

EDITORIAL FORWARD

The present issue comprises a selection of papers presented at the 1st International Symposium “STYRIA GAIA” : The Archaeology of Styra & Southern Euboea, which took place at Styra, 3-5 July 2009. The conference was organized by the Styra Municipality and the Laboratory of Archaeometry, University of the Aegean. Approximately 20 presentations and discussions were offered by an international group of professionals and the proceedings were well attended by colleagues and a large number of interested citizens from the Styra and Karystos communities.

Styra and Southern Euboea have a rich history, but mysterious and unexplained archaeological remains have received very little scientific investigation. The aim of this symposium was to bring together Greek and foreign experts to present new archaeological findings and relevant information from their research in the region between Eretria and Karystos. A predominate theme throughout the symposium was to consider the ancient materials in view of modern trends in cultural resource management and the discussion of means for preservation and presentation of the ancient monuments and artifacts to the mutual benefit of the local community, visitors, the environment, and posterity.

Dr. Donald Keller (Boston Univ., USA)
Guest Editor



ANCIENT LAND ROUTES ON THE PAXIMADHI PENINSULA, KARYSTOS, EUBOEA

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ABSTRACT

Recent regional surface surveys have placed more focus on rural investigations, but the means of transport and communication within those rural surroundings has not always received adequate attention. The Southern Euboea Exploration Project has undertaken a new phase of research in the Karystos area with the goal of developing a methodology that allows for a more detailed record of the pre-modern land routes. On the Paximadhi peninsula it was possible to identify numerous fragments of suspected ancient routes dating to the Classical and Hellenistic periods. In the majority of cases these fragments were closely associated with adjacent datable ancient sites. By taking into consideration the evidence recorded during the survey it was sometimes possible to propose the extension of these ancient segments and to theorize the directions, lengths, and purposes of ancient networks.

KEYWORDS: Karystos, Paximadhi peninsula, ancient routes, ancient roads, rural landscape, archaeological survey, Classical and Hellenistic sites

INTRODUCTION: THE PROJECT

Recent regional surface surveys have placed more focus on rural investigations, but the means of transport and communication within those rural surroundings has not always received adequate attention. Ancient routes are a category of archaeological material that can be studied independently. Or, to be more precise, physical roads and trails may be considered an autonomous category of archaeological material that can be isolated, measured and described, but routes and lines of communications must be analyzed by taking into consideration other aspects of the research environment. The reconstruction of the system of communication (within a specific region for a given time period) needs also to include a discussion of the surrounding landscape, the location of resources, the habitation pattern, and the use of the land. It is a combination of these aspects of human behavioral patterns, together with the topographical characteristics that determined the evolution of the route system in the first place.

Analysis of the routes can provide insight into the distribution of population centers as well as areas of economic activities (such as harbors or landings, quarries, fields and grazing lands). It can also widen our understanding of the reasons for communication (trade, social contacts, religious activities, political relations and boundaries).

The first field project undertaken (in 1986 and 1987) by the Southern Euboea Exploration Project (SEEP) was an intensive surface survey of the Paximadhi peninsula to the west of Karystos (Keller and Wallace 1986, 1987, 1987a). During this survey, routes were recorded whenever their relationship with an ancient findspot or site was obvious or when they had features that made them stand out from the more recent network of trails.

In 1989 SEEP initiated a new phase of research in the larger area to the east and north of the Karystos bay (Keller and Wallace 1990, Wallace et al. 2006, Rotroff and Wickens 2010). This was a systematic extensive or reconnaissance survey over the larger area in order to gain an initial sample of archaeological remains in the region. The methodology employed smaller teams walking the pre-modern routes and trails recorded on Greek 1:5000 topographical maps and recording material at 10 meters to either side of the trails. These routes then served as survey transects instead of following lines of the compass as on an intensive survey. A second aspect of this "route survey" methodology was a more detailed recording of the pre-modern trails themselves. Following this extensive route survey in the east, it was decided to revisit Paximadhi and record the peninsula routes and networks in the same method. This would make use of recording methods devised in the east to provide a better understanding of the routes on the Paximadhi peninsula

The Paximadhi peninsula (fig. 1) is a triangular-shaped area with its apex pointing south and its base delineated by the flat alluvial Karystos plain (Kampos) on the north. The defining feature of the 22 square kilometer peninsula is a north-south, V-shaped ridge (ca. 214–242 masl) pointing south. The range encloses a ravine-valley area that opens onto the plain at the north. The western side of the peninsula faces the open sea and is characterized by steep slopes extending down to a rugged coast. The eastern side, in contrast, faces the shallow Karystos bay and offers a more hospitable landscape. The summit of the eastern ridge top extending from Paximadhi peak to Karababa peak lies farther back from the shoreline and the slopes descending from the ridge top are

more gradual, giving way to a series of low spur hills that project onto a continuous stretch of low coastal land.



Figure 1. Map of the Paximadhi Peninsula showing terraced landscape and sites of Classical - Hellenistic date. Ancient routes indicated by bold lines between “r”s

As predicted by the topography, the relatively flat tops of both the eastern and western segments of the V-shaped ridge and the eastern shoreline provided more evidence of traffic than the steep and ravine-segmented coast of the western side. Additionally, evidence of ancient habitation and agriculture was concentrated on the more hospitable eastern side of the peninsula.

On the Paximadhi peninsula it was possible to identify several fragments of suspected ancient routes. In the majority of cases these fragments were closely associated with adjacent datable ancient sites. By considering the evidence recorded during the survey of routes on the peninsula, it was sometimes possible to propose the extension of these ancient segments and to theorize the directions, lengths, and purposes of ancient networks. In theorizing the function of various routes it was also necessary to consider the terrain of the area as well as the location, distribution, and function of the

recorded ancient sites on the peninsula. The most identifiable of the ancient route segments are those that show some evidence of joint community efforts, as in construction of retaining walls, cutting through bedrock, or build up at gully crossings. In some cases it can be determined that later pre-modern trails make use of ancient routes and then divert where the ancient constructions have fallen into disrepair. In some respects, the Paximadhi peninsula presented a unique time capsule for the study of a variety of ancient rural routes in a small undisturbed environment. Archaeological evidence demonstrates that the peninsula had been inhabited and cultivated from the Archaic through Roman periods. From the Byzantine period to the present, however, the peninsula—with the exception of the Kourmali plateau, (discussed below)—was used only for the winter grazing of sheep and goats. Except for the construction of some shepherds’ huts and the ravages of time, the remains of the pre-Byzantine buildings, agricultural terraces, and traces of routes had remained undisturbed.

A discussion of the theoretical framework devised to study ancient routes remains outside the scope of this paper. Here is presented tentative conclusions and summary information on the ancient Paximadhi routes—grouped into three categories: access routes to sanctuaries, a route connecting a Classical hamlet to the world beyond the peninsula, and a network of routes connecting a number of individual sites on the peninsula.

SANCTUARY ROUTES

The Archaic-Classical sanctuary C19 (findspot number) is located near the eastern end of Plakari ridge (Keller 1985, 104-105, 182-183). The remains include a te-

menos enclosed by walls on three sides and high ground to the west. Remains of a temple are located near the center of the temenos and a 14 line religious inscription was found built into a hut just southeast of the site. At the northwest corner of the site a possible ancient approach leads to the northwest and down the northern slope of Plakari. It is a flat ramp-like area with a width of 6 to 8 m that descends at a gentle gradient and does not follow the contours of the hill, as an agricultural terrace would. The ramp does not have a down slope retaining wall nor any other signs of construction. The ramp-like approach can be followed for about 60 m, but then is lost in a hollow on the hillside, which is occupied by curved terrace walls of a more recent date. At the foot of the northern slope of Plakari, in the Rigia river area, a cluster of findspots dating to the early Iron age and Classical periods have been recorded. These findspots may represent the 7th through 5th century BC location of ancient Karystos. In this case, the ramp leading down from the C19 sanctuary would link the settlement to the sanctuary, which, together with an earlier Geometric-Archaic sanctuary on Plakari ca. 300 m west of C19, may have served as the acropolis of the ancient settlement.

The Archaic-Classical rural sanctuary C73-74 is located just below the peak on the eastern slope of the Karababa range (Keller 1985, 98-99, 188-189). The remains include a 8.5 by 10 m rectangular platform extending west behind a natural rock outcrop with a niche that contains a small rock cut basin in its base. A few meters to the east of this feature a rectangular 7.5 x 11.8 m area is supported by a terrace wall built of huge cut schist blocks. Between these two features is a horseshoe shaped altar made of very finely cut light green schist blocks.

The sanctuary sits on the steep eastern slope of Karababa. The slope itself defines the western boundary of the temenos. The higher landscape then drops abruptly towards the south to a wide saddle just beyond the southern wall of the temenos. At the northern end of the temenos a well-constructed roadbed leads northeast away from the site (fig. 2).



Figure 2. Access road to the C73-74 Sanctuary, view from northeast

The road has a retaining wall and varies in width from 1.5 to 2.1 m. The gradient and width of the road would have been suitable for wheeled traffic. The surface is level and unusually smooth. It continues evenly for ca. 85 m along the slope of the ridge before losing definition as it approaches the large saddle between Karababa and Kazara. A definite continuation beyond this saddle could not be defined, but it may coincide with some of the modern herder trails that descend the north slope of Kazara in the direction of the Rigia river at the north base of Plakari, the proposed site for Iron Age and early Classical Karystos. It should be noted that the herder trails coming up from the Rigia area and passing over the Kazara saddle tend to continue southwest on the ridge top, that is above the ancient road and sanctuary. Recent herder trails can be found criss-crossing the saddle south of the sanctuary, but there is no evidence that the ancient road continues south beyond the site. It appears that the sanctuary

itself was the end point of the ancient road.

Another rural sanctuary is located at findspot C32, near the center of the eastern side of the peninsula (Keller 1985, 88, 207). At C32 a man-made terrace sits above a large dome-shaped outcrop of rock, clearly visible from most points along the eastern shore of Paximadhi. On the terrace are the remains of a stone wall enclosing an area of 6 x 6.5 m in front of a natural boulder that has had a large niche cut into its face. In the floor of the niche is a rock cut basin and runoff channel. A path and rock cut steps lead down from the niche and temenos to an open cave or rock shelter beneath the dome.

On the nose of a spur ridge immediately to the northeast of the C32 sanctuary site are traces of a route leading uphill and southwest. The remains can be divided into three fragments. At first, a 5.5 m wide stretch of the route runs for 29 m between the bedrock on the uphill side and a wall on the down slope side. The route then curves around a large oval outcrop of bedrock for ca. 8 m and continues its uphill course. The width of the curving section of the route is ca. 3.5 m. The route can then be followed beyond the bedrock for another 11.5 m. This upper section runs between two parallel rubble walls along the top of the spur ridge and has a width of 3 m. The highest traceable point of the route is on the same elevation as the sanctuary, which is ca. 75 m to the south.

The area between the end of the route and the sanctuary is covered in eroded terraces and it is possible that the route has collapsed. Given the unusual construction of the route and the lack of any signs that it continued in other directions, it appears that the route was meant as an access route to the sanctuary.

OUTSIDE ROUTE

In the northwestern area, a Classical-Hellenistic hamlet is located at the northern edge of the Kourmali plateau (Wickens and Keller 2001). The hamlet consists of 12 individual findspots and includes sections of an enclosure wall with one semi-circular tower preserved. The hamlet enclosure wall can be traced north from a substantial Classical building at the southeastern corner of the site to a series of structures at the northeast. The settlement wall then appears to turn west toward the findspot with the semi-circular tower. In contrast to the scattered Classical-Hellenistic farmsteads in the southeast area of Paximadhi, we found only two possible Classical-Hellenistic farmsteads outside the hamlet in the northwest.

At Kourmali two large Late Roman farming estates were also recorded. One is situated at the western edge of the Kourmali hamlet and the later structures here, including two large threshing floors, obscure some of the earlier Classical remains. The second Roman estate is located at the southern end of the plateau. Kourmali is also the only area of the peninsula where evidence of recent farming activities in the form of still standing kalivia and recently abandoned threshing floors is found.

At the northeast corner of the Kourmali Classical hamlet, a route can be traced leading to the northeast. The route gradually descends the eastern slopes of the Kourmali range for a distance of ca. 1 km until it reaches the flat land of the a valley extending to the Karystos plain north of the peninsula. Down slope retaining walls are present along most of the route and there are several points where large stones have been placed in gullies to facilitate crossing. There are also points where rubble fill has been used to level out sections

of the route crossing uneven bedrock. At points where the route runs between the down-slope retaining walls and up slope bedrock, measurements were taken that provide an almost constant 2.5 m width.

The Kourmali road is the longest, most complete route recorded on the peninsula. Unfortunately, as noted above, the Kourmali plateau contained not only the Classical hamlet, but also was heavily used in the Late Roman period and recent past. Therefore, although it seems that the road leads directly to the northeast corner of the Classical hamlet, it is possible that it was created and used during one of these later periods.

NETWORK ROUTES

Three definite stretches of ancient roads are found in the southeast quarter of the peninsula. These sections seem to form part of a network of roads connecting agricultural and military sites of late 6th or early 5th century BC date (Keller and Wallace 1988, Keller 2004). The network of roads and associated sites appear to remain in use through the Classical period and in some cases the Hellenistic period as well.

Road between C27 and C30

The surface remains at C27 indicate a number of open spaces and buildings within a partial enclosure wall (Keller 1985, 84-85, 206, Keller and Snyder 2004). The overall area of the site is 40 by 120 m. At the southwest end of the site is a raised platform and possible foundation for a square tower standing beside a rock-cut cistern. The site is located above a series of sheltered coves and has a view over both the bay and the sea between Kea and Attica. The rock-cut cistern at the south end of the complex is a unique feature on Paximadhi. The cistern is 8 m deep with a

bell-shaped main chamber and a separate adjoining access shaft. Site C27 appears to be a small outpost or emborio; that is, a place of refuge for the farmers living in the area and possibly a center for the collection and distribution of goods.

The farmstead of C30 (Keller 1985, 86-87) is the southernmost of a string of five or six farmsteads extending north along the lower slopes of the eastern coast. These farm sites all have visible remains of three or four rooms or enclosures: some have associated towers and some have associated threshing floors.

At the northeast corner of the emborio site, at a saddle on the ridge top, a road leads northeast along the upper eastern slope of the ridge (fig. 3).



Figure 3. Remains of the ancient road that connected Sites C27 and C30, view from northeast.

The location is at the gully before Site C30. Most of the ancient road has been destroyed by new construction

The route descends at gradients of 0 to 5 % and continues ca. 300 m toward the Classical farmstead of C30. A retaining wall is preserved in places along the road. The average width of the road is 2.7 m. The road can only be traced to the gully just south of the farm, but there is evidence that it continued north along the slope just west of the remaining Classical farms arranged north of C30. Several of these farmsteads, for example C38, an excavated farmstead with pottery phases

that parallel those at the C27 emborio site, appear to have pathways leading west from the sites, back to the slope along which the proposed road would have passed (Keller and Schneider 2005).

At the point where the road leaves the emborio site and runs north along the eastern slope, there is evidence of a second route extending along the ridge top toward the northwest. This route could be followed, but its nature and date are uncertain because of the difficulty in defining routes along ridge tops.

Road between C46 and C47

West of the C27 emborio site, and above the inlets area between Cape Mnima and Ay. Paraskevi, are found the Classical sites of C46 and C47, which are joined by an ancient road (fig. 4). Site C46 consists of a 7 x 10 m structure adjoining a long wall that encloses an area of 18 x 34 m. Site C47, to the north, consists of one 5 x 6 m structure adjacent to a smaller enclosure of 10 x 10 m. Both sites appear to be more military than agricultural due to their location outside terraced landscape and the lack of multi-room buildings found at farmsteads (Keller 1985, 83-84).



Figure 4. North end of the ancient road between C46 and C47, view from northeast

The road between the sites runs north-south along the upper slope below the Classical watch tower on Paximadhi peak.

The preserved 100 m of the route includes short sections of retaining wall in places and in at least two cases seems to have been marked by upright marking stones. The route is 1 to 1.5 m wide and it appears to continue north beyond C47.

At C47 a recent mule trail, which may indicate a reuse of the ancient route, continues to the northeast, following the contours of the landscape to reach the ridge top extending north from the C27 emborio site. A theoretical extension of the C46-C47 road to the southeast of C46 would lead to a Classical farmstead and a military site at Ayia Paraskevi.

Road at C54

The Classical farmstead C54, at 240 masl, is one of the higher farmsteads in the group along the eastern slopes of the peninsula (Keller 1985, 91-92, Keller and Wallace 1988). The main structure at the site is a 17 x 18 m building with three or more rooms or enclosures. A straight field wall projects westwards from the building to bond with a perimeter wall of ca. 1,200 m in length. This unique feature, an intact estate wall, encloses an area of ca. 9 hectare, an area of land holding that agrees well with the spacing noted between the other farmsteads in the southeastern quarter. There is an opening in the estate wall at the southwest, beside a small 3.5 x 4 m structure. A section of ancient road passes along the estate wall on the south and southwest and past this opening or gate. The route that runs outside the C54 estate wall here has a width of about 2 m and is bordered by the estate wall on the east and bedrock along the west. There is some indication that rubble fill was used in places to level the surface of the route over the bedrock. The area to the south and southwest of the estate wall is a relatively flat saddle that continues on to the flat

ridge, extending southeast to the C27 emborio site.

Thus a network of routes appears to have extended north and west from the emborio site. One route extending along the slope of the eastern ridge to eventually reach shore level about half way up the coast of the bay, near a point where many traces of un-dateable routes and a Classical rock-cut cist grave are found. Another section of route extended north west along the higher ground to reach farmsteads at the higher elevation. A third section of route seems to have branched off from the ridge top route to continue southwest passing above the inlets of the Ayia

Paraskevi area and linking a string of military sites in the area.

CONCLUSION

In conclusion it can be stated that even in a small area such as the Paximadhi peninsula, various levels of communications existed between different types of sites of human activity. The study and analysis of survey and excavation material from the Paximadhi peninsula continues and it is believed that additional segments of pre-modern routes in the area may eventually be identified as ancient and thus provide a fuller picture of ancient communication routes on the peninsula.

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THE KARYSTIAN KAMPOS SURVEY PROJECT: METHODS AND PRELIMINARY RESULTS

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ABSTRACT

The Karystian Plain (the Kampos) is part of the Karystia that had not been archaeologically explored in a systematic way despite its obvious economic importance for the inhabitants of southern Euboea. In the course of two seasons of fieldwork the Kampos Survey was able to cover approximately forty percent of the designated survey area. In the process we located 36 previously unknown archaeological findspots ranging in date from the end of the Neolithic to the Late Byzantine times. In this paper we present our preliminary results. Our data suggest that the Kampos was as important to the ancient Karystian as it is to the area's inhabitants today.

KEYWORDS: Karystian Plain, prehistory, Classical and Roman periods, obsidian, surface survey

INTRODUCTION

In this paper we present preliminary results of the two seasons of intensive archaeological field survey of the Karystian Plain or Kampos. The project is organized by the Southern Euboea Exploration Project (SEEP) with the permission from the Hellenic Ministry of Culture. The project is funded by the Institute for Aegean Prehistory (INSTAP) and by the personal funds of the late Professor Malcolm Wallace. The fieldwork part of the project took place during the summers of 2006 and 2007. Currently, the detailed study of the material and other data collected in the field is under way by an international team of scholars.

The Kampos is located northwest of the Bay of Karystos (fig 1) and stretches roughly east-west, starting at the head of the bay, where it is the broadest and where the modern town of Karystos is located, and tapering somewhat towards Marmari on the western coast.



Figure 1 The Karystian Kampos viewed from the east. South Euboean Gulf and east coast of Attica in the background.

On the north it is bordered by the Karpaston range and on the south by the Bay of Karystos and the northern foothills of the Paximadhi Peninsula. It is the largest agriculturally viable piece of land in the area and is also fairly well watered, especially in the spring. This agricultural po-

tential of the Kampos as well as its geographical location between Karystos and the sheltered deep water port at Marmari were added incentives to the research project. The Karystia, although somewhat marginal in modern times, had been an important region in the past. Previous work in the area by both the Greek Archaeological Service represented by the 11th Ephorate of Prehistoric and Classical Antiquities and by SEEP provided a sizeable body of data to support this assertion. Although the eastern part of the Kampos had been explored in the course of previous work, large gaps in our knowledge of the area, potentially very important for reconstructing the Karystian past, still remained. It was our goal to fill in those gaps.

The survey target area in the plain covers approximately 260 ha (fig 2), including the lower foothills of the Karpaston range to the north and of the Paximadhi Peninsula to the south.

