

*The Leukos survey project*¹

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Abstract

Το άρθρο παρουσιάζει τα αποτελέσματα της αρχαιολογικής επιφανειακής έρευνας δύο θέσεων στην Κάρπαθο των Δωδεκανήσων, στο Λευκό και στο Σώκαστρο. Η πρώτη θέση αφορά σε οικισμό του 4ου - 6ου αιώνα, ο οποίος αναπτύσσεται γύρω από δύο αμμώδη λιμάνια, τα οποία συνέβαλλαν στην προσόρμιση των πλοίων. Ανάμεσα στα πολυάριθμα, αν και φτωχά διατηρημένα, κατάλοιπα οικιών εντοπίζονται δύο μεγάλες εκκλησίες που εξυπηρετούσαν τις ανάγκες της κοινότητας του Λευκού, καθώς και μια μεγάλη δεξαμενή, λαξευμένη στο βράχο, η οποία πιθανώς εξυπηρετούσε τις ανάγκες των πλοίων που προσέγγιζαν τα λιμάνια. Το μεγαλύτερο μέρος της κεραμικής που συγκεντρώθηκε είναι τοπική, ενώ και ο εντοπισμός ενός μικρού κεραμικού κλιβάνου πιστοποιεί το γεγονός αυτό. Κατά την έρευνα εντοπίστηκε, επίσης, εισηγμένη κεραμική, που περιλαμβάνει, Phocaean και African Red Slip Wares, καθώς και υστερορωμαϊκούς 2 αμφορείς (Late Roman 2). Ο οικισμός του Λευκού εγκαταλείφθηκε ολοκληρωτικά στα τέλη του 6ου – αρχές 7ου αιώνα.

Το Σώκαστρο είναι ένα μικρό νησάκι κοντά στη δυτική ακτή της Καρπάθου. Το πλάτωμα του νησιού κατοικήθηκε και οχυρώθηκε τον 11ο αιώνα, ενώ δεν υπάρχουν ίχνη παλαιότερης κατοίκησης, παρά τις περί του αντιθέτου παλαιότερες απόψεις. Εντός της οχύρωσης, ερευνήθηκαν και καταγράφηκαν τα καλά διατηρημένα κατάλοιπα πολλών στερνών. Η έρευνα διέκρινε δύο τύπους: μικρές στέρνες σε σχήμα βαρελιού ή μπουκαλιού, οι οποίες συνδέονται με μικρές, μάλλον οικιακού χαρακτήρα, κατασκευές, και μεγάλες δημόσιες δεξαμενές. Η μεγαλύτερη δεξαμενή του δεύτερου τύπου, έχει χωρητικότητα περίπου 300.000 λίτρα. Μια μικρή τρίκλιτη εκκλησία, η οποία διέθετε τη δική της στέρνα, εξυπηρετούσε τον οικισμό. Είναι πολύ πιθανό, ότι τα άφθονα αρχιτεκτονικά κατάλοιπα από μάρμαρο και γρανοδιορίτη, που εντοπίστηκαν διάσπαρτα στον οικισμό, να προέρχονται από την εκκλησία. Οι κάτοικοι του οικισμού εισήγαγαν κεραμική, όπως γραπτή εγχάρακτη, γραπτή εγχάρακτη επιζωγραφισμένη, γραπτή κεραμική με πράσινο και καφέ χρώμα, καθώς και εφυαλωμένη γραπτή κεραμική με επίχρυσμα. Όπως και ο Λευκός, έτσι και το Σώκαστρο είχε μάλλον σύντομο βίο. Με βάση τις αναλύσεις

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της κεραμεικής η ακμή του οικισμού χρονολογείται στον 12ο και τον 13ο αιώνα. Μετά την περίοδο αυτή σταδιακά παρήκμασε, φαίνεται δε ότι κατοικείτο περιστασιακά έως τον 16ο αιώνα, περίοδο κατά την οποία εγκαταλείπεται οριστικά.

Introduction

From 2008 to 2011, we conducted archaeological explorations in the area known today as Kato Leukos on the Greek island of Karpathos. Our interest in the site was sparked by the late Gilbert Bagnani. In June of 1923, as a graduate student and a member of the Italian School of Archaeology at Athens, Bagnani traveled to Karpathos in the company of the director of the School and a fellow student.² While investigating the visible remains at Kato Leukos, Bagnani commented in his notebook, “there can be no doubt that it is the site of an ancient city, perhaps Nysiros, the only one of the four cities of Karpathos whose site is still unknown.” His suggestion was in direct response to Strabo’s claim that Karpathos was home to a tetrapolis.³ Three of the four cities, Pigadia, Arkassa and Vrykous, are known,⁴ the fourth remains unidentified (**fig. 1**). In addition, Bagnani also noted architectural blocks with cuttings and moldings characteristic of temple architecture strewn about the upper portion of the site. He did not publish his work, but deposited his field notes in the archives at Trent University and the Italian School at Athens. Armed with Bagnani’s observations we superficially inspected the area in 2004 and then commenced four seasons of intensive archaeological surface survey in 2008. Our goals in the field were fourfold, to determine: 1) the chronological parameters of the settlement; 2) the extent of the settlement and its relationship to the land- and sea-scape; 3) the settlement’s urban institutions, and; 4) the settlement’s role in seafaring and maritime trade.

Although the results of our field work could not confirm Bagnani’s suggestion that Kato Leukos was the fourth member of Strabo’s tetrapolis, our survey established the remains of two later settlements: a 4th- to 6th-century CE port settlement (hereafter, Leukos) and an 11th- to 13th-century CE fortified islet (hereafter, Sokastro) (**fig. 2**).

Karpathos lay at the crossroads of two major shipping lanes and the ceramic evidence recorded at both settlements confirms their participation in seaborne trade.⁵ Because Karpathos lacks natural resources and arable land, the Leukos Survey Project sought to determine whether the two settlements were entirely dependent for survival on the ships transporting their tradable cargos which plied the island’s waters and sheltered in its natural harbors. The tumultuous history of the Aegean during the medieval period no doubt also contributed to the short-lived nature of both settlements. Our project was the first scientifically-based archaeological survey conducted on Karpathos, and the preliminary results presented here begin to define the medieval history of the island with newly-gathered data.

The settlement at Leukos

The results of the survey of the Leukos portside settlement were published in 2015, but a brief overview is provided here in order to discuss the broader archaeological context of the Kato Leukos Area.

Kato Leukos is a small, oval-shaped, seaside plain on the west coast of Karpathos. The area has suffered several bouts of tectonic activity which dramatically affected its landscape. One earthquake

2. Bagnani (1923).

3. *Geo.* 10.5.17.

