it.

On a spot equally distant (2 m) from the S-W wall as well as from the N-W wall we discovered six middle-sized rough stones in circular arrangement, the maximum outer diameter of which is 65 cm (Figs. 17-18). They must have been the base or foot-hold of a wooden column, and judging by the inner diameter of the stone arrangement, the column's base diameter would have been approximately 25 cm. Stone bases for wooden columns are quite fre-

quent, such as those reported from a LH IIIC building in Mygdalia, Achaia (Papazoglou-Manioudaki & Paschalidis 2017, 454, pls. 175a-b, 176a).

From the middle of the N-W wall runs a transversal wall made of middle-sized stones. Its direction is NW-SE, it has an average width of 50 cm, and it is preserved for a length of 3.25 m, where it joins the natural bedrock, which in this area of the building must have served as floor (Figs. 17-18). Half a meter south of the southeastern end of the transversal wall we discovered a hydria and an oenochoe partly preserved in several fragments (Fig. 19, see following subchapter on finds). Both vases were removed with all soil content for future analysis. A secondary wall, made of small stones, connects obliquely the S-W and the transversal walls. It is 1.75 m long with E-W direction and creates a divided space, possibly for storage. Alternately it could have been filled with soil and creating an elevated level for sitting or even sleeping. Close to the eastern end of this smaller wall we found a slightly concave mortar of gray stone in depth 10-25 cm (Fig. 20). The mortar measures 51 x 20 x 9 cm. Close to the northern end of the N-W wall we documented a concentration of small finds, mostly clay and stone spindle whorls, some other stone tools, as well as several sherds of undecorated household pottery (see following subchapter on finds). By the end of the 2017 season the western half of the visible part of the Building 1 has been excavated, with the intention of completing the remaining half in the following season.

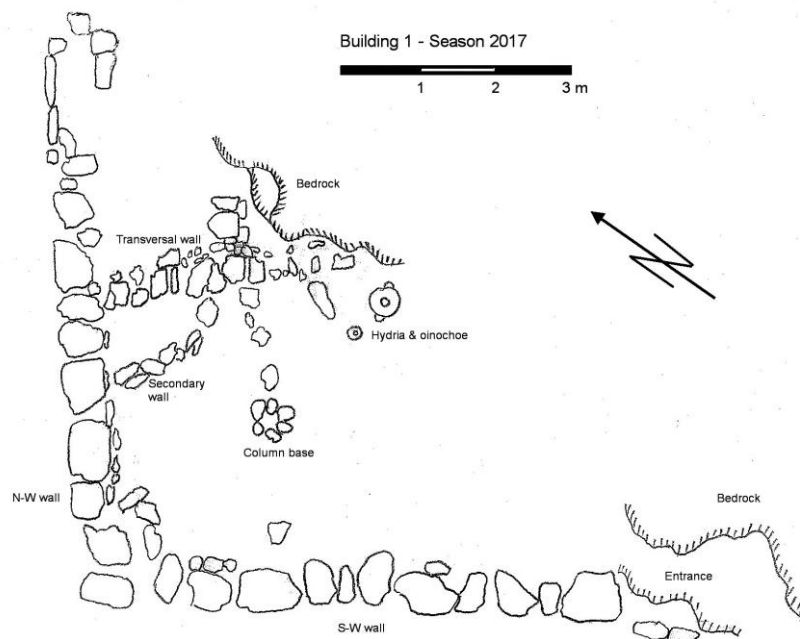


Figure 17. Preliminary plan of the Building 1 showing the area excavated during the 2017 season. L. Strolin and A. Sideris.



Figure 18. The Building 1 at the end of the 2017 season.



Figure 19. The hydria and oenochoe found in situ, near the transversal wall of Building 1.



Figure 20. Stone mortar in the secondary wall of Building 1.

7. FINDS FROM THE BUILDING 1

The finds comprise mostly pottery sherds, stone mortars and grinders, clay and stone spindle whorls, stone beads, two small metal artifacts, animal bones, as well as, sea shells.

Pottery: The main pottery concentration was found within the destruction layer, near the entrance of the building and on its west, in depths between 20 and 30 cm. It comprises sherds from the body and the rim of large pithoi, some with a relief band (Fig.

