The Vrokastro Survey Project

Providing a Context for an Early Iron Age Site

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One of the most dramatic coastlines in Europe is located along the northern shores of eastern Crete, where seaweathered rock formations, promontories, and small beaches form the Bay of Mirabello. In 1986 a 50-square-kilometer area flanking the Bay was selected by Hayden for intensive and systematic survey. Two factors influenced this choice. Many surveys previously undertaken in the Argean have focused on "central-place" areas—those containing, for example, a large city-state of the historical Greek period or a Minoan palace. Although the Mirabello region is topographically and ecologically varied, it remained primarily rural for most cultural periods. Since town and city life has always been based upon the successful exploitation of these rural environments, they deserve study. In addition, important settlements excavated early in this century in the Bay of Mirabello area will be better understood within the environmental and archaeological context the Vrokastro Survey Project will provide.

The Site of Vrokastro

Early in this century Edith Hall, a pioneer in Cretan studies, excavated a settlement in a commanding position above the Bay of Mirabello, on the terraced slopes and peak of...
Background of Field Work at Vrokastro

After Harriett Boyd and Edith Hall completed excavation of the Minoan town of Gournia on the Bay of Mirabello, Hall began the first brief season of excavation of an Early Iron Age settlement (ca. 1200-700 B.C.) on the mountain of Vrokastro, located near the coast 3 kilometers west of Gournia (Figs. 1-3). (Both excavations were sponsored by The University Museum.) This site had been known to Richard Seager (who, in Shaw, this issue) through reports provided by the locals, and although he visited while work was in progress, Hall was left with the responsibility of completing excavation, supervising alone or with one "chaperon" up to 50 workmen (Hall letter, 10 May 1910). As a result of her pioneering efforts a substantial portion of the settlement and related burials were excavated. The houses belong primarily to the Geometric period (8th century B.C.), although she recovered from unstratified or mixed fill pottery dating to the earlier Late Bronze or Early Minoan IIIIC (period ca. 1200-1160/1130 B.C.), and even a few Minoan IIIA2 (ca. 2160-1600 B.C.) pots and walls, testifying to earlier use of the peak. The Geometric settlement is located on the north face and summit of the mountain and extends into fields located to the south and southwest of the peak (Hall 1914:81-82).

A: Fertile coastal areas, floodplains, and valleys or basins (olives, carob, almonds, grain, fruit, and irrigated vegetable gardens; altitude 0-400 m).
   Zone 1: coastal area
   Zone 2: Istron River valley
   Zone 4: upland fields south of Vrokastro
   Zone 9: Aphendhi Christos Valley
   Zone 12: pass between the villages of Mesaraki and Prina
   Zone 13: Mesaraki Valley

B: Steep ravines and cliffs with pine, oak, and juniper forest (altitude 100-500 m)
   Zone 10

C: Mountain ranges, steep river slopes and basins, and upland terraces suitable for agriculture (primarily cereals, vines), herding (sheep and goats), and herbrownage (altitude 300 to 800 m).
   Zone 3: Xeropotamos River slopes and basin
   Zone 5: middle slopes of Kolumbous Mountains
   Zone 6: upper slopes of Kolumbous Mountains
   Zone 7: Tzamachi terrace
   Zone 8: Schneizer plateau
   Zone 11: Istron River slopes

Figure 4. Division of the Aghios Phanourios area into 50-meter-wide units or tracts; arrow indicates tract 3, line 0, which is 50 m wide. Each 50-meter-wide line is walked by three to four individuals at evenly spaced intervals. Every datable or "diagnostic" artifact observed on a walking line is collected and labeled by zone number, unit number, tract number, line, and meter.

Vrokastro. This mountain is near the sea and forms part of a limestone and conglomerate barrier between the fertile coast and inland, upland fields (Figs. 1-3). Hall's excavation revealed an important Late Bronze and Early Iron Age town, significant for its size, broad chronological range (ca. 1300/1150-700 B.C.), and wide variety of artifacts, house plans (Hayden 1963a,b), tomb types, and burial practices. Vrokastro remains one of the few excavated settlements within Crete belonging to the close of the Bronze and the Early Iron Age, generally regarded as a time of turmoil throughout the Aegean, when many low-lying or coastal settlements are abandoned and populations decrease or move to safer, more mountainous areas.