4. Moutsopoulos (1975-7), pp. 123-126.

5. Deligiannakis (2016), pp. 70-71 and 181-85.

caused the westernmost portion of the plain to drop about 32 meters in elevation, resulting in the formation of a lower, seaside plain separated from an upper plain by a steep and rocky amphitheater-like ridge. The 4th- to 6th-century CE settlement clustered on the lower plain around three natural bays separated by two peninsulas (**fig. 3**).

The northernmost bay is unprotected and its waters are too rough for the beaching of ships. The middle bay, Xonissi Bay, is shallow with a natural breakwater at its mouth that quells large waves and swells, keeping its waters quite calm. The southernmost bay, known as Leukos Bay, is nicely sheltered and shallow, and therefore conducive to the beaching and anchorage of ships. Today it serves as the port for the village's small fishing boats. To the east rises the precipitous ridge which formed the boundary of the survey area.

Prior to our survey, only salvage excavations had been undertaken in response to the expanding tourist and hospitality industry of the modern village. In the 1970s, the Greek archaeologist E. Kollias conducted excavations on behalf of the Greek Archaeological Service in two areas.⁶ On the western shore of Leukos Bay, Kollias excavated a large three-aisled basilica. Today only the apse is exposed while the rest lies beneath a small restaurant. Kollias dated the basilica to the 6th century but published no stratigraphic or ceramic data to support his conclusion.⁷ He also opened about 350 square meters of trenches at the eastern edge of the sandy plot of land known as Lyttos Field (**fig. 3**) where he found walls and floors of several domestic structures.⁸ Many of the rooms contained large pithoi embedded in the limestone bedrock floors. Kollias also recovered 65 coins dating from the 1st to 7th century CE, with the majority belonging to the 4th, 5th, and 6th centuries.⁹ More recently, in 2010 and 2012,¹⁰ the Service again conducted excavations in response to two proposed restaurant expansions, finding more of the settlement's densely packed houses in several small trenches. Near the shore of Xonissi Bay, a small updraft kiln was also uncovered.

For our survey, we established a 10 x 10 m grid based on the Universal Transverse Mercator (UTM) coordinate system over the entire area of Leukos, tallied all visible ceramics and other artifacts in each square, and then extracted the diagnostic material for further study. All visible architecture and other landscape alterations, including the structures excavated by the Service, were mapped and drawn. The survey results distinguish three areas of the settlement: 1) the precipitous ridge between the upper and lower plain and the area immediately below it; 2) the settlement on the lower plain situated around the bays; and 3) the liminal area in between and also on the lower plain where neither surface ceramics nor architecture were noted. As such, this area may have supported small agricultural fields when the settlement flourished.

Fourteen tombs had been cut into the soft limestone of the ridge (**fig. 3**). The architecture of the tombs was generally consistent, with a shallow and short dromos leading to a vertical stomaion.¹¹ Many of the doorways were cut with rebates to receive stone slabs that once sealed off the burial chambers. Inside the tombs, modern refuse and soil accumulation presently fill most of them which limited detailed examination of the interior architecture. The burial chambers were generally circular in plan and roughly semi-domed in elevation. Some chambers had been expanded or enlarged with the carving out of additional rooms. None of the tombs have ever been excavated, but our survey identified sherds belonging to the Late Roman period in many of them.

A large church had been built immediately below the tombs near the base of the ridge. All that is

6. Kollias (1970).

7. Kollias (1970), 15.

8. These trenches and their material remains were published by Karambatsos (2006).

9. Karambatsos (2006), 290-94.

10. Christidou-Stylianou (2013).

11. Moutsopoulos (1975-7), pp. 203-205 illustrates several tombs.

visible today is its apse wall and a portion of the rear, or east, wall extending northward from the base of the apse. The church appears to have been comparable in size to the basilica in Leukos Bay based on similarities in the thickness of the walls and the construction method consisting of roughly shaped limestone blocks and rubble set in a heavy mortar. A small modern chapel now occupies the older apse; within it are several white and gray marble and granodiorite architectural elements, including a column base and a drum, that no doubt originally belonged to the early medieval church.

To the west and beyond the liminal area, the main settlement clustered near the bays and extended out onto both peninsulas (**fig. 4**). Many walls were recorded in the survey, though few individual structures were discerned among them. Sun, wind and rain have and continue to erode the remains, particularly on the wind-blown peninsulas, and most walls stand only to a height of two to three courses. Construction methods were rudimentary and consisted of locally-gathered rubble bonded with the occasional use of mortar. Wall thicknesses averaged 70 cm and thus most likely the buildings stood only one or two stories in height. A few walls along the north edge of Xonissi Peninsula and along the north edge of Lyttos Field were built much thicker and served as retaining walls. One notable structure still partially stands on the sandy spit of land connecting Lyttos Field and Xonissi Peninsula (labeled C and D in **fig. 4**). It is a fragment of a barrel-vaulted, two-story building built with worked limestone blocks and rubble laid in crude courses with thickly applied mortar. The room attached to it on the north was built with the same construction method and contained a shallow niche in its west wall. It is thought to have been a bath complex, but until it is excavated its original function is the subject of speculation.¹²

Rock-cut structures were also part of the urban fabric of Leukos; two were measured and drawn on Xonissi Peninsula and three on Akrotiri Liana Pounta. The largest one, on Xonissi Peninsula, shows two phases of construction (labeled N in **Fig. 4**). In the first, a large rectangular room, measuring about 22 x 4.5 m, had been sunk in the bedrock. In its northeast corner, a small, square-shaped settling basin was carved deeper into the bedrock and coated with *cocciopesto* on its four walls and floor. In the second phase, two additional rooms were added to the south side. The *cocciopesto* lining of the settling basin and the same plaster coating preserved in patches on the walls of the initial construction phase suggest that the building functioned as a portside cistern. The rock-cut structures on Akrotiri Liana Pounta are not as nicely preserved as those on Xonissi Peninsula. They are located on the peninsula's south face where today they are constantly battered by the crashing surf. Three structures had been built side-by-side with their north walls and floors cut into the bedrock and their south walls and the party walls separating them built of rubble masonry bonded with some mortar.

Marble and granodiorite architectural elements also littered Akrotiri Liana Pounta, including a column base and a small table or altar leg carved in the form of a spiral-fluted column. Six large granodiorite column drums presently stand embedded in the modern concrete quay of Leukos Bay. All of the elements probably originally belonged to the basilica in Leukos Bay.

Among the tallied ceramics, the predominant diagnostic imported forms were Phocaeen Red Slip Wares (PRSW), Late Roman 2 amphorae, and some African Red Slip Wares (ARS). Other imported sherds were undiagnostic in form, but their fabrics were consistent with diagnostic material from Phocaea in southwest Asia Minor. Two PRSW thin-walled sherds were stamped with a Christian cross and date to the late 5th or early 6th century CE. The majority of the sherds, 80 - 90% of the tally, were locally-produced table wares, an observation subsequently confirmed by the discovery of the small updraft kiln by the Greek Archaeological Service about five months after our fieldwork in 2010. Overall, the surface survey yielded pottery from a tight chronological timeframe: mainly from the 5th through 6th century CE with a few very early 7th-century outliers.

