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THE
Roman Aqueducts and
Bathhouses of Crete

Catalogues

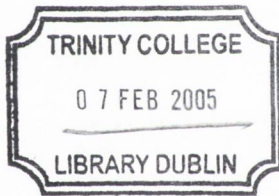
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AMANDA KELLY

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CATALOGUE A

ROMAN AQUEDUCTS OF CRETE: 1st-4th CENTURIES AD

1. Kouphonisi

Plate : Fig. 19; plates 1a-c and 2a-c.

Location : Kouphonisi is a small island 8km southeast of the Goudouros promontory off the southeast coast of Crete. It is the largest of a group of islands including Makroulo, Strongli, Trachila and Marmara. The islets are separated from the mainland by the narrow, and aptly named Dhiavlo Koufo.

Site Description/Context : Leonard who engaged in a one-man survey of the island in the early 1970s subdivided the island into three main areas (**fig. 19**). These three areas consisted of the north coastal area, the southern coastal cliffs and the intervening plain. The Roman settlement is focussed on the northwestern point of the island. The settlement includes a theatre, baths and at least two town-houses. The villa or town-house (**fig. 19**, BLDG 6) south of the bathhouse is comprises small rooms with mosaic floors and mortared stone walls with frescoed interiors (Papadakis 1983a, 380-2, fig. 2). Building 5 is also associated with mosaic flooring (Leonard 1972, 361). Leonard interprets the architecturally defined level area south of the theatre as a possible *forum* (1972, 356). The remains of aqueducts and their associated cisterns are visible in the wide plain which occupies the centre of the islet to the south of the city.

The theatre is located southwest of the main town-house (**fig. 19**, BLDG 6). Its aeolianite stone seating rests directly on the soft rock-cut marl (**plate 1a**). Aeolianite forms the main building material for the theatre, baths and town-houses. Fragments of pink and white veined marble columns lie in the theatre's orchestral area attesting the grandeur of this modestly sized structure.

Unexcavated structures extend east of the main site along the north coast of the island indicating a larger settlement (**fig. 19**, BLDG 3, 4 and 5). The main edifices survive to a substantial height, the elevations of the bathhouse being particularly high with some walls standing 2m high (**plates 49b**). Nonetheless, wind and sea erosion of the structures is becoming a serious threat. The collapsed architecture scattered in the

shallows below the bathhouse is suggestive of a more extensive settlement, much of which has been eroded due to the nature of the soft marl which forms its foundation.

Leonard believes that the small islet of Marmara was joined to Kouphonisi in ancient times (1972, 355). This theory is supported by the fact that this islet, like the island itself, has architectural walling associated with black-and-white mosaic flooring. Its detachment has been attributed to the 6th-century AD earthquake that rocked Crete submerging the harbours of both Mochlos and Itanos.

Aqueduct Description : Spratt traced low-profile aqueducts from the city to the hills to the south where he identified a spring (1865, I, 241). Leonard was, subsequently, unable to locate this source but mentions two wells east of the coastal buildings (1972, 357, n. 5).

Water system I : Leonard identifies two water systems which he labels 1 and 2 (**fig. 19**). ‘Water System 1’ consists of cisterns 1, 2 and 3 and their corresponding aqueduct which runs on a north-south axis south of the *forum* area. Spratt also observed that ‘in the plain to the south of the small tower or fortress are three vaulted and solidly built cisterns’ (1865, I, 241). The dimensions supplied by Spratt reveal that he viewed cisterns 1 and 2 as an integrated unit. He reports that the largest cistern was 650ft (198.1m) long and sub-divided in three compartments which provided water for summer use (cited in Leonard 1972, 358, n. 6).

These vaulted cisterns were located by the present author when tracing the aqueduct towards the foothills southeast of the plain (**plate 1b**). Cistern 1 (of Leonard’s water system 1) is clearly the largest and most intact of any of the vaulted cisterns on the island. It lies south of the *forum* and is constructed on a north-south axis. In 2002 this cistern still survived to a height of 4m with the spring of the vault clearly visible (**plate 1b**). The roof has collapsed since 1976 when a photograph was taken showing a portion of its roof intact (Papadakis 1976a, 196, fig. 5). Leonard’s measurements for this feature, 14m x 65m (1972, 357), are excessive when compared to the more modest dimensions of 20m x 4m x 4m recorded by the present author in 2003. However, it could originally have been much larger, since its current state of preservation is poor and overgrown (personal observation). The cistern is freestanding but seems to be sunken due to silting and wind-blown sand deposition.

The walls of cistern 1 are composed of a core of mortared rubble faced externally with roughly-cut local stone and internally with brick which is further coated with *opus signinum*. A shepherd has converted the northern end of the cistern into a modern shelter. Two parallel lines of architecture extend from here on an east-west axis, one of which curves to the south at its tip (indicated on **fig. 19**). Their purpose is not clear, although they seem integral to the water system.

It seems logical that the aqueduct associated with the largest of the cisterns (Leonard's aqueduct 1) (**plate 2a**) should also be relatively large. The section of the aqueduct running towards cistern 1 from the hills was traced for a distance of about 200m in this direction. Its channel is 0.35m wide and 0.20m deep while the overall substructure is 0.70m wide and stands 0.50m high from the modern ground level, although silting is evident (personal observation).

Cistern 2 of water system 1 could not be traced in the field in 2003 and also seems fragmentary in Leonard's plan (**fig. 19**). Cistern 3 was visible directly south of Leonard's *forum* area. It is again vaulted and consists entirely of stone-faced mortared rubble. The cistern was recorded in 2003 measuring 2m x 6m x 1m high which contradicts Leonard's relatively substantial dimensions of 9m x 18m (1972, 358). Its connecting aqueduct is low in profile, sometimes only surviving at ground level and runs towards the cistern on a northwest axis. Its channel is 0.14m wide while the overall substructure measures 0.50m wide and 0.45m high.

Water system II : The second water system lies to the east of the *forum* area. Its aqueduct (Leonard's aqueduct 2) can be traced for over 100m on a southeasterly axis across the plain towards the hills. The dimensions of aqueduct 2 are similar to those of water system 1 near the Roman settlement (**fig. 19**). Here, its channel is 0.14m wide and 0.20m deep (**plate 2b**). The substructure measures 0.50m wide and 0.45m high. It leads to a small cistern to the east of the possible *forum* area.

The channel surface is lined with *opus signinum* with ceramic and greenstone inclusions (**plate 2c**). It has a polished grey surface. The profusion of greenstone in the *opus signinum* seems to be a common feature in all the aqueduct sections on the island but has not been detected in *opus signinum* anywhere else on Crete.

The settlement is founded on a lower level than that of the interior of the island and consequently the aqueducts would enter the city at a sufficiently elevated position.

Generally the aqueducts are low in profile with the highest elevations near vaulted cistern 1 to the south where the channel dimensions are also largest i.e. at the furthest edges of the plain from the settlement (**plate 2a**). The channels tend to diminish in size as they approach the town. The low elevations are probably due to the topography and heavy sedimentation which obscure the original height of the substructures. During fieldwork this inland section of the island was covered with wind-blown sand.

Type : Public overground aqueduct.

Date : Unknown. Possibly 2nd century AD.

2. Hierapytna

Plate : Fig. 20.

Location : Lat: 25°75'N; Long: 35°008'E. Hierapytna is located on the south coast of east Crete on a plateau between two waterways at a strategic vantagepoint for controlling the eastern isthmus. Hierapytna probably gained control of the isthmus in the Hellenistic period, after the defeat of Praisos in 146 BC, a control that continued under Roman rule.

Site Description/Context : Hierapytna had all the amenities of a Greek provincial city in the Roman Empire including a variety of public buildings such as baths and aqueducts (*IC III iii* summaries; Sanders 1982, 139-140; Baldwin Bowsky 1994, 11). Belli contributes additional features, such as a naumachia, two theatres, an amphitheatre (as depicted in **fig. 20**) and temples (cited in Falkener 1854, 11). These elaborate Roman constructions would indicate a high level of development during the Roman period (Mourtzas 1988, 1557-8).

Hierapytna, as a coastal city of considerable importance, would have had a particularly elaborate harbour. Belli remarked that Hierapytna was connected to a small island by a mole consisting of a 20ft thick wall (6.0m) which also served as a gabion battery to the commodious harbour (cited in Falkener 1854, 11).

Aqueduct Description : The *Stadiasmus Maris Magna* (319) reports that Hierapytna was a city which boasted off-shore islands called Xrissa, a harbour and 'water from the Ieras Pynhes in Bienon'. Spanakis also claims that modern Hierapytra is supplied, via an aqueduct, by water from the spring of Aghios Ioannos Psychro from which the ancient city was also supplied (N.D., I, 102). There is still an abundance of

springs at Aghios Ioannis Psychro situated *c.* 3.5km east of Aghios Ioannis northeast of Hierapytra and 5km from the coast (Nowicki 2000, 81-2, fig. 33). Despite the numerous references to an aqueduct at Hierapytna it has not been described in detail and its existence in the field remains elusive although perhaps discernible in Spratts' admiralty map (**fig. 20**).

Type : Public aqueduct.

Date : Unknown.

3. Pachyammos

Plate : Figs 21 and 22.

Location : Lat: 25°N8'E; Long: 35°N108'E. Pachyammos is located at the end of a valley connecting the north and south of the island at its narrowest point along the isthmus. The plain is well-watered by various springs; notably those in the village of Vasiliki and at the chapel of Aghia Anna at the head of the Xa Gorge (Rackham & Moody 1996, 181). A Venetian mill and its associated leat are visible clinging to the sheer southern cliff-face at the mouth of the gorge.

Site Description/Context : The present study confirms that the aqueduct was designed to supply a rectangular building at Pachyammos, thought to be a villa, equipped with a private bath-suite (B 8). The structure is located 200m south of the coast just west of the Monasteraki River delta in an area called 'Sta Hellenika' (see B 8).

Aqueduct Description : Tracts of an aqueduct have been cited in the wider Pachyammos-Vasiliki area and are generally traceable on the western side of the road that runs north and south between the Gulf of Mirabello and the south coast. Aqueducts have been cited at Vasiliki and Pachyammos (Sanders 1982, 140-1; Baldwin-Bowsky 1994, 9, n. 12). Seager notes a small conduit which he believed supplied the Roman settlement on the Kephala (1906-7, 115). The open channel is *c.* 0.2m wide (Zois 1992, 280). Soles also records the aqueduct associated with a tomb in the area of Vasiliki (1973, 240).

It can be argued that these citations all refer to one aqueduct designed to feed the private bath-suite in the structure at Pachyammos. Hastings planned a complicated system of cisterns and aqueducts on the eastern side of a rectangular structure (**fig. 21**).

The aqueduct was traced 75m further inland to another cistern. The aqueduct was also cited crossing the Monasteraki River on a bridge about 500m south of the site (Orlandos 1972, 118; Zois 1992, 280). Despite the fact that Seagar suggests that the small conduit tapped a spring in the hills near Episkopi 4km to the south (1906-7, 115), it is far more likely that the water from the Xa Gorge was facilitated as the aqueduct could not be traced in the field further south of this source (personal observations).

Type : Private overground aqueduct.

Date : 2nd century AD.

Dating methodology : The only clue for the date of the aqueduct can be found at the site which the aqueduct supplied. Two coins were recorded from the excavation of the structure at Pachyammos. One coin dates to the reign of Antoninus Pius while the second is late antique. Sanders notes that a 2nd-century AD date for the private structure would comply with its general construction style (1982, 140, no. 2/12).

4. Lyttos

Plate : Figs 23-26 and 84; plates 3 and 4.

Location : Lat: 25°N416'E; Long: 35°N216'E. In brief: the aqueduct runs from the Kournias springs along the foothills of Lasithi terminating at Lyttos.

Site Description/Context : The ancient city of Lyttos is located 1km to the northeast of the modern village (previously Xidas) on a ridge in the western foothills of the Lasithi range (**figs 23-24**). Belli remarked that the hill ridge presented the worst topography he had ever encountered for an urban setting, with a remarkably restricted area of level ground (cited in *The Builder* 7/12/1901, 499). Similarly, Spratt reported that the remains of the site

'exist upon the summit of a narrow but tortuous ridge, overlooking the plain upon its eastern margin, just over the village of Xidhia or Xidhi ... Thus situated upon the summit of a western shoulder of the Lasethe, the city of Lyttus or Lyttos occupied a very commanding position; yet the hill has no striking form of outline or feature. The site is, however, a remarkable one; for it is at the point of

junction or branching-off of numerous narrow ridges that descend from it to the south, west and north, the sides of all of which are very abrupt' (1865, I, 94).

A theatre on the slopes of the ridge, planned by Belli in the 16th century, is reportedly the largest in Crete, with a diameter of 435ft (132.6m). Unfortunately, its location has not been secured in the field (Spanakis 1968, 158, pl. ΚΓ'). The church of Aghios Georgios on the southern peak is founded on a 2nd-century AD building. The city's *bouleuterion* has been partially excavated revealing a large area with built platforms or benches, which was destroyed by earthquake *c.* AD 200. No baths have been located but from the existence of the aqueduct it may be deduced that there was at least one.

Aqueduct Description :

4.1 The Route (fig. 24)

The aqueduct traverses the hinterlands of the villages of Krasi, Keras, Gonion, Avdou, Kastamonitsas and Xsida. It taps the Kournias spring near the village of Krasi delivering water to the southeast edge of the city of Lyttos. The distance between the city and the source is 10km as the crow flies but the aqueduct measures 22km. The aqueduct, with the exception of a *c.*1.5km-long tract from Terazi until Plativola, functioned with free-flow whereby the channel was either revetted or carved to maintain the slope. The aqueduct travels through a mountain zone for most of its course and only departs from this contour line at a distance of 19km from its source.

Spratt observes that the city of Lyttos is connected with the Lasithi massif by a coll or neck, and that on leaving the steep mountainside the aqueduct runs along this to reach the city (1865, I, 101). On departing from the mountainside the aqueduct travels on a substantially elevated substructure wall for its remaining route of 3km. It continues in a northwest direction on an angled line from the mountainside to the area of Lyttos (**fig. 24; plate 4a**). The aqueduct passes through numerous localities along its route. Starting from the spring at Kournias it passes just above the villages of Kera and Ano Kera, into the Gorge of Rozas and the ravine of Ampelos, the chapel of Aghia Marina, Stolous, Aghia Fotini, Lugias, Kalastra, Tou Kuthiou to Plai, Kavga, Kavgoudi and Mikro Kavgoudi leading to the tip of the ravine of Porou tis Goulas where it departs

from the mountains. Subsequently, it passes through places such as Poros tou Toikhou, Koutelo, Kaliva, Plativola and Troullia.

4.2 The Slope

The undulating landscape along the path of the Lyttos aqueduct has serious repercussions for its design and layout. The aqueduct runs overground for its entire length and either avoids or conforms to difficult or insurmountable terrain along its route. The aqueduct follows the contours of the steep slopes of the mountain range of Dikte which afford the elevation necessary for its operation for most of its length (**plate 3a**, the aqueduct ledge is indicated by the arrow). This solution more than doubles the length of the aqueduct but reduces the need for substantial substructure walls. Elevated substructures were further reduced by the incorporation of an inverted siphon on departing the mountain slopes.

The difference in height between the estimated source and the *castellum* is 110m. Therefore, the greatest slope for the overall distance is 110m (the smallest only 44m) for the transport of water with free-flow. Oikonomaki provides the following heights of the channel at the subsequent locations (1984, 78):

The surviving height of the substructure wall, at a distance of 450m from the spring, is +705m. At Aghia Fotini, above the rock on which the cave chapel of Aghia Anna and of Aghios Ioannis the Theologan was founded, around 8km from the spring, the height is 645m. At Petrokopeio (located at the widest area of Mikro Kavgoudi) at a distance *c.* 10km from the spring the channel height is 605m. At Terazi, 900m further on from Petrokopeio, the estimated height is 600m. Here a drop is facilitated by a water pressure tower, which facilitates a sudden drop of 2m. The final height of the terminal cistern at Filakes is ± 600 m (Oikonomaki 1984, 78).

The floor of the water pressure tower, located at the aptly-named locale of Terazi, bears traces of *opus signinum*.¹ The structure is square in plan, each side measuring 2m in length. Its southern wall survives to a height of 0.75m and abuts the last section of the mountainous trajectory of the aqueduct. These remains represent a tower which would have regulated the necessary pressure to traverse the ridge connecting the mountains with the two main heights of Lyttos itself (Oikonomaki 1984,

¹ Terazi is an Arabic word that roughly translates as water plumb-line referring to balance and scale.

73). The tower would also have compensated for the abrupt change in direction at this juncture.

4.3 The Rock-Cut Channel (figs 25-26)

The channel is rock-cut in places where the limestone massif becomes too steep to construct any type of substructure (**plate 3a**). The force and direction of the flow of water determine the shape and dimensions of the channel. The process of carving the channel involved the shaping of a rock-cut ledge along the contour of the hillside (**fig. 25**). The vertical height of the inner edge of the ledge depends on the sheerness of the slope and fluctuates between 0m-2m (Oikonomaki 1984, 71). The channel is cut into this ledge close to the inner edge of the ledge where it is protected from the elements and from erosion.

Taramelli confines his report of the aqueduct to this rock-cut channel which he traced the Gorge of Rozas (1899, 406-7). In his profile sketches a small indentation on the inner side of the ledge is discernible which may indicate some form of roofing over the channel (possibly vaulted) to prevent debris from entering the channel or absorption of water by the sun (**fig. 26**). Taramelli's sketches, while not particularly accurate, offer a good general impression of the channel. In one of his sketches the channel width is relatively regular throughout (being 0.40m wide at the top and 0.35m at the base) whereas in another section the channel tapers gently towards its base. The vertical depths he records for the channel (the inner side being 1.05m-1m and the outer side 0.50-0.80m) while feasible are likely to lie on the higher side of the average scale (**fig. 26**).

At Kavgoudi, the rock-cut ledge has a width of 1.18m-1.25m while the rock-carved channel has a vertical depth of 0.37m (inner wall) and 0.29m (outer wall) (**fig. 25a**). The channel is cut closer to the inside of the ledge. The distance of the channel from the inner edge of the ledge fluctuates from 0.30m-0.42m, while the channel lies 0.57m-0.62m from the outer edge of the ledge. In this section there is relatively little differentiation between the width of the bottom and the top of the channel (Oikonomaki 1984, 71). The width of the top of the channel varies from 0.29m-0.40m and the width at its base is 0.18m-0.26m (**fig. 25a**).

Another section, again in the area of Kavgoudi, yields different dimensions but the method of construction remains the same. Here the width of the ledge is 1.20m, while the depth of the channel is 0.60m. The width at the top of the channel is 0.30m while it tapers to 0.18m at the base (**fig. 25b**).

The differences in the profile shapes rely on the specific difficulties confronting the aqueduct in each area. Differences between the two sections represent measures taken to prevent erosion and damage. There seems to be some patterning in the dimensions represented by a correlation between ledge width and channel depth: when the width of the ledge is less than 1.20m the channel tends to be deeper.

4.4 The Built Channel

In the area of Petrokopeio the channel is supported on a low substructure wall. The channel is *c.* 1.20m deep and 0.30m wide. At Petrokopeio the walls forming either side of the channel are each 0.50m thick. Elsewhere, the widths of the half-walls are not always equal, that nearest the mountainside having a width of 0.40m while the outer wall, facing downhill measures 0.60m. This mainly occurs where the water flow changed direction or dropped abruptly in level.

The base of the channel at Petrokopeio is lined with limestone slabs, *c.* 0.12m wide and 0.05m-0.06m thick. A lining of *opus signinum* forms an elevated concave channel base. The surface of the channel was smoothed with lead in order to aid water flow and to hinder water absorption from the channel (Oikonomaki 1984, 79).

4.5 The Substructure Wall

The aqueduct of Lyttos employs specific masonry features in order to maintain its desired height and steady slope along its mountainous tract. This tract is known as ‘Αμαξοδιάβαση’ by the villagers of Kastamonitsa which suggests that it was used as a thoroughfare when its original function ceased. The ground level was exceptionally steep in places and the substructure reflects the dramatic undulations of the bedrock. The necessary level for the channel was projected along its trajectory and the masonry was built down from this to meet the mountain slope. The drop from this line-level to the bedrock varies according to fluctuations in ground level resulting in variations in the height of the substructure wall. Consequently, the height of the substructure wall ranges from 2m-3m along the mountainous route where the terrain is very rocky. The height

can ‘drop’ dramatically at specific points where the bedrock beneath recedes, in some instances to over 6m. In instances where the terrain drops considerably, the wall has to be reinforced with a type of stone revetment composed of an outer facing of square limestone slabs. The mountainous terrain ensures that this is a common feature along the mountainous tract of the aqueduct.

4.6 The Substructure Wall on Departing from the Mountainous Terrain

A single narrow ridge connects the city of Lyttos with the steep face of the Lasithi Massif. Spratt records that

‘this connecting ridge or neck divides the watershed or ravines that lead to the north and south coasts of Crete, by the Aposoleme Valley, the Pediada Plain, and the Valley of Ene; and there are the remains of an aqueduct upon this col or neck, that led from some distant part of the mountains of the Lasethe to Lyttus in its ancient and flourishing days’ (1865, I, 99).

The portion of the aqueduct to which Spratt refers is found near the entrance to the gorge of Porou tis Goulas starting at the point known locally as Terazi (**fig. 24**). This section traverses the more gentle and level terrain linking the Lasithi Massif with Lyttos itself. A double-faced and substantially elevated substructure was necessary to support the channel here (**plate 4a**).

The length of the aqueduct from Terazi to Lyttos is 3km. The last place before Lyttos is widely known by the toponym ‘O Toikhos’, which is also the name of the hamlet located just below the tract. The substructure follows a southeast-northwest direction for *c.* 500m from Terazi, at which point it angles to the west and continues towards Lyttos (**plate 4a**). Oikonomaki measures the greatest thickness of the wall, of 4.70m, at Poros tou Toikhou, just over the village near the church of Aghios Constantinos (1984, 74). He also reports that the foundations of the wall at this point are 7m thick, a statistic only possible after drilling exposed the foundations in the late 1970s.

The present author examined the substructure wall at this point and recorded a thickness of 4.40m where the substructure is intercepted by the modern road (**plate 4a**).

The wall consists of a mortared rubble core faced with large roughly-shaped limestone blocks. It stands to a height of 6.5m behind the church where horizons of large stones (or bonding courses) divide the elevations into three tiers (**plate 3b**, as indicated by the arrows). The stones of the bonding courses are better shaped and more substantial (average stone 0.80m x 0.30m) than those in the general wall. The wall also steps in slightly, by 0.14m, along these horizons. The section, revealed by the road-cut, affirms that these bonding courses are not superficial but continue through the core of the wall.

At Poros tou Toikhou, 200m to the north, the wall thickness measures 2.35m which corresponds with the width at Tripa tou Toikhou (**plate 4a**, as indicated by the arrow). Here, the substructure survives to its greatest height of 8.10m. Further north, near the spot where the surviving elevated substructure forms a high terrace; the thickness of the wall is 2.10m. On approaching the city of Lyttos (i.e. for a length of 900m after Tripa tou Toikhou) the substructure survives as an elevated dirt track with a thickness of 2.60m (personal observation).

4.7 The Inverted Siphon at Poros tou Toikhou

There is a definite correlation between substructure thickness and height in aqueduct studies. It has already been observed that at Lyttos the greatest width of the wall occurs at Poros tou Toikhou 1 near the church of Aghios Constantinos. It can be inferred that this also represents the point supporting the greatest elevation of the wall. If the aqueduct continued to Lyttos with free-flow across this low-lying area, the greatest height of the wall would have occurred at this point where the wall would have to reach between 35m and 40m. Oikonomaki deduces that if the aqueduct travelled with free-flow at Poros tou Toikhou 1 a considerably elevated substructure complete with communicating doorways and arches would have been necessary (1984, 74). Remains of a connecting gate are visible at Poros tou Toikhou 2, in the middle of the pass between the hill of Kalivas and the locale Kamini.

Alternatively, the water could have been conducted in an inverted siphon from Terazi to a slightly reduced height at Kalivas. This theory is supported by the discovery of a stone pipe near the substructure at Poros tou Toikhou 2 in an area littered with fallen debris (Oikonomaki 1984, 75 and pl. 6). The stone water-pipe constitutes an

element of an inverted siphon consisting of a series of large stone blocks with cylindrical perforations along their greatest length.

4.8 The Masonry Style

The aqueduct's architectural appearance is relatively uncharacteristic for most of its length. It avails exclusively of limestone from the slopes of Dikte which overshadows the region. In general, the substructure is composed of a mortared rubble core faced with roughly-shaped local limestone (**plates 3-4**).

In some areas along the Lyttos aqueduct the outer lining of stone has collapsed but the core itself remains intact, as is well-demonstrated at Poros tou Toikhou 2 (**plate 3c**). The aqueduct here is substantial, five times the present author's height of 1.63m which tallies nicely with Oikonomaki's 8.10m. The substructure wall was faced with roughly-pointed limestone blocks, with the pointed side set into the core of the wall, the flat side serving as the facing. These stones were fixed in repeated horizontal series of similarly-sized stones before the core solidified.

This facing was further divided into repeated friezes by horizons of larger limestone blocks separated by intervals of half a metre (**plates 3c-4b**). These horizons were composed of substantial equally sized well-dressed stone. Their positioning was at the same height on both faces of the wall and Oikonomaki believed that they penetrated the wall and acted as bonding courses. However, they seem to be superficial features in the elevation ascending the ridge at Poros tou Toikhou where they may merely act as intervals in the construction series (**plate 4c**).

4.9 The *Castellum*

The system terminates at a large cistern which collected the water allowing it to settle before dispersal for use in the city. The *castellum*, identified as the ruined structure known as Filakes or Filakes tis Aretousas, was located on the fringes of the city (Oikonomaki 1984, 77, pls 9 and 14). The structure is constructed with *brick-faced mortared rubble* with buttresses similar to those seen at Kastelliana and the L-shaped cistern at Aptera.

Type : Public overground aqueduct.

Date : 2nd century AD construction date.

Dating Methodology : The 2nd-century AD date for the construction of the Lyttos aqueduct is based on the monument's incorporation of comparative types such as stone bonding courses, a stone-piped inverted siphon, brick facing and brick buttressing. Moreover, the profusion of statue inscriptions dedicated to Trajan and Hadrian are particularly numerous in the city and Belli noted that in the time of Trajan, Hadrian and the Matidia the city flourished (cited in *The Builder* 7/12/1901, 499).

5. Chersonisos

Plate : Figs 23, 27, and 84; plates 5, 6 and 7.

Location : Lat: 25°383'N; Long: 35°3083'E. The modern city of Chersonisos lies on the north coast on the western tip of a sweeping bay. The ancient city of Chersonisos lies below and about Limani Chersonisou.

Site Description/Context : As the name would suggest the most important remains are those around the harbour (Sanders 1982, pl. 64). The ancient harbour is formed by the headland Kastri to the north and a series of three moles on the eastern and southern sides forming a well-sheltered anchorage measuring 270m x 150m. Belli informs us that the port was capable of holding thirty galleys (cited in Falkener 1854, 16). Belli adds that although the city was small (2 miles in circuit), it possessed an amphitheatre, a theatre and many other splendid buildings (cited in Falkener 1854, 16). Bondelmonte describes other lavish edifices ornamented with columns, a magnificent port, now destroyed, and long conduits of water (cited in Falkener 1852-3, 274). Two baths have also recently been located (B 9 and 10). Belli supplies a plan of an elaborate theatre in Chersonisos perhaps represented by the theatre excavated by Vallianou (1988, 525). A small test trench sunk in this theatre in 1988 exposed a north-south wall associated with pottery dating to the beginning of the 1st century AD in the lowest layer (Vallianou 1988, 525).

Aqueduct Description :

5.1 The Route (fig. 27)

The aqueduct of Chersonisos passes through the areas of Kalo Xorio, Potamion and Chersonisos. The aqueduct starts in Koutsounara (which is on the fringe of the Xoridakia area in the hinterland of Kalo Xorio) and conducts water to the southern limits of the city of Chersonisos. It was supplied by the same springs which supply Kalo

Xorio today, feeding the gardens directly below the village descending to the bed of Mikro Potamos.

The direct distance between the source and the city is only 6km but the length of the aqueduct extends for 14km (Oikonomaki 1986, 52). This disparity, although substantial, is not unusual and is mainly attributable to the deep valley of Aposelemi which lies between the aqueduct source and the city. The engineers were forced to adjust the route in order to avoid the wider berth of the river. Consequently, the aqueduct was obliged to stretch 3.5km in the opposite direction in order to procure a crossing of the Mikro Potamos, a branch of the larger Aposelemi. Subsequently, the aqueduct doubled back, parallel to the river on the opposite bank, in order to cross the Aposelemi at a suitable bridging point. The aqueduct then continues above ground on a roughly straight course, with the exception of a 200m stretch, where the aqueduct becomes subterranean (Oikonomaki 1986, 52).

The aqueduct begins at the springs of Koutsounara and travels through the localities of Fountana, Pigaidaki, Katsoprinous to Ruaki, Nikolo to Langadi and Stafilinos (**fig. 27**). At Xerokameres 2 the first of its monumental bridges is encountered (**plates 5a-c**). From here it travels north-northeast passing through the territories of Xalastas, Pyrgos, Toixos and Nisi and crosses the Aposelemi with a bridge in the area known as Xerokameres 1 (**plate 6c**). It travels through the valley of Pyrgos, following the car road, from which it is initially separated by a distance of 50m. Subsequently, the aqueduct veers southeast to flank the Aposelemi River running parallel to it at a distance of 30m before it angles sharply to bridge the river at Xerokameres 1. The aqueduct travels along the car road for the next 250m and then disappears. Subsequently, the aqueduct reappears at Rousou o Lakkos running parallel to the road, but intersecting it at one point.²

200m before it re-crosses the road it is confronted with particularly elevated terrain. The aqueduct veers away from the road, to the west, and reaches a ruined house of Pandoxeiou (xani) tou Simo where the aqueduct channel is preserved at ground level (Oikonomaki 1986, 53, pl. 1). At this point the aqueduct continues underground for the

² The toponym is attributed to a folktale which explains how an engineer proposed to bring the water from the spring of Koutsounara to Chersonisos crossing the Aposelemi Valley. When his project failed he was killed and buried in a large hole located along the river at a place which is still known as Rousou o Lakkos (Oikonomaki 1986, 81).

next 200m. It emerges near the army base located a few meters below this level at Simo to Xani (Oikonomaki 1986, 54). Subsequently, the aqueduct continues on a straight course to the terminal collection cistern on a moderate slope.

5.2 The Caput Aquae

A small fragmentary structure was originally identified as the *caput aquae* of the aqueduct in the fields of Georgios Nikolas Xamalaki in the area of Katsoprinos to Ruaki (Oikonomaki 1984, pl. 16; 1986, 78). Its masonry style, similar to that of the Lyttos aqueduct, is composed of a mortared-rubble core faced with courses of roughly-cut limestone blocks (Oikonomaki 1986, 73, n. 62).

However, the aqueduct can be traced 150m above this structure in the aptly named area of Foundana where there is also a freestanding spring-house associated with a profuse spring. It is also possible that the aqueduct would have exploited the group of springs at Khoridakia located 150m further up still, as these springs have the hydraulic capacity to discharge water to a wide zone. Moreover, there is still another even bigger spring called Epano Vrisi (Upper Spring) located 700m above and to the southwest of the spring at Khoridakia and these may also have been tapped. These springs lie 1200m further on from the *caput aquae* identified by Oikonomaki. Regardless of the location of the precise spring tapped by the aqueduct, the aqueduct of Chersonisos is securely connected to a group of springs that are copious and sufficient to serve the city. The presence of such springs alone defies any need to traverse the countryside further south towards Lyttos.

5.3 The Slope

The areas through which the aqueduct passes are generally flat. There is a general lack in abrupt drops or violent undulations in the terrain along the length of the aqueduct. This relatively level terrain negates the employment of elaborate technical solutions which are encountered in other aqueducts. The general response to insurmountable topographical obstacles was evasive action. This lent an ambling character to the aqueduct and more than doubled its total length. Problems only confronted the aqueduct between its starting point and Simo to Khani and this course must have been traced out many times in order to secure the most suitable way to traverse the landscape and to

preferably avoid the most considerable obstacles (Oikonomaki 1986, 64). Specifically problematic points are represented by the bridging of the Mikro Potamos and the Aposelemi Valleys and the underground section at Simo to Kani where the ground rose considerably higher than the line of the channel (Oikonomaki 1986, 54 and 66). However, the general difficulty confronting the structural engineers was stabilising the downslope face of the substructure along the mountainous tracts.

The length of the aqueduct is 10km and the height difference in the area between Koutsounara and Simo to Khani is 40m (Oikonomaki 1986, 64, fn. 38). This height difference of 40m allows for the 170m stretch over the Aposelemi River where the aqueduct travelled under pressure. The slope sufficient for the transportation of water with free-flow for a distance of 10km could range in theory between 2m and 50m. The height difference of 40m for the length of 10km is traced as follows: The springs are located at a height of 225m, at a distance 3.5km from the spring, in the area of Xerokamares 2, the channel is located at a height of 207m (Oikonomaki 1986, 65). At Xerokamares 1, before the start of the bridge the height is 200m whereas in nearby Simo to Xani, 3km further along the route, the height is 185m.

The gentle slope of the initial stages is afforded by successive twists and turns which maintain a functional channel gradient. The channel falls about 5m or 6m lower than the height of the terrain at Simo to Xani (Oikonomaki 1986, 65). Subsequently, the channel follows a moderate descent for the remaining 4km. At certain points along its length, undulations in ground level would have necessitated shafts to drop the level of flow (Oikonomaki 1986, 66).

5.4 The Substructure Wall

The aqueduct is damaged along much of its length. This destruction is due to both the suitability of the lower terrain for cultivation and the general low profile of the substructure. It is best preserved where it traverses the steeper contours of rocky slopes. Consequently, much of its substructure with a single façade survives. A good example of this is visible just after the bridge of Xerokamares 1 and continues nearly until the fork in the road at Kastelli Pediados. Generally the height of this substructure type, located only on the downslope face, ranges from 0.5m-3m.

5.5 Drainage Culverts

In an effort to stop rainwater from undermining the foundations, the substructure was equipped with drainage culverts (Oikonomaki 1986, 57). These serve to protect and reinforce the substructure and are usually positioned at the base of the outer façade. Three examples are evident just after the bridge of Xerokamares 2 in the area of Xalastas. The culverts are square in section with widths of 0.20m-0.28m, they penetrate the substructure for lengths of 1.4m-2m. The intervals between the culverts are correlated with the slope of the terrain and range from 2m-4m. The channel section dimensions of the three well-preserved culverts are 0.20m x 0.20m, 0.25m x 0.25m and 0.28m x 0.28m (Oikonomaki 1986, 57).

5.6 The Channel

The large dimensions of the channel suggest that the water supply was sufficient, not only for the needs of the city and harbour, but also for watering the areas through which it passes (Oikonomaki 1986, 66). The built channel is constructed in the same manner as that of the Lyttos example (see A 4.4). Its construction is evident at Nisi and at other points where the aqueduct is founded on steep or rocky slopes. The channel is placed closer to the inner edge of the substructure wall (0.40m from the inner edge and 0.60m from the outer edge i.e. on the side with the descending slope). The difference in the widths of the two half-walls is a measure of function and protection. The difference is considerable along sections with abrupt bends or exaggerated curves (Oikonomaki 1986, 67). The width of the half-walls along the straight line of the route is 0.50m each.

Limestone slabs are set at the base of the channel opening at a depth of 0.28m. The slabs measure 0.13m x 0.30m with thicknesses of 0.04m-0.06m. The slabs create a flat surface which is covered with *opus signinum*. The surface of the channel has also been smeared with lead and polished smooth (Oikonomaki 1986, 67).

5.7 The Free flow Bridge at Xerokamares 2 (Paliokamara)(figs 27 and 28).

The aqueduct continues from the *caput aquae* along the hillside with no major obstacles until it reaches the Mikro Potamos Valley. The abrupt morphology of the

valley necessitated the construction of a considerable bridge known as Xerokamares 2 (**plates 5a-c**).

The bridge of Xerokamares 2 was 60m long, 16m high and supported a free-flow channel over the river (Oikonomaki 1986, 54). A settling tank is evident within the section of the road-cut at the start of the bridge. This settling tank facilitates the abrupt change in direction and height in the water level necessary to cross the river. The settling tank is a small square structure surviving to a height of 0.70m. The size of the settling tank excludes the possibility of its use as a water pressure tower, such as that at Terazi along the Lyttos aqueduct which is essentially a composite element within an inverted siphon system. Sanders incorrectly identified the settling tank as the remains of the aqueduct's *caput aquae* (1982, 146).

5.7.1 Morphology of the Bridge of Xerokamares 2

The bridge does not exactly align with the axis of the aqueduct but instead curves gently towards the river (**fig. 28**). The height of the wall needed a great width at its base, since, as the wall rises the width simultaneously decreases. The width of the wall at its highest point is 3.5m thick, although Sanders supplies 3m (1982, 146), Mariani reports 2.50m (1895, 239) and Raulin notes 2m-3m (1869, 153). The foundations of the bridge measure 4.20m in thickness where they are embedded into the bedrock (Oikonomaki 1984, 58).

Special attention was given to the strength of the structure which was reinforced with a series of 'bonding courses' penetrating the width of the masonry (**plates 5a-b**). Such features are generally reserved for elevations of great height along the aqueducts of Crete.

The surveyors of the Chersonisos aqueduct sought out the narrowest section of the valley with ground stable enough to support the construction of an arched substructure. Oikonomaki states that the bridge would have had to rise to 16m in order to conduct water with free-flow and that subsequently the length of the bridge would have to extend to 60m (1986, 54) (**plate 5c**, the red line indicates the original line of the bridge). Sanders supplies an even higher elevation stating that the height of the arch, as surviving, is about 12m and this is about a further 7m below the level of the shaft, yielding a combined height of 19m (1982, 146). Considering such expansive

dimensions it is almost certain that the bridge would have supported other arches besides that of the central arch (Oikonomaki 1984, 58).

5.8 The Inverted Siphon at Xerokamares 1 (fig. 27).

The Aposelemi Valley lies on the direct line of the aqueduct's course and its great depth and expanse would have required a bridge of several kilometers had tactical manoeuvres not been implemented. The remains of the aqueduct until the brink of the Aposelemi Valley are low in profile and follow the hillside contours. This valley has a depth and width far greater than that at Mikro Potomos. The valley is heavily wooded but even from distance the stacks of the bridge are clearly visible (**plate 6c**, as indicated by the arrows).³ The stacks show that the bridge consisted of a series of arches and although their exact number is uncertain, six stacks are visible today. The central stacks are 8m wide at their base, diminishing to a mere 1m where the aqueduct rejoins the hillside. The tallest pier still stands about 25m high (**plates 6a-b**). Oikonomaki believes that these piers supported a venter bridge for an inverted siphon (1984, 87).

If the bridge functioned without pressure its necessary height would have to rise to over 70m (200ft) according to Spratt, who believed that the water was conducted across the valley with free-flow (1865, I, 103-4). Such a bridge would have to extend for a length of 170m along a southwest-northeast axis.

However, the great depth of the riverbed presupposes the use of an inverted siphon at this juncture. The aqueduct lies 35m above the hydraulic water table when it reaches the Aposelemi Valley (Oikonomaki 1986, 59). A header tank was constructed to serve as a water pressure tower, rather like that associated with the aqueduct of Lyttos at Terazi. It consists of a deep shaft and would have secured the hydrostatic pressure which would allow the water to rise to the edge of the opposite bank (Taramelli 1899, 401; Oikonomaki 1986, 60). The structure measured 8.8m x 6.2m with walls 1.5m thick. The walls survive to a height of 2.5m-3m and were constructed with facings of both brick and limestone. Its substantial dimensions and solid construction would suggest that the water was conducted under pressure from this point (Oikonomaki 1986, 59). Its outer facade, on the descending side, is supported by two buttresses, the larger being 1.5m high and 1.2m thick.

³ A medieval mill is also visible in the river valley availing of the natural river force.

