Recapturing the Dynamics of the Early Byzantine Settlements in Crete: Old Problems – New Interpretations through an Interdisciplinary Approach

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Abstract
This paper presents the methodological framework and the first results of a project launched in 2014 entitled Recapturing the Dynamics of the Early Byzantine Settlements in Crete: Old problems – New Interpretations through an Interdisciplinary Approach. Through an interdisciplinary approach, combining a careful reading of historical and archaeological evidence with the spatial analysis offered by the application of new technologies in archaeological research, the project highlights the developments of Cretan settlements from the fourth century to the early ninth century. In particular, we will examine the data categories and discuss how they are brought together for analysis in a Geographical Information System.

Keywords: Crete, Early Byzantine Period, Settlement History, Remote Sensing, GIS

Introduction
Recapturing the Dynamics of the Early Byzantine Settlements in Crete: Old problems – New Interpretations through an Interdisciplinary Approach is the title of a research project launched in 2014. With an interdisciplinary approach, combining a careful reading of historical and archaeological evidence with the spatial analysis offered by the application of new technologies in archaeological research, the project attempts to highlight the changes in Cretan settlements from the fourth century to the early ninth century. The main goals of the project are the detection of the network of Cretan cities and their territories and the investigation of the different types of settlements and their interdependence with micro-geographical features. A methodological approach which considers the geographical and environmental context of settlements as one of the determining factors for the interpretation of complex historical phenomena goes back to the issue of environmental determinism which has influenced both classical and prehistoric archaeology (cf. Förster et al, 2012: 171-72). Owing to its recent development as a discipline, Byzantine landscape archaeology has not experienced the conflict between processual and post-processual archaeologists seen in other disciplines. In Greece in particular, only in the last two decades has landscape archaeology been developed thanks to a number of important regional surface surveys (Bintliff, 2013). Without historiographical tradition, and without historiographical weights, Byzantine archaeologists in Greece began to explore the landscape as the cultural product of the interaction between humans and their environment under continuous transformation. To what degree the historical developments of the Byzantine settlements are linked with their physical...
location is a completely new question, open to discussion.

During the long time period covered by the project, major changes in political, social and economic life influenced settlements in terms of both their form and function. A crucial question is how to understand why certain settlements survived the crisis of the seventh-eighth centuries, while others disappeared forever. Given the “global”, rather than local, nature of the crisis of the seventh-eighth centuries, the integration of the micro-regional analysis of the Cretan landscape in a wider Mediterranean and insular framework is required.

**Crete from the Fourth Century to the Arab Conquest: the Historical and Geographical Context**

Crete was fully integrated in the maritime military and trade routes given its strategic position in the unified Mediterranean Sea. This sea surrounding the island, connected it with, but also isolated it from, the outside world. Attempts to detect a Mediterranean insular system during the Early Byzantine period revealed useful comparisons between Crete, Cyprus and Sicily (Zanini 2013a). The island seems to have enjoyed a long period of peace and prosperity from the first century BC until the first half of the seventh century AD (Cosentino, 2013).

On the other hand this stresses how different the history of Crete is when compared with other regions of the Byzantine Empire. The island did not suffer from invasions similar to those inflicted on the Balkans, nor did it experience the serious consequences of the Byzantine-Persian wars on
the eastern borders of Empire. Crete belatedly entered a period of crisis when compared to other Byzantine provinces. The main reason for this crisis was the rapid spread of the Arabs through the eastern Mediterranean basin. The island was eventually conquered by Arabs around 824 (Christides 1984) and ceased to belong to the Byzantine Empire for almost 150 years. It returned to Byzantine authority only in 961. The Arab conquest constitutes an absolute break in the periodisation of the island’s history.

Crete is characterised by a wide variety of landscapes. Apart from long miles of coast, mountain ranges, such as Psiloritis, the White Mountains and the Mountains of Lassithi, occupy approximately 52% of the island and constitute the main geographical feature of the Cretan landscape. Plains occupy a mere 3.6% (Chaniotis, 1999: 181). Between the coast and the mountains, the landscape is defined by hills, valleys, plains, plateaus and gorges. According to a widespread view, the fragmentation of the landscape, with dominating mountains which isolate several areas, probably determined the organisation of Cretan populations into several autonomous cities in antiquity. Such an interpretation of urban organisation echoes the concept of landscape settlement chambers (Siedlungskammer) with micro-regions well-defined by physical constrains; the latter was proposed in the pioneer study of H. Lehmann regarding the long-term history of settlements of eastern Crete (Lehmann, 1939. Cf. Farinetti, 2011: 5-11).

