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Department of Archaeology

‘Contextualisation of three ports of the Hellenistic and Roman periods on Crete’

by

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Declaration

I certify that:

a) The following dissertation is my own original work.
b) The source of all non-original material is clearly indicated.
c) All material presented by me for other modules is clearly indicated.
d) All assistance received has been acknowledged.

Signed

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Abstract

Even with increasing interest in Hellenistic and Roman Crete the story of the settlements that once lined the coastline remains untold. These settlements, many of which have been destroyed by the advance of urban and tourist development or by coastal erosion, played an important part in Hellenistic and Roman Crete. All three of the harbours in this study can trace their origins back to the Archaic and Classical periods when the coastal settlements apparently prospered.

This comparative study of Hierapytna, Hersonissos and Phalasarna during the Hellenistic and Roman periods looks at these harbours and urban centres through two periods of change. It begins by showing how these harbour towns developed under a city-state system of control and in an environment that was politically and competitively challenging and where investment in harbour facilities was clearly limited in comparison to the previous periods and then goes on to look at the build-up and arrival of another period of prosperity based on the benefits of being a Roman province in the late first to third centuries C.E.

The study considers the development of each harbour town assessing the written, epigraphical and archaeological evidence and examines the similarities and differences between each of these harbours and their areas of urban occupation. The study reveals that whilst the evidence today for the harbour and urban areas is very limited (except possibly for Phalasarna) it is possible to assess these harbour towns and the changes that took place within them. Particularly in the case of Hierapytna it also shows how much the landscape has changed since the last century as urban development has expanded and an entire ancient city and its harbour has been lost.

Preface

The focus of this study is on the period from circa 330 BCE to 565 CE or from the Hellenistic into the Late Roman period.

Dates are shown as B.C.E. (Before Common Era) unless they are referenced by a specific event or translation. For the purpose of this work the ‘Common Era’ has been taken as synonymous with ‘Anno Domini’.

As I am very much a novice in the Greek language I have based my study largely on research material that has been published in English.

Acknowledgements

The foundations to this research stem from my work with the Colloquium for Post-Minoan Crete in the latter part of the 1990's. Sadly business commitments kept me occupied until 2015 when I was able to consider taking early retirement to return to full-time study and the world of Hellenistic and Roman Crete.

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Abbreviations

ABSA	Annual of the British School at Athens
ADelt	Αρχαιολογικόν Δελτίον
AJA	American Journal of Archaeology
AR	Archaeological Reports
ASAtene	Annuario della Scuola archeologica di Atene e delle missioni italiana in Oriente.
BAR	British Archaeological Reports
BCH	Bulletin de correspondence hellénique
IC	Guarducci, M., (1935-1950). *Inscriptiones Creticae I-IV*. Rome.
SIG	Dittenberg, G. (ed.), (1915 – 21). *Sylloge Inscriptionum Graecarum* I-IV.

CONTEXTUALISATION OF THREE PORTS OF THE HELLENISTIC AND ROMAN PERIODS ON CRETE.

Chapter 1: Introduction

The study of Hellenistic and Roman Crete has significantly advanced since the work of Ian Sanders in the late 1970's. The publication of Sanders' research in 1982 (Sanders 1982) presented a tantalizing glimpse of Crete in the Roman period and in the thirty-four years that have followed our knowledge and understanding of rural and urban settlement during the Hellenistic and Roman periods has increased. Excavations at urban sites such as Aptera, Chania, Eleutherna, Gortyn, Knossos, Lato, Lyttos and Prinias have provided new information about the foundation, development and organisation of these urban centres along with a better understanding of the relationship between the cities and towns and the surrounding countryside. Ongoing fieldwork by the British School at Athens at Knossos (Stewart *et al*. 2015) and by the Scuola Archeologica Italiana di Atene at Gortyn (Lippolis 2016) has begun to address the issues of layout, planning, placement and function of buildings within these inland urban centres and is already beginning to show that change within the urban centres was a continuous process that began on Crete in the Archaic/Classical period and continued into the Roman period and beyond. Recent studies of individual public buildings within the urban landscape have also embraced a new approach as seen in the study of the Roman theatre at Aptera (Niniou-Kindeli *et al*. 2016) where investigation has generated a detailed account not only of the surviving remains but also of the structural changes that were made to the original Greek structure to adapt the theatre to the requirements of Roman performance. This research has also shown that we should consider other similar structures across the island to see if they too have earlier origins.

Since Sanders' work there has also been a series of detailed field surveys, for example on the Lasithi Plain (Watrous 1982), at Gournia (Watrous *et* al. 2012), Kavousi (Haggis 1996), Vrokastro (Hayden *et al*. 1992), Knossos (Stewart *et al*. 2015) and also Raab's research into rural settlement on the Akrotiri Peninsula (Raab 2001). The surveys represent a different approach to collecting and analysing data and have has generated a wealth of previously unavailable information on the countryside, settlements and the environment. The latter point is especially important as whilst we are learning more about the

environment during the Roman period we have virtually no data available for the environment during the Hellenistic period.

Whilst our knowledge and understanding may have improved since the late 1970's the attitude towards sites and monuments of the Hellenistic and Roman periods has not changed and, in my own mind, it has worsened. The urban landscape of the coastal settlements, harbours and ports that together played an important part in the island's economy during the Hellenistic and Roman periods, remain understudied and at risk. Over the years an increasing number of the coastal urban centres have suffered from the effects of modern urban expansion and tourist development, often allowing for only rushed archaeological excavation or observations. Frequently it is difficult to gain access to information on these sites and the finds that have been made. The recent change in the political and financial environment in Greece as a whole is a new factor to consider and is already having an impact in the archaeological sector.

Of the two main periods included in this study the settlements of the Hellenistic Crete are the least studied. From the perspective of the urban landscape the architecture is often confused with that of the preceding Archaic and Classical periods with the result that earlier material can be wrongly assigned and dated to the Hellenistic period. The same can be said of the ceramic record with local pottery, like the eastern Cretan wares, where the absence of detailed analytical work and study has resulted in variance in the dating of these production centres (Vogeikoff-Brogan 2004, 215).

This comparative study of Hierapytna, Hersonissos and Phalasarna during the Hellenistic and Roman periods aims to look at these harbours and urban centres through two periods of change and to fill in a considerable gap in the study of the archaeology of Crete. These three harbour towns were selected from a long list of possible candidates. The list included towns such as Kydonia and Kisamos, where there has been several excavations and surveys. In the end it was decided to select Hierapytna, Hersonissos and Phalasarna as a testing ground to see if it would be possible to answer the research questions in situations where the information was likely to be limited.

The study begins by showing how these harbour towns developed under a city-state system of control and in an environment that was politically and competitively challenging and

where investment in harbour facilities was clearly limited in comparison to the previous periods and then goes on to look at the build-up and arrival of another period of prosperity based on the benefits of being a Roman province in the second and third centuries C.E.

The study considers the development of each of these harbour towns by assessing the available written, epigraphical and archaeological evidence, and examines the similarities and differences between each of these harbours and their areas of urban occupation. Whilst this study does not answer all the questions about the development of these urban centres on the Cretan coastline during the Hellenistic and Roman periods it aspires to further enhance our perspective of Crete during periods under discussion and to stimulate further research through the research questions posed here.

Research Questions

The study is aimed to explore two research questions: -

- What can the surviving evidence of the Hellenistic harbours tell us about the way that they were organised and developed?

- What evidence is there of change in the harbours their urban hinterlands in the immediate post-conquest period?

Chronology

The more widely accepted chronology has been used as the basis for this study.

630 – 480 B.C.E.	Archaic
480 – 338 B.C.E.	Classical
338 – 67 B.C.E.	Hellenistic
67 B.C.E. – 395 C.E.	Roman
395 – 827 C.E.	Late Roman/First Byzantine/ Late Antique period

Within this chronological model it is recognised that there is some movement of the dates amongst scholars. The fall of Lappa and the cessation of the hostilities in 67 B.C.E. marks the end of the three-year Roman military invasion (Dio. *Roman History*. 36.17) and is

generally taken as the start of the Roman period though in practical terms it may have taken some years to complete the reorganisation of administrative affairs on the island.

The commencement of the Late Roman/Early Byzantine/Late Antique period is less easy to define and there is confusion over the terminology of this period. The start date of the period taken here is arbitrary and based on the separation that occurred between the western and eastern parts of the Roman Empire at this date. The reorganisation of the Roman Empire did have an economic impact that affected Crete. Marangou has argued that the island's export economy had ceased by the beginning of the fourth century C.E. (Marangou 1999, 278). Whilst there seems to have been a change in trading patterns, this view is not correct as exports clearly continued into the Late Antique period.

Certainly, during the fourth century C.E. onwards it is likely that there was disruption and perhaps reorganisation of shipping traffic from Egypt as the port area of Alexandria suffered damaged from a sequence of natural disasters that restricted its operational capabilities (Kiss 2007, 191). Gallimore has observed a change in the ceramic record at Hierapytna for this period which may have some relation to there being less traffic using the East-West shipping route (Gallimore 2015a, 298).

In terms of layouts, buildings, and service structures within the urban centres it is evident that the beginning of the Late Roman period is one of rebuilding and re-organisation. The earthquake of 365 C.E., and subsequent ones (Stiros, 2010), caused a significant amount of structural damage that is evident in settlements across the island and it is clear that the communities took some time to recover from this. Some areas within urban centres were abandoned and other parts rebuilt, usually with a reduction in surface areas and sometimes with a different function (see Lippolis, 2016, 171 for the damage and rebuilding at Gortyn and Themelis 2009. for the damage at Eleutherna). Sweetman is of the opinion that the effects of the earthquake were short-lived and that some of the earlier prosperity seen in the coastal settlements quickly returned (Sweetman 2013, 13). However, whether this return of prosperity was island-wide is questionable and there may be other reasons for this regeneration where it occurs. Gallimore suggests, for instance, that Hierapytna experienced economic decline in the late Roman period due to the silting up of the harbour and the changing focus in trade patterns (Gallimore 2015b, 108).

There is an argument to assign the commencement of the late Roman period on Crete to 365 C.E. due to the disruption and changes that took place following the earthquake of this date.

The chronological period of 395 to 827 C.E. on Crete is perhaps better described as having two parts or phases. The first is an intermediate late Roman phase that slides almost unnoticed into the Early Byzantine/Late Antique period. In the archaeological record this transition is witnessed by the mass construction of Christian churches. Sweetman sees this change as taking place in the early fifth century C.E. but taking into consideration the reduction in Mediterranean trade and the restriction of coinage that occurs in the first quarter of the sixth century C.E. perhaps this later date is more relevant (Sweetman 2013, 6). It is worth observing that the Early Byzantine period is well attested through the large amounts of pottery that have been excavated from sites like Gortyn and Eleutherna.

Problems and Limitations

The study encompasses both the harbour areas and their urban hinterlands, looking at the development of both areas and how they relate to each other. Generally speaking the harbours selected for this study have been relatively well studied and there is a good corpus of research material, site reports and academic articles available. The urban areas are more problematic and where there has been excavation, the sites tend to remain unpublished apart from being briefly referenced in the *Archaeological Reports* or Greek archaeological journals such as *Archaiologikon Deltion* and *Kretika Chronika*. This situation has changed recently with *Archaeological Reports* no longer publishing site information.

Answering the posed research questions is not always easy and straightforward. Further problems were encountered in locating many of the excavation sites on town plans due to their referencing by family plot names without supporting information. These limitations mean that the study has ended up as a broad overview using the available evidence in a different way and very clearly highlighting the gaps in our knowledge and information.

A background to the research topic

1. Geography

The island of Crete is 260 km long and between 12 and 60 km wide. Crete is the largest island in the modern state of Greece and after Cyprus the second biggest in the Eastern Mediterranean. The island is crossed west to east by a high mountain range comprising the White Mountains in the west, the mountain of Idi in the middle and the mountain of Dikti to the east (Figure 1). Seasonal rivers originating in the mountains run through fertile valleys to the coast and the fertile plains of Lasithi in the east and the Mesara in the southern part of the central region of the island have produced evidence of agricultural exploitation since the Neolithic period.

The shore-length around the island, comprising sandy beaches and rocky shores, is 1046 km. The coastline has changed significantly and the present shoreline has to be looked upon with caution. The effects of the tectonic movement (in particular to that of the Western Hellenic fault line that lies off western Crete) and the eustatic rise in sea levels has impacted on the coastline and the settlements that once stood beside it. For all periods of human occupation there are sites that are now underwater, sites that have been moved slightly inland and sites that now sit on the shore but above the present sea-level. Archaeologically this has resulted in some sites being subject to destruction and erosion whilst others have been better preserved. Of the harbours discussed here we find that the combined effects of tectonic movement and the eustatic rise have resulted in a rise in the sea level since Roman times of about 1.2 metres at Hersonissos (Leatham and Hood 1958-9, 266; Mourtzas 2012, 45), a similar rise in sea levels for the outer harbour area at Hierapytna (Mourtzas 1998, 1563). However, at Phalasarna as the result of uplift the ancient port is now about 6.6 metres above sea level and 100 metres from the present shore line (Pirazzoli *et al*., 1992).

Mention should also be made of the tidal variance. There has been little study of this in the context of ancient coastal sites. Whilst not always obvious, modern records show that there can be a variance between high and low tide around the island. At Herakleion the maximum modern tidal range is 0.09 metres, which may not normally be of significance, unless the high tide coincides with a period of high winds coming off the sea (Tide-Forecast, 2016.). Tidal variance would have made little difference at Hersonissos or Hierapytna, but might be relevant to the harbour at Phalasarna as it was an inland harbour.

Other natural elements that have affected coastal settlement include the problems caused by the winds hitting the island. From November to April the winds bring rain, especially in the southern part of the island. The southerly and south-westerly winds comprising air from the African region are warm and often laden with dust particles. These winds can often rise to gale force offshore and pose a danger to shipping. They can restrict shipping activity and make access to the harbours along the south coast difficult (Ogilvie 1945, 209). St Paul witnessed this first hand when the Alexandrian grain merchantman on which he was a passenger got into difficulties with the winds off Crete whilst on route to Rome during the reign of Tiberius. The merchantman would have sailed past Hierapytna on the southern coast to seek shelter off the coast of Kaloi Limenes ('Fair Havens'). Within the shelter of the island the sea was still rough and the crew had to throw some of the cargo overboard to prevent the ship taking on water. The commentary in the *Book of Acts* shows that not all harbours along this coastline were regarded as good winter harbours and that St Paul needed to travel as far as Phoinix, a small promontory settlement west of present day Loutro, before they could find a suitable harbour (*Acts* 27: 1-44). St Paul ended up wintering at Lasaia amongst the Jewish community there (Harrison 1993, 215).

Local north to north-west winds prevail all year. These winds are gentler than the winter gales and tend to blow in the afternoon bringing coolness and moisture that is important for crop growing in the coastal plain. In the spring and autumn, the coastline is hit by a *sirócco* wind that generates large waves and a wind strong enough to cause structural damage and making walking difficult in exposed areas (Rackham and Moody 1996, 36-37). The *sirocco* wind would have impacted on shipping crossing the Mediterranean especially in the spring which was the period when grain traffic from Alexandria was at its peak. The harvest period in Egypt ran from the beginning of April to the end of May which meant that the months of May and June were peak shipping periods to Rome (Rickman 1971, 303). As the wind comes without much warning, the inlets and harbours of Crete would have offered safe anchorage during this brief period of rough seas.

2. Crete, the land of 100 cities

Whilst the roots of the tradition of Crete as the land of 100 cities may be earlier (Perlman 1992, 193), it is Homer who makes the first literary reference in the Iliad (Homer *Iliad.* 2.649 though he contradicts this view in the *Odyssey* where he refers to it as having 90

towns; Homer *Odyssey*.19.172-7)). Over time the image of Crete as the land of 100 cities or *ἑκατόμπολις* (*ekatompolis*) became a firm tradition featuring in the writings of classical authors who went on to make various attempts to list the fabled 100 cities or *poleis*. Evidence that this tradition persisted well into Roman times can be seen in the funerary inscription of a gladiator from Gortyn where it is used in the epitaph to enhance his status (*IC*.IV.373).

Pliny, writing in the first century C.E. refers to Crete being of "renown" for its 100 cities but only manages to list 40 with the explanation that "about 60 other towns of only the memory exists" (Pliny *Hist Nat.* IV.xii.59). Whether the 60 towns were abandoned by this time or Pliny just did not know their names is a matter of debate. Strabo on the other hand may have visited Crete around 31 B.C.E. and mentions that his own family had connections with the island and that he was not a stranger to Knossos (Strabo *Geography*, X. IV. 10). His commentary on the island though is clearly drawn from several third-party sources and for someone who claimed to know the island well his writings are rather sparse on useful detail, especially for eastern Crete.

In the Hellenistic period the island of Crete was territorially divided up into a series of city-states of various shapes and size who co-existed economically with the aid of local and more distant treaties. The pressures on settlement that had been evident since the Archaic period escalated during the Hellenistic period. Territory was certainly very important as reflected in Strabo's account of the conquest of Praisos circa 140 B.C.E. and the subsequent dispute over the new border between Hierapytna and Itanos to which Rome was asked to intervene and settle the dispute (Strabo *Geography*, X. 479; IC. III.iv, no.9, lines 61-65). Territorial dominance also extended to and on the sea and the settlements along the coastline became important for the control of the shipping lanes that passed along it and the trade that this generated. Many of the coastal urban centres seem to have been founded in the late Archaic and Classical periods. Perlman has suggested that the founding of some of these coastal settlements may have involved the relocation of groups of citizens from the inland cities (Perlman 1992, 202.).

3. Hellenistic and Roman coastal settlement

With the use and combined study of classical texts, archaeological, epigraphical and numismatic evidence it is possible to begin to visualise the urban landscape of the Cretan

coastline during the Hellenistic and Roman periods. In the Hellenistic period the urban landscape of the coast was clearly dominated by the larger harbours and trading centres of Hierapytna, Itanos, Kydonia and Phalasarna. These were politically strong *poleis* that had developed from smaller Archaic foundations to become large and powerful entities with trading connections to places like Rhodes, Cyrene, Egypt, the Greek mainland and Peloponnese and Phoenicia (Cross 2011, 57). Their locations in eastern and western Crete made them well placed to benefit from shipping crossing the Mediterranean and this was undoubtedly a significant factor in their development and growth during the Hellenistic period. Out of the four harbours cited above only Hierapytna seems to have maintained operations to a level that it could be classed as a port during the Roman period.

During the Hellenistic period there were other smaller settlements along the coast that had harbours and which developed as trading centres. Cross in his study of Cretan Hellenistic city-states identifies 33, including Hersonissos, such coastal settlements of which half can be classed as *poleis* and the remainder as coastal settlements or trading centres for inland *poleis* (Cross 2011, 53-58). These coastal settlements were of varying size and status and most them have yet to be properly investigated and researched. Their distribution around the island (Figure 2) shows how important the coastal plain and access to the sea had become in the Hellenistic period. As part of their function, these smaller coastal settlements are likely to have played an important role as boarding and stopping off-points in coastal communications around the island and as distribution centres for goods and produce shipped along the coast. Some of these settlements, such as Kastelli Kissamou and Phoinix, continued to be operational and clearly prospered during the Roman period, though there appears to have been some reorganisation and rethinking which may account for Hersonissos being upgraded in this period.