5.9 The Underground Tract

At Simo to Xani the aqueduct becomes subterranean. The length of the tunnel is 200m with a specus width of 1.80m-2.10m and a maximum height of 3m. If the actual ground level is compared with the necessary height of the channel, it can be deduced that the channel's greatest depth underground is only *c.* 5m (Oikonomaki 1986, 61). It is impossible to examine the interior brickwork lining of the tunnel as it is half filled with debris.

5.10 The Monumental Cisterns

The water of the aqueduct was collected in a massive cistern complex located on the southern outskirts of the modern city on land owned by Georgios Apostolaki in the area of Palatia. The cistern was a known archaeological site prior to its recent excavation due to the visible surface remains (Mandalaki 1999, 260). The cistern was mainly subterranean although its elevations reached a height of 1m above the modern ground level.

Excavation revealed a rectangular subterranean cistern complex measuring 58m long x 22m wide x 5.5m deep (**plates 7a-b**). The cistern occupies the entire Apostolaki Plot, with the exception of the western section, and it is clear that the complex is even more extensive and continues towards the modern car road. The enormous size of the cistern necessitated the existence of buttresses close to its north wall. Three were uncovered in the west of the section measuring 2.65m long x 1m wide with a visible height of 1.5m (Mandalaki 1999, 262).

Only a small area in the southwest section of the cistern, measuring 16.60m x 5.40m, was excavated to floor-level and here the entire height of the cistern was established at 5.50m. This elevation survives in good condition for a length of 21.3m from the southwest corner. The wall was composed of a mortared rubble core faced with brick and coated with *opus signinum*. In the southwest corner a small section of the roof survived *in situ* (Mandalaki 1999, 261).

The maximum wall thickness is 1.6m, although the width of the southern wall could not be completely uncovered because the house of Apostolaki borders this side of the plot. An internal wall measuring 1.10m thick survives to a height of 5.40m running

east to west. The wall incorporates a series of three arches set at intervals of 2.69m. Each arch measures *c.* 3m high with widths of 2.65m (Mandalaki 1999, 261). These arches survive almost completely intact and their interiors were not excavated for fear of collapse (Mandalaki 1999, 262). The stratigraphy of the cistern is clear in the sections of the arches.

Mandalaki reports that the roof form is problematic as, although all the fallen debris (which naturally relates to the roof) was recorded, none offered any indication of a curved edge (1999, 262). Much of the debris from the cistern itself represented fallen sections of the brick-faced mortared rubble (Mandalaki 1999, 263). Small finds were scanty and limited but incorporated sections of terracotta pipes with stone and brick fragments. The quantity of Roman and late-antique ceramics found in the fill suggested a final destruction in the middle of the 4th century AD. Mandalaki attributes the destruction to seismic activity (1999, 261).

Type : Public composite aqueduct.

Date : Both Sanders (1982, 146) and Oikonomaki (1986, 75) suggest a construction date at the start of the Antonine period. This is somewhat echoed by the framework offered for the construction of the aqueduct of Chersonisos between AD 110-140 (Ιστορία της Ανθρωπότητας 577-8).

Dating Methodology : The construction style is characteristic of the 2nd century AD. The small finds discovered in the excavations of the cisterns at Palatia, although sparse, establish the date of the cistern's destruction in the 4th century AD (AR 2000, 129).

6. Malia

Plate : Figs 23, 29 and 30; plates 8a-9c.

Location : Lat: 25°49'16"N; Long: 35°28'3"E.

The Roman site at Malia is spread over a large area just west of the Minoan palace in the area of the river delta (**fig. 29**).

Site Description/Context : Sanders records 'various concrete walls scattered over several hundred metres from the shore inland to the site of the basilica' and suggests the remains represent a large villa or a wealthy village (1982, 147). At Klozani a cistern internally lined with brick represents the western extent of the scatter (Daux 1965,

1006-7). Immediately south of the football ground of Sissi, outside the village to the southwest, a semi-spherical millstone and some 5th century AD pottery indicates later activity in this area (AR 1996-7, 110). A basilica dating to the 5th or 6th century AD was partially excavated in 1957 (Daux 1958, 829; 1961, 950-3). This basilica was probably not in use later than the first quarter of 6th century AD. An elaborate Late Antonine sarcophagus was reused for the double inhumation of a man and woman in the 4th century AD. It was discovered below the apse of the basilica (Daux 1958, 828, figs 12-13). Sanders claims that the basilica was built over a 4th-century AD building of unknown extent and function (1982, 147).

Cistern Description : Sanders reports that ‘east of the basilica on the edge of the higher ground above the marshes there stands 2.70m high the remains of a bathhouse’ (1982, 147). This he describes as ‘a rectangular building built up against the natural rock ... 5.0m wide and at least 10.0m long, with a heavy *opus signinum* floor’ (Sanders 1982, 147).

On visiting the site it became clear that the structure described by Sanders more likely represents a collection cistern for the spring, also located at this point. This cistern was measured in 2003 and yielded internal dimensions of 8.2m, northwest-southeast, and *c.* 4.6m, southwest-northeast, although its limits to the northeast could not be accurately gauged as it was destroyed at this point (**plates 8a-c**). The exterior walls, which survived on the northwest, southwest and southeast, were approximately 0.80m thick. The floor of the cistern is lined with *opus signinum* which is bevelled along the edges where it meets the outer walls (**plates 8a-b**, as indicated by the arrows). The interior facing of the southwest wall incorporates three lines of brick just above the floor.

The cistern is positioned on a relatively high rock outcrop overlooking a spring to the southwest. The cistern effectively forms a terrace wall overlooking the lower flat ground to the southwest. The floor of the cistern rests approximately 2.20m above the base of the southwestern wall. The wall itself rises to a height of 2.80m. The western face of the wall consists of large unworked local limestone bonded together with mortar (**plate 8c**). The facing was executed in two phases as is apparent from a horizontal seam within the stone coursing at an elevation of *c.* 1.5m.

A drain penetrates the southwest wall midway along its length just above the floor of the cistern. It is visible on the outer face (southwest) of the wall just over a ledge (0.2m-0.26m thick). The ledge runs along the wall and may have supported some form of channel (**plate 8c**, as indicated by the arrow). The spring issues from the base of the southwestern wall directly below the point where the pipe penetrates its façade.

Description of aqueduct : Van Effenterre had originally recorded the cistern in 1976 and described it as a cement-lined mortared construction resembling a cistern located on the verge of the talweg in the marsh area (Van Effenterre 1976c, 6, n. 1). He tentatively suggested that the cistern fed a small aqueduct visible in the rock outcrops to the east of the beach (Van Effenterre 1976c, 6). Recent investigation, conducted by the author, confirms that Van Effenterre's original supposition was correct.

The cistern availed of the copious spring, over which it is constructed, and fed a low-profile contour aqueduct, which in turn conducted water to a collapsed structure founded on the rocks east of the bay. The Malia Survey traced the aqueduct for 100m through the natural outcrops east of the beach (Müller 1991, 746-7, fig. 44) (**fig. 30**, marked in red). Ground Minoan sherds have been identified within the *opus signinum* lining of the channel. The *opus signinum* has been slipped and smoothed.

The channel is small and square in section (Müller 1991, fig. 44) (**plates 9a-b**). The manner of its construction is correlated with the nature of the undulating rock outcrop through which it is built. The channel is alternatively supported on a low substructure wall (with either a single or double façade) or is merely rock-cut, depending on the nature of the rock-outcrop. The substructure wall is composed of a mortared rubble core with an inner and outer facing of local unworked limestone.

While there is no absolute evidence linking the cistern to the aqueduct, a persuasive argument supporting their association can be presented. The cistern and the aqueduct are similar in construction, both incorporating roughly-cut local stone and lined with comparable *opus signinum*. The fact that the water from the cistern was directed through a pipe along a ledge running along the southwest side of the cistern, possibly incorporating a channel, is the most compelling piece of evidence linking the two structures (**plate 8c**, the ledge is indicated by the arrow). The ledge

and the aqueduct follow the same orientation while there is a notable gradual descent in height from the cistern along the route of the aqueduct.

Their proximity in the field, orientation, and relative height are all suggestive of their connected function. The function of the channel is to conduct water from the fresh water source southeast of the marsh (collected in the cistern described above) to an installation founded on the rock-outcrops along the shore (**fig. 30**). Nearing its destination the channel angles sharply towards a structure on the sealine itself. The structure consists of badly destroyed compartments of which the best preserved is a semi-circular cistern designed to receive the water from the aqueduct (**plate 9b-c**). One other compartment is visible but the structure has been badly damaged through sea erosion. The function of this building remains uncertain.

The connection of the cistern with the aqueduct somewhat explains the reason for the elevated position of the cistern which was necessary for the conduction of water with gravity flow as far as the coast. The channel would have to maintain a constant slope to function with free-flow from the spring to its destination. It runs along the contours of the eastern edges of the delta forming a high terrace. In fact the cistern can be interpreted as a small *caput aquae* supplying the small aqueduct.

The area directly below the cistern to the west is inundated with the water of a spring and is covered in bamboo forest. The water level below the southwestern wall of the cistern is still relatively high in summer and is said to be considerably higher in winter. Locals remember women washing clothes at this spot while the folklore of the area tells of the ‘Virgin of the column capital’ appearing here.

Type : Public overground aqueduct.

Date : Sweetman agrees with Sanders’ ‘bathhouse’ function for the structure and dates it to the end of the 3rd century AD (1999, 154, 454). Sweetman also attributes a mosaic to the structure (1999, 154, 454). Sanders’ original report does not mention a mosaic and certainly does not date one, instead he does refer to a ‘heavy *opus signinum* floor’, which is not necessarily a mosaic but a sealant commonly used in Roman cisterns. The structure is clearly a cistern lined with *opus signinum* and cannot be associated with either a mosaic or a bathing function.

The remains to the east of the swamp (which indicates the cistern and aqueduct) were originally considered to be Turkish (Müller 1991, 746 citing M. and H.

Van Effenterre, pers. comm.). The date is reiterated when the channel is referred to as a later aqueduct of uncertain date (Pelon *et al.* 1992, 179). The style of brick-faced mortared rubble lining the cistern point to a construction in the Late Antique period; however, the bevelled edges within the *opus signinum* could indicate a slightly earlier date, possibly in the 3rd century AD.

7. Ini

Plate : Plates 10a-c.

Location : Ini is situated north of Priansos. Its territorial region is delineated by the foothills of Lasithi to the east while the terrain opens up to the north and west towards the Pedhiadha plain.

Site Description/Context : The ancient site extends from the low rise of Kephala across the lower plain to the east where the river forms its eastern limit. Dense pottery scatters and masonry had been recorded in the fields below the hill as early as the end of the 19th century (Mariani 1895, 326). In 2003 the dense pottery scatters included *terra sigillata*, African Red Slip, a spacer pin, and a Classical black glaze strainer, amphora fragments and Roman glass (personal observations). Lithic finds include column fragments and basalt grinders. Coins from the area include silver coins dating to Vespasian, four copper Roman examples while one other is late antique (Alexiou 1966, 410). In the 1950s a clay figurine of a female dressed in a long himation with a raised arm was also reported (Platon 1956, 420). The site is often associated and, indeed, confused with the ancient site of Arkades (located at Afrati by Sanders), celebrated by Theophrastus and Pliny for its springs (Halbherr 1896, 565-6; *IC I v praef.*).

To the north of the site a Roman architectural structure is located near a ruined mill. The structure lies below the mill, close to the riverbed, east of the chapel of Zoodoxos Pigi. The elevations are composed of a mortared rubble core (with water-rolled pebbles within its matrix) faced with brick (Ducrey & van Effenterre 1973, pl. I', 2). Sanders describes this structure as a vaulted building with walls surviving to a height of 3m of which the lower tiers are faced with stone while the upper are faced with brick (1982, 151). He describes a three-roomed structure covering an area of 9.4m x 5.9m (Sanders 1982, 151). In 2003 the remains of this building were located. The remains were badly destroyed but the corner was still visible to a height of 3m and the spring of

a brick-built vault was detectable (personal observation). The function of this building is not certain.

Two possible baths were also recorded in the area as discussed in the Bath Catalogue (B 11 and 12).

Aqueduct Description : Spratt casually mentions the remains of an aqueduct on the site noting that

‘the foundation of some buildings of the same age, as well as those of two or three churches are seen near the aqueduct and upon the top of the hill close over the river’ (1865, I, 304-5).

The remains of an arched aqueduct, with piers measuring 2m x 2m, runs on an east-west axis towards the hill (Ducrey & van Effenterre 1973, pl. I', 1). The largest intact pier of the aqueduct still stands 3.70m high (**plates 10a-c**). Sanders claims that too little survives of the system to determine whether it was taking water from the springs of the city out or bringing more in from the mountains of the Lasithi Massif to the east (1982, 151). However, the presence of bathhouses at the site affirms that the aqueduct is supplying these buildings.

It seems that the aqueduct is conducting water into the city from the direction of Lasithi as a low-profile aqueduct tract can be traced in the surrounding fields descending to the site from the Lasithi direction i.e. the southeast (personal observation). Here the aqueduct only survives as foundations consisting of a mortared rubble core with a stone facing. It can be traced through the fields in a southeasterly direction for a distance of c. 150m.

A branch of the main water supply skirts the hill to the west of the main site where its architectural remains are detectable along the base of the rise running south. The foundations consist of a mortared rubble core faced with stone and, occasionally, brick. A small cistern is also discernible on the lower slopes of the rise surviving as an architectural corner internally lined with hydraulic mortar. The walls of this feature are 0.50m thick and extend for 1.8m and 0.90m at a 90° angle from each other. Just east of this a large portion of collapsed masonry (measuring 2m x 0.5m) is faced with brick.

Another channel runs north of the elevated aqueduct tract towards the spring of Zoodoxos where the modern chapel was built, possibly over an ancient building. It seems likely that this line was reused in the later period as the leat of a medieval mill abuts the aqueduct to which it forms a perpendicular extension. Another branch running south leads to a badly destroyed building which possibly represents a bathhouse (B 12).

Type : Public overground aqueduct.

Date : Sanders dates the construction of the bathhouses and the other buildings on the site to the Hadrianic period (1982, 151).

Dating Methodology : He records *Eastern Sigillata*, *Candarli Ware* and even Gaulish Samian Ware but nothing later in date which indicates a subsequent decline in prosperity at the site after the 3rd century AD. Furthermore, an inscription dating to the Late Antonine period regarding the upkeep of the bathhouse may also relate to that of the aqueduct (Ducrey & van Effenterre 1973, 287). The dimensions of the brick-faced mortared rubble of the aqueduct could potentially be Trajanic (0.043m) which would establish the aqueduct as the earliest on the island.

8. Knossos

Plate : Figs 31-33; plates 13a-19c.

Location : Lat: 25°18'N; Long: 35°3'E. Knossos is hidden from the sea by low hills and is surrounded by higher ground to the east and west. The imposing limestone ridge of Ailias lies across the river to the east, while to the west is the low 'Acropolis Hill' (Monastiriako Kephali). The Roman city of Knossos is located about 5km southeast of Herakleion with its *forum* situated to the northwest of the palace. It occupied an area of 1km² (100 hectares) west of the Kairatos River and north of the palace.

Site Description/Context : Since the Minoan palace has hitherto claimed nearly all the archaeological attention in the area relatively little is known about the later periods. However, recently, enough work has been conducted to formulate a rough outline of the site's history in the Roman period. Evans informs us that the palace had been left largely free of occupation in the later periods as if ...

... ‘some surviving tradition of the religious aspect of the Minoan building in its function of Sanctuary as well as Palace may have served to protect the site. It may well, indeed, have been included in some later temenos like that of the Grove and the Temple of Rhea’ (1903-4, 51).

The *forum* of the Roman city lay to the northwest of the palace and was surrounded by the civic basilica, the theatre, baths, stoa (?) and numerous lavish urban villas. The imposing 2nd century AD houses include the Villa Dionysus and the House of the Diamond Frescoes (beneath the Unexplored Mansion). Roman tombs are widespread being found at Spilia, Gypsades and among the tombs of the North Cemetery. Paton suggests that the presence of theatrical masks in three chamber tombs dating from AD 50 to AD 150 is indicative of a theatre building at Knossos at the time (1994, 152).

Aqueduct Description :

8.1 The Topography and Route

Herakleion is the most difficult place to water in Crete according to Rackham and Moody (1996, 44). Water supplies for Herakleion are difficult today and in the 1980s the Knossos road was thronged with tanker trucks going to and from the great spring at Arkhanes (Rigsby 1976, 325; Rackham & Moody 1996, 44). In the Venetian period Herakleion’s aqueducts were supplemented by cisterns and by thousands of wells, often mentioned in the 17th-century AD property conveyances. As these shafts were easily contaminated by sewage and salt, their water was probably intended for watering gardens while drinking water was normally fetched from the public well at Katsambas, located 1km outside the walls (Rackham & Moody 1996, 44).

In contrast to this, the relatively inland area of Knossos was well watered, by Cretan standards; fed by local springs with a water-table high enough to justify the sinking of wells (Roberts 1979, 23). A boundary inscription refers to the copious rainfall in the area.

‘Pig’s Hill and Eagles and Artemisium and the sacred precinct of Archos and the river and to White Pass and Agathoia along where the rainwater flows and Laos’ (Rigsby 1976, 327).

The region had numerous northward flowing streams which have cut deep fertile valleys into the landscape creating a series of ridges and valleys though the gradually rising terrain to the south. These streams are for the most part intermittent with a good water flow in winter. The Vlychia River was probably seasonal in antiquity but the Kariatos was perennial yet considered insufficient for the needs of the population (Cadogan 1992, 136).⁴ However, in the early 17th century Francesco Morosini proposed that water be diverted from the Kairatos River (or Cazzaban) to supply the needs of Herakleion (Gerola 1932-40, IV, 18, fig. 1). This aqueduct was taken over by the Turks and maintained until the liberation of Crete. Kairatos alluvium was deposited mainly in the time between the breakdown of the Roman aqueduct and the construction of the Venetian one (Roberts 1979, 239-240).

The Venetian aqueduct of Herakleion, the plans for which are preserved in Venice, travelled *c.* 18km into the hills (Gerola 1932-40, IV, 14; Spanakis 1950, 26). The Venetian aqueduct follows that of the Roman through the Kairatos Valley which runs between Arkhanes and Knossos. The valley forms a natural connecting thoroughfare and the river was exploited from one period to the next. The valley is narrow and gorge-like, but downstream it widens out slightly to reach the sea 5km north of the Knossos (**fig. 31**). The aqueduct surveyors would have favoured the unobstructed route along the Kairatos Valley rather than over Ailias, to the east, or towards Fortetsa to the northwest.

The entire course of the aqueduct traversed through Knossian territory as Arkhanes lay within the territory of the city-state since the 5th century BC (Rigsby 1976, 316). Hood and Smyth have mapped the conjectural course of the Roman aqueduct (**fig. 31**, nos 160, 168, 188, 191, 217, 318, 319, 346-353). It adheres to the valley contours rather than experimenting with siphons or extravagant bridges (evident in the Venetian aqueduct) and avoids the deeper section of the Vlychia streambed.

The Roman aqueduct tapped water from the Fundana spring rising from an eastern spur of Mount Juktas, as did the Venetian (Gerola 1932, IV, 24). It is also possible that the Minoan architects conveyed water to the Palace from this source

⁴ Cadogan notes that the Kairatos would not have been navigable (1992, 136).

(Evans 1903-4, 53). A continuity of water exploitation can be argued from the Bronze Age until the medieval period at Knossos.

8.2 The Roman aqueduct at Spilia (fig. 31).

The most conspicuous section of the late aqueduct is the great Gothic arch at Spilia, probably an Egyptian work of the 1830s built by Mehemet Ali (Gerola 1932-40, IV, 14; Spanakis 1950, 26). A substantial section of the Roman aqueduct is also exposed at Spilia in the steep bank just below the Egyptian aqueduct (**fig. 31**, no. 353). The Roman aqueduct is evident actually abutting the Egyptian example whose construction must have caused serious damage to its predecessor (**plate 13a**, the Roman aqueduct is indicated by the arrow). The Roman aqueduct is much lower in elevation and its characteristic *opus signinum* coating is 0.15m thick (**plate 13b**).

8.3 The Roman aqueduct in the gully to northwest of Spilia

The aqueduct continues around a deep gully to the northwest of Spilia where it is recorded by Hood and Smyth (1981, nos 351 and 352). The Egyptian aqueduct ran at a high enough elevation to cross the inlet to the south of the Upper Gypsadhes whereas the Roman aqueduct was forced to circumnavigate the lower slopes. A bank and ditch running along the top of the northern bank of the gully must represent the line of the aqueduct (**plate 13c**, as indicated by the arrow).

8.4 The Eastern flanks of Upper and Lower Gypsadhes

The Roman aqueduct can still be traced along the eastern flank of the Upper Gypsadhes (**fig. 31**, nos 348-350). The aqueduct winds around the eastern slopes of the hills in a northward trajectory as indicated by large blocks of toppled masonry (**fig. 31**, no. 350; **plate 14a**). The northern edge of this gully is formed by an elevated substructure of the aqueduct which forms a lofty terrace (**fig. 31**, nos 346-7). This terrace continues to the east for *c.* 90m before curving around a spur of the Lower Gypsadhes to the north. This terrace is formed by the aqueduct substructure wall but also supports the Venetian aqueduct which is further flanked by an overgrown walkway (**plate 14b**, the Venetian aqueduct is indicated by A and the Roman aqueduct by B).

The Venetian aqueduct also adheres to that of the Roman along the northern contours of the Lower Gypsadhes, as demonstrated by tract no. 318 (**fig. 31**). Here the channel was 0.41m wide with a height of 0.70m (Hood & Smyth 1981, 58). The channel was lined with *opus signinum* incorporating bevelled edges. The channel was capped with cover slabs. The aqueduct reappears on the northern flank of the Lower Gypsadhes completing its circumnavigation (**fig. 31**, no. 318).

8.5 The Roman aqueduct under the Venetian bridge

Both the Venetian and Roman aqueducts continue towards the Vlychia River which they both bridge (**fig. 31**, no. 160). The Roman bridge crossed the Vlychia just 90m north of the bridge which carried the Venetian and Egyptian aqueducts (**plate 15a**). The remains of the Roman bridge project from the western bank of the lower riverbed (**plate 15b**, as indicated by the arrow). The remains in the riverbed measure 3m x 1.5m and consist of a mortared-rubble core packed with small roughly worked stones *c.* 0.20m x 0.15m x 0.20m (**plates 16a-b**, the arrow indicates the top of the Venetian aqueduct). Only one other stump of masonry can be seen ascending the banks on the eastern side of the river.

8.6 The Roman aqueduct reported over rock-cut tombs

A possible cistern is visible in the bank of the river beyond the bridge which may represent an aqueduct feature. The structure consists of mortared rubble walls enclosing a space about of about 2.5m x 2m. Just beyond this rock-cut tombs flank the west side of the path. Here, Hood and Smyth noted a section of mortared rubble walling above the entrance of the northern most tomb, which they interpreted as part of the aqueduct. The fact that this tract seems to cut into the tomb suggests that the aqueduct is a later feature (Hood & Smyth 1981, 24, no. 168). Yet, fieldwork in 2003 did not secure this citing over the tombs and while mortared rubble architecture was noted it seemed directly associated with the tomb rather than with the water system (personal observation).

8.7 A Roman Cisterns in the Knossos Village and on the Acropolis Hill

The aqueduct enters the Knossos village from the south and connects with conduits and cisterns in the village centre. Hogarth discovered numerous ancient water conduits and cisterns in the village in 1900 (1899-1900, 80). Part of a large cistern lined with *opus signinum* with bevelled edges (a feature also encountered in the aqueduct channel) is still exposed in the village today (**plate 17a**) while another rock-cut cistern was also reported to the north-west (**fig. 31**, no. 191). On the nearby site of the Vlachakis hotel a pair of Roman cisterns was also found (Hood & Smyth 1981, no. 190).

Hogarth mentions a large Roman cistern or reservoir south of the Roman cemetery which he associates with the conduits at Metochi, interpreting them all as an integrated but extended system (1899-1900, 81). He attributes the function of this structure under the summit of the Acropolis Hill on the northeast slope as ‘a larger Roman cistern or reservoir for the supply of water to the town below’ (1899-1900, 81, pl. xii; Hood & Smyth 1981, no. 144). Due to its location there is reason to believe that this acted as a type of *castellum* serving Roman Knossos, although it seems to be set at too high a level to be fed by the Roman aqueduct. Unfortunately, there is no trace of the cistern today and its exact position is uncertain.

8.8 A Cistern to the West of the Stratigraphic Museum

Roman water channels lined with *opus signinum* were discovered in the excavations west of the Stratigraphic Museum (**fig. 31**, no. 188). A cistern, measuring 2.2m x 1.4m, was also discovered although its southeast corner was partially destroyed by a WWII pit. It was executed in brick-faced mortared rubble while its floor constitutes a rough version of *opus spicatum*. It was accessed via steps on its northern side (*AR* 1987-8, 91, fig. 16; view from north). The cistern has been dated to the first half of the 1st century AD on the basis of its contents which include an early 1st-century AD Knossian lamp, another lamp of the same period, a coin of AD 22, a Julio-Claudian coin and several Arretine stamps. Such Arretine evidence is reminiscent of Phase I of the Praetorium Complex at Gortyna dating to the 1st century AD where Augustan material was found in a stratified layer above a Hellenistic structure of unknown function (for the Arretine layer see Colini 1969-70, 449).

8.9 The Roman Aqueduct in the area of the North House

The excavated area of the North House (in the area of the Unexplored Mansion) is defined by the south face of the aqueduct to the north, 12.5m in length (Sackett *et al.* 1992, 47, pl. 40a). The aqueduct actually is the outside wall of the North House. The line of the aqueduct in the north is common to both a Hadrianic destruction deposit and a Severan deposit (Sackett *et al.* 1992, pls 3 and 4). The aqueduct here consisted of a mortared rubble core faced with large rectangular cut blocks forming a facing of *petit appareil* (**plate 18a**). The substructure is 1.5m high with an overall thickness of 2.5m.

The channel was partially visible above ground before excavation. Excavation revealed strong walling with some evidence of restructuring, especially where there is a slight change of course to the north at the lower end (**plates 17b-c**). The water channel itself is 0.35m wide and has a considerable slope running from west to east (0.50m in 10m, or 1m in 20m) (Sackett *et al.* 1992, 57). Sherds collected from cleaning operations date as late as the 4th century AD and indicate that the channel remained open even after the destruction of all the buildings in the excavated area. The channel is covered with large capstones which are fitted into ridges which run along the surface of the substructure wall on either side of the channel (**plates 17b-c**).

The strength of the structure, the care with which it was lined, covered and maintained, in conjunction with its longevity of use, support its interpretation as an aqueduct rather than a drain.

8.10 The Royal Road Pipelines

A Roman road runs in the same direction as the Minoan Way but is separated from it by a 2m thick gradually-forming deposit. The south side of the road is bounded by three conduits or water-pipes, two of which are square in section, the other round (**fig. 32**). The mortar for these pipes still survives adhering to the masonry flanking the south side of the Royal Road (**plate 19a**, as indicated by the arrows). These pipes represent the urban distributions of the aqueduct system which becomes a piped system within the city limits. The pipes associated with the Roman road indicate a source more

or less corresponding with a still existing fountain on the line of the Venetian and later Egyptian aqueduct.

8.11 The Royal Road Cistern

A Roman cistern, lined with thick *opus signinum* with bevelled edges, is located immediately north of the Theatral Area of the Minoan palace (**plates 19b-c; fig. 31**, no. 217). It cut through the top of a Middle Minoan house wall at the north end of the West Court of the palace (Hood & Smyth 1981, 24, no. 217). Evans describes ‘a huge flooring of Roman cement ... 65cm in thickness and intruding on the area to be excavated to the extent of some 60m²’ (1902-3, 106). Evans could only remove the main portion of the cistern ‘after a long process of blasting’ (1902-3, 106).

The *opus signinum* employed to line this massive stretch of cistern is packed with broken tiles and ceramics (**plates 19b-c**) and resembles that seen in the cistern in the Knossos village (**plate 17a**) and along the aqueduct channel under the bridge at Spilia (**plate 13b**). The presence of *opus signinum* with bevelled edges in these features reinforces the idea that they constitute integral elements of a unified aqueduct system.

8.12 Vaulted cisterns under the Atrium of the Trefoil Basilica

The excavations of the university building on the Knossos-Herakleion road revealed large vaulted subterranean cisterns underneath the atrium of the Trefoil Basilica (*AR* 1978-9, 56, fig. 47) (**fig. 33**). A *terminus a quo* for the construction of the church was provided by a single coin, dating to AD 400, found at the bottom of a foundation trench (presumably of the church walls) (Megaw 1984, 323-4). The excavator also interpreted the coin as providing a 4th-century AD *terminus ante quem* for the abandonment and disuse of the cisterns while potentially allowing for their construction at a much earlier date. However, there is no need to establish such a rigid sequence as the size ratio and spatial positioning of the cisterns within the church indicate a more integrated plan whereby the cisterns collected run-off water from the roof of the basilica.

The cisterns were faced internally with brick. Despite the fact that the cisterns are now covered, it is apparent from the published plan that they measured 8m (north-south) x 7m (**fig. 33**). Judging from the scale in the published photographs, it seems that

they stood 1.75m high to the spring of the vault and rose *c.* 3m high to the apex of the roof (**plate 18c**).

8.13 The Roman aqueduct associated with the Villa Dionysus

The most significant buildings which have been directly linked to the Roman aqueduct are the House of the Diamond Fresco, the Villa Dionysus and the private bathhouse excavated by Wardle (B 14). Paton reports that an elaborate water system, installed in the upper southwest corner of the villa, supplied the residence with water from the aqueduct. The installation was composed of a shallow upper-storey tank whose water supply was regulated with the use of a stop-cock (**plate 74c**). The system was probably designed to supply solar-heated water. A terracotta pipeline conducted the water from the tank to the ground floor where the water was dispersed in lead pipes enclosed in stone-built channels (Paton 2000, 30).

Type : Public overground aqueduct.

Date : 2nd-4th centuries AD

Dating Methodology : Dr. Susan Walker dated the construction of the Roman aqueduct at Knossos to the 2nd century AD. Hadrianic and Severan dates were secured through the excavations of the North House (Sackett *et al.* 1992). Prior to this it was thought to be constructed between 31 BC and AD 138 and subsequently altered and repaired throughout the following centuries (Roberts 1979, 239). The system is thought to have fallen into disrepair after AD 400.

Paton (1994, 149-152) observes that the tract found above the tombs in 1978 (Hood & Smyth 1981, 24, no. 168) would suggest that the aqueduct was built after these tombs went out of use in the mid-2nd century AD. This would imply that the Roman city had to wait a long time for this desirable amenity and for the others that depended on it, such as the public baths. However, the evidence is not persuasive and this specific architectural material was considered inconclusive during fieldwork for this study. Moreover, the presence of potentially early baths at Knossos would presuppose an earlier aqueduct supply (see B 55*).

9. Plora

Plate : Plates 20a-c.

Location : A couple of small sites are located before the pass through the Asterousia Mountains to the sanctuary and harbour at Lebena. This pass was controlled by the site at Plora/Apesokari (Sanders 1976, 131-2).

Site Description/Context : The site of ancient Pyloros was located around the modern villages of Plora and Apesokari, rather than to the west, as Pendlebury suggested (1939, 374). A Roman marble head of a male statue and a 2nd-century AD bust of the god Dionysus (depicted with horns and wearing an ivy wreath, pine-cones and a panther skin on his breast) were both found in the area around Plora (Lembessi 1971, 500, pl. 517g; Vasilakis N.D., c, 239; Herakleion Museum no. 470).

Architectural remains are located to the north of the road connecting the villages of Plora and Apesokari. About halfway between the villages a dirt-track leads to a vineyard surrounded by recently ploughed olive groves. Here, a badly-destroyed structure, composed of a mortared rubble core with facings of brick, is visible underneath a large pile of stones which rises to 4m (**plate 20a**, as indicated by the arrow). These stones have been cleared from the immediate vicinity and carefully placed in order to conceal the monument. The stones are piled up to form an outer facing to the Roman structure. One wall survives intact for 2m on an east-west alignment.

Pottery and marble veneer are abundant in the surrounding fields and numerous foundation walls are discernible in the surface of the trackway. Sanders claims that massive walls at Ellenika, to the northwest of Apesokari, may represent the outer limits of the same site which would indicate a large settlement (1982, 159; Pendlebury *et al.* 1932-3, 88).

Aqueduct Description : Sanders observes that between the villages the substantial remains of a cistern, measuring 10.5m x 6m, are linked to another building by a wall or aqueduct (1982, 159). It is possible that the structure described above represents Sanders' other building.

The cistern survives to a height of 1.20m and its walls are 1m thick. The interior is filled with rubble but a pipe is visible in its northern wall (**plates 20b-c**). Marble veneer is found littering this area. The aqueduct is fragmentary and could only be traced between the cistern and the ruined structure. The substructure of this aqueduct is 0.5m wide and only survives to a height of 0.40m. The channel itself has a width of

0.20m. A farmer has actually used the aqueduct as a field boundary and in places it has been concealed by stone clearance, vegetation and collapse. It is possible that the aqueduct system is extensive, since other linear piles of stone are incorporated into field boundaries throughout the vicinity.

Type : Public overground aqueduct.

Date : The pottery is predominately 2nd-4th century AD which would comply with the brick dimensions of the badly-damaged structure.

10. Gortyna

Plate : Figs 34-39; plates 21-26.

Location : Lat: 24°E 958'N; Long: 35°E 066'N. Gortyna is situated in the northeast sector of the Mesara Plain on a tributary of the Geropotomos River (the Mitropolianos) at the foot of a range of low hills forming the eastern foothills of the Psiloritis range which act as the boundary of the plain (**plates 21a-c**).

Site Description/Context : The modern Mitropolianos River runs close to the city and is thought to be that the ancient Letheus River celebrated as the scene of the rape of Europa (Falkener 1854, 20). Falkener observes that the famous plane tree, which never lost its leaves, no longer exists (1854, 20). Conversely, it was noted by Theophrastus and by some strange twist of fate it stands sign-posted at the site today.

Gortyna, like many other cities in the Empire, flourished in the period between the Hadrianic and Severan periods. At its peak the city extended into the plain for about 1km east of the *praetorium* where the most important monuments for spectacles were built (**fig. 36**; Di Vita 2000a, 10). Belli recorded the remains of two theatres, an amphitheatre, a circus, baths, temples, *fora*, basilicas, *nymphaea*, aqueducts and cisterns (cited in Falkener 1854, 20). The amphitheatre has recently been identified incorporated into the basilica of Aghioi Deka (Vasilakis N.D., a, 102). The city boasted at least two *thermae* (B 18 and 19) and another smaller late-antique bath (B 20). Belli executed plans of the baths at the site but unfortunately they do not survive.

Aqueduct Description : The remains of the Roman and late-antique aqueducts of Gortyna descend the gorge of the Mitropolianos River. The river has eroded a small steep-sided gorge through the western end of a flysch ridge, the south slope of which is mantled by a Pleistocene conglomerate deposit (**plate 21c**).

The aqueducts have been recorded by a myriad of travellers and scholars who have visited the ancient ruins since the 15th century (Pagano 1992, 279). At the start of the last century the water system was the subject of an intensive study conducted by Taramelli (1902). Taramelli confined his examination to sections near the acropolis, the three reservoirs near the theatre and the *caput aquae* at Zaros. In 1978 the Italian School at Athens organised a new plan for Gortyna with 2000 divisions at 1:500. In the process different tracts and levels of the aqueduct were studied within the city precincts. More recently, La Torre has studied the trajectory of the aqueduct on its bifurcated course from the city towards Zaros (1988-9). The Zaros spring, located at a distance of 15km from the city, was the source of the earliest aqueduct of the city (Di Vita 2000a, 13).

Taramelli remarked that while the scanty springs, issuing from the neighbouring mountains were sufficient for the Greek inhabitants at Gortyna, such supplies were not adequate for the population in the Roman period (1902, 120).

10.1 The Route (figs 34, 35, 36 and 38)

Tracing the course of the aqueduct from its source to the city is extremely difficult since some tracts are inaccessible due to the precipitous nature of the terrain. Consequently, Taramelli's descriptions focussed on the *caput aquae* and the siphon bridge crossing the Mitropolianos River rather than offering a detailed layout of the aqueduct from Zaros to the city. Taramelli admits honestly that

'for various reasons depending on the state of the island and the restricted time allowed me, I was not able to follow the whole course of the aqueduct, which will be the object of future researches' (1902, 127).

Nevertheless, Taramelli offers a length of over 35km for the aqueduct which he believes traversed the valleys of Panayia, Moroni and Plouti on arcades (1902, 126-7) (**fig. 38**). However, La Torre confirms an alternative trajectory through plotting the previously unknown tracts of 17, 18 and 19 (1988-9, 319). These tracts affirm that the main aqueduct does not follow Taramelli's course, but rather continues in a northerly direction along the Mitropolianos Valley for at least 1.5km further north of Plouti

following the eastern slopes of the mountains that separate this valley from those of Plouti and Moroni.

10.2 The *caput aquae* at Zaros

Zaros lies at the foothills of Mount Psiloritis at an altitude of 430m (**plates 22a-23b**). The *caput aquae* at Zaros is actually located 2km further west up the gorge from Lake Votomos at the mouth of the gorge ‘τό Φαράγγι της Στέρνας’ (the Gorge of the Cistern) which opens onto the Vrontisi Valley. Taramelli was informed by the villagers of Zaros that the local spring was called ‘η Μάνα του Νερού’ or the ‘Font of Water’ located in locale aptly named ‘η Στέρνα (The Cistern)’. The main spring, which the local villagers called *Λιμιόνας* in the 1900s, was located just east of the *caput aquae*.

The presence of the *caput aquae* here is testimony to the quality of the spring water and, consequently, it is still bottled today. The copious springwater flows underground in modern channels in front of the ancient cistern and still supplies the modern town of Gortyna.

Taramelli noted, when he visited Zaros at the start of the 20th century, that the *caput aquae* only emitted a small trickle of water, probably due to blockage, at the rate of 2 or 3 litres a second (1902, 124). In the 1900s the cistern measured 37m long x 5m wide and 4m deep (**fig. 39**). Dimensions recorded in 2000 present a slightly smaller edifice of 34.1m long x 4.2m wide (internally) x 4m high (**plates 22a-23b**). Taramelli noted that the walls were 1.4m thick, with a powerful 2m-thick outer wall built in solid ‘*enplecton*’ (1902, 122).

Taramelli informs us that the cistern was originally attached to the cliff, which forms the eastern side of the gorge, by a spur of masonry 0.70m wide which strengthened the structure against floods (1902, 122, fig. 13a). This architectural spur is no longer visible today and has been concealed by sediment. This subsidence formed a high terrace to the east of the cistern and, consequently, the cistern and its associated aqueduct tract act as a retaining structure for this massive terrace which has formed over the course of the 20th century (personal observation).

It is also apparent from the plans that the wall nearer to the mountainside rose 2.30m higher than the western wall (**figs 39 and 40**). This is not the case today, as the walls are now roughly equal in height. Taramelli wrote that the destruction to this wall

is evident at several points where it was dismantled by subsidence from above (1902, 123). Hence, it can be deduced from the visible large bulk of subsided earth behind (to the east) the cistern, in conjunction with Taramelli's observations, which reveal the extent of subsequent damage to the wall, that the high elevation of the back wall was destroyed by subsidence.

The roof too has collapsed since Taramelli's reports which describe a vaulted roof of such strong 'concrete' that it was not possible for him to gain access to the interior (1902, 123). Today, the interior can be easily accessed where it can be seen that the interior brick facing is further coated with *opus signinum* (**plates 23a-b**).

The channel outlet was originally placed in a high portion of the cistern in order to serve as a filter (as is apparent from Taramelli's elevation; **fig. 39**). Taramelli noted that the channel outlet from the cistern was blocked by a carob tree growing out of the interior of the cistern which he charmingly includes in his sketch plans. Today this tree is nowhere to be seen and its removal may account for much of the damage to the southern end of the cistern. The southern wall no longer survives to any considerable height (personal observation).