12. Giovanopoulou and Sakeli (2003), p. 220.

The geography and topography of Sokastro

Today, the islet of Sokastro is a small, steep-sided rocky plateau poking out of the sea with no accessible shoreline (**fig. 2**). It was once a peninsula but past tectonic activity or erosion destroyed the connecting spit of land. Now, a narrow and treacherous strait separates the islet from the coast and only the occasional swimmer and brave explorer willing to jump from the bow of a boat onto a low rocky and wave-eroded limestone shelf on the south side of the islet is rewarded with the opportunity to see the abandoned remains. The footprint of the islet currently measures approximately 108,000 square meters. The plateau, rising about 40 meters above sea level and located in the southwest quadrant of the islet, became the site of the fortified settlement (**fig. 5**).

The area within the circuit wall is estimated to measure 21,000 square meters. The full extent of the settlement is unknown because a large portion of the west-southwest side of the islet has fallen into the sea, taking with it part of the settlement and leaving behind a very steep and rocky cliff. The eastern side levels off towards the former land bridge and here lie the remains of the only building to have been erected outside the fortification wall.

The topography within the settlement is more or less level with a slight rise on the west and a shallow hollow towards the north in the area of Cistern Complex BB (**fig. 5**). On the western half, constantly gusting winds have exposed the underlying bedrock, while wind-blown soil has accumulated in and around the standing walls on the eastern half. Small portions of the bedrock had been worked in the northwest portion of the site apparently to create level floors for two freestanding buildings, both of which have now collapsed. No evidence was found to suggest that the topography within the settlement was significantly altered for construction or landscaping purposes. Nor did we locate a built roadway, ramp or staircase leading up to the settlement.

Sokastro: Previous archaeological studies

Prior to our fieldwork, no scientifically-based archaeological work had been undertaken on the islet. As far as we know, only three individuals ventured out to Sokastro and wrote down their casual observations. In 1903, Richard Dawkins¹³ visited the remains and immediately noted the large number of cisterns and tumbled walls. He suggested that Sokastro had been built by the Franks¹⁴ but offered no evidence for his conclusion. Curiously, Dawkins mentioned walls and rooms on the west, seaward-facing side of the island, which seems to indicate that this portion had not yet fallen into the sea and the full circuit of the fortification wall was still standing at the time of his visit.

Twenty years later in 1923, Gilbert Bagnani visited the site. In his unpublished notes,¹⁵ he thought the large tumbled boulders strewn about in the narrow strait between Karpathos and Sokastro were the remains of a connecting causeway similar to the one still standing at Monemvasia. He too noted the large number of cisterns, especially the very large one at the north edge (designated Cistern BB in our survey). Similar to Dawkins and again without providing supporting evidence, Bagnani concluded that the fortified settlement was Frankish rather than Byzantine.

Sometime prior to his 1977 publication on Karpathos, Nicholas Moutsopoulos also visited Sokastro.¹⁶ He examined the standing and fallen architecture in much more detail than the two previous visitors. In particular, he pointed out the rubble masonry of the walls and its lack of broken brick and

13. Dawkins (1902-3), pp. 209-10.

14. Dawkins (1902-3), pp. 209-10.

15. Bagnani (1923).

16. Moutsopoulos (1975-7), pp. 340-44.

tile fragments included in the wall matrix. To him, the omission of this building material meant that the builders were not familiar with typical Byzantine or Frankish construction techniques. He also noted the double-colonnette window mullions among the tumbled remains and assumed that they had been taken from the 6th century Leukos Bay basilica. He dated the surface ceramics to the 8th to 10th century although he neither described his survey strategy nor presented comparative sherds from sites elsewhere. He found no trace of an organized settlement, square or church, and concluded that “it was only a pirate haven” serving as a naval base for the Saracens of Crete. He also thought the entire settlement was abandoned abruptly because he observed no signs of remodeling or additions among the many buildings.

The fortified settlement on Sokasto

Except for one building located on the landward side of the islet towards the coast of Karpathos, the entire settlement was contained within the fortification wall that hugged the outer edges of the plateau (**figs. 5 and 6**). Entire sections of the west and south circuit have fallen into the sea, and here and there along the remainder of the circuit, short stretches have collapsed and tumbled down the steep slopes. The wall was built of rubble masonry and mortar laid directly on bedrock (**fig. 6**). The sizes of the individual stones varied considerably; some were obviously quarried and crudely worked while others were simply gathered by hand. No quarries were noted in the survey of the islet, so much of the rubble must have been brought over from the Kato Leukos area with possible sources located to the north of the earlier settlement and along the coast where the jagged limestone bedrock is exposed and easily accessible. The thickness of the fort wall also varied considerably; at its narrowest, it measured ca. 70 cm over a short stretch of the north circuit towards the east return (grid squares Q16 and R16), and at its widest, ca. 1.96 m, in the southeast section (grid squares N4, O4, O5 and P5). Some stretches of the north wall show evidence of repair or reinforcement. One such section just to the west of Cistern BB (corresponding to grid squares H17, I16, I17, and J16) appears to have been reinforced with two phases of thickening the original wall. At both the west and east returns of the north stretch, the wall bulges outward, creating the impression of semi-circular bastions from below. The eastern bastion has largely collapsed and fallen down the steep slope. Another smaller bastion was added to the north stretch near the west return (grid squares F18 and G18). One gate pierced the wall on its east side (grid square P6) but it is poorly preserved and its masonry largely eroded and tumbled down the slope. A second gate may have existed on the west side but that section of the circuit has fallen into the sea.

Within the fortification wall, the settlement was once densely packed with many freestanding and abutting buildings (**fig. 5**). Among the remains, we noted no signs of intentional destruction. Because of the difficult and treacherous access to the site, the settlement has remained largely untouched by later, post-abandonment pilfering by those seeking to recycle building material. The site has succumbed only to wind, rain, and sun erosion. Many freestanding buildings were easy to identify because their footprints are preserved and most of their walls are still standing. Remarkably, several buildings stand nearly intact, such as the freestanding, barrel-vaulted Cistern B03 (**fig. 7**). The buildings that did give way to erosion were identified by their collapsed remains which today look like large piles of rubble. Certainly, if some of the rubble were cleared from those piles, more building footprints would be revealed. Because of the dangerous and precipitous cliff edges along the northwestern and southern portions of the settlement, it was not possible to examine the buildings and tumbled debris there firsthand, but the ortho-rectified,¹⁷

17. Ortho-rectified photographs use a surface model of the earth to geometrically correct distortions caused by optical camera lenses and irregular topography and contours. Each pixel of an aerial photograph is mapped to a surface model, which incorporates elevation data, so that each feature (e.g. wall, building, tree, etc.) appears as if it were viewed looking straight

low-altitude, high-resolution aerial photographs provided sufficient data to identify and plot the fallen walls and buildings.