Hall suggested that this site was one of many contemporary settlements within a "circle of 5 kilometers from the peak" (1914:82). Our regional survey within the Bay of Mirabello area continues Hall's work begun 75 years ago, and will provide what earlier work at the site could not—an environmental and archaeological framework for the settlement on and near the mountain of Vrokastro.

Systematic Survey: Scope and Methods

Survey and excavation are two basic tools of field work available to archaeologists and other scholars and scientists who want to investigate past civilizations. Excavation generally involve the detailed study of the physical remains, history, and environment of just one site. An intensive survey, on the other hand, involves exploration of an entire region by walking across it, usually in some systematic manner (Fig. 4). Sites are identified by the presence of artifacts (usually pottery and architectural remains) and have a clear "edge" or boundary; these are mapped and analyzed according to size, function, and date. Complementing the identification of settlement systems belonging to all periods are interdisciplinary studies of the ecology, geology, history, demographics, and agriculture of the region. So in addition to locating sites dating from the Neolithic through the Turkish periods, our research program focuses on the physical environment, economy, and history of the area.

For the more recent periods (Venetian through Turkish), available statistics on land use, local histories, and population figures can be applied directly to what is known about the number, type, density, and location of sites. Measuring the distances between sites is one technique for determining the distribution and possible clustering of sites, and analyzing spatial relationships.
between smaller communities and larger settlements.

For earlier periods different techniques must be used. Geomorphic studies, for example, can provide indications of soil conditions for earlier periods. Pollen cores provide another source of information regarding ancient plant communities and climate; the types of vegetation represented by pollen indicate that western Crete during the Middle to Late Bronze Age may have been slightly less evaporative, with warmer winters and slightly cooler summers (Moody 1987:129). It is quite possible that, with minor exceptions, extreme fluctuations in climate have not occurred for millennia in the more arid eastern half of the island.

These data on soils and climate, coupled with careful recording of modern plant communities, can provide a baseline from which to reconstruct earlier environments (Fig. 5). These may have differed very little from the recent landscape (before the advent of modern irrigation systems and massive bulldozing for olive terraces). Distributions of sites belonging to earlier chronological periods can then be measured against factors such as slope, soil conditions, altitude, water resources, potentials for agriculture, pastoralism, and defensibility. These factors or criteria will provide a framework for interpreting the history of settlement within the Bay of Mirabello area.

**Topography of the Survey Area**

The boundaries of the survey area are determined by natural topographical features. The northern edge is the Bay of Mirabello, punctuated by coastal promontories (Figs. 3, 6) and beaches capable of providing anchorage for small craft today and in earlier periods. The inland, upland valley of Meseleri (Fig. 7), enclosed on its northern side by the cliffs of Schinavria Koriphi, forms the southern limit. The western boundary extends from the rich agricultural land flanking the Istron River valley through a deep gorge to the village of Prina at the southwest corner (Fig. 8). The eastern side of the study area lies along the watershed between the Xeropotamos and Gourniapotamos rivers.

The mountain range of Vrokastro and Koptanes, at an altitude of 300 m, separates the densely populated coastal zone from an upland region of hills and fields (Fig. 10). Seasonally occupied fieldhouses and metochia (a group of fieldhouses, sometimes concentrated, sometimes dispersed) scattered across this upland region offered shelter for man and animals and a place to store harvested crops and tools. Many of these metochia belong to the Late Venetian or Turkish periods (A.D. 1500-1800) and are abandoned.

South of these upland fields the land rises steeply, broken by a series of deep ravines, first to the mountain range of Kolumbous (Fig. 10) and then to the upland terraces of Tzamachi below Schinavria Koriphi (altitude 700 m). Much of this terrain is covered with dense woodland consisting primarily of pine and juniper. Along the Tzamachi terrace there are more metochia and fields that until recently were cultivated. Thus the entire survey region from coast to southern boundary falls within the

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**Figure 7.** The Meseleri Valley and mountain of Schinavria Koriphi from the south. The valley floor is cultivated primarily in olives, grain, and some vines; pine, prickly oak, and heather grow on surrounding terraced limestone and marl slopes.

**Figure 8.** Prina area and the chapel hill of Stauromenos (alt. 418 m) from the northeast. This fertile, well-watered area is cultivated in olives, vines, and irrigated vegetable gardens. Sherd s recovered from the north side of Stauromenos indicate occupation of Early Iron Age (contemporary with Vrokastro) and later date.