10.3 The portion of aqueduct associated with the *caput aquae* (fig. 39)

Taramelli notes that the section of the aqueduct which would have attached to the cistern has been demolished by 'peasants' (1902, 125). However, a few meters from the cistern's southern end Taramelli reports a 100m stretch of the aqueduct (**fig. 39**). This was located in 2000 where the substructure formed a 4.7m high terrace which equates with Taramelli's calculation (**plate 23c**). Taramelli also records that the substructure wall was 2m wide but the subsidence against the wall has rendered any comparative data impossible. Taramelli records a substantial channel along the top of the wall measuring 0.80m deep and 0.50m wide at the top and 0.35m at the bottom (1902, 125-6, fig. 14). It was lined with a 'double layer of mortar and pounded shells' and was probably covered with a low vault, traces of which are visible elsewhere. Drainage channels, which Taramelli originally recorded, are still visible along this substructure tract, also, (**plates 24a-b** and also visible on **fig. 39**). These small arched channels occur along the aqueduct at 20m-25m intervals set perpendicularly to the axis of the wall. They incorporated a slight incline to protect against rainwater damage.

10.4 The Roman villa at the *caput aquae* at Zaros

Taramelli identified a large structure near the spring in 1902 composed of an entrance passage (8m x 5m) which led into a spacious room (30m x 9m) (1902, 127, fig. 16). Taramelli identified the remains as a villa of some rich citizen of Gortyna on the basis of its fine brickwork. Subsequently, Sanders proposed that it may have served as the '*simla*' for the governor at Gortyna (1976, 134; 1982, 155). Monolithic Egyptian granite columns, like those in the *praetorium* at Gortyna, may have adorned this structure since millstones sliced from them have been found in the vicinity (Paton 1999, 290).

Roman coarse wares were recorded from the area north of the cistern (Sanders 1982, 155). Gold coins of Theodosius and silver coins of Julia Augusta have also been cited here (Pendlebury 1939, 375; Alexiou 1965a, 291; Herakleion Museum no. 1273). A stamped tile, similar to those from Lebena and Gortyna, bearing the text *Julius Fuscus*, was also found (*IC I xxxi* 10).

10.5 Votomos lake

It has been well established that Gortyna was supplied by water from the area of the Votomos lake (a three-hour walk northeast of Gortyna) in the Roman period (**plate 24c**) (*ADelt* 1987, 537). The *caput aquae* is located further up the gorge beyond the lake. However, Roman hydraulic architecture is visible in and around the lake. During excavations in the northwestern section of the lake the aqueduct was found running for a length of 11.5m where it was composed of brick with a vaulted roof (*ADelt* 1987, 537-8, fig. 10, 538 and 539).

The lake is either the result of springs which surface naturally at this point or a natural watercourse which came down the gorge. Certainly, the latter theory would suggest that no springs originally surfaced at Votomos and that the lake is a by-product of the destruction of the aqueduct system which effectively flooded this area (*ADelt* 1987, 537, fig. 10, pls 308a and c).

10.6 The Aqueduct Substructure before its Bifurcation

La Torre (1988-9) followed the course of the single aqueduct along the Mitropolianos Valley tracing tracts 20, 19, 18, 17, 16, 15, 14, 13, and 12 at which point the aqueduct splits into two distinctive lines (**figs 34 and 35**). From the *caput aquae* until tract 20 the aqueduct could not be traced leaving its intermediate course open to debate.

Tract 20 follows a north-south axis but is badly destroyed and fragmentary. It is set on a steep slope which is covered in prickly vegetation which has hindered its documentation (La Torre 1988-9, 315). Tract 18 is located along the slopes of Orthipetra before a couple of hairpin bends along the modern road. In fact, the road drops from an altitude of 260m to 240m. The surviving tract of the aqueduct aligns with tract 17 on the 260m contour (La Torre 1988-9, 315). The aqueduct is lost to landslides just beyond tract 18 where there is a substantial inlet in the contours of the hill. It is difficult to precisely gauge the shape of its trajectory here as the aqueduct could have retained its course in either a direct line or followed an angled format, as the road has done (La Torre 1988-9, 315).

Tract 17 crosses a deep fissure in the hillside where the aqueduct is again reduced to fragmentary foundations incorporated into field borders and vineyard terraces. Reused fragments in the modern walls are identifiable from their coating of *opus signinum*. After this point topography becomes the key to its identification as the aqueduct seems to adhere to the 250m contour but veers to the 260m contour in the fields near the Gergeri road (La Torre 1988-9, 315). Further along the aqueduct is only represented by collapse with no *in situ* foundations located for another 200m (La Torre 1988-9, 315). Such uniform collapse is due to landslide action which is affirmed through contour map studies.

Tract 16 is a 3m-long tract located in vineyards where it survives following the 240m contour. Here the channel base survives but seems to have rotated slightly from its original alignment (La Torre 1988-9, 314). Other fragments of collapse in this area, although less profuse than those associated with tract 13, are again attributable to landslides with fallen blocks reaching the riverbed.

Tract 14 is preserved for over 10m (**plate 25a**). Here almost the entire section of the structure is preserved including the vaulted roof of the channel. The *specus*

measures 1.4m high from the base to the top of the vault and is 0.60m wide (La Torre 1988-9, 313-4, fig. 40). A few meters below tract 14 are the remains of a structure composed of a mortared rubble core faced with stone blocks. La Torre identifies this as a fountain with a drinking trough (1988-9, 314, fig. 40) (**plate 25b**) which would suggest the presence of an ancient road.

Tract 13 consists of *in situ* piers associated with imposing sections of collapse (1988-9, 310, no. 13). The topography had necessitated the use of piers to support the channel on an arcade. Enormous masses of the substructure collapsed and rolled 100m into the valley where they are visibly embedded in the ground down as far as the riverbed (La Torre 1988-9, 313, no. 13) (**plates 25c and 26a**). The collapsed sections consist of massive blocks composed of mortared rubble cores which preserve a great deal of their limestone facing. The base of the channel is also visible in much of the collapse (personal observation).

10.7 The Point of Bifurcation

The bifurcated tract of the aqueduct is denoted from the point marked XV on **fig. 35**. It was possible to trace the fragmented course of both aqueducts for the remaining 3 or 4km to the city from here. Both aqueducts are located on a ridge along the steep valley banks. Both branches were constructed using the same techniques and are composed of a mortared rubble core faced with cut stones laid in courses (Taramelli 1902, 130). However, there are marked differences in regard to their channel sections and the nature of their roofing. The upper substructure wall is slightly bigger (measuring 1.7m high x 1.8m wide) than the lower (measuring 1.1m x 1m) while their channel dimensions are similar.

The point of bifurcation is indicated by the proximity of the two aqueducts at the point where they are separated only by the road-cut running from Ambelouzos-Gergeri (La Torre 1988-9, 304). This road has damaged the monument considerably. The distance between the two aqueducts increases progressively as they approach the city.

The bifurcation was a response to the demand for feeding different zones of the city which was achieved through entering the urban area on different levels. Such differentiation in altitude was necessitated by the fact that the Roman city of Gortyna,

capital of the joint province of Crete and Cyrene, was a sprawling urban landscape rich in baths, *nymphaea* and fountains (La Torre 1988-9, 318).

10.8 The Upper Aqueduct

At several points along the course of the upper aqueduct it is detectable that the bedrock was cut to form a terrace in the steep slope and it is this rock which was used to build the walls. The substructure was founded on this terrace where the inner edge directly abutted the rock-cut scarp. The external wall and the roof were freestanding constructions which have now generally collapsed, while that of the inner edge and the base are better preserved (La Torre 1988-9, 307).

Along tract 5 of the upper aqueduct the channel is supported on a massive substructure, *c.* 1.80m thick (**fig. 34**). The substructure supports a 0.60m-wide (two Roman feet) channel which was composed of two half-walls, each 0.60m thick. The channel was coated with a thick layer of *opus signinum*, 0.03m-0.05m thick. The roof of the upper aqueduct is vaulted while its base has a U-shaped section (La Torre 1988-9, 304). On at least one occasion the arched cover is constructed with a pitched brick vault (La Torre 1988-9, 307, fig. 28).

The channel of the upper line varies in dimensions along its course and is mainly rectangular, narrowing slightly at the top (0.65m high and 0.56m wide). In key places along the upper aqueduct, *i.e.* near the acropolis and nearing some of the reservoirs, the channel becomes narrower and taller (1m high).

10.9 The Lower Aqueduct

The lower aqueduct is not as well preserved as that of the upper and introduces some peculiar characteristics, especially in regard to its channel section. The channel is only 0.60m in height, and 0.45m in width, with a flat base and a flat roof composed of large limestone cap-stones held in place by ridges along the top of the substructure (La Torre 1988-9, 304, 316-318). The channel of the lower aqueduct is consistent in shape and size even where it nears the acropolis. Such confined dimensions must have been problematic in terms of inspection and maintenance (La Torre 1988-9, 316). Its small size may be due to the fact that it had to supply the many sluices that fed the lower quarters of the city (Taramelli 1902, 131, fig. 18).

10.10 The Inverted Siphon crossing the Mitropolianos River (fig. 34, no. A)

The first inverted siphon encountered on the descent of the aqueduct towards Gortyna occurs at the ruins of a mill where the lower tract crosses the Mitropolianos River. The siphon is unusual in construction with a complex arrangement not encountered in other aqueducts on the island. 10m before a settling tank on the main course, a small branch departs from the main supply at an oblique angle (La Torre 1988-9, fig. 43). This small branch reduces the water flow entering a settling tank along the main tract. This settling tank facilitates a sharp change in direction allowing the water to descend towards the brink of the gorge (Taramelli 1902, 129, figs 17 and 133, fig. 20). The water of the main course descends a steep incline for 11m where it is collected in a massive cistern on the brink of an almost sheer drop of 20m to the river below. The water from the tributary branch is also collected in this cistern or tower (La Torre 1988-9, 316-7, figs 41-43). The tower is faced with brick and is lined internally with mortar. At this point a mule-track skirting the top of the ravine passes through an arch in the substructure wall indicating that it must follow an ancient routeway (Taramelli 1902, 133; for tract of the road see Di Vita 1988-9, pl. II). At this point the aqueduct must have incorporated either a bold arch or a siphon to cross the ravine. The aqueduct is again visible for some metres on the opposite side of the ravine at a height of 20m.

10.11 The Inverted Siphon crossing the Ruaki Valley (fig. 34, no. B)

The aqueduct continues in its twofold course approaching the little valley of Ruaki which skirts the acropolis on its northwest side where the tracts gradually approach one another (**plate 21c**, as indicated by the arrow). Both lines cross the valley with the use of a double siphon bridge which would have accommodated both channels (Taramelli 1902, 135, fig. 3). These siphons are much smaller than the previous example.

The upper tract crosses the valley on a small bridge composed of two arches resting on a 2m-thick central pylon. The lower aqueduct is supported on a bridge with regular arches (Taramelli 1902, 135). This bridge must have been 12m long in order to span the Ruaki. Due to the gradient of the terrain Taramelli concludes that the bridge had two storeys although the bridge is now badly destroyed (1902, 135) (**fig. 34, no. B**).

However, Taramelli indicates that the water was enclosed in pipes in an analogous description (1899, 400).

10.12 The Aqueduct associated with the western acropolis (fig. 34)

The aqueduct reached the entry of the ravine formed by the Mitropolianos River between the rises of Aghios Ioannis and Pervolopetra on two parallel aqueducts running to the west of the river, separated by a distance of 43m (Taramelli 1902, 128) (**plate 21c**). The upper and lower branches continue in a parallel course on the west bank of the river along the steep slopes of the western acropolis. The upper branch supplied the acropolis, while the lower reached its foot, where the collection and distribution reservoirs were located. The parallel lines encircle the western acropolis behind the theatre (**fig. 34; plate 21a**). The lower aqueduct disappears underground for 100m, maintaining a depth of 8m-12m, to avoid a spur of the acropolis. Taramelli records a 12m-deep ventilation shaft measuring 1.5m x 1.5m (1902, 138, fig. 23). The upper channel runs above ground for its entire route. Despite its fragmentary condition, associated features are identifiable along its course. A sizeable rectangular structure survives to a height of 2m. It is composed of thick stone-faced walls (2m thick) and a stone bench (0.70m wide) runs along the interior of the room. The structure is founded on a base or platform of larger stones which is now mostly buried. Taramelli interpreted the structure as the swimming pool of an *exedra* for gymnastic exercise, rather than a cistern (1902, 139).

Taramelli also recorded another reservoir which he associated with the theatre

‘where fountains and jets of water would certainly not be wanting, according to Roman custom to refresh the spectator and to cool the plants and flowers laid out for decoration’ (1902, 118).

This reservoir was partly destroyed in 1902 but its overall dimensions were 4m x 3.8m with thick walls (*c.* 1.25m) which limited the internal space to a width of *c.* 1.5m wide. Traces of a brick vaulted ceiling protected the water from evaporation. This reservoir was probably not isolated in the field as fragments of other similar structures are discernible in the area of the theatre.

Two similarly-constructed structures could be connected with the lower aqueduct. Taramelli records one example just southeast of the theatre. It measured 3.5m x 3.5m and stood to a height of 1m. Taramelli noted that its interior lining was well preserved and that it was then still quite fit to use as a bath (1902, 139). These reservoirs would have been fed by the aqueduct as would all the hydraulic constructions found on the slopes of the acropolis (Taramelli 1902, 120).

10.13 The aqueduct associated with the eastern acropolis (fig. 34)

A branch from the lower line crosses over the Mitropolianos River using the siphon bridge (see A 10.10). This branch continued along the western slope of Pervolopetra hill traversing the areas of Volakas and Kamarakia where there were cisterns and *castella* for water distribution. The aqueduct entered the city on the hillside above the agora at Volakas, from where it was divided into a system of ceramic conduits supplying different urban areas. It glides close to the hill acting as a general provider with various conduits branching off to supply villas and the quarter situated in the region now occupied by the village of Aghioi Deka. The eastern line supplied the water for the eastern districts of the city; the zones of the *praetorium*, the *nymphaea* and the great *thermae* (La Torre 1988-9, 304).

The channel is supported on a low 2m-thick substructure wall composed of a mortared rubble core with facings of irregular limestone. The channel is rectangular in section, 0.47m wide (max height 0.66m) with a vaulted roof constructed with trapezoidal bricks (Pagano 1992, 279).

10.14 Nymphaea

The two almost identical monumental *nymphaea* (Pagano 1992, nos 25 and 8) most likely date to the 2nd century AD. Sanders assigned their construction to the 2nd century AD based on comparisons with similar architecture in Asia Minor (1982, 76). At Gortyna, *nymphaeum* 25 is located to the north of the *praetorium* (**plate 26c**) while *nymphaeum* 8 is located near the Megali Porta. The former measures 17m x 8m while its main basin is 11.5m x 4.5m x 1m deep. The water enters the *nymphaeum* via the central niche and finally collects in three marble basins set along the front of the fountain. The walls were fitted with alternating niches and pilasters and two corner

columns (Vasilakis N.D., a, 90). At some date after its initial construction the open basin was converted into a 3m high vaulted cistern, the façade was rebuilt and basins in the form of shaved-down sarcophagi were added (**plate 26c**). Columns were erected along its southern façade bearing dedications to the Emperor Heraclius (*IC IV 512b*; Pagano 1992, 282: see text 7.2.9).

10.15 Aqueduct A

Aqueduct A is nearly entirely supported by a single wall and only by individual arcades at three points. This aqueduct is connected to a series of cisterns which serve to regulate the flow for distribution to different sections of the city.

10.16 Aqueduct B

Two parallel walls, set 3.25m apart, protect a section of the aqueduct channel (Pagano 1992, 280, fig. 5). The walls were composed of a mortared rubble core faced with small regular stones. The base of the channel was lined with a series of tiles with widths ranging from 0.46m to 0.36m. The conduit was coated with *opus signinum* incorporating bevelled edges. The channel was filled with a layer of beaten earth containing sherds of the 2nd century AD. This channel had actually replaced a terracotta pipeline (each pipe with a diameter of 0.14m and a length of 0.41m).

10.17 Aqueduct C

An impressive feature of the Gortyna aqueduct is its urban arcade as best evidenced in Tournefort's sketches (**fig. 37; plate 26b**). The arcade was necessary to maintain a water-level high enough to provide reasonable service within the city throughout the plain. This arcaded tract is thought to date to the late 4th century AD (Di Vita 1984, 232), when after a severe earthquake, the conduits in the interior of the city had to be completely renovated with two branches added to the principal line.

The arcaded branch at Gortyna, known as Aqueduct C, lies between the Mires-Herakleion road and the area of the *praetorium*. The arcade of Aqueduct C was flanked by a paved road which passed an early basilica, in which a series of dedicatory inscriptions to the consul of Crete in AD382 and AD383 (Oecumenius Dositheus Asclepiodotus) were found.

The arcade had leaned dangerously to the west, where the terrain lies at a lower level, in recent years and required conservation. The tilting was due mainly to the fact that forty years ago a modern trackway was built along the west of the arcade, allowing access to the excavations of the *praetorium*. Great heaps of stones were set resting against the ruins along the narrow street (Di Vita 1988-9, 472-4, figs 59-60).

The arcade itself stands to a height of 4.6m while the arches are 3.5m wide (**plate 26b**). Each pier measures *c.* 1.35m x 1.1m. The channel incorporates two successive phases and several repairs. The elevations are composed of a mortared rubble core faced with irregular limestone and some brick and tile fragments (Pagano 1992, 280). Particularly noteworthy associated features include reservoir 34, measuring 5.4m x 11m, and water tower 35 which were both fed by the arcade (Pagano 1992, fig. 6).

10.18 The water supply system in late antiquity

The layout of the water distribution system changes again in the late 6th or early 7th century AD. During the reign of Heraclius Gortyna again became an important centre of administration and a catchment area for corn and oil production in the Mesara plain. However, the settlement was now divided into groups of occupation in mainly outlying districts. Aqueducts A and C provided a series of piped conduits (**plate 26b**). The major *nymphaea* 25 and 8 were restored and continued in use (Pagano 1992, 281). Late-antique houses lean against the western side of the arcade of Aqueduct C. The houses are set on different levels dating from the 5th until the 7th century AD.

The construction of numerous fountains (nos 2, 4, 5, 7, 10, 11, 14, 15, 16, 17, 18, 19 and perhaps the reservoirs nos 9, 17 and 23 which constitute the three aqueduct terminals) belong to this period (Di Vita 1984, 221). The distribution of the later fountains provides information regarding the occupation of the urban zones in this period. They indicate that the area of the ancient agora (represented by fountains and reservoirs 36 and perhaps 33 and 34), the acropolis, the area around the *praetorium* (represented by fountains 2, 3, 4, 5, 6, 7), the southern zone around the Megali Porta (represented by fountains 8, 9, 14, 22) and the area of the basilicas of Mavropapas and Mitropolis were all resettled. In fact, Gortyna was probably an ancient bishopric at this stage. The circus to the southeast was also in use at this time, as was a small peripheral

zone to the east (Pagano 1992, 282, fountain nos 10, 11, 23). Water was only delivered to specific points, while the majority of the population had to use the public fountains built in the different habitation zones (Pagano 1992, 282). The presence of such a series of distribution points is indicative of the relative importance of the city in this period. This restructuring of the city in late antiquity may have been an attempt to preserve the city prior to the occupation of the island by the Arabs.

The aqueduct must have been reused in medieval times according to Belon's observation that the supply was later employed to turn several mills (cited in Falkener 1852-3, 278, n. *). Indeed, when Halbherr excavated the odeum he was 'enjoying the cool water of a mill stream' which he was forced to divert in order to excavate the area (cited in Pentreath 1964, 125).

Type : Public composite aqueduct.

Date : Pagano states with confidence that the aqueduct was constructed in the first Imperial period (1992, 280). This deduction seems to be based on epigraphic evidence. An inscription found near the odeum (dated to the 1st or 2nd centuries AD) refers to a person named Soarchus who had brought water to the place at his own expense (*IC IV 330*: see text 7.2.5) and another inscription dating to the reign of Commodus mentions a *nymphaeum* (*IC IV 334*: see text 7.2.4). Certainly, the similarity between the lower tract of the Gortyna aqueduct (see A 10.9 above) and the Roman aqueduct tract associated with the North House excavations at Knossos (see 8.9 above) is striking. The Knossos tract is related to both a Hadrianic destruction deposit and a Severan deposit (Sackett *et al.* 1992, 47, pls 3, 4 and 40a) and similar dates can be suggested for the Gortyna tract.

The late-antique tracts have been attributed various dates ranging from the 4th and 6th centuries AD. Di Vita maintains that during the 6th century AD the terracotta pipes which distributed water to the residencies of Gortyna were old and damaged by earthquakes and almost impossible to repair, consequently, three new branches were constructed on elevated arches (2000a, 13).

11 Lebena

Plate : Figs 41-43; plates 27 and 28.

Location : Long: 24°941' N; Lat: 34°933' E. The sanctuary is located on the south side of the Asterousia Mountains, around the bay immediately east of Cape Lenda or Cape Lebena (sometimes referred to as Akrotiri Kephalas or Ormos Loutra).

Site Description/Context : Belli planned an elaborate temple building in the late 16th century (**fig. 43**). However, since then the only comprehensive topographical study that has been conducted in the bay area is that of Federico Halbherr and Antonio Taramelli who first visited the area in 1894 (**fig. 41**). Taramelli visited the ruins of Lebena 'as a companion and modest auxiliary of Professor Halbherr' (Di Vita *et al.* 1984, 73; Melfi 2001, 54).⁵ The survey was aimed at determining the archaeological potential of the site in preparation for subsequent excavation. The site was excavated by the Italians under the directorship of Halbherr in 1900 and 1910. The report written by Taramelli, together with the general topographical sketch of the bay, is preserved in the archives of the *Scuola Archeologica Italiana di Atene*. The sketch has been published in *Creta Antica Cento Anni di Archeologia Italiana (1884-1984)* (**fig. 41**).

The focus of the Asclepeion is a spring located on a low coastal rise (Sanders 1982, 79, figs 19 and 59). The remains of the main temple complex with its auxiliary buildings occupy the whole bay. The structures include porticoes, stoas, *nymphaea*, cisterns, aqueducts, baths and shipyard provisions, all of which facilitated the waiting patients and pilgrims. The temple of Asclepius, popularly thought to be built on the model of that at Cyrene (Pausanias II xxvi 9), was resorted to by pilgrims as far afield as Libya (Philostratus *Apolloni* IV 34; Falkener 1852-3, 286; Dillon 1997, 74; Edelstein & Edelstein 1998, 234). The majority of the structures at Lebena resemble either a bath or cistern. Consequently, bathing seems to have been a principal part of the therapeutic and religious activity on site (Melfi *forthcoming*). Pendlebury categorically stated that the site was equipped with a temple, baths and a fountain (1939, 373).

The majority of structures on the site are Roman in date and it is likely that the sanctuary was a place of respite for the citizens of the Roman Gortyna. Pendlebury remarks that in the Imperial Roman period Lebena was a fashionable watering-place which 'hitherto had been nothing more than a fishing village' (1939, 367-8). However,

⁵ Almost all the information regarding Lebena was afforded to me by Milena Melfi who has gleaned more from the ruins than anyone since Taramelli and Halbherr and I am sincerely grateful for all her informative assistance.

worship at the site predates that of Asclepius who is the focus of worship in Roman times. Sacred laws from the sanctuary refer to offerings to the Nymphs and Acheloos (*IC I xvii 7*; *SEG XXXVIII 916*). Savelkoul conjectures that the cult of Asclepius superseded that of the Nymphs and Acheloos without ever completely eclipsing the more ancient deities of the sanctuary (1985-6, 47-56). An inscription informs us that the old fountain of the Nymphs and Acheloos was enlarged for the new cult of Asclepius by the father of Soarchos (*IC I xvii 21, ln.1*). Half a century later Soarchos himself repaired his father's fountain. There is an implied decline of the fountain between these renovations which Savelkoul attributes to the war of Knossos against Lyttos and Gortyna starting in 221BC.

Both forms of worship were water-based and correspond to the progression of worship at Lissos. The nature of the worship would account for the type of buildings on the site. Taramelli's sketch plan depicts the buildings of the central group which include the temple (TA) and attached building (B1), with other uncertain ruins, the channel for the central stream (CR), and a small structure with a cistern (Q) (**fig. 41**).

Halbherr's investigations in 1900 revealed a very different complex to the extravagant plan executed by Belli. He discovered the compartments of a stoa north of the temple which are also mentioned in inscriptions from the site. The treasury was located between the stoa and the *cella* of the temple: a Late Hellenistic inscription confirmed its identity. Other Hellenistic inscriptions are engraved above blocks of the wall belonging to a pre-Roman temple that was destroyed. These inscriptions carry accounts of recoveries, part miraculous, part medical, part both, similar to those remembered by the inscriptions of Epidauros.

The treasury and a rectangular-sectioned well are similar to the *favissa* of the temple of Pythion Apollo at Gortyna. The floor of the treasury is decorated with a black-and-white pebble mosaic which depicts a white seahorse set in a black background and framed by a rectangle panel bordered by a thick band containing a wave pattern motif (**plate 27b**). It is the dragon of Asclepius, which is mentioned in the inscriptions found in the stoa. Sweetman regards the work as the only definitely Hellenistic mosaic on the island (1999, 104). The mosaic was damaged in the 2nd century AD when the tail was cut off by the sinking of a circular hole. Subsequently, a crudely-cut hole was dug through the body of the seahorse.

Taramelli records buildings spreading westward along the beach from the Psamidomouri promontory to the steep slopes of the Leon promontory (**fig. 41**). He describes a rectangular construction (**B**), 7m x 5m, approximately mid-way along the beach. The edifice is internally lined with *opus signinum* and possibly functioned as a fountain containing a small spring (Taramelli *unpublished manuscript*). Melfi has identified a spring in the modern restaurant of *El Greco* and observes that today the restaurant garden is home to the most luxuriant vegetation of the whole bay (pers. comm. 2001 October).

Taramelli reports substantial walls to the west of structure **B** which form two parallel right-angles. Taramelli traces these angled walls for a distance of 6m to the east and 3.70m to the north (*unpublished manuscript*). The walls are coated with *opus signinum* suggesting that the structure held water. Taramelli suggests that the building facilitated the supply of water for ships docked in the bay. However, the structure's proximity to the sea would also support a sea-bathing function.

A substantial wall and traces of supporting rooms (Building **OO**) can be traced parallel to the beach to the west. The structure remains one of the most visible features of the bay. It is a long building, faced with brick, and subdivided internally by roughly equal partitions. The interior is lined with *opus signinum* and pipes connect the different compartments. The structure has been interpreted as a docking facility, while also exuding the same characteristics and functions as building **NN** which has been interpreted as a ship-shed. A wind break function has also been suggested as the wall is hammered by the sea in stormy weather.

The remains of a circular structure are situated near the river a few meters from the sea (**fig. 41**, structure **C**). The building is almost circular with a diameter of 8m but its remains are reduced to an incomplete surface outline. Its walls are constructed with facings of brick. Its function is not clear, but it is possible that it contained water and possibly represents the collection cistern for a *nymphaeum*.

Aqueduct Description :

The aqueduct has been reported by Belli, Coronelli (1706, site no. 43) and Spratt (1865, I, 353). Tarditi wrote that the water at the spring (presumably the temple fountain) seems to have been conducted downslope from the fault between seams of flysch and serpentinite-amphibolite rock (1992, 160).

The aqueduct is clearly denoted on Taramelli's sketch plan where it is seen approaching the site from the west (**fig. 41**, marked as **AA**). Taramelli follows the course for over 54m (**AA**) and observes that it continues for another 20m in the form of a contour terrace (*unpublished manuscript*). Taramelli records a height of 1.4m and a width between 0.80m and 1m (*unpublished manuscript*). It was visible in 2002 descending the river contour towards the site. It departs from the river's course and travels along an east-west contour on approaching the temple (**plate 28a**). It supplies a reservoir (or a possible bathing facility) to the west of the temple (**plates 28b-c**: structure B1).

Taramelli observes that the channel was coated with a lime mortar consisting of lime, sand and crushed sherds (*unpublished manuscript*). Taramelli notes that the aqueduct was comparable to the Gortyna examples (1902, 119-120). The substructure is composed of a mortared rubble core faced with finely-worked local stone (*petit appareil*) but there are no traces of the channel to which Taramelli refers (**plate 28a**). Stone blocks from its collapsed facing litter the hillside below. The widening of the modern coastal road has badly damaged the aqueduct.

The aqueduct supplies the fountain associated with the main temple, as well as numerous bath-like structures (see B21-3). The façade of the temple's fountain has been reconstructed several times and, consequently, it is difficult to assess its masonry style (**plate 27c**). The fact that the aqueduct leads to the structure **B1** (as indicated on **fig. 41**) suggests that they are contemporary.

In 1900 Halbherr cleared the temple, isolating the columns and clearing away the floor. Ramps were revealed in front of the temple leading down to the rivulet. It was originally thought that a reservoir supplied the water for the main stream on the site (**CR**) which flowed along the furrow in front of the temple to the sea. Khatzi-Vallianou also observes that the site is crossed by three stream beds but claims that the two western examples were only formed after the abandonment of the sanctuary, since they cut through a large building (1989, 8). Conversely, it can be argued that the stream in front of the temple was integral to the sanctuary's design but that in Roman times water flow through the site was confined and regulated. When the sanctuary was abandoned the surplus of water precipitated the destruction of many of the structures.

An aqueduct branch departs from the main supply and continues on a north-south axis towards the tip of Cape Psammidomouri (**fig. 41**, marked **AR**). Taramelli has suggested that this branch supplied selected buildings on this headland, notably a rectangular building with a north-south axis (**fig. 41**, **B4**). Another structure, located 20m from the group of buildings **T** and **TT**, was also examined by Taramelli (**fig. 41**, as indicated by the arrow). The rectangular structure, measuring 11.50m x 4.20m, is partially rock-cut into the edge of the bluff. It was internally divided into two separate parts. The smaller western compartment lies at a lower level than the eastern compartment. The fact that the walls are internally coated with *opus signinum* and that a channel connects the two compartments suggests that the building acted as a cistern. Its position on the edge of the bluff suggests that the cistern was designed to collect water from the aqueduct in order to supply boats when they landed at Lebena. The presence of possible ship-sheds on the nearby beach (a function suggested for structure **NN**) would support this theory (**fig. 41**). Melfi observes that the specific remains on the beach have been largely incorporated into modern houses (pers. comm. 2000). However, the position and scale of structure **NN** is comparable with shoreline constructions at Tholos and Lasaea (Melfi 2001 *forthcoming*). Similarly, at Delos many coastal structures demonstrate characteristics of dockyards and store facilities for ship provisions, including a supply of water.

Type : Public overground aqueduct.

Date : Most of the structures within the sanctuary have been dated to the Antonine period (Melfi 2000, 46-7). Consequently, it would be feasible to transfer this date to the aqueduct. The broader settlement has been attributed mainly to the 2nd and 3rd centuries AD (Vasilakis 1996, 643).

12 Lasea

Plate : Plate 83a.

Location : Lat: 24°866' N; Long: 34°94'E. The site of ancient Lasea is located 8km west of Lebena near Kali Limenes. The ancient city is located on a small headland opposite Nisis Traphos (Spratt 1865, II, 7-10).

Site Description/Context : A breakwater extends towards the islet of Traphos but leaves a channel, 10m-15m wide, between the island and its south end. A Minoan

settlement was identified on the acropolis, to which a Minoan tholos in the vicinity can be attributed. It is also possible that nearby copper workings could have been exploited in antiquity (*AR* 1987-8, 70). The city has not been excavated but Hellenistic tombs (Alexiou 1964a, 284), various inscriptions (*IC* I xv) and amphorae (discovered off the coast) have been reported (Alexiou 1967b, 488). A freestanding vaulted tomb of the same type found at Lissos and Souia was also discovered on the next headland to the west.

The population size at Lasea has been estimated at 400-500 (Blackman & Branigan 1975, 36). Blackman and Branigan's survey identified a possible temple, basilica, harbour installations, a drowned quay or breakwater and an aqueduct system (1975, 28-32, figs 7-8). The extent of the damage caused by modern development and illicit excavations is exposed through a comparison with the actual remains in the field and the 1971 plan (*AR* 1987-8, 70).

Aqueduct Description : Blackman and Branigan locate a spring to the northeast of the site high in the inlet of a stream (the second stream to the east) which flows to the sea to the east of the site. They follow this aqueduct from the spring for a distance of 600m (Blackman & Branigan 1975, 30). This aqueduct was also reported by Khatzi-Vallianou as bringing water from the nearby spring (1979, 382). The aqueduct consisted of a 'plastered' channel, reportedly '10cm. wide and 5cm. deep', carried on a mortared wall (Blackman & Branigan 1975, 30). These measurements are obviously incorrect as they are too small to be effective. The water is thought to supply a large cistern located at the northeast corner of the headland and constitutes the main supply of water to the site.

Type : Public overground aqueduct.

Date : The site itself is covered with pottery including Eastern Sigillata, African Red Slip 104-5 and Late Roman C 3E (Blackman & Branigan 1975, 28-32, site SC10; Sanders 1982, 160). It is not stated whether the aqueduct is Roman but from its association with the Roman cistern in the initial report its contemporary date is implicit. Conversely, in their later report Blackman and Branigan record a Venetian aqueduct high up in the eastern river valley whose water must have been tapped at a spring at Gavaliana, 1km to the north of the site (Blackman & Branigan 1977, 53, 77, W3 and W4, fig. 35, pls 7c and d). The spring at Gavaliana is one of the

two perennial springs in the region, the other is found at Aghia Kyriaki. Doe and Holmes note that the spring at Aghia Kyriaki yields 345m³ of water per month at the end of the dry season but calculations on the aquifer supplying the spring suggest that it is capable of yielding an average of 300m³ per day through the year (1977, 19).

13 Eleutherna

Plate : Fig. 44; plates 29-30.

Location : Lat: 24°66'N; Long: 35°33'E. The ancient city is located in the hinterland of Rethymnon at the northwest base of Psiloritis. It is situated on a long narrow flat-topped ridge rising to a height of 40m with steep sides. The streams at either side are the Halopota to the west and Kyriaki to the east (Themelis 1992, 91).

Site Description/Context : The acropolis of ancient Eleutherna, set on a promontory between two streams, dominates the surrounding countryside with a splendid view as far as the sea (Spratt 1865, II, 89; Woodward 1929, 224-6; *IC* II xii). The summit is approached from the south along a rock-cut road, with an accompanying drain, which leads onto a courtyard about 10m wide where the bedrock is cut to resemble paving stones.

Cistern Description : On the west side of the acropolis massive Roman cisterns were cut into the soft marly limestone strata (plates 29a-b). These massive cisterns comprises at least two complexes each divided into three aisles by rock-cut pillars (plate 29b). Each cistern measures *c.* 40m length x 25m width x 5m-6m height (Sanders 1982, 162). An arched rock-cut channel set low in their common wall connects the cisterns (plate 29c). The dividing pillars form two series of rectangular colossal supports for the roof measuring 2m x 2m although Mariani quotes 3.5m x 3.5m; 1895, 213). Their combined capacities represent the largest cistern capacity on the island. The cisterns were replenished by a short but well-constructed aqueduct which tapped the Pigadaki spring further up the valley to the west of the site (Themelis 1992, 91). A rock-cut aqueduct drained the cisterns penetrating their back wall from the eastern side of the acropolis. The aqueduct draining the reservoirs tapped the cisterns at a high level in their walls which suggests that the cisterns functioned essentially as sedimentation cisterns.

Each cistern has a large entrance which descends to a subterranean level via series of rock-cut steps (**plate 29a**). In 1577 Barozzi compared the cisterns with a temple reporting that the ruins of the city represent a monastery called Eleutherna (cited in Spanakis N.D., II, 159). Faure also compared the entrances of the cisterns at Eleutherna with the entrance of the cave of Gero Spilios (Melidoni) which has a similar entrance of rock-cut steps (1996, 105). This cave is damp and dripping water and pools are encountered in its further recesses. Belli noted that one can explore the cave for a considerable distance but progress is eventually impeded by the appearance of water (cited in Falkener 1852-3, 290).

Aqueduct Description : The aqueduct which tapped the cisterns conducted the water through the mass of the acropolis to the edge of the cliff overlooking the city, directly above its several bath complexes (Themelis 1994-6, 270-1).

The aqueduct was reported as early as 1895 by Mariani (1895, 213) who described a tunnel 2m in height with a central channel (**plates 30a-b**). The tunnel measures 2m high x 1m wide and is definitely rock-cut and tooling is visible along its walls (**plate 30a**); however, Davaras' section depicts steining along the walls and roof of the tunnel (**fig. 44**). Lolos claims that, in comparison to other aqueducts in Greece, only the Cretan aqueducts at Eleutherna (1m x 2m) and Elyros (1.8m x 2.2m) seem to be bigger in section than the Hadrianic example at Corinth (1997, 300).

The channel penetrates the acropolis for *c.* 150m and its back wall is constructed in large ashlar blocks through which a small hole tapped the cisterns high in their wall, as initially suggested by Mariani (1895, 213) and Spanakis (N.D., II, 159). The hole is set centrally in the back wall of the aqueduct at about 1m above the channel floor. Small niches, presumably for lamps, are discernible in the rock-cut channel walls (**plate 30c**, as indicated by the arrow).

Aqueduct Type : Public rock-cut underground aqueduct.

Date : A system of small cisterns and conduits which have been dated to the Hellenistic period provides us with a *terminus post quem* for the massive Roman cisterns (Kalpaxis *et al.* 1994, 28-37). Even if the monumental cisterns and aqueduct were not part of the same integrated design (as has been suggested), the cisterns would still have to post-date the Hellenistic cisterns which supplied the city. The cisterns could not easily be fed by rainwater and it seems almost certain that the

aqueduct tracts and the massive cisterns functioned as an integrated system. The water was conducted from the Pigadaki Spring to the massive sedimentation cisterns which were drained by the underground aqueduct channel. The system was in operation in the 2nd century AD when the three baths of the lower city were operational. The underground aqueduct tract is also considered Hadrianic due to comparison with the Athenian and Corinthian tunnels.

14 Axos

Plate : Fig. 45; plates 31a-c.

Location : Lat: 24°N85'E; Long: 35°N316'E. Axos is located north of the Psiloritis foothills near the source of the Oaxos River. The site is situated in the eastern part of the Mylopotamos Valley about 3km northeast of Zoniana.

Site Description/Context : The settlement spreads along a rocky ridge which extends *c.* 600m and dominates the modern village. Relatively little is known about the ancient city but its longevity has been established through excavations of the cemetery which continues from the Archaic to the Roman period (Papapostolos 1975, 347-8; *Vradini* 7/6/83; *Nea* 7/6/83).

Aqueduct Description : To the southwest of the Axos ridge architectural foundations of a wall are evident in the road to Zoniana (**fig. 45**, as indicated by the red dotted line). The wall survives to a height of 1m with a width of 1.60m to either side of the road and is composed of a mortared rubble core faced with roughly-cut limestone blocks (**plates 31a-b**). It runs parallel to the road on a north-south axis for 12.40m, effectively following the contour of the hill adjacent to the site.

Falkener wrote that

'the principal object is a noble aqueduct which conveyed water from a lofty mountain to another which, from its numerous ruins of great and sumptuous edifices is supposed to have been included in the city' (1952-3, 288).

Elderly shepherds from the area remember the wall standing 4m high, incorporating both a marble channel and arches in the 1940s. Spanakis wrote that the aqueduct wall was 8m high in the base of the valley (N.D., II, 59). Pashley measures the

distance across the valley at about seventy to eighty paces and notes that two pieces of the aqueduct are left standing, one of which was 16 paces long and 30 feet (9.1m) high, the second was a shorter tract but of the same height (1837, I, 150). He also observes that the stones of the elevations were small and that a great deal of mortar was used in their construction. This area is known locally as Tou Teikhou or To Teikho tis Axos (The Wall of Axos) which is suggestive of a substantial wall at this point. The villagers of Axos believe that the aqueduct conducted the water from a cistern at Skafida, 2km-3km from the site, and also refer to a collection cistern on the Axos hill (Spanakis N.D., II, 59).

Type : Public overground aqueduct.

Date : Pashley assigned the aqueduct to the Venetian period in the light of the fact that his guide informed him that a Frank took a piece of marble from the substructure wall (1837, I, 150). He concluded that during the Venetian period any monument of ancient art was used in construction. Spanakis also records that an ancient fountain in the area supplied the city in the medieval period (1991, 116). However, such tenuous dating is not convincing especially when we consider the lack of Venetian architecture on the site today and it seems equally plausible that the aqueduct is Roman in date.