21, cf. Popham et al. 2014, fig. 2.41.1, pl. 24.1), more sherds and ring bases from undecorated vases, the spout of a vessel - probably of a bridge-spouted jar (Fig. 22), handles, rims and other sherds of fine pottery shapes, mostly cups with out-turned rim and deep bowls (Fig. 23). Among the very few sherds with painted decoration there are two from cups or skyphoi: one with chevrons and another with a large red band under the rim, dated variously from the LH IIIC Early to the Sub-Mycenaean periods (Fig.

24a-b; for the banded rim cup cf. Popham et al. 2006, 181-186, figs. 2.15, 2.16, 2.18.7-8; pls. 17.1-4,9, 43.2, 44A; Papazoglou-Manioudaki & Paschalidis 2017, 454, fig. 176a; Bächle 2018, 34, fig. 5). Close to the eastern end of the transversal wall we found a hydria of reddish clay and another vase of ovoid shape, probably an oinochoe, made of grey-brown clay (**Fig. 19**). The smaller vase has a maximum belly diameter of 20 cm, but the part above the shoulder is entirely missing. The hydria has maximum body diameter 40 cm, and its length with the handles measures 50 cm. Part of the neck with the entire mouth and part of the vertical handle are missing.¹ The bottom of the vase was possibly intentionally removed, since it has not been found, despite the fact that the hydria was nesting in a small cavity on the floor made especially for it. It was possibly used for libations in association with the adjacent oinochoe, as it is located close to the natural rock, and at the precise center of the building's plan (at least as we may figure it out on the base of the currently available data).



Figure 21. Pithos sherd with relief band.



Figure 22. Spout probably from a bridge-spouted jar.



Figure 23. Large sherd with handle of a deep bowl.

Stone tools and lithic industry: A stone mortar was found close to the transversal wall of the Building 1 (**Fig. 20**), and two more northwest of the Building 2 and on the eastern end of the Southern Terrace (**Fig. 25**). Inside the Building 1 we found as well two spherical grinding stones or crushers, a discoid stone grinder, and two fragments of stone axes made of green (basaltic ?) stone, one of which is particularly well polished (**Fig. 26**). During the sieving of soil coming from the area south of the transversal wall we found three small fragments of obsidian blades (**Fig. 27**). Several fragments of quartz from the same area and from near the entrance of the building do not show any trace of elaboration (**Fig. 28**). Some of the stone tools, as well as the obsidian blades, may indicate that the site was occupied already during earlier periods (EBA or Neolithic), but such artifacts are quite frequently found in Mycenaean contexts as well (e.g. Petrou 2008, 346, fig. 25).

¹ Both the hydria and oinochoe are not yet restored, preventing thus any conclusion on their exact profile, attribution, and dating.



Figure 24. a) Rim sherd of a cup with chevron motif. b) Sherd of a banded rim cup.



Figure 25. Stone mortar from the eastern part of southern terrace.



Figure 27. Fragments of obsidian blades.



Figure 26. Two spherical stone crushers and fragment of a stone axe.



Figure 28. Quartz fragments.

Spindle whorls: We found in total eight spindle whorls, all of them in the northern corner of the building. Four of them are conical, two biconical, and two spherical. Two are made of clay (one conical and one spherical); the remainder are of black steatite except one conical exemplar, which is made of

green steatite (**Fig. 29**). On the opposite side of the building, close to its entrance, a fragment of friable yellowish clay was found. It belonged probably to a loom weight, like the one discovered in the previous season (Sideris et al. 2017, fig.27), but its suspension hole is not preserved.

Beads: Two halves of stone beads have been found: one is discoid and made of black steatite and the other discoid/lentoid from green steatite (**Fig. 30**).

Metals: In the destruction layer, close to the S-W wall we uncovered a small oblong bronze lamella with one end rounded and perforated (l. 4.2 cm, **Fig. 31**), and a small lead band with a "nail" perpendicular to the band's surface (dimensions 3.9 x 2.5 cm, thickness of the band 0.5 mm). The latter served as repairing ligament between the broken parts of a pottery vase (**Fig. 32**). Such use of the lead lamellae has been further confirmed by the discovery in the

same area of a sherd with its repair hole empty, and another sherd still preserving the repairing lead "nail" (**Fig. 33**).



Figure 29. Clay and steatite spherical, biconical and conical spindle whorls.