4. Archaeological Backgrounds

1. Hersonissos

The acropolis of the ancient *polis* at Hersonissos is thought to have been located to the south of the peninsula of Akrotiri Chersonisos, just north-west of the modern village of Limenas Chersonisou (Sanders 1982, 144-46 (6/7)). The coastal township here grew up around a rocky promontory jutting out to the sea and surrounded on both sides by shallow water and sandy beaches. It is possible that the promontory was the site of early occupation and was clearly defendable. Minoan pottery and structural remains have been

found in the area of the promontory (Leatham and Hood. 1958-9, 266; *AR* 2003-4, 78; *ADelt* 52 Chr, 991-2). Remains of pre-Roman stonework are evident on promontory but these are undated and their function is unclear. Pearlman is of the opinion that the *polis* here was founded in the Classical period (Perlman 2004, 1155) and remains of a section of the quayside may date from this period (Leatham and Hood 1958-9, 269-70).

2. Hierapytna

The origins of the *polis* Hierapytna are not clear. Red-Figure amphora from a tomb discovered during rescue excavations in the centre of the modern town are indicative of settlement in the area during the fifth century B.C.E. (Davaras 1972, 647, pl. 602; Papadakis 1986, 78-80). The *polis* minted coinage from the fourth century B.C.E. onwards. Several plaques dating from the Archaic period, including one containing a representation of the goddess Artemis are listed as being in the Ierapetra museum collection. (Papadakis 1986, 77-80).

The area of the ancient city now lies beneath the modern town of Ierapetra, though clearly on a different footprint. The actual location and size of the Hellenistic urban area is uncertain and the low number of Hellenistic finds can be attributed to archaeological investigations stopping at the Roman levels (Gallimore 2015b, 108) and the problem of a relatively high water table in this area (Gallimore 2015a, 11).

3. Phalasarna

The *polis* of Phalasarna also has an early foundation date. Situated in the Bay of Livadi in north western Crete the inland harbour town of Phalasarna was well established by the Hellenistic period. In many ways it was the perfect harbour, sheltered behind the promontory of Cape Koutri, and built as concealed inland port and with an entry passage that could be controlled and defended if needed. Additionally, the slopes of the promontory and the adjoining plain offered space for the city with a topography that facilitated the minimum of defensive fortifications.

The settlement at Phalasarna originated in the Archaic period. A cemetery containing both pithoi and cist-graves has been found dating to this period. A Corinthian aryballos and other pottery from this cemetery are suggestive of established external trading connections (*AR* 1970-71, 32; *ADelt* 24 Chr 2, 431-3). Some of the structures in the urban and harbour

areas may date from this period. The main building phase at Phalasarna took place in the Classical period when stone was quarried along the rocky coast to the southeast for the new building work in the urban and harbour areas. Today the remains of at least three temples, public buildings (one of which had two floors) and houses, all constructed of regular blocks of stone in the isodomic or pseudo-isodomic style and dating to this period can be seen spread across the slopes of the acropolis. The presence of several cisterns, wells and tanks indicates that fresh water was a valuable resource, albeit limited. The nearest water source was likely to have been 7 kilometres to the south near Platanos (Hadjidaki 1992, 244). The urban area is largely unexcavated.

The area selected for the construction of the harbour seems to have been originally a sea water lagoon (Hadjidaki 2001, 15). The possibility of Phoenician influence on the design and layout of the harbour is certainly something that merits further exploration (Markoe 2000, 69). The earliest mention of the harbour is that of Scylax of Caryanda in the fourth century B.C.E who refers to it as "*Phalasarna cum portu clauso*" – i.e "Phalasarna with a closed harbour" (Pseudo-Scylax, *Periplous* 47). This has been interpreted in many ways but the best way to describe this is that unlike other harbours where foreign ships could anchor without protection, the harbour at Phalasarna was located within the city's fortifications, which was the true state of affairs.

As with the other Cretan city-states, the minting of coins from the fourth century B.C.E. is an indicator that Phalasarna had a secure economic structure. The fineness and quality of the quayside and tower stonework at Phalasarna during the Classical and Early Hellenistic periods is another indicator that the economy of this city-state was relatively healthy. Coming at a time when trade with Ptolemaic Egypt was expanding the construction of the harbour can be viewed as an investment on behalf of the community and an expression of the desire not only to be known as having the best mercenary army but also as having the finest harbour on Crete (Hadjidaki 2001, 155).

Chapter 2. The Hellenistic *Poleis* and their harbours

Introduction

The coastal settlements of Hersonissos, Hieraptyna and Phalasarna were well established by the Hellenistic period. The origins of the settlements at Hierapytna and Phalasarna can be traced back to the Archaic period and at Hersonissos to the Classical period. In the Hellenistic period each of these settlements was a city-state or *polis* with land and territory that extended beyond the urban area.

The Hellenistic coastline was quite well settled comprising a mix of independent city-states, like Hieraptyna and Phalasarna, and what Cross terms as secondary settlements. These were smaller city-states, for example Hersonissos, and those settlements that had become harbours for the larger inland city-states (Cross 2011, 53-58; Figure 2). Cross identified a total 37 independent city-states and secondary settlements around the coastline. Using Cross's classification, it is possible to propose a further sub-division that can assist with our understanding of the coastline settlements during this period. This sub-division has three groups:-

Group One: Settlements with a large harbour and where the direct importing and exporting of goods is part of the economy. The scale of operations of the harbours in this group enables them to act transhipment centres for onward movement of goods to other cities on Crete. Hierapytna and Kydonia are examples of this group.

Group Two: Smaller trading centres that form part of the coastal trading network and use it to import and export goods. Their commercial actives are aimed at sustaining and supplying the needs of their communities and access to direct trade from overseas would have been on an ad hoc basis and mostly likely infrequent. Settlements in this group tend to have either small harbours or quayside frontages, e.g. Hersonissos, Lebena and Lisos.

Group Three: Military harbours where war ships may have been kept and military personnel embarked for oversea tours of duty. Phalasarna is currently the only example in this group on Crete.

Political Perspectives

Hersonissos

The city-state of Hersonissos had gained enough political stature and autonomy to have commenced the minting of its own coinage by circa 330 -280/270 B.C.E. (Perlman 2004, 1155). Territorially it was a small city-state but it was politically strong as seen with its inclusion in the treaty between Eumenes II and Cretan cities in 183 B.C.E. (*IC*. IV.179; *SIG*. 627).

Throughout the Hellenistic period Hersonissos maintained a close relationship with the inland city-state of Lyttos, located 12 km to the south and for whom it seems to have served as its harbour (Strabo *Geography,* X.IV.14). Relations between these two *poleis* may well go back as far as the sixth century B.C.E. (Viviers 1994, 252-54) but the signing of a *sympoliteia* treaty with Lyttos towards the end of the second century B.C.E. (*IC*.I.XIX.3A) signifies a period when both *poleis* seem to have been able to work together whilst maintaining their own political independence. The harbour serviced the needs of both its own community and that at Lyttos, and presumably several satellite settlements within its own *chora* and that of Lyttos.

Hierapytna

Surviving epigraphical evidence provides the image of a traditional Greek city with public buildings, such as the *prytaneion,* and open air meeting places. The *prytaneion* was the town hall of the city-state and housed the hearth of Hestia with its eternal fire. It was the place to which foreign visitors were invited for meals, as were the ambassadors from Magnesia in inscription *IC*. III. iii.3C. However, there are no clues as to the location of these buildings nor to the location of the *agora*.

The inscriptions also provide evidence of internal and external relations and confirm that as a city-state Hierapytna was a powerful force with warlike intentions when it came to the acquision of land and territory. This can be seen in the tense relationship between Hierapytna and the neighbouring city-state of Itanos (Papadakis 1986, 16). The city-state engaged in trade by treaty, as seen in the treaties with Olous and Rhodes (*IC*. III.iiiA). The treaties with Knossos, Gortyn and Lyttos demonstrate that Hierapytna was a major power on the island by the mid second century B.C.E.

Hierapytna was ruthless in its quest for expansion. In the second century B.C.E. it moved to annex the territories of Oleros and Priansos and between 145 and 140 B.C.E. it conquered and destroyed Praisos, inheriting a dispute over land near the sanctuary of Diktaian Zeus and the island of Leuke, now called Kouphonisi (Chaniotis 2005, 11-12). This expansion led to the movement of people as settlements were destroyed and slaves acquired. Strabo comments on the way people from a settlement called Larisa were moved to the city of Hierapytna (*Geography* IX.V.78). Bennett has estimated the territory of Hierapytna to have been 1050 km^2, making the territory of the Hellenistic city-state the largest on the island (Bennet 1990, 202).

There is little doubt that Hierapytna benefitted from its position on the coast close to the north-south routes that ran from Egypt to Athens. Certainly by the Hellenistic period it appears to be a well-established harbour and transhipment centre for eastern Crete. From here goods, produce and people would have been transported to the coastal satellite settlements on the southern and northern coasts and to other coastal trading points outside of the territorial boundaries.

Phalasarna

As a city-state Phalasarna was independent and relatively isolated in this part of western Crete. There has been little study of its territory but it is reasonable to assume that satellite settlements existed along the coast and inland. Its inland borders were shared with the city-state of Polyrrhenia, for which Cross suggests may have also originally shared the use of the harbour (Cross 2015, 248). If the port facilities were shared with Polyrrhenia then this arrangement is unlikely to have lasted for long as epigraphic evidence reveals a period of hostilities between the two city-states in the late fourth – early third centuries B.C.E. (*IC*. II.XI. 1).

Unlike Hersonissos and Hierapytna the ancient town and harbour area of Phalasarna has not yet been threatened by modern development. The remains of the *polis* town can be still seen upwards from the harbour area on the rocky slopes of Cape Koutri and across the plain. Hadjidaki has estimated the total area of the town to be about 60 ha (Hadjidaki 1992, 244). The fortifications that flank the landward east and north sides of acropolis have been dated to the fifth-fourth centuries B.C.E. The remainder of the fortifications at Phalasarna

have several phases that are linked to the establishment of the urban area and then to the development of the harbour.

The full extent and sequence of the fortifications around the town has yet to be studied but it is likely that the circuit around the urban area was built first as this area was settled before work commenced on the building of the harbour. It is possible that some of the defensive work may be connected to the period of hostilities with Polyrrhenia and again circa 184 B.C.E when Phalasarna seemingly got pulled into another warring dispute amongst city-states and when according to Polybius the town was actually occupied by a force of soldiers from Kydonia (*The Histories*, XXII.15).

It is clear that by the Hellenistic period Phalasarna had a reputation for the exporting of the services of armed mercenaries. In 171 B.C.E. a force of 3000 soldiers and generals from Knossos and Phalasarna was engaged in the army of Perseus of Macedon (Livy *The History of Rome*, XLII.51). A stylised image of a warship prow occurs on the peace treaty inscription between Phalasarna and Polyrrhenia and this may indicate that the harbour was a naval base as early as the third century B.C.E. (*IC*. II.XI. 1). The discovery of an inscribed slingshot and bronze coinage from the Phalasarna mint on Antikythera has also led to the suggestion of the existence of camps where mercenary armies were kept and trained (Kelly 2012, 288-289; Martiş *et al.*, 2006). If this is the case, then the importance of Phalasarna and the *polis'* involvement in Greek affairs generally needs to be reconsidered.

Phalasarna was not alone on Crete in having a military and naval associations. A treaty dating to circa 200-197 B.C.E. between Rhodes and Hierapytna refers to the recruiting of mercenaries on Crete to fight in the Rhodian army and sets out the terms under which the Rhodians could use the harbour at Hierapytna as a military and naval base to support this if needs be (de Souza 1999, 82-83). The involvement and presence of military contingents from other countries in eastern Crete was not unknown during the Hellenistic period and the harbour at Hierapytna would have offered a good base, treaties permitting. The same treaty also set out terms for enlisting the support and help of Hierapytna in fighting piracy. This is an important point as prolonged disruption by pirate attacks on the passing shipping would have resulted in a detrimental effect to Hierapytna's economy and it is reasonable to

assume that there were times when it was necessary to dispatch patrols to 'police' the seas when pirates were known to be active in the area.

Sailing around the coast of Crete in Hellenistic times may not have been made easy by the political environment of the city-states. Access to harbours outside of their own territories would have been dependent on agreements and alliances.

The Hellenistic harbours and urban areas

There are interesting differences between the harbours in this study during the Hellenistic period. The position of the main sailing routes across the Mediterranean certainly influenced the development and harbour operations of Hierapytna and Phalasarna. The trading contacts that came as the result of this helped their economies, especially from the contact with Ptolemaic Egypt that Hierapytna and Phalasarna both jointly benefitted from.

With frequent traffic sailing along the southern coast of Crete en route to and from Rome, there were good trading opportunities for importing and exporting goods. This situation was possibly enhanced with the fall of Delos in 88 B.C.E. and the subsequent reorganisation of trading routes. Physical evidence of Cretan exports at this time can be seen in the occurrence of east Cretan Hellenistic amphoras in both Alexandria and Ostia (Bowsky 1994, 7 and 15). Similarly, at Hierapytna imported amphora have been noted as coming from Campania, Africa, Egypt, Cilicia, Knidos Rhodes, Thasos, Syria-Palestine and Sicily (Gallimore 2015, 205).

Hersonissos on the other hand was on the side of the island that does not appear to have been serviced by the main sailing routes. The Hellenistic harbour here functioned as a local trading point servicing both its residents and those of Lyttos.

The archaeological evidence is challenging for all three harbour towns under discussion. The ancient city of Hierapytna was located in the modern Vigliá or Póles districts in the western part of modern Ierapetra (Figure 3). There is currently little physical evidence to support the expected size and scale of the Hellenistic harbour and its associated urban hinterland. Few remains that can be assigned to the Hellenistic period have survived in a landscape that has undergone quite a dramatic change over the centuries, including an

earthquake in 1508 that destroyed a large sector of the contemporary town; the landscape remains problematic and not properly understood.

From the remains and monuments seen and recorded by Cristoforo Buondelmonti (1414-1420), Onorio Belli (1582-96) and Thomas Spratt (1865) it is clear that evidence of the ancient city was a feature in the landscape for many centuries and the remains of some monuments, e.g. the large theatre that was recorded by Belli in 1586, remained visible until as late as the Second World War (Papadakis 1986, 43-44). The observations of the early travellers show that the process of destruction of standing structures and the removal of antiquities was something that continued over many centuries. The drawings and descriptions of the early travellers have become a valuable source of information for this city and even though many of the observed remains originate from the Roman period, the descriptions of the surrounding topography are useful in reconstructing the ancient landscape.

As is understood, the remains of the Hellenistic city and part of its harbour lie under the Roman city. Spratt informs us that "the chief part of the city occupied a level and low plateau between a watercourse opening to the sea near the large theatre and amphitheatre, and another nearly a mile or so to the west of it" (Spratt 1865a, 262-3). This watercourse is taken to be the western boundary of the ancient city but matching it with the modern landscape is not easy as there are now two watercourses in this same area and it is not clear which, if any, of these was the one that Spratt observed. The preference has been to opt for the stream that is called "Almirós" as beyond this to the west is a cemetery of first-second century C.E. date (*AR* 2006-2007, 98). The northern extent of the settlement in the Paramithás district seems to be marked by a large cemetery of similar date to the one on the western boundary (*AR* 1998-99, 119; Gallimore 2015a, 17). These are some of the boundaries of the later Roman city though and without firmer evidence it would be wrong to speculate that the footprint match is exactly the same.

Actual evidence of the dwellings within the Hellenistic city is limited and fragmented. The remains of Hellenistic houses have been reached on some sites where problems have not been encountered with the water table. These include the E. Phronimaki plot (*AR* 1988-1989, 102; *ADelt* 35 Chr, 518-21) and the Assariotaki plots (Gallimore 2015a, 55-56; Figure 4). These excavations have produced evidence to suggest the sequential transition

of houses from the late Hellenistic through to the early Roman period, as seen in the urban area at Hersonissos. Excavations on the Yiomelaki plot (Figure 4), which was located close to the modern shoreline also revealed evidence of destruction during the late Hellenistic period that has tentatively been associated with an attack on the town during the final stages of the Roman invasion in 67 B.C.E. (Gallimore 2015a, 59-60). The structures noted so far reveal nothing out of the ordinary and suggest that the urban area was nothing more than a normal Greek coastal town with a central area where the public buildings were located.

In his study of pottery from three localities including the Assariotaki and Yiomelaki plots, Gallimore proposed that the early settlement area was perhaps in the Manolianá district (Figure 3) close to an inlet which has been suggested as the location of an early harbour. He also suggested that expansion into the Vigliá district came after the destruction of Priasos and was linked to the subsequent population relocation to the town (Gallimore 2015a, 262-263). Examples of red-figure pelike that suggest an early date for the foundation of Hierpytna were found in the Manolianá district supporting the suggestion that the early settlement may be identified in this area (Papadakis 1986, 77-80).

The development of the harbours at Hierpytna is also not easy to understand. Traveller Cristoforo Buondelmonti writing in 1415 provides us with an early account of the ruins and landscape at that time:

"The town is built by the sea-shore, with a great number of buildings and columns. We also saw a big harbour. I concluded that due to age and action of the sea which spreads away to the south, the harbour has become silted up. The villagers who have settled there have converted it from the once famous port that it was into a fertile field. I noted buildings and huge temples spread over a large area and was most curious to observe parts of statues scattered about". (cited in Papadakis 1986, 38).

Buondelmonti was not the only traveller to observe this view of the harbour landscape but sadly this has now been lost to us. On the basis of the information that is available only a speculative overview of the development of the harbour can be advanced.

Of particular note in this context is the marshy area close to the coast. Spratt commented that this area of land was "cut off from the sea, and forming a malignant marsh that annually poisons the poor inhabitants with fever of a very malignant form" (Spratt 1865a, 255). Today this area is known as the "Mikrí Alikí" (small salt-pit) (Papadakis 1986, 45-46; Figure 5). Given the parallels with the utilisation of the swampy, marshy ground area at Phalasarna it is tempting to suggest that this may have originally been the site of an inland harbour as advanced by Gallimore (Figure 5), but currently there is no evidence to support this theory and it is more probable, as was originally suggested by Lehmann-Hartleben (1923, 201-2), that this area formed part of an inner harbour of a Roman date. However, whether it was accessed directly from the sea or through the coastal harbour is not yet properly understood.