15 Aghia Pelagia

Plate : Fig. 46.

Location : Aghia Pelagia (ancient Apollonia) is located 12 miles west of Herakleion (Evans 1921, 299, n. 1). Here on the lower cliffs of a peninsula are walls constructed using squared blocks of the local stone.

Site Description/Context : Evans remarked that the best remains of a Minoan port can be seen at Aghia Pelagia (1921, 299, n. 1). The architectural remains include house foundations associated with sherds dating back to the Early Minoan period. Evans claimed that the site continued in occupation into the Greek period (1921, 299, n. 1). Excavations in the area yielded mainly Minoan and Classical and Hellenistic evidence. The site was investigated in advance of the development of the headland as a hotel complex which subsequently destroyed much of the site (*AR* 1978-9, 38; *AR* 1981-2, 54; *AR* 1984-5, 60).

The site probably represents ancient Apollonia which the ancient sources locate near Knossos (Ptolemy *Geography* III xv 5; Pliny IV xii 59; Polybius XXVIII 14). Ancient Apollonia was a city which gained historical recognition only because of its destruction in 171BC by the Kydonians. The city's numismatic record reveals an unusually large variety of issues (included coins from Knossos, Gortyna, Priansos, Axos and Arkadia all dating from 300BC to 200 BC) considering the relative insignificance, historically speaking, of the city (*ADelt* 1973, 560-1; *ADelt* 1974, 89; Sideropoulos 1998 *Abstracts*).

The site has produced a large quantity of early 2nd-century BC pottery characterised by a mixture of fabrics, some probably Knossian. Callaghan and Jones deduced from the pottery that

'obviously, this relatively unimportant city did not have a flourishing school of ambitious vase painters and seems to have relied on more than one of its neighbours to supply its fine table wares' (1985, 4)

This view would contradict that of Marangou-Lerat who stated that Apollonia was not just a powerful *polis* in its own right, but was a significant focus of the territorial ambitions of Knossos, Tyliisos and Gortyna (1995). In the 3rd century BC the area was equipped with an installation for stocking wine and a small fulling mill (Marangou 1999, 270). A Classical-Hellenistic farmstead has been interpreted as a vintner's shop as well as a warehouse for shipment. West Slope Ware and stamped Rhodian and Thasian amphora handles were also found (*ADelt* 1976, 354-7; *SEG* XXXIV 914, 239).

The only reference to Roman walls is mentioned by Sanders who notes that the later 3rd-or 2nd-century BC houses, constructed of crude stone walls built on rock-cut terraces continue of use until the Early Roman period (1982, 154). Roman coins are also mentioned (Alexiou 1973, 473).

Description of the aqueduct : Taramelli refers to an aqueduct descending the wooded slopes of Strumbula towards a cistern on the coast at Aghia Pelagia (1899, 319) (**fig. 46**). Taramelli reports the aqueduct near the chapel of Aghios Panayia, less than a kilometre from the bay (1899, 319). The rock-cut channel was preserved for a

considerable distance when traced by Taramelli. Taramelli informs us that the aqueduct led to a large cistern constructed using the *diamicton* method. He observed that both the cistern and the aqueduct were lined internally with mortar with crushed sherds (*opus signinum*). In the sea just below the cistern Taramelli noted traces of a quay mole and docks and concluded that the cistern was used for the supply of water for ships (1899, 318).

Taramelli compares the aqueduct with those of Gortyna, Lebena, Lyttos and Chersonisos, amongst other Cretan aqueducts (1899, 319). Buondelmonti describes an aqueduct carried on arches leading from Mount Strumbula and supplies a depiction of the mountain (cited in Van Spitael 1981, 149-150, pl. IV). A stream pours from the foot of the mountain and carries the text ‘aqua admirabilis ad uisendum’. However, Buondelmonti reports that the aqueduct travelled for two miles to the sea to feed mills (cited in Van Spitael 1981, 149-150, pl. IV).

Type : Public overground aqueduct which supplied the settlement and docking ships.

Date : The aqueduct could be tentatively dated to the 2nd century AD based on Taramelli’s comparisons with examples at Gortyna, Lebena, Lyttos and Chersonisos (1899, 319).

16 Lappa

Plate : Plates 32a-33c.

Location : Lat: 24°N333’E; Long: 35°N283’E. The village of Lappa occupies a fine position above the Mousellas River valley, looking back to the sea from the wooded eastern foothills of the White Mountains. The ancient city spreads from the modern village down the hillside and far below a collection of springs which cools the air even in the hottest months. Today Lappa is still famous for its copious springs and is thronged with tourists seeking cool surroundings in the hot summer. The port of the city lies at Yeoryioupolis on the north coast between Rethymnon and Khania.

Site Description/Context : Ancient Lappa, one of the two free cities of Roman Crete, remains largely unexplored due to the intense continuous occupation of the site down to the present day. One of the many perennial springs on the site flows out of a

conglomerate cliff inside a small cave chapel of Aghios Dynamios (**plate 32a**). It originally flowed over a Roman mosaic floor within the chapel but this is no longer visible. The chapel of Aghios Elousa, which is still accessed via a Roman road, is constructed over a temple of Artemis (**plate 32b**). The Roman road also passes a cave dedicated to the nymphs. Lappa would have presented the perfect setting for nymph worship due to its abundant springs. The spring water was, and still is, diverted into ancient and medieval aqueducts in order to supply inhabitants with washing water, to turn mills and to create a cooling atmosphere. Ruins of Roman aqueducts and medieval mills can be seen below the springs amongst lush vegetation, including taro and many aquatic plants (**plate 32c**) (Rackham & Moody 1996, 42).

In the *plateia* of the modern village there are Hellenistic wells and cisterns and it is possible that before the large ‘Octavian’ cistern was built there was not abundant water in the upper city. A 3rd-century AD marble cistern with seven interior arches was located in the village. Unfortunately, the entrance has been sealed and it is impossible to investigate the complex although it is tempting to imagine something comparable to the Hellenistic arched cisterns at Aptera. Thenon mentions a cistern on the site whose construction he compares with that of Aptera (1867, 267).

Aqueduct Description : A large cistern, supposedly constructed in the time of Octavius, has recently been adapted to supply the modern village (**plates 33a-c**). The cistern is situated on the foothills of Alona, or Rodousas, above the ancient city, on the outskirts of the modern village in the area called Vigla. It measures 10m x 26.10m and stands 4.2m high. It possibly corresponds to a cistern recorded by Pashley measuring 76ft x 20ft (23.1m x 6.0m) located about 300 paces south-southwest of the city (1837, I, 83). A cistern was also recorded by Bondelmonti who described a large cistern, which bore an inscription, measuring 40ft x 20ft (12.2m x 6.0m)(cited in Falkener 1852-3, 293; cited in Cornelius 1755, I, 16). The cistern is composed of a mortared rubble core faced completely with irregularly-cut stone (**plates 33b**).

Unfortunately, due to its modern reuse it was impossible to study the cistern internally. However, when this cistern, and its aqueduct, were incorporated into the modern water supply of the village in the 1970s, its interior was exposed and four photographs were published before its renovation (Tzedakis 1977b, pl. 206). The cistern was cleared of debris from its collapsed vaulted roof which was reconstructed and

reinforced with modern cement (Tzedakis 1977b, 333). In the published photographs much of the original vaulted roof is intact and a row of internal narrow steps leads down to the base of the cistern. The *opus signinum* coating the interior of the cistern is bevelled along its corners.

Defner reported that an aqueduct brought water from a large cistern, located high outside the city, to the baths (1928, 74). The remains of the aqueduct, which would have fed the lower city, are evident on the outer edge of the ‘Octavian’ cistern (**plate 33a**). The aqueduct survives only for a length of 6.4m. It is 1.10m wide and stands 2.2m high to its vaulted roof which is also composed of split stone (**plate 33a**). The cistern may have constituted the main supply for the upper city and is, indeed, the main source today. It possibly acted as a *caput aquae* collecting water from a spring within the cliff which the cistern abuts along its short axis.

Type : Public overground aqueduct.

Date : The cistern is supposedly ‘Octavian’ in date, although this seems highly unlikely as its construction complies with 2nd-century AD hydraulic construction throughout the island.

17 Minoa

Plate : Figs 47-48; plates 37a-b and 73b-74b.

Location : The site of Minoa is located on a small bay on the southeastern tip of the Akrotiri Peninsula, 12km from Khania. It looks across Souda Bay towards Aptera with the islet of Marathi located in-between (Spratt 1865, II, 130; Theofanidis 1950-1, 1). Numerous structures dating to the Roman and late-antique periods have been recorded on the islet.

Site Description/Context : A small Hellenistic bottle-shaped cistern was located near the tower on the small hill, northeast of the Roman site. Jennifer Moody located a large subterranean spring to the east of the Roman site. Originally this seems to have been a natural cave which was only manually shaped in Roman times. It is accessed by a series of rock-cut steps, with a width of 1m, only nine of which survive (**plate 37a**). This rock-cut stairway descends into the cistern to a depth of 2.98m, below which the steps have been eroded. A square hole, measuring 1.49m x 1.86m, was cut into the roof, probably to access the water from above (**plate 37b**). The rock-cut cavity lies 3m east of

the stairway and penetrates the natural bedrock for a depth of 0.85m. The water is now brackish due to a rise in sea-level in the area since Roman times (Moody *et al.* 1990, 14).

A complex of rooms located on the seashore was uncovered and interpreted as a bath-suite possibly belonging to a Roman villa (see B 40). Theofanidis observed that the architectural complex was extensive and that the excavation only uncovered a small portion of the building (1950-1, 9).

Aqueduct Description : An aqueduct was traced descending through the Kamares Gorge on a built bridge which survives in parts until the north tip of the Marathi Valley (Theofanidis 1950-1, 9). The circular cistern associated with the villa site on the coast actually represents a composite part of the aqueduct system (**plates 74a-b**). The cistern would have regulated water intake from the aqueduct with the use of a stop-cock.

Theofanidis records a spring on a low hill an hour from Minoa. Here, east of Katevati in the area of Sternes in Marathi, the small cave of Marathospilios was accessed by a series of twenty rock-cut steps (Theofanidis 1950-1, 9; Faure 1996, 129). At the base of the steps is a cold spring which provides a durable water source and is still used in the summer months. If a Roman aqueduct tapped this spring some type of water-lifting device would have been necessary due to the low depth of the water in the cave.

Type : Private overground aqueduct.

Date : The aqueduct could be 2nd century AD as suggested by the datable finds within the bath-suite (B 40).

18 Khania

Plate : Fig. 79

Location : Lat: 24°041'N; Long: 34°50'E.

Site Description/Context : The continued importance of the city of Kydonia (modern Khania) has inevitably resulted in a lack of information about its past. The destruction caused by the Venetians has been demonstrated by excavations on the Kastelli where a vast Minoan site was established, yet few later levels survived the Venetian activity here (Hallagher & Tzedakis 1985, 26; Baldwin Bowsky 1995b, 271).

The remains of a theatre existed up to the 16th century AD when refortification resulted in its destruction. Belli had planned the theatre but unfortunately this too has been lost (cited in Falkener 1854, 27). The existence of Classical and Roman buildings can be detected in the numerous reused column-drums incorporated into the masonry of the Venetian wall skirting the base of the Kastelli hill.

The wealth of Roman Kydonia is evident from the proliferation of mosaics known from several sites within the broader city (Sanders 1982, 169, fig. 62). The best known mosaic is that of Poseidon and Amymone, dating to the 2nd century AD, discovered off Korakas Street. A short distance northeast, 8m under the National Bank, another mosaic was located, possibly associated with a 2nd-4th century AD house. The lavish mosaics establish this area as an affluent neighbourhood of the city.

Aqueduct Description : Belli records the existence of an aqueduct, theatre and Doric temple, all of which have disappeared (cited in Falkener 1854, 27). Pashley wrote that the ancient Roman city probably obtained most of its water from the same copious source as that which supplied the town in his time (1837, I, 17). In this respect it is interesting that excavations near the Venetian aqueduct produced many coins of Gordian and Maximinus, and marble Imperial sculptures, among which was a fine head of Antinous (Falkener 1854, 27).

A spring at Boutsounaria supplied the aqueduct to Khandia in the 16th century and a Venetian palace was located around the spring (**plate 38b**). Boschini, writing in the 17th century, describes the palace and its marvellous water-gardens as having ‘truly royal and Imperial grandeur’ (cited in Rackham & Moody 1996, 42). The Venetian rock-cut springhouse is still visible today (**plate 38a**) while the Venetian cistern still serves the village and the surrounding environs (**plate 38b**). The British Admiralty Handbook reports that the water of Khandia is obtained from a spring at ‘Butzunaria’ about five miles to the south of Khandia from which water is conducted to the city in pipes (1913, 29). Another possible source for the Roman aqueduct are the three springs at Aghia (ky) which also contribute to the drinking water of modern Khandia (D’Assiras 1992, 68-9).

A heavy layer of sedimentation, between 2m and 6m thick, has been detected throughout the Khandia plain. The layer of sedimentation overlies Roman walls in the valleys and streambeds and no pre-medieval structures have been constructed above it.

This sedimentation would naturally obscure Roman, and earlier remains in this area, while such basic stratification suggests a tremendous and possibly abrupt phase of erosion and deposition occurring in the Khania plain since Roman times. It has been suggested that this deposition was triggered by the great tectonic uplift of AD 400 (Moody *et al.* 1990, 17). The profusion of Roman bathhouses excavated at Khania (B41-44) presuppose the existence of a substantial aqueduct.

Type : Public aqueduct.

Date : The date of the aqueduct should correspond with the date of the numerous bathhouses found within the modern city i.e. between the 2nd and 4th centuries AD.

19 Elyros

Plate : Fig. 49; plates 39a-40c.

Location : Lat: 23°N8'E; Long: 35°N3'E. The city is located on a promontory just south of Rhodhovani. Pausanias regarded the city as probably the largest city in southwest Crete (X xvi 5). In Classical times it was believed to be the largest city in Crete with a population of 16,000 (Psimenos 1996, 152). Souia was the Hellenistic port of the city and can be seen from the site to the south (Savignoni 1901, 424).

Site Description/Context : No large-scale excavation has ever been conducted on the site. However, the outline of the *cavea* of the theatre is still visible today (**plate 39a**). Savignoni noted that the remains of the theatre were the most distinguishable within the city limits (1901, 425-6, fig. 115). It rests, like other Roman theatres in Crete, against the hillside, with maximum elevations of *c.* 2.30m. On the slopes beneath the cistern are the remains of large portions of Roman walling (**plate 40a**). Actually many of the terrace walls here are actually Roman elevations of *petit appareil*, often considerably high with some examples surviving to over 3m. All the walls in this area are composed of a mortared rubble core faced with roughly-cut limestone blocks. At one point an almost complete arch covers the ancient paved road which leads downhill at this point.

Aqueduct Description : Savignoni claimed that the ancient city was supplied with potable water by an underground aqueduct which continued for a distance under

the road linking Rhodhovani to the hill of Elyros (1901, 424-6). The subterranean tract which Savignoni records was constructed with stones bonded with mortared rubble (1901, 424-6). The *specus* was relatively large with a height of 2.20m and a width of 1.80m (Savignoni 1901, 424-6; Lolos 1997, 300).

The aqueduct emerges just before the site and can still be seen at the modern crossroads directly north of the site. The channel is supported on a substructure constructed of a mortared rubble core faced with roughly-cut phyllite, schist and limestone (**plates 39b-c**). The substructure is intersected by the road but continues along the opposite side, skirting the road to Livadia (to the northwest of Elyros). Today the substructure wall runs for a distance of 10.40m towards the site and stands 2.4m high with a thickness of 1.1m. This overground tract must represent a continuation of the underground system. Locals also confirm that this represents the system which ran from the area of Rhodhovani to feed the baths at Elyros. Indeed, cisterns are located at the point where the aqueduct penetrates the city (as discussed below).

Cistern Description : At the point where the aqueduct enters the city there are a series of vaulted structures which Andreadaki-Vlazaki has identified as cisterns (1996, 56, fig. 63). They are situated below and to the northwest of the theatre. Four badly-damaged vaulted cisterns line the trackway leading behind the church of Panayia along a western contour of the hill (**plates 40b-c**). They are faced internally with brick. The vaults are set perpendicularly to the track (i.e. on a north-south axis) and vary in width from 2.20m-3.15m. The largest stands to a height of 2.54m.

A further three vaults are set behind these on east-west axes (Andreadaki-Vlazaki 1996, 56, fig. 63). Another two chambers are located behind these: the smaller on an east-west axis measures 1.60m x 1.50m, while the larger, to its south, forms a long tunnel 1.60m wide and runs 16m on a north-south axis. Its full length could not be calculated as it burrows into the hillside.

Type : Public composite aqueduct.

Date : A Hadrianic date has been attributed to the aqueduct based on a comparison with those of Eleutherna and Polyhrennia.

20 Souia

Plate : Fig. 49.

Location : Lat: 23°N825'E; Long: 35°N25'E. Souia was a small ancient city located on the south coast around the largest bay in western Crete. It was traditionally partnered with, and regarded as the port of, ancient Elyros. It is located in a wide river delta at the end of a valley running south from Elyros.

Site Description/Context : Souia is popularly linked with Elyros and served as its port in the Classical and Hellenistic periods; however in the Roman period it functioned as a distinct autonomous city. The extensive remains of the Roman city are mostly located near the coast on the eastern banks of the river (*IC* II xxvii; Tzedakis 1965, 570 for a funeral stele from the site; Sanders 1982, pl. 4). The remains are mostly Roman and consist of an aqueduct, baths, tombs and three Early Christian basilicas along with an array of unidentified structures.

Aqueduct Description : The aqueduct is visible to the west of the river above the main road leading north out of the modern village. Spratt (1865, II, 241), Savignoni (1901, 443-4), Falkener (1852-3, 298) and Vermeule (1968, 444) report its existence while Pashley's guide made a comparison with the aqueduct of Souia and the then functional aqueduct of Khania (1837, II, 106, n. 19). Pendlebury also claimed that towns such as Souia, Diktyinnaia and Priansos showed traces of elaborate aqueducts which 'brought down the water to these dry, sandy settlements' (1939, 365, 356).

Pashley informs us, rather unhelpfully, that between Rhodhovani and Souia on a higher range of hills near the village of Livada a portion of an aqueduct was visible (1837, II, 102). Spanakis confirms this stating that it was widely believed that the aqueduct lead from the area of the village of Livada, two miles north of Souia down the valley towards the coastal site (N.D., II, 360).

Strangely, Spanakis when describing the aqueduct of Elyros recalls that this aqueduct conducted water from the springs at Kamari towards the village of Livada (N.D., II, 162). He refers to the remains of the aqueduct, at a place known locally as Aulaki but this reference is more applicable to the Souia aqueduct. It could be proposed that the Souia aqueduct started at Kamari and descended the Kamarianos Valley which meets the north-south flowing valley at Drakou Poros south of Livada. The source at Kamari would be more suitable for the source of the Souia aqueduct as the fall in terrain towards the coast from here would provide gravitational ease to this site rather than that of Elyros.

Type : Public overground aqueduct.
Date : Unknown.

21 Lissos

Location : Lat: 23°75' N; Long: 35°25'E. The site is located on the south coast of Crete in the small Bay of Aghios Kyrkos, 3km west of Souia.

Site Description/Context : The site is hemmed in on all sides by cliffs with only a narrow exit to the sea and a narrow gorge leading up into the mountains. The site flourished in the Hellenistic period until its abandonment in late antiquity despite the fact that the site is practically inaccessible by land. Recently a dramatically sunken Roman harbour has been discovered through underwater explorations (Hadjidaki *forthcoming*). It is unfortunate that the more recent explorations at this site are not, as yet, published since the site is rich in monuments and epigraphical evidence from both the Hellenistic and Roman periods (Baldwin Bowsky 1995a, 280).

A theatre is located in the centre of the site and its *cavea* has an internal diameter of *c.* 15m. The remains of a basilica have been identified below the chapel of Aghios Kyriake to the north of the theatre (Spratt 1865, II, 241; Savignoni 1901, 448; *IC* II xvii; Sanders 1982, 172). Numerous fragmentary buildings, constructed with mortared rubble cores faced with stone and brick, are located to the south of this complex and extend towards the sea and the chapel of Panayia. This chapel overlies a basilica and a fine Asiatic sarcophagus, or rather its reused fragments, is visibly incorporated into the chapel (Sanders 1982, 47 and 128).

Perhaps the most impressive remains on the site are the large numbers of vaulted tombs which spread over the more gentle western slopes of the site (Spratt 1865, II, 241; Sanders 1982, 42; Ninou-Kindeli 1990, 49-57; *Ena* 3/7/1991; *AR* 1991-2, 70). The tombs are barrel-vaulted and lined internally with thick plaster. The standard form is of a rectangular structure *c.* 2m x 3m (2m high) with a narrow doorway in one wall and *arcosolia* in the other three walls. Sanders recorded similar barrel-vaulted tombs at Lasea and Souia while comparing them with similar types found in Cilicia (1982, 42). However, the similarity in tomb type is unlikely to correspond to a demographic link as there is a lack of foreign names on the tombstones from the Cretan

sites. However, the location of the Cretan sites on the south coast suggests that the ideology at least spread through commercial coastal traffic.

A small Doric temple of Asclepius is positioned far up the bay below the eastern cliffs (Sanders 1982, 84-5, fig. 20). The temple was constructed in the Hellenistic period but adorned with a mosaic floor in the 1st century AD. The focus of the sanctuary is the therapeutic spring, which still flows in front of the temple, down into the centre of the site. A fountain is set below the temple and linked to it via a series of pipes. This connection establishes that the fountain was integral to the worship activity at the site (Platon 1992, 171). A block of the fountain's masonry was subsequently engraved with a cross, perhaps denoting a Christian significance to the site in its later use. In modern times the area of Hirtakina abounds with curative water, and it has been suggested that the Asclepeion was supplied from these therapeutic springs (Platon 1957, 337). The temple was impressively adorned with a votive tabletop carved in marble from Phrygia (c. 1.1m x 0.7m x 0.8m) (Khania Museum no. 1261). An inscription on the rim records that Koan Agathemeros, son of Eucharistos, handed over his table as vowed to Asclepius Soter (Baldwin Bowsky 1995b, 267, no. 2; Paton 1999, 285). In 1957 Platon explored the site of the sanctuary of Asclepius at Lissos and records twenty statues and statuettes with numerous inscribed bases (1957, 336-7).

The cave of Aghios Kyrkos is located in the Gorge of Spiles north of Lissos (Faure 1996, 151). The sherds found within are almost exclusively fine wares of the Classical, Hellenistic and Roman periods. The cave was probably frequently visited in the period corresponding with the height of the temple at Lissos. However, the finds consisted of plain votives of local manufacture while there is an obvious dearth of valuable or metallic objects. It is likely that the cattle breeders of the ancient city who worshipped at the cave deposited cups and small pots at the base of the two stalagmites. According to Faure the cave was dedicated to Pan and the Nymphs from at least the Archaic period (6th century BC) through to the end of the Roman period corresponding with similar dates for worship at the sanctuary of Asclepius and Hygieia below (Faure 1996, 199).

Aqueduct Description : Spanakis reports a theatre, aqueduct and Roman baths (B 47) at Lissos (N.D., II, 249). To the north of the fountain Platon and Davaras located a large, subdivided, cistern which was lined with hydraulic mortar (1960, 516). Platon

and Davaras' description of an adjoining polygonal wall which carried an extensive pipe towards the cistern in a rectangular channel seems to reflect an aqueduct (1960, 516).

Type : Public overground aqueduct.

Date : Although founded at the start of the 3rd century BC, the site flourished in the 2nd and 3rd centuries AD (Ninou-Kindeli 1990, 51) and the aqueduct use may also reflect this flourish.

22 Diktyннаion

Plate : Figs 50-52; plates 41-42

Location : Lat: 23°75'N; Long: 35°68'E. The Diktyннаion Temple is located on the east side of the Rhodopou Peninsula. The temple itself was founded on the southern side of the small bay of Menies on Cape Apathi.

Site Description/Context : Today the peninsula is dry and arid and uninhabited (Rackham & Moody 1996, 129). However, the *Stadiasmus Maris Magna* describes the Diktyннаia peninsula as 'high and tree'd down' (cited in Rackham & Moody 1996, 129). The community associated with the temple thrived and the temple accounts reveal the hire of sheep and cattle and the sale of cheese and wool (*IC* II xi 3). Nearby Polyrhennia was famous for its sheep (Bury 1900, 137).

The temple was easily accessed by land and sea, although the latter must have constituted the preferred means of transport. A sacred road was constructed from funds from the sanctuary treasury, as attested by the inscribed Latin milestone found near the village of Rhodhopou (*IC* II xi 6). The paving slabs of the Roman road are visible twisting up out of the valley.

The site was well known to travellers and was described by both Pococke (1745, 244-5) and Spratt (1865, II, 197). The temple has been attributed to Diktyнна on the basis of a statue and several inscriptions found in 1913 (Khania Museum no. 79; *IC* II xi). In 1942, during the Second World War, excavations of the sanctuary were conducted by Gabriel Welter. Welter's excavations provide an impression of the entire sanctuary complex of the Hadrianic period. The excavations established that the site was a focus of worship from as early as the 9th century BC with an association with Diktyнна only emerging in the Classical period.

The temple was remodelled several times, lastly under Hadrian as attested by his statue found in one of the associated buildings (Welter & Jantzen 1951, 116). The temple was surrounded on three sides by stoas (**fig. 50**). A stepped altar of white marble, measuring 5.3m x 5.3m, was located just west of the temple. To the northwest a circular area with a diameter of 4m was also located but its function could not be determined, although the excavators thought it reflected a treasury.

A series of structures are located in the sheltered cove below the temple to the north. They undoubtedly served both the priests and pilgrims to the site (Sanders 1982, 174). Sanders informs us that while other buildings have apses there is no supporting evidence to claim that one of these was an odeum as has been supposed (1982, 174). It is possible that a bathhouse is discernible in the niches covered with *opus signinum* and barrel vaults faced with brick.

Cistern Description : A series of four substantial sunken vaulted cisterns are located to the west of the temple (**fig. 50; plates 41a-b**). The overall structure measures 20.1m x 11.75m. The depth of the cisterns (excluding the sedimentation tanks in the floor) is 2.20m to the spring of the arch, according to the plan provided by Welter and Jantzen (**figs 51a-b**). These measurements were confirmed in the field in 2002. Sediment tanks are set into the floor at the base of the cisterns and measured 2.7m deep yielding an overall depth of 4.90m. The cisterns alone had a capacity of 240m³, but if this is combined with the capacity of the sedimentation tanks, the overall capacity reaches 384m³ (Welter & Jantzen 1951, 113). This capacity seems very low, even taking into account the thickness of the dividing walls.

The sediment tanks set into the floor are faced with brick. These tanks communicate through arched passages in the interior walls. The cisterns themselves are connected by pipes in the walls. Three pipes (0.08m diameter), set at intervals of 1.75m, penetrate the three interior walls allowing for water circulation. Thicker pipes also penetrate the exterior wall (**plate 42a**). These pipes had a double wall and a diameter of 0.14m diameter and penetrate the 0.50m-thick outer wall.

The walls of the cistern complex are composed of mortared rubble (**plate 41c**). The mortared rubble core of the walls includes large beach pebbles. *Opus signinum* lines the internal vertical surfaces of the complex and its matrix includes large claystones, serpentine, quartz and phyllite. Moreover, the position and size ratio of these

cisterns within the reconstruction of the temple complex would suggest rainwater collection from the roof of the temple rather than a spring-fed system (**fig. 50**). In fact it is possible that the cisterns were fed at courtyard level, as is suggested by Welter and Jantzen's section drawing (**fig. 51b**) A water source for the cisterns has not been located.

Aqueduct Description : Pendlebury notes that towns such as Souia, Diktyinnaia and Priansos were equipped with elaborate aqueducts (1939, 365). Vermeule also notes 'an elaborate aqueduct' at the temple of Diktyinnaion (1968, 441). Pockocke reported substantial walls, associated with earthen pipes, on the side of the hill overlooking the lower complex and suggested that they facilitated the conduction of water down into the bay from the cisterns (1745, 245; Warren 1972, 89).

A substantial wall is apparent halfway up the hillside (**plate 42b**). It is composed of a mortared rubble core faced with roughly-cut stone. The base of the wall is penetrated by four pipes. The feature seems to have functioned as a sedimentary cistern which regulated the water flow from the cistern complex above. The water must have descended the steep slope in pipes in order to supply the lower complex around the bay. The water of the cisterns was drained by the two pipes which penetrated their outer wall (**plate 42a**).

The lower complex is divided from the temple by a winter flood course and the remains of a bridge are clearly evident directly below this regulatory cistern (**plate 42c**). The remains of a pier of a single-arched bridge are still visible on the south side of the stream. The pier has a width of 1.56m and a length of 2.75m (Bougia 1996, 265). The substructure of the bridge survives to a height of 1.37m (Bougia 1996, 265) but the area has been subject to silting. The bridge is constructed with mortared rubble core faced with roughly-worked sandstone, but the facing is severely eroded. Sanders (1982, 174) and Cameron (1988, 262) suggest that the bridge could have also functioned as an aqueduct bridge. However, Bougia interprets the bridge as part of the road system associated with the sacred road funded by the temple treasury, mentioned above (1996, 266).

Type : Public overground aqueduct.

Date : The last stage of use was probably Hadrianic based on the fact that several statues of Hadrian were discovered in the temple precinct while

honorary inscriptions (*IC II xi 5*) and a milestone, found in the vicinity, are also attributed to his reign (*IC II 28*; Vermeule 1968, 441 and 443). It is clear from the epigraphic record that Hadrian was the sponsor for the ultimate remodelling of the temple complex. The cisterns are of a vaulted type comparable with those of Aptera, Chersonisos and Kastelliana which date to the 2nd century AD.

23 Polyrhennia-Kastelli Kissamou

Plate : Plates 43a-44b.

Location : Polyrhennia = Lat: 23°67' N; Long: 35°45'E. Kastelli Kissamou = Lat: 23°67'N; Long: 35°5'E. Polyrhennia is located high in the hills 7km south-southwest of Kastelli Kissamou in western Crete. The city is located on the summit of a high and sheer hill in the mountain range of Prophitis Ilias (**plate 43a**).

Site Description/Context : Cisterns for rainwater collection appear to have been the only source of water on the upper slopes of the acropolis whereas on the lower flat-topped ridge of Miocene conglomerates it was possible to dig wells down to the water table. Hellenistic rock-cut bottle-shaped and cylindrical wells are dotted over the lower southeast slopes of the acropolis extending downslope towards the village. The cisterns are household features associated with rock-cut houses, comparable to those at Praisos in eastern Crete.

The Aqueduct Route : The aqueduct was first noted by Pashley (1837, II, 48) and was described briefly by Thenon (1867, 421). Theofanidis refers briefly to the aqueduct (1942-4, 18) but strangely, Savignoni (1901, 314-348), De Sanctis (1901) and Sanders (1982, 173), who all refer to the site, never mention the aqueduct. The omission of the feature by such eminent archaeologists indicates the obscure nature of the underground tract. Thenon claims that the founders of the city tried to make the acropolis unassailable, but as there was no water on the actual summit the inhabitants dug long conduits into the rock to conduct water from a distance source to their city (1867, 421).

The present study presents an alternative model to that of Thenon which presents an aqueduct tract from Polyrhennia to Kastelli Kissamou. The demise of Polyrhennia may be reflected by the lack of inscriptions dating later than the 2nd century AD. Sanders notes that the evidence for real wealth at the site is attested mainly in the

'Early Roman' inscriptions, including dedications to Metellus, Augustus but only one recording some benefaction of Hadrian (1982, 173; *IC* II xxiii 14, 12, 66). A demise at Polyrhennia in the Roman period coincides with the *floruit* of Kastelli Kissamou. The wealth of Kastelli Kissamou in the late 2nd and 3rd centuries AD is amply displayed by Sweetman in her collection of the mosaics of this busy centre (1999, 391-2).

In pre-Roman times Kastelli Kissamou was not an autonomous city (it did not cut its own coinage) and was probably controlled by Polyrhennia and used as its port. However, power was transferred to the lower site of Kastelli Kissamou in the Roman period and it was here that the Roman nucleus thrived (Pologiorgi 1985, 80). The ancient port is located at Mavro Molo which must represent the large artificial harbour secure from all winds described by Belli (cited in Falkener 1854, 26).

The city was explored from 1966-1983 by Davaras, Tzedakis and Papapostolou while the modern excavations are directed by Stavroula Markoulaki of the 25th Ephorate of Prehistoric and Classical Antiquities. These excavations attest that the Roman city of Kastelli Kissamou was initially constructed in the 1st century AD (*Kathimerini* 31/1/93). The Roman cemetery lies in the immediate vicinity of the city (Pologiorgi 1985, fig. 2, nos 31, 32, 33, 34, 35). The earliest tombs dated to the first half of the 1st century AD, although one isolated cist grave of the late 4th century BC was discovered (Pologiorgi 1985, fig. 2, no. 36). The latest graves dated to the late 2nd and early 3rd centuries AD.

The subsequent affluence of the city is attested by the preponderance of mosaics, many of which represent private housing. A good example is represented by the courtyard immediately north and west of the Mitropolitikos Church where a 2nd-century AD mosaic is set around the *impluvium* of a wealthy private residence (**plate 77c**) (Markoulaki 1999, 197-9, pl. 27; *Ergon* 1997, 128, fig. 3). Another wealthy private house is located in the Pateraki Plot where the main mosaic panel in the *triclinium* of the villa depicts The Three Graces and is associated with a ceramics of the 2nd and 3rd centuries AD (Markoulaki 1987, 33-59).

Recent excavations in the northern part of the modern town have revealed a series of buildings which include a theatre mentioned by Belli (cited in Falkener 1854, 26), who also recorded the existence of an amphitheatre (cited in Pologiorgi 1985, 70, fig 2, no. 23). Certainly, the theatre is discernible in the curve of a series of modern

buildings built on ancient foundations which are still visible in places (personal observation).

Public baths (see B 48-51) and the construction of a central drainage and water system, including drainage channels and cisterns, have been detected throughout the city (Pologiorgi 1985, 70, figs 2, 7, 8, 19). In the Niotaki Plot rescue excavation revealed part of the Roman drainage system for the city was uncovered including water channels sloping down to a large cistern to the north (15.75 x 2m x 2.21) (*AR* 1997-8, 126).

Aqueduct Description : The aqueduct tunnels at Polyrhennia are extensive and Thenon wonders, despite the soft nature of the rock, what the efforts of such a work would have cost (1867, 421). In 1867 the villagers told Thenon that the tunnels extended for up to ‘two hours into the rock’ (1867, 421). However, Pashley was informed that they travelled only ‘one hour underground’ (1837, II, 48). One of the older inhabitants of the village claimed that as a child she could run underneath the village at least from the central area to the lower spring (pers. comm. 1999).

Thenon noted that two tunnels exist at Polyrhennia (1867, 421). He recorded one passage measuring 2.30m high x 1.35 wide, while a second tunnel was slightly smaller measuring 1.50m high x 1m and was situated at a slightly higher level (Thenon 1867, 421). Ninou-Kindeli quotes Thenon’s dimensions (1992, 252). The dimensions of the tunnel vary along its course. At the fountain on the lowest edge of the village, now surrounded by cement clothes-washing basins, the dimensions of the tunnel measure 2.17m high x 0.72m wide. The tunnel widens to 1.50m on ascending from here. The channel itself is initially positioned to the side of the tunnel and measures 0.15m wide x 0.10m deep, but is filled with sediment. The channel also becomes notably wider and deeper as the aqueduct ascends (personal observation).

The course of the aqueduct incorporates sweeping curves and numerous shafts along its length. The first shaft is encountered at a distance of *c.* 1.5m inside the tunnel from the village spring. Another shaft is located in the centre of the village, just off the main footpath, which is equipped with rock-cut steps but unfortunately its entrance is blocked by an iron grid (**plate 44a**). Another shaft is located on private property behind the first house on entering the village, above the medieval water-tower, again this shaft is cut into the rock of the acropolis (**plate 44b**).

Pashley located the mouth of the underground aqueduct at a fountain near the medieval water-tower to the west of the village (1837, II, 48). Pashley measures the aqueduct tunnel and provides measurements of about 4ft (1.2m) in height and 2ft (0.7m) in width (1837, II, 48). Ninou-Kindeli also noted that the aqueduct ended at the fountains in the two squares of the village (1992, 252). Thenon reported an underground cave next to the mouth of the aqueduct which was home to the fountain nymph and records the presence of a small niche designed to contain a statuette (1867, 421). In front of this ‘cave’ (probably the rock-shelter in front of the aqueduct) the rock face was veneered with marble and decorated with an Ionic moulding which was subsequently discovered in the loose rock pile nearby (Thenon 1867, 421). These features represent an elaborate façade, possibly a *nymphaeum*.

The Aqueduct in Kastelli Kissamou: The water appears to come from the direction of the gorge of Kria Vrissi located 2km southwest of the market town (Tzedakis 1967, 498). Pashley refers to the remains of the aqueduct to the south of Kastelli Kissamou where he describes a large mass of collapsed walling of brick-faced mortared rubble (1837, II, 44). He could only observe the tip of the vault above ground. On the southern fringes of the modern town the aqueduct has been located associated with a lavish bath installation and its vaulted cistern (B 48). A section of a vaulted aqueduct with internal facings of brick follows a north-south axis. Traces of the ancient aqueduct were also recorded in the area of Plakouria which lies southwest of the *kastelli* at the edge of the modern town where a rectangular maintenance shaft has also been cited (Tzedakis 1967, 498; Pologiori 1985, 70, fig. 3, 73).

Type : Public composite aqueduct.

Dimensions : The underground *specus* measured c. 2.17m x 0.72m

Date : Hadrianic. The subterranean aqueduct at Polyrhennia is comparable to that of Eleutherna and their similarity of form suggests a similar chronology. A Hadrianic date has been applied to the aqueduct at Polyrhennia on the basis of an inscription which is thought to mention its construction (Vermeule 1968, 444). Moreover, the rise of Kastelli Kissamou and the construction of its numerous bathhouses would comply with a construction date in the 2nd century AD.

24* Ano Zakro

Plate : Figs 53-54.

Location : Mariani reports an aqueduct of unknown date in the vicinity of the site of Sta Ellenika. The site occupies a rise below the outskirts of the village of Ano Zakro and overlooks the Gorge of the Dead from a northeastern vantagepoint (1895, 294, fig. 81)(**fig. 53**).

Site Description/Context : The aqueduct is depicted in a sketch published in 1895 by Mariani (**fig. 54**). Mariani believed that the aqueduct supplied a small citadel settlement, represented by numerous stone walls and rock-cuts ascending a steep rise (1895, 294). However, the site has also recently been identified by Nowicki who describes it as a LMIIIc-a defensive settlement (2000, 54-5, n. 7).

Aqueduct Description : In Mariani's sketch an aqueduct can be seen winding its way along the course of a river which it crosses at Sta Ellenika (**fig. 54**). Mariani maintained that this rock-cut aqueduct '*una condottura scavata*' conducted water from the area of the aptly-named Vryssi or Paliomilou next to Ano Zakro to the settlement of Sta Ellenika (1895, 294). However, the association with the settlement is anachronistic as Nowicki has dated the settlement to Late Minoan IIIA-C (2000, 55). The rock-cut aqueduct represented in Mariani's sketch is obviously a much later feature. Nonetheless, Nowicki is correct in observing that before intensive irrigation started in the Zakro basin, the gorge may have carried far more water and the ancient settlement at Ellenika may have benefited from a greater supply (2000, 54).

Type : Public overground rock-cut aqueduct.

Date : Unknown.

25* Tholos

Plate : Plates 81a-82c.

Location : Tholos bay lies directly north of Pachyammos in east Crete (B 8). A monumental Roman structure is located on the foothills of Skinias on the western side of Tholos Bay. The structure lies on the western slopes overlooking the Platys river alluvium.