As already noted by the three previous visitors to Sokastro, the clear majority of the settlement's preserved and visible structures were cisterns. A thick coat of *cocciopesto* applied to the interior wall and ceiling surfaces distinguished cisterns from the other building types. The cisterns can be divided into two groups: small domestic and large community cisterns. The sheer size of the latter in comparison to the former suggests that the biggest cisterns, which required a sizeable crew of skilled laborers to build, served a large number of people or some purpose not immediately apparent, and thus the term 'community' was applied; the designation is further discussed below. The domestic cisterns can be further classified into three types: circular, barrel-vaulted, and bottle-shaped. Six cisterns were entirely subterranean; they were noticed only because of their missing access portal, or manhole, covers. Accumulated soil filled these cisterns and therefore they could not be entered for either examination or measurement. The survey documented four community cisterns, 48 barrel-vaulted, six bottle-shaped, and two circular cisterns.

All the buildings, regardless of their function, were built in the same manner with locally gathered limestone rubble bonded with mortar, although the amount of mortar used in any one building varied quite a bit. Crude coursing is evident in many of the standing walls. In contrast to Moutsopoulos' observation, broken fragments of terracotta tile and brick were indeed incorporated into the wall matrix. In several walls, whole bricks were used. However, none of the above were laid in any systematic fashion to distinguish a particular building technique, but appear to have been used randomly. Sokastro seems to have been settled and fortified in the 11th century with no evidence of either prior building activity or *spolia* incorporated in any of the extant buildings, so perhaps the builders pilfered the terracotta fragments from the much earlier, dilapidated and abandoned remains at Leukos. Only the large community cisterns deviated from the typical construction method with the use of quarried and shaped limestone blocks. About a dozen pit quarries were sunk into the exposed limestone bedrock of the upper plain above the ridge in Kato Leukos. While they may have served as the source for the blocks, the upper plain lay outside our survey area and so the quarries themselves could neither be investigated in detail nor dated. The interior surfaces of all cisterns were thickly coated with *cocciopesto* applied in two layers: a scratch coat with coarse aggregate (ca. 1-3 mm) measuring about 1-2 cm thick and a top coat with a finer aggregate (less than 1 mm) about 5-8 mm thick. The top was redder in color than the underlying scratch coat.

Among the domestic cisterns, the barrel-vaulted type was much more proliferous than any of the other types. In plan, these were all more-or-less rectangular, with footprints measuring about 2 x 5 meters, with a barrel height of about 2.5 meters. A few were quite small and give the impression of very tall sarcophagi. Exact dimensions could not be measured because of the accumulated soil upon the floors in every building. Some of the barrel-vaulted cisterns were freestanding e.g. B02 and B03 (**fig. 7**) but many were incorporated into small complexes. One such complex, in grid square O11 (**fig. 5**) consisted of three cisterns (B18, B19, and B20), a small, single-room building and open areas enclosed by a low wall. Another complex (in grid squares J7, J8, K7, and K8) consisted of two barrel-vaulted cisterns (B34 and B35) attached to a single-room building (B36) also with an open-air space enclosed by a low wall. The four exterior walls of a cistern often continued above the vault to enclose a second story which

down (i.e. orthogonally). Source photographs always depict some type of displacement in the features because of the optical lens shape, and such distortion increases further away from the center-point of the photograph. The height of the object may also add further distortion. For example, a radio tower or tall building will appear to lean in a photograph, and the slant is exaggerated if the structure is located at the edge of the photograph rather than at its center. Ortho-rectification removes these types of distortion and thus ortho-rectified photographs have a uniform scale throughout and can be used to take accurate measurements of the features depicted.

perhaps served as living quarters. Such was the case for a complex of three cisterns abutting end-to-end (B30, B31, and B32 located in grid square N9). Rubble, including brick and tile fragments, set in mortar was laid down to create a crudely leveled floor above the barrel vault. The second story walls, preserved only to two or three courses, offer no evidence of an entrance of any sort.

Bottle-shaped cisterns, relatively smaller than the barrel-vaulted ones, had circular floors with diameters measuring ca. 1.2 m and walls that rose in a conical shape with diminishing diameter up to a height of about 1.8 m. Bottle cisterns seemed to have been attached to small houses. For example, cisterns T04 and B17 (grid square M12) were attached to a small, single-room building. Cistern T07 (grid square J7) was freestanding, but built as part of small complex that included a single-room building and an open area enclosed by a low wall. Only two circular cisterns were noted (C01 in grid square F8 and C02 in grid square L6). Both are much larger than bottle-shaped cisterns with interior floor diameters of ca. 2.8 m (C01) and 4.1 m (C02) and their walls rise vertically without decreasing in diameter. While the small diameter of the top of a bottle cistern could have been covered with a single, largish slab (measuring ca. 80 cm on its broadest dimension) or terracotta tile, the size of the circular cisterns required roofs perhaps constructed of wood. These two cisterns appear to have been entirely freestanding without any abutting walls or rooms. Fig. 8. Interior of Cistern BB-3

The second category, dubbed 'community cisterns' because of their extremely large size in comparison to the domestic ones, is represented by four identified examples, of which Cistern BB was the largest (fig. 5). It was built at the north edge of the settlement where its north wall served as a short stretch of the fortification wall. It consisted of five parallel barrel vaults with the middle vault, BB-3, the largest among them (fig. 8). This vault's footprint measures ca. 15 x 5 meters and the vault rose to slightly more than four meters. Four irregularly spaced ribs added further structural integrity to the vault. With a conservative estimate, BB-3 alone could have stored more than 300,000 liters of water. The second community cistern, AA, built on the south side of the settlement, consisted of two parallel barrel vaults linked by an arcade constructed of squared limestone blocks with tile and brick fragments and rubble used as chinking between the stones (fig. 9). Small windows pierced the upper portions of the arcade and allowed water to flow between to the two vaults when the cistern was full. The northern vault is entirely intact, even preserving its manhole cover on top, which must have provided access to the cistern for cleaning or repair. Cocciopesto coated the interior surfaces although much of it has fallen away. Located at the very northwest corner of the settlement, Cistern CC (B01) was partially sunk into the bedrock. Because of the precipitous nature of its location, teetering on the edge of an eroding cliff face, it could not be entered and examined. Its distinctive access portal alerted us to its presence, but the small size of the portal led to its initial classification as another small, barrel-vaulted cistern. However, photographs taken both from a kite-mounted camera and from a small fishing boat below the cliff revealed that it was much bigger than we previously assessed and its cocciopesto interior was very nicely preserved. On the site plan (fig. 5), its footprint is estimated. Similarly, the fourth community cistern, in the area of grid square B15, was sunk into a crevice in the bedrock at the northwest corner of the cliff's edge. Its dangerous location prevented us from entering it and plotting its location, and thus it was not given an identifying number. Photographs taken from a fishing boat below show that it was built in much the same manner as Cistern AA with an ashlar built arcade linking two barrel vaults.