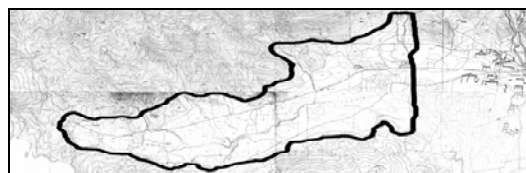


Figure 2 Topographic map of the Kampos with the boundaries of the survey area. North is up.

The boundary of the survey area in the east coincides with the westernmost extent of Dr. Donald Keller's dissertation survey (Keller, 1985). Our aim was to learn as much as possible about the use of the Kampos in the past and to locate the focal points of that use in the form of findspots. Since the Kampos is under rapid modern development, obtaining information on the exact location of archaeological sites in the area will help in their protection. An important goal of the Kampos survey was to compare in the

same setting some of the methods used previously in the field by SEEP in order to gauge their reliability and effectiveness. In addition, we wanted to examine whether some of the routes that exist today in the Kampos have been used as thoroughfares in the more distant past. Finally, we wanted to examine the effects of alluviation on the visibility of ancient remains in the plain.

METHODS

In 2006 the survey methodology consisted of two to four people walking in transects determined mainly by natural or man-made features of the terrain (fig 3). This method intentionally corresponded to the “route survey” approach used by SEEP east of the Bay of Karystos on the Bouros-Kastri Peninsula. Our transects followed paved and unpaved roads, footpaths, gullies, ravines, and current or seasonal water flows; in short, all features of the terrain that could serve as thoroughfares. Additionally, two long arbitrary transects that roughly coincided with the edges of the survey area were surveyed on the north and south foothills bordering the Kampos. The team members were also allowed to depart from the transects and investigate any areas that seemed promising as potential locations of findspots. Only a small representative sample of material was collected during this phase of the survey and only from locations that were designated as findspots.

The 2007 survey was executed using the intensive stratified sampling method. The survey team in the 2007 season consisted of seven to ten people in the field at any time. The entire survey area was divided into 100 x 100 m squares, which were then surveyed independently or in clusters using the stratified sampling approach (fig 3).

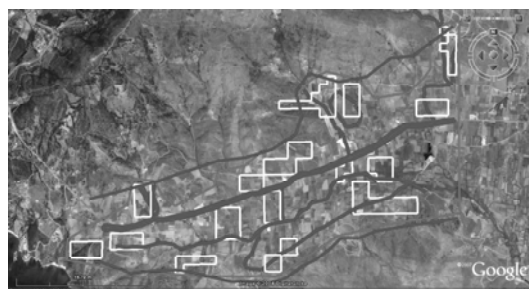


Figure 3 Survey coverage. Dark gray – the 2006 transects. Light gray – squares surveyed in 2007. Courtesy of Google Earth.

“Stratified sampling” in this particular case meant that the squares to be surveyed were not chosen randomly but with respect to specific predetermined guidelines; e.g., to include all of the different geomorphological features present in the survey area as well as taking into account some of the results of the 2006 season. The 100 x 100 m squares were further divided into ten 10 x 100 m transects, each surveyed by a team member. Total collection was carried out on the surface of all the areas designated as findspots, while the thin material scatter between the findspots was recorded (in case of non-diagnostic material) or recorded and collected (diagnostic sherds, obsidian, etc.).

We were able to locate 20 findspots in 2006 and 16 in 2007. Judging only by the number of discovered findspots it would be possible to conclude that the extensive method employed in 2006 was more productive. However, the degree of efficiency notwithstanding, the route-survey method was not able to address other aspects of the use of the Kampos—namely the offsite distribution of archaeological materials. Moreover, many of the findspots discovered in 2007 are located not far from the 2006 survey transects. This shows the inadequacy of the extensive survey when trying to locate all past remains in a given area and especially the ones located at unexpected locations. Therefore, the main

difference between the methods used in 2006 and 2007 field seasons is not in the quantity but in the quality of data that was acquired.

RESULTS OF THE SURVEY

We were able to locate and record 36 new archaeological findspots in the course of the survey. As we suspected, the plain was not a forgotten area in the past but was the location of lively activity in both prehistoric and historic periods.

The prehistoric finds were the most surprising. At the beginning of the project one of our working hypotheses was that prehistoric remains would be largely covered by alluvium. Consequently, we only expected to find evidence of the prehistoric use of the plain in areas located on higher grounds and on other locations away from the heaviest effects of alluviation. Contrary to our expectations, we have found at least 15 findspots that are either purely prehistoric or have a prehistoric component. They are located on both schist outcrops and on the flat alluvial soil of the plain. Moreover, some findspots located on sloped terrain (e.g., findspot 06N16) did not show evidence for deflation and displacement of materials, which would have been the case if they were affected by alluvial or colluvial shifts of the topsoil. This suggests that either the major alluvial events that participated in the formation of the Karystian Kampos originated earlier than our earliest prehistoric finds (dated to the Final Neolithic or at least the EBA) or that alluviation in the plain was topical—i.e., it affected different parts of the plain in different ways. Final answers to these questions can only be provided by geological analyses. What is puzzling is that we did not find any prehistoric findspots that could be termed

“settlements” as they are traditionally defined based on surface finds—we did not find any architectural remains and pottery is present only in the form of a few very small fragments. Most of the prehistoric findspots are characterized by obsidian scatters, some of which are among the largest found in Greece thus far (William Parkinson pers. comm.). Good illustrations of this are findspots 06N16, 07S28, and 07N35 (fig 4).

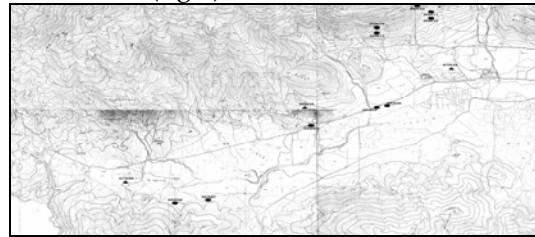


Figure 4 Locations of findspots mentioned in the text. Triangles mark prehistoric and circles Classical/Hellenistic/Roman findspots. North is up.

The findspot 06N16 is located on a ridge north of the modern road to Marmari and above the small Ay. Photeini chapel. The site consists of a large number of obsidian flakes, tools, and core fragments (ca. 400 pieces) and small pottery fragments. The evidence suggests blade and flake production on the site (William Parkinson pers. comm.). Three tanged points also came from this findspot. Findspot 07S28 is located in the western part of the Kampos, around a rocky outcrop at the edge of a modern farmstead. A total of 287 obsidian pieces were collected from the area of about 100 x 50 m. The significance of this site is that almost the entire lithic reduction sequence is represented among the finds. Findspot 07N35 is located on the eastern side of the survey area and in the immediate vicinity of the excavated EBA site of Ay. Georgios. The findspot consists of a large obsidian scatter of about 2500 fragments stretching

over an area of at least 150 × 100 m. We also surveyed parts of this findspot in more detail using a 2 × 2 m grid. Our goal was to check for any patterning in the material distribution that would help us identify the specific activities taking place at this location. The 07N35 assemblage consists of tools made on pressure flakes, many of which can be identified as notches and borers, but no blade cores were found. The material is chronologically consistent with the LN/EB period (William Parkinson pers. comm.). On the basis of current data this findspot could be tentatively interpreted as a specialized site, a place where particular chipped stone tools were produced or modified to be used for specific, yet unclear, activities. There is little evidence for blade production at the site, which suggests that the blades were produced elsewhere. This seems even more probable given that the nearby EBII site of Ay. Georgios, excavated by the 11th Ephorate, produced evidence for the full reduction sequence accompanied by a wealth of lithic material (Sapouna-Sakellaraki 1992 and personal observations).

We located a limited number of Classical and Hellenistic findspots in the northwestern and western region of the Karystian plain during the 2006 and 2007 survey seasons. The large number of Roman findspots, as well as the large amount of Roman material scatter, in comparison to the distribution range of the Classical to Hellenistic findspots, can hypothetically reflect varying degrees of intense Roman farming versus pastoral activities in the Kampos, from the 5th century B.C. to the 2nd century A.D. Due to the visible architecture and their prominent locations, sanctuaries were the most clearly visible remnants of the Classical and Hellenistic

periods (fig 4) with parallels in Attica and most of the Cycladic islands.

Findspot 06N14 is located at the north central edge of the Kampos, on a rocky outcrop. Three sets of steps cut on two different levels in the natural rock lead to a platform at the summit of the outcrop and to several niches. Parts of a dry-stone wall of N-S direction are visible to the west of the outcrop. Black glazed sherds, belonging to skyphoi and a kantharos and plain ware sherds, together with millstone fragments and a black glazed rooftile were found at this site. These finds, together with the form and location of the pits, the niche, the rock cut steps leading to it, and the possible *perivolos* wall suggest that the remains belong to a small Classical rural sanctuary. Another probable sanctuary with a rock cut niche on a stone outcrop facing east with surface finds of Roman times was identified at findspot 06N19. An additional rectangular cut was found on the top of the outcrop. Plain and combed Roman sherds were observed at this site.

Remains of a Byzantine chapel (06N11) were found not far from the northeastern border of the survey area. It is possible that some of the Cape Mnima sandstone blocs used in its construction belong to an earlier edifice—perhaps a Roman tower. A poorly preserved circular stone construction (06N12) preserved at a height of ca. 0.50 m and located in the immediate vicinity of 06N11 could represent the remains of a round Classical tower (cf. for Attica e.g. Suto 1993, 3, table 1); however, at this point there is no sufficient evidence to support that. The other, perhaps more likely, possibility is that these remains represent an old threshing floor.

Many findspots consisted of scatters of Early to Late Roman plain and combed ware pottery of different intensity includ-

ing pithos sherds, amphora and jug strap handles, rim and base parts, other utilitarian vessel fragments, and column fragments and tiles. Roman constructions or building remains were visible at several locations, such as findspot 06S07, where parts of a water pipe were found apparently in situ. A number of cist graves, probably dating to the Roman period, were found at findspot 06S08 (Chidiroglou 1997, 405 and 1998, 363-366).

At other findspots Roman surface material was mixed with Byzantine, as at findspots 06S05 and 06S06 and at the site of the modern church of Eisodia Theotokou, where traces of a Byzantine chapel (06N13), together with six blocks of Cape Minima sandstone, two fragmentary *cipolino* columns and a small white marble Ionic capital were also found. Blocks and parts of stone olive or wine presses were found reused in various modern rural installations in the Kampos, serving as a reminder of the perennial recycling of ancient building materials. A good example of this practice is findspot 06N02 where a Roman sandstone block serves as a doorstep to the modern installation and a schist counterbalance block of an ancient olive press (cf. Brun 2004, 98, 102) has been incorporated into the (relatively) modern threshing floor nearby.

DISCUSSION AND CONCLUSIONS

Our results allow us to formulate several tentative conclusions. The area of the Karystian Kampos, probably due to its economic importance, has been inhabited from Prehistoric to modern times. It seems that the densest human presence is at-

tested in the Kampos during the EBA and Roman periods, a fact that indicates interest in the resources of the plain during these times. Intense olive or wine cultivation could be the reason during the Roman period. Due to the lack of palynological studies, this hypothesis remains a possible but unsubstantiated way of explaining the density of Roman sites. At the moment, it is more difficult to interpret the interest that prehistoric populations had with the Kampos, but it is likely that it was also based on its significant agricultural potential.

The scarce Classical to Hellenistic finds can be variously explained. One should keep in mind the factor of chance in locating sites in alluvial soils or areas with long centuries of cultivation and of building material recycling. Moreover, the pertinent material evidence has not been studied in full and some reinterpretations are possible. On the other hand, one could hardly expect the Karystians, who suffered during the Persian wars and were then for years penalized by the Athenians (Herodotus, 6.99. 2, 8.112. 2, 8.121.1, 9.105; Thucydides 1.98.3, 4.42.1, 4.43.3, 7.57.4, 8.69.3; also see Wallace 1972, 171-254), to expand their cultivation in the Kampos in these difficult years.

To conclude: despite our relative successes more work remains to be done in the Kampos, not only in the study of data collected during the most recent survey, but also in the form of further archaeological exploration of the areas not yet surveyed and in the form of additional detailed research at particular findspots.

ACKNOWLEDGMENTS

We would like to thank all the people involved with the organization and execution of the Kampos Survey. We are grateful to INSTAP, Indiana University's Schrader Fund,

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ABBREVIATIONS

ArchDelt Archaeological Report (Αρχαιολογικόν Δελτίον)

KODAI Kodai. Journal of ancient history

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THE ARCHAEOLOGICAL RESEARCH IN THE REGION OF THE MODERN MUNICIPALITY OF STYRA: OLD AND NEW FINDS

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ABSTRACT

This paper offers a brief outline of the results of the salvage excavations undertaken in recent years by the 11th Ephorate of Prehistoric and Classical Antiquities (IA EPKA) in the area of Lefka, Nea Styra, together with a brief description of surface finds in the region of Styra. A more extensive archaeological description and topographical assessment of all known sites, including farm houses, towers, possible sanctuaries, tombs and quarrying areas will be provided in a forthcoming larger study by the author. The brief assessment of old and new data presented here is given as a preliminary summary of the topography of the ancient demos of Styra, which, according to inscriptional data, was incorporated in the Eretrian territory, during the last years of the 5th century B.C.

KEYWORDS: Styra, Lefka, Nimborio, Messochoria, Aghios Nikolaos fortification, bronze serpent column, Dragon Houses, farm houses, towers, quarries, Claudianus, cemeteries, Classical, Hellenistic and Roman periods

INTRODUCTION: EARLIER FINDS

The region of Styra in Southern Euboea (fig. 1) is first mentioned in the *Iliad* and then by ancient authors of the Classical, Roman and later periods (*Iliad* 2.539, Herodotus 8.1, 8.46.4, 9.28.5. Thucydides

7.57.4. Demosthenes, *Against Meidias*, 167. Pausanias 4.34.11, 5.23.2. Strabo, *Geographica*, X 1, 6–C 446. Stephanos Byzantios, 588, 14. See also: Hansen and Nielsen 2004, 660).

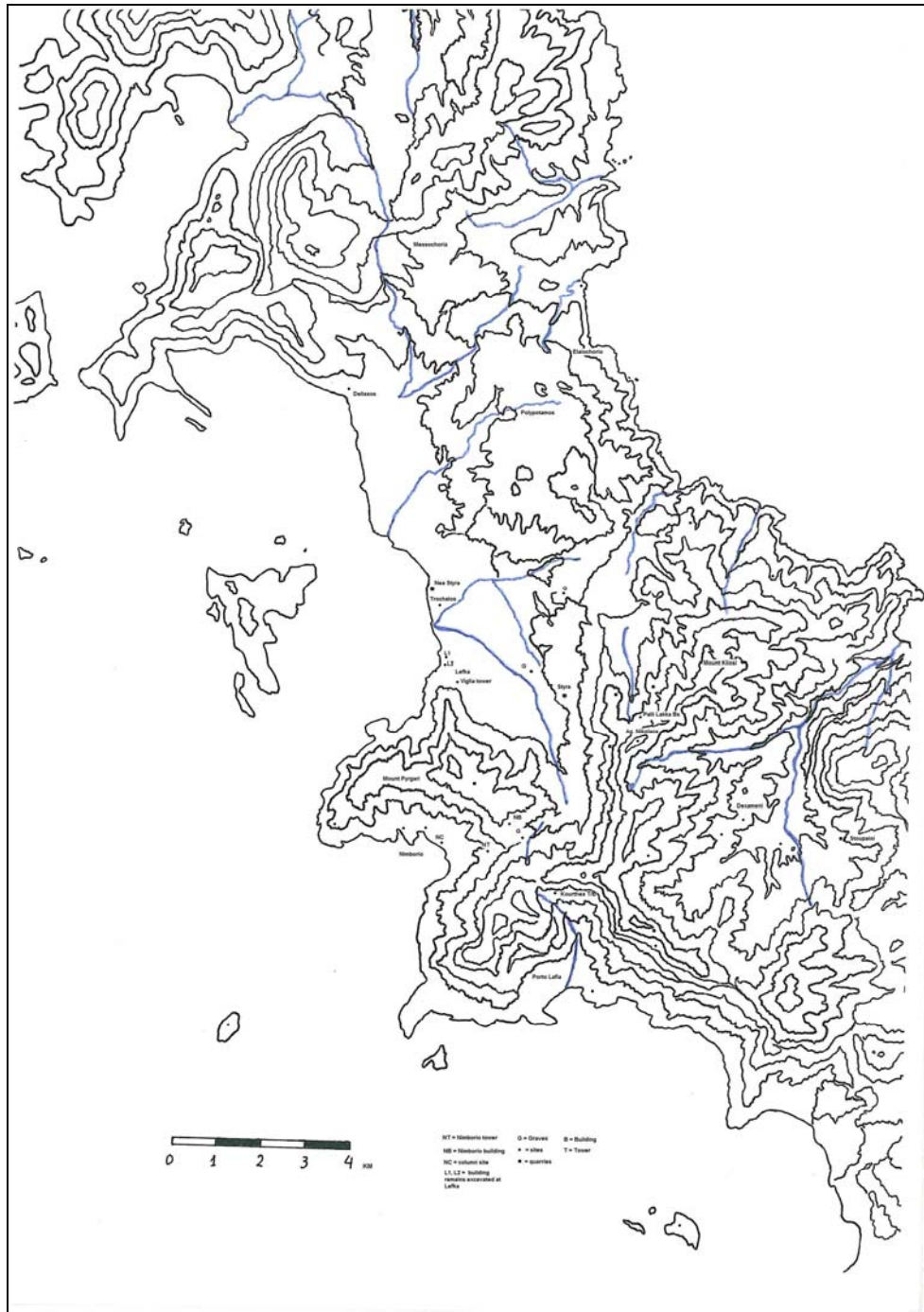


Fig. 1 Map of the region of Styra, Southern Euboea, showing sites mentioned in the text

Travelers and scholars of the 19th and early 20th century took interest in a number of antiquities extant in the region of Styra, including the Aghios Nikolaos fortification on Mount Kliosi, the complex of three buildings known today as the Palli Lakka Dragon Houses (fig. 2, 3), the Roman cipollino quarries, and inscriptional finds of the region (Ross 1848. Ross 1851. Rangabé 1853, 218-224. Lacroix 1853, 419-421. Bursian 1856, 49-50. Bursian 1868-1872, 430-431. Baumeister 1864, 24-27. Girard 1851. Girard 1852. Geyer 1903. Philippson 1951, 625. *IG* XII.9.52 to *IG* XII.9.71. Johnson 1925, 401-405. See also: Fittschen 1999-2000, 133-147).



Figs. 2, 3. Styra, Palli Lakka site. Views of the ancient buildings – Dragon houses.

Historians and other literati of the 18th and 19th century referred to the Styreans

fighting with the Athenians against the invading Persians in the battles of Salamis and Plataiai in 480 and 479 B.C., a fact memorized by Herodotus and the well known inscribed bronze serpent column that was dedicated by the Spartans and Greek allies in the sanctuary of Apollo in Delphi and now in the Hippodrome (At Meydanı) in Istanbul (fig. 4) (Herodotus 8.1, 8.46, 9.28, 9.31, 9.81. See: Gauer 1968, 75-96. Bommelaer 1991, fig. 69, left. Lacroix 1989, 183-198. Stichel 1997, 315-348, pls. 52-57. Neer 2007, 239, fig. 26).



Fig. 4. Istanbul, Hippodrome (At Meydanı). The visible part of the bronze serpent column.

In the second half of the 20th century, scholarly research focused on historical testimonies connected with ancient Styra, such as its Dryopian origin (Herodotus 8.46.4. Pausanias 4.34.11. Dryopian Karystos: Thucydides 7.57.4. See: Fourgous 1989, 5-32), its pro-Athenian contribution to the Persian wars, the inclusion of the city, as an independent polity, in the First Athenian or Delian League and its subse-

quent annexation by the city state of Eretria (IG I³ 269.V.29. IG I³ IV.28. 263. IG I³ 71.I.74. Thucydides 7.57.4. See: Meritt et al., 1950, 198-199). According to recently studied inscriptional testimonies, the demos of Styra was incorporated in the Eretrian territory, during the last years of the 5th century B.C. (IG II 5, 116 c. IG II² 230. Strabo, *Geographica*, X, 1, 6 - C 446. Wallace 1947, 118, 130, 142. Knoepfler 1971, 223-244. Reber 2002, 40-53. Contra: Wallace 1972, 59-69). Also, in the second half of the 20th century and onwards, archaeological research in southern Euboea and the region of Styra has been conducted by the Greek Archaeological Service (IA EPKA) and foreign archaeological institutes, including the Swiss Archaeological School and the Southern Euboea Exploration Project (SEEP), under the aegis of the Canadian Institute in Greece.