Cistern Description : The monumental Roman structure to the west of the bay measures 52.50m x 5m (internally) (Haggis 1996a, 419). It stands 3m high to the spring

of the vault yielding an overall capacity of *c.* 787.5m³. Boyd provided slightly larger dimensions for the structure (57m x 9.3m) with an average wall thickness of 1.1m and a surviving height of 3.7m (1901, 155).⁶

The spring of the barrel-vaulted roof is visible in the brick-faced mortared rubble of the interior (**plate 81c**). Putlog holes are evident along the spring of the vault which is a common feature in vault construction. The walls are composed of a mortared rubble core internally faced with brick and externally faced with a degenerate form of *petit appareil* (Haggis' use of the term *opus incertum* is not applicable; 1996b, 194). Where the facing has collapsed, the mortared rubble core is exposed revealing a compact aggregate with inclusions of local stone (personal observation).

The eastern façade of the east wall bears evidence for six buttresses with an original ten recorded by Boyd (1901, 155) (**plate 82a**). Boyd also records three interior walls in the structure which are duly marked on Sanders' plan (1982, 140, fig. 51). These have been interpreted as screen walls similar to those found in the *horrea* at Myra and Patara (Haggis 1996b, 198). However, subdividing walls are also a feature of monumental cisterns. Considerable secondary reuse is represented by white plaster lining the middle section of the interior, beam holes chiselled into the *brick-faced mortared rubble* and actual timber beams (**plate 81b**). The corner features are also secondary additions (**plate 81c**).

Type : The structure is probably a monumental cistern despite its identification as a granary. The structure embodies all the characteristics common to monumental cisterns in Crete. The structure is a monumental vaulted structure with elevations which are faced externally with *petit appareil* and internally with brick (**plates 82a-c**). The structure is coated internally with *opus signinum* which incorporates bevelling along the angles: a feature commonly found in cisterns on Crete. Buttressing is also common at many of the monumental cisterns on Crete (e.g. Aptera and Kastelliana). An aqueduct, no longer visible in the field, must have fed the cistern which would have supplied docking ships in the bay.

Date : Late 2nd and 3rd centuries AD

⁶ Sanders notes that the walls are actually thicker; the west being 2.4m while the east is 1.63m (1982, 140-1).

Dating methodology : The 2nd-century AD date attributed to the building (Haggis 1996a, 419) would comply with its construction in *petit appareil* and *brick-faced mortared rubble* (**plates 82b-c**) and the presence of bevelling in the *opus signinum* lining the interior. However, the bricks are 0.04m thick with mortar joints of 0.035m which would correspond with phases II and II.I of the Megali Porta baths dating specifically to the late 2nd and 3rd centuries AD.

26* Olous

Location : 35°15'N, 25°45'E. Ruins of the ancient coastal city of Olous occupy both sides of the isthmus of Poros on the western coast of the bay of Mirabello. The commodious double harbour must have made this an attractive setting for the ancient city.

Site Description/Context : The ancient city focusses on the eastern side of the isthmus where a basilica with a mosaic floor, associated with 7th-century AD dedicatory inscriptions, were discovered.

Aqueduct Description : The existence of an aqueduct here is based on the briefest of references by Pendlebury (1939, 376). No evidence for its existence was located in the field. Furthermore, no features dating between the 2nd and 4th centuries AD, which would provide a contemporary context for a Roman aqueduct, have been published from this area. Nonetheless, it may be relevant that the area directly overlooking the site of the basilica to the northeast is called Loutra (Baths) (noted on the map Bousquet 1938, pl. XLII).

Type : Public aqueduct.

Date : Unknown.

27* Kaminaki

Plate : Fig. 23.

Location : The site lies to the southwest of the Lasithi plain near the start of the route to Viannos. The remains in question lie to the south of the asphalt road, 300m east of Kaminaki, in an area called Magatzedhais.

Site Description/Context : Walls and sherds associated with a Roman aqueduct were recorded at Magatzedhais (Pendlebury & Money-Coutts 1935-6, 11-2, site 9a and

b, nos 29-30, fig. 2). Sherds recorded from Koutsounaria 100m to the south probably reflect the same extended site (Watrous 1982, 59).

Aqueduct Description : Watrous cautions that the ‘aqueduct’ at Magatzedhais probably represents a large irrigation ditch built of cut blocks, on the basis of the similarity of the punched chisel marks on the stone with those on other Venetian-period constructions in the area (1982, 59). Watrous attributes the pottery scatter on the site to between the 4th and 7th centuries AD and the medieval period (including glazed ware). However, he attributes the main phase of the site to the ‘Late Roman’ period (1982, 59).

Type : The remains are either an aqueduct or an irrigation ditch.

Date : ‘Late Roman’ or Venetian.

28* Aghia Photia

Location : In the modern village of Aghia Photia in the *eparchia* of Monafatsi.

Site Description/Context : Sanders reports that the ‘entire squalid’ modern village is constructed on top of a group of ten to twelve cisterns, each measuring *c.* 12m x 4m (1982, 150). The cisterns are constructed in brick-faced mortared rubble but only their vaulted roofs are visible above ground. The original report reveals that the area was known locally as Loutres and that an aqueduct conducted water from here to a Roman settlement called Argio in the middle of the Monafatsi plain (Xanthoudidis 1916, 24). Unfortunately, the existence of this aqueduct has not been substantiated in the field.

Type : Unknown, but the overall capacity is considerable even if each cistern is only 2m high a capacity of *c.* 1000m³ would be attained.

Date : Unknown.

29* Kastelliana

Plate : Fig. 55; plates 11a-12c.

Location : Vaulted cisterns are located at the eastern end of the village of Ano Kastelliana on the south side of the main Pargos-Demati road. They are located in the northern foothills of the Asterousia Mountains at the confluence of two rivulets. The acropolis of Kastel Belvedere overshadows the landscape to the north

(**plate 11a**) and the cisterns are quite visible from its summit (**plate 11b**, as indicated by the arrow).

Site Description/Context : The inselberg of Kastel Belvedere dominates the landscape and was the location for the Hellenistic city of ancient Priansos. There is a range of bottle-shaped cisterns on its summit. A small spring is located high on its western slope. The lower area of Kastelliana has also yielded numerous finds. Alexiou records two bull figurines, the head of a Hellenistic female figurine, a copper mirror, silver Rhodian coins and a glass vessel in the area of Tsikrou near the monumental cisterns (1965b, 555). Sanders records a lamp with a centaur motif and a gold earring from a locale called Prasokefalo at Favriana near Kastelliana (1982, 151).⁷ It can be postulated from the quantity of material that there was a considerable Hellenistic site in the vicinity which was substantially developed by the time the large vaulted cistern complex was constructed.

It is curious that on the 1: 50000 Cretan map the monumental cisterns (described below) are indicated (actually roughly sketched) by a church symbol which is placed in the centre of the structure (Sheet 27 Viannos). Platon reports the discovery of a 'Late Christian' basilica in the area of Loutra at Kastelliana (1954, 516). The floor of the basilica was embellished with mosaiced panels of *clematis* with *guilloche* borders. Sanders was not sure if this actually was a basilica as nothing survived in 1973 (1982, 104).

Cistern Description : The first reference to the monumental cisterns at Kastelliana in 1916 also included the citing of an associated aqueduct (Archäologischer Anzeiger 1916, 56). This was probably the source of Pendlebury's information when he claimed that towns such as Souia, Diktyinnaia and Priansos showed traces of elaborate aqueducts which conducted water to these dry, sandy settlements (1939, 365; Vermeule 1968, 444). Platon also describes the cisterns as a square complex measuring 25m x 25m and locates them near a Late Christian basilica in a place called Loutra at Kastelliana (1954, 516). Platon thought the building may have been associated with a bathhouse as suggested by the toponym Loutra (Baths) (1954, 516-8).

⁷ This description is reminiscent of the report of a lamp with an anaglyph of a centaur and a gold idol in the shape of a horn found in nearby Patella (Alexiou 1964a, 284; 1965b, 555).

The cistern complex was located in 2002 at the foothills of the Asterousia Mountains. The complex measures 18.4m x 12.6m (internally) and is subdivided into four vaulted compartments each measuring 12.6m x 4m (**plate 12a**). The walls are 1.40m thick and stand to a height of 3m to the spring of the vault but the roofs have not survived (**plate 12b**). The elevations are internally faced with brick with horizons of *bipedales* visible along the spring of the vault (**plate 12c**, as indicated by the right arrow). Putlog holes are also visible along this horizon to aid in the construction of the vaulted roofs. The northern wall has four buttresses, comparable with the L-shaped cisterns at Apera. This complex is also fitted with a small compartment for the equipment of a channel. The compartment is located on the north side of the complex where it forms an appendage to the main complex. It is most likely that the aqueduct entered the cistern from the west as the terrain would allow for a free-flow supply along the contour of a rivulet flowing from the Asterousia Mountains (**plate 11b**).

Type : Public monumental cistern complex.

Date : Dated to the 2nd-3rd century AD on the basis of its brick construction style (Livadiotti 2000, 64)

30* Aradena

Plate : Plates 34a-b.

Location : The site is located on the west side of the dramatic gorge of Aradena and is accessed by a slat bridge (**plate 34a**). The cistern is located at the northern limit of the now largely-deserted village.

Site Description/Context : The cistern seems to be the only clearly-identifiable Roman structure on the site. However, columns and ancient blocks are abundant in the medieval remains of the village and some ancient foundations are evident under the later walls.

Cistern Description : Defner originally reported a cistern northwest of Aradena which the villagers call Khoros ton Ellinon (1928, 172). The cistern was located in 2000 measuring 23.22m x 13.50m. Its wall elevations rise to a height of 1.5m, but excavation of the interior fill would increase its depth, perhaps considerably (**plate 34b**). Its elevations are composed of a mortared rubble core with a facing of *petit*

appareil with buttercrust joins (**plate 34b**). The average size of stone in the facing measures 0.30m x 0.25m.

Typology : Public monumental cistern.

Date : Unknown.

31* Aptera

Plate : Figs 56-58; plates 35a-36b.

Location : Lat: 24°N15'E; Long: 35°N466'E. The city of Aptera extends across a large plateau at the top of a rise which dominates the southeast of Souda Bay and the surrounding regions. Two baths (B 38 and 39) lie directly north of the cistern complexes.

Cistern Description : Olivier describes two large cisterns complexes at Aptera 'lined with red plaster and showing the lines of the watermarks' (cited in Falkener 1852-3, 296, fn[†]).

The L-shaped Cistern : The L-shaped cistern complex is situated to the west of the monastery on the site (**fig. 56**, no. 1). The cistern has an L-shaped plan and represents the largest freestanding cistern on the island, measuring *c.* 60m long x 6.3m wide x 9m high (long side) and 35m x 6.3m x 9m (short side) (**plate 35a**). Ninou-Kindeli and Christodoulakos claim that the cistern can hold a capacity of 5,500m³ (2000, 34). The cistern is mostly freestanding although an earth bank abuts the short base of the L. The long stroke of the L stands entirely above ground-level surviving up to 6m high with buttresses at its northern end (Sanders 1982, pl. 71) (**plate 35b**). Putlog holes are visible over the buttressing while the spring of the vault is clearly visible in the interior brickwork (**plates 35a-b**). The entire complex is connected to a smaller collection tank to the north which probably served the bathhouse to its north (B 39). The elevations consist of a mortared rubble core faced both internally and externally with brick. The core consists of an aggregate of large stones set in a strong binding matrix.

Drerup originally believed that this massive cistern collected rainwater (1951, 93), a view which was recently echoed by Ninou-Kindeli and Christodoulakos (2000, 34). However, this would be extremely unusual, if not impossible, for a public cistern of this size. A source of water for the complex has not been found but a source has been proposed in the mountains some distance to the southwest (Sanders 1982, 167). Profuse

springs are recorded near the village of Stulo, presenting a possible source for an aqueduct leading to the cistern (evident on the British Admiralty Map 1852). Buondelmonti notes that the water from these springs is deliciously cold in summer (1837, I, 61; cited in Cornelius 1755, 8).

Type : Public monumental cistern. The cistern would have supplied water for the bathhouse to the north.

Date : It should be contemporary with its corresponding bathhouses (Ninou-Kindeli & Christodoulakos 2000, 34).

The Triple Cisterns : The triple cistern complex lies to the northeast of the monastery (**fig. 56**, no. 2). The earliest traveller to have reported these cisterns was Buondelmonti (cited in Van Spitael 1981; cited in Cornelius 1755, I, 8). However, Savignoni's account of the cisterns is more detailed as he considered the complex the most important at Aptera (1901, 292). Savignoni's account is accompanied by a plan and section drawing of the triple cisterns (**fig. 57**). The complex is subdivided into three aisles by two rows of arches (**plates 36a-b**). Both rows of five arches are supported on four columns, constructed of large dressed stone blocks, each measuring 0.30m x 0.4m. The layout of the arches is not entirely regular. The pillars are effectively staggered so that the two rows of arches and pillars do not correspond to one another (**fig. 57**). The two arrangements are of different thickness and the pillars in the thicker series are not evenly spaced, although Savignoni notes that measurements were made difficult due to the fact that the cistern still contained water, as it does today (personal observation). Savignoni supplies dimensions for the entire complex: 24.36m long x 18.56m wide x c. 8.20m high (1901, 294, fig. 4). Drerup provides 24.7m x 18.50m (1951, 93).

Drerup also suggests that this triple cistern complex collected rainwater (1951, 93). The drainage channel is located in the northeast corner of the complex. It is brick vaulted and is comparable in form to that of the 'Octavian' cistern at Lappa. Savignoni does not incorporate this vaulted draining channel into his plan of the complex.

Pashley, who made sketches of the cisterns (**fig. 58**), recorded that the walls were covered with a hard mortar and that regular brickwork was visible in places where the coating has been destroyed (1837, I, 39). Pashley also remarked on an aperture in the roof measuring 18 inches high and almost as wide (i.e. 0.46m), which he associated

with a terracotta pipe located near the mouth of a small 'aqueduct' (1837, I, 39). This square cavity is visible high in the north wall (personal observations).

Date : The ashlar blockwork, with its lack of bonding material, has been assigned to the Hellenistic period (Gaef 1888, 1872 and 1896) and consequently the use of brick-faced mortared rubble in the outer walls and the vaulted drainage system were considered secondary features. However, the fact that arcaded ashlar is uncommon in the Hellenistic period (Andrew Wilson, pers. comm.) it can be proposed that the different constructional styles represent one Roman phase. It has recently been noted that the cisterns fed the Roman baths to the north and, therefore, must have continued in use until the abandonment of these baths (Ninou-Kindeli & Christodoulakos 2000, 34).

32* Phalasarna

Plate : Plates 45a-46c.

Location : Lat: 23°N616'E; Long: 35°N516'E. The aqueduct was located in the coastal plain to the south of the ancient city of Phalasarna. It emerges from the eastern foothills bordering the plain, where it is initially subterranean, and traverses the plain on an elevated substructure wall.

Site Description/Context : Pendlebury mentions an aqueduct, a Doric capital and cistern at the south end of the plain in an area called Stis Panayias to Livadi (1939, 370). Unfortunately, Pendlebury does not tell us the precise date of the aqueduct.

Aqueduct Description : The source of the aqueduct was located in the higher foothills at the eastern edges of the plain where the aqueduct penetrates a rocky outcrop. Its source is located within a complex including a fountain, field walls and an *aloni* which accords with the Venetian ruins of the broader area which include villages and monasteries (personal observation). Near the base of the rocky outcrop is a possible shaft for access to the aqueduct. At this point the subterranean tract of the aqueduct is steened with small stones and is capped with substantial limestone slabs (1.15m x 0.73m x 0.10m). Fourteen of these survive where the aqueduct emerges from the cliff face (**plates 45a-c**).

The aqueduct continues as a subterranean tract for 10m and leads to a fountain on the roadside, while another cistern lies beneath the road. This subterranean tract

probably connects with the aqueduct tract supported on an elevated substructure running parallel to the sea-cliffs at a distance of *c.* 20m (**plates 46a-b**). Consequently, the aqueduct would effectively measure *c.* 2km in length. The substructure stands to a height of 2.5m and the channel is clearly visible running along the top of the wall. The stone is quarried from the sea cliffs over which the aqueduct is founded.

Type : Agricultural, possibly representative of a mill leat.

Date : The aqueduct would appear to be medieval in date and its sealant and bonding material are not of the usual Roman type of *opus signinum* or mortar seen elsewhere on the island. The fact that the stone used in the construction of the aqueduct demonstrates *tafoni* erosion patterns indicates that it was hewn from the sea cliffs, probably at a time when they had already risen out of the water i.e. post AD 400 (**plate 46a-b**). The aqueduct actually terminates just over the sea cliff and it is likely that a mill may have been located at this point and Jennifer Moody has identified a confined area of cat-tails which would denote an area of moisture at this point (**plate 46c**; pers. comm. 2002).

CATALOGUE B

ROMAN BATHHOUSES OF CRETE: 1st-4th CENTURIES AD

1. Makriyalos

Plate : Fig. 59; plates 47-48.

Location : Makriyalos is situated 25km east of Hierapytna at Katovigli where the narrow coastal plain opens onto a large bay. The site is located on a dominant, but isolated, promontory near the church of the Panagia on the cliffs overlooking the small modern harbour where boats leave daily for Kouphonisi in the summer. The site was probably connected to Hierapytna, the nearest large city, by road; a Roman road has been traced behind the coastal plain leading to Makriyalos from the villages of Skinokapsala and Aghios Ioannis (*IC* III iii 25-9; Pendlebury 1939, 385; Baldwin Bowsky 1994, 10 and fig. 8).

Site Description/Context : Excavations revealed what was reported to be a Hellenistic-Roman villa composed of 37 rooms including courtyards (**fig. 59**)(Papadakis 1979, 406; Paton and Schneider 1999, 288). The complex itself measures 62m (north-south) x 34m (east-west) (*AR* 1987-8, 72).

The main entrance to the villa complex is to the east, opening onto rooms Φ , $\Phi 1$ and $\Phi 2$ (**fig. 59**). Φ and $\Phi 1$ bore traces of similar mosaic flooring suggesting that they initially held a common function. This mosaic may have extended into the 2.8m-long passageway, $\Phi 2$, which connects with the central court N. Rooms $\Phi 3$ and $\Phi 4$ are independent areas characterised by mosaic flooring consisting of a black and white geometric design surrounded by ivy leaves. These rooms were originally joined forming one area, but were subsequently divided by a partition wall constructed through the mosaic floor.

Another patch of a floor mosaic can be found in the northwest corner of area H1. A Roman marble statue of Pan was discovered in the northeast corner of this room (Papadakis 1979, fig. 217d). The head is missing but metal attachments still survive for its adherence while buckish legs survive to the knee. The figure is naked apart from a cloak which is closed at the neck by a brooch.

The long rectangular central area, area N, represents an open-air courtyard. It measures 24.10m x 4.50m and spans one third of the length of the overall complex. It can be directly accessed from five rooms (B, P, Σ, Z, Φ2). Functionally, the central courtyard served three roles; it acted as a communal area, an interconnecting passage and as a light source. In contrast, area Δ1 constitutes the northern courtyard but does not fulfil the same functions as it only connects with one room, H1. Its substantial size suggests that this was an assembly or a recreational area.

Wall-plaster and rectangular marble floor-slabs are preserved in the northeastern corner of area Ξ while the western area yields a badly-destroyed tessellated mosaic. The area was divided in two by a transverse wall, the remains of which protrude from the northern wall. The different floor types and the dividing wall would point to the existence of two rooms rather than just one, as has been reported.

The floor and walls of area E1 are covered with hydraulic mortar. A drain conducted water into the room from the northeast corner. The conduit extends to the centre of the room and terminates in a circular depression. The function of the room was interpreted as that of a cistern. The area connected with Γ1 via a narrow gap in its southern wall. This gap is probably a secondary feature relating to a subsequent function for the area.

The large area occupying the southwest section of the complex is perhaps a rectangular pool or even an *impluvium* as is suggested by its coating of *opus signinum* and the peripheral drainage features.

Bathroom Description : The private bath-suite is located in the southeast corner of the villa complex (**fig. 59**). A horseshoe-shaped plunge-bath, with external dimensions of 3.9m x 3.15m, protrudes to the south of the complex overlooking the sea (**plate 47a**). The floor of the pool, including its access steps, were lined with *opus signinum* which is also faced with marble veneer.

Area Ω lies directly north of the pool and is similarly lined with *opus signinum* and marble veneer (**plate 47b**). A limestone threshold in the eastern wall of this room connects with area H which is also paved with marble slabs of varying provenance.

Area O lies northwest of the pool and has a mosaic floor composed of black and white *tesserae* depicting a geometrical design of intersecting circles (**plate 47c**)

(Papadakis 1983b, 59). It is not certain if this room is located within the bath-suite as no communicating threshold is detectable. However, a small adjunctive area to room Ψ could be interpreted as a square plunge-bath due to its stepped entrance and the fact that it is lined with marble veneer. Consequently, area Ψ could function as a second *frigidarium* within the bath-suite (personal observations).

The foundations of the eastern block of the bath-suite are set *c.* 1m lower than the western sector. This block includes areas K, K1, M1, Λ1, Θ1. Area K1 represents a hypocaustal chamber with an apse incorporated into the substantial northern wall (**plate 48a**). It is tempting to interpret this apse as a brick fire-chamber for supporting a furnace-boiler. The walls survive to a height of 0.70m and are faced with brick over a mortared-rubble core. The area has been badly damaged since its excavation in the 1980s as can be deduced from comparisons between the photograph published in *Kathimerini* in 1997 (**plate 48b**) and that taken in 2002 (**plate 48a**). Papadakis reported that 37 circular *pilae*, set on square and circular bases, remained *in situ* in 1980; the highest surviving to a height of 0.52m, with evidence of 18 other bases (1980, 525). Today only a few square bases remain *in situ* with circular discs scattered through the area. Low shelves line the western wall internally and probably also supported the suspended flooring.

An opening in the western wall of K1, measuring 0.56m, probably communicated with a *praefurnium*. The adjacent areas, M1 and K, were filled with ash and their floors scorched red by fire. It is probable that both areas represent *praefurnia* which serviced the adjacent hypocausts, K1 and Λ. It seems that area Λ was only converted into a hypocaust at a secondary stage, as the wall incorporating the brick arch of the flue (visible in the left-hand corner of **plate 48a**) merely abuts the corner of the wall common to Θ and Λ, and consequently, represents a later addition (personal observations).

Area Θ1 has a vaulted roof, sturdy walls and a floor of levelled bedrock (Papadakis 1979, 408, fig. 2). Area Ι1 forms a Γ shape around room Θ1 and, despite its shallow depth of 0.80m, was clearly a cistern as indicated by its coating of *opus signinum* incorporating bevelled edges (personal observation). Area Λ1 accommodates the niche of the hypocaust K1 and is located between Θ1 to the east and K to the west.

Dimensions : The villa measures 62m x 34m (*AR* 1987-8, 72). Papadakis recorded that the entire excavation covered half an acre (1983c, 59).

Type : The complex represents a substantial and wealthy Roman villa fitted with its own private bath-suite.

Date : Intense activity is attributable to the 2nd century AD but occupation continues until the 3rd (Papadakis 1979, 406-9; 1983b, 59) and perhaps the 4th century AD (Empereur *et al.* 1992, 638).

Dating Methodology : Papadakis claims that the site was Hellenistic-Roman in date, although elsewhere he states that the ceramic evidence covers the period from the 1st to the 3rd century AD (1986, 230). A 2nd-century BC lamp, discovered in room Δ1, constitutes the only definite pre-Roman find reported but represents a surface find and is not related to a distinct stratified layer (Papadakis 1979, 407). However, a Hellenistic date would seem to be corroborated by the fact that Sweetman observes that the mosaic associated with rooms Φ, Φ1, Φ2, Φ3 and Φ4 was formed of black and white *pebbles* (1999, 112). However, all the mosaics visible on the site, including those of rooms Φ, Φ1 and Φ3 and Φ4, the black-and-white mosaic of intersecting circles in area O and that occupying the floor in the western section of area Ξ are all composed of cut *tesserae* and no pebble mosaics could be detected on the site by the present author (**plate 47c**).

Material evidence from the site is overwhelmingly Roman and the villa is absolutely Roman in design. Platon, who initially reported the site, claimed that the remains mainly reflected a Roman date (1959, 391). Based on the building technique and the material used and from the published accounts it has been deduced that the date of construction can be placed around the early to middle 2nd century AD (Paton & Schneider 1999, 288).

A portrait head of the emperor Hadrian found just below the villa propounds the 2nd century AD date (Harrison 1993, 244-5; Papadakis 1997-8). The plan is distinctively Roman, which is reinforced by features such as floor mosaics, marble veneer (including marble from Proconnesus on the Sea of Marmara and Chemtou in Numidia).

It is also relevant that there are a number of spacer pins from the bath-suite on show in the Sitia Museum considering Farrington and Coulton claim that most of

the known examples date to the 2nd century AD (1990, 64). A number of finds in the villa, especially those of the hypocaust (including sherds of glass scent-bottles and a mould-made terracotta lamp, depicting a stag attacked by hounds possibly representing the death of Aktaion), reflect activity in the 2nd century AD (Papadakis 1980, 525, pl. 327d).

2. Sitia

Plate : Fig. 60; plate 49a.

Location : Lat: 26.1166; Long: 35.208. Sitia is a small harbour town on the north coast to the east of Crete. The bath installation is located under the Venetian courthouse overlooking the harbour (**plate 49a**).

Bathroom Description : Roman fish tanks are visible in the water under the Venetian courthouse. Davaras attributes a separate function to a large rock-cut compartment to the south of the largest fish tank, as it lacked specific features otherwise crucial to its use as a fish tank (1974, 90). The feature neither allows for sufficient circulation nor depth of seawater to store enough fish to justify its large dimensions. Instead Davaras attributes its careful design and apsidal form to a recreational function and suggests it could have been a bathing pool (1974, 90, fig. 2, 93, pls 214-7). The compartment measures 4m x 3.7m and incorporates a sloping floor with a 0.2m inclination towards the sea (**fig. 60**). It is coated with a smooth layer of mortar (0.10m thick). A rock-cut step or bench with a width of 0.2m occupies its western side. Both this feature and its overall apsidal shape are common characteristics of Roman plunge-baths. A channel, measuring 0.1m x 0.07m, pierces the curving eastern wall at its apex, just above the floor. This channel leads to a small trapezoidal tank which would have somehow regulated the pool's supply (**fig. 60**). The channel could easily have been blocked to control the amount of water reaching the pool. Davaras records the existence of some auxiliary rooms to the west of this compartment located under debris and modern masonry (visible in **plate 49a**). Consequently, he postulates that the pool was a component of a larger bathing complex. The regularly-spaced holes in the rock-cut elevations perhaps secured some form of facing.

Dimensions : The pool itself measures 4m x 3.7m.

Type : The rock-cut pool possibly represents a sea-bathing feature within a public bathing complex.

Date : Unknown.

3. Kouphonisi

Plate : Figs 19 and 61; plates 49b-50c.

Location/Site Description/

Context : See aqueduct entry A 1.

Bathhouse Description : The site of the public bathhouse is located on the northern beach of the main island opposite the small islet of Marmara (**plate 49b**).¹ The bathing complex was divided from the residential buildings to the south by street Π (**fig. 61**). The baths were supplied with water from two aqueduct systems which transferred water from a spring in the hills in the south of the island (see A 1).

Apsidal pool Δ overlooks the sea to the northeast (**plate 49c**). The pool is set at level 0.50m lower than its adjacent area B. The pool's eastern end is apsed while its western end incorporates a stepped bench, serving both for access into the pool and seating (**fig. 61**). The southern wall of the pool survives to a height of 2.82m but the northern side has been badly damaged by sea erosion. Blocks of collapsed architecture lie submerged in the water below (personal observation). Only a minimal effort has been made to consolidate the pool's foundations and further collapse is inevitable. The pool is faced internally with brick which only survives in the lower tiers (**plate 49c**). The facing has collapsed above this point revealing a mortared rubble core. The brick-faced mortared rubble is coated with a thick layer of *opus signinum* which survives to a height of 0.50m above the floor of the pool. The walls were originally faced with marble veneer which also still survives in patches (Papadakis 1986, 229, fig. 1). The floor of the pool was also lined with marble plaques of irregular shape and of varying provenance, colour and thickness. In the centre of the floor are a series of channels outlining the base of a potentially decorative feature.

Area Γ lies to the west of pool Δ and is badly destroyed. Its floor is set at the same level as the adjacent pool but 0.50m lower than that of hypocaust A. It was lined

¹ Leonard refers to the bath building as 'BLDG 1' (1972, 360).

with *opus signinum* and, despite the fact that the area has largely collapsed into the sea, it is still possible to suggest that it functioned as a type of pool (Papadakis 1986, 230).

The main hypocaust (A) is located to the south of pool Γ. It originally consisted of 49 square *pilae* set in series of 7 x 7. Today, these *pilae* are either indicated by the presence of the base-tile or only survive as imprints in the floor. In the southern wall a small brick arch, measuring 0.70m x 0.40m, communicated with *praefurnium* E (**plate 50a**). An airduct was also located higher in the same wall.

Praefurnium E consists of an area, measuring 2.6m x 2.2m, connected to two hypocausts; N and A. Traces of burning reached a height of 1m above floor level and the stratigraphy included a 0.30m-thick layer of ash. The walls survive almost to their original height (3.8m). A similar airduct in the east wall communicated with the garden area (Z). A doorway in the south wall (measuring 2m high x 0.80m wide) is defined by a substantial monolithic lintel and threshold stone.

Area B is located to the south of pool Δ with which it connected via a doorway. Its north wall survives to a height of 1.8m and incorporated a small circular opening which also accessed pool Δ. The area also opened onto garden Z. It shared a common window (measuring 0.90m x 0.90m) with the area over hypocaust A. The walls of area B are veneered with marble while its floor was also lined with marble tiles, some of which still remained *in situ* when excavated. In the light of this evidence the black-and-white *tesserae* collected from this room must represent the flooring of another room, perhaps that of an upper storey. The room's function is uncertain but the excavator has suggested that it acted as an *apodyterium* or *tepidarium* (Papadakis 1986, 230).

The small hypocaust N is located to the west of *praefurnium* E with which it was connected via an arched opening. The ceramic *pilae* of this hypocaust were set in series of 6 x 5, and, as in hypocaust A, they only survive as either imprints in the floor or as base-tiles. The area represents a later extension to the bath installation and its construction altered the original eastern façade of the complex. The west wall of *praefurnium* E consisted of three different walls, each relating to a different constructional phase. The addition of hypocaust N effectively blocked two arched windows.

Areas K, Λ and M occupy the southern section of the bathhouse which is bordered by street II to the south. The areas probably represented *apodyteria*, reception areas or relaxation areas. The floor of the largest room, K, was covered with a burnt context which contained numerous lamp fragments, marble veneer, iron nails and fragments of wood, probably from the rafter beams of the roof. The subsequent layer also contained traces of plaster and roof tiles.

Area Z is located in the centre of the complex and its associated stratigraphical evidence identified it as the open-roofed garden of the baths; a popular feature in Roman baths. The lowest layers consisted of a context of earth and sand, ideal for plants, over which was a thin layer of earth containing traces of organic remains. Finally an upper layer of sand was deposited by wind action, this layer sealed the entire settlement.

A terracotta pipeline was discovered running east to west in area Z. It consisted of 17 separate pipes, each 0.50m long, with the narrower ends attached to the wider ends and sealed with mortar. The pipeline was set in the ground in a double coating of mortar. The pipe terminated with a lead tube which acted as a diminutive siphon (2.22m long, 0.06m in diameter) (Papadakis 1986, 231). Another roughly-built channel crossed the garden on a southeast-northwest axis from area M. It was 17.50m long and stood to a height of 0.79m but its construction style suggests a late date.

The area to the west of the bathhouse (section I) was probably open to the elements although this cannot be affirmed due to its damaged condition. However, a large section of a water channel was traced to the north of the area, running on an east-west axis, for a distance of 3.2m. It pierces the eastern wall of section I and continues into area Z. Originally, the channel was supported on a low substructure (0.53m high x 0.26m wide) but silting in the area gives it a sunken appearance. The channel is lined with a series of tiles (measuring 0.30m x 0.30m), ten of which survive, each bearing an incised X (**plate 50c**).

A series of six stone steps were discovered along the western wall of area Z. The steps had a width of 0.80m and rose to a height of 1.7m. They must have ascended to the roof of the *praefurnium* E and accessed the second floor of the building. At the southern wall of area Z, near room K, extensive destruction layers

were identified. Fragments of fallen wall painting, identical to that associated with House I (to the south of the bathhouse), were discovered among the debris.

Dimensions : The bath measures 24m x 16m. The installation must have had at least two storeys, as can be deduced from the stairs in area Z and the fallen *tesserae* found in area B.

Type : The array of public buildings in the vicinity, such as the theatre and possible *forum*, would further intimate the public nature of the bath. Indeed, the bath has been referred to as a public *balaneion* with no clear explanation (Papadakis 1986, 228). Certainly, large pools, such as pool Δ, do not feature in the private establishments on the island. The capacity of the theatre would suggest a community on the island sizeable enough to justify the construction of a public bath installation. Moreover, Papadakis has suggested that the second hypocaust may have been a subsequent addition to cater for the female population on the island after mixed bathing was supposedly outlawed by either Hadrian or Marcus Aurelius (1986, 229).

Date : 1st to 3rd century AD.

Dating methodology : The chronology is based on the ceramic record although the stratigraphic record is not discussed in detail in the published reports (Papadakis 1986, 228-31). The pottery from area B consisted of domestic ware and amphorae dating from 1st to the 3rd centuries AD (Papadakis 1986, 230). Numerous lamp fragments, dating between the 1st and 3rd centuries AD, were among a large quantity of sherds recorded from hypocaust N. Other notable finds include a complete pan, bronze nails, a bone needle and fragments of three fingers from a marble statue (Papadakis 1986, 229).

The architectural phasing of the complex, such as the restructuring of the eastern wall of area Z and the addition of hypocaust N, attests its longevity. Longevity is suggested by repair to the lead siphon, with earth and hemp, while the water channel in area M also represents a later construction. Leonard observes that one wall elevation, constructed by alternating three rows of brick with layers of coarse stone, was reminiscent of a style of masonry popular from the 5th to the 10th centuries AD (1972, 360, pl. CIX 2). However, the stratified chronology established through excavation does not concord with such claims.

4. Ano Zakro

Location : The modern village of Ano Zakro is situated in an upland valley c. 6km from the Bay of Zakro. It is located at the end of an ancient route that ascended from the coast through the Gorge of the Dead (Pendlebury 1939, 9).

Site Description/Context : In this otherwise arid region, the upland valley is well watered and is famed for its numerous springs (Papadakis 1983c, 139). A copious spring is located directly above the village and even today its water is conducted down to the village in an aqueduct (albeit roofed with corrugated iron) which follows the contours of the valley slopes. Its route passes a chapel just before it descends sharply towards the village. Marble columns lying in the chapel precinct could attest the existence of an earlier shrine, perhaps associated with a water divinity.

There is some evidence for Roman activity in the broader Zakro area including private houses and a single Roman fish-tank on the northern edge of the Zakro bay (Davaras 1974, 87). Information afforded by the villagers would hint at a more elaborate Roman settlement here (pers. comm.).

Bathroom Description : The architectural components of a bathroom were reported by Mariani at the locale of Kali Strata in the lower section of the village overlooking the gorge (1895, 293). The identifiable features included both a *tepidarium* and a hypocaust with both square and circular ceramic *pilae* (Mariani 1895, 293-4; Spanakis 1991, 277). However, while the circular *pilae* had diameters of 0.27m, the widths of the square examples were reported as 0.62m which would be more appropriate for the width of *bipedales* often used in the *suspensurae* flooring of a Roman bath or in association with spacer pin heating systems. Unfortunately, the hypocaust is no longer visible and none of the villagers could offer any clue to its original location. Guilbride was also unsuccessful in finding any associated remains in 1999 (1999, 21).

Type : It is possible that Mariani's report reflects the site of a private bath connected to a villa, as suggested by Sanders (1982, 137-8).

Dimensions : Unknown.

Date : Unknown.

5. Myrtos

Plate : Plates 51-52.

Location : Lat: 25°N59'E; Long: 35°N00'E. The modern village of Myrtos is located on the south coast of Crete at a distance of 20km from Hierapytna. The bathhouse is located 75m west of the village literally on the coast road.

Site Description/Context : Myrtos was classified as a Roman village in the 1960s (Hood *et al.* 1964, 93). This classification is supported by Roman architectural remains and inscriptions discovered in the modern town (*IC* III iii 53-4). A Roman building with a white tessellated mosaic was discovered during the installation of a modern water-pipe in the village (Alexiou 1967a, 214, fig. 202b; 1968, 404; *Ergon* 1967, 127, fig. 129). The corner of another structure was discovered with the walls extending for 1.5m and 1.45m respectively. The elevations (1.46m high) were composed of brick-faced mortared rubble punctuated by a bonding course of large stone blocks, each *c.* 0.38m high (Alexiou 1967b, 214, fig. 202b).

On the beach directly below the bath, a massive wall extends due south from the scarp on which the coast road lies. The structure is constructed in *petit appareil* but the facing is badly destroyed. The beach is considerably lower, *c.* 10m, than the coastal road and the remains could represent a type of harbour installation or breakwater.

Bathhouse Description : Hood *et al.* recorded a 'large concrete and brick building', incorporating the remains of hypocausts, 75m west of the village to the north of the coast road (1964, 93). They also observed a large circular cistern with external radial buttresses yet did not connect the two structures (**plates 51a-b**). In reality, this cistern forms an integrated part of the bath-suite. The cistern is located directly east of the bath complex which stretches out along the coast road (**plate 51c**).

The baths have been excavated but the results were never published (*AR* 1973-4, 39; 1977-8, 82). The coast road cuts through the bath, an event which clearly damaged the complex. In the road scarp the hypocaustal *pilae* are visible, through a once-arched aperture, in series of squares and circles (**plate 52b**). The bricks angle up towards the arch but the apex of the arch has collapsed (**plate 52a**). The fact that this aperture was subsequently blocked indicates a secondary architectural phase.

In the road scarp an expansive *opus signinum* floor is visible at a level of *c.* 0.5m-1m below ground surface immediately west of the circular cistern (**plate 52c**). This could either represent mosaic bedding or the lining of a cistern. The circular cistern is lined internally with similar *opus signinum*. The constructional method and shallow depth of the circular cistern are also exposed by the road cut and the radial buttressing is clearly visible (**plates 51a-b**).

Type : Private bath-suite of a villa. Paton claims that the complex represents the private baths of a grand villa (*AR* 1973-4, 39; 1977-8, 82). In her view, it is potentially one of the most interesting Roman monuments in Crete (*ADelt* 29b², 1973-4, 908). Surprisingly, Sanders was not as enthusiastic (1982, 138, no. 2/4). It is probable that the villa was located at a thriving Roman port settlement. The private classification, although unconfirmed architecturally, has generally been accepted. Its proximity to Hierapytna suggests that the villa was a satellite site to this major centre.

Dimensions : Sweetman reports that the preserved area of the geometric mosaic measures 5m x 22m (1999, 115). These dimensions reflect a substantial room for a Cretan bathhouse. The room has been identified as a *tepidarium* (*AR* 1973-4, 39).

Date : Two constructional phases are discernible: the first in the late 1st century AD and the second in the Antonine period.

Dating Methodology : Paton originally suggested that the bath-suite was built in the Late Antonine period (*ADelt* 29b², 1973-4, 908). However, Sweetman (1999, 116, cat. 58, pls 88-92) and Livadiotti Rocco (2000, 63-4) date the mosaic earlier, placing it between the late 1st and early 2nd century AD establishing the site as one of the earliest Roman baths on Crete.

However, there can be concordance with both the earlier date, proposed by Sweetman and Livadiotti Rocco, and the later date, supported by Paton, if the site is understood as having subsequent constructional phases. A study of the brick thickness within the wall elevations provided evidence for two construction phases. The brick-faced mortared rubble of the circular cistern yielded relatively thick dimensions corresponding to phase II of the Praetorium Baths at Gortyna (see Di Vita 2000b, xlviii). Alternatively, the hypocaustal brick is narrower and the mortar joints wider;

reflecting a Late Antonine date. Livadiotti Rocco associates the second phase of the baths of Myrtos with the construction of similar monuments in the 2nd and 3rd centuries AD on Crete (2000, 64).