Every cistern, regardless of its classification, incorporated water intakes and access portals; however, many of these devices do not survive very well. No open-air drains were found in the survey that could have been used to collect water from large surfaces (e.g. roadways and open areas) and direct it towards the water intakes. Certainly, during the winter months, rainwater must have been collected somehow but again no such devices were discovered. Instead, water seems to have been brought to the settlement from nearby sources and poured into the cisterns. Among the cisterns that still preserve their vaults including the large community cisterns, terracotta intake pipes, with interior diameters

ranging from about 4 to 8 cm, can be seen piercing the vaults. In the barrel-vaulted, domestic cistern B31 (in grid square N9), a small, very shallow funnel had been molded out of cocciopesto to direct water towards the intake pipe. Cistern B31 originally stood two stories high, and the funnel drain, rectangular in plan, was placed in the corner of the second floor; water was somehow directed or poured from the second story into the cistern below. In bottle-shaped cisterns T04 (in grid square M12) and T03 (in grid square Q13), the intake pipes, composed of two to three interlocking segments, pierced the vertical wall at a downward angle about two-thirds the way up the side of the cistern. It is not clear how this cistern type was filled.

One small church (grid squares N6 and N7) was identified in the survey (**fig. 5**). Erosion has taken its toll on the church's architecture and most of its details have now been lost or lie beneath a dense pile of collapsed rubble. However, we could determine that it was a three-aisled church with an external, shallow central apse and two very shallow internal apses corresponding to the two side aisles. A small niche was sunk into the wall of the central apse. The church apparently had its own cisterns; a barrel-vaulted one was attached to the east wall behind the apse and another freestanding cistern was built immediately next to its north wall. Scattered about the settlement, but particularly in the southwest quadrant, were numerous marble and granodiorite architectural elements including an altar table leg, column bases, column shafts, and window mullions of the double engaged half colonnette type. These probably belonged to the small church.

The ceramic evidence

Fineware pottery from Sokastro includes almost the full range of 'Middle Byzantine Production':¹⁸ Fine Sgraffito Ware, Painted Fine Sgraffito Ware, Green and Brown Painted Ware and Slip-Painted Ware, amongst other categories. A selection of these are presented in Appendix A below. The chronological range for these wares was recently fine-tuned by G. Sanders, who put forward a revised typo-chronology framework, beginning in the early 12th and continuing into the mid-13th century.¹⁹

While major centers of MBP have been identified at Constantinople and Corinth, recent chemical analyses have pointed to Chalcis, the harbor of Thebes, as a production center in Central Greece. At Chalcis, kiln furniture (clay tripods) and pottery wasters attest to MBP production there.²⁰ Waksman, Skartsis, Kontogiannis and Vaxevanis note that if the 12th century represents a period of relative calm in eastern Central Greece, political fragmentation in the 13th century gradually undermined the predominance held by MBP in the region and gave rise to several regional workshops catering to local markets.²¹

MBP was widely distributed throughout the Mediterranean, but it was particularly popular in the Eastern Mediterranean. Waksman *et al.* draw our attention to the locations of shipwrecks in the Aegean which almost exclusively yielded MBP dating to the 12th and 13th centuries among their recovered ceramics, including wrecks near the islands of Pelagonnisos-Alonnisos, Kastellorizo and Skopelos, with a further two off the coast of Lycia at Adrasan and Kavalliani.²² In light of this evidence, and given Karpathos' proximity to Lycia, the location of Sokastro was perhaps a stopover for the trading ships which plied these routes.

Lastly, in addition to the fine wares from Sokastro, coarsewares featured relatively prominently in

18. The term is used by Waksman *et al.* (2014), pp. 379, 380, note 6, and abbreviated to MBP by Sanders (2000) and (2003).

19. Sanders (2000) and (2003).

20. Waksman *et al.* (2014), p. 381.

21. Waksman *et al.* (2014), pp. 379, 381.

22. Waksman *et al.* (2014), p. 380.

the survey assemblage represented by jars, storage vessels and some cooking pots, and utensils, including a ceramic sieve and a possible chafing dish. These coarse wares may have been locally produced and several ceramic wasters attest to on-site manufacture. In addition to the ceramic vessels, a variety of delicate glass wares (including elegant stemmed vessels) were also noted in the field.

Miscellaneous finds

Several metal and metal-related artefacts were discovered strewn about the site and tallied in the survey: iron slag, iron nails, pieces of copper and bronze sheet. Fragments of terracotta moulds were also found and together with the slag indicate some sort of manufacturing facility at Sokastro. Also, about a dozen agricultural implements were found on the surface including grinding stones and basins. The settlement may have been farming nearby fields or receiving unprocessed raw grain through trade.

Preliminary conclusions

The survey results show two major settlement phases in the Kato Leukos area. Late Roman building activity occurred in the upper plain, but that area lay outside of our survey permit. Nonetheless, a Late Roman occupation is indicated by the sherds recovered in and around the rock-cut tombs on the ridge, although some of these sherds may have washed down from above. Perhaps excavations in the lower, seaside plain will reveal earlier periods, but for now the evidence points to a small portside settlement at Leukos that thrived from the 4th to 6th century. The settlement was densely packed with numerous small houses and the largest and most prominent buildings placed near the natural harbors, such as buildings C, D, and N. The basilica was also situated seaside and greeted ships entering Leukos Bay. A second large church also serviced the community. Its location, far from the settled areas and near the rock-cut tombs, suggests that it served as the cemetery church for the town's inhabitants. The imported ceramic evidence shows that Leukos directly or indirectly engaged in trade. Karpathos sat at the crossroads of two major shipping routes: 1) an east-west route between Crete and Rhodes, extending up to the southern Anatolian coast or up to Constantinople; and 2) a north-south route linking the ports of North Africa with Rhodes and beyond up to Constantinople.²³ Regarding the latter, the Leukos settlement thrived at the time when the grain route that supplied Constantinople was flourishing;²⁴ perhaps it provided port facilities for ships and products moving to and from the capital. Two literary references indicate Karpathos' involvement in shipping along the south-north route. Strabo²⁵ makes a nautical reference when he mentions Karpathos: "One of the cities was called Nisyros. It lies opposite Leuce Acte in Libya, which is about one thousand stadia distant from Alexandria and about four thousand from Karpathos." His statement implies that Karpathos lay on the shipping route from Africa into the Aegean.²⁶ A more direct reference is found in the Theodosian Codex of 438²⁷ which mentions a Karpathian fleet that regularly brought grain from Alexandria to Constantinople. That the settlement was exporting some product or was involved in the trans-shipment of goods is attested by the small updraft kiln at Leukos used in the local manufacture of amphorae. While further excavation may clarify its role in seaborne trade, Leukos and the surrounding area was completely abandoned at the end of the 6th

23. Pryor (1988), pp. 6-8.

24. Teall (1959), pp. 91-96.

25. *Geo.* 10.5.14-17.