Surveys by Theocharis, Sampson, and the British School at Athens reported prehistoric building remains and Late Neolithic to Early Bronze age sherds in the areas of Lefka, Trochalos at Nea Styra, and Delissos. Three fragmentary marble Early Cycladic figurines from the site of Gkisouri, probably at Nea Styra, were published by Wolters in the late 19th century. Similar new finds are currently under investigation by M. Kosma (IA EPKA) at Nea Styra (Wolters 1891, 54-55. Theocharis 1959, 279, 284, 309-310. Sampson 1980, 128, no. 36, 218, 246, note 136. Sackett et al. 1966, 78-80, no. 88, esp. note 131, figs. 14, 15, 18, no. 25).

Many archaeological and historical issues, including the location of the ancient city of Styra, its public buildings, and the extent of its habitation and cemetery sites remain unresolved. New research, however, has been conducted at the Classical to Hellenistic fortification better known since Medieval times as Kastro Larmena

at the site of Aghios Nikolaos on Mount Kliosi (Sackett et al. 1966, 79, note 130. Koder 1973, 123-125. Skouras 2003, 103-104, no. 132. Fachard 2005, 114-123. See also: Fachard 2006, 87-96). Kastro Larmena covers an area of 3.5 hectares on a plateau between two schist peaks and consists of two long E-W curtain walls, in pseudo-isodomic trapezoidal masonry. Each wall is provided with a projecting square tower (fig. 5, 6). There is one impressive gate 3.50 m high, built of local limestone blocks, in the west side of the northern wall and possibly another in the southern wall. Classical and Hellenistic sherds, iron slag, and terracotta beehive fragments were found at the site (Fachard 2005, 122, pl. 23,3. cf. *Agora* XII, 287, no. 711).



Figs. 5, 6. Styra, Aghios Nikolaos. Views of the fortification (photos by N. Simos).

Additionally, special interest in a growing catalogue of ancient square and rectangular buildings located on mountain ridges or low hills in the area of Styra and now collectively known as the Styra Dragon Houses was promoted in the late 1950s by N.K. Moutsopoulos and more recently by K. Reber and the late T. Skouras (Moutsopoulos 1982, Skouras 1991, Reber 2001a). Also, for other sites in Southern Euboea: Reber 2001b). The so-called Dragon Houses share similarities in construction, including limestone and schist pseudo-isodomic, trapezoidal masonry, large one-slab lintel and door jambs and the corbel roofing system attested in at least some of the buildings. Some of these constructions, including the square or almost square buildings at Nimborio (fig. 7) and Viglia-Lefka can be identified as ancient towers with many parallels in Attica and the Aegean islands and may be related to the supervision of cultivation at nearby fields or the exploitation of marble quarries (Cf. Attica: Suto 1993, 1-19. Thorikos: Spitaels 1978, 39-110. Kampos, Aliveri in Euboea: Chatzidimitriou 1999, 340, fig. 8. Kea: Mendoni 1998, 275-307. Kythnos: Chatzianastasiou 1998, 259-273. Andros: Koutsoukou and Kanellopoulos 1990, 155-174. See also: Moreno 2007, 134-135). During a number of investigations conducted by IA EPKA, amphora and pithos sherds of late Classical to Hellenistic date have been observed and sampled in the area of a number of these buildings, e.g., the towers at Kourthea-Porto Lafia and Viglia-Lefka. Other Dragon Houses, e.g., the rectangular building excavated and reconstructed by N.K. Moutsopoulos at Metsifi, conform to the usual rural farm house type, sometimes with rooms created in two rows along the long axis. The building at Metsifi is located near a rock horos inscription belonging to the de[mos]

probably of Styra (Moutsopoulos 1982, 340, 347-370, horos: figs. 53-55). An inscribed schist stone with an erotic inscription of the Archaic period was found inside the same building at Metsifi and was recently published by A. Matthaïou (MK 27. Moutsopoulos 1982, 358, 362, fig. 79. Matthaïou 2007, 161-168).



Fig. 7. Styra, Nimborio. Ancient tower.

Architectural remains with sherds of Classical to Hellenistic date have been located at Styra (Keller 1985, 262-263). Chidioglou reports sherds of the 5th century B.C. near walls located on Mount Pyrgari in 2000, (filed in IA EPKA = 11th Ephorate of Prehist. & Class. Ant.) and later ones at Nimborio, associated with a 37.5 x 20 m structure and nearby looted cist tomb, in 2003 (filed in IA EPKA). Two pre-modern, circular stone lined kilns or storage pits were found in the area of Delissos in the mid 1990s and an apsidal building associated with Roman surface sherds was located in the area of Dexameni a few years later (Chidioglou, reports filed at IA' EPKA). Graves of the 5th century B.C. have been investigated at the site of Gyzi (Sapouna-Sakellaraki 1990, 160-162) and looted stone sarcophagi of Hellenistic to Roman date have been found at Nim-

borio, Messochoria, and on the road to Nea Styra.

MORE ON RECENT FINDS

More recently, in the area of Lefka, Nea Styra, the remains of two late Hellenistic to late Roman buildings were investigated. The first building, measuring 7.70 x 3.25 m and dating to Roman Imperial times, came to light in 1999, in a salvage excavation undertaken by the Archaeological Service. Its walls had been constructed of schist slabs embedded in lime cement. Three rooms on an E-W axis and earthen floors were partially revealed. The foundation of the walls had been set on a thick ancient cement layer, as a precaution against the danger of flooding, imminent even today. Part of a low wall of simple dry stone construction, perhaps representing the remains of an enclosure or court, came to light in the west (Cf. Adam Veleni et al. 2003, 109-114). Late Roman Imperial to Early Byzantine sherds of plain wares and pithoi, glass panel and vessel fragments, and some metal finds also came to light. Some of the sherds belong to vessels of terra sigillata type. One clay oinochoe handle was preserved with an incised cross. In the same area a marble Ionic capital was visible at the time of the excavation, built into the small chapel of Aghios Ioannis. The chapel is modern, but a predecessor in the same area is probable (Chidiroglou 1999, 343-344).

The second building of Hellenistic to Roman date was also partially excavated in a flooded area nearby. Its dry stone walls, constructed of small to medium sized schist slabs set in layers, were preserved to a height of 0.25 to 0.40 m. Sherds of Hellenistic and Roman date, belonging to pithoi, amphorae and jugs were found on the surface and in all excavated layers

(Cf. Jones et al. 1973, 355-452. Adam Veleni et al. 2003, 56-60, 78-82).

A larger version of this paper will be presented in a forthcoming article by the author containing an overall outline and topographical assessment of all known sites, as well as a description of recent and old ceramic and metal finds from the Styra region (fig. 1). The publication will also report on the relevant ancient sources and inscriptions pertaining to the region, including the recently relocated inscribed Roman funerary stele of Lais (*IG XII.9.66*, now MK 434. Papavassileiou 1910, 100, no. 25) and two inscribed marble funerary stelai of the 4th century B.C., found in 1988 in Karalides, Elaiochorio at Polypotamos, and now in the Karystos Museum (MK 347, MK 348: For their types cf.: Knoepfler 1984, 245, fig. 8. Kurtz and Boardman 1971, 223 and fig. 52. Möbius 1968, 108).



Fig. 8. Karystos Archaeological Museum. Cipolino column with quarry inscription from Nimborio.

In conclusion we can tentatively assert the following: An Early Bronze Age settlement with Cycladic connections can be located at Lefka-Trochalos and Gkisouri, Nea Styra. Based on the testimony of the extant towers and farm houses of Classical to Hellenistic date, the habitation nuclei of historic times seem to have been dispersed, although a fortified stronghold, most probably an acropolis, existed at

Aghios Nikolaos on Mount Kliosi and can be dated in the same period. This well-built fortification, attests to communal effort or central, perhaps Eretrian, administration guidance. Dispersed civic nuclei of Classical to Hellenistic date are also verified by the various cemetery sites, looted or excavated, known in the area. Two habitation buildings of the simple farm house type, dated from late Hellenistic to late Roman times have been partly excavated at Lefka, near the once visible ancient mole. The imposing tower and farm house remains, together with inscriptions, ceramic, and metal finds of the Archaic to Hellenistic periods denote elite group activity in the region of ancient Styra.

A significant economic factor in Roman times was the systematic and extensive exploitation of southern Euboean marble quarries by local officials and Imperial delegates, such as Claudianus, as attested by inscriptions on a column in a quarry on Mount Kliosi and on two 6 m long columns recently found at Nimborio beach (fig. 8) (Quarries: Papageorgakis 1964, 262-278. Lambraki 1980, 31-62. Zappas 1981-1982, 243-275. Vanhove 1989, 226-231. Vanhove 1996. Lazzarini 2007, chapter 12. Chidioglou 2009, 73-91).

Systematic site recording and further investigation in southern Euboea will provide more answers to a number of historical and archaeological issues for this region and its relationships to Athens, the Cyclades and the rest of ancient Greece.

ABBREVIATIONS

Agora XII Talcott L. and Sparkes B.A., *Black and Plain Pottery of the 6th, 5th and 4th centuries B.C., The Athenian Agora XII*, Princeton, New Jersey 1970.

IG I^B Lewis D., *Inscriptiones Atticae Euclidis anno anteriores, I, Decreta et Tabulae Magistratum*, Berlin 1981.

IG II Köhler U., *Inscriptiones Atticae aetatis quae est inter Euclidis annum et Augusti tempora*, Berlin 1895.

IG II^B Kirchner J.E., *Inscriptiones Atticae Euclidis anno posteriores*, Berlin 1913.

IG XII.9. Ziebarth E., *Inscriptiones Graecae, XII.9*. Berlin 1915

MK Karystos Archaeological Museum

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NEW EARLY CYCLADIC FIGURINE AT NEA STYRA

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ABSTRACT

The existence of an Early Bronze Age coastal site in the district of Nea Styra has been known since the end of the 19th century when three marble figurines of early Cycladic type had been found in the area. During the 20th century survey investigations conducted by Greek and foreign archaeologists offered new evidence which demonstrated the significance of the site during the Early and Middle Helladic periods. A new figurine of early Cycladic type, which recently came to light at Nea Styra due to the control of building permits by the 11th Ephorate of Prehistoric and Classical Antiquities, reaffirms the identification of the area as one of the three most important sites on Euboea during the Early Helladic II period. This paper focuses on a newly discovered figurine and its typological character. The new find is compared to the figurines that had been found in the 19th century at Nea Styra. We hope that the scheduled excavations on the private land plot where the new figurine was found will offer new data leading to a better understanding of the character of the Early Helladic settlement in this part of southern Euboea.

KEYWORDS: Nea Styra, Gkisouri, Lefka, Cycladic marble figurine, Early Helladic, Bronze Age settlement, Bronze Age cemetery

In the summer of 2008, due to the control of building permits performed throughout the island of Euboea by the 11th Ephorate of Prehistoric and Classical Antiquities, a series of trial trenches were made by a mechanic excavator on the private land plot of an individual, who wished to construct country houses. The plot is located at Gkisouri, in the district of Nea Styra (fig.1). The discovery of architectural remains, sherds, and bones led to the immediate stop of mechanical excavations.

In the following days a modest excavation took place and brought to light obsidian blades, sherds of Early Helladic pottery, part of the head of a Cycladic marble figurine, and the upper part of a marble bowl with lugs.

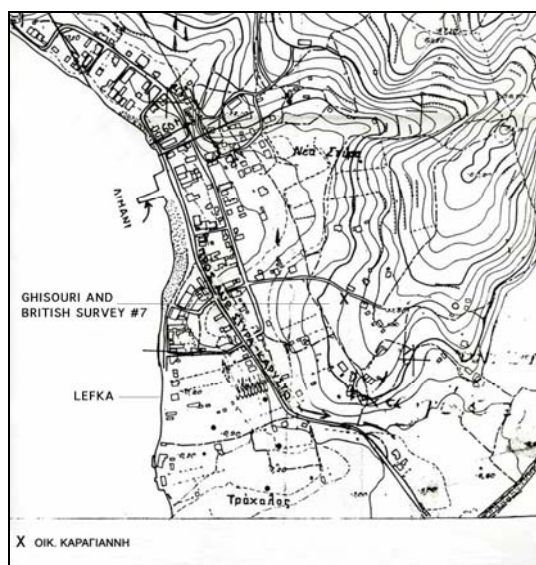


Fig. 1 Map of the Greek Geographical Service with the district of New Styra. The location of the private land plot, at which the early Cycladic figurine was found, is marked with "X".

At the same time, soil from the previous trial trenches was examined and revealed a large number of elaborate obsidian blades, bones, and sherds of coarse and fine Early Helladic II pottery (includ-

ing rim fragments of sauce boats with the characteristic Urfirnis glaze of the period). Also found were fragments of marble and stone vessels (rims and body fragments of drinking vessels, probably bowls and also part of the base of a spool - shaped pyxis) and the torso of a Cycladic marble figurine (Karystos Museum inventory number KM 1252), which shall be the object of the present paper. Almost 118 years ago, in the summer of 1890, the discovery of three Cycladic marble figurines in the district of Nea Styra led to the hypothesis of an Early Bronze Age coastal site (Wolters 1891). Subsequent survey investigations, conducted by Greek (Theocharis 1959) and foreign (Sackett et al. 1966) archaeological expeditions, confirmed the presence of a prehistoric settlement, which was oriented towards the sea, and must have controlled the broad bay to the west, and possibly the nearby island of Aigilia, (known today as Megalonisi). This settlement, which has been characterized by scholars as the second most important Early Helladic site in Euboea after Manika, is situated in Lefka, a level area along the length of the shore, south of the present harbor in Nea Styra. In the area of Lefka there are several robber pits, dug for the supply of building material or simply in an attempt to unearth antiquities. In addition, it is believed that some walls visible in the sea also belong to buildings of the Early Helladic II settlement. The same area has also produced some Middle Helladic sherds, but no Late Helladic material has been found. When Wolters published the three Cycladic marble figurines in 1891, the exact location and the circumstances of discovery were not reported, however, it was generally believed that they were found in the locality of Gkisouri, the low hill inland and east of the flat coastal area of Lefka. The British archaeological survey (Sackett

et al. 1966) in the mid 1960 placed their Nea Styra Site 7 also at Gkisouri, but expressed the opinion that the Wolters figurines probably originated in the area of the larger settlement at Lefka near the sea (fig.1). Kalligas (1983) suggested that the three figurines were probably found in graves, which might also argue for a location in the flat coastal area of Lefka rather than the hill at Gkisouri. The 2008 discovery of new figurines at the building plot in Gkisouri, however, adds credibility to the turn of the century belief that the Wolters figurines came from Gkisouri. The newly found figurine torso, (the fourth Cycladic marble figurine discovered at Nea Styra, or fifth if the non-matching head fragment, discussed below, is included) has an oblique break between the forearms, which has been mended. The head and both legs are missing. The upper parts of both shoulders are damaged and there is some chipping around the oblique break. The back of the figurine is more heavily encrusted than the front. The preserved part of the torso is almost 11 cm in height (fig. 2, 3).



Fig. 2 Front view of the figurine KM 1252

The trapezoidal torso is characterized by broad angular shoulders and wide-spaced pointed breasts. The forearms are folded beneath the breast. No fingers are incised on the hands. The arms, which are differentiated from the torso on the front

by shallow incisions, protrude markedly to the sides, thus giving the characteristic shape to the figurine. The outline of the body from the waist to the point where the thighs are preserved is rendered curvilinear. The pubic triangle is quite broad, covering almost the total pelvis, bisected at its apex by a continuation of the leg-cleft, thus indicating the vulva. A slightly bulging belly is emphasized even more by the arched arrangement of the tapering forearms.



Fig. 3 Rear view of the figurine KM 1252

The treatment of the back is even more abstract: the arms are not differentiated from the torso and a shallow V - shaped incision has been used for the rendering of the neckline. The shallow vertical incision that indicates the spinal column isn't aligned with the rear leg cleft. The buttocks are angular. The figurine is a typical representation of the canonical type (See Thimme 1975) or folded - arm figurine (See Renfrew 1969) and chronologically dates to the Early Cycladic II period, also known as the Keros Syros culture (See Renfrew 1991), which corresponds to the mature phase of the Cycladic Culture and dates between 2700 – 2300 B.C. The most distinctive feature of the figurines belonging to this group, the folding of the arms beneath the breast, is a motif seen in earlier figurines, but the dominant traits of the new type include the standardization

of the forearms known as the “canonical arrangement,” meaning the placement of the left forearm always above the right. Also canonical in this group is the strict frontality, the triangular or lyre-shaped head tilted backwards with a flat surface at the crown, which seems to symbolize some kind of head cover or special coiffure (See Stampolidis and Sotirakopoulou 2007), and united legs, with the feet angled downwards as if the figure is standing on tiptoe. The KM 1252 figurine from Gkisouri presents great similarities with the marble figurines, which have been attributed by many scholars (See Getz - Preziosi 1987) to the “Schuster Sculptor” (the artist named after the late owner of the only complete figurine from his hand now available for study). The Schuster group consists typologically of a masterful combination of the later examples of the Spedos variety (named after a cemetery on Naxos) and earlier examples of the Dokathismata variety (named after a cemetery on Amorgos). The general impression given by KM 1252 presents affinities to the figurines of the above group, for example, the figurine belonging to the ex Kahane Collection in Zurich (Getz - Preziosi 2001) or that in the Sainsbury Centre for Visual Arts (Sotirakopoulou 2008; Getz - Preziosi 2001) (fig. 4). Since the KM 1252 figurine is only preserved to the thighs, we do not know if the outline of the lower body and the legs would have been rendered with the same curvilinear and plastic way as in these figurines. However, the treatment of the upper body with the broad angular shoulders and the trapezoidal torso, which is a salient feature of the Schuster artist’s style, are seen in all three examples. A closer examination, however, reveals the presence of further diversifications. In the examples attributed to the “Schuster Artist”

the neckline at the front is curved, whereas in KM 1252 it is V - shaped; the vertical incision that indicates the spine is aligned with the leg cleft, while in our example these two lines aren’t aligned; and finally, in the figurines attributed to the “Shuster Artist” the arms on the rear are differentiated from the torso with broad grooves, while the only incisions on the back of KM 1252 are those of the spine and the neck.



Fig. 4 The figurine in the Sainsbury Centre for Visual Arts. After P. Sotirakopoulou 2005

Yet the main feature of KM 1252, which provides a particular nature to it, is the arrangement of the forearms: in the figurines attributed to the “Schuster Artist,” the elbows of the folded arms are situated on the same level. In some Schuster examples the left forearm of the figure is extending to the right upper arm, in others there is a clear termination of the left forearm before the right arm. It is not clear if this arrangement represents a chronological element (See Getz - Gentle 2001). In the Nea Styra figurine the left forearm extends to the right upper arm, but the right forearm is extensively long and does not end on the left side of the body as usual: on the contrary, it is tapering at its end,

which is found under the left elbow. This arrangement creates the illusion that both left and right hand are put on the same level, an illusion enhanced by the continuous incision that links the hands. Both similarities and variations presented between KM 1252 and the other figurines attributed to the “Schuster Artist” confirm the opinion already expressed by many scholars that the types and varieties of Cycladic marble figurines with folded arms are not restricted to the currently established catalog of examples. If the marble figurines that present close resemblances to each other may be assigned to individual artists or sculptors, if this is a procedure that might be reconstructed through our knowledge for the social structures of the third millennium B.C. and if finally Styra’s new figurine may be attributed to the “Schuster Artist” are questions beyond the intended scope of this paper. The blending of curved outlines for rendering the waist, the belly, and the pelvis, as well as the use of straight angular outlines for the torso, however, places our figurine within the type of Cycladic figurines with combined characteristics from both the Spedos and Dokathismata varieties. Equivalent finds have been distinguished by Christos Doumas as forebears of the Dokathismata variety (Doumas 1994), whereas similar examples coming from the “Keros Hoard” have been considered to be an intermediate type between the late Spedos and the early Dokathismata varieties (Sotirakopoulou 2008).

Similarly, the two marble figurines (fig. 5) (there is no drawing for the fragmentary third figurine) that were unearthed at the end of the 19th century in the district of Nea Styra, as represented in Wilhelm’s drawings, belong to the canonical type with folded arms. Although our knowledge is based only on these drawings and

there is no evidence regarding the treatment of the back, it is believed that they can be assigned to the later examples of the Spedos variety. The almost horizontal and rounded shoulders that characterize one of the examples, the curved incision at the base of the neck, the deep cleft between the joined legs in order to differentiate them, and the shallow incisions for rendering the ankles, are distinctive features of the Spedos variety. The obvious absence of rendering the waist and the minimized free space between the lower forearm and the pubic triangle, however, are basic characteristics of the latter examples of the variety. The knees are not depicted with horizontal incisions.