**Figure 9.** Plateau of Tzamachi above Kolumbous, looking east to the Steha Mountain range on the east side of the Lethmos of Herakleia. The Monastery of Panaghia Phaneromeni is in the middle distance. Cereals and vines were grown here before World War II; many fieldhouses are now abandoned and large flocks of sheep and goats browse in fields that were once under cultivation.
altitude range of permanent settlement within Crete and the traditional crops for such a range include olive, vine, and grain.

The Wild Vegetation

The uncultivated vegetation of the Vrokastro region is similar to other areas within Crete; it consists of a mosaic of maquis, garigue, and steppe. In varying proportions, along with patches of woodlands (primarily pine, juniper, and prickly oak). Maquis is a plant community consisting of trees that have been reduced to shrub size, in many instances due to browsing by sheep and goats. Garigue consists of undergrowth that is woody plants that never grow into trees and are usually green-gray and aromatic. Steppe consists of plants such as grasses and legumes. Pine has been invading the area from the south coast and upland Lasithi plain to the west, and now forms areas of continuous woodland, especially in the higher altitudes. The proportions of each kind of vegetation in any Cretan environment are directly related to activities such as cultivation, browsing, woodcutting, and burning, as well as soil and water conditions. When land goes out of cultivation, progression in the wild vegetation is from steppe to garigue, with maquis taking many decades to become established.

Cultivation, Land Management and Pastoralism

Within the Vrokastro region and throughout the island much of the cultivated land is supported by terrace walls; terracing is even found in the most remote ravines of the survey region. Once cereals were grown on many of these terraces, and today the more accessible terraces are frequently planted in young olives. Viticulture was once more extensive (Edith Hall, letter of 10 May 1910), and carob, used for animal fodder and in the production of sugar, was once widely exported (Spratt 1885, 1:110-111). Areas that are well-watered and contain deep soils, such as the Istron River valley, are planted in vegetable gardens and fruit trees. At least 3,000 sheep and goats browse within the study area, especially in the upland areas of Kolumbo and Tzamachi. Flocks maintained regionally may have always been important for subsistence (meat, milk, and wool are consumed locally), and today they generate a cash-income.

Results

The Early and Middle Minoan Periods (Fig. 12a,b)

Three years of walking across this landscape have revealed many sites contemporary with the first periods of occupation of the peak of Vrokastro, that is the Middle Minoan IA-III periods (ca. 2100-1600 B.C.). These sites testify to extensive occupation of the coastal zone and areas near the coast; preliminary geobotanical studies indicate that some of the coastal settlements are now partially under water and others may be buried under deep alluvium in the Istron River valley or along the northern slopes of Kornames. The cluster of Early and Middle Minoan sites on the low hills flanking the Istron River valley suggest early use of this area of deep soils for cultivation. Many Early and Middle Minoan sites are located on hills and slopes between 100 and 200 m in elevation. At 300 m, Vrokastro (VK 1) is an exception, and reasons for use of the peak in the Middle Bronze Age cannot be known. Hall emphasized its usefulness in the subsequent Early Iron Age as a lookout and citadel (1914:81-82); the peak is clearly visible from both the eastern and western sides of the Bay of Mirabello (Kavousi and Aghioi Nikolaos). The peak may have served a similar need in this earlier period. One other alternative is that it may have been the site of a Middle Minoan cult place or “pea-like tomb” (see Mhaly, this issue) but this is not supported by Hall’s excavation (no figurines were found, only fine painted pottery).

The Late Minoan I Period (Fig. 12b)

Very few sherds of Late Minoan I date (ca. 1600-1450/1425 B.C.) were recovered from the site of Vrokastro, suggesting a temporary abandonment of the peak. At the northwest foot of the mountain, however, recent building beside the coastal highway has revealed a site (IS 1) of Late Minoan I date with pottery of high quality. Just south of the peak, near a spring, an extensive sherds scatter indicates another Middle Minoan-Late Minoan I community at VK 6, so dense of the peak does not indicate retreat from contiguous areas. Inland and south of Vrokastro, Minoan sites tend to be found near springs, together with sherds of later periods, suggesting the use of these water sources through time. Irrigated gardens might have been grown near springs, and upland fields, still dry-farmed today, may have been planted in cereals, olives, and vines. Beekeeping and sheep and goat herding, prevalent in the area today, may have been activities practiced in the Bronze Age.