26. Morton (2001), pp. 184-85.

27. *Codex of Theodosios II*, 13.5.32; Deligiannakis (2016), pp. 88-89.

or the very early 7th century. Its downfall coincides with the Arab incursions into the Aegean which disrupted seaside ports along the same maritime routes that Karpathos serviced, particularly those on the southern Anatolian coast²⁸ and especially on Crete.²⁹

Then, after a period of nearly 500 years, the islet of Sokastro was fortified and settled in the 11th century. The survey found no evidence of earlier occupation³⁰ and therefore Sokastro could not have played a role in the regional turbulence caused by the Arab incursions.³¹ The settlement's fortification wall and large number of cisterns suggests that it had been founded in anticipation or in the face of long periods of isolated siege. Overall, the architecture of Sokastro was quite humble. The method of fortification was rather unpretentious and lacked a regular bastion-curtain system, a batter to the wall, an inner fort wall or redoubt, a freestanding tower, and a fortified gate. Within the enceinte, the settlement lacked any sort of urban organization; the buildings were laid out haphazardly apparently with no system of streets or thoroughfares. The church was quite small and unassuming; it did little to distinguish itself architecturally – aside from the sparing use of imported stones, some of which may have been recycled from the remains of Leukos – or command the space around it with a courtyard, square, or tower. The only architectural distinction denoting some sort of organization or authority is the extremely large cisterns, especially Cistern BB at the north. These may have been built and devoted to purposes meaningful to the entire settlement rather than to small-scale household subsistence, and hence the designation 'community cisterns'. 'Public' might be another term applicable to the very large cisterns. But because cisterns were apparently evenly distributed throughout the settlement and incorporated into every home or dwelling, which implies that every inhabitant took it upon themselves to store water rather than rely on a central authority, the need for publicly accessible cisterns in Sokastro seems negligible. Thus, the community cisterns probably did not supply water to the inhabitants themselves but to the ships passing through.

The lack of literary and epigraphic evidence leaves the reasons for the fortification of Sokastro to speculation, but within the broader Aegean context, the small church indicates a return of Christianity to the Kato Leukos area after a nearly 500-year hiatus. When the Arabs overtook Cyprus and Rhodes in the second half of the 7th century and then eventually Crete in the early 9th century,³² the major shipping lanes became quite dangerous,³³ which perhaps caused the abandonment of Leukos. When those same routes were re-conquered by the Byzantines,³⁴ interest in coastlines and ports previously vacated understandably grew. Fortifying Sokastro was quite strategic and it could have been used to defend the natural harbors immediately to its south and to protect against piracy along the shipping routes. In the last decade of the 11th century, Karpathos served as a base for the Byzantine campaigns to recapture Crete.³⁵ Whether the ships harbored at Sokastro is uncertain but the large community cisterns could have stored and provided water for the sailors. Sokastro thrived for the next two centuries and engaged in seaborne trade as indicated by the imported pottery. It then experienced an abrupt decline in the 13th century, and by the 16th century the islet was abandoned. In the very early 14th century, Karpathos came into the Venetian sphere of influence when the Cornaro family took over the island.³⁶ The need for or interest in the natural sandy ports of Kato Leukos seems now to have passed.

28. Foss (1994); Hohlfelder (2005).

29. Pryor (1988), pp. 94-95.

30. Moutsopoulos (1975-7), pp. 341-342.

31. Christides (1981), 82 and Moutsopoulos (1975-7), 344.

32. Malamut (1988) pp. 67-88.

33. Pryor (1988) pp. 102-108.

34. Malamut (1988), pp. 88-91; Pryor (1988), pp. 102-11.

35. Malamut (1988) pp. 85, 92.

36. Moutsopoulos (1975-7), pp. 417-19.

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Appendix A: A selection of ceramics from Sokastro

Prepared by Amanda Kelly

10. Sherd P12.1
11. Sherd I14.1
12. Sherd I10.1
13. Sherd I15.1
14. Sherd I11.1
15. Sherd J9.1

Fine Sgraffito Ware

The designation Fine Sgraffito Ware refers to a decorative technique using finely-executed incision to draw delicate motifs including spirals, scrolls and vegetal patterns. At the higher end of the spectrum, the decoration achieves a lacy effect while the broader repertoire extends to animal and human figures. Excavation evidence, mainly from Corinth and Constantinople,³⁷ suggests that Fine Sgraffito Ware was in consistently high demand in the 12th century, when it was widely distributed.³⁸ Joanita Vroom dates Fine Sgraffito Ware from around the mid-12th to the second half of the 12th century, and even into the early 13th century.³⁹

Sherd P12.1

[FIGURE 10]

Type: Fine Sgraffito Ware

Grid: P12

Shape: Open form, body fragment.

Description: The body sherd is perforated, which may constitute a repair.

Fabric: Dark red/brown (5YR 6/6) fabric with rare white (quartz) inclusions and rare small voids.

Slip: Thick white slip and pale glaze on both sides. Traces of very finely incised vegetal decoration on the interior.

Sherd I14.1

[FIGURE 11]

Type: Fine Sgraffito Ware

Grid: I14

Shape: Open form, body fragment.

Description: Traces of finely incised concentric circles and vegetal motifs.

Fabric: Dark red (5YR 6/5) with rare red and white inclusions and rare small voids.

Slip: Inside, thick white slip, pale yellow glaze.

³⁷ Morgan (1942), p. 117.

³⁸ Papanikola-Bakirtzi *et al.* (1999), p. 58.

³⁹ Vroom (2005), p. 85.

Sherd I10.1

[FIGURE 12]

Type: Fine Sgraffito Ware

Grid: I10

Shape: Open form, body fragment.

Description: Traces of finely incised concentric circles and tendril/vegetal motifs.

Fabric: Orange/red (2.5YR 6/6) with rare white inclusions and some small voids.

Slip: Inside, thick white slip, pale yellow glaze.

Painted Fine Sgraffito Ware or Green Colored Sgraffito

As with Fine Sgraffito Ware, the decoration of Painted Fine Sgraffito Ware also involved the incision of thin lines that cut through the white slip. Its incised decorative repertoire also consists of interlace and horizontal bands of scrolls, spirals or tendrils; however, these incised patterns are now combined with strokes, spirals or simple geometric and floral motifs in green paint. The ware's chronology largely falls within the second half of the 12th century,⁴⁰ which Vroom fine-tunes to mid-second half of the 12th century.⁴¹ Workshops have been identified in Thessaloniki but others have also been located in Turkey.⁴²

Sherd I15.1

[FIGURE 13]

Type: Painted Fine Sgraffito Ware

Grid: I15

Shape: Bowl, everted rim and body fragment.