The bay on which Hierapytna sits has also changed over time and two projecting moles are all that is visible of the ancient outer harbour basin. The moles have two phases, the first of which may be Hellenistic. This comprised the construction of two small breakwaters of rocks jutting out from the shore. They would have been almost like small jetties and would have offered a limited amount of shelter. Their function may have been more like modern groynes in preventing sand from moving along the beach and collecting at the end of the bay where the main harbour area was located. Concrete moles were added to these in the Roman period. This is suggests that there was not much of what could be called a harbour today and that the beaching of vessels and unloading onto smaller vessels whilst at anchor in the bay was practised. Today the landscape at the western end of the bay where the ancient city once sat is dominated by the Venetian fort and harbour (Figure 6) but in Hellenistic times this was most probably where vessels anchored and off loaded their goods. If there was a quayside frontage, then it may lie buried under the Venetian and modern towns.

Hersonissos was also a quayside harbour (Figure 7). Here various sections of the Hellenistic quay were observed by Leatham and Hood in their marine survey of the area in 1955 (Leatham and Hood 1958-59; Figure 8). The entire area has now suffered from tourist development with hotels and bars squeezed into every available plot of free land and the expansion of town has now run for a considerable distance in both directions along the coastline from the original village. Leatham and Hood considered that the promontory, or "kastri", may have served as the acropolis in Classical times and whilst there are clearly

remains on the headland, aside from a slight windbreak offered by the rocks and now occupied by the chapel of Ayia Paraskevi, the remainder of the promontory is a rather exposed location for the winter winds and storms that hit the northern coast (Leatham and Hood 1958-59, 266-7; Figure 9). That said, Leatham and Hood found evidence of Minoan structures on the west side of the promontory and a later basilica church was built in one of the most exposed parts (Leatham and Hood 1958-59, 266 and figure 2 for a sketch plan of the harbour).

The discovery of tombs and other remains of the Classical period in the area support the premise that this harbour town was established by this period (*AR* 2000-2001, 126). This coastal settlement was known for its temple of the goddess Artemis Britomartis. The temple is mentioned by Strabo (*Geography*, X. IV. 479.14) and in an inscription found in the area (*IC*.I.VII.4). The goddess also appeared on coinage of the period (Svoronos 1890, 49). Sanders suggests that the temple might have been located on a promontory located on the coast about one kilometre to the east of the harbour and town. This would have made it a prominent feature in the landscape both from land and sea (Sanders 1982, 146). If this was the case this might then account for the building of an early Christian basilica church on the top of this promontory, especially since it was distant from the main urban area of the town.

The shelter offered by the promontory, shallow waters and sandy beaches were perfect for a coastal settlement here. In its early stages of development Hersonissos may have been nothing more than a small coastal village where boats could be pulled up onto the beach. This changed though and a quayside frontage had been developed by the Hellenistic, if not in the Classical, period (Leatham and Hood 1958-59, 269-270; Figures 8 & 10). The creation of this quayside, made of squared blocks fitted together without mortar, has similarities with the Classical period harbour quays at Phalasarna. The stonework in the second basin at Phalasarna is likely to be closer to the date of the quay at Hersonissos and here the sea facing walling comprised carefully cut and joined ashlar sandstone blocks (Figure 11). The outward faces of the stone were chiselled smooth, which would have been necessary if vessels were docking against it (Frost and Hadjidaki 1990, 524). The creation of a quayside frontage presumably necessitated the building up and levelling off the ground on the landward side, thereby creating space for the stacking and storage of incoming and outgoing produce.

At some stage an enclosed harbour area was created utilising the shelter offered by the promontory. The first phase of this comprised a breakwater of huge rough boulders. With one entrance to the harbour this initiative was clearly done to improve the anchorage, presumably through the winter months. The dating of this first phase is not clear. This work is likely to be done after or in conjunction with the construction of the Classical/Hellenistic quay frontage. Sanders considers that the slight variance in the rocky breakwater to the later Roman concrete mole, as seen in Leatham and Hood's published plan, was of significance and he proposes a late Hellenistic date for this work (Leatham and Hood 1958-59, figure 2; Sanders 1982, 144-5).

The remains of the urban area for the Hellenistic period are limited. Modern development and the expansion of this tourist resort along the coastline has outpaced archaeological investigation and much has been destroyed in the process. Coastal and tidal erosion has also increased along this stretch of the coastline. Whilst some of the remains recorded in 1955 were still visible when visited in 2016 they are now further away from the shore line and more sections of walling and quay frontage have been exposed, some of which in a newly exposed area to the west of the promontory (Figure 9).

The impression for the Hellenistic period is that Hersonissos was occupied by a small community. The promontory certainly seems to have had structures on it but its total area was not large and it is possible that the public buildings continued inland. It is likely the agora occupied a small area and that the public buildings that would be located around it, were also small in size. Another indicator of the smallness of this community comes from the location of the Hellenistic cemeteries and this suggests that the urban area was confined to the shoreline and did not extend far inland. Archaeological work on the Apostolakis plot in 1999 revealed tombs dug into the bedrock that date to the third century B.C.E. The location of these tombs, 150 metres to the northwest of the Roman theatre, may confirm the southerly extent of the settlement (*AR* 2006-2007, 104-5; Figure 12).

The site of Phalasarna is vastly different from the other two harbours. It is known to be chronologically and stratigraphically complex. The site has become known for the initial theory put forward by the excavator that the harbour might have been attacked by the invading forces in the early stages of the Roman conquest of the island (Hadjidaki

1988,463), but a subsequent environmental study has now clarified this situation, providing useful information on how the harbour was affected by silting and identifying a sequence of seismic events that began in the late Hellenistic period (Pirazzoli *et al.*,1992).

The isolation that the urban and harbour areas benefitted from when they were occupied continued into the historical period and it is clear from the accounts of the early travellers that despite post-occupation earthquakes a substantial amount of the structures remained visible and recognisable until the beginnings of the twentieth century (Spratt 1865b, 227-235; Pashley 1837b, 62-73). The fact that this site was not subject to the pillaging and collecting of antiquities of the scale seen at Hierapytna definitely contributed to its preservation.

Pashley and Spratt both visited Phalasarna and have provided useful descriptions about the urban and harbour areas (Pashley 1837b, 62-73; Spratt 1865b, 227-235). Like Hierapytna the descriptions detail a landscape littered with structural remains, though less so for the urban area. Spratt does venture to give a more detailed description of the remains in the urban area and it is clear that some of the structures there had survived in enough height for him to identify them as houses and temples (Spratt 1865b, 233). He planned the site with great accuracy, even recording some outer defensive walls that have yet to be investigated. Spratt was also bemused by the location of the site away from the coastline and he was the first to realise that the land had been uplifted along this part of the coast Spratt 1865b, 232; Figure 13).

The harbour at Phalasarna seems to have been developed out of a natural sea water lagoon (Lehmann-Hartleben 1923, 81; Hadjidaki 2001, 155). Whilst it is possible that the clearing of the land and the commencement of building began in the Archaic period, most the finished stonework can be dated to Classical times (Hadjidaki 2001; Frost and Hadjidaki 1990). Archaeological excavations began in 1986 and continue to reveal more of the harbour complex (Hadjidaki 1988; Figure 14).

The harbour comprised two basins, the first of which, and the nearest to the sea, is often termed the “military port”. The construction of the harbour would have been highly labour intensive but evidence suggests that the settlement here was well established and reasonably large by the time that the harbour was built. Test trenching in the first basin

(called Trench A in Figure 14) has confirmed that the lagoon was excavated out to the natural sandstone bedrock (Hadjidaki 1988, 474-5). Upcast soil from the lagoon was thrown out on the sides and is found reused later in the fill of some of the towers and curtain walls. This waste material contains a section of fourth century pottery types including black glazed vessels, skypohoi, craters, bowls, plates and Athenian red figure ware indicating that the urban settlement was well networked by the time that work started on building the harbour. It is clear that the lagoon had become a dumping ground for waste material from the early settlement.

The harbour was constructed by digging out the lagoon and creating a basin to allow for the construction of the quayside walls. Some of the fourth century B.C.E. debris found above the bedrock in the test trench probably comes from this phase. Once the quayside walls were constructed the channels were cut through to link the basin with the sea.

The main access channel, 10–12 metres wide and 1.5 metres deep (Hadjidaki 1988, 475) would have been wide enough for vessels of the time, including triremes. The channels were not only important for the access of vessels but also for the flow of water in and out of the artificial basin. Here the matter of tidal variance is an important consideration and we do not know how tidal this harbour might have been and how the issue of the collection of stagnant water within the inner basins was dealt with. At some point a second channel was dug reaching the sea some 100 metres to the north of the main channel. Hadjidaki considered this channel to be a desilting channel but it seems to sit higher than the main channel and thus makes this unlikely (Hadjidaki 1988, 475). A more logical interpretation is that this channel was dug to generate an inward flow of water in an attempt to create circulation of the water within the basin.

Phalasarna must have provided an impressive sight. At the end of the main channel at least one tower guarded the entrance to the main basin. The tower on the east side was built on a rubble mound and the outer tower stonework dressed in manner that was clearly designed to impress (Hadjidaki 2001, 156). The possibility that this was a beacon tower should not be dismissed as this seems to be first harbour structure encountered when coming from the sea.

The main channel led directly into a quadrangular shaped basin some 100 x 75 metres in size. In the Hellenistic period the original stone quays with mooring blocks would have just been visible and possibly usable (Figure 15). Vessels tying up would have stood some distance above the quayside. Erosion marks along one of the quay sections show that the quayside surface was only 40 centimetres above the water level in the basin at the time of the original build (Hadjidaki 2001, 156). This would have meant that the level of water in the basin was higher by the Hellenistic period and perhaps a lot closer to the quayside surface. The natural bedrock seems to occur at a depth of around 2 metres and depth of water in the basin when it was first dug would have been between 1.0 and 1.5 metres (Pirazzoli *et al.* 1992, 386).

The Hellenistic harbour remained enclosed by walls and towers. The visitor would have been able to observe some of the former glory of the port in the surviving defensive structures, but there had been phases of rebuilding of a lesser quality. The original defences and towers had been built to withstand attacks and sieges. Though still present, there had certainly been a deterioration in the state of the defences by the Hellenistic period and this is perhaps indicative of a change in fortunes for the harbour (Frost and Hadjidaki 1990, 524). The walls at Phalasarna were not only important for defence: they also served as a wind break. This was important to prevent wind that carried deposits silting the harbour basin.

Amongst the items stored on the quayside were catapult stones. These have been found at various locations during the archaeological investigations and wrongly interpreted as being indicative of an attack on the harbour (Hadjidaki 2001, 159; Frost and Hadjidaki 1990, 517). Whilst their presence may be associated with defence, by the late Hellenistic period these were also items taken on board ships as ballast and so moved about. They may also have formed part of the military arsenal that was held as stock ready for when it was needed to be loaded on vessels to accompany departing mercenaries. As Phalasarna, and this first basin, had military/naval associations, the presence of these items in the archaeological record should not surprise us.

The purpose of the second basin or “Secondary Port” which lies in an area to the north of first basin is uncertain. Its relationship to the first basin is far from clear and originally it was unclear as to whether it was a second basin or just a surviving area of the original

lagoon that had filled up with brackish water that had overflowed from the main basin (Frost and Hadjidaki 1990, 525). From an engineering perspective it would have been difficult to add a second basin once the main basin had filled with water. Access to the second basin seems to be through a fortified gateway and channel running from the main basin (Hadjidaki 2001, 157).

Inside the second basin the line of ashlar sandstone walling observed in the 1988 season running in northeast direction has been found to extend for a considerable longer distance. (Frost & Hadjidaki 1990, 524-5) Also a series of steps running into this basin have been found that may well have connected it to the urban area. The suggestion that this was a smaller commercial harbour with storage areas and ship sheds currently seems possible. However, more investigation is needed before we can fully understand the function and dating for this area and it is not impossible that the evidence is being read the wrong way. The current hypothesis is that this second basin was added in the Hellenistic period, though there is fourth century B.C.E. pottery recorded in the stratigraphical sequence (Frost and Hadjidaki 1990, 525). The stonework certainly reflects an earlier date and the possibility that this was part of the original build should not be dismissed. The depth of water in this basin also seems to have been the same as in the main basin, namely 1.0 – 1.5 metres. Around the secondary basin the remains of possible storage areas and ship sheds have yet to be investigated but are perhaps indicative that this end of the harbour complex did serve a commercial function (Frost and Hadjidaki 1990, 524).

Whilst Phalasarna was fully operational at the beginning of the early Hellenistic period there are good grounds to consider whether it remained so throughout the Hellenistic period. As already observed, the margin at which point the harbour would have become flooded was only 40 centimetres from the top of the quayside in the third century B.C.E. As time progressed the natural rise in the sea-level would have made the harbour more liable to flood and perhaps dangerous to use during the winter months. There is also a need to consider the occurrence of natural events. It appears that there was subsidence of the land in this part of Crete by around 20 centimetres during the first century B.C.E. (Hadjidaki 2001, 157). The possibility of other tectonic movement affecting this part of Crete during the Hellenistic period cannot be ruled out and this may account for some of the archaeological observations from the site (for example in the tower moat fill; Hadjidaki 1988, 472).

Silting was also clearly becoming an issue by the late Hellenistic period. The test trench in the first basin area has shown that there was a considerable build-up of silt within the first basin by the later part of the Hellenistic period. This is likely to have an impact on use of the harbour and restricted the size of vessels entering the harbour (Pirazzoli *et al.*, 383 figure 6).

A final consideration should be made to the economics of the port. If its military/naval activities formed a key part of the local economy, then the expansion of the Empire and growth of Roman influence would have eventually had an impact. Hadjidaki has suggested that the start of Phalasarna's decline may have been as early as 168 B.C.E. when as many as 1500 men may have been lost fighting in the final battle of King Perseus of Macedonia (Hadjidaki 2001, 158). As the loss of men must have been part of risks in the mercenary business, it is questionable if this loss would have triggered economic decline. It is more probable that a retraction in the market for hired mercenaries was one of several contributory factors over time that led to the decline of the harbour and the town. Applying all of these factors together would result in decline in the operational capabilities of the harbour and a collapse of the local economy. Phalasarna did not need the Roman forces to attack it; by 69 B.C.E. Phalasarna posed no threat nor was the harbour of much use to the invading army and whilst it may have been usable for small boats, its days as a thriving military and commercial harbour had come to an end.

The site at Phalasarna, like Hierapytna, has yielded a lot of fragments of Hellenistic transport amphorae that are clearly associated with local wine production. A third century B.C.E. inscription from Kydonia (*IC*.II.I.10) records the purchase of vineyards by the city and the giving of these to several *proxenoi*. Evidence of the making of wine has also been found at inland sites including Phaistos where a fourth century B.C.E. agricultural complex was excavated by Levi (Levi 1965-6) and at Knossos (Carington Smith 1994, 359-376). The Phaistos structure comprised several rooms, including a wine press along with a stock of foreign amphorae. It is plausible that in the third century B.C.E. there was a large amount of reuse of foreign amphorae as Cretan production centres had yet to be established. As the Hellenistic period progress production centres developed at Knossos, Keratokampos, Hierapytna, Trypetos, the region of Achladokampos and Loutra (Tsatsaki and Nodarou 2014, 287). The Loutra production centre has been dated as been operational

from the end of the second century B.C.E. to the third quarter of the first century B.C.E and the excavators suggested that the products from this workshop were being used for the storage of olive oil (Tsatsaki and Nodarou, 2014, 310).

Chapter 3. Imperial development and expansion.

The Conquest of Crete

Hierapytna appears to have been the only harbour town in this study that was directly involved in the military campaign to conquer Crete. The account given by Dio Cassius informs us that in the final stages of the campaign the Cretan general Ariston retreated to Hierapytna where he faced resistance from Lucius Bassus, a Roman general who had sailed from Kydonia in advance of Ariston to gain control of the city and which, according to Dio Cassius' commentary, is something that he managed to successfully achieve (*Roman History*, XXXVI,19). This commentary is not only interesting but may be of some importance to the later development of the Roman town. Firstly, there is the use of the harbour, which is also mentioned later when armies flee the city ((Dio Cassius *Roman History*, XXXVI,19) and secondly it raises the question as to whether there might have been a military camp at Hieraptyna. Currently there is not enough available information to make a clear assessment of the truth of this account, though it is worth noting that in 2001 and 2002 during the excavations at the Yiomelaki plot in the Viglιά district where the excavators managed to reach the late Hellenistic levels they found evidence of burning and destruction (Gallimore 2015a, 59-60; Figure 4). This was a military campaign and the likelihood that there was a military camp here, albeit only a temporary one, is a possibility. The presence of that camp might have influenced the development and layout of the Roman town.

With no evidence of rebellion against Roman rule it is probable that the pre-existing city-state system was left to function much as before and a governor appointed to maintain the peace and oversee the collection of taxes (Sanders 1982, 4). Roman traders and veterans soon settled on the island, a resource that was used by Pompey when he needed to raise an army (Caesar *De Bello Civili*, III.4.1.). A Roman coin deposited in Hieraptyna between 48 and 44-42 B.C.E. may be associated with the return of Pompey's veteran soldiers (Baldwin Bowsky 1994, 9; Raven 1938, 146-147).

The Roman Harbours

From the first century C.E. onwards changes can be seen taking place in the coastal settlements. The emergence of new and revitalised harbours around the island was most likely in response to a growth in both the local coastal and cross-Mediterranean trade.

During the first and second centuries C.E. the harbours of Hersonissos and Hierapytna underwent modifications to enlarge the areas of quayside where ships could dock and enabling them to operate throughout the year. These modifications both involved significant engineering projects and made the harbours more commercially viable. In contrast at Phalasarna a tsunami that landed on the western coast Crete in circa C.E. 66 resulted in the final abandonment of the harbour.

Hersonissos

The Hellenistic harbour at Hersonissos clearly had limitations. Its stone breakwaters offered some protection but were probably not high nor strong enough to withstand the winter storms. The amount of quayside docking space within the harbour was restricted.

In the first half of the first century C.E. the entire harbour was upgraded. The quay areas were increased and concrete moles added inside the stone breakwaters. The scale and cost of this work should not be underestimated. The way the Hellenistic city had evolved close to the shoreline may have meant that space along the quayside frontage was limited. As part of the improvements the quayside was brought forward. Vitruvius Pollio, writing in the latter part of the first century B.C.E., set out a detailed account of the procedures for constructing harbours. His work, *De archiectura*, provides useful information that can also assist us understand the work that was undertaken at Hersonissos.

The quay and the harbour area were surveyed as part of the ROMACONS project in 2007 (Hohlfelder and Brandon 2014, 89-93). This was the first detailed study of the harbour since the work of Leatham and Hood in 1955 (Leatham and Hood 1958-1959, 266-270). The ROMACONS survey and the subsequent study of the concrete mix provided useful information about the construction and visual appearance of the moles in Roman times. The analysis of the concrete mix showed that the Hersonissos moles contained pumiceous ash pozzolan from the Bay of Naples (Oleson *et al*. 2014, 270-272). From this, and the underwater study it is possible to reconstruct the building process.