6. Oleros

Location/Site Description

Context : The site of ancient Oleros, famed for its shrine to Athena, has long been located in the Meseleri Valley in eastern Crete (Spratt 1865, I, 134; Mariani 1895, 318-9; Pendlebury 1939, 362, 376; *IC III v passim*). Local tradition maintains that there was an ancient site under the village of Meseleri, but Sanders failed to substantiate this and only reported sherd scatters, including African Red Slip (1982, 138-9). The Vrokastro Survey has recently located the Roman town on the northern edge of the plain opposite the modern village of Meseleri (Hayden *et al.* 1992, 332). The survey recorded abundant architectural remains on the north slopes of the plain and along the valley floor. Many architectural elements were identified (such as column-drums and bases and cut blocks) incorporated into terraces and field-houses just east of Meseleri (Hayden *et al.* 1992, 343).

Bathroom Description : Baldwin Bowsky notes that private villas and baths are located at Myrtos, Oleros and Pachyammos (1994, 9, n. 12). This claim stems from Sanders' description of a small structure at the foot of a hill which he identifies as a bathhouse (1982, 138). He reports an apsidal room with a diameter of 5m lined with *opus signinum* and an adjacent room, measuring 9m² (Sanders 1982, 138). A wall extending from the west of this room suggests a third compartment. Hayden contends that this structure should lie somewhere in the area of OL3, north of the Meseleri village at the base of the Schinavria ridge near a *kalderim*, where the survey located a rock-cut building foundation but no apsidal room (Hayden, pers. comm. 2000). Hayden *et al.* make no reference to any bathhouse in their survey publication (1992, 343).

Type : Unknown.

Dimensions : The overall dimensions of the complex are unknown. The apsidal feature had a 5m diameter while the adjacent room measured 9m² (Sanders 1982, 138).

Date : Unknown.

7. Hierapytna

Plate : Fig. 20.

Location/Site Description/

Context : See aqueduct entry A 2.

Bathhouse Description : The devastation of important monuments through official neglect is exposed by the Greek newspaper *Exormese* 12/5/91 (*AR* 1990-1, 71). The residents of Hierapytna were witnesses to the destruction of a public Roman bathhouse, originally located at the junction of the streets of Kypros and Nikiforou Foka. Residents describe an elaborate structure, decorated with marble and supplied by an aqueduct (pers. comm. 2000). The cement shell of an unfinished building now occupies the area of the bathhouse. Disarticulated clay *pilae* and amphora handles were recorded amongst the rubble of the building-site.

Type : Public.

Dimensions : Unknown.

Date : Unknown.

8. Pachyammos

Plate : Plates 53a-c; figs 21 and 22.

Location : see aqueduct entry A3.

Site Description/Context : The Roman structure discussed here is located on the eastern outskirts of the modern village of Pachyammos. It is found 200m south of the coast and 50m west of the turn for Hierapytra. The Roman structure lies relatively isolated in the landscape. The nearest sites are that of Vasiliki and the structure at Tholos (Haggis 1996a, 420, fig. 25).

Bathhouse Description : A large rectangular structure, measuring 17m x 42.4m, was excavated by Boyd in 1903 and was subsequently back-filled (1904-5, 13). Despite back-filling the site is still visible today and the long lateral walls can be traced running parallel to the shore (**plates 53a-b**). The lateral wall is constructed of a mortared rubble core faced with roughly worked stone. According to the original plan, drawn by Hastings (**fig. 21**), the main building consisted of two long corridors

running parallel to the sea, between which were three rooms, the outer two being subdivided into six compartments. A series of three rooms were arranged in a row along the western end of the complex.

Hastings' plan denotes a horseshoe-shaped feature to the northeast of the complex which can be identified as a plunge-bath. In the plan the feature is labelled a cistern and details, such as its access step and ridge along the curved, are included. Its identification as a plunge-bath is further affirmed through its proximity to the cistern and aqueduct system (see A 3).

The visible remains in the field corresponding to the bath-suite include a vaulted compartment. The vaulted feature lies at the eastern end of the lateral wall and is constructed in brick-faced mortared rubble (**plate 53c**). Its identification as a *prae-furnium* is supported by the presence fire-blackened brick and an airduct (**plate 53c**, indicated by the arrows). Its position in the field also corresponds with the area of the horseshoe-shaped 'cistern' indicated in Hastings' plan. Sanders, in his adaptation of Hastings' plan, omits the specific details which obscure the identification of these features (**fig. 22**).

Type : The site almost certainly represents a private villa with its own integrated bath-suite. However, Boyd originally thought that the complex reflected a Roman camp due its regularity of plan (1904-5, 13). She subsequently contradicts this identification deducing that it reflected the basement level of a villa on apparently the same grounds. Sanders too supports its identification as a villa, yet simultaneously contradicts this, noting that it may merely reflect a complex warehouse (1982, 140, fig. 50, for reference to 'villa', 241). Its identification as a villa is also supported by Baldwin Bowsky (1994, 9). It is likely that the site was a villa and that activity in the area fell within the jurisdiction of Hierapytna.

Dimensions : The entire ground-plan of the villa occupies an area measuring 42m x 17m.

Date : 2nd century AD.

Dating Methodology : The Roman villa was excavated in 1903 but its stratification was not published and perhaps never recorded. The 2nd-century AD date attributed to the structure may be partially reliant on a coin of Antoninus Pius mentioned in the original report. However, the layout of the bath-suite, with its

horseshoe-shaped plunge-pool, and the construction of the walls, incorporating facings of brick, would support this chronology.

Chersonisos

Site Description : See aqueduct entry A 5.

9. Chersonisos: the bath in the Aspetaki Plot

Location : The Aspetaki plot is located in an area, north of the theatre on Sanoudakis Street, thought to represent the agora. Excavations revealed Hellenistic and Roman remains including a Roman road which ran for a distance of 37.5m on a northwest-southeast axis (Englezou 1991, 402; Empereur *et al.* 1991, 497, fig. 15, no. 4; *AR* 1997-8, 112)

Bathhouse Description : The partially destroyed remains of a Roman hypocaust, consisting of two *pilae* columns, were discovered (Englezou 1991, 402). The extent of the entire complex was impossible to estimate as the architectural walling continued into the unexcavated eastern baulk. However, a cistern discovered nearby, measuring 4.3m x 0.85m (Mandalaki 1999, 252-3), may constitute part of the larger bath installation. The masonry and construction of the cistern was similar to that used in the *scenae* of the theatre. The walls were not actually bonded to each other but were merely adjoined at the corners. The cistern walls were supported by three buttresses (measuring 1.3m x 1.3m). The cistern was lined internally with a thick layer of *opus signinum*, which also served to strengthen the angles between the walls and floor. The stratigraphic fill of the cistern was composed of a 1.3m-deep layer of loose earth containing Roman sherds overlying a 2m-thick layer containing lamps, miniature pots, amphora fragments, domestic wares, stone vessel fragments, a stone pounder, marble veneer fragments and numerous glass sherds (Mandalaki 1999, 252-3).

Type : Unknown.

Dimensions : Unknown.

Date : Probably 2nd or 3rd century AD.

Dating Methodology : The date is loosely based on constructional and decorative evidence including brick facing, *opus signinum* and marble veneer. Spacer

pins, which usually date to this period, have also been recorded from the area (Empereur *et al.* 1991, 495).

10. Chersonisos: the bath on Dimokratis Street

Location : The bath is located on Dimokratis Street in the harbour area.

Site Description/Context : Excavation revealed that a *triclinium*, dating from the 4th to the 7th century AD, was constructed over the destroyed hypocaust of a Roman bath (Starida & Mari 2000, 29-30). The *triclinium* consisted of a large hall paved with irregularly-cut coloured marble tiles while three auxiliary rooms were floored with mosaics. The bench of the *triclinium* was constructed of architectural elements pillaged from the preceding Roman bath, including a dedicatory inscription (Starida & Mari 2000, 30). The substantial Hellenistic building blocks incorporated into the walls of the *triclinium* were also evidently reused.

Bathroom Description : The hypocaust beneath the *triclinium* is only briefly mentioned by the excavators (Starida & Mari 2000, 30). Sweetman refers to the paved floor of a ‘Late Roman’ bathhouse (1999, 64); however, from the original report it is clear that the mosaic and marble floors, found *in situ*, pertain to the *triclinium* which is built over the bathhouse, and that this represents the ‘Late Roman’ phase.

Type : Unknown.

Dimensions : Unknown.

Date : The bath was abandoned before the 4th century AD when the *triclinium* was built reusing many of its architectural elements.

Dating methodology : The pottery of the *triclinium* dates from the 4th to the 7th century AD. Conversely, Sweetman has dated the bath as ‘Late Roman’ and assigned it a 4th or 5th-century AD date (1999, 64). Sweetman’s claim that the pottery is ‘Late Roman’ (with some clear examples of ‘Early Byzantine’ combed-ware) is undermined in the light of some confusion between the *triclinium* and the earlier bath (1999, 64). It seems from the architectural phasing, that the Roman bathhouse was abandoned when the *triclinium* was built, probably in the 4th century AD, implying that the bath was constructed some time prior to this. Indeed, the bathhouse may have been out of use well before the construction of the *triclinium*

and their sequence could potentially present a very loose horizon.

Moreover, Sweetman has stated that no known mosaics have been found in a private or domestic context in the 'Early Christian' period in Crete (1999, 406). Yet, the mosaic was found in the *triclinium* and not the earlier bath and, consequently, it belongs to a private context dating between the 4th and the 7th centuries AD. A *terminus ante quem* for the use of the bath is established by the construction date of the late-antique *triclinium*. The *triclinium* was essentially composed of architectural elements taken from the preceding Roman bath. One such element constitutes a dedicatory inscription, which formed the bench of the later *triclinium*, but unfortunately its date was not reported.

11. Ini: the Bath reported by Sanders

Plate : Plates 54a-b.

Location/Site Description/

Context : See aqueduct entry A 7.

Bathhouse Description : Spratt mentions a Roman bathhouse associated with contemporary buildings in the area of Ini (1865, I, 304-5). Subsequently, Sanders reports the remains of a bathhouse 30m north of the largest surviving portion of the aqueduct (1982, 151). His descriptions can be assigned to a structure just to the north of the large piers of the aqueduct (located close to a small modern hut constructed with cement breeze-blocks). Here, piles of collapsed mortared rubble and stone blocks surround a small intact chamber. The maximum height of the intact portion stands is 3m. The north and south sides of the compartment have incorporated arched recesses into their wall thicknesses. Both niches are 1.10m high, and measure 0.35m and 0.45m wide, respectively (**plates 54a-b**). The walls of the compartment comprise a mortared rubble core, composed of an aggregate of pebbles and mortar, faced internally with brick while the exterior facing is executed in *petit appareil*. The northern wall is lined internally with *opus signinum*, stands to a height of 1.8m and extends for 5m before terminating in a pile of collapse. The southern wall extends for 7.84m while the eastern wall only survives for a length of 3.8m. The three walls are 0.5m thick. Unfortunately it is not possible, without at least an intense survey and cleaning programme, to estimate the plan of these baths.

Type : The structure is considered public in light of its proximity to the impressive aqueduct.

Dimensions : Unknown.

Date : Late Antonine, possibly attributable to the reign of Marcus Aurelius.

Dating Methodology : Dated on the basis of the epigraphical evidence relating to the bath and the brick dimensions.

12. Ini: the Bath South of the Aqueduct

Location/ Site Description/

Context : See aqueduct entry A 7.

Bathroom Description : A branch of the aqueduct departs from its main north-south line to supply a specific structure to the south. The branch departs from the main course at a juncture where there is a right angle in the dirt road. It continues due south and terminates at a badly-destroyed building constructed of brick-faced mortared rubble. The fact that the line of the aqueduct leads to this building suggests that this was another bathhouse. The building is mentioned by Ducrey and van Effenterre who observe that 100m further south of the aqueduct another pile of bricks eclipses a structure (1973, 281).

Type : Public.

Dimensions : Unknown.

Date : 2nd century AD.

Dating methodology : The date is loosely based on brick dimensions.

13. Ligortynos

Plate : Plates 54c-55c.

Location : The modern village of Ligortynos is located *c.* 25km from Gortyna, on the north bank of the Anapodaris River. The site is set on a low hill overlooking the northeastern end of the Messara. Platon informs us that the site used to be known as Loutres or Vaptisteres (1952, 479). The ruins of the early medieval cruciform church of Aghia Triada are located on the southern edge of the village. A Roman building, possibly a bathhouse, has been identified in the church foundations.

Site Description/Context : In its final form the structure is evidently an early medieval church but reused brick and marble and granite columns attest its Roman foundations (**plate 54c**).

Bathhouse Description : Platon recorded a hypocaust, heating and ventilation pipes and a type of cistern within the cruciform area of the church (1952, 479). Such specific evidence was not visible in 2001; however, marble columns in the vicinity, brick incorporated into the base of the southwest wall, and individual bricks scattered through the later matrix, all indicate a Roman construction phase.

Considerable sediment is notable in the area since Gerola's visit to the site in the 1930s. This is clearly evident from a comparison of Gerola's photograph of a fountain-house in the immediate vicinity of the church (**plate 55c**) with photographs taken of the same feature in 2001 (**plates 55a-b**). Field walls and stone basins, clearly evident in Gerola's photograph (**plate 55c**) are no longer visible today (**plate 55a-b**). In fact, it is only from a comparison with Gerola's photographs, which reveals three stone collection basins in front of the edifice, that the feature could be identified as a fountain-house. Gerola deduced that this skilfully-executed fountain-house might have originally been part of a Roman *nymphaeum* (1932-40, VI, 74-5, n. 1, fig. 50). Subsequently, it has been inferred that the second vaulted structure also acted as a fountain (Guilbride 1999, 33).

Type : Unknown.

Dimensions : Unknown.

Date : Unknown.

14. Knossos: The Private Bath

Plate : Figs 62-63; plates 56a-57a

Site Description/Context : See aqueduct entry A 8.

Location : A small bath is located 700m south of the Villa Dionysus and northwest of the Villa Ariadne.

Bath-suite Description : The bath-suite occupies an area of 250m² and is composed of eleven rooms with a possible courtyard (**fig. 63**). The mosaic known as the Athlete Mosaic is located in the area northwestern area of the bath-suite and is thought to represent the entrance. The mosaic depicts two figures, apparently engaged

in a boxing match, with the names of the competitors inscribed over their heads ... ΚΛΟΣ ΣΑΤΟΡΝΙΛΟΣ (**plate 57a**).

A square plunge-bath (11) lies to the south. It is executed in brick-faced mortared rubble and traces of marble veneer are still attached to its walls (**plate 56c**). A terracotta pipe drained the plunge-bath at its base and connected with the main drainage system running throughout the complex. A stone plug, complete with iron fittings for a chain and handle is reported as a unique find (*AR* 1995-6, 41, fig. 24). The floor level of the bath is 0.75m lower than the other areas of the complex. The pool is accessed by two steps in the southwest corner while gaps in the north and eastern walls may indicate further thresholds.

A large room decorated with a floor mosaic depicting a net pattern motif is located to the southeast of the plunge-bath. This mosaic consists of a white background with a large net pattern rendered in blue and white *tesserae* (**plate 56a**).

The southwestern corner of the suite is occupied by a cistern, measuring 3m x 3m, which is set at a higher level than the rest of the complex. The pebble flooring of area 2 to the north is set almost 1m lower.

The northeastern section of the suite is occupied by a hypocaustal complex consisting of an apsidal hypocaust chamber (6) which connects with a second adjacent example (7) via a brick-built flue (**plate 56b**). Brick was strictly reserved for these hypocaustal areas and the plunge-bath (11). Several spacer pins were also found in this area (**plate 83b**).

The substructure drains are visible, with some of their capstones, to the west of the complex. A reused cornice block is also embedded in the nearby floor. Area 12 (located to the north of area 3 and to the west of the plunge-bath) is thought to represent an open-air courtyard. Its compacted earth floor lies at the same level as that of the plunge-bath. This area yielded rich finds including a fine gemstone depicting Artemis Ephesia and a large relief-decorated vase with a symposium scene finished with a blue and amber glaze with suggested parallels in Asia Minor (*Wardle unpublished manuscript*).

Type : Wardle suggests that the establishment is private based on the scale of the bath-suite and deduces that the overall complex is representative of a town-house.

Dimensions : The excavation cleared an area of 250m² to expose possibly one third of a town-house occupying an *insula* measuring 30m x 25m (artsweb.bham.ac.uk). The bath-suite measured 25m x 10m.

Date : The construction of the complex is attributed to the 2nd century AD while its abandonment is attributed to the 3rd century AD.

Dating Methodology : The chronology is mainly based on the mosaic evidence. Sweetman dated the Athlete Mosaic to the 2nd or 3rd century AD (1999, 85). Wardle initially assigned the net pattern mosaic to the late 3rd or early 4th century AD but Sweetman claims that the date is attributed on unclear grounds (1999, 83). Sweetman claims that the net pattern is similar to mosaics in the Praetorium Baths at Gortyna (1999, 83).

Wardle observes that in the records of Olympic victors for the year AD 209, the name Saturninos (an alternative spelling) with the epithet *Cres Gortynios* - a Cretan from Gortyna appears. Consequently, Wardle suggests that these remains represent a town-house equipped with its own private bath-suite which may have belonged to a patron of the Olympic competitor (*unpublished manuscript*). He claims that the bath-suite was already abandoned by the 3rd century AD when extensive stone robbing took place (*unpublished manuscript*).

15. Knossos: the Public Bath in area H

Plate : Fig. 62; plates 57b-c.

Site Description/Context : See aqueduct entry A 8.

Location : A potentially public bathhouse is located 50m south of the Villa Dionysus, 30m away from the principal road of the city (**fig. 62**). The bathhouse seems to be located in the heart of the public city located near the civic basilica and the public theatre.

Bathhouse Description : A deep excavation trench was laid along the base of a substantial wall. The trench revealed that the wall stood 6m high, with a width of 1.5m, and extended for 30m (**plate 57c**). Wardle suggests that the bath actually occupied an entire city block, measuring 30m x 30m, and that the two or three-storeyed façade of the bath fronted onto the main city thoroughfare (*unpublished manuscript*). The wall is located 30m from the main road. The trench also revealed a

section of mosaic floor and marble wall veneer at the base of the wall (**plate 57b**). Only the mosaic's wave crest border was exposed but the size of the motif, *c.* 0.25m thick, would indicate a potentially large mosaic (AR 1993-4, 75).

Wardle suggests that another mosaic, discovered by Halbherr in 1885, belonged to the same building (AR 1993-4, 75). However, there seems to be little evidence to substantiate such a claim. The mosaic discovered by Halbherr contained four figural heads set in its corners and, if anything, would be comparable to the Four Seasons Mosaic in the Villa Dionysus (Halbherr 1893, 112; Hood & Smyth 1981, 42, no. 112, 43, no. 115; Di Vita *et al.* 1984, 61, fig. 21). It is possible that these mosaics are of the same school as they are executed in similar formats. The wall also incorporates brick features in its lower tiers which contribute to a bathhouse identification. A semi-circular brick-lined niche and a brick arch are visible at the base of the wall at its southern end (Wardle *unpublished manuscript*). Wardle also traced a distinctive line of blocks along the northern section of the wall at a height of 3.5m above floor level, which he interprets as the horizon for the spring of a vaulted roof (*unpublished manuscript*) (**plate 57c**).

Type : The decoration and brick features associated with the wall suggested a bath context while the scale of the wall and the wave crest border motif supported a public function.

Dimensions : Wardle has suggested that the bath occupied a possible 30m x 30m, a highly speculative estimation considering the limitations of the excavation.

Date : late 2nd or early 3rd century AD.

Dating Methodology : Sweetman has dated the Wave Crest Mosaic to the late 2nd or early 3rd century AD (1999, 84). This would generally comply with the presence of the associated marble veneer. A crack penetrated the substantial wall for its entire height of 6m indicating the severity of an earthquake which Wardle believes destroyed the building (*unpublished manuscript*).

16. Kato Asites

Plate : Figs 64-65; plates 58a-c.

Location : The village of Kato Asites is located in central Crete to the south of Knossos. The triconch church of Aghia Katerina is located immediately southwest of the village and is founded directly over a trilobate section of a Roman bathhouse.

Site Description/Context : Sanders maintains that there was a Roman town here, possibly ancient Pannonia (1982, 155). The spring which supplied water for the bathhouse is located at the foot of the western hills and still supplies the area with water (via modern cement channels). Platon informs us that near Kato Asites an aqueduct of large terracotta pipes was discovered, ten of which were signed OVAPONTOC (1957, 339; Davaras 1963, 141).

Bathhouse Description : The bathhouse was subsequently converted into the church of Aghia Katerina (Sanders 1982, 155, 70, fig. 13). The elevations are composed of a mortared rubble core faced with roughly-squared stones with wedges of brick and stone flake (**plates 58a-c**). The bathhouse consists of a rectangular central room with adjunctive semi-circular plunge-baths on three sides (Alexiou 1963, 407; 1964b, 444). The main rectangular chamber, measuring 5.80m x 10.3m, was entered through a doorway (now blocked) in the west wall. The floor was covered with a geometric mosaic (executed in blue, red and white *tesserae*) with a *guilloche* border and quarter-round marble moulding along the edges (Sanders 1982, 70). Unfortunately, today the mosaic is no longer visible and must have been either covered or removed.

The horseshoe-shaped plunge-pools opening out of this chamber each measure 3.7m wide, extending 2.5m to the apex and with a depth of *c.* 1.65m (**fig. 64**). The best preserved of the three is the northern example which still preserves its *opus signinum* lining, its three access steps and its low ridge along the curving wall (visible at a depth of 1.20m) (**plate 58a**). *Opus signinum* is also visible in the eastern plunge-bath. The southern plunge-bath is destroyed and is covered by the modern trackway (**plate 58b**). It is interesting that the southern example is omitted from Gerola's plan of the later church (**fig. 65**) while it appears in Sanders' plan of the bath (compare **figs 64** and **65**). This might result from the fact that the feature was integral to the bath but not the later church.

The eastern lateral wall of the building had windows on either side of the central plunge-bath, one of which was subsequently converted into a doorway, presumably when the original western doorway was blocked (**plate 58c**). A circular cistern with steps leading into it was noted to the west of the building (Alexiou 1964b, 444) but could not be seen in 2000 (personal observation). The bath seems to be associated with the piped water supply reported in the area (Platon 1957, 339; Davaras 1963, 141).

Type : Uncertain. The remains could be either private or public, perhaps representing the public bathhouse of ancient Panonnia. Alexiou hints at a broader Roman settlement in the environs (1965b, 555).

Dimensions : The rectangular chamber measures 5.80m x 10.3m and each horseshoe-shaped plunge-baths measures 3.7m in diameter and extends 2.5m to the apex. However, wall foundations can be traced to the west of this module which would suggest a much larger bath context.

Date : Sanders claims that the construction dates ‘earlier rather than later in the Roman period’ (1982, 70). The date of its conversion is more secure, occurring in the 5th century AD. The bath must have been abandoned by this time.

Dating methodology : The *terminus ante quem* for the use of the bath is supplied by the date of its conversion into a church. Sanders cites the 5th century AD martyrrium at Gortyna as the closest parallel for the plan of the church in Crete (1982, 113).

17. Nibretos

Plate : Fig. 38.

Location : Nibretos is located in central Crete to the north of Gortyna. The bath is located close by in the deserted hamlet of Droson which lies on the opposite side of the valley from the main village of Nibretos.

Bathhouse Description : Platon and Davaras recorded a building of Graeco-Roman date with marble floors and *exedrae* (1961-2, 289). The finds included a bronze *lekane*, glass *lacrimaria* and fragments of two marble *lekanai* depicting scenes from the Labours of Hercules including The Apples of the Hesperides and The

Capture of Cerberus. Sanders concludes that it is uncertain whether a building associated with such objects represents a bathhouse or a shrine to a local hero (1982, 155; Platon & Davaras 1961-2, 289).

Type : Raab regards Nibretos as a villa site (2001, 28) while La Torre accepts its identification as a bath (1988-9, 320).

Dimensions : Unknown.

Date : ‘Graeco-Roman’ (Platon & Davaras 1961-2, 289).

Dating methodology : Platon and Davaras apply the term Graeco-Roman to the structure but offer no further explanation (1961-2, 289). However, the fact that they record marble floors would concur with a 2nd-century AD date.

18. Gortyna: The Praetorium Baths

Plate : Figs 66 and 67a-f; plates 59a-62c.

Location/Site Description : See aqueduct entry A 10.

Context : The *praetorium* complex at Gortyna was traditionally identified as a *praetorium* and thought to represent the residence of the proconsul of the joint province of Crete and Cyrene in the 1st century AD (Di Vita 1990-1, 459; 2000a, 13).

The area of the *praetorium* complex in Gortyna was occupied until the 8th century AD (Di Vita 1990-1, 459). Evidence of the earliest phase of the Praetorium Complex is difficult to discern due to subsequent intense reuse of the space. The first phase was almost totally destroyed by the construction of the baths which occupy the area from the time of Trajan (**fig. 66**). The first *praetorium* contained a massive central court (measuring *c.* 1000m²) surrounded by an ample portico on at least three sides (Di Vita 2000b, xxxv). Excavations in the northeast corner of the central court (Sector III) revealed two columns of the original eastern portico *in situ* (Di Vita 1990-1, 460). A passageway running along the southern *praefurnia* incorporated the eastern foundations of the stylobate of the great portico into its construction (Di Vita 1990-1, 461). The stylobate was subsequently dissected by a wide channel that drained the water from the southern pool of *caldarium* 13 (Di Vita 1990-1, 461). The entrance was originally to the north of the complex at a point opposite the *nymphaeum*.

Bathhouse Description :

• **Phase II** : **the start of 2nd century AD**

The first *praetorium* suffered a serious destruction in the second half of the 1st century AD and subsequently the central section was transformed into public baths before the time of Trajan (La Rosa 1990, 431). The main areas belonging to this phase include *caldarium* 13 (with a pool to the east heated by *praefurnia* to the north and east) and *frigidarium* 26-7. The great court is still largely intact in this phase (**fig. 67a**). The oldest floors of the complex are attributable to this phase and consist of spreads of small river pebbles set in a mortar matrix, as seen under the mosaic in room 64 (**plate 59b**). Remains of *opus scutulatum* also survive in area 36, as well as various spreads of black-and-white mosaic in the *forica* of area 47 and in *frigidarium* 26-27. *Apodyterium* 45, in the southwest of the complex, was also fitted with a mosaic floor (no. 254) in this phase (**plate 59c**) (Di Vita 1990-1, 456-7, fig. 54). The mosaic is composed of a white background with black geometric designs composed of thin black bands forming large triangles and rectangles. The mosaic was damaged when a pipe was laid through its central section (Di Vita 1990-1, 458, fig. 54).

• **Phase III** : **mid-2nd century.**

Phase III is essentially Hadrianic. It involves the addition of a second *frigidarium* (**fig. 66**, area 32), with two pools to its east and north (areas 31, 33 and 68), to the west of *frigidarium* 26-7 (**plates 62a-b**) (Di Vita 1990-1, 444). The large area to the west of this is now floored with a mosaic (floor 64c) (**plate 59b**). This overlies the aforementioned pebble floor of Trajanic date while the mosaic is later covered with paved floor slabs of the late 4th and 5th centuries AD. All the phases are intersected by a *dolio* of the 8th century AD.

• **Phase IV** : **second half of the 2nd until the first quarter of the 3rd century AD.**

Phase IV witnesses the transformation of the area from what had essentially been a *gymnasium* into a bath installation comparable to examples in Asia Minor.

Movement became circular, moving from west to east. The bathers departed from the *basilica thermarum*, via a passage which connects with the two *frigidaria* (areas 32 and 26) (**plates 62a-b**). Then they continued to *tepidarium* 24 and to the two *caldaria* (13 and 12), proceeding next to the second great *tepidarium* (10) and the *sudatorium* (9), which also communicated directly with the triconch area leading back to the *basilica thermarum* (**fig. 66**).

The eastern façade of the baths now looks directly onto the court (area 2) of temple 4 (**fig. 66**). The side passage of the temple is now flanked by the eastern *praeefurnia* of *caldarium* 13, by now in use for centuries. The western wing is also completely remodelled and the main entrance was probably relocated just north of area 64b. This area joins with areas 37-39 to create a massive room, measuring *c.* 26m x 17m. *Tepidarium* 24 is subdivided to create areas 24 and 25.

A *basilica thermarum* accessing the baths is now located between the *frigidaria* and triconch structure. The triconch is blocked off from the large court when the western portico is transformed into a corridor, occupying much of the court itself. This corridor acts as an access area to the *praeefurnia* of *caldarium* 13 and the new heated areas 12 and 10. *Tepidarium* 10 connects directly with area 9, a small room with heated walls (*sudatorium*) located in the northwest corner of the portico in front of the triconch.

Access from the triconch (**plate 61c**) was via a corridor along the west wing of the great portico, which essentially transformed the area into the entranceway to the *apodyteria* and the great *forica* which also remained active. The *forica* received an open-air pool and a second black-and-white mosaic superimposed over the original. The apses of the triconch were stripped of the mullions that supported its trabeated framework which were replaced by elevations of brick-faced mortared rubble (Di Vita 2000b, li). The modifications incorporated a reused inscription referring to Cl. Acilius Cleobulus. Guarducci proposed that he was a relative of the consul of AD 210 or that it publicised an euergetive action particularly appreciated by the Gortynians (*IC IV 335*). *Forica* 19 is also constructed in this phase. Phase IV also sees the introduction of *bipedales*.

- **Phase V–VII** : **second half of the 3rd century AD**

Major alteration work was focused on the heated rooms from the second half of the 3rd century AD (phases V-VII). *Caldarium* 13 loses its eastern pool but gains two large pools to the north and south (**plates 60a-61a**). Seven *praefurnia* now service the area. The building technique also changes but still incorporates brick-faced mortared rubble.

- **Phase VIII** : **end of the 3rd or the beginning of the 4th century AD**

This construction phase was probably prompted by an earthquake at the end of the 3rd or the beginning of 4th century AD. The structural modifications are most evident in alterations to *caldarium* 13; the southern pool becomes semi-circular (with a diameter of 9.5m) (**plate 60a**). Its curved southern façade is fitted with five glass-panel windows. Four of its seven *praefurnia* remain in use; two examples were modified to include *testudines alveolorum*.² The northern pool was also remodelled to incorporate a heating system incorporating a cavity for heating the walls facilitated by the use of spacer pins, some of which have been found *in situ* (Di Vita 2000b, li).

A mixtilinear pool was constructed in the southern section of area 12 (pool 371).³ The walls and steps of pool 33 (**plate 62b**), of *frigidarium* 32, and those of the pools of *caldarium* 13 (**plates 60a and 61a**) were coated with marble veneer while the *suspensurae* floor of area 13 was also replaced. The date of the marble veneer in *caldarium* 13 was secured by a coin of Licinius, dating to AD 316, recovered from beneath the facing.

² The *testudo alvei* ("The tortoise of the pool") was a remarkable device for ensuring that the heated water in hot pools was evenly distributed. It was a hollow metal receptacle, which sat directly over the fire in the furnace. It opened into the pool, and by the process of convection, water circulated into it from the pool and, once heated, flowed back out into the pool. A couple of complete examples are known including a lead example from Cuicul and a bronze example from Künzig which demonstrate their hemi-tube form. Despite the scarcity of the device itself, emplacements for it are a regular feature within bath remains. The term is found in Vitruvius (V x 1).

³ This feature is reminiscent of the mixtilinear pool in area 17E in the Baths of Caracalla which also constitutes a secondary addition to the room (dating to the late 3rd and 4th centuries AD). DeLaine interprets it as a response to water supply problems, either representing a replacement for larger pools, now out of use, or as an architectural celebration of improvements to the water supply (1997, 39-40, fig. 29).

However, the overall complex witnessed a significant regressive phase at this stage. The entire shop façade along the north road was abandoned. These rooms had already collapsed, or were severely damaged, by the start of the 4th century AD and had not been reconstructed by AD 365 when the whole city suffered an intense destruction. Rather than reconstruct the façade, it was abolished and initially became a sidewalk and later a colonnaded street.

• **Phase IX : last half of the 4th until the early 5th century AD**

The earthquake of AD 365 prompted a remodelling of the urban layout. This is evident in the rooms along the northern road which are in an abandoned state by the start of the 4th century AD. They are now trimmed back to their foundations for a width of 5m. Wall US 78 extends for 53m and defines the new northern outline leading to the temple. The wall begins at the southwestern corner of pool 31 (which it actually cuts) and angles slightly to run parallel with the façade. It flanks the sidewalk which subsequently receives a colonnade and becomes the new north road, with a substantial width of c. 9m (**figs 66 and 67e**). This wall is of great structural significance as it delineates the new area and thus demonstrates that the bath complex and can now only be entered from the north and is, consequently, much reduced.

The reconstructions of the late 4th century AD attest a total change in the mode of construction at Gortyna. *Facings of 'pseudo-listata mista'* replaced those of brick. Brick is only used in specific instances such as the construction of the northern wall of the new pool 31.

The great *caldarium* 13 only undergoes minor changes but the passage between 12 and 13 is blocked and areas 12 and 10 seem to have been abandoned along with their relative *praefurnia*. The small *laconicum* 9 and pool 33 of *frigidarium* 32 are also abolished. Pool 33 now connects with area 67 becoming the main entrance to the bath complex which gains a certain monumental appearance due to the presence of two columns which separate this pool from area 32. The earlier marble floor of area 32 is covered with limestone paving slabs and the area now connects with the triconch via an intermediary room. The remodelling of the *basilica thermarum* is attributed to *Oecumenius Dositheus Asclepiodotus* the consul of Crete for AD 382 and 384.

• **Phase XII** : 7th century AD

Phase XII probably constitutes the last major construction phase of the baths and corresponds with intense alterations throughout the city. The phase reflects the first decades of the reign of Heraclius and is characterised by the widespread reuse of materials after the earthquake of AD 618-620.

The reconstruction of the *nymphaeum* to the north of the baths in AD 612 is an exception as it incorporated new brick while the foundations of the basin were carefully constructed to sustain the weight of the vault. In the Christian district of Mitropolis, the basilica of Justinian was also reconstructed and a new judicial basilica was built over the floors of the 4th-century AD *praetorium*. The paving for the new basilica was taken from everywhere (even from the odeum). The death of Heraclius is attested in the inscriptions on the columns of the new basilica and in the nearby *nymphaeum* which honours the Imperial family (Di Vita 1988-9, 456, n. 25).

The monumental entrance of the *praetorium* complex had previously opened onto the north road in the 6th century AD, but now opens via a passage in wall 11 leading to the pool 33 which has been filled in. This led into an ample hall divided by two rows of columns forming three aisles, each 3.85m wide. This directly connected with the room, formerly a triconch. The northern and western apses had been removed, while in the southern apse a rectangular platform was constructed.

Areas 26-27 are accessed from area 32 which had been the original *frigidarium* of the baths. In the last two constructional phases the area was converted into a small private bath which communicated with the residential palace. This constitutes the last remnant of the Trajanic baths. Colini refers to this feature as a '*frigocalidario*' which contained all the elements of a bath in one large compartment (cited in Di Vita 2000b, lxix, n. 72). At the end of the 7th century AD Gortyna was abandoned by the majority of its inhabitants, who ascended the acropolis defended by fortification walls. Only the ruins and a few small nuclei were left in the now mostly-rural landscape of the lowland plain.

Type : Public.

Dimensions : The *praetorium* complex itself was over 1000m² (Di Vita 2000b, xxxv).

Date : The public baths of the *praetorium* complex functioned from the 2nd century AD until the 6th century AD (although it survived as a private bath into the 7th century AD).

Dating methodology : The standard excavations, which established the overall chronology for construction styles on Crete, are those of the *praetorium* complex of Gortyna. The phasing of the construction of the baths is well documented through the plans of Rocco and Livadiotti (**fig. 67**). The baths demonstrate distinctive phases which document their monumental development and progressive abandonment (Di Vita 1990-1, 447). The architectural phasing has established a chronological framework which has been applied throughout the island.

In summary: the original complex suffered some huge catastrophe in the second half of the 1st century AD after which the baths were constructed (Di Vita 1990, 431). Certain areas of the bathhouse were out of use by AD 382-3. The baths were restored in the 4th century AD when the *praeses* Ecumenius Dositheos Asklepiodotus erected a *kainon praetorion*, a new autonomous tribunarial basilica, over the demolished northwest corner of the baths to replace the one destroyed in AD 365 (Di Vita 2000a, 13). Two reliefs can be dated to this 4th-century AD restoration of the baths on the basis of their style. They consist of the depiction of a lion and boar and a second depiction of Asclepius, which still preserve its original colour, all mounted on top of two tall fluted pilasters (AR 1986-7, 56). The analysis of the collapsed roof of the *caldarium* yielded a good estimation for the final abandonment of this area at the end of the 6th century AD. This period preceded one characterised by a total lack of marble veneer, as demonstrated by its removal from the southern pool 334 when its apse was demolished (Di Vita 1990-1, 450).

| | |
|--------------|---|
| Phase II | : Trajanic |
| Phase III | : Hadrianic |
| Phase IV | : between the mid-2 nd and mid-3 rd centuries AD |
| Phase V-VIII | : between the mid-3 rd and mid-4 th centuries AD |
| PHASE IX | : last half of 4 th until the early 5 th century AD |
| Phase XII | : 7 th century AD |

19. The Megali Porta Baths

Plate : Figs 37 and 68-69; plates 63a-64c.

Location : The Megali Porta Baths occupy an area to the south of the Praetorium Baths.

Site Description/Context : The Megali Porta Baths formed the western façade of an enormous central square, onto which it opened through an *exedra*. The square was also fronted (on its north side) by two small twined buildings which have been identified as temples. This square possibly represents a *forum* as is suggested by the planning blueprint of the Roman city.

Bathhouse Description : The Megali Porta and the Praetorium Baths represent the main ruins at Gortyna to attract the attention of visitors over the past centuries. Travellers describe an arch of the Megali Porta Baths which remained standing until the 18th century. This is also clear from Tournefort's engraving of Gortyna dating to 1767 (**fig. 37**). This representation has been verified by recent studies where evidence for the spring of an arch was detected within the width of wall M 25 (Masturzo & Tarditi 1994-5, 246, fig. 10).⁴ Masturzo has devised a hypothetical reconstruction for the first phase of the baths (**fig. 69**). The baths have been subdivided into 21 areas with five main bathing areas: *frigidarium* X, *caldarium* IV, cistern II, *laconicum* XV and area XVI.

There is a slight rise, with regular dimensions, in the terrain to the north of the general complex. It has been suggested that this represent the area of the original Hellenistic *palaestra* of the complex, completing a format comparable to the Praetorium Baths, which were planned around an ample peristyle (**fig. 67a**).

The outer limits of the complex are delineated by a series of later walls representing the hydraulic distribution network of the late-antique period. The complex is bordered to the north by the walls M 1, M 127, M 4 and M 5 and to the east by walls M 9 and M 30 (Masturzo & Tarditi 1994-5, pl. VI).

Area II, located to the north of the complex, consists of a compartment, measuring 9.4m x 18m, with a wall thickness of 1.7m which possibly facilitated a barrel vault (**fig. 68**). The area was used as a cistern, as indicated by the lining of

⁴ The numerical order for the walls of the complex are taken from Masturzo and Tarditi, as denoted on their accompanying plan VI (1994-5).

opus signinum incorporating characteristic bevelling along the angles (Masturzo & Tarditi 1994-5, 243).

Area IV represents the *caldarium* of the complex and consists of a long rectangular room with two substantial side-niches (**fig. 69**). The room, measuring *c.* 13.2m x 26m, was roofed with a barrel vault rising to a potential height of *c.* 15.58m. The southwestern wall of the area incorporated a wide aperture that availed of the afternoon sun. Two substantial piers M 92 and M 59 supported this southern façade. The area is bordered to the northwest by wall M 19 which is preserved to almost its original height (**plate 63a**). The brick-faced mortared rubble of M 19 incorporates perforations for the use of spacer pins (**plate 63b**, between the angular putlog holes). These perforations are placed at regular intervals within the brick-faced mortared rubble at horizontal distances of *c.* 0.52m-0.53m and vertical distances of 0.60m-0.62m. These intervals indicate the incorporation of *bipedales* secured in position with the use of spacer pins.

Area VIII is located immediately northeast of *caldarium* IV. In phase 3 a small compartment, VII, was constructed within this area in order to access *praeefurnia* V and VI which heated the pool located in the north of *caldarium* IV.