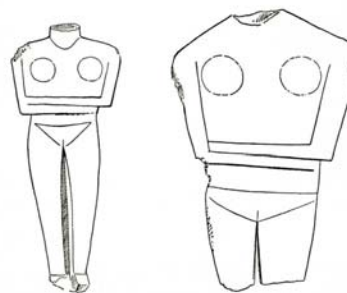


Fig. 5 Drawing of the two Cycladic figurines, which are discovered the summer of 1890 at New Styra. After P. Wolters 1891, 54-55

The modest excavation carried out by the Greek Archaeological Service in the summer of 2008 also yielded, as noted above, part of a head belonging to a marble figurine (KM 1251) (fig. 6). The chin and the neck of the head are not preserved, however, features such as the triangular shape and the straight cheeks make it obvious that it falls within the Dokathismata variety. The initial thought that KM 1251 and KM 1252 might belong to the same figurine was proved wrong after the completion of conservation. KM 1251 and KM 1252 are made out of different materials: the head is made

out of white, fine - grained marble with great transparency, and the torso of white coarse - grained marble with gray veins. It should be noted that neither of the marbles are found in the geology of Styra.



Fig. 6 The marble head with inventory number KM 1251

A new excavation was started in June of 2009 on the private land plot. This is a first and important step towards studying the prehistoric remains at New Styra, because for the first time information will be derived from an excavation context rather than surface finds. Furthermore, the site at Nea Styra appears to be the first known major Early Helladic II residential center in southern Euboea (Sampson 1980), whereas much of the occupation in this part of Euboea at this time is represented by scattered and smaller sites. It is hoped that further results from the excavation will prove or disprove Wolters' suggestion in 1890 that Gkisouri is the location of the cemetery of the EH II settlement. Although the Gkisouri excavations have only begun, the material recovered, including the artifacts from the earlier salvage stage of work, gives evidence for a strong link to the Cycladic Culture. This material includes the Cycladic figurines and fragments of marble vessels in typical

Cycladic shapes such as a spool - shaped pyxis and a bowl with four lugs at the rim. This evidence for close contacts between southern Euboea and the Cyclades recalls the ongoing debate and discussions regarding the nature of this contact. Renfrew (2006), for example, argues that Cycladic material found in the Helladic settlements of Attica and Euboea indicates only a strong cultural influence and not an indication of Cycladic settlements or colonies. Other EH mainland sites with strong Cycladic influences include Aghios Kosmas (Mylonas 1959) and Marathon (Marinatos 1971). In the case of Marathon, Marinatos (1971) and Doumas (1977) argue for an actual Cycladic colony. Pandelidou - Gkofa (2005) in the final publication of the EH I cemetery of Tsepi at Marathon, however, states that the local features and distinctive attributes of the material does not support the theory of a Cycladic settlement. In the case of Manika in central Euboea (Theocharis 1959; Sampson 1988), some scholars interpret the Cycladic features of the finds as indications of mere commercial exchanges, stressing that the presence of Cycladic attributes in the artifacts do not over rule the purely Helladic character of the settlement. On the other hand, according to other scholars (Sapouna - Sakellarakis 1986/87; Sakellarakis 1987; Doumas 1976), the lack of local ware from specific parts of the Manika cemetery indicates that the individuals buried there were Cycladic islanders. At this early stage of research at Gkisouri, it is not possible to speak of Cycladic settlement versus influences, or imports versus local imitations. The dual goal of the present paper is: first, to present new evidence about the remains at an EH coastal site in southern Euboea, directly across the Euboean Gulf from the contemporary flourishing settlements of

Rafina, Askitaro, and Tsepi in Attica and to stress the potential for reciprocal relations between these sites, as suggested by Kalligas (1983). Secondly, to present news of recent investigations to the local Styra community in order to encourage the interest and involvement of the community in the process of reconstructing the history of their area.

ABBREVIATIONS

AAA	Αρχαιολογικά Ανάλεκτα εξ Αθηνών (Athens Annals of Archaeology)
AEM	Αρχείο Ευβοϊκών Μελετών (Archive of Euboea Studies)
AJA	American Journal of Archaeology
AntK	Antike Kunst
AM	Mitteilungen des Deutschen Archaeologischen Instituts, Athenische Abteilung
BSA	Annual of the British School at Athens
ΠΑΕ	Πρακτικά της εν Αθήνας Αρχαιολογικής Εταιρείας (Proceedings of the Archaeological Society of Athens)
SIMA	Studies in Mediterranean Archaeology

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RESCUE EXCAVATION AT THE AGHIOS NIKOLAOS FORTRESS (STYRA). A PRELIMINARY REPORT.

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ABSTRACT

The imposing remains of the Aghios Nikolaos fortress are well known to the inhabitants of Styra. They lie near the summit of Mt. Kliosi and enjoy a panoramic view over much of southern Euboea. A topographical survey and short excavation were conducted at the site in 2004 and 2005. Results of the investigation suggest that the Eretrians, after the annexation of Styra, constructed the fortress at the beginning of the 4th century BC to guard the border with Karystos to the south. Evidence is also presented for a 5th century BC sanctuary that occupied the rocky plateau near the summit. The 4th century fortress was partly dismantled in Byzantine and later periods and the stones were re-used in later fortifications nearby.

KEYWORDS: Styra, Eretria, Aghios Nikolaos, Classical fortress, mountain-top sanctuary

INTRODUCTION

Following the field survey campaign conducted in 2004 on three sites in southern Euboea (Myrtia, Tsakaioi, Aghios Nikolaos) (Fachard 2005), we were able to conduct a small rescue excavation on the site of Aghios Nikolaos, a mountain top dominating the plain of Styra. It should be noted that this rescue excavation followed illegal digging observed on the summit during the summer of 2004. The excavation took place in April 2005 with M. Chidiroglou (IA EPKA) and the undersigned as co-field supervisors. We are grateful to the IA EPKA and in particular to its Ephor A. Karapaschalidou for making this collaboration possible. We would like to thank our collaborators Th. Theurillat and C. Laurent (Swiss School of Archaeology), as well as our two workers N. Simos and G. Karachalios. The present paper consists of a preliminary report. The final report, including the study of the pottery, will be published in the near future by M. Chidiroglou and S. Fachard.

POSITION

Mt. Kliosi (Koryphi, 682 masl) forms a long and high mountain barrier stretching over 15 km between the Euboean channel on the west and the open sea on the east. A fortress of the Classical period was built west of the summit, on a small saddle (648 masl). The position guards a strategic passageway over the Kliosi range and enjoys an exceptional view over Euboea, Attica, and the southern Euboean channel. To the north Styra, Myrtia, Zarakes, Mt. Mavrovouni, Aliveri, Mt. Servouni, and Amarynthos can be seen: on a clear day, Eretria is also visible. To the south one can easily distinguish several valleys leading to the Aegean Sea, Philagra, Mt. Ochi, and parts of the territory of Karystos. To the

west the southern Euboean channel, Rafina (ancient Halai), Marathon, and Rhamnous are visible. In the 4th century BC, the border between Eretria and Karystos was probably located south of the Kliosi range, Styra being one of the Eretrian southernmost demes at that time (Reber 2002; Fachard 2009, 64-66).

THE FORTRESS

The plan of the fortress closely follows the outline of the ridge top (fig. 1). The bedrock ridge top provides a gap bordered on the west and east by the natural rock outcrops. This wide "passage" was then blocked by two walls constructed between the natural rock faces. The northern wall, orientated east-west, is 74 m long with a postern gate set in it and is reinforced by a small tower (4.20 x 3.47 m). The 2.4-2.5 m thick wall is double faced with packed rubble fill.

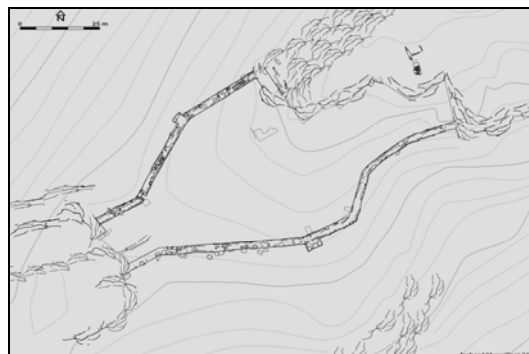


Figure 1: plan of the Aghios Nikolaos fortress

The postern, 1.25 m wide, is the only preserved opening of the fortress: it is well preserved compared to the rest of the northern section, reaching a preserved height of 4 m (fig. 2). To the south, the wall is 114 m long, with a width of 2.40-2.60 m and is defended by a square tower (5 x 5.05 m). The masonry is best described as being trapezoidal to polygonal. The fortified perimeter of the fortress

reaches 310 m, enclosing an internal area exceeding 3500 m². In constructing the fortress the quarriers exploited the geological strata of the cipollino bedrock, extracting the blocks on site by carving the rock faces edging the plateau.



Figure 2: The postern seen from the north

THE EXCAVATION

Four trenches were opened inside the fortress, one at the postern, two perpendicular to the southern wall (where the sediments seemed thicker) and the fourth near interior long walls visible on the surface.

The trench at the postern gate did not reveal any information because the bedrock was reached after only a few centimetres. The trenches at the southern wall were more successful, allowing us to gather information about the date of the walls and the methods of construction. It appears that the builders first carved the bedrock in steps and then fitted the foundations of the wall directly on it. In the first southern trench, the interstices between the rock and the foundations blocks were filled with earth, stone fragments, charcoal and a few sherds, including the rim of a black glaze skyphos dating from the beginning of the 4th century BC, giving a *terminus post quem* for the construction of the fortress. This filling was covered with

several layers and floor levels related to the wall. Another Classical sherd found associated with the wall foundations in the second southern trench supports the 4th century date.

The destruction of the fortress walls cannot be dated precisely. Nevertheless, judging from a layer composed of fallen blocks and packed stones, it seems that the walls of the were destroyed in the Byzantine or Medieval period, probably by the removal of the ancient blocks for other constructions, in particular the Medieval castle of Larmena situated on the eastern part of the summit (Koder 1973, 68, 122-125). Finally, some walls belonging to internal constructions were excavated in the eastern part of the fortress. Unfortunately, it was not possible to date these walls.

REMAINS OUTSIDE THE FORTRESS

Other remains are visible along the plateau summit of Mt. Kliosi, east of the fortress. Two trenches were placed near the Aghios Nikolaos church (see Skoura 2003, 103-104), the first uncovered the foundations of the building on the bedrock while the second trench, situated between a cistern and the church, uncovered two walls, probably of classical date. East of this sector, the concentration of surface pottery is the thickest, testifying to a large chronological occupation: Prehistoric (obsidian), Classical, Hellenistic, Byzantine and Ottoman.

North of a rocky terrace, where the bedrock has been cut away over a large area, a thick accumulation of earth was excavated, revealing abundant material, including classical tiles and pottery. A large number of black glazed sherds were found, including the rim of a red-figured calyx krater of the end of the 5th century

BC. The excavation showed that this *bothros* resulted from the cleaning of the plateau, probably in the Ottoman period. The fragment of a funerary or votive inscription, carved in a cipollino plaque, was found nearby: it displays the letters:]IPA[

CONCLUSIONS

The building of the fortress at Aghios Nikolaos can now be dated to the 4th century BC, thanks to the stratified pottery discovered during the excavation. It was around 400 BC that the region of Styra was annexed by the Eretrians, who probably constructed the fortress to guard and protect the new southern extension of their territory.

However, the summit of Aghios Nikolaos was already occupied in the 5th century BC, as the remains of pottery and tiles clearly testify. The quality of the black-glazed pottery on this mountain top is surprising and could suggest the pres-

ence of a sanctuary. Two late inscriptions found on the slopes of Mt. Kliosi indicate the worship of Zeus: IG XII 9, 58 mentions *Dios Hy(psist)ou Sôtiros*; IG XII 9, 59 is inscribed in a quarry and mentions *Zeus Hypsistos*. Since the epithet *Hypsistos* could fit a mountain cult at a summit, it is reasonable to suggest that the mountain was dedicated to Zeus. The god is often venerated on mountain tops (see Langdon 1976; Cook 1914; Cook 1925). *Zeus Hypsistos* seems also to have been worshipped in Karystos, according to Zappas (1981, 261). On the cults of the region, in particular Zeus, see Chidiroglou (1996, 179-184).

The remains on Mt. Kliosi suggest the presence of an important, probably religious, site belonging to the ancient city-state of Styra before its annexion by Eretria. Styra became a deme of the Eretrian chora in the 4th century, and its incorporation was followed by the construction of the Aghios Nikolaos fortress which guarded the southern border of the *chôra*.

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ASTRONOMICAL ORIENTATIONS OF DRAGON HOUSES (LAKA PALLI, KAPSALA, OCHE) AND ARMENA GATE (EUBOEA, GREECE)

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ABSTRACT

The preliminary investigation of the astronomical orientation of monuments at Styra, southern Euboea, includes the triple so called 'dragon house' complex at Laka Palli, one dragon house at Kapsala and one on the summit of Mount Oche, and a monumental gate in the megalithic fortification wall at Armena. Recent luminescence testing dates these remains to approximately the Classical period with apparent re-use in Roman and later times. Thus far no definite astronomical orientation has been determined in the layout of the structures and no celestial stone markers or similar features have been found associated with the dragon houses, however, the relationship of significant stars, constellations and solar stands was well known in antiquity, and the limited results presented here suggests the possibility for further investigation. This study, which considered possible orientations related to sun rise and sun set for the summer and winter solstice, as well as, alignments towards equinoxes and major bright stars and constellations, did observe a general preference for a southern orientation at most of the sites and a possible feature for time observations in the dragon house complex at Laka Palli.

KEYWORDS: Dragon houses, Euboea, Armena, astronomical, orientation, Kapsala, Laka Palli, stars, constellation

INTRODUCTION

Southern Euboea is home to several ancient rectangular structures of unknown function, called dragon houses, built of large cut blocks with virtually intact walls. The preserved stone roofs provide evidence for a false arch construction in which the outer and lower courses of stone serve as a counterweight. Similar corbelled roof construction in earlier times is known in Tiryns and Mycenae as well as in Cyclades, Thrace and southern Russia (Johnson, 1925). The buildings take

their name not from dragons as we understand them today, but from mythical creatures with supernatural powers that were able to achieve such craftsmanship. Most of the dragon houses are located on the region of Styra, but the most famous example is on the peak of Mount Oche, above Karystos (fig. 1). Similar contemporary buildings are found in Karia (Asia Minor) and one is known on Mt. Hymettos in Attica (Carpenter and Boyd, 1977).



Figure 1. Map of Southern Euboea, showing the dragon houses and Armena Gate: D-LP: Laka Palli, D-KA: Kapsala, D-OH: Oche AG: Armena Gate

Many interpretations have been offered over the years about the function of the dragon houses. Suggestions have included buildings of (wealthy) farmers, houses and storage rooms for quarry workers, military posts, or shrines and temples (Carpenter and Boyd, 1977). The dragon house of Mt. Oche has been connected to the worship of Hera and Zeus (Ulrichs, 1842; Welcker, 1850; Bursian, 1855; Baumeister, 1864; Moutsopoulos, 1982).

Bursian (1855) and Welcker (1850) argue that the Laka Palli triple complex were temples dedicated to either of the following triadic deities: Demeter, Persephone (Kore), and Kalymnos, or Apollo, Artemis and Leto, or Zeus (Dias), Hera and Hevi. Another interpretation is that those close to ancient quarries were dedicated to Hercules, the protector of quarry workers, as an inscription discovered in a shrine at

the area of the ancient quarries near Karystos suggests (Chapman, 1993).

In the present study the possible astronomical orientations of the dragon houses of Laka Palli, Kapsala and Mt. Oche are examined, as well as the orientation of the gate of the Armena fortress.

The Laka Palli dragon house complex is located on the western slope of Mt. Kliosi, to the east of Styra. It consists of three buildings placed on three sides of a rectangular enclosure or courtyard, with their entrances facing onto it (Fig. 2, 3).

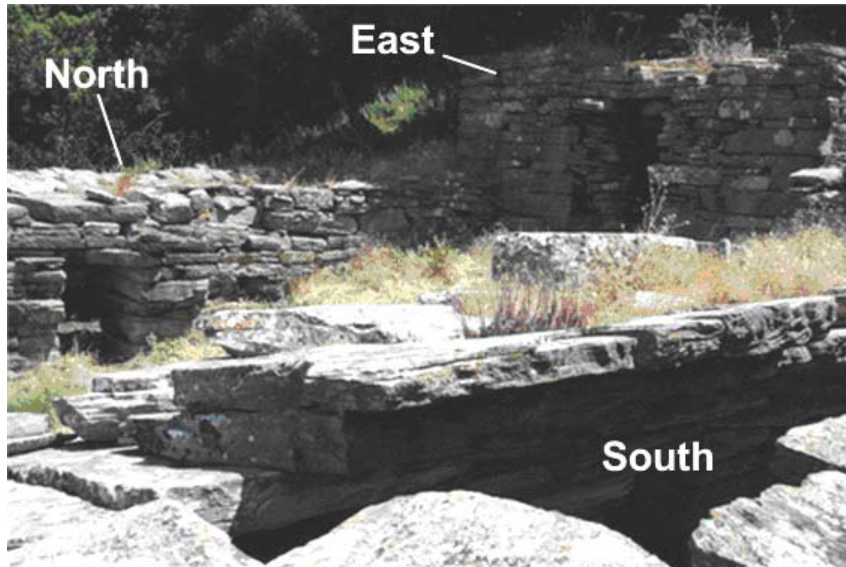


Figure 2. Laka Palli dragon houses

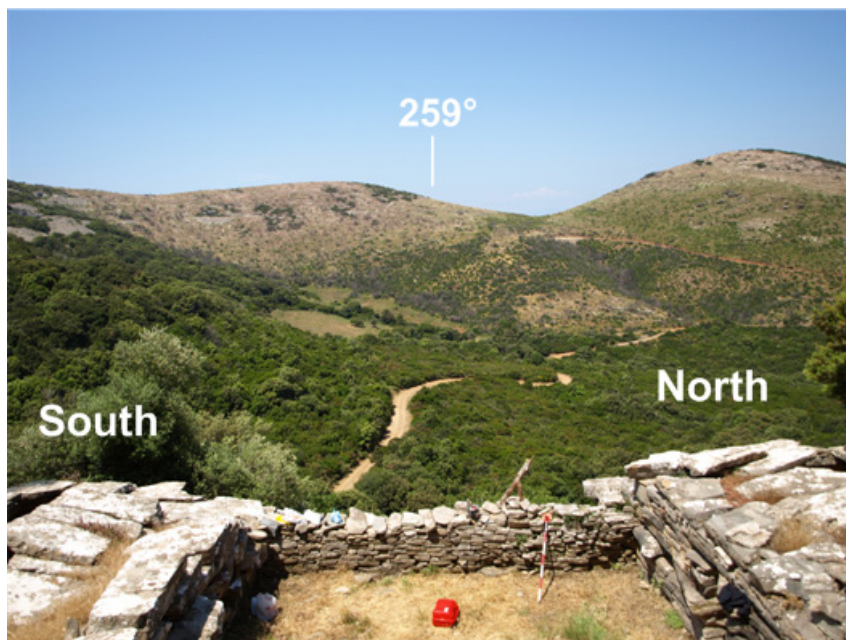


Figure 3. Looking west from the entrance of Laka Palli central (east) dragon house

We keep the names used by Carpenter and Boyd (1977), i.e. East, North and South, which correspond to the locations of the buildings in relation to the centre of the complex. The eastern (or central)

building is almost square in shape and its ceiling has an opening, called the 'opaion' (Fig. 4).



Figure 4. The hole (opaion) at the ceiling of Laka Palli central (east) dragon house

The Kapsala dragon house is located in an easily accessible position adjacent to the road that runs from Styra to Karystos and a few kilometres beyond Kapsala village. Its roof had probably collapsed and

was rebuilt in modern times. Now it consists of two separated areas, a roofed room and a courtyard. The entrance is now partially blocked by a partition wall (Fig. 5).

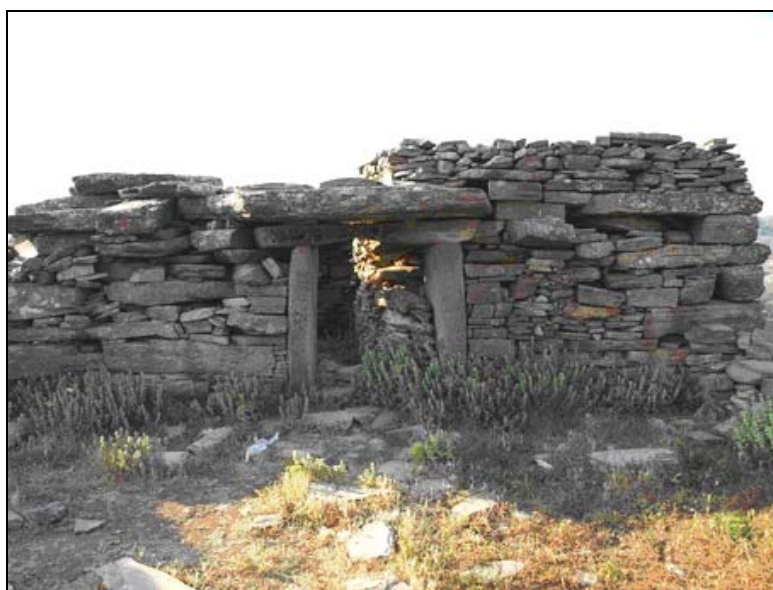


Figure 5. Kapsala dragon house

The dragon house of Mt. Oche is the most monumental and elaborate of the group. It is located on one of the twin peaks of the mountain and it overlooks the straight between Euboea and Andros. The excavation carried out by Moutsopoulos in 1959 unearthed ceramic vessels that range in date from the 7th century BC to Roman times (Moutsopoulos, 1982). The Mt. Oche dragon house is considered by most to be a temple (Carpenter and Boyd, 1977).

