# A TOPOGRAPHICAL ANALYSIS OF THE LOCATION OF HARBOURS AND ANCHORAGES OF THE EASTERN MEDITERRANEAN IN THE MIDDLE AND LATE BRONZE AGES, AND THEIR RELATION TO ROUTES OF TRADE

Thesis submitted to the University of Oxford in fulfillment of the requirement of the degree of Doctor of Philosophy

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VOLUME II

Appendix I: **PART II**

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# APPENDIX I : PART II

LIST OF IDENTIFIED AND POSSIBLE HARBOUR SITES AROUND THE COAST OF THE EASTERN MEDITERRANEAN

The following is a comprehensive list of the harbour and anchorage sites, both potential and those documented archaeologically or historically, that existed around the shores of the eastern Mediterranean in the Middle and Late Bronze Age. This 'second millennium sailors' guide' or 'coastal pilot' is arranged in clockwise fashion, starting in southern Turkey and following the coast around to the Northern Levant (Syria and Lebanon), Southern Levant (Israel) and to Egypt. The gazetteer of sites also includes the islands of Cyprus and Eastern Crete, which formed integral parts of the routes connecting these coastlands.

This list includes the major topographical features of the region such as headlands and rivers (natural features are listed in capitals/ italics and described where necessary in italics). Sites are referred to by their modern names (listed in bold), with alternative modern names in brackets, and ancient names, if known, underlined. Each site is given a site number. Example of layout in text as follows:

*RIVER/HEADLAND (comment if appropriate)*

**#Site no. KEY Site Name** (alternative name) ancient name
Latitude & Longitude

KEY (character of evidence relative to each site)

| | |
|---|---|
| . | Sheltered haven |
| $ | Anchorage used in antiquity (1st millennium BC-400 AD) |
| * | Anchorage with second millennium material |
| @ | Known second millennium anchorage |
| [ ] | Major second millennium harbour site1 |

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1 The aspect of each harbour and a McKee Type definition (or definitions) of the location of the harbour in relation to the prevailing wind, is outlined for each site listed in Part II.

Some sites include a footnote which dicusses the possibility of entering and leaving the harbour depending on the effects of fetch and the prevailing winds:

The fetch is calculated in nautical miles from the nearest stretch of land to the harbour, through eight points of the compass. Wind roses are then consulted to determine the percentage of 'foul wind' conditions

# TURKEY : MAINLAND

(Admiralty chart number 236)

## (LYCIA)

*KIZIL BURUN (anvil headland enclosing west side of bay)*

*KÖYCEGIZ KÖRFEZI (bay)*

**#01 . Ekinçik Liman**
36:50 N 28:34 E

North-western most bay of Köycegiz Körfezi. S-facing bay backed by broad sandy beach, anchorage on west or southeast behind small promontory (anchorage on southeast more sheltered in unsettled weather) (Heikell 1989: 165,fig.). McKee Type (2)/(3) anchorage.

**#02 . Dalyan** (Delikada) (islet)
36:48 N 28:36 E

Islet situated at the mouth of meandering Köycegiz River, on the east side of Köycegiz Körfezi. Anchorage off the north-eastern tip of the islet provides some protection from W winds in McKee Type (4) anchorage (Heikell 1989: 166). Good temporary stop for goods being transported to upriver harbour of Caunos (#03).

**#03 @ Caunos/Kaunos** Cannus/ Caunos
36:50 N 28:37 E

Site located up stream of Köycegiz River (Fig. #03). Once an inlet now silted, marshy, lagoonal environment fronted by sand spit that runs from east to west (Fig. #03.1). Site located below steep cliffs (Akurgal 1985: 254,fig.97; Fig. #03.2), would have been wonderfully sheltered riverine harbour in antiquity. Main river course which now runs to the southeast of site, once passed below site to the west, but is

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for the summer months at the harbour under consideration (obviously modern data has had to be employed). The likelihood of not entering or leaving the harbour is then calculated. Figures on days with 'no wind' or with 'winds greater than Force 5' were not available, and so the likelihood of not entering the harbour has been determined by taking the percentages of 'foul winds' that oppose entrance to the harbour aspect; while the likelihood of not leaving the harbour has been determined by taking the percentage of 'foul winds' that oppose departure from the harbour and multiplying this figure by the corresponding fetch for the points of the compass within the harbour aspect.

now silted and consists of a narrow river course and small lagoon. Strabo (XIV.651) reports that the city of Kaunos had dockyards and a 'closed' harbour. Raban (Haifa survey 1987/8: 96) believes the lagoonal area to the west of the Roman site would have provided an excellent enclosed McKee Type (4) anchorage in the Bronze Age, linked via the river area below the cliff, to the sea.

*DIŞBLIMEZ BURUN (headland)*

**#04 . Aşilsk**
36:43 N 28:39 E

Shelter from W winds on the east side of Dişblimez Burun in lee of promontory in S-facing bay. Very steep, rocky coast. Small river enters sea at this point. Mckee Type (2)/(3) anchorage.

*KAPU DAĞ/ KURTOĞLU BURUN (anvil-shaped promontory forming west side of Fethiye Bay)*

*FETHIYE KÖRFEZI (Makri Bay Sinus Glaucus, is 13km wide at entrance, prevailing SW-S winds)*

**#05 $ Kizilkuyruk Koyu** (anchorage of Lydae/Clydae/Chydae situated on promontory)
36:37 N 28:52 E

Located on the east side of Kapu Dağ promontory. E-facing anchorage, sheltered to south by small headland and in lee of the Dağ (Heikell 1989: 169; Fig. #05). McKee Type (4) shore. The remains of the Roman and Byzantine ruins of Lydae lie on the promontory to the west of the site. Presumably Kizilkuyruk Koyu acted as the harbour for the ancient site.

*TERSANE ISLAND (largest island in Fethiye Bay, situated on west side of Bay. Elevation of 210m)*

**#06 $ Tersane** Telandria
36:41 N 28:55 E

Narrow inlet on northwest side of island. Difficult to identify entrance to inlet (Heikell 1989: 172,fig.). Aspect NE. Nearly all round shelter in McKee Type (4) anchorage. Byzantine ruins have been identified along the shores of the creek, with the remains of an ancient dockyard.

**#07 . Wall Bay**
36:35 N 28:50 E

Long, deep anchorage of Wall Bay with many sheltered inlets, lies on the western reaches of Fethiye Körfezi (Heikell 1989: 169,171,fig.). The rocky islands to the northeast of the mouth of the anchorage include Tersane Island and Domuz

Island. The anchorage is open to N onto Fethiye Körfezi. Best anchorage at south-western point of bay in lee of Kapu Dağ on east side of isthmus that joins Kapu Dağ to mainland. The wind sometimes gusts off the high land, otherwise a very sheltered bay with low swell and fetch from NNE, described as a McKee Type (4) anchorage.

**#08 . Taşyaka** (Tomb bay) Crya
36:41 N 28:51 E

Located on the western shores of Fethiye Bay. It is the best anchorage on the south side of the bay (Heikell 1989: 171,fig.). Open to southeast, facing Tersane Island. Sheltered McKee Type (4) anchorage. Fresh water. Lycian ruins of Crya above bay.

**#09 . Göçek Liman**
36:45 N 28:56 E

Situated in the north-western corner of Fethiye Körfezi. Well sheltered by Göçek Island offshore to the south. SSE-facing, approach from the east and shelter in lee of island (Heikell 1989: 173,fig.). McKee Type (4) shore.

*KIZIL ADASI (island)*

*FETHIYE ADASI (Makris/ Isola Longa/ Isle of the Knights) (island)*

**#10 $ Fethiye** (Megri, Makri) Telmessus
36:38 N 29:09 E

Situated on southeast side of Fethiye Körfezi. Site located at head (S) of NW-facing bay, closed at mouth by Fethiye Adasi (Heikell 1989: 174-5,fig.). Almost totally enclosed bay, 3.2km long by 0.8km wide, presently 8-14 fathoms deep. Winds prevail from W and NW. Shores low and muddy to marshy in east, rockier headland to west. Entrance to bay either side of Fethiye Island, south-western passage is wider, sand spit on eastern side. Ancient coastline believed to follow lowest point of Lycian 5th century BC ruins on south-eastern shore which are situated on a crag detached from a steeply scarped hill (Bean 1979: 40). Modern town on coastal plain below. Would have provided excellent shelter throughout antiquity on McKee Type (4) shore.

*IBIS BURUN (headland)*

*GEMILER BAY*

**#11 $ Gemili Adasi** (Aya Nicolai)
36:33 N 29:04 E

Island of Gemiler is 1200m long by 400m wide

(Cambridge Expedition 1977: 2,photo; Fig. #11). The north-western end of the island is covered in Byzantine ruins, many submerged including sections of a quay (Cambridge Expedition 1977: 2). Provides a safe refuge for Turkish sailors in bad weather (Stark 1956: 134). Anchor in sandy bottomed beach in west corner of island, basically out of winds, in lee of island, in McKee Type (4) anchorage. Swell can work its way in when the meltemi wind is strong (Heikell 1989: 177-8).

*YORGUN BAY*

**#12 . Ölü Deniz** (Yorgun Köyü) (Dead Sea)
36:33 N 29:07 E

Located in the eastern bay of Belceğiz Körfezi. Well sheltered coastal lagoon, fine sand beaches, entered by narrow channel from southeast (Heikell 1989: 178,fig.). Sand spit across entrance (Fig. #12), possibly SE-facing in antiquity, more exposed before development of sand bar, thus a McKee Type (2)/(3) anchorage.

*SANDAK DAĞ (Seven Capes/ Yedi Burunay) (outer range of Western Taurus)*

*INCE BURUN (headland)*

*XANTHOS RIVER (Esen Çayi) (upstream to Xanthos)*

**#13 $ Patara** (Kelemiş Liman) Pttara/ Patara
36:16 N 29:19 E

Marshy enclosed lagoon once the site of the Lycian harbour of Patara now cut off from the sea by a sand bar that formed across the mouth of the river (Flemming et al 1973: 54,fig.51; Toksöz 1986: 82-89; Fig. #13). Patara was the principal port on the coast of Lycia (Bean 1979: 84). Appian described it as 'the port of Xanthus', the Lycian capital, Xanthos also being mentioned in the Hittite texts (Laroche 1971: 142,182), possibly implying Patara's function as its harbour in the second millennium. Both Strabo (Lib XIV in Lycia) and Livy (Livy XXXVii.16,17) referred to the harbour at Patara. Its previous location on the sheltered river mouth of the River Xanthos (Esen Cayi)(the mouth of the Xanthos River is now some 5km west of the site), with access to the interior prior to the silting of the river, would have provided a sheltered anchorage in the second millennium (Fig. #13.1). Now open ground, marshy in winter and in places in the summer, choked up with sand and bushes (Fig. #13.2). Harbour 1.6km long north to south and 0.4km wide, surrounded by a wall in antiquity

of which some remains in the east (Bean 1979: 85). A hill some 19m in height stands to the east of the harbour entrance. Prevailing W winds have caused continuous dunes to form from the site to the mouth of the River Xanthos. Winds run parallel to the shore and the anchorage could be described as a McKee Type (2)/(3) shore.

*YALI LIMAN (bay)*

**#14 . Kalkan** (Kalamaki)
36:16 N 29:25 E

Situated on the northeast side of Yali Liman, open to SSW. Deep water, little shelter. Modern town at base of steep rocky mountains on small coastal ridge (Fig. #14). Shelter on southwest side of bay behind rocks (Heikell 1989: 180). Jura shoal to south-southwest of Yali Liman. Fierce gusts off highland to west. 'Inconvenient anchorage' (MP 1915: 112). Livy's Port Phoenicus (Livy XXXVii,16). McKee Type (1) 'lee shore'.

*SARIBELEN ADASI (island)*

**#15 . Port Vathy** (Buçak Liman)
36:12 N 29:37 E

Long narrow inlet, 4.5km in length extends west to southwest at head. Protected to the south by Ada Burun and to the north by the mainland. Exposed to W winds, NNE winds blow with great force off the mountains (Heikell 1989: 181-182,fig.). Modern port of Andifli (continues into Kaş #16) at head of inlet and peninsula. MP observes 'unsuitable for sailing vessels'. Two rocks above water on south side of entrance. McKee Type (1) shore.

*ADA BURUN (headland)*

**#16 * Kaş** Antiphellus (harbour of Phellus) Lycian Habesos

36:13 N 29:38 E

Small bay, open to SW, although protected somewhat by offshore island of Kastellórizon (Heikell 1989: 182,fig.; Fig. #16). Dominated by steep, rocky mountains, rising to 450m above the site. Modern harbour of Kaş to southeast of Ada Burun with additional anchorage in Longos to west, south of Ada Burun (small reef to south offers some protection to small boats). Sheltered by Vathi peninsula to west-northwest and east and southeast by seaward end of Kiran Dağ, on a McKee Type (4) shore (Fig. #16.1). Ruins extend around the town and across the isthmus that joins Kaş to

Vathy (#15). Kaş is known from at least the 4th century BC when it was called Antiphellus, and consisted of little more than a few buildings around the harbour. There can be no doubt that at that time Antiphellus was merely the port of Phellus. Garstang (1941: 37) places Apasas the capital of Arzawa at a site near Antiphellus and adds that there are 'indications of pre-Hellenic antiquity' at Antiphellus. At the site of Kaş, Antiphellus (Lycian Habesos) (OCD 1970), Bass has discovered a fragment of a Canaanite amphora (Bass 1989, personal communication). Although a mere fragment of amphora, this discovery was made at a sheltered anchorage, greatly used in the first millennium. This, coupled with the assumption that the Late Bronze Age shipwreck at Uluburun, that has been excavated to the east of Kaş, was either leaving, or more probably heading for Antiphellus when it sank (Bass 1986), indicates its use as an anchorage in the second millennium. Flemming et al (1973: 54) describes how the sea level has changed at the site since antiquity due to seismic and tectonic activity, as the breakwater bedrock-cut is now largely submerged by 1.3m ie submergence of c. -1m/ 1000 years (Flemming 1978: 412,62-63). Most important city of region in Roman period (Princeton 1976: 64).

**#17 $ Bayindir Limani** (Sevedo/Sebeda) (harbour of Phellus) Vehinda.

36:10 N 29:38 E

Lies opposite Kaş (#16; Fig. #16) to southeast in almost enclosed anchorage which is open to the north. A 'small but good harbour' (Bean 1979: 98) and according to the MP 'the port is easy to enter and affords good shelter. Vessels either anchor or moor .. to shore'. Surrounded by steep-sided hill, very sheltered, deep anchorage, spit of land extends in north-easterly direction from south-western corner of bay and provides additional shelter in a McKee Type (4) harbour. Believed to be earlier settlement than Kaş. Disagreement between scholars as to whether the site of Phellus lies in the small coastal area on bay of Bayindir or in mountain of Felendağı above the bay which is accessible by a cliff path (Bean 1979: 96). No drinking water or arable land on coast.

*KASTELLORIZON ISLAND*

**#18 * Limin Kastellórizon** (Megiste)(Meis)

36:09 N 29:36 E

Island situated off shore southwest from Kaş (#16). Westerly current runs either side of

island (between 0.5-1.5 knots on north side) and sometimes re-tracks north to run up western side of the island ie encircles island (MP 1915). Harbour situated on north-northeast side of island facing Kaş, known as Limani (Pirazzoli 1987b: fig.1; Fig. #18.1). Sheltered by long promontory on north-northeast side and land to south and north (Fig. #18). Open to NE. Number of islands to east between anchorage and mainland Turkey. Most sheltered on south-eastern side of inlet (Heikell 1989: 232). Submerged remains in Limani inlet and the exposed basin of Mandraki to the east indicate that subsidence has been gradual, continuous and rapid and is still progressing today (Pirazzoli 1987b). Would have provided an excellent offshore anchorage for goods being transported to the mainland on a McKee Type (4) shore.

*ULU BURUN (headland) (Late Bronze Age wreck located off this headland at a depth of 30-55m)*

**#19 $ Asar Bay** Aperlae (Siçak Iskelesi)
36:08 N 29:48 E

The site of Aperlae lies at the head of a long narrow bay, which is exposed to the southwest and sheltered to south by Ic Ada and the promontory of Siçak Yarinadasi. The bay is entered from the west-southwest, there is a steep ridge to the south and a low isthmus ahead that separates Asar Bay from Kekova Roads. Its name, Siçak Iskelesi, implies that it serves as a landing place for the town of Siçak inland (Bean 1979: 102). The Hellenistic and later Roman ruins are on the seaward slope of a low hill on the north side of the bay of Asar. The remains of the harbour lie below the site. Asar Bay or Aperlae was surveyed by Carter (1978) and has revealed submerged harbour works of the 5th century BC, including a quay, but no doubt could have provided shelter in the second millennium. There has been submergence to depths of 2.5m as a result of seismic and tectonic activity (Carter 1978), deducing a subsidence rate of nearly 2m/ millennium (Pirazzoli 1987: 65). In the prevailing SW day breeze it appears from seaward that Asar Bay is a trap for sailing vessels, and although the strength of the sea is largely dissipated along the shore before reaching Aperlae, it is still a hazardous entry and exit, and would be described as a McKee Type (1) anchorage. Stark (1956) and Flemming (1973) amongst others, do not identify Asar Bay with ancient Aperlae, they believe Aperlae to be associated with Kekova Roads to the east.

*KEKOVA ISLAND* *(7km long island, lies WSW-ENE direction, sheltered water between island and mainland. The sea level around Kekova Island has risen as a result of seismic activity c.2.5m since antiquity (Flemming 1978)*

**#20 $ Tersane** (Xera)
36:11 N 29:51 E

The small cove lies 450m to the northeast of western end of Kekova Island (Heikell 1989: 186,fig.). N-facing, McKee Type (2)/(3) anchorage (Fig. #20.1). Ruins all around bay and u/w. Sandy bottom, good holding (Heikell 1989: 186). Small beach at head of cove (Fig. #20). Sheltered, deep inlet. Sheltered from W winds.

**#21 . Karaloz** (Port St. Stefano)
36:11 N 29:53 E

Anchorage on south-eastern side of Kekova Island. Deep inlet, ESE-facing, dog-leg to south at western end, therefore completely sheltered at head. Deep water, mud bottom, difficult to identify entrance from distance and difficult to enter if strong W winds (Heikell 1989: 189). Entrance to inlet on McKee Type (2)/(3) shore.

*TURKEY : MAINLAND*

**#22 . Pölemos Bükü**
36:10 N 29:48 E

Long, narrow inlet, 2km long, open to ENE, located at western end of Kekova Roads. Protected by promontory of Siçak Yarinadasi on south side and mainland to west and northeast. Modern town of Bolar located at head of inlet. Small islets on north side of inlet. Mud bottom, good holding, in McKee Type (4) anchorage (Heikell 1989: 186). Some u/w ruins.

**#23 $ Üçagiz** Teimiussa (Ölü Deniz, Tristomo)
36:11 N 29:50 E

Tristomo means 'three mouths' in Greek, indicating the different entrances to the bay (Bean 1979: 115). Situated at the head of the Kekova Roadstead on the mainland and linked to the broader outer part of bay by a rocky channel. Long, narrow inlet runs in west-southwest to easterly direction, almost totally enclosed at western end and open to the south. 'Perfect all-round shelter' (Heikell 1989: 187-8,fig.), thus McKee Type (4) anchorage. Supposedly settled by colony from Myra (Beaufort 1818).

**#24 $ Kale Köy** Simena (Kekova)
36:12 N 29:52 E

Located on mainland on promontory that runs

northeast to west and forms the eastern arm of Uçagiz Liman (Fig. #24). Commands view of eastern entrance to bay. Numerous islets offshore (to southeast and west). Ancient quarrying and sea level change have altered water line, with submergence of approximately 2-3m since antiquity (Flemming 1980). Site dominated by Medieval castle on hill above. Anchorage open to SSE, only suitable for mooring in calm weather and in the morning before the wind picks up (Heikell 1989: 186). Partially protected by offshore islands. Bad holding, with many rocks above and below water in McKee Type (1) anchorage.

**#25 . Castle Bay**
36:12 N 29:53 E

Located on mainland 600m east of Kale Köy (Heikell 1989: 188). Cove offers partial shelter from prevailing winds. Rock on west side. S-facing. Shelter west to southeast, McKee Type (2)/(3) anchorage.

**#26 $ Gökkaya Liman** Sura (Yali bay)
36:13 N 29:54 E

Inlet surrounded by steep hills. Aspect SE. Very narrow coastal ledge, protected entrance to wide open inlet opposite offshore island of Ashil Adasi (Heikell 1989: 189,fig.; Fig. #26). Approach via channel, 75m wide to north of island. Very sheltered, McKee Type (4) anchorage. Ruins at head of inlet. Land and sea breezes.

*DEMRE/ANDRAKI RIVER (brackish with a bar at the entrance (Fig. #27.2)*

**#27 * Myra** Myra (Demre/ Kale/ Andriace)
36:13 N 29:58 E

Upstream Andraki River, 1.6km north of Demre (ancient Kocademre), the ancient site of Myra stands at the foothills of a high cliff now some distance from the sea (Toksöz 1986: 95,fig.). Keen (Keen 1990, personal communication) identifies Myra with Sura, Lycian Surezi and possibly that of ancient Suruta, which appears in the Annals of Mursili II (Laroche 1971: 61), and would therefore verify the occupation of the site in the second millennium BC. The whole area is now a low-lying, fertile, alluvial plain covered with fruit trees and green houses, over which the River Demre has prograded a delta in a southerly and north-easterly direction (Fig. #27). 'One time by the sea but alluvium deposited by Demre (Andraki) River has built up a coastal plain for several miles around as well as covering much of the ancient city' (Heikell 1989: 190; Fig. #27.3). Two islands stand at the mouth of the

River Andriace, and a lagoon is found on the edge of the coastal plain separated from the sea by a narrow ridge of sand and gravel (Beaufort 1818; Personal observation 1989; Fig. #27.2). Stark (1956: 156) states that Myra probably had a small port on the river at the back of the lagoon (Fig. #27.1) and a second at Andriace. The river is now too shallow for boats to navigate upstream (Beaufort 1818) but would have housed a McKee Type (2)/(3) anchorage at its mouth. The only ruins of the Lycian site that remain in the port area are the foundations of the granary (Mellink 1985). Myra was the 'only' port at which St Paul stopped between Sidon and Crete (Acts 17.5). There is evidence for submergence of approximately -1m/ 1000 years in the region of the lagoon on the coast (Flemming et al 1973: 57).

*KUM BURUN (headland)*

*BUNDA BURUN (headland) (seaward end of the third Western Taurus)*

**#28 . Kök Liman** (Gök) (Yeronda inlet)
36:16 N 30:09 E

Short inlet to the west of Güvercin Adasi, the south-western promontory of Finike. Surrounded by hills to west (Bunda Burun), north and east, aspect S-facing. Anchorage on south-eastern side of inlet. Good water supply. McKee Type (1) anchorage, subject to heavy swell.

*GÜVERCIN ADASI (headland)*

*FINIKE KÖRFEZI (bay) (extensive coastal plain)*

**#29 $ Finike** Phoenius Classical Phoinike
36:18 N 30:09 E

Situated on the far the western edge of Göksu Plain in lee of Güvercin Adasi (to the southwest Başgöz). Well sheltered, SE-facing, McKee Type (4) anchorage. River Kara runs in from the north and River Göksu (Arycandus) slightly further to the east, causing siltation of area (Personal observation 1989). Beaching and anchorage in lee of promontory, particularly prior to siltation. Open to S winds. Bay is low and sandy, backed by alluvial plain (Fig. #29). Shallow water, sea rarely calm. The Classical harbour of Phoinike is believed to have replaced the second millennium port of Limyra prior to the siltation of the river which caused the Bronze Age harbour to fall into disuse. The name of the town indicates some connection with Phoenician traders, which could date occupation at the site

from the later part of the second millennium (Keen 1990 personal communication).

**#30 * Limyra** Limyrus Hittite Zumarri

The site lies at the foot of the south slope of the Tocak Dağ on course of Göksu River (ancient Limyrus), now some 5km from the sea (Toksöz 1986: 104,fig.). Once believed to have been located nearer to, if not on the coast. The Classical port of Limyra has been identified as the Hittite port site of Zumarri (Laroche 1971: 47). In addition, Bronze Age sherds, Late Helladic IIIB-C type, have been discovered at the site by the excavator Prof. J. Borchhardt in soundings north of the cenotaph of Gaius Caesar (Mellink 1983) which imply not only its occupation in the Late Bronze Age but also contacts with the Aegean. Despite Limyra's present situation some distance inland at the head of the silted plain of Başgöz, its use as a riverine, McKee Type (4) harbour is implied for the end of the second millennium BC (Fig. #30).

**#31 $ Karaöz** Gagae (S of Yenice) (White Rock)
36:16 N 30:24 E

The site stands on a low hill now separated from the sea by 0.8km of flat, sandy ground, on the edge of a bay located at the farthest eastern end of the Plain of Finike. Once believed to be coastal before siltation, possible alternative location for the anchorage of Myra (Raban 1994, personal communication). Modern shelter in cove on north side of Karaoz Liman (in southern part) (Heikell 1989: 192). Reasonable shelter, open to W and N on McKee Type (4) shore.

*GELIDONYA BURUN (Taşlik Burun) (cape) (Current WSW, 0.75 up to 3 knots, especially noticeable inshore)*

*GULF OF ANTALYA (Runs from Kizil Dağ to Cape Anamur 170km to the east. Headed by an alluvial Plain of Pamphylia)*

**#32 . Çavus Liman** (Adrasan) (Gümrük)
36:18 N 30:30 E

Modern settlement on southern part of wide, broad bay, sheltered by Kizil Dağ to south and southeast and Musa Dağ to north (Fig. #32). Narrow coastal plain by modern settlement, hills to northwest. Aspect of anchorage in southwest corner is northeast, anchor at this end (Heikell 1989: 192,fig.). Sheltered McKee Type (2/3) anchorage. Affected by land and sea breezes, otherwise sheltered from S/SW winds.

*ÇAVUS BURUN (Musa Dağ) (headland)*

**#33 . Çineviz Liman** (Port Genovese)
36:22 N 30:31 E

Almost enclosed (land locked) anchorage. Protected on east by Çineviz Adasi, steep, white mountains to west and isthmus to south (Heikell 1989: 193; Fig. #33). Long narrow inlet for anchorage behind Çineviz Adasi. Cove either side of isthmus, more sheltered on east, although three above-water rocks in anchorage. Winds from N and W (gust off mountain) but otherwise sheltered McKee Type (4) anchorage. No immediate access to interior.

**#34 $ Olympus** Olympus (Çirali Liman) (Deliktash)
36:23 N 30:31 E

Open anchorage in lee of headland of Musa Dağ and at mouth of River Kavsik, in southwest corner of bay. Sandy, narrow coastal plain to north. Aspect E to NE. Sheltered from south and west in mouth of river, also shelter from north by mountains. On the south bank of the river mouth a well preserved portion of a Hellenistic quay can be seen, with later repairs in the Roman and Hellenistic periods (Akurgal 1985: 265; Toksöz 1986: 114,fig.). A little inland, upstream there was a lake, which is now just marshes (Princeton 1976: 650), that could well have acted as a riverine harbour in antiquity, affording a McKee Type (2)/(3) anchorage.

*TRIANESIA ISLANDS (Group of small low islands; anchorage all around especially cove on the east)*

**#35 $ Tekirova** Phaselis
36:31 N 30:34 E

The only good harbour on the west side of the Gulf of Antalya is at Phaselis, where a projecting peninsula creates a natural 'double harbour', further protected by a headland to the north (Fig. #35). Land communications on this coast are poor and the easiest approach is now, and must always have been by sea (Blackman 1973: 355). According to tradition, Phaselis was founded as a Rhodian colony in 690 BC. The site of Phaselis was surveyed by Blackman in 1973 (Blackman 1973: 355-364). The city lies on a narrow peninsula which projects some 600m seawards and ends in cliffs over 30m high on the south-eastern side. Here lies the ancient acropolis which supports three ancient harbours, 'South', 'Central', and 'North' (Fig. #35.4), the earliest constructed harbour being the 'South Harbour', to the west of the acropolis (Blackman 1973: 356; Fig. #35.1). The 'South Harbour' is linked to the mainland to the northwest by a narrow strip of land which is deep in sand dunes.

Blackman describes how the ancient breakwater of the 'South Harbour' is now submerged by 5-6 metres, although this exceptional depth is also due to the weighty breakwater structure sinking into the sand on which it is supported (Blackman 1990 Personal communication). There is a possibility that anchorage was sought either side of this anvil-shaped promontory in the second millennium despite the lack of material evidence to support this prior to the arrival of the Greeks. To the north of the 'South Harbour' there is a marsh which is a lake in the winter and nearly dries out in the summer (Blackman 1973: 358, fig.5). Strabo (xiv: 666) mentions that Phaselis has three harbours and a limne or marshy lake, it is possible that the marsh was less silted in the Bronze Age and was more easily linked to the back of what was has since been called the 'North Harbour', so forming an extremely sheltered harbour. The 'North Harbour' is protected by a line of rocks on its north-eastern side (Fig. #35.3). The 'Central Harbour' lies in a small bay, naturally protected by the acropolis to the south and west (Fig. #35.2). On its northside a low ridge of rock projects to the southeast which was later reinforced by the city wall and harbour mole. It appears that the 'Central Harbour' has been subjected to both sea-level rise and siltation. The harbour of Phaselis offered shelter on either side of the McKee (4) Type peninsula or possibly in the marshy area which, regardless of the prevailing winds, would have been an ideal shelter in the second millennium. Lorimer (1950) supports the theory that Phaselis was used as an anchorage in the Bronze Age. She believes it was used by the Mycenaeans because it possessed a natural source of water and was cut off by the mountains from the interior and therefore less likely to have been attacked by Lycians.

*INCE BURUN (headland)*

*AV BURUN/KOCA (headland) (Creek on south side, and small bay on north)*

**#36 . Kemer**

36:36 N 30:35 E

Small bay. Aspect NE, protected by headland of Av Burun to east and low promontory runs north of site in north-easterly direction (Heikell 1989: 195; Fig. #36). Situated on the south-eastern edge of small alluvial plain. Strong N wind and swell. Land and sea breezes. McKee Type (4) shore.

*KARA DAĞ (mountains drop straight down to the sea)*

*RASHAT ISLAND*

**#37 $ Antalya (Adalia)** Attaleia Satalia (Site of Olbia?)
36:53 N 30:42 E

The site of Antalya is located in the middle of the south Turkish coast at the head of the Gulf of Antalya. It is situated on top of cliffs (30m high) near the mouth of the river Devrense, on the north-western edge of the Gulf of Antalaya. The harbour is protected to the south by a small headland (and the remains of the Roman breakwater). Cliffs extend 6.5km to the west and 16km to the southeast, they provide shelter from S/SW sea breezes but prevent landing. Antalya provides a good landfall, especially for summer anchorage. Access is provided both for beaching on the low-lying, sandy river mouth to the west, or for anchorage within the small rocky bay of the modern day marina where protection is provided on the north, east, and southeast (Fig. #37). The aspect of the harbour is WSW (Fig. #37.1). In autumn and winter S and SE winds prevail (moderate Force 5-6). In the summer cold, N winds blow from the interior at night, and moderate W sea breezes sweep up the west side of the gulf during the day and approach the harbour from the south. Therefore the shore is considered to be a 'lee shore', McKee Type (1), and the smaller bay 'exposed to parallel winds', McKee Type (2)/(3). Deep anchorage. Deep gorge to west of town provides good water supply. River carries calcareous matter, deposited in sea. Bean (1989: 21) states that 'Here for the last two thousand years has been the principal south-coast port' , as it is 'the best natural harbour on this coast' (Princeton 1976: 111). Although there is no evidence for anchorage here prior to 2nd century BC, the site has been occupied intermittently from the fifth millennium BC, acting as a good point to access routes inland, and the anchorage would have provided adequate shelter throughout antiquity2. Two copper oxhide ingots have been

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2.

ANTALYA

Fetch

Fetch (in nautical miles)

| S | N | E | W | NE | NW | SE | SW |
|---|---|---|---|---|---|---|---|

found offshore near Antalya, dated to the 16th and 15th centuries BC (Gale 1991: 201).

*BABA BURUN (headland, over hanging cliffs)*

**#38 $ Lara** Palaia Attalia Magydus (possibly ancient Olbia)
36:50 N 30:48 E

The shore at Lara is backed by sand dunes. The River Düden enters the sea to west of the site. Yali Dağ to the east forms a small, low promontory and offers some shelter to east (Fig. #38). In the 4th century BC an artificial harbour was constructed at Lara, of which remains of a rubble mole can still be seen (Bean 1989). Prior to the construction of the breakwater the harbour was exposed, with a S-facing aspect presenting a 'lee shore', Mckee's Type (1), and low-lying surrounding topography which offered some shelter.

*AKSU RIVER (Perge upstream, prior to historic times navigable to the site. Eişma (1978) notes that 'The riverine harbours of Perge (some 13km inland) and Sillyon (situated inland and to the east of Perge in the middle of the plain) all inland cities of Pamphylia, now completely silted'.*

**#39 $ Side** Selimiye (Eski Antalya)
36:46 N 31:24 E

Low, sandy headland on coastal plain, projecting west-southwest from coastline. Side was colonized in the 7th to 6th century BC and preserves a silted Roman harbour (Akurgal 1985: 336). Although there is no archaeological evidence for earlier occupation Eusebios places its foundation in 1405 BC. Anchorage to the north

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 300+ | 0 | 0 | 2 | 0 | 0 | 140 | 9 |

Consideration of winds effect on harbour in the summer

| For foul winds | N | NW | SE | S | SW | NE |
|---|---|---|---|---|---|---|
| | 24% | 13% | 6.5% | 15% | 19% | 22% |

Therefore, the likelihood of not entering the harbour:
(% of days with foul wind)
From the W : 0%
From the SW : 22%
From the S : 24%

Therefore, the factor likelihood of not departing the harbour:
Fetch x (% of days with foul wind)
To the W : 0
To the SW : 58.5
To the S : 130

or the south of the headland. Aspect of the southern harbour is WSW, little natural shelter from prevailing winds (Fig. #39). Lines of reefs leading across northern small bay and off to southwest (Fig. #39.1/.2). Natural reefs of cemented beach cobbles form basic harbour with later artificial blocks added (Flemming 1980 Unpublished paper). It was possible that the anchorage was almost an island or anvil-shaped promontory in the Bronze Age, now joined to the mainland by an isthmus. Flemming (1980) also observes that the 'SE harbour basin is partly dug out of the land or perhaps exploits a natural lagoon (partially silted)', which possibly acted as an early harbour. The harbour is located on a SW-facing 'lee shore', McKee Type (1), or (2)/(3) if the headland was an anvil-shped promontory in the Bronze Age. Hard sand bottom. No fresh water. Until artificially re-excavated, the site was covered with sand dunes (Evans 1973: 100).

*MANAVAGAT RIVER (Sand bar across entrance, but probably not in antiquity when possibly navigable)*

**#40 . Melas** (upstream Manavagat river)
36:47 N 31:26 E

Navigable river, muddy discharge runs parallel to coast. Strabo describes port (see Beaufort 1818), possibly the port of ancient Seleucia which has been identifed some 8km upstream (Bean & Mitford 1965: 4). As a riverine site, it would be considered to be a McKee Type (4) anchorage.

*KARA BURUN (Classical Myraba) (headland)*

**#41 . Kara Burun** Ptolemais?
36:39 N 31:41 E

McKee Type (4) anchorage in lee of quarried island.

*FIĞLA/ FIDAN BURUN (headland)*

**#42 * Fiğla** (Fidan) Ptolemais
36:36 N 31:47 E

Anchorage either side of anvil-shaped, small low promontory (Fidan Burun). Promontory projects in a north hooked shape, 0.8km southwest from coast. Off the cape there are numerous rocks. On the west side of headland is an open, SW-facing bay. On the east side of the headland of Fidan Burun a small bay, partially protected by the headland provides adequate shelter (Fig. #42). Remains of Classical breakwater adds protection to bay (Tigrel 1975: fig.,photo; Fig. #42.1). There is also a Bronze Age site in vicinity. The

bay is facing SE and fairly well protected from onshore breezes and therefore a McKee Type (2)/(3) anchorage, with partial protection from the headland. Flemming (1980b) observes that the harbour is 'entirely composed of natural beachrock'. Beaufort (1818) describes remains of Cyclopean walls.

*KALEARDI BURUN (Dildarde Burun) (headland)*

ROUGH CILICIA (CILICIA TRACHEIA)

**#43 $ Alanya** (Alaya) Coracesium
36:32 N 32:01 E

Situated in lee of large south projecting promontory, of Kaleardi Burun (Fig. #43). Anchorage on east side, sheltered from prevailing SW winds by promontory to south-southeast and land to the west, north and north-northeast (Heikell 1989: 205,fig.). Mountains at back of slightly silted plain fed by River Oba or Alakilise. Town rises steeply from low, sandy isthmus on rocky east side of promontory. Once an island, now joined by isthmus. Petrified beach to east. Surf dangerous during S winds (Geo. Handbook 1942), otherwise excellent protection from prevailing SW winds. McKee shore Type (2)/(3). Anchorage loose sand bottom, landing place on stony beach. Seljuk fortress on promontory. No evidence for Bronze Age occupation but adequate shelter for anchorage. A sudden uplift movement of the shore has occurred in this area and has been dated to 1540 years B.P. (Kelletat & Kayan 1983 in Pirazzoli 1987b: 66).

*DIN CAYI (river)*

**#44 $ Aydap** Iotape
36:19 N 32:16 E

Situated on the north-western side of a rocky, limestone promontory that extends in a south-westerly direction and is connected to the coastline by a low saddle. Limited shelter is afforded in small coves on both sides of the promontory (Fig. #44). The site is enclosed by cliffs on all sides with the ruins of ancient Iotape on top (Rosenbaum et al 1967). The cove is about 60m square, only large enough to provide anchorage for a few vessels, with the possibilty of additional protected anchorages beyond the point to the southeast (Vann 1991: 5,fig.3-5). The bay is S-facing and thus exposed to onshore sea breezes on a McKee Type (1) shore, but would have been well sheltered from W winds. Broader bays with broad beaches flank the city to the northwest and southeast, where beaching may have

been possible in calm seas. There is no evidence for settlement prior to the Classical period but the bay would have provided a sheltered anchorage for stop-overs en route along the coast during all periods. Flemming (1986) records no displacement at the site since antiquity.

*BIÇKICI DERE (river)*

**#45 $ Gazipaşa** (Halit Liman) Selinus-Trajanopolis
36:16 N 32:18 E

The site is situated on the mouth of the River Masa (Dörcal) which runs over the flat alluvial plain and is sheltered to the south by the knoll of Kale Burun, whose cliffs fall 200m into the sea (Fig. #45.1). There has been possible siltation in the area to the east and southeast of the site between Kale Burun and Koru Dağı. The river now takes a sharp bend to the southwest cutting a sand bar and entering the sea at the acropolis base (Fig. #45). The plain to the north was once a gravel beach and is now petrified. The anchorage in the rivermouth (Vann 1991: 6,fig.6-7) is WSW-facing and sheltered only by the river banks and the headland to the south. With the afternoon onshore breeze a swell rolls into the anchorage (Heikell 1989: 207). S winds prevail and therefore the anchorage is described as a McKee Type (2)/(3) anchorage.

*KALE BURUN (headland)*

*KORU DAĞI (Seliniti Burun) (headland)*

*KEŞIK BURUN*

**#46 * Antiochia** Antiochia ad Cragus (Gunen Koy)
36:08 N 32:27 E

The ruins of Antiochia lie a few kilometers northeast of the modern village of Endiseguney. Cliffs project from the town 300m down into the sea. Vann (1991: 7,fig.8-10) states that 'A pair of small coves between the fortified citadel and the necropolis in the western portion of the city, are likely to be the harbour... The western inlet is small and approached by a narrow channel flanked by sheer cliffs [Fig. #46], while that on the east must be entered by a natural cavern through the hill which brings one into an even smaller protected body of water [Fig. #46.1]... The entrances must have been very difficult to recognise from the water.' This first millennium anchorage offered ideal shelter for a pirates hideout 'but not as successful for traders' (Vann 1991: 7) could well have offered shelter prior to this period and has continued to do so since.

Raban (1994, personal comunication) has identified Bronze Age artifacts scattered on the seafloor. The anchorages are almost totally enclosed, but with SSW-facing aspects entrance to them and exit from them could be somewhat problematic, but once at anchor extremely sheltered in McKee Type (4) anchorage. Hellenistic ruins on cliff top.

**#47 $ Kalidiran** (Yakacik Köyü) Charadus (Karadan)
36:05 N 32:35 E

Small S-facing, wide aspect bay, situated on the mouth of Kaladiran River, at the head of a large valley. The site has been identified as the fourth century BC city of Charadrus (Bean & Mitford 1965: 42). The river is slightly silted at the mouth. Hills to the southwest and southeast (Karga Burun), as well as behind the site. Some shelter from onshore breezes, W and NW winds on west side of bay, but swell. Vann (1991: 21) believes that 'The site must have been significant in antiquity for there are too few places along this coastline that provide such a sizable plain at the edge of the sea'. Good for beaching vessels on McKee Type (1) shore.

*KARATAŞ BURUN (headland)*

**#48 . Karataş** (Melleç)
36:03 N 32:42 E

Small anchorage in lee of the low, rocky finger of Karataş Burun (to the west), on west side of bay with shingle backed beach. Sand and rock bottom. Uncomfortable anchorage in afternoon breeze and some swell, McKee Type (2)/(3) anchorage. Medieval building stands near water. Vann (1991: 21) believes the headland and beach would have afforded a good harbour.

*ANAMUR BURUN (headland)*
(Admiralty Chart Number 2632)

**#49 $ Anamur Burun** Anemurium
36:02 N 32:49 E

Situated on the southern extreme of the Taurus mountains, at the south-western point of Anamur Plain (Heikell 1989: 208; Fig. #49). A good sheltered anchorage is afforded in lee of (to the east of) Anamur Burun (152m high, bold and steep, 1500m north to south and 400m wide, Anamur Burun is a very prominent landfall, especially from Cyprus, and important in terms of access inland). The general aspect of the coastline is S-facing, although the harbour aspect is SE and the promontory provides some shelter from the W winds but is exposed to the

south and east. The predominant summer wind is SSW, although an onshore breeze can blow from the southeast later in the day, making the anchorage quite exposed at times. The shoreline can therefore be described as one that is 'exposed to parallel winds' ie McKee Type (2)/(3) anchorage3. Sandy beaches extend c.10km to the east. Sandy seabed in anchorage. Greco-Roman harbour of Anamur (Rosenbaum et al 1967: Pl.IB) which acted as significant road station and port until the Medieval period, could well have provided shelter to vessels from prevailing winds throughout antiquity, just as it does today. Flemming (1986) observes no significant change in sea level since antiquity. The northern reaches of the upper citadel and lower town are however, buried by sand dunes and could possibly be the area of the Bronze Age harbour.

*BOZYAZI DE (river)*

**#50 * Bozyazi** Arsinoe?
36:06 N 32:59 E

Small, sheltered, sandy bay on east side of of a small headland, just west of Kizil Burun, described by Flemming (1971, personal communication) as 'a natural harbour'. Beaufort (1818) believed that the bay 'had once extended further inland, so as to have been entitled to the appellation of a harbour; this place may therefore answer to the Arsinoe of Strabo'. The bay is indeed extremely silted forming a broad coastal plain (1989, personal observation), created by alluvial deposits from the River

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3 ANAMUR

Fetch

Fetch (in nautical miles)

| S | N | E | W | NE | NW | SE | SW |
|---|---|---|---|---|---|---|---|
| 54 | 0 | 153 | 0 | 1.6 | 0 | 56 | 300+ |

Consideration of winds effect on harbour in the summer

For foul winds:

| S | SE | E | N | NW | W | NE | SW |
|---|---|---|---|---|---|---|---|
| 11% | 24% | 21% | 3% | 16% | 8% | 4% | 16% |

Therefore, the likelihood of not entering the harbour:

| From S | SE | E |
|---|---|---|
| 3% | 16% | 8% |

Therefore, the factor likelihood of not departing the harbour:

| To S | SE | E |
|---|---|---|
| 81 | 180 | 260 |

Bozyazi that runs into the back of the harbour, which could well have extended further inland in the second millennium. The bay is sheltered from W winds and is S- to E-facing and described as a McKee Type (4) anchorage. Flemming (1986) observes no significant change in sea level since antiquity. Gjerstad (1934: 176) records finds of Cypriot White Slip I and II ware having been recovered here, implying its occupation in the Late Bronze Age and contacts with Cyprus. Offshore the island of Nagidussa, that reveals later ruins, offers additional shelter.

*KIZIL BURUN (headland connected to mainland by isthmus)*

#51 . **Gözce**
36:07 N 33:12 E

Mountains to east, plain to west. Broad, silted anchorage particularly in the west. S-facing on mouth of river Değirmen. Possible to beach craft on northwest shore (1989, personal observation). Access to interior up river. McKee Type (1) anchorage.

#52 * **Soğuksu Liman** (Yenikaş) Melania
36:07 N 33:19 E

Extremely sheltered, almost land-locked, long, horseshoe shaped, S-facing, McKee Type (4) bay. Protected by mountains to north, an anvil-shaped headland of metamorphised limestone 0.5km in extend, is connected to mainland by an isthmus, on which ruins have been identified, possibly Melania of Strabo (Beaufort 1818), lies to the west of the bay and Karabiyik Burun to east (Fig. #52, Fig. #52.1). Scores of pottery of various periods have been identified on the seafloor and there is an ancient tell beneath the ruined castle on the west side of the promontory (Raban 1994 personal communication). Anchor to east side of headland in southwest corner of bay (Heikell 1989: 209,fig.). Open to S and SE winds. Sand and rock bottom. 'Deposits of beach rock include much pottery suggesting that the site served as a harbour in antiquity' (Vann 1991: 8,fig.12-13). Water from river in north side of bay. Would have provided adequate shelter to vessels throughout antiquity, possible Bronze Age site to the east (Raban 1994, personal communication). Flemming (1986) observes no significant change in sea level since antiquity.

*KARABIYIK BURUN (headland)*

#53 $ **Aydincik** (Glindere) Celendris (Chelindreh)
36:08 N 33:21 E

Located on the east side of Karabiyik Burun,

protected by the headland from W winds and by mountains to the north. E-facing, small but secure McKee Type (4) anchorage (Fig. #53, Fig. #53.1). Petrified beach. Three small islands lie in front of the silted bay. Shelter also possible on east side of plain. A Bronze Age site and a few Medieval ruins around the west side of the harbour (Heikell 1989: 210), all covered by modern village. Flemming (1971 personal observations) describes Celenderis as a 'natural harbour' and identifies no significant sea level change since antiquity (Flemming 1986).

(Admiralty Chart Number 2632)
*SANCAK BURUN*

*BABADIL ADALARI (island)*

**#54 $ Sipahill Limani** (Babadil Liman) Grambusa
36:07 N 33:34 E

Anchorage between two islands separated by rocky channel in south-eastern corner of Babadil Bay (Heikell 1989: 211). Sheltered from WSW winds. SE and NW aspect of McKee Type (2)/(3) bay.

*ADA BURUN (headland)*

*OVACIK KÖRFEZI (bay)*

**#55 . Ovacik** Holmus
36:10 N 33:42 E

Located in the north-eastern extremity of Ovacik Bay on alluvial plain. Sheltered by mountains to north and southwest, Ovacik Burun provides some protection to east. Anchor off southwest side of S-facing bay. Exposed to SSE and WSW, thus a McKee Type (1) anchorage.

*OVACIK ADA BURUN Sarpedon (headland connected to mainland by isthmus)*

**#56 $ Ovacik Adasi Anchorage** (Cavaliere) Aphrodisias
36:10 N 33:43 E

Large anvil promontory of Ovacik Ada Burun on Zephyrium peninsula, 2.5km across, 151m high at end and almost circular in shape, is joined to mainland by isthmus, '400 yards across' (Beaufort 1818; Fig. #56). Anchorage on either side of the isthmus (foul winds on west side) but the east anchorage is the more protected as it is sheltered by Ovacik Adasi offshore to east and less exposed to W winds (Fig. #56.1, Fig. #56.1). Bay faces W/SW and NE (especially good anchorage in northeast). In the early 19th century AD there were two shallow ponds on the isthmus which

connected to the sea by channels (Beaufort 1818). Remains of Classical quay walls have been identified on the isthmus, possibly representing a later inner harbour. Vann (Vann 1991: 9,fig.14-15) describes the site as 'a classic example of a city with two anchorages either side of an isthmus'. It is likely that the peninsula to the south of the isthmus was in fact an island or a lagoon in the Bronze Age, and shelter was sought in the lee of the island or in the lagoon, however, no Bronze Age remains have as yet been found. Very steep and rocky mountians to north (Fig. #56.2). Homer says that the Sarpedonians landed their army here in support of the Lycians during the Trojan War (Denham 1964: 119). The anchorage would have provided an excellent stop-over point for ships voyaging along the south Turkish coast during the Bronze Age. Due to its being an anvil-shaped headland it is decribed as a McKee Type (4) anchorage.

*OVACIK ADASI (island)*

*DANA ADASI Pityussa (island)*

*TAŞUCU KÖRFEZI (bay, steep mountains to west, sand-spit on east shore)*

*BAĞSAKADA (island)*

**#57 $ Ağalimani** (Bağsak) Mylae (harbour of Seleucia, replaced by Taşucu Holmi)
36:16 N 33:52 E

Sheltered, ESE-facing bay on west side of Taşucu Körfezi. Protected by small headland to south and by offshore island of Bağsakada to the southwest, mountains to west and promontory of Liman Kalesi to north-northeast on which the castle stands (Fig. #57, Fig. #57.2/.3). The anchorage is well sheltered in the southwest corner of the bay (Heikell 1989: 212,fig.; Fig. #57.1) from onshore sea breezes and would be described as a Type (4) McKee shore. The offshore island is also covered with ruins and has been extensively quarried (Flemming 1980 Unpublished paper) and perhaps could have acted as an offshore anchorage in antiquity. Late Bronze Age ruins have been found on the mainland nearby.

*LIMAN KALESI (small headland with some shelter on north side)*

**#58 . Taşucu Holmi**
33:15 N 33:55 E

Situated at the head of Taşucu Bay (Fig. #58). A modern artificial harbour protects from

exposure to prevailing S winds and long fetch, and is the port of Silifke. Currents from SW. Mobile delta to southeast of anchorage to point of Incekum Burun. Little shelter in the Bronze Age, in McKee Type (1) anchorage but may have been possible to navigate up stream to Silifke depending on outlet of Gösku River at that time.

*INCEKUM BURUN (headland)*

*GÖKSU (SILIFKE) RIVER DELTA Calycadnus (The shape of the delta and extent of the delta and the outlet of the river will have changed over time throughout antiquity)*

**#59 @ Silifke** (Seleucia) Possible Bronze Age Ura
36:22 N 33:57 E

Situated on the north-western edge of the Göksu (Silifke) delta, on the River Göksu. Sheltered by mountains to north. Prograding delta to south and east. Garstang places the unidentified site of Ura, referred to in the Ugaritic and Hittite texts (KBo XII 42 rev. Col.III; PRU, IV 17.130; RS 20.213) in the vicinity of the Late Bronze Age site of Silifke, as it is believed to have been located in Western Cilicia (Garstang 1943: 1-12). Historically the site was founded by Seleucus I when its port was then only 6.5km from the river mouth (Denham 1964: 121) which gives an indication as to the degree of progradation that the Silifke delta has undergone since this time. Mellaart (1954: 203) records the finding of Early Bronze Age material at Silifke implying the possible occupation of the site throughout the Bronze Age. It is possible that shelter was afforded in a riverine anchorage, McKee Type (4) in the Bronze Age.

*GÖKSU RIVER (river outlet)*

**#60 * Hüdüde Hüyük**
36:18 N 34:01 E

Ancient settlement identified by Gjerstad (1934) on Silifke delta, 7km east-southeast of Silifke. Possibly located on ancient course of Göksu River and acted as riverine harbour for upstream Silifke in antiquity, thus a McKee Type (4) anchorage. Mee (1978: 123/9) has identified Mycenaean and Minoan pottery at the site.

**#61 $ Susanoğlu** (Presenti/Persembe) Corasium
36:25 N 34:03 E

Situated on the north-eastern edge of the Göksu (Silifke) delta. Extensive ruins stand at the head of a small bay. Rocks to east, sandy beach to west. Exposed to day breezes. The silted

river valley area at the back of the beach is known to have been an estuarine harbour in the Hellenistic period, that of ancient Corasium. Strabo believes it acted as the eastern harbour of Silifke. Here traces of Hellenistic storehouses and sea walls have been identified (Taşkiran & Kurt 1986). The river valley itself is infilled with alluvial deposits creating a fertile plain (Fig. #61.1). Exposures in the valley bottom reveal a large area of clay and sand deposits, believed by van der Have, T. and van der Berk, V. (1991, personal communication) to be lagoonal deposits, possibly deposited after the entrance to the valley was blocked by sand bar build up, thus implying that the alluvial process was relatively recent (Fig. #61). No thorough survey work has been undertaken, and no prehistoric ceramics identified to date, but prior to silting, which is believed to have been a relatively recent phenomenom, the river valley would have offered very adequate shelter to vessels in the narrow sheltered, McKee Type (2)/(3) inlet (Fig. #61.2)

**#62 . Narli Küyü**
36:25 N 34:08 E

Situated on north-western side of SE-facing bay which lies southwest of Akkum Liman. Small cove is sheltered by the headland of Akyar Burun to south and 'provides an excellent but small protected harbour which probably served the ancient settlements up the hill' (Vann 1991: 9,fig.18-20). Sheltered from day breeze but open to NE and E winds and night breeze and described as a McKee Type (2)/(3) anchorage. According to Flemming (1978), this portion of the south coast of Turkey is one of the most stable areas in the Mediterranean, so the relationship of shoreline to water level has not changed significantly since antiquity.

*AKKUM LIMAN (bay)*

**#63 $ Kizkalesi** (Korghos Kalader) Corycus
36:27 N 34:10 E

Broad, wide SE-facing bay, protected by small promontories to the east-northeast and southwest, as well as by an offshore island to the southeast (Fig. #63). Two Medieval castles were constructed one on the mainland at the north end of the ancient harbour, the other on the island. Remains of two Roman breakwaters survive (Vann 1991: 10). Onshore prevailing winds, shelter to the north of the islet on which the castle is situated. Day breezes from the SSE, swell in afternoon (Heikell 1989: 215,fig.).

There is a local tradition that the Sea Castle was once joined to the mainland and charts recording water depths clearly show a natural ridge of higher seabed leading from the promontory to the island. If the island had been joined to the mainland at this point then adequate shelter would have been provided for anchorage but otherwise the bay would have been extremely exposed in the Bronze Age. The necropolis and city of Corycus is on the mainland and extends inland up a valley to the northeast behind the Land Castle. The valley appears to have experienced a certain degree of alluviation (1991 personal observation; Fig. #63.1) and may have been partially drowned in the Bronze Age, therefore offering sheltered anchorage. Genarally the harbour is described as a McKee Type (1) anchorage.

**#64 $ Ayas** Elaeusa-Sebasté

36:28 N 34:12 E

Small headland with two bays either side, protected by hills to the north. The north bay is ESE-facing (Fig. #64) and the south bay, S-facing. A shallow bay would once have occupied the area between the seaward headland, which was once an island (confirmed by Strabo), and steep land opposite (Vann 1991: fig.25). Degree of increased alluviation has resulted in response to the reduced rate of sea-level rise, leaving the valley of Ayas infilled with Quaternary sediment. The headland is now connected by a low isthmus and drift sand but would have provided quite adequate shelter in the lee of the island in antiquity (Princeton 1976: 294; Fig. #64.1). McKee Type (4) anchorage. Roman remains are seen on the slopes of the hill and in lee of the headland.

*KARAKI DE (river)*

**#65 * Tömük Kalesi Hüyük**

36:38 N 34:23 E

An artificial tell on the right hand side of the road 4km northeast of Lamas and south of Soli, of similar formation to tells on the Cilician Delta (Gjerstad 1934: 158). Situated near the point where the narrow plain of the shore ends and off shoots of the mountains reach the coast. Remains include Cypriot White Slip I wares recorded by Gjerstad (1934: 176) and Mycenaean wares in the second millennium wares in the surface scatter (Mee 1978: 123/19). McKee Type (2)/(3) anchorage assuming settlement on coast during Bronze Age.

*SMOOTH CILICIA (CILICIA PEDIAS)*

**#66 * Soli** Pompeiopolis (Viranşehir) Possibly Bronze Age Ura

36:37 N 34:33 E

The site of Soli stands on the Mezetli River, 11km southwest of Mersin at the south-western most point of the Cilician Delta, just on edge of the Taurus Mountain Range. Slightly prograding river mouth silting up vast artificial Hellenistic harbour (now filled almost entirely with sand and beach rock). The two parallel breakwaters, believed to have been constructed at least since the 1st century AD (Vann 1991: fig.28), but obviously used as an anchorage prior to this period, still remain now filled with beachrock and covered with sand dunes. Second millennium remains have been identified at Ayas, the site of Classical Pompeiopolis-Soli. Bronzes found at the site compare to those at Middle Bronze Age Ugarit and Tarsus (Astour 1965: 16; Schaeffer 1948: 273-278,fig.174) and Gjerstad (1934: 158) says the site has been occupied throughout the Bronze Age and beyond. The area of the ancient harbour would no doubt have been located inland of the Roman site in the silted river bottom. McKee Type (2)/(3) anchorage.

*CILICIAN PLAIN/DELTA (The prograding nature of the delta (outlined in Ch IV.2) has deterred settlement on the delataic reaches of the plain since antiquity. This is illustrated in Seton Williams (1954: 156) survey which indicates that the majority of Bronze Age settlements (and later) appear to have been restricted to the higher ground around the Pleistocene terraces and the rocky Karataş promontory on the south-eastern edge of the delta. The rest of the delta is marshy up to 10-15km inland. Additional sites on the Cilician Plain are identified by Seton Williams (1954) as possessing second millennium material but whether these sites were used as anchorages has yet to be determined.)*

**#67 [] Mersin** (Yümük Tepe) Zephyrium

36:47 N 34:38 E

The ancient harbours of Mersin did not lie on the coastal delta but on the slightly dissected terraces to the west (Erinç 1978). 'The ancient site of Mersin is a mound of medium size which stands on low ground some two miles back from the shore ... and is called Yümük Tepe' (Garstang 1953: 1,5,fig.2,pl.1). Little shelter is afforded along the present McKee Type (1) coast. The anchorage in a roadstead to the east of the modern harbour entrance, was described by

Mellart (1954) as an 'open anchorage'. Possible Bronze Age anchorage on southern side of the mound (Raban 1994, personal communication) where the modern course of the river passes below the site (Fig. #67/.1). Low sand hills form sandy cape. Broad sandy beach, suitable for beaching. Best anchorage offshore. Sea breeze and SW to W and S to SE winds in summer cause a nasty short swell and may raise the sea level by 0.6m. Strong current along shore during SW and E winds. Winter N and NW winds predominate. Seas often heavy. Morning mist. (Geo. Handbook 1942). The site was occupied from the Neolithic period through the second millennium, with evidence of contacts throughout the eastern Mediterranean including Mycenaean Aegean contacts (Garstang 1953). Garstang (1953: 1) continues 'Not only did the settlements on the Mersin Hüyük share in the successive culture movements that affected the Cilician Plain, but they controlled the ancient trade route which connected rich centres in Syria, such as Carchemish and Aleppo, with the cities and ports of western Anatolia, including the land bridge into Europe, by way of the easiest of the few passes through Taurus, that of Calycadnos valley and the Pisidian Highway'. Hittites dominated the site during the 14th and 13th centuries BC, after which time the site was destroyed and when reoccupied, revealed a stronger Levantine, Cypriot and Mycenaean influence, implying greater maritime contacts (Sherratt & Crouwell 1987). The excavation of the site is just re-starting. Mersin is still utilised as a modern port today, however, as a result of its continual use and reconstruction, no evidence for the earlier harbour works remain.

**#68 @ Kazanli** (harbour of Tarsus) Anchiale?
36:50 n 34:44 E

Located roughly 2km inland to east of modern outlet of Kizil Demre (river), north-northwest of the modern village of Kazanli, on more solid ground to east of sand dunes. The flat topped site is c. 15m in height and c. 50m across (Seton Williams 1954; Fig. #68). The site displays large amounts of second millennium pottery including greater quantities of Mycenaean Late Helladic IIIB-C material than that discovered at Tarsus (Mee 1978: 121-156; Sherratt & Crouwell 1987: 325). The majority of pottery dates between the Early Bronze Age to the Early Iron Age, after which time the site was abandoned. Garstang (1938: 16,pl.V), who partly excavated the site in 1937, describes Kazanli as 'one of the finest known sites for illustrating the archaeology of the Cilician Hittite area'. The site was

dominated by the Hittites during the 14th and 13th centuries, when the largest quantities of Cilician pottery of the Hittite period were recovered (Garstang 1938: 12-20). Much of the latter pottery compares with related Palestinian material, with some Late Cypriot material (some possibly locally made) and lots of Late Helladic IIIC (Sherratt & Crouwell 1987: 340). The site is situated near the mouth of the Tarsus River and is believed to be a former port of Tarsus and would have offered an ideal river mouth anchorage on a McKee Type (2)/(3) shore in the Bronze Age. The mound is high sided and allows a good command over the surrounding flat delta plain, it is also visible from afar ie a good landmark to sailors along an otherwise low-lying shore (Gjerstad 1934: 159).

#69 [] **Tarsus** (upstream Tarsus/Tersoos river) (Tarsa) (Gözlü Kule) Cukurova

36:55 N 34:53 E

Presently located upriver of River Tarsus (bar across river mouth), some 15km from the coast, not on the coastal delta, but on a slightly dissected coastal plateau to the west of the coastal delta, with the nearby River Tarsus (ancient Cydnus) deeply entrenched. During the Bronze Age the sea was a number of kilometers further to the north of its present location and Tarsus would probably been on the sea or a McKee Type (4) marine embayment (Fig. #69). From textual evidence Tarsus, or Hittite Tarsa, was known to have been an ancient harbour. Excavated by Hetty Goldman in the 30's and 40's, Tarsus has revealed significant Bronze Age remains, with occupation levels dating from Neolithic times (Goldman 1950: 528,fig.1-2). Ceramic remains have revealed Bronze Age connections throughout the eastern Mediterranean, particularly with the northern Levant (Astour 1965: 16). Like other sites in the region Tarsus was dominated by the Hittites during the 13th and 14th centuries BC. The exact location of the harbour of Tarsus is unknown but recent geomorphological surveys by Evans (personal correspondence) demonstrates it to have been situated to the southwest of Tarsus in a large marine embayment, that was eventually drained as a result of tectonic uplift and general silting up of the River Tarsus (Fig. #69.1). The Roman harbour of Tarsus, known as Rhegma, was on a lake or lagoon connected to the sea by a channel. It was abandoned by Justinian prior to the 6th century AD, at which point the river of Tarsus was diverted to its present channel east of the modern city (Princeton 1976: 883-884). Sedimentary evidence suggests that the

area of the ancient harbour is now drained marshland, covered with extensive plantations of eucalyptus trees that drain the swamps, and marked the course of the river prior to silting (Princeton 1976: 883-4; Van der Have 1991, personal correspondence). Tarsus declined as a port as a result of rapid siltation of the Tarsus River, on which the harbour was located (Erinç 1978). Evans (1973: 96) locates the Bronze Age shoreline about 3km inland from the present shore.

*SEYHAN DELTA*

**#70 . Adana** (upstream Seyhan/Sarus river)
37:00 N 35:20 E

Adana is believed to have been the port that received the boat of Cleopatra, which implies that the river was once much wider and the site an upstream McKee Type (4) harbour in antiquity.

*DELI BURUN (promontory)*

*TUZ GÖLÜ (lagoon/ marsh)*

*AKYATAN GÖLÜ (lagoon/ marsh/ salt lake)*

*FENER BURUN (cape)*

*ISKENDERUN KÖRFEZI <u>Sinus Issicus</u> (gulf) (located between Fener Burun and Resülhinzir 40km to the southeast. Muddy shores. Winds from S and W)*

**#71 $ Karataş** <u>Megarsus</u>
36:33 N 35:24 E

Located on the east side of Cape Fener upon which there are many later ruins and 'there may have been shelter for ships immediately on the east side of the headland' (Flemming 1980 Unpublished paper). The main ruins are to the northeast of modern Karataş. Two islands offshore linked to the mainland by shallow reefs which provide some protection in a McKee Type (4) anchorage on an otherwise exposed, open McKee (2)/(3) Type coastline (Fig. #71). About 1km south of the site, along the headland, the coast is cliff-like and at this point shallow reefs extend to the northeast, towards the islands providing additional shelter. Slightly uplifted area on Karataş promontory. Anchorage faces SE. It is likely that the coastline was considerably different at this point in the Bronze Age, that the Ceyhan River then discharged at this point, and that Cape Fener was an island later joined to the mainland by the prograding delta. However, anchorage could still have been sought in lee of

the islands or island of Fener Burun in the Bronze Age.

*CEYHAN DELTA*

*AKYATAN GÖLÜ (lagoon)*

*PORTAKAL BURUN (cape)*

*CEYHAN NEHRI Pyramus (river) (Now outlets into İskenderun Gulf but ancient writers refer to outlet on south coast, which implies that the river has shifted course over time. Strabo refers to Mallos, a site which stood on an eminence near the mouth of the River Pyramus, not far from the sea, near Aegae.)*

**#72 * Domuz Tepe**
36:40 N 35:29 E

The site of Domuz Tepe is situated 12km from the coast on the south-eastern side of the Cilician delta just on the western edge of the Misis Dağ/ Karataş promontory, north of the present course of the Ceyhan River which passes through a saddle to cross to the eastern side of the promontory at this point. Situated to the northwest of the modern town of Yesilköy on the edge of a low, limestone plateau commanding a good view over the flat Ceyhan river valley plain, the site of Domuz Tepe is a formidable size, extending over an area of roughly 150m by 100m, and stands approximately 20m high (Fig. #72.1). Although the River Ceyhan is now some half a kilometer to the west of Domuz Tepe, it is once believed to have passed much closer to the site (Bird 1985: 96). However, as a result of the Tarsus uplift (see earlier **Tarsus** #69), large quantities of sediment built up to the west of the Misis Dağ, causing the river baseline to rise to the lip of the saddle and ultimately forcing it through the saddle at Bebeli, to build its delta out into the İskenderun Gulf to the east, as opposed to directly south as was its previous course (Bird 1985: 96,fig.53/1916; Evans 1971: 394; Fig. #72). This change in the river course is very apparent on aerial photos (Gilbert personal communication). The date of the change in the river course is not clear, although it is believed to have occurred sometime during the 1st millennium BC (Erol 1967: 98; Gilbert, Personal correspondence). Just prior to the change in the river course Domuz Tepe would have commanded an excellent strategic position in a well sheltered spot behind the Dağ, to monitor the movement of vessels entering the Ceyhan river and proceeding up river to the Taurus Mountains. It is therefore possible that this would have been the 'major

commercial corridor' for access to the north, via the Misis Dağ promontory. The promontory is the only area of high ground in an unstable marshy region with little arable land (Fig. #72.2). There was no other reason for the site of Domuz Tepe to be located here other than to act as a riverine harbour to deal with goods being transported from the eastern Mediterranean to the Anatolian plateau, the centre of the Hittite lands to the north. The second millennium harbour of Domuez Tepe situated on the Ceyhan River at the head of the Ceyhan Delta, is now completely cut off from the sea due to deltaic progradation (Bird 1985: 96). The site, identified by Seton Williams in her survey of 1951 (Seton Williams 1954: 121,fig.1), displays a degree of second millennium remains including traces of Mycenaean IIIC pottery (Mee 1978: 121-156) and Middle Cypriote ware (Seton Williams 1954: 154) and is listed amongst the important Middle and Late Bronze Age sites in the area (Seton Williams 1954). Despite the potential importance of the site, no further investigations have been carried out since 1951. The site is a McKee Type (4) riverine anchorage.

*YUMURTALIK LIMAN (bay)*

#73 $ **Ayas** (Yumurtalik) Aegae
36:34 N 35:47 E

The headland of Ayas on which stands a castle, is situated on the north-eastern point of Yumurtalik Bay, at the entrance to the bay, presently 'the most natural harbour on the south coast of Turkey' (Flemming 1980b; Fig. #73). However, it is quite likely that the bay did not exist in the second millennium, at least not as it does today, but anchorage would still have been provided in lee of the headland (personal opinion) on a McKee Type (4) shore. Anchorage is sought to the east and northeast of the headland and is partially sheltered by an offshore island (Kiskalesi) to the east of the bay. A rocky spit runs to the south-southwest. The anchorage, in the lee of the headland, is E-facing. Additional shelter is provided to the southwest by the Ceyhan delta (Geo. Handbook 1942). The anchorage is sheltered from all but E and SE winds. The anchorage is believed to have extended further inland in ancient times prior to the silting of the River Uzundere. Two ancient, probably Roman, moles have been identified in the bay, which reinforce a natural reef, which offers protection in its lee. The modern town of Yumurtalik is west of Ayas on the cliffy north shores (Dede Dağ) of the Bay of Yumurtalik. To the south and west the

shores are low and swampy with reefs off the headland in an area known as Liman Burun.

**#74 * Soyali Hüyük**
36:54 N 35:54 E

Site located 5km inland at the north-western end of the İskenderun Gulf, on the east side of the valley of Kizil Su, which runs from Kürtkulak to the sea. The large conical mound is situated on a rocky outcrop with very steep sides on the north and northwest. The site commands a good view of the valley with its south side more gently sloping into the valley, on a McKee Type (2)/(3) shore. It is located near the entrance to the pass over the Misis Dağ. The main occupation of the site according to Seton Williams (1954: 169) appears to have been Hittite, with Mycenaean IIIC and earlier Middle Bronze Age remains. Assuming the progradation of the delta since the Bronze Age, it is likely that Soyali could have been located closer to or on the coast, during this period. Its location near a pass across the Misis Dağ would have been ideal for the transportation of goods inland.

*PLAIN OF ISSUS*

**#75 * Kara Hüyük**
36:55 N 36:05 E

A small mound located to the southwest of Erzin, 5km northeast from the coast. The site is believed to have been located closer to the coast in the Bronze Age and would have been exposed to winds blowing up the İskenderun Gulf on a McKee Type (1) shore. Hittite occupation has been identified at the site (Seton Williams 1954: 127).

**#76 @ Kinet Höyük** Issos?
36:51 N 36:09 E

Steep sided mound, 30 to 40m in height, is situated on low plain on the north-northeastern edge of İskenderun Gulf. 'The largest site in the area, Kinet Höyük, has long been identified an ancient Issos. Its location on the sea, and the findings ... suggest that it was functioning as early as the Bronze Age as a harbour' (Gates & Özgen 1992). Excavation confirmed continuous occupation at the site from the Early Bronze Age to the Medieval period. Mycenaean and Cypriot pottery has been identified at the site from the Late Bronze Age (Hodos, 1994 Personal communication). Geomorphological survey of the area has identified courses of the River Deli, one of which is believed to have passed by the bottom of the tell. So far only traces of the

Roman harbour have been uncovered to the south of the mound but it is feared that any earlier harbour remains will have been already destroyed by the Delta Petrol Ürünleri Ticaret A.Ş. propane station on the coastal plain (Gates 1992). The site is located on a McKee Type (1) shore but some shelter would have been provided in lee of the tell.

**#77 $ Payas** (Bayas) Baiae
36:46 N 36:12 E

Small low-lying headland on otherwise featureless coast. Anchorage to north of delta at swampy mouth of Seyithan River, in small sandy bay or landing on beach (Geo. Handbook 1942). Small offshore island provides some shelter from S winds on McKee Type (2)/(3) shore. Aspect W to N. Ancient harbour partly inland filled stones and sand, although the remains of the ancient breakwater are still visible. Beach to north backed by low cliffs. Low and marshy to south. Sheltered all winds except WSW and SSW. Good drinking water (Geo. Handbook 1942). The Classical city was known as Baiae, but all the visible remains are Ottoman, Venetian or Genoese.

**#78 $ İskenderun** (Alexandretta) Classical Alexandria ad Issum Mynandus
36:36 N 36:11 E

Coast swings round to west at this point and forms small N-facing bay on McKee Type (4) shore. Marshy, narrow, low-lying coastal plain of Alexandretta is covered in sand and shingle, but would have been closer to the foothills in the Bronze Age (Woolley 1938: 2,nt.4). Mountains to east and south. Alexandria ad Issum founded by Alexander in 333 BC. Anchor offshore, water shoals to sandy beach in south-western corner. Silting. Winds W to SW between May and August, light until February. The few traces of Classical remains are now covered by the sprawling modern city of Payas.

**#79 $ Arsus** (Ulçinar) Rhossus
36:25 N 35:53 E

Coast turns to west-southwest at this point and forms a N-facing bay on McKee Type (4) shore. Sheltered from west, south and east, in the mouth of the River Bent. Flat land surrounds site, rising slightly on west side of bay. Mountains to southeast and east (Kizil Dağ). Ruins of Rhossus on southwest side of river. Good anchorage in summer. Woolley (1938: 2) states that the site housed a Bronze Age harbour which has since been 'deeply overlaid by Roman remains'. Albright also noted Bronze Age material on the shore especially

in the north, covered by later Roman and Hellenistic remains (Seton Williams 1954: 126,nt.6). The beach is gravelly and bordered by outlying reefs particularly to the north, which present a danger to vessels. Prevailing winds are land and sea breezes.