The main geographical distinction lies between coastal and inland settlements although many significant differentiations in the micro-geography of both coastal and inland settlements can also be detected. Kissamos, Kydonia, Chersonesos and Hierapydona were important poleis and ports with fertile plains in close proximity and enjoyed easy communication routes with the interior. To the contrary, a group of settlements along the south coast of Crete, such as Syia, Lissos, Tarra, Phoinix and Einatos, faced exclusively towards the sea, while isolated from the interior by steep mountains that limited communication routes. After the shrinkage of “globalised” Roman commerce, the isolation of these southern coastal settlements seems to have been absolute and to have led to their permanent abandonment.

This development of the coastal settlements does not exclude a parallel development of inland cities. The completion of the Cretan road system under Hadrian gave impetus to the development of inland cities sited close to major routes. The case of mountainous or half-mountainous cities, such as Syvritos, Lampe, and Eleutherna, is typical: like

Fig. 2. Crete. Cities and important settlements mentioned in Synekdemos and Stadismus that have been identified on the ground (map by K Armstrong).
the majority of inland cities, they were situated at an altitude of 300-400 m above sea level. Their economy – based on agriculture, animal breeding, beekeeping, timber and herb-gathering (Chaniotis, 1999) – allowed them to enjoy the status of economic self-sufficiency even in times of crisis (Tsigonaki, 2007: 264-65).

Project Goals and Methodology (fig. 1)

Historical Data Retrieval

The first thread of the project is a systematic retrieval of all of the historical information available. The retrieval of, and commentary upon, historical sources has already been attempted by earlier scholars, such as D. Tsougarakis and A. Bandy (Bandy, 1970; Tsougarakis, 1988; 1990; 2011). However, the historical evidence that covers the Early Byzantine period is very limited. There is no written source dedicated to Crete, only sporadic pieces of information that may be separated by a great chronological distance. It is like a projector throwing ample light on specific segments of space and time, while others are left completely in the dark. A characteristic example is that of Andrew of Crete, archbishop of Crete and prolific writer of the end of the seventh/first half of the eighth century (Auzepy 1995). His writings offer abundant evidence of the island and especially the see of Gortyn at a very critical juncture. On the other hand, although there are numerous references in the Byzantine sources to the occupation by the Arabs in the early ninth century, one of the greatest historical adventures of the island, many points remain obscure.

Regarding settlement history, the disadvantage of the textual sources is that they speak only about the cities and the most important settlements (fig. 2). Hierokles Synekdemos constitutes an official public document which although compiled in the sixth century (before 535), reflects the situation of the cities in the middle of the fifth century (Höningmann, 1939: §649, 3-651, 2; Avramea, 1997: 35). The 22 Cretan cities mentioned therein are considered to be those that enjoyed the status of official polis (civitates): Gortyna, Einatos, Bienna, Hierapydna, Kamara, Alygos (Olous), Chersonesos, Lyktos, Arkadia, Knossos, Sybritos, Oaxos (Axos), Eleutherna, Lampe, Aptera, Kydonia, Kissamos, Kantanos, Elyros, Lissos, Phoinix and Araden. For that reason, it is not surprising that many settlements with a different status are omitted. The Stadiasmus Maris Magni, a guide for seafarers, offers a full picture of the coastal settlements. However,
its dating is quite problematic. Specialists date
the compilation of the work from the third to the
fifth century (Arnaud, 2009: 166-70). Many of the
Cretan sites mentioned in the Stadiasmus have yet
to be identified on the ground. If these two docu-
ments taken together illustrate the situation at the
beginning of the period examined by the project,
official documents regarding the ecclesiastical
organisation of the island highlight the situation
at the end of the period. Notitia Episcopatuum 3,
a document dated to the first decades of the ninth
century (Darrouzès, 1981: 7-9; Zuckerman, 2006:
202-14), i.e. just before the Arab occupation, refers
to twelve bishoprics in the following hierarchical
order (fig. 3): Gortyna, Arkadia, Knossos, Cher-
sonesos, Sitia, Hierapetra (Hierapydna), Sybritos,
Lampe, Kantanos, Kissamos, Kydonia and Eleuth-

The review of historical sources will enable the
integration of new data and the use of new analyti-
cal research tools. Some rethinking over the avail-
able historical sources may shed further light on
the mobility of people, the religious environment
and other aspects of social and economic life.