Near the Laka Palli dragon houses, at the peak of Aghios Nikolaos of Mt. Kliosi, stands the gate of the Armena fortress (Fig. 6). It is constructed of large blocks of stone, especially at the base. Unfortunately only a few of the adjacent stones of the fortress walls are still in place. Inside the fortress there is a small modern chapel, which was also examined.



Figure 6. Armena Gate, looking outwards (northwest)

METHODOLOGY

Orientation measurements were made with a magnetic compass and a clinometer, with a minimum instrument error of 0.5° (Meridian MG-3101). The geographic latitude and longitude of each site were measured with a portable GPS device (Garmin GPS III) and by Google Earth. The declination values were calculated with the GETDEC4 software.

Possible sunrise/sunset days and stellar alignments were computed with the programme Stars. Finally, representation of the ancient night sky was created with SkyMap Pro.

A recent dating project (Liritzis et al., 2009) of the stone foundations of the Laka Palli and Kapsala dragon houses and the Armena Gate dated these buildings to the 5th century BC. Therefore the date used in all celestial maps is ca. 400 BC.

Theodossiou et al. (2009) have suggested that the Mt. Oche dragon house is aligned to the rise of Sirius (alpha Canis Majoris). Since this alignment corresponds to the orientation of the right side of the building (i.e. the wall on the right as we face the entrance), we decided to measure the entrances and the right sides of the rest of the dragon houses as well, to compare our results.

RESULTS AND DISCUSSION

Dragon houses

Tables 1 and 2 show the calculated declinations for the houses' entrances and the corresponding alignments to the sun and the stars, respectively. Tables 3 and 4 show the same calculations for the right sides of the dragon houses.

The declination values that correspond to the buildings' entrances suggest that, with the exception of Laka Palli East house, none of the other buildings is aligned to a sunrise or a sunset (or the rise and set of the moon), consequently the orientation of the dragon houses probably was not connected to the sun or the moon.

Additionally, if we consider the orientation of the East house as the main orientation of the Laka Palli complex, there is no general pattern in orientation. The three sites of Laka Palli, Oche, and Kapsala look west, southwest, and

southeast respectively. On the other hand, two of the buildings, Kapsala house and Laka Palli North house, have the same southeastern alignment. In addition, the dragon house at Oche has a southwestern orientation, so there is a possibility that this broad southern orientation was deliberate.

Due to the small number of buildings investigated and their diversity in orientation, it is impossible to determine if any of the buildings had deliberate stellar alignments. There are, however, some noteworthy results to be considered. Probably the most impressive alignment is that of the Laka Palli East house to Orion's belt (Fig. 7). At ca. 400 BC the three stars of the belt would be positioned directly over the point on the western horizon toward which the house is oriented. Even if this alignment was not intended, it would hardly have been missed.

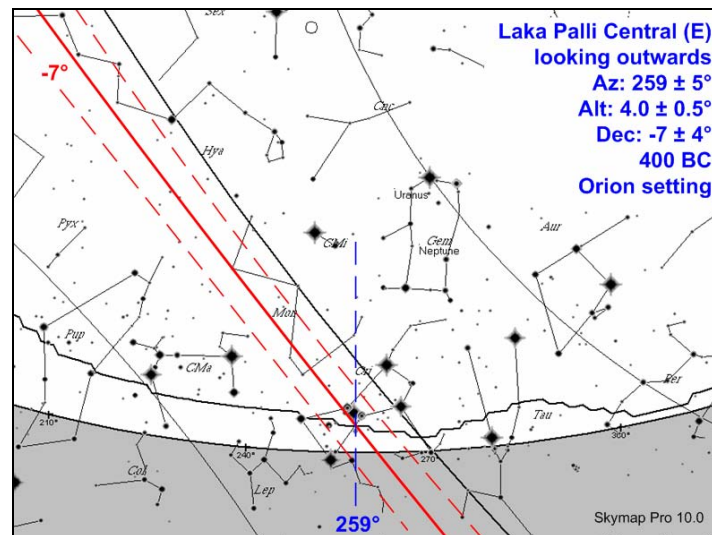


Figure 7. Laka Palli East d/house, entrance orientation. Orion setting (c. 400 BC)

The Laka Palli South house is aligned toward the head of the constellation Draco, when it would be at its lowest point in the sky. However, this view was

probably blocked by trees (and the North house) since the orientation of the South house is too close to the mountain slope.

The declination of the Laka Palli North house and the Kapsala house does not correspond to a significant star or constellation. Actually, the specific declination line (i.e., the path that any star follows in the sky) is very close and almost parallel to the horizon, so it is

unlikely that any star could have been noticed along this line. On the other hand, the constellations of Canis Major, Scorpius, and Sagittarius would pass a few degrees above the horizon of these buildings (Fig. 8).

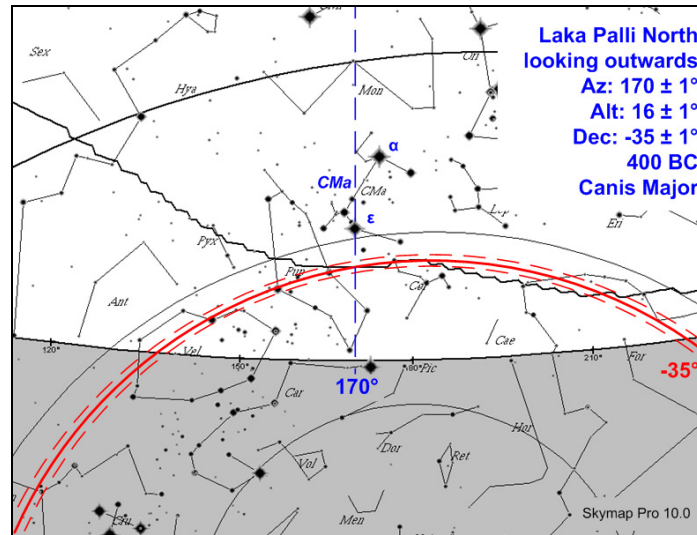


Figure 8. Laka Palli North d/house, entrance orientation. Constellation Canis Major appears a few degrees above the horizon of the d/house (c. 400 BC)

The entrance of the Mt. Oche dragon house is aligned to the constellation Crux (Southern Cross) at the time of its setting (Fig. 9). Additionally, the two brightest stars of the constellation Centaurus would also pass over this point. However, the visibility of these alignments is uncertain, since the horizon is at sea level, which could be obscured by mist. At the present time these stars are constantly below the horizon.

The study of the right sides' orientations produced the following results. While the Mt. Oche house is aligned to the star Sirius in Canis Major, as previously proposed (Theodossiou et al., 2009), and other bright constellations, none of the other buildings follow this orientation. In the case of Laka Palli, the relevant constellations are the same to

those that are visible from the entrances of the buildings, due to the layout of the complex (e.g., the orientation of Laka Palli East right side is identical to the orientation of Laka Palli North entrance). At Kapsala, only two constellations of low illumination were observed.

A special mention should be made about the 'opaion' (i.e., opening) in the ceiling of the Laka Palli East house. A view through the opening at ca. 400 BC would show many bright stars and constellations at their zenith, namely: Vega in the constellation Lyra, Deneb in Cygnus, Capella in Auriga, Hercules, Corona Borealis, Perseus, and Bootes (Fig. 10). Each constellation would be at the zenith on a different month, for a given time. Although it cannot be proven, the 'opaion' might have been used for time

observations, in addition to other possible uses (religious, social). Unfortunately, the exact size (or even the existence) of the opening in ancient times is not certain.

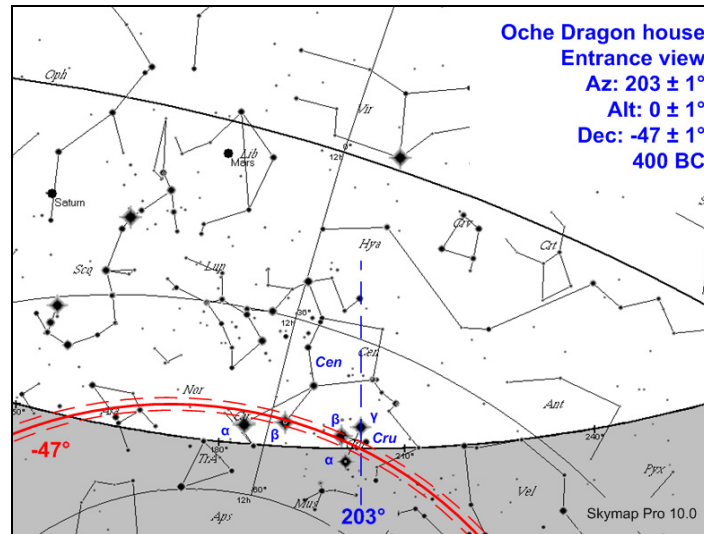


Figure 9. Oche d/house, entrance orientation. The brightest stars of the constellations Crux (Southern cross) and Centaurus set at or near this point of the horizon (c. 400 BC)

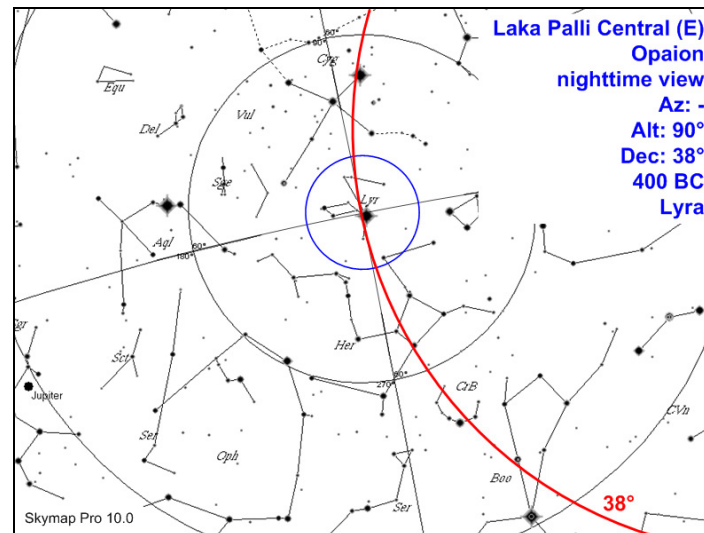


Figure 10. Laka Palli East d/house, 'opaion' view. Vega, the brightest star of the constellation Lyra is at the zenith. The constellations Cygnus, Hercules, Corona Borealis and Boötes who also pass from the zenith are visible (c. 400 BC). The inner circle has a radius of 10 degrees (altitude: 80°)

Armena gate

The Armena fortress gate has a north-west-southeast orientation, which is very close to the summer solstice sunset and the winter solstice sunrise. In fact, both solstices are within the error margins. Looking outwards (to the northwest), the

gate is also aligned to the constellations Leo, Gemini, Cancer, and Andromeda (Fig 11). In the opposite direction, the gate is aligned to the constellations Canis Major, Scorpius, and Sagittarius, as well as the peak of Mt. Oche. However, this line of sight must have been blocked by other structures inside the fortress. Thus, only

the summer solstice sunset could have been observed through the gate. Although the basic function of the site was militaristic and the gate locations may

have been dictated by the topography of the peak, this solstice association would not have passed unnoticed.

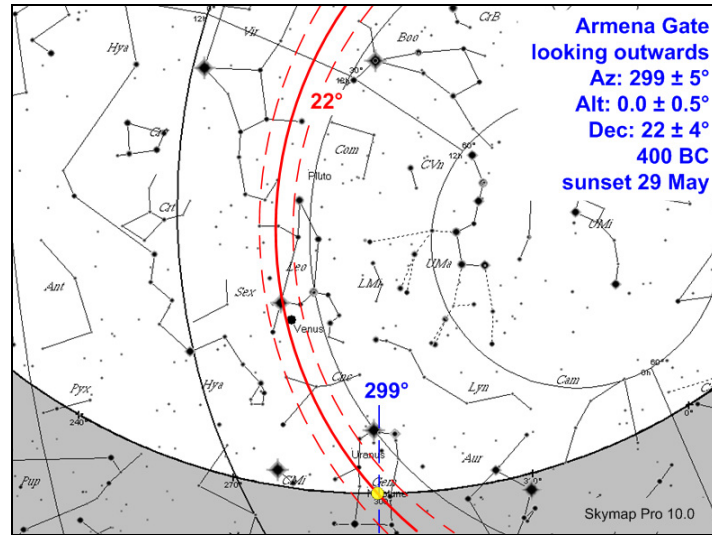


Figure 11. Armena gate, looking outwards. Sunset of May 29th (c. 400 BC). The summer solstice sunset (dec: 23.5°) is within the error margins. The constellations Gemini, Cancer and Leo who set at the gate’s orientation are visible

A group of parallel grooves on top of the rock outcrop southwest of the gate has an almost southern orientation and a declination similar to that of the Mt. Oche dragon house. The constellation Crux and the brightest stars of Centaurus would rise from that point on the horizon. In the case of the Armena gate grooves, however, the view may have been blocked by nearby buildings.

Small church

The azimuth of the church or chapel and the calculated declination show that it is not oriented within the area of possible sunrises, as might have been expected, but is a couple of degrees farther to the north. This orientation, however, does follow exactly the alignment of the mountain peak. Also, from the entrance of the church there is a clear view to the sea at the southwestern horizon.

CONCLUSIONS

As mentioned above, the small number of studied buildings does not allow us to reach a safe conclusion regarding the orientation of the dragon houses. Nevertheless, there is at least an indication that the general southern orientation of the Kapsala and Oche dragon houses is significant. This research will be expanded to include the rest of the dragon houses in the Styra area, in order to create a valid statistical group that will show which (if any) of the proposed alignments are deliberate and not as arbitrary as they currently seem.

The diversity in astronomical alignments is not the only element that separates the studied buildings. The Mt. Ochi house was built at the highest point of its landscape, while the others were not. The Laka Palli houses lie sheltered at the lower

part of a valley and the Kapsala house is located in an open area. The entrances of the Ochi and Laka Palli houses have the best overview of the nearby area, but the Kapsala house looks to the opposite direction (probably to avoid the northern winds). Thus, it is quite probable that these dragon houses were not built to serve the same functions (Carpenter and Boyd, 1977). Archaeological excavations are necessary to provide additional information about the function of each building.

In this preliminary study, no clear relationship between the investigated alignments and celestial elements pertaining to the gods Hera and Zeus or Hercules have been discovered that might support a potential cultic function for the dragon houses. The constellation Hercules, for example, appears only in one occasion, at the zenith of the Laka Palli 'opaion'.

Nonetheless, the correlation between the stars Regulus (alpha Leonis, also named Basiliscus by the Greeks) and Antares (alpha Scorpii) to the gods Zeus and Ares (Robbins, 2001), the constellation Orion to the goddess Artemis (Mair, 1921) and others require further investigation when more data become available.

Finally, the possibility that the Armena gate was deliberately aligned close to the summer solstice sunset should not be hastily rejected. The area of the fortress contains the modern church and several older chapels. Furthermore, it is known that mountain peaks were sacred places where cultic ceremonies were held (Carpenter and Boyd, 1977). The absence of any cultic activity inside the fortress during Classical and Hellenistic times seems rather unlikely. Again, new excavations could give answers to some of these issues.

ACKNOWLEDGEMENTS

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TABLES

Table 1. Entrances' orientation – Dragon houses, Armena Gate, small church φ: latitude, λ: longitude, A: Azimuth, h: horizon altitude, δ: declination, σ: error, *Orientation too close to the mountain slope, view maybe blocked by vegetation #View probably blocked by other structures

Site	φ	λ	A	σA	h	σh	δ	σδ
Dragon houses								
Kapsala	38° 7' 29"	24° 14' 42.5"	165.6	0.5	15.0	0.5	-35.2	0.5
Laka Palli E house	38° 9' 10.3"	24° 15' 49.5"	259	5	4.0	0.5	-7	4
Laka Palli S* house	38° 9' 10.3"	24° 15' 49.5"	355	1	0.5	0.5	52	1
Laka Palli N house	38° 9' 10.3"	24° 15' 49.5"	170	1	16	1	-35	1
Laka Palli opaion	38° 9' 10.3"	24° 15' 49.5"	-	-	90	-	38	-
Oche	38° 3' 31"	24° 28' 03"	203	1	0	1	-47	1
Armena Gate	38° 8' 41.2"	24° 15' 36.3"	299	5	0.0	0.5	22	4
Armena Gate (opposite)#	38° 8' 41.2"	24° 15' 36.3"	120	5	2.0	0.5	-22	4
Armena Gate parallel grooves	38° 8' 41.2"	24° 15' 36.3"	165	5	0.0	0.5	-50	4
Small church	38° 8' 44"	24° 15' 44.5"	58.5	0.5	2.5	0.5	25.8	0.5

Table 2. Possible stellar and sunrise/sunset alignments of dragon houses' entrances and Armena gate A: Azimuth, h: horizon altitude, δ : declination *Orientation too close to the mountain slope, view maybe blocked by vegetation #View probably blocked by other structures

Site	A	h	δ	Constellations (c. 400 B.C.)	Sun rise/set
Dragon houses					
Kapsala	165.6	15.0	-35.2	<i>Canis Major, Scorpius, Sagittarius, (Centaurus)</i>	-
Laka Palli E (house)	259	4.0	-7	<i>Orion, Corvus</i>	2-Mar, 10-Oct (sunset)
Laka Palli S* (house)	355	0.5	52	<i>Draco, Cepheus</i>	-
Laka Palli N (house)	170	16	-35	<i>Canis Major, Scorpius, Sagittarius, (Centaurus)</i>	-
Laka Palli (opaion)	-	90	38	<i>Lyra, Cygnus, Bootes, Auriga, Perseus, Hercules, Corona Borealis</i>	-
Oche (house)	203	0	-47	<i>Crux, Centaurus</i>	-
Armena Gate	299	0.0	22	<i>Leo, Gemini, Andromeda, Cancer, (Cygnus), (Perseus), (Auriga)</i>	29-May, 13-Jul (sunset)
Armena Gate (opposite) #	120	2.0	-22	<i>Canis Major, Scorpius, Sagittarius, (Centaurus)</i>	11-Jan, 30-Nov (sunrise)
Armena Gate (parallel grooves)	165	0.0	-50	<i>Crux, Centaurus, (Vela)</i>	-

Table 3. Dragon houses right side orientations
 ϕ : latitude, λ : longitude, A: Azimuth, h: horizon altitude, δ : declination
 *Right side of north building faces the mountain slope

Site	ϕ	λ	A	σA	h	σh	δ	$\sigma \delta$
Kapsala	38° 7' 29"	24° 14' 42.5"	75.6	0.5	11.0	0.5	18.0	0.5
Laka Palli E house	38° 9' 14.4"	24° 15' 49.2"	169	5	16	1	-35	4
Laka Palli S house	38° 9' 14.4"	24° 15' 49.2"	265	1	3	1	-2	1
Laka Palli N* house	38° 9' 14.4"	24° 15' 49.2"	80	1	-	-	-	-
Oche	38° 3' 31"	24° 28' 03"	113.2	0.5	0	1	-18.4	0.5

Table 4. Possible stellar and sunrise/sunset alignments of dragon houses' right sides
 A: Azimuth, h: horizon altitude, δ : declination

Site	A	h	δ	Constellations (c. 400 B.C.)	Sun rise/set
Kapsala	75.6	11.0	18.0	<i>Serpens, Andromeda</i>	10-May, 2-Aug (sunrise)
Laka Palli E house	169	16	-35	<i>Canis Major, Scorpius, Sagittarius</i>	-
Laka Palli S house	265	3	-2	<i>Orion, Libra, Corvus</i>	15-Mar, 27-Sep (sunset)
Oche	113.2	0	-18.4	<i>Canis Major, Orion, Scorpius</i>	28-Jan, 13-Nov (sunrise)



THE DRAGON HOUSES OF STYRA: TOPOGRAPHY, ARCHITECTURE AND FUNCTION

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ABSTRACT

This paper deals with the so-called Dragon houses in southern Euboea and particularly in the region of Styra. In the publications of both N.K. Moutsopoulos and T. Skouras a series of different houses are mentioned, but without precise information on their location. Thus, my first aim was to rediscover these houses and to verify whether they correspond to the type of the well-known houses at Palli Lakka, Kapsala and on Mount Ochi. I soon realized that some of the Dragon houses in the lists of the two authors are in fact ancient farmhouses or watch towers.