*RESÜLHINZIR (Domuz Burun) (headland)*

*ANTAKYA/ ANTIOCH KÖRFEZI (gulf) (lies between Resülhinzir and Ràs el Basit 42km to south. Several valley mouths on the north of the gulf are believed by Flemming (1980b) to have been 'better harbours some time in the past'.)*

**#80 $ Seleucia Pieria** Seleucia Pieria (Magaracik)
36:04 N 35:58 E

Situated to the north of the mouth of the River Orontes, near the modern day Magaracik anchorage. Erol (1967) based on the evidence of Turkish archaeologist, M. Şenyürek-E. Bostanci, believes that the site of Seleucia Pieria is the 'continuation of a prehistoric site'. Erol (1967: 99) continues to explain how in the northern reaches of the Orontes alluvial plain there are 'relics of two old dried-up lagoons which were formed to the inside of old coastal bars about 4-5000 years ago. The ancient harbour of Seleukia Pieria was founded at the northern end, the northern lagoon. The finding of Hellenistic-Roman pottery by M. Şenyürek-E. Bostanci, on marine sands in a cave at the foot of the scarp indicates that the sea originally came to the foot of the scarp and that the lagoon was used by the ancient Greeks as shelter for their small ships about 1000 years BC'. Erol (1967: 97) believes the lagoon provided shelter prior to the Hellenistic period and was later adapted by the Romans, in order to protect against the changing environmental conditions. Erol adds further evidence that may dispute the findings of Şenyürek-E. Bostanci, but if the lagoon, a later Classical harbour, was utilized by the Greeks as the port of Antioch from 300 BC, then it could well have served as a harbour in the Bronze Age (Fig. #80).

There are two harbour basins visible at Seleucia Pieria, the 'lagoonal' basin is now completely silted up and covered by fields. The entrance to the bay is now separated by a wide sandy beach. A river used to run into the back of the harbour which eventually assisted in the silting of the harbour. In the 1st century AD a most impressive canal and tunnel was dug through a spur of the mountains to divert the river into

the sea north of the harbour (Fig. #80.1). The mouth of this tunnel opens onto the beach behind the second harbour basin which lies on the coast, north of the inland harbour basin. This coastal harbour basin was protected by two moles, but is also now silted at the back of the harbour, possibly caused by the material being carried through the tunnel. It is possible that the outer basin was linked to the inner basin by a channel. The relative dating of the two harbour basins is not known, but as Flemming (1980b) states 'It is inconceivable that the two can have functioned at the same time', although it is generally believed that the coastal harbour was constructed after the lagoonal harbour silted up. Erol (1967) however, does not believe that alluviation was solely responsible for the unlucky history of the city and its harbour and he identifies a series of solution notches along the coast to the north of the city which he says are 'certain evidence of higher seas levels ... during the Flandrian transgression'. Flemming (1980b) on the other hand believes that there has been 'no relative change of sea level' at the site. The harbour is exposed to the NW, W and SW and experiences heavy swell on a McKee Type (1) shore.

*ORONTES/ ASI NEHRI (river)*

**#81 * Al Mina** Al Mina (Classical Posidium ?) Harbour of Alalakh and Sabouni (Samandag/Süveydiye)

36:04 N 35:59 E

The site of Al Mina is located at the mouth of the River Orontes, the broad alluvial river providing an ideal haven for small craft in a McKee Type (4) anchorage, on an otherwise exposed coastline. The site was discovered by Woolley in 1935 (1953: 172) in his search for the Bronze Age harbour of Alalakh. The site is located on the north banks of the Orontes River on the little mound of Sheikh Yusuf. To the east of the low mound which stands some 9m in height and is c.750m long and 300m wide, is flat land, and to the south, the harbour (Woolley 1938: 6,fig.2). The course of the river now runs some 'two or three hundred yards away to the east' (Woolley 1953: 173) but traces of a dried river-bed that washed away the edge of the mound, provides evidence that the river once ran adjacent to the sides of Al Mina (Fig. #81). Unfortunately the ten levels of remains at Al Mina only date from between the 8th to the 4th centuries BC, considerarably later than the prosperous city of Alalakh. However, Woolley interprets the remains at the site as a series of warehouses and believes 'that the greater part of the ancient

mound had been washed away' (Woolley 1953: 174).

Woolley also identified a nearby mound, close to the river and about 5km inland from the harbour known as Sabouni. Here 'the pottery proved that it had been inhabited during all the periods represented by the ten levels of the harbour' (Woolley 1953: 178) and beyond - Mycenaean sherds dating to the 13th and 12th centuries BC, Cypriot White Slip milkbowls of the 15th century and a cylinder seal of about the 18th century, were also discovered. For Woolley this proved the use of the site of Al Mina as a commercial harbour throughout the second millennium through to the establishment of the artifical harbour at **Seleucia Pieria** at the end of the first millennium BC. However, many scholars doubt Woolley's findings as the evidence for Al Mina is largely lost and based on the findings from only one trench (Ridley 1993 Personal communication). Sabouni, the modern town of Sueidia functioned as the residential area of the merchants who conducted business at Al Mina. On the south shores of the mouth of the River Orontes stand the imposing flanks of Mount Casios, supposodely named after the Greek hero Kasos who founded the settlement of Posidium here in the 5th century BC. Boardman (Boardman 1973), amongst numerous other scholars, does not accept the identification of Al Mina as ancient Posidium, he believes the more likely site to be Ràs el Basit on the Syrian coast to the south. However, Mount Casios would have provided an excellent landmark for sailors to navigate by when on course for the mouth of the Orontes, as it is visible from Cyprus (Downey 1961). The mouth of the river is sheltered from NW prevailing winds.

#82 [] **Antioch** (Antakya) (upstream Orontes river) Alalakh (Tell Atchana)
36:12 E 36:10 E

The final harbour to consider in Turkey is that of Antioch, 20km up the Orontes River on the Amuq Plain (Fig. #82). The Amanus mountains lie to the west and the Anti-Taurus to the north. Now a wide, flat alluvial plain fed by the Afrin, Kara-Su and Orontes rivers with the large lake of Antioch in the centre (Fig. #82.1). 'In antiquity there was no lake; the plain was well watered but not waterlogged' (Woolley 1953: 19), very fertile and wooded. 'It seems that in the 6th century AD an earthquake destroyed the site of Antioch (inhabited since the third millennium) ... and damned the whole outlet of the three rivers ... the entire area therefore turned into a stagnant

lake whose bed was ever being raised by the silt of the three streams' (Woolley 1953: 19). Alternatively, Braidwood (1937) believes that the lake already existed in prehistoric times, surrounded by second millennium sites, and that the silting of the lake and subsequenty the river, was accelerated by seismological disturbances. The original harbour is believed to have been at the mouth of the river at Al Mina (#81), later to be replaced by **Seleucia Pieria** (#80) to the north. The Orontes was then navigable to Antioch but now silting and large mud banks prevent navigation upstream. Thus, Antioch would have acted as a riverine harbour in a McKee Type (4) location in the Bronze Age. The sites of Antioch and Alalakh on the fertile Amuq Plain are located at an interface between the Hittite and Mesopotamian Empires, as well as a physical gap between the Amanus and Lebanon mountains, providing contact routes to the east and to the north. The finds from Alalakh imply strong links between Minoan Crete, Asia and the Hittite cultures (Woolley 1936).

## NORTHERN LEVANT : MAINLAND
(Admiralty Chart Number 2632)

## (SYRIA)

*ANTAKYA KÖRFEZI (bay)*

**#83 * Kara Duran** (Qasab bay) Class. Charados Ugaritic Gurru
35:55 N 35:55 E

Qasab Bay is situated to the southwest of Keldağ on the edge of steep hills. The Jebel Akra, ancient Casius, rises steeply to the east (MP 1915). A slight promontory to the west provides some protection to the anchorage. Cliffs to north of bay. Aspect of the bay is NNW on a generally northeast to southwest inclined shore, thus a McKee Type (2)/(3) shore. Outlet of small stream. Astour (1970: 114,n.5) comments 'As part of the area that passed to Ugarit from Mukiš, this could well have been Idrimi's landing place "in front of Mt.Casius" as read by W.F. Albright (1950) 'and believes that it was utilised as an anchorage in the Late Bronze Age.

**#84 * Ile Pigeon** (Pigeon Island) Class. Makra Nêsos Ugaritic Himulli
35:54 N 35:53 E

Low, small island, Pigeon Island, situated close offshore (MP 1915). Shelter in the lee, on the east side of the island (Dussaud 1927: 418). Steep cliffs onshore (Geo. Handbook 1943). Could be described as a McKee Type (4) anchorage as it is sheltered from the prevailing winds by the island. Astour (1970: 115) describes this island as being the 'Ugaritic maritime town' of Himulli, as established by Nougayrol (PRU IV: 15). Dussaud (1927: 418) has identified an ancient mole associated with the harbour.

## (Admiralty Chart Number 2633)

*RA'S AL-BASIT (headland)*

**#85 @ Ràs el Basit** Class. Posidium Ugaritic Humulli?
35:51 N 35:48 E

The ancient ruins of Ràs el Basit are situated on a short promontory which projects into the sea to the northwest of the promontory of Ràs el Basit. The anchorage lies to the west of the short promontory and is protected from prevailing winds by the promontory of Ràs el Basit and is used throughout the year (Geo. Handbook 1943; Courbin 1972: 49,fig.1; Fig. #85). The promontory of Ràs el Basit is low and anvil-shaped, rising to a flat topped limestone hillock 55m in height (MP 1915). Anchorage is possible

either side of the promontory on which the site of Ràs el Basit is situated, though the main anchorage was to the west. The open bay, 200m wide at the mouth, is exposed to the NE, N and NW, and extends 0.8km back to the sandy shore where beaching of craft is feasible (Schaeffer 1935: 175; Fig. #85.2). Mud and sand bottom in bay. Anchorage in south of bay offers excellent protection (Schaeffer 1935: 175). The anchorage at Ràs el Basit is well sheltered from prevailing winds and can be described as a McKee Type (4) shore. Traces of an ancient mole have been identified off the southwest shore of the eastern bay below the promontory site. The mole extends a short distance to the east. (Schaeffer 1935: 175; Courbin 1986: 176,fig.1; Fig. #85.1). Currents set to the N. The bay is surrounded by mountains. The main area of occupation was to the south of the anvil-shaped promontory. Second millennium remains, including Cypriot milk-bowls, Base-Ring I/II and White Slip I/II ware, together with pottery from Tyre and an Egyptian steatite cylinder seal (Courbin 1973: 28, 1986: 184) have been uncovered on a small tell area in the north-eastern part of the promontory (northeast of the Roman area known as 'Meidan'). The wealth of imported material and known associations between Ràs el Basit and Ugarit, demonstrate the international flavour of the site (Astour 1970). At the base of the mound, on the edge of the port, Courbin (1986: 183) has identified a large Cyclopean wall, together with other isolated walls and tombs, that date to the Late Bronze IB period. Houses and walls to the west revealed Mycenaean IIB-IIIA material (Courbin 1986: 183). The Late Bronze Age, c. 14th century BC, is the earliest date we have for occupation at Ràs el Basit, although a cylinder seal from the mid second millennium has also been found in the area of the Mycenaean pottery (Courbin 1986: 180-183). The Late Bronze Age I period appears to have ended in some sort of destruction and in the Late Bronze Age II period a large defensive wall was built to the west of the site, there are also traces of a small palace to the southwest (Courbin 1986: 184). The anchorage has been identified by numerous scholars including Boardman (1973: 38-46) as the Greek settlement of Posidium.

**#86 * Īsā Begli** Class. Sinêra Ugaritic Sinaru
35:47 N 35:50 E

Coast tends to south-southeast at this point and is dominated by steep hills which rise up to 430m in height. The anchorage at Īsā Begli is represented by a slight indent in the coast, with

very little shelter. The aspect of the bay is WSW to N and is fairly exposed to the prevailing WSW winds and therefore can be described as a McKee shore Type (1). Advantage could have been taken of the land and sea breezes for manoeuvring in and out of the harbour. Small stream outlet at back of inlet. Second millennium remains have been recovered from the site and it is believed that the site had maritime associations with Ugarit (Astour 1970: 115).

#87 $ **Slaiyeb Turkman** (Sayeb Turcoman) 'Dn?
35:42 N 35:48 E

Open roadstead on low coastal plain with sandy beaches and short cliffs. Beaching could have been possible on the sandy beach, taking advantage of the land and sea breezes to manoeuvre in and out of the anchorage. The site is exposed to the prevailing winds and is therefore described as a McKee Type (1) shore. Astour (1970: 115) believes that the Ugaritic maritime town of 'Dn is possibly located near to the modern settlement of Slaiyeb Turkman.

#88 * **Rās Fasori** (Ra's al Fausuri/Borj Islam) Ugaritic Rêšu Class. Pasieria
35:40 N 35:46 E

Flat headland, shelter afforded on N-facing bay, on north side. Protected by small islet that lies off the headland to the north side of Ràs el Fasori therefore sheltered from prevailing WSW winds (MP 1961; Dussaud 1927: 417) on McKee Type (4) shore. The headland is described as a 'conspicuous cape' which rises to a height of 300m inland (Geo. Handbook 1943: fig.22). Low coastline with sandy beaches which ends seawards in low cliffs, 10-30m in height (Geo. Handbook 1943). Deep water (MP 1961). Ràs Fasori was occupied in the Late Bronze Age and is currently being excavated (TAVO B 1113 1990). Astour (1970: 115-116) associated the site with Ugaritic Rêšu and continues to note that the 'owners of light ships' were residents of Rêšu (UT 2085) and that 'all stages of the purple industry, from catching murices to dying fabrics, were practised by the same entrepreneurs (UT 2078)'. Ugaritic text UT 1024 refers to foreign merchants at Rêšu.

#89 [] **Minet el Beida** Ugaritic Ma'hadu (White Harbour) [harbour of Ugarit] Class. Leukos Limen
35:37 N 35:46 E

Minet el-Beida is a sheltered bay, protected by promontories on either side of the harbour entrance. The aspect of the bay is NW and it is 0.8km wide at the entrance and recedes about 0.8km in a south-easterly direction on a McKee

Type (4) shore (Geo. Handbook 1943; MP 1960; Schaeffer 1978: Fig.10). The harbour provides good shelter from strong SW winds. A small stream, the Nahr el-Fidd, flows into the back of the south-eastern corner of the bay. Depths decrease gradually in the bay to the sandy shore (MP 1960). Lowland behind. The bay of Minet el-Beida was the harbour of Ugarit, attested in Ugaritic text UT 319 and is known in Ugaritic as Ma'hadu. Minet el Beida was located on a cross-roads within the eastern Mediterranean, linking north and south, east and west, and acting as a trade gate to Syria (Heltzer 1978), on the intersection of land and sea routes. Ugarit was strategically located for contacts with the interior via the Bdāmā pass in the Bargyus Range. Ugarit achieved great commercial power. The Ugaritic text UT 319 outlines a list of ships that are described (Astour 1970: 116) as "ships of Ma'hadu". The strength of the Ugaritian fleet was impressive. Hundred's of ships have been recorded in the fleet in the 'Catalogue of Ships' (UT 319, 2085; Sasson 1966: 131). Astour (1970: 116) believes that Ma'hadu was considered to be part of the 'metropolitan area' of Ugarit but 'was treated as a separate administrative entity'.

The settlement associated with the harbour is located on the shores of the southwest side of small bay and covers an area of over 300m in diameter (Fig. #89). Many of the remains are covered in sand (Schaeffer 1939: 31,fig.19) and it is, and no doubt was, possible to beach vessels on the shore of the bay (Saadé 1954: 122-125). Saadé (1954: 122-125) believes that the bay of Minet el-Beida would have been larger in the second millennium BC, and that the limestone cliffs which enclose it would once, prior to marine erosion, have extended further into the sea (Fig. #89.1). Saadé (1954) believes that the beach would have extended approximately 120m inland from its present position and that its progradation is due to the increased sediments that have eroded from the cliffs, as well as the alluvial sediments deposited by the Nahr el-Fidd. The white chalk cliffs of the 'White Bay' are visible from a long way out to sea and would have provided an ideal landfall for Bronze Age vessels (Saadé 1954: 148-152). The harbour is about 1km from the great mound of Ras Shamra, ancient Ugarit.

Ugarit was first mentioned in the third millennium in the Ebla tablets (Astour 1981). Ugarit utilised not only the port of Minet el-

Beida but a number of other anchorages in the region and controlled 50km of coast as far south as Tell Sukas (Drower 1975: 131). Two-thirds of the site has been excavated including parts of the harbour (Drower 1975: 130). The city reveals rich residential areas together with numerous palaces and an artisan quarter to the south (Drower 1975: 132).

Some of the most useful textual material relating to second millennium trade of the eastern Mediterranean is recorded in the tablets found at Ugarit. The texts of Ugarit were written between the late 15th century and the 12th century BC, mainly in Akkadian and alphabetic Ugarit, although some texts have been recovered written in Hurrian, Hittite, Egyptian heiroglyphics and with Cypro-Minoan inscriptions (Masson 1969: 379). The texts contain, according to Heltzer (1978) 'a lot of information on trade, as well as its distribution to merchants (tamkars) for further operations'. We are also given the impression from the texts that Ma'hadu was a fairly populous place, Astour (1970: 118) estimates in the region of thousands, and those documents that mention the residents show them as businessmen, ship-owners, merchants, financiers and manufacturers (Astour 1970: 118; Schaeffer 1935: 168-171). Foreign merchants at Ugarit lived in a special district (Rainey 1963). The excavations at Minet el-Beida confirm the textual accounts. They have revealed the site as a thickly settled and economically extremely active place, with huge warehouses, great quantities of imported Cypriot pottery and vessels with wine, salt and oil for export, numerous shops that produced perfumes, alabaster flasks, bronze artifacts and ivory boxes from Egypt (Schaeffer 1935: 168-171, 1939: 30-32; Astour 1970: 118). Olive oil has been recovered from the warehouses of Minet el Beida ready for shipment (Drower 1975: 132).

Numerous tombs have also been discovered around the shores of Minet el-Beida including the so-called 'Royal Tombs' which were found at the back of the bay to the south. Material from the tombs confirms the international flavour of the site - Mycenaean rhyta, vases and female idols, cylinder seals, material from 18th Dynasty Egypt, together with 14th and 13th century BC material from Cyprus and the southern Levant have been recovered (Schaeffer 1929,1932,1933).

Frost (1969b: 235, 1970b: 389) states that nineteen anchors have been found at Ugarit and

ten from the port area of Minet el-Beida, again implying the maritime nature of the site. One anchor found near the west entrance to the Temple of Baal, has been dated to the Middle Bronze Age (Schaeffer 1939: 55). Schaeffer (1978: 371-381) believes that this implied that the harbour of Ugarit was used in the Middle Bronze Age but occupied a riverine position closer to the main site. It was not until the Late Bronze Age that the anchorage moved to Minet el Beida (Astour 1981). One Akkadian text PRU IV,118 refers to a ship of a Ugaritian that crashed against the quay at Ugarit (Fensham 1967: 222), thus implying the previous existence of a quay at Minet el Beida. By all accounts the harbour of Ma'hadu was a thriving commercial centre, even the ideogram of the name Ma'hadu derives from the Sumerian *KAR*, meaning *kāru*, "waterfront, commercial centre" (Astour 1970: 120) ie harbour.

Minet el Beida possesed a metal workers foundery and evidence for the smelting of copper is witnessed all over the site. Linen and wool from the hinterland, were processed and dyed red-purple by the crushed murex shells here (Drower 1975: 132). Merchants of many 'nationalities' not only traded, but also resided at ancient Minet el-Beida. The epigraphic evidence refers to Hittites, Hurrians, Cypriots, Assyrians, Egyptians and people from throughout the Levant at Ma'hadu, including people from Ura, Arwad, Tyre, Beirut, Byblos, Akko, Ashdod and Ashkelon (Unpublished RS 19.4 in Schaeffer 1962: 141; Drower 1968).

Ugarit remained independent of the great powers throughout much of the second millennium BC and played no direct role in Egyptian history until the reign of Amenophis III, when a special treaty was signed between the two regions (Drower 1968: 475). The Amarna letters imply that Ugarit thus became a vassal of Egypt (EA 45-49). The city was eventually destroyed at the end of the Late Bronze Age, c.1200 BC by a fire or eathquake or possibly by the 'Sea Peoples' (Drower 1975: 147).

**#90 . Minet el Keban**

35:36 N 35:45 E

A small bay that lies within the bay of Minet el Beida, to the west of the main anchorage (Fig. #90). Also a sandy bay encumbered with rocks and separated from Minet el Beida by a rocky point. Anchorage to the northeast of Minet el Keban off white sand beach, or beaching along a McKee Type (4) shore. Good shelter from strong

SW summer breezes (MP 1976). Saadé (1954: 122-125) believes that the small cove at Keban was used concurrently with Minet el-Beida and that it provided more shelter from storms but was restricted in space.

*RAS IBN HANI (headland)*

**#91 @ Ràs Ibn Hàni** Ugaritic Ašar-Ba'la? Class. Diospolis
35:35 N 35:43 E

Very long, low promontory, 0.8km wide, which extends from the coast for 1.6km in a south-westerly direction turning west at the end. It is the most protruding cape along the coast of Syria. On the north side of promontory is a N-facing bay with crab-like entrance formed by two small promontories, this is probably the main anchorage of the ancient site as it is the most sheltered (Fig. #91). On this assumption we can describe the anchorage as a McKee Type (2)/(3) shore as the predominant winds blow roughly parallel to the harbour mouth. To the south of promontory shelter is provided in the lee of the promontory, in a large SW-facing bay, 1.6km wide. The bay extends inland in east-northeasterly direction for a distance of 1.6km and has a rocky reef across the entrance (Geo. Handbook 1943; MP 1915). The north-western shore of promontory has been quarried and on the summit of the promontory the remains of a temple and ruins have been identified (MP 1950).

The site was occupied from the 14th century and remains recovered from the site imply its associations with Ugarit (Astour 1970). Quantities of material from throughout the Bronze Age have been recovered from the site especially from area 'E' (Bounni et al 1979: Fig.1). On the southeast of the tell a large palace has been uncovered, the 'Palais Sud' which covers 60m from southeast to northwest and is the largest second millennium palace in Syria next to Ugarit (Bounni et al. 1979: 220). A second palace has also been identified on the north side of the peninsula, known as the 'Palais Nord', where an oxhide ingot mould apparently dating to the 15th century BC, has been found for the casting of copper ingots (Lagarce et al. 1983: 279). Copper droplets found in the mould 'proved to be consistent with the Cypriot field' (Knapp 1990: 131,table 2). Finds include a faience cylinder seal.

**#92 . Tell Farous** (Deir el-Farous) (Ibn Batouta)
35:31 N 35:48 E

Small hill on the coast some 1.25km north of Latakia. Schaeffer (1935: 173) refers to the site

as Tell Farous and Dussaud (1927: 415) as Deir el-Farous. The site is roughly 60m in diameter. Neither Schaeffer or Dussaud give any indication as to the date of the site, which sits on a W-facing, McKee Type (1) coast.

**#93 @ Latakia** (al-Lādiqiya/Lattaquié) Ugaritic Appu; Class. Laodicea ad Mare

35:32 N 35:47 E

Square, block-like, rocky promontory of Ràs Ziaret which extends from the coastline c.2km to the southwest (Fig. #93). Shelter is afforded on either side of the promontory. On the northwest side the aspect is west-northwest and on the south side the aspect is south-southeast. The settlement is bound by two hills to the east (Fig. #93.1). The ancient harbour was located on the north side of the promontory but has since silted up and been built over by the modern town. Some remnants of the Roman quay survive (Princeton 1976: 482). The harbour and settlement are sheltered from S winds by Ràs Ziaret which rises to a height of c.70m (Geo. Handbook 1943) on a McKee Type (4) shore. There is limited space in the harbour due to silting. Surface finds dating to the Late Bronze Age, including Mycenaean pottery, have been found on a small tell near the ancient port of Latakia (very probably ancient Ramitha), which imply the occupation of the site from the 14th-12th centuries BC (Riis 1965: 77; TAVO B 1113 1990). The harbour of Latakia, Ugaritic Appu, is mentioned in Ugaritic texts as being a maritime city in the Bronze Age (Astour 1970: 115). The continued use of Latakia as a port extends up until the modern day and maybe as a result of this, no recognisable archaeological evidence for its use as a Bronze Age anchorage has yet been identified.

*NAHR EL KEBIR (river)*

**#94 . Nahr el Kebir**

35:30 N 35:48 E

The wide, sandy river mouth of Nahr el Kebir, the largest river on the coast of Syria, could well have offered protection to vessels on a coastline with otherwise limited shelter. However, the entrance is open to prevailing WSW winds which could make exit from the river problematic unless land breezes early in the morning were utilised or the use of oars employed (Personal observations). The anchorage is described as being located on a McKee Type (2)/(3) shore (Fig. #94). Tuthmosis III is said to have sent his army to Nahr el-Kebir and from

here they took a route through the mountians up the Eleutheros Valley to Orontes (Drower 1973).

*NAHR ER ROUS (river)*

**#95 * Qal'at er-Rūs** Atallig
35:24 N 35:54 E

The river of Nahr er Rūs (Rous) is situated at the junction of a sandy, lagoonal coastal plain, and to the south low cliffs emerge with offlying rocks (Geo. Handbook 1943). The site is described as a McKee Type (2)/(3) anchorage. Evidence for settlement in the Late Bronze Age has been identified at the mouth of the river Rus (TAVO B 1113 1990). Astour (1970: 115) has identified the site with the 'Ugaritic maritime town' of Atallig (PRU V.56/ RS 18.119). Regular excavation has revealed Late Bronze Age material over an area of 300sq.ms (TAVO B 1113 1990). Schaeffer (1935: 171-3,fig.13) describes a second tell a few kms north of Nahr el Rous where he identified 17th-16th century BC pottery types, perhaps the riverine anchorage was established to serve the larger site upstream or alternatively the coastal morphology has altered since the Middle Bronze Age.

**#96 * Jebeleh** (Jeble/Jablah) (Tell Tuwain) Gib'ala Class. Gabala
35:23 N 35:55 E

The anchorage at Jebeleh is simply a slight bight in a straight coastline surrounded by low cliffs 10-30m in height (Geo. Handbook 1943) and backed by a low plain. Some shelter is afforded off the beaches to the north and south of the W-facing bay. The anchorage is small and circular in shape and approached by a narrow entrance which breaches the sandstone barrier from the northwest, thereby avoiding offlying rocks (MP 1961). It is open to the prevailing W and SW winds and is a McKee Type (1) shore. Despite the little shelter afforded at this anchorage there is evidence for its occupation in the Late Bronze Age, the modern town having been built on top of the ancient city. Astour (1965,1970: 115) identifies the town as the Late Bronze Age 'Ugaritic maritime town' of Gib'ala (PRU IV, RS 17.335)

**#97 @ Tell Sukas** (Soukâs) Šuksu
35:18 N 35:55 E

The anchorage of Tell Sukas consists of two sheltered bays either side of a promontory, that form two natural harbours (Fig. #97). The settlement mound on the promontory between the bays rises to 24m in height and is described by

the MP (1976) as a 'conspicuous, conical hill' with low cliffs 290m across (Geo. Handbook 1943; Riis 1970: 17,fig.5). It stands on a platform of sandstone covered with red sandy loam (Riis 1970: 10), 600m east of the modern village. Both bays are W-facing and therefore exposed to prevailing W winds, although some shelter from SW winds is afforded in the south-western corners of both the north and south harbours. The harbours can be described as 'lee shores', McKee Type (1), with parallel winds on a McKee Type (2)/(3) shore once at anchor in lee of the promontory.

The site was occupied since the Neolithic and throughout the second millennium (Riis 1970). Sukas fell within the Ugaritic sphere of influence and a Ugaritic tablet has been found here (Drower 1975: 131; Riis 1973: 204). Regular excavation has revealed large amounts of Late Bronze Age pottery, including a 14th century Mycenaean pithos jar, Late Helladic I-IIIA pottery (Riis 1973: 204) and Late Helladic figurines (Riis 1970). A Bronze Age sanctuary has been identified on the north-eastern corner of the tell. A Ugaritic garrison was established here to protect the karum (merchant colony) and to function as a stop-over point (Sasson 1966: 135).

Other imported finds include Cypriot Base Ring Ware, a piece of an 18th Dynasty Egyptian steatite fish, and a hippo tooth in a Late Bronze Age context. A cylinder seal of the 14th century BC Ugaritic type has also been discovered, as well as a stone mould for casting bronze (Riis 1970, 1963: 217,fig.9). The town was surrounded by a large town wall constructed during the Early and Middle Bronze Ages and was occupied through to its first destruction in c.1170 BC. The Amarna texts refer to the settlement at Šuksi. The site suggests strong associations with Ugarit (Astour 1970: 115) and later the southern Levant (particularly in the house architecture) (Riis 1970). Hellenistic remains have also been found at the site.

*NAHR ES-SENE (river)*

**#98 * Arab al Mulk/ Beled el Mulak** (Hureisssūn) Paltos
35:16 N 35:55 E

Located on the south side of the mouth of the River Abou Baara (Nahr es Sinn) on a low plain (Frost 1964: Pl.3; Fig. #98). A headland extends to the south and provides shelter in the river mouth from SW winds on an otherwise exposed McKee Type (1) shore. The ancient ruins of Paltos

are located on the headland. Regular excavation has revealed Bronze Age remains at the site (TAVO B 1113 1990). On either side of the river mouth, Frost (1964: 71,pl.3,fig.4) has identified 'des curieux abris taillés dans le roc de chaque côté de l'embouchure du Nahr es-Séné à Paltos'. Frost makes no comment on the dating of these presumably rock-cut shelters but there is little doubt that the swampy, river mouth could have been utilised as an anchorage during the second millennium BC.

*RA'S BELDI EL MELEK/ MALIK (headland)*

**#99 . Hareissoun**
35:14 N 35:58 E

Shallow anchorage in the bay of Hareissoun to the north of the pipe terminals at Banayas (Denham 1964: 144). The anchorage is exposed to prevailing winds along a McKee Type (1) shore.

**#100 . Baniyas** (Bâniâs) Balanea
35:11 N 35:57 E

At this point the coast turns to the south west and forms a wide, open bay which faces from SW to N. On the south side of the bay a small headland extends to the northwest providing additional protection to the bay. This headland also offers protection to a second bay which lies to the south. A river enters the back of the north-eastern side of the second bay, which faces N to W. Between the mouths of the two rivers Nahr Jaam and Nahr Bàniyas, anchorage is possible off the sandy shore or beaching on the shingle beach (MP 1961) along a McKee Type (1) shore. Access is possible from here to Hama in the interior (Geo. Handbook 1943).

*RAS HASAN (headland)*

**#101 $ Tartus/ El Mina** Medieval Tartoûs Greek Antaradus
34:54 N 35:53 E

The site of Tartus is situated on a coastal plain 6.5km wide, fronted by a shingle beach to the north and south (Geo. Handbook 1943). A short distance c.0.8km north of the modern harbour of Tartus is the shallow, rock-cut basin of Al Mina, the site of the ancient harbour. The Geo. Handbook (1943: 61) describes how 'sponging craft and other small boats' moor here. Little shelter is provided at the modern harbour of Tartus, which is on a straight W-facing coast, although the ancient harbour of Al Mina (N-facing) is sheltered by the rock-cut ledge to the west and two breakwaters. It is believed that the basin was cut by the Phoenicians (Geo. Handbook 1943)

and that little shelter was therefore afforded in the second millennium. The shore could be described as a McKee Type (1) shore, as it is exposed to prevailing winds.

*RUAD : ISLAND*

**#102 [] Arwad** (Ruad/ Arvad Island) Arad Phoenician Arados 34:51 N 35:51 E

The island of Ruad is situated c.3.5km to the south-southwest of Tartus, some 3km offshore. Frost (1970: 64) states that 'Geographically, Arwad is the most important harbour site on the Syro-Lebanese littoral (as) it commands the Homs Gap' that leads to Palmyra and eventually the 'Silk Road'. The island is approximately 700m long by 450m wide, with a perimeter of 1.5km and rises to a height of 12m in the middle (Frost 1964: Fig.2, 1995b: 7; Fig. #102). It forms the northern most extremity of a reef which runs parallel with the mainland for roughly 5km. Now partly submerged, the reef is marked on the surface by four sandstone, islets or *rameleh*, that all run parallel with the mainland and that all bear traces of rock-cut structures (Frost 1970: 64,pl.4), and could well have been used to shelter behind in antiquity.

Anchorage on the Island of Arwad is off the north-eastern shore where shelter is provided from the prevailing wind by two natural bays which indent the landward shores of the island (Fig. #102.1). The sheltered bays were converted into a double harbour in antiquity, being divided by a natural rock mole (Frost 1964: 69, 1970: 66). The southern harbour originally extended inland, beyond the modern waterfront (Frost 1966: 21). The harbour has a sand and mud bottom with good holding, although extremely sheltered, strong SW winds can cause a heavy swell (MP 1915). The anchorage can be described as a McKee Type (4) shore.

The anchorage at Ruad offers 'the best shelter along the coast for vessels of less than 15-foot draught' (Geo. Handbook 1943: 61). Frost describes the island as 'an irregular cone of rock, round which, on three sides, an esplanade had been cut at sea-level; the double harbour accounted for the fourth (side)... Where the slope of the rock is steepest along the west, the esplanade is narrowest; this being also the weather side, double sea-walls were indicated ... hewn out of the rock' and where necessary heightened by colossal uncemented blocks quarried from the esplanade (Frost 1966: 17, 1970: 67).

Along the north and south of the island, long stretches of wall continue along the water's edge (Fig. #201.2). One part of the sea wall still stands to a height of five courses, c.9m (Frost 1964: 69, 1972: 98).

Prior to investigations by Frost (1964, 1966, 1970) the construction of the rock-cut installations on Arwad were believed to date from Phoenician, Hellenistic, Roman and later Crusader times (Dussaud 1927: 113; Renan 1864), however there is a growing body of evidence to suggest that the island of Arwad was adapted at an earlier period. By Frost's (1973: 91) definition 'Arwad is the largest and best preserved rock-cut harbour on the Levant coast', fitting Poidebard's definition of a proto-harbour (see later under **Sidon** #122). 'The design of the whole (island) depends on rock-cut rather than stone-built foundations, which in itself suggests a Bronze - rather than an Iron Age origin' (Frost 1970: 66). Only where the sea walls are most exposed and have been subject to marine erosion, do we find traces of known architectural styles, such as characteristic Hellenistic blocks with horse-shoe shaped grooves for lifting ropes. It is therefore assumed that these represent repairs which postdate the original rock-cut installations (Frost 1966: 17). Historical records name Arwad as a harbour as early as the 16th century BC and confirm the political and strategic importance of the Arwadite thalassocracy. An inscription in the Temple at Karnak boasts of the spoils of corn and oil taken by Thutmose III from Ardata, confirming the wealth of the island in the 15th century BC, as well as its connection with the mainland (Frost 1980: 2). The 13th century Amarna archives refer to the might of the Arwadites when they record the rulers of Byblos begging protection from Egypt against the raiding Arwadite fleet (TAVO B 1113 1990; Frost 1970: 64, 1995b: 7), thus implying that the island had considerable sea power. Assuming that the rock-cut installations at Arwad were constructed during one period, disregarding later repairs, which they must have been if the island was to remain protected against winter storms, then it would imply that the island was indeed adapted from at least the 15th century BC when we have textual evidence to support its occupation. It is quite possible due to the almost impenetrable location of Arwad, that in the Bronze Age the island served as an anchorage-harbour for its colonial towns on the mainland opposite (Frost 1972: 98).

Frost (1966: 18) believes based on

observations under water, that the island has tilted land ward to the east since the sea walls were constructed on the island. At the same time, Wetzel and Haller (1945-1948: 45) have observed a change in the sea level of the reef. After the deposition of the Arwad reef, the sea rose beyond its present level relative to the land. It then retreated, returning towards the end of the Iron Age to a height of 3-4m above present sea level, and eventually fell to its present level. In the light of more recent interpretations of sea-level fluctuation along this coast, this seems a somewhat simplistic approach to the pattern of sea-level change at Arwad. For example Flemming (1986) indicates a 1m rise in sea level at Arwad in the last two and a half thousand years, prior to which he observes a fall in sea level of c.1m around the end of the Late Bronze Age. However, further evidence for these oscillations can be determined by studying the flat erosion 'trottoirs' and 'marmites' and their associated (Vermetus) mollusc growth which surround the island, especially on the south side, both above and below the water (Frost 1980: 5).

Frost (1966: 28) concludes, that with more detailed analysis of the ruins of Arwad and their positions relative to sea level, that 'this data should eventually allow us to recognise which part of the defences were standing in the early 15th century BC during the campaigns of Thutmose III, which sheltered the redoubtable seafarers of the Tell el-Amarna tablets, and which stones might have been seen by Tiglath Pileser in the 11th century when he put out from Arwad to hunt a "horse of the sea"'.

*NORTHERN LEVANT : MAINLAND*

**#103 $ Marathus** Armit Sumura
34:50 N 35:53 E

The site is located on a straight, W-facing, sandy beach, surrounded by sand dunes that penetrate inland for 0.8km (Geo. Handbook 1943). Hills recede inland behind the plain. The site is located on a McKee Type (1) shore exposed to prevailing winds. Ancient ruins and extensive quarrying have been identified at the site mostly dating from the Phoenician and Roman times (Princeton 1976: 550-1). Late Bronze Age material has also been recovered (TAVO B 1113 1990).

*MACHROUD : ISLAND*

**#104 $ Machroud** (Maqroûd)
34:46 N 35:53 E

Machroud is a small island located south of El Abbas and El Faris islands, the southern most islets or *rameleh* that form part of a reef that runs parallel with the mainland, some 3km off the Syrian coast. The island offers shelter from the prevailing winds in its lee, so making it a Mckee Type (4) shore. 'The island is an oval rock, 60m long, now rising to a height of about 2m above sea-level. The centre appears to have been scooped out, and with (four) openings pierced through its most sheltered north and east walls. Closer examination reveals that the landward quarter of the enclosure is not rock-cut, but built of blocks. The weather side is entirely rock-cut.' (Frost 1966: 23; Fig. #103). The openings on the north to north-eastern edge of the island are prolonged underwater by four rock-cut channels, somewhat eroded, but that eventually join a wider, shallow cutting that Frost (1966: 23) refers to as the 'road'. The road runs east to west for a considerable distance, petering out to the west at a depth of 9m. Vestiges of steps and walls have been identified at the point where the channels join the 'road'. There is little explanation for the peculiar rock-cuttings identified on the island of Machroud, although there is a suggestion that the 'road' cutting represents the foundation trench for a wall (Frost 1966: 27). Alternatively, the cuttings could simply be vestiges of former quarrying of the island. However, it is obvious from these submerged cuttings, that would have been cut above water, along with the presence of at least two lines of vermetus on wave-eroded trottoirs, that the island has been subject to considerable changes in sea-level. Wetzel (in Frost 1972: 112) interprets the sea-level changes at Machroud much in the same way as the sequence of changes in respect to Arwad. He considers that the 'sea retreated after the deposition of the reef to below its present level, but that at the end of the Iron Age it returned to a height 3-4m above its present level'. Based on this interpretation Frost (1966: 26-7) believes that 'we can deduce that the constructions on Machroud must have been Bronze Age and that they were useless at the beginning of the Iron Age', the point at which the harbour was replaced by the anchorage of Tabbat el-Hamman on the mainland opposite. 'All submerged architecture antedates the Iron Age, since this accords with the archaeological and historical indications ... and geological evidence' (Frost 1966: 27). Thus, the island no

doubt functioned as an anchorage in the Bronze Age.

*NORTHERN LEVANT : MAINLAND*

**#105 * Tabbat el-Hamman** (Mantar)
34:45 N 35:56 E

The site is situated 45km north of Tripoli, c.1km southwest of the village of Mantar. The anchorage at Tabbat el-Hamman is simply a small bight in the coastline, providing little shelter as it is open to the SW to NW. The shore is a McKee Type (1). Much of the original port is now covered in sand (Poidebard & Lauffray 1951: 35). The area of occupation at the site extends far beyond the tell and much is covered by the dunes to the north and northeast of the tell (Braidwood 1940: 184). The tell is at least 150m in diameter and 12m high (Fig. #105/105.1). Braidwood (1940: 196,185:Pl.X) was unable to find much direct evidence for occupation during the Middle and Late Bronze Age at the site, apart from a small amount of material from the beginning of the Middle Bronze Age and a couple of fragments of Cypriot 'milk bowls', although there is evidence for settlement at the site prior to and after this, as late as the Byzantine period.

A breakwater of 'rubble and roughly dressed ashlar block masonry' has also been identified at Tabbat al-Hamman (Braidwood 1940: 204-205). It is an L-shaped structure which protected a small bay from the prevailing SW winds and may have been utilised as a jetty for unloading and loading goods (Braidwood 1940: 204). The date of the structure has been attributed by Braidwood (1940: 208) to the 9th century BC based on the evidence of nearby quarrying. However, despite the lack of substantial material evidence the anchorage could have been used in the second millennium in order to serve its island anchorage of Machroud, whose role was later usurped in the Early Iron Age by the harbour at Tabbat el-Hamman. Alternatively the anchorage could have served the Bronze Age site of Tell Simiriyan which is located some 4km inland to the east of Tabbat el-Hamman. Simiriyan has been identified by Braidwood (1940: 219-221) as possibly being the site of Simyra of the Amarna letters, that was abandoned at the end of the Bronze Age. Once abandoned it is believed that the inhabitants of Tell Simiriyan then moved to the seashore, at the bay at Mantar and constructed the Iron Age breakwater (Braidwood 1940: 221). Frost comments that the general absence of Bronze Age material at Tabbat el-Hamman could well be related to the relative

change in sea level which she interprets as being higher prior to the Iron Age, when the 'jetty (which is the earliest known Phoenician installation on the coast) was built on such an exposed, sandy shore - that in itself Frost (1970: 69) says 'shows how urgent was the use for it'. Flemming (1986) confirms that sea level was at its present position in the 9th century BC.

**#106 * Tell Simiriyan** Simyra/ Sumura Class. Zimyra
34:45 N 35:57 E

Tell Simiriyan is a small tell, inland from the Bay of Mantar and situated upstream the al Abrash estuary. This Late Bronze Age tell has been identified by Braidwood (1940: 219-221) as the site referred to in the Amarna letters as Simyra. However, there is some confusion as to the exact location of Simyra, the site that was ravaged by Tuthmosis III in his seventh campaign to Syria (Drower 1973: 455). Numerous references imply that the site was located on the coast, although the possible coastal locations such as Mantar or Tabbet el Hamman reveal little or no second millennium BC material. Another suggestion for its location is at the site of Tell Kazel which lies further inland from Mantar Bay (Braidwood 1940: 220-221).

Tell Simiriyan, assuming this to be the correct identification of the location of Simyra, is believed to have utilised the Bay of Mantar as an anchorage in the second millennium (Dussaud 1927), as well as a riverine anchorage on the River Abrash. The Bay of Mantar is a small, W-facing, McKee Type (1) exposed anchorage. Mudbrick walls from the Late Bronze Age, and pottery from the Early and Middle Bronze Ages have been found on Tell Simiriyan, including local Syrian coastal pottery of the Late Bronze Age and Cypriote 'milk bowls'. At the end of the Bronze Age the site was abandoned and it is believed that the inhabitants of Tell Simiriyan moved from the tell site to the shores of Mantar Bay, which served as the Iron Age town and harbour of Tabbat el-Hamman. The site was occupied until at least the Byzantine period (Braidwood 1940: 221).

## (LEBANON)

*NAHR AL ABRASH (river)*

**#107 . Nahr al Abrash** (Hamidiyeh)
34:44 N 35:58 E

Possibly used to shelter vessels visiting Tell Simiriyan upstream to the north. Other

possible identified location for Tell Simyra is the site of Tell Kazel some 4km upstream of the mouth of Nahr al Abrash. Tell located near mouth of river on McKee Type (1) shore.

*PLAIN OF AKKAR (flat sandy shore, marks widest tract of level lowland in west Syria. Lagoons north and south of Abrash river, other rivers also run onto plain. Gateway between Jebel Ansariyeh and the Lebanon Ranges to the interior)*

*NAHR EL KEBIR (river)*

**#108 . Shiek Jabber** Eleutheros
34:38 N 35:58 E

Situated at the mouth of the Nahr el Kebir on the Plain of Akkar. The site is W-facing on a McKee Type (1) shore. The river acted as a 'gateway' between the Jebel Ansariyeh and the Lebanon Ranges to the interior. Some shelter was provided at the river mouth that possibly acted as an anchorage serving the transit of goods inland. Honigman (Dussaud 1927: 218) believes that this is the site of the harbour of Mantar and is listed as one of the settlements visted by Tuthmosis III in his third campaign (Drower 1973: 453). However, there are no sizeable tells in the area.

*NAHR EL ARKA (river)*

**#109 * Tel 'Arqa** Iraqata
34:33 N 35:59 E

Situated at the mouth of the 'Aqra River at the point where the coast bends round to the west and forms a slight bay (Fig. #109). The site is dominated to the south by the northern extent of the Lebanon Mountain Range. The site is W-facing on a McKee Type (2)/(3) shore. Regular excavation at the site has revealed Bronze Age material (TAVO B 1113 1990), although the main period of occupation was in the Roman and Byzantine periods (Will et al 1973: 61). The site of Iraqata was taken in the last campaign of Tuthmosis III (Drower 1973: 458-9) and is referred to in the Amarna letters (EA 100,103).

**#110 * Tel Haned** (Tel al-Hana) Ullaza Class. Orthosia
34:28 N 35:55 E

Situated on the border between the Akkar Plain and the Lebanon Range, at the western extent of a broad N-facing bay, at the mouth of the Nahr al-Baird. Some shelter is provided by a small headland to the west and in the river mouth in a McKee Type (4) anchorage. Tel Haned has been identified as the Late Bronze Age settlement of

Ullaza that is referred to in the Amarna Archives (EA 104,107).

*LEBANON MOUNTAIN RANGE*

**#111 $ Tripoli** (El Mina)(Tarabulus) Simyra Wahliya (TAVO B 1113 1990)
34:27 N 35:49 E

Low, rocky point of El Mina (34:27 N 35:48 E), the port of modern Tripoli, extends off the coast in north-westerly direction. Surrounded by cliffs to the south, southwest and west. Shelter is provided on either side of the promontory, on the north-northeast (NW- to NE-facing) and to the southwest (NW- to SE-facing). The modern harbour of Tripoli, El Mina, is located on the north side of the promontory, to the west of the banks of the Abu Ali stream (Fig. #111). The harbour is sheltered except from the northeast and the bottom is muddy. Captain E. Smith (1840) confirms this fact, he advises 'anchorage offshore to the southeast in lee of the promontory, especially in NE gales'. The anchorage is described as a McKee Type (4) shore. A line of reefs and rocky islets project off the north-western end of the peninsula for 6-7km out to sea (MP 1950). The last of these islets is known as Ramkin Islet. The modern town of Tripoli is located c.2km inland southeast from El Mina on the banks of the Abu Ali River (Denham 1964: 147). A sandy beach is found to the south of the peninsula, and the Jebel Turbul rises steeply above the town to the east. The foothills of the Lebanon Range slope upwards more gently to the south and southeast of the town (Geo. Handbook 1943). Tripoli is believed to have been settled in the Late Bronze Age (TAVO B 1113 1990); however almost nothing remains of the ancient city today (Princeton 1976: 935).

**#112 . El Qalamun** (Kalmoun) Ormn
34:23 N 35:47 E

Probable identification of a Late Bronze Age (TAVO B 1113 1990) settlement situated on a NW-facing section of the coast. Little shelter on a McKee Type (2)/(3) shore.

*IL HURI BAY (HERI) (bay)*

**#113 $ Enfeh** (El Heri/Enfe/Anfa) Ambi
34:22 N 35:43 E

The site is situated slightly to the south and in the lee of a long, narrow, rocky cape, on a W-facing coast that extends off the coast in a westerly direction. The modern town of Enfeh is located to the south of the peninsula, although

some shelter is also provided to the north of the promontory (MP 1915) on a McKee Type (2)/(3) shore. At the tip of the finger-like promontory is a rocky islet on which the ruins of the ancient city are situated. The site is believed to have been the location of the capital of Amurru in the Late Bronze Age, and is mentioned in the Amarna texts (TAVO B 1113 1990). There is plenty of fresh water provided by nearby springs.

**#114 $ Şigata** (Sheka) Šikkā
34:19 N 35:42 E

The site is located at the south-eastern most point of Il Huri Bay, sheltered to some extent by the headland of Ràs esh Shiq'a that lies to the west. The bay is semi-circular in shape, some 7km in length, with a NW to N aspect. Mountains lie to the northeast. Anchorage is afforded in the southern part of the bay in 16m of water, off a white sand shore. The anchorage is extremely sheltered from the prevailing summer SW winds (MP 1915) on a McKee Type (4) shore. Lots of fresh water provided by nearby springs. Şigata is the probable location of the Late Bronze Age site of Şikkā that is mentioned in the Amarna texts (TAVO B 1113 1990).

*RAS ESH SHAKAH/ SHIQ'A/ CHAQAA (headland)*

*RAS SEL'ATA (headland) (ancient Theuprosopon)*

**#115 $ Batrun** (al-Batrun/Batroun) Batruna
34:15 N 35:39 E

Located to the south of Ràs Sel'ata at the foot of the Lebanon Ranges. A short headland protrudes from a W-facing coast. Slight bay to the north, open to the NW. The remains of the ancient port were still visible in 1915 (MP). Sandy sea bed, anchor offshore in 18m in the mouth of Nahr el Joz (Geo. Handbook 1943). McKee Type (2)/(3) shore. Batrun is the possible location of the Late Bronze Age settlement of Batruna which is mentioned in the Amarna texts (TAVO B 1113 1990). According to Frost (1973: 79,fig.16) Batroun accords to Poidebard's definition of a 'proto-harbour' as it reveals rock-cut sea walls (see later **Sidon** #122), which, as evidenced by the dating of the Tabarja line, date prior to the 2nd century AD (Frost 1973: 90).

**#116 [] Jebeil** (Byblos/ Ğibail/ Jbail) Bronze Age Byblos/ Gebla; Iron Age Gubāl
34:07 N 35:38 E

A short promontory of fossilized sand on a thick layer of soft clay (Saghieh 1983) extends

off the coast in a westerly direction (Dunand 1963, 1938; Jidejian 1968; Fig. #116.2). Protection is provided either side of the promontory. Due to the nature of the promontory it has been subject to erosion, particularly on the north, although the cliffs to the south still remain (Saghieh 1983). The promontory rises to a height of 28m on its northwest side, just to the northwest of the Baalat-Gebal Temple. There is a slight depression that runs across the middle of the promontory (Dunand 1963: 13,fig.). The site of the ancient anchorage, which is now partially infilled with sand and stones (MP 1915) (more recently it has been dredged (Denham 1964: 147), is found to the north of the ancient ruins, well sheltered in a circular bay, some 120m in length and 60m wide (Fig. #116). The ancient harbour is naturally protected to the west by the southern extent of an anvil shaped promontory and to the south by the promontory on which the settlement was located. The promontory also encloses a second bay to the south. The ancient port is open to the SW. The bay on the north side of the anvil shaped promontory is open from the NW to the NE (Dunand 1963; Fig. #116.1) on a McKee Type (4) shore, and the bay on the south side of the site promontory is open to the W and is the seaward extent of a small ravine (Dunand 1963: 13,fig.). It is possible that all three anchorages were utilised in antiquity, although the main port was the central one, sheltered by an anvil-shaped promontory. A second hollowed way leads from the site down to the main port, north of the settlement (Dunand 1938, 1954). A long straight coastline extends to the south of the anchorages. The site of Byblos is situated at the foot of the Lebanon Ranges and covers an area of 10 hectares (Dunand 1963: 13). The Medieval town of Byblos is situated to the north of the promontory site, on the eastern shores of the ancient anchorage.

Byblos was a major harbour in the second millennium and is mentioned in the Ur III records as Gubal (TM 75, G.2231; Astour 1981). A small fishing community existed here from 5000 BC (Dunand 1963: 15; Jidejian 1968). On the settlement promontory massive ramparts surrounding a complex city have been identified, dating to the Early Bronze Age (Jidejian 1968). At the same time connections between Egypt and Byblos are attested in the Palermo Stone, when the Egyptians journeyed to Lebanon to obtain cedars needed for boat construction (Breastead 1907: 146,147). These boats were referred to as the 'Byblos Ships' (Säve-Söderbergh 1946) and reference is made in a stela erected by

Tutankhamen at Thebes, to the continued undertaking of journeys to the Lebanon by the Egyptians to obtain cedar with which to build their boats (Jidejian 1968: 53). During the second and third millennium BC Byblos is thought to have been a timber and ship-building centre (Jidejian 1968). By the Middle Bronze Age, after a period of control by the Amorites, Byblos had resumed close ties with Egypt and this is represented in the wealth of Egyptian material and inscriptions that have been found at Byblos. The Royal Tombs at the site, located on the exposed cliff face on the shore of the harbour, attest both Mesopotamian and Egyptian influences, together with longer distance connections reflected in the recovery of Middle Minoan Kamares ware (Dunand 1963: 26; Jidejian 1968). It was during the Middle Bronze Age that the Temple of Obelisks was erected at Byblos to replace the earlier Temple of Baalat-Gebel. During the Late Bronze Age, Byblos became more independent but fell under the Egyptian sphere of influence again in the 15th century during the campaigns of Thutmosis III. From this period remains of early Phoenician texts have been recovered from Byblos (Dunand 1963: 30). Ugaritic text (PRU VI 136; RS 19.28) refers to Byblos as a commercial maritime partner of Ugarit (Heltzer 1978: 151), and Byblos is mentioned in the Tell el-Amarna tablets on numerous occasions when pleading to Amenophis IV (Akhenaten) for help against attack from the north. Byblos was visited during the campaign of Ramesses II. The Phoenicians built extensively over the city. The site was still occupied in the Crusader period. Jidejian (1968) outlines a full bibliography associated with Byblos and its successive excavations, including references to the excavations by Monet and later Dunand.

*NAHR IBRĀHIM (river) (ancient Adonis)*

*RAS MA'AMELTEIN (headland)*

**#117 $ Juneh** (Bouar) (Jounié)
33:59 N 35:37 E

Wide open, broad bay, facing WNW, protected to the north by Ràs Ma'ameltein and to the south by Ras el Teir. Shelter is provided in the south-eastern corner of the bay near the modern town of Juneh. The foothills of the Lebanon Ranges surround the bay. The bay is deepest in the northern and central part with rocks in the south (MP 1950). Juneh is located on a parallel shore, McKee Type (2)/(3). Flemming (1986) states that the sea level was 0.8m higher than present in the Roman period. Frost (personal communication)

found evidence of moorings here and believes that Juneh was used as a 'Proto-harbour' in the Bronze Age.

*RAS EL TEIR/ TAIR (headland)*

*NAHR EL KELB (Dog river)*

**#118 * Nahr el Kelb** Lycus
33:57 N 35:36 E

Anchorage is possible on north side of the river mouth of the Nahr el Kelb, sheltered in a McKee Type (4) anchorage. The Nahr el Kelb flows directly off the Lebanon Mountains to the east (Geo. Handbook 1943: Pl.46). A stele of Ramesses II is carved into the rocks above the river (Jidejian 1968: 54), it also marks the site of ancient Lycus.

*RAS EL KELB (headland)*

*(Admiralty Chart Number 2634)*

*RAS BEIRUT (headland)*

*ST. GEORGE'S BAY*

**#119 . St. George's Bay** (Junel Khudr)
33:54 N 35:33 E

Nahr Beirut flows into St. George's Bay. Sandy shore, inland ground rises rapidly. Anchor in 18m of water (MP 1976) on a McKee Type (2)/(3) shore in a McKee Type (4) anchorage. Winter anchorage (MP 1915).

*ST. ANDREW'S BAY*

**#120 @ Beirut** (St. Andrew's Bay) (Beyrouth) Berytus Amarnan Beruta
33:54 N 35:31 E

Beirut was and still is the main harbour of Lebanon. The anchorage of St. Andrew's Bay is situated on the north side of Ras Beirut, a prominent headland that extends off the coast in a westerly direction (Fig. #120). It is a small bay, N-facing and provides shelter for anchoring, sheltered by the headland to west-northwest (Geo. Handbook 1943: Pl.50,Pl.125). Since the predominant summer wind is SW, protection is provided in the bay of Beirut. The shore is considered to be a 'lee shore' with the harbour itself subject to 'exposure to parallel winds',

thus a McKee Type (2)/(3) anchorage4. Captain E. Smith (1840) points out that the anchorage sometimes experiences a rolling swell caused by the S wind. The modern city of Beirut is situated on the headland to the south of the anchorage, along with the remains of the Hellenistic and Roman settlements. The coastline is generally steep and straight, with a W-facing aspect. The land rises in prominent red sand hills to the south and west of the town to a height of 90m (MP 1976). The land also rises to the east to a height of '2,733-feet at a point 6.5 miles away' (MP 1915). The site is mentioned in the Amarna texts (Conder 1894: 97-99) but little of the Bronze Age site remains, due to modern building and continuous use. Sasson (1966: 135) says that Beirut acted as a haven/ garrison for Ugaritic traders and was renowned for its metal working and foundaries (UT. 2101).

*NAHR ED DAMUR (river) (Ancient Tamyras)*

*RAS DAMUR/ RAS ER SAADIYAT (headland)*

*NAHR OULA/ EL AWUALI (river)*

**#121 . El Awuali**
33:36 N 35:23 E

At least two Bronze Age sites have been identified at the mouth of the Nahr el Awuali (Raban 1994, personal communication) on a McKee Type (1) shore.

*SIDON : ISLAND*

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4. BEIRUT

Fetch

Fetch (in nautical miles)

| S | N | E | W | NE | NW | SE | SW |
|---|---|---|---|---|---|---|---|
| 0 | 167 | 0 | 300+ | 9.6 | 114 | 0 | 234 |

Consideration of winds effect on harbour in the summer

For foul winds:

| SW | W | N,S,& NW negligible. |
|---|---|---|
| 45% | 10% | |

Therefore, the likelihood of not entering the harbour:

| From SW | W | NW | N |
|---|---|---|---|
| 0 | 0 | 0 | negligible |

Therefore, the factor likelihood of not departing the harbour:

| To | SW | W | NW | N |
|---|---|---|---|---|
| | 688 | 170 | min. | min. |

#122 [] **Sidon** (Saida) (Sour) (Zire) Ziduna
33:34 N 35:22 E

The offshore Kurkar ridge of 'Zire' that forms the island of Sidon, lies 1km off the Lebanon coast south of Beirut, opposite Sidon's ancient rock-cut harbour on the mainland (Fig. #122). The island ridge is some 540m long and runs roughly parallel to the mainland. The island provides shelter from the prevailing winds on its lee shore and can therefore be described as a McKee Type (4) shore. The maritime city and Phoenician metropolis of Sidon, is covered to a great extent by the later Medieval and modern city. The site occupies a huge mound on the mainland and additional harbour works have been identifed on the island, that lies offshore to the north (Poidebard & Lauffray 1951: Pl. VI). As a result of the work of Poidebard and Lauffray (1951), and Frost (1973) we have been able to establish a number of details about the first and possibly second millennium harbour installations constructed at Sidon.

Sidon had two ports on the mainland, one to the south of the city in a big cove (Round Bay), the other to the north (the Closed port, within the city walls), which now houses the modern port (Fig. #122.3). A third harbour was utilised on the offshore reef or island to the north of the city, known as 'Zire' (Fig. #122.1/.4). It is likely that shelter was sought in lee of the island prior to the construction of the rock-cut harbour on the mainland. The island harbour was an open anchorage for 'visitors'. The offshore reef provided an excellent anchorage and shelter to vessels from W winds in the deep water between the island and the mainland (Fig. #122.2).

The easily adapted linear sandstone reef of 'Zire' island, was converted on its eastern landward side to form a flat area that could be utilized as a quay and landing stage. Additional protection is provided by a double sea wall which was constructed on the seaward side of the island of Sidon for increased shelter especially against winter storms (Frost 1973: Fig 2; Fig. #122.5). Colossal masonry was used in the construction of these sea walls. Frost (1973: Fig.18) illuminates how well protected the anchorage must have been in antiquity and to an extent still is today. Enclosing this area on the landward side of the island, were two jetties, the northern (6) and southern (5) jetties (Frost 1973: Fig.2). They delimited the area of the inner anchorage. Little remains of the northern jetty whereas there are still portions of the southern jetty visible

above the present water level. The original platform of rock upon which the quay was constructed is now some 3m below sea level. At the base of the platform some 12,000 cubic/ms of masonry, carved stones and columns have fallen into deeper water. The northern end of the island of Sidon has been badly eroded. There was also a wall built between the main island of Sidon and a small islet to the south, (Frost 1973: fig.2/4). This is no longer standing, but would once have helped divert the swell around the island and prevented siltation of the anchorages (Muckelroy 1978: 77). The evidence is that these early harbour builders were 'unable to undertake large-scale building in any depth of water, so that the lines of their constructions were dictated by the presence of the natural reefs; hence the large size and unusual shape of these harbours' (Muckelroy 1978: 76). This is apparent in the way that the Sidonian anchorages seem to be very much restricted by the shape of the reef, especially when it came to the building of additional facilities such as warehouses and store rooms which were often sited very close to the 'weather' side of the island with very little protection (Fig. #122.4). Frost (1973: 78) refers to the earliest harbour-builders as "carvers".

The basic pattern of the installations on Sidon Island conform to Poidebard's definition of the Levantine proto-harbour; that is that reefs and islands, which provide the only natural shelter along this exposed coastline were adapted as harbours during the period before man had learnt to construct under water and build moles (Frost 1973: 78). But what is the evidence for the dating of these constructions? (Problems involved in trying to scientifically date rock-cut structures are discussed in Chapter III.3). Eiselen (1907) suggests that Sidon was already becoming a city in 2800 BC. Chalcolithic houses have been found along the shore in the sheltered bay of Minet er Rouman to the south of Sidon (Frost 1973: 86), together with Late Bronze Age burials (Renan 1864). In the 14th century BC the Amarna letters mention appeals from the rulers of Byblos, Beirut, Tyre and Sidon to Amenophis IV for protection against invaders from the north (Conder 1894: 44-46). Successive destruction and construction was to follow until the 8th century BC when the Sidonians regained prosperity under the Assyrians. There are still no references to maritime activities that directly relate to the harbour at Sidon, although Sidon is believed to have been a prosperous coastal city for nearly two millennia. From possibly the Chalolithic

period onwards the site provided shelter behind the offshore reefs, on a stretch of coastline with very few good anchorages. The second millennium was a period of developing trade and exchange and the records indicate that Sidon was a thriving commercial centre dependent upon the shelter provided by the offshore reefs to protect merchant vessels. The construction of rock-cut installations to enhance the harbour facilities was therefore a natural progression. This is of course not to say that all the sophisticated harbour facilities at Sidon were constructed in the second millennium. The masonry work of the jetties for example, is said to compare with that of Persian masonry, the period according to Frost (1973: 89), of greatest expansion of the Sidonian harbour. It is however a possibility that towards the end of the second millennium the know-how and technology was available to adapt the offshore reef at Sidon into a secure, sheltered, and functioning island harbour, where traders could come and exchange goods.

The harbour of Sidon is now silted up and surrounded by sandy beaches. The site has been affected by earthquakes, eustatic and probably tectonic change as well as over building (Frost 1973: 90). Flemming (1986) has identified two phases of sea level change at Sidon, a difference of c.-1m about 850 BC and a successive rise in sea level in the Roman period to c.1m above present.

*NAHR ZAHRANI (river)*

**#123 * Nahr Zahrani**
33:30 N 35:20 E

A tell with Bronze Age occupation levels has been identified just to the north of the river outlet on a McKee Type (4) shore (Raban 1994 personal communication) and could well have functioned as an anchorage in the second miillennium BC.

*RAS SARAFEND/ RAS EL-QANTAR (Double-headed headland)*

**#124 * Sarafand** (Sariptu) Sarepta
33:27 N 35:17 E

The site of Sarepta is on the seashore north of the modern village of Sarafand (Pritchard 1978: 5,fig.3). Two areas of occupation have been identified on the shores near Sarafand, a site that was first settled in 1600 BC (Pritchard 1978: preface). A low mound has been identified on the promontory of Ras el-Qantar, which jutts 100m into the sea and rises to a height of 12m

above sea level. 500m to the southwest a second promontory of Ras esh-Shiq has been identified (Pritchard 1978: 5,fig.3). To the east of the promontory is a moon-shaped bay 'that could easily have provided a safe anchorage for ships' (Pritchard 1978: 7; Fig. #124). Remains from this site have been found over an area 0.5km to the south. The south harbour of Ras esh-Shiq has revealed large blocks of a sea wall or quay relating to a harbour of the Roman period and later Byzantine period (Pritchard 1971: Pl.I, 1978: 14; Fig. #124.1).

The first season of excavation at the tell of Ras esh-Shiq in 1969, located the Roman port and excavated buildings along the quay that ran for a distance of 59m along the harbour (Pritchard 1971b: 61,fig.I). No remains prior to 1st century AD were found in the area of the southwest harbour (Pritchard 1978: 49), however, in the bay, 100m offshore, Pritchard (1971) describes an L-shaped reef below the surface which serves to shelter the shoreward area. To the east and west of the reef two channels have been identified both of which provide access to the anchorage, which is between 2-0.5m deep. This offshore reef could have provided shelter to vessels prior to the establishment of the Roman port.

The second season of excavation at Sarafand concentrated on the northerly tell of Ras el-Qantar that lies just to the south of the present day fishing harbour and rises abruptly from the shore. The earliest material recovered from the site dates to c.1600 BC through to the Hellenistic period (Pritchard 1978: 77). The harbour at Ras el-Qantara lies 'immediately to the north of the promontory on which the mound stood (and) would have provided a convenient harbour' (Pritchard 1978: 71). The north-western extent of the tell which shelters the bay to the south, has been eroded by the sea. The anchorage is N-facing and therefore can be described as a McKee Type (2)/(3) shore.

Excavation has revealed two building levels from the Late Bronze Age period from which an assemblage of local pottery including amphora and pithoi has been recoverd, together with Mycenaean Late Helladic IIIA/2-IIIB pottery (Baramki 1973: 194), Cypriot White Slip and Base Ring wares (MCIII-LCIII) and Egyptian scarabs (Pritchard 1971b: 63, 1978: 77, 1985-1988). Documentary evidence from the Papyrus of Anastasi I supports the occupation of Sarafand in the 13th century BC

(Pritchard 1971b: 61), and the site is mentioned in a Ugaritic text of the 14th century BC (321, I, 46 in Gordon 1947: 173). To the northeast of the modern fishing harbour a well stratified series of buildings has been identified dating from the Late Bronze Age to the Hellenistic period (Pritchard 1975). There is no doubt that the anchorage at Ras el-Qantara was utilised as a harbour in the Late Bronze Age.

*MOUNT HERMON (JEBEL ESH SHEIKH)*

*RAS MINET BOUZEID*

*NAHR EL QASIMIYE (river) (Ancient Leontes)*

*NAHR AL LITANI (river)*

*TYRE : ISLAND*

**#125 @ Tyre** (Sur)(Sour) (Tel Rašidiya) Usu
33:16 N 35:12 E

The city was originally an island c.1.6km long, that ran central to a reef, parallel to and some 630m offshore (Princeton 1976: 944). The low, flat island was later connected to the mainland by a causeway constructed by Alexander in 332 BC (Katenstein 1973) and today is seen as a sandy isthmus (MP 1976), referred to as the promontory of Ras el Naqura (Fig. #125/.1). Settlement extends over 300m in diameter. Poidebard (1939) produced an invaluable plan covering some 5km of the now submerged harbour area. Assuming a change in sea level, Poidebard postulated that because the offshore reef at Tyre, that stretches out on both sides of the island, afforded the only natural protection, they would have been utilised as "outer harbours".

Poidebard (1939) outlined the existence of two harbours, one to the north of the island, known as the 'Sidonian Harbour' where sections of the reef still emerge above the water, and one to the south, the 'Egyptian Harbour', which is completely submerged. The Sidonian harbour at the north-eastern end of the island, offered natural shelter to ships, although a small strip of rocks and an offlying mole provided additional protection. Within the southern harbour immediately south of the island, two alignments of blocks have been identified as relating to a submerged mole, at least 750m long and c.8m wide. The mole ran from the south-eastern corner of the island in the direction of the reef. This is referred to as the "Closed Harbour". Frost (1971:

108-109) believes these to possibly be submerged structures relating to the later Roman settlement. Poidebard (1939: 31-37) and later Frost (1971: 105-107) identified two additional alignments of rocks in the south harbour c.2km off the mainland. The rock alignments are respectively 500m and 390m long, both c.30m wide and they utilised the natural reef. Frost (1971) believes these features to be natural, but Poidebard describes them as breakwaters. However, Frost (1971: 106) continues to point out that whether man-made or natural, it 'does not mean that the reefs may not once have been outer ...roadsteads of Tyre'. As is the case for the harbour of Sidon (#122), it is also possible that the harbour of Tyre was utilized as an anchorage in the second millennium.

The excavated harbour works are believed to have been developed by the Phoenicians early in the first millennium BC (Katenstein 1973), however, Herodotus places Tyre's foundation at c. 2550 BC (Frost 1980: 3). Textual evidence reveals that Tyre was mentioned in the 14th century BC in the Tell el Amarna tablets, supporting an established settlement here in the second millennium (Condor 1894: 100-109). During the 15th century Battle of Megiddo, Tyre appears in Egyptian inscriptions as a vassal of the town (Frost 1980: 3). Ugaritic texts PRU V 59 and VI 179 refer to maritme connections between Ugarit and Tyre (Heltzer 1978: 151). Tyre later became one of the most important Phoenician cities and a major fortified port (Fig. #125.1).

Although the bulk of evidence for occupation comes from the first millennium BC and later, the textual evidence suggests that sailors sought shelter behind the offshore reefs prior to this period. Tyre is another site that fits Poidebard's description of a proto-harbour (see under **Sidon** #122). The remains of the north and south harbours that can be seen today are almost entirely Roman Imperial and Early Byzantine in date.

**#126 . Tel Habeish** (Râchidiyé) Paloetyrus
33:14 N 35:13 E

Located 7km south-southeast of Tyre, 0.8km inland. Stream flows into sea at this point (MP 1950) and the site is located on a McKee Type (1) shore.

*RAS EL BIYADA (headland)*

**#127 . Alexandrion**

33:09 N 35:10 E

Located to the south of the promontory of Ras el Biyada is the Classical site of Alexandrion. The site is situated on a W-facing shore and is therefore described as a McKee Type (1) anchorage.

*RAS EL ABYAD (headland) (Ancient Promontorium Album)*

*RAS HANIQRA (headland)* Unpublished paper

## SOUTHERN LEVANT (ISRAEL)

*ROSH HANIQRA (cliffs)*

**#128 * Rosh Haniqra** (Tell Taba'iq)
33:06 N 35:05 E

Small mound situated on the lowest terrace of the coastal ridge, c.1km from the sea. The tell is located between 40-45m above MSL (Flemming et al 1978: 43) on a McKee Type (1) shore. The tell is steep sided to the west and south, a valley runs to the east of the tell and mountains to the north. Pottery has been identified here relating to the Early Bronze to Late Bronze periods (Tadmor 1993: 1288). The tell was excavated by Tadmor and Prausnitz between 1951-1952 (1959) but only the fortified remains of the Early Bronze site were uncovered. Evidence for both earlier and later occupation has been identified closer to the shore. The abrasive terrace immediately seaward of the railway cutting to the north of the site is deeply incised with quarries and tanks believed by Wreschner (Flemming et al 1978: 43) to be Late Roman or Byzantine.

**#129 $ Rosh Haniqra Islands**
33:04 N 35:05 E

Offshore islands, 1km off Rosh Haniqra, form part of the submerged kurkar ridge. The islands are called Tekelet, Shakhaf, Nachlieli (Flemming et al 1978: 43) and are exposed to west winds but shelter in their lee is afforded on McKee Type (4) shores. Tekelet is very low, 1m above MSL; Shakhaf is composed of residual blocks from extensive quarrying; Nachlieli consists of quarry residuals rising 2-4ms above MSL and cut to a depth of 20cm below MSL. The quarrying has left a continuous rampart against waves on the west, while the east side of island has been completely quarried away (Flemming et al 1978: 43-45). The remains on the islands date from the Iron Age and later Classical period and none of them imply that anchorage installations were employed. However, it is quite probable that the offshore reefs provided shelter to vessels in the Bronze Age and beyond. Anchorage in the lee of the islands would provide a McKee Type (4) shelter.