Area IX represents a *tepidarium*, measuring 8.9m x 5.8m, which probably connected with *caldarium* IV (**fig. 68**). A doorway separated the northeastern walls of area IX while the southwestern area shows extensive remodelling. Wall M 26, common to both area IX and *frigidarium* X, stands to a considerable elevation. Apse M 124, representing the southwestern apse of *frigidarium* X, begins from the southwest end of wall M 26 (**plate 63c**). The entire central area of this apse is missing but the opposite extremity survives, represented by pylon M 56 and its curved wall M 57. The corresponding apse was detected at a substantial distance (over 30m) to the northeast. Its northwestern portion is represented by wall sections M 8 and M 121, while the southeastern portion is represented by the curved wall M 7.

The northeastern wall, M 10, of the *frigidarium* is *c.* 2.4m (*c.* 8 Roman feet) thick and was designed to support the lateral pressure of the vaulted roof which covered a span of 13.6m. The walls of the *frigidarium* were internally decorated with niches which are visible along the interior face of M 26 and M 66 (Masturzo & Tarditi 1994-5, 249). Architectural elements were found among the collapse of northeastern

wall M 10: one of the collapsed blocks incorporated an arch with a radius of 1.32m while evidence for a window was recorded in the great north wall of the *frigidarium*. The overall cruciform plan of area X is considered typical of Imperial *frigidaria*.

The small area XX in the southeast of the complex acted as a passage which presumably connected with areas XIII, XIX, XVI and the resulting space XXI (located between the apses of *laconicum* XV and *frigidarium* X). Area XXI could constitute a *praefurnium* constructed to heat the pools in the niche of area IV and that of the apse in area XV (**fig. 68**).

Another range of heated rooms is indicated by the presence of the *praefurnia* along the southwest of areas IV and XV. The large apsed *laconicum* XV, measuring *c.* 16.20m x 9.30m. The adjacent area, XVI, has the same length as the former (area XV) but has a narrower width. It has been identified as a *tepidarium* (Masturzo & Tarditi 1994-5, 269). The southwestern wall of XVI contained a window, supported by walls M 45 and M 44.

To the northeast of area XVII a narrow corridor was identified, area XVIII, probably a service passage, formed by walls M 32, M 34 and M 86. To the south of the bath an ample square (area XXII), formed by walls M 61, M 110 and M 62, was thought to represent another cistern due to its lining of *opus signinum*.

A wide semi-circular apse, with a diameter of *c.* 15.2m is located in the southeast corner of the rectangular block containing the bath complex (**plates 64a-b**). The absence of visible evidence for applied architectural decoration makes its identification as a monumental *nymphaeum* unlikely. It is possible that it represents a monumental *exedra*. The dimensions of the brick facing of this semi-circular wall (M 58) is datable to the 3rd century AD (Masturzo & Tarditi 1994-5, 257).

Type : Public bath.

Dimensions : Sanders claimed that the bath complex covers an area of 60m x 60m (1982, 158); however, Masturzo and Tarditi's plan present an even larger installation (**fig. 68**). It clearly would have occupied an entire block within the city plan, as is also evidenced with the *praetorium* complex (1982, 156, fig. 58, no. 11 and pl. 69).

Date

Phase I : Hadrianic period.

Phase II : second half of the 2nd century AD.

Phase II.I : 3rd century AD.

Phase III : 4th and 5th centuries AD.

Phase IV : 6th century AD on.

Dating Methodology : The chronology of the architectural phasing of the bathhouse was derived from the dimensions of its brick; however, the absolute dating of the Megali Porta Baths, based on the comparison of the constructive characteristics, specifically that of the brick-faced mortared rubble, with other monuments of Gortyna is problematic as many of the monuments within the city are awaiting publication. Consequently, Masturzo and Tarditi limited a comparative study to specific structures such as aqueduct C, the large theatre, the buildings on the acropolis (the western wall), fountain 5, the semi-circular *nymphaeum* to the west of the sanctuary of the Egyptian Deities, the sanctuary of the Egyptian Divinities itself (the wall south of the entry), the theatre on the acropolis, the eastern theatre, the Pythion theatre, the temple in the *praetorium* (Temple of the Augusti), the Baths at the T-junction (B 20) and the Praetorium Baths (wall US 602) (1994-5, 264).

In summary: the brick thicknesses decrease with certain regularity in the course of the 2nd century AD. It is observed that the facings incorporating bricks considerably less than 0.04m thick are placed at the later end of the 2nd century AD. The thickness of the horizontal mortar joint is maintained between 0.02m and 0.03m throughout the 2nd century AD and only becomes a definitive feature with the late Imperial age.

20. Baths at the T-junction at Gortyna

Plate : Fig. 70.

Location : A small late-antique bath was discovered in Sector L southeast of Aghios Titos (Di Vita 1979-80, 448, fig. 7). This bath lies to the west of the modern T-junction at the site (Sanders 1982, 158).

Bathhouse Description : The bath is designed on a north-south axis with two oblong areas offset to the north and south (**fig. 70**). The walls are preserved to a height of over 2.5m and are constructed of roughly-worked stones bonded with mortar (Di Vita 1979-80, fig. 10).

The ruins of the bath were subsequently the focus of a late-antique cemetery. 56 tombs were grouped around the apsed feature of the bath (Di Vita 1979-80, 449, fig. 8). The bath must have been destroyed in the 6th century AD with some later activity represented by a ceramic kiln in the east of room 2. The structures of the bath began to collapse in the 7th century AD.

The bath was probably built in the last quarter of the 4th century AD and overlies a *nymphaeum* of Imperial date. Harrison incorrectly interprets the bath structure itself as that of a *nymphaeum* with fishponds (1990, 504). The earlier structure survives only as a brick foundation.

Type : Unknown.
Dimensions : Unknown.
Date : 4th-6th century AD (Di Vita 1979-80, 451).
Date Methodology : The structural phasing and construction style provides clear chronological delineation.

Lebena 21-23

Plate : Figs 41-43.

Location/Site Description/

Context : See aqueduct entry A 11. The profusion of bathing structures at Lebena is clear from even a brief visit to the site. Vasilakis conducted excavations in nine trenches spread over the site which all yielded evidence for public buildings (1989-90, 286). The associated architecture comprises numerous cisterns and sections of water channels.

21. Lebena: The Stoas (B1)

Plate : Figs 41-42; plates 28b-c.

Location : These structures are located in the main complex on the rise directly west of the temple.

Bathroom Description : To the west of the temple a group of wall foundations represent what is traditionally known as the West Stoa. The complex is 14.8m long and subdivided into two series of small compartments, each measuring 2.6m x 3.9m, some of which seem to represent bathing facilities despite the fact that they survive

only as foundations. A structure, measuring 4.5m x 3.25m, forms an adjunct to this wing. Its *opus signinum* lining and thick walls indicates its use as a cistern, possibly associated with the bathing facilities (**plates 28b-c**). This structure is referred to as a *nymphaeum* by Charalampos (1992-3, 278). The identification as a cistern associated with a bathing facility is also reinforced by the fact that the aqueduct terminates just west of this complex.

Type : Public.

Dimensions : 4.5m long x 3.25m.

Date : 2nd century AD.

Dating Methodology : Date attributed to the main activity of the wider area of the sanctuary. The broader settlement has been attributed mainly to the 2nd and 3rd centuries AD (Vasilakis 1996, 643).

22. Lebena: Structure B*

Plate : Fig. 41.

Location : Structure B* lies on one of the terraces south of the small chapel of Aghios Ioannis which was constructed over a basilica bearing the same name.

Bathroom Description : Taramelli describes the structure in his notebooks. He records the foundations of a large rectangular room extending for 15m on a north-south axis and another smaller compartment, measuring 5m x 8m, extended to the south of this. Two compartments flank the main room: a rectangular compartment to the east and a square compartment to the west. The fact that they were internally lined with *opus signinum* is suggestive of a hydraulic function.

Halbherr's excavations later affirmed the initial interpretation of the building as a bathing complex. Halbherr writes in his notebooks that trenches laid in 1911 in the area of Building B* revealed

'a huge construction in brick, probably devoted to physical cures. On the floor of the building small columns of discoidal bricks laid one upon the other have been found' (unpublished manuscript).

These discoidal bricks are likely to represent *pilae* from the *hypocaust* of a bath. This may be the bath referred to in the complex by Pendlebury (1939, 373). Melfi also agrees that the foundations represent a bath building complete with *pilae* and *suspensurae* (pers. comm. 2001). In 1999 she observed that only scanty remnants of building B* survived including stretches of brick-faced mortared rubble, occasionally lined with *opus signinum* and associated with fragments of terracotta pipes.

Type : Public.

Dimensions : The main room was 15m long while the southern compartment measured 5m x 8m. The dimensions for the compartments to the east and west are not known.

Date : Unknown. Possibly 2nd century AD.

Dating Methodology : A date corresponding with the general date of the entire complex. The broader settlement has been attributed mainly to the 2nd and 3rd centuries AD (Vasilakis 1996, 643).

23. Lebena: Structure B***

Plate : Fig. 41.

Location : Another possible bath B*** has been recognised a few meters to west of B** on the lip of the gully carved by the central stream.

Bathroom Description : Taramelli describes the structure as a long and narrow building which opens onto the edge of the man-made channel of the stream course. The structure survives to a height of 1m with finely-constructed stone walls which extends on an east-west axis for *c.* 27m. It could originally have been longer as its edges are not clearly defined. The external wall was 0.4m thick but the building was only 2.50m wide and was subdivided into various compartments.

The fact that the complex was internally lined with *opus signinum* and that the aqueduct (**fig. 41, marked as AR**) was directed to these lower slopes suggests that the area was also used for bathing. Taramelli suggest that these baths could have been of the open-air variety (*unpublished manuscript*).

Type : Public.

Dimensions : 27m long x 2.50m wide, with a 0.4m thick external wall.

Date : 2nd century AD.

Dating Methodology : The date is based on the accepted date for the majority of structures in the complex. The broader settlement has been attributed mainly to the 2nd and 3rd centuries AD (Vasilakis 1996, 643).

24. Sybritos

Plate : Fig. 71.

Location : Lat: 24.658; Long: 35.2583. The modern village of Thronos is situated at the northwest entrance to the Amari Valley. This valley is located in the southwest slopes of the Idaean mountain range and is rich and fertile, watered by the Platis River. The conical hill called Kefala rises 618m above sea level at the back of the village. The ancient name Sybritos is supposedly derived from *Su* meaning water and *Britos* meaning sweet which may refer to the copious springs found near the hill (Spanakis N.D., II, 355).

Site Description/Context : The most famous Roman remains from the site constitute the mosaics of the *plateia*. These mosaics are today incorporated to the main basilica in the village but originally belonged to an earlier important building over which the basilica is built (Sanders 1982, 114). Another mosaic, possibly dating to the 4th century AD, was located within a private context in the area called Ta Marmara to the southwest (Kirsten 1951, 149, pl. 119, no.4).

Bathroom Description : The richest area for Roman remains lies between the church and the house of Stavrolakis where the path descends to the valley. At this point Kirsten recorded a brick column founded on bedrock supporting a mosaic fragment. Kirsten attributes this arrangement to the hypocaustal system of a Roman bath (1951, 149). In the immediate area basements of a range of Roman houses are recognisably incorporated into the foundations of the modern houses of the village. Kirsten deduces that this area was a much richer area in terms of Roman settlement than that of the outlying area of Ta Marmara.

Type : Unknown.

Dimensions : Unknown.

Date : Unknown.

25. Vizari

Plate : Plate 65a-c.

Location : The modern village of Vizari is located mid-way along the Amari valley. A Roman town has been identified in the level ground about 1km east of the modern village.

Site Description/Context : The site at Vizari is famous for its basilica dating to the 8th or 9th century AD (**plate 65a**). There is evidence of an extensive Roman town extending between the basilica and the village. Traces of occupation include the remains of stone-faced mortared-rubble walling which spread over an area of *c.* 300m (north-south) x *c.* 500m (east-west) (Hood *et al.* 1964, 77). Sanders records ‘cement’ walls throughout the area (1982, 162). In the light of the discovery of a possible bathhouse in conjunction with the wide pottery spread it can be deduced that the Roman settlement was flourishing (Kalokiri 1959, 34).

Bathhouse Description : Kalokiri cleared a mosaic floor thought to belong to a bathhouse 1km southeast of the basilica (1959, 33-34, pls II’¹, 1 and 2, IΔ’; Hood *et al.* 1964, 65, no. 6). The mosaic, measuring 3.35m x 5m, was set in an apsed room with traces of a square bench around the southern niche (**plate 65b**).

The black-and-white mosaic consisted of three parts; the central panel and two wings. The central panel was composed of a square frame bordered by series of black dotted lines. The southeast corner of this frame was occupied by a representation of a helmet, complete with plume and cheek-pieces, set between two greaves (**plate 65b**) (Platon 1958, 471; Kalokiri 1959, 33-34). Sweetman located the mosaic in the basilica itself and interpreted the design as ‘two large-billed birds, one either side of a coiled snake’ (1999, 107-8). This is incorrect and Kalokiri’s initial interpretation of a triumphal scene, albeit a unique scene in the Cretan mosaic retinue, is the more accurate interpretation. A schematic shield defines this corner motif, completing this triumphal group. The theme must have been repeated in the other three corners where smaller fragments belonging to identical features were recorded. Unfortunately the central roundel has been destroyed.

To the south of this frame, at the apex of the apse, a second frame depicts a winding budding branch unfolding and terminating in a pomegranate. Two birds sit on the branch before the tendril uncoils (**plate 65c**).

Type : The fact that the area was thought to be a flourishing settlement at least provides the context for a possibly public bath (Kalokiri 1959, 34). Hood *et al.* describe the area as a Roman town (1964, 77).

Dimensions : The mosaic floor measures 3.35m x 5m.

Date : The mosaics have been dated to the last half of the 3rd century AD.

Dating methodology : Kalokiri assigns the mosaic to the last half of the 3rd century AD and applies this date to the bath building itself (1959, 34; Hood *et al.* 1964, 77). Sanders compares the black-and-white shield design to similar motifs in the mosaics at Kastelli Kissamou and the foliated scroll to those of Nea Paphos in Cyprus which date to the 3rd century AD (1982, 54).

26. Stavromenos Chamalevri

Plate : Fig. 72; plates 66a-c.

Location : Stavromenos Chamalevri is located in the *eparchia* of Mylopotamos at the eastern edge of the coastal plain of Rethymnon. The large site occupies an area between the sea and the first hill inland and stretches for about 1km along the coast. Its ancient name remains unknown, although Allaria and Pantomatrion have been suggested (Hood *et al.* 1964, 62). The bathhouse is located on the north slope of a hill called Tskouriana which lies to the west of the modern settlement of Stavromenos Chamalevri (Hood *et al.* 1964, 62). The toponym Loutra attached to this area must be a legacy of these ruins.

Site Description/Context : The earliest occupation on the site dates back to the Early Minoan period (*Kathimerini* 28/7/93); however, the area became a significant centre in Classical times and possibly continued as a dominant centre into the Roman period (Gavrilaki-Nikoloudaki 1988b, 557). Eva Tegou of the 25th Ephoreia reported that the excavations in Chamalevri revealed buildings of the Late Classical and Early Hellenistic period (Gavrilaki and Tzifopoulos 1998, 343, n. 4).

On Sinani hill a rock-cut structure was discovered to the east of the bathhouse (Hood *et al.* 1965, 64). The structure has been identified as a cistern and has been linked to a rock-carved channel measuring 2.2m long and 0.80m wide (Andreadaki-Vlazaki 1991, 431). The cistern was filled with ceramics dating to the 2nd century AD including numerous amphora fragments.

Bathhouse Description : Excavations at the Dafnomili Plot revealed a Roman bath (Andreadaki-Vlazaki 1991-3b, 245, pls 5a and b). The overall complex consisted of a row of rooms, with nine distinguishable areas, aligned on an east-west axis (**fig. 72**).

Area 6 is a horseshoe-shaped plunge-bath, measuring 3.7m in width and 2.2m to the apex of its curved eastern wall. The pool is accessed via a bench or step along its straight western wall (**plate 66a**). The area was identified as a plunge-bath on the basis of its apsed shape, characteristic bench and the fact that a drainage pipe pierced its southern wall (Andreadaki-Vlazaki 1991-3b, 245). The pool was lined internally with *opus signinum*. The excavation of this feature yielded an assortment of different material including cooking pots, amphora necks and handles and jugs dating to the ‘Late Roman’ period, along with a LMIIIA kylix stem and fragments of later glazed ware.

Area 1 is located to the south of plunge-bath 6 and measures 5.5m x 4.5m. It may have had a mosaic floor originally as the area was littered with *tesserae*. A rock-cut drainage channel crossed the room on an east-west axis and continued into area 2 (**plate 66b**). Numerous lamps of ‘Cretan type’, amphora handles and ‘Late Roman’ cooking ware sherds were found in the area (Andreadaki-Vlazaki 1991-3b, 245).

Area 2 was badly destroyed (2.7m x 4.7m). The pipe discovered in area 1 also traverses through this room and connects with the hypocaustal area to the west (area 3). Removing the surface layer revealed layers of white ash over a layer of yellow and green sandy earth. A destruction layer of small stones and brick fragments was found below this. These were all removed to expose clay disc *pilae*, some surviving up to heights of between 0.43m and 0.76m, while others were preserved only as foundations within the floor (**plate 66c**). Spacer pins constituted characteristic finds associated with the room, which imply that the bath was heated using a wall cavity for the diffusion of heat from the floor. Other fragments of storage and transport pots

were also found including amphorae, jars and *pithoi* (Andreadaki-Vlazaki 1991-3b, 246). The room is thought to have had a vaulted roof (Andreadaki-Vlazaki 1991, 430).

Area 4 represents a second *caldarium* located west of *caldarium* 3, measuring 5.5m x 2.7m. The floor was partially rock-cut and was set at a slightly lower level. The walls are composed of brick-faced mortared rubble. The area also yielded clay *pilae* set on large rectangular bases. A pipe in the southern wall terminated just above the *pilae* i.e. at the original floor level. An arched flue to the west of area 5 indicates a second *praefurnium* in this direction (area 8).

Area 5 represents the *praefurnium* located to the south of the *caldarium* (area 3), with which it is connected via an arched opening (Andreadaki-Vlazaki 1991-3, 246, fig. 5a). The rock foundations of the bath have been levelled and the walls of the bath are constructed of unworked stones. A bench (0.65m x 0.5m) constructed of small stones was positioned along the west wall of the *praefurnium*. The 0.75m-wide entrance is located in the east wall. The area was accessed via a rock-cut threshold and a rectangular stone step with a small ramp. Sequential phasing over time is evident in the architecture of the chamber, as it has a blocked entrance in its west wall while the stratigraphy included successive floors of compacted earth. An arched opening found in the western wall, comparable to that of room 3, indicates the existence of a second *praefurnium* to the west (AR 1996-7, 124-5). The *praefurnium* communicated with *caldarium* 3 through a low arched flue. Nearly complete cooking pots were collected from this area (some from the arched entrance) along with cups, *pilae*, stone grinding basins and some animal bone. It has been suggested that the room was a cooking establishment (Andreadaki-Vlazaki 1991-3b, 246).

Type : Uncertain. Possibly public due to its potential size, duration, double *caldaria*, and its location in the heart of a substantial Roman settlement. However, the horseshoe-shaped plunge-bath is identical to the example in the private villa at Makriyalos.

Dimensions : Andreadaki-Vlazaki concludes that due to the fact that other walls are found in the immediate vicinity this was a considerable establishment (1991-3b, 247).

Date : 2nd century AD until its abandonment in the 5th century AD.

Dating Methodology : Dated on the basis of stratified layers and associated pottery (Andreadaki-Vlazaki 1991-3b, 246; 1991, 430; *AR* 1996-7, 124). Many lamps of ‘Cretan type’ (perhaps similar to those found at Alpha mentioned below) were found associated with amphora handles and fragments of cooking pots of ‘Later Roman’ date (Andreadaki-Vlazaki 1991-3b, 245). Spacer pins were also found which generally indicate a 2nd or 3rd century AD date (Andreadaki-Vlazaki 1990, 446, pl. 222a).

27. Alpha

Location : A Roman bathhouse was found in the *eparchia* of Mylopotamos near the village of Alpha in an area locally called Mnimata (Tombs) named after the Roman tombs found here.

Site Description/Context : The site is close to another Roman site at Plaka Kalis and both sites are arguably satellite settlements of Eleutherna.

Bathhouse Description : Thorough stratigraphical excavations were conducted in the Vasilakis Plot. All the floors of the bath-complex are rock-cut. An arched compartment built of brick-faced mortared rubble represents a *praefurnium*. This structure was cleared for a length of 2.3m but continued into the baulk to the east. The southern wall of the *praefurnium* contained four airducts, three measured 0.24m x 0.22m while the other two were slightly smaller, measuring 0.2m x 0.1m. The *praefurnium* had two steps on its western side (0.30m wide) and a landing which led to other rooms. The floor was lined with a thick layer of ash while a thick layer of scorched earth filled the rest of the vaulted compartment (Vanos 1994-6, 290-1; 1993, 486-7, pl. 151d). Near the floor of the *praefurnium* a bone hook was found along with green glass shards. In the north wall of the room a low brick arch (1m x 0.8m) communicated with a low hypocaustal area with series of brick *pilae* (Vanos 1993, pl. 151ε-στ; 1994-6, pl. 21b).

Trench III was opened to the east of Trench I in order to follow the walls of the *praefurnium*. The walls were easily traced and another arched opening was located in a wall to the north, at the same height as the previous arch of the hypocaust.

The upper layers of the area yielded a stone basin measuring 0.67m x 0.53m. The basin held a group of lamp fragments of a recognisable 'Cretan type' (Vanos 1993, 487). Five rectangular stone slabs were also found, each measuring 0.60m x 0.35m x 0.20m. The slabs, one of which was a reused cornice piece similar to that reused in Wardle's private bath in Knossos, covered a central drain with a width of 0.20m (Vanos 1994-6, pl. 21a). Spacer pins were also found in Trench III (Vanos 1993, 487; 1994-6, 291). In the northwest corner of the plot rock-carved cisterns were discovered. The excavator compared them with those at Eleutherna, although the latter are clearly of a much larger scale.

Type : Unknown. Possibly the bath-suite of a villa or a satellite settlement of Eleutherna.

Dimensions : Unknown.

Date : Possibly 3rd century AD.

Dating Methodology : The bath has been attributed a 3rd century AD date. Surface finds from the area included marble pieces and two 3rd-century AD coins (Vanos 1994-6, 290). It is unclear whether these surface finds contributed to the 3rd-century AD date assigned to the bath, as this may have been secured through other stratified finds including glass utensils and architectural elements although no chronological explanation was offered (Vanos 1994-6, 290).

The fact that spacer pins were retrieved from the hypocaustal areas might actually suggest a 2nd-century AD date as Farrington and Coulton note that most of the known examples in the wider empire date to the 2nd century AD (1990, 64). Admittedly, the Praetorium Baths at Gortyna yielded a late 3rd- or 4th-century AD date for this heating system. The 'Cretan type' lamps (perhaps similar to those from the bathhouse at Stavromenos Chamelevri) must have contributed to the date arrived at by the excavator but they were not discussed in detail in the report (Vanos 1993, 487).

28. Eleutherna: The Large Bath

Plate : Fig 74; plate 68c.

Site Description/Context : See aqueduct entry A 13.

Location : A public bathhouse was discovered below the acropolis plateau to the southeast in the area of Katsivelos. House 2 lies directly below this bath to the north while the basilica of Saint Michael lies below to the east (**fig. 73**).

Bathhouse Description : The bath was built on top of a massive Hellenistic retaining wall in the south of the excavated area. The site of the bath offers a magnificent view of the site to the north over which it towers. Prior to the recent excavations vaulted roofs of structures were visible above the terrace. They were traditionally believed to be tomb remains. Excavation confirmed that they form a system of staggered water cisterns, each one lower than the previous, which descend from north to south. They were supplied by a network of conduits which were fed from the main aqueduct of the acropolis. The vaulted cisterns supplied the monumental bath which occupied the terrace.

The bath is composed of massive dressed rectangular blocks of local limestone whose ashlar qualities are reminiscent of Hellenistic construction rather than that of a Roman bath. The plan is rectangular with protruding apsed features and demonstrates a degree of symmetrical balance (**fig. 74**). A large rectangular paved court composed of large slabs of local limestone occupies the central area (**plate 68c**). Two columns along the long axis supported the roof of the paved area during the first phase of the building.

The second building phase is characterised by a slight transformation of room arrangement along the main northern side. The original roof seems to have been abolished at this time and a degree of deterioration is also evident, as attested by the removal of some paving stones. A stone bench was placed between the two columns. A tall slender Ionic column of white marble, along with its capital and base, were found fallen beside the bench. Its original use is not known but it appears that its role was decorative and not functional as the necessary iron attachments and fittings to secure the base and capital were missing. It formed an architectural frame for the reused sculpture of Aphrodite fixing her sandal and her escort, Pan, which were found in the same area.

A series of rooms were located along the length of the south side of the central paved area. The rooms at the eastern end functioned as hypocausts and have series of cavities for the applications of spacer pins. The large rectangular area to the

west incorporated an apse and functioned as the *frigidarium*. The four areas were roofed with vaults composed of large limestone blocks, the collapsed blocks were concave on the interior and convex on the exterior, while a line of trapezoidal key stones were set along the length of the apex.

A series of auxiliary rooms were identified along the length of the north side of the central paved area. These rooms overlooked the Hellenistic terrace which limited the northern extent of the bath.

An impressive and well-preserved stairway provided access to the building at the eastern end of the northern stoa. This entrance effectively connected the central courtyard with the central street of the city.

The daring, expensive and careful construction of the bath reflects the economic strength of the city in the Roman period to which the initial plan of the building and its construction seem to belong. A thick 3rd-century AD destruction layer, with intense evidence of fire, signals an end to the use of the bath. A large quantity of fallen stone from wall collapse covers the floors of the rooms and the central paved area. Architectural elements such as spacer pins were found in abundance while decorative material included numerous pieces of coloured marble veneer and painted wall plaster (Themelis 2002, 60). The impression is that of violent collapse and sudden abandonment of the area.

The layers were rich in portable finds including numerous coins and small objects relating to the clothes of the bathers such as pierced bone and shell. A cylindrical gold amulet, with two suspension strips, featured among the finds (Themelis 2002, pl. 67). It is similar to an amulet from a grave in the area of the atrium of House 2. Numerous coins and Corinthian lamps date the destruction to after the middle of the 3rd century AD.

Particularly noteworthy are the reused sculptural pieces found within the baths. A statue of Pan was discovered fallen on the paved floors of the north stoa. The god is depicted wearing a skin which contained peaches, nuts and figs. His ears are pointed and animal-like while his facial features are human. The statue can be dated stylistically to the end of the 4th or the beginning of the 3rd century BC or perhaps even later. The statue of Aphrodite in the pose of 'Sandalbinder' survives almost

complete, except for the left arm, the right hand and left foot. The statue dates from the 1st century BC or the 1st century AD.

Type : Public.

Dimensions : c. 25m x 16m.

Date : The initial phase of the structure is thought to date to the late 1st or early 2nd century AD. The presence of the spacer pins suggests use in the 2nd century AD. Corinthian lamps and coins indicate a destruction just after the middle of the 3rd century AD. The contents of the final strata indicate a violent collapse and sudden abandonment of the installation (Themelis 2002, 60).

29. Eleutherna: The Small Bath

Plate : Figs 73 and 75; plates 67a-68a.

Site Description/Context : See aqueduct entry A 13.

Location : This public bathhouse was discovered at Katsivelos below the acropolis plateau to the northeast (**fig. 73**).

Bathhouse Description : The bath constitutes a Roman installation (despite being referred to as a small *balaneion* by the excavator, see Themelis 2002, 49-53) located in the northern area of the large excavation plot. Two identical interconnecting apsed areas were discovered in the western section of the bath (**fig. 75**, areas 70 and 50). Both of these areas originally functioned as hypocausts as indicated by their circular and square *pilae* and spacer pins. The *suspensurae* floors do not survive. The areas are connected by airducts which penetrate their shared wall. Hypocaust 50 also connected with a smaller adjacent area (57) which also functioned as a *praefurnium*. To the west of these apsed hypocausts, three rooms were discovered (70d, 77 and 74) which also belong to the early phase of the bath. Their use is not known.

The two main hypocaustal halls (areas 70 and 50) belong to the first phase of the building but ceased to function as hypocausts in the 4th century AD when they were used as storage and refuse areas until the Protobyzantine period, effectively until the 6th and 7th centuries AD. The last phase of the structure coincided with the construction of a Protobyzantine house which occupied the area in the years of Constans II.

In the latest phases of the bath two hypocausts were constructed to the south of the complex, areas 43 and 44a (**plate 67a**). Oval area 60 might have acted as a type of fire chamber supporting a furnace-boiler similar to that found in the Large North Baths at Timgad (Yegül 1992, 369, fig. 463). The *praefurnium* servicing this *caldarium* complex is represented by area 45 and communicates with the hypocaustal areas via a small brick arch. Areas 47, 48 and 48a are large paved rooms. The square sunken feature (area 51) off room 47 is difficult to interpret but may function as a plunge-bath (**plate 67c**).

Structure 84 is located above the bathhouse to the west and is internally lined with *opus signinum* (**plate 68a**). The structure is likely to be a cistern which acted as a storage and settling cistern for the water from the main aqueduct which emerges from the cliff-face just above this point (see aqueduct entry A 13). A conduit drains the cistern at its base and leads in the direction of these baths (**plate 67b**). It can be concluded that this structure acted as a regulatory cistern for the water supply of the baths.

- Type** : Public baths.
- Dimensions** : The main bathing block is expansive as it stands at approximately 17m x 25m.
- Date** : 2nd until the 6th or 7th centuries AD with at least three phases.
- Dating Methodology** : The baths' construction can be assigned to after the middle of the 2nd century AD, namely after the destruction and abandonment of the adjacent public building. The bath was substantially altered in the 4th century AD when two apsed hypocaustal halls (70 and 50) were abandoned and were used as storage areas for refuse in the Protobyzantine period. They were filled with a variety of material, stone, animal bones, glass and pottery dating to the 6th and 7th centuries AD (Themelis 2002, 109).

30. Eleutherna: The Private Bath-Suite in House 2

- Plate** : Fig. 73, areas 23 and 26; plate 68a
- Site Description/Context** : See aqueduct entry A 13.

Location : In the area of Katsivelos immediately north of the Large Bath (B 28).

Bathroom Description : Evidence for a private bath-suite was identified in Roman House 2. Here a hypocaust survives on a second storey which is a unique occurrence in the Roman world. The circular *pilae* remain *in situ* supporting *suspensurae* flooring which has been covered with white marble veneer (**plate 68a**). White marble veneer also covers the walls and was presumably held in position by the many spacer pins collected from this area.

In other areas of the house, specifically area 26, multi-coloured painted plaster and numerous coins had fallen from a room above (Themelis 1994-6, 269). The adjoining room 23 also yielded an almost entire mosaic floor which had collapsed from a room above which the excavator also attributes to the bath-suite (Themelis 1994-6, 269, 268 for plan, pl. 11; Themelis 2002, 80).

Type : Private, due to its context in a private Roman house.

Dimensions : Unknown, but quite extensive as it occupies the upper storey between room 26 and the public bath to the south.

Date : 2nd to 4th centuries AD.

Dating Methodology : The destruction level of room 26 yielded numerous fallen objects including 58 copper coins dating from the middle of the 3rd century AD, although there were also many examples from Cretan mint under Hadrian. Thus Themelis argues that the graffito, reading *Νείκην Τῶι Κυρείῳι*, on the lintel-stone of the doorway between rooms 23 and 26, related to the persecution of the Christians under Decius around the mid-3rd century AD (1994-6, 269, pl. 12b). However, Tzifopoulos also hints at a later date (2000, 252).

House 2 has two phases, the first lasts until the last quarter of the 3rd century AD after which the house changes shape, and probably use. It continues to be occupied until some time in the 4th century AD when the entire house was destroyed by earthquake (Themelis 1988, 300; 1994-6, 269; 2002, 76). House 1 is also destroyed by this event.

31. Plaka Kalis

Location : Plaka Kalis is located in the *eparchia* of Mylopotamos. It is located *c.* 3km between Perama and Eleutherna on an ancient route crossing the hills and fertile valleys which are typical of the region. The site is situated between the Kalandarianos and Margaritsanos Rivers in the area known as Plevriana Margariton.

Site Description/Context : Sanders maintains that Plaka Kalis could represent a satellite villa of Eleutherna (1982, 30, 163).

Bathroom Description : Platon excavated the Roman bathroom here (1957, 337). The hypocaust is represented by an area of limestone paving slabs surviving for a length of 5m associated with circular *pilae*, terracotta pipes and marble veneer fragments.

Type : Private (Sanders 1982, 30).

Dimensions : Unknown.

Date : Unknown.

32. Lappa: Remains thought to represent Belli's Plan

Plate : Figs 76-77.

Site Description/Context : See aqueduct entry A 16.

Location : Belli draws the plan of a construction at Lappa which he labels a temple (**fig. 76**). The majority of subsequent observations about the building are based on this plan itself rather than the remains in the field. Falkener interprets the plan as that of a bath and compares the *exedrae* in the corners of the large oval rooms to *sphaeristeria* commonly found in Roman baths (1854, 25, n.).

Sanders records actual bath remains in the vicinity of the medieval mills below the springs that supply the Mousella which he equates with Belli's illustration. Sanders attributes a bathing function to the remains in the field on the basis of their proximity to numerous springs 'leaving little doubt that this was a bathroom and not a temple as Belli calls it' (1982, 83).

Bathroom Description : Bathrooms have been recorded at Lappa by several authors and Spanakis in particular observed the standing remains of a *frigidarium*, a *tepidarium* and a *caldarium* (N.D., II, 243; Spratt 1865, II, 117; Defner 1928, 73-4).

All that survived when Sanders viewed the remains below the mills were two piers constructed of brick-faced mortared rubble which stood 3.5m high, each measuring 2m x 2m and set 6m apart (1982, 83). Sanders also reports two cisterns in series, each 4m wide, attached to one of these piers (1982, 83). Sanders claims that these remains represent the complex planned by Belli (as measuring 82m x 36m, and thought to be comparable with 3rd and 4th-century Imperial *thermae*). If this is the case, and it is almost impossible to prove, it clearly demonstrates how much more has been destroyed since the last century.

Rather surprisingly, it is Pashley who adds substance to Sanders' rather unscientific deductions. Pashley records the remains of an odd circular building with an internal diameter of 60ft (18.3m) near the entrance to the village (**fig. 77**). He observed that the arches represent recesses, each constituting over a semicircle with a diameter of 11ft (3.3m). About 300 paces to the south-southwest he also records a large ancient cistern (which could represent that discussed under aqueduct entry A 16; known as the 'Octavian' cistern). Pashley's descriptions were accompanied by an etching of the structure denoting three then-complete arches with at least six piers (**fig. 77**) (1837, I, 81 and 83). His description would seem to relate to a structure at least similar to Belli's plan (**fig. 76**).

Type : Public.

Dimensions : Unknown.

Date : Unknown. Sanders suggests that the plan executed by Belli portrays a 3rd or 4th-century AD Imperial bath type (1982, 84 and 163).

33. Lappa: The Bath under the Church of Aghios Nikolaos

Plate : Plates 69a-c.

Site Description/Context : See aqueduct entry A 16.

Location : Bath foundations are detectable in the chapel of Aghios Nikolaos located within the village on the northern cusp of the hill (Gerola 1908, II, 51-3).

Bathroom Description : The brick-faced mortared rubble of the earlier bath structure is evident at the base of the chapel walls (**plate 69a**). Brick facing is also evident in the wall opposite the chapel, effectively a terrace wall supporting the

pedestrian street above. The section of brick facing in this terrace is pierced by two pipe-holes (**plate 69c**).

An apsed feature adjacent to the church has been transformed into an outdoor shrine (**plate 68b**). It measures *c.* 1.5m in diameter and stands 2m high. At the apex of the apse a small brick arch is visible and may represent a *praefurnium* feature. Sanders identified a possible plunge-bath, measuring 2.5m x 1.4m, in front of this apsed (1982, 163). This feature is no longer visible.

Type : Unknown. Possibly public due to its location in the heart of the ancient city and its potential size.

Dimensions : Unknown.

Date : Its construction has been dated between the 1st and 2nd centuries AD on the basis of its brick dimensions (Livadiotti Rocco 2000, 63-4).

34. Lappa: The Bathhouse in the Centre of the Village

Plate : Plates 70a-c.

Site Description/Context : See aqueduct entry A 16.

Location : The bathhouse is located in the centre of the village which also represents the heart of the ancient city.

Bathhouse Description : The main mosaic associated with the bathhouse was first discovered in the 1920s according to information Markoulaki gleaned from the oldest inhabitants of the village (1994-6, 249). The bathhouse, as it stands today, includes two architectural rooms (**plate 70a**). The room containing the largest mosaic is partially rock-cut. Two of the walls are rock-cut, plastered with hydraulic mortar overlaid with marble veneer (Markoulaki 1994-6a, 246-50). The main mosaic is composed of two main frames. The main frame is executed with a vault pattern identical to that of the Seasons Mosaic in the Villa Dionysus at Knossos (**plate 70b-c**). The corner insets of the main mosaic, set within an overall geometric design, depict stylised vegetation in the form of long-stemmed and long-leafed plants. The central motif is an eight-petalled flower set in an elaborate roundel while four more flowers are set in the diamond panels of the vault design. The lateral panels are defined by radiating fans set in arcs. Each inset is defined by a simple *gilloche* on coloured ground which also serves to frame the overall section. This is further

bordered by a band of ogives, also framing the entire section, while a further boundary consists of a broad straight-tongued outlined double *guilloche* (Balmelle *et al.* 1985, 124, f). According to Markoulaki the design of this mosaic is Western in style (1993, 481; *AR* 1997-8, 121).

The second frame within this room is decorated with a chequered mosaic design bordered by a wave crest motif (**plate 70a**). The central motif presents a three-petalled flower or whirligig set in a square defined by a simple black band and a further band of simple *guilloche*.

An adjacent room, also adorned with a mosaic floor, is now mainly covered by the modern pedestrian pathway. Despite its condition a swastika meander border is still discernible (personal observation). A thick wall pierced by two entranceways divides this room from the larger room occupied by the main mosaic described above (**plate 70a**).

No coherent account of the bathhouse has been published. However, a plate of the main mosaic frame has been published in a tourist guidebook although there is no corresponding text (Petraki 1997, 87). A motor-biking guide to Crete refers to the mosaic, supplying a photograph of its wave scroll border, while lamenting the lack of information on the site and strongly advises visitors to complain about this at the local cultural centre (Psimenos 1996, 247).

Type : Public.

Dimensions : Uncertain due to spatial restrictions imposed by the modern environs but it is evident that the walls continue in all directions from this central area. The main room measures 8.05m x 4.5m.

Date : According to the modern sign at the site the mosaic has been dated to the 3rd century AD; however, this date has not been referred to or explained in print.

35. Plakias

Location : The ancient site of Lamon is thought to be focused around the harbour area of modern Plakias. Hood and Warren were notably unimpressed with the Roman remains here but still suggest that it could represent an ancient harbour settlement (1966, 183).

Site Description/Context : The church of Aghios Georgios 200m east of Plakias, on the opposite side of the river from the modern site, is thought to represent the main area of ancient Lamon (Hood & Warren 1966, 183). The church is located c. 100m north of the road which skirts the beach. Hood and Warren do not mention any bath remains but record ‘Roman concrete’ to the west of the church and spreads of pottery sherds (including amphora fragments), glass sherds, tile, an iron axe-hammer and further architectural elements around the chapel. They also record the remains of a slab-covered grave and scraps of bone in the vicinity (1966, 183, no. 25).

Bathhouse Description : In the Plakias area construction work in the field of Brokalaki in 1976 revealed a Roman structure, believed to be a Roman bath. It was considered an important discovery as no other remains had previously been reported from the area (Tzedakis 1976, 372).

A small gulf to the west of Plakias, called Phoinikias, yielded archaeological remains. Andreadaki-Vlasaki remarks that this harbour is also referred to as Finikias-Loutro (discussion Markoe 1998, 241).⁵ It is possible that the appellation Loutro refers to the bathhouse discovered by Tzedakis in this area (1976, 372).