Description: Estimated diameter 20 cm (outer lip). Small part of rounded upper body and horizontal rim with rounded lip. Incised design covering upper surface of rim. The rim is perforated, which may constitute a repair.

Fabric: Light red/orange (2.5 YR 6/6), medium-coarse fabric with some quartz inclusions.

Slip: Thick white slip, traces of green paint, transparent glaze on the upper surface of horizontal rim and inside body.

Green and Brown Painted Ware

The survey recorded many examples of Green and Brown Painted Ware. Waksman *et al.* assign Green and Brown Painted Ware to about the mid-12th until the mid-13th century.⁴³ Similarly, Vroom dates the ware to the second half of the 12th and the beginning of the 13th century.⁴⁴ Its use at Corinth seems to have been slightly more extensive, however, since several variants of Green and Brown Painted Ware were discovered there in deposits dated numismatically to the late 11th, 12th, and early 13th centuries.⁴⁵

40 Papanikola-Bakirtzi *et al.* (1999), p. 81.

41 Vroom (2005), p. 87.

42 Vroom (2005), p. 87.

43 Waksman *et al.* (2015), p. 399.

44 Vroom (2005), pp. 82-83. Note also that Vroom's fig. 7.1 is comparable to the Sokastro examples cited here.

45 Sanders (2000), pp. 159-61.

Sherd I11.1

[FIGURE 14]

Type: Green and Brown Painted Ware

Grid: I11

Shape: Bowl, flaring upper body/rim, rounded lip.

Fabric: Light red (2.5 YR 6/6), medium fine, rare limestone and quartz inclusions, with some medium voids.

Slip: Inside, white slip covers surface, over which a loop (or partial spiral) of green paint was applied, over which a thinner loop of dark brown paint was applied, colorless glaze over surface (Green and Brown Painted Ware II).

Slip-Painted Ware, also known as Light on Dark Slip Painted I-II

Slip-Painted Ware, also known as Light on Dark Slip Painted I-II, is so called because its decoration is executed in white slip which stands out against a background of natural clay. The entire surface is then washed with a thin colorless lead glaze that gives the white slip a light yellowish hue. The slipped decorative repertoire includes spirals, wavy lines and crosshatchings.⁴⁶ The ware has been dated to around the late 11th to the 12th century.⁴⁷ Several examples were recorded in the survey.

Sherd J9.1

[FIGURE 15]

Type: Slip-Painted Ware

Grid: J9

Shape: Body sherd.

Fabric: Reddish orange (5YR 6/6) fabric with few small white inclusions and small voids.

Slip: Slip-painted decoration consisting of yellow-cream dots, lead glaze covering surface.

⁴⁶ Vionis, Poblome, De Cupere, and Waelkens (2010), p. 450, fig. 21:e.

⁴⁷ Morgan (1942), pp. 100-104; Vroom (2005), p. 81; Vroom (2003), pp. 150-51; Vionis, Poblome, De Cupere, and Waelkens (2010), p. 450.

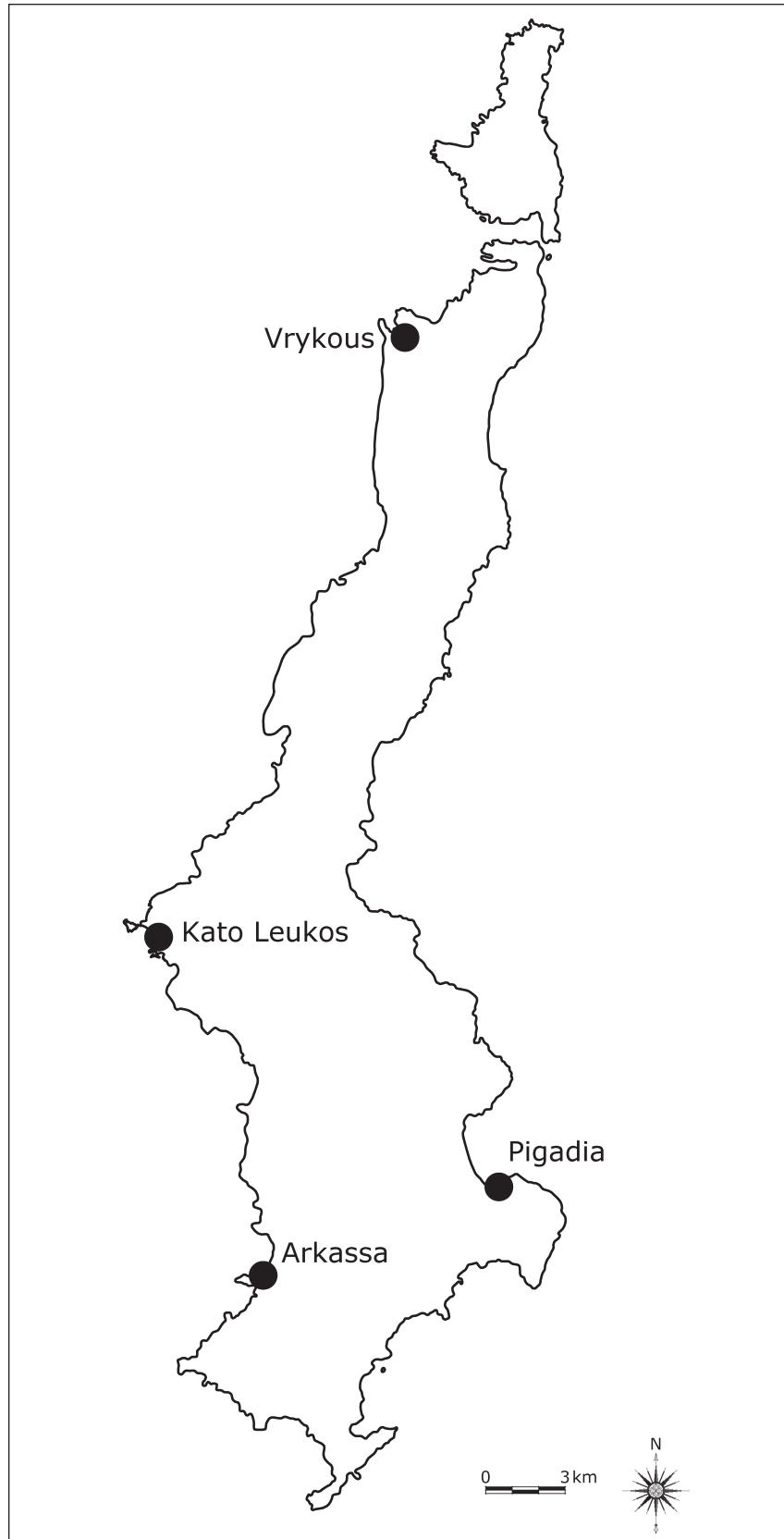


Figure 1. Map of Karpathos.