**#130 @ Misrefot-Yam** (Minet el-Musheyrife) Misrephoth-Maim
33:06 N 35:05 E

Misrefot-Yam stands on a low sandstone peninsula gently rising 120m from sea. Rocks and the outlet of River Betzet lie to the south of site. The mound rises steeply on the west and

south sides, and is bounded by a small valley to the north. Predominately SW winds in the summer on exposed W-facing coast. Recent commercial extraction of sand and construction along this stretch of shore has changed the natural processes of the coast. The site reveals evidence of interrupted occupation from the Middle Bronze to the Byzantine periods (Raban 1993b: 963), and is believed to be Biblical Misrephoth-Maim, which relates to the extraction of salt from the sea by evaporation in ponds. Sherds collected on the tell have revealed associations with the Middle Bronze II period. The location of the site is clearly strategically related to the sea and in fact the settlement's harbour was excavated out of dry land south of the tell (Raban 1993b: 963). To the south and on the eastern lee side of the tell, low marshland is observed, in the area of the outlet of the River Betzet. Raban (1987: 182,fig.5) has identified a 20-30m long navigational channel that has been cut to the south of the tell behind a rocky abrasive platform some 100m from the sea. Raban (1987: 182) believes that the diversion of the natural course of the Betzet River allowed vessels to sail around the south side of the tell into a lagoonal anchorage on the eastern lee side. The lagoonal anchorage would have provided excellent shelter to vessels and in its position in the lee of the site can be described as a McKee Type (4) site (Fig. #130). The seaward outlet of the river was likewise protected by a semi-circular natural breakwater from S and SW winds. The rocky reef would have prevented the silting up of the outlet by the sea-carried sand. Probes on the bottom of the channel indicated that its original width was at least 14m and the depth of the water was more than 2m (Raban 1993b: 963).

*BETZET RIVER*

*KEZIV RIVER*

**#131 @ Tell Achzib** (Akhziv) (Ez-Zib) Casal Lamberti
33:03 N 35:06 E

Offshore kurkar reefs and ridges protect the 330m long beach at Achzib (Fig. #131.1/.4). The prevailing winds are from the WSW. There is little evidence of a significant change in MSL. The twin mound settlement which was occupied from the Middle Bronze IIA to the Crusader period, is situated on a low peninsula promontory which rises steeply from the north side of the rectangular bay and is flanked on the north side by the Chezib River and to the south by the River Sha'al (Raban 1987: 180; Yedaya 1986: 233). The

width of this bay was about 330m and it penetrated well into the lower courses of both rivers (Raban 1987: 180). Excavations have revealed that during the Middle Bronze II period attempts were made to widen the river bed of the Keziv River, as well as dam the river course upstream by cutting a new diversion channel through the low saddle in the coastal ridge just north of the site (Fig. #131). These efforts to deter silting were obviously insufficient, as the Sha'al is not a perennial river, and so during the dry summer nothing prevented the sand bar from progressively blocking the bay mouth, turning it into a closed, sand silted lagoon. As a result, a ditch was cut around the landward, eastern side to the tell, rejoining the sea through a rock-cut navigation channel to the south of the acropolis, leaving an artificial, silt-free entrance (Raban 1985: 22,fig.4,fig.7; Fig. #131.2/.3). The excavated soils and bricks were used to make a fortification rampart around the town, with a 5m high stone revetment. The channel was cut during the Middle Bronze II to isolate the port and the city and improve the navigability of the river course (Raban 1987: 180). The southern curve of the channel is at present blocked by sand. A similar channel was cut through a low saddle in the coastal ridge just north of the site, which kept the entrance to the River Chezib silt-free in antiquity, as it does today (Fig. #131). 'The altered Keziv outlet completed the water moat around the town, yet the old course could be used as an inner harbour unaffected by flood-carried riverine deposits' (Raban 1987: 181,fig.4), creating a McKee Type (4) anchorage. To the south of the tell, on the south side of the rock-cut channel Raban has identified a number of horizontal stone bollards for the mooring of craft sheltering from SW winds (Yedaya 1986: 232-233).

To the east and south of Achzib two cemeteries have been identified. The eastern cemetery is known as er-Ras, and contains burials from the end of the Bronze Age, as well numerous Phoenician rock-cut and shaft tombs. The city reached its greatest expansion in the 10th-6th centuries BC. During this period the city was fortified and covered an area of 20 acres. The Hellenistic and Roman cities have not left remains of harbours or jetties, but quarrying and cut pools on the kurkar reef, which probably originated in the Roman times, relate very closely to present MSL. The only possible harbour would have been in the mouth of the Chezib River, partly sheltered by the kurkar reef and in the

lee of the site. Flemming et al (1978: 45) states that the sea level was 0.5m higher than present in c.1500 BC. Crusader walls and fortifications are seen along the shore.

**#132 $ Achzib Islands**
33:03 N 35:05 E

Four small islands lie 3km offshore from Achzib, being high points on the kurkar ridge which extends more or less parallel to the shore from Acco to Rosh Haniqra (Flemming et al 1978: 46). Submergence of the order of 40-50 cm has occurred relative to the present sea level since the Phoenician period (Flemming 1986). Shelter was afforded in the lee of the islands on a McKee Type (4) shore.

The largest island is Sigavion with outcrops of rock rising up to 2.3m. The island is surrounded by a vermetus rim which retains the water within, at a height at about 40cm above MSL. The quarrying within the island is cut down to 30cm below MSL so that the central pool is 70cm deep. Quarrying has also been detected on the other three islands, although evidence for this on the northern, smallest, island has now eroded away. The date of the quarries is highly uncertain. The technique of leaving protective residuals is typically Phoenician, but could be as late as the Roman or even Byzantine periods (Flemming et al 1978: 46). The islands of Achzib would have provided shelter to vessels in the second millennium (Personal observation) and in a recent article by Galili and Sharvit (1994) indication of their use as anchorages in the Late Bronze Age is suggested. Galili and Sharvit (1994) describe the anchorage site as a 'sheltered anchorage formed by the natural protection of a partly submerged kurkar ridge'.

**#133 * Nahariya**
33:01 N 35:05 E

Tel Nahariya lies on the south side of the Ga'aton River, and the port was presumably in the river mouth. Little shelter is provided at this site and is therefore described as a McKee Type (1) shore. It is possible that Nahariya was linked by the Ga-'athon River to the important Middle and Late Bronze Age site of Kabri that lies 5km inland at the foot of the hills. Most of the area is covered by modern houses. The site is exposed to W winds. Recent commercial extraction of sand and construction along this stretch of the shore has changed the natural processes of the coast.

Limited excavation undertaken to the north of the river by Ben Dor and Dothan, revealed that the site was first occupied in the Middle Bronze II period (Dothan 1977b: 908). More recent excavation by O.Yogel to the south of the river on the main occupation mound, on behalf of the Israel Department of Antiquities and Museums, has identified two major periods of occupation (Fig. #133). The early city existed from the end of the Middle Bronze IIA to the end of the Late Bronze Age, and the later city was occupied during the Persian and Hellenistic periods (Barag 1993: 1088). The earlier settlement was concentrated in an area directly to the south of the Nahal Ga'aton, the principal stratum being in the Middle Bronze IIB period when a 3.8m thick fortification wall was constructed (Barag 1993: 1089). In addition, the foundations of a Middle Bronze II temple lie 800m north of the river, c. 100m back from the water line, at the back of a broad beach, on a small mound. This area was a cult site. The floor of the Middle Bronze IIA-B square temple is laid at 5.5m above MSL. About 900m north of the mound, close to the shore, is a small mound, on top of which a High Place or Bamah was discovered, also of Middle Bronze IIB date. The shrine ceased to exist during the second half of the 16th century BC (Dothan 1977b: 908-912). It is possible that the temple was constructed for use by sailors who anchored in the mouth of the Ga'aton River. There is no evidence of a change in sea level (Flemming et al 1978: 46), although the course of the Nahal Ga'aton is believed to have flowed a little to the south of the modern course in the second millennium and anchorage was possible in the river mouth (Barag 1993: 1089,plate of aerial view of site). The surviving remains from the Late Bronze Age III comprise a corner of a room that abuts the Middle Bronze city wall. Cypriot, Mycenaean LHIIIB and local wares have been found associated with this level (Barag 1993: 1089).

*NA'AMAN RIVER*

**#134 [] Acco/ Tel Akko** (Tell el Fukhar)(Acre) Ptolemais
32:55 N 35:06 E

The tell and harbour city of Akko lies at the northern end of Haifa Bay, the only marked indentation on the southern Levant coastline with S-facing aspect (Geo. Handbook 1943b). The site stands on the seaward end of the Plain of Esdraelon, on the natural route inland from the coast to Damascus (Geo. Handbook 1943b). The MSL was 2m lower than present in the Crusader period, and the shoreline was 20m east. A great deal of

silting of the lagoons on the Qishon flood plain occurred east of Akko citadel. 'Akko is one of the oldest harbour towns along the eastern coast of the Mediterranean Sea' (Raban 1983a). A rocky triangular peninsula projecting east and then southwest into the Bay of Haifa marks the site of the Classical and Medieval cities. The tell of the Bronze Age city lies 1.5km to the east of the present Old City, on the north bank of the River Na'aman (Belus), on the mound of Tell el-Fukhar (Tell Napoleon), 700m from the sea (Dothan, M. 1976; Fig. #134). Akko is listed in the tribute lists of Tuthmosis III and in the Tell Amarna tablets. The Karnak relief represents the campaign of Ramesses II against Akko, in which the city gates are shown collapsing (Dothan 1988: 297).

The highest point of the mound is on the northern edge and forms a plateau summit, standing at a height c.35m above MSL (Raban 1991b: 20). The mound slopes down on its south side in a series of abraded ledges that are slightly tilted towards the northwest, to a height of c.29m at the crest of the slope (Area C) (Dothan, M. 1976; Raban 1991b: 20). The south side of the mound is hollow and is intersected by deep gorges and isolated hills, some of which were created during earth quarrying in the 1940s and Arab period (Raban 1991b: 27) and forms a crescent shape (Dothan, M. 1976: 5,fig.3; Raban 1991b: 19,fig.3). It is also possible that the hollow area of the anchorage was kept silt-free in the Bronze Age and that the sand (1 million cubic metres) was used to make the Middle Bronze IIA rampart (Raban 1991b). There is evidence for quarrying during the second millennium as rubble stones found in 13th century BC structures at the site, were coated with marine ostrea shells that were alive when the stones were quarried, implying that they had been quarried from marine sand (Raban 1991: 138). The Na'aman River lies to the south of the hollow area. The river mouth could have been used as an riverine anchorage prior to silting, although evidence for harbour constructions have not been found in this area. The river has shifted its course southward in the last few centuries and was originally much closer to the kurkar hill the site of the tell (Dothan, M. 1976). One explanation for the shift in the river course is attributed to the fact that Akko stands on a fault line, the Hilazon Graben, which has caused the area to the south of the tell to uplift. In the initial history of the city, c. 2000 BC, the Na'aman River ran to the south of the tell. North and west of the tell is believed

to have been low-lying, possibly even flooded by shallow sea (Sivan 1981). The present rocky peninsula on which the Old City of Akko is situated, being a rocky offshore islet (Raban 1991b) that would have provided shelter from W winds (Fig. #134.1). Neev and Bakler (1987) identified an uninterrupted marine sequence to the west of the tell covering the present Akko promontory, which existed up until the Iron Age, implying submergence of the promontory prior to this date, after which time it reemerged due to tectonic uplifting. Subsequent infilling from the River Na'aman, and uplifting of a W-E Ahihud Fault (Neev & Bakler 1987: fig.14), caused the eventual abandonment of the second millennium harbour at Akko, which was much later replaced by the Crusader harbour to the west.

The site has been excavated since 1973 under the direction of Moshe Dothan. The earliest remains are of Middle Bronze II period (Raban 1983a), around 2000 BC (Fig. #134.2). The Middle Bronze Age tell was fortified with at least six phases of terre pisée, or beaten earth, ramparts, the earliest of which dates to the Middle Bronze IIA period (Raban 1991b: 28,fig.11). 'Sloping layers of sand, ash, mudbrick, crushed sandstone and beaten earth alternate to form a glacis fortification' (Raban 1983a). An extremely well preserved section of the fortification was uncovered on the northwest slope of the tell (Area B) and three successive lines of fortification of the rampart and glacis, have been identified, after which, during the last phase of the Middle Bronze IIA, around 1800 BC, a different technique was adopted, a massive brick structure of citadel type was built and a new rampart, mostly of sand, was laid against the north side of the structure (Raban 1991b: 21). One of the outstanding architectural features of the site was a Middle Bronze IIA 'Sea Gate' (Area F) 20m long and 1.8m wide, with adjacent rampart and occupation levels. Several phases of the gate and rampart have been identified, after which the gate was abandoned, filled with sand, and covered with a new and higher rampart (Raban 1991b: 24). Much of the pottery associated with the fortification excavation included not only local ware but also quantities of Cypriot White Painted ware and one piece of Tell el-Yehudiya ware. Area 'C' reveals a series of Late Bronze Age building strata with quantities of Cypriot ware, mainly of the Base Ring, White Slip and Monochrome type, and some Mycenaean sherds. The latest occupation levels on the mound date to the Hellenistic period.

Akko was a flourishing harbour town from the 15th century BC. Raban (1985, personal communication) believes the Bronze Age harbour lay to the south of the site within the boundaries of the crescent shaped tell, that is on the north boundary of the Na'aman River, or in a nearby lagoon. The south side of the tell reveals no traces of fortification ramparts, in fact a gap 250m in length has been left between the two ends of the rampart (Raban 1991b). Despite quarrying in this hollow south area, traces of beach-rock, wave-cut platforms and uplifted ledges have been identified which resemble abrasive shelves along the waterline of exposed rocky coast (Raban 1991b: 27; Fig. #134.3), implying that in fact this was once a rocky shore exposed to considerable wave energy, prior to silting and faulting (Raban 1985 personal communication; 1991b: 29). This hollow gap protected by the tell would have provided considerable shelter to vessels in the Bronze Age in a McKee Type (4) anchorage.

Recent excavation on the eastern tip of the southwest rampart (Area P), reveals that the rampart continued toward the northwest, encircling the hollow on its west side (Raban 1991b: 29; Fig. #134.4). The sand rampart was laid directly on bedrock at this point and at one point an arch or postern of large stone blocks was intersected into the rampart some time after its completion. The sherds collected from the floor of the arch were all of Middle Bronze IIC type. The dimensions of the passage way are somewhat restricted (1.3m high and 0.6m wide) and could represent an alternative feature other than a passage. In the lee of the rampart in Area 'P' traces of an ashlar pier of a gate have been identified and have been dated to the Middle Bronze IIA period (Raban 1991b: 29-31,fig.13). The Late Bronze II floor in this area is based on pebbles and sand ie. beach material implying close locality to a marine environment (Raban 1991b: 31,fig.4) A stone anchor of the Bronze Age type has also been found in the lower south area, close to Area 'P' (Raban 1991b: 32), confirming the use of the hollow area to the south of the tell as a haven for vessels in the Middle and Late Bronze Ages. In the Late Bronze I period, the upper part of the rampart was levelled and residential buildings constructed. No traces of fortifications were uncovered anywhere on the site relating to the Late Bronze period (Raban 1991b: 29). Ugaritic text PRU V 59 refers to Ugaritic ships anchored in Akko harbour (Heltzer 1978: 151).

The tell was an important Phoenician city and continued to be occupied throughout the Iron Age, but during the 6th century BC the city spread north and west to occupy the headland which forms the northern limit of Haifa Bay, and which is the location of the modern city. The headland functioned as the harbour area in Phoenician through to Crusader times and could well have provided additional shelter to vessels, in its lee, in the Bronze Age.

*HAIFA BAY/ BAY OF ACRE (Bay is 12km in length and faces NW. The shoreline recedes 4km inland and is backed by sand dunes. Rescued from a shipwreck close to the shore at Haifa are two unique tin ingots inscribed with Cypro-Minoan letters, which date from 16th to 11th centuries BC (Maddin et al 1977: 45-47).)*

*QISHON VALLEY (The line of the Bronze Age shore is believed to be indicated by the position of five Bronze Age tells; Tell Zivda, Tell Zarat, El Iaham, Nahal and Abu Hawam, that lie in an arc across the alluvial plain of the Qishon between Tel Akko and Haifa (Flemming et al 1978: 50-51; Ronen & Olami 1983; see Chapter IV.2.a.)*

**#135 * Tell Nahal**
32:48 N 35:04 E

Tell Nahal is situated on the Qishon Plain due south of Tell El Iaham, some 3km from the seashore (Flemming et al 1978: 51; Ronen & Olami 1983: xiii & 19-20, site no.33). Tell Nahal is believed to be situated on the line of the Bronze Age shore prior to the silting of the plain (see Chapter IV.2). The tell is round in shape and 80-100m in diameter (Ronen & Olami 1983) and located on a McKee Type (1) shore. Well dressed stones have been found at the bottom of the tell on the south side, that have fallen from the mound (Ronen & Olami 1983). Evidence for occupation levels from the Late Bronze Age to the Ottoman period have been uncovered at Tell Nahal. Presumably the location of Tell Nahal on the edge of what was previously and to a lesser extent still is, the sheltered Bay of Haifa, would have provided an ideal beaching or anchorage point for Bronze Age vessels.

**#136 * Tel Regev** (Khirabet Harbaj/ el Harbaj)
32:45 N 35:04 E

Tell Regev is located in the south-eastern corner of the Qishon Valley, some 5km SE from Tell Abu Hawam. The tell is round and flat topped and stands some 18m above the surrounding plain overlooking the entrance to the Nahal Zippori and Qishon passes. The Qishon River flows to the north of the mound. Ronen & Olami (1983: 63-

65,xxi,no.113) state that Garstang excavated the northwest side of the tell and exposed material dating to the Early Bronze III, Middle Bronze I and Late Bronze Age I-II and Hellenistic through to Ottoman periods. On the east side of the tell a section of a wall 10m in length has been preserved. Prior to the silting of the Qishon Plain it is quite likely that the site stood closer to the sea on the banks of the Qishon River and acted as a riverine McKee Type (4) anchorage en route to the inland hinterland via the Qishon Pass.

**#137 [] Tell Abu Hawam** (Mutatio Calamon/Salmona)
32:48 N 35:01 E

Tell Abu Hawam is presently situated 1km inland on the eastern outskirts of the modern town of Haifa, between the lower courses of the River Qishon and the Wadi Salman (Raban & Galanti 1987). Located in the swampy delta of the Qishon River, the mound covers c.4ha (Balensi 1988) and originally rose about 7m above the surrounding plain (Hamilton 1934: 74; Fig. #137). The area around Tell Abu Hawam 'is one of the most unstable in the country' (Avnimelech 1959: 103). It is separated from the Carmel Range by a fault-line passing near the foot-hills. A parallel fault-line is found near the foot-hills of Usha. A third fault-line cuts across the area in an almost N-S direction (Avnimelech 1959: 103,fig.1). The whole area known as the Emeq Zevulun has been continuously subsiding in relation to the hills (Avnimelech 1959). Tectonic and other factors, such as fluctuations in water volume, predominant winds and wind-borne sand, have influenced changes in the course of the River Qishon (Avnimelech 1959). A layer of abundant marine mollusca in the Late Bronze Age, and evidence of beachrock overlying part of the tell in the Iron Age, imply tectonic oscillations during these periods, so providing a further example of change of harbour location relative to sea level. Subsequent silting by the River Qishon has resulted in the land-locking of the harbour site 1km from the coast. The present course of the river now runs to the east of the site, but is originally believed to have run along the west side of the tell in the Neolithic period (Avnimelech 1959: fig.2).

Mr P.L.O. Guy (1924) describes the previous position of Tell Abu Hawam 'It must originally have been situated on the coast at the point where the mouth of the Qishon would form a small harbour, and have commanded the road along the shore towards Acre'. Hamilton (1934: 80) points

out that the site was located on the shortest route from Beisān, Megiddo and the Esdraelon valley to the coast, and therefore acted and existed as a shipment depot. Artzy (1994: 130) adds to this statement by stressing how Tell Abu Hawam owed its importance to its position at a junction between land and sea routes, possibly linking to inland sites, to the Jordan valley and beyond. From surveys carried out in 1985 (Raban & Balensi 1985; Raban & Galanti 1987) it is clear that the sea level in the Middle Bronze Age was lower than the present MSL and the ground around the tell was marshy. With a rise of sea level in the Late Bronze Age the sea flooded the shore at the edge of the tell forming a salt water lagoon or sheltered marine bay, reaching a peak at the end of the Late Bronze Age, c.0.5m above MSL. The relative level of the sea fell in the later stages of the Iron Age, causing the open sea to become a marine lagoon and finally a salty marsh. After the Persian period the MSL continued rising slightly but the waterfront receded rapidly due to silting. It is assumed that through antiquity the coastline ran very close to the edge of the settlement and it may well be that in the second millennium BC the site was an island or a peninsula between the deltaic estuaries of the Qishon and Salman Rivers, which were flooded by sea water (Raban & Balensi 1985).

The coast is N-facing at this point and sheltered to some degree by the Carmel Range that projects in a northerly direction into the south shores of Haifa Bay to the west of the site. The anchorage could then be described as a McKee Type (2)/(3) shore. Artzy (1994: 130,nt.13) points out that Tell Abu Hawam is situated on the same bay as Akko, but at the opposite end of the Bay of Haifa. Thus boats could enter the bay in different wind directions, taking advantage of the most convenient anchorage. Leonard (1987) suggests that Tell Abu Hawam was the main port of entry during the Late Bronze II period. At Tell Abu Hawam remains have been found from the Middle Bronze II c. 1600 BC, through to the Byzantine period (Hamilton 1934b, Balensi 1985).

The site is believed to have expanded around the reign of Tuthmosis III, possibly to accommodate the large naval force he used to transport his troops when raiding the Levant coast. During the Late Bronze Age a fortification wall of Cyclopean masonry (Hamilton 1934: 74), buildings of Cyclopean masonry and a large building, possibly the Governor's House, on the southwest of the tell, were erected. Many of

these stone structures were constructed on a thin bedding of earth and ash, possibly the remains of previous wooden structures that had burnt (Hamilton 1934: 74). Finds from the Governor's House date to the 14th century BC and include a selection of Canaanite jars, 14th and 13th century BC Mycenaean rhytons, figurines and pottery, Cypriot milk bowls and Base Ring ware, bronze weapons, faience and glass beads, pumice stone, numerous seals, many of which were Cypriot in design, and fragments from a small oxhide ingot (Balensi 1988; Hamilton 1934b). Hamilton (1934b) also recovered a scarab bearing the cartouche of Amenophis III, a seated bronze statuette and large quantities of Cypriot and Minoan material. The site supported a harbour, and quantities of imported pottery have been uncovered, including Late Minoan IIIB imports (Balensi et al. 1993: 11) and Cypriot LCIA-IIc cylinder seals and statuettes (Balensi 1985).

A thick wall built of large, rough stones was found 20m west of the Late Bronze Age city wall, on the side facing the sea. In the layer of sand at the foot of this wall sherds of pottery were found covered with a concretion of sea shells. The function of this wall, whether it was a land structure or part of the harbour, is not explained. Nevertheless, the wall was clearly built very close to sea level, implying that the settlement was located directly on the coast, and that the mouth of the Qishon was apparently the site of an ancient harbour (Anati 1975: 9). It is also thought that the area between Mount Carmel and Tell Abu Hawam was lagoonal in the second millennium and therefore anchorage was also possible on the southwest side of the tell in the area of the lagoon, providing shelter to vessels in addition to the harbour on the northeast side of the tell at the outlet of the River Qishon (Balensi et al. 1993: 11). Anati (1959: 89, 1975: 9) is categoric that Abu Hawam was a Bronze Age port. Traces of a water channel or mooring basin have also been found below the citadel (Balensi et al. 1993: 14).

Another interesting feature found on the sandy shore amongst river gravel, are traces of bronze scrap, described as being related to a Bronze scrap industry. Also in this area a number of stone anchors have been discovered of varying shapes and sizes. Some are made of stone from the Carmel Range and others from Cypriot stone (Balensi et al. 1993: 13). The settlement spread to the low sand dunes around the site in the closing stages of the Late Bronze Age (Hamilton

1934: 74) and numerous imported finds have been located in this area particularly material from the Argolid (Balensi et al. 1993: 11). The Bronze Age town was destroyed during the period when the Sea Peoples roved in the district during the reign of Ramesses III (Anati 1975: 11) and replaced by a smaller settlement of predominately residential buildings during the 11th and 10th century BC, which were later abandoned. During development of the Qishon port in the 1950s a Late Bronze cemetery was discovered 500m southeast of the tell, which has been heavily destroyed by river floods and building in the port area (Anati 1975: 10). On the opposite bank of the present course of the Qishon River, 1km north of the site, covering an area of 100 dunams, a second eroded Late Bronze Age cemetery has been identified. Finds include imported Mycenaean IIIA and Cypriot Base Ring ware (Anati 1959: 89-105). There is no doubt that Tell Abu Hawam played a major part in trade and exchange of the latter part of the Late Bronze Age.

*QISHON RIVER*

**#138 . Rambam** (hospital)
32:50 N 34:59 E

Sheltered position at northern most point of Carmel ridge and the south-eastern most point of Haifa Bay. The site is exposed to the north therefore shelter is provided from prevailing W winds, on a McKee Type (2)/(3) shore. Construction workers reported finds of Roman remains during enlargement of the Port of Haifa in the suburb of Rambam. This has not been substantiated, but the area is likely to have been settled in antiquity since it would have provided natural shelter for a small harbour (Flemming et al 1978: 51).

**#139 * Tel Shiqmona** (Tell es-Samaq)
32:49 N 34:57 E

Tel Shiqmona lies southwest of Carmel Cape, at a height of 12.7m. The prolongation of Mt. Carmel limestone forms a broad shelving reef extending northwest from the shore (Flemming et al 1978: 52). Shiqmona is the northern most site on the Carmel coast. There was probably no relative change in MSL (Flemming et al 1978: 52). Excavations have revealed structures close to the shore from the Late Bronze Age to the Byzantine period. There are historical records referring to a harbour, but no signs of artificial harbour works on the shore, or u/w, and no natural shelter (Flemming et al 1978: 52). The harbour is possibly situated to the south of the site at

Kafr Samir. An anchorage on this coast would have been exposed to W winds and would therefore be described as a McKee Type (1) shore. Several strata of the Late Bronze Age have been excavated, including the remains of a temple or public building on the southeast slope of the tell. The finds reported from here include a large quantity of Mycenaean and Cypriot vessels, including Milk bowls, Base Ring ware and dipper jugs and Mycenaean figurines (Elgavish 1975). In a room to the north of the public building, dated to the Late Bronze IIB period, finds uncovered include bronze and silver implements, an Egyptian faience goblet, a number of scarabs and cylinder seals probably Helladic, together with Cypriot Milk bowls and juglets (Elgavish 1977, 1978). A Late Bronze II courtyard is connected with the public building together with two silos (Elgavish 1978). Six strata of Late Bronze levels have been identified dating from the 16th century BC. From the 10th century BC remains of 60m of the casemate constructed city wall have been exposed, together with private dwellings and storerooms. Three successive fortresses have been erected here from the Persian, Hellenistic, and Roman periods. The Byzantine town was situated on the south slopes of the mound, close to the seashore.

*NAHAL MITLA (river)*

**#140 * Northern 'Atlit Bay**
32:44 N 34:57 E

In Northern 'Atlit bay, 4km to the north of 'Atlit, at the mouth of the Nahal Mitla, a Late Bronze Age stratum has been discovered (Stern 1984: 42,nt.11) along a McKee Type (1) exposed shore. Late Bronze pottery and stone anchors have also been recovered some 70-100m offshore in 2.5-4.5m of water (Ronen & Olami 1978/21).

In the southern part of Northern 'Atlit bay, a 'row of wooden piles rectangular in section and 50m long was discovered' under water (Galili 1986: 109). 'The piles (0.2 x 0.25 x 0.6m) were driven into the seabed at 2m intervals' (Galili 1986: 109). It has been suggested that they represent the lower section of a wooden pier or jetty and that the row was connected with a second row of wooden poles found on the seabed in the area of the Crusader cemetery (CMS 1987; Galili 1986: 109).

**#141 * Tel Megadim** (Tell Sahar)
32:43 N 34:56 E

The site of Tel Megadim is situated at the mouth of Nahal Megadim, on the coast just north

of 'Atlit. The site is exposed to W prevailing winds and is therefore a McKee Type (1) shore. The main mound of Tel Megadim is situated 200m from the waters edge and covers an area c.200 x 200m. Hebrew references document the discovery of pottery from the Early Bronze Age and Late Bronze Age within 500m inland. Building remains, plastered cisterns and installations have been recorded dating to the Early Bronze Age, Persian and Roman periods (Broshi 1977: 825-826). A small Late Bronze Age settlement has been uncovered (Stern 1984: 42,nt.12), with several buildings as well as local and imported pottery. Bronze Age pottery is reputed to have been found offshore, but no details are available (Galili & Weinstein-Evron 1985: 44-45). The largest concentration of remains date to the Persian period, with town fortification walls.

*OREN RIVER*

**#142 @ 'Atlit** (Certha)
32:42 N 34:56 E

The Crusader site of 'Atlit is situated on a prominent sandstone rock promontory, which projects c.400m offshore in a westerly direction and is joined to the shore by an isthmus. The rocky promontory offers shelter to a sandy bay surrounded by cliffs to the north which is also protected by a series of offshore rocks which run off the northern seaward end of the promontory. A second bay lies to the south of the promontory and is the second largest bay on the southern Levantine coast (Fig. #142). The bay is relatively protected, although it faces southerly storms and a cautious approach is suggested to avoid the reef at the western edge of the bay entrance (Raban & Linder 1993: 117-118,fig.). The flat promontory was naturally fortified with cliffs to the north, west and south (Johns 1933:146). Salt pans lie inland to the southeast of the site.

The ancient site extends over an area of 200 acres, and is bound by a sandstone ridge to the east, and the River Oren to the north. The ancient tell site extended east into the area of the modern salt pans and south as far as the church. The area between the promontory and the river outlet was previously higher and drier, evidenced by Middle Bronze II graves that have been located on the sea bed, the submergence due to fault line movement that lies to the west of the present coastline (Raban 1985: 31). Neev and Bakler (1978) identify a down-warping of the coastal plain, however Galili and Weinstein-Evron

(1985: 50) state that no additional tectonic movement has affected this stretch of coastline as the offshore kurkar ridge is continuous. Subsequent to submergence the coastline has retreated 1km to the east and it is suggested therefore that the area to the south of the Nahal Oren outlet could well have served as a riverine harbour in the second millennium (Raban & Linder 1993: 117), on a McKee Type (4) shore. The situation and shelter afforded by the anchorage would no doubt have attracted Bronze Age sailors. A corpus of stone anchors recovered from 'Atlit represent the most significant group of stone anchors found so far in the Levant (McCaslin 1980: 39-44) and support the idea that 'Atlit was used as an anchorage in the Bronze Age. Raban (1985: 176) states that 'further inland the river was never navigable and actually had to have an artificial rock-cut passage through the coastal sandstone ridge'. This passage through the kurkar ridge is identified in Ronen & Olami (1978/69) but it is questionable as to whether the feature is man-made or natural.

The settlement of 'Atlit shows remains in every period from Middle Bronze Age to Crusader (Johns 1933). The extensive Phoenician harbour walls of the earliest known fully constructed harbour on the Mediterranean coast, have been mapped by Linder and Raban (1965). The breakwaters consist of two faces of headers filled with rubble. The water depth within the harbour varies between 1.5-4.0m over most of its area but there is much fallen masonry and broken beach-rock. Sea walls also remain. The dominant visible structures at 'Atlit are the colossal Crusader walls and towers of the Pilgrims Castle, which enclosed the promontory on both sides. Late Middle Bronze Age, to early Late Bronze Age material has also been excavated 100m east of the fosse. To the northeast of the promontory remains of the Phoenician harbour installations have been identified and a series of quays and jetties from this period identified (Linder & Raban 1965). This area is known as the northern harbour and is believed to have been in use during the 7th-5th centuries BC. There is no reason however why any of the later harbours associated with 'Atlit could not have provided shelter to Bronze Age sailors. Still north of the Phoenician harbour, Middle Bronze II jar burials have been found in the earth 75m from the present shoreline (Ronen Olami 1978/79). A Late Bronze Age gateway with a sill 2.0m above MSL, and 25m back from the present waterline has also been uncovered, together with Late Bronze sherds, including some

imported material, on the north beach at the foot of the tell (Johns 1933: 149).

**#143 $ Neve Yam**
32:35 N 34:55 E

Neve Yam lies off a sandy beach enclosed by two rocky, low dune covered peninsulas which lie 1km apart, forming an open bay. The shoreline is exposed to the W and therefore described as a McKee Type (1) shore. The site is located near to the old estuary of Mughara River. The shoreline is very exposed and any change in wind direction can alter the whole shape of coastline within hours. It is assumed that the Neolithic shoreline was approximately 300m to the west of its present position. 250m offshore are two rocky islets which are believed to mark the position of the previous shoreline. In January 1968 a severe storm exposed Neolithic walls of rectangular houses, silos, storage pits and pottery extending just below sea level to 30m inland at Neve Yam (Wreschner 1983: 325-333; Raban 1983b: 225-226). There is some evidence for kurkar quarrying on Tamnun Island just offshore. It is possible that the kurkar ridges could have provided some shelter to vessels in the Bronze Age. In the lee of these ridges a collection of single-holed, weight stone anchors dated by Galili (1985) to the Middle Bronze Age have been identified, implying its use as an anchorage in this period (Raban 1988b: 285), possibly in association with the Middle Bronze IIa site of Tel Nami (#144) some 2km to the south (Galili et al. 1994b: 106). Flemming (1986) identifies a change in sea level relative to the modern sea level of c.-2m since the Neolithic period (Flemming et al 1978: 54). In an area under the chicken coop of Kibbutz Neve Yam, 900m north of Tel Nami, an area of settlement has been identified, which contains Byzantine sherds and one Late Bronze Age Cypriot import sherd (Artzy 1991). Only limited surveys in this area have so far been carried out.

*ME'AROT RIVER*

**#144 @ Tel Nami**
32:40 N 34:55 E

The tell is on a sharp promontory headland c. 8m above MSL, which juts some 150m into the sea and is joined to the mainland by a low sand isthmus or tombolo. Aerial photographs show that the headland was almost cut off from the mainland in 1944, while the present distribution of drift-wood showed that storm waves can carry right across the spit. The highest point on the saddle is currently c.1.74m above MSL (Flemming et al

1978: 54) and is 0.5 acres in area (Raban 1985: 19). Geomorphological investigations at the site and in the region of the Me'arot River to the north, indicate that the ancient outlet of the river, which was located near Tel Nami, could have served as an esturial anchorage, possibly in the lee channel between the islet and the shore (Raban 1985: 19-20; Artzy 1986,1988b). The location of the tell situated along an otherwise shelterless stretch of coastline, would therefore have been an ideal harbour in antiquity, providing shelter in lee of the headland from prevailing W winds. The tell is discernable from out at sea by a cavity in the Carmel Ridge which lies 4km to the east of the site, carved out by the Me'arot River (Artzy 1994: 138).

It would appear from the results of drills and seismic tests, that the sand spit or tombolo that currently joins the island to the shore, would not have existed in the Bronze Age and the shore would have been protected by an island just offshore (Flemming et al 1978: 55), with an inner anchorage system, possibly a bay or lagoon between the Tel Nami promontory and the mainland to the east (Artzy 1990: 75). Raban (1985: 19-22,fig.8) adds that the channel that separated the island tell from the mainland was kept silt-free from sediment deposited by the outflow of the Me'arot River, by the construction of a massive Middle Bronze IIa retaining wall made of big blocks of rubble, laid on both sides of the channel. 'The drainage of the lagoon was then directed to an outlet which was dug through the mid part of the coastal (east) retaining wall, so that the outflow of the river might keep the wave carried sand from accumulating in the channel' (Raban 1985). This trough or channel between the kurkar ridge or promontory of Tel Nami and mainland settlement, is thought to have since been infilled by sediment, although the beach area to the southeast of the site is still de-silted by high wave activity (Marcus 1991: 97). However, excavations in the area (Area D) have been unable to locate the Middle Bronze IIa retaining wall, although a retaining rampart dating to the later Late Bronze IIb period has been identified (see below) and it is assumed that a similar construction must have existed in the Middle Bronze Age to protect the tell from the encroaching sea (Artzy & Marcus 1991: 10). With sea-level rise after the abandonment of the site and continued deposition of sand, the tombolo formed, leaving small bays to the north and south of Tel Nami. Assuming the anchorage at Nami was protected from prevailing winds by the

promontory and river mouth, then it can be described as a McKee Type (4) anchorage, with a fetch of 2400km. Raban (1987) believes the site acted as a marine 'outpost' during the Middle Bronze IIA period.

Three settlements inhabited during the second millennium BC have been located in the region: Tel Nami, Nami East and an area some 600m south of the Nami promontory known as Site 104-106 (Kislev et al. 1993: 145-6,fig.2; Fig. #144). Excavations at Tel Nami ie the promontory area and Nami East, the area on the shore immediately opposite the promontory, have revealed pottery from the Middle Bronze IIA & B and Late Bronze IIA (14th century BC) & IIB (13th century BC) periods, intervened by a period of abandonment (Artzy 1990: 74). There is little good agricultural ground in the area of the site and based upon this fact, and the wealth of imported pottery, it would appear that the site was involved in maritime trade (Artzy 1994: 139).

In the Middle Bronze Age the sea level at Nami is believed to have been 1-1.5m below present (Artzy 1989, personal communication). The Middle Bronze remains on the promontory are covered by Late Bronze remains, although the occupied area of the tell in this later period seems to be some what reduced in size due to encroaching seas. The Middle Bronze IIB period on the promontory, then island, was followed by a period of abandonment, but the anchorage in the lee of the tell was still in use (Raban 1985: 20; Fig. #144.1). A Late Bronze rectangular temple with a courtyard has been identified at the highest point of the tell (Area G). Large amounts of scrap metal and metal working tools have also been found in this area implying that bronze working or recycling was taking place (Artzy 1994: 126). Additional remains include ceramic, bronze, silver and gold objects and jewellery (Artzy 1994: 125). On the north and east side of the tell a rampart built on a sand layer and composed of small stones, mudbrick ruins, and ash, held together by clayey cement, was constructed in the Late Bronze Age IIB (Artzy 1988b). The rampart abutted a large wall. The building of the rampart was followed by a period of violent destruction at the end of the Late Bronze IIB period (Artzy 1990: 75). At this stage the area of the tell and anchorage were reduced due to rising sea level and subsequent silting (Artzy 1990: 73-76). On the southeast side of the tell, in the area immediately above the rampart (Area D), was a storage and living area (MBIIA),

with large storage jars and alley ways, as well a number of fires. The Middle Bronze IIA storerooms were 'probably connected to the anchorage' (Artzy 1990: 76) and quantities of Middle Cypriot pottery were also recovered similar to assemblages found at Akko. Marcus (1991: 170) believes that 'the similar assemblages suggest that these two sites were active parties in the same international maritime trade network during this period, and were primarily ports of entry for foreign goods', along with Dor (#145) and Ashkelon (#166). However, the excavator M. Artzy (1994: 123) perceives the role of Nami as an outlet for an overland route, to Megiddo, Beth Shan and the east bank of the Jordan River (Artzy 1994: 139), as well as port of entry, which would explain the sites particular prominence in the Late Bronze IIB period. This assumption is based on the wealth of material accumulated at Nami during the latter part of the Late Bronze Age particularly in relation to the size of the site when compared to major sites such as Tell Abu Hawam (#137) and Tel Akko (#134; Artzy 1994: 130-1).

In the final stages of the Middle Bronze Age IIA (c.1950-1750 BC) habitation of Area D, four storage jars have recently been discovered containing charred seeds of *Lathyrus clymenum* L., a type of Spanish vetchling that has since been shown to have originated in the Aegean (Kislev, M.E. et al. 1993), and therefore indicates 'direct' relations between the Aegean and the southern Levant in this early period. Many imported wares from all over the eastern Mediterranean have been found on the site, including a high proportion of ceramics from Cyprus (including cult objects similar to those displayed at sites in Cyprus), the Aegean (especially LHIIIB stirrup jars) and Egyptian scarabs (Artzy 1994: 130). Marcus (1991: 216) believes that 'the establishment of Nami was a result of the need for a landfall settlement which could serve as a port for ships plying the sea route between the Delta and the Northern Levant' ie a maritime way-station. 'The wealth accumulated at Nami during the last part of the Late Bronze Age is amazing for the size of the site' (Artzy 1994: 130).

On the mainland opposite the headland of Nami, east of the tombolo that presently connects the peninsula of Tel Nami to the mainland, the site extends to the area known as Nami East (Fig. #144.2). The area is covered in sand dunes. West of the mainland site of Nami are the modern fish

ponds, which were either an area of swamp, lake, or body of brackish water in the second millennium (Artzy 1994: 123). Occupation strata with sherds from the Middle Bronze II and Late Bronze II period have been found in this area, corresponding with the settlement strata on the tell. A Late Bronze Age cemetery in Nami East (Area O), with LBIIB graves and pottery (including Collar rim and Canaanite Storage jar burials, as well as imported wares from Cyprus and Mycenaean IIIB stirrup jars, and a Hittite ring and Mitanni seal (Artzy 1993 personal communication), have been uncovered 0.05m under the sand. A large rectangular, stone-lined building has also been identified in this area but was abandoned in the Late Bronze IIB period due to the rising sea level (Artzy 1989 personal communication). The burials from Area O include Cypriot milkbowls and White Shaved ware and Mycenaean ceramics, together with numerous pieces of bronze, gold, silver and ivory, as well as Egyptian scarabs and faience. A rectangular well with rounded corners has been found some 100m from the shoreline in Area O and is c.2.40 x 2.70m (Artzy 1991). The well fell out of use in the Middle Bronze IIA, due to a relative rise in sea level of 0.5m (Marcus 1991: 123-127). Additional Late Bronze IIB graves were uncovered to the south of Area O in a region referred to as Area N. Below the Late Bronze Age IIB graves a washed stratum of Middle Bronze IIA was observed (Artzy 1991). Stone anchors of the Bronze Age and other remains of sunken vessels have been mapped under water around the site (Artzy 1990: 74). No continuous habitation has yet been identified in this area and what caused the final abandonment of the site at around 1200 BC is not yet known (Artzy 1990: 75). To the north of Nami two rock-cut channels have been identified in relation to a smaller peninsula (Marcus 1994, personal communication).

**#145** [] **Dor** (Tantura)(Tell el-Burj) Dor
32:36:50 N 34:54:40 E

The site of Tel Dor is situated on a rocky promontory which forms part of a kurkar ridge which stretches parallel to and overlooks the sea (Wachsmann & Raveh 1984: 223; Fig. #145.3). The large mound of Dor is known as Khirbet el-Burj, and is situated in the centre of the site north of Tantura Lagoon and occupies an area of 50 acres (Stern 1984: 41). A number of bays lie to the north and to the south of the site which provided shelter to vessels in antiquity (Fig. # 145). Prior to the second millennium BC the tell was encircled by lagoons, to the south and north,

with a branch of a lagoon or marsh to the east (Sneh 1981). During the second millennium BC the sea level reduced and some of the lagoons silted up. Towards the end of the Late Bronze Age the sea level rose again and the area which is now known as Tantura Lagoon which lies to the south of the site, would have served as an ideal anchorage especially in the 14th and 13th centuries BC (Fig. #145.1). Tantura Lagoon is sheltered by the offshore reefs which now form a chain of islands stretching to the south of the tell, that were partly eroded during this period of sea-level rise, but in the Bronze Age constituted a continuous ridge which formed a natural proto-harbour (Raban 1985: 332; Raban & Galili 1985). At the end of the Late Bronze Age the sea level in the south lagoon is thought to have been -1m below present and the sediments deposited during this period indicate weak wave energy therefore implying a sheltered natural anchorage (Sneh 1981; Fig. #145.5). Underwater surveys in Tantura Lagoon have revealed evidence for intensive use of the lagoon as an anchorage through the ages (Wachsmann & Raveh 1984: 224). Raban (1985: 338,fig.18) believes that the modern day fish ponds area to the east of tell was also lagoonal and would have provided sheltered anchorage in antiquity (Fig. #145.2). During the Roman period it is thought that the sea level continued to rise, reaching a maximum height at the end of the Byzantine period.

The city is believed to have been founded in the Middle Bronze Age, with the earliest structures uncovered to the northwest of the mound dating to the Middle Bronze IIA period (Fig. #145.4). By the Late Bronze Age Dor was the 'most important site in this coastal strip' (Stern 1984: 41). Excavations on the site have uncovered a number of Late Bronze Age strata, some of them containing numerous imported Mycenaean and Cypriot vessels (Stern 1984: 42). Later remains have been uncovered dating to the Late Iron Age and Hellenistic period. The site is first mentioned in a 13th century BC inscription of Ramesses II, as a Canaanite city. The Late Bronze Age Canaanite city of Dor was captured in the mid 12th century BC by the Sikils, a Sea Peoples tribe. It is also mentioned in the c.1100 BC account of the journey of Wen Amon to Byblos (ANET: 17/ 25-29). After violent destruction by the Phoenicians in the mid 11th century BC, Tel Dor flourished in the Iron Age, particularly as a Phoenician harbour, being the most important Israelite harbour concerned with trade. The city was occupied until the Byzantine period.

The acropolis area which is situated in the centre of the site and is dominated by the tell, is bordered to the south by 'South Bay' and Tantura Lagoon and to the east by fishponds, and covers an area of 500m north to south and 300m east to west (Garstang 1924a: 65,Pl.I). The dominant architectural feature of the mound is a large rectangular structure of the Hellenistic period at the south-western end, which has been partially excavated by Garstang in 1923 and 1924 and is known as the Temple Podium (Garstang 1924a: 67). A rectangular foundation extends further seaward with the base of the stones in about 40cm of water. However, this water level is formed by the pool retained upon the reef flat by the vermetus rim (see Ch.III.3), which is itself raised. This structure could have been a simple landing stage (Flemming et al 1978 :56). On the south side of the tell Garstang (1924: 41,fig.2) excavated a cut along the central point of the base of the mound at the back of 'South Bay' associated with a sandstone ridge and identified an Early Iron Age house built in cyclopian style (Garstang 1924: 41-42,fig.2). Garstang (1924: 40-42) also identified a Bronze Age stratum below the Early Iron wall, with traces of Cypriot and local pottery of this period. Extending east of Garstang's wall on the water line lies a pavement of large, rectangular slabs, c.80m in extent (Raban 1981: 297,fig.24; Fig. #145.6). Despite bad preservation four lines of quays are distinguishable, 10m wide (Raban 1981: 297,304, fig.25). At the east end of the pavement Raban identified a series of ashlar walls or quays that ran for a distance of c.40m (Raban 1981: 297, 304,fig.24/D, 1983: 229-230,fig.1/G). The earliest structure in this area is this cyclopian 'headers' wall 'G' (Raban 1983: fig.1/G), east of the ashlar quay. 'Incorporated in the upper course of the wall there is a pavement of partially hewn sandstone slabs, which continues northward at a level of 0.2-0.3m above MSL ... and was heightened by additional layers of sandstone slabs and ashlar blocks. The platform terminates about 10m north of the wall 'G' (Raban 1981: 305,fig.25, 1983: 229-230,fig.1 (Area 'A'; Fig. #145.7/.8/.9). 'The third stage comprises a rectangular platform ... made of carefully cut rectangular slabs, which were laid on top of the earlier platform ... A pavement, about 2m wide, connected this stage to the backshore, leading north ... The surface of this stage is 0.81m above MSL' (Raban 1983: 229,fig.1,2). 'During the fourth stage this pavement was heightened by the addition of secondary used slabs...It seems that the need of a higher pavement was caused by the

rising sea level...During the fifth stage this high pavement was used as a base for part of a long retaining wall 'H' which ran along the south foot of the tell' (Raban 1983: 229,fig.1,fig.3). Raban (1983: 232), through association with the pottery finds, dates stages four and five to the Early Iron Age and the earlier stages to the second half of the Late Bronze Age. He identifies the different platforms as successive phases of quays or landing stages (Fig. #145.11).

Incorporated in this area, to the east of Garstang's excavations and west of the quays, 2m from the waterline, are the remains of a rectangular well (Raban 1983: 232,fig.1/D), with an ashlar facing and a drainage channel built of large slabs, also believed to date to the end of the Late Bronze Age. Wall 'M' above these features reveals pottery dating to the 11th century BC (Raban 1983: 236). To the east of the well 'D' and north of the paving area on the shore line, excavation in area 'C', revealed a further series of quay systems associated with the landing stages, and outlines how the various stages were constructed in response to the rising sea level (Raban 1983: 236-238). Although survey and excavation of this area is incomplete, Raban (1983: 236-238, 1991:143) is able to identify at least three successive quays dating to the 13th, early 12th and late 12th centuries BC respectively. 'In the earlier phase there was a quay, paved by ashlar slabs, which was laid on courses of slim headers. This quay was over 40m long and 10m wide ... and incorporated the well 'D' in its west extremity ... The later quays were built largely by reusing blocks from the earlier ones and on the same general plane' (Raban 1988b: 276-7, 1991: 143). These successive quays are contemporaneous and continuations of the quays previously described south of area 'H'. Associated with the ashlar quays Raban has identified a storage area and magazines all of which apparently date to the latter part of the Late Bronze Age (Raban 1983: 238). The Late Bronze Age ashlar quays at Dor represent the only harbour installations of such a period and nature along the southern Levantine coast.

On the rocky island just south of Tel Dor, the northern most of the islands in the island chain that borders the Lagoon of Tantura and which is now joined to the mainland by a tombolo, two pools were excavated and identified as a network of fish tanks (Raban 1981). A large number of Bronze Age type anchors have been recovered form Tantura Lagoon, together with

pottery dating from the 17th to the early 12th centuries BC, including the possible cargo of conical jars dating to the 1200 BC (Raban 1988b: 273-4). Along the beach of the Lagoon of Tantura extending to the outlet of the Dalia River in the south, remains of settlements occupied from the fourth millennium to the Early Bronze Age, have been identified (Raban 1985: 332).

To the northwest of Tel Dor there is a small, sheltered bay, known locally as 'Love Bay' which is partially protected by an island and may also have been used as a harbour in the second millennium (Wachsmann & Raveh 1984: 224). The southern shore of the bay is bordered by rock cuttings and channels. It seems that the bay was once the inner and most important harbour of the city of Dor - at least from its days as a Phoenician maritime base and in the Hellenistic period. On top of the up-raised abrasion platform that borders the north point of Tel Dor and covered by the sandy beach of 'Love Bay', a course of Cyclopian blocks was found some 20-30m inshore, running in a N-S direction along the east shore of the bay. They are believed to be header bases for the retaining wall of the tell, or a quay running parallel to the water line. Middle Bronze IIA and IIB floors were identified in the lee of this wall indicating the earliest urban phase at the site. On top of the floor levels lie the remains of a huge rectangular Late Bronze Age ashlar structure, believed to be a public structure related to the city of the Sikuli (Raban 1985: 335), and contemporary with the ashlar structures and quay which lie 300m south on the south side of the tell, indicating the magnitude of the tell during the 13th to 11th centuries BC. These in turn are overlain by Persian ruins. In addition, post Bronze Age shipyard and port facilities have been identified in the north of 'Love Bay', together with a wave catcher located on the west side of the tell south of the bay. The deep channels of the breakwater were cut into the sea cliffs to serve as 'traps' for the excess water which is thrown landward by large waves.

On the rocky north shore of 'Love Bay' a flat strip of bedrock separates the anchorage from a big, shallow bay to the north known as 'North Bay'. This strip is part of a kurkar ridge which was quarried and used for local building stone. On the west side, facing the sea, the original stone face was left to serve as a natural breaker. A rectangular area in 'North Bay' probably served as an inner harbour from at

least the 5th century BC, with industrial basins from the later Roman period on the flat strip of bedrock to the south (Raban 1985: 341).

Both uplifted and submerged remains occur interspersed and occasionally superimposed at Dor, the whole area having been uplifted in one period, and submerged in another. Raban (1985: 348) and Flemming et al (1978: 75-9) have interpreted the sequence of sea level change at Dor as follows: In the Chalcolithic period sea level was considerably lower than present, causing the shore line to be situated further to the west. Throughout this period and continuing through to the beginning of the second millennium BC the sea-level rose, causing the abandonment of coastal rural settlements to the south of the acropolis. By the first half of the second millennium the sea level reached a peak height of 0.5-0.8m above present, but during the period between 1600 to 1300 BC the sea level subsided again to -1m lower than present. At this point Raban (1985: 348, 1988b: 273) believes that 'South Bay' was still not open to the sea, but was connected via water channels to Tantura Bay, which in turn linked the brackish lagoon that lay in the lee of the tell. Between 1300-1150 BC the gradual sea-level rise necessitated the repeated rebuilding of the quays and walls on the south side of the tell. Towards the end of this period a slight regression was experienced. Finally after 1150 BC to the end of the millennium, the sea-level rose slightly and stabilized.

Stern (Stern & Sharon 1987-88) is currently excavating the fortifications and monumental building remains on the summit of Tel Dor, dating from the Middle Bronze through to Iron Age periods, as well as the ruins of the Roman and later Byzantine city which spread to the east and south, expanding beyond the confines of the earlier mound.

**#146 $ Ma'agan Michael** (Hamman Island)
32:33 N 34:54 E

Situated on the low rocky island off of Kibbutz Ma'agan Michael. The island of Hamman contains the remains of Roman quarries and a fish pool all of which are fairly well related to present sea level (Flemming et al 1978: 58-59). The island could well have been used as a temporary anchorage for shelter in the Bronze Age, providing a McKee Type (4) anchorage in its lee. In fact Galili and Sharvit (1994) imply its use as an anchorage since the end of the Bronze Age.

*RIVER TANINIM*

**#147 $ Tell Taninim** (Tell Malatt) (Crocodilopolis)
32:32 N 35:53 E

Tell Taninim/ Tell Malatt is located at the mouth of the River Taninim on the coast and reveals material from the Late Iron Age, Hellenistic and Roman periods. The headland is eroded kurkar. Tel Mevorakh was possibly served by the estuarine anchorage of Tell Taninim on the coast during the second millennium and would thus have afforded a McKee Type (1) anchorage.

**#148 * Tel Mevorakh** (Tell Mubarak)
32:32 N 35:54 E

Tel Mevorakh is a small mound situated on the south side of the Crocodile River some distance inland. The site does not exceed 1,000 sq.ms but rises to a height of 15m above its surroundings (Stern 1978: Pl.1, 1984: 1). The location of the site on the junction between the Sharon Plain and narrow Carmel coastal strip which is blocked on the east by the mountain ridge and on the west by swampland, served as a key nodal point for access N-S along the coastal plain (Stern 1984: 1). Presumably the river was navigable to this point and acted as a riverine, McKee Type (4) harbour connected to the coastal outlet at Tell Malat. Raban (1987: 178) has suggested that perhaps this segment of the coastline between Mevorakh and Dor to the north, was a semi-closed marine lagoon as far east as the sandstone ridge in the second millennium. The area of the site is limited by construction.

In the Middle Bronze Age it was occupied by a series of fortresses, the earliest encircled by a terre pisée rampart, with later remains of numerous dwellings which encircled the fortress and extended over the entire hill (Stern 1984: 64). In the Late Bronze Age the mound was occupied by a sanctuary (Stern 1984: 1). Cypriot pottery has been recovered from the 18th and 17th century BC stratum of the mound, together with local pottery. Pottery has been collected from four Middle Bronze Age strata at Mevorakh, dating Middle Bronze IIA down to Middle Bronze IIC and including several different Cypriot vessels including amphorae (Stern 1984: 55-59). The excavator Stern (1984: 44,fig.5,69) concludes that in the Middle Bronze Age Mevorakh was a road fortress of the central city of Dor (#145), 'indeed located in a key position on an important crossroads ie., on the junction between the traditional Via Maris and the coastal road'.

**#149 $ Caesarea** (Khirabet Qesari Site A) Sebastos/ Caesarea Maritima

32:31 N 34:54 E

The Herodian harbour of Sebastos was built between 22 and 10 BC, to the plan of the Hellenistic Limen Kleistos, to serve the town of Caesarea - a well enclosed harbour with a separate inner anchorage. The inner harbour basin, now completely silted, was linear, perhaps rectangular in shape, and may have incorporated the small mouth of a former river bed. This artificial basin was ca. 40m wide (N-S) and 100m long. The east quay was constructed on the remains of a kurkar ridge, some 0.8m below MSL. Herod's harbour at Caesarea was one of the earlier artificial harbours constructed in the ancient world, and was formed by two breakwaters built on concrete foundations, enclosing an area of approximately 3.5 acres. The southern limit of the anchorage was a natural rock promontory, which extended from the shore and was modified in antiquity, and extended over 600m into the sea.

This brief introduction to the man-made harbour at Caesarea outlines a number of natural features, such as the natural rock promontory of the Outer Harbour south breakwater and the river mouth and kurkar ridge that were incorporated into the structure of the Inner harbour, which could well have been utilised in an anchorage of an earlier Bronze Age date, along a McKee Type (1) shore. However, subsequent construction in the Roman and later periods, coupled with the fault movement offshore, has most likely destroyed any potential evidence for the use of the site as an anchorage in the second millennium.

A bay to the south of Herod's harbour served as second anchorage to the Roman and possibly earlier harbour, in fact Galili and Sharvit (1994) allude to the use of this anchorage in the Late Bronze Age. The south bay has a sandy bottom and a long, narrow kurkar breakwater projects 75m in south-westerly direction into bay and provides additional protection. Approximately 200m north of the base of the north Herodian breakwater, outside the Herodian harbour, an eroded kurkar ridge projects a short distance into the sea, protecting a small bay to the north. It is believed to be part of the earlier 2nd century BC Hellenised harbour of Straton's Tower but also could have provided shelter during an earlier period. Again Galili and Sharvit (1994) believe this bay was used as an anchorage in the Late Bronze Age. However, there is no evidence for

occupation at the site prior to the Late Iron Age. Predominant winds are from the SW, occasionally northerly, causing surface swell and currents at the exposed western end of site.

**#150 * Sedot Yam**

32:29 N 34:54 E

Sedot Yam is situated on the coast south of Caesarea, about 300m east of the shoreline and 600m south of the Crusader fortifications of Caesarea. Additional finds have been recovered under the water off the beach at Kibbutz Sedot Yam, linked to a line of kurkar offshore reefs (Galili et al 1993: 66,fig.6). U/w exploration off the south end of the beach revealed a c.5m wide double row of ashlars representing the remains of the foundation of a structure (Fig. #150). The row extends c.75m shoreward from the eastern edge of the kurkar outcrop and lies in a depth of 1.7-3.0m. The ashlars measure 0.5 x 0.6 x 1.3m and some have round drill-holes. The stones disappear under a layer of sand 30m offshore (Galili et al 1993: 66,fig.6/Area C). It is assumed (Galili et al. 1990) that the perforated stones served as bases for the wooden poles of a jetty or installation that blocked the flow of sand from the south, providing shelter to the north (Peleg & Reich 1985: 16-17). Approximately 170m south of the 'jetty' remains of a cargo of a Late Bronze Age shipwreck have been identified, implying the use of this area as anchorage in the Late Bronze Age. The cargo remains include four semi-convex lead ingots with script markings, a bronze axe and several single holed stone anchors (Galili et al 1993: 65-66,fig.6/Area B). Shelter would have been afforded from prevailing westerly winds in a McKee Type (4) anchorage in lee of the reef.

**#151 * Tel Zeror**

32:27 N 34:57 E

Tel Zeror is located some distance inland up the River Hadera in the Sharon Plain. The site reached its peak of prosperity in the Middle Bronze IIA period, and was enclosed by city walls built on an earthen rampart and surrounded by a moat (Ohata 1970: Pl.I; Kochavi 1993: 1525). It was abandoned in the Middle Bronze IIB period and reoccupied at the beginning of the Late Bronze Age by a community of coppersmiths of Cypriot origin. Thus, despite the location of the site some distance inland, it appears that it could well have functioned as a McKee Type (4) riverine anchorage in the Bronze Age, served by riverine boats. The site was resettled in the later Iron and Persian periods (Kochavi 1993: 1525).

**#152 * Tell Girth** (Girit)
32:25 N 34:53 E

The tell is situated on the kurkar ridge close to the shore, part of which has been eroded by waves (Flemming et al 1978: 65). East of Tell Girth tombs of the Late Bronze Age I-II have been uncovered, and there is pottery on the tell from the same period including imports from Cyprus (Flemming et al 1978: 65). The site was a small port in the Late Bronze Age period (Gophna & Kokhavi 1966). The anchorage is W-facing and therefore can be described as a McKee Type (1) shoreline.

*ALEXANDER RIVER*

**#153 * Tel Mikhmoret** (Minet Abu-Zabureh)
32:24 N 34:52 E

The modern village of Mikhmoret fronts onto a small cliff-encircled bay on the north side of the Iskander (Alexander) river (Flemming et al 1978: 65). The mound is situated on the south headland of the bay and the cemetery on the north headland (Porath et al. 1993: 1043; Fig. #153.1). Remains from Mikhmoret have been found from the Late Bronze Age, Middle Iron Age and Hellenistic period. Isserlin (1961), in a small excavation on the south side of the harbour, found material of Persian and Hellenistic periods. Phoenician tombs on the north side of the harbour extend down to, and within, 2m of the water. Foundations of the buildings on the south side of harbour project from the cliff at a height of 2.7m. No architectural remains have been found from the Late Bronze Age, although a selection of local and imported, predominately Cypriot, material has been uncovered suggesting the use of the bay as a harbour in the 14th and 13th centuries BC. The estuary to the south of the site was partly blocked in antiquity by the coastal ridge and there is evidence for the cutting of a 5m wide navigation channel through this reef in order to have direct access with the lagoonal anchorage southeast of the tell (Raban 1985: 19,fig.5, 1987: 184; Fig. #153). The dating of this rock-cutting is possibly Phoenician, although other Bronze Age examples can be seen along the coast of the southern Levant. The estuary would have provided a McKee Type (4) anchorage in the Bronze Age. The walls on the lee side of the channel are part of an anchorage basin that existed on the south side of the mound (Raban 1993: 964).

*NAHAL POLEG (river)*

**#154 * Tel 'Ashir**

32:15 N 33:51 E

Tel 'Ashir is a small mound on the first kurkar ridge on the southern bank of Nahal Poleg. It is situated not far from the rivers outlet to the sea. A N-S gap has been eroded through the kurkar ridge by the meandering channel of the River Poleg during lower sea level (Gifford & Rapp 1989: 206). As the sea-level rose during the Holocene the sea would have flooded this indentation creating a natural harbour and a logical place for a port settlement. Gifford & Rapp (1989) took core hole samples (Tel Poleg 1) at the river mouth of Nahal Poleg and a shell sample from 1.15m below sea level from this core produced a date of 3550 BC. 'Thus a marine embayment existed at the mouth of the Nahal Poleg in the mid-Chalcolithic, and possibly in the Bronze Age' (Gifford & Rapp 1989: 206), adding further evidence that the river mouth could have been used as a McKee Type (4) anchorage serving the upriver site of Tel Poleg in the Bronze Age. With continued sedimentation this indentation would have been filled in by the first millennium BC (Gifford & Rapp 1989: 206). The site was not fortified and is believed to have been a Middle Bronze I cult site (Gophna 1993: 1195).

**# 155 @ Tel Poleg**

32:15 N 34:51 E

Tel Poleg is located on an artificial breach in the second kurkar ridge 1.2km inland on the banks of the Poleg River. Until the 20th century the area was one large swamp and 'marine conditions could have extended inland as far as Tel Poleg in the third and second millennia, depending on the rate of sedimentation' (Gifford & Rapp 1989: 206). Thus. it is possible that there was a harbour in the Poleg River, or in a lake to the east of the site, that has now drained and is dry (Flemming et al 1978: 66), which afforded a McKee Type (4) river embayment anchorage.

The south area of the mound of Tel Poleg has been destroyed in the course of development work. Most of the finds from Tel Poleg belong to the Middle Bronze IIA, the period when the tell was fortified (Flemming et al 1978: 65-6; Fig. #155). The fortress enclosed an area of some 3 acres (Gophna 1993: 1193). A section of a brick wall preserved to a length of 23m and 2.7m thick (Area A), has been identified at the eastern end of the site. In Area 'C' and 'D' part of the brick fortress, with tower (15 x 8.5m), kurkar rampart and a gateway, has been identified on the west

side of the tell, overlain by the later remains of a large Iron Age and Persian settlement (Gophna 1978: 959-960; Gophna 1993: 1194,fig.). The site was also a Late Bronze Age settlement (Stern 1984: 42,nt.16).

The site probably lay at the innermost tip of the estuary in the Bronze Age. To the north of the site a large artificial channel has been cut through the ridge. Raban (1987: 178) believes that this cutting was made when the site was first occupied to facilitate small craft to sail further upstream to a marshy lake that lay to the east (Fig. #155.1). 'The cutting not only lowered the river bed, but also short-cut the natural course [of the river] that was at the south side of the Middle Bronze site' (Raban 1987: 184). Gophna (1973: 111-119) suggests that the passage was made as a moat, part of the Middle Bronze fortifications. However, Raban (1987: 184) argues that the passage is too deep and wide, over 10m, for such a purpose and that such a moat is unparalleled elsewhere in Middle Bronze Levant, and thus, must be connected to a riverine anchorage.

**#156 $ Apollonia** (Arsuf) Rishpon/Apollonia/Sozusa
32:12 N 34:49 E

Remains of the site of Apollonia are present on the cliff top at a height of 25m above sea level, down the slopes of the cliff and awash on the shore. Remains of Roman and Crusader structures have been identified at the site of Apollonia (Princeton 1976: 72). An open rectangular arrangement of masonry and natural kurkar rocks has been identified on the shore, west of the Crusader castle, projecting about 0.50m into the sea and extending for about 100m south along the shore. The structure could represent a harbour basin (Grossman 1989/1990), although the water here is shallow 3-5m deep. The natural ridge could have provided some protection to vessels anchored offshore or beached in the Bronze Age on a McKee Type (4) shore. The area within the rectangular sheltered area has silted up somewhat, and the reef or beach-rock has accumulated around it (Flemming et al 1978: 66). In a recent article by Galili and Sharvit (1994) the presence of a Proto-Harbour using the offshore kurkar ridge as protection, is supported for the period of the second millennium (Fig. #156). Fifteen stone anchors with a single perforation characteristically dating to the Late Bronze Age have been found offshore (Galili et al 1993: 64,fig.4), again supporting the use of Apollonia as an anchorage in the second

millennium.

*NAHAL GELILOT*

**#157 * Tel Michal** (Tell Makmish)
32:10 N 34:47 E

Tel Michal is 600m southeast of the Accadia Hotel, on a small hill in the area of sand dunes near to the shore (Flemming et al 1978: 66), to the south of the outlet of the River Gelilot (Fig. #157). Avigad (1960) reports buildings and pottery from the Early Bronze Age through the Persian period to the latest occupation in the Hellenistic period. It was an ideal trading post in ancient times, with easy access to the Sharon Plain (Herzog et al 1978: 99) and a Phoenician trading post for communications with Cyprus (Avigad 1977: 768-770).

The site was excavated in 1977 to 1980. The site is situated on a kurkar cliff rising above the Mediterranean coast (Fig. #157.1) and consists of five hills which cover an area of 800 x 500m (Herzog et al 1978) and was first occupied in the Middle Bronze IIB period (Herzog et al 1989: 7; Fig. # 157.2). The predominant occupation of the second millennium settlement is on the tell in the centre of the site which is situated just up from the beach, the 'High Tell' (Area A; Herzog et al. 1989: 408,Pl.3&4, 409,Pl.6; Fig. # 157.3). The northern hills (Area D, E, F) of the site were primarily occupied in the Persian and Hellenistic periods (Herzog et al 1978: fig.2). 'High Tell' is bordered by two ravines to the north and south, while the south slope is eroded, the east slope is covered with sand and the west side, now badly eroded, rises in a steep kurkar cliff to a height of 18m. The maximum height of the tell, before the removal of the overlying dunes was 30m above sea level and from here a good view of the surrounding coastline is obtained (Herzog et al 1978, 1989: 5). In the western part of the 'High Tell' the earliest settlers built a 4m high Middle Bronze IIB hamra platform with retaining walls and encircled by an earthen rampart and glacis (Herzog 1993: 1036; Herzog et al 1989: 32).

The port settlement area was established in the Middle Bronze IIB period. 'Throughout most periods of its occupation, Tel Michal was very likely a maritime station - engaging in international trade and providing services to ships and seafarers' (Herzog et al 1989: 8). Natural kurkar breakwaters can be observed offshore which are believed to have provided some

protection to shipping, as well as anchorage in the mouth of the river (Herzog et al 1989: 407,pl.2). An ashlar construction (0.40 x 0.40 x 1.25m) has been identified attached to the southern end of the natural breakwater offshore, where the breakwater is lower (Grossman 1989/1990: 139). A CMS survey in this area identified a 30-40m wide, 2m deep channel between the kurkar ridge and the beach. The channel would have afforded a safe anchorage, protected by the kurkar ridge (Herzog et al 1989: 38). The protection offered to the harbour by the offshore ridges mean that the shore at Tel Michal can be described as a McKee Type (4) shore.

To the north of Tel Michal core hole samples were taken through the Nahal Gelilot river channel (Gifford & Rapp 1989). Results from this core sample reveal that at 'about 5200 BCE...a water depth of 1-2m would have existed in the ancestral Gelilot channel some 100m or so seaward of the present channel mouth. This area would have been the most likely natural anchorage for the Middle Bronze IIB settlement at Tel Michal' (Gifford & Rapp 1989: 206). After which time the channel silted up.

Middle Bronze Age material, predominantly Middle Bronze IIB, has been recovered from the 'High Tell' and the North hill. The site flourished in the Middle Bronze IIB period, when much Cypriot material was recovered (Herzog et al 1978: 126). Late Bronze Age strata expanded the area of the 'High Tell' to the east by means of a 15-20m wide and 10m high earth fill, to compensate for the loss of terrain on the seaward side of the tell and which has determined the shape of the mound today (Herzog 1993: 1037; Herzog et al 1989: 38). Three phases of Late Bronze Age occupation have been identified, with a rampart and hamra platform dating to the Late Bronze I and II periods. During this phase a small fort was erected at the north end of the mound, to the south of which are remains of dwellings (Herzog 1993: 1037). Recent excavation has revealed Canaanite storage jars, local cooking pots and imported Mycenaean and Cypriot (predominantly MCIII) pottery remains, including Base Ring II, White Slip Wares and a Bichrome Ware vessel. A 12th Dynasty stamped bulla bearing the name of Amenemhat III has also been recovered, together with Hyksos scarabs (Herzog et al 1989: 341-344).

*YARKON RIVER (the main drainage channel of the Sharon Plain)*

**#158 * Tel Aviv**

32:06 N 34:47 E

The site of Tel Aviv is slightly inland near the mouth of the Yarkon river, rising from the alluvial plain (Flemming et al 1978: 67). Within Tel Aviv city there are about thirty ancient sites, most of them date from the Bronze Age and have been systematically surveyed over a period of twenty five years by Kaplan (1955). The ancient harbour is usually assumed to have been further up the River Yakron, possibly at Tell Qasile, or Matsad Yarkon (Raban 1994, personal communication). The Middle Bronze Age site of Sde Dov was exposed during building operations. It is an elliptical hollow dug in the kurkar rock and measures approximately 20 x 9m and contains thin occupation strata, pottery, animal bones, ovens and hearths.

Excavations near Tel Aviv Harbour, about 30m from the present shoreline, revealed a small cemetery with eighteen Middle and Late Bronze Age tombs, in the form of rectangular rock-cut shafts, about 1.6m deep. On the long side of each tomb was a vaulted burial niche in which the body was placed (Kaplan 1978: 1159-1168). The presence of abundant second millennium material implies the practise of at least mooring boats here in the second millennium along a McKee Type (1) shore.

**#159 * Tell Qasile** (serving Tell Gerisa/ Jerishe, Tell Afeq)

32:06 N 34:47 E

The site is situated 1.75km from the sea, 250m north of the present course of the River Yarkon, on the south-western corner of a kurkar ridge (Fig. #159). The top of the hill is 26m above present sea level (Mazar 1980). The mound site of Tell Qasile has suffered from erosion on the southern and western slopes, but would have covered an area of 15-16 dunams (Mazar 1980). The city was built in the Late Bronze Age period, in the second half of the 12th century BC. This short phase of occupation ended in destruction and was followed by three phases of Philistine settlement (Mazar 1985). Remains from the Philistine period, the late 12th century BC, are dominated by a series of temple buildings, originally built of mudbrick, later of stone walls and containing benches around the walls and a raised platform, with a spacious lime floored courtyard to the east. A series of four temples have been identified up to the late 10th century BC together with associated cult objects and imported material, including Cypriot White Slip

I ware and Egyptian type storage jars (Mazar 1985: 125-6). The remains of large brick fortification walls have also been discovered associated to this period. The site was violently destroyed at the beginning of the 10th century BC, and then occupied discontinuously up until the Arab period.

The Yarkon River was exploited as a well protected haven for a riverine harbour, either a dug basin or a sheltered stretch of the river, where goods were trans-shipped from sea-going vessels to river boats and transported upstream to Tell Aphek. The river would have afforded a McKee Type (4) anchorage to vessels in the Bronze Age.