I will present the typology of the “real” Dragon houses and will also compare them with some stone houses found in other regions around the Mediterranean: in Italy, France, Switzerland, and the former republic of Yugoslavia. Despite different opinions concerning their function, I will add some arguments in favor of that proposed by Moutsopoulos. I believe that we are dealing with shepherd dwellings, used perhaps only part of the year, mostly in summer, when shepherds crossed mountains with sheep and goats or maybe even with some cows.

KEYWORDS: Dragon houses, Euboea, Mount Ochi, Palli Lakka, Kapsala, Styra, herding

INTRODUCTION

On 21 October 1797 the British Engineer John Hawkins climbed Mount Ochi near Karystos and discovered on its summit at a high of 1400 m a building that was constructed entirely of stone (fig. 2,1). He realized that this building must date from a very ancient age. A first account of his discovery appeared in 1820, but it was the German archaeologist H.N. Ulrichs who published it in more detail in 1842 (Hawkins 1820; Ulrichs 1842; cf. Ulrichs 1863). Ten years later it was the French scholar J. Girard who focused attention in his publication *“Mémoire sur l’Île d’Eubée”* on a second building situated at Palli Lakka (fig. 3,3) near Styra (Girard 1852). The local population called these buildings “Drakospita” (Dragon houses) because they imagined that Dragons were housed in these buildings in ancient times (for the legend see Carpenter and Boyd 1976; 1977, 179 note 2).

These two Dragon houses were discussed afterwards in a number of publications of more or less scholarly character (see bibliography). Between 1980 and 1991

three Greek scholars, A. Lambraki, N.K. Moutsopoulos and T. Skouras published a series of other buildings in the region of Styra which were also called “Dragon houses” because of the similarity in the technique of construction (Lambraki 1980; Moutsopoulos 1982; Skouras 1991). Previously the scholarly community did not pay attention to these newly discovered buildings for two reasons: the publications were written in Greek and difficult to find in libraries outside of Greece and the authors failed to give detailed information about the exact location of these buildings. As I began to interest myself in these Dragon houses I had first to try to relocate them in the mountains around Styra. Achilles Katsarelias, the former guardian of the Eretrian Museum, was a great aid in helping me to find these houses. After weeks of climbing in the Styrean mountains, our research proved successful. In fact, we re-discovered all of the buildings mentioned by Moutsopoulos and Skouras and we were able for the first time to draw a map giving the location of these buildings (fig. 1).

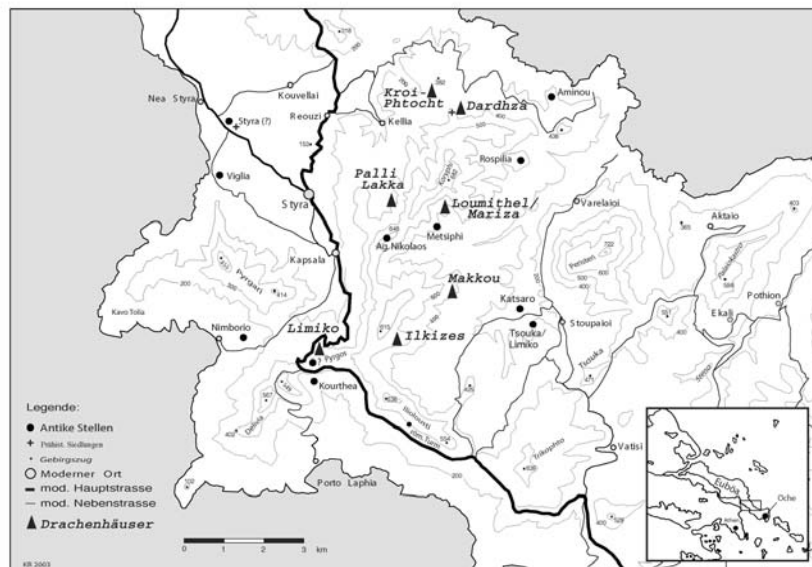


Fig. 1 Map of the region round Styra (updates map in Reber 2001, pl. 51,1)(K. Reber)

While constructing the database of these buildings I became aware of another problem: I realized that many of them were in fact not real "Dragon Houses." Moutsopoulos and Skouras presented in their publications a total of 19 Dragon houses, 13 of them in the region of Styra. In fact, additional investigation has shown that a number of the structures reported by Moutsopoulos and Skouras should be interpreted as ancient military or agricultural towers. Only six buildings could be considered as belonging to the "Dragon house" group as defined by the two sites of Mt. Ochi and Palli Lakka (Reber 2001). This brings the total number of known Dragon houses to eight. The six additional structures are the following:

THE DRAGON HOUSES

The most northern Dragon house is situated at Kroi-Phtocht near the village of Kellia (Moutsopoulos 1982, 387-389 fig. 99-100 Pl. 106-110; Reber 2001, 347 Pl. 51,2). The name "*Kroi-Phtocht*" derives from the Arvanite language and means something like "*cold water-spring*." Actually, a small stream passes just beside the house. The Kroi-Phtocht-house (fig. 3,4) is composed of two rooms, arranged at the north and east sides of a central courtyard. The west wall of the eastern room is preserved up to the height of the door lintel, and although the roof has fallen, the beginning of the corbel vault is visible.

The same is true for the roof of the Makkou house (fig. 3,1), which consists of two independent rooms constructed on a small terrace (Skouras 1991, 49-52 Pl. 21-24; Reber 2001, 346-347 Pl. 51,2. 52.5). The eastern room is built against the natural rock on the north side of the terrace. Between these rooms and the cliff there is a narrow hall, which was accessible from the west side.

At a distance of only one kilometer southwest of the Makkou house is found the Dragon house Ilkizes (fig. 3,2), a long-rectangular building with a small courtyard, which was limited in the south by the steep cliff (Skouras 1991, 45-48 Pl. 18-20; Reber 2001, 346 Pl. 51,2. 52,4). The different technology of construction in the lower and in the upper part of the walls demonstrates that the walls, probably already collapsed in antiquity, had been rebuilt in modern times for a secondary use of the building.

The Dragon house of Limiko near Kap-sala (fig. 2,2) has only a single room, resembling the Dragon house on the Ochi Mountain peak (Moutsopoulos 1982, 396-397 fig. 112 Pl. 133-141; Lambraki 1980, 37 fig. 1-2; Reber 2001, 344-345 Pl. 51,2. 52,1). The entrance in the south is framed with lateral stones as at the Ochi house. Over the door lies a gigantic flat stone, which is set directly on the walls to both sides of the door in order to reduce weight on the door-lintel. As at Ilkizes, part of the walls are constructed with smaller stones, indicating a secondary use in later times.

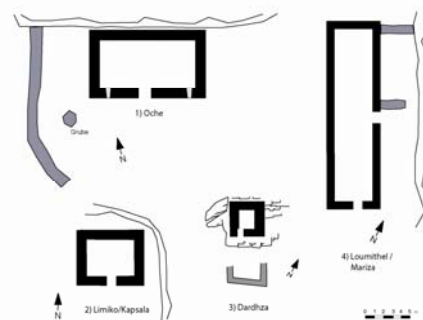


Fig. 2 Drakospita (K. Reber)

The smallest Dragon house is found at Dardhza (fig. 2,3) and consists of a single 4 m square room (Moutsopoulos 1982, 385-387 fig. 98; Reber 2001, 347). Below the cliff on which the house stands is a terrace

that contains the remains of walls that may have surrounded an open court.

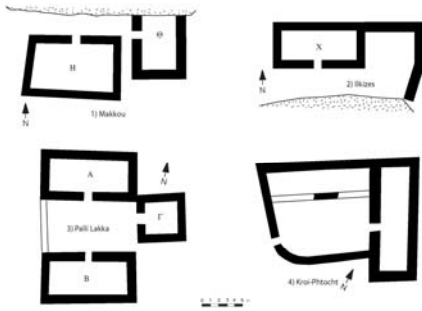


Fig. 3 Drakospita (K. Reber)

Finally, the largest Dragon house is that at Loumithel-Mariza (fig. 2,4), which has a width of 6 ms and a length of 21.8 ms (Moutsopoulos 1982, 381-385 fig. 95-97 Pl. 57-67; Reber 2001, 345-346 Pl. 51,2. 52,2-3). Stones from the collapsed roof lie as they had fallen. The house had an entrance on the southern narrow side, which was to be entered over a few steps, and a second entrance in the eastern side, which can still be recognized. From the second entrance one enters a courtyard situated between the house and the cliff behind it.

The buildings, briefly introduced here, have a variety of common characteristics, which may be evaluated in the definition of a Dragon house. First, all constructions are completely of stone. Second, the building material consisted of stone from the immediate vicinity. Third the roofs have the form of a corbel vault, built with large, flat stones. Fourth, the buildings stand isolated in the mountains, i.e. detached from any settlement patterns and far from commercial or traffic routes. The structures are all oriented to the south and are associated with an enclosed area or courtyard.

THE FUNCTION

Many different suggestions have been made concerning the function of the

Dragon houses. H.N. Ulrichs supposed that the house on Mt. Ochi was a temple to the goddess Hera and, as Stephanos of Byzantium mentioned, the location of a cult in honor of the *ieros gámos*, the holy wedding, of Zeus and Hera (Ulrichs 1842; Ulrichs 1863). Others declared it as a monumental tomb (Thiersch 1852) or as a watch post (Wiegand 1896). The complex at Palli Lakka was interpreted by F.G. Welcker, A. Rangabé and others as a sacred place, although the authors could not agree on the dieties honored there (Welcker 1856; Rangabé 1853).

Entirely different is the suggestion of H. G. Lolling who proposed a relationship with the Roman cipolin quarries and interpreted the Dragon houses as lodgings for the stone quarry workers (Lolling 1876 / 1877). This idea was taken up by J. Carpenter and D. Boyd (Carpenter and Boyd 1976; 1977) as well as recently by T. Kozelj and M. Wurch-Kozelj, who explained the Dragon houses as lodgings, not for workers, but for the Roman officers who supervised the workers in the quarries (Kozelj and Wurch-Kozelj 1995). Even if this idea demonstrates a certain originality, it must definitely be rejected, because the complex at Palli-Lakka is the only Dragon house within sight of a Roman stone quarry (for the quarries see Vanhove 1996; Lambraki 1980).

Finally, the suggestion of T. Skouras, who proposed to interpret the Dragon houses as sanctuaries for Heracles, the protector of the stone quarry workers also has to be rejected (Skouras 1991). It makes little sense to construct eight sanctuaries to Heracles in the area of Styra, when the majority of them lie far from the stone quarries.

There remains the interpretation of the Dragon houses as architectural evidence of an ancient shepherd's tradition. This

possibility was first considered by L. Ross (Ross 1851). N.K. Moutsopoulos took up this idea again and referred to some modern stone constructions in the Ida Mountain on Crete, which are covered, as are the Dragon houses, with corbel vaults (Moutsopoulos 1982, 454; Santillo Frizell 2001; Blitzer 1990; Warren 1973; Marinatos 1971). These modern shepherd huts, which on Crete are called *Mitàta*, served as lodgings for the shepherds as well as for the production and storage of cheese. They were combined with a walled courtyard, which was used for milking of the sheep and goats.

Stone buildings with corbel vault are known through all periods, not only on Crete, but also in many other locations around the Mediterranean. Already in 1925, F.P. Johnson had compared some ancient Carian constructions on the peninsula of Halicarnassus with the Euboean Dragon houses (Johnson 1925; cf. Radt 1970, 196; Carpenter and Boyd 1977). At Mt. Aipos on the island of Chios, Vassilis Lambrinouidakis found other ancient stone constructions with corbel vaults (Lambrinouidakis 1982), and a similar building is also known on Mt. Hymmetos in Attica (Carpenter and Boyd 1977, 189-193 fig. 16-20).

In addition to these ancient constructions we also know a large number of modern stone huts which continue the ancient tradition of corbel vaulting. In Bici in Istria we find modern huts with conical roofs, which recall the so-called Trulli in Italy (Hamm 1974). Similar buildings are also found in the Swiss Alps, for example on the Bernina or on the Alp Grüm (Meyer et al. 1998; Hamm 1974). These buildings are known as "*Heidenhütli*" and date mostly from the Middle Ages or later: however, some of them seem to date as far back as the Bronze Age. Fi-

nally, we could also mention the famous *Bories*, which are common in the Provence in the South of France (Lassure and Repérant 2004).

The geographically scattering of these examples from different ages show that we can hardly speak of mutual influence, but that the phenomenon of stone buildings with console or corbel vault in mountain areas can appear in different times at different places (Hamm 1974; Santillo Frizell 2001; Santillo Frizell 1989).

The shepherds of ancient Greece were—as known from different sources—slaves belonging to the holdings of rich citizens, like the herds they had to look after (Forbes 1994, 192; Skydsgaard 1988; Hodgkinson 1988). Already in Homer's *Iliad* (XI, 697) Nestor reports that his father Neleus had seized a herd of cattle and a herd of sheep including the shepherd from the Eleians. This is confirmed by Isaios (6.33), where we read that Euktemon from Athens had sold his herds together with the shepherd. Eumaios, the pig herder of Odysseus, had built his lodging and stable with his own hands (*Odyssey* XIV, 5). Eumaios lived on this farm together with four other pig herders. Besides them, several goat herders under the leadership of Melanthios stood in the services of Odysseus (*Od.* XX, 175), as well as other cattle and goat herders under the direction of Philoitios (*Od.* XX, 185). It seems therefore that Odysseus owned enough staff that could have been put to work in the construction of such houses (cf. *Od.* XIV, 100).

Therefore, the suggestion that herd owners had entrusted their slaves with the construction of rural stone huts is quite probable. Indeed, the owners of the herds probably made available manpower and technical equipment as well as the trained professional masons who mastered the

static problems of such corbel constructions. This, at least, is what the shepherds on Crete relate. They no longer build the *Mitàta* in the old style with corbel vaults because they lack the necessary masons with the traditional knowledge (Moutsopoulos 1982).

The isolated position of the Dragon houses in the mountainous region of southern Euboea, like the apparently timeless and geographically independent typology of the corbel construction, speaks in favor of the interpretation suggested by Ross and Moutsopoulos as lodgings for the shepherds, stables, and for cheese and dairy processing.

Animal farming, along with agriculture, represented the most important branches in the industry of the Greek *Poleis*. Euboea was at least, as its name indicates, known for cattle breeding (*eu bous* – rich in cattle) and the bovine animal is to be found as a symbol on many Euboean coins (Brunner 1998; Picard 1979). The fact that there was good pasture land on Euboea is also mentioned by Thucydides (II, 14), who states that the Athenians took their herds over to Euboea at the beginning of the Peloponnesian War to protect them from the aggression of the Spartans.

Although the Dragon houses, in comparison to the modern alp-huts, are found at lower altitudes (in Euboea they are between 500 and 1400 meters above sea level) and closer to rural communities, the buildings might not have been used during the entire year. From the sources it appears that the ancient pastoral societies were organized after the model of seasonal transhumance, and accordingly the higher pasture regions were visited only in the summer (for the discussion about the forms of animal husbandry see Forbes 1994; Nixon-Price 2001; Skydsgaard 1988; Hodkinson 1988). Thus Varro informs us

in his *res rusticae* (2, II, 8) that the winter pastures often lie many miles away from the summer grazings. Nevertheless, one of the most important reports on this kind of transhumant cattle economy is found in Sophokles' *King Oedipus* (1132ff), where it is described how the shepherd of Laios, instead of abandoning the newly born Oedipus in the mountains, gave the baby to his colleague who traveled from Corinth up to the Boeotian mountains to pasture his herds. The image of a shepherd with his supplies walking in summer from Corinth to the Kitharaion Mountain south of Thebes seems to have been usual at the time of Sophokles. Indeed, a juridical problem arose from it because the pastures often lay in the territory of different *poleis* and arrangements concerning the rights of use had to be found in order to avoid conflicts. Fortunately, such a convention is preserved among the inscriptions in the sanctuary of Apollo at Delphi, which inform us how the Locrian towns Myania and Hypnia had regulated the use of the pastures in the border area at the beginning of the 2nd century BC (Bousquet 1965). From this convention it appears that the foreign shepherds might use the pastures up to time of the sheep shearing in the spring, then they had to move. Shepherds who led their sheep later to this area had to leave the pastures again after 10 days.

It is to be supposed that a contract with similar content existed also between the cities of Styra and Karystos. The Dragon houses south of Styra lay exactly in the boundary zone between the territories of both cities. This is shown by the inscription () on a rock at Met-siphi, mentioned for the first time by Moutsopoulos (Moutsopoulos 1982, 338-342 fig. 54-55; cf. Kalaloungas and Kalaloungas 1998 fig. 40; Reber 2002, 45

pl. 10, 4-5), indicating the frontier-line between Styra and his neighboring Demos.

We may assume that the Dragon houses in the region of Styra had served exclusively as summer lodgings for the shepherds. The life that these shepherds had in that area is described in Dio Chrysostomos' seventh (Euboean) discourse. The main persons in this discourse lived in an uncultivated area in the vicinity of Cape Kaphereus in southern Euboea in

the time of Domitian. In summertime, they used a small hut called "skepi" together with eight goats, a cow and a calf. In wintertime they descended with their cattle down to the valley as would the shepherds that used the Dragon houses described above. The corbel vault buildings of southern Euboea are accordingly some of the rare architectural testimonies of an ancient pastoral society of Classic and Hellenistic times in Greece.

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EDUARD SCHAUBERT'S TRAVEL NOTES ON SOUTHERN EUBOEA IN MAY 1847

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EXTENDED ABSTRACT

The German architect Eduard Schaubert (1804–1860), State Architect and Director of Public Works at King Otto's court, had a strong interest in archaeology. During his stay in Greece, between 1830 and 1850, Schaubert travelled abundantly throughout the country and studied its ancient ruins, architecture, sculpture, and inscriptions. In May/June 1847 he toured Southern Euboea visiting several sites (see appendix). His observations, written in notebooks, have never been published, but are of interest in several respects: What was to be seen, how was the condition of the monuments, how were they interpreted by other researchers before Schaubert and by himself and what sources did he use. In addition there are a number of excellent line drawings of monuments presenting detailed information about them.

Eduard Schaubert's travel notes belong to the comprehensive surveying tradition of the island which began in 1833 when Euboea passed by treaty from the Ottoman Empire to the newly founded Kingdom of Greece. The government's objective was not only a profound knowledge of ancient Greece, it was also striving to bring about the country's economic and urban revival.

The two presentations, given at the conference in Styra, are focussing on Schaubert's observations. They are part of a wider research project on the architect's travels in Euboea, the Northern Sporades (1847) and Boeotia (1848). The forthcoming critical edition will provide an insight of his life as an architect, town planner, and archaeologist.

KEYWORDS: *Archaeology, ancient and modern Greece, survey, topography*

APPENDIX: EDUARD SCHaubERT'S TRAVEL ROUTE

Karystos / Othonopolis – Paleochora - Castel Rosso - Kylindroi - Oche, Dragon House - Moukla - Marmarion - Mikromarmarion - Psygi - Styra - Krya Vrisi (Dragon houses) - Aghios Nikolaos (Castle Larmena) - Stoupaïos - Filagra – Geraistos / Kastri – Platanistos - Ellenikon



Overview of modern Karystos, Palaiochora with Castel Rosso and Mt. Ochi (©: Hans R. Goette)

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SURFACE LUMINESCENCE DATING OF 'DRAGON HOUSES' AND ARMENA GATE AT STYRA (EUBOEA, GREECE)

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ABSTRACT

The Optical Stimulated Luminescence (OSL) surface dating employing the single-aliquot regenerative (SAR) technique on quartz was applied to some small enigmatic buildings made of large marble schist slabs in a skillful corbelling technique, and a fortified megalithic gate, at Styra, Kapsala, Laka Palli and Kastro Armena in southern Euboea. The function and origins of the structures have created a puzzle that has fed the imagination and lead to various interpretations by many scholars. No archaeological excavations or methods of dating have been available for the megalithic-like structures. The dates reported suggest the earliest construction to have taken place during the Classical period. Re-use of these structures has occurred during Hellenistic and Roman times (the latter associated with the large scale quarrying of marbles), as well as, in Medieval times (found in agreement with the historical literature) and the contemporary period (as reported by shepherds). In all cases the datable slabs were rather reset as repairs.