Figure 2. Kato Leukos area.



Figure 3. The settlement at Leukos (Survey Area shaded).

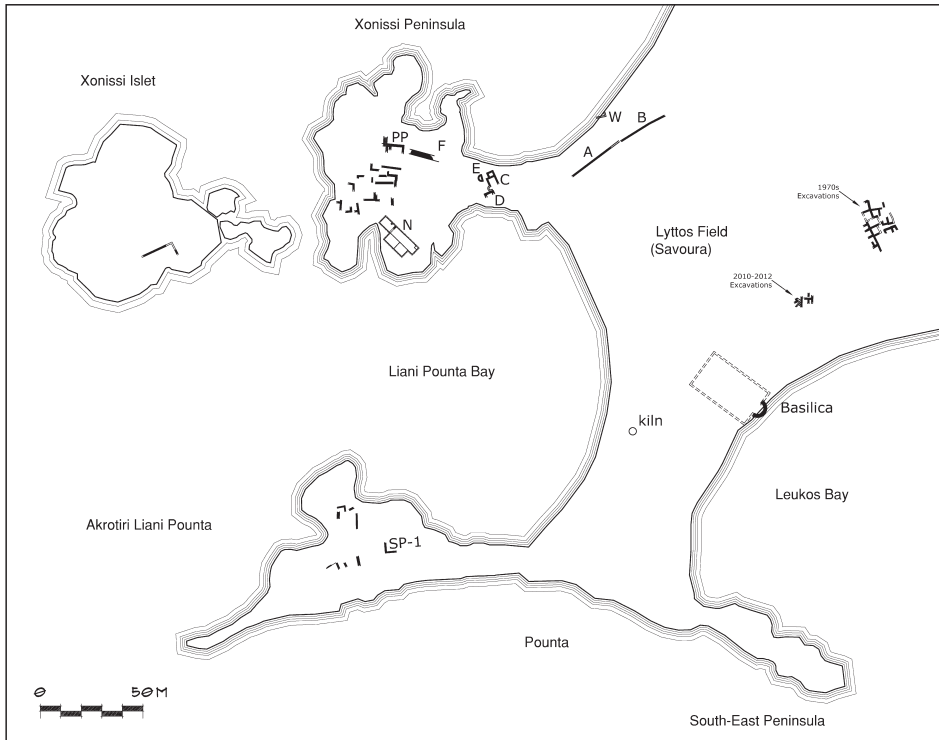


Figure 4. Walls and buildings in Lyttos Field and the two peninsulas.

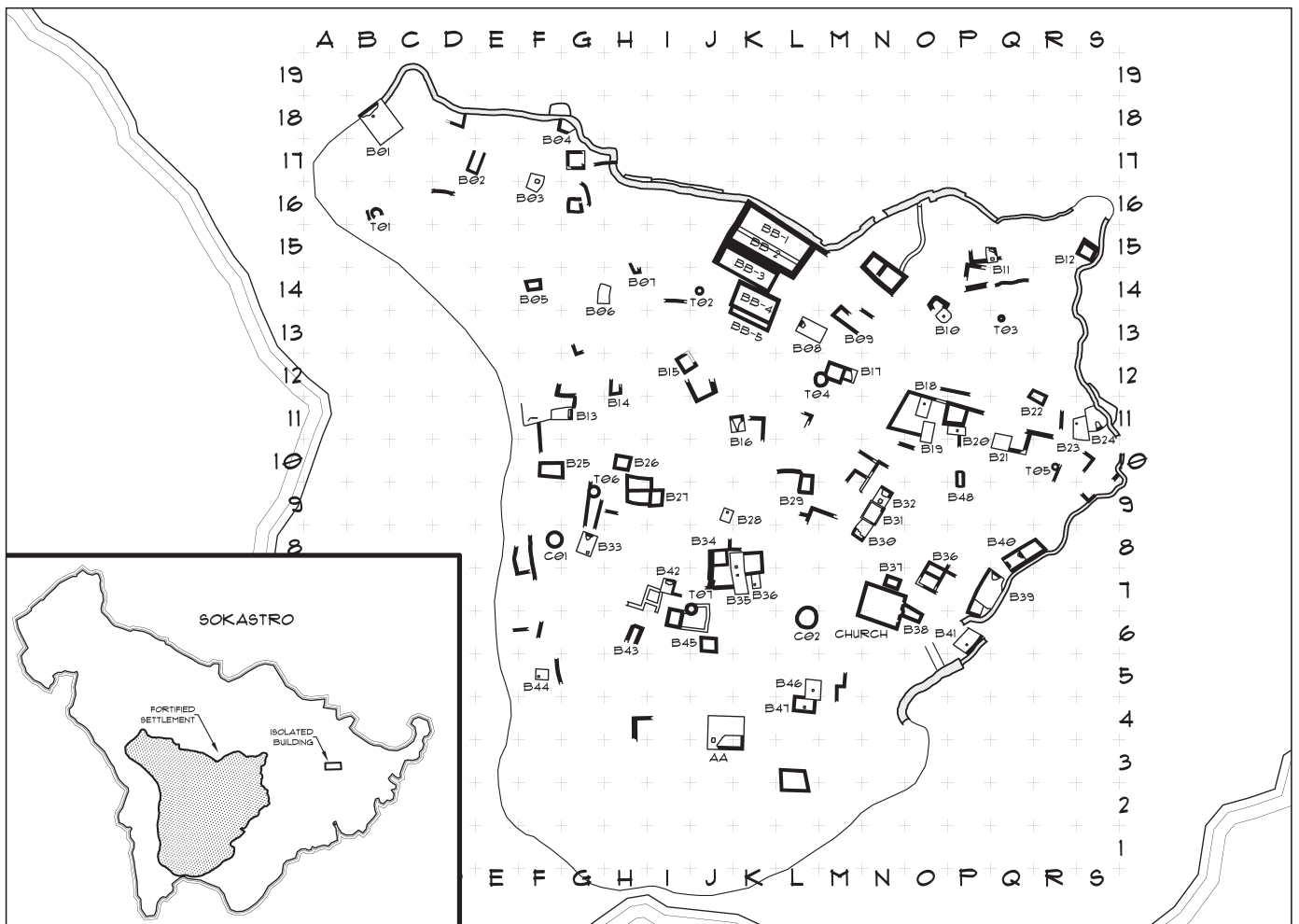


Figure 5. Plan of fortified settlement on Sokastro. Inset: Sokastro map.



Figure 6.
North stretch of fort wall (from west).



Figure 7. Cistern B03 (from southeast).



Figure 8. Interior of Cistern BB-3.



Figure 9. Interior arcade of Cistern AA.



Figure 10. Sherd P12.1.



Figure 11. Sherd I14.1.



Figure 12. Sherd I10.1.



Figure 13. Sherd I15.1.



Figure 14. Sherd I11.1..



Figure 15. Sherd J9.1.