The harbour moles at Hersonissos would have been built in stages by first building a framework of posts and tie beams on the land. The new quay frontage would have given space for this work to be undertaken. Once complete the framework would have been

manoeuvred out into the harbour, lowered into the water and anchored (Vitruvius *De architectura,* V. XII. 1-6). Vitruvius makes it very clear that the ground surface underwater must be clear and this is probably why the concrete moles at Hersonissos are inside of the older stone breakwaters. Once the framework was anchored the concrete mix was poured in to fill the framework. This exercise was then repeated for the next section of harbour mole. The completed harbour basin was 270 x 150 metres in size with an entrance that was 90 metres wide (Figure 16). The 2007 survey found that the southern mole was preserved for a length of 22.7 metres in two parts and standing just below the modern sea-level. The long L-shaped mole now lies buried beneath a modern concrete breakwater and was originally 150 metres long with a 30-metre-long return. It was between 5.2 to 5.3 metres wide. A survey of the inner surfaces of the moles found evidence of recesses where the original timber framework had rotted away (Hohlfelder and Brandon 2014, 89). The Roman concrete quay frontage had survived for a length of 30 metres and showed that the width of the concrete fronting was 2.6 metres. The 1 metre rise in sea levels along this part of the coastline has meant that the remains of the concrete moles are now underwater.

For a small harbour like Hersonissos the scale of this project was a huge undertaking and investment. The work would have necessitated skilled engineers, probably from other similar projects such as Caesarea Palaestinae, Pompeiopolis and Alexandria, timber for the framework would have needed to be sourced and brought to the harbour and stone quarried locally to go in the concrete mix. This project also would have lasted for many months at the very least, necessitating nearby work camps and accommodation for the more senior project overseers. The pumiceous ash pozzolan used in the maritime concrete at Hersonissos was probably quite widely available by this time. One of the possible reasons for this was that the volcanic ash was used as ballast in the outward-bound freighters sailing from Naples. The volcanic ash, as it could be sold for construction purposes, had a value that could add to the profit of a voyage. The Capuan trading links with the Knossos colony may well have facilitated the availability of volcanic ash for marine concrete projects on Crete (Hohlfelder and Brandon 2014, 92-93).

The completed harbour moles and quayside would have created additional space enabling more vessels to be berthed. Whilst the concrete moles may have only originally stood to a height of 1 metre above sea level, the shelter afforded by the promontory on the west side would have enabled the harbour to function throughout the year. It is unlikely that the

earlier stone breakwater could have held back the rough seas during the winter months and this may have limited use of the harbour. Harrison considers that the harbour could have berthed as many as 30 small and medium sized vessels, a vast improvement on that of the Hellenistic harbour (Harrison 1993, 191; Falkener 1854, 16). The new concrete moles also made it possible for larger vessels to berth and unload easily, though turning around within the harbour might not have been so easy. Alternatively, they could have anchored outside of the harbour and off loaded on to smaller vessels for transhipment into the harbour.

The visual impression of the harbour basin may have been enhanced by statues or columns placed along the moles. The ROMACONS survey observed a line of rectangular stone plinths 0.65 x 0.55 metres and spaced between 8 and 9 metres apart on the surface of the mole that extended south from the headland. These had originally been noted by Leatham and Hood and thought to be mooring bollards, however a re-evaluation of these has suggested that they may have been the bases for columns or statutes (Leatham and Hood 1958-1959, 267; Hohlfelder and Brandon 2014, 92). If this was the case, then it is possible that some of the over-life size statues that have been found in the Hersonissos area may have originally been placed around the harbour (*AR* 1986-87, 55).

Sanders suggests that there may have been a tower or lighthouse at the point where the L-shaped mole turned inwards as mentioned in the *Stadiamus Maris Magni* (Sanders 1982, 146). There was little debris field noted in the Leatham and Hood survey that might give an indication of this and part of this area now lies beneath the modern concrete breakwater (Leatham and Hood 1958-1959, figure 2). Vitruvius mentions the placing of towers either side of the harbour entrance (Vitruvius, *De architectura,* V.XII.1) and it is possible that towers of some sort may have stood at the ends of the moles on either side to mark the entrance to the harbour.

The increased capacity of the harbour would have benefited not only Hersonissos but also other inland towns and settlements in this part of central Crete. There is little doubt that the relationship that had developed between Lyttos and Hersonissos in the Hellenistic period continued to flourish in the Roman period. Lyttos was a wine producing area in Roman times and it is possible that the founding of the nearby *Colonia Iulia Nobilis Cnossus* created new markets for export to Italy. The main harbour for the Knossos colony was Heraklion, some 30 kilometres along the coast to the west but there is no reason why

goods could not have been transhipped to and from Hersonissos to the colony. The harbour at Heraklion dates from the fourth – third century B.C.E. and its own development and expansion during the Roman period can be directly attributed to its involvement in the Cretan wine trade in which the colony at Knossos was certainly a part (Bowsky 2012, 332).

The Leatham and Hood survey recorded the remains of several sections of Roman walling within the new quay space which may indicate that the Roman urban area extended along the quay frontage as it seems to have done in the Hellenistic period. The mosaic fountain that today stands in isolation in the middle of the modern street (Figure 17) once stood in the courtyard of an early second century C.E. *domus*. The location of this quayside building in the corner of the Roman harbour may be significant and raises the possibility that this is the house of a harbour official. Given the level of investment in the harbour it is unlikely that there would not have been an administrative officer to collect and administers taxes and harbour fees.

The absence of any obvious storage or warehousing structures is not surprising. Even with the upgrade, Hersonissos was not a major shipping harbour and it seems to have continued to operate on the basis of serving the needs of its own community and those of Lyttos. Inbound goods would most likely have been distributed immediately and outbound ones stored on the quay in advance of loading. None-the-less an area for trading must have existed and it is possible that the remains observed by Leatham and Hood along the quayside were those of shops and storage areas.

Hierapytna

Like Hersonissos, it is likely that the Hellenistic harbour at Hierapytna was vulnerable to the winter storms and had a limited amount of quayside berthing space. The small amount of protection offered by the rock jetties would have left ships anchoring in the bay with little protection during storms and in the winter months. In particularly bad weather conditions it is possible that the harbour had to close. Hierapytna also faced some other challenges in that conquest of Egypt in 30 B.C.E. brought to an end the close relationship that Hierapytna, and other cities in eastern Crete, had shared with the Ptolemies. There was also a new generation of large merchantmen vessels that were able to journey from Alexandria straight to Rome without stopping (Harrison 1993, 215). The standard size of

ship used in the transport of grain by the end of the second century C.E. was between 340 and 400 tons (50,000 modii) which was a marked increase in size to the earlier vessels (Rickman 1971, 6-7). The move to non-stop journeys of the grain fleet would have meant that the larger sized vessels were less likely to stop at this harbour, but there were still a lot of smaller vessels travelling the shipping lanes and for them Hierapytna remained a stopping point. Casson states that the journey from Rome to Alexandria in favourable winds took over ten days (Casson 1974, 155) but this was for the return trip and the outward one was certainly longer and might take up to two months (Rickman 1971, 10). Whilst these non-stop journeys were beneficial to the fleet owners it would have been less so for Hierapytna which stood to lose business and revenue from harbour duties paid on imported and exported goods (*portorium*). If Hierapytna was to remain a competitive and a viable harbour, then changes were needed.

The upgrading of the harbour comprised two phases. The first phase involved extending the rock breakwaters at the end of the bay. This was done by the addition of concrete moles which extended a natural ledge and the rocks of the Hellenistic jetty to create an enclosed sea basin (Brandon 2014, 136). The function of the moles may have been more to reduce the movement of sand and to prevent currents driving vessels to shore in periods of rough weather. In the winter months it is likely that the moles were breached by high tides and wind driven waves. Any vessel wintering in this basin would have been at risk and the construction of an inner basin was a logical next step.

The second phase involved digging out and creating a channel that led into an inner basin. Our understanding of this inner basin is very confused, further impeded by the fact it is no longer visible and following the earthquake of 1508 part of this area became covered by the rebuilt town. Our main sources of information are the journals and observations of early travellers.

The inner basin is often referred to by the early travellers as a "*naumachia*". The source for this association seems to be the early Italian traveller Cyriacus of Ancona (1391-1453/55) who described the lagoon as the site of a Roman *naumachia.* Onorio Belli, whose visit dates to 1590, reiterates this (Falkener 1854, 11) as does Spratt in the report of his visit in 1851. The situation is further complicated by Belli who thought that there were three harbours but Spratt's account makes it quite clear that there were only two harbour

areas. At the time of Spratt's visit part of the outer basin had become silted up and it and the connecting passage to the inner basin had been built over by the Venetians. All that was left of the inner basin was a seasonal marsh. This area remained marshy until 1950 and was the subject of archaeological investigations in 1996 and 2007 (*AR* 2003-2004, 88; Gallimore 2015a, 21-22), neither of which have been able to provide much more information on the nature of the inner basin or how it was linked to the outer one. If the example of Portus is anything to go by then it could be expected that the quayside of this inner harbour would have contained warehouses and buildings for harbour officials and administration, still, until more evidence is forthcoming our interpretation of the quayside, its landscape and the type and number of ships that it could dock must remain speculative (Keay 2012, 44-48).

There are several similarities between the development of Portus and those of the harbour at Hierapytna. One of the reasons behind the decision to build the new harbour at Portus was that the larger ships were having to be offloaded whilst at anchor off the coast at Ostia and this had become weather dependant (Meiggs 1973, 52). This was probably the same for the outer harbour at Hierapytna where the anchorage lay at the end of bay where the ships would have been exposed to winds and currents. Work on the outer basin at Portus was begun by Claudius in 46 C.E., which is similar to the suggested date for the construction of the outer basin at Hierapytna (Lehmann-Hartleben 1923, 201-2). The internal dock, Darsena, at Portus was also built by Claudius and was further developed as work commenced on the inner, hexagonal, basin during the reign of Trajan (Keay and Paroli 2011, 1). The experience gained at Portus could well have been used in planning the new inner harbour at Hierapytna.

The reason for the construction of the inner basin may not have been totally commercially orientated. The harbour end of the bay is quite exposed and it is evident from the later silting up of the harbour that the natural sea current caused a build-up and deposition of sand at the end of the bay where the Hellenistic and Roman towns were located. The surviving outer Roman moles do not appear to be as well built as those seen at Hersonissos and without a proper survey there is no information on how they were constructed. Their appearance today may be misleading as it is clear that they have suffered quite badly from marine erosion. That said it is hard to envisage these moles standing more than 1 metre above the water line in Roman times. Spratt mentions seeing some perforated blocks that

protected from its sides in the western mole, which were presumably mooring stones (Spratt 1865a, 263). Their location near the southern end of the modern town wall and his comment that the wall was built on top of the mole for "a short distance" may indicate that the Roman quayside is nearby (Spratt 1865a, 264).

The journey and plight of St Paul as a passenger on a merchantman off the Cretan coast may also tell us something about the harbour at Hierapytna. The problems encountered during his journey from Caesarea to Rome in the autumn of circa 60 C.E. are another example of the risks undertaken whilst trying to cross the Mediterranean during the winter months. It has been traditionally thought that long haul shipping was restricted to May to October but it is evident that this was not necessarily the case and there were times, as after Rome's winter famine of 40-41 C.E., when the emperor intervened and persuaded merchants to put to sea during the winter months by underwriting their risk of loss in the stormy weather (Suetonius *The Lives of the Twelve Caesars, The Life of Claudius*, 18). The busiest period was certainly in the early spring and from April onwards as the grain harvest in Egypt became available and grain fleet set sail to restock the warehouses in Rome. St Paul's vessel was clearly heavily laden and sailing in the autumn when stormy weather would have been expected. It did however sail past Hierapytna whilst looking for a safe anchorage and this may indicate that prior to the development of the inner basin this harbour was not regarded as a good place to seek shelter and ride out a storm.

There is general agreement that the two phases of the harbour development date to the Claudian period for the outer basin and the Hadrianic period for the construction of the inner one (Lehmann-Hartleben 1923, 201-2; Bowsky 1994, 13). Bowsky sees the Hadrianic harbour work as linked to a period of prosperity within the town when there is considerable building activity in the town including the construction of the theatres that were lavishly decorated and adorned with statues of local dignitaries (Bowsky 1994, 13). This was a time of prosperity and growth for Hierapytna. The links that the town had built up with Rome were visibly portrayed around the town as in the statue of a victorious Hadrian dressed in his armour and wearing the laurel wreath of victory with a subjugated barbarian at his feet and other statues of the emperor that have been found over the years (Papadakis 1986, 49-53).

The enlargement of the harbour was a significant factor in increasing Hierapytna's trading base, both for imports and exports, as well as fostering local and regional industrial growth. Hierapytna continued to serve as a distribution centre for the onwards transhipping of goods and produce destined for other parts of the island. With less restrictive practices than in the Hellenistic period the distribution network was able to grow and expand. The joining together of Crete and Cyrene as a Senatorial province also brought new business to the harbour as it was the largest harbour on the southern coast and well placed for traffic back and forth from Cyrene (Papadakis 1986, 18; Figure 18).

Phalasarna

The harbour of Phalasarna was having problems of a different nature in the last quarter of the first century B.C.E. The harbour had clearly become very silted and this would have restricted the size of vessels that could use the harbour. Also there had been a slight submergence of the land causing a rise in the sea level and this would have meant that the edge of the harbour quayside was frequently underwater. The submergence of the land may be connected to the large earthquake that affected Gortyn in about 30 B.C.E. where buildings collapsed and the damage was significant enough to cause disruption for several years afterwards (Papadopoulos 1999, 191-241). The evidence of these tectonic events can be seen in the region of Kommos where there was a sudden deposit of sand after the Hellenistic period. A two-metre uplift has also been recorded in this area between 100 B.C.E and C.E. 200 (Price *et al.* 2002, 197 note 51).

Further seismic events occurred in the period 55 – 110 C.E. An earthquake in circa C.E. 66 appears to have been followed by a tsunami that made landfall along the coast of western Crete. Evidence of this tsunami was found in the trial trench in the first basin. The material dumped in front of the harbour by the tsunami and a receding coastline may have finally isolated Phalasarna from the sea (Pirazzoli *et al.* 1992, 383 and 390). It is not yet clear whether the earthquake of C.E. 66 or the one of C.E. 365 was responsible for the collapsing parts of the harbour structure into the channel, but there is little doubt that this action was natural and not the result of any form of attack on the harbour as has been previously advanced.

The harbour at Phalasarna would have been unusable by the second half of the first century C.E. but this does not mean though that this area was not occupied in the Roman period.

Evidence of settlement during the Roman period has been noted about 4 kilometres to the south of the harbour (Pirazzoli *et al*. 1992, 385) and in the harbour area by Pendlebury (Pendlebury 1939, 370). From his visit to the site Sanders was quite adamant that there was no Roman pottery nor concrete at Phalasarna, (Sanders 1982, 172). The tradition of Phalasarna certainly lived on well into the Roman period. It was mentioned by Dionysius Calliphontis (118 – 122 C.E.) and Ptolemy and later in the *Stadiasmus Maris Magni* (Pirazzoli *et al.* 1992, 375) but in spite of these references it is clear that the harbour was unusable.

The urban areas – layout and organisation

There was a period of development and expansion in both Hersonissos and Hierapytna during the first and second centuries C.E. During this time urban settlement expanded into areas that had previously been unoccupied land. On this space new residential and public buildings were constructed. Whilst there is more archaeological evidence from Hersonissos and Hierapytna for the Roman period than for the Hellenistic period, the information is still limited and often fragmentary.

It is possible that the Roman town of Hierapytna was laid out on a grid pattern with the boundaries of the urban area clearly distinguished. The presence of a military camp or base may have influenced subsequent street pattern. Gallimore suggests that the town was laid out on a grid pattern based on the modern north-south road Kyprou (*Cardo Maximus*) and Dimokratias (*Decumanus Maximus*) that runs east-west (Gallimore 2015a, 18: Figure 19). His suggestion is not unreasonable in that these roads cross the area where the ancient town lies and the north-south road would have entered the harbour area directly. The location of the forum is not known but if it lay at the intersection of the *cardo maximus* and the *decumanus maximus* then it would have been only a short distance from the harbour area.

The importance of the roads and their maintenance within the urban area of Hierapytna can been seen in the Claudian inscription detailing the work of Q.Paconius Agrippinus, a quaestor, to repair major and minor roads (*IC* III.III.25-29, 40/41). This inscription offers a unique insight into the management of the road system within the towns on Crete and to the different types of traffic using the roads. At Hierapytna there was a distinction between the roads used for chariots, pedestrians and for animals.

During the Roman period Hieryapytna may have covered an area as great as 150 hectares (Gallimore 2015a, 17) as it extended from the shore of the Libyan Sea to Plateia Plastiria in the east, to the "Almirós" stream in the west and into the modern Paramithias district in the north. The discovery of a substantial Roman building that is believed to be associated with the town's defences to the north of the modern town may be an indicator that the extent of the urban area was clearly defined (*ADelt* 32 Ch. 338; *AR* 1985-86, 94). These defences probably represent a symbolic boundary as there is no obvious evidence to suggest that the town needed defending during this period.

The definition of areas was clearly important at Hierapytna as shown in the Augustan boundary inscriptions from Episkopi, Kato Chorio and Kentri show that it was not only the urban area that developed quickly and that the hinterland to the north had grown at a similar pace (Baldwin Bowsky 2006). In the east the hinterland may have extended as far as Makrygialos and Lagada and to Myrtos in the west but the dating of this expansion is not known (Baldwin Bowsky 2006, 570).

The evidence concerning layout of the Roman town of Hersonissos is not as clear as it is for Hierapytna. During the Roman period the size of urban area increased both along the shore and inland. Over the years several excavations have taken place in close proximity to each other in the area of the Roman town but these have not been published. It is possible that these excavations, when compared to each other, will answer some of the outstanding questions concerning the layout and development of the town. Reports from some of the excavations show that there was a network of well-made roads (*AR* 1996-67, 103; *AR* 1997-98, 112) and that parts of the Hellenistic cemeteries were built over (*AR* 2000-1, 126; *AR* 1994-95, 60). The discovery of Roman cemeteries also provides an indication of the extent of the Roman town in some directions (*AR* 1983-4, 60; *AR* 2006-07, 104-5). It is not known if the town boundaries were delineated. The discovery of the remains of first – second century C.E. pottery kilns within the known Roman town may indicate an industrial area (*AR* 1998-99, 113).