Figure 30. a) Half of discoid steatite bead. b) Half of a discoid/lentoid steatite bead



Figure 31. Bronze lamella with rounded and perforated edge.



Figure 32. Lead lamella with its "nail": repairing ligament for broken pottery.



Figure 33. Pottery sherd with its lead reparation ligament still in place.



Figure 34. Animal bone with three parallel knife marks.



Figure 35. Various sea shells of edible molluscs and gastropods

Animal bones and sea shells: Inside the Building 1 and mostly around the central area of the S-W wall several fragments of animal bones have been unearthed, some burned inside the destruction layer, while others in the floor layer beneath the destruction. They include mostly sheep and goat (one with three parallel knife marks, **Fig. 34**), the long bone of a bird, and a mandible fragment of a young pig. The sea shells include the following species, all of which are edible: *Cerithium vulgatum*, *Crepidula fornicata*, *Mytilus* sp., *Monodonta turbinata*, *Ostrea edulis*, *Tarantinea lignarius*, *Spondylus gederopus* and *Pina nobilis* (**Fig. 35**).

8. ONGOING ARCHAEOMETRIC STUDY

The archaeometric work is ongoing regarding: a) stable isotope, DNA and diagenesis of bones, b) OSL dating of ceramics and stone material, c) XRF and Raman characterization and provenance of ceramics and local clay sources, d) detailed SEM, XRD, XRF analysis for firing technology and provenance.

The Kastrouli inland fortified site indicates a dating in the Late Helladic III period with some elements of reuse of the site in the Geometric, Archaic, Classical and Hellenistic times. The research refers to the dating by luminescence of the stone wall that circumvents the site, a tomb construction, and a few ceramics (Liritzis et al., 2016; Liritzis et al., 2018). The dating approach to applying luminescence provides an excellent opportunity to search for the Late Bronze Age (LBA) collapse consequences at the site. The thermoluminescence (TL) measurements of ceramics were carried out following multiple aliquots made of the polymineral material. For the equivalent dose (ED) estimation of pottery samples, the multiple aliquot, additive dose procedure (MAAD) in TL was applied. For the OSL SAR technique was used for ED determination. Firing temperature was estimated also using TL and it is safe to conclude that the firing temperature of the original ceramic was ca. $400 \pm 50^\circ\text{C}$. In further analysis of more ceramics firing temperatures are estimated to $750\text{-}1000^\circ\text{C}$ (work in progress). At least a dozen of luminescence dates were produced on well stratified archaeological sections and context; of ceramics from Tomb A and from the stone wall, and in situ stone building material from the tomb.

For the ceramics OSL/TL ages of 890 ± 240 and 1530 ± 290 BC, and within the overall error bars ($\sim 10\%$) the ages 1180 BC, 690 BC, 420 BC; for the external fortified wall three dates 1250 ± 145 , 680 ± 130 , 437 ± 140 BC, and for the tomb 900 ± 138 and 1350 ± 310 BC, those indicate the periods of first occupation during Late Helladic, then use of the site during Dark Ages/Geometric period and Classical/ Hellenistic times.

Further, a proposed decision-making procedure, whose goal is to classify unknown ceramic findings based on their elemental compositions derived by R, G, B chromatic values, gives satisfactory results. Munsell scale is a widely used method to inexpertly define color classification in ceramics but lacks reliability and objectivity (Bratitsi et al., 2018). Measuring other parameters (HSB, Lab) does not provide correct results or sufficient enough for color assessment. The RGB seems to inhere potential with promising results. Measuring larger area in lieu of a point focus is after all indicative of the color, provided that the USB images are taken under similar conditions, same distance between USB microscope lens and ceramic. USB is preferred to stereoscope; for the latter lighting has greater dispersion.

Using a dark room is a very significant condition to avoid external inhomogeneities brought by the light. The end result is a combination of mineralogical composition, firing temperature, and reducing or oxidizing firing conditions, as the briquettes have evidently shown (cf. Cianchetta et al. 2016). Ongoing research on more combinations of mixed clays which are fired at different temperatures provide further insight into this effect (Liritzis et al., 2019 ongoing).