**#160 @ Tell Jerishe/ Gerisa/ Garisha**
32:05 N 34:48 E

Tell Jerishe is situated about 4km east of the seashore, on the south bank of the Yarkon River (Flemming et al 1978: 67). The River Yarkon was navigable as far inland as the site during the Bronze Age (Gifford & Rapp 1989: 206). The large mound consists of two hillocks and covers an area of 60 dunams. The surviving kurkar provided a convenient river crossing and its location at the end of the navigable stretch of the river made Tell Jerishe the regions main port. 'Until the beginning of the 20th century, when the breakwater was built at Jaffa, dozens of small boats anchored daily at this spot' (Herzog 1993b: 480). The riverine anchorage would have provided a McKee Type (4) anchorage in the Bronze Age.

The site of Tell Jerishe was originally excavated by Sukenik during the 1930s and later by Geva in 1976 and displays remains from the Early Bronze through to the Late Bronze Age (Geva 1982; Fig. # 160). It presumably was a 'staging post' on the river transport system along the Yarkon river. The most outstanding feature of the tell is the Middle Bronze Age II, Hyksos defense system. 'The complex and excellent structure of this glacis has no parallel in the country' (Avigad 1976: 574-578,fig.). The glacis fortification was formed of layers of earth and sand spread on the slopes and surrounding the whole of the mound (Geva 1982: 14-18). At the upper edge of the mound, along its slopes, a wall of large, sun-dried mud bricks was built 3m wide. In all, three fortifications systems have been identified associated with the Middle Bronze Age (Herzog 1984). During this period Tell Jerishe was a prosperous city with scanty building

remains, pottery kilns and evidence of a high level of material culture. Local pottery, including large vessels such as storage jars and kraters, and Cypriot imported Middle Bronze II White Painted wares have been identified at the site (Geva 1982: 14-18). The Late Bronze Age settlement extends over the whole of the mound, surrounded by fortification walls, and is rich in buildings and objects attesting to the economic prosperity of the Canaanite cities under Egyptian rule. A section of a public structure was uncovered on the north end of the mound, with finds including a 13th century BC Cypriot-style cylinder seal and a 13th century BC scarab (Herzog 1984). The town was completely destroyed in 1200 BC, with partial remains from the from the 12th century BC indicating re-occupation by the Philistines, with evidence of a more rural subsistence implied by the finds which include millstones, flint sickle blades, together with the remains of the shaft of a well 5.6m in diameter cut into the kurkar. Tell Gerisa acted as a riverine anchorage in the Bronze Age (Raban 1987: 178).

**#161 * Jaffa** (Yaffo) Jaffa/ El Qal'a
32:03 N 34:45 E

Tell Yaffo is situated on a high promontory jutting into the sea to the south of Tel Aviv (Fig. #161). There are large rocks, or small islands, 50-100m offshore (Flemming et al 1978: 67). Raban (1985: 17) believes that Yaffo was settled as a port in Middle Bronze II, 'on a rocky promontory just south of the ancient outlet of the Nahal Ayalon' on a McKee Type (2)/(3) shore. A second potential prehistoric riverine anchorage area has been identified (Hanauer 1903: 258) half way between the coastal town of Jaffa and the ridge of Saknet Abu Kebîr in a large basin known as 'El-Basa' that lies in a marshy lagoonal area 1km southeast of the present coastline (Raban 1985: 27; Fig. #161.1). Hanauer (1903) describes how at the beginning of this century local people reported boat anchors being dug up in the lowest part of this hollow area, which at the time still turned into a lake after heavy rainfall and is now occupied by a modern stadium. At the beginning of this century an attempt was made to re-open the channel that is thought to have connected the basin to the sea in ancient times (Raban 1985: 27). During the work a massive section of what was described as a curving sea wall was discovered (Hanauer 1903: 260). In addition probes in the area revealed sand beyond 11m below the bottom of the hollow, implying that the original sea bed was c.7-8m

below present in prehistoric times (Hanauer 1903: 260). The basin is located on a tentative ancient course of the Nahal Ayalon, which was diverted in modern times and now runs north to a point 3km from the shore and finally empties into the Yarkon River. Drilling bores offshore to the north of the Yaffo promontory has revealed finds of river pebbles implying that in fact the area was once the outlet of a river (Raban 1985: 27). However, as to the dating of the alteration of the river course and whether it was a man-made or natural event, we are unsure. The modern fishing harbour is constructed by the joining up of the offshore rocks to form a concrete breakwater.

Jaffa is first mentioned in Egyptian sources as one of the cities conquered by Tuthmosis III in the 15th century BC. It is also mentioned in the Amarna letters as an Egyptian stronghold (Haya & Kaplan 1976: 532). Yaffo is mentioned as an early Canaanite port. It was also occupied in the later Classical periods. The town of Jaffa flourished in the Late Roman and Byzantine periods. On the hill foundations and pottery have been found from throughout the Bronze Age, and it can be assumed that the ancient harbour utilized the shelter of the offshore reefs and rocks. The city was fortified in the Middle Bronze Age (Kaplan 1964: 288), and became extremely important in the Late Bronze Age. In 1955 Kaplan undertook a systematic excavation of ancient Jaffa. To the south in Area A, Middle Bronze Age remains of walls towards the northern and southern edges of the area were uncovered, the south wall being set on a rampart of beaten earth and kurkar. Late Bronze Age remains include a citadel gate and two entrance walls, 18m long and 4m apart, built of grey mud brick, as well as a small stone built silo. From the 12th century BC a Pre-Philistine temple, known as the 'Lion Temple', has been found. The hall measured 4.4 x 5.8 and was entered from the north. The floor was covered in white plaster (Haya & Kaplan 1976: 534-541).

**#162 $ Tell Haraz** (Tell Yona)
31:59 N 34:44 E

The tell is a steep-sided mound on the shore. There is a depressed area of marsh and reeds next to the site, which could have been a lagoon or lagoonal harbour providing shelter on an otherwise exposed McKee Type (1) shore. The site was occupied during the Middle Bronze IIA period (Flemming et al 1978: 68). The site is now within a military compound and no excavation has been possible (Flemming et al 1978: 68).

*SOREQ RIVER*

**#163 * Yavne-Yam** (Tell Soreq) (Palmachin/ Minet Rubin) Jamnia

31:56 N 34:42 E

The tell of Yavne Yam is situated on a prominent headland next to the mouth of the Soreq River, where wind-blown dunes were encroaching on the surrounding agricultural land until the dunes were artificially stabilised. A line of sandstone kurkar reefs extends north from a point seaward of the promontory tip, providing sheltered anchorage between the reef and the shore on a broad sandy bay, 'the area between which forms the shape of an oblong basin' (Galili et al 1993: 61; Fig. #163). The depth of water in the bay is presently up to 6m deep and therefore anchorage is relatively safe for most of the year (Galili et al 1993: 61).

Occupied from c. 2000 BC, in the Middle Bronze Age, Yavne Yam was one of the only inhabited sites on the coast for a stretch of 3km north and 10km south of the Rubin River. The tell has yielded remains from the Middle and Late Bronze Age, Iron Age, and in the Hellenistic period and later, the site extended north along the low hills overlooking the bay. Walls and rocks from several periods come down close to the water level around the promontory, and down to the beach further north.

The most impressive remains in the area are those of a Middle Bronze IIA square enclosure bounded by free standing terre pisée ramparts, with glacis (Kaplan 1969) and apparently covering an area of 64 hectares (Finkelstein 1992: 205). Kaplan (1969) is of the opinion that the fortifications of Yavne Yam date to the 17th-15th centuries BC and that the enclosure within the rampart is earlier, possibly relating to the first stage of the Middle Bronze II period or Middle Bronze IIC. More than half of this enclosure has been eroded due to the slowly rising sea level and possibly tectonic activity (Kaplan 1978b: 1216). However, the entire eastern rampart and parts of the north and south ramparts are preserved, together with two gate structures of sun-dried bricks and flanked by towers. The length of the eastern rampart is approximately 800m. Three gates of successive periods were uncovered, the last dating to the 16th century BC. Building remains and graves where found in a strip along part of the inner rampart slope, also dating from the MBIIA, as well as on and around the small mound located on the headland of Yavne-

Yam (Minet Rubin) (Kaplan 1978b: 1217).

At the beginning of the Late Bronze Age the enclosure ceased to be used as a fortification. Although Kaplan believes that the Middle Bronze II enclosure was originally square there is little evidence to support this and in fact it is more likely that the enclosure was semi-circular in shape, similar to the tells of Akko (#134) and Ashkelon (#166), with the harbour below. No trace of the ramparts of the enclosure have been found offshore. In fact, within the area of the offshore central reefs a stone rampart, starting at its fringes and facing east, is present (Galili et al 1993: 62,fig.2/Area A). The width of this rampart is c.50m and it is c.100m in length. Galili proposes that the rampart may have been constructed to protect the anchorage area from SW waves (Galili et al 1993: 62). The presence of a marine installation in the area of the so called eroded square enclosure does question the existence of such a sizeable structure. It is of course possible that the marine rampart was constructed after the erosion of the larger terrestrial enclosure. However, some twenty five stone anchors with single perforations, characteristic of the Late Bronze Period, have been found in the lee of the marine rampart, Area A (Galili et al 1993: 62), implying that anchorage from at least the Late Bronze Age was possibly sought leeward of Minet Rubin (Galili 1986: 109; Fig. #163.1). It now seems increasingly likely that the rampart at Yavne Yam took a semi-circular shape facing the sea as was the case with a number of other Middle Bronze ramparts of southern Levant (Finkelstein 1992: 205; Kischen 1991).

In spite of the probability that this site was utilised as a harbour there is little evidence, other than the marine rampart and stone anchors, to support this notion from any archaeological period. However, from a later period, we have reference on a Greek inscription that was recovered from the site which relates to the time of Antiochus V, that the then Sidonian colony at Yavne Yam wrote to the king to ask permission to grant them tax reductions because of the damage to the city and its harbour suffered during the Hasmonean wars (Levy 1988/1989: 188). In addition, in the area directly to the north of the promontory, Area B and C (Galili et al 1993: 62,fig.2), a complex of several items of the Late Bronze Age were also discovered (Galili & Raban 1985). However, the water here is very shallow, 1-3m, and it would

seem more probable that the main anchorage of Yavne Yam was situated in the north-western part of the basin[1], in a McKee Type (4) anchorage.

*RIVER LACHISH*

**#164 @ Tel Mor** (Tell Mura/ Kheidar)
31:50 N 34:39 E

Tel Mor stands on a small sandstone hill on the north bank of the Lachish River in an area of warehouses on the fringes of the modern industrial district of Ashdod, 1km from the sea (Fig. #164.1). This stretch of the river is still navigable (Raban 1994, personal communication). The tell covers an area of about 6 dunamas and rises about 17m above the surroundings (Dothan, M. 1977: 889) but has been cut into on the north side as a result of grading the neighbouring waste ground. The site of Tel Mor was supported by the riverine McKee Type (4) harbour that served the ancient kingdom of Ashdod which is situated 7km to the southeast, near the source of the Lachish river. Tel Mor fulfilled the needs of sea transport and commerce for Ashdod (Dothan, M. 1973: 3), and in fact the two sites developed simultaneously until the point when the artificial anchorage was developed at Ashdod-Yam to replace the anchorage at Tel Mor. Prior to the silting of the River Lachish caused by the sand dunes riverine boats would have been able to navigate upstream to Ashdod, just as small boats are able to navigate the 9km to the kibbutz close to Ashdod today (Dothan, T. & M. 1992).

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[1] YAVNE YAM (using Jaffa windrose)

Fetch
Fetch (in nautical miles)

| S | N | E | W | SE | SW | NE | NW |
|---|---|---|---|---|---|---|---|
| 0 | 280 | 0 | 300+ | 0 | 186 | 0 | 97 |

Consideration of winds effect on harbour in summer
For foul winds :

| SW | W | NW | Rest negligible |
|---|---|---|---|
| 45% | 30% | 10% | |

Therefore, the likelihood of not entering the harbour:

| From N | NW | SW | W |
|---|---|---|---|
| negligible | | | 0 |

Therefore, the factor likelihood of not departing the harbour:

| To | N | NW | SW | W |
|---|---|---|---|---|
| | 33 | 98.5 | 614 | 519 |

The remains at Tel Mor date from the 16th century BC (Dothan, M. 1977: 889; Fig. #164). Pottery and buildings of Middle and Late Bronze Age have been found relating specifically to its function as a harbour and a fort; including the thick brick wall remains of the central storehouse; and presumably, as no actual harbour works have been discovered, the river mouth sufficed as the harbour, perhaps with simple wooden jetties or quays. Earliest finds from the site date to the 16th century BC (Stratum 12) and contain a great deal of local material as well as Cypriot imports, including Middle Cypriot II Red-on-red ware and Base Ring Juglets (Dothan 1973: 5-9). 'Strata 11-10 dating to the 16th and 15th centuries BC, clearly reflect a period of flourishing trade and commercial relations with both Egypt and Cyprus and the Phoenician coast' (Dothan, M. 1977: 889).

From the 13th century BC a square fortress built of brick, 23 x 23m, has been identified (Dothan, M. 1977: 889), with considerable amounts of Egyptian, Mycenaean and Cypriot pottery remains (Fig. #164.2). On a jug handle were incised markings in Cypro-Minoan script (Dothan, M. 1977: 889). The city was destroyed in the second half of the 13th century BC and above the ruins of a small, square fort or migdol, that was approached by a ramp, have been uncovered. In addition Late Bronze Age houses and workshops with furnaces and clay pipes for smelting and casting copper have been found, together with Egyptian pottery and scarabs (Dothan, M. 1977: 890).

In the 12th century BC Philistine remains of a small open agricultural settlement covered the site. Erosion on the top of the mound has destroyed much of the later remains, apart from an 8th century BC casemate wall of the city fortress. From the Hellenistic period, a large public building was uncovered on the eastern slope of the mound. The site was excavated by Moshe Dothan in 1959 and 1960 (Dothan, M. 1977: 890).

*NAHAL EVTAH*

**#165 * Tell Poran**

31:45 N 34:36 E

Located about 5km upstream on the River Evtah, Tell Poran was a large fortified Middle Bronze IIA site. The area between the site and the present coastline is now covered in sand dunes, thus, obscuring the ancient landscape

(Raban 1987: 178). However, it is possible that Tell Poran was used as a McKee Type (4) riverine anchorage in the Bronze Age.

**#166 @ Ashkelon/ Ashqelon**
31:40 N 34:33 E

Ashkelon is situated directly on the seashore. The shoreline is an unbroken smooth, sandy beach, backed by a cliff about 20m high upon which most of the remains of the site have been found (Fig. #166.1). The site provides a summer anchorage exposed to prevailing winds and is therefore described as a McKee Type (1) shoreline. The semi-circular site covers an area of c. 12 acres (Avi Yonah & Eph'al 1975: 121). Ashkelon, a coastal city in southern Palestine, was economically important in various periods, both because of its port and its location on the Philistine section of the 'Via Maris'. Garstang and Phythian-Adams did the first systematic excavating here in 1920-1921. Avi-Yonah and Eph'al (1975; Tadmor & Berman 1974: 132) state that a Neolithic settlement was on the shore of Ashkelon, with traces of round huts and silos. Ashkelon is mentioned for the first time in the two groups of 19th century BC Egyptian Execration Texts (Avi Yonah & Eph'al 1975: 121). From the Middle Bronze IIA a hematite cylinder seal relating to the Old Assyrian colony period of Kanesh was recovered at Ashkelon (Stager 1993: 106). Ugaritic texts mention Ashkelon (Heltzer 1978: 152). Ashkelon is again witnessed in accounts from the Amarna letters of the 14th century BC. Other than a revolt during the reign of Ramesses II, Ashkelon remained faithful to Egypt (Avi Yonah & Eph'al 1975: 121).

Excavation of the main site shows occupation throughout the Bronze Age, Iron Age, Hellenistic, Roman and Crusader periods. The spectacular encircling arc mound and wall with towers, which is c.2km long and encloses 150 acres, was built in the Byzantine period. The Bronze Age to Iron Age mound (el Khadra) lies in the middle of the semi-circle's diameter, adjacent to the shore, and slightly south of the centre of the site. However, recent excavation has shown that the Byzantine earthworks were built upon the earlier Middle Bronze crescent-shaped rampart that was also open to the west (Stager 1991; Finkelstein 1992: 205). South of this is a depression (Flemming et al 1978: 71,fig.11,Section B-B; Fig. #166) which is supposed to have been the position of the Bronze Age inner harbour which formed an almost landlocked bay. The area is now silted up and overgrown so that the extent of the basin can

only be estimated, it could have been at least 100m in diameter (Fig. # 166.2). In 1986 the Centre for Maritime Studies, Haifa, drilled cores from the shore to 200m inland in this hollow area. The results confirmed that the area had been a silted hollow since the 5th century BC, and that prior to this period the cores contained evidence that the area had been open to the sea. Radical changes have been experienced at Ashkelon during historical times, partly caused by an active fault line which is thought to run 1.3km in front of the site along the water line, the land site having uplifted and the sea floor subsided by 4-6m (Raban 1994: 147). A number of Late Bronze and Early Iron Age structures were found some 200m inland, indicating the previous shoreline. This implies that this area was once the Canaanite and Philistine inner harbour. The profile of the strata in the cliffs published by Garstang (1921) shows Late Bronze Age material must have been closer to present sea level.

From the Middle and Late Bronze Age occupation and destruction levels are exposed in the stratigraphy, some related to imported Egyptian material. Parts of the Middle Bronze IIB-C rampart have been uncovered. The rampart stood to a height of c.18m and 22m wide, and was built of mudbrick and ran for a length of 2km around the site (Stager 1991: 24-43). Four phases of glacis have been identified (Stager 1993: 106). The remains of a sanctuary, the Sanctuary of the Silver Calf (MBIIC), have been uncovered at the bottom of the north gate entrance (Stager 1991: 24-43). From the Late Bronze I-II period a series of courtyards, silos and burials have been uncovered, along with material from Cyprus including Base Ring jugs and bowls, but no fortifications (Stager 1993: 106). The Late Bronze Age site was destroyed by Merneptah c. 1207 BC (Harris Papyrus). Ram Gophna (Magon <u>in</u> Flemming et al 1978: 71) reports three other Bronze Age sites close to Ashkelon.

The Philistine fortifications consisted of a mudbrick tower and glacis. Two public buildings have been excavated, which contained over one hundred and fifty enigmatic artifacts including clay cylinder seals. In the Roman period Ashkelon was again an important harbour. The upper section of the city dates from the Crusader period. 100m offshore, slightly north of the mainland site, the rocky exposure of Ashkelon Yam has been identified.

*RIVER SHIQMA*

**#167 $ Anthedon** (Khirbet Teda) Anthedon/Agrippias
31:32 N 34:27 E

The site is situated on a hill 4km north of Gaza, and about 1km back from the sea on a McKee Type (1) shore. The site of Anthedon was a Hellenistic city and renamed Agrippias by Herod when he took it over from Augustus (Princeton 1976: 59). Pottery of Late Bronze Age and Hellenistic periods has been found (Flemming et al 1978: 73).

**#168 * Gaza**
31:31 N 34:26 E

The site of Gaza was an important city on the coast of Palestine from the earliest times. It was built on the Via Maris, the main highway connecting Egypt with Syria, Mesopotamia and Asia Minor. The tell of Gaza is situated some 5km from the seashore. The Late Bronze Age tell was the basis for the cities of subsequent periods. Phythian Adams excavated walls on the tell of the second millennium and elsewhere on the tell uncovered imported Cypriot Base-Ring and White Slip ware (Ovadiah 1993: 465). In Roman times the city was expanded towards the shore, to form Gaza Maiumas or Maiumas Neapolis, the Port of Gaza (Flemming et al 1978: 73; Princeton 1976: 345-346). No remains of any harbour constructions have been found. The straight sandy shore is backed by low cliffs so that progradation cannot have concealed any remains, although some erosion is possible. Shallow anchorage is provided offshore but it is exposed to W winds. The shoreline is described as a Mckee Type (1).

**#169 @ Tell el-'Ajjul** Tell el Ajjul (Gaza) (Beth'Eglayim)
31:29 N 34:25 E

The site lies 6km southwest of Gaza on a sandstone ridge c.3km from the sea shore on the north bank of the silted estuary of the Besor river in a McKee Type (4) environment (Raban 1985: 23). 'The mound overlooks the silted estuary of the Wadi Ghazzeh, which in Bronze Age times would have provided the only natural haven for sea-going vessels between the Egyptian Delta and the Bay of Carmel' (Tufnell 1962: 1). The site is partly obliterated on its western flanks by encroaching dunes. The mound of 28 to 33 acres has retained a roughly rectangular plan (Tufnell 1975: 52). The river reaches the sea across an alluvial flood plain between low hills, and in the 3rd and 2nd millennium BC, after the Flandrian rise of sea level, the sea would have extended back between the hills to form a broad estuary (Flemming et al 1978: 74). The river is over 300m wide and there is almost no gradient to

the sea, thus the river would have been navigable in the Bronze Age and Tell el-'Ajjul would then have been located on a natural riverine harbour and could have functioned as an inland depot for the loading and unloading of goods (Raban 1985: 23). The southern corner of the tell is now partly damaged by seasonal floods from the river. Petrie (1931-1934/ I.2) identified the site with Biblical Gaza, but this is not now accepted. Tell el-'Ajjul should probably be identified with Beth'Eglayim, which Eusebius described as a village on the coast, eight miles from Gaza (Onomasticon 48/19).

Tombs from the Chalcolithic and Early Bronze Age were found on the south bank of the River Besor, but remains on the tell to the north are of the Middle Bronze Age period. Large Middle Bronze I cemeteries have been identified to the east and west of the mound. The earliest deposits so far discovered on the mound were burials cut into the sandstone on the north corner (Tufnell 1962: 3-9). Six successive groups of burials have been identified in this area dating up to the 17th/16th centuries BC, the most prosperous period at 'Ajjul. Finds from the graves include metal work, weapons, scarabs and jewellery (Tufnell 1962). The Middle to Late Bronze Age fortifications consisted of a fosse 6m deep and a revetment (Tufnell 1962: 1) which surrounded the city on three sides. Traces of early buildings on stone foundations were found in the south-eastern quarter of the city. The main entrance to the city was on the northeast side, where a strip of marl some 7.62m wide was not removed for the fosse, forming a causeway entrance. Emerging from the causeway and extending some 152m into the plain were curious tunnels, less than 2m in depth, with openings at regular intervals. The tunnels predate the cutting of the fosse. A city plan was laid out on orderly lines. A series of five palaces have also been identified in the northwest corner of the mound, covering an area of 55 x 43m. The fifth palace might be 9th century BC. If so it would be the only Iron Age building on the mound. Large quantities of pottery and jewellery, particularly gold jewellery, together with a large number of inscribed seals, many ascribed to Egyptian rulers, have been recovered. Although Tell el-'Ajjul was a large and prosperous city, situated on a junction between important trade routes, with elaborate defensive fortifications, it was soon abandoned, possibly because the estuary silted up and the meandering river made navigation hazardous.

*RIVER BESOR*

**#170 * Deir el-Balah**
31:27 N 34:24 E

The town of Deir el-Balah is 1.5km from a McKee Type (1) shore and about 13km southwest of modern Gaza. The site, excavated between 1972 and 1982, reveals occupation levels from the Late Bronze Age to the Byzantine period, including a Late Bronze Age cemetery. The Late Bronze Age remains were the most significant and primarily Egyptian in character (Dothan, M. 1993: 343). The Late Bronze Age settlement was occupied from the late 14th century to the late 13th century BC. The earlier occupation reveals a large residential complex built around a large artificial lake which acted as a reservoir. The settlement was essentially Egyptian in character, with some Canaanite wares and Cypriot White Slip milkbowls and Mycenaean pottery. The 13th century BC occupation levels comprised an artisans quarter and an industrial area. A cemetery was discovered to the west of the settlement and was used throughout the period of Late Bronze Age occupation. Again the dominant element was Egyptian, yielding the largest group of anthropoid coffins as yet uncovered in the Levant (over fifty). The rich burial offerings include Egyptian kurkar funerary monuments, carnelian and gold jewellery, a large group of scarabs dating to the 19th and 20th Dynasties, bronze objects and pottery from Cyprus, Egypt and Mycenaean Aegean (Dothan, M. 1993: 347). Like the nearby Late Iron and Persian settlement of Ruqeish, Deir el-Balah is believed to have been a centre for maritime trade and overland commerce during the Late Bronze Age, acting as a way-station for vessels en route from Egypt.

**#171 * Tel Ridan** (Khan Yunis)
31:23 N 34:17 E

The tell slopes directly up from the shore to a height of 15m, covering an area of about 350sq.ms. The site consists of two mounds with a Late Bronze Age cemetery located on low sand dunes between them (Vitto & Edelstein 1993: 1283). Pottery of the Middle and Late Bronze Age have been found on Tel Ridan (Flemming et al 1978: 74). Most of the north mound has been eroded by the sea, but the excavated remains reveal settlement of the Middle Bronze Age II period (Vitto & Edelstein 1993: 1283). The south mound has been partly disturbed by later Byzantine levels, but a Late Bronze cemetery resting on earlier Middle Bronze remains has been identified. An assortment of imported goods

including Egyptian and Cypriot wares have been recovered from the cemetery (Vitto & Edelstein 1993: 1283). 400m offshore to the southwest, two small eroded kurkar reefs stand, displaying quarrying to MSL (Flemming Unpublished report; Fig. #171). The eastern end of the reef had remnants of artificial paving of large flagstones, possibly a quay. It is quite possible that the offshore reef formed a continuous wave barrier prior to sea-level rise and erosion, and 'probably protected an extremely useful anchorage throughout the Bronze Age' (Flemming, personal communication). Surveys conducted by Galili and Raveh in the 1980s confirm the existence of an anchorage in this area in the second and early first millennium BC (Raban 1993: 964) in lee of the offshore reefs in a McKee Type (4) location (Fig. #171). The small Middle Bronze IIB harbour was probably the first natural shelter and anchorage facility to be encountered by sea-going vessels that came from the Nile Delta (Oren 1993: 1388). Thirty stone anchors were also found in lee of the island implying its previous use as an anchorage (Galili 1986: 109). The sand in the lee of the reef extends offshore to a depth of 10m and it is believed that the bay has been subjected to infilling since the Bronze Age. Since the Bronze Age the islets have subsided c.2m so that the remains of the quays are now below sea level.

**#172 $ Tell el Jinan**
31:23 N 34:17 E

Late Bronze Age material has been identified at the site of Tell el Jinan which is located on a McKee Type (1) shore.

**#173 $ Tell Rafia** (Raphia) Raffah Malumas
31:19 N 34:13 E

The site is situated close to the exposed McKee Type (1) shore. Early and Middle Bronze Age pottery has been found on Tell Rafia (Flemming et al 1978: 75).

## EGYPT

**#194 * Haruba** (Haruvit)
31:11 N 33:59 E

Two related sites located in the area of Haruba in the north-eastern Sinai, were occupied in the Late Bronze Age; an administrative centre (A-345) and a military fort (A-289). They are located in the active coastal sand dunes about 12km northeast of el-'Arish (Oren 1993: 1390). Excavations in the fortress (A-289) revealed an abundance of finds, with many pottery types of the Late Bronze to Early Iron Age, c. 13th and 12th centuries BC, including local Canaanite types, Egyptian wares of the 19th and 20th Dynasties, Mycenaean and Cypriot imports, beads, bronze artifacts, scarabs and alabaster vessels. The site was believed to have been active in the overland trade route of the 'Way of Horus' under Sethos I. The site was destroyed in the mid 12th century BC.

About 400m north of the fort, near the coast, an Egyptian administrative building (A-345) and industrial centre of the New Kingdom, have been excavated. Most of the pottery belonged to the earlier 18th Dynasty, with the majority of vessels of Egyptian origin, together with Mycenaean and Cypriot imports (Oren 1993: 1391). The site may have served as a stop-over McKee Type (2)/(3) anchorage en route between the Levant and the Egyptian Delta, as well as a road station along the 'Way of Horus'.

**#174 $ El'-Arish** Rhinocolura
31:11 N 33:48 E

El'-Arish has been identified as the Classical site of Rhinocolura (Oren 1973: 199,fig.1; Gardiner 1920: 99-116), the administrative centre of northern Sinai in the Roman period and the commercial port of Nabatean trade. The ancient ruins lie to the west of the modern town, in the vicinity of the Turkish fortress. The harbour site was originally located on the west bank of the Wadi el-'Arish, at the outlet to the sea on a McKee Type (2)/(3) shore. The course of the wadi has now shifted eastward and the site of El-'Arish is covered in sand dunes (Oren 1993: 1395).

**#175 $ El-Flousiyeh** (Felusiyat) Ostracine
31:08 N 33:26 E

The site of El-Flousiyeh is located on the south-eastern shores of Lake Bardawil, 2km from the sea in a Mckee Type (4) environment. The site

is spread out over what are now a number of islands on the edge of the lake. The site of El-Flousiyeh was part of the province of Augustamnique during the Roman period and was known as Ostracine. The port area was situated to the north of the main island settlement. A Byzantine fortress was located in the northeast of the southern (main) occupation island. Excavation has revealed a number of rooms on the western side of the fortress, possibly of Roman origin. In the maritime area to the north a basilica with mosaic floors has been identified. The only remains from the Arab period are a mosque that had been erected in 1017 AD and abandoned in 1300 (Cledat 1916-1917). It is possible that the site was used as an anchorage prior to the Classical period.

**#176 $ Khatib el Kels** Mt.Casios/ Casius-Baal Zephon/ Kasios
31:13 N 33:03 E

The Classical site of Khatib el-Kels is situated on the north shores of Lake Bardawil, on the narrow coastal isthmus. The ancient site of Mt. Casios has been associated with the modern town of El-Kels (Gardiner 1920). Classical Kasios was an important way station on the coastal road as well as an industrial centre that specialised in shipbuilding (Oren 1993: 1393). A large hill dominates the modern town of El-Kels. This is known as Ras Baron and is believed to have been the ancient site of Mt.Casios. The smaller (30 dunams) cult centre of Casius-Baal Zephon (the patron of ships and seafarers), that existed throughout the Iron Age, lay to the south of El-Kels. Traces of hewn stones, fragments of ancient pottery, some Early Bronze Age but predominately Iron Age II and Persian, and possibly the remains of a temple have been identified on the hill, together with three wells and fragments of Greek inscriptions. By the Hellenistic period the settlement had been superseded by Hellenistic Casios and resettled on the low hills near the edge of the lake to the southwest. The later settlement was considerably larger and occupied up until Early Arab times. The site was no doubt utilised as a resting point on the caravan route and possibly a landing place in a sheltered McKee Type (4) anchorage, for vessels travelling between Egypt and Phoenicia.

## (Nile Delta)

*PELUSIAC BRANCH*

**#177 $ Tell el-Fara'in (Tel el Farama)** Class. Pelusium
31:03 N 32:32 E

Situated in the marshy area of the ancient Pelusiac mouth of the River Nile, in the NW Delta, the site of Fara'in consists of three mounds (Baines & Malek 1980: 167; Kees 1961: 196; Fig. #177). The site was an important centre in Late Naqada II period (c. 3000 BC), and was known as Classical Pelusium. From the earlier periods settlement remains have been identified on two mounds and a temple on the third mound to the west. In the Roman period the site was a large fortified centre (Gardiner 1920). Remains of a wall of burnt red brick can be seen to the northeast of the site. A stone square towered fortress known as Tineh lies to the northwest (Chester 1880: 148). The site is exposed to prevailing winds on a McKee Type (1) shore.

**#178 * Tell Abu Sefeh** (Kom el-Qantara) Thel/ Sile
30:52 N 32:22 E

Extensive ruins of the site of Sile, modern Tell Abu Sefah lie to the east of the Suez canal (Baines & Malek 1980: 167) on the edge of lagoons which lie to the southeast of modern Lake Manzala and south of the ancient Pelusium arm of the Nile (Kees 1961: 190). The narrow tongue of land on which the site is situated was protected to the west by the Bitter Lakes and to the east by brackish waters and a frontier river referred to as the 'Canal of Horus'. Sile was a true frontier post on Egypt's most threatened flank and at the same time a natural centre of trade and industry (Kees 1961: 190-1,195). Tuthmosis III, Sethos I and Ramesses II all set out from Sile on Asiatic campaigns along the land route from the eastern Delta to southern Canaan, along the 'Way of Horus' (Kees 1961: 193; Oren 1993: 1388). El-Qantara is possibly the site of a Late Bronze Age Migdol tower (Chester 1880: 147) and displays remains from the Early Dynastic period (Baines 1989, personal communication). The remains of terracotta coffins, pottery and glass from the Roman period have also been identified, together with a sandstone obelisk which stands to a height of 2m. The lagoonal environment of the site afforded a McKee Type (4) anchorage.

**#179 * Kom Tennis**
31:12 N 32:14 E

Situated on a small island in Lake Manzala, in the NE Delta. Early Dynastic period finds have been identified at Kom Tennis (Baines & Malek 1980: 18; Baines 1989, personal communication). Shelter is provided to vessels at anchor in a McKee Type (4) anchorage.

**#180 * Tanis** (San el-Hagar) Greek Tanis, Dja'net
30:59 N 31:53 E

The site of Tanis developed in 1329 BC on the south shore of Lake Manzala in the NE Delta (Semple 1932; Kemp & O'Connor 1974: 101-3; Saville 1941), rising out of the flat lowland that surrounded the site. The site was strategically situated on the Nile and protected on the seaward side by a broad lagoon (Kees 1961: 196), thus affording a McKee Type (4) anchorage. The site of ancient Tanis became the residence and burial place of the kings of the 21st and 22nd Dynasties. The most impressive structure standing at the site is a large brick-built rectangular enclosure, 430 x 370m. Some of the inscriptions relating to this enclosure bear the names of rulers of the Old and Middle Kingdoms, and also of Ramesses II (Baines & Malek 1980: 176). San el-Hagar has also been identified with Pi-Ri'amsese, the delta capital of the Ramessids, but none of the buildings appear to have been built at such an early date and it has been suggested that the monuments bearing inscriptions relating to this date have been reused from other sites (Baines & Malek 1980: 177).

**#181 * Tell Nabasha** (Tell Far'un) Imet
30:51 N 31:55 E

The large mound of Tell Nabasha is situated in the NE Delta, to the northeast of Qantir on the old Pelusiac branch of the Nile and is some 1.5km across (Baines & Malek 1980: 167). Tell Nabasha was the capital of the area in the New Kingdom, until Tell Basta replaced it in the 18th Dynasty. It was also occupied in the 1st and 2nd Intermediate periods (van der Brink 1987). A brick-built temple enclosure (215 x 205m) of the Ramessid period has been identified. Remains of the Greco-Roman period settlement lie to the southeast of the temple (Baines & Malek 1980: 176). As a riverine anchorage a McKee Type (4) is awarded.

**#182 @ Qantir** Piramesse
30:48 N 31:50 E

Qantir lies some 9km north of the modern town of Faqus and 2km north of the ancient site of Avaris, modern Dab'a, in the NE Delta, on the ancient course of the Pelusiac branch of the Nile, and thus affords a McKee Type (4) riverine anchorage (Fig. #182). A number of sandy mounds in the area show settlements of the Middle Kingdom and 2nd Intermediate Period, and of the Ramessid Period (Fig. #182.1). The 19th and 20th Delta residence and palace of the Sethos I, Ramesses II, and their successors have been

identified at the southern end of the village (Bietak 1986: 229). Qantir is associated with the Delta residence of the 19th Dynasty of Pi-Ri'Ramsese or Piramesse, identified as the town of Ramesse. In the area to the south of the Qantir cemetery, recent excavation has revealed the remains of a huge building complex possibly identified as barracks for charioteers. To the south was situated a major compound for military workshops. The discovery of weaponry of Hittite typology suggests close links between Egypt and Kheta after the marriage of a Hittite princess to Ramesses II (Bietak 1986: 295). Excavation in 1986 (Leclant & Clerc 1987: 304) have revealed in Area QI STEG a kind of seawall or dam connected with an irrigation canal and pedestrian walkway.

**#183 [] Tell el-Dab'a** Avaris
30:47 N 31:50 E

The site of Tell el-Dab'a has been identified for some time as the Hyksos capital of Avaris. It lies to the east of the eastern most branch of the Delta, commonly called the Pelusiac branch, on a *gezira* mound. Corehole samples have revealed that Avaris was situated at the point where the Pelusiac splits into two channels that surrounded Qantir, later known as Pi-Ramesse, and continued on a route northwest to Mendes and the central Delta, and a route northeast to the Sinai and Gaza. The eastern channel separated the area of Avaris from the centre of Pi-Ramesse (Fig. #183). Internally, Avaris was divided by lakes and channels between the sandy turtlebacks. 'The situation of the water provided ideal harbour facilities and shipping connections in antiquity' (Bietak 1991: 28, 1979: 116) in a McKee Type (4) environment, as well as easy maritime access to Upper Egypt and the Mediterranean Sea. 'The site also commanded the entrance into the NE Delta between the Pelusiac branch and the huge overflow lakes of the natural Bahr el-Baqar drainage system' (Bietak 1975: 113-116). The settlement is spread over numerous sandy mounds which cover an overall area of 2.5 sq.km, interspersed with channels. The main tell of Dab'a developed on a turtle back, rising above the annual inundation. Today the mound covers 500m (Bietak 1986: 226). To the north and east the channels have formed a natural lake basin with connecting feeder channels to the Nile (Bietak 1986). This is the area of the ancient harbour (Phillips 1994).

The settlement of Tell el-Dab'a was first established by indigenous people on a small scale in the latter part of the third millennium BC. From the 12th Dynasty (c.1990-1780 BC) occupation

was concentrated on the southern shores of the lake and grew over the ensuing 13th Dynasty, to beyond 1640 BC, as a result of a massive influx of Canaanite settlers (Bietak 1991: 29). During the Hyksos period the settlement expanded yet further, revealing so far no less than six strata of Middle Bronze II A/B-C, along Canaanite lines. The impact of Asiatic people at Dab'a is particularly visible in Stratum F, dated by Bietak to Middle Bronze IIA-III, the end of the Middle Kingdom (Bietak 1986: 237,241-247; Fig. #183.1).

Research to date alludes to Tell el-Dab'a being the largest and oldest Middle Bronze Age site in the Delta. The domestic and cultic character of the quadrants excavated owed nothing to Egyptian culture, being wholly of northern, Levantine inspiration (Redford 1992: 114), with vast quantities of Tell el-Yahudiya ware and material from the Levantine coast. Many temple complexes, urban areas and tombs and cemeteries have been uncovered at the site relating to this period of occupation. The main settlement areas include the tell of el-Dab'a (Area A), the area to the north of the lake known as Ezbet Rushdi and 1km to the east of the tell at Ezbet Helmy (Area F). Around the Middle Bronze IIB-III period c.1600 BC, it is obvious that trade relations with Cyprus had grown. This is witnessed in Stratum E/1 by the large amount of Cypriot White Painted ware that has been recovered from graves (Bietak 1986: 262). Recent excavation in the area of Ezbet Helmy (Area F; Fig. #183.2) c.1km to the west of Tell el-Dab'a, indicate that Dab'a had established connections with the Levant prior to the Hyksos period. From Stratum D/2 c.1800-1760 BC, Area F/1, rectangular houses of sandy mudbrick including a Syrian 'Mittelsaalhaus' have been uncovered (Bietak 1991: 31-33). This kind of building was unknown in the southern Levant and it is assumed that the architectural expertise was directly imported from coastal Syria by newcomers arriving at Dab'a who originally may have been sailors, shipbuilders or military craftsmen in Egyptian service (Bietak 1986: 293). From the next stratum, Stratum D/1 (which corresponds to Stratum H in Area A) c. 1760-1750 BC 'The remains of a palace of Egyptian type have been unearthed dating from the 13th Dynasty' (Bietak 1986: 293-294; Bietak & Dorner 1993: 17,fig.2). The palace was built in the central quarter of Area F in two phases dating from c. 1760 BC. A second palace unit was added later to the east (Bietak 1991: 34). The fortification wall of the palace lay next to the old Pelusiac

branch of the Nile and commanded splendid views over the waterways. Small quantities of Classical Kamares ware (MMIIA-MMIIB/IIIA) have been recovered from the palace gardens (Walberg 1992: 158) relating to Stratum D/1 c. 1780-1750 BC (corresponding to Stratum G/4 in Area A), together with a gold pendant of Minoan origin, the technical detail of which compares favourably with the pendant of Minoan style from the Aigina Treasure and the Chrysolakkos bees from Malia, both of which date no later than the Middle Minoan II period (Walberg 1991: 111). From the pavement of the 13th Dynasty palace a cylinder seal depicting a Syrian weather god in smiting posture astride the tops of two mountains has been recovered (Porada 1984: 485-488,fig.III.2). The seal has been dated to c. 1760 BC and implies further connections with the Levant via the sea. Although the presence of clearly Minoan-related finds, together with Syro-Palestinian features in tombs, implies that Dab'a had developed relations with both Crete and the Levant, it must be pointed out that at this stage the predominant pottery remains and architectural styles are still Egyptian with Middle Bronze Age ceramics making up less than 20% of the pottery finds, however contacts are clearly implied prior to the Hyksos period of the 15th Dynasty (Bietak 1991: 34-36; Phillips 1994). Through the ensuing strata increasing amounts of Levantine connections are evident at Dab'a Area F and although the domestic architecture largely consisted of Egyptian type villas, the funeral practices and temple constructions were Levantine in nature (Bietak 1991: 38-41). Several strata have been identified at Dab'a which testify to the continual settlement at the site throughout the whole of the Second Intermediate Period (Bietak 1986: 232).

By the 15th Dynasty the palace was enclosed by a massive casemate wall and seated on a platform that so far covers more than 80m by 60m (Bietak 1986: 293, 1992: 26). 'The platform was cut into a fortification wall with buttresses, constructed slightly earlier but also dating to the Hyksos period and thought to have formed part of a town enclosure along the Pelusiac Nile' (Bietak 1992: 26). The garden area was to the north of and immediately adjoining the foundation platform. Some of the most astonishing finds were uncovered in the debris which accumulated over the palace garden (Area F) (Bietak 1991: 17,fig.2, 1992: 26). Over four hundred boxes of scattered fresco fragments were collected from all over the area of the palace platform and

gardens. The frescoes portrayed many features best known from Minoan Crete, though not necessarily uniquely Cretan, including floral motifs, bull-leaping scenes and 'Minoan' costume (Bietak 1993 London communication, 1992: 27). They have been dated by Bietak to the Late Hyksos period and interpreted by Bietak as indicating the presence of highly skilled artists from the Minoan world (Bietak 1992: 27-28), implying intense trading relations between Crete and Hyksos Egypt.

Following a period of destruction, the 18th Dynasty settlement at Dab'a Area F started to spread over the area of the Hyksos palace platform. Scarabs in well defined contexts as well as numerous lumps of well rounded pieces of pumice have been recovered associated with the 18th Dynasty and will contribute greatly to our understanding of Egyptian chronology (Bietak 1992: 28). Dab'a was again settled on a grand scale and became the seat of government during the time of the 19th and 20th Dynasties (c. 1300-1080 BC) (Bietak 1986: 225), again owing its importance to its very favourable geographical position (Bietak 1979: 119). The settlement of this period covered the area from Tell el-Dab'a in the south and extending to Qantir, 2.5km in the north, an area of perhaps 4-5 sq.km (Bietak 1986: 269). A large temple area occupied the highest preserved section of the tell in this period (Bietak 1986: 269-170). At the northern edge of the main temple, on the shore of the lake, Bietak found a huge system of possibly defensive walls and a series of holes which he identifies as mooring posts (Bietak 1986: 271).

**#184 * Tell Basat** Bast Class. Bubastis
30:34 N 31:31 E

Tell Basta lies southeast of Zaqaziq, strategically located along the route of the Pelusiac branch of the River Nile, on the route between Memphis and the Sinai. The peak of the town's prosperity was reached during the 22nd Dynasty and the 5th century BC. A temple stands on an island surrounded by two arms of the sacred lake (Baines & Malek 1980: 175). Some Old Kingdom monuments and tombs have recently been found (Baines & Malek 1980: 175). The remains of a palace or mayor's house dating to c. 1740-1710 BC are amongst the finds (Bietak 1986: 294). Basat was possibly a McKee Type (4) anchorage in the Bronze Age.

**#185 @ Tell el Yahudiya** Nay-ta-hut Greek Leontopolis
30:17 N 31:20 E

Tell el-Yahudiya (The Mound of the Jews) lies 2km southeast of the modern village of Shibin el-Qanatir. A strange rectangular earthwork enclosure has been identified at the site, the so-called 'Hyksos Camp', measuring some 515 x 490m (Baines & Malek 1980: 174,fig.). It is most probably a fortification and dates to the late Middle Kingdom or 2nd Intermediate Period. No Egyptian parallels have been found for this glacis enclosure, and so the suggestion that it was a Hyksos stronghold is a likely hypothesis. Later material has also been found here: Inside the enclosure a massive statue of Ramesses II and a temple of Ramesses III have been identified (Baines & Malek 1980: 174). Tell el Yahudiya was possibly a McKee Type (4) riverine anchorage.

**#186 * Giza** (Cairo)
29:27 N 31:12 E

At Giza, to the north of Memphis on the south-western outskirts of modern Cairo, a harbour basin has been identified dated to the Old Kingdom (Goyon 1971: 145,fig.5). The Pyramid of Mykerinos is linked to the Pyramid of Khephren by the harbour basin. The quay associated with the Pyramid of Mykerinos was built of large, regular stone blocks and referred to as the 'Southern Dyke' of Mykerinos Pyramid (Goyon 1971: 145-6). A number of canals were found in association with the basin whose purpose was to link the temples with the causeways and river, as well as transport building materials to Giza. In the Valley of Khephren, Goyon (1971: 138-143) identified a small port with a quay that runs along the principle facade of the temple for a distance of 7.85m and possessed a number of T-shaped moles or piers, comparable to other quays that existed in the later New Kingdom. Goyon (1971: 138) also implies the existence of a harbour basin at the foot of the Pyramid of Cheops but provides no details. Quantities of commercial jars from Syria and Cilicia have been found in Old Kingdom tombs in the Giza cemetery, implying that seaborne trade of bulk cargo was active in the third millennium BC (Reisner & Smith 1955; Raban 1994: 7). The harbour would have afforded a sheltered McKee Type (4) anchorage.

**#187 [] Memphis** Prw-nfr
29:51 N 31:15 E

Located on the west bank of the Nile River (Fig. #187), Memphis was the royal residence and capital during the Early Dynastic and Old Kingdom

period (c. 2920-2134 BC), with many temples surviving from the New Kingdom. The site extends for over 30km and incorporates the cemeteries of Dashur, Saqqara, Abusir, Zawyet el-'Aryan, Giza and Abu Rawash (Baines & Malek 1980: 135). Memphis stands at the southern most point of the Nile Delta, strategically straddling Upper and Lower Egypt (Kees 1961: 147). Memphis was enclosed by canals to the east and west of the site as it is today (Kees 1961: 171). 'Its harbour and local workshops played an important part in Egypt's foreign trade' (Baines & Malek 1980: 134). From the Old Kingdom period Memphis and Heliopolis to the north of Cairo, were connected to each other and the river by canals. The harbour district of Memphis was situated near the modern railway station at Badrashein (Kees 1961: 171) and provided McKee Type (4) shelter. During the reign of Tuthmosis III in the 18th Dynasty (c. 1580-1350 BC) the Prw-nfr served as a major naval base and royal dockyard of Memphis (Säve-Söderbergh 1946: 37-39; Glanville 1931, 1932). Papyrus B.M. 10056 is a register from the dockyard, recording the wood used and types of ships constructed at the dockyard of Prw-nfr (Memphis) over a period of eight months (Glanville 1931). Reference is made in the papyrus to 'storesheds' connected to the royal harbour or dockyard, as well as military and commercial connections with the northern Levant (Glanville 1932). Goyon (1971: 137-146) has suggested reconstructing basins and quays in front of the temples of Ounas (Unas) and Pepi II at Saqqara, Memphis, dating to the Old Kingdom period. Goyon (1971: 143,fig.3) describes a vast basin at Ounas 140m long of fine stonework, with two stone moles 70m long by 3m wide. A small slipway has also been identified for the beaching of craft, as well as a flight of steps which lead from the harbour basin to the temple (Goyon 1971: 143-4). The basin at the pyramid of Pepi II is described by Goyon (1971: 144,fig.4) as being part of a large temple esplanade situated at the foot of the pyramid. The temple was aligned next to the quay of the harbour basin, flanked by two parallel jetties which lay perpendicular to the basin. Cypriot Base Ring ware has been found in 18th Dynasty context at Memphis and Base Ring II sherds, along with Canaanite amphora in 19th Dynasty context (Knapp 1990: 123). In addition, recent Aegean and Cypriot finds have been recorded from Kom Rabis, Memphis (Bourriau 1987), all implying maritime contacts.

**#188 [] Tell el Amarna** (Akhetaten)
27:38 N 30:53 E

El-'Amarna was the short-lived capital of Egypt during much of the reign of King Akhenaten. Unlike other Egyptian towns much of its layout is known as it was abandoned about fifteen years after its establishment (Baines & Malek 1980: 123). The site is situated on the lower courses of the Nile, in Middle Egypt, on a large bay on the eastern banks, north of the massif of Gebel Abu Feda (Baines & Malek 1980: 123,fig.; Fig. #188), along the desert edge. Except for the side facing the river, the river basin at el-'Amarna is entirely enclosed by rocky cliffs. The bay is 10km long and about 5km wide, but the town itself only occupies the area closest to the river. The city constructed by Akhenaton was c.4-5km in length and c.800m wide with no enclosure wall (Bietak 1979: 121,fig.8). 'Its most important central part contained the Per-Aten-em-Akhetaten (Great Temple) and 'The Great Palace'... Close by was the 'Record Office' which in 1887 produced the cuneiform diplomatic correspondence, known as the Amarna Letters' (Baines & Malek 1980: 124). Although no direct traces of the harbour that undoubtedly served Amarna have as yet been identified, a number of tomb reliefs at the site show fleets of ships docked. Perhaps the most detailed waterfront scene is from the Tomb of May and depicts the reward of May at the palace of Akhetaten (Davies 1908: Pl.V). The riverside palace is depicted in the background and in the foreground boats are seen moored by barbed mooring posts to piers that are viewed directly from the side (Davies 1908). The vessels are moored parallel to the shore, an orientation not seen previously (Marcus 1990: 51). One scene in the tomb of Merya depicts a fleet of ships docked at the gate of the Temple of Aten at Akhetaten (Davies 1903: Pl.XXXIX), another comes from the Tomb of Pentu and shows cargo vessels docked at a quay attached by a looped bowline to a barbed mooring post (Davies 1906: Pl.VIII; Marcus 1990: 48).

## (NILE DELTA)

**#189 $ Naucratis**
30:54 N 30:35 E

The port of Naucratis was established in 620 BC as a Greek trading centre (Petrie 1931-34 ;Boardman 1973). The site may have had casual use as an anchorage in the second millennium as it is located on the Rosetta branch of the River Nile and afforded McKee Type (4) shelter.

**#190 * Site-44**
31:25 N 31:00 E

Ceramic sherds ranging from the late Second Intermediate Period to the 18th Dynasty, c. 1600-1500 BC, and from later the Ptolemaic period, have been recovered from a sediment boring drilled on the southeastern margin of the Burullus lagoon in the Nile Delta (Stanley et al. 1992b: 264). S-44 lies to the northwest of Kôm Tennis, and 17km south of the modern town of El Burg. The site is located on the edge of the lagoon and was seasonally flooded by the Sebennitic branch of the Nile River, whose major channel was c. 5km to the east. The present elevation of the marshy wetland site is 0.3m above the lagoon level (Stanley et al 1992b: 268). The site was first occupied in the 16th century BC and later reoccupied in the New Kingdom, c. 1400-1200 BC. Since first occupation the site has been continually buried as a result of the lowering of the delta plain surface by tectonic (isostatic) subsidence and compaction, and 'a concomitant eustatic rise in sea level during the Holocene' (Stanley et al 1992b: 271), resulting in a long-term sediment accumulation rate at the site of c. 2m/ century, over the last 7000 years (Stanley et al 1992b: 268). The 16th century BC fragments at -9.4m represent the oldest Pharaonic materials yet encountered in the north-central Nile delta. The site no doubt provided shelter to vessels in a McKee Type (4) environment in an embayment at the mouth of the Sebennitic branch of the Nile.

**#191 $ Tell el-Fara'in** Per-Wadjit Class. Buto
31:12 N 30:45 E

Located to the east of the Rosetta branch of the Nile, the site of Tell el-Fara'in consists of three mounds, two with town remains, one with a temple (Baines & Malek 1980: 166). The site was the Egyptian capital of the Delta in the Early Dynastic period and was occupied in the New Kingdom and again in the Greco-Roman period (Baines & Malek 1980: 43,53). The site may well have afforded a McKee Type (4) riverine anchorage on the now dried up Canopic branch of the Nile in the New Kingdom.

**#192 * Kom el-Hisn** Imu
30:48 N 30:36 E

The large mound of Kom el-Hisn is located to the west of the Rosetta branch of the Nile River. From the New Kingdom the site was the capital of the third Lower Egyptian nome (Baines & Malek 1980: 168). A large rectangular temple enclosure has been identified at the site and statues of

Amenemhet III and Ramesses II. Extensive cemeteries of the Middle and New Kingdom have been excavated. It is possible that the site acted as a McKee Type (4) riverine anchorage along the Rosetta branch of the Nile in the New Kingdom.

**#193 @ Alexandria** Pharos
31:11 N 29:52 E

The harbour city of Alexandria is situated to the west of the mouth of the Rosetta branch of the Nile Delta, seaward of Lake Mariut, on the offshore reef island of Pharos and on the mainland opposite. As expressed by Homer (Odyssey IV: 354-59)

"There is an island in the surging sea
which they call Pharos lying off Egypt.
It is a harbour with good anchorage".

The island of Pharos is presently joined to the mainland by an artificial isthmus, but when the site was first occupied Pharos was an island. The site of Alexandria has been affected by both siltation and geological subsidence.

The harbour city of Alexandria was founded by Alexander the Great in 332-331 BC. However, there is also evidence for the adaption of a pre-Hellenic port which lies to the west of the Island of Pharos (Fig. #193). The island provided a prominent headland which enabled identification of the site from the sea on an otherwise featureless coastline. Our knowledge of the harbour works at Pharos (Fort Kait Bay) Island is largely due to the work of Gaston Jondet (1916) who early this century was able to complete a survey of the ancient harbour, before the construction of the breakwaters of Alexandria's new harbour in 1916 (Fig. #193.1). He discovered a range of ancient breakwaters along the offshore reefs, extending from the east side of the Bay of Anfouchy westward as far as Abu Bakr Rock, following the natural line of the reef (Jondet 1916: 13). The port was limited to the south-southeast by Pharos Island (Jondet 1916: 14). The entire seaport was completely submerged at depths of up to 8.5m. The port predated the city that was built by Alexander to the southeast of the Pharos Island.

The outer breakwaters which were in parts double, extended for some 2000m in an E-W direction and were c.10m wide. They protected the harbour from the north, west and northwest (Plat Taylor 1965: 161). It is not to say however, that the entire length of the outer breakwaters was man-made, as it is quite possible that large

sections of the breakwater simply took advantage of the submerged reef that runs from Marabout Point in the west to the north of Pharos Island, and was later reinforced to provide continuous protection to the harbour. Both Frost (1972) and Flemming (1980) treat Jondet's (1916) claim that the breakwater of Pharos was continuous over 2000m and of such an early date, with 'cautious scepticism'. However, Frost (1972) does point out that the nature of 'proto-harbours' of which Pharos is an example, is dependant upon the size of the adapted offshore reef, which in the case of Pharos is extremely large, hence the size of the harbour. Jondet (1916) goes on to describe how the outer breakwater protected a rectangular basin known as the outer harbour or basin. A second breakwater ran parallel and to the southeast of the outer breakwater and was even longer and guarded the Inner basin. The breakwaters were composed of two stone walls 50m apart and 13m thick, the space between which was filled with loose rubble (Jondet 1916: 23). The walls were built of huge limestone blocks, the upper ones now appear eroded by the sea. Several jetties about 60m long, ran from the leeside of the outer breakwater into the outer basin (Saville 1941). The depth of water in the basin was believed to be about 8-12m deep. These breakwaters enclosed the western basin, inner harbour, which is some 2360m long and 200-300m wide (Jondet 1916: 14). Along the breakwaters were solid quays of carefully hewn blocks (Saville 1941), ranging from 3-5m in length. The quays were paved on top.

The inner harbour was approached from the south, rounding Abu Bakr and then turning north behind the promontory of Ras el Tin, thereby entering by sheltered waters (Jondet 1916: 17; Plat Taylor 1965: 160). To the east of the original entrance was a curving landing quay on firm argillaceous sand. It was some 160m long, 14m wide, 6-7m high (Jondet 1916: 17), and built of large rough-hewn blocks of limestone laid in courses, topped with paved flags. At the northern end was a jetty of 142m in length which protected the harbour's northern entrance (Saville 1941). To the west were ten solid quays of different lengths, measuring some 700m long, reaching to Abu Bakr, now included in the foundations of the modern mole (Jondet 1916: 20; Plat Taylor 1965: 160). The entrance was about 217m wide (Saville 1941). Just off the northeast tip of Ras el Tin within the confines of the inner harbour, the submerged ruins of a large building and a small private dock where discovered, believed to be

later in date than the harbour works (Saville 1941). These structures were built on sand and clay and therefore have been subject to general subsidence.

In 332 BC Alexander the Great arrived at Pharos and constructed the later port of Alexandria, destroying much of what remained of the ancient port of Pharos. Because of this massive re-working earlier harbour structures of Pharos are hard to date but Saville (1941) believes that construction first began soon after 2000 BC, probably initiated by Senusret of the 12th Dynasty, famous for his building of colossal buildings. However, no mention of these ancient harbour works is to be found in the historical records and no archaeological remains have been found to support a pre-Hellenic dating of the west harbour installations. Again the problems of dating rock-cut structures arises (See Chapter III.3).

The Alexandrian harbour, or Eastern harbour, was constructed by Alexander the Great. It lies to the east of the earlier harbour, and was protected from the east by Cape Lochias, most of which has now been lost to the sea. To the west lay the Heptastadium, a mole that was constructed to bridge the 1500m gap between Pharos Island and the mainland (Ra-kedet). No early installations have been recorded here. 'At the SE corner of the harbour, where Cape Lochias met the shore, there was a small inner marina reserved for the use of the royal household, known as the Royal Port' (Morcos 1985).

On the extreme eastern tip of Pharos Island, marking the west entrance to the Eastern harbour, lie the submerged ruins of the Pharos (lighthouse). An additional small anchorage lies between the Eastern harbour and the pre-Hellenic harbour, in the Bay of Anfouchy, which was also protected by the breakwaters of the west harbour. This was the commercial harbour of Alexandria and possibly earlier the fishing harbour (Plat Taylor 1965). It was a small bay, approached by two entrances, one from the Outer basin and the other directly from the sea (Saville 1941).

A group of earlier tombs have been identified just on the mainland next to this harbour. Many of the once glorious monuments of the city have long since been destroyed. The modern city and port of Alexandria have contributed considerably to this phenomenon. The general aspect of the coast and the site is N-

facing (outgoing) but the entrance to the harbour is south westerly (incoming). The predominant summer wind is north-northwesterly, also a product of the meltemi. The shore is therefore considered to be a McKee Type (1) 'lee shore', but the entrance to the harbour is exposed to parallel winds. Once behind the offshore reefs the harbour of Pharos provides ample shelter and deep water for anchorage in a McKee Type (4) location.

*ARABS GULF*

**#195 $ Abuqir** Canopus
31:19 N 30:04 E

The site of Canopus is situated on the western edge of the Nile Delta. Remains of Roman occupation have been identified at Canopus. On the waters edge lie the remains of a quay (Naville 1887: 35). The site is exposed to prevailing winds along a McKee Type (1) shore.

**#196 $ Abu Sir** (Taenia) Taposiris Magna
30:59 N 29:35 E

The site is situated on the Abu-Sir ridge, on the northern shores of Lake Mareotis/ Mariut (Rowe 1954: 488,fig.). According to Shenouda (Princeton 1976: 878), 'the city owed its prosperity to the fact that it was a transit port with two harbours, one controlling the water-ways through the lake into the Canopic branch of the Nile and the other on the Plinthinete Gulf of the Mediterranean. The site would have afforded a McKee Type (4) anchorage on an otherwise exposed shore. The Canopic branch dried out in the 8th century AD'. North of the large town of Abu-Sir, the Classical necropolis site of Taposiris Magna is identified by the presence of a restored Roman lighthouse, supposed to be a miniature of the Pharos of Alexandria. The site was once the location of the remains of the temple of Osiris. The temple has since disappeared but the massive Hellenistic enclosure walls still stand. The void inside the enclosure covers an area of 86 x 86m, and contains the traces of a 7th century AD monastery and church (Ward Perkins 1946: 48-53). Surrounding the temple is a vast complex of ruined buildings. Down the south side of the hill are the ruins of the dyke that marked the western entrance to the lake.

**#197 * El-Bordan** Hamu
30:51 N 29:19 E

Situated on the extreme western end of Lake Mareotis, El-Bordan was one of a series of sea-coast forts in the coastal region of Thehenu (the

eastern section of the western delta), that were established as anti-Libyan forts during the period of Ramesses II and III, c. 1200 BC (Rowe 1954). The area is now used by fishermen and affords shelter in a McKee Type (4) anchorage.

*ARABS GULF*

*GULF OF KANAYIS*

*RAS ALAM EL RUM (promontory)*

**#198** [] **Matruh** Mersa Matruh (Bates' Island) Class. Paraetonium

31:22 N 27:15 E

The ancient site of Mersa Matruh is situated to the east of the modern town of Mersa Matruh on an island in the lagoon and on the northern, eastern and southern shores of the East Lagoon (White 1985: 15-16). To the north of the lagoon a sand bar and sandstone ridge protects the salt water lagoon from the sea. To the west of the East Lagoon is the modern harbour of Mersa Matruh, to the west of which lies the West Lagoon, the location of the Hellenistic harbour town of Paraetonium (Fig. #198).

There has certainly been some change in sea level in the vicinity of the island, affecting the spread of settlement since the site was first inhabited. The East Lagoon presently measures approximately 1.35km E-W and c.700m N-S, and water depths rarely exceed 3m (White 1986: 58). Sand and salt flats lie to the east of the lagoon and lead directly to a second eastern lagoon. This whole area would undoubtedly have been water bound in antiquity. The island today measures c.135m NE by SW and c.55m NW by SE and is formed of layers of sandstone, however there is evidence to show that there have been times in history when the island has been considerably larger and possibly, in the period after the Bronze Age, attached to the mainland (White 1985: 5-6). Survey work carried out by White (1986) around the shores of the island has revealed a line of ashlar blocks (S111) in the water 10m east of the islands's north-eastern tip, at a depth of 1.3m (White 1986: 60-61,fig.9). A second u/w feature was observed c.2m northwest of the island's northern tip. 'It consists of a rectangular slot of unknown purpose, cut in the sandstone shelf' (White 1986: 60-61). Predominant winds are from the W and blow almost continuously with some force even in the summer months (White 1986: 59,nt.22). There is no source of fresh water on the island (White 1986: 59).

Bates (1927) first excavated the lagoonal island, subsequently known as 'Bates' Island' (Fig. # 198.1/2), and identified the site as that of ancient Paraetonium. Material from the Late Bronze through to modern times has been recovered from the site (White 1989: 89,fig.1). On the island the remains of a stone circular structure, 3m in diameter, were found on a rocky crest, a short distance south of the centre of the island. To the northwest lay the remains of an Arab period house, known as Bates's House. Numerous curiously shaped stone constructions lay to the east, associated with Imperial Roman period pottery. A number of Hellenistic walls were also found on the island (White 1986: 61,fig.9). However, the principal importance of the island lies in the vast amount of Late Bronze Age pottery that was recovered, primarily imported material. The largest concentration of Late Bronze Age pottery was found in the vicinity of Bates' House (White 1985: 7). Mycenaean (LH IIIA & B), Minoan (LM IIIB), Cypriot Base Ring I & II ware, White Painted, White Slip (LC IIA to C) and White Shaved ware, as well as Cypriot Red Lustrous ware and fragments of a Levantine amphora and Canaanite jar are amongst the variety of imported Late Bronze Age pottery uncovered on the island (White 1985: 10). However, the greatest amount of pottery came from Cyprus, amounting to eighty percent of the imported pottery. The imported material was supplemented by a narrower selection of contemporary locally produced pottery, possibly produced by nomads or local Berber Libyans. Only a few Pharaonic Egyptian ceramics appeared on the island, associated with metal working debris; a few bronze artifacts, lumps of slag and crucible fragments (White 1989), that was no doubt associated with the Cypriot presence. The bronze samples recovered 'raise the possibility that the island was used for manufacturing objects in bronze to use in exchange with the native populations' (White 1985: 11). A small chamber of rubble stones was also uncovered from this period, together with a small rectangular structure with slightly rounded corners and an oven in the northwest corner (White 1985: 11, 1986: 79-81). It would appear that during the summer months (winter storms would have prevented anchorage in this small, poorly protected lagoon) of the 14th century BC/ later 18th Dynasty, Bates' Island functioned as a Cypriot trading post, being the nearest safe landfall south of the eastern tip of Crete when sailing on the NW winds to the Egyptian Delta. It is possible that the island 'served as a summer revictualling

station for 'Mediterranean traders' en route from Crete to the Egyptian Delta, the Levant and Cyprus' (White 1986).

The Late Bronze Age site was abandoned towards the end of the 14th century BC. On the mainland, 2.5km to the southeast of the island (Area VI), Bates uncovered a small cemetery of cist burials on top of the stony ridge, perhaps belonging to native Berber Libyans of the second millennium BC (White 1986: 53). On the shore opposite the island to the east (Area II), on a rocky sandstone ridge, a circular depression, rock-cut channels and pits were found, dating to the Roman period, some earlier (White 1986: 54). In Area III to the south of the lagoon, a couple of sets of rock-cut steps are seen, one of which leads to a rock-cut chamber, equipped with a drainage sump in the floor and water channel running off to the north, thought to be Classical in date (White 1986: 56). On the northern shores of the lagoon (Area V) the outline of a ruined square building was discovered on the top of a rocky hill, possibly an Imperial Roman cistern (White 1986: 56). These last three areas are littered in Roman pottery.

**#199 $ Delphinon**

31:22 N 27:07 E

The Classical site of Delphinon is located on a lagoon to the west of Mersa Matruh and could well have provided shelter to vessels in a McKee Type (4) anchorage in the Bronze Age.

# *CYPRUS : ISLAND*

## *NORTHERN CYPRUS*

### *MORPHOU BAY*

### *CAPE LIMNITI*

**#200 $ Loutros Bay**
35:11 N 32:44 E

Loutros bay is located on the southern shores of Morphou Bay to the east of Cape Limniti. Good summer anchorage is provided (MP V) in the mouth of the River Limniti and to a certain extent in the lee of the cliffs of Cape Limniti and its offshore islet, Tou Petra and is therefore described as a McKee Type (4) anchorage. The anchorage is NNE-facing. Flemming (1973: 3) states that the islet of Tou Petra off Cape Limniti was connected to the mainland in the Neolithic period and would certainly have provided shelter in the Bronze Age. The island of Tou Petra is known to have been occupied in the Neolithic period together with the area to the west of Vouni on the mainland opposite.

**#201 $ Karavastasi** (Aepeia) Soli
35:09 N 32:50 E

Soli is located on the north coast of Cyprus at the southern most point of Morphou Bay, overlooking the plain (Fig. #201). Ruins cover the summit of the hill, extend down over the north slopes of the bay, and onto a narrow, low lying stretch of flat land to the east below the hill which extends as far as the harbour (Princeton 1976: 850-1). The ancient harbour of Soli is on an open bay which nowadays offers little protection against W winds and could be described as a McKee Type (2)/(3) anchorage. The site was settled in the third millennium BC, primarily to extract copper ore from the nearby mines of Skouriotissa to the south (Robertson 1975: 212). The copper is believed to have brought prosperity to the region from as early as the third millennium BC (Holmes 1975: 100). Late Bronze Age settlement in the vicinity of Soli is well attested, although archaeological evidence for the occupation at Soli only exists from the Cypro-Geometric period, c.700 BC. However, Strabo records the town as possessing a harbour, and Robertson (1975: 212) states that the site 'possessed an excellent harbour' which silted up around 4th century AD. The town is thought to have been settled by Achaean immigrants around

1100 BC. The site owed its prosperity to the nearby copper mines, and flourished down to the Early Byzantine period.

Soli consists of two parts; the acropolis and the lower city. The harbour area lies below the acropolis and both the west and east ends of the breakwater are visible above the water, forming the entrance to the harbour, which is now almost entirely silted. Flemming (1973: 3) surveyed the breakwaters and concluded that they were mostly natural reefs with scattered uncut blocks. The natural offshore reefs could have provided some protection to sailors before the construction of the breakwaters. The main area of the harbour is probably between the shore and the theatre, covered by alluvium deposited by the River Xeros (which now flows into the sea to the east of the site) and waste from the mine workings (Flemming 1973: 3).

RIVER ELEA

**#202 * Morphou** (Toumba tou Skourou)
35:12 N 32:55 E

The site of Toumba tou Skourou is located on the left bank of the Serakhis River which joins the Ovgos River and flows into the eastern shore of Morphou Bay. The Serakhis and Ovgos Rivers form the two main drainage arteries of the central plain of Cyprus on the northwest coast. The site is c.6.5km southeast of the river mouth and 8km directly east from the coast. At the modern day confluence of these two rivers, Syrianochori, a marshy lake has formed and sediment has built up over the past few years. However, up until fifty years ago the river was navigable up to the site of Toumba tou Skourou and it has been suggested that in fact prior to silting the site was situated on the coast or at least constituted a McKee Type (4) estuarine anchorage (Vermeule & Wolsky 1990). Catling (1964: 32) first proposed this theory by stating that 'it is quite possible that the coastline reached farther inland in antiquity at this point, and the site may have been virtually on the sea'. The site was occupied from the end of the Middle Cypriot period, late 17th century BC to c.700 BC, with a gap between the end of the Late Cypriot II period and Cypro-Geometric III period (Vermeule 1974; Collombier 1987: 161-2). The site flourished in the Late Cypriot I period and in the Late Cypriot IIC period possible Aegean influences are noted in the form of an ashlar building (Karageorghis 1990).

Catling (1975: 138) believes that the site originally attracted settlers, possibly Anatolian, who 'made an original landfall in Morphou Bay'. Toumba tou Skourou is located near to the copper mines of the Troodos Mountains, particularly Apliki and Katydhata (Vermeule & Wolsky 1990) and industrial smelting kilns have been identified at Toumba tou Skourou (Karageorghis 1981). Vermeule (1973: 25) believes that this 'seaside copper-working town first attracted Minoan sailors to explore the island', as it is the first haven for vessels arriving from the Aegean. A series of massive parallel walls believed to have been a fort dating to the end of the Middle Cypriot and beginning of the Late Cypriot period, which was then extended and infilled to make an artificial mudbrick platform believed to have been an industrial acropolis, has been identified at the centre of the site (Nicolaou 1973b: 54). Toumba tou Skourou reached a height of prosperity in the Late Bronze Age particularly the 14th and 13th centuries BC, when trade links with the Levant and the Aegean, flourished (Collombier 1987: 161-2). Late Minoan IA pottery has been found at the site implying trade in copper between Toumba tou Skourou and Crete during this period (Vermeule 1972: 223-4; Vermeule & Wolsky 1978: 294-304,fig.4,6,13-15; Watrous 1992: 171). Collombier (1987: 162) proposes that an active port of trade developed here in the sheltered estuarine anchorage. The site was linked with a small group of Bronze Age sites in the region of Morphou Bay, including Ayia Irini (#203), Myrtou Pigadhes, Pendayia and Apliki, all sites that prospered in the Late Cypriot I period from the rich copper ores in production at the nearby mines of Skouriotissa and Mavrovouni (Vermeule 1973: 25).

The site was eventually abandoned due to siltation and replaced by Soli in the Early Iron Age, possibly due to the deterioration of the harbour facilities (Catling 1975: 193). Anchorage is also possible offshore in Morphou Bay, but is exposed to strong W winds (MP V). Much of the site has been covered by sand blown from the western shores (Collombier 1987: 162).

*RIVER SERAKHIS*

**#203 * Ayia Irini** (Palaeokastro)
35:18 N 32:58 E

Ayia Irini was an important harbour site at the beginning of the Late Bronze Age, located on the northwest coast 13km north of Morphou (Karageorghis 1981). The anchorage is W-facing

and described as a McKee Type (1) anchorage. Settlement is attested here for both the Middle and Late Bronze Age (Catling 1963). Pecorella (1973: 24) described the site as a 'convenient harbour with access to the central plains of Cyprus and southern coastal cities'. It is also thought to have functioned as a stop-over point between Crete and the Levant (Pecorella 1973: 23-4; Portugali & Knapp 1985: 71-72). A number of Late Cypriot I-II tombs containing Late Helladic I-IIA and Syro-Palestinian ceramics, as well as tools and ornaments of bronze, Cypriot seals of steatite and faience (the techniques of which compare with those of the northern Levant (Porada 1986: 289), weights of haematite and steatite, ivory objects and a painted Egyptian ostrich egg, have been excavated from the necropolis by the sea (Nicolaou 1973b: 55). The site sheds new light on the status of Morphou Bay in the Late Cypriot period and alludes to the exploitation of agricultural lands on the Kormakiti peninsula during this period (Pecorella 1973: 23-24).