The distribution and extent of Middle Minoan and Late Minoan I pottery on the promontory of Prinatikos Pyrgos indicate one of the largest Minoan coastal settlements. Walled and sherds of Late Minoan I date protruding from the western scarp of the promontory and extending into the water testify to the extent of physical evidence for the
Bronze Age remaining under later occupation levels (Greco-Roman and Byzantine through Turkish), and to the extent of coastal submergence. Minoan settlement in this area also centers on the hill Kato Aniko (KA 1, 2) and the Asphendi Chirovo Valley (AC 2), directly east of the Istron River valley.

Just south of the modern villages of Kalo Chorio and Pyrgos, in the lower or southern extent of the Istron River valley (Fig. 3), another Middle Minoan-Late Minoan I settlement (KK 1) is located on a low hill near a chapel dating to the Venetian period. These Bronze Age sites, as well as settlements of later periods, are frequently placed above the most fertile soils, where they are strategically located to exploit the resources of the region. The sites of KM 1 and 2 (Kendromouri), located on hills overlooking the western end of the Gournia plain, may have used the plain for cultivation. The site KM 1 may rival in size the settlement of Gournia on the opposite side of the plain.

Another factor that appears to influence site location are routes through the survey region (Fig. 11). For example, there is a Middle Minoan-Late Minoan I site and a later Medieval settlement in the small, upland Prophitis Ilias Valley (PT 2), beside an important route that connects the north coast (at Kalo Chorio) to the south coast and town of Hierapetra (the ancient Hierapetra) via the Meseler Valley. Most of these routes were constructed during the Venetian or Turkish periods for foot traffic and pack animals. These cobbled roads probably follow more ancient paths.

At a higher altitude for Minoan occupation, in the area called Tza-machl between Kolimbous and Schinavria Koriph, more Minoan sites have been found, some encompassing the Late Minoan I period, again near water sources (Fig. 9; TM 1, 7). Only the ridge south of Schinavria Korih, overlooking the fertile Meseleri Valley, appears not to have been exploited during the Minoan period. (It may be that the fertile Meseleri Valley, as yet unexplored, contained the major settlement of this period.)

The Late Minoan I/III through Early Iron Age Periods (Fig. 12c)

It is often difficult to distinguish between the Late Minoan I and Late Minoan IIIA-IIIB periods (1900-1200 B.C.) based on pottery fabrics collected from the surface. Both periods, for example, produce fine buff pottery. Sherds of these periods with a recognizable shape or decoration do occur together at some sites. One such site is at Aghios Phanourios (APh 3) in the coastal foothills overlooking the Vromiti promontory. Late Minoan I, III, and later historical (Greco-Roman) pottery extends from a ridge top where a raised village of the Turkish period is located, down a long hill slope to the north. Remaining walls are massive and may be Bronze Age in date (Fig. 13). This settlement overlaps renewed occupation of Vrokastro (ca. 1200 B.C.). Only one hill and a deep ravine called “Chavka” (bowl) separate these two sites, and Late Minoan III burial (1200 B.C. or later) in pithoi were excavated in this ravine by Hall (1914.179-173). The settlement at Phanourios falls within Hall’s “5-kilometer circuit” of contemporary sites.

Another site within her circuit was identified in the cove of Elias to Nisi, the coastal promontory at the base of Vrokastro (Fig. 9). Although the site is denuded and many walls were destroyed in a nearby lime kiln, sherds indicate a Late Bronze, Early Iron Age and Orientalizing date, especially pithoi fragments with rope decoration, incised circles or spirals (ca. 1200-600 B.C.). These sherds are similar to examples from Vrokastro (Hall 1914:91; fig. 40). On the south, the site is enclosed by a massive and possibly contemporary wall built on fill containing Late Minoan I and earlier sherds. The wall safeguards the most exposed approach to the settlement, just as cliffs protect the
other sides of the promontory. This is the first walled coastal settlement of this date found within the island, and it may have served as a lower, fortified community providing the Vrokastros population with access to the sea. Hall excavated structures and tombs south and southwest of the Vrokastros peak in the fields and rocky slopes of Karakoula, Agia Thalassa, and Maziokhoria (1914:152-174); the Vrokastros Survey Project relocated some of these excavations. A major spring just south of Vrokastros served an earlier Minoan site (VK 6) and a village of metochi of the Turkish period. Just east of this spring another Late Minoan III site with massive wall foundations was identified in 1887 (VK 7).