The research program focuses on the following
categories:

1) Literary sources, such as geographical and
hagiographical works, chronicles, Conciliar
Acts, Notitiae Episcopatum and letters, provide
an accurate list of the Cretan settlements and
highlight the administrative and ecclesiastical
status of each of them. In particular, hagi-
ographical texts reveal important aspects of
the settlements’ socio-economic history and
preserve toponyms relating to their micro-ge-
ography.

2) Inscriptions shed light upon building activity
by political and ecclesiastical authorities. They
also provide specific information about the
physical presence of different social groups,
urban elites, artisans and traders.

3) In terms of coinage, the absence of numismatic
finds from excavated sites has received special
attention within the controversial question of
the collapse of the urban economy in the so-
called Byzantine “Dark Ages”. The recording
of published numismatic finds from the Cretan
settlements will allow for a re-consideration of
this issue.

4) Dated, inscribed seals contribute to the discus-
sion of the status of the cities and their place
in the administrative system of Crete. Further-
more, the localities where the seals were found
serve as topographical indicators for the spatial
organisation of the cities, since the find-spots
of seals may indicate the city’s religious and
administrative centres.

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Fig. 4 Crete. Cities and settlements known from archae-
ological evidence (Map created by K Armstrong from
data gathered by the project as of 28 February 2015).
Archaeological Data Retrieval

The second thread of the project is the retrieval of all the available archaeological data concerning Cretan settlements of the Early Byzantine period. Along with the settlements known through written sources, a large number of important settlements are understood from archaeological evidence (fig. 4).

The first scientific archaeological records date back to the nineteenth century, thanks to the pioneering work of archaeologists like A. Taramelli, F. Halbherr and St. Xanthoudidis. Although they were mainly interested in inscriptions or prehistoric antiquities, they did not ignore the Byzantine monuments when they encountered them. The monumental work of G. Gerola, who explored the island from one end to the other, is dedicated exclusively to the medieval monuments of Crete. He bequeathed four precious volumes to us, plus a photographic archive (Gerola, 1905-1932; Curuni & Donati, 1988). A modern contributor to the first archaeologists’ work was I. Sanders. His book on Roman Crete, the fruit of diligent topographical fieldwork, also incorporated the monuments of the Early Byzantine period (Sanders, 1982). Modern archaeological investigations on the island include a significant number of extensive topographical surveys and, importantly, intensive field surveys, conducted in different regions of the island, such as Sphakia, Akrotiri Peninsula, Chamalevri, Hagios Vassileios, Knossos, Malia, Kavousi, Kommos, Hagiocharango, Western Messara, Vrokastro, Gournia, Kavousi, Itanos, Gavdos and Chryssi (cf. Gkiasta, 2008 for further bibliography). Although most of them focus on the prehistoric period, they rescue valuable information on the rapidly evolving Cretan landscape. Cities of the Early Byzantine period that have been systematically excavated number only two: the capital Gortyn (Di Vita, 2010; Zanini 2013b) and Eleutherna, a small sized city in the centre of the island (Tsigonaki, 2007; 2012). For the majority of sites, the archaeological data derive from the rescue excavations conducted by the Greek Archaeological Service.

The scarcity and uncertainty of the archaeological evidence becomes clear from the above brief account of the archaeological research reality on the island. The uncertainty concerns both the date and the function of the sites, the two principal axes of any spatial-temporal analysis. Besides some obviously incorrect dating given in old publications, the application of different systems of periodisation, along with the fuzzy use of terms like Greco-Roman, Late Roman, Late Antiquity, Early Christian or “Dark Ages” in modern publications, further complicate the analysis. The interpretation of function and the typological categorisation of architectural structures is a major problem for any spatial analysis project, whatever the historical period. How to distinguish a village from a hamlet or a farmstead or even a monastery when the only information available derives from isolated rescue excavations or surface surveys? Even worse, the meaning of relating terms varies from one publication to another (cf. Farinetti, 2011: 27-39).