The forum or *agora* area at Hersonissos was located slightly to the north west of the theatre, some distance from harbour area (Figure 20). The *agora* area has not been fully investigated but Hellenistic material has been found in the immediate locality, including

late Classical – Early Hellenistic tombs (*AR* 1996-97, 103; *AR* 2006-07, 104). Harrison considers the forum to have been small and lacking in space (Harrison 1993, 195) but if this was the case then it is more likely to be relative to size of the community. The discovery of several well-built structures adjacent to the *agora* area, including the one noted by Sanders as lying between the theatre and the harbour, suggests that was the area where the main public buildings were located (Sanders 1982, 101; *AR* 1996-97, 103; *AR* 2000-01, 126). These buildings include a possible Roman temple that is associated with the discovery of a life-size marble statue of the emperor Trajan (*AR* 2006-7, 104-5; *AR* 2000-1, 126).

Theatres were also a dominant feature in the urban landscape of Hersonissos and Hierapytna. There were two within the urban area at Hierapytna and one at Hersonissos. The theatre at Hersonissos was located to the close to the area that is thought to the *agora.* It is clear from Onorio Belli's plan of the theatre at Hersonissos that the structural remains of this building were still visible in 1586 (Falkener 1854, 16; Figure 21). The lack of any visible antiquities of note may be the reason why, unlike the theatres at Hierapytna, he did not make a written description of the remains. Spratt later described the theatre as being 156 feet in diameter but it is clear from his description that the building had been robbed of its stonework as only the foundation of the *proscenium* and part of the wings and back wall remained (Spratt 1865a, 107). Further damage was evident when Sanders visited the site and by this time a road had been driven through the stage area (Sanders 1982, 59-60).

Even though the surrounding area seems to have been quite built up in Roman times there is little doubt that the theatre would have stood out in the urban landscape and given the topography of the land, it is likely that the theatre would have been visible from the harbour, acting as a focal point within the town. A significant part of the structure seems to date to the first century C.E. but on the basis of the findings of the excavations undertaken by S. Mandalaki, it is possible that parts of the theatre may be older and date to the late Hellenistic period (*AR* 1994-95, 60; *ADelt* 42 Chr 532-4).

The discovery in 1986 of five moulds of ships decorated with amphitheatre scenes of gladiators fighting lions a during the excavation of a Roman house on the Ialotaki plot are thought to be associated with the production of bread that was sold at either the theatre or the amphitheatre (*AR* 1992-93, 67: Sporn 2016). The production of bread that is especially

made for sale at entertainment events may indicate the presence of Roman settlers within the Hersonissos community. The epigraphical record includes such names as Tertulla (*IC* I.VII.7), Tacitus (*IC* I.VII. 17) and Sergius (*IC* I. VII. 20), which further suggests that there may been foreign settlers resident within the community.

Though little remains of them today, the two theatres are the best documented structures in Roman Hierapytna. They comprised a large and small theatre located diagonally opposite each other on the edges of the urban area. The smaller theatre was located next to the modern church of Timios Stavros in the north-eastern part of the Roman town. Dating to the early second century C.E., the theatre still had the seating areas visible on Belli's visit. Some of the remains from this theatre, including capitals and entablatures, were collected together and sent by him to Venice. He undertook an excavation of sorts in front of the *scene* but this was not a scientific exploration only an attempt on his part to recover some of the statues. These were made of 'stucco' and fell into a powder when he tried to remove them from his excavations (Falkener 1854, 12: Figure 22). The lower structure of the theatre seen by Belli had been badly robbed by the time of Spratt's visit. A *terminus ante quem* for the construction date of this theatre is given by a dedication to L. Flavius Sulpicianus and dated to end of the second century C.E. (Sanders 1982, 59 & 179).

The larger theatre was also still visible on Spratt's visit. The remains survived until the 1940's when they were blown up by the occupying forces in the Second World War to make way for gun emplacements. Despite some irregularities in Belli's description of this theatre in Roman times this was clearly a magnificent structure. He comments "it was most richly decorated with columns, cornices, and other ornaments, now, alas, a heap of ruins" (Falkener 1854, 13; Figure 23). There has been little discussion on the date of this theatre and the possibility that it dates from the Hellenistic period and was later upgraded to meet Roman standards cannot be ruled out. It would be unusual for a Hellenistic city of Hierapytna' s standing not to have had a theatre and the fact that this theatre appears to have been dug of out of rising ground may be supportive of this earlier date. A headless, armless draped female marble statue, an Antonine copy of a mid-fourth century B.C.E. representation of Kore, was found on the site of the supposed theatre in 1980 (*AR* 1986-87, 58) and the large than life-size headless statue of a man that now features in the San Salvatore fountain in Heraklion is also reported as coming from this theatre (Spratt 1865a, 261; Figure 24).

The presence of two theatres within a town is rare on Crete and the only other example of this occurring is at the provincial capital city of Gortyn. Their occurrence may relate to Hierapytna holding a regional administrative status. which may also account for its minting of coinage under Tiberius and Caligula (Bowsky 1994, 10). There was certainly a sizable Roman population settled here as evidenced in the epigraphical record (Bowsky 1994, 32-44).

Another important building in the urban landscape was the amphitheatre. Belli records the presence of amphitheatres at both Hersonissos and Hierapytna (Falkener 1854, 14 & 16). In both instances he provides only the briefest of information. Falkener records that Belli drew a plan of the Hierapytna amphitheatre but that this was lost (Falkener 1854, 14). The structure appears to have been located to the east of large theatre, which would have put it well within the urban area and between the large theatre and the harbour complex. Little is known about the structure itself but it was still visible when Spratt visited the town. Spratt was able to confirm its location on rising ground that had been dug out and then used to site the amphitheatre. Neither Belli nor Spratt mention the presence of any brick work. Belli's reference to "solid masonry" is verified by Spratt who adds that it was "chiefly built with small stones and mortar, but faced apparently in part with thin slabs of white and variegated marble" (Falkener 1854, 14; Spratt 1865a, 260). It is evident from Spratt's report that the stonework of the building had been badly robbed by this time as he records that "not a single square block or stone seat is anywhere to be seen" (Spratt 1865a, 260). The lack of brick work and excessive use of concrete taken with the fact that it appears to have been built to fit into landscape suggests that this structure may be of an earlier date, perhaps dating to the latter half of the first century B.C.E.

The presence of an amphitheatre at Hierapytna may be another indication of a resident Roman element within the local population. Bowden observes link between the presence of these structures and Roman settlers, and in particular veterans, of which there is believed to been some resident at Hierapytna (Bowden 2011, 109; Baldwin Bowsky 1994, 9). Given the smaller scale of the settlement at Hersonissos the presence of an amphitheatre is surprising. It was not noted by Spratt nor has a suitable structure been identified during the archaeological investigations. It could be that Belli was confusing the remains with other structures that were visible at that time.

One other large structure at Hierapytna is worth mentioning. In the south-west angle of the town Spratt observed a large structure as lying "prostrate with its foundations, but which, from its many compartments, seems to have been a palatial edifice of some importance" (Spratt 1865a, 263). This structure is no longer visible and it would be wrong to speculate too much without knowing more about it. Its location is interesting in that it places the structure close to the coast and past the large theatre. It is some distance from where the forum this thought to have been located which raises the question as to whether this was a public building or perhaps an official residence.

During the first to third centuries C.E. bath houses and the supporting services needed to ensure the regular supply of fresh water appear within the urban areas. Evidence of bath houses has been found at both Hersonissos and Hierapytna, though there has been more investigation of those found at Hersonissos. The baths building close to the theatre in Hersonissos has been the subject of the most investigation, though as many as four others have been identified within the urban area. The bath houses cluster together in an area close that of the *agora*, the theatre and the other public buildings that are located there. This may be due to the location of the large water cistern that was an essential part of the water supply network. Four of these bath houses date to between the first and third centuries C.E. and one to the fourth century C.E. The bath house closest to the theatre was first excavated in 1981 revealing a hypocaust floor and two plunge baths. Excavations in 2006 extended this area under Sanoudaki Street and revealed fragments of mosaic pavements and a large underground cistern connected to the bathing complex (Grigoropoulos *et al.* 2008, 306).

Examples of private baths have also been found at Hersonissos. Excavations on a Roman house at the Papadakis plot produced evidence of a small bath within a room with a hypocaust floor. The room showed signs of being lavishly decorated with marble veneer on the walls. The bath area was linked to a network of terracotta and lead pipes (Grigoropoulos *et al.* 2008, 306). Another bath house on the Tsangarakis plot revealed cold bath with internal dimensions: 6.23 x 4.17 metres. The wall was originally dressed in marble revetments and was added to the building in the late second to third centuries C.E. It was then used alongside two small plunge baths, pools, hot baths. This building is

particularly interesting as it included areas for undressing along with service corridors. It continued to be used until Early Byzantine times (Grigoropoulos *et al.* 2008, 307).

Hersonissos lies in an area where there are few natural water sources and in an area of relative low rainfall, especially during the summer the months. From the early second century C.E. Hersonissos was supplied with fresh water through an aqueduct that tapped into the fresh water sources inland in the Kalo Chorio area. Like the harbour works the construction of this must have been a large and expensive undertaking. The aqueduct brought water to a reservoir within the urban area that measured 55 x 18.50 x 5.50 m^3. It had a capacity of 5,500 m^3 (Galanki *et al.* 2006). From this reservoir water was carried in terracotta pipes to other smaller cisterns and then to buildings such as the bath houses in the theatre area, the fountain by the harbour and to private houses.

Throughout the first to the third centuries C.E. the quality of life was improved in both Hersonissos and in Hierapytna. Paved streets, public bath houses, running water, theatres and buildings for live entertainment were a marked change from the urban landscape of the Hellenistic period. Even in death echoes of this prosperity followed as seen in the Attic marble sarcophagi that have come from Hierapytna (Papadakis 1986, 46-49). The remains from the cemeteries however serve as a reminder that this good fortune was not shared by everybody in the community.

Chapter 4: The harbours in the late Roman period

In light of more recent research and investigation Sanders' perspective that the third to fifth centuries C.E. was a period of economic decline on the island can be challenged (Sanders, 1982, 30). Whilst this period witnessed several significant events and changes, both administratively and economically, evidence from many of the coastal settlements suggests that whilst some of the prosperity and growth seen in the first to third centuries C.E. was reduced, life in the coastal settlements continued much as normal into the Late Roman/Late Antique period.

In terms of administrative changes, under Constantine the island was upgraded to a senatorial province under a *consularis* in the Diocese of Macedonia in the Prefecture of Illyricum. There is little evidence to suggest that administrative change had any impact and in the coastal settlements things continued much as they had done previously. The exception to this might be Hierapytna that seems to have followed the likes of Thessaloniki, Constantinople and other cities in the Balkans, in building fortifications. The fortification wall is only present in one section that runs close to the modern shore line to the west of the harbour. A study of the wall, which is approximately 160 metres in length, has identified several periods of construction beginning in the third century C.E. through to the sixth century C.E. The wall includes a semi-circular tower and gateway (Gallimore 2015a, 18-19). Why this fortification was raised and the size of the enclosed area is not known. It is possible that the wall was originally built in response to the reforms of Diocletian, maintained and strengthened over time. Interestingly the latest datable Roman inscription from Hierapytna is a fragment of Diocletian's *Edictum de Pretiis* (*IC* III.III.64). There is no known reason why Hierapytna would have needed fortifications as early as the third century C.E. but the possibility that the wall was built as a reaction to a threat or concern of possible attack should not be dismissed.

The Late Roman/Late Antique period opened with a series of seismic events that affected settlements throughout the island, the most well-known and largest of which was the earthquake of 365 C.E. (Stiros 2001). There is little doubt that the earthquake and tsunami of 21 July 365 C.E. off western Crete had a profound impact across the island and the Eastern Mediterranean. Whilst Crete had experienced earthquakes before, it is clear from the archaeological record that a tectonic movement of this size had not occurred in a long

while. Originating off the southwestern edge of Crete this earthquake is estimated to have been 8.5 on the Richter scale (Stiros 2010). The account by Ammianus Marcellinus records that the earthquake began before sunrise and he records how the sea receded and then returned with such a force as to destroy buildings and leave vessels stranded inshore (Ammianus Marcellinus *Roman History*, XXVI, X, 16-19). Across the Eastern Mediterranean coast communities were faced with disaster (Kiss 2007, 191).

This event marked the end of Phalasarna. The entire harbour was uplifted and pushed inland as the coastline of western Crete rose by as much as 6.4 to 9 metres in a single day. The harbour was left to be buried by drifting sand and soil over the following centuries. The subsequent tsunami in this area has been questioned. Scheffers and Scheffers argue that there is no clear evidence for this event in western Crete (Scheffers and Scheffers 2007, 622-23) but deposits in the harbour basin at Phalasarna would suggest otherwise (Stefanakis 2006, 15).

At Hersonissos this earthquake, like Gortyn, Eleutherna and Lyttos, seems to have led to the collapse and abandonment of some buildings and areas. The supply of fresh water from the aqueduct ceased, presumably as the result of damage to the aqueduct, and the large holding cistern was destroyed (*AR* 1999-2000, 129; *AR* 2001-02, 104). As this fed the bath houses, then this also accounts for their demise.

The earthquake would certainly have generated a period of rough seas and high tides. At Hersonissos the shelter offered by the promontory and the moles probably kept the vessels anchored inside relatively safe from harm. The situation at Hierapytna would have been different. The period of stormy weather following the earthquake would have resulted in the breaching the moles of the outer harbour and may have led to the deposition of a significant amount of sand at this end of the bay. This, and possibly subsequent earthquakes, also affected the sea level causing it to rise. The extent of this initial rise is not known but it certainly would have made the outer harbour at Hierapytna vulnerable, especially during the winter months. Gradually the accumulation of sand trapped within the moles would have led to a silting of the outer basin, limiting access and use of the harbour and affecting long term economic viability of the harbour.

Whilst being well documented the earthquake of 365 C.E. does not stand alone and it is possible that not all the damage currently attributed to this event was done at this time. Research has shown that there were other seismic events that seem to cluster together in a period extending from the fourth to the sixth centuries C.E. (Stiros 2001). There are split views on the effects of these events on the settlement and the economy. In terms of the communities it is evident that across the island there was a significant amount of structural damage and areas were abandoned. How much displacement of the local population this caused is not known. It appears though that life soon resumed as normal and certainly in terms of the coastal settlements there is little evidence of a reduction in the size of the general population. Indeed, and as observed by Sweetman, along the north coast there is evidence to suggest that the settlements soon began to flourish again (Sweetman 2013, 13).

Evidence of this revitalisation can be seen in the urban area at Hersonissos where from the fourth century C.E. onwards new residential buildings were erected within the area of the Roman town, some with mosaic floors (*AR* 1991-92, 59; *AR* 2000-01, 126). This though appears to be in contradicted at Hierapytna, where in the second half of the fourth century C.E. the buildings in the Pangalou, Yiomelaki and Assariotaki plots all seem to be destroyed and the areas abandoned (Gallimore 2015a, 303). This may well be associated with the earthquake of 365 C.E. or subsequent seismic events.

One of the features of the Late Roman/Late Antique period is the appearance of the Christian basilica in the urban landscape and the spread of Christianity amongst the communities. Sanders identified a total of 68 basilica churches across Crete, including a number 'possible' churches (Sanders 1982, 89). Sweetman has suggested that a number of 45 is more realistic when taking into account only those that have identifiable ground plans (Sweetman 2010, 58). Sanders date range of 450 – 550 C.E. for the building of the basilica churches has also been questioned with new evidence suggesting that some churches may have been founded as early 400 C.E. (Sanders 1982, 89; Sweetman 2010,55). To date no examples of basilica churches have been found at Hierapytna, a circumstance that may be attributed to the limited number of excavations that have been carried out and the re-siting and rebuilding of the town after the 1508 earthquake. A fourth century C.E. bishops list cites a bishop from Hierapytna as attending the Council of Sardica in A.D. 343 and this may be an indication that there was a Christian community in existence at Hierapytna at this time (Tsougarakis 1988, 224).

There is more evidence of Christian basilica churches at Hersonissos where three have been identified (Sanders 1982, 95-97; *AR* 1998-99, 113). Two of these were located on the coast, one on the promontory on the west side of the harbour and the other on a promontory slightly further along the coast to the east and outside of the urban area. The third possible church was located within the urban area but has been dated to the fifth century C.E., possibly reflecting the availability of space at this later date (*AR* 1998-99, 113). The promontory locations had been occupied in previous periods, perhaps the most significant of which was the possible site of the temple of Britomartis on the promontory to the east of the town. The basilica on the promontory overlooking the harbour was enclosed by a wall. Sanders refers to the wall as a defensive, which in view of its exposed position may well be correct, but it could equally have been built as just an enclosure wall (Sanders 1982, 98). This church would have served the community and may have been the seat of a bishop. Its presence on the promontory overlooking the harbour would have made it a focal point from both the sea and the shore.

The spread of Christianity can also be seen in a change in burial practices. At Hersonissos this is represented by the appearance of small box-like tombs (*AR* 2006-7, 104-5) and a change in the burial orientation. Late Roman burials have been found within the area of the earlier Roman town (*AR* 2000-01, 126), presumably where space has become available, and this is a change in the earlier practice of burying the dead outside of the urban area.

Even though our evidence for the Late Roman/Late Antique period is limited it does seem to indicate that for Hersonissos at least this was a period that was relatively prosperous and reasonably secure. This does not seem to have been the same for Hierapytna though. Gallimore proposes that there is a decline in the prosperity and the population of Hierapytna from the end of the third century C.E. onwards (Gallimore 2015a, 49). On such limited evidence it is difficult to make a proper assessment and to confirm that this is correct or not. Certainly, as the harbour area got more restricted due to silting, the local economy would have suffered possibly leading to a decline in the population. If the destruction seen in the Panalou, Yiomelaki and Assariotaki plots is a reflection of damage also done elsewhere in the urban area, then this may have been the reason for the decline, but without this evidence it is impossible to say. It is worth noting that the earthquake of

1508 damaged Hierapytna to the extent that it had to be totally rebuilt. It is possible that the earthquake of 365 C.E. may have had a similar effect.

Chapter 4. Conclusion

The study of the harbour towns of Hersonissos, Hierapytna and Phalasarna has provided an opportunity to study their origins, development, and in the case of two harbours, the reasons for their subsequent demise. The study has also looked at some of the changes that took place in the harbours and in the urban areas during the Hellenistic and Roman periods. These three harbours were intentionally selected to see if would be possible to answer the research questions when only a limited amount of information was available. The study shows that this has not only been possible but it has provided useful comparative material that can be used when researching other harbours on the island.

Organisation and development of the Hellenistic harbours

The Hellenistic harbours can be categorised into three groups:- Hierapytna, a large harbour engaged in the import, export and transhipment of goods; Hersonissos a small harbour servicing the needs of the community; Phalasarna, a harbour whose main function is associated with military activities.

The larger harbours, of which Hierapytna and Kydonia are examples, utilised their geographical locations to engage with and benefit from the passing shipping routes. This enabled them to build on the existing trading networks and contacts that had developed during the Classical period and to find new markets for Cretan exports. Hierapytna also became a transhipment centre for the onward movement of goods by land and sea to settlements and harbours in its own territory and, where treaties and alliances permitted, beyond to other smaller harbours around the island.