*CAPE KORMAKITI (north-western tip of Cyprus)*

**#204 $ Cape Kormakiti** Crommyon
35:24 N 32:56 E

Numerous small bays and an offshore islet provide possible shelters in the vicinity of Cape Kormakiti. Cape Kormakiti is a low headland rising to flat topped hill 5km to the southeast (MP V). Good protection is provided in the summer for temporary shelter between the headland and the offshore islet in a McKee Type (4) anchorage (Denham 1964: 167). Close to the lighthouse on Cape Kormakiti about 5-6m above sea level (Flemming 1973: 3) is a quarry and possibly an ancient tomb or habitation, and a water cistern.

**#205 * Orga** (Nekrotapheion/Alonia)
35:21 N 33:02 E

Orga is located on the northwest coast of Cyprus to the west of Yeoryios Bay. A Late Bronze Age settlement and cemetery, Alonia, have been identified at the modern village of Orga (Catling 1963: 167). Two small NNE-facing bays are located on the coast and provide some protection from W winds. McKee Type (2)/(3) shoreline.

*YEORYIOS BAY*

*VAVILAS POINT*

**#206 * Vavilas**
35:22 N 33:37 E

In the lee of Vavilas Point lies the modern

settlement of Vavilas. Settlement is attested here throughout the Middle and Late Bronze Age (Catling 1963). A sheltered NNE-facing anchorage is provided in the lee of Point Vavilas, and can be described as a McKee Type (4) anchorage.

*KYRENIA MOUNTAINS*

#207 * **Lapithos** (Lambousa) Lapethus
35:37 N 35:13 E

Lapithos is situated on the north coast of Cyprus, and covers a large area along the seashore and a little way inland. The site lies between the headlands of Akhirepietos, in the east and Vavilas Point in the west. It is believed that there was originally a rocky ridge that ran parallel to, and a little back from the sea, that extended to Troulli hill in the east. Shelter is provided west of Akhirepietos Head (MP V) on a McKee Type (2)/(3) shore. Lapithos was first occupied in the Neolithic period. An Early to Middle Bronze Age cemetery has been identified on flat rocky land close to the shore and is known as Vrysis tou Barba. The tombs contain some of the earliest Syrian material on the island (Herscher 1975: 39-60), together with Middle Minoan ceramics and a number of dagger blades (Catling & Karageorghis 1960: 109-112; Åström 1972: 405, 1979: 57-62). The site flourished again during the Late Bronze Age, with abundant evidence for copper working and locally produced pottery (Åström 1972: 28) and was then believed to have been occupied by Achaean settlers in the 12th century BC and known as Lambousa. The early city was situated close to the coast and on the rocky hill and was primarily concerned with trade and the export of pottery.

The city expanded in the later Classical and Hellenistic periods, flourishing between the Archaic and Greco-Roman periods. Ancient Lapethus preserves substantial remains of a harbour and breakwaters, together with most of the course of the ancient city wall. The west harbour breakwater is preserved to a length of c. 155m; the north breakwater c. 40m, and is overlapped by the west breakwater, creating a small, but safe harbour protected from the N winds. The breakwaters have recently been reinforced with new stone blocks (Princeton 1976: 483). The repeated occupation of the site throughout antiquity would imply the utilization of an anchorage here prior to the construction of the later harbour.

*AKHIREPIETOS HEAD*

**#208 . Snake Island** (Nisi Tis Glykyotissis)
35:21 N 33:18 E

Snake Island is a flat rocky islet situated offshore close to the north coast of Cyprus to the west of Kyrenia. On the cliff tops of Snake Island, steps and a road are visible (Flemming 1973: 3). The island would have provided some protection on its eastern side, on a McKee Type (4) shore, against prevailing winds for sailors in antiquity. Denham (1964: 168) describes this side of the island as 'entirely sheltered from W winds'. Anchorage is possible in 2 fathoms of water.

**#209 $ Kyrenia** (Girne) Cerynia
35:21 N 33:19 E

The site is located on the shore along the north coast of Cyprus. The ruins spread over a large area where the modern town is now situated on an indentation in the coast that extends for c.250m (MP V). The coast is N-facing and exposed to NW and N winds. The shore can therefore be described as a McKee Type (2)/(3) shore when subject to prevailing winds and also McKee Types (1) and (4) as it is also subject to land and sea breezes. The present-day harbour of Kyrenia corresponds to that of the ancient town and is recognisable from out at sea by the landfall of the Karpas Mountains which lie to the south. The ancient breakwaters can still be seen behind Kyrenia castle. According to Flemming (1973: 3) the ancient moles examined were outside the present harbour and to the west. The necropolis extends along the shore to the west. There is evidence at the nearby inland villages of Karmi and Kazaphani, of Late Cypriot occupation, but there is no archaeological evidence for the founding of Kyrenia earlier than the Cypro-Geometric period. However, the Late Cypriot site of Vounos is located to the southeast and reveals Late Minoan IIIA/B stirrup jars fragments (Catling & Karageorghis 1960: 109-127; Catling 1963; Åström 1972: 407) which could possibly have been imported via the anchorage at Kyrenia. The town flourished into the Early Byzantine period until it was sacked during the first Arab raids of 647 AD (Princeton 1976: 451). Very little remains in the way of later monuments.

**#210 . Platymeis** (Platymatis)
35:20 N 33:30 E

The site is spread out along the shores of two bays known as Platymeis beach which are located either side of a promontory on the north coast of Cyprus. Much alluvial accretion was noted by Flemming (1973: 3) who suggested that

possibly the ancient harbour is now inland. Numerous ancient quarries, cuttings and tombs have been identified near sea level in the area of Platymeis beach. The site is located on a McKee Type (2)/(3) shore.

*STAZOUSA POINT*

**#211 . Stazousa Point**
35:20 N 33:37 E

Moderate shelter is provided in three sandy bays that lie to the east of Stazousa Point (Denham 1964: 170), with excellent natural anchorage in lee of the promontory on a McKee Type (4) shore.

**#212 * Moulos/ Akanthou** (Athienou/ Ayia Marina)
35:22 N 33:40 E

Natural ridges of rock provide good, small harbours on both sides of the flat ended headland of Moulos, although modern fishermen tend to shelter in the eastern anchorage (Flemming 1973: 2) on a McKee Type (4) shore. The site was occupied from the Middle Cypriot to the end of the Late Cypriot period. Minoan pottery has been recovered from the site, particularly evident for the Late Minoan period (Catling & Karageorghis 1960: 120-125). Extensive remains and pottery have been found on the cliff top in the vicinity of Ayia Marina. Finds include three fragments of large Late Minoan III stirrup Jars, one with a Cypro-Minoan sign (Catling & Karageorghis 1960: 120-121). Catling and Karageorghis (1960: 125) have suggested that the site provides evidence of Minoan vessels trading along the north coast of the island in the Late Bronze Age. Pottery could also have been imported from the east coast via the Lefkoniko Pass which acted as an important line of communication between the north-eastern coastal plain and the Bay of Salamis. Pottery has also been found on the beach. Some walls, possibly Neolithic in date, protrude from alluvial deposits near the beach (Flemming 1973: 2).

*KARPAS MOUNTAINS*

**#213 * Dhavlos** (Dhaylos)
35:26 N 33:55 E

Shelter is provided in the small N-facing bay that lies on the coast below the modern town of Dhavlos. The shore can be described as a McKee Type (2)/(3) shore. Catling (1963) identified a Late Bronze Age settlement at Dhavlos. In more recent times Dhavlos was a trading station for carob beans (Denham 1964: 170) but could well

have provided shelter to vessels sailing along the north coast of Cyprus in antiquity.

**#214 * Ayios Photios**
35:34 N 33:37 E

Ayios Photios is situated on a steep, rocky cliff on the northeast coast of Cyprus. The site offers some protection from the prevailing westerly winds and can be described as a McKee type (2)/(3) shore. It is possible that in the Late Bronze Age, Ayios Photios was a stop-over or watering point for vessels moving between the Aegean, southern Anatolia and Syro-Palestine. Late Bronze Age material has been recovered at the site (Catling 1964). McCaslin (1980: 28) has recovered a stone anchor of Bronze Age type in the anchorage of Ayios Photios.

*CAPE PLAKOTI (shelter provided on the eastern, lee side of the cape)*

**#215 * Ayios Thyrsos** (Acheon Akti)
35:34 N 34:16 E

Ayios Thyrsos is located on the north side of the Karpas Peninsula in eastern Cyprus, on a steep, rocky coast. Protection from the prevailing westerly winds is afforded in the lee of offshore islands (Denham 1964: 171) on a McKee Type (4) shore. Catling (1963) identified the Late Bronze Age fortified site surrounded by massive defensive walls. Late Helladic IIIB sherds, pithos sherds and locally made Base Ring and Wheelmade Red Lustrous sherds have been found. A Middle and Late Bronze Age cemetery was also identified on the hill side to the east of the Late Bronze Age settlement. It is possible that in the Late Bronze Age, the site was a stop-over or watering point for vessels moving between the Aegean, southern Anatolia and Syro-Palestine. Quarries and an u/w tank have been noted at Ayios Thyrsos (Flemming 1973: 2). Flemming (1978: 415/159) noted a change in sea level of -0.25m over the last 2000 years.

*RONNAS BAY*

**#216 * Ayios Philon/ Agios Philos** Carpasia/Karpasia
35:38 N 34:23 E

The ruins of Ayios Philon are situated on the north coast of the Karpas Peninsula, about 3km north of the village of Rizokarpasso, and cover an area of approximately 3km. They are now mostly hidden by sand dunes. The town stretched along the shore, fronted by a shingle beach, and slightly inland to the foot of the high plateau (Fig. #216). The site is located on a natural

rocky, round, WNW-facing bay, with anchorage preferable in the middle of a McKee Type (1) shore (Denham 1964: 171). The town is believed to have been founded earlier than the 7th century BC, although little evidence exists apart some from Middle Bronze Age material found by Gjerstad (1926) in the region of Tsiourkha. Ayios Philon flourished in Classical, Hellenistic, Greco-Roman and Early Christian times, but was abandoned in Early Byzantine times after the first Arab raids in 647 BC (Princeton 1976: 436). The Classical moles of the harbour are still visible at the site of Ayios Philon. The two harbour moles are the most considerable in Cyprus. The one on the east side can be traced for about 100m and is constructed mainly of large, well-dressed rectangular blocks of stone, resting on the natural rock. The second mole was built later in a similar style and protrudes from the shore to a large rock in the sea. It is longer than the east one (about 120m including the rock) (Plat Taylor 1980: 153-216). The natural rocks on which the later moles were founded could have provided shelter for an earlier anchorage, although the bay was never very deep. Sixteen stone anchors have been found in the anchorage of Ayios Philon (Green 1973), believed by McCaslin (1980: 28) to be of the Bronze Age type. About 1km along the shore northeast of Ayios Philon, is a small island and promontory covered in tombs and quarries. Bones and pottery were observed here (Flemming 1973: 2).

**#217 $ Aphendrika/ Aphendrica** (Ayios Dimitrios) Ourania
35:39 N 34:28 E

Denham (1964: 171) describes the bay at Aphendrika as a 'useful small inlet affording shelter from the west to small vessels'. The bay is N-facing and sheltered by a promontory which lies to the west. The shore can be described as a McKee Type (4) shore. Water is available. Tombs and foundations have been observed near the shore (Flemming 1973: 2) and identified as the ruins of ancient Ourania. McCaslin (1980: 28) discovered a stone anchor of Bronze Age type in the bay at Aphendrika.

*EXARKHOS BAY*

**#218 . Kordylia Nisha** (Cordilia)
35:40 N 34:13 E

Kordylia is described by Denham (1964: 171) as 'the best sheltered, natural harbour on the north coast for small vessels under eight feet draught, being open only to the NNW', ideal therefore for Bronze Age vessels. Approach to the

anchorage is behind four small islets that lie offshore. The shore can be described as a McKee Type (4) shore.

*CAPE ANDREAS (north-eastern extremity of Cyprus)*

#219 * **Cape Andreas** (Apostolos Andrea) Dinaretum
35:42 N 34:35 E

Cape Andreas forms the eastern most point of the Island of Cyprus. On the east side of the Cape, in its lee, a McKee Type (4) shore is noted, however, the anchorage can also be affected by offshore winds blowing from the Cilician coast to the north. Neolithic occupation remains have been excavated at the site of ancient Dinaretum which is situated on the tip of Cape Andreas. Ancient tombs and quarries have been identified on the north side of the cape, together with a lime kiln (Flemming 1973: 2). Green (1973) has identified four anchor sites on the north side of Cape Andreas. The seabed to the north of Cape Andreas is very deep (Green 1973: fig.2,5) and two of the anchor sites (Sites 23 & 26) are from ships that have dragged their anchors in the deep water over the sand, up to the point where they fouled against a steep cliff rock face. At other points, where rocks emerge above the seabed to the north of the islands off to the northeast of Cape Andreas, individual anchors were also found. Two other lines of stone anchors were also located at Cape Andreas (Green 1973: 167-168,fig.30). Seventy-two anchors have been found in total. Since the size and weight of the stone anchors found at Cape Andreas is relatively small, Green (1973: 175) suggests that the single lines of stone anchors represent the remains of an alternative anchoring technique practised prior to the introduction of heavy anchor chains and iron anchors, that is the use of several single anchors weighted at intervals along a single rope. An alternative suggestion by Frost (in Green 1973: 171) is that the small stone anchors were used by small fishing and sponging boats, thereby the weight of the anchor reflects their use. Most of these anchors would simply cause a dragging effect on the seabed in strong winds, but would not necessarily be employed to anchor the vessel permanently, rather restrain its movement whilst waiting for favourable winds to pass around the cape.

Two sheltered bays lie to the south of the Cape Andreas on the north side of a headland on which a monastery is situated. The two coves, both E-facing, are known as North and South Cove and are divided by a small promontory (Fig.

#219). They provide useful summer shelter from the prevailing W winds and swell. The North Cove has a sandy bottom and is backed by a sandy beach. South Cove affords better protection but requires caution in selecting a clear berth due to rocks under the water (Denham 1964: 172,fig.). Cape Andreas was an ideal point to depart en route to the Levant coast and was no doubt used as an anchorage where vessels awaited favourable conditions before onward voyage in the Bronze Age.

*GALOUNOPETRA POINT*

**#220 . Koroni**
35:37 N 34:29 E

A small, sheltered, S-facing bay with narrow entrance situated on the south coast of the Karpas Peninsula, eastern Cyprus. Winds are southerly along this stretch of the coast and thus the anchorage is located on a McKee Type (1) shore. Wave cut terraces and solution notches were studied by Flemming (1973: 2) around the shores of Koroni Bay. Pottery has been observed u/w in Koroni Bay (Flemming 1973: 2).

*KHELONES POINT*

**#221 $ Khelones** Chelones/Khelones
35:37 N 34:29 E

The ruins of a small ancient town extend along the shore east of modern storehouses to the northeast of Khelones Point, some 22km southwest of Cape Andreas. The ruins are now covered by sand dunes and there is nothing to be seen above ground level. The site was in use from Archaic to Early Byzantine times, and was abandoned after the first Arab raids in 647 AD (Princeton 1976: 220). The bay is used by fishermen today and may have been used as an anchorage in the Bronze Age. The anchorage is open to the E-NE and therefore a safe anchorage during SW winds (a McKee Type (4) shore) but exposed to easterly winter winds (MP V). There is a Greco-Roman sanctuary on the shore at the eastern end of the town. In the sea opposite the storerooms, is a large rock (known as Aspronisi) and two or three other wave-washed reefs which now form part of a fishing shelter. Further to the east, there are a few more reefs along with a group of small upright rocks known as Gynaikopetres (Princeton 1976: 221). These offshore reefs could also have provided a degree of shelter in antiquity. The remains of what appeared to be a slip for the launching of ships to the west of the town was noticed by Hogarth (1889). McCaslin (1980: 28) has observed stone

anchors of the Bronze Age type in the waters off Khelones, thus suggesting further evidence for its use as an anchorage in the Bronze Age.

*KARPAS MOUNTAINS*

*MELISSAKROS POINT*

**#222 * Korovia** Nitovikla
35:29 N 34:17 E

Catling (1963: 165,157) identified the Middle Cypriot III settlement and cemetery site of Nitovikla. The site is situated on the south side of the Karpas promontory on the coast due southeast of the inland modern village of Korovia and east of a small stream. It is situated on a wide open SSE-facing bight and backed by cliffs and can be described as a McKee Type (4) anchorage, except when winds prevail from the S in the latter part of the day. The site was occupied from the Middle Cypriot III period, with a rectangular fortress, that received some alterations in the Late Cypriot IA and IB periods, and a Middle Cypriot cemetery to the east (Catling 1963: 157/98,97; Åström 1972: 9,33, 1972b: 3-5; Fig. #222). The site was deserted c.1400 BC.

*CAPE ELAEA*

**#223 . Gastria Bay**
35:19 N 33:59 E

Gastria Bay lies to the west of Cape Elaea. The small, S-facing bay is well protected, sheltered from W and N winds on a McKee Type (4) shore. The site may well have functioned as a stop-over point en route to Enkomi in the Bronze Age.

*FAMAGUSTA BAY*

**#224 [] Enkomi** (Famagusta) Salamis
35:11 N 33:55 E

Enkomi-Ayios Iakovos is situated in eastern Cyprus, on the edge of a plain to the west of the Bay of Famagusta, c.1.5km west of the modern village of Enkomi (Fig. #224). The site of Enkomi was first occupied in c.1700 BC (Middle Cypriot III period), reaching a peak of prosperity between the 13th and 12th centuries BC. The site is located on what was an inland lake, now silted up, during the second millennium, which formed part of the northern banks of the Pedhieos River (Fig. #244.5). The lake was once linked to the sea on its southern side via the River Pedhieos, which was navigable up to the lake. The lake is

believed to have served as the Bronze Age harbour of Enkomi and 'ships could sail up the mouth of the Pediaeus River to Enkomi' (Åström 1969: 76). The lake provided excellent shelter in a McKee Type (4) anchorage because of its location inland up river. The mouth of the river, being on the edge of a bay also provided sheltered entry. Although not a perfect landfall in the sense of the first sight of land when approaching from seaward, as it is backed by the low-lying Plain of Messaria, the lake at Enkomi provided a perfectly enclosed harbour once vessels were at anchor. Catling (1964: 16) described the anchorage at Enkomi as an 'excellent harbour'. The area between the lake and the coast was once marshy ground which has since stabilised (Collombier 1987: 162). The site of Enkomi lies to the east of the harbour and to the west of the base of a small calcareous cliff, on the edge of a plain (Fig. #224.1/.2). The location of the site on the edge of an inland lake, which linked the coast, with mineral resources and wood in the mountains to the west, was to facilitate the industrial nature of the town and hence its prosperity. The location of the site near to the coast at a point c.180km from Ugarit as the crow flies, would have encouraged contacts between the two areas (Courtois & Lagarce J. & E. 1986).

The earliest Middle Cypriot III settlement at Enkomi was fortified. Traces of copper smelting have been identified at the site from this period, supporting the Mari texts of c. 1700 BC which refer to copper production at Alashiya (see Ch.I). Enkomi was at this period the export centre of copper from the mine of Kalopsidha to the southwest, to the Levant coast (Karageorghis 1981). Despite destruction at the end of the Middle Bronze Age, by the 15th century BC Enkomi had extended its trade contacts throughout the Levant and as far as the Aegean. Copper smelting was actively undertaken at Enkomi throughout the Late Bronze Age, reaching a peak in the Late Cypriot IIC period, c.1300-1230 BC (Dikaios 1971). Artists workshops excavated at the site reveal facilities for the working of copper, textiles, ivory, gold and silver (Åström 1969: 76). During this period trade with Egypt and the Levant expanded and connections with Mycenaean Greece were particularly strong, indicating the possibility of Mycenaean settlers at the site. A variety of imported artifacts were found at the site throughout the Late Bronze Age and include faience goods from both Egypt and the Aegean, jewellery, scarabs and stone objects, murals with bull motifs, Anatolian and Syrian artifacts.

Traces of a large cyclopean style enclosure wall were uncovered at Enkomi by Schaeffer in 1946 to the north, south and west of the town with a gate in the middle of the west wall (Courtois & Lagarce J. & E. 1986: 2-5), perhaps linking the site with its harbour (Fig. #224.4/.3). In later years excavation uncovered a major section of the central part of the town which from the beginning of the Late Cypriot II period was arranged on a grid-like pattern on N-S, E-W axis, separated into domestic quarters and industrial areas with metal workshops and potteries (Courtois & Lagarce J. & E. 1986: 3-6,fig.1,2). There is extensive evidence for metallurgical production of bronze and copper throughout the period of occupation, in fact the majority of finds relate directly to the commerce of Enkomi and its role as an industrial centre (Courtois & Lagarce J. & E. 1986: 59-68). Particularly interesting are the pieces of ox-hide ingot that have also been recovered from the site, some bearing Cypro-Minoan inscriptions. Cypro-Minoan inscriptions have also been found on tablets, and an anchor recovered from the site (Karageorghis 1981; McCaslin 1980: 27,fig.13/1), which together with Late Minoan pottery uncovered at the site, imply contacts between Minoan Crete and Enkomi. Schaeffer (Courtois & Lagarce J. & E. 1986: 1) uncovered a 12th century BC building known as the 'House of the Bronzes'. The site also contained numerous sanctuaries and each house had a well (Courtois & Lagarce J. & E. 1986: 56-58). All the tombs uncovered at the site were located inside the houses, as at Ras Shamra.

The site was destroyed at the end of the Late Cypriot IIC period and later resettled with even stronger Mycenaean influences in architectural styles and pottery assemblage, largely of the Late Helladic IIIC/1b Proto-White-Painted ware type, possibly by Mycenaean settlers (Karageorghis 1981; Catling 1973: 38). Chamber tombs have been found all over the site from this period, with rich finds of gold, ivory and pottery of the Mycenaean period. The town was eventually abandoned at the end of the Late Cypriot IIIB period due to a series of earthquakes and the silting up of the harbour (Dikaios 1971; Karageorghis & Demas 1988), although there appears to be some continued occupation, largely outside the walls of the settlement, in the Late Cypriot IIIB period.

Enkomi was replaced towards the beginning of the 11th century by the harbour of Salamis situated on the coast near the mouth of the River

Pedhieos. The earliest remains identified at Salamis date to the 11th century BC and have been found in the vicinity of the harbour. Salamis became the most important Early Iron Age harbour town on the east coast of Cyprus.

The general aspect of the coastline at this point is easterly, although the bay continues around to the west and south at the southern end of the site forming a sheltered area about 200m in diameter. Flemming (1974b: 166) identifies this southern area as being the most likely area for the ancient harbour. The position of the site at the eastern end of the island means that it is essentially sheltered from prevailing W winds, except when negligible westerly winds blow down from the Messaria Plain. The pilot (MP V) also mentions that light N & NE winds occur in the summer, with strong winds from the E and NE. Denham (1964: 174) mentions prevailing summer breezes from the SE & S. In addition the coastline is affected by sea breezes that start in the morning from the SE and veer to the SW by the afternoon. Thus, the shore is generally considered to be a 'weather shore', McKee Type (4)[1].

In 1971 Linder and Raban visited the coastal site of Salamis and in an unpublished report identified a reef (beachrock) that lies off the present shore about 100m from the beach, as an ancient shoreline (Flemming 1974: 165,fig.2). This is the area that Flemming (1974) identifies as the ancient harbour, being protected by the offshore reef. The reef is now exposed at low

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[1] ENKOMI

Fetch

Fetch (in nautical miles):

| S | N | E | W | NE | NW | SE | SW |
|---|---|---|---|---|---|---|---|
| 4.9 | 0 | 97 | 0 | 274 | 0 | 117 | 0 |

Consideration of winds effect on harbour in the summer

| Foul winds: | E | S | W | NW | SW | SE | N | NE |
|---|---|---|---|---|---|---|---|---|
| | 15% | 10% | 20% | 10% | 15% | 5% | 5% | 25% |

Therefore, the likelihood of not entering the harbour:

| From | SE | E | NE |
|---|---|---|---|
| | 10% | 20% | 15% |

Therefore, the factor likelihood of not departing the harbour:

| To | SE | E | NE |
|---|---|---|---|
| | 54.1 | 148 | 303 |

water, allowing sand from the sea floor on the seaward side of the reef to be blown over the reef by strong onshore winds and to build up on the leeward side of the reef, forming a lagoon. During storms some sand is blown on to the land forming sand dunes, whilst general infilling of the lagoon and harbour also takes place (Flemming 1974: 164). The strongest winds that affect this stretch of the coast are from the E/NE and therefore the advisable location for the harbour entrance would be S-facing. A report by Flemming (1974: 163-173) revealed u/w remains in the southern part of the lagoon that extended for over 2km to the north. Most of the harbour has silted up, but part of the breakwaters still survive. The northern breakwater is built on a discontinuous extension of the offshore reef which runs parallel to the coast to the north and also continues south, until at the end it turns inland in a broad hook, creating an entrance to the southern harbour, 200m wide (Flemming 1974: 169-170,fig.2 & 5). It is possible that these natural protective reefs that were utilised as breakwaters in the Hellenistic and Roman periods, could also have been used to shelter behind in the second millennium in conjunction with the inland harbour of Enkomi.

## SOUTHERN CYPRUS

*CAPE GRECO (South-eastern extremity of Cyprus)*

**#225 . Cape Greco**
34:57 N 34:05 E

The anvil-shaped headland of Cape Greco is connected by an isthmus to mainland. Shelter is afforded from prevailing winds either side of the isthmus in lee of the headland on a McKee Type (4) shore. The headland no doubt presented a threat to Bronze Age mariners voyaging along the coast of southern Cyprus as the wind conditions in the vicinity of the headland were changeable. Thus, it may well have been necessary for mariners to anchor in its lee while awaiting favourable conditions before continuing their voyage. McCaslin (1980: 26,fig.12) observed three stone anchors of Bronze Age type on the east side of Cape Greco.

**#226 . Ayia Napa**
34:58 N 34:00 E

A broad S-facing bay is situated c.7km west-northwest of Cape Greco. There is an indifferent lee here from the W winds but in calm weather you can anchor off the bay (Heikell 1989: 230). The bay of Ayia Napa has shallow depths of c.1.5m and

the entrance is rock-bound. The anchorage is located along a McKee Type (2)/(3) shore.

**#227 $ Ayios Yeorgios** (Potamos) Dades?
34:57 N 33:55 E

Ayios Yeorgios is situated on the east coast of Cyprus to the north of Cape Pyla, on the outlet of the river. The harbour utilised the entrance to the river mouth and is SE-facing. The anchorage can therefore be described as being on a McKee Type (4) shore. Ancient walls and quarries have been identified on both sides of the harbour entrance. An ashlar wall has been identified on the southwest side of the entrance submerged by 0.05m (Flemming 1973: 1). Ashlar foundations are extensive on the southwest headland. Local fishermen claim a tide of c.0.3m affects the site.

*CAPE PYLA*

*LARNACA BAY*

**#228 @ Pyla-Kokkinokremos** (Dhekelia)
34:57 N 33:43 E

Kokkinokremos (the 'red cliff') is a rocky plateau situated about 800m from the coast of the northern part of Larnaca Bay, about 3km southeast of the village of Pyla and c.10km northeast of Larnaca (Karageorghis & Demas 1984: 3; Fig. #228). The highest point of the plateau is 63m above sea level, and is c.600m long and c.450m at its widest, with a deep ravine to the southeast which forms a bay at the heart of the plateau (Karageorghis & Demas 1984: 3-4). A narrow point connects the site to a larger plateau which lies to the northwest (Fig. #228.3/4). Surveys carried out at the site have revealed that the whole of the plateau was occupied, suggesting that the settlement was of considerable size, although no water source has been found (Karageorghis 1990). The plateau was surrounded by low-lying, marshy land which is believed to have formed an almost enclosed harbour in antiquity which has since silted up (Dikaios 1971: 896; Fig. #228.1). A small sandy, S-facing bay is present on the coast at Dhekelia to the southeast of the site, which is subject to onshore winds and therefore described as a McKee type (1) harbour, although Karageorghis & Demas (1984: 29) describe the Late Bronze Age harbour at Pyla-Kokkinokremos as 'superb'. The plateau rises steeply from the plain permitting excellent views of the surrounding land and seas, dominating not only the plain but also Larnaca Bay and allowing excellent defence of the site. 'It also controls

the pass connecting the Messaria plain with that of Larnaca' (Karageorghis & Demas 1984: 5).

The site was occupied in the Late Cypriot IIC/IIIA period (Karageorghis 1990). Remains of houses, 'casemate' fortification walls and streets of the fortified settlement have been identified on the east edge of the plateau (Karageorghis & Demas 1984: 6-24,Pl.IV; Fig. #228.2). The finds from this area include Late Minoan III pottery, particularly large storage vessels, as well as a fragment of a handle with a sign of the Cypro-Minoan script, a fragmentary stirrup-jar in Anatolian Grey Polished ware, a fragment of an oxhide ingot, Egyptian alabaster, fragments of four Canaanite jars, Mycenaean IIIB pottery, including a chariot crater and quantities of local Cypriot pottery, largely undecorated Plain Ware (Karageorghis & Demas 1984: 33-44; Catling & Karageorghis 1960: 115-7). A high standard of material culture with implications of wide-ranging external contacts is implied at the site by the wealth of bronze, silver, gold and alabaster remains that have been recovered (Karageorghis & Demas 1984: 29). In 1953 several fragments of Late Minoan pithos sherds and a fragment of a limestone trough bearing 'horns of consecration' in relief were recovered from the site (Karageorghis & Demas 1984: 1). There is also evidence for metallurgical activity at the site (Karageorghis 1990). Tombs have also been uncovered at the site, one of which contained a metal hoard (Karageorghis & Demas 1984: 55-7). The evidence implies that the site was abandoned abruptly at a period before the appearance of Mycenaean IIIC:1b pottery, c.1200 BC, apparently having been occupied for a period of no more than 25-30 years.

To the west-southwest of the site the Late Cypriot settlement-cemetery of Pyla-Verghi has been discovered to the southeast of the modern town of Pyla (Fig. #228). Late Cypriot tombs and architectural remains were found at the site of Steno, about 300m east of the north-eastern slope of Pyla-Kokkinokremos, and further Late Bronze Age cemetery remains 1km south of Steno on the coast (Karageorghis & Demas 1984: 5,fig.2). All of these sites identified on the plain appear to have been abandoned at least by the time that Pyla-Kokkinokremos was founded.

**#229** [] **Kition** (Larnaca)
34:55 N 33:39 E

Kition is situated on the west side of

Larnaca Bay which extends from Cape Pyla to Cape Kiti, on the southeast coast of Cyprus (Collombier 1988: 35). The ruins of the ancient site of Kition are situated over a large area where the modern town of Larnaca is now located. Kition was a major harbour town of Late Bronze Age Cyprus, situated in the sheltered marine embayment of Larnaca and relatively close to the coast of the Levant. The site was first occupied in the Late Cypriot IIC period, reaching a peak of prosperity during the Late Bronze Age. After a period of abandonment the Phoenicians arrived at the end of the 9th century BC and settlement continued through to the Byzantine period. The Late Bronze Age town is situated in the northern area which is known as Kathari. The Classical settlement was located on the high ground of Bamboula Hill and in the area of Chrysopolitissa church to the south. Fertile land lies to the west and southwest of the site, while the land to the north is marshy (Collombier 1988: 37). In the summer months the breeze normally begins in the SE and in the afternoon veers to SW (Denham 1964: 175). To the south of Kition lies the Salt Lake of Larnaca.

The Bronze Age city of Kathari is situated on a low hill of marl bedrock which rises up to 10m above sea level and runs parallel to the present shoreline about 500m away and slopes gently south (Nicolaou 1976: 15). Marshy ground lies to the north and northeast of Kathari and is believed to have extended to the east and south east in antiquity (Gifford 1978: 56-83; Fig. #229). This ascertainment is made by Gifford who in the 1970's took a number of corehole samples from the area of Kition (Gifford 1985b: fig.1; Fig. #229.2), from which he was able to reconstruct the coastal palaeogeography of the Larnaca Lowlands and to ascertain the area of the Bronze Age harbour of Kition, Kathari. The area of marshy ground that lies to the north and northeast of the Bronze Age settlement, is believed to have formed a bay which gradually silted up until the end of the Late Bronze Age when only a small inlet to the sea survived (Nicolaou 1976: 71,figs.15-17). Karageorghis (1976: 78) notes a green clay layer with distinct traces of burning covering floor III, Temple 4 which relates to the Late Cypriot IIIA occupation at the site of Kition Kathari. This layer could indicate partial flooding of the site caused by an encroachment of the bay, prior to silting. The bay and then the inlet are believed to have acted as the Bronze Age harbour of Kition, Kathari, which shrank in size due to longshore drift (Fig.

#229.1). Corehole samples taken by Gifford (1978: 58-63, 1985: 47,fig.4, 1985b: 375-387,fig.1) reveal a lagoonal environment present in this area until at least the Hellenistic period. Nicolaou (1976) describes Kition as the 'only safe harbour on the south coast'. The natural mound directly east of Bamboula Hill (K6) is believed to have been an island in the Bronze Age, located south of the marine embayment of the Bronze Age harbour.

In the area of the Bronze Age settlement of Kition, Kathari (Area II; Fig. #229.4), Karageorghis uncovered several sanctuaries of the Late Bronze Age, associated with metallurgical workshops and smelting kilns (Nicolaou 1976: 7,nt.12). A wealth of imported material has been recovered from this area particularly from the early 13th century BC. At the beginning of the 12th century BC it is believed that the site was settled by Mycenaean colonists from the Greek mainland (Karageorghis 1976). The remains of the fortifications of the "Mycenaean" city have been uncovered in this north part of the city, Area II (Princeton 1976: 457; Gifford 1978: fig.13). The late 13th century BC cyclopean city wall which tended northwest and then west, was erected on the remains of an older mudbrick city wall (Karageorghis 1976: 59ft.). Sections of the cyclopean city wall have also been uncovered in Area IV which lies 250m southeast of Area II (Gifford 1978: fig.12). The 'industrial quarter' has been identified close to the north city wall in Area II, with numerous workshops containing evidence for copper smelting and casting of copper objects in the 12th century BC (Karageorghis 1976: 75; Gifford 1978: 60). 12km north of Larnaca is the copper mine of Troulli from which the copper was extracted, smelted and exported via the harbour of Kition (Collombier 1988: 37). Active trade existed between Cyprus and the Aegean and the Levant throughout the Late Bronze Age, particularly the exportation of copper. Other imported material from this area include Mycenaean IIIB and Minoan pottery, a small amount of Anatolian pottery, and faience and alabaster vases, together with scarabs, imply connections with Egypt (Karageorghis & Demas 1985).

Several dozen stone anchors of various sizes, reused as building material were found in the excavated area of Kathari, Area II (Karageorghis 1976: 60; Fig. #229.5). Late Bronze Age stone anchors have also been discovered on the west side of the Salt Lake to the south of

Kition (Nicolaou 1976: 11). In two separate locations in Area II at Kition, Temple 1 and Temple 4, graffiti of ships incised on stone blocks, have been identified thought to relate to the Phoenician period but could be reused blocks, thus further proof for the 'evidence of ancient mariners' at the site (Basch & Artzy 1985: 321). Alongside the external side of the earliest cyclopean Mycenaean city wall in Area II, are two ashlar built rectangular structures identified by Karageorghis (1976: 53-4,60-1) as defensive 'bastion' walls (Fig. #229.3). These structures were built upon debris of an earlier sun-dried mud brick structure (Karageorghis 1976: 59-60). To the north of the structure lies the fortification wall of the town, however, this ashlar structure is not connected to the wall and the paved ashlar surface is situated lower than the base of the wall (Raban 1988b: 281). The alignment of the platform of ashlar blocks and paved ashlar stone slabs which face the lagoon on the north side of the site, and the fact that they are not connected to the fortification walls, combined with the similarity of these structures to the so-called 'bastion' and quay of the third phase of harbour features at Dor (#145), have led Raban (1983: 238-241, 1988b: 281, 1991: 143,fig.XLc) to suggest that the Kition 'bastions' are in fact free-standing quays of the first harbour at Kition, established at the artificially scraped edge of the marine lagoon. 'This site was probably an inner harbour of Kition in the 13th century BC ... Kathari, where the sea penetrated, might have been used as a suitable place for a harbour' (Collombier 1988: 44).

Around the middle of the 11th century BC collapsed structures at Kition imply a natural disaster, possibly an earthquake (Karageorghis 1976: 92) which hastened the end of the period (Gifford 1978: 17). Also in this area, a Temple of Astarte built at the end of the 9th century BC above an earlier temple which fell into disuse in about 1000 BC, has been discovered. Houses were built in the Cypro-Geometric period in the extreme north of the city above the Late Bronze Age remains.

The later Classical acropolis lay to the south of the Bronze Age settlement and occupied the eastern side of Bamboula Hill, extending all over the plateau. The sea penetrated inland at Bamboula Hill reaching the foot of the Classical acropolis, and then turned to the south towards the St.Joseph Convent forming a natural harbour,

the enclosed, lagoonal harbour of Strabo (14.6.3) (Nicolaou 1976: 71,fig.17). In 1990 a number of slipways were found in the lagoon, believed to date from the Phoenician period.The Classical harbour was eventually abandoned due to gradual siltation by soil washed down from the nearby hills and the build-up of a shingle bar across the entrance to the inlet from south to north. Eighteenth century antiquarian accounts refer to a shallow pool next to Bamboula Hill which is believed to be the remains of the Classical harbour basin (Nicolaou 1976: 18-43; Gifford 1985b: 380). A corehole (K7) drilled to the southeast of Bamboula Hill indicates a lagoon or back-beach swamp environment transitory behind the main beach accretion zone (Gifford 1985b: 383,fig.1). It was eventually replaced by the modern harbour of Larnaca (Nicolaou 1976: fig.6).

Erosion of the shore is apparent in many places along this stretch of the coast, together with northerly longshore transport, formation of sand bars and accumulation of spits. The structure of this coastal plain is one of beach deposits prograding eastwards, sometimes trapping behind them depressions that became lagoonal environments (Gifford 1978: 56-84). The present coastline is now some 500m from the ancient one (Nicolaou 1976: fig.15-17).

Gifford (1978: 3) has determined that a linear rate of sea level rise of 2.52m/ 1000 years affected the Larnaca coastal sediments for the period 5000-0 BC, with sea level c. 0.5m below its present position at the end of that period. This westward transgression of the sea caused by rising sea-level, is suggested until sometime in the second millennium BC, after which, although the sea level was still rising, net aggradation of the coastline seaward was caused by large quantities of alluvium being deposited to the south at the mouth of the Tremithos River and hence being carried by currents and winds by a process of longshore drift around Cape Kiti and northwards along the east side of Larnaca Bay and eventually deposited along the shore. This process of northerly longshore transportation with the associated formation of sand bars and spits, combined with the progradation of slope wash deposits eastward, was to affect the second millennium anchorage of Kition Kathari. These deposited sediments formed beach accretion ridges across the mouth of the Bronze Age harbour (Gifford 1985b: 354-5,fig.4).

*HALA SULTAN TEKKE SALT LAKE (Gifford (1985: 47) explains*

*that the Salt Lake depression originated in the Late Pleistocene as 'a discontinuous, shallow valley or trough between the toe of the Tremithos River's alluvial fan and earlier Pleistocene aeolian and marine rock units to the east'.)*

# 230 [] **Hala Sultan Tekke** (Mosque)(Vyzakia) Hala Sultan Tekke

34:54 N 33:39 E

Hala Sultan Tekke is situated on the southwest shores of the Main Larnaca Salt Lake and covers an area of 600 x 400m (Åström 1994, in press). The site was built on a Late Pleistocene or Early Holocene alluvial deposit of the Tremithos River (Gifford 1978: 2), in a shallow depression that slopes northeast to the Main Salt Lake (Gifford 1978: 87; Fig. #230).

From corehole samples taken by Gifford (1985: 46,fig.2) in the 70's a reconstruction of the Late Bronze Age palaeogeography of the Larnaca Lowlands has been possible. The site of Hala Sultan Tekke was located on the south western shores of a lagoon or marine embayment, still accessible to the sea, now known as the Larnaca Salt Lake (Fig. #230.1). During the late second millennium, the westward transgression of the sea caused by rising sea-level, was reduced, and net aggradation of the coastline seaward was caused. Northerly deposition of longshore drift sediments probably choked the eastern channel of the embayment of Hala Sultan Tekke, eventually cutting it off from the sea (Gifford 1985b: 345). As stated by Engvig and Åström (1975: 6) 'It is highly probable that the present Salt Lake at Hala Sultan Tekke was a navigable harbour with an inlet from the sea in the Late Bronze Age. This is suggested by the situation of the Late Bronze Age town along its shore and by the many stone anchors found in the town'. Slope wash from the land surface west of the Salt Lake depression also contributed to the infilling of the inlet (Gifford 1985: 47,fig.4). Mollusca excavated from the Salt Lake from sealed Late Cypriot IIIA/1 levels support the theory that the lake must have been a lagoon at this period (Åström 1986: 63-68) soon to be cut off from the sea. Nicolaou (1976: 9,fig.2) describes how the Salt Lake was much larger in antiquity, joined by an inlet which was directly open to the sea. The lake is assumed to be the harbour of the city, its entrance running south - 'the inlet, as it then was, must have been far and away the best of the islands harbours' (Nicolaou & Catling 1968: 227). At the entrance a natural dam of sand and stone formed within a few hundred years by longshore drift of

sediment and rising sea-level and prevented the sea water from getting in (Gifford 1978: 168; see Fig. #229.1). This process is believed to have started accumulating some time during the Late Bronze Age thereby cutting off the city and its harbour from the sea (Engvig & Åström 1975: 9,fig.4; Gifford 1978: 168).

The city of Hala Sultan Tekke was of considerable size and flourished in the Late Bronze Age period, from the 16th to the 12th centuries BC. It was again settled in the 4th century BC. It was probably the most important ancient port of the island, certainly during the Late Bronze Age (Engvig & Åström 1975: 7). The Bronze Age city is situated to the northwest of the Mosque Hala Sultan Tekke, on the banks of the Salt Lake (Fig. #230.2), which is nowadays dry most of the year and lies 1.11m below sea level (Åström 1994, in press). Excavation at the site of Hala Sultan Tekke reveal extensive foreign imports predominantly from the Late Cypriot II-IIIA/1 period, relating to the 13th and first part of the 12th centuries BC (Åström 1986). 'The cylinder seals alone indicate far-flung relations in and beyond Cyprus' (Åström 1986: 63). Other imported finds include Mycenaean pottery, mainly IIIA/2 to IIIC/1 stirrup jars and some craters, Egyptian and Levantine objects of alabaster, glass and faience, together with numerous Canaanite jars, Cretan vase sherds of Late Minoan IA to IIIB/C, a stemmed bowl of Red Burnished Ware from Anatolia, cartouches of Horemheb and Seti I, a scarab seal of Ramesses II and ostrich shells, carved pieces of elephant tusks and lapis objects from the Near East (Åström 1986; Catling & Karageorghis 1960: 112). The variety of imported material was immense. Evidence for copper workshops has also been identified at the site in the industrial area, along with bronze-smiths workshops, moulds and potter kilns (Nicolaou 1973b: 54). Evidence for stone working, purple dye and fishing is also apparent (Åström 1994, in press). Numerous Late Bronze Age settlements have been identified in the area of the Salt Lake particularly nearer the west side of the lake (Nicolaou 1976: 11,fig.3).

Beyond the entrance to the harbour the seas were exposed and little protection is available against bad weather. The prevailing wind is from the N, thus fair wind conditions for ships entering the harbour entrance a fair wind, but conversely would provide difficulties when it came to leaving the harbour.

**#231 * Cape Kiti**
34:49 N 33:36 E

The anchorage or 'Proto-harbour' (McCaslin 1980: 21) at Cape Kiti served primarily as a water stop for vessels en route to Larnaca Bay to the north, in the Late Bronze Age and later periods. Anchorage was especially sought on the eastern side of the cape in the shallows amongst the reefs on a McKee Type (2)/(3) shore (McCaslin 1978; Fig. #231). The area north of Cape Kiti up to the supposed entrance to Hala Sultan Tekke harbour was surveyed in 1973 (Engvig & Åström 1975: fig.3). The area is low and sandy and affected by the process of longshore drift which has caused the formation of sand bars and spits. Despite a vast quantity of material that was recovered from the sea bed, including numerous stone anchors of Bronze Age type (McCaslin 1978), the probability of additional material being obscured by sand deposition is high. A dense concentration of material was noted in the area to the north of Cape Kiti (Area I) and it has been proposed that ships sought shelter here from difficult winds and currents off Cape Kiti and then sometimes found themselves caught by the NE winds which arise suddenly (Engvig & Åström 1975: 22-24,fig.43). Gifford (1978: 3) has determined that a linear rate of sea-level rise of 2.52m/ 1000 years affected the Larnaca coastal sediments for the period 5000-0 BC, with sea level c.0.5m below its present position at the end of that period.

*CAPE KITI*

*TREMITHOS RIVER (The Tremithos River and its alluvial fan was one of the two most active geomorphological elements of the Larnaca Lowlands region during the Late Pleistocene and Holocene epochs, according to Gifford (1985: 45). The Tremithos River, primarily an agent of deposition, has carried millions of tons of alluvial sediment from the eastern foothills of the Troodos Massif down to the coast west of Cape Kiti. These deposited sediments have then been carried by currents and winds by a process of longshore drift around Cape Kiti and northward along the east side of Larnaca Bay, thereby altering the local coastal geography).*

*PETOUNDA POINT*

**#232 . Petounda Point** (Palaea)
34:47 N 33:30 E

The natural reefs that have been identified offshore from Petounda Point appear to provide shelter for a natural McKee Type (4) harbour. A

great deal of pottery has been identified u/w and on the cliffs at Petounda Point (Flemming 1973: 1).

**#233 * Maroni *Vournes***
34:44 N 33:23 E

The site of Maroni-Vournes is situated about 200m above sea level on the south coast of Cyprus, 1km inland on the east bank of the River Agiou Mina or Maroniou which runs down to the sea (Cadogan 1986: 104). The River Maroniou rises in the Troodos Mountains and provided water for the site (Johnson 1980). The site was occupied from the 16th century BC, with radical changes occurring in the Late Cypriot IIC period (Karageorghis 1990: 5). The site encompasses an administrative centre, with an ashlar building comparable to but slightly smaller than, the one discovered at Kalavasos *Ayios Dhimitrios* (#235), together with associated oil production and metallurgical areas. Quantities of Egyptian and Syro-Palestinian artifacts, including Canaanite jars, have also been uncovered (Johnson 1980: 5,19; Karageorghis 1990: 7), together with Late Minoan III pottery (Catling & Karageorghis 1960: 113) and an increased number of Mycenaean imported pottery after the Late Helladic IIA/2 period (Cadogan 1986: 104), implying extended contacts with the Aegean. Maroni *Vournes* was possibly a Bronze Age McKee Type (4) riverine anchorage, acting as an outlet for copper distribution and inlet for trade items, and served by the anchorage of Maroni *Tsaroukkas* (#234), located along the shore to the south of the site. Karageorghis (1990: 2) believes that the site developed along with a number of other sites in Cyprus at the time of the commencement of Cypriot involvement in the copper trade with the Aegean.

**#234 @ Maroni *Tsaroukkas***
34:44 N 33:22 E

The site of Maroni *Tsaroukkas* has been identified along the coast to the southeast of Maroni *Vournes* (#233), slightly west of the present mouth of the River Agiou Mina (Rupp 1987: map 1,14; Fig. #234/). The site has received three initial seasons of survey and excavation (Manning et al 1994). Late Bronze Age building remains have been found along the shore, with storage areas and evidence for production in the form of weaving and possibly metal, together with an area of tombs in the cliff above the site (Manning 1994, unpublished). Finds from the site include an Egyptian scarab seal, a Late Cypriot cylinder seal, Cypriot fine ware vases, metal

artifacts and fragmentary pieces of a Late Helladic IIIA/2 squat jar.

Offshore, to the eastern end of the site near the mouth of a small stream, twenty anchors of the Late Bronze Age type have been recovered. The area is thought to be suitable for an anchorage (Manning 1994, unpublished; Fig. #234.1). About 200m to the west of the site, offshore of the Archaic-Classical site of Maroni *Yialos*, a further five stone anchors of Late Bronze Age type were recovered, together with later Roman amphorae (Manning 1994, unpublished).

The Late Bronze Age site of Maroni *Tsaroukkas* therefore offers 'a site where Late Bronze Age Aegean, Cypriot and east Mediterranean trade converges' (Manning 1994, unpublished). The site appears to have been associated with a likely anchorage or harbour site which possibly served the riverine site of Maroni *Vournes* (#233) upstream, located on a McKee Type (2)/(3) shore.

**#235 @ Kalavasos *Ayios Dhimitrios*** (Vasilikos Bay)
33:44 N 33:18 E

The Late Cypriot IIC town of Kalavasos *Ayios Dhimitrios*, is situated some 4km inland from the Bay of Vasilikos, on the south coast of Cyprus. The site is located on the Vasilikos River Valley which flows into the sea via the eastern side of Vasilikos Bay. The river bed would have been wider and shallower in the Bronze Age (Gomez & Pease 1992: 5) and it is feasible that the site was a riverine anchorage served by the reasonably sheltered, S-facing, McKee Type (2)/(3) bay at Zygi or Vasilikos Bay, both located along the coast to the south of the site. Zygi, is the more sheltered of the two bays and Bronze Age material has recently been recovered from Zygi (South 1994, personal communication), supporting the idea that it functioned as a river mouth anchorage in the Bronze Age. The site lies on a natural cross-roads linking the central and eastern regions of the island with the west, as well as along a N-S route 'from the sea to the Kalavasos copper mines' (Rupp 1987: 85) and therefore acted as a copper distribution route, or, as described by Knapp (1986), a "gateway community".

The site of *Ayios Dhimitrios* is located at the point where the river valley narrows and covers an area of c.10-12 hectares. It lies c.8km south of an area of ancient copper mines known as Laroumena which are believed to have been worked since the Middle Bronze Age (Rupp 1987:

83,fig.1). Amongst the finds recovered from the site of *Agios Dhimitrios*, the most outstanding architectural complex is the ashlar Building X, the west side of which was devoted to a pillared storage hall 19.5m long by 7.25m wide. The room contained up to fifty massive pithoi of up to 2m in height arranged in rows on stone blocks and in pits beneath the floor (South 1989: 321; South 1994). Recent analysis of the pithoi imply that the majority stored olive oil. To the west of Building X, a large storage tank, c.2m long and 1.3m deep, which also contained traces of olive oil methyl esters, has been identified. It appears therefore that the residents of the site were involved with the processing and storage of olive oil (South 1993). Building X was destroyed by fire c. 1200 BC (Karageorghis 1990: 3). Additionally, metallurgical activities are attested at the site by evidence of the remains of a smelting furnace, copper slag and metal objects, including fragments of oxhide ingots, found in association with Building IX, believed to have been a small scale workshop in the Late Cypriot IIC period (South & Todd 1985; South 1994; Gale 1991: 201). Apart form an abundance of locally made White Painted III ware, pottery finds recovered from *Ayios Dhimitrios* included Aegean ceramics identified in the palatial/ administrative building, and imported pottery from the northern Levant (South 1994). A small, silver Hittite statute was also found in a grave at the site (South 1993). Thus, the site appears to have been involved in the production of copper, acting as an outlet for copper mined to the north. Karageorghis (1990: 3) believes that the sites prosperity was due to 'its importance to the copper trade'.

A number of Late Cypriot IIB to IIIC tombs have been identified in the valley below the site which contained rich grave goods from the Levant, Near East, Asia, Mycenaean Aegean and Egypt (Rupp 1987: 83). A number of other second millennium sites have been identified in the Vasilikos Valley including the Middle to Late Cypriot IA settlement and copper extraction site of Kalavasos *Mitsingites* (Rupp 1987: map 1,4; Todd 1979: 29,fig.6) and Tokhni *Lakkla* (Rupp 1987: map 1,12), a coastal site to the east of the valley mouth where a few White Slip, Base Ring and pithos sherds have been discovered.

*CAPE DOLOS*

*AKROTIRI BAY/ LIMASSOL BAY*

#236 $ **Amathus** (Limassol) Amathos
34:43 N 33:08 E

Amathus is located on the south coast of Cyprus 12km east-northeast of Limassol, on a S-facing shore and can therefore be described as a McKee Type (2)/(3) shore. However, it is also affected by land and sea breezes and would therefore also be described as a McKee Type (1) and (4) anchorage. The ruins of the city are located on the hill and on the slopes to seaward (S) below. 'The ancient Greek port of Amathus is one of the best preserved, man-made ports in the Mediterranean' (Michaelides 1988: 1597). The necropolis spreads to the east, north and west of the town (Princeton 1976: 47). The site first appears to have been occupied in the 9th century BC, with traces of Cypro-Geometric I-II pottery on the acropolis (Hermary 1987: 376-8). The site had an extremely Egypto-Cypriot character from the 8th century BC (Hermary 1987), and it is possible that the harbour was first utilised during this period. The site flourished during the Hellenistic and Greco-Roman periods and into Early Byzantine times, but was slowly deserted after the first Arab raids in 647 AD (Princeton 1976: 48).

Only a small part of the ancient harbour is still visible, to the southeast of the acropolis, part of which has silted up. Much of the coastal area of Limassol - Amathus Bay has been covered in recent marine deposits, the majority of which were transported into the bay by the Garyllis and Yermasoyia Rivers and have subsequently been redistributed eastward along the coast by littoral drift (Michaelides 1988: 1601). The coastal and sea bottom of the Limassol - Amathus Bay area is therefore subject both to gradual sinking and to advance of the shore line, processes aided by earthquake movements, much evidenced throughout the fourth century AD along the south coast of Cyprus (Michaelides 1988: 1602). The port of Amathus was almost square in shape and with dressed stone breakwaters to the west, south and east (Empereur & Verlinden 1987: 7-18), most of which rest upon recent marine deposits, except the south-eastern corner which Flemming has identified as exploiting a natural reef as its substructure (Flemming 1973: 1). Frost (1995b: 15) believes that the harbour was possibly a Phoenician type 'cothon'.

Some debate has arisen as to the first reference to the ancient port by Pseudo Skylax of Caryanda (end of 4th century BC) who mentions the existence of Amathus as a 'desert' port (*erimos*)

an epithet since corrected to *therinos* (of summer). The latter would imply a naturally sheltered summer anchorage, while the former to the abandonment of the port which excavation and survey at the site indicated was established towards the end of the 4th century BC (Empereur & Verlinden 1987: 8). The problems that surround the changing geomorphology at the port of ancient Amathus are complex, but its general location on a S-facing coast, with some protection from surrounding hills and supply of fresh water, could have at least accommodated the beaching of vessels or use of the supposed natural reef identified by Flemming (1973: 1), in a period prior to the construction of the port.

*AKROTIRI PENINSULA* *(projects 8km south of general coastline and is 5km broad)*

*AKROTIRI SALT LAKE* *(situated in the middle of Akrotiri Peninsula, covering an area of roughly 4km sq.)*

**#237 * Akrotiri Salt Lake**
34:37 N 32:58 E

Stanley Price (1980: 8) stated that the 'Akrotiri Salt-Lake was probably formed as a result of seaward development of spits from mouths of (the) Kouris and Garyllis rivers eventually reaching (what was then) the offshore island (of Akrotiri) running west from the present Cape Gata and forming a tombolo, with an area of sea-water isolated as a salt-lake'. Swiny (1981) and Michaelides (1988: 1601) both testify to the large volume of sediment deposited at the mouth of the two rivers.

Although the assumptions of Stanley Price present a valuable introductory analysis of the pattern of geomorphological change in the area of the Akrotiri Salt Lake, the picture is more complex. Other factors must be taken into consideration. Firstly, the littoral drift along the coast east of the Akrotiri Peninsula is essentially easterly, which would not have encouraged the rapid southerly transportation of sediments from the Garyllis river mouth. In fact, the formation of the easterly spit that eventually linked the mainland to the island of Akrotiri, is not thought to have occurred until historic times (Nir 1993: 32), thereby leaving the eastern side of the peninsula open to the sea in the Bronze Age. However, prevailing winds on the west side of the Akrotiri peninsula are onshore, which prevent the River Kouris from prograding out into the sea, causing the build-up

of sediment at the river mouth and forcing sediment to accumulate along the shore and to the south. This would correspond with Stanley Price's argument, although, he neglects to address the volume of alluvial material that was actually deposited at the Kouris river mouth, perhaps not as voluminous as is implied. Nevertheless, a certain amount of material has obviously accumulated in this area since the Late Bronze Age, indicated by the recent discovery of Late Bronze Age tombs between the main road and Kourion beach, which were buried under 2m of alluvial deposition (Swiny, H. 1994, personal communication). The question of tectonic activity is not brought into Stanley Price's equation, despite the fact that localized fault activity is known to be present in the area, particularly along the south-western side of Akrotiri Island, where Flemming and Webb (1986: 21) estimated a maximum subsidence of one meter/ 1,000 years. Perhaps the problem is partially answered by aeolian deposition, wind blown deposits that have accumulated in the area of the Salt Lake. There can be no doubt that wind blown material has contributed considerably to the formation of the Akrotiri Salt Lake particularly since the relative stabilization of sea level at the end of the Bronze Age. Geological maps clearly distinguish the Pleistocene marine deposits from those of recent alluvial and aeolian deposits that have accumulated in the area of the modern Salt Lake (Fig. #237).

The remains of a Hellenistic or Roman shipwreck have been identified some 150m inland from the west coast of the peninsula (Heywood 1982: 164; Collombier 1987: 167), northwest of the modern town of Akrotiri, implying that this area was submerged during this period (Fig. #237).

In the Venetian period a canal was constructed on the east side of the peninsula (Flemming 1973: 5) to provide access to the Salt Lake, which was presumably lagoonal, linked to the sea by a channel or even open to the sea in the Bronze Age. Bearing all these factors in mind, it is quite feasible that the infilling of the Akrotiri Salt Lake has occurred since the Bronze Age and that prior to this period the area of the Salt Lake was a lagoon linked to the sea or a marine embayment providing sheltered anchorage in a McKee Type (4) environment behind the offshore island of Akrotiri (Fig. #237.2), however, no direct archaeological evidence to activity at the site has been revealed prior to

the 5th century BC. The site was eventually abandoned due to siltation (Fig. #237.1).

Obviously a number of questions remain unanswered: No systematic corehole study of the Akrotiri Salt Lake has as yet been undertaken in order to ascertain the precise nature of the area during and since the second millennium. The nature and function of the site of **Asomatos** (#240) has yet to be determined. And even if the area of the Akrotiri Salt Lake did offer shelter to vessels in this period, we have yet to determine the function of the harbour, what catchment area it served, how it related to the possible anchorages at the mouths of the Maroni and Vasilikos valleys to the east (#233/5) and the sites of the Kouris valley to the west (#241). Further research needs to be undertaken to determine not only the typology of the anchorage at Akrotiri but also its function.

*CAPE GATA (south-eastern point of Akrotiri Peninsula. Reasonable shelter under Cape Gata from prevailing W winds)*

**#238 $ Dreamer's Bay** (Vatha Bay)
34:34 N 32:58 E

Dreamer's Bay is a bathing beach on a cliff-lined coast of the south shore of Akrotiri Peninsula, in southern Cyprus (Swiny, H.W. 1982: 162). It is sheltered to a certain extent from prevailing W winds by a low headland on the west side of the bay, however the general aspect of the bay is S-facing on a McKee Type (2)/(3) shore. The site at Dreamer's Bay consists of a linear stone mole 13.2m long and 1.25m u/w. The mole is composed of a rubble foundation about 2m thick and supporting 4-5 courses of ashlar masonry. On the central axis of the mole was a paved road bordered with ashlars laid as headers. The mole does not form a protective breakwater, and was not constructed in order to withstand wave action from either side. Flemming (1973: 5) believes that the mole was originally built projecting into a sheltered bay protected by cliffs and provided a quay surface for loading and unloading. The mole may be in an anomalous position due to submergence and coastal erosion. The date of the mole is unknown, however associated buildings identified at the site, including a warehouse have related pottery dating to the 5th and 6th centuries AD (Swiny, H. 1982: 171), although there is no reason that shelter could not have been sought in the bay to provide access to the island in the Bronze Age. McCaslin (1980: 3,fig.1) and Green (1973: 167,170) have

identified stone anchors of the Bronze Age type along the southern shore of Akrotiri peninsula. Flemming (1978: 415/172) notes submergence of 2m in the bay in the last 2000 years.

*CAPE ZEVGARI (south-western point of Akrotiri Peninsula)*

**#239 $ Akrotiri**
34:35 N 32:57 E

Akrotiri is situated to the southwest of the Akrotiri Salt Lakes and on the northern section of a massive sandstone and marl outcrop which is believed to have formed a separated island which lay off the southern coast of Cyprus prior to the Roman period (see #237).

**#240 * Asomatos *Phasouri***
34:37 N 32:58 E

Within the plantations on the modern Limassol road, north of the Salt Lake of Akrotiri Gjerstad (1926: 15) identified a Late Bronze Age cemetery with associated pottery, 1km east of the modern village of Asomatos. The cemetery site of Asomatos Phasouri is currently located on the northern shores of the Akrotiri Salt Lake on the edge of the Pleistocene marine deposits. Assuming that the Late Bronze Age cemetery of Asomatos Phasouri was associated with an, as yet, unidentified site of the same period, it is possible that the site could well have utilised an extremely sheltered anchorage on the shore of a lagoon or marine embayment of the Akrotiri Salt Lake (#237) in the Late Bronze Age period.

*EPISKOPI BAY*

*KOURIS RIVER (The Kouris River, prior to modern damming at its head and tapping of several large springs near Khalassa village, was one of the island's major rivers. The configuration of the shoreline in the area of Episkopi-Akrotiri has been affected by the alluvial deposition of the Kouris River.)*

**#241 @ Episkopi *Bamboula*, Episkopi *Phaneromeni***
Curium/Kourion
34:40 N 32:54 E

Along the lower reaches of the Kouris River two Late Bronze Age sites have been identified. At the village of Episkopi *Phaneromeni* (Swiny, H.W. 1982: Map 3; Fig. #241) excavations have revealed evidence of a Late Bronze Age rural settlement and cemetery dating from the 16th century BC (Swiny, H.W. 1982: 29). A Middle Bronze Age settlement has been excavated in the northern sector of the site, with Early to Middle Bronze Age tombs in Areas 'C' and 'J' not related

to the main Late Bronze settlement (Swiny, H.W. 1982: 30). The River Kouris borders the site to the east (Fig. #241.1). The site was succeeded by the later settlement (14th century BC) of Episkopi *Bamboula*, which is located some 500m to the northwest of Episkopi on a sloping ridge commanding a good view over the valley of the river Kouris (Fig. #241.2). Early houses from the settlement date from about 1600 BC (Area E). The later settlement was occupied between c.1250-1150 BC and was enclosed by a fortification wall with a gate and two towers (Swiny, H.W. 1982: 38). Amongst the narrow streets and houses of the Late Bronze Age settlement, traces of a metal smith's workshop were found. Rock-cut tombs have been identified associated with the site. Finds include objects of faience, ivory, glass, bronze and gold, some imported from larger centres in Cyprus and abroad, together with many examples of Cypro-Minoan script, and fragments of Late Minoan II/III pottery (Swiny, H.W. 1982: 44; Åström 1972: 407). Ample water supply was provided by the nearby river which was then perennial (Swiny, H.W. 1982: 31). The artifacts recovered from both sites were mostly made of clay or stone, with a number of utilitarian copper implements (Swiny, H. W. 1982: 32-33). The name of Kir appears in an Egyptian inscription at Medinet Habu of the time of Ramesses III (1198-1167) and has been identified as Kourion (Princeton 1976: 467).

It is possible that the Late Bronze Age sites of Episkopi *Phaneromeni* and *Bamboula*, as well as Erimi *Kafkalla* and Kandou *Balies* (Swiny 1981: 54,fig.3), also located in the Kouris valley, could have acted as outlet nodes for the distribution of copper from copper production sites, including the important site of Alassa *Pano Mandilaris* (Karageorghis 1990: 10-12), situated up the valley (Swiny 1981: 51-87). *Phaneromeni* and *Bamboula* may well have afforded sheltered riverine McKee Type (4) anchorages in the Bronze Age.

The ruins of the later site of Kourion are spread over a large area, on a bluff overlooking the sea in the northeast corner of Episkopi Bay (Fig. #241.4). The beach below the hill is a sweep of sand and cobbles. The river mouth of Kouris Potamos to the south would have provided little shelter (Flemming 1973: 5; Fig. #241.3). A rocky reef lies just offshore, below the acropolis to the northwest of the road to the beach and may have provided some natural shelter to sailors in antiquity (Flemming 1973: 5; Fig. #241.5). The shore is sandy and beaching of

vessels was possible in the calm conditions of the summer, although little shelter is provided from the prevailing W/SW winds that produce a heavy onshore swell especially in the afternoons (Collombier 1987: 167; Swiny, H.W. 1982: 163; Fig. #241.4). The site was first occupied in the Neolithic period and continued throughout the Bronze Age. The most important group of tombs of the Cypriot Protogeometric period so far discovered in Cyprus was found within the necropolis of Kourion and included a 'royal' tomb in which a gold and inlaid sceptre with two hawks on the top was recovered. The majority of the pottery from this early period dates to the later Cypro-Geometric period. In Hellenistic and Greco-Roman times, the city of ancient Kourion flourished. The remains of a mole (about 80m long) can be seen to the west of the town at low tide, but there was probably no proper harbour, although Strabo mentions the existence of an anchorage (Princeton 1976: 467). Flemming (1973: 5) identified no harbour works but suggested that a patch of low-lying marshy land between the beach ridge and the cliff below the city, might possibly be the location of the ancient harbour now covered with alluvium and beach gravel. To the north of this area Late Bronze Age tombs have recently been revealed buried in over 2m of alluvial sediment (Swiny, H. 1994, personal communication).

**#242 . Paramali Bay**
34:40 N 32:47 E

Possible anchorage at the mouth of the Paramali River which lies on a S-facing coast and provides some protection for vessels, on a McKee Type (2)/(3) shore. The Middle Cypriot site of Paramali *Mandra tou Pouppou* lies some 4km inland upstream from the bay and could well have utilised the bay for anchorage purposes during this period (Swiny 1981: 54; Fig. #242). Until the beginning of this century Paramali Bay was used by carob traders to export their produce.

**#243 . Evdhimou Bay**
34:34 N 32:45 E

The broad S-facing bay of Evdhimou on the south coast of Cyprus provides some shelter from onshore winds and swell (MP V) and could be described as a McKee Type (2)/(3) anchorage. The Evdhimou River flows into the back of Evdhimou Bay (Fig. #243.). A number of Middle Cypriot settlement and cemetery sites, including Evdhimou *Stympouli* and *Alatomi*, have been identified upstream from Evdhimou Bay, together with the large Middle Cypriot settlement of Evdhimou

*Shilles* which lies to the east of Evdhimou valley (Swiny 1981: 54; Fig. #243), implying the use of an anchorage in the bay linked to an access route inland up the valley of Evdhimou during the Middle Bronze Age.

**#244 . Pissouri Bay**
34:39 N 32:43 E

The broad, S-facing bay of Pissouri on the south coast of Cyprus provides some shelter from onshore winds and swell in the lee of Cape Aspro and could be described as a McKee Type (4) shore. Flemming (1973: 5) details possible anchorage in Pissouri Bay but identified no signs of ancient settlement or harbour works from any period.

*CAPE ASPRO*

**#245 @ Old Paphos** (Palaepaphos) Kouklia
34:42 N 32:34 E

Old Paphos (Kouklia) lies some 16km to the southeast of Nea Paphos on the south-western coast of Cyprus, and encompasses the later sanctuary of Aphrodite. The site is situated on the east banks of the Dhiarrizos River, presently the only river along the southwest coast of Cyprus that does not dry up in the summer (Maier & Karageorghis 1984: 40), thus implying that it was probably a large navigable channel in the Bronze Age. The site occupies a flat-topped, low limestone ridge which is situated some 1.5km from the sea. The west of the site is covered by fairly extensive ruins of buildings, chiefly of Roman date. The shallow valley of Evreti to the east contains many chamber tombs and wells of the Late Bronze Age and served partly as the necropolis and partly as living quarters with potters and ivory carvers workshops (Fig. #245). Rupp (1987) believes that the site developed due to the fertile arable land and water resources provided by the Evreti Springs, together with small copper resources in the upper drainage region of the River Dhiarrizos.

A SW breeze prevails in the summer months along a McKee Type (2)/(3) shore. The anchorage of the site is presumed to have been to the east of the present mouth of the river (McKee Type (4), in the lee of a promontory that has formed by deposited material from the river (Rupp 1994, personal communication). The River Dhiarrizos has the largest discharge of the rivers of Cyprus and material from all periods has been found at the mouth of the river (Rupp 1994, personal communication). Good possibilities for beaching were available on the coast (Rupp 1987). Two

large, limestone monoliths have been recovered from the west bank of the river close to the sea and could well have been connected to the anchorage (Maier & Karageorghis 1984: 42).

The site was first occupied in the Late Cypriot I period and was the first port of call for ships from the Aegean, however it did not receive the brisk trade of the harbour towns in the east because it was not frequented by ships from the Levant and was probably just a 'roadstead', offering limited harbour facilities (Maier & karageorghis 1984: 40). Finds from the 14th century BC at Kouklia include cylinder seals from the Near East and stamp seals from Crete, ivory carvings and gold and an anthropomorphic weight (Maier & karageorghis 1984: 67). Traces of slag at the site imply a degree of copper smelting and working, although the site lies a considerable distance from the nearest copper mines. Ivory wastes have also been recovered implying an ivory workshop (Åström 1969: 77). Towards the end of the 13th century BC, beginning of the 12th century BC, Kouklia experienced a period of upheaval possibly caused by a series of migrations from mainland Greece. During the 12th and 11th centuries BC Palaepaphos exhibits one of the largest collections of Mycenaean pottery in Cyprus, particularly Late Helladic IIIC/1 and Proto-White-Painted ware, together with evidence of cyclopean style architecture, perhaps implying the presence of settlers from the mainland Aegean (Maier & Karageorghis 1984: 65; Maier 1973; Hooker 1976: 153). The first sanctuary of Aphrodite was constructed towards the end of the 13th century BC (Rupp 1987). Palaepaphos continued to be an important centre through to the 4th century BC when Nea Paphos succeeded Palaepaphos as the regional centre.

*ZEPHYROS POINT (some shelter in bay to the west)*

*MOULIA ROCKS (some shelter behind rocks from W winds)*

**#246 . Yeroskipos**

34:44 N 32:26 E

The headland opposite Moulia could also have provided shelter in its lee in antiquity. The headland lies below the modern village of Yeroskipos and has been considerably eroded since Neolithic times. Material from different periods has been identified on shore and on the edge of the plateau above the village a second millennium site has been identified (Rupp 1994, personal communication). Combined with the shelter provided by Moulia Rocks, the lee of the headland

at Yeroskipos would have provided a degree of shelter to vessels in antiquity on a McKee Type (2)/(3) shore (Fig. #246). Raban (1994: 11) has suggested the identification of a Late Bronze Age anchorage at the outlet of the Ezuza River to the southeast of the settlement and headland of Yeroskipos.

**#247 $ Paphos** (Nea Paphos/Kato Paphos)
34:46 N 32:25 E

Situated on the west coast of Cyprus, the ruins cover an extensive area, c. 100ha. Natural shelter is offered to ships as the small bay on which the site is situated, is protected by a large promontory that extends southwest from the coast to the west of the site and is described as a McKee Type (4) shore (Fig. #247). Two hills command the site, and the immediate coastal terrain is relatively flat. Recent construction of the main road and promenade in the area east of the harbour has covered up many ancient foundations. Paphos or Nea Paphos, was founded in the 4th century BC, sometime after 321-320 BC. The ancient site of Nea Paphos, or simply Paphos, now occupied by the modern town of Kato Paphos, was the capital of Cyprus during the latter part of the Hellenistic period and throughout the Roman era, until the 4th century AD (Princeton 1976: 673-6). The vast necropolis extends north and east of the site. A city wall surrounds the town, best preserved in the north-western corner. The ancient harbour was mainly artificial with two breakwaters projecting into the sea for a considerable distance; the east arm is 600m long and the west one is 210m. The inner harbour is now silted up and lies below the site at the back of the waterfront. A survey by Hohlfelder and Leonard (1994) provides details of the construction of the later harbour. The estimated size of the harbour, including the area now silted in and built over, is c. 22ha. Although no direct archaeological evidence has been recovered from Paphos the site could well have provided shelter to Bronze Age vessels, possibly in the area that now lies silted at the back of the harbour.