KEYWORDS: OSL, Luminescence, Dragon Houses, Styra, Armena, Dating, Kapsala, Laka Palli, Euboea

INTRODUCTION

The Dragon houses are approximately two dozen mysterious structures in the area of Styra in southern Euboea (others include one on Mount Hymettos in Attica and several in Asia Minor near the Hali-carnassus peninsula) that have lead to various opinions regarding construction date and function (Fig. 1).

The Dragon houses at Styra have variable dimensions of about 3.50 - 6.00 width x 13.0 - 9.00 m length, and wall thickness of ~2.00-2.50 m.

The thickness of the megalithic slabs varies in size: 1.70x 0.84 m, 2.10x 0.60 m, 2.00x0.65 m, and the slabs in the trilithon (pi like dolmen) are 2.30x1.60x0.25 m, weighing around 10 tons.

A detailed architectural study regarding stones *in situ* on the edges of the roofs as "counterweights" and the corbelling in general and comparisons of these megalithic buildings has been made by Moutsopoulos (1960, 1982) and Carpenter and Boyd (1977).



Fig. 1 Satellite view of Styra area indicating the sites

Hawkins (1820) was the first to discover the Oche Dragon house in 1797 and considered it an ancient temple. Several travellers and explorers in the 19th c. describe some of the other buildings (e.g., Wiegand, Walpole, Bursian, Ulrichs, Lacroix, Girard, Baumeister, Welcker).

Some historical accounts for southern Euboea and Styra are found in *Homer (Iliad B, 536)* and *Herodotus (I, 146)* Plutarch and refer to the ancient inhabitants of the region as Avantès and Dryopians, both derived from Pelasgians. *Strabo* mentions Lelegians, who may have migrated to Karia (7.7.12-[321-2] and 13.1.58-59 [611]).

Lelegians are believed to be masons by virtue of their skill with stone as found in the quarries of Hymettos and Karystos in southern Euboea (Radt, 1970; Carpenter & Boyd 1977). This is in contrast to the account of *Herodotus 1.171* (see also, Kourtidou, 1932; Johnson, 1925; Carpenter and Boyd, 1977), who recognises Styrians as a prehellenic tribe of Dryopians that inhabited the area after the Dorian invasions. Another theory is presented by Strabo who attributes the settling of a colony of the Athenian tetropolis (four cities) of Marathon.

In fact, the first written report of Styra is made by Homer in the Iliad in the "catalog of ships" (*νηών κατάλογο*) in the campaign against Troia. No archaeological excavations had been carried out at the Dragon houses, with the exception of a small scale dig by Moutsopoulos at the house on the top of Mt. Oche (1480 m.a.s.l.) (Moutsopoulos, 1960. See also Ulrichs, 1842, 1863; Wiegand, 1896). The excavation took place inside and outside of the Mt. Oche Dragon house and produced pottery, clay lamps, charcoal, bones, fragments of bronze vessels and an iron spear head. The artifacts provide a date range from Archaic to Hellenistic and Roman times, but according to Carpenter and Boyd (1977) the Archaic finds are not associated with the building itself and are of Hellenistic age.

In 2005, the Swiss School of Archaeology carried out a small scale excavation at the foundation of the Armena fortress (also known as Kastro Larmena) (682 m.a.s.l.) near Styra. The fortress was constructed by Eretrians during the 4th c B.C. in order to guard the border with Karystos. Other findings near the fortress date to the 5th c B.C. (Fachard, this volume).

The fortification was partially destroyed during Byzantine and Medieval times and the large blocks were reused in a new fortress. Other findings indicate the use of the fortress in the 15th c A.D. when Euboea was occupied by the Ottomans (Fachard Sylvian, International Symposium on Styria Gaea 2-5 July, 2009, Abstract Book, Dept of Mediterranean Studies University of the Aegean & Municipality of Styra).

Several interpretations have been offered regarding the function and construction of the Dragon houses, e.g., as residence of shepherds or quarrymen, as signaling towers, or as temples (Ulrichs,

1863; Pausanias 36, 1 and *Scholiast of Theokritos XV*). In some cases interior architectural remains of a possible altar and artifacts suggested a religious function.

In this paper we approached the date of construction of the structures by applying surface luminescence dating method of monuments introduced by I. Liritzis in 1994 on the actual stone blocks (Liritzis 1994; Liritzis et al., 1997; Habermann et al., 2000; Greilich et al., 2005; Liritzis 2010a, b). The sampling was made on three sites: a) the complex of three Dragon houses at Styra; b) the Dragon house at Kapsala, (both sites have been used by shepherds and quarry workers and are covered with thick vegetation and no archaeological excavation has taken place at either site); c) the trilithon (pi shape) Gate and fortified wall at the Armena fortress (for additional photos, see, Liritzis and Artelaris, 2010, this volume).

SAMPLING AND SAMPLE PREPARATION

Small sized samples were removed from firm contacts between two joining blocks with the aid of a hammer and chisel, gently and efficiently hit to detach a piece with the undisturbed original block surface. It is this surface, presumably exposed to light for a period between the time that the block was cut and shaped and the time that it was placed in the wall and covered by another block, that provides a contact surface untouched by light and thus a resetting of the luminescence clock to zero. The choice of adequate contacts between two joining blocks is guided by visual inspection. The samples are preferably taken from lower courses if possible, or from another part of the wall with no obvious indication of disturbance or rebuilding. Sampling from lower courses near the floor has the ad-

vantage of including a higher gamma ray dose rate generated from the sediment floor especially in low radioactivity rocks (e.g., limestones) and more likely represent an original non-repaired or altered part of the building. That is, samples are not taken from an area where possible ancient disturbance might have exposed the block surface to sun light. Care was taken when removing the samples to avoid light: samples were quickly detached and wrapped in black plastic bags. (Liritzis

2010a; Theocaris et al., 1997). Figures 2-7 indicate some of the sampling positions and the type and size of blocks involved. Pieces of 2-3 cm to a side were cut and then replaced *in situ* after removing a couple of mm in laboratory red room conditions from the surface layers.

To avoid possible destruction of the original intact surface each detached piece was separated into more than 2 sub areas and treated as ranges of interest (ROI). An example is shown in Fig.8.



Fig. 2 Laka Palli, sampling at the entrance of the 1st House, 4th sample

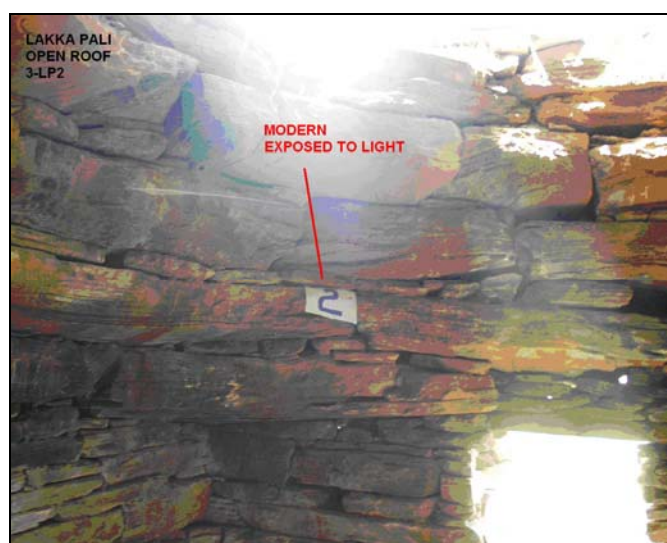


Fig. 3 Laka Palli. Sampling in the open roofed house



Fig.4 Gate of Armenia. Sampling at the base



Fig. 5 Fortified wall at Armenia, left to the Gate entrance. Sampling and gamma reader.



Fig. 6 Kapsala sampling near the top of left entrance interior

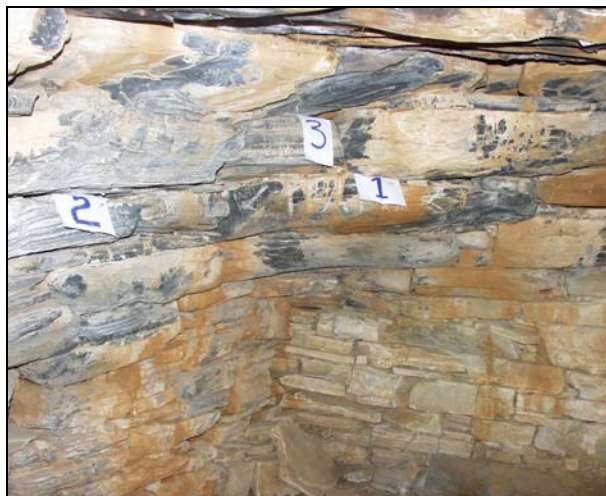


Fig. 7 Kapsala Sampling positions (Nos. 1, 2, 3)

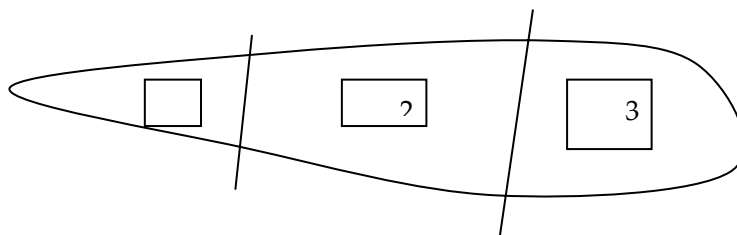


Fig. 8 Kapsala Dragon house, 4th sample, with three sub regions sampled. KAPS4 1, 2 and 3. Scale: length of part 1 is ~0.8 cm. (see Table 1)

All samples were maintained in sealed black plastic bags to prevent sunlight exposure and to retain sample's original moisture. Each sample surface cleared of dirt and any organic or secondary products with quick immersion into diluted HCl acid 0.1% and rinsed with running water. Thereafter, surfaces were gently rubbed with a file to remove layers of powder less than 1 mm thick. These polyminerall grains were diluted in HCl to remove calcite, washed in acetone and finally sieved with a ~ 60-150 μm mesh, to gather the quartz.

METHODS AND INSTRUMENTATION

Dose Rates

Potassium determination

FAAS technique (Flame atomic absorption spectrometry) was used for potassium estimation (Flame Atomic Absorption Spectroscopy, Perkin Elmer, USA mod.: Aanalyst 800 Dual System (Flame and Graphite Furnace ionization). The standard procedure was applied i.e. 0.2 gr of sample was transferred to solution in a microwave oven in the presence of 5 ml HF (49%) and 5 ml HNO₃ (69.5%). Thereafter it was diluted to 100 ml. The calibration standard used was SARM 69, from which five solutions of different concentration made the calibration curve.

Additional use of Scanning Electron Microscopy (SEM) coupled with energy dispersive spectrometry (EDS) analysis (Philips FEI-Quanta INSPECT with SUTW detector and coupled with EDS PV7760) was made. Quantitative analysis used software EDS-Genesis with errors made via ZAF correction. Analyses were performed in 25 keV with 35° take-off angle. Detection limits are some decades of ppm while most reliable are those >0.1%. It provided an additional estimation of K distribution and more important, it's topography within the scanned areas; in all samples K was found relatively homogenous within the sample matrix. At least three values were averaged per sample and block. Comparison between SEM and FAAS was made and a calibration curve constructed to reassure precision.

U, Th determination

The uranium-235 (and consequently U-238) and thorium-232 were measured by alpha counting employing the pairs technique assuming U-equilibrium. The alpha counter was a 7286 Low Level Alpha Counter, Littlemore Sci. Eng Co Oxford with a PM tube type EMI 6097B Measurements were calculated by two similar counting systems (at Rhodes and CETI) calibrated in standards following devised conversion factors as well as relevant computations (Aitken, 1985)

In-situ monitoring of the radiation field was practiced with a calibrated portable Tl-doped NaI scintillator unit (SCINTREX, model SPP-2) calibrated within a set of concrete blocks doped with U, Th and K hosted at N.C.S.R. Demokritos

Conversion to dose rates was based on Liritzis and Kokkoris (1992) and Liritzis et al., (2001).

Equivalent dose (D_e) determination

Two OSL readers (model TL/OSL – DA – 15) were used (based at CETI and NCSR Demokritos) operating at identical conditions, simulation was made under blue LEDs light source ($\lambda_p \sim 470$ nm, FWHM 30 nm), equipped with a calibrated 0.075 Gy/s $^{90}\text{Sr}/^{90}\text{Y}$ β -ray source (Bøtter-Jensen et al., 2000) delivering 4.5 and 6.25 Gy/s respectively for the two sets. Heating was carried out using a heating rate of 1 °C/s, in order to avoid thermal gradient, using a 7.5 mm Hoya U-340 ($\lambda_p \sim 340$ nm, FWHM 80 nm) filter. The power level was software controlled and set at 90 % of the maximum power of the blue – LED array, delivering at the sample position ~ 32 mW cm^{-2} .

The D_e was determined on recovered traces of quartz from calcareous schists (Liritzis et al., 2007, 2010).

The single aliquot regenerative – dose (SAR) protocol, introduced by Murray and Wintle (2000) was used in order to estimate the equivalent dose using blue OSL. The blue OSL signals were measured in the continuous wave OSL (CW – OSL) mode for 50 seconds at 125 °C with the laser held at 90% power. The background OSL levels measured after 45-50 seconds exposure were subtracted from the initial luminescence intensity (0-1 seconds) of the decay curves obtained. Each disc was exposed to infrared radiation for 100 seconds at 125 °C before of the blue stimula-

tion, in order to reduce the malign influence of feldspars grain to the signal. The procedure is similar to the double SAR procedure of Banerjee et al. (2001), containing additional SAR steps in order to minimize the need for chemical separation. The post-IR OSL signals resulting from polymineral grains are believed to be dominated by the quartz signal. At any rate, all samples were subjected to X-Rays Diffractometry (XRD) scanning prior to any OSL measurement to explore quartz/feldspar presence.

After the measurement of the natural luminescence signal, each aliquot was given a series of increasing regeneration doses, namely 10, 20 and 40 Gy, in order to obtain a growth curve for each one. The regenerated OSL signal was then measured for three different regeneration doses, including a zero-dose check for the extent of thermal transfer (Aitken, 1998) and a repeat dose point in order to examine the adequacy of the test dose sensitivity-correction procedure. The equivalent dose was then estimated as the dose required producing the natural signal, by interpolating it from the growth curve. The latter was modeled for each aliquot by either a linear or a linear-plus-saturation-exponential growth form.

XRD

Prior to any OSL on marble schists XRD was made to identify presence of quartz and feldspar, for applying the appropriate procedure of total dose evaluation; TL and plateau test for limestone and OSL with SAR for mineral presence. Table 1 shows the XRD results indicating for all variable traces –but large amounts for Gate Armena– of quartz, as well as, albite, dolomite, muscovite, chlorite and mainly calcite

TABLE 1 XRD data for dragon houses and megalithic gate and wall at Armenia (Liritzis *et al.*, 2010)

Sample	Quartz	Calcite	Dolomite	Chlorite	Muscovite	Albite
1-LP1	+	++++	Tr	+	++/+	+/tr
2-LP1	tr/-	++++	-	++	++	+
3-LP1	+/tr	++++	-	+++	++	-
KAPS1	Tr	++++	-	++	+++	-
KAPS3	Tr	++++	-	+	++/+	-
KAPS4	+	++++	-	+	++/+	+
2-LP2	tr/-	++++	+/tr	+	++	+/tr
1-LP4	+	++++	-	+	++	-
KAPS6	+/tr	++++	+/tr	-	+	-
3-LP3A	+	++++	-	tr	++	Tr
KAPS5	+	++++	-	+/tr	++	+
3-LP4	+	++++	-	+/tr	++/+	+
KAPS	tr/-	++++	-	-	+	-
LAT2	++	++++	-	++	++/+++	+++
PYARM	++++	-	-	tr	+/tr	-
1-LP	++	++++	-	+++	+++	+++//++
2-LP	++	++++	-	+	++*+	+
3-LP	+	++++	-	tr	++/+	+

++++: predominant, +++: abundant, ++: common, +: few quantities, tr: trace, -: not determined

SOLAR BLEACHING AND PENETRATION ISSUES

Prior to application of SAR technique for the determination of De solar bleaching of polymineral grains and penetration depth of sunshine into the surface was tested. The petrology of all samples is similar but with variable veins presence. When a typical surface of Laka Palli house stone was exposed to light for 20 minutes and 2 hours the remaining OSL per 200 μm layer up to 1 mm shows a remaining dose of around 1 Gy to a depth of 600 μm thereafter exhibits approximately a five-fold increase (Fig.9).

For a longer exposure time of 2 hours from another sample surface, five successive layers 400 μm thick were measured by SAR, as the average of two aliquots from each of the layers. Regeneration

doses of 10, 20, 40 Gy were administered, with a test dose of 10 Gy and cut heat at 160 °C. The remaining OSL was 0.2 Gy gradually increasing to 0.8 Gy at depths higher than 1.7 mm depth. It should be noted that the natural signal was very weak.

Obviously quartz in calcareous schists obviates complete quartz resetting clock in a short time as it occurs for sole monolayer of quartz grains. Longer sun exposures ensure complete bleaching (Fig.10), in concordance to earlier literature accounts and theoretical considerations of photon attenuation in rocks with depth (Habermann *et al.*, 2000; Liritzis *et al.*, 1997, Liritzis and Galloway, 1999; Geirlich, 2004; Greilich *et al.*, 2005; Vafiadou *et al.*, 2007; Liritzis, 2010b).

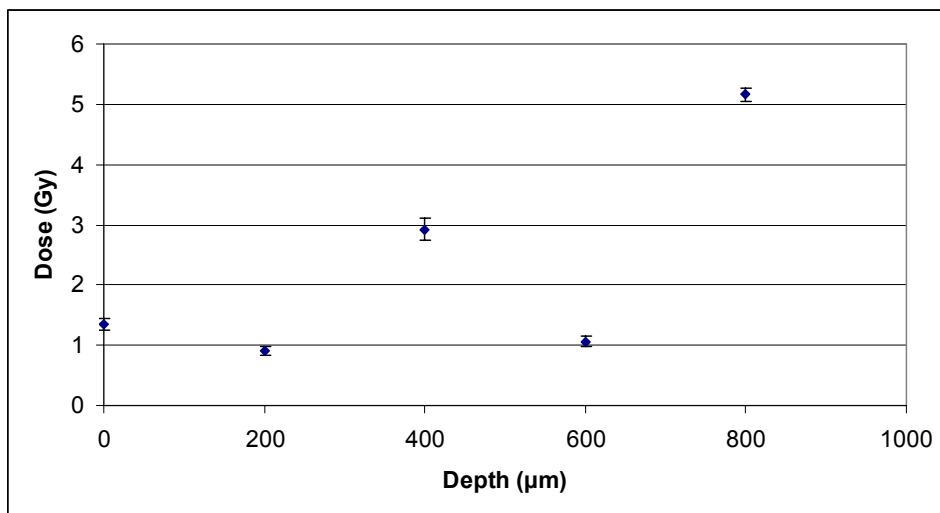


Fig. 9 Laka Palli (LP1) Bleaching of surface by exposed to sunlight 20 mins and removing five layers of ~ 200 µm thickness

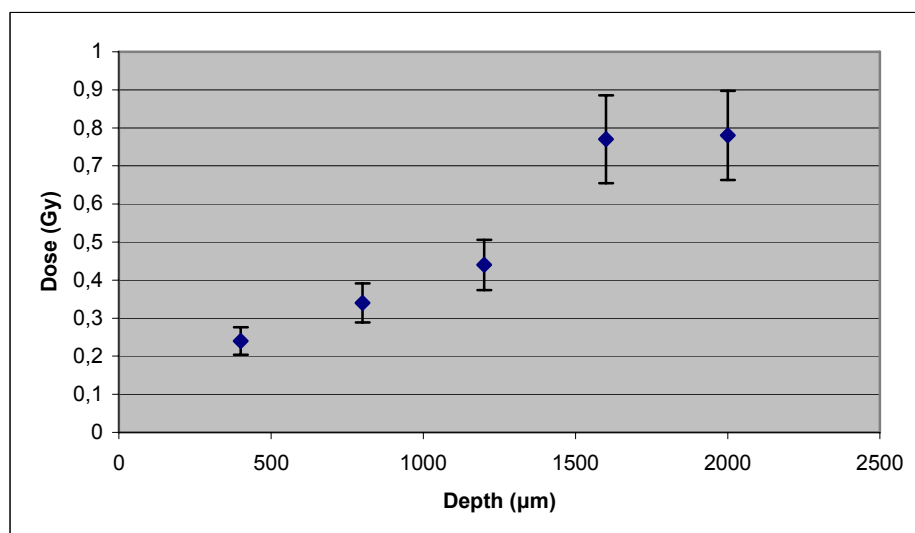


Fig. 10 Kapsala dragon house, exposure of 2 hours to sun. Remaining OSL per 400 µm layer to a depth of 2 mm

RESULTS OF EQUIVALENT DOSE & DOSE RATES PER MONUMENT

Out of 18 samples measured from three sites only 8 gave satisfactory dose results, passing all applied criteria tests (6 from Kapsala, 4 from the 1st Dragon House at Laka Palli, 2 from the 2nd Dragon house at Laka Palli, 4 from 3rd Dragon house at

Laka Palli and 2 from the Armena gate and fortified wall (see Figs 2-7).