Evidence suggests that the Hellenistic harbour at Hierapytna consisted of little more than an area of quayside frontage at the end of the bay. In busy times vessels were probably offloaded whilst at anchor in the bay and the goods transhipped to smaller boats to bring them to the quayside or they may have been beached and offloaded close to shore. The building of stone jetties in the Hellenistic period was probably more an attempt to slow down the natural movement of sand. Winter storms sweeping across the bay would have meant that the unloading of vessels was difficult both at anchor and when against the quayside.

In the second category, Hersonissos was a different type of harbour. Even with work undertaken to create a new quayside and the construction of a protective breakwater the function of this harbour, like many others along the coast, was to service the needs and requirements of its community. Hersonissos also served as a transhipment point for goods and produce going to and from Lyttos but it was not involved in trading on the scale as seen at Hierapytna. Most of the vessels stopping here in the Hellenistic period would probably have been small and part of the fleet of boats that travelled around the coastline trading and carrying foot passengers.

The final category of harbour was the military one, of which Phalasarna appears to be the only example on Crete. Developed in the Archaic and Classical periods this harbour only underwent minor changes and work on the defences during the Hellenistic period. On available evidence it would seem that a large part of Phalasarna's economy was based on the hiring out of mercenaries to fight overseas. As an inland harbour it faced unique challenges the greatest of which was possibly the problem of silting. This proved to be a problem throughout the Hellenistic period. To try to resolve the problem a second channel was cut in order to try and achieve circulation of the water in the harbour. It would seem that this did not work. The combined effects of a lack of diversification, silting of the harbour and the forces of nature resulted in much reduced use of the harbour by the end of the Hellenistic period.

Though outside of the scope of this study, there are noticeable resemblances between Phalasarna and the Phoenician port of Tyre. The northern harbour at Tyre was also set within the city walls and concealed in a similar manner to Phalasarna.

Evidence of change in the immediate post-conquest periods

The harbours of Hersonissos and Hierapytna both were upgraded in the early Roman period to improve their berthing capabilities and to enable them to operate throughout the year. Some of this work, like the construction of the concrete moles at Hersonissos and the creation of the inner basin at Hierapytna, would have required skills, expertise and materials that needed to be sourced from elsewhere. It was a costly investment but evidence from the urban areas suggests that it was one that quickly paid off.

The possibility that the connections between the colony at Knossos and Italy could have facilitated the availability of volcanic ash for marine engineering projects on Crete is something that has not been considered previously. Equally of interest are the parallels that can be drawn between the harbour work at Hierapytna and those at Rome's port of Portus. The works undertaken at Hierapytna and Hersonissos reflect the potential seen in the harbours by the Romans and reinforce the possibility that these are not isolated examples on the island.

Archaeological and epigraphical evidence from the urban areas suggests that the pace of change was gradual and spread out over the first and second centuries C.E. Unoccupied land offered opportunities for expansion and in both Hersonissos and Hierapytna. Paved streets, bath houses, new public buildings, temples, theatres and places for live entertainment began to fill the urban landscape along with new areas of residential housing. Fresh running water, sometimes brought from a considerable distance from the settlement, was distributed through the urban areas through a network of cisterns and terracotta and lead pipes.

One of the problems encountered with this study was the lack of detailed assessments of the other harbours on the island during these periods. It would be surprising if some of the changes observed at Hersonissos and Hierapytna, including the engineering projects, were unique to them. It is to be hoped that further research and investigation will be increasing our understanding and answer some of the questions that have emerged during this study.

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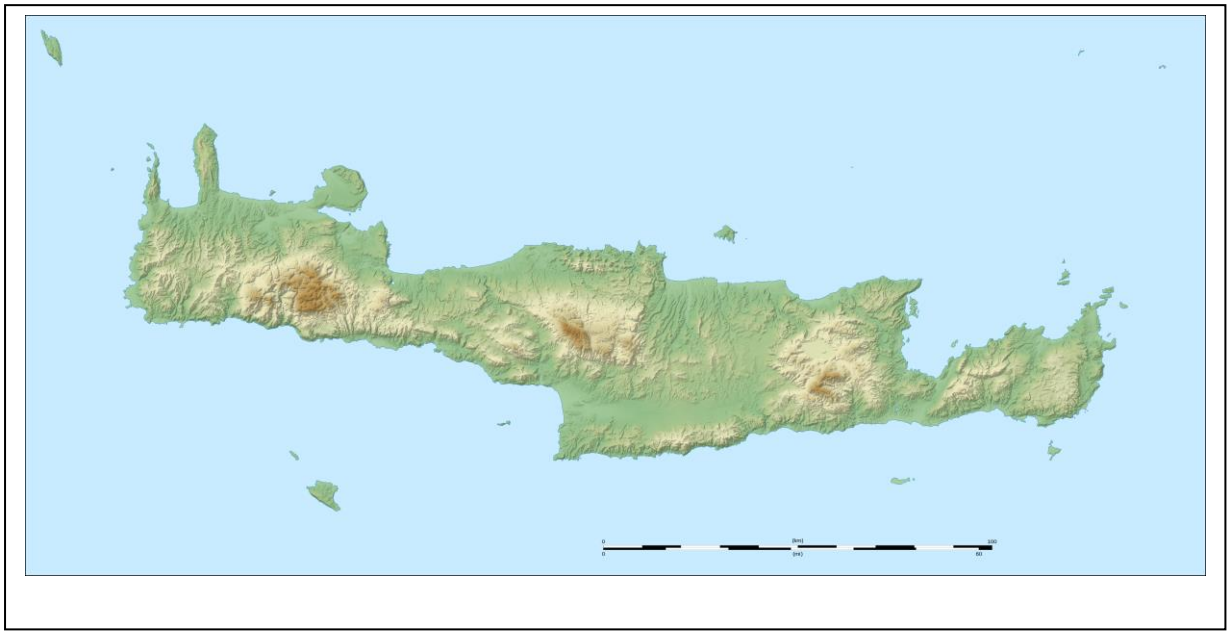


Figure 1. A relief map of Crete. Accessed from https://upload.wikimedia.org/wikipedia/commons/thumb/0/0b/Crete_relief_map.svg/3370px- Crete_relief_map.svg.png. on 19.08.2016.

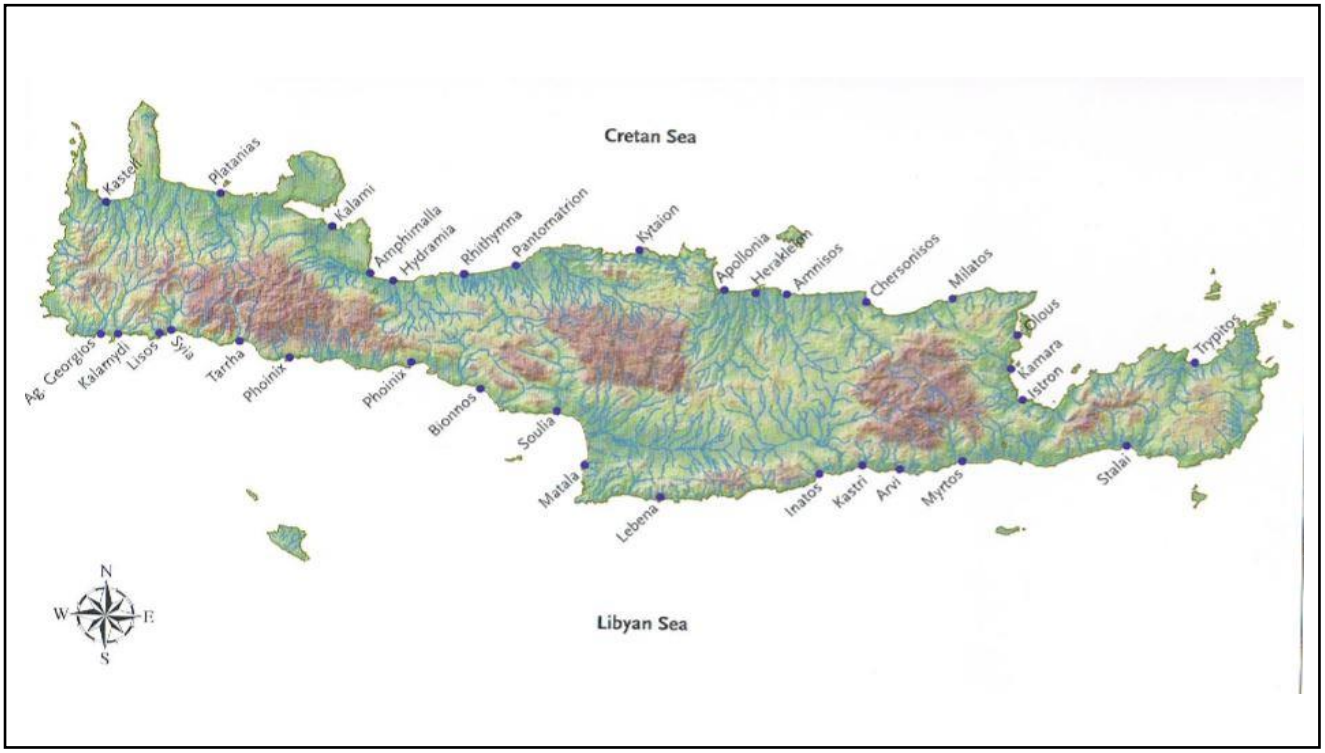


Figure 2. The smaller Hellenistic coastal urban centres comprising a mix of *poleis* and harbour settlements for inland *poleis*. From Cross 2011, Map 3.

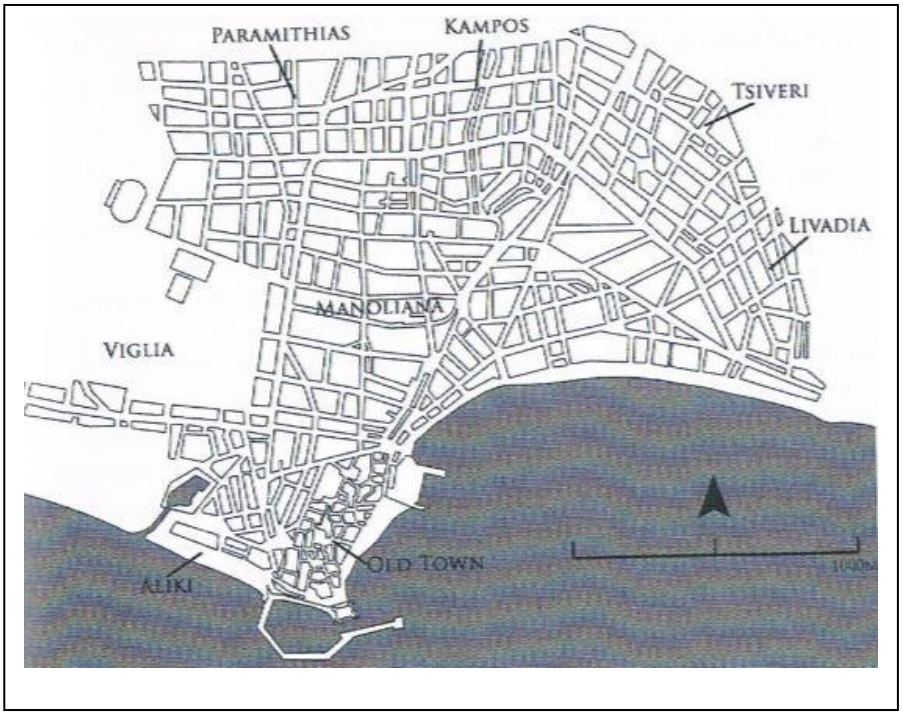


Figure 3. The districts of modern Ierapetra. From Gallimore 2015a, 9, Figure 2.2.

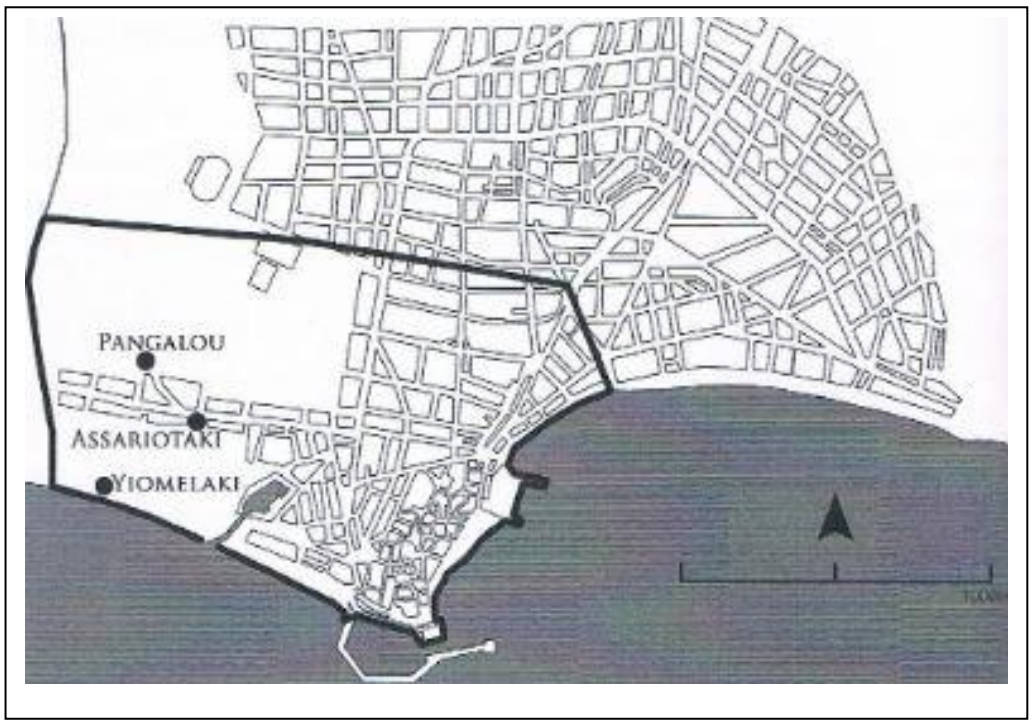


Figure 4. The location of the Assariotaki, Pangalou and Yiomelaki plots. From Gallimore 2015a, 54, Figure 3.1.

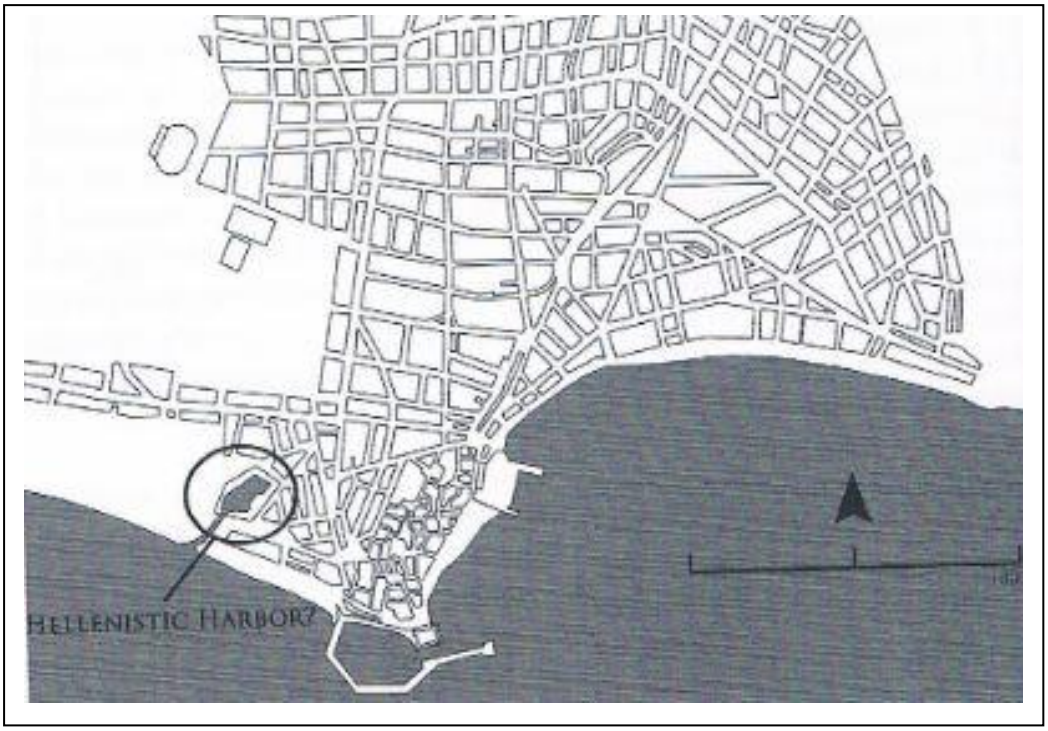


Figure 5. The suggested location of a Hellenistic Inner Harbour at Hieraptyna. From Gallimore 2015a, 14, Figure 2.4.



Figure 6. The modern harbour frontage at Ierapetra showing the remains of the Roman harbour moles. Accessed from http://www.sail-la-vie.com/images/locations/ierapetra-harbor-lasithi-crete-sailing-greece.jpg. on 05/10/2016.



Figure 7. The modern harbour of Hersonissos. Photography: Michael J Curtis. September 2016.

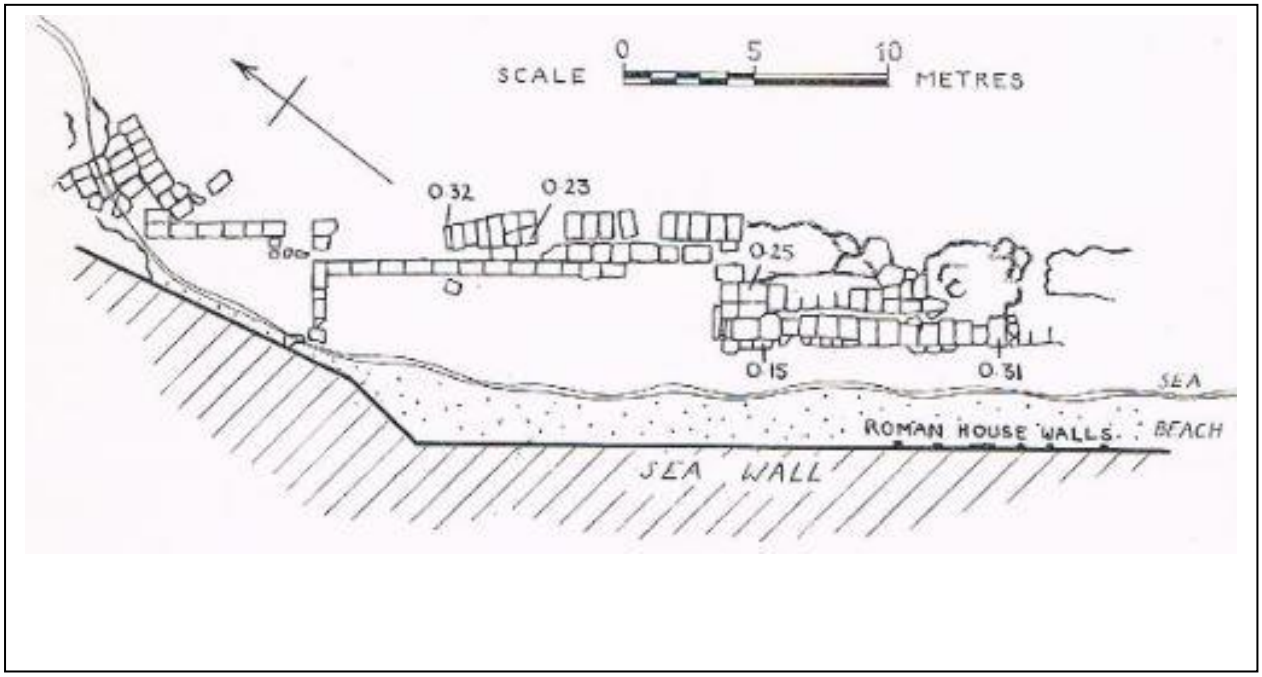


Figure 8. A plan of the Classical/Hellenistic quay frontage at Hersonissos as seen by the 1955 survey. From Leatham and Hood
1958-1959, 268, Figure 3.