*PAPHOS POINT*

**#248 @ Maa-Palaeokastro** (Coral Bay)
34:51 N 32:22 E

The defensive settlement of Maa-Palaeokastro is located on the west coast of Cyprus on a large promontory c. 450m in length, flanked by two bays to the north and south (Fig. #248). Anchorage was sought either side of the promontory at Maa,

which stands at a height of 14m above sea level. The north and south sides of the promontory are steep and offered excellent natural protection, while the west end of the promontory slopes away gradually to the sea. The promontory is joined to the mainland by a narrow isthmus, thus forming an anvil-shaped promontory (Fig. #248.2). Fresh water in the east bay (Karageorghis 1990: 21-23).

A Cyclopean defensive wall was constructed at the narrow, landward point of the promontory, to the east of the settlement. The main period of occupation at Maa was towards the end of the Late Bronze Age, particularly the Late Cypriot IIC/2 period (Karageorghis 1990: 2), possibly settled by Mycenaeans around the Late Helladic IIIC/2-Late Cypriot IIIA/2 period. (Karageorghis & Demas 1988: 259). Two main periods of occupation are indicated at the site, the first corresponding to just before 1200 BC, when ashlar buildings, a cyclopean wall and dog-leg gateway were constructed dating to the Late Cypriot IIC period, and the other just after when Mycenaean IIIC/1b pottery was introduced (Karageorghis & Demas 1984: 1; Fig. #248.1). Ample evidence for metallurgical activity is witnessed at the site, with the discovery of an oxhide ingot fragment in a Late Cypriot IIC context (Karageorghis 1990: 23; Gale 1991: 201).

The promontory of Maa was an ideal anchorage for sailors arriving from the west, as it was visible from out to sea and one of the first places the prevailing winds and currents would have assisted passage to on the island (Fig. #248.3). However, an u/w survey undertaken by Giangrande et al (1987: 189-190) found no Late Bronze Age remains in the waters around the peninsula at Maa and conclude that, despite the favourable depths either side of the promontory for anchoring, 'any anchorage associated with the settlement would have been elsewhere' (Giangrande et al 1987: 190). Despite the short period of occupation at the site and the fact that any material contemporary with the Late Bronze Age settlement would be difficult to see u/w due to erosion, this is a surprising and somewhat disturbing conclusion to the survey, considering the theoretical assumption that the headland at Maa would have offered an ideal McKee Type (4) anchorage either side of a promontory. From geological observations it would appear that the promontory was much larger in antiquity and is now subject to considerable wave erosion to its aeolian substructure (Gomez 1994, personal communication).

**#249 $ Kerati** (Keratidhi Bay)
34:51 N 32:21 E

The Bay of Keratidhi is a small, shallow sloping, reasonably well protected bay that forms the northern extent of the bay that lies to the north of Maa-Palaeokastro (Fig. #249/#249.1). The bay is described as being on a McKee Type (1) shore. The bay is S-facing and contains a dense concentration of pottery on the sea bed relating to the 18th-19th century AD carob trade that operated from here, together with several piles of 'ballast' stones and one stone anchor (Giangrande et al 1987: 190,fig.5). Leonard also records the finding of Bronze Age material in the bay (Leonard 1994, personal communication). The entrance of the harbour is probably at the same depth as it was in antiquity. Flemming (1973: 4) observed flint fragments and scrapers that probably washed down from a prehistoric site 50-100m back from the beach, which he attributes to small amount of alluviation that has been deposited by a gulley that runs into the back of the bay on the north side, over a period of two thousand years (Flemming 1973: 4). The extent of the alluviation is however minimal and 'the lack of alluviation may have ensured the continued use of Kerati as a harbour' (Giangrande et al 1987: 190). At the back of the bay there is a wedge of colluvial material, c.2m high, which dips inland and appears to have experienced erosion, attested by a surface and wall exposed in the section, as well as the surface of the land dropping in places (Gomez 1994, personal communication). It would therefore appear that perhaps the bay is not so protected in conditions of onshore winds and can thus be described as a McKee Type (1) shore.

**#250 $ Maniki**
34:53 N 32:19 E

Maniki is situated on the northern shores of a small, shallow, S-facing bay which is separated by a channel from Maniki Island, which lies off to the south-southwest. Roman pottery dumps and a mooring post on the shore indicate that the bay was used as a harbour in this period (Giangrande et al 1987: 191). The lack of pottery identified u/w from not only the Roman period but possibly also earlier periods, can be explained by the nature of the surrounding geomorphology. Around the harbour, soft marine calcareous layers are overlain by terra rossa rather than more resistant shoreline deposits, making this area particularly vulnerable to marine erosion. Large quantities of mud found on the bed of the present harbour suggest that erosion is continuing today.

Wave cut notches around the bay also indicate slight uplift, which would have lead to an overall shallowing of the bay by 0.5-1m over the last 2000 years (Giangrande et al 1987: 191). Thus the effectiveness of Maniki as a harbour must have been reduced and any possible indication of the use of Maniki as an anchorage in the second millennium eroded away. Despite the shelter offered by the offshore island of Maniki, the water in the channel between the island and the bay is often rough in moderate weather, being situated on a McKee Type (2)/(3) shore. Five stone anchors, possibly of the Bronze Age type, have been recovered from the channel between the island and the harbour (Giangrande et al 1987: 191).

*CAPE DREPANUM*

**#251 $ Drepanum Drepanum** (Ayios Yerghios)
34:54 N 32:19 E

Drepanum is situated on the west coast, northwest of the modern village of Peyia. Cape Drepanum is low and flat, with sunken offshore ledges (MP V). Ruins from the Hellenistic and Early Byzantine period are spread over the headland of Cape Drepanum. At the end of the headland the island of St.George (Yeronisos), ancient Tegessos or Drepanon, is located offshore (Princeton 1976: 283). Below and to the west of the settlement at Drepanum, between the headland and the offshore island of St.George, a natural bay has in recent times been extended to form what is now an excellent harbour, or McKee Type (4) anchorage (Fig. #251). What archaeological remains there may have been on the sea-bed of this bay to indicate its period of utilization as a harbour, have since been destroyed by recent dredging (Giangrande et al 1987: 192). The shallowing of the harbour is apparently caused by a fault line that runs between the mainland and the island of St.George, which deepened the offshore zone (Giangrande et al 1987: 192). A strong current runs between the island and the harbour. The island of St.George was once attached to the mainland but was eroded by the sea at a point of weakness caused by the fault line. Gomez & Pease (1992: 4) believe that the headland of St.George was an island by c. 5000 BP, but none-the-less would have provided considerable shelter to vessels in its lee in the Bronze Age. Thus, the anchorage can be described as a McKee Type (4) anchorage. A long-line-set of anchors (see Ch.II.2.i) has been found in 6m of water in lee of the island (Frost 1970a: 20-21), however, no structures were found in the water

(Flemming 1973: 4). Flemming (1978: 416/176) notes submergence of 0.3m in the last 2000 years. In the seaward face of the mainland cliff are rock-cut tombs in two tiers. The offshore island of St.George contains traces of a complete encircling ashlar wall, and the foundations of many structures which date to the Roman period. Earlier Neolithic structures have also been identified on the island, no doubt constructed when the area was still linked to the mainland.

**#252 $ Lara**
34:57 N 32:19 E

Lara is situated on a promontory, Lara Point, which projects 0.8km from the coast with sheltered bays on both its north and south sides (MP V: 133). The headland is recognisable from out at sea and may have acted as a landfall for Bronze Age mariners approaching from the west. The west, seaward side of Lara Point is steep. Lara-South is S-facing and less sheltered than the bay to the north of Lara Point, Lara-Limnionas. Lara-Limnionas is a N-facing bay and protected on its southwest side by cliffs that extend in a northerly direction off Lara Point, thereby forming a McKee Type (4) shore (Fig. #252). The amount of shallowing in both bays since Roman times due to coastal uplift, is about 0.6m (Giangrande et al 1987: 192). Few archaeological remains have been uncovered on land. However, an u/w survey undertaken by Giangrande et al (1987) has revealed a rich concentration of archaeological material ranging from Hellenistic to later Byzantine periods in the north bay of Lara-Limnionas. Fifteen single-holed stone anchors were also recovered from Lara-Limnionas, indicating its use as an anchorage in antiquity. Fishermen still anchor here today, although they do not regard it as a very secure harbour (Giangrande et al 1987: 192). A smaller amount of pottery and only three stone anchors were identified u/w in Lara-South, implying a shipwreck concentration rather than dumping from anchoring ships (Giangrande et al 1987: 192). Up to a third of the original sea bed in the eastern part of Lara-South has been encroached on by alluviation in the Medieval period, obscuring any earlier archaeological evidence and possibly indicating that the bay was more exposed in the past (Giangrande et al 1987: 192). Raban (1988b: 290) records the finding of a 13th century BC Collar-rim jar at the site.

**#253 . Yeranisos** (cape)
35:01 N 32:18 E

Cape Yeranisos is situated on the west coast

of Cyprus on the western side of the Akamas peninsula, with reefs and islands extending about 2.5km seaward. To the southeast of the Point Yeranisos a small S-facing bay fronts the eastern extent of the cliffs of the cape and is sheltered somewhat by the coast to the south. Thus a McKee Type (4) anchorage. The waters in the area are quite shallow. A small stream flows into the back of the bay on its north-eastern side. A marble column has been found set in the bedrock acting as a bollard near to the site of Yeranisos. Amphorae from a wreck have been found in the bay (Flemming 1973: 4).

*POINT YERANISOS*

**#254 * Kioni**
35:05 N 32:16 E

Kioni is located on the western littoral of the Akamas peninsula, close to a modern bombing range. Leonard (1994, personal correspondence) has identified Late Bronze Age material in the bay. The anchorage is described as a McKee Type (1).

*CAPE ARNAUTI (Cape Arnauti Island)*

**#256 $ Ayios Nikolaos**
35:06 N 32:18 E

Ayios Nikolaos is situated on the western edge of Khrysokhou Bay, to the east of Cape Arnauti. The bay of Ayios Nikolaos provides a perfectly natural harbour and can be described as a McKee Type (4) shore. On the shore in the area of Ayios Nikolaos, large surfaces of quarrying have been identified. They are awash at the seaward edge by 0.65m (Flemming 1973: 3). Nisi Tis Khamilis just to the north, is also quarried and u/w. Submergence of 0.75m in the last 2000 years has been identified at the site (Flemming 1978: 416/180).

**#257 $ Fontana Amorosa** Akamantes
35:05 N 32:18 E

Situated on the east side of Cape Arnauti about 3km southeast of the cape. The small bay is E-facing and therefore provides excellent shelter from W winds (Denham 1964: 166), on a McKee Type (4) shore. Care needs to be taken of a shallow patch at the north end of the beach (Heikell 1989: 225). Anchorage is preferable in 5-6m on the sand near the south end of the bay. Denham (1964: 166) records finding a mass of Roman pottery on the seabed, implying its use as an anchorage in antiquity.

*KHRYSOKHOU BAY*

**#258 $ Lachis/ Marion Polis** Arsinoe
35:04 N 32:24 E

Marion Polis is located on the northwest coast of Cyprus near the sea. The site extends over a large area partly covered by the present village of Polis. The city was built on two low plateaux overlooking the narrow plain below and the Bay of Khrysokhou beyond. The small bay is located at the most southern point of Khrysokhou Bay. It is McKee Type (1). The bay is very shallow, with depths of 1m or less for the most part (Heikell 1989: 225). The site of ancient Marion Polis consisted of both a west and an east city, the east one being inhabited before the west, at the beginning of the Cypro-Geometric period (Princeton 1976: 552). The site also preserves the remains of an ancient mole or quay west of the present harbour. This is of considerable length and would probably have been much longer in antiquity as a large part of the harbour has silted up. Trade to the west would have passed through this harbour, particularly relating to the exportation of copper. Catling (1964) believes this was a minor anchorage in the Bronze Age.

*POMOS POINT (rugged low point with offshore rocks)*

*MORPHOU BAY (extends between Pomos Point and Cape Kormakiti)*

**#259 . Cape Kokkino**
35:11 N 32:41 E

Cape Kokkino projects in a northerly direction into Morphou Bay. Some shelter is provided from W winds on the east side of the cape in a McKee Type (4) anchorage. An abandoned breakwater of unknown date, has been identified to the east of Cape Kokkino by Flemming (1973: 3). Small fishing boats still anchor here during the summer (Denham 1964: 166).

## *EASTERN CRETE*

(Travelling in clockwise direction from North to South coast)

## *(Admiralty Chart number 1091)*

*CAPE DIA*
(35:25 N 25:02 E)

*ISLAND OF DIA/ STANDIA (Lies in the northeast approaches to Iráklion Gulf, approximately 8km offshore)*

**#260 * Dia** (Standia) Dia
35:26 N 26:15 E

On the south coast of the Island of Dia four small bays afford varying degrees of protection against N winds. Kápari Bay, situated in the middle towards the west of the island, offers some protection to small vessels. Panayía Bay is well sheltered from N winds, and the eastern most bay, Agriliás, offers some shelter to boats at anchor, with particularly good holding at the entrance to the bay. There is a small Greek and Roman town on the bay in the southwest of the island (Hood 1996, personal communication). All the anchorages are located on S-facing bays and can therefore be described as anchorages on a McKee Type (4) shoreline. Hutchinson (1962: 100) describes the anchorages of Dia as examples of the use of a small island lying a few miles off the coast as harbours, and although not generally recognised as important, these anchorages may well have served as offshore trading posts serving the Minoan palaces on the mainland opposite or have provided shelter to vessels awaiting favourable maritime conditions to access the anchorages in the Gulf of Iráklion. Evans (1928: 239) identified 'some slight traces of Minoan habitation' in two principal bays on the south coast. Evans (1921: 298) also identified the remains of 'an early wall' close to sea level in the cove of Ayios Georgios, the western most bay. Dia could also be another candidate for a Minoan harbour of Knossos.

*GULF OF IRAKLION (Candia Bay)*

*PANAYIA POINT*

**#261 * Ayia Pelagia**
35:24 N 25:02 E

Ayia Pelagia lies immediately to the south of Panayia Point, on the western shores of the Gulf of Iráklion, 16km west of Heráklion and is backed by low, schist cliffs. The headland to the

north provides sheltered anchorage from prevailing N and NW winds and can be described as a McKee Type (4) shoreline. Evans (1921: 299) described the anchorage as the 'best existing remains of a Minoan port' that he had so far identified, although its use as such is unlikely. Anchorage could have been sought either side of the headland, both sides of which are backed by sandy bays. The site was occupied from Middle Minoan III to Late Minoan IIIB (Phillips 1991: 364). Remains of Minoan buildings, tombs and pottery have been found at the site of Ayia Pelagia, particularly from the Late Minoan IIIB period, which appears to have been the greatest period of occupation. An Egyptian scarab and some beads have also been recovered (Phillips 1991: 364).

**#262 $ Palaiókastron**
35:22 N 25:02 E

Shelter is provided in the southwest corner of the Gulf of Iráklion, to the south of the promontory of ancient Palaiókastron. The mountains to the west provide shelter from W winds, but the site is exposed when the winds veer to the NNE (MP IV). Anchorage is afforded in 27-45m of water, off a McKee Type (4) shoreline.

**#263 $ Heráklion/ Iráklion** Herakleion Heracleum Candia
35:21 N 25:08 E

Heráklion, the Venetian and modern-day port of Crete, was also a harbour in the Greek and Roman period, and may have been utilized in the second millennium as the western most extent of the Minoan harbour of Katsambas/ Poros (Spratt 1865; Evans 1921: 298). Any evidence for Heráklion having been utilised as an anchorage in this period is undoubtedly obscured by the later Venetian harbour moles. Good anchorage is afforded c. 1km offshore in the summer in c. 32m of water, on a muddy bottom (MP IV). The anchorage is N-facing and without man-made harbour installations for protection, is exposed to the prevailing wind. It is therefore described as an anchorage on a McKee Type (1) shore. Davaras (1976: 358/9) identified Heráklion as a site that was settled in the Late Minoan period, but offers no evidence to support this observation.

**#264 @ Katsambas** (Nea Vrioula)
35:21 N 25:10 E

In 1928 Sir Arthur Evans (1928: 229) placed the harbour of Minoan Knossos at the mouth of the River Kairatos (Katsambas) on the west bank, c. 1km east of the modern town of Heráklion (Fig.

#264). The river mouth lies about 6km north of the Palace of Knossos, to the west of a short promontory. Evans (1928: 231) suggested that additional shelter could have been afforded in the smaller river mouth at Poros to the west. Tombs dating from the Middle Minoan IIIB to Late Minoan A period, together with Late Minoan III buildings and imported Egyptian artifacts have been identified in the area of Poros (Phillips 1991: 748; Evans 1928: 229). Evans (1928: 153,230) believed that a road along the western slopes of Kephala and Isopata connected the Palace with its harbour at the mouth of the river. Alternatively, a route to the east, following the course of the River Kairatos from Knossos to the coast, may have been used. The harbour would have been easily identified from the sea by the landmark of Mount Juktas which stands immediately to the south of Knossos and lies in direct line with the river mouth and the site. The shoreline in this area prior to modern construction is known to have been relatively flat and sandy (Schäfer 1991: 112), with a maximum width of 1km. The riverine anchorage would have been protected against E winds by the rocky promontory of Nea Halikarnassos to the east, but would have been exposed to the N and NW winds that prevail along this stretch of coast (a McKee Type (1) shoreline). In addition the lower course of the Kairatos valley is quite steep, with deep water in front of its mouth, which does not make for a comfortable anchorage (Schäfer 1991: 113). However, it is possible for boats to beach along the sandy shore or in the mouth of the river. Neolithic and Minoan remains have been identified in the vicinity of the site (Princeton 1976: 386; Davaras 1976: 358-9/168). The site appears to have been occupied from the Middle Minoan period through to Late Minoan III times (Phillips 1991: 469). An alabaster amphora bearing the cartouche of Tuthmosis III was found in Late Minoan IIIA/1 tomb in the cemetery of Katsambas to the south of the settlement (Evans 1935: 339; Phillips 1991: 62,469).

**#265 @ Amnisos** (Karteros) <u>Matium</u>
35:20 N 25:13 E

Amnisos lies on the north coast of Crete c. 8km east of Heráklion. It is a harbour site and is located at the mouth of the River Karteros, now considerably silted. The site is sheltered to the west by a rocky, vertical headland and to the north by the low islet of Monocharako that lies c. 400m immediately offshore. Shelter could have been sought in the lee of the 30m high promontory to the west or vessels could have beached along

the c. 2km long, sandy shores of the concave beach at Amnisos (Schäfer 1991: 113; Fig. #265/#265.1). Therefore, although the site is N-facing it is sheltered and can be described as a McKee Type (4) shore. A coastal recession deposited a deep layer of sand over the site, probably in the Classical period (Princeton 1976: 438).

Linear B tablets (Hiller 1982: 33) relate the importance of the site in terms of its close links with the administration of the Late Minoan III Palace of Knossos and as a the harbour to the port of Minoan and early Archaic Knossos (Schäfer 1991: 111). Homer (Odyssey 19.188-9) and Strabo (X 4,8) both refer to the harbour at Amnisos. Evans (1935: 1002) described the anchorage as the 'Eastern haven of Knossos'. Amnisos is referred to in a topographical list from the mortuary temple of Amenophis III at Kom el Hetan (Kitchen 1965: 5; Vercoutter 1954: 78-90; Cline 1994: 112/A.24,114/A.34) as one in an itinerary of sites visited on an Egyptian voyage or voyages made to the Aegean. Thus, the coastal settlement of Amnisos is a likely candidate for one of the harbours of Knossos, however, it is the only important Minoan harbour site along this coast that does not reveal imported material from Egypt (Phillips 1991: maps 2,3,8,10,11,14,15,19).

A villa of the Late Minoan IA period, known as the 'Villa of the Lilies' was excavated on the shores of Amnisos in 1932 by Marinatos (1933). It is situated on the east side of a low hill known as Paliochora. It was a two storey building with frescos, a reception room and a six-bayed, pier-and-door partition which opened on to a terrace overlooking the sea (Davaras 1976: 5-6). The villa was destroyed by fire, possibly caused by an earthquake at the end of the Late Minoan I period. Other Minoan remains have been found around the base of Paliochora-hill, including a fountain-building and a megaron. The remains suggest a continuous period of occupation at the site stretching from the Middle Minoan IIIB to Late Minoan IIIB periods (Schäfer 1991: 112). Beyond the low hill to the west, the architectural remains of a massive terrace structure have been uncovered, identified as a 6th century BC Archaic sanctuary dedicated to Zeus Thénatas (Blue Guide 1988: 145).

To the west of the Sanctuary of Zeus and associated with an earlier Late Bronze Age building constructed beneath the Archaic sanctuary, an ashlar building dating to the Late

Minoan I period has been identified on the shoreline. The surface of the foundation blocks of this building lie 1m below the sea level (Schäfer 1991: 113). Presumably it would have originally been erected some distance from the shore in a place protected from the sea breakers and would therefore imply a considerable rise in sea level since the Late Bronze Age. However, the building has also been compared to building 'P' at Kommos on the south coast of Crete (#308), the so-called ship-shed (Schäfer 1991: 114). The design and location of both buildings are very similar and if Amnisos were the harbour of the Palace of Knossos then a minimum number of buildings, perhaps storehouses or ship-sheds, would have been a functional necessity. The nature of the function of this building would therefore also have implications as to the level of the sea in the Late Bronze Age. One should also bear in mind that the river has created a considerable floodplain since this period, with deposited materials pushing the shore forward (personal observation 1991; Schäfer 1991: 114). It is quite possible therefore that the shape of the coastline at Amnisos was more irregular and much less silted in the Bronze Age (Schäfer 1991: 114,pl.XXVIII,b,dotted line; Fig. #265). Flemming & Pirazzoli (1981: 74) have suggested a submersion of the land of 1.5m since the Minoan period, confirming Pirazzoli's (1988: 173) identification of a change in sea-level of -1.8m since 3600 BP. Shaw (1990: 425) believes that the change in sea level was even more drastic, formerly being c. 3m lower than present, and that with this in mind, 'we can postulate a sandy spit leading out to the present islet'.

**#266 @ Ayia Theodoroi** Nirou Khani/ Nirou Chani
35:20 N 25:16 E

The site of Nirou Khani is on the north coast of Crete, 16km east of Heráklion and is thought to have been a supplementary harbour of Knossos (Hadjidaki 1977) as it was connected by an ancient road, although somewhat hazardous, to Knossos which continued in a easterly direction to Malia (Evans 1928: 280). Submerged quays and column bases were identified at the site by Evans (1928), c. 2m u/w. The anchorage at Nirou Khani is composed of two sandy bays separated by a promontory 100m in length that extends in a north-easterly direction into the sea (Sotirakis 1992: 46; Fig. #266). The promontory is believed to have acted as a breakwater particularly sheltering the smaller bay on the east side from prevailing W and NW winds. The anchorage, although N-facing, can be described as being on

a McKee Type (4) shore, as it is sheltered from prevailing winds.

The site was excavated by Marinatos (1926) who identified a large, rectangular cavity excavated out of the porous rock of the promontory, 46 x 12m and 1.8m deep, now partially submerged, which he believed to be a ship-shed (Marinatos 1926: 146). Frost (1963: 109) has identified a second cavity also hewn out of the promontory situated to the seaward side of the first and divided from it by a wall, c. 30 - 40cm u/w (Fig. #266.1/.2/.3). Shaw believes that there are in fact three separate parallel spaces ranging from 4.45 to 5m wide (Shaw 1990: 425). Frost (1963: 107-109) identified a submergence of between 4-5m at Nirou Khani which would imply that the rectangular structure was a dry dock. This is unlikely as no other such installations have been identified from this period. However, Flemming and Pirazzoli (1981) estimated a sea-level rise of no more that 1.75m at Nirou Khani based on the depth of the other submerged Minoan houses in the bay (see next paragraph) which would imply that the structure would more likely have been just below or at sea level in the Late Bronze Age. The rectangular cavities are surrounded by square ashlar blocks which continue as a pavement area to the south (personal observation 1991). It is also possible that the cuttings may have been Greek or Roman quarries, or perhaps the deeper cutting was utilised as a Roman fish tank, although much larger than any other fish tanks identified along this coast (see below). However, the headland and the island off the headland have been quarried in antiquity but are not submerged and must therefore have been excavated at a much later date than the dockyard.

600m along the southeast side of the promontory a well preserved Late Minoan IA period megaron was excavated which contained numerous religious artifacts (Sotirakis 1992: 47). A second, large, oblong building of well dressed ashlar blocks has also been identified on the southeast side of the reef (Sotirakis 1992: 48). The northeast corner of the building is washed by the sea. A separate line of rubble stones which extends into the sea for a distance of 20m has also been identified in this area (Sotirakis 1992: 47).

1km to the east of the site on the right bank of the mouth of the River Vathianos, Evans (1928: 280) identified massive blocks of what he described as a Minoan mole. However, the

structure is well above present sea level and is more probably part of a large Minoan building.

*CAPE KHERSONISOS*

**#267 * Chersónisos** (Limín Khersonisou) Chersonisos
35:19 N 25:24 E

The site of Chersónisos is on the rocky promontory of Kastri which juts out into the sea in an easterly direction and is flanked by sandy beaches to north and south (Fig. #267). In the bay to the south of Kastri is the Hellenistic and Roman harbour of Chersonisos. Good anchorage is provided here for small vessels in 9-11m of water (MP IV), particularly in the summer when sheltering from NNW winds, although the anchorage can be affected by swell (MP IV: 59). The anchorage is situated on an E-facing shoreline on the west side of the Gulf of Moulin (Malia) and can be described as a McKee Type (4) shore.

There are traces of Minoan settlement on the headland of Kastri and to the west of the harbour (Sotirakis 1992: 97), although the main period of settlement and predominant ruins at the site are from later Classical Greek and Roman periods (Davaras 1976: 50-51). A Christian basilica now dominates the headland of Kastri. Three rock-cut fish tanks of the Roman period have been identified on the northeast side of the promontory at a depth of 2m below the present sea level, and in the bay to the south traces of large concrete Roman breakwaters and moles can be seen enclosing a sheltered anchorage c.270 x 150m in area (Leatham & Hood 1958-9: 266-73). It is quite possible that the area could also have been a Minoan anchorage.

*MALIA/ MOULIN/ MALION BAY*

*CAPE DHRAPANOS*

**#268 [] Malia**
35:18 N 25:30 E

On the north coast of Crete, 30km east of Iráklion, is the site of Malia which was first settled at the beginning of the Early Minoan period and flourished with a palace until its destruction at the end of the Late Minoan I period. Despite the destruction of the palace the town around continued to be occupied well into Late Minoan III. The centre of the settlement was located on relatively low ground c. 500m from the shore and separated from it by a ridge of low hills (Raban 1983: 239). The palace is thought to have been served by two harbours, one to the

west, and one to the east. A paved road lead from the palace to the western harbour. The city buildings occupied an area of about 1sq.km (Fig. #268).

To the west along the shoreline some 500m from the palace, there is a sandy bay flanked by a low, rocky reef on its western extremity (Fig. #268.7). To the west of the bay there is evidence of a previous river mouth (now silted up), leading to an extensive hollow area or inland lagoon (now marshy land), which presently stands at less than 2m above sea level, that is believed to have been used as a harbour (Raban 1991: 139,pl.XXXV; Gifford 1992: 177; Fig. #268/.1). This would have provided an enclosed anchorage on an embayment of the sea providing plenty of natural shelter in the Bronze Age (Bintliff 1977: 42). The embayment became infilled with silt during historical times (Bintliff 1977: 42).

A narrow channel, Raban's (1991: 139,pl.XXXV) 'drain channel', 1.6m wide was cut on the east side of the promontory and runs in a north-easterly direction out into the bay (Fig. #268/.3). The channel is similar to ones at Akhziv and Misrefot Yam on the Levant coast (#131, #130), which were built in an attempt to prevent the silting up of the natural river courses. The cutting continues well below the present sea level (Raban 1991: 139). A second channel, described by Raban (1991: 139) as the 'naval channel', lies some 20m to the west of the 'drain channel' and is 5-6m wide and 40m in length and runs out to sea in a northerly direction (Fig. #268/.1/.2). Although the channel now has silt on its bottom, probing has shown that the bedrock is no less than 3m below mean sea level (Raban 1991: 140). On the southwest side of the channel the edge has been levelled and paved with ashlar blocks. Raban (1983: 239) describes this feature as a quay, similar to those identified at Tell Dor (Raban 1983)(see #145). In the winter this channel still functions as a drainage channel for the overflow of rainwater flooding the nearby hollow (Raban 1991: 140). A wider rock-cut channel, or natural opening, across the low ridge has been identified some 15m to the west. The third channel is 12-15m wide and presently blocked by a sandbar on its lee side. Raban believes that by damming the natural outflow from the lagoon ie the small river which runs out to sea on the east side of the promontory, a lagoonal harbour was created in the hollowed marshy area (Raban 1983: 239; Fig. #268.6). 'Channels 2 and 3 were probably used for

navigation, and maybe also for maintaining ample circulation of water within the basin, as a flushing agent. It seems that even when sea level was 2m lower, such a system would have properly functioned with the hampering process of siltation being a lesser menace' (Raban 1991: 140). It is however, difficult to date these rock-cut installations, although ashlar masonry techniques were being used by this period as well as in later antiquity (Ch.III.2.ii; Ch.VII).

The dating of the rock-cut channels at Malia, believed by Raban to be connected to the Minoan harbour and of a similar date, has been questioned by a number of scholars, because of the problems of dating such rock-cuttings. Frost believes that at least one of these cuttings was made in the last century as a sluice for a mill that lay in the marshy, hollowed area to the south of the beach (Frost 1989, personal communication). This has been confirmed by local inhabitants (Shaw 1990: 428). Effenterre (1980: 75-80) believes the identification of Malia as a harbour site to be too speculative and states that the rock-cut channels are in fact natural formations (Effenterre 1980: 77). However, although the dating of these rock-cuttings is problematic, it would appear that a number of similar installations have been identified around the shores of the eastern Mediterranean in second millennium contexts (Raban 1985; see Ch.III.3).

A second anchorage is believed to have been utilized in the bay to the east of the reef which in fact would have provided some shelter from the prevailing NW winds behind the low reef, for mooring or beaching (Raban 1991: Pl.XXXVI), although the lagoonal harbour would obviously have offered much greater protection (Fig. #268/.7). On the east side of the bay a series of partially submerged large, stone block walls, which appear to represent the foundation course of a rectangular structure, have been identified (Guest-Papamanoli & Treuil 1979: 668). The structure is aligned roughly W-E and is divided into a series of narrow parallel galleries (three have been identified) extending up to 37m in length and between 2.5-3m wide. The western ends of the galleries are submerged and the eastern ends are buried beneath the sand on the shore (Guest-Papamanoli & Treuil 1979: 668; Guest-Papamanoli 1989: 116,fig.3). Raban (1991: 139) has described this structure as a ship-shed of the Minoan period, similar to that discovered at Kommos (Raban 1991: 139; see #308). The deepest part of this submerged structure is presently

under 1.3m of water and has possibly been subjected to subsidence due to its position on a sandy sea bed in an area of high wave energy, as well as general sea-level rise. Shaw (1990: 428) believes that the sea-level rise at Malia must have been at least 3m, based on the position of the u/w rectangular building in relation to modern sea level and that therefore the theory suggesting the lagoonal anchorage to the south of the site to be less likely, since the lagoon, the dam and the rock-cutting entrances would have to confirm a uniform lowered sea-level. The Bay of Malia did indeed experience a degree of submergence in historical times as Roman and Byzantine ruins have been identified u/w (Demitzakis 1973: 59/23. However, Lagios and Hipkin (1986) state that Malia is located on a horst and therefore subject to uplift (see Ch.IV.2.a). Flemming (1978: 414/ 100), on the other hand, has identified a submergence at the site of -1m since the Bronze Age. Anne Guest-Papamanoli (1989; Fig. #268.5) believes that any harbour must be searched for 100m away, north of the present shore, near the end of the rocky promontory (Shaw 1990: 428; ). Further research needs to be undertaken to confirm the level of the sea during the Bronze Age period and thus its relation to associated waterfront structures.

A third anchorage has been identified in the embayment of a river mouth on the coast to the northeast of the palace, beyond the cemetery of Chrysolakkos (Fig. #268.8). The outlet of the river is protected on its east side by the promontory of Ayia Varvara (Raban 1991: 140). Shelter was sought in the embayment of the river and supplemented by protection afforded by the small, rocky islet of Ayia Varvara which lay some 50-100m offshore to the northwest across the mouth of the river. 'This body of water had been divided in antiquity by an artificial rampart (described by Hue and Pelon (1991: 121) as a natural sand bar or tombolo), about 150m long, which ran from the lee of the islet to the centre of the river bed (Fig. #268.9). There is a small retaining wall across the eastern half of the river bed, at the present water-line, blocking the riverine load of sediments during the winter flooding from reaching the eastern part of the bay... These artificial features seem to serve the aim of creating a weather protected and silt-free basin, which was probably used as a mooring place for sea-going vessels' (Raban 1991: 140, 1983: 239). Even allowing for a lower sea level of about 1.5m in the Minoan period Raban believes that harbour was functional.

On the promontory of Ayia Varvara numerous Middle Minoan sherds and stone walls are visible (Raban 1991: 140). In addition, a reasonable sized residence with a maritime flavour known as the 'Maison du pauvre pêcheur' has been identified (Effenterre 1980 :75; Hue & Pelon 1991: 118). Pieces of pumice stone were uncovered in the house and believed to have been used as fishnet weights (Hue & Pelon 1991 :118-119), together with a variety of shellfish remains. This adds further evidence to the inlet being used as an anchorage concerned with fishing and local subsistence.

The general aspect of the coastline at Malia is N-facing, representing a 'lee shore', McKee Type (1). The channel that leads to the proposed enclosed harbour or hollowed area, is also N-facing. However, anchorage on either side of the promontory would have been NE- and NW-facing. The predominant summer wind is the NW meltemi wind, so that good anchorage would be found to the east of the promontory, on a McKee Type (4) shore[1]. To the south of the site is the massif of Séléna which served as an excellent landmark by which to guide ships to shore.

The function of the harbour facilities at Malia is unclear. The palace is the third largest in Crete after Knossos and Phaistos, and it is reasonably suggested that in the Middle Minoan period Malia was the capital of a major independent state. However, it is less likely

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[1] MALIA (Using wind rose for Iráklion)

Fetch

Fetch (in nautical miles)

| S | N | E | W | SE | SW | NE | NW |
|---|---|---|---|---|---|---|---|
| 0 | 60 | 0/2 | 0/2 | 0 | 0 | 86.5 | 159 |

Consideration of winds' effect on harbour in summer

| Foul winds : | N | NW | W | NE | Rest negligible |
|---|---|---|---|---|---|
| | 10% | 50% | 10% | 5% | |

Therefore, the likelihood of not entering the harbour:

| From N | NE | NW | W | E |
|---|---|---|---|---|
| negligible | | | 0 | 0 |

Therefore, the likelihood of not departing the harbour:

| To N | NE | NW | W | E |
|---|---|---|---|---|
| 77.7 | 46.5 | 630 | 0/1 | 0 |

that the anchorages functioned as a major port of international trade, particularly in the Late Minoan period, as surprisingly few imported finds have been recovered from the palace and other more suitable anchorages, such as Zakros (#290) and Kommos (#308), have been identified as major ports of international trade for Crete. Hue and Pelon (1991: 119) suggest that the function of the harbour at Malia was primarily one of redistribution, located at a central point along the northeast coast of Crete, some 20 nautical miles from the Knossian port of Katsambas (#264), and 30 nautical miles from the Gulf of Mirabélo. Malia was a point of centralisation, redistributing mainly agricultural goods via coastal trade or cabotage along the north coast of Crete.

The first traces of the town at Malia date to the Pre-Palatial, Early Minoan period. In the Proto-Palatial period, Middle Minoan IB-II, the palace was constructed around a central court with a shrine, residential quarters, workshops (Chapouthier & Demargne 1962; Fig. #268.4). The civic centre lay to the northwest of the palace, together with Quartier Mu. Quartier Mu at Malia was a major administrative, storage and cult area, with potters and metal workshops, which was destroyed at the end of the Middle Minoan IIB period (Wiener 1991: 338; Detournay et al. 1980). A Minoan lead weight and a number of stone weights have been discovered here in a Middle Minoan II context (Poursat 1978: 133-4), possibly implying that one of the functions of Quartier Mu, which is located closer to the sea, was to process imported goods and exchange with maritime traders anchoring in the harbour. To the north of the palace on a rocky bluff over looking the sea is the unique and elaborate burial comlex of Chrysolakkos (Effenterre 1980: 47,fig.62,fig.10). Amongst the tombs excavated here was a rich grave of the Proto-Palatial period which contained rich grave goods of gold and may well have been a 'royal' tomb of the ruling family of Malia in Middle Minoan times.

The entire settlement was destroyed at the end of this period but reestablished again in the Neo-Palatial, Middle Minoan III period. Houses have been identified situated to the north, southwest and east of the palace, along with workshop areas (Vandenabeele 1992). A number of houses have also been identified on the southeast side of Malia Bay, having been occupied at different periods. North of the 'agora' several roads have been identified which lead to sea.

Linear A tablets have been recovered from the Neo-Palatial period in the area of the hypostyle hall. Other finds include outstanding examples of Minoan gold work.

Three limestone anchors have also been discovered at the site (Shaw & Blitzer 1983: 92). One of them was found in House Ea, some 650m from the sea. The other two came from what has been described as either a stone-cutter's workshop (McCaslin 1980: 33) or a Middle Minoan sanctuary (Poursat 1980). Evidence for Bronze Age quarrying has also been discovered by the sea on the rocky shore west of the main bay (Guest-Papamanoli 1989). A number of steatite seals with impressions of boats have also been recovered from the site (Detournay et al. 1980: 207).

A few parts of the site, notably House E, were reoccupied after the site was destroyed at the end of the Late Minoan IB period. However, by the end of the Bronze Age the site was totally abandoned.

Effenterre (1980: 79) has identified an over land route that runs E-W along the coastal seaboard and was utilised from Minoan times through to the modern day.

**#269 . Sision** (Sísi Cove)
35:19 N 25:31 E

Sísi Cove, c. 5km to the east of the village of Malia, is small naturally, sheltered NW-facing bay protected from prevailing winds by a reef which extends partly across the entrance to the bay from the west (MP IV: 60,107). Assuming the winds are not too strong the anchorage can be described as being on a McKee Type (4) shore, vessels anchoring in lee of the offshore reef. Davaras (1976: 358-9/122) describes Sision as possessing evidence of Late Minoan occupation.

*TRAPANI POINT*

*CAPE AYIOS IOANNIS/ SPINALONGA/ ST. JOHN*

*ISLAND OF SPINALONGA*

**#270 $ Spinalonga**
35:18 N 25:45 E

The island of Spinalonga is situated to the northwest of the Gulf of Mirabélo. To the north of the island lies the entrance to the Bay of Spinalonga and to the south is the end of the peninsula of Elounda. The Bay of Spinalonga lies to the west of the island between it and the mainland. Good shelter is provided here for small

vessels on a McKee Type (4) shore, except when W winds blow (MP IV). At the head of the Bay of Spinalonga (south end) is an isthmus which joins the peninsula of Elounda to the island of Spinalonga. Nowadays sand bars stretch across the northern entrance to Spinalonga Bay and prevent vessels with a deep draft from entering. Spinalonga Bay would have provided excellent shelter to vessels during the Bronze Age. Some shelter is also provided on the east side of the island, in it's lee, in the cove of Kolokithiá, which is protected by an offshore island. The island of Spinalonga was originally the fortress site which protected the Greek city-state of Olous (Davaras 1976: 301). A Venetian fortress was built here in 1579 AD. In the channel between the island and the mainland peninsula of Spinalonga is a reef of bedrock which breaks the surface to a height of about 1m in two places (Flemming 1978: 101). The original height of the reef is believed to have been higher is it was quarried in antiquity.

**#271 * Elounda** (Porou) Olous
35:16 N 24:45 E

Situated on the west side of the Gulf of Mirabélo, just north of Agios Nikolaos, the Greek city-state of ancient Olous spread from the mainland, over the isthmus, onto the peninsula of Spinalonga (Fig. #271). The area of the site is known as Poros and the bay to the south of the island Porou Bay. Excellent shelter is provided in the large, wide bay of Porou. The entrance is open to the E and SE and thus sheltered in N and NW winds, particularly on the east side of the bay. There is good holding but the coral centre in the middle of the bay is to be avoided (MP IV: 61-62). The anchorage can be described as a McKee Type (4). At the beginning of the 20th century AD, the French dug a small channel across the isthmus connecting Elounda Bay with the open sea. Sections of the ancient fortification wall is visible at the highest point of the isthmus. To the west of the isthmus is a Hellenistic necropolis with traces of graves, which has also yielded a pithos of the Late Minoan IIIB period. Just to the north of the site lies a substantial Middle Minoan settlement, associated with a scatter of Early Minoan pottery (Princeton 1976: 646). The site is believed to have submerged by -1.9m over the last 2000 years (Pirazzoli 1988: 173/table 3). Demitzakis (1973: 59/22) supports this belief and states that the isthmus of Spinalonga 'must have been higher and wider in ancient times'. He identifies the remains of buildings that are now u/w either side of the

isthmus.

*GULF OF MIRABELO/ MIRABELLA*

*CAPE PLEORA*

**#272 $ Ayios Nikólaos** Lato pros Kamara
35:12 N 25:43 E

Ayios Nikólaos is situated on the mainland in the southwest corner of the Gulf of Mirabélo, on the north-eastern peninsula of Mandráki Point. The Bay of Ayios Nikólaos encompasses a number of small bays and indents and is partially sheltered by a series of islands which stretch offshore from the town in a north-northeasterly direction. Ayios Nikólaos is thus described as a McKee Type (4) anchorage. The main anchorage at Ayios Nikólaos is located on the north side of Mandráki Point in a shallow bay. Additional shelter is afforded in an indent which runs in a north-northwesterly direction from the northwest corner of the bay, as well as an inner harbour within the confines of the town. Anchorage is also possible on the south side of the peninsula in 12-14m of water, which is also partly sheltered from the south (MP IV). Davaras (1976: 357-359/116,161) lists Ayios Nikólaos as a Middle and Late Bronze Age site in his map but offers no evidence to support this observation. It was, however, the site of the port of the inland Greek city of Lato, and was known as Lato pros Kamara (Davaras 1976: 135).

**#273 * Istro/ Palako** (Pyrgos/ Kaló Khorió region) Minoa
35:07 N 25:44 E

The NE-facing cove on which the site of Palako is situated, is located in the south-western corner of the Gulf of Mirabélo and was inhabited during the Late Minoan and Hellenic periods. The site is identified as the Minoa of Strabo (Spratt 1865: 138). To the east of the sandy bay is a short peninsula that juts out into the sea. Some shelter is provided on the east side of the cove in lee of this small promontory. The anchorage is sheltered from prevailing winds on a McKee Type (4) shore. Kritza River flows into the bay on the west side of the point. Few remains have been identified on the coast, as the city and its port are believed to have been submerged by the sea or buried under alluvium deposited by the river (Spratt 1865: 138-9; Demitzakis 1973: 59/21; Pirazzoli 1988: 173/table 3). Up the river valley inland to the south of the cove, a second site of Kato Korio or Vrokastro was inhabited during the Late Minoan IIIC period (Myers, Myers & Cadogan 1992: 286-9).

Vrokastro is situated high up on a narrow limestone ridge and could well have utilised the anchorage of Palako at the mouth of the valley. Spratt (1865: 139-140) comments that the sea would have been closer to the site during the Late Bronze Age. However, it is unlikely that the area would have been isolated as a small, rocky promontory on the coast, as Spratt also suggests.

**#274 * Gournia**

35:07 N 25:48 E

Gournia lies on a knoll over looking a sheltered anchorage on the southern McKee Type (1) shores of the Bay of Mirabélo. The anchorage was possibly utilized in the second millennium BC, although the shore site today is badly eroded and undercut (personal observation 1991). The location of the site on the isthmus provided an ideal and convenient position for communication with the south coast, over the 12km wide isthmus between the mountains. The excavated area of the site occupies an area of 15,000 sq.m. (although entire area has not been excavated ). The earliest traces of settlement at Gournia date to the Early Minoan period with the discovery of ossuaries of this period located outside the site and on the slopes at nearby Sphoungaras, close to the sea. The site flourished in the Middle Minoan III period as an industrial town. During this period a palace or governor's residence was erected on the crown of the hill (Fig. #274). Its portico on the southern end of the palace faces onto the 'public court' of the town, which was accessible by two roads. The palace contained a number of magazines, a large storeroom and a Lustral Basin. The settlement grew up around the palace with narrow paved streets which are still visible climbing up the slopes of the hill. These streets were constructed in the Middle Minoan period and have steps and a public drainage system (Boyd 1904: 33-37). There is a road which leads from the acropolis to the harbour on the north coast below. The houses in the town belong mainly to the Late Bronze Age and are small and tightly clustered both inside and outside the major ring-road that surrounds the site (Boyd 1904: 33-37). The road system divides the town into six blocks. The basement walls of the houses and thresholds still survive today. A copper oxhide ingot has been discovered at Gournia in a Late Minoan IB context (Betancourt et al. 1978). A small Late Minoan I shrine has been identified to the west of the site and is known as the 'town shrine'. The site was destroyed towards the end of the Late Minoan I period, although traces of Late Minoan III occupation have been identified

in various parts of the town site, including a house at the southern end of the settlement that is thought to been of Mycenaean as opposed to Minoan plan.

**#275 * Pachia Ammos** (Pachyammos) Pakheia Ammos
35:07 N 25:48 E

Pachia Ammos is a small summer anchorage situated in the south-eastern corner (head) of the Gulf of Mirabélo, located on a McKee Type (1) shore (Fig. #275). The coastline here has experienced recent silting (Denham 1986: 218; Fig. #275.1). Anchorage is possible in 1m of water off a N-facing shore. The anchorage is exposed to NE winds (MP IV). Minoan and Greco-Roman remains have been recovered from Pachia Ammos. Remains of a large Middle and Late Minoan cemetery have been identified here, with over two hundred pithoi burials and a Late Minoan chamber tomb (Davaras 1976: 217).

**#276 $ Kavoúsi** (Tholos)
35:08 N 25:51 E

The site is situated on an indent on the east shores of the Gulf of Mirabélo, northeast of Pachia Ammos, with shelter provided from N winds in a McKee Type (4) anchorage, in the lee of a small headland to the north of the cove. Early Iron Age remains of the settlement of Tholos have been found close to the shore of the gulf, with a temple (Davaras 1976: 114). Other later buildings have also been identified in the vicinity. Inland from the coast, a large Minoan settlement, also known as Kavousi, is currently being excavated on top of the mountain.

*ISLAND OF PSEIRA/ PSIRA*

**#277 @ Pseira/ Psira** (Psíra)
35:11 N 25:52 E

Pseira is a small, hilly island (highest point 211m) located at the eastern end of the Gulf of Mirabélo, 3km west of Mochlos, north Crete (Fig. #277). Today the island is barren and uninhabited. The eastern coastline is indented by three sandy coves separated from one another by tongues of land, one of which juts out into the sea for 150m (Davaras et al. 1992: 266). On the upper part of this promontory and on the adjoining hill side to the south which extends down into the middle cove, are traces of a small Minoan town, inhabited first in the Final Neolithic period. The site evidently owed its existence to excellent harbourage for small craft offered by the sheltered middle cove on the south side of the point (Fig. #277.1/.2/.3). The bay is

exposed solely to the east, and easterly gales are a rare occurrence in Cretan waters (Seager 1910; Leatham & Hood 1958-59: 277). It offers natural protection from storms blowing from the N and W and 'it still provides one of the most protected havens along this part of northern Crete' (Betancourt & Banou 1991: 107). The anchorage is located on a SSE-facing McKee Type (4) shore.

The excavation of Pseira has revealed a town that expanded during the Early and Middle Minoan times, reaching its greatest size in Late Minoan IB period (Betancourt & Banou 1991: 107). 'During this entire period, it must have relied on the sea for many of its supplies; it was surely an important way-station along the east-west coastal trading route that linked the palaces of Knossos and Malia in central Crete with the west, as far away as the Levant' (Betancourt & Banou 1991: 107). Most of the ceramic material found at the site came from nearby parts of Crete but others were imported from Knossos, the Phaistos-Kommos area and Kato Zakros, as well as the Cyclades, Cyprus and the Levant (Betancourt & Banou 1991: 107). Foreign imports are particularly noticeable from the Late Minoan I period onwards and include fragments of Canaanite amphora and White Painted VI amphora ware (Betancourt & Banou 1991: 108). The stone vase industry seems to have been a thriving activity on the island, relying on materials supplied by sea, mostly from the Cretan mainland (Betancourt & Banou 1991: 108). A stone anchor has recently been found at the site (Carter 1994, personal communication). Other imported materials include copper, tin and finished bronze objects; gold and silver jewellery; and sandstone from nearby Mochlos in Crete (Betancourt & Banou 1991: 108-9).

The settlement at Pseira covers an area of 15,000 sq.m, although the majority of houses are clustered along the narrow peninsula, with steps at intervals that descend into the harbour on the south side. The main road runs along the axis of the site, with smaller streets meeting at right angles. House remains have been identified built of large, roughly squared boulders of local limestone. Domestic shrines have been recorded in some of the larger houses. In what appears to have been the public shrine of the town Seager (1910) uncovered relief frescoes portraying a pair of goddesses. The conclusion that the site acted an important way-station or trading centre 'seems to be one of the few explanations for a wealthy harbour town set on an island with little

arable land, no mineral wealth, and few attractions other than the harbour' (Betancourt & Banou 1991: 109). Perhaps an additional reason for choosing this site as a trading station was its isolation. Its location on an offshore island kept a distance between the traders and the mainland populations. By the Late Minoan period after the decline of the trading station at Mochlos, the prosperity of the site grew.

The settlement was also occupied in Roman times possibly as a 'military camp' with traces of the adjacent harbour in the bay below (Leatham & Hood 1958-59: 277). Submergence of -0.75m has been observed at the site over the last 2000 years (Flemming 1978: 414/106).

*ISLAND OF MOCHLOS*

**#278 * Mochlos** (St. Nicholo) Mochlós
35:09 N 25:53 E

Mochlos is a small, round, limestone island situated c.150m off the northeast coast of Crete, in the eastern approaches to the Gulf of Mirabélo (Fig. #278.1). The island is about 300m in diameter and rises to about 50m high on the north side, although the cliffs on the east and west sides of the island are almost as steep. The island of Mochlos was an important Early Minoan settlement and harbour site. The site reached its peak of expansion in the Early Minoan II period, with rebuilding in the Middle Minoan IA period, after which occupation seems less intense (Fig. #278). The site was finally destroyed in the Late Minoan I period (Branigan 1991: 98). At the beginning of the Bronze Age the island of Mochlos was in fact joined to the mainland by an isthmus. A 1.5m rise in sea level resulted in the submergence of the isthmus which connected the island on its south side, to the mainland and brought an end to the anchorages that were exploited in the sheltered waters on either side of the isthmus. The narrow isthmus is now c. 2m below sea level (Fig. #278.2).

The earliest occupation on the island dates to the Final Neolithic to Early Minoan I period. This is particularly apparent in the cemetery area on the west side of the island where Seager (1909: 273) discovered an Early Minoan house-tomb complex. 'The quantity and quality of the gold jewellery and stone vases recovered from the Early Minoan cemetery also identify [Mochlos] as one of the richest sites in Early Minoan Crete' (Branigan 1991: 98). The main occupation period appears to have been from the Early Minoan II

period to early in the Middle Minoan period and is located mainly on the landward, south side of the island (Soles 1992: Fig.25.1; Fig. #278.3). Limited occupation extended into the Late Minoan and later Classical Greek periods. Minoan dwellings and a narrow stepped road descending along the outer wall of a large building of dressed stone lying about 15m from the shore, are visible on the south edge of the island (Leatham & Hood 1958-1959: 273). Traces of ancient walling of uncemented rough stone have been identified about 50m south of the island in 1.5-2m of water, close to the sunken isthmus and are believed to have been the remains of a dwelling or part of a Minoan retaining wall for the isthmus (Leatham & Hood 1958-59: 273). Accordingly, after the Middle Minoan IA period the population of the settlement decreased as the area of the island was reduced due to rising sea-levels (Seager 1909: 273).

Traces of Minoan occupation have also been found on the mainland opposite the island, together with later Roman settlement, including rock-cut tombs and fish tanks (Leatham & Hood 1958-59: 273-5).

Mochlos has been described as a 'gateway community' (Branigan 1991: 103) controlling exchange within and into and out of Crete, well situated on the east-west sea route along the north coast of Crete and possessing a perfectly naturally sheltered harbour. As noted by Seager (1909: 274) 'Mochlos must have possessed the best harbour on the coast' prior to sea-level rise, with shelter available either side of the isthmus depending on the direction of the wind. Thus, a McKee Type (4) shore.

*CAPE KASTELLOS*

*CAPE PHANEROMENI/ FANEROMÉNI*

*CAPE VAMVAKIA (Sitia Point)*

*BAY OF SITIA*

**#279 * Sitía** (Etia) Eteia/ Siteía
35:12 N 26:07 E

Sitía is situated on the south-western shores of the Bay of Sitia, c. 1.5km south-southwest of Sitía Point, on a gently sloping rocky coast (Fig. #279). The site is very sheltered from W winds (MP IV) on the west side of the bay but can get uncomfortable when winds veer NW (Denham 1986: 216). Anchorage is provided on an NE-facing bay beneath the ruined fort, on

a sand and mud bottom. The shoreline is described as McKee Type (4). Minoan material has been recovered from the area of the modern town of Sitía from Early Minoan through to Byzantine times, although most of the ruins are covered by later buildings. Most of the visible remains date to the Roman and Venetian periods.

**#280 * Pétras** (Pétra)
35:11 N 26:09 E

The ruins of a large Minoan site have been identified in the area of Pétras, 3km to the east-southeast of the modern town of Sitía, on what was most probably the edge of a riverine bay of the sea prior to riverine silting. Early to Late Minoan finds have been recovered (Princeton 1976: 830; Fig. #280). The site is situated in the middle at the back of the Bay of Sitia, in a marshy area close to the mouth of the Stómios River. The coast is N-facing but is sheltered from prevailing winds by the west side of the Sitia Bay. The anchorage is thus located on a McKee Type (4) shore. Mariners would encounter problems leaving the anchorage when the winds veered to the N.

**#281 $ Agia Photia** (Ayia Photiá)
35:13 N 26:11 E

Agia Photia is located above the McKee Type (1) eastern shores of Sitia Bay. The site was an extensive coastal cemetery, one of the largest in the Aegean, during the Early Minoan I and II periods (Davaras 1976: 128-9). Over two hundred and fifty graves have been excavated at the site and reveal a wealth of material, predominantly Cycladic in nature, relating to the third millennium BC (Davaras 1982). Amongst the finds Melian obsidian blades, bronzes and fishhooks have been recovered, implying the maritime nature of the site. The site, like Mochlos (#278) to the west, could have functioned as a 'gateway' for peoples from the Cyclades.

*CAPE MAVRO*

**#282 . Kiriamádhi Bay**
35:18 N 25:17 E

To the north of Tenda Bay and southwest of Cape Sídhero lies the small bay of Kiriamádhi (Fig. #282). The entrance to the bay is c. 1.5km wide and NW-facing. Small islands offshore provide some protection, although the bay is still quite exposed on a McKee Type (1) shore, but still used by small craft today (MP IV: 66).

*CAPE SIDHERO/ SIDHEROS (Cape Samoniun) (The eastern most*

*point of Crete, surmounted by 208m high hill)*

**#283 . Ayios Ioannis/ Sidhero**
35:19 N 26:18 E

This small 2-fathom-deep cove, close under the south side of Cape Sidhero, affords shelter in all weather except when winds prevail from the SE (Denham 1986: 215). Wreck Rock lies offshore to the south. This is a suitable anchorage to seek shelter when approaching Crete from the direction of Rhodes, as it is sheltered from the predominant NW summer winds on a McKee Type (4) shore.

**#284 . Dhaskaliá**
35:18 N 26:18 E

Dhaskaliá Bay lies c. 2km south of Cape Sidhero (Fig. #284) and provides shelter from W and N winds on an E-facing bay. The anchorage is still used by small vessels today and lies on a McKee Type (4) shore.

*GULF OF GRANDES*

**#285 * Erimoúpolis** (Vaï) Itanos
35:16 N 26:17 E

Erimoúpolis is situated on Erimoúpolis Bay which lies directly opposite the Island of Elasa, south of Cape Sidhero. The promontory of Itanos to the north of the site ends in Cape Sidhero and the site of Itanos is located just to the south of this promontory on a low hill fronted by two sandy bays (Fig. #285). Good anchorage is provided in the summer with shelter from N and NW winds on a E-facing bay (MP IV), particularly in the north bay. The anchorage at Itanos is on a McKee Type (4) shore. On both sides of the ancient acropolis (Fig. 285.1) there are submerged river outlets that run into the backs of the bays. As a result of subsidence of the coast of 2m in the last 2000 years and the disrupted gradient of the river, the coastal area became marshy and has now silted up (Raban 1991: 140,pl. XXXVIIc/d; Fig. #285.2). Beachrock lies offshore in both bays and anchorage would have provide a substantial, well sheltered harbour in the Bronze Age (Fig. #285.3).

Itanos was first occupied in the Bronze Age, but, the sparse remains presented at the site today date mainly to the Greco-Roman and Byzantine periods. Traces of Minoan ruins have been found south of Itanos, near the beach of Vaï, and include the remains of a Late Minoan IA villa (Blue Guide 1988: 192; Davaras 1976: 334).

*ISLAND OF ELASA*

**#286 $ Elasa** Onysia
35:16 N 26:20 E

Ancient remains have been found on the Island of Elasa which lies offshore (E) from the site of Itanos. The site is still utilised as an anchorage today on a McKee Type (4) shore. Shelter is sought on the lee side of the island.

*CAPE TENDA*

**#287 * Koureménos**
35:11 N 26:16 E

Koureménos is located on the sandy shores of Koureménos Bay which is situated to the north of Palaiokástrou Peninsula and stretches for 1.5km in length. Koureménos was the site of a small Late Minoan settlement (MacGillivray & Driessen 1990: 396). Good landing is provided in the bay to the south of Cape Tenda, particularly in the north (MP IV). The anchorage is E-facing and therefore described as being situated on a McKee Type (4) shoreline. Submerged masonry walls have been found u/w in the bay.

*PALAIKASTROU PENINSULA (Kastri)*

*GRANDES ISLAND (shelter on south side)*

**#288 @ Palaikastro** Heleia
35:12 N 26:17 E

The site of Palaikastro is situated to the northwest of the headland of Cape Plaka on the southern shores of a NE-facing bay, immediately west of the island of Grándes and south of Palaiokástrou Peninsula (Kastri), c. 90m high, both of which provided shelter to the site (MacGillivray & Sackett 1992: 223,fig.32.1; Bosanquet 1901-2: Pl.XVI; Fig. #288). The flat-topped bedrock promontory of Kastri serves to anchor a 1.5km long curving beach to its north and a small beach to its south. The anchorage of Palaikastro to the south is on a well sheltered McKee Type (4) shoreline. The principal monument at Palaikastro is a long-lived Minoan town situated 200m west of the salt-flats of the present shoreline on a low plain known locally as Roussolakkos (Fig. #288.1/.2). The salt-flats have formed as a process of siltation, due to the result of erosion from Kastri and deposition by a stream which drains from the hills to the northeast - the sediment being deposited in the bay - which increased as the rate of sea level rise was reduced around the end of the Late Bronze Age (Flemming 1978: 429-431; MacGillivray

& Driessen 1990: 396). Earthquake activity in the area and a major fault tending E-W that lies to the north of the town has caused subsidence of c. 0.5m and would also have contributed to the present state of the shoreline (Pirazzoli 1980). The area would have looked quite different in the Bronze Age. The coastline was probably much nearer the town and there would have been a large bay providing shelter for shipping and forming a natural harbour. 'Palaikastro played an important role in eastern trade as it offered convenient harbourage at a place important for navigation' (Davaras 1976: 241). The beach is backed by cobbles. Rock-cuttings can be seen on the south side of the limestone peninsula of Kastri, together with submerged fragments of walls at a depth of -1.8-2.2m, believed to be structures at least 2200 BP (Demitzakis 1973: 59/19; MacGillivray & Sackett 1992: 229,fig.362.6-8).

The site was occupied from the Neolithic through to the end of the Late Minoan period when, during the Late Minoan IIIC period, the last dwellings on Kastri were abandoned (MacGillivray & Driessen 1990: 395). The settlement at Roussolakkos covers an area of about 600 x 600m. Walls and pottery deposits suggest the emergence of the town at Roussolakkos in the Middle Minoan IB/IIA period. Traces of large buildings (Area X) were subsequently built above the earlier structures in the Middle Minoan IIB/IIA period. There seems to have been a widespread destruction of the settlement at the end of the Middle Minoan IIIA period (MacGillivray & Sackett 1992). The town was resettled in the Middle Minoan IIIB period and most of the visible remains date from this period to the Late Minoan IB period. Part of the main street has been excavated revealing several Late Minoan IA houses. Branigan (1972: 754) describes the main street as 'straight... broad and flanked by impressive house facades' possibly the dwellings of merchants-mariners. Other building remains include an impressive public ashlar building of Late Minoan IB date and a walled road that ran from north to east to the Minoan harbour, and is known as the 'Harbour Road' (MacGillivray & Sackett et al. 1987: 151-2). The 'Harbour Road' lead to Building I which is situated about 40m to the east of the harbour (MacGillivray, Sackett et al. 1987: 152). It is a Late Minoan I house with paved court yard, whose function was possibly connected with the harbour. Palaikastro was a very major Minoan town (Hood, personal communication 1996). The site was destroyed by severe fire, possibly an earthquake,

in Late Minoan IA. Traces of volcanic ash have been identified on top of buildings relating to this destruction by fire at the end of the Late Minoan IB period (MacGillivray 1995). The site was resettled in Late Minoan II, continuing until Late Minoan IIIB. A great deal of the material relating to this later occupation reveals signs of foreign contact and exchange (MacGillivray 1995). In Late Minoan IIIC, settlement moved to the bleak and windy promontory of Kastri possibly as a defensive move (MacGillivray & Sackett 1992). A large surface deposit of *murex* shell remains have been found on the southern slopes of Kastri, believed to relate to the manufacture of purple dye sometime in the Minoan period (Bosanquet 1904: 321; Stieglitz 1994: 50).

There are several Early and Middle Minoan ossuaries in the countryside around Roussolakkos, and an important Middle II to Late I Minoan period mountain shrine to the south of the site at Petsophas (MacGillivray & Sackett 1992: Fig.32.1). Minoan quarries have been identified at Ta Skaria along the shore to the southeast of the site, below Cape Plaka. Ashlar blocks were cut from the quarries and used in the building of the town (Bosanquet 1901-2).

*CAPE PLAKA*

*CARUBA BAY/ KAROUMBES (a number of watch towers and guard posts have been identified on the west shores of Caruba Bay (Tzedakis et al. 1990), linking a Minoan route way along the back of the bay and across Cape Plaka to the north)*

**#289 * Karoùmbes**
35:09 N 26:16 E

This extremely sheltered bay on the west side of Caruba Bay is sheltered to the north by a small peninsula and to the west by steep mountains. It is situated on a E-facing coast, on a McKee Type (4) shoreline. Davaras (1976: 358-9/106) records Late Minoan remains at this site.

**#290 [] Kato Zakros** Zakros
35:06 N 26:17 E

Kato Zakros is situated on the east coast of Crete, on the edge of a plain at the back of a small bay. A ravine runs into the site from the west and a stream passes to the south side of the ruins down to the beach. Alluviation from the river, combined with subsidence of 1m (Pirazzoli 1988: 174) since Roman times, has caused the plain to silt up. As a result deltaic build up has occurred on the edge of the bay (Flemming &

Pirazzoli 1981: 78). The site is a well protected, E-facing, natural harbour, which lies on the north side of Cape Zakros and is enclosed by precipitous, barren, limestone ridges, especially to the north (Platon 1971: 25,fig.; Fig. #290.1).

The Bay of Zakros has been described by Platon (1971: 40-1) 'as one of the safest in eastern Crete, providing a secure refuge for small vessels ... the waters of the inner bay stay relatively calm even when strong and violent winds blow from the NW, descending with great force from the steep cliffs and down through the ravine'. At the turn of the century Zakros is still described (Hogarth 1900/1: 123) as one of the best known ports of call for fishing fleets on the eastern side of the island and a principal station for sailing vessels en route from the Aegean to Libya. The anchorage is located on a McKee Type (4) shore, protected from prevailing westerlies. Watch towers have been identified along the coast to the south of the gorge (Tzedakis et al. 1990: 60-61/35).

Zakros was one of the most important harbour sites of ancient Crete, acting as the main gateway to the island from the Orient. It was the site of a Minoan palace which was destroyed by fire at the end of the Late Minoan I period (althoguh the palace of Zakros is quite small when compared with the palaces of Knossos, Phaistos and Malia). The ruins of the palace and surrounding town mare situated on the north side of the plain in a sheltered spot nestling between the hills (Fig. #290.2). The palace dates to the Neo-Palatial, Middle Minoan III to Late Minoan IB period and like other Minoan palaces it was constructed on a labyrinthine layout and was probably several storeys high. The building is approached from the east via the East Wing, the residential quarter. This was the main entrance and was in direct communication with the harbour via a paved road (Platon 1971: 72,89). In the middle of the palace is the Central Court. The West Wing housed the palace sanctuary and to the south were the workshops where evidence for bronze-working, pottery, perfume and oil production and luxury items, such as ivory, faience and rock crystal, were also manufactured (Platon 1971: 72,120). Artifacts recovered from the palace all imply its royal character and important role in overseas trade. Six bronze ingots in a Late Minoan IB context, thought to have been imports from Cyprus or possibly Anatolia, have been recovered from a room above

the Central Shrine (Gale 1991: 204). Other finds include ivory tusks from the Levant, an Archive Room full of tablets inscribed in Linear A, and Egyptian basalt vessels (Platon 1971).

The palace was surrounded by an urban community situated on the hills to the northeast and south, of which some of the houses have been explored. Paved roads surrounded the palace. Wiener (1991: 341) believes that 'the palace and town worked as an integrated economic unit, with the palace shrine, storerooms and workshops containing all the luxury products, including reworked Egyptian vases, ivory tusks and oxhide ingots and the town responsible for preparing and storing foodstuffs'. Over one thousand seal impressions have been collected from a house located on the corner of the hill to the north, 50m from the palace and 300m from the sea. This building, House A, was quite possibly a control point for goods coming in and out of Zakros (Wiener 1991: 341). Imported artifacts from throughout the eastern Mediterranean and Asia Minor have been recovered from the site and it is thought to have been a large Minoan trading station prior to its destruction (although the size and style of the houses do not appear to have been as grand as Palaikastro). Platon (1971: 242) believes, rather optimistically, that the ample evidence for contacts between Zakros and Egypt is extensive enough to identify Zakros as the point of departure of the *Keftiu* embassies shown in the wall paintings in the tombs of high Egyptian magistrates of Queen Hatshepsut and Tuthmosis III. He identifies timber as being one of the main exports from Zakros to Egypt, exchanged for gold, alabaster and basalt (Platon 1971: 243).

The harbour lay 100m below the palace, providing natural shelter for vessels (Fig. #290/ #290.3). 'Zakros commands a fine harbour protected from both N and S winds' (Alexiou 1987). A submerged rubble breakwater of unknown date, in 4m of water, has been identified on the southwest shore of the bay, extending approximately 100m offshore. This quay was identified by Platon (1971: 244) after a fierce storm, and he believes it was used in the Bronze Age for loading wood on to ships. Few traces of any harbour installations can be seen in the shallow bay of Zakros today (personal observation 1991). Rock-cut tanks have been identified under 0.7m of water offshore in front of the site, dating from the Roman period (Flemming & Pirazzoli 1981: 77-78). Flemming and Pirazzoli

(1981: 78) conclude that the sea level was 1m lower when the Minoan palace was constructed.

*CAPE ZAKROS*

**#291 * Katsonvaui** (Kato Cámpos)
35:03 N 26:14 E

To the south of Cape Zakros there is a slight bight in the coast that is sheltered at its southwest end by Kato Campos. The small Minoan settlement of Katsonvaui is located at the back of the bay (Tzedakis et al. 1990: 60-61/50). A further indent in the coast lies to the north of the site and a Minoan route way runs along the back of the bay and then turns inland (Tzedakis et al. 1989: 43-75). The anchorage is situated on a McKee Type (4) shoreline, facing ESE.

*KAVALLOS BAY*

**#292 $ Ampelos** Ampelos
35:02 N 26:15 E

The site of Ampelos is situated at the head of Kavallos Bay on the south-eastern point of the island. The bay is SSE-facing, 1.5km wide and protected by the two offshore islands of Kavallos which lie across the entrance to the bay. The bay is backed by a narrow, shelving stony plain that forms the shore (Spratt 1865: 238). Mountains rise steeply up behind Ampelos reaching a height of 700m inland. There is a fresh water spring in the vicinity. Although the anchorage is generally sheltered on a McKee Type (4) shore, it is difficult to approach when squalls blow off the mountains from the north.

Ampelos was occupied during the Greco-Roman period, when the site is believed to have acted as a fishing-town (Spratt 1865: 239). Davaras (1976: 357-9/67,79) notes the occupation of the site during the Middle and Late Minoan periods, but offers no evidence for his observations, however, traces of what is thought to be Minoan quarrying has also been identified at Ampelos (Tzedakis et al. 1990: 60-61/52).

*ISLAND OF KOUPHONISI (Located off the southeast coast of Crete and covers an area of 2 x 4km. Numerous erosion and solution notches, raised caves and erosion terraces provide evidence that the island has been uplifted in several stages. Separated from the mainland by the channel of Kuphon, c. 2km wide)*

**#293 $ Kouphonisi** (Koufonisi) Leuke
34:56 N 26:10 E

Fragments of Middle Minoan pottery and the

foundation of a large stone structure have been identified on the north shore of the island of Kouphonisi, in association with numerous *murex* fragments, which are believed to have been used in the production of purple dye (Bosanquet 1904: 321, 1939-40; Stieglitz 1994: 50). The main fresh water source of the island is found on the shore below the site. The majority of the remains on the island are however Greco-Roman, the main site being the nearby settlement of Levke (Papadakis 1983; Blue Guide 1988: 199). The island is described as a McKee Type (4) anchorage.

*CAPE GOUDHOURA*

**#294 . Akri Goudara** (Makrís Yialós)
35:00 N 26:08 E

Situated at the north-eastern end of the bay of Goudhoúra (Makri-Yalo), bound by the steep Cape Goudhoúra to the east-southeast and offshore rocks to the west (MP IV), the site is SW-facing on S-facing McKee Type (2)/(3) bay. Davaras has identified Middle and Late Minoan material at the site (1976: 357-9/62,71), but again offers no evidence to support his observations.

*CAPE KATO NERO*

**#295 $ Agia Photia** (Ayia Photiá)
35:00 N 25:51 E

Agia Photia is situated on the coast east of Cape Ierápetra on a small SE-facing bay. The bay is reasonably sheltered from the west by a small headland. The shore can be described as a McKee Type (2)/(3) except when squalls are blowing off the mountains. Davaras (1976: 357-9/29,117) identifies the site as being occupied in the Middle and Late Minoan periods, but offers no evidence to support his observations.

*CAPE IERAPETRA*

*ISLAND OF GAIDHOURONISI (low-lying island lies c. 11km off the south coast of Crete, shelter is provided from S winds at the north-eastern tip of the island and on the north side of the island)*

**#296 $ Ierápetra** Hierapetra Hierapytna
35:00 N 25:44 E

Ierápetra stands on a small plain on the south coast of Crete, on the south side of a narrow block of land or isthmus which forms the shortest and easiest route across the island of Crete to the Gulf of Mirabélo on the north coast. The plain projects seaward slightly, particularly on the eastern side. To the east is a small

headland which bounds the west side of the Bay of Ierápetra and provides shelter from N and NW winds in 9-11m of water (MP IV) and is bound by Cape Ierápetra to the east (Fig. #296). The anchorage is S-facing and therefore exposed to S winds (MP IV). This anchorage can generally be described as being situated on a McKee Type (2)/(3) shoreline, except when squalls blow off the mountains or when S winds prevail. Extensive areas of beachrock have been identified offshore to the west of the anchorage (Flemming 1978: 420). There is evidence of submergence of -0.5m since the Roman period (Pirazzoli et al 1982: 40/table 3). The ancient anchorage has silted up due to alluvial deposition. The site of Ierápetra is thought to have been occupied in Minoan times (Spanakis 1982, Papadakis 1986, Davaras 1976: 358-9/157), although there is little evidence of habitation during this period. The site was a major Greek city state of Crete and flourished in the Roman period, to which the architectural remains once visible belonged. Remains of the outer Roman harbour can still be seen running out from the Venetian castle. The inner basin is now marshland, or covered by the modern town, but may have provided anchorage for vessels in the second millennium BC prior to silting.