All published information on the remains of fortifications, infrastructure, public and religious monuments, houses, workshops and cemeteries are being recorded in a relational database, alongside and related to the historical evidence discussed above, and with links to a GIS system, realised in an Arc GIS 10.2 environment. Moreover, the GIS contains additional information, such as terrain models, geology and hydrology. The uncertainties within the current archaeological data are tempered by a critical reading of the published information and parallel topographical fieldwork. The latter includes the localisation of sites, surveying them with high-precision GPS, recording detailed descriptions and the photographic documentation of the archaeological structures. This process not only fills the large gaps in the published documentation, but also ensures the accuracy of the localisation of specific structures which is required for spatial analysis in a GIS environment.

At this stage of the project fieldwork is focused on fortifications. Scholars agree that the need for security and defence against external invaders was a key factor in the radical transformation of Byzantine settlements, which led either to the fortification of their old acropolis or their reloca-
tion to safer places in the hinterland (Saradi, 2006: 464-70). We consider Cretan fortifications a prime indicator of the spatial re-organisation of the settlements, which have been systematically neglected by previous research. The historiographical topos, according to which the urban population had abandoned the cities of the island already in the second half of the seventh century so that Crete fell defenceless into the hands of the Arabs, is until now very powerful (for example Cosentino, 2013: 99). Scholars passed over the fortifications of the Early Byzantine period without recognising them. The publication of the Early Byzantine fortifications at Gortyn (fig. 5) (Perna, 2012: 145-67), Eleutherna (fig. 5) (Tsigonaki, 2007: 272-76), Kydonia (Andrianakis, 2012), Herakleion (Andrianakis, 2013) and Lyktos (Gigourtakis, 2011-2013) contributes to a shift in the dominant historiographical perception. For all the above cases a date of the seventh or the eighth century has been proposed based, not only on historical arguments, but also, as regarding Eleutherna, to archaeological data provided by systematic excavations (Tsigonaki, 2015). Through the study of the fortifications, the issue of the abandonment of the cities of Crete in the seventh century is placed on a new footing.

The increasing volume of data regarding the fortified settlements in Early Byzantine Crete is valuable in terms of regional research, so each dot added to the map is precious. However, in this process methodological problems arise, such as the identification, documentation and dating of fortifications, but broader historical issues also arise. Which types of settlements were eventually fortified? Can we detect specific characteristics which are related to the geographical-environmental parameters? Did central planning, evoking the militarisation of the island, actually exist? Does the fortification signal the shrinking of the city or the demarcation of controlled areas within the city? How do the constraints of security redefine the relationship between towns and country during a period of prolonged insecurity? Some examples will illustrate the complexity of these issues.
Syia (Sougia) is an important coastal settlement, where the landscape has been disfigured by unregulated building activities. It is located to the west of the nearby city of Lissos which remains largely unexplored but also untouched by modern human interventions. During topographical fieldwork, sections of Early Byzantine fortifications have been discovered at Syia, but not at Lissos. The contrast between the fortified settlement of Syia and the unfortified official city of Lissos should be emphasised, although it is not presently placed within a comprehensive narrative. Evidence for the dating of the defensive work at Syia to the Early Byzantine period is provided by masonry style, a chronological criterion that is not entirely reliable, but is in most cases, the only one available.

The fortification on the acropolis of Matala, one of Gortyn’s harbours sites, was published by the Kommos Survey team. This section of the wider publication has passed largely unnoticed, concealed, as it is, in a collection largely dedicated to a prehistoric Cretan site. The fortification is dated to the fifth century on the basis of pottery from the surface survey (Shaw & Shaw, 1995: 329, 335, 337-38, 672). However, strong similarities of the masonry style, building technique and general form between the Matala fortification and those at Gortyn and Eleutherna leaves no doubt that these defensive works are contemporary, all dating to the seventh or the beginning of the eighth century (fig. 5). The question here involves the representativeness of surface findings; in simple words, how reliable is the evidence of the surface pottery (which is de facto out of context) for the dating of the fortification on a multiperiod site, particularly on a strongly eroded surface?