Figure 9. A view towards the ‘Kastri’ from the west showing a new section of exposed quay frontage. Photography: Michael J Curtis. September 2016.



Figure 10. A section of the exposed Classical/Hellenistic quay at Hersonissos to the east of the Roman harbour. Photography: Michael J Curtis. September 2016.

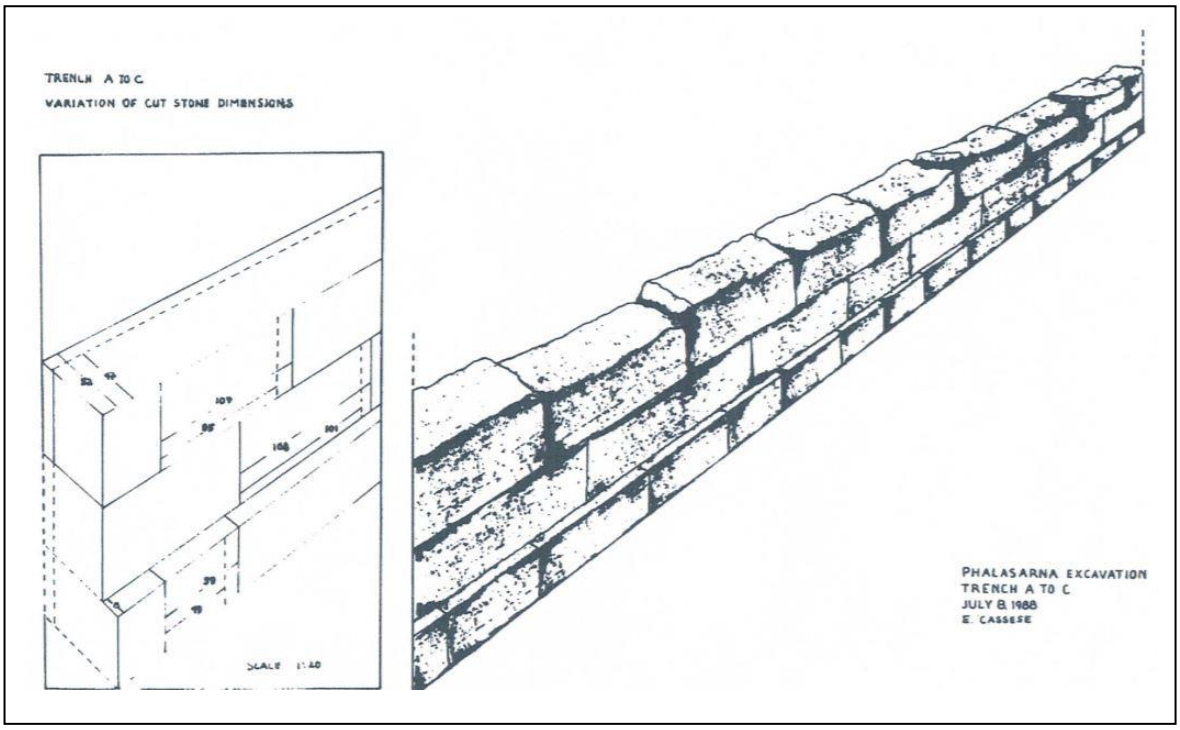


Figure 11. The wall in the 'Secondary' basin at Phalasarna. From Frost and Hadjidaki 1990, 526, Figure 11.

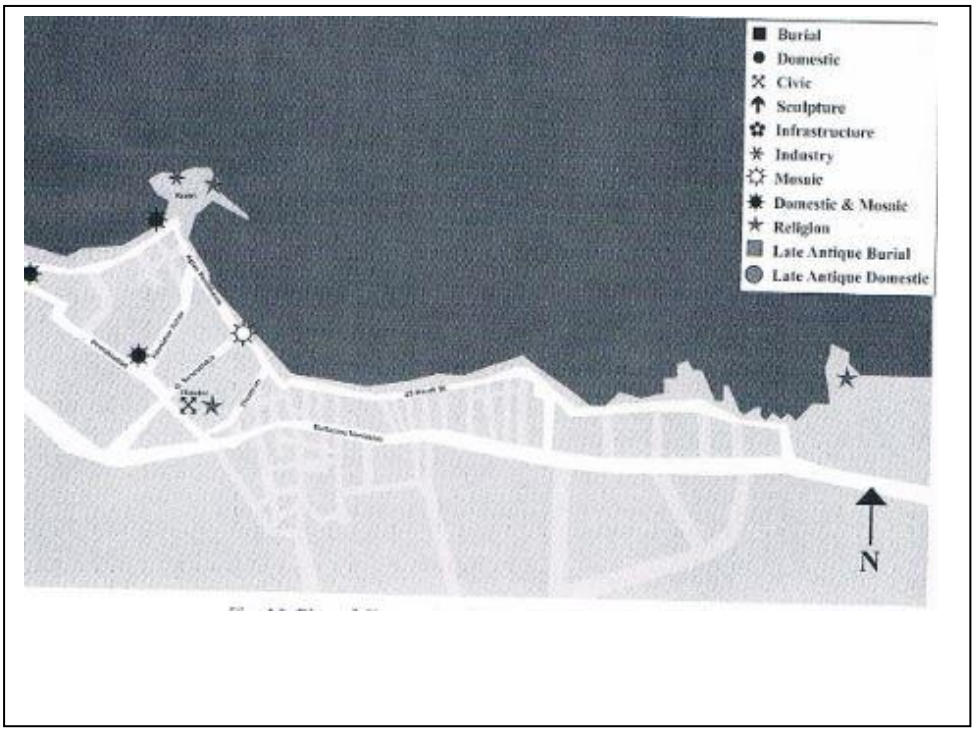


Figure 12. A map showing the location of Roman finds at Hersonissos. From Sweetman 2013, 34, Figure 16.

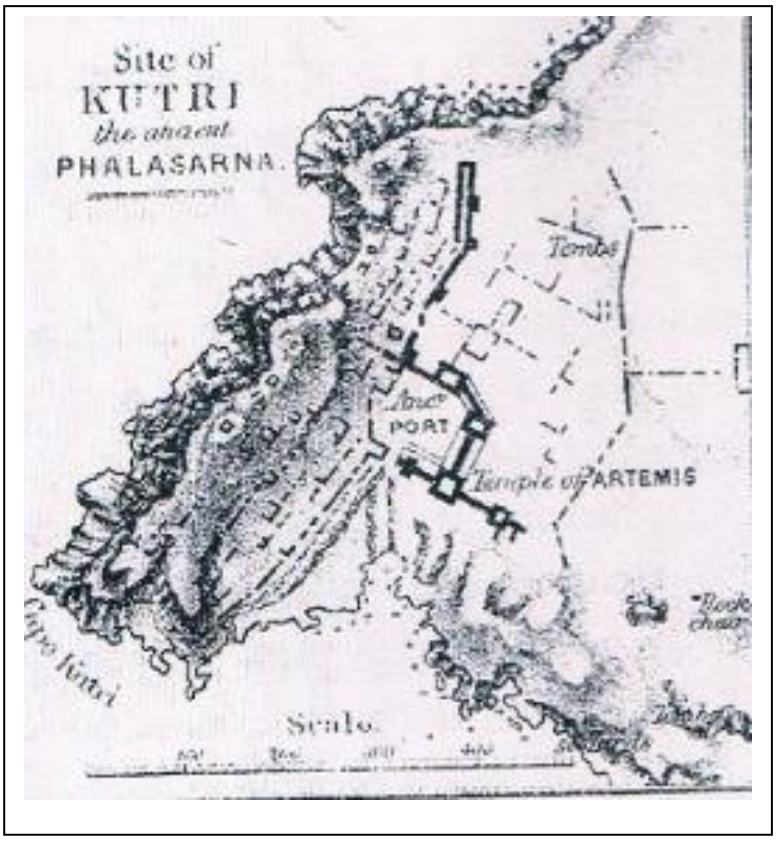


Figure 13. Spratt's plan of Phalasarna. From Spratt 1865b, 229.

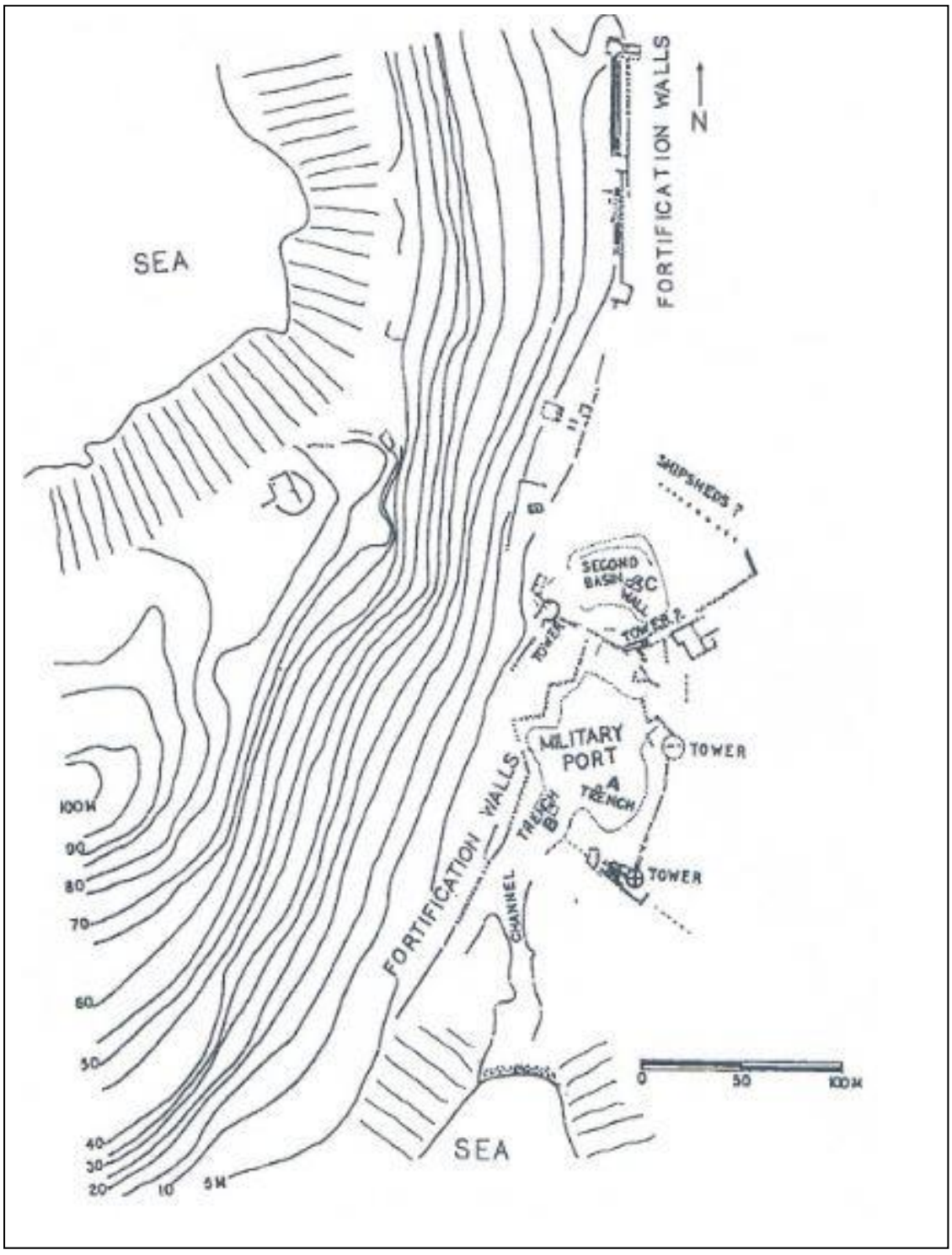


Figure 14. A site plan of the Harbour at Phalasarna. From Pirazzoli *et al.* 1992, 376, Figure 2.



Figure 15. Harbour quays and mooring stones at Phalasarna. Accessed from http://honorfrostfoundation.org/dr-pasquale-valle-the-hellenistic-transport-amphoras-from-the-excavation-at-the-harbour-of-phalasarna/ on 11/10/2016.

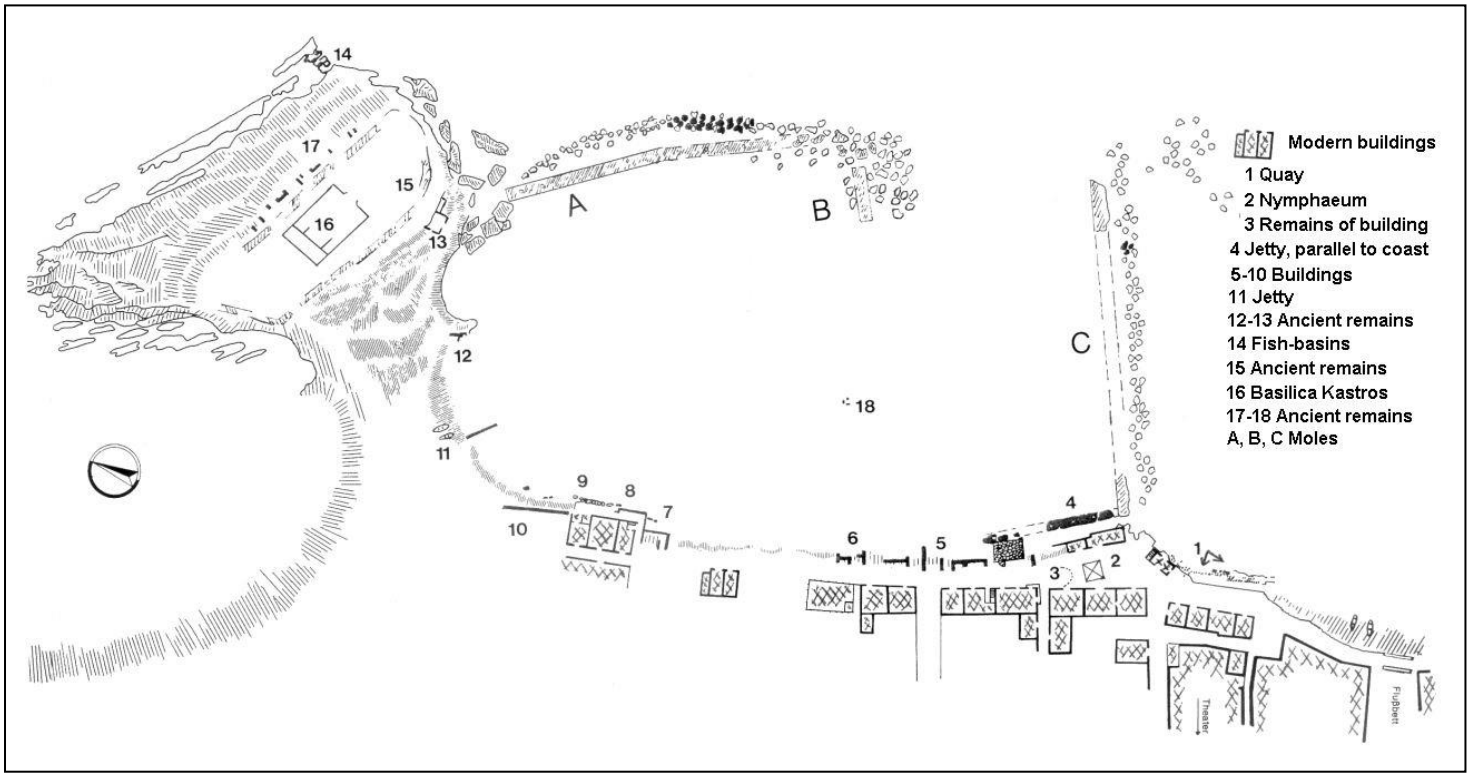


Figure 16. A plan of the Roman harbour of Hersonissos showing the position of some of the quayside wall sections. Accessed from http://www.ostia-antica.org/harbours/crete-plan2.gif on 22/10/2016.



Figure 17. The Roman pyramidal fountain at Hersonissos. Photograph: Michael Curtis. September 2016.

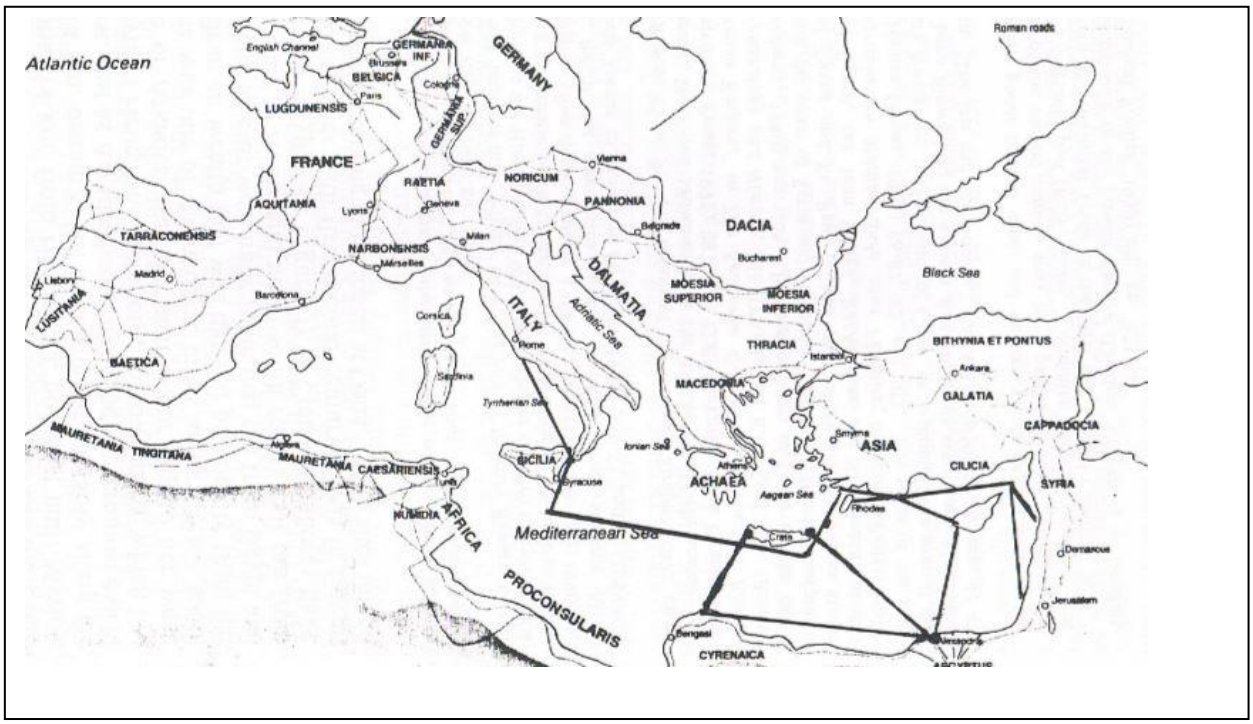


Figure 18. Trade routes across the Mediterranean in 117 C.E. From Baldwin Bowsky 1994, 8, Figure 3.