Farther west in the Istron Valley Late Minoan IB-II B C III pottery has been found on the summit and sides of Xivoumi (KK 2), the highest hill in this valley. This site produced high quality fine and coarse wares belonging to the last part of the Bronze Age, with motifs and shapes paralleled at contemporaneous high sites such as Karphi in the mountains enclosing the Lasithi plain. A bull figurine was also recovered, a rare find for a surface survey. This settlement, in contrast to those at Vrokastros and Phanourios, does not seem to extend past the close of the Bronze Age. More Late Bronze Age pottery was found on western slopes of the gorge linking this valley to the Prina area (PN 3), and Early Iron Age pottery was identified in terraced olive groves north of the hilltop chapel of Stavroniketa northeast of Prina (PN 3, Fig. 8), indicating a number of potentially contemporary sites along a route to the south coast (Fig. 11).

Late Geometric through the Archaic Periods (Fig. 13b)

Sites belonging to the Late Geometric period (at the close of the Early Iron Age) through the Archaic period (750-500 B.C.) have been identified at locations on the high ridge of Schiniorita Karphi north of and overlooking the Meseleri Valley and at Prina. Abundant wall foundations exist at these sites, and sherds include Orientalizing or Archaic pithos with concentric circles, spirals, and lozenges and palmette patterns in relief (Fig. 14). One feature noted at SK 2 and KPh 3 (Fig. 12d) is placement of a few rectangular buildings on raised platforms. Sherds of Orientalizing date also occur at the Vrokastros settlement and possibly on the coastal promontory of Nisi Pandeleimon (NP 1). (Initial occupation of this coastal promontory at the close of the Geometric period could indicate a less threatened coastline.)

Conclusion

By systematically walking across this landscape the Vrokastros Project has supplied a context for the Early Iron Age site on the Vrokastros peak that appears to support one suggestion made by Hall: this settlement was located within a cluster of sites that were, in part, contemporaneous with it, and it was probably the most important of these communities in terms of size and length of occupation.

The limits of systematic survey are demonstrated by Hall’s second suggestion—he believed that at some stage in the history of the area the older Minoan/Mycenaean stock was driven into the hills (i.e., to Vrokastros) by “invaders” who raised the Istron River valley (1914:82). Imported pottery made of non-local clays, which may have been carried into the area by new settlers, has been identified at some of these coastal sites. Alternatively, these fabrics may simply represent pottery imported by a stable, local population. It is therefore unlikely that surface survey alone can prove that any of the contemporary settlements were established by newcomers.

During earlier periods Vrokastros was one of the more unusual locations selected for occupation—most Middle Minoan settlements within this region were at lower elevations—suggesting a special and as yet unknown function for this peak in the Middle Bronze Age. Pottery recovered from sites found during the survey indicates that there are more settlements of Late Minoan I and earlier date than Late Minoan III through Early Iron Age communities. Although these later sites are fewer in number, they appear to be larger. This may indicate either a smaller population in these later, less stable times, or that the local population was moving into fewer, larger settlements (for protection?).

One significant insight resulting from close examination of the coast is the presence on most of the promontories of some pottery, especially pithoi fragments, belonging to the period between 1200 and 700 B.C. These sherds, along with the settlement in the cove of Elia to Nisi, indicate continued though perhaps limited use of the exposed coastal region (possibly for fishing, agriculture, or trade) subsequent to and at the close of the Bronze Age. Certainly it was imperative during this period to maintain a watch on the coast, and the summit of Vrokastros was ideal for this purpose. The mountain was more than a "lookout" for nearby sites, however, for it provided a refuge with easy access to fertile coastal and upland areas.

Intensive, systematic survey coupled with ethnographic, environmental, and historical studies can yield extensive data pertaining to site size, location, date, possible function, and relationships between sites and their physical environments. These detailed regional perspectives form a solid basis for future work, including excavation. Current surveys based in Crete are making a valuable contribution to research concerning this great island, where current development threatens antiquities and our ability to reconstruct the past.

Bibliography


Letters by Hall were cited with permission of The University Museum Archives.

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