The type of masonry also indicates a date in the seventh or the beginning of the eighth century for the fortification at Veni Korphi (fig. 5). At Veni Korphi the fortification proves beyond any doubt the existence of a hitherto completely unknown Early Byzantine settlement in central Crete, whose identification and character should be investigated.

Remote Sensing and GIS Spatial Analysis

The GIS-based spatial analysis, making use of the fieldwork data, remote sensing (satellite imagery and aerial photography) and the processing of digital elevation models (DEMs) will comprise the third thread of the project.

The way we perceive and understand the landscape today is radically different from that of previous decades. Apart from visiting and exploring sites, an absolutely essential process, where the researcher experiences the landscape with all his or her senses, we have at our disposal analytical tools, such as aerial or satellite photography, that distance the researcher, permitting an overview of the landscape. Traditional aerial photography and alternative images taken through the use of Unmanned Aerial Vehicles (UAVs) allow us to capture the details of specific Early Byzantine settlements and to digitise their internal architectural features, as well as consider their landscape settings. New aerial reconnaissance is being conducted using a UAV with a digital camera that allows the production of detailed topographic models, particularly in a mountainous landscape like that of Crete, using photogrammetric approaches (Cantoro & Sarris, 2012). This method is coupled with an examination of older aerial photos provided by the Greek Geographic Service of the Hellenic Army and old topographical maps. Where excavation plans are available, they will add detailed dating evidence to the investigation, permitting an examination of the changing use of space within the settlement over time.

A key component of the project is the use of GIS to perform various analytical tasks using the historical and archaeological records. Rather than simply acting as a repository for the spatial data, the GIS will also be employed analytically at the scale of the whole island and in order to study micro-regions where we have a more complete picture of the archaeological record. This study will include Site Location Modelling (identifying common landscape elements present at Early Byzantine settlements), Site Catchment Analysis (examining the resources available for each set-
tlement) and Territorial Models (looking at political control and settlement hierarchies).

The GIS will also allow for an investigation of settlement networks and communication as well as their accessibility to the sea, their proximity to cultivable territories, to water sources and to sources of raw materials. Modelling and classification of the landforms will provide an insight into the naturally fortified character of certain settlements, their inter-visibility and the defence-network planning. The results of remote sensing analysis combined in the project GIS will allow an assessment of various aspects of the settlements, such as the estimation of the size of the inhabited area or the area and morphology of the enclosed urban space and the precise location and nature of fortifications.

Criticisms have been levelled at this sort of GIS analysis: opponents have argued that it places too much emphasis on the geographical features of the region or the micro-region (Gaffney & Van Leusen, 1995), rather than to social and historical factors that have an influence on the human use of space. However, up to now, the geographical factors in the settlement history of early Byzantine Crete have gone wholly unexamined in the literature. Balance is needed, and while a characterisation of past people as economic mini-misers-maximisers is certainly inappropriate, the environmental characteristics of the space in which humans act has some role to play; the question concerns the extent of this role. Therefore this analysis will employ, wherever possible, models and methodologies that humanise the spatial analysis. This includes introducing social factors into the location models, such as relational (for example, time-based rather than Euclidean) calculations of distances, “fuzzy” topographical analysis (Fisher, Wood & Cheng 2004) and visibility analysis (Wheatley & Gillings, 2000). The latter is crucial for the investigation of a centrally-planned defence system, if one exists. Besides, historicity must certainly be a factor in these models, considering how the previous settlement patterns exert influence on the Early Byzantine use of the landscape.

Epilogue

Considering the overall scheme of the data and the structure of the project (fig. 1) the methodology proposed is straightforward: the collection and analysis of information about the geographical and environmental setting of the settlements allows a better understanding of the interaction between human interventions in space and geographical features related to these interventions. People acting in and on spaces and places are at the centre of this analysis, which is why the incorporation of all available information from historical sources and archaeological data is necessary.

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