9. CONCLUSIONS

The identification of the Eastern Fortified Precinct and the Eastern Gate with its accession ramp obviously sheds new light in the spatial organization and the function of the Kastrouli fortified settlement. The precinct could have multiple other uses besides the obvious defensive one. It could have served as temporary shelter for traveling people and transiting goods; or possibly as a horse stable. It could have, as well, been a storage area, or even a place of control (and documentation?) of incoming and outgoing goods. The two gates, East and West, are facing the two possible directions from where any traveler would have approached Kastrouli, either from Eastern Phokis and the Antikyra Gulf, or from Locris, Western Phokis and the Kirrha Gulf. The destruction by fire of the Building 1, without thus far any signs of reoccupation, may not be just an accidental event. It may actually indicate a temporary abandonment of the site or of some parts of it. In other words it may represent a gap in the perceived continuity, as it seems suggested by some archaeometric data. Especially the TL and OSL dates obtained from the 2016 material invite for a more subtle description of the Kastrouli history in the LH III and subsequent periods (Liritzis et al. 2018, tab. 4, chapter 5).

Pottery and figurines datable on typological and stylistic criteria from the Tomb A range from LH III A2 to LH III C Early or Developed (Sideris et al. 2017, 278-279). There is no doubt that the Tomb A

has been used during a long period, a fact confirmed moreover by the at least nineteen individuals identified during the anthropological study of the skeletal remains (Chovalopoulou et al. 2017). Although absolute chronology is still debated for the Late Helladic period (Deger-Jalkotzy & Zavadil 2001; Wiener 2003; Vitale 2006, 193-194; Aston 2011; Toffolo et al. 2013, 2-7), it seems relatively safe if we ascribe the pottery and the figurines from the Tomb A to various dates between 1370 and 1090 BC (longest possible time-range) or between 1320 and 1170 BC (shortest possible time-range). One hundred and fifty years was thus, the shortest possible period during which the Tomb A has been in use. The two ceramics OSL/TL ages are 890 ± 240 and 1530 ± 290 BC. There is no problem with the higher date, which overlaps with the typological dates for 80 years minimum or for 130 years maximum. The lower ceramic OSL/TL date, however, indicates that we should opt for the use of the Tomb A at least until 1120/10 BC, invalidating thus the higher typological/stylistic date of 1170 BC as latest date for the use of the tomb. The maximum overlap that we may obtain between typological pottery dates and the lower OSL/TL date for the use of the Tomb A is barely 40 years.

The situation seems less clear with the OSL dates obtained from the lowest course slabs of the Tomb A, just above the bedrock. The higher date (1660-1040 BC) fits well with the multiple occupancy and the dates of the pottery and the figurines. The lower date (1038-762 BC), however, does not overlap at all with the higher one. It indicates without a doubt that the tomb has been reopened sometime during the Submycenaean or/and the Geometric periods. Various reasons could have led to such a step, among which a new burial is the most probable. To this explanation points also the right femur collected in the upper stratum inside the tomb before the start of the excavation, with calibrated ^{14}C date 810-760 BC (Liritzis et al. 2016, 247). Alternately, looting already in this early time cannot be excluded, although some kind of heroic cult would have been more in the spirit of what we know from other Mycenaean tombs, including those in the nearby Medeon and Delphi (Antonaccio 1993, 133-135).

The OSL dates of the fortification wall indicate at least two or possibly even three phases. The earliest one (1395-1105 BC), covering practically the entire 14th - 12th centuries, is in accordance with the pottery finds, which on typological/stylistic criteria are not earlier than 1370 BC. The other two dates (810-550 BC and 577-297 BC) overlap slightly for a quarter of a century and if they are correctly correlated they may indicate some major repairs on the wall during the second quarter of the 6th century BC. This would be the time immediately after the First Sacred War in

Phokis, an event which may have triggered the need for rehabilitation or upgrade of the Kastrouli fort. If, however, they represent two distinctive events, they should be interpreted as two major interventions or repairs of the wall: one during the Archaic period and another, either in the Late Archaic or in the

Classical periods. This is not entirely surprising since Archaic and Classical sherds have been reported on the surface of the Kastrouli site by Dasios (1992, 84) and Raptopoulos (2012, 1072). Thus far, however, our research has not confirmed archaeologically these later periods.

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CREDITS

All pictures are by A. Sideris except if stated otherwise in the caption.

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