**#297 * Myrtos-*Pyrgos***
35:00 N 25:35 E

Myrtos is located on a 77.6m high conical hill overlooking the sea, on the east side of the valley of the River Myrtos about 0.5km from the modern village. The site overlooks the entrance to a river valley and commands a good view of the valley and the coast. It is clear that the river mouth of Myrtos was not a major anchorage, as it is located on an exposed McKee Type (2)/(3) shoreline. The settlement was more probably situated here to utilise the narrow alluvial strips either side of the valley for agricultural purposes. However, the river mouth could have supported a small scale fishing anchorage.

The extensive Minoan settlement covered an area of about 150m from west to east and 100m from north to south (Hood et al. 1964: 94). The summit of the hill is formed by a small plateau which slopes steeply southwards. The south and west slopes were especially productive of sherds of the Minoan periods, from Early Minoan to Late Minoan I (Hood et al. 1964: 94). The site was occupied from the Early Minoan II period to Late Minoan IB, over four successive phases (Cadogan 1992: 202). Traces of Minoan houses and terracing were also found on both slopes. The principal

monument of the Middle Minoan IA period was a two-storey house-tomb in the southwest corner of the site. A large number of stone vessels were recovered from the site (Hood et al. 1964: 94). A large impressive Minoan villa has also been discovered on top of the hill dating to the Late Minoan I period. Its architecture is of palatial quality and the finds include two Linear A tablets and clay sealings. The villa burnt down in the Late Minoan IB period (Cadogan 1992: 202).

The Early Minoan site of Myrtos *Fournou Korifi* lies 4km east of the village of Myrtos (Warren 1972). The site has revealed about ninety rooms from the Early Minoan II period. One of the rooms on the southwest corner of the site has been identified as one of the oldest known Minoan domestic shrines.

*CAPE THEOFILOS*

**#298 * Arvi** (Moni Arvis)
34:59 N 25:28 E

Arvi was the site of a Greco-Roman coastal settlement. It is situated at the head of a valley and sheltered from the wind by high hills all around. A number of Minoan settlements have been noted in the valley (Hood et al. 1964: 89-93,fig.19; Fig. #298). There is an extensive Middle Minoan settlement on a high hill known as Kamini to the east of the valley, c. 1km from the sea. Sherds and stones from houses have been identified over an area of about 150m from the summit of the hill to the south. From the northern end of the saddle which links the hill of Kamini to the north, a path leads up the face of the mountain to the Middle and Late Minoan stronghold of Fortetsa. Middle Minoan III and Late Minoan I sherds have also been noted at the southern end of a ridge of hills on the west side of the valley, known as Komitas, associated with a Minoan farmhouse which overlooks the sea to the south (Hood et al. 1964: 92,fig.19/E). The valley mouth is situated on a S-facing, straight-line coast with little shelter and can be described as a McKee Type (2)/(3) anchorage. It is difficult to approach this site from the east when W winds prevail.

**#299 * Trokhaloi (East)**
34:59 N 25:25 E

Trokhaloi East is a small Minoan settlement in a little valley about 2km west of Arvi and to the east of Keraton Bay. The site is some 100m from the sea on the south end of a ridge. Minoan walls and pottery dating from the Middle Minoan

and Late Minoan I periods have been identified on the east side of the ridge (Hood et al. 1964: 86). Some shelter is provided at the site from W winds by the promontory that forms the eastern side of Keraton Bay. The anchorage can be described generally as one on a McKee Type (2)/(3) shoreline, although it is difficult to approach from the east when W winds are strong.

*KERATON/ KERATOKAMBOS BAY*

**#300 * Trokhaloi (West)**
34:59 N 25:24 E

Minoan and Roman settlements have been identified by the sea in a small valley about 4km west of Arvi, in the far eastern reaches of Keraton Bay. The Minoan settlement is located on the hill immediately north of the road to the east of the valley (Hood et al. 1964: 84). Traces of the settlement are confined to the southern slopes of the hill and in a cutting to the north of the road. To the south of the road most of the material appears to be Roman with the exception of a 5m long Minoan wall (Hood et al. 1964: 85). Most of the pottery recovered dates to between the Middle Minoan II-III to Late Minoan I periods. The anchorage is situated on a SW-facing bay and therefore can be described as a McKee Type (2)/(3) shore, although the anchorage is difficult to approach from the east when W winds prevail.

**#301 * Kastri Keratokampou**
35:00 N 25:21 E

Kastri lies on the sea shore to the west of the stream bed which enters Keraton Bay via a gorge which leads down from Khondros. The site consists of a saddle-shaped hill running from west to east, with a rocky peak at the eastern end (Hood et al. 1964: 82). Some shelter is provided 0.8km offshore near to the head of Keraton Bay, just off the village of Kastri, although waves pick up in the bay when gusts blow off the mountains and down the gorge from the north. The bay provides spacious anchorage but is not so well sheltered from W winds and swell (MP IV), on a McKee Type (2)/(3) shore. A coastal bank and rocks are situated on west side of bay. The majority of Minoan pottery was found at the west end of the site and comprised of both Middle and Late Minoan sherds (Hood et al. 1964: 83). Classical and Hellenistic sherds were also recovered. On the north side of the road by the beach about 50m east of the stream bed, a thick deposit of Minoan pottery, mostly amphora fragments, which extended for about c. 30m to the

east, was noted and identified by Hood, Warren and Cadogan (1964: 83) as the possible position of ancient warehouses on the shore.

*ANAPODARI/ ANAPODIARIS RIVER*

*KARASAH POINT*

**#302 . Sudsuro** (Marithaki) Priansus
34:58 N 25:16 E

Sudsuro lies on the southwest side of the semi-circular bay of Sudsuro (Tsoútsouros) which is bounded by Cape Sudsuro to the west and Karasah Point to the east. The shingle beach bay is c. 3km wide and is SSE-facing and backed by cliffs and bold crags. Anchorage is afforded in 13-18m of water offshore in the calm patches of water that avoid the gusting winds that blow down the valley between the two mountain ranges to the north (MP IV). Thus, the site is described as a McKee Type (4) anchorage. The site of ancient Priansus is located on the northeast side of the bay.

*CAPE SUDSURO/ TSOUTSOUROS*

*ASTEROUSIA MOUNTAINS*

**#303 * Trypeti**
34:56 N 24:58

Trypeti is situated to the east side of Cape Trekala at the back of a sheltered sandy McKee Type (2)/(3) bay. The anchorage is SSE-facing. The anchorage is approached from the land by a narrow gorge. Evans (1928: 82-83) identified early foundations visible in the corner of the beach and wall terracing at the bottom of the slope (Fig. #303). Evans (1928: 83) also identified quantities of Middle Minoan ware and Late Minoan I oil jars, as well as the corner of a larnax with Linear A script signs. Evans (1928: 83) believed that the site was linked by a track across the inland range to the Messara Plain. Davaras (1976: 358-9/85) has also identified Late Minoan remains at this site.

*CAPE TREKHALA/ TRAFOULAS*

**#304 * Léntas/ Lendas** Lebena
34:56 N 24:56 E

Lebena lies in a small bay to the east the Lion's Head promontory (Cape Kephala). The site is located in the modern village and extends on to the Lion's Head promontory (Fig. #304). Predominately occupied in Hellenistic and Roman times through to the 9th century AD, Lendas

possessed a harbour. An Early Minoan settlement and cemetery site has also been identified on the low hill connecting Léntas Cape (Nisis Tráfos) with the mainland (Blackman & Branigan 1975: 35; Phillips 1991: 642-3). The site was occupied through to the Middle Minoan I period, but the majority of walls and tholos tombs uncovered are Early Minoan in date. Imported Egyptian goods have also been recovered from the site (Phillips 1991: 642-3).

Smaller vessels anchor in the outer part of the cove (MP IV) or beach on the beach. The island of Ksimithomouri lies close off the east entrance of the cove. Léntas is well sheltered from prevailing winds on a McKee Type (2)/(3) shore.

*CAPE KEPHALA*

*BAY OF KALON LIMÉNON/ KALI LIMÉNES ('Fair Havens')*

**#305 * Kalí Liménes** ('Fair Havens') Kaloi Limenes
34:56 N 24:50 E

Kalí Liménes is situated at the southwest end of the small bay of Kalón Liménon. The bay is open to the east but partially sheltered by the offshore islands to the south (Megalonísi). Good shelter is provided from W and N winds in the McKee Type (4) bay by the promontory of Líthinon and between the offshore islands (MP IV; Fig. #305), although shelter is not completely guaranteed as this stretch of the coast is subject to changeable weather. Evans (1928: 85) states that it is 'impossible not to believe that this harbour was not made use of in the great days of Minoan sea dominion', possibly as a stop-over point en route to Kommos (#308), although prevailing W winds make passage to the west difficult along the south coast of Crete. The bay is backed by a sandy beach and Ayiofarango Gorge and shoals extend offshore. The valley of Ayiofarango has been infilled with alluvial deposits since the Early Bronze Age, most sediment having been deposited by the Roman period and may account for silting in the bay (Doe 1973; Bintliff 1977: 611). The bay affords sheltered anchorage. Paul stopped at Kaloi Limenes en route between the southern Levant and Rome (Acts 27.8).

Two Early Minoan tholos tombs have been recorded on the hill side above the site (Blackman & Branigan 1975: 17-20/SC2). Also on the small steep-sided and smoothly contoured hill above the bay are the remains of an Early or

Middle Minoan farm, as well as a Roman building (Blackman & Branigan 1975: 22-23/SC5).

Some 2km along the beach to the northeast of Kalí Liménes are the remains of the Greco-Roman site of Lasaia. Remains of the Greco-Roman harbour mole can be seen extending in a south direction out from the shore to an islet that lies 100m offshore, that of Nissos Traphos, which formed the base for the ancient city of Lasaia (Blue Guide 1988: 136). Early Minoan tholos tombs have been identified on the steep hill side to the north of Lasaia (Blackman & Branigan 1975: 26).

*ISLAND OF MEGALONISI (Rises to 58.9m, passage between island and mainland obstructed in centre by shoals)*

**#306 * Trypeti**
34:56 N 24:45 E

The site is situated on the south coast of Crete on a S-facing indent to the east of Cape Líthinon. The indent is backed by a sandy beach and enclosed by two rocky promontories on either side. The anchorage is well sheltered from prevailing winds on a McKee Type (4) shore. Quantities of Middle Minoan II and Late Minoan I pottery have been recovered from the site (Sotirakis 1992: 55). The anchorage could well have acted as a stop-over point en route to Kommos (#308), used by mariners to shelter their vessels before rounding the dangerous point of Líthinon.

*CAPE LITHINON/ LITTINOS Lisses (cliffy headland)*

*GULF OF MESSARA*

**#307 $ Mátala** Metallon
34:59 N 24:46 E

Mátala lies on a small bay to the south of the Gulf of Messara. The bay is surrounded by calcareous sandstone cliffs which extend to a height of 45.7m on the north side (MP IV) and forms an almost landlocked natural harbour (Fig. #307). In antiquity, as today, it is likely that ships would have moored in the southern part of the bay in 1.8m of water, protected to a certain extent from prevailing winds, providing shelter for vessels in both prehistoric and Classical times. The anchorage is generally described as being on a McKee Type (1) shore. There is a sandy shore at the back of the bay which could have been a landing place. The anchorage possibly acted as an additional port to the palace of Phaistos. The ancient settlement lay mainly on

the hill at the southern end of the bay (Princeton 1976: 558). Most of the visible remains, including the rock-cut chambers, of which there are over one hundred in the cliffs around the site, are Roman, with very little trace of Bronze Age occupation, however, Evans (1928: 87), Hadjidaki (1977) and Spanakis (1982) all believe that Mátala was utilised in the Bronze Age as one of the port towns of Phaistos despite the fact that there is negligible evidence for Bronze Age occupation at Mátala.

*CAPE NISI*

**#308 [ ] Kommos/ Komós** (Komo)
35:00 N 24:46 E

The ancient site of Kommos is situated about 500m north of the southern end of Messara Bay. At this point the shore retreats towards the east, forming a well protected corner with the rocky shores of Cape Nisi, which lies to the south. A half submerged reef, some 7-8m high has been identified 300m offshore, which at one point rises above the water level and forms a small rocky islet known as Papadoplaka (Fig. #308). Shaw (1990: 426) calculates a rise in sea-level at Kommos of 2.50m. Shaw (1982: 194) thinks it is possible that in the Late Minoan period Papadoplaka was linked by a partly submerged sandy spit or tombolo to the coast. This offshore reef no doubt acted as a breakwater, breaking the force of the prevailing WNW winds and protecting the anchorage at Kommos. The shoreline would have been 50-100m closer to the offshore reef and the submerged tombolo linked to the island would have provided adequate natural shelter for vessels in the second millennium BC (Gifford 1992). A small landing place is noted in the southeast corner of the bay (MP IV: 39). The protection afforded by the offshore reef at a Kommos implies that it is an anchorage on a McKee Type (4) shore (Fig. #308.4).

Kommos was first occupied in the Middle Minoan II period through to the Late Minoan IIIB period (Shaw & Blitzer 1983: 91). After a gap of three hundred years the site was reoccupied in c. 950 BC. It was an important harbour town throughout the second millennium BC believed to have served Ayia Triada (#309) and the Palace of Phaistos. The settlement was located on a low hill at the back of the beach, with civic buildings below and to the south (Fig. #308.3). A number of Middle and Late Minoan houses have been excavated on the hilltop and slopes. To the north of the buildings a broad (2.85m wide) E-W

paved road, with drainage channel on its north side, has been located. The broad road was constructed about 1550 BC and went out of use c. 1300 BC. It was a major passage-way that separated the installations near the shore from the houses on the upper slopes and hilltop (Shaw 1981). The road may have lead inland to Ayia Triada, Phaistos and beyond. Hadjidaki (1977) describes a road with double wall lines that runs from the Palace of Knossos to the south coast at Kommos, this could be the road that Evans (1928: 72) described as a 'Minoan Built Way' at Visala, below Kanli Kastelli, to the south of Knossos.

During the Late Minoan I period an enormous palace-like building (J/T) was constructed next to the shore, with an extensive colonnade facing onto a court in its centre (62 x 40m)(Fig. #308.1). The scale and layout of the building implies that its function was more likely related to the harbour and its commerce (Shaw 1986: 263). This building, J/T, is presently at 2.72m above sea level and has been badly eroded over time by the huge SW swells that accumulate in the winter and crash directly onto the beach (Shaw 1990: 426). Building J/T was succeeded in the Late Minoan IIIA 1 period by building P (Shaw 1990: 426). Building P consists of a series of at least four ashlar E-W galleries, c. 5.6m wide and 35m in length (Fig. #308.2/.3). The western ends of the long, roofed galleries face the sea and reveal no signs of closure. It is believed that the buildings were used for storage or as ship-sheds (Shaw 1986: 266-268; 1990: 426) to protect the ships against the raging winter storms. Building 'P' is some distance from the sea and would have been further in the Bronze Age, but it has been suggested that the ships were only housed here during the winter storms when they were not being used, having been dragged over rollers to the ship-sheds (Shaw, M. 1985: 23). Another possibility is that the large, open area to the west of building P may have been used for shipbuilding and the galleries served as longer term storage areas (Shaw, M. 1985: 23). However, there is no evidence for shipbuilding in this area. Finally, the Shaw's (1990: 425,fig.9; Shaw, M. 1985: 21-23,fig.8) have published a tentative reconstruction of the ship-sheds, building 'P'; and they draw a number of comparisons between similar buildings discovered on Crete, including the 'bastion' building at Ayia Triada (Shaw, M. 1985: 21; #309), the u/w building in Moulin Bay, Malia (Shaw, M. 1985: fig.11; #268), and the partly submerged rectangular structures at Nirou Khani (Shaw 1990: 425; #266). Comparisons are

also drawn between building 'P' and the shoreside scene in the Miniature Fresco from the West House at Akrotiri (Shaw, M. 1985: 23,pl.IIIb; Shaw 1990: 430) which depicts a large, flat roofed, one storey building, 'with an unusual façade consisting of at least four large openings' (Shaw 1990: 430).

The site flourished in the Late Bronze Age. Large numbers of Knossian type vases from the Late Minoan IB period have been found at the site (Watrous 1992: 170), providing some support for the claims by Evans (1928: 60-92) that Kommos was linked directly to Knossos by a 'Royal Road' (although they could also have arrived by sea). The largest number of imported vessels in the Late Minoan I at Kommos come from the Aegean, with Egyptian, Canaanite and Cypriot vessels turning up in Late Minoan IB contexts (Watrous 1992: 170). Two copper ingots believed to be of Cypriot origin (Muhly et al. 1988: 283-84) have also been found in Late Minoan I contexts and are further evidence 'of the Cretan trade route that ran eastward via Karpathos and Rhodes to Cyprus' (Watrous 1992: 173,fig.10; Portugali & Knapp 1985). The rise in foreign imports is particularly impressive in the Late Minoan IIIA 1 period (Shaw 1986: 269; Watrous 1992: 174), with many examples of imported pottery from the Greek mainland, the Cyclades, Cyprus (including large numbers of White Slip II 'milkbowls' and Base Ring I and II fragments), the Levant (including two distinct types of Canaanite amphoras predominantly of the southern type), and Egypt, especially vases and storage jars (Shaw 1981a: 245-247; Watrous 1992: 156-163,175-6). By the Late Minoan IIIA2-B period international trade links at Kommos encompassed an area from Sardinia to the Levant. However, after the 14th century BC the numbers of Cypriot, Canaanite and Egyptian imports fall; and Chaniote, Peloponnesian, and Italian wares begin to increase (Watrous 1992: 182).

At least five stone anchors have been recovered at the site, their archaeological contexts placing them as late as Late Minoan III although some may be earlier (Shaw & Blitzer 1983). All of the pierced stones were found near or on the way to the seashore, which has lead the excavator to believe that they were being used or were intended to be used as anchors rather than for some other activity (Shaw & Blitzer 1983: 91). All the anchors are of the so-called Cretan one-holed type (McCaslin 1980: fig.35/b). There is also extensive evidence for fishing activities

at the site with finds including barbed bronze hooks, netting needles, line weights and numerous different types of fish bones (Shaw 1981).

Occupation continued at the site throughout the Geometric/ Archaic to Early Roman periods (Shaw 1992: 149,fig.)

**#309 * Ayia Triada** (Ayia Triàda)
35:03 N 24:48 E

Ayia Triada sits on the west slope of a low marl hill which slopes down to an alluvial plain some 4km from the coast. The ancient River Lethaeus, modern Yeropotamos, runs across the Plain of Dikáki (Messara) to the north of the site and provides 'access to the sea' (MP IV: 39). Much of the alluvial deposition that has accumulated between the site and the coast is believed to have been deposited since the 2nd millennium BC (Watrous 1984: 131). This assumption is based on geomorphological surveys undertaken in the nearby Ayiofarango Valley to the south, where alluviation in the valley began slowly after c. 3000 BC (Blackman & Branigan 1975: 23). To my knowledge no geomorphological studies have been undertaken on the alluvial plain of the Yeropotamos but it is feasible that in Minoan times an embayment of the Libyan Sea occupied the base of the Ayia Triada-Phaistos ridge (Gifford 1992: 75). However, it is more probable that the Gulf of Messara extended further to the east during this period, but not as far as the foot of the Ayia Triada-Phaistos ridge, and that vessels moored here and trans-shipped goods up the Yeropotamos River to Ayia Triada. It has been suggested that Ayia Triada could be reached from the sea in the Bronze Age by navigating the then wider river inland to the site (Bintliff 1977: 619). Thus, a McKee Type (4) riverine anchorage, may have been used at Ayia Triada during much of the Bronze Age (Fig. #309), serving the main harbour of Phaistos.

The Middle Minoan IIIB to Late Minoan IB villa at Ayia Triada is believed to be the summer residence of the Palace of Phaistos which lies some 3km to the southeast (Watrous 1984: 124,fig.III.1). Beneath the villa are houses of the Middle Minoan II-IIIA period. The villa is divided into two separate areas, both with two main phases of occupation (La Rosa 1992: 75). The larger one Villa A, appears to have been more wealthy than its neighbour, Villa B. The overall plan of Villa A contains many of the features of the palaces: a 'domestic quarter', extensive storerooms, and a main hall for ceremonial

purposes (Watrous 1984: 132). Wall paintings and Linear A tablets have been recovered in Villa A. Two of the Linear A tablets detail coppersmiths lists (Watrous 1984: 130). Linear A tablets have also been recovered from what is believed to have been the service quarter and storage area of Villa B (Watrous 1984: 131), together with a hoard of copper ingots in a Late Minoan I context (Gale 1991: 204).

To the north of the villas lies the lower court which is bounded at its northeast end by the portico of a massive 'bastion', believed to have been a later construction than the villas (Watrous 1984: 131). This building was destroyed in the Late Minoan IB period and later restored in a slightly modified form. Watrous (1984: 131) believes the 'bastion' was a warehouse with a residential or official section, possibly for a harbour of the Late Minoan period when the sea was closer to the site. Even if the shoreline has not altered drastically from its present situation (as discussed above) the 'bastion' could have served at least in part, for the storage of local produce and products which would then be exchanged for goods brought in by sea trade (Watrous 1984: 131-2). Another interesting point to consider is the remarkable similarity in the design of the so-called 'ship-sheds', building 'P, also of Late Minoan I date, that have been excavated at Kommos (#308) (Shaw, M. 1985: 21-22). A number of Late Minoan II houses and streets have also been identified in the vicinity of the 'bastion' near the base of the hill (Watrous 1984: 132). These houses probably represent the dwellings of a lower class.

**#310 $ Ayia Galini** Sulia/ Soulia/ Soulena
35:06 N 24:42 E

The river mouth harbour site of Ayia Galini (Erimópolis) is situated at the mouth of the Elektra (modern Platis) River, in the north-eastern corner of the Gulf of Messara. The Platis River runs inland, half way across the island (MP IV) and would have acted as a good route inland in ancient times. The bay is surrounded by high cliffs, particularly on the west and overlooks a narrow beach (Leatham & Hood 1958-59: 278). The entrance to the valley is S-facing and located on a McKee Type (2)/(3) shore. Traces of a Roman quay or seawall have been found at the waterfront, associated with the Roman site of Soulia that lies c. 1km inland to the northeast (Flemming 1991, personal communication).

*CAPE MELISSA (Northwest point of the Gulf of Messara)*

## FIGURE LIST AND DESCRIPTION OF FIGURES IN PART II

Published plans of sites listed in the catalogue (Part II) are here reproduced for convenience of reference, in their form as published. They employ a variety of conventions and have been completed to different standards of accuracy; some do not even give a scale or north arrow. Never-the-less they give a valuable indication of the coastline, natural shelter provided and the location of the harbour and associated harbour facilities.

## MAIN MAP

The Main Map (four sheets located in a sleeve at the back of this volume) are presented at a scale of 1:500,000 km and show the location and site number of each site discussed in the catalogue (Part II), together with all the geographical features referred to in both the text and the catalogue. The Main Map, and Fig. V.2 and Figs. VI.2.i-VII.3.ii inclusive which relate to the main text, have been compiled on a CAD program with the generous help of Pringle Brandon Architects, London.



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Fig. # 03 Caunos. Plan of site, after Heikell 1989: 167.

Fig. # 03.1 Caunos. Looking down the river to Delikada from the citadel, after Heikell 1989: 167.

Fig. # 03.2 Caunos. View of Köycegiz River plain below citadel; possible location of Bronze Age harbour. (Photo L. Blue).

Fig. # 05 Kizilkuyruk Koyu. Location of site and surrounding environment of western Fethiye Körfezi, after Heikell 1989: 169.

Fig. # 11 Gemili Island. Plan of region, after Heikell 1989: 177.

Fig. # 12 Ölü Deniz. View of bay and modern snad bar, looking north. (Postcard).

Fig. # 13 Patara. Plan of site, after Flemming et al. 1973: 54,fig.51.

Fig. # 13.1 Patara. View looking east across site and silted river esturary; possible location of Bronze Age harbour. (Postcard Güney).

Fig. # 13.2 Patara. View looking inland up silted river estuary. (Postcard Güney).

Fig. # 14 Kalkan. View of site looking northwest. (Postcard).

Fig. # 16 Kaş. Approaches to Kaş Liman and Kastellórizon, after Heikell 1989: 182.

Fig. # 16.1 Kaş. Plan of site, after Tosköz 1986: 90.

Fig. # 18 Limin Kastellórizon. Plan of site, after Pirazzoli 1987b: Fig.1.

Fig. # 18.1 Limin Kastellórizon. View looking northeast across Limani Harbour, after Pirazzoli 1987b: 60,fig.2.

Fig. # 20 Tersane Bay, Kekova Island. View of bay looking south. (Photo L. Blue).

Fig. # 20.1 Tersane Bay. View of the southwest end of Kekova Island looking into Kekova Roads. Tersane Bay in lee of promontory (Photo L. Blue).

Fig. # 24 Kale Köy. Plan of Üçagiz Liman and Kale Köy, approaches and anchorages, after Heikell 1989: 187.

Fig. # 26 Gökkaya Liman. Plan of site, after Admiralty Chart 1964.

Fig. # 27 Myra. Plain in front of site looking south over greenhouses. (Photo L. Blue).

Fig. # 27.1 Myra. Looking east from site across alluvial plain; possible location of Bronze Age harbour. (Photo L. Blue).

Fig. # 27.2 Myra. Lagoon along shore south of Myra. (Photo L. Blue).

Fig. # 27.3 Myra. Alluvial accumulation of plain to south of Myra. (Photo L. Blue).

Fig. # 29 Finike. View looking northeast across harbour front, towards silted valley plain. (Photo L. Blue).

Fig. # 30 Limyra. View of silted plain from the acropolis, after Toksöz 1986: 105.

Fig. # 32 Çavus Liman. Plan of site, after Heikell 1989: 192.

Fig. # 33 Çineviz Liman. Plan of site, after Heikell 1989: 193.

Fig. # 35 Phaselis. Plan of site, after Admiralty Chart

Fig. # 35.1 Phaselis. View looking northwest across the southern harbour. (Photo L. Blue).

Fig. # 35.2 Phaselis. View looking south across the central harbour. (Photo L. Blue).

Fig. # 35.3 Phaselis. View looking north across the northern harbour. (Photo L. Blue).

Fig. # 35.4 Phaselis. Plan of site, after Tosköz 1986: 122.

Fig. # 36 Kemer. Plan of site, after Heikell 1989: 195.

Fig. # 37 Antalya. Plan of site, after Admiralty Chart 1964.

Fig. # 37.1 Antalya. Looking southwest from Antalya across Antalya Bay. (Photo L. Blue).

Fig. # 38 Lara. Plan of site, after Admiralty Chart 1964.

Fig. # 39 Side. Plan of site, after Denham 1964: 108.

Fig. # 39.1 Side. Offshore reefs, looking south (Photo L. Blue 1989).

Fig. # 39.2 Side. Offshore reefs, looking north (Photo L. Blue 1989).

Fig. # 42 Fiğla. Plan of site, after Tigrel 1975: Fig.2.

Fig. # 42.1 Fiğla. View across harbour looking out ot sea, after Tigrel 1975: Fig.12.

Fig. # 43 Alanya. Plan of site, after Admiralty Chart 1964.

Fig. # 44 Aydap. Plan of site, after Denham 1964: 123.

Fig. # 45 Gazipaşa. Plan of site, after Admiralty Chart 1964.

Fig. # 45.1 Gazipaşa. General view from citadel, after Rosenbaum et al. 1967: Pl.XV.1.

Fig. # 46 Antiochia. View of western bay, after Rosenbaum et al. 1967: Pl.VI.1.

Fig. # 46.1 Antiochia. View of eastern bay, after Rosenbaum et al. 1967: Pl.VII.1.

Fig. # 49 Anamur Burun. Plan of site, after Heikell 1989: 208.

Fig. # 52 Soğuksu Liman. Plan of site, after Heikell 1989: 209.

Fig. # 52.1 Soğuksu Liman. View of site from west. Anchorage in bay to south of white building, in lee of promontory. (Photo L. Blue).

Fig. # 53 Aydinick. Plan of site, after Heikell 1989: 212.

Fig. # 53.1 Aydinick. View of site looking west. (Photo L. Blue).

Fig. # 56 Ovacik Adasi. Plan of site, after Admiralty Chart 1964.

Fig. # 56.1 Ovacik Adasi. View from the headland looking north towards the mainland (Photo L. Blue 1991).

Fig. # 56.2 Ovacik Adasi. View across the isthmus, looking west (Photo L. Blue 1991).

Fig. # 57 Ağalimani. Looking east from southwest shore of Bağsak Bay. (Photo L. Blue).

Fig. # 57.1 Ağalimani. Plan of site, after Heikell 1989: 212.

Fig. # 57.2 Ağalimani. View of promontory of Liman Kalesi, looking east (Photo L. Blue 1991).

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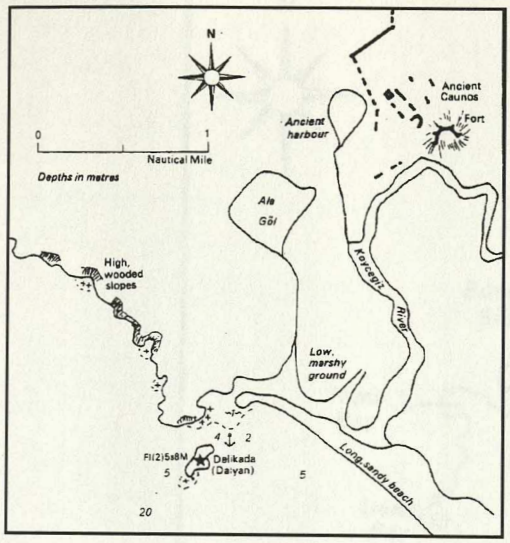
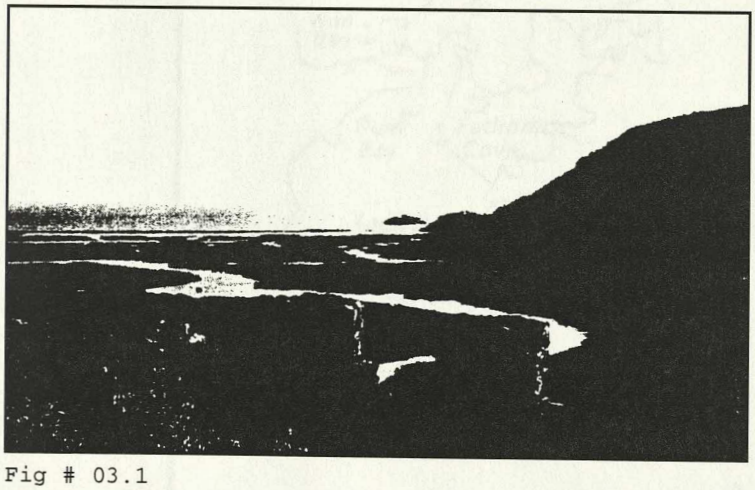



Fig # 03



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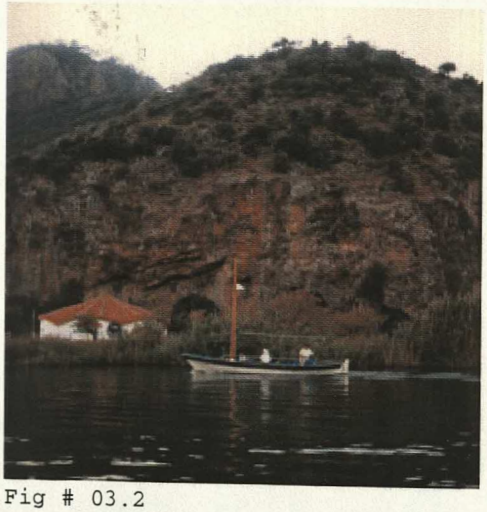

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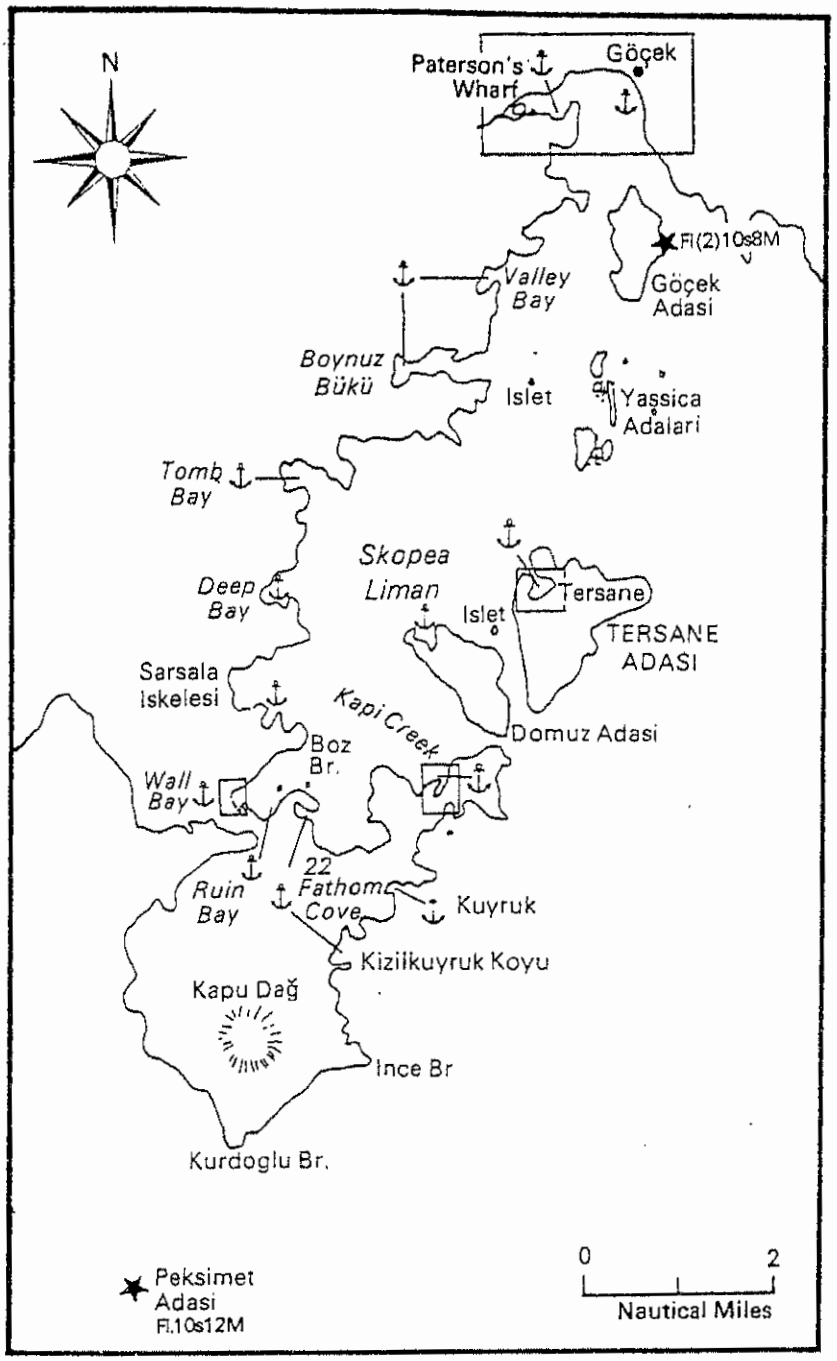



**SKOPEA LIMAN** 36°35'N 28°50'E

Fig. # 05

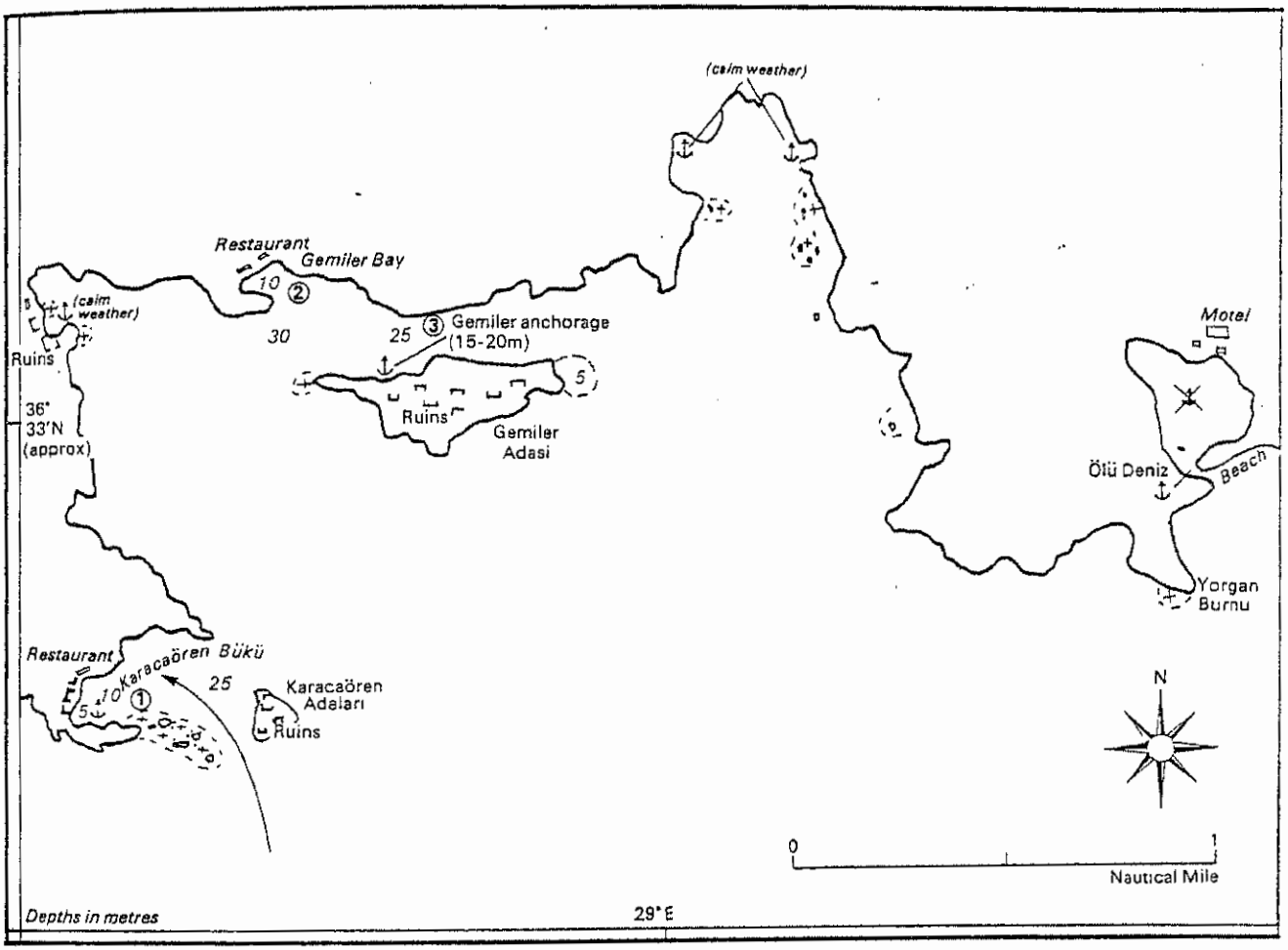

(calm weather)
Restaurant
Gemiler Bay
10
2
(calm weather)
Ruins
30
25
3 Gemiler anchorage
(15-20m)
5
Ruins
Gemiler
Adasi
36°
33'N
(approx)
Motel
Ölü Deniz
Beach
Yorgan
Burnu
Restaurant
Karacaören Bükü
25
10
1
5
Karacaören
Adaları
Ruins
N
0
1
Nautical Mile
Depths in metres
29°E

Fig. # 11



Fig # 12



Fig # 14

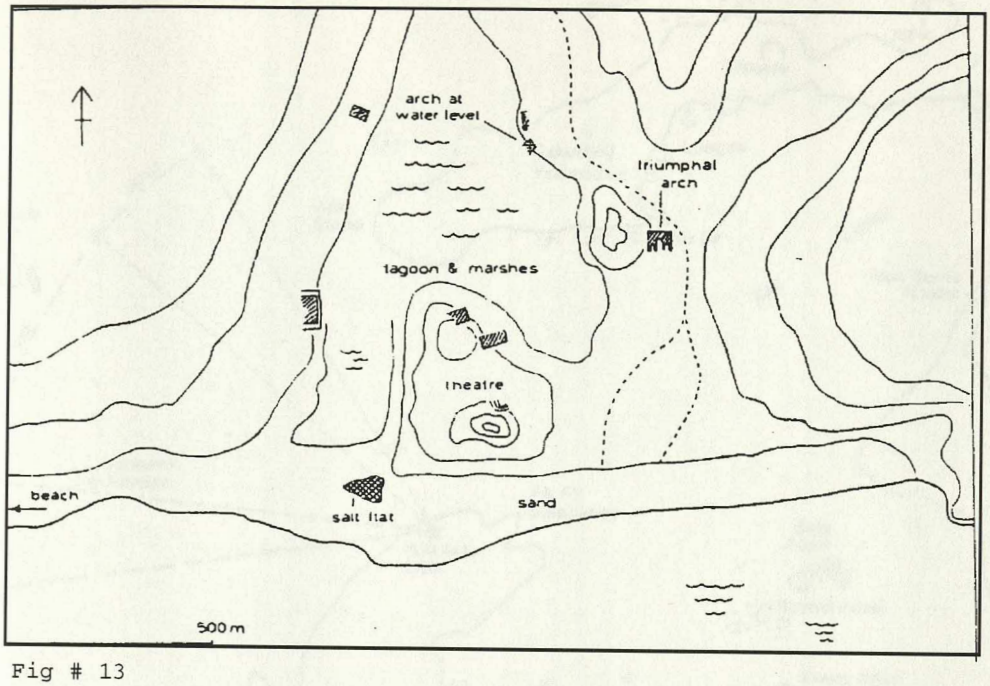


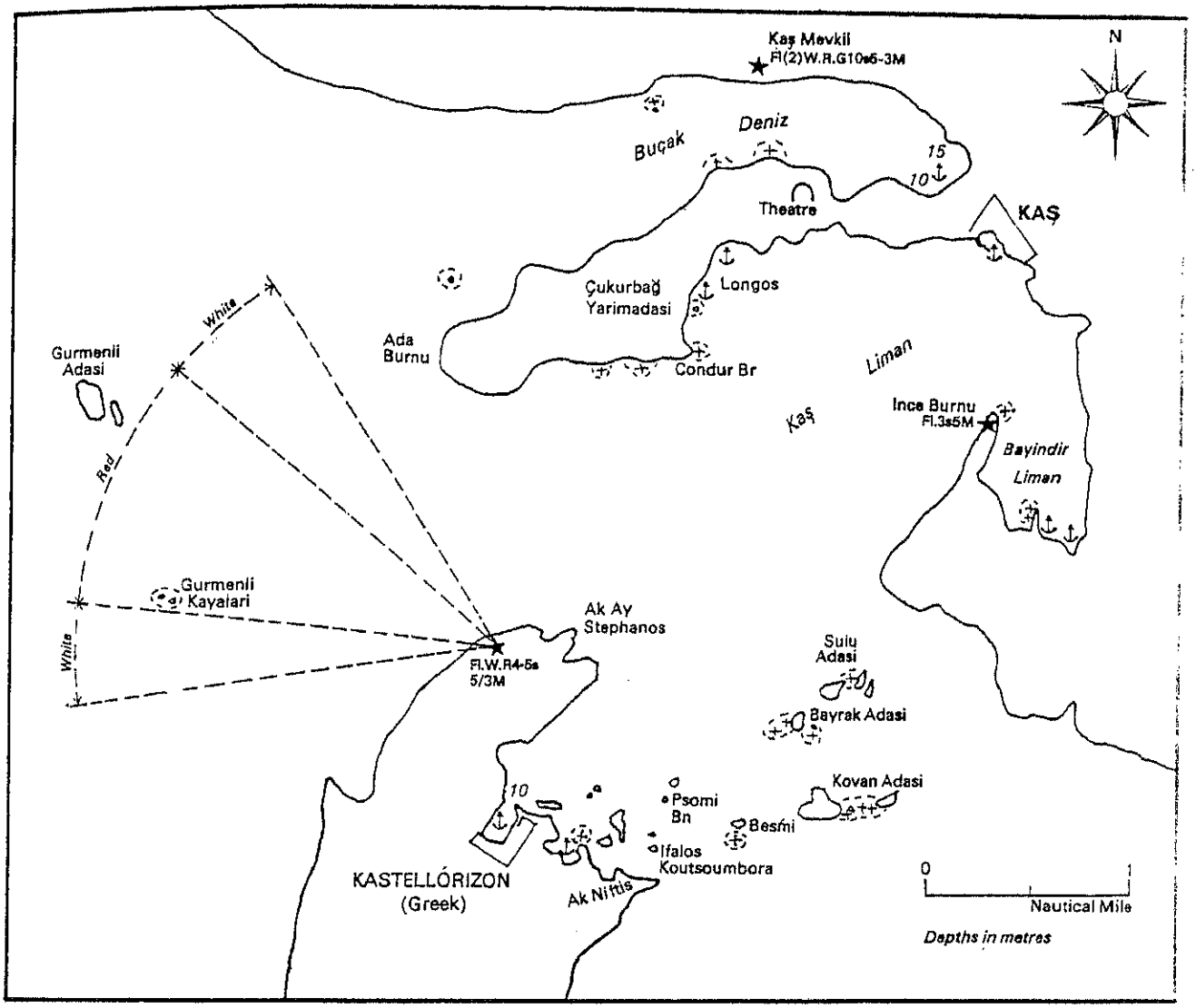

Fig # 13



Fig # 13.1

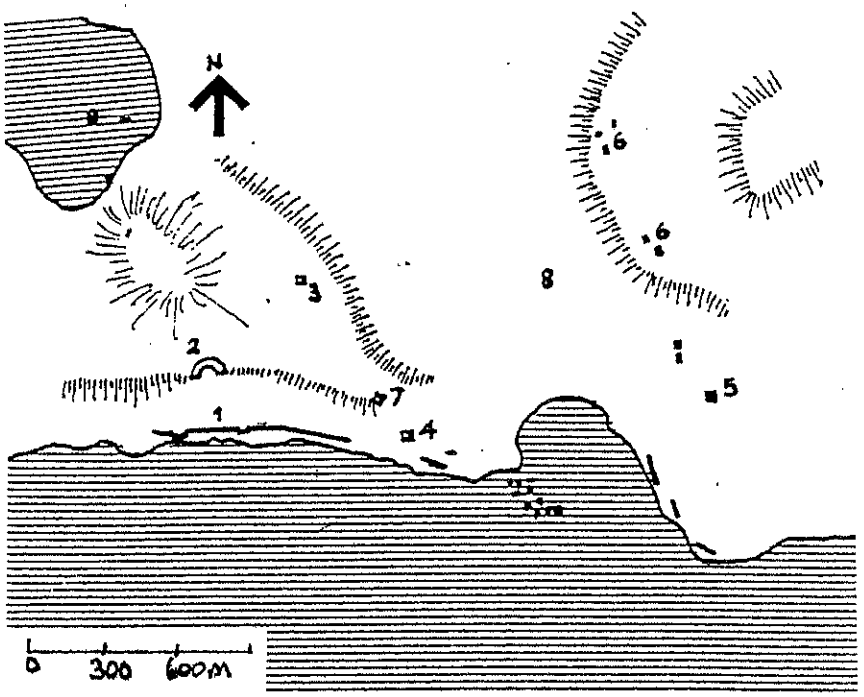


Fig # 13.2




APPROACHES TO KAŞ AND KASTELLÓRIZON 36°10'N 29°35'E

Fig. # 16




PLAN OF ANTIPHELLOS

*1 — City Walls, 2 — Theatre, 3 — Rock Tomb, 4 — Temple, 5 — Lycian Sarcophagus, 6 — Rock Tombs, 7 — Greek Church, 8 — Town of Kaş, 9 — Harbour of Bucak*

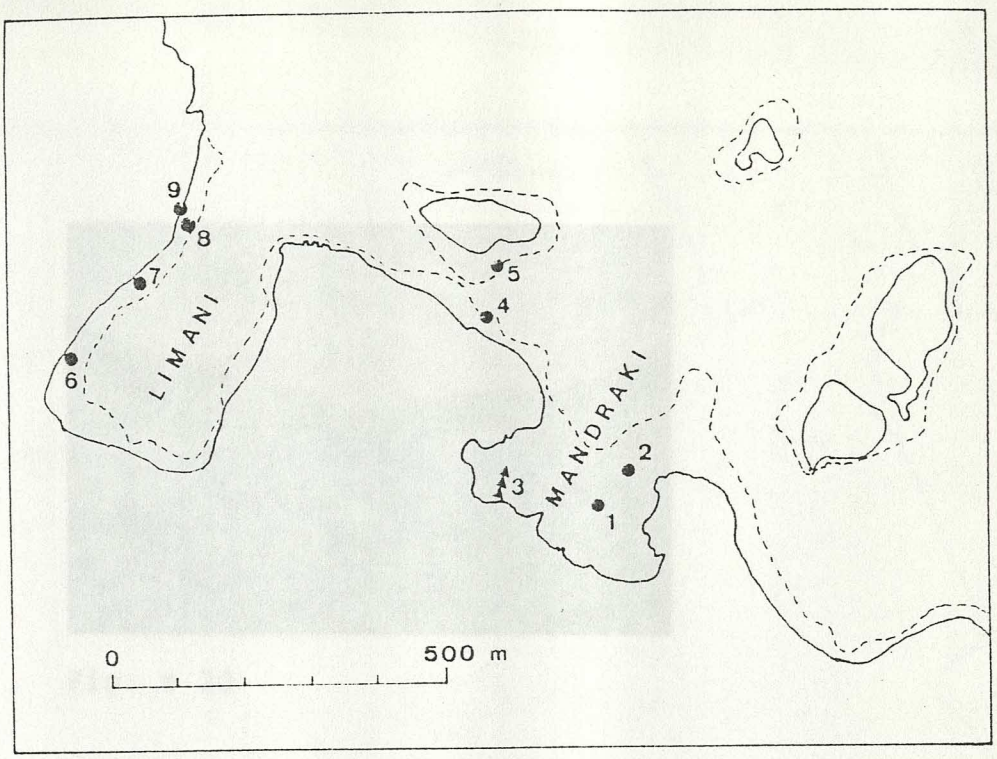



Fig. # 18



Fig. # 18.1



Fig. # 20

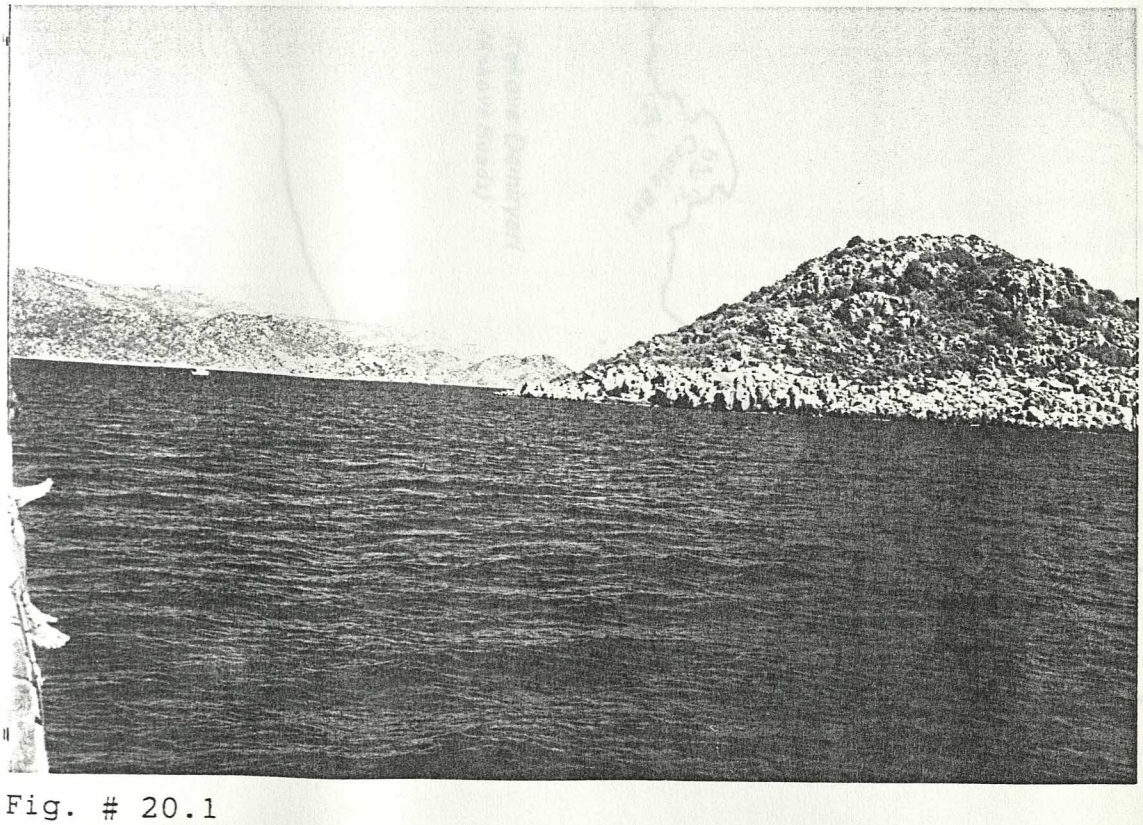


Fig. # 20.1

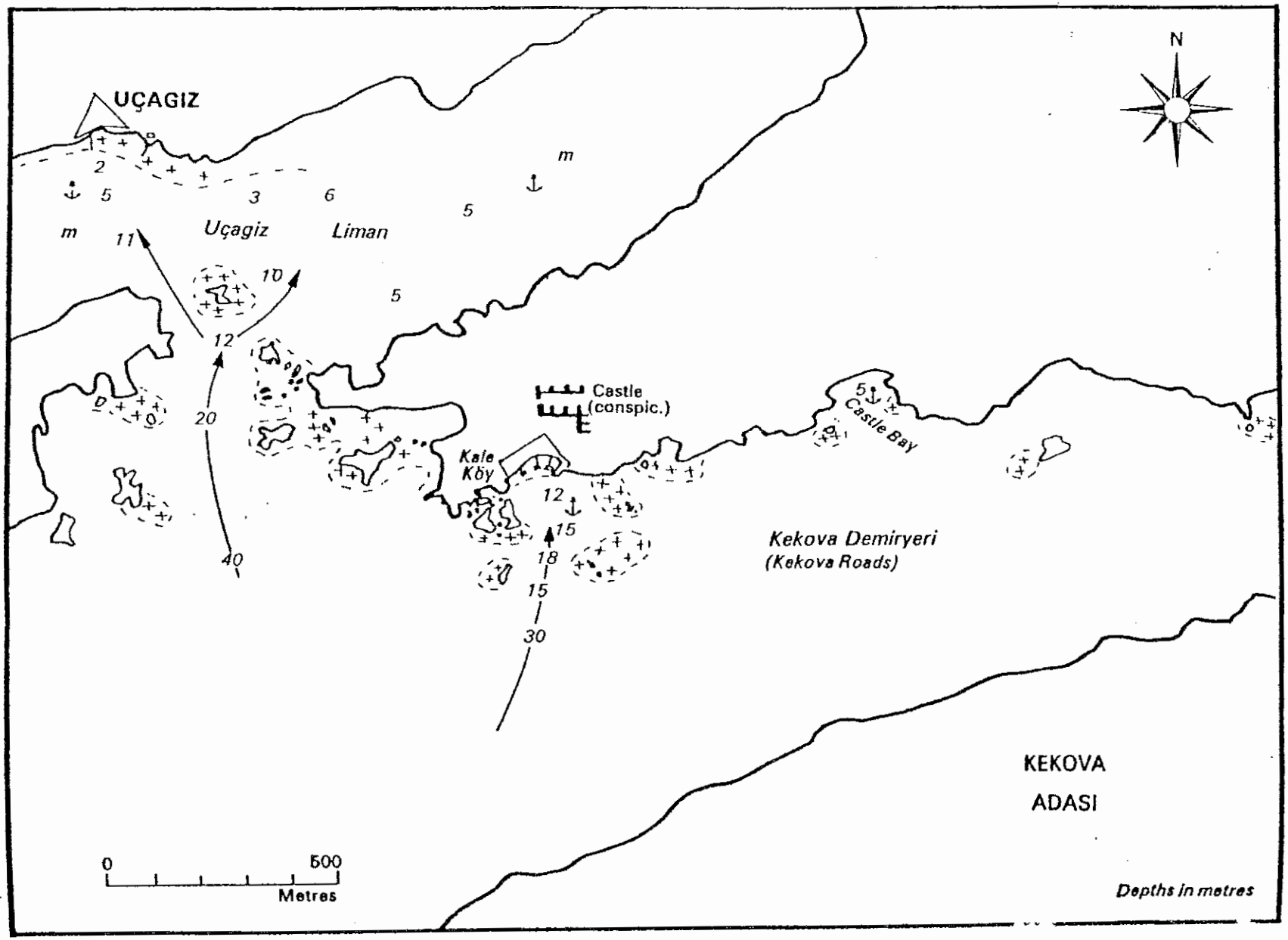



Fig. # 24

UÇAGIZ LIMAN AND KALE KÖY APPROACHES AND ANCHORAGES Kale Köy 36°12'N 29°52'E

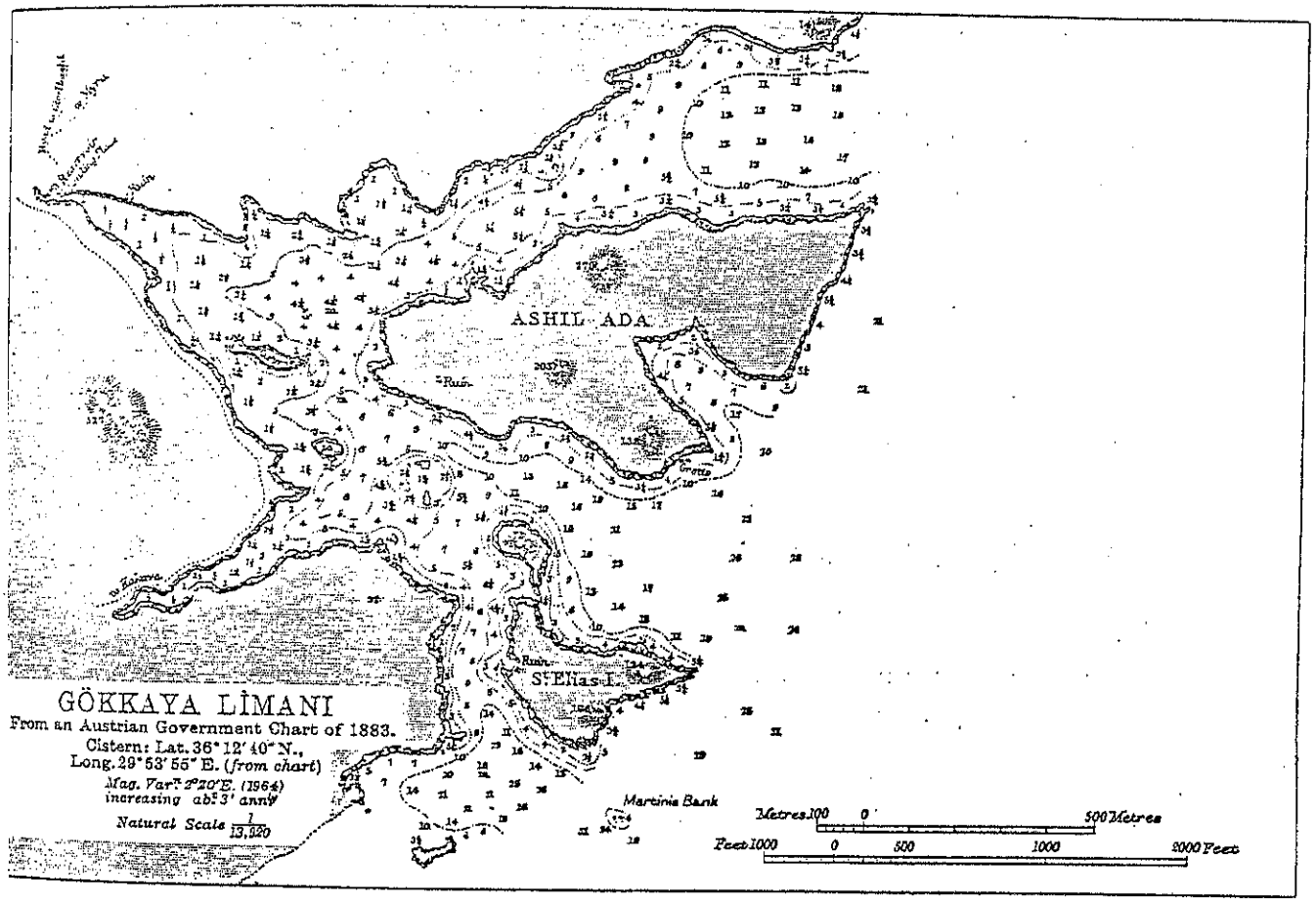

ASHIL ADA
St Elias I.
Martinis Bank
GÖKKAYA LİMANI
From an Austrian Government Chart of 1883.
Cistern: Lat. 36° 12' 40" N.,
Long. 29° 53' 55" E. (from chart)
Mag. Var.n 2°20'E. (1964)
increasing ab.t 3' annly
Natural Scale 1/13,120
Metres 100 0 500 Metres
Feet 1000 0 500 1000 2000 Feet

Fig. # 26

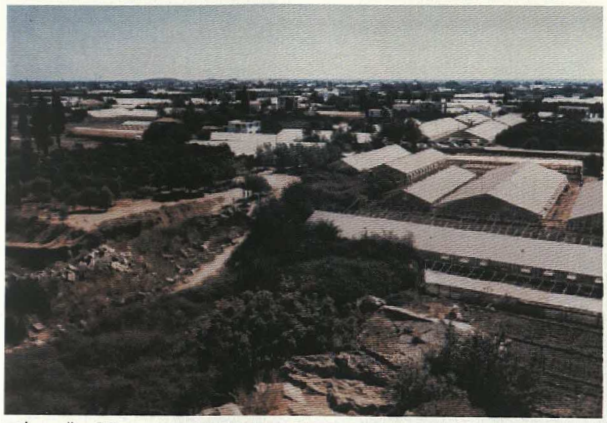


Fig # 27

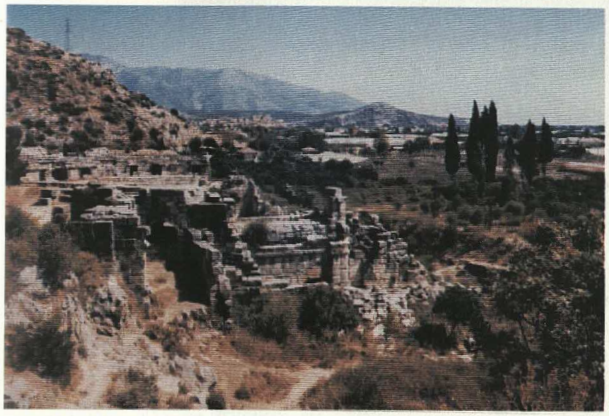


Fig # 27.1

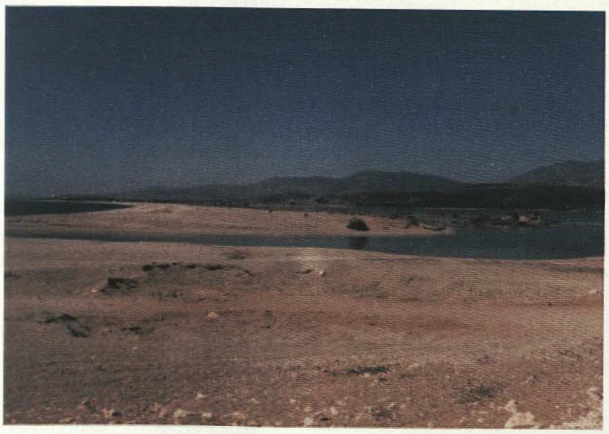


Fig # 27.2



Fig # 27.3



Fig. # 29

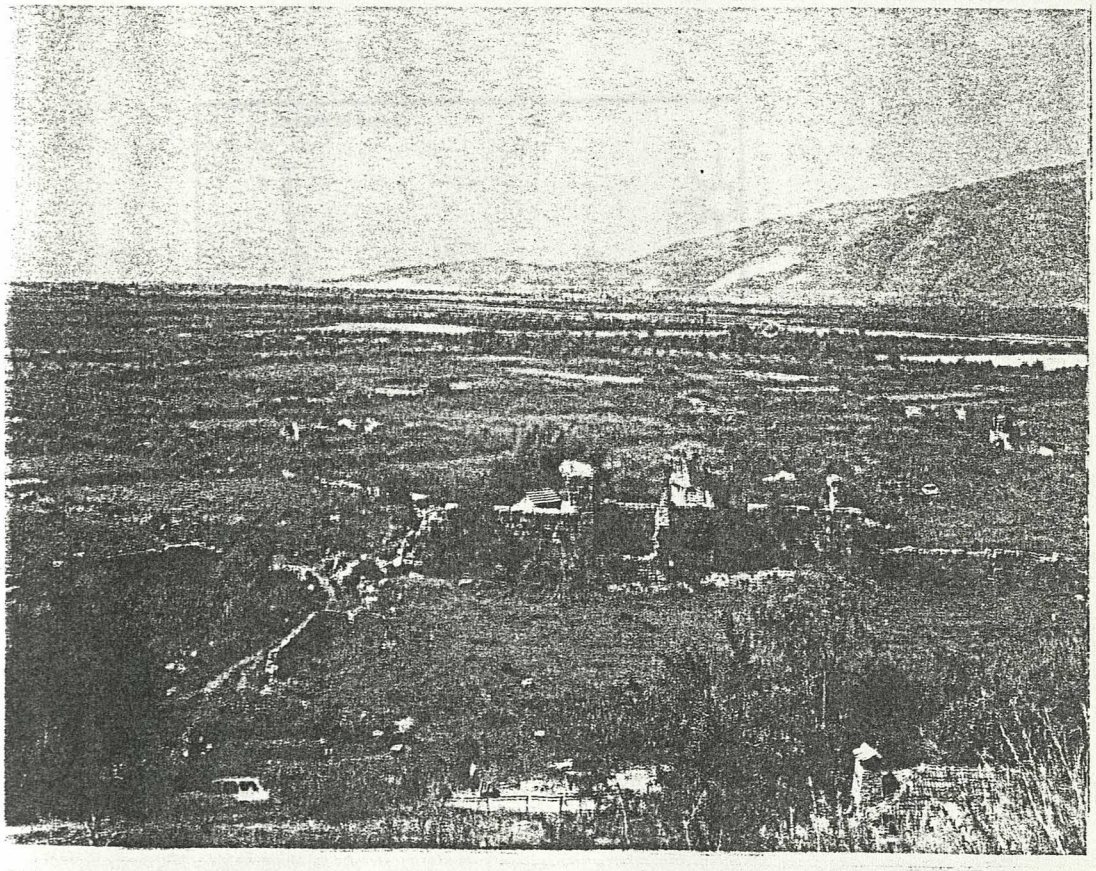
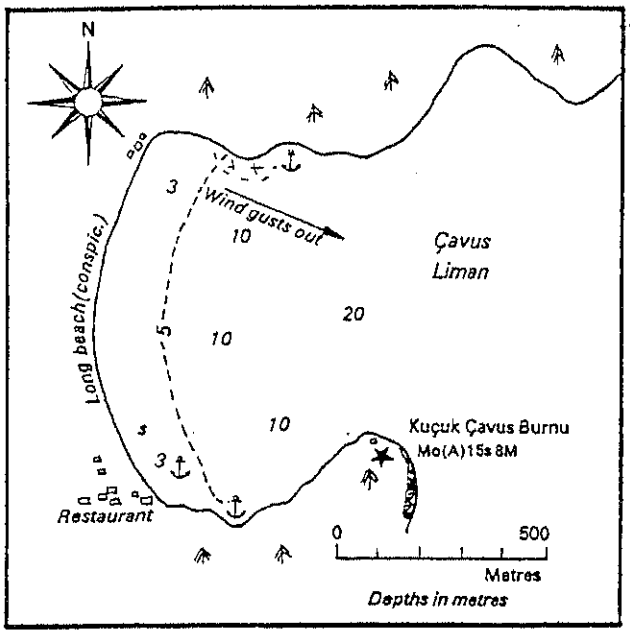
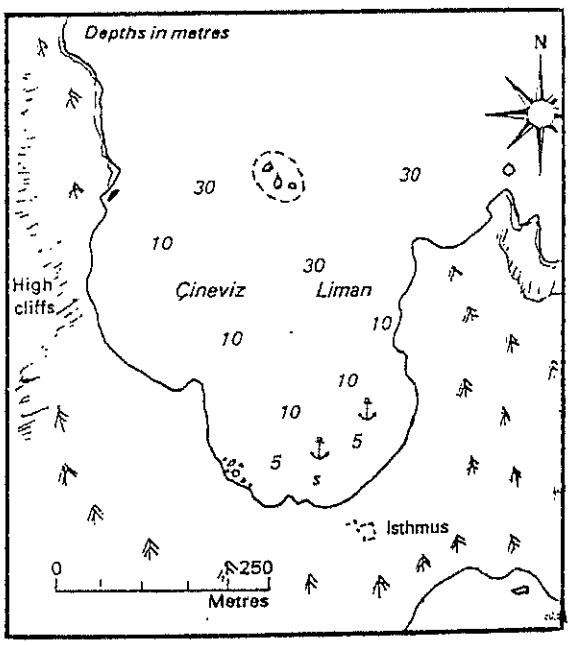