The tests applied included: dose recovery, bleaching, recuperation, sensitivity change from recycling, fading, and solar penetration tests. Deconvolution of OSL curves and component-resolved analysis was not performed. The reason is that the OSL signals present an extremely rapid

decay in the first seconds of stimulation, providing thus a strong indication regarding the presence of a unique fast component, being dominant at the initial part of the OSL curves.

Gate and Wall at Armenia

A total of 16 single aliquot discs were measured with SAR giving three dose distributions: 1.19 ± 0.2 Gy (4 discs), 4.75 ± 0.5 Gy (8 discs) and 42.32 ± 10.05 Gy (4 discs) (Fig.11 a, b, c).

Doses derived from discs of all three samples taken from the base of the megalithic entrance gate and the base of the side fortification wall (i.e no preferred doses from either of the three samples, P1-1, P1-2, P2., was made).

The recovery test, varied $\pm 15\%$ around 1, the recycling $0.95 \pm 5\%$, and recuperation between 3-9%. All measurements followed the IR post-blue mode. From the three doses only the 1.19 Gy is accepted the rest represent presence of geological luminescence (Fig. 12)

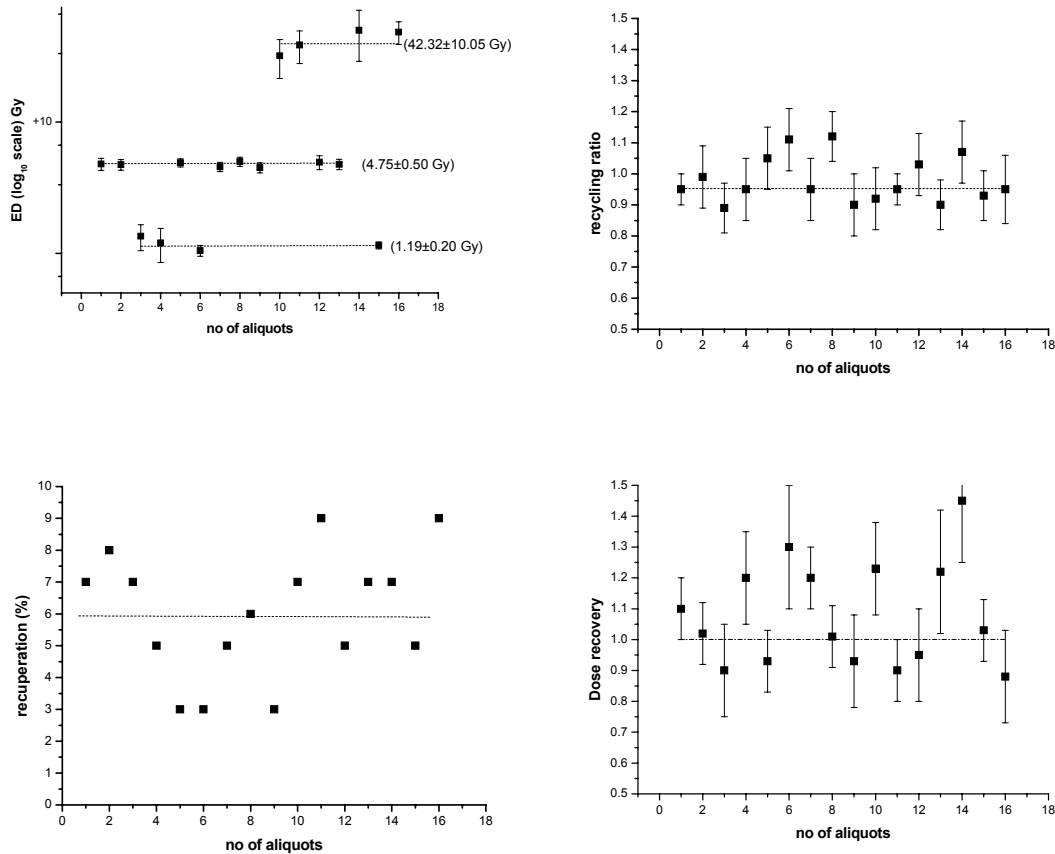


Fig. 11 Equivalent dose distributions (a), recycling ratios (b), recuperation (c), and dose recovery (d), for Pyli (Gate) and fortified wall of Armenia

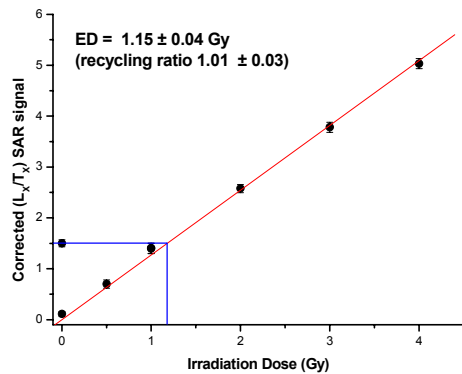


Fig.12. Characteristic SAR-OSL growth curves for ED estimation: the one recovered dose for 'Armena' samples

Dragon Houses at Laka Palli and Kapsala

Some characteristic respective tests for Kapsala and Laka Palli Dragon houses are shown below. Fig. 13a shows a characteristic set of OSL shine curves stimulated by using blue light for 100 secs at 190 °C, after the signal resulting from feldspars was

previously removed by IR stimulation. As it was earlier noticed, all post IR OSL curves are rapidly decaying at the first seconds of stimulation. Fig. 13b shows the effect of different preheat temperatures to the equivalent dose values, the recuperation of the signal as well as the recycling ratio of the repeated regeneration dose. Even though the equivalent dose plateau is formed for low temperatures, preheat temperature of 150 °C should be rejected due to both extremely high recuperation value (~50%) as well as low recycling ratio (~0.75), while the one of 170 °C due to high recuperation value. Therefore, the temperature region between 190 and 210 °C was chosen as the optimum preheat T. This sample gave ED=1.78 Gy. Fig.14 a,b give another recuperation and recycling diagram for Kapsala House as a function of no of aliquots, and Fig.15 (a, b). recuperation and recycling ratios for Laka Palli as a function of no of aliquots.

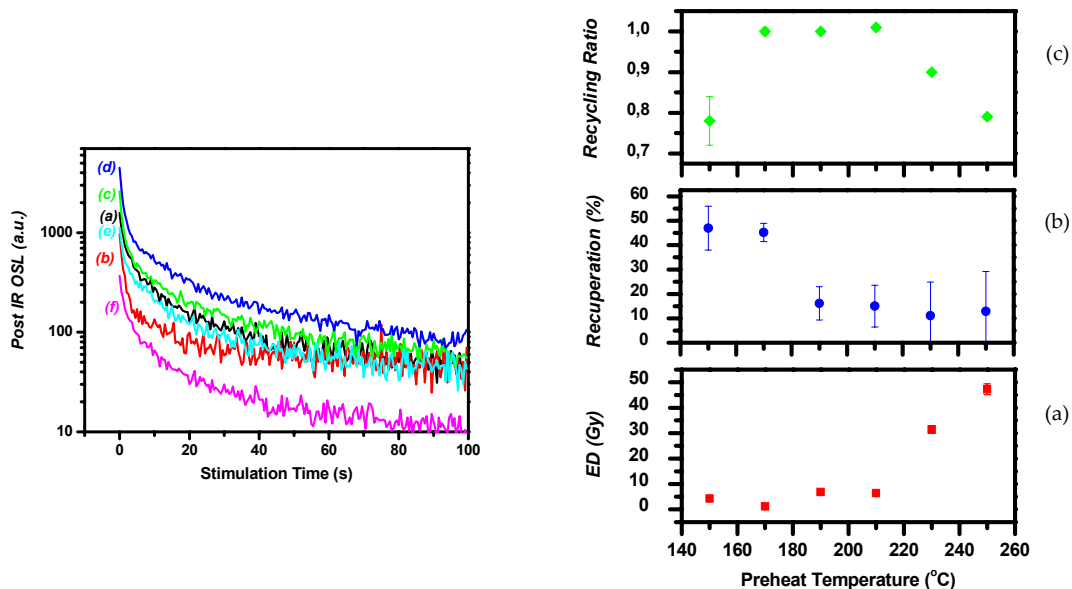


Fig. 13 (a, b) Technical details after measurements at Kapsala sample (Lab code KAPS4.) A (LEFT): Typical post IR OSL decay curves for the natural signal (a), the three incremental regenerative doses, (b, c and d respectively), the repeat dose point (e) and the recuperation afterwards (f), for the first 100 s of stimulation. B (RIGHT): The dependence of equivalent dose (a), recuperation and recycling ratio values (b) on preheat temperature.

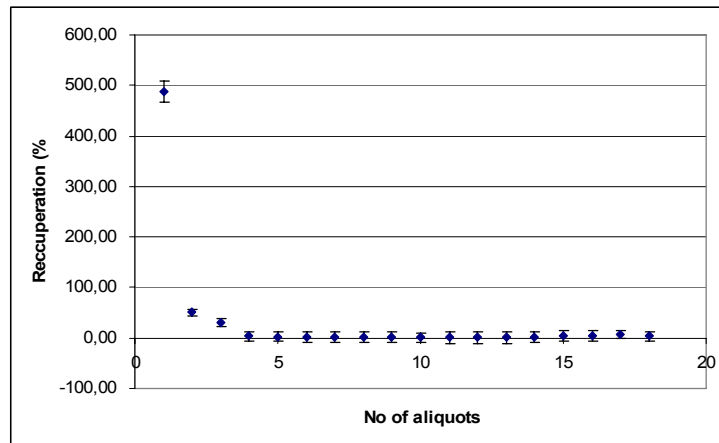


Fig. 14a) Kapsala, recuperation diagram

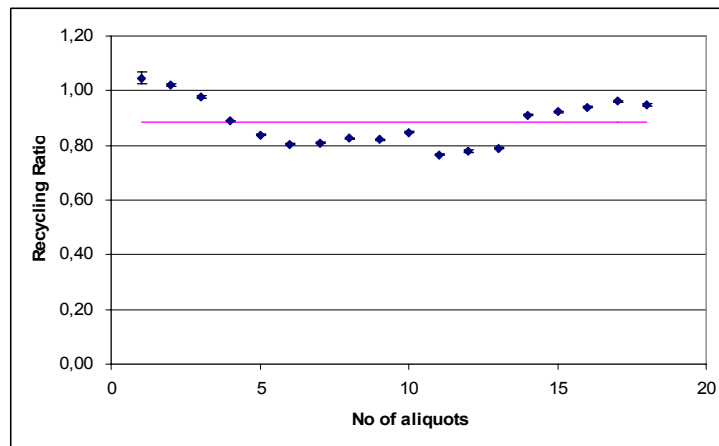


Fig. 14b) Kapsala, recycling ratio (average $0,88 \pm 0,02$)

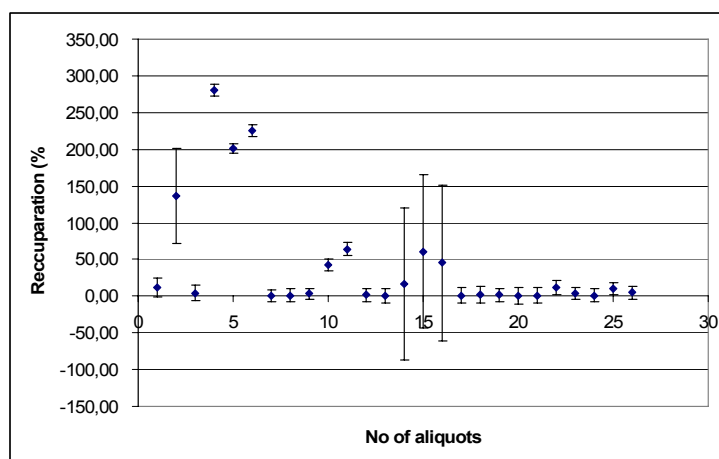


Fig. 15a) Laka Pali, Recuperation

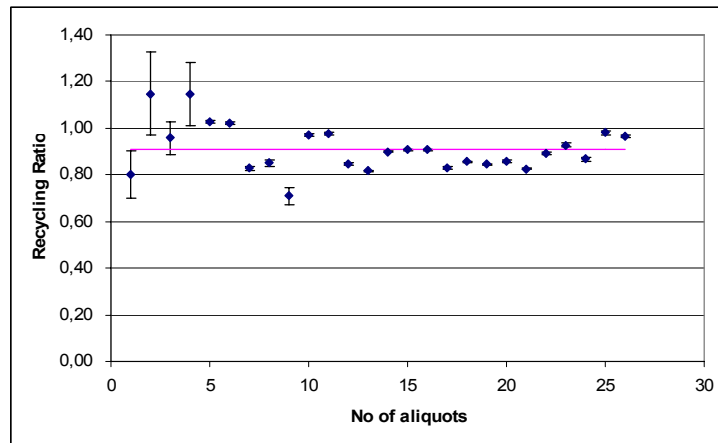


Fig. 15b) Laka Pali, recycling Ratio (average 0.91 ± 0.02)

Table 2 presents the equivalent dose, annual dose and the calculated age. More data were obtained but not included that concern which assess the degree of variation of geological and inappropriate doses, as well as, the micro variation of dose rates within a regional quarry.

Equation (1) provides the OSL age

$$\text{Age (in years)} = D_e / d \quad (1)$$

Where D_e = equivalent dose, d = annual dose = $D_a + D_b + D_{g+c}$, D_a = alpha ray dose rates from U, Th, D_b = beta particle dose rate from U, Th, K and Rb of the sampled

piece of rock itself, the dated surface occasionally overlaid by sandwiched mortar, but mainly they were in firm contact. D_{g+c} is the gamma-ray dose-rates plus cosmic ray. The grain size selected was 60-180 μm and a beta attenuation factor of 0.95 was applied, no water-uptake is accounted for the rocks, and finally an internal radioactivity of quartz grains of 0.01 mGy/yr and $k=b/a$ ratio of 0.1 are assumed (Liritzis and Kokkoris, 1992; Liritzis et al., 2001; Vandenberghe et al., 2008, Liritzis, 2010; Liritzis et al., 1997).

TABLE 2 Calculated OSL ages, annual dose, equivalent dose, sample code no and site.

SITE	SAMPLE REF No.	TOTAL DOSE, D_e (Gy)	ANNUAL DOSE (mGy/yr)	AGE B.C./ A.D. (calendar years)
KAPSALA	KAPS3	~0	0.76 ± 0.07	Contemporary
KAPSALA	KAPS1	0.53 ± 0.04	0.61 ± 0.06	1245-1030 A.D.
KAPSALA	KAPS4	1.78 ± 0.01	0.67 ± 0.05	650 ± 200 B.C.
	KAPS4 (another piece)	1.16 ± 0.03	0.67 ± 0.05	140-420 A.D
LAKA PALLI	1 st House, 1/LP4	0.43 ± 0.015	0.83 ± 0.07	1460-1550 A.D
LAKA PALLI	3 rd House open roof? 3LP3A	2.31 ± 0.03	0.947 ± 0.09	430 \pm 230 B.C.
LAKA PALLI	3 rd House, (another piece), 3LP3	1.60 ± 0.02	0.947 ± 0.09	480-160 A.D
ARMENA	P1, P2 (base of gate and left wall)	1.190 ± 0.02	0.607 ± 0.06	50 \pm 200 A.D (150 B.C.-250 A.D)

DISCUSSION

The De were measured with single aliquot regeneration technique at wide pre-heat temperature ranges (190-210°C) and applying standard criteria tests including Dose-Preheat Temperature Plateau, Recuperation, Fading, Sensitivity Correction due to preheat and shining, Dose recovery. Only those samples which satisfied the tests were accepted.

The division of the detached sample surface, where possible, into more than two sub areas of interest proved extremely important to exclude geological doses and/or partial bleaching, variously disturbed grains of adjacent subareas.

The earlier date is of Classical period and this alone may support the hypothesis of Karian builders left behind after the defeat of Persian kings by Athens and its allies. (Boardman et al., 1988). Moreover, the later dates are supported by historical evidence of re-habitation of these buildings and the fortress.

To elucidate further the obtained dates it is necessary to review the diachronical trend of Styra, including the significant historical events and archaeological evidence that define the region. With this summary the luminescence ages of the Dragon Houses and the Armena fortress are placed in their historical frame.

From the historical reports, ancient Styrians participated in 480 BC in the Salamis sea battle against Persians in 480 B.C. and in the battle of Plataeae, and Styra joined the Athenian league in 477 BC. The OSL dates corresponding to this phase are 430±230 BC and 650±200 BC. In the Lamian war Styra supported the Macedonians against Athens and as a result Styra was destroyed by the Athenian general *Leosthenis*. (Hansen & Nielsen eds, 2004). Styrians were famous for the purple

dye industry, but during the Roman occupation their economy was largely influenced by the extraction of marble (the famous Styrian or Karystian stone).

Of particular attraction was the dark green veined marble cipollino, named after the onion (see e.g. Kosso, 1996), which from the 1st c BC to the 3rd c. AD was considered one of the most valuable and widely exported marbles in the southeastern Mediterranean. The OSL dates relative to these activities are 140-420 AD, 150 BC –250 AD.

During the Frankish period the settlement of Styra was situated in its present location on the lower slope of Mt. Kliosi (at 450 masl) below the Armena fortress above. In 1300 AD the Styra region is occupied by the Catalans and in 1373 AD it is sold to the Venetians. Relevant OSL ages are 1030- 1245 AD. The fortress remained in use after the occupation of Euboea by the Ottomans in 1470 AD. The relevant OSL dates for the Turkish occupation are 1460-1550 AD. (Bury, 1888; Norwich, 1996)

Near the Armena fortress on the summit is the chapel of Saint Nikolaos (dating to the beginning of 18th c) and the chapel of Saint Mary (Panagias), build in 1746 AD (as known from inscriptions above the entrance) and constructed on top of an earlier single vaulted Basilika of early the Byzantine period besides a spring. Ancient quarries are dispersed on the slopes of Mt. Kliosi as well as in the surrounding region indicating heavy quarrying during Roman times.

Carpenter and Boyd (1977) correlate and compare the shape, size and construction techniques of Dragon houses with those in Karia of Asia Minor (on the Halikarnassos peninsula) and with one on Mt. Hymmetos in Attica and date them to the Hellenistic period. Carpenter and

Boyd (1977) offer another hypothesis that Darius brought Karians with him to Euboea (*Herodotus*, 6.99) in the campaigning against Greece. In fact historians state that Xerxes had in his army Karian soldiers and mariners participating in land and sea battles (*Herodotus*. 7.93, 195; 8.19-22, 66, 68, 87-89, 93, 101-106, 133-36; 9.31-32, 107).

After the defeat of Xerxes a number of Karians may have been left behind. A Karian contingent may have been stranded at Karystos. Prior to the arrival of Themistocles (*Herodotus* 8.112, 121), and after Kimon (*Thucydides*, 1.98), (480-472 B.C.) these isolated group may have contributed to the construction of the Dragon houses (see also relationship of the Apollo Temples in Boeotia and Karia) (Picard, 1952; Steinherr, 1955).

Another interpretation, by Johnson (1925), suggests that Karians, due to political pressure by Rhodos (2nd and 3rd centuries B.C.) immigrated to the Aegean and possibly Euboea (Fraser and Bean, 1954; *Polybius* 2I.24). The coasts of Asia Minor and Karia was Hellenized from early Archaic times and the geographical dispersion of Karians extended from Persia to Rome and from the Black Sea to the Sudan. (Schulten 1936, Launey 1949, Miller 1971).

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One issue is certain, the Euboea Dragon houses are peculiar buildings and it is this reason that absolute dating followed by archaeometry approaches, has been attempted. Excavations at the sites of these structures is eagerly awaited.

CONCLUSION

The enigmatic "Dragon houses" in southern Euboea and the megalithic fortress gate at Armena, all built with huge blocks, have been attributed by various ancient or modern historians to pre-Hellenic people (Pelasgians, Dryopeans, Lelegians) or to Karians of later times. The Dragon houses have been hypothetically considered as temples, dedicated to Zeus and Hera, or mere shelters built by quarry workers during Classical to Roman times. However, the dating of Dragon house construction with the surface luminescence dating (OSL) of quartz grains present in the calcareous schist provided ages that define the original construction, as well as, later re-uses. Dates of Classical, Hellenistic-Roman, early Byzantine, Medieval and contemporary times are reported, which are in concordance to the historical and archaeological data.

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