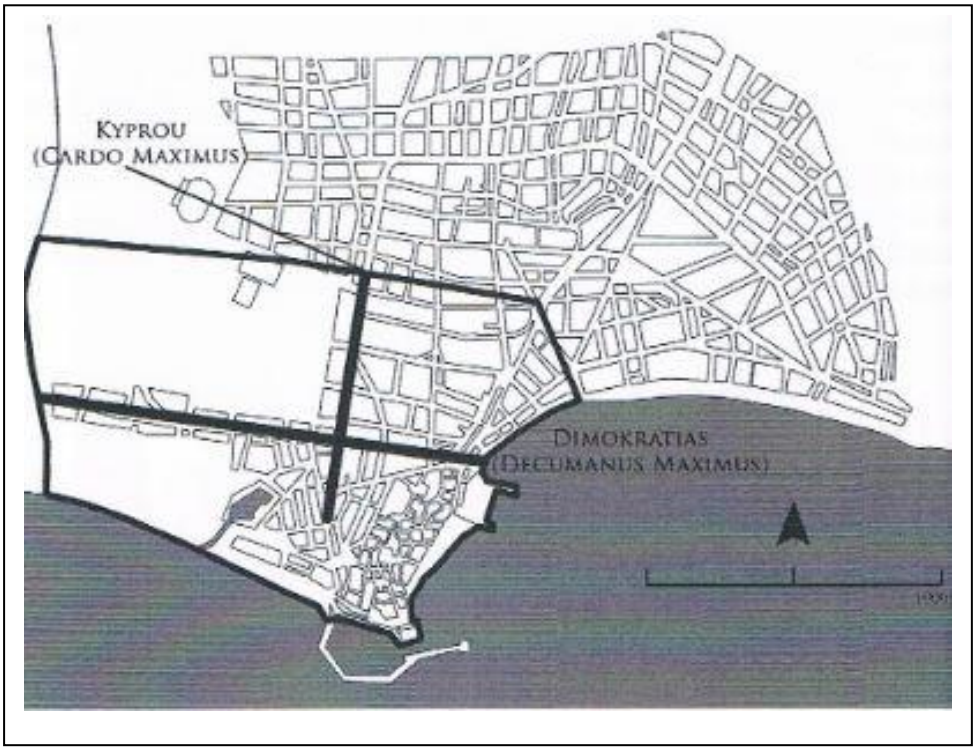


Figure 19. Possible location of the Cardo Maximus and Decumanus Maximus in Roman Hierapytna. From Gallimore 2015a, 18, figure 2.8.

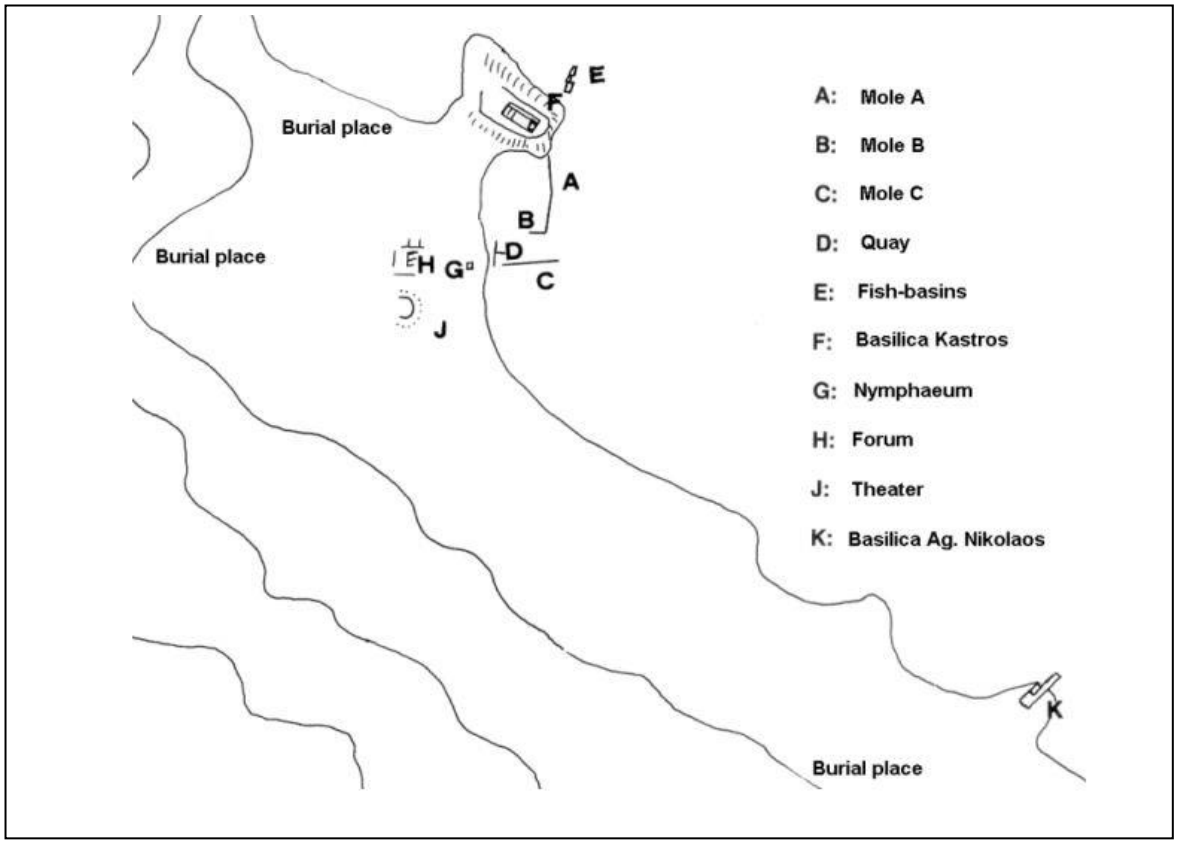


Figure 20. Roman Hersonissos showing the location of the forum and theatres areas. Accessed from http://www.ostia-antica.org/harbours/crete.htm viewed on 23/10/2016.

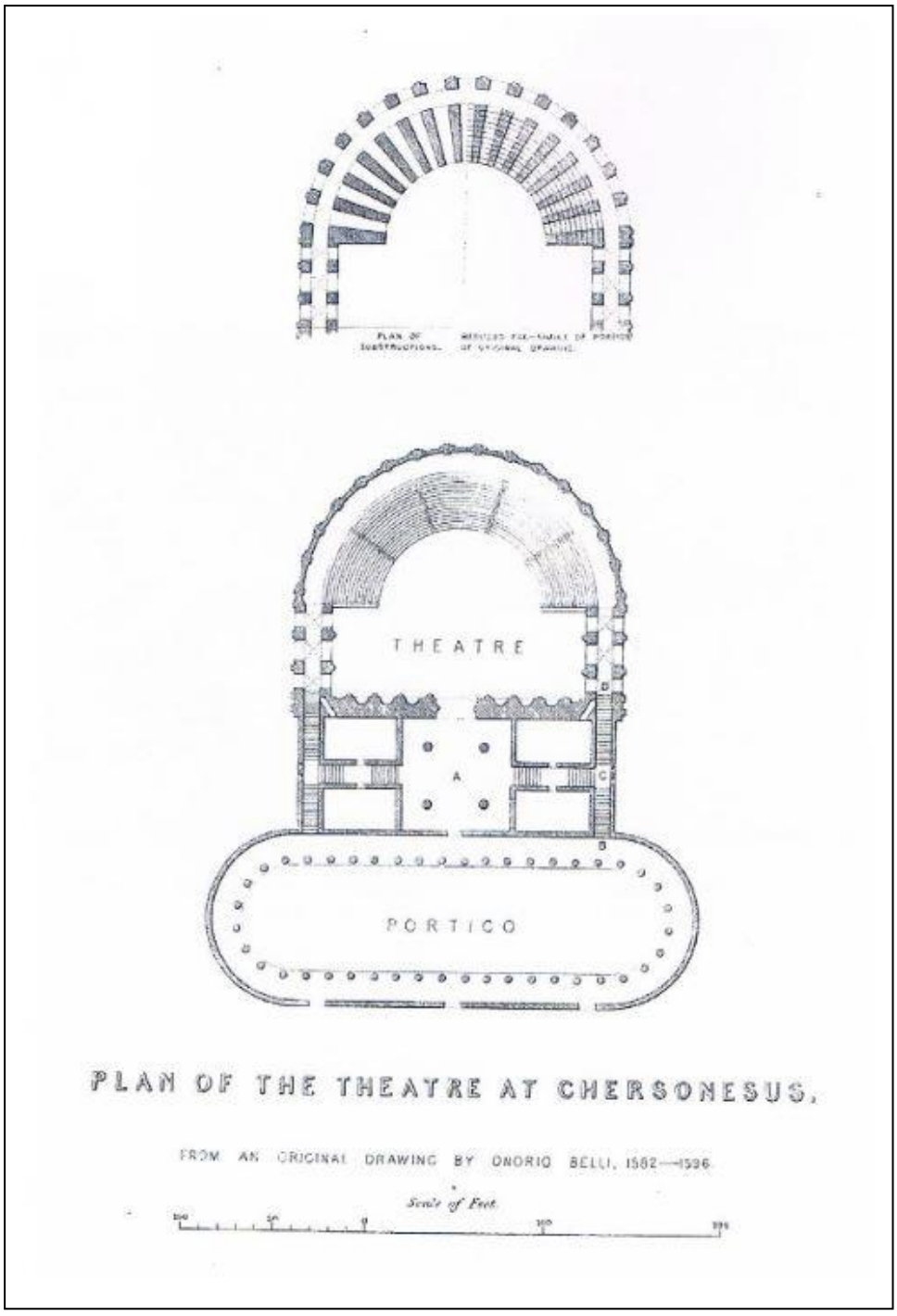


Figure 21. Onorio Belli's plan of the theatre at Hersonissos. From Falkener 1854, opposite page 16.

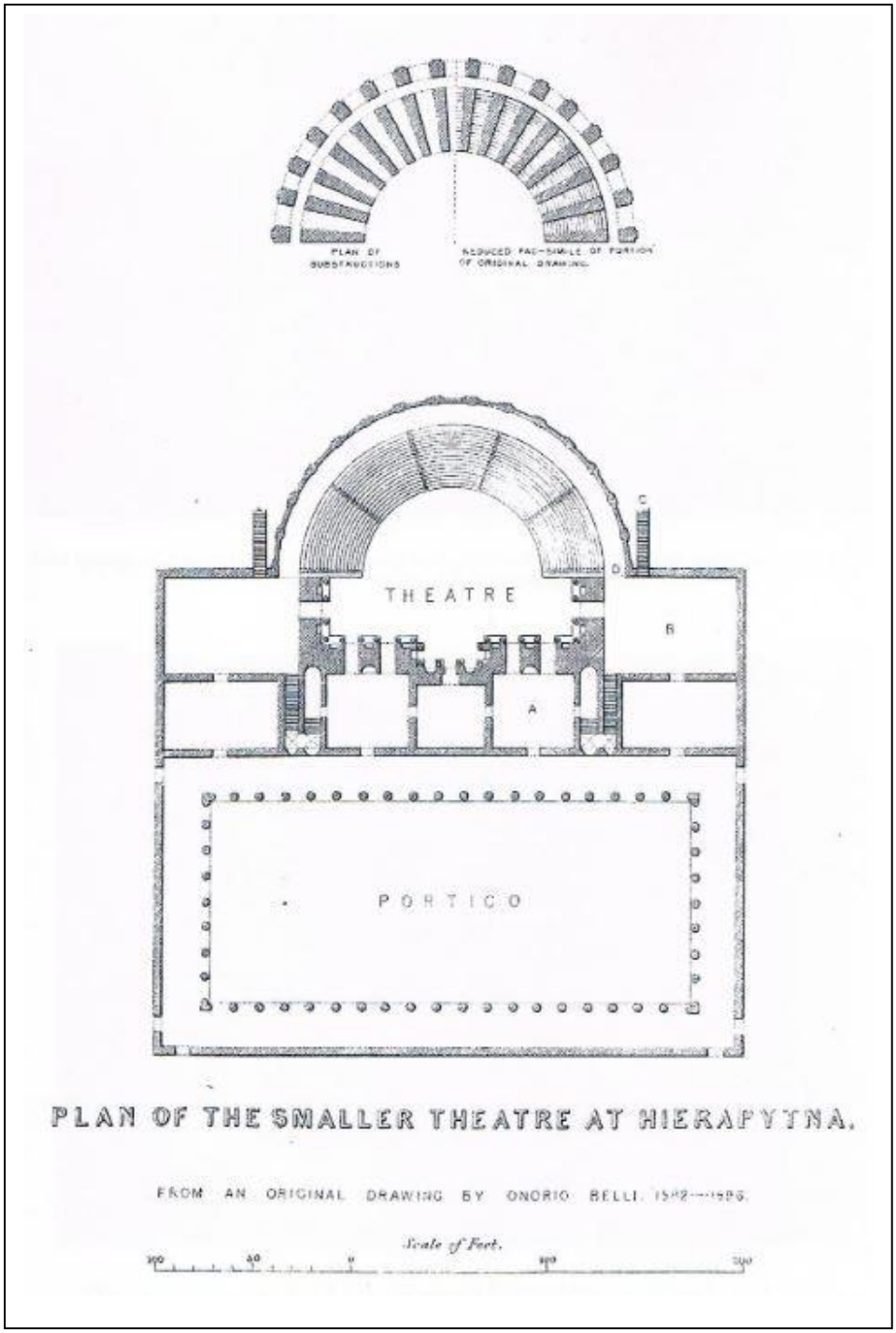


Figure 22. Onorio Belli's plan of the small theatre at Hierapytna. From Falkener 1854, opposite page 12.

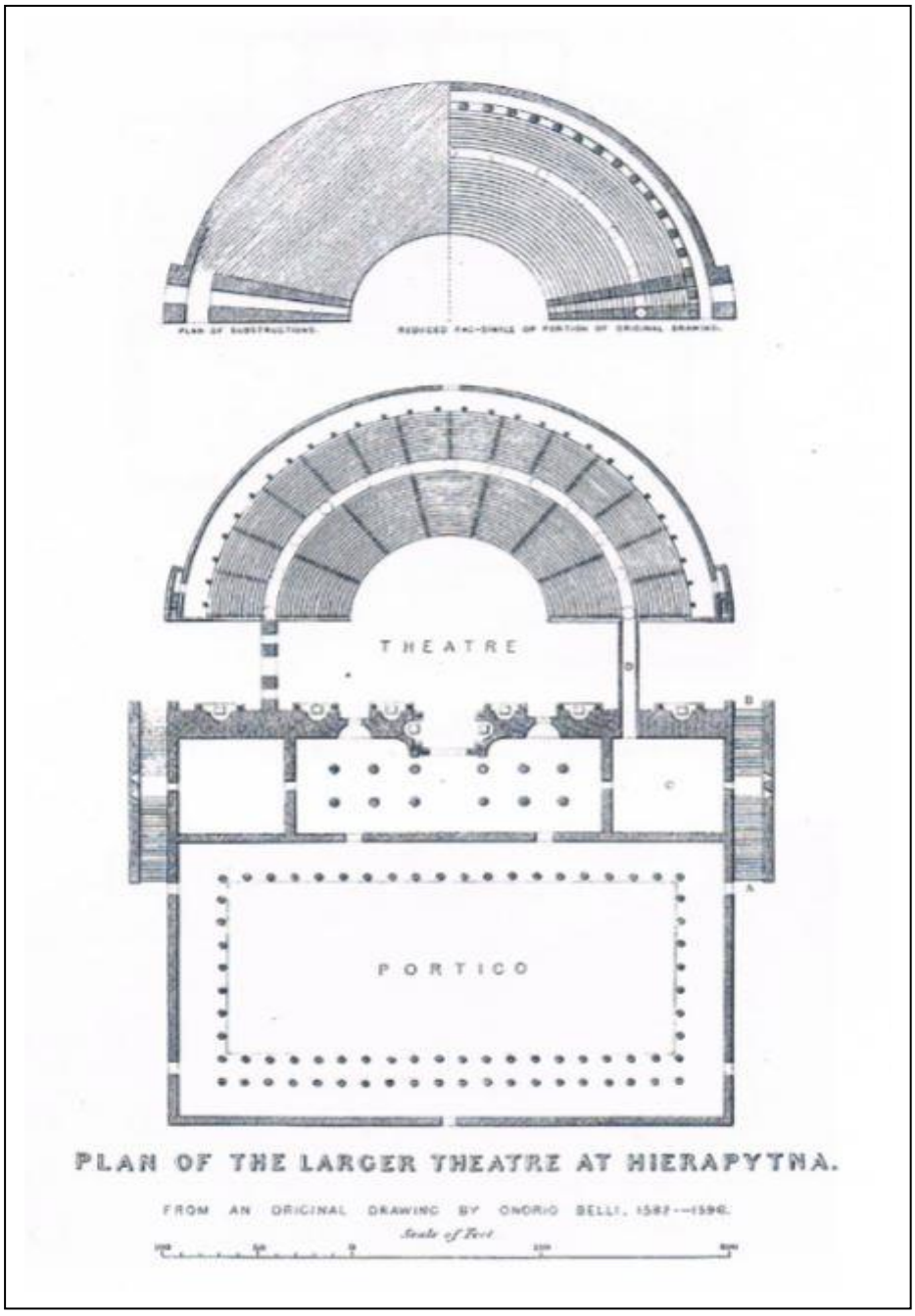


Fig 23. Onorio Belli's plan of the large theatre at Hierapytna. From Falkener 1854, between pages 12 and 13.



Figure 24: The “San Salvatore” fountain in Heraklion.
Photograph: Michael J Curtis. September 2016.