Fig. # 30




ÇAVUS LIMAN 36°18'N 30°30'E

Fig. # 32




ÇINEVIZ LIMAN 36°22'N 30°31'E

Fig. # 33

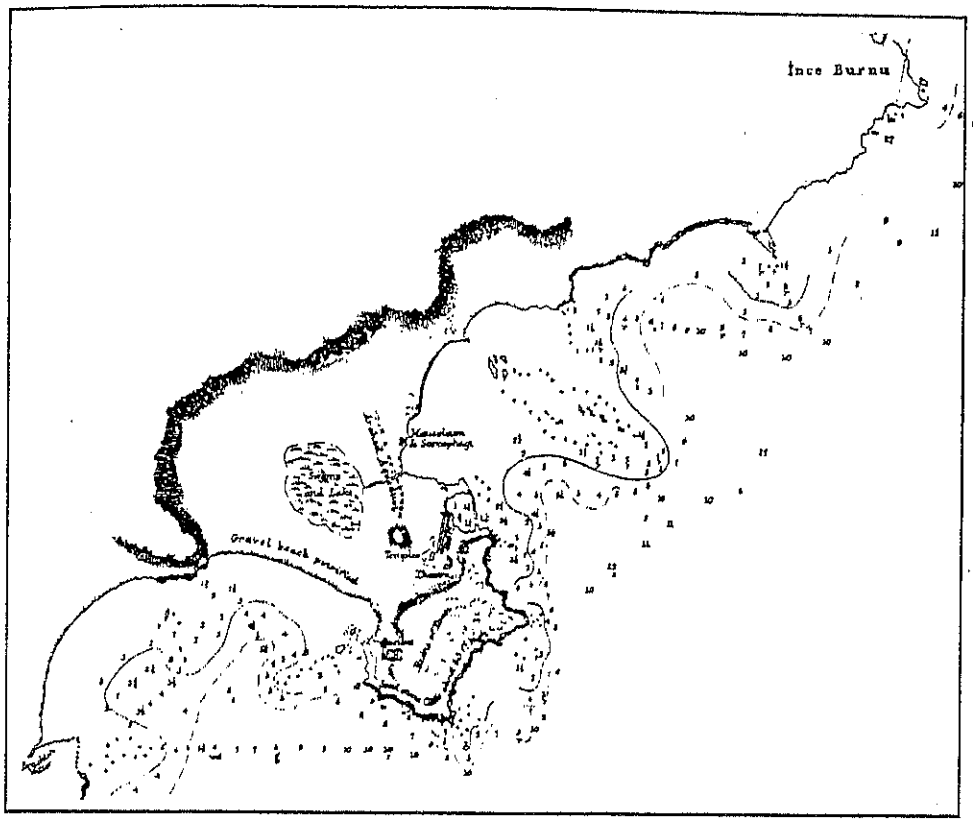



Fig. # 35

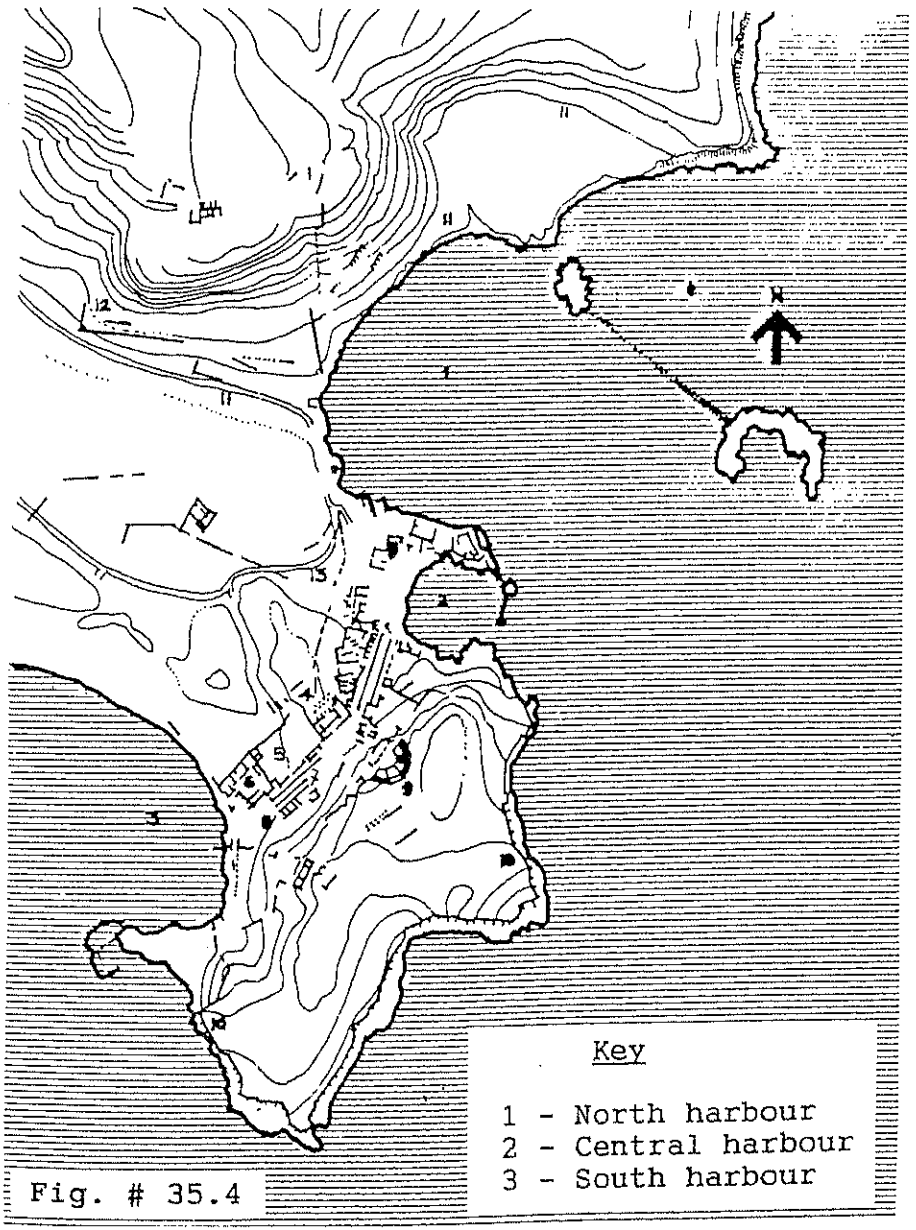



Fig. # 35.4



Fig # 35.1

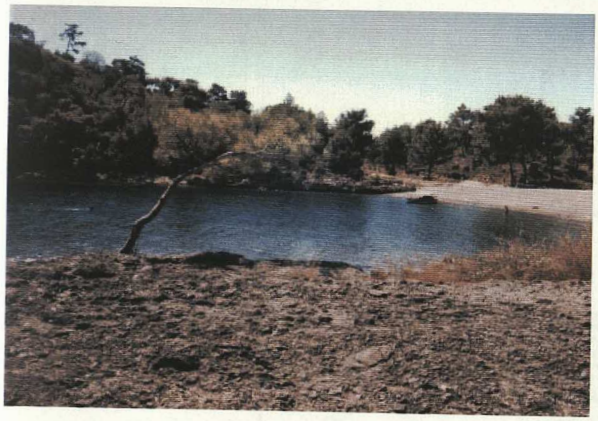


Fig # 35.2



Fig # 35.3

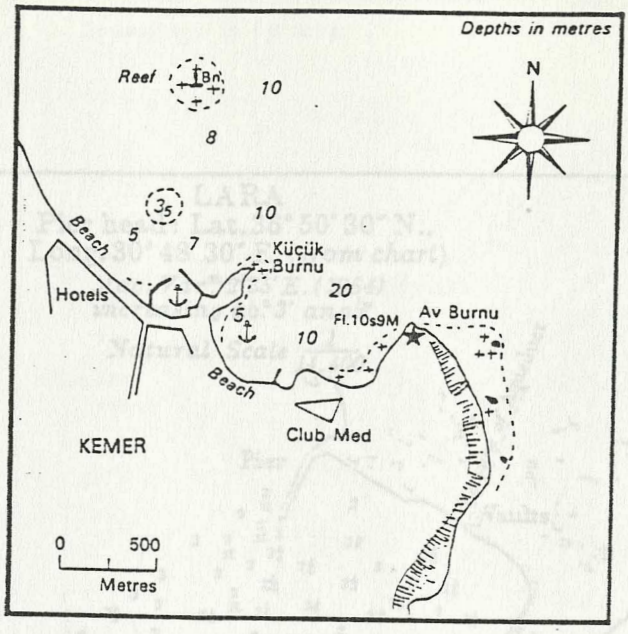



Fig. # 36

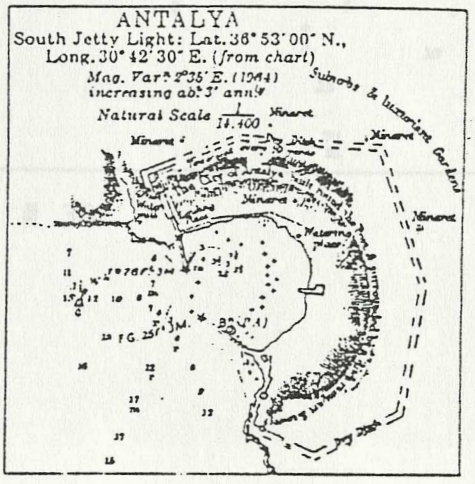



Fig. # 37

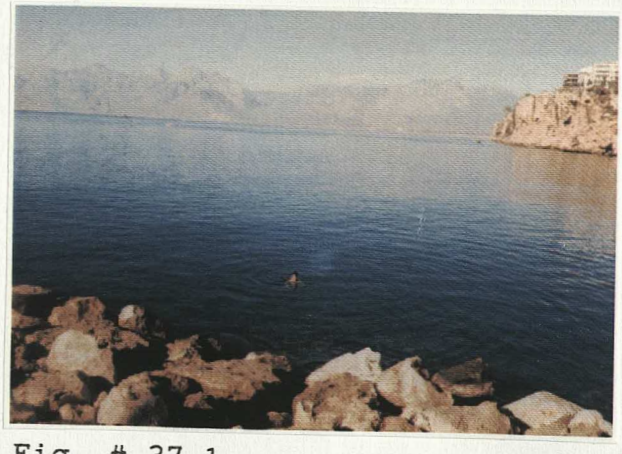


Fig. # 37.1

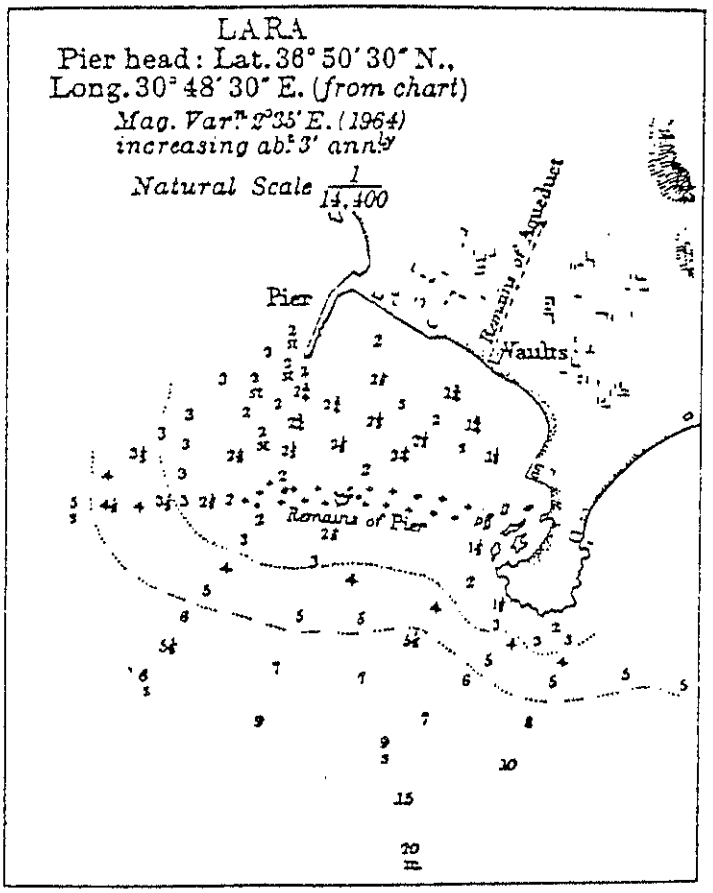

LARA
Pier head: Lat. 36° 50′ 30″ N.,
Long. 30° 48′ 30″ E. (from chart)
Mag. Var.n 2°35′ E. (1964)
increasing ab.t 3′ ann.ly
Natural Scale 1/14,400
Pier
Remains of Aqueduct
Vaults
Remains of Pier

Fig. # 38

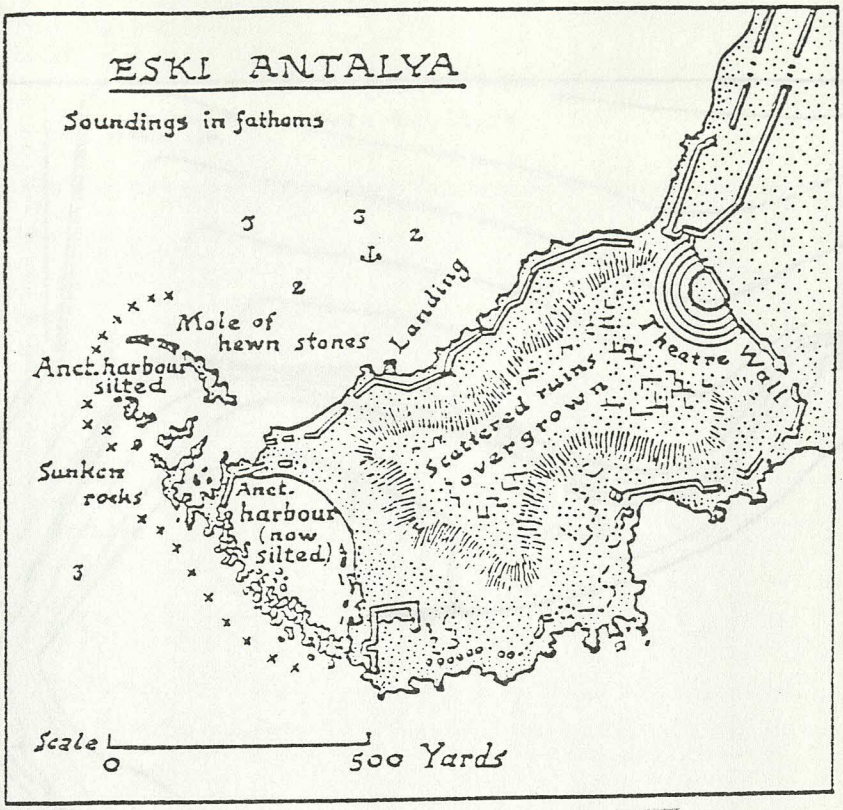



Fig. # 39

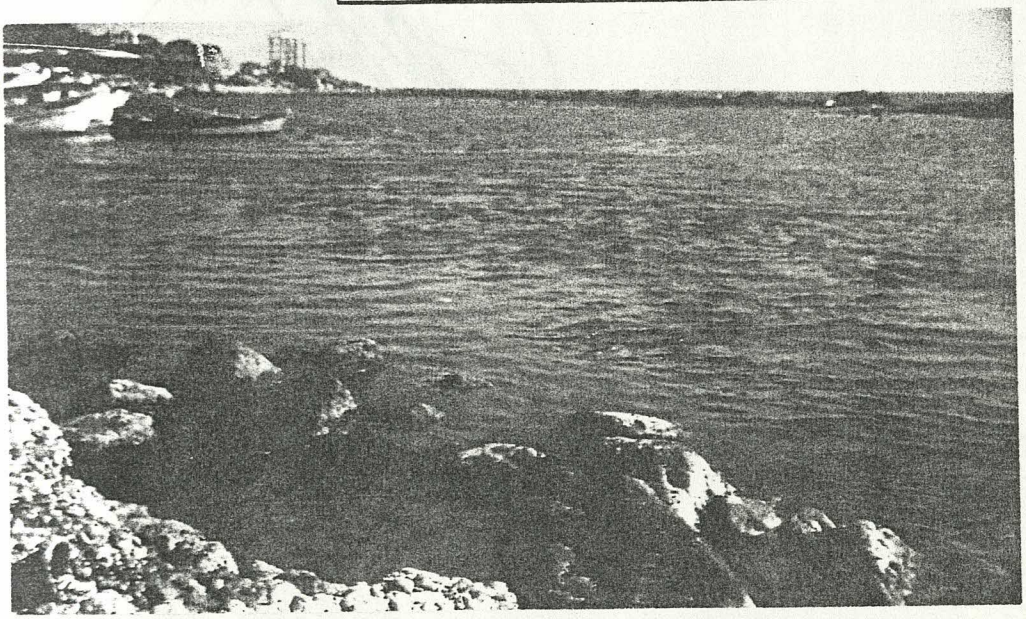


Fig. # 39.1

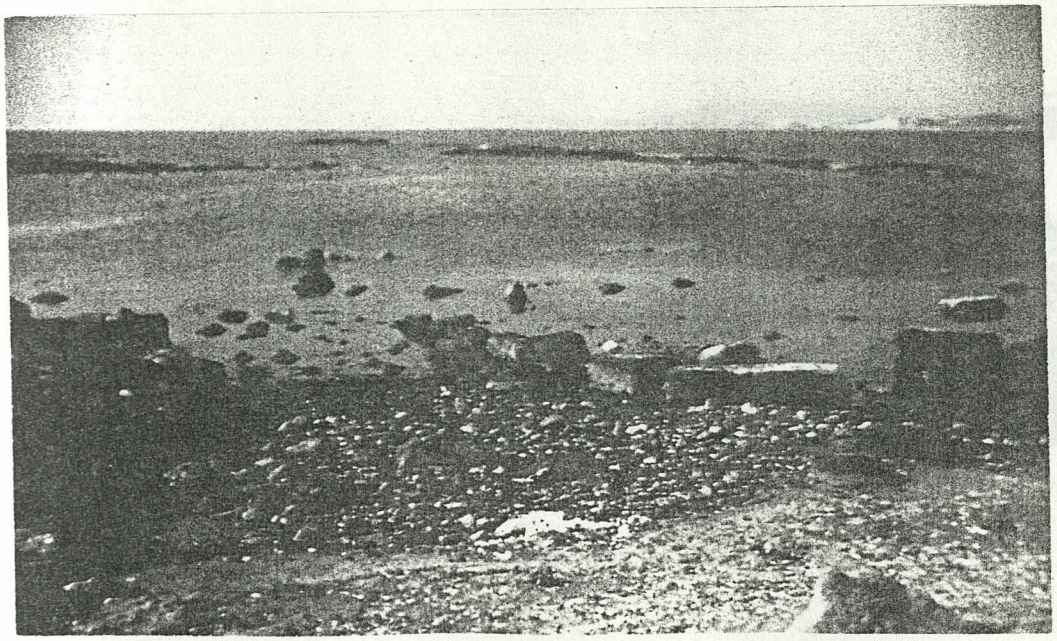


Fig. # 39.2

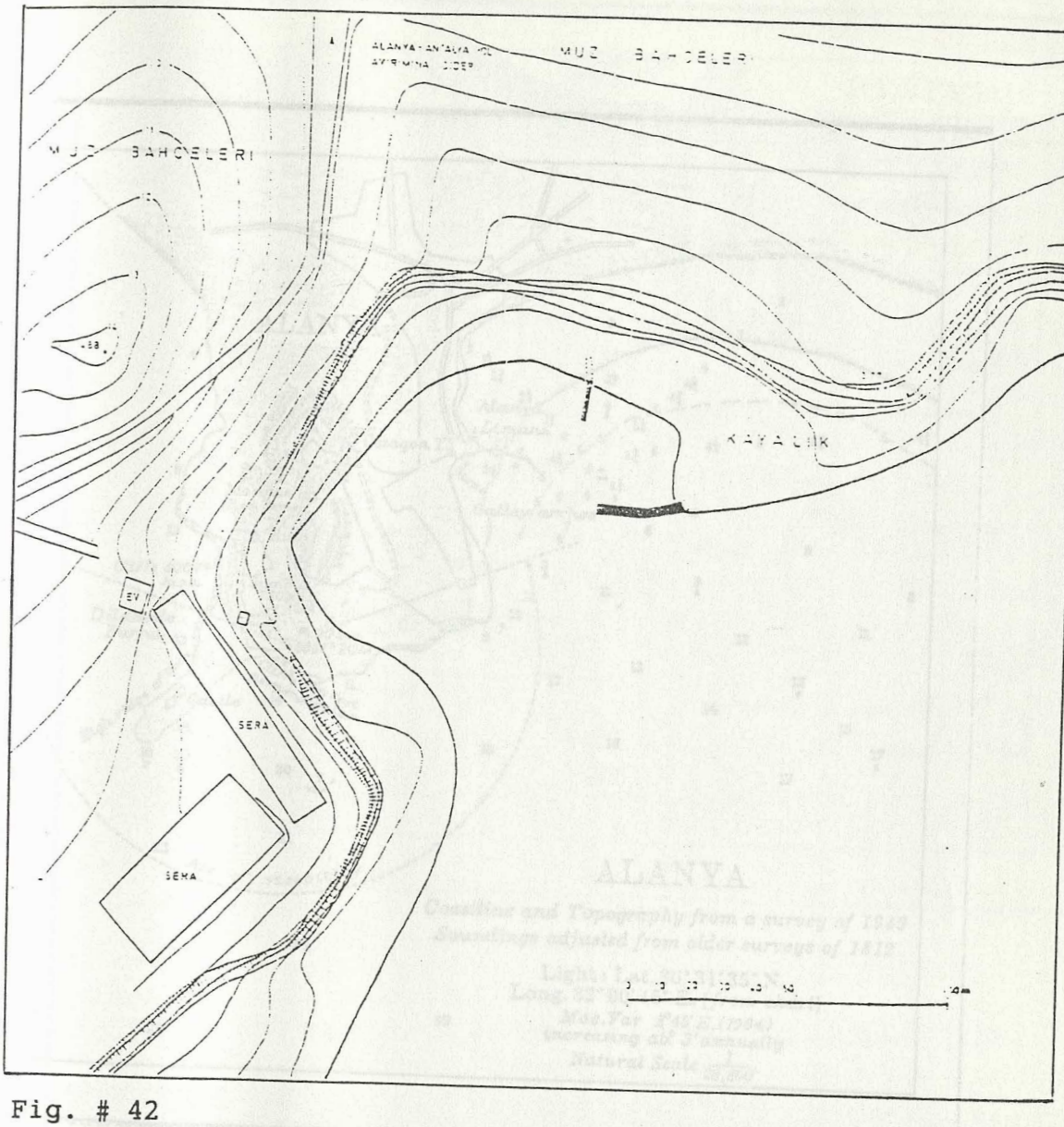



Fig. # 42

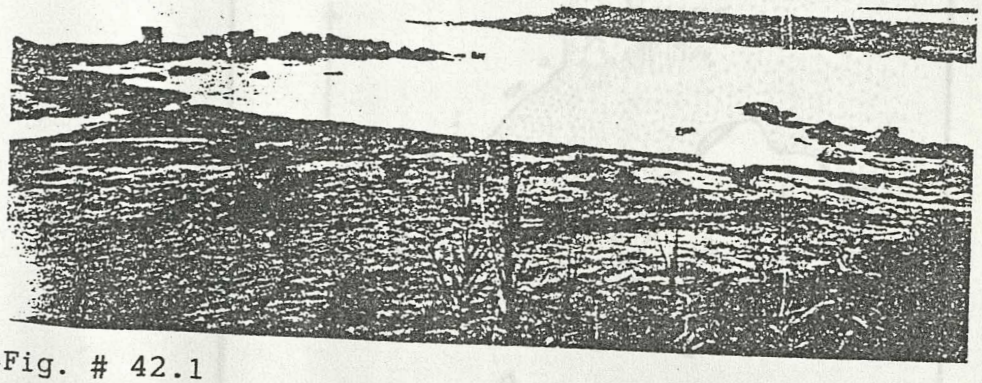


Fig. # 42.1

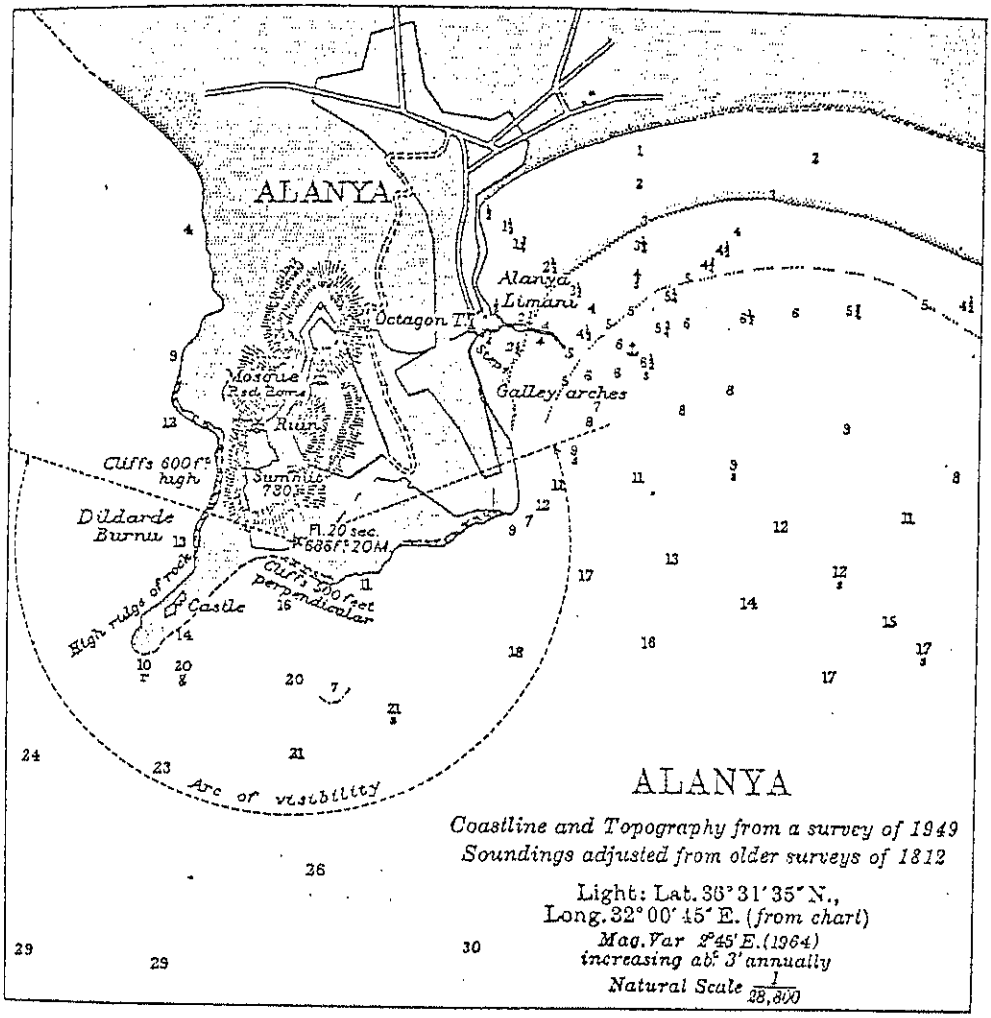

ALANYA
Alanya Limani
Octagon Tr.
Mosque
Red Tower
Ruins
Galley arches
Cliffs 600 ft high
Summit 730 ft
Dildarde Burnu
Fl. 20 sec.
686 ft 20M.
Cliffs 300 feet perpendicular
High ridge of rock
Castle
Arc of visibility
ALANYA
Coastline and Topography from a survey of 1949
Soundings adjusted from older surveys of 1812
Light: Lat. 36° 31' 35" N.,
Long. 32° 00' 45" E. (from chart)
Mag. Var 2° 45' E. (1964)
increasing ab.t 3' annually
Natural Scale 1/28,800

Fig. # 43

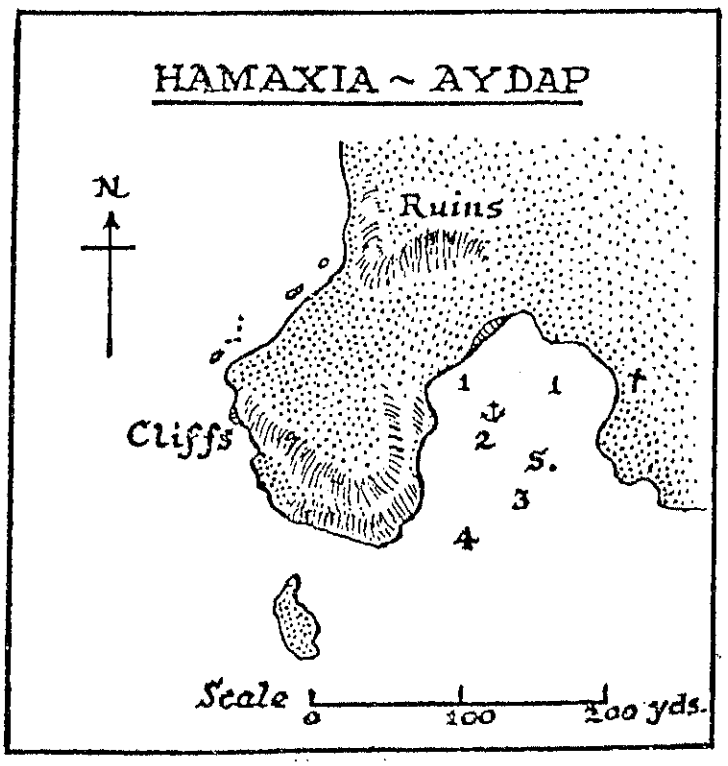

HAMAXIA ~ AYDAP
N
Ruins
Cliffs
1
2
3
4
5.
Scale
0
100
200 yds.

Fig. # 44

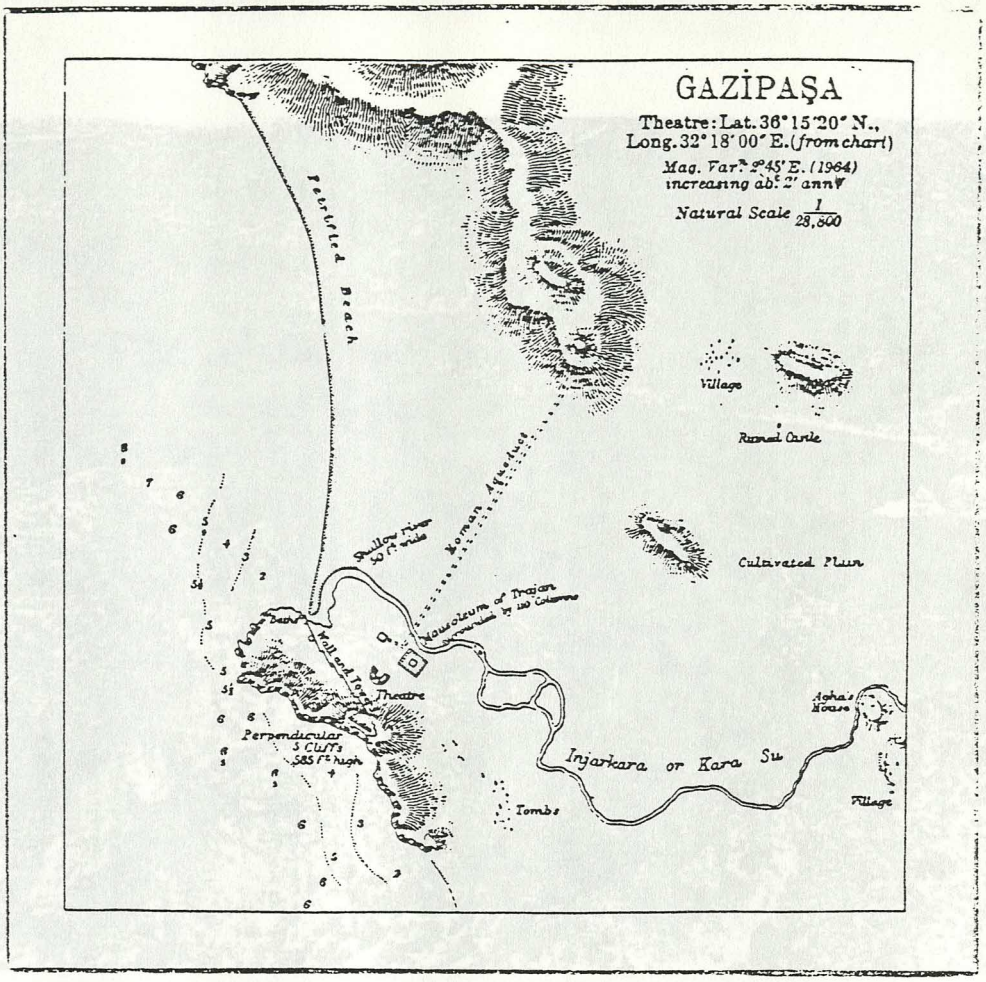



Fig. # 45

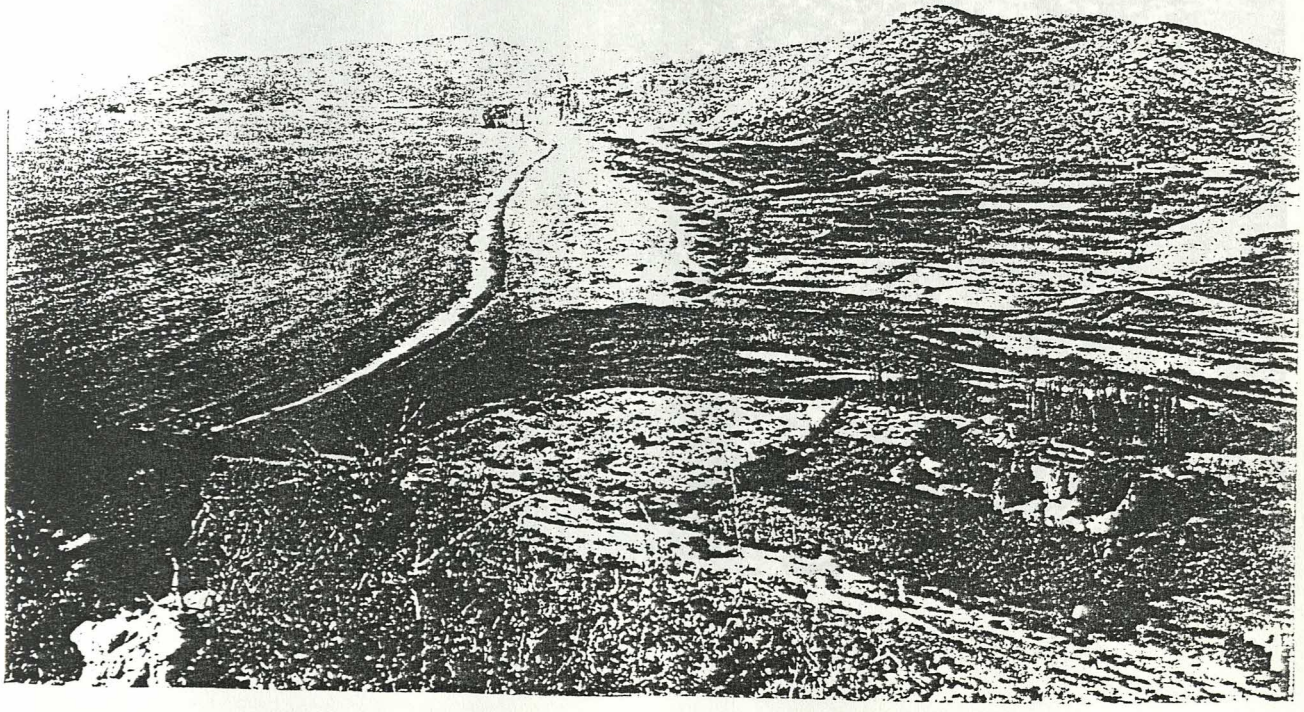


Fig. # 45.1

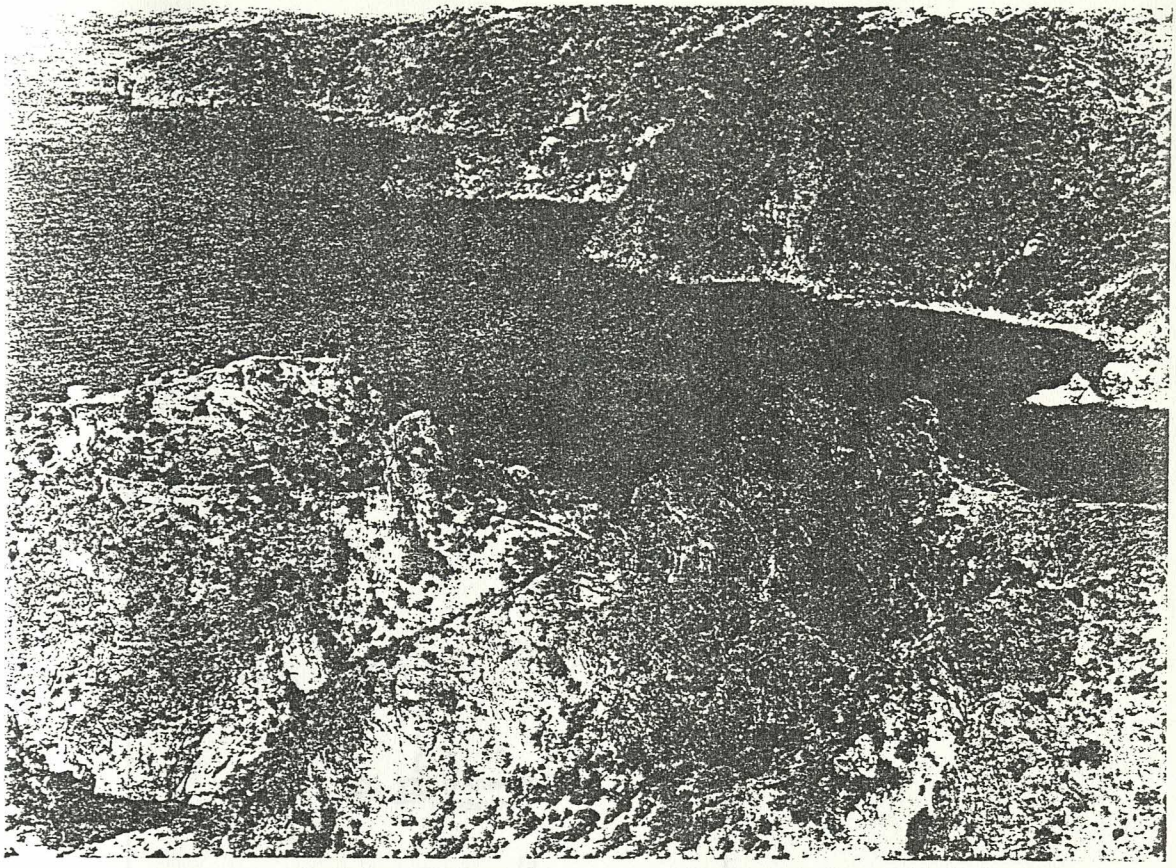


Fig. # 46

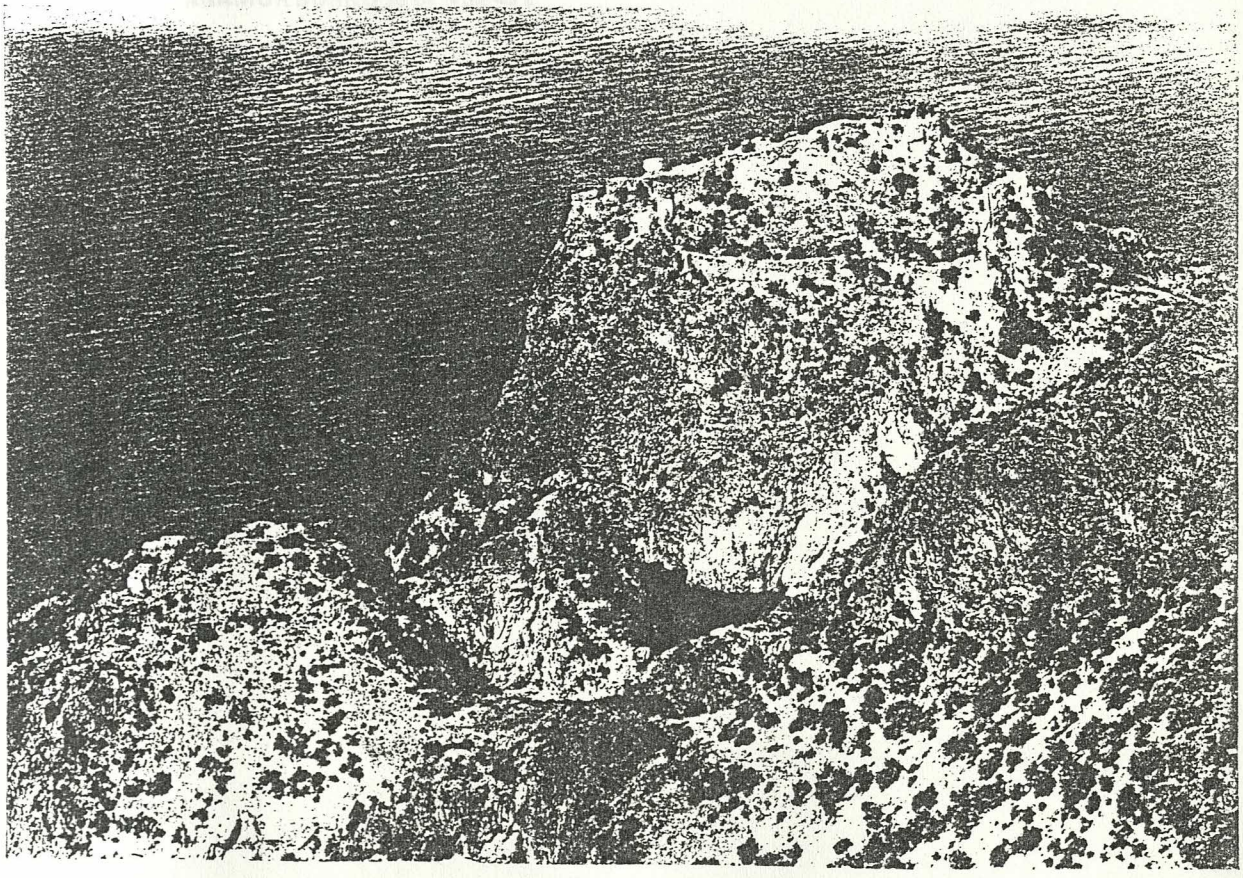
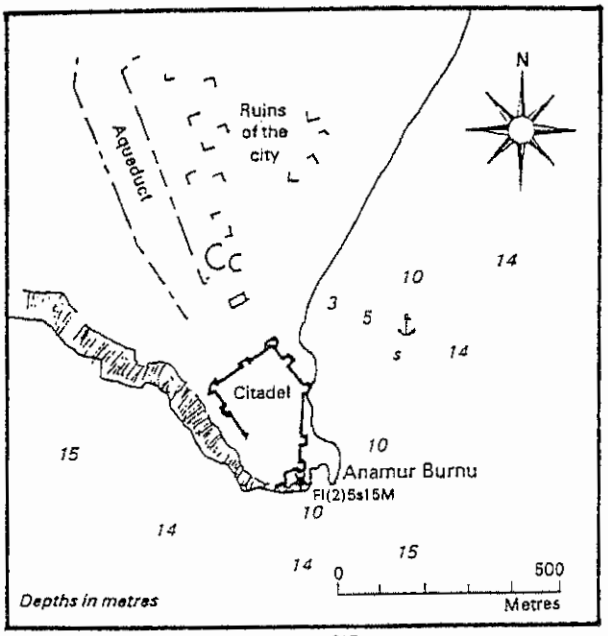


Fig. # 46.1




ANAMUR BURNU 36°01'N 32°49'E

Fig. # 49

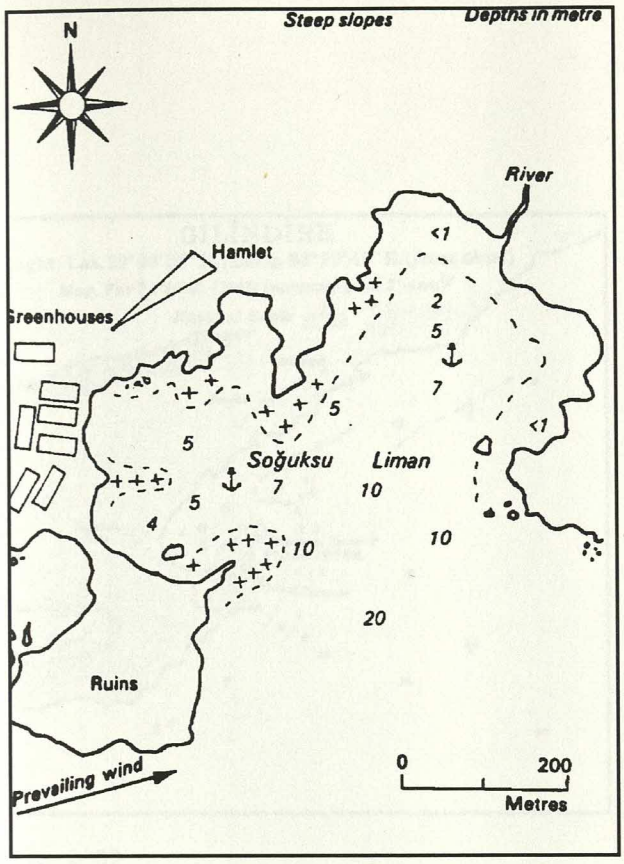



Fig # 52



Fig # 52.1

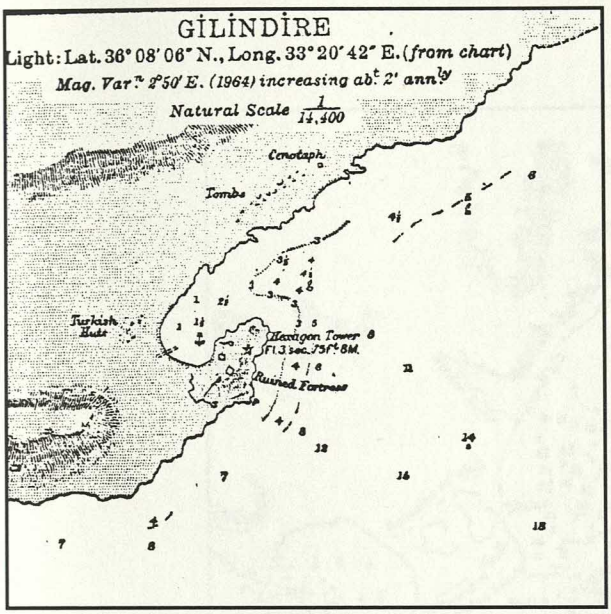



Fig # 53



Fig # 53.1

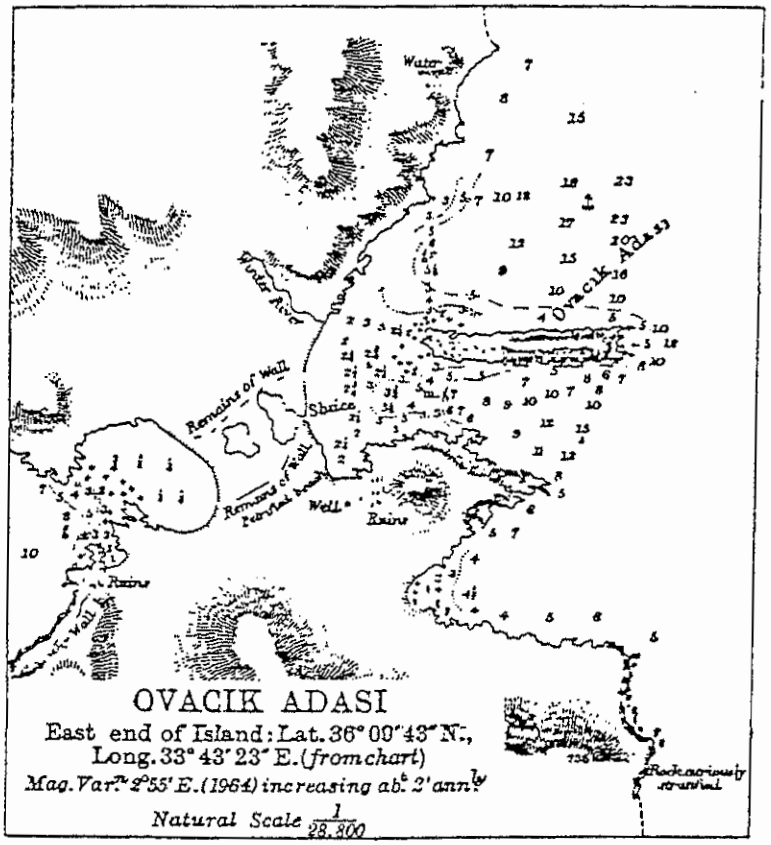

Water
Ovacik Adasi
Remains of Wall
Sluice
Remains of Wall
Remains of Wall
Well
Ruins
Ruins
OVACIK ADASI
East end of Island: Lat. 36° 00' 43" N.,
Long. 33° 43' 23" E. (from chart)
Mag. Var.n 2° 55' E. (1964) increasing ab.t 2' annly
Natural Scale 1/28,800

Fig. # 56

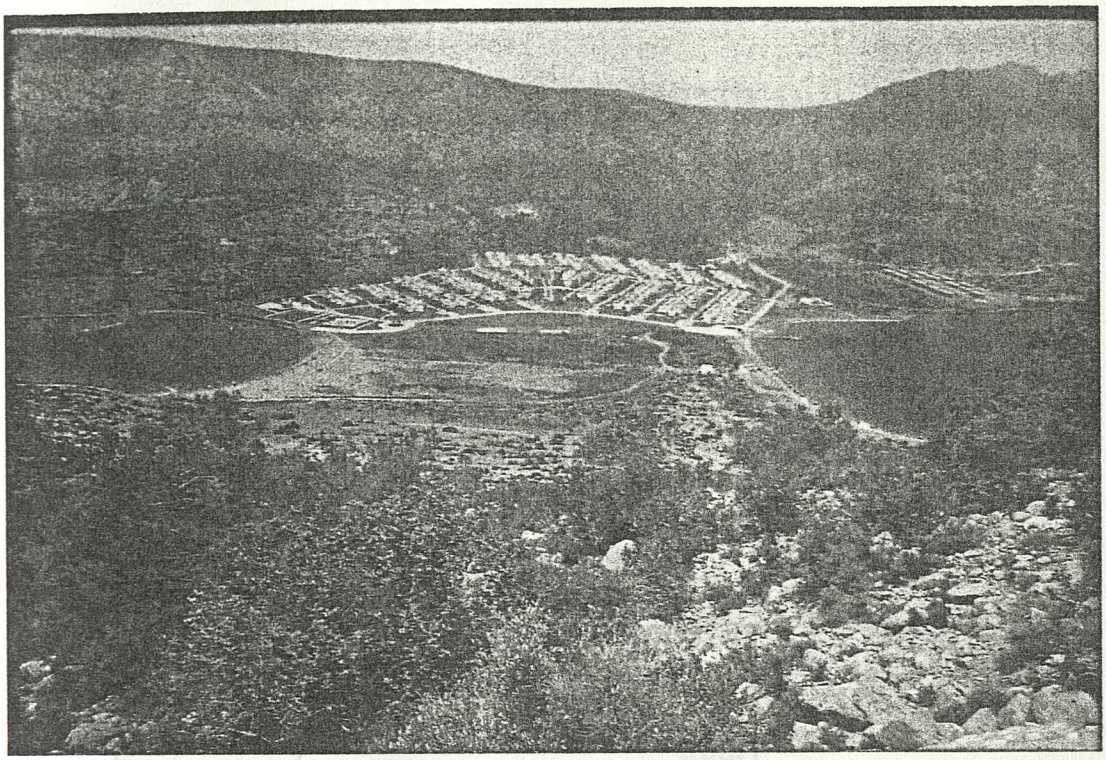


Fig. # 56.1

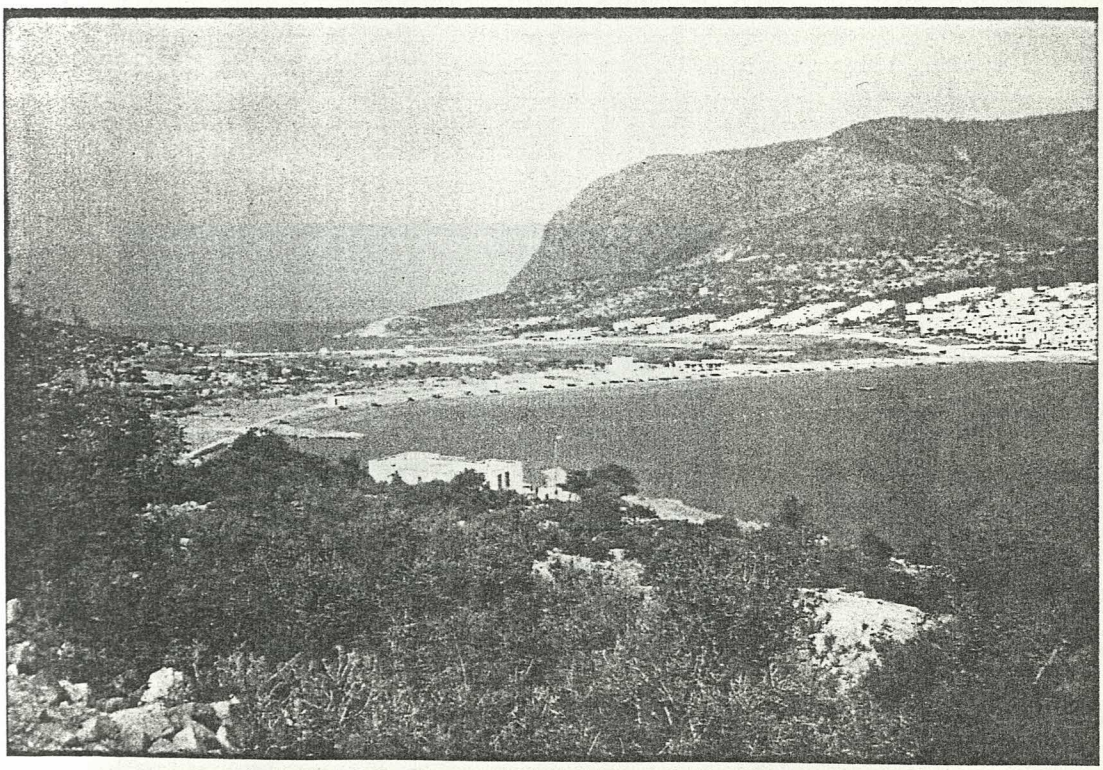


Fig. # 56.2

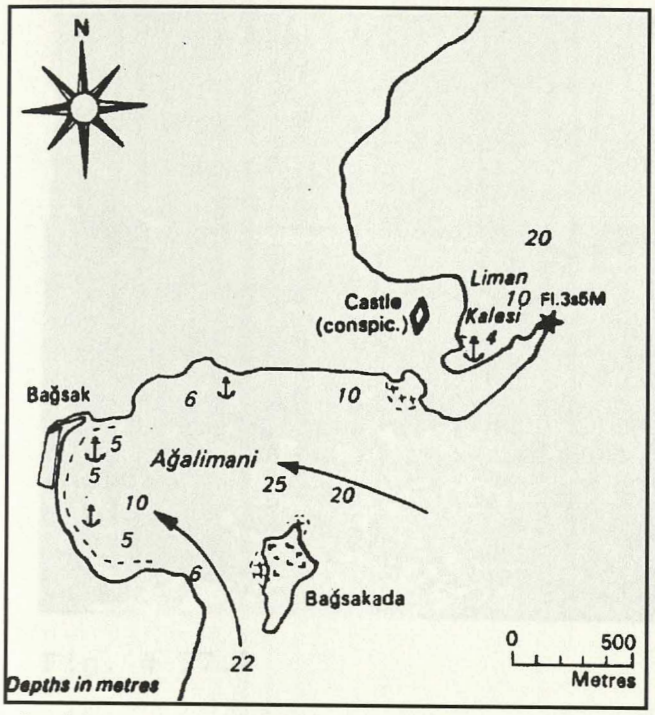



Fig # 57



Fig # 57.1

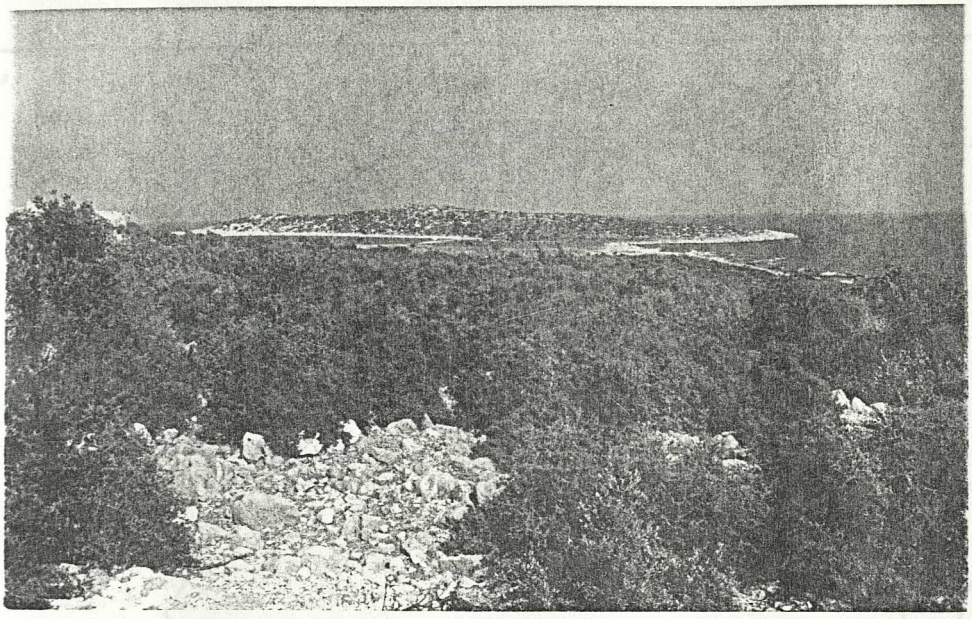


Fig. # 57.2

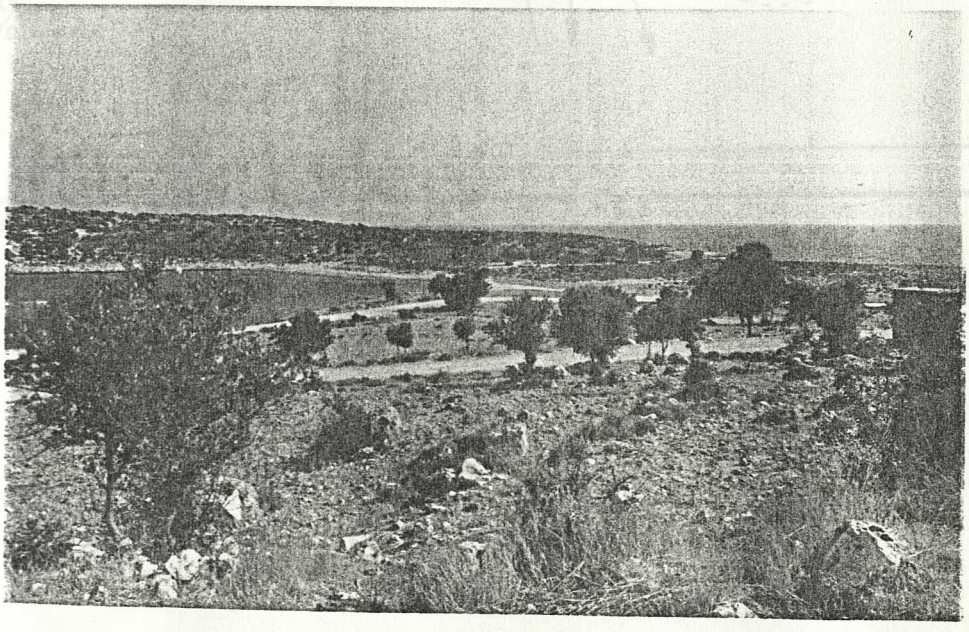
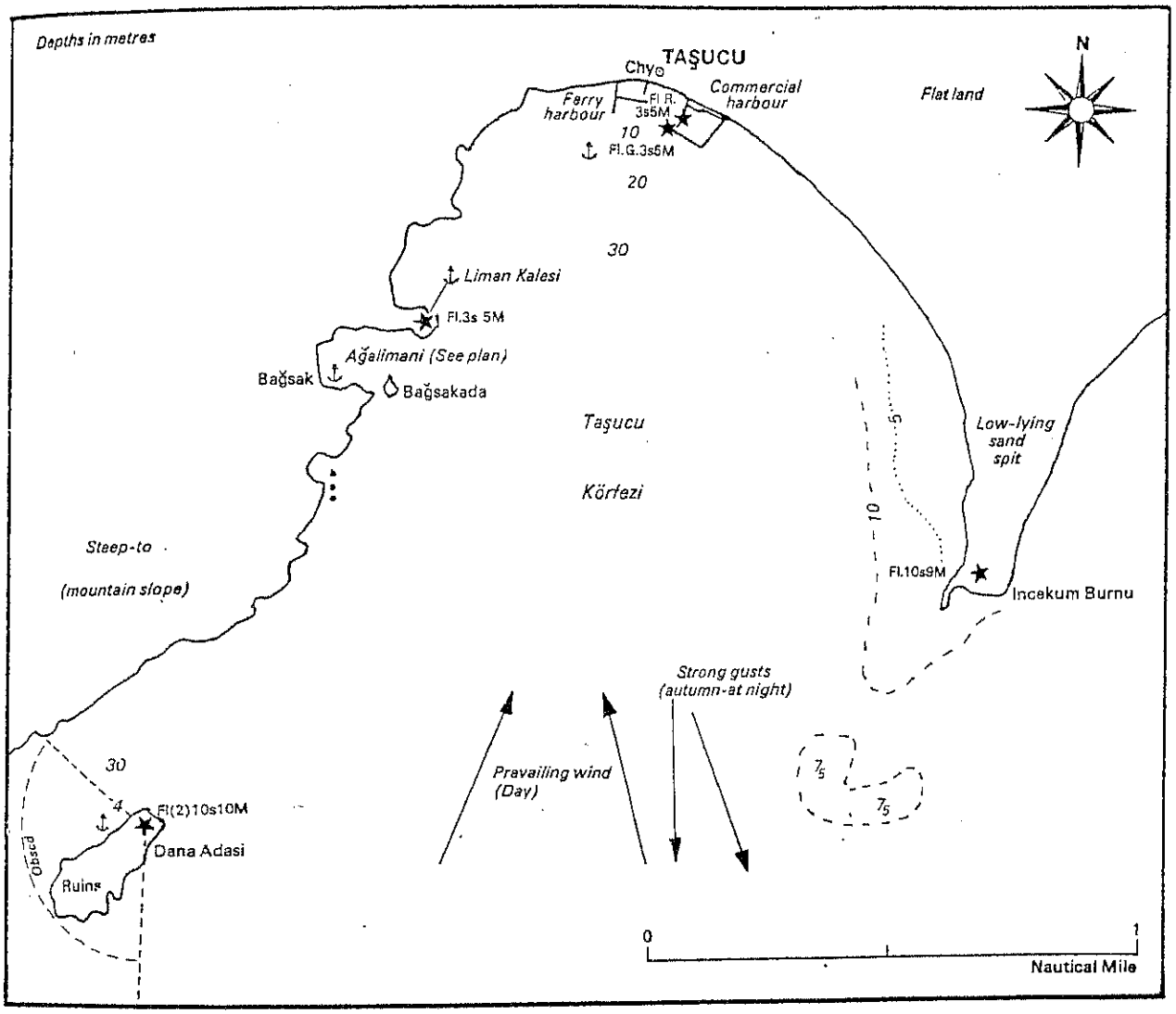
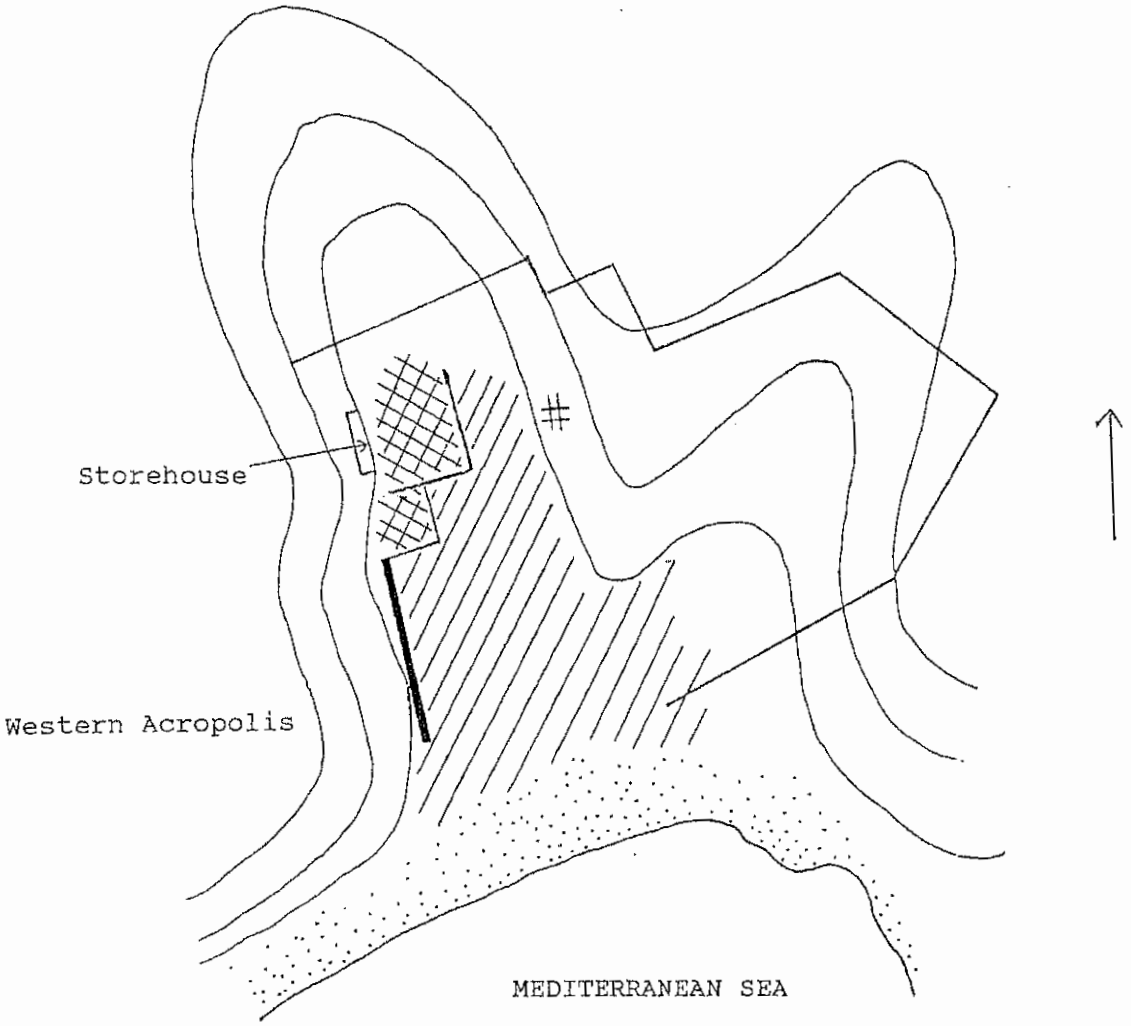


Fig. # 57.3




TAŞUCU KÖRFEZI 36°15'N 33°55'E

Fig. # 58




Cistern

Smaller walls

Sea wall (large rocks)

Red loamy soil (much pottery)

Clay/ sand deposit (no pottery); possible location of sea prior to build up of lagoon behind sand bar

Fig. # 61

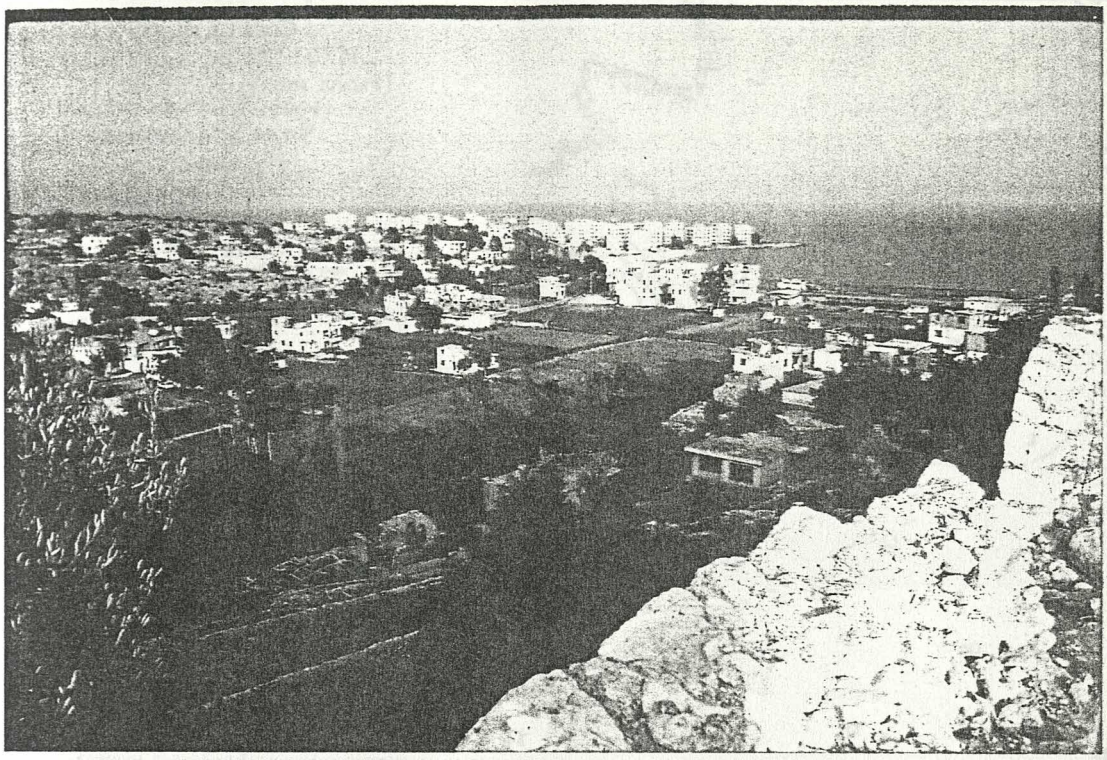


Fig. # 61.1

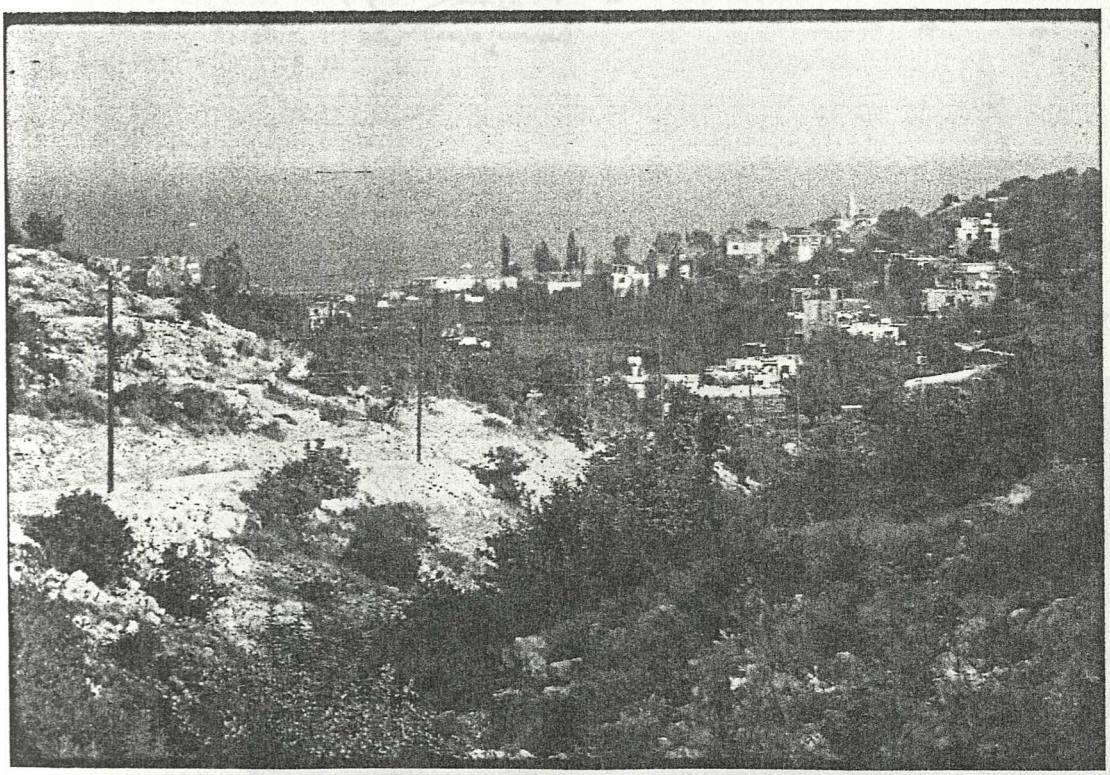


Fig. # 61.2

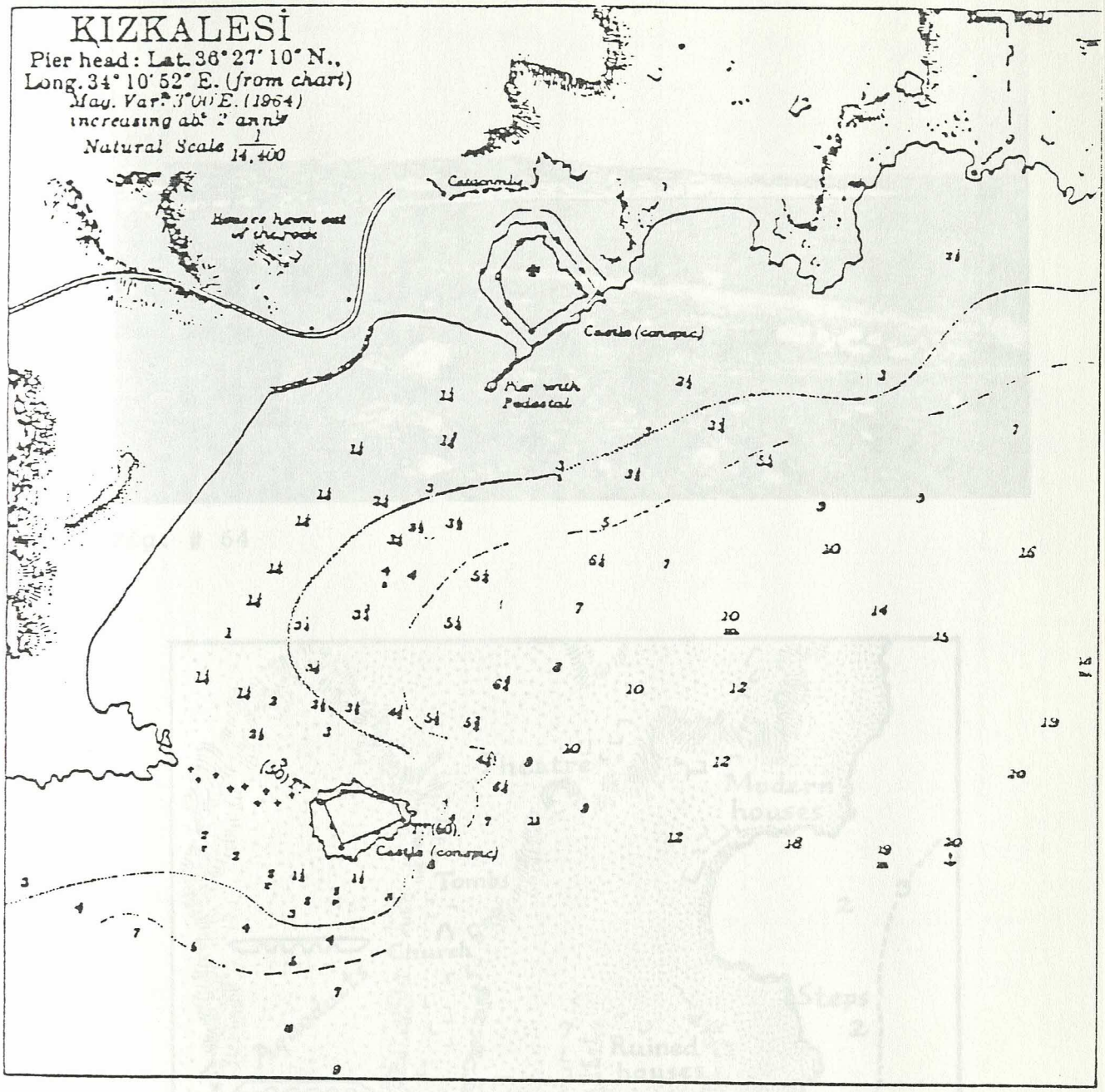



Fig. # 63