Type : Tzedakis suggested that the bath was a public bathhouse in the Roman city of Lamon (1976, 372). However, he also refers to the building as a *balaneion* and admits that only a small trial excavation was carried out and its context and significance is still vague.

Dimensions : Unknown.

Date : Unknown.

36. Preveli Ellenikon

Plate : Fig. 78.

Location : Platon identified a bathhouse on the east bank of the Megas Potamos River, c. 250m north of the larger of the 19th century bridges (1947, 638).

Site Description/Context : On the west bank of the tributary scatters of brick and ceramics indicated a smaller building which Hood and Warren label a Greco-Roman farmhouse (**fig. 78**) (1966, site 20 (2), 181). They recorded traces of ‘Roman

⁵ It is marked on a published sketch plan of the area (Hood & Warren 1966, 183, fig. 9).

concrete' walls together with dense plain orange sherds scatters extending to the north and south along the river bank covering an area of over 50m².

Bathhouse Description : Platon describes a circular bathhouse structure with a horseshoe-shaped (*πεταλοειδούς σχήματος*: literally petal-shaped) central room off which other rooms open (1947, 638). Visiting the site twenty years later Hood and Warren found a fragment of white marble wall veneer (1966, 180). Sanders (1982, 164) compares the plan of the building (based on Platon's description) with that of Belli's design of the bath building at Lappa (**fig. 76**) and the temple at Lebena (**fig. 43**).

Type : Hood and Warren refer to the complex as a possible Roman villa which would have controlled this well-watered and secluded valley of Prevali, as the monastery controls it today (1966, site 20 (1), 180). It may be relevant that Platon refers to it as a *thermae* (1947, 638).

Dimensions : Unknown.

Date : Unknown, although the building is referred to as Greco-Roman in the original report (Platon 1947, 638).

37. Loutro

Plate : Plates 71a-c.

Location : Lat: 24° 15'N; Long: 35° 46' E. The ancient site of Loutro is spread across a promontory, either side of which are two bays (**plate 71a**). The bathhouse is located on the eastern side of the peninsula.

Site Description/Context : The importance of the harbour in Roman times is illustrated by the inscription erected by the captain of the 'Isopharia' of Alexandria in the early 2nd century AD (*IC II xx 7*). The activity on the site was severely interrupted in the 4th century AD by a dramatic tectonic event which rendered the shallower western harbour ineffective. However, while the western harbour was raised high and dry, the deep-water harbour on the eastern side of the peninsula still functioned.

Ceramic scatters along the shore and the harbour itself reveal that this harbour was used from the Hellenistic period (and even earlier) into late antiquity. It was (and is) the only winter harbour on the south coast of Crete (Pirazzoli *et al.* 1982, 27-43).

Gerola mentions only one basilica at the site (1908, II, 58-9), yet the Sphakia Survey identified four (see <www.west-cret.com> or <www.crete.tournet.gr>). The survey also recorded Roman and ‘Late Roman’ houses and ancient terracing in the south of the peninsula. The stone of these buildings was reused for the construction of later limekilns, the Venetian fort and for the intensive terracing of the area (the terrace walls are generally multi-phased).

Bathhouse Description : A bathhouse should be expected at the site on the basis of toponymic evidence alone. A bathhouse is represented by apsed and vaulted structures, constructed of brick-faced mortared rubble, on the eastern bluff overlooking the eastern bay, which is currently being eroded by the sea (Jennifer Moody, pers. comm. 2000; **plates 71b-c**).

Type : Public.

Dimensions : Unknown.

Date : It is not clear when the baths were constructed. The baths were probably abandoned after the 4th-century AD seismic uplift.

38. Aptera: The Bathhouse associated with L-Shaped Cistern

Plate : Fig. 56; plates 72a-c.

Site Description/Context : See aqueduct entry *31.

Location : The bath is located directly north of the L-shaped cistern (**fig. 56**).

Bathhouse Description : The elevations of this bathhouse still survive two-storeys high as is clearly evident from the height of the apsed wall in the main room (**plates 72a-b**). A staircase accessing the upper floor is still discernible to the east of the complex (**plate 72c**).

The bathhouse comprises a northern central room with an apsed area to the north. A niche for either a small statue or a fountain is set within the wall of the apse. The floor of the apsed area is set 0.5m higher than the rest of the room and is floored with a bedding of pebbles. The main room is identified as a hypocaust due to the presence of several *pilae* bases. The room may have functioned as a *caldarium* with either a *labrum* or a small statue incorporated into the apse. This main area communicates with a smaller eastern room via an arched doorway.

A complex of at least six smaller rooms is located directly south of this (**fig. 56**, no. 3). This series of rooms does not seem to communicate with the northern central room at this level. However, the interconnecting doorways within this sector are clearly defined with heavy lintels. Three substantial barrel-vaulted rooms form the southern extent of the elevated remains. Sanders records masses of collapsed vaulting (on north-south axis) in these rooms (1982, 167).

Sanders attributes an elaborate ground-plan to the structure including a triple-apsed arrangement at the northern end of the building (1982, 167, fig. 60). Sanders' triple apse design is not included in Drerup's plan, denoting only a single central apse to the north, which seems to more accurately reflect the remains in the field (1951, pl. 66, no. 9).

The elevations are composed of roughly-worked stone facings over a mortared rubble core. The large dressed stones, predominantly used in the corners, were reused from earlier structures. There is only negligible use of brick. Regularly-spaced putlog holes would have supported scaffolds necessary for constructing a building of this height.

Type : Public.

Dimensions : The two-storey building is substantial in comparison with other baths on the island.

Date : The masonry of the baths complies with a 4th-century AD construction date.

Dating Methodology : Sanders labels both bathhouses as 'Late Roman' on his plan of Aptera (1982, 167, fig. 60). Both baths are labelled 'Byzantine' on Drerup's plan (1951, pl. 66). The construction work of the baths supports these vague dates. The elevations are constructed with stone-faced mortared rubble with wedges of stone flakes (and the odd reused brick) securing the main blocks. Large dressed blocks forming cornerstones are reused from earlier structures.

39. Aptera: The Bath to the North of the Triple Cistern

Plate : Figs 56-58; plate 73a.

Site Description/Context : See aqueduct entry *31.

Location : The bathhouse lies to the north of the triple-vaulted cisterns and is currently being excavated and conserved (**fig. 56**, no. 3).

Bathhouse Description : The bathhouse is constructed of stone facing over a mortared rubble core. Two large windows are evident high in the northern wall (**plate 73a**). Regularly-spaced holes, apparent in the masonry elevations, have been interpreted as spacer pin holes (Livadiotti Rocco 2000, 64).

Type : Public.

Dimensions : Unknown.

Date : Possibly constructed as early as 2nd century AD but with a predominantly later use.

Dating methodology : Spacer pins are generally 2nd century AD in date although there are some later examples. Ninou-Kindeli and Christodoulakos also report other contemporary features such as *suspensurae* flooring and *tegulae hamatae* (2000, 34).

40. Minoa

Plate : Figs 47-48; Plates 73b-74b.

Location : The bathhouse is located on the southern coast of the Akrotiri peninsula in western Crete.

Site Description/Context : See aqueduct entry A 17.

Bathhouse Description : The main Roman structure at Minoa is located on the seafront and was excavated by Theofanidis in 1939. The modern road cuts the complex along its south side; however, a plan of the features covered by the road is supplied in Theofanidis' general plan of the complex (**fig. 47**).

Theofanidis' initial identification of the complex as part of a quay installation, including a guardroom and an arsenal has impeded its correct interpretation (1950-1, 7). It has subsequently been re-identified as the bath-suite of a large seaside villa (Sanders 1982, 169, fig. 61; Raab 2001, 113). The overall complex is represented by traces of 'concrete walls' running c. 85m parallel to the shore, 0.7m above present sea level. Theofanidis excavated an area at the eastern end of these walls, measuring 25m x 25m, which exposed a range of 15 compartments (Sanders 1982, 169)(**plate 73b**).

This excavated area represents that of a bath-suite and can be further divided into three areas; the circular cistern, the main bath block and the veranda feature. The main set of rooms lies to the north of the veranda and a colonnade fronted this series of rooms judging from several bases found here. The veranda terminates in an apsed room (A and B) to the east. Room B was initially interpreted as an arsenal on the vague premise that it was surrounded on three sides by a corridor (Theofanidis 1950-1, 7). Similarly, areas Γ and Δ were originally thought to be dormitories for guards or soldiers because area Γ bore traces of mortar on its eastern wall and stone pipes along the western, while area Δ had a small bench (Theofanidis 1950-1, 7). The circular bricks found in the area prompted Theofanidis to draw comparisons with elements of a pillared stoa despite their clear connections with hypocaustal arrangements while the stepped feature in Δ is also indicative of a pool (1950-1, 7).

Areas E and Z are found to the west. In area E square plaques survived and along the east wall traces of steps ascended to a door in the north wall communicating with 'courtyard' Θ . In room Z the finds included a rectangular stone well-head with a circular mouth, the base of a wooden column and a basin carved out of a Doric capital. The capital measured 0.44m high with a width of 0.60m and a diameter 0.43m.

Theofanidis describes area H as a mortar-lined apsed cistern accessed via two steps to a depth of 0.50m (1950-1, 7) (**plate 73c**). A large number of terracotta pipes were found within this compartment (Theofanidis 1950-1, 7). This room should correctly be interpreted as an apsidal plunge-bath complete with characteristic access steps. The plunge-bath is coated in *opus signinum* overlaid with white mortar. Theofanidis suggests this area would have supported a vaulted roof (1950-1, 7).

The large area (Θ) to the west of this plunge-bath communicated with the surrounding rooms leading Theofanidis to interpret it as a courtyard or guardhouse. The floor was coated with mortar and was set 0.70m higher than the adjacent rooms. *Bessales* were also found here and also in areas Γ and Δ . In the north wall of the courtyard a brick arch, with a diameter of 0.90m and a height from the mortared floor of 0.35m, communicated with area Λ . Theofanidis deduced from its low height that it related to an earlier functional feature of the room.

Area I consisted of two connecting rooms to the west of the ‘courtyard’ (area Θ). The northern section consisted of a small area which Theofanidis interpreted as a cooking facility due to the presence of a curved feature which he interpreted as a hearth, despite the fact that two channels carried terracotta pipes through the area (Theofanidis 1950-51, 8). The floor of the southern, and much larger section, of area I was lined with mortar while the remains of a step were visible at its eastern wall from where it communicated to ‘courtyard’ Θ.

Area K was a small corridor connecting both area I with ‘courtyard’ Θ. The walls and floor were internally lined with *opus signinum*. Room Λ is similar in dimension to K being both small and narrow, its southern wall had an arched aperture which communicates with ‘courtyard’ Θ (as mentioned above). The height of the arch from the floor on this side of the wall was only 1.2m. Theofanidis believes that this small aperture was used to convey water from the circular cistern to area Θ (1950-1, 8).

Area M is a small compartment completely lined with mortar. A bench ran along its southern side which drops to a lower level in the southwest corner of the room. Theofanidis ascertains that it is difficult to attribute a bathing function to this area as it cannot be drained and he maintains that it was merely a cistern (1950-1, 8). Area N was located to the east of M and the north of H and is an almost square area (measuring 5.45m x 4.28m). The compacted earth floor showed evidence of fire.

Among the finds in the bath-suite Theofanidis describes cylindrical terracotta pipes, each 0.19m long with a diameter of 0.06m and a wall thickness of 0.01m. These were found in plunge-bath H, in room I and in the area between area A and B.

The water for the bath-suite was stored in a large sunken circular cistern (**plates 74a-b**). Theofanidis refers to it as a well (φρέαρ). The cistern was composed of a massive 1.5m-thick wall faced internally with brick. It was drained through an opening, measuring 0.5m on its western side (**plate 74b**) (Andreadaki-Vlazaki 1983, 368, pl. 162a and b). Internally the cistern has a depth of 1.48m which was punctuated about mid-way by a 0.20m-thick ledge. The interior lip of the cistern incorporates a shallow ledge while several small gaps, occurring at intervals along the ledge, may have facilitated some form of roofing (**plates 74a-b**). The interior of the cistern is

lined with *opus signinum* while the floor is composed of water-rolled pebbles set in a white mortar.

Type : Private bath-suite of a villa.

Dimensions : The scale of Theofanidis' plan of the site attributes an exaggerated scale to the villa (1950-1, 5, fig. 7), whereas Sanders' claim that the private bath-suite occupied an area of 25m² is actually too low (1982, 169) (**fig. 47**). The villa covers an area of approximately 225m² (15m x 15m). The associated walls extending for 85m represent the overall private complex.

Date : 2nd century AD.

Dating Methodology : Theofanidis applied a 2nd-century AD date to the structure on the basis of coinage and datable finds, although he does not supply specific contexts for such finds which would secure their reliability as accurate dating indicators. The coins include a Kydonian issue of Trajanic date, an Imperial issue of Marcus Aurelius, and an Athenian issue. The construction style of the building including its brickwork and the use of *opus signinum* would support this date. The presence of the Trajanic coin and the pottery spread would push this date to the very early 2nd century AD (perhaps late 1st century AD) which would establish the villa at Minoa as one of the earliest private Roman bath-suites on the island. The presence of a Doric capital could suggest that the building replaced an earlier Hellenistic type, as argued by Raab whose sherd sampling also demonstrated a Late Hellenistic-Early Roman profile (2001, 113-4). However, Raab concedes that the construction is 'Early Roman' (2001, 113). Later material included lamps were also reported as 'Protobyzantine' (Theofanidis 1950-1, 10-11).

41. Khania: The Small Public Bathhouse in the Municipal Carpark

Plate : Fig. 79, no. 9 and Fig. 80.

Site Description/Context : See aqueduct entry A 18.

Location : The municipal carpark in Khania is located between Peridou and Karaiskaki Street (**fig. 79**, no. 9). The area is thought to be part of the agora of Hellenistic-Roman Kydonia (Markoulaki 1990, 436-7). A small bath was discovered during excavations of the area and is located to the north of the plot (**fig.**

80, in T3 and T5). The excavations also revealed two roofed cisterns associated with a building complex of two large rooms with a stoa of unfluted columns.

Bathhouse Description : The partial remains of a bath include a hypocaust and *praefurnium*. The hypocaust had four series of clay *pilae* (fig. 80).

Type : Possibly public due to its location in the agora.

Dimensions : Small and fragmentary.

Date : Dated to the 2nd or 3rd centuries AD on unclear grounds (Markoulaki 1991-3, 206).

42. Khania: The Bathhouse with Three Hypocausts

Plate : Fig. 79, no. 9 and Fig. 80.

Site Description/Context : See aqueduct entry A 18.

Location : This bath was located southeast of bath B 41 and today lies under the municipal carpark in Khania (fig. 79, no. 9).

Bathhouse Description : The southeastern sector of the excavation plot (for the municipal carpark) produced three hypocausts belonging to a substantial bath installation (fig. 80, all located in T4). This bath is completely separate and actually predates the small bath in Section 1 (B 41).

The hypocausts were aligned on an east-west axis and were associated with two semi-circular areas to the northwest. The flues were set into the north walls of the hypocausts while access was from the east (from the side of Peridos Street) via a long and narrow corridor, which, given its substantial 2m-thick wall, probably represents the external façade of the building.

The eastern hypocaust (measuring 2.5m x 3.8m) consisted of four rows of square bases of the *pilae* (AR 1973-4, 40; Markoulaki 1990, 439, pl. 217a). The middle hypocaust (measuring 3.5m x 3.7m) only partially survived but some square bases for *pilae* were evident. The western most of the three hypocausts had five rows of three circular *pilae* and measured 3m x 3.4m (Markoulaki 1990, pl. 217b; 1991-3, 206-7, pl. 4b).

The two semi-circular features survive as foundations and are integral to the water system and contemporary with the hypocaustal complex. The floor in the southern semi-circular area was coated with *opus signinum* and broken clay plaques.

A small terracotta pipe connected the two semi-circular areas. The pipeline then continued to the north while another pipeline formed a tangent to it and continued to the east. The pipeline connected with a more substantial pipe immediately north of the circular features and continued to the northwest until it terminated in a circular area cut into the bedrock. This feature has been cut by a later stoa. The pipe was 13.5m long. *Tesserae* found throughout the area are thought to have fallen from a second storey (Markoulaki 1990, 440)

Type : Described as a public installation (Markoulaki 1990, 440).

Dimensions : Described as a large bath installation (Markoulaki 1990, 439) and from the published plan it would appear to be at least approx. 15m x 20m.

Date : Markoulaki provides a date in the 1st century AD (1991-3, 206). This constitutes an early bath for Crete.

Dating Methodology : Architectural phasing indicates that the bath was destroyed when a stoa, which cuts it, was constructed in the 2nd century AD (Markoulaki 1990, 440). The construction of the stoa supplies a *terminus ante quem* for the destruction and subsequent abandonment of the bathhouse and consequently the excavator reasonably proposed a 1st century AD date for the bath construction (Markoulaki 1991-3, 206). However, the vagueness regarding when exactly in the 2nd century AD the stoa was built makes it impossible to fine-tune the date when the bath was destroyed within the 2nd century AD and whether it was abandoned prior to this or when the bathhouse was originally constructed.

43. Khania: The Bathhouse at Kastelli

Plate : Fig. 79, no. 3.

Location : See aqueduct entry A 18.

Site Description/Context : During excavations on the Kastelli hill in Khania a bath was located in the Souvari Plot under Tsagarolon Street, a side street off Kanevaro (**fig. 79**, no. 3) (Tzedakis 1977a, 326; Hallager & Hallager 1997, 202).

Bathhouse Description : The bathhouse consisted of a rectangular structure with an apse executed in brick-faced mortared rubble (with a diameter 2.40m). The walls

of the apse stood 2m high and were covered with a layer of hydraulic mortar surviving to a height of 1m. The floor of the apse was located at a level 2.73m below the surface. Marble veneer was found along the base of the walls of the apse (Tzedakis 1977a, 326, pl. 194d). The structure appears to continue under the baulk where a mortar-lined floor was also detected. This floor was located at a level 0.24m lower than the floor of the apse.

To the west of this feature two step-like benches were located along a wall. Both benches were covered in mortar and a glass fragment was found *in situ* on top of one of them. The wall associated with the benches bordered a room which extended to the west. The tip of a mosaic from this room was found 1.8m below ground surface, 0.93m higher than the floor of the apse. It consisted of large white marble *tesserae* while some blue *tesserae* found along the trench suggest that the mosaic extended a considerable distance.

Type : Tzedakis refers to the bathhouse as a *balaneion* (1977a, 326).

Dimensions : The apse had a diameter of 2.40m but the dimensions of the other areas are not provided and the excavation was notably restricted.

Date : Tzedakis claims that the bath was 'Late Roman' but does not explain the dating methodology (1978, 368; *AR* 1985-6, 95).

44. Khania: A Bathhouse in Cathedral Square/Plateia Metropoleos

Plate : Fig. 79, no. 2.

Location : This bath is located within the Venetian walls of the city near the museum (**fig. 79**, no. 2)

Bathhouse Description : A hypocaust associated with three mosaic depictions was discovered in Plateia Metropoleos (Tzedakis 1970, 467-8). Excavation revealed a complex of two rooms with mosaic flooring associated with a large hypocaustal area. The flooring of the first room portrayed a Triton blowing a conch in the form of a murex shell (Tzedakis 1970, 467, pl. 409b). In the second room a vegetal tendril motif, complete with pomegranate, was set within a frame (Tzedakis 1970, 467, pl. 409c). In the same room, in front of the main entrance to the building, was the portrayal of two sandals accompanied by the letters ΛΑ which were formed by sandal

straps. This can be interpreted as an invitation to have a safe bath; *Λούσαι Ἀσφαλῶς*, more commonly seen in Latin as *bene lava* or *salvus laves* (Tzedakis 1970, 467, pl. 409a; Sanders 1982, 54, 170; Dunbabin 1989, 18 and 43).

The hypocaust survived in good condition and consisted of circular *pilae* set on square bases in series of 4 x 5 (Tzedakis 1970, 468, pl. 409d). The hypocaust was apsed and faced internally with brick.

Type : Public.

Dimensions : Unknown but the excavator believed the complex to have been extensive (Tzedakis 1970, 468).

Date : The bathhouse has been dated by its architectural features and by the style of the mosaics to the first half of the 2nd century AD (Tzedakis 1970, 468).

45. Platani Soudas

Location : The site was located in an area called Gras Limnionari east of Aptera, off the main northern road near Platani Soudas.

Site Description/Context : Pococke noted where the River Platani falls into the sea there was a great number of plane trees which grew about it forming a beautiful grove (1745, I, 247). The river was so wide at this point that Lear had to hire a mule in order to cross it (Fowler 1984, 50).

Bathroom Description : Platon excavated a bath in this area consisting of three rooms each measuring 6m x 3m (1954, 517). The walls were constructed of brick-faced mortared rubble. An apsed cistern with three access steps was identified and associated with two pipes; the description is reminiscent of a plunge-bath. A hypocaust was located in the room to the south (Platon 1954, 517).

Type : Unknown.

Dimensions : Each room measured *c.* 6m x 3m.

Date : Unknown.

46. Souia

Plate : Figs 49 and 81; plates 75a-76c.

Location : See aqueduct entry A 20.

Site Description/Context : Markoulaki also recorded a small vaulted cistern in the vicinity of a bath on the private property of Basia. The rectangular cistern measured 2.6m x 1.35m with a surviving height of 2.3m (1981, 402, pl. 299a; *AR* 1989-90, 81 Ninou-Kindeli 1990, fig. 5b). A system of terracotta pipes running through the walls directed water from the vault of the roof (Markoulaki 1981, 402). Just east of this chamber was an apsed niche. To the west of the cistern a rectangular well was reported communicating with the cistern through a low opening. The well was filled with Roman pottery and glass sherds.

Bathhouse Description : Savignoni reported a hypocaust and bathhouse from Souia (1901, 443-4, figs 137-8) but Sanders subsequently claimed that the bathing edifice had disappeared (1982, 171, no. 19/17, 2). However, Savignoni provided both a plan and a photograph of the baths (**fig. 81** and **plate 75a**) and it is clear from comparisons with recently published photographs that these remains correspond with a structure examined by Markoulaki in 1981 (1981, 401, pl. 298b) (**plate 75b**) and also subsequently located in 2003 (**plates 75c-76c**).

Savignoni described the Roman bath as a complex with only two rooms (1901, 444-5). He identified the narrower room, incorporating an apsed feature, as the hypocaust (**fig. 81**). In the wider rectangular room he observed pipes (with diameters of 0.11m) set obliquely within the wall. He records the height of the vault as 3.60m and the thickness of the dividing wall as 0.85m (1901, 443-4, fig. 138). Savignoni's report seems to comply with the more recent citations in the area, although his plan seems more simplistic than the remains in the field (**plate 76c** depicts a pipe set obliquely in the wall of a vaulted cistern of the complex). However, he does admit that the building was difficult to survey due to the amount of debris obstructing visibility (1901, 444).

In 1981 Markoulaki conducted an investigation of the structures located on the east point of the ancient city of Souia near the sea. In the field of Papadreou stone walls of a single building were recorded, including a 9m-long corridor and three other rooms surrounding a small cistern (measuring 0.9m x 0.1m). The walls consisted of stone-faced mortared rubble. Roman diagnostic sherds were found in abundance. The published photograph identifies the building as 'θήρμες' (Markoulaki 1981, 401, pl. 299b) and also identifies it as the same building described by Savignoni.

The central section of the vaulted roof has collapsed since (**plate 76a**). A brick-bonding course is visible over the spring of the vault which is comprised of radially-laid split stone (**plate 76b**, as indicated by the arrow). Markoulaki reported that all the walls were constructed in stone-faced mortared rubble; however, brick-faced mortared rubble is visible in the interiors (**plate 76c**).

Type : Public, due to its location in the centre of the ancient city.

Dimensions : The overall bath complex measured *c.* 15m x 15m (Markoulaki 1981, 401). However, foundation walls would indicate a larger complex.

Date : Ninou-Kindeli suggests that generally the structures at Souia date to the 2nd or 3rd century AD but specifically refers to the bath construction through her accompanying illustration (1990, 51, fig. 5b).

47. Lissos

Location : See aqueduct entry A 21.

Site Description/Context : The bath is associated with the use of the temple on the site.

Bathroom Description : Spanakis records a theatre, aqueduct and Roman baths at Lissos (N.D., II, 249). Vasilakis also reports that baths and aqueducts existed at the site (N.D., a, 78). Platon reports that immediately south of the temple a narrow stoa with an inscribed architrave follows the same alignment, and for the same length, as the temple. He reports a bath structure and a priests' house to the northwest of the temple and stoa (Platon 1992, 170). The complex was accessed by steps from an opening in the enclosure wall (which was also the supporting wall of the upper terrace). The bath remains constitute a single tub of a pre-Roman type which attests the longevity of the activity at this site.

Type : Public/religious bathing structure.

Dimensions : Unknown.

Date : The use of the bath would have presumably been contemporary with that of the temple which continues in use from the Hellenistic until the Hadrianic period. The fact that the marble of a votive table was constructed of a costly Imperial marble reflects that the use of the temple continued into the Roman

period. Another votive table mentions a freedman, probably of Hadrian. These finds attest the longevity of worship at the site beyond the accepted destruction date of the temple by earthquake in the 1st or early 2nd century AD (Platon 1992, 168).

48. Kastelli Kissamou: The Bath with Marble Décor

Plate : Fig. 82, no. 4; plates 77a-b.

Location : See aqueduct entry A 23.

Site Description/Context : Scattered around the vicinity of this bath are traces of rooms executed in brick-faced mortared rubble. To the north of the bathhouse a vaulted cistern was recorded (Tzedakis 1967, 498). The public aqueduct has also been cited close to this cistern and must have fed the bathhouse at this juncture.

Bathhouse Description : The bath is located on the southern outskirts of the modern town near the house of Pateromixelaki. This Roman bath was originally excavated in the 1960s when a marble statue of a satyr was discovered (Tzedakis 1967, 498-9; 1970, 471, pl. 412g; *Kathimerini* 31/1/93). The structure was lavishly decorated as can be deduced from its veined marble columns and orthostats, polychrome plaster, and marble floor paving and wall veneer (Tzedakis 1970, 471; **plates 77a-b**). Sanders records the bathhouse noting its marble floors, column bases and drums (1982, 173).

The western wall of the complex, where the satyr was found, was constructed of brick-faced mortared rubble coated with marble veneer, some of which survives *in situ* (Tzedakis 1967, 498; *Ethnos* 14/12/92; *Niki* 15/12/92). The presence of marble veneer is also attested by pegs-holes in the brick facing (**plates 77a-b**). The existence of vibrantly-coloured painted plaster in conjunction with evidence for marble wall veneer demonstrates the existence of mixed wall decoration throughout the complex.

Type : Public.

Dimensions : Unknown.

Date : The bath at Kastelli Kissamou was dated to the 3rd century AD according to its ceramic record but the claim was not explained or developed in the report (Andreadaki-Vlazaki 1991-3a, 228). A 2nd or 3rd-century AD date is supported by the style of the satyr statue and the presence of Imperial wall veneer.

49. Kastelli Kissamou: The Bath in the Hartzoulaki Plot

Plate : Fig. 82, no. 2.

Location/Site Description/

Context : See aqueduct entry A 23.

Bath Description : Two trial trenches were laid in the Hartzoulaki Plot (fig. 82, no.2). The first revealed mosaic matrices while the second contained a wall constructed of cut stone (5m long x 0.6m wide x 0.86m high). The mosaics had been destroyed or removed leaving their matrices intact. The east end of the wall angled with another which continued under the baulk. The discovery of a clay disc intimated that the area represented a destroyed bathhouse (Tzedakis 1979, 397). An area in the south side of the trench revealed a plastered floor which may constitute a section of a courtyard.

Type : Unknown.

Dimensions : Unknown.

Date : The bath has been attributed a 4th-century AD date, although this could represent the destruction date of the bath.

Dating Methodology : The date was assigned on the basis that forty 4th-century AD copper coins, mostly attributable to Constantine II, were discovered in the hypocaust (Tzedakis 1979, 397; *AR* 1987-8, 76). However, the numismatic evidence is not convincing as the coins may only correspond with the destruction of the bath. Moreover, although five Roman pots were retrieved, including a pointed amphora foot, their date was not included in the report.

50. Kastelli Kissamou: A Hypocaust in the Papadaki Plot

Plate : Fig. 82, no. 3.

Context : See aqueduct entry A 23.

Location : On the property of Papadaki (Pologgiorgi 1985, 70, fig. 2, no. 11)

Site Description/Context : Nothing else has been reported about the complex except the discovery of a large hypocaust with elevations of brick-faced mortared rubble surviving to a height of 3m (Tzedakis 1967, 498-9; Sanders 1982, 173).

| | |
|-------------------|------------|
| Type | : Unknown. |
| Dimensions | : Unknown. |
| Date | : Unknown. |

51. Kastelli Kissamou: The Bath at the Apostolaki Plot

Plate : Figs 82-3, no. 1

Location/Site Description/

Context : See aqueduct entry A 23.

Bathroom Description : In the Apostolaki Plot sections of a large cistern were found associated with a range of rooms and storage facilities dated to the Roman period. The complex was originally interpreted as a cistern installation but was subsequently identified as a bathing complex (Tzedakis 1979, 394, fig. 2, pl. 202a).

The bath was composed of six areas, including two cisterns (**fig. 83**). A large circular feature, with a diameter of 4.2m-4.3m, occupied the northeast section of the complex (Tzedakis 1979, 394, fig. 2, pl. 202a). It was constructed with uncut stone of varying sizes and was lined internally with mortar. Its walls survive to a height of 1.14m above ground level but its base was never reached.

Another wall, constructed on an east-west axis (wall 1), formed a tangent to this circular building. It angled to the south around area 1, forming the northern and western border of this area. Area 1 is a roughly rectangular room accessed from the northeast through an aperture measuring 0.60m x 0.66m. The walls of the area have been covered with mortar. A hole in the floor (0.12m x 0.18m) of its southeastern area facilitated a drainage channel which was lined with mortar and covered with slabs. The drainage channel connected this area 1 with area 2.

The second cistern was located to the south of area 1 and was roughly square in shape, measuring 1.56m x 1.24m internally and 1.92m x 2m externally. The walls of the cistern stood to heights of 0.62m (north), 0.84m (south), 0.65m (east) and 0.69m (west). The top of the wall was capped with tiles identical to those covering the drainage channel. The interior of the cistern was coated in a 0.08m-0.10m-thick layer of *opus signinum* which incorporates bevelled edges. A terracotta pipe accesses the cistern in the mid-way along the base of the south wall (Tzedakis 1979, 395-6, fig. 2, pl. 202b).

This terracotta pipeline leads into area 2 to the south which was probably a courtyard. The floor level of this area was not found. Access to the area was via an eastern entrance identified by a threshold of small stones and packed earth measuring 0.64m x 0.60m (Tzedakis 1979, 396).

Area 3 was located to the west of this courtyard and consisted of a long narrow rectangular area measuring 4.6m x 1.15m. The walls survived to heights of 0.97m (south), 1.16m (north) and 1.29m to the east. The floor was lined with *opus signinum*. The west section of area 3 was destroyed but may have represented the entrance to the complex. A coin found here was dated to the time of Antonius Eusebous in the 4th century AD.

In area 5 a *pithos* was found *in situ* (with a body diameter of 1.25m) while to the east the remains of another was discovered (Tzedakis 1979, 396, pl. 202g). The floor of this area was located 1.71m lower than the top of the eastern wall. The southern wall of area 6 was exposed for a length of 1.56m and was painted internally with panels of various colours.

Type : Unknown.

Dimensions : An area of 12m x 12m can be discerned from the published plan.

Date : Uncertain.

Dating Methodology : The numismatic evidence ranges from the 1st until the 5th century AD. Three copper coins were found in the circular cistern. These consisted of one small copper coin of the 5th century AD; the second was a worn Greek coin with a faded amphora motif while the third was Knossian and dated to the reign of Caligula and Germanicus i.e. AD 37-41 (Tzedakis 1979, 394). Area 3 of the bathhouse also yielded a Cretan coin dated to the time of Antonine Eusebous in the 4th century AD (Tzedakis 1979, 396). These coins may mark a period when the bathhouse was out of use but not even this is clear. No other dating methodology was offered and the *pitharia* in area 5 were not discussed (Tzedakis 1979, 396, pl. 202g).

52 Koleni Kamara

Plate : Plates 78a-d.

Location : Sanders records that in the area of Phaleliana near the small settlement of Koleni Kamara an extensive Roman building was unearthed, possibly a bathhouse (1982, 174; Tzedakis 1970, 473).

Site Description/Context : In the area of Phaleliana a Minoan and Classical site, thought to reflect the ancient site of Methymna, is sign-posted off the main road. The extension of the national road between Kolymbari and Kastelli Kissamou was altered northwards so that this important Prehistoric and historic site be preserved (*AR* 1996-7, 122). In the 1980s test trenches were laid and revealed architectural remains of the EM, MM, LMI, LMIII periods as well as Classical, Hellenistic, Roman and late-antique contexts. A Roman building with six storage vessels placed on a tile and stone floor was also discovered (*ADelt* 1961-2, 300).

Fieldwork revealed that the site was littered with Minoan pottery (including some tripod legs). Walking east towards the river, following the modern water channel, column fragments were visible and portions of disused medieval channel pieces (personal observations). Brick was also found in abundance in the adjacent fields. At the end of the line of water channels, the small Venetian chapel of Aghios Georgios is located near the river. Tzedakis records that the site of Koleni Kamara lies south of the main road and that the area is full of traces of Roman architecture (1967, 499-500). However, he makes no reference to the chapel and, consequently, does not mention the earlier Roman structure over which it is built.

Bathhouse Description : The chapel is a charming example of Venetian design with a moulded doorframe and a stone-carved window at the apex of the apse at the rear of the church (**plate 78a-d**). The chapel measured 4.20m x 6.35m excluding the back alcove.

It is obvious that the chapel is built over a Roman structure from the brickwork evident in the back corners of the chapel, especially in the northwestern corner where walls of brick-faced mortared rubble extend from the church foundations (**plate 78c**). The brick facing incorporates peg-holes possibly for the attachment of marble veneer (**plate 78c**). Another earlier wall extends to the west at the front of the church. Furthermore, stone and brick-faced walling is evident in the foliage in the immediate area, especially to the south and east. Thick foliage and a

large old olive tree obscure the details of the plan but the complex forms a low mound which covers an area of at least c. 10m x 10m.

The interior of the chapel is of interest as brick is visible through the thin white-plastered walls. However, unlike the *in situ* brick-faced mortared rubble visible in other areas of the chapel, this brick may represent reuse of the earlier material. Clearly, the brickwork over the doorway is an example of reused Roman material (**plate 78b**).

Down pipes, for both water and aeration, were also observed in the wall elevations of the church. It proved difficult to estimate where the ancient walling stopped but it could be ascertained with reasonable confidence that in some places it reached the spring of the vault, although secondary working was also apparent. Terracotta pipes were evident high in the vault. The openings in the north and south walls (the lateral walls) of the chapel, one of which has a slanted base, may also have originally facilitated water supply. The altar was also supported on an ancient column. The structure obviously reuses a Roman structure and the pipes, the vault and the extensive architectural remains would suggest an elaborate bathhouse.

Type : Possibly public as it is set in a wider, and possibly, urban area. However, Sanders thought it was a private farmstead (1982, 30).

Dimensions : Unknown.

Date : A 2nd-century AD construction date is possible based on the brick dimensions. The chapel itself is easily dated to the Venetian period in the light of the Italianate custom of embedding datable *sgraffito* pots over the entrance (Rackham & Moody 1996, 181). Four *bacini* are evident here (**plate 78b**). The chapel may date from the 13th to the 16th century AD.

54* Knossos: The Temple Baths

Site Description/Context : See aqueduct entry A 8.

Location : This enigmatic structure was cited southeast of the Civic Basilica north of the path to Makritikhos (Hood & Smyth 1981, no. 121).

Bathhouse Description : Hood and Smyth record a building which they identify as either ‘a public bathhouse or a temple’ in their survey (1981, no. 121). The analysis is based on both Raleigh Radford’s initial interpretation of the ruins as a bath and

Hogarth's earlier report which identified the structure as a temple (1899-1900, 81; Paton 1994, 147). It is labelled as a temple on both Hogarth's (1899-1900, 81, pl. xii) and Evan's plans (1928, ii, opp. 547). The confusion as to the nature of the building prohibits its inclusion as a substantiated bathhouse in this catalogue and consequently the entry does not feature in the numbered catalogue.

Type : Unknown.

Dimensions : Unknown.

Date : Unknown.

55* Knossos: Bathhouse elements from the area of the Stratigraphic Museum

Site Description/Context : See aqueduct entry A 8.

Location : In the general vicinity of the Unexplored Mansion.

Bathhouse Description : The building associated with the Room of the Polychrome Paintings was modified in the early 2nd century AD. Circular clay discs, thought to represent the *pilae* of a dismantled hypocaust, were set on the new floor and on top of the older walls (*AR* 1978-82, 93, fig. 28). Such material in a secondary context suggests that a bathhouse existed in the immediate area prior to the early 2nd century AD. This discovery is significant, since although an early Roman bathhouse might be expected in the area of Knossos, its presence has not, as yet, been affirmed.

Other evidence from the immediate area could also be associated with a Roman bath. Two spacer pins were found in the excavations of the Unexplored Mansion. One was discovered in a fill belonging to the late 2nd century AD and its manufacture in local clay is highly significant (Sackett *et al.* 1992, 246, no. R3, 3a, pl. 217). The second example survived as a surface find (Sackett *et al.* 1992, 256, pl. U 165, pl. 217). The relevance of a small group of glass bath flasks, also discovered in the area, remains unexplained (no. 287 of which was found in an early 2nd-century AD context) (Price 1992, 436, nos 285-7).

Type : Unknown.

Dimensions : Unknown.

Date : Prior to the early 2nd century AD.

Dating Methodology : It is specifically the discovery of *pilae* and spacer pins which indicate the destruction of a bathhouse prior to the early 2nd-century AD renovations in the Room of the Polychrome Paintings.

56* Gortyna: A Bath to the East of the Odeum

Plate : Fig. 36.

Site Description/Context : See aqueduct entry A 10.

Location : Below the west acropolis at Gortyna and to the east of the odeum (**fig. 36**).

Bathhouse Description : There is speculation as to the existence of a bath building in the area of the odeum. East of the odeum a range of rooms of uncertain date and function were subsequently added to the original structure. The floor of this extension sealed a Hellenistic coin while coins from over the floors date to the 4th century AD and represent the final use of the area.

Further additions to this range have been interpreted as a bath-suite by Sanders (1982, 66). A slab-covered drain is visible running under the rooms of the complex (Vasilakis N.D., a, 46-7). A mosaic in this area was initially attributed to the earliest levels (Pernier 1925-6, 65) but Sweetman (1999, 99, n. 34) recently dated it to the 2nd century AD on a comparative basis with the Theodosius Mosaic. Despite arguments for its identification as a bath-suite its presence is not secure. However, the partnership is encountered at Beth She'an where a Byzantine bath abuts an odeum founded in the second half of the 2nd century AD (Dauphin 1996, 52).

Type : Unknown.

Dimensions : Unknown.

Date : Unknown.

57* Diktyннаion

Plate : Fig. 50; plates 41a-42c.

Site Description/Context : See aqueduct entry A 22.

Location : Located in the bay below the temple to the north.

Bath Description : Water from the cisterns was directed across the river towards a complex of structures to the north of the river by means of an aqueduct

bridge (**plate 42c**). Spratt alone refers to the structures in the bay and hints at their possible association with a bathing function (1865, II, 197). From an examination of the buildings in this area, it was thought that many represent bathing areas. The elevations generally survive to over 1.5m in height and are executed in brick-faced mortared rubble lined internally with *opus signinum*. The constructions are generally barrel-vaulted. In one instance a complete niche survives with a pipe in its back wall intimating its function as a fountain. It was difficult to discern an accurate plan for the complex.

Dimensions : Unknown.

Type : Public/religious bathing structures.

Date : Although the sanctuary was a place of worship from the 9th century BC until the Roman period, the reported bath buildings appear to be Hadrianic and later although Spratt refers to the complex as ‘Late Roman’ (1865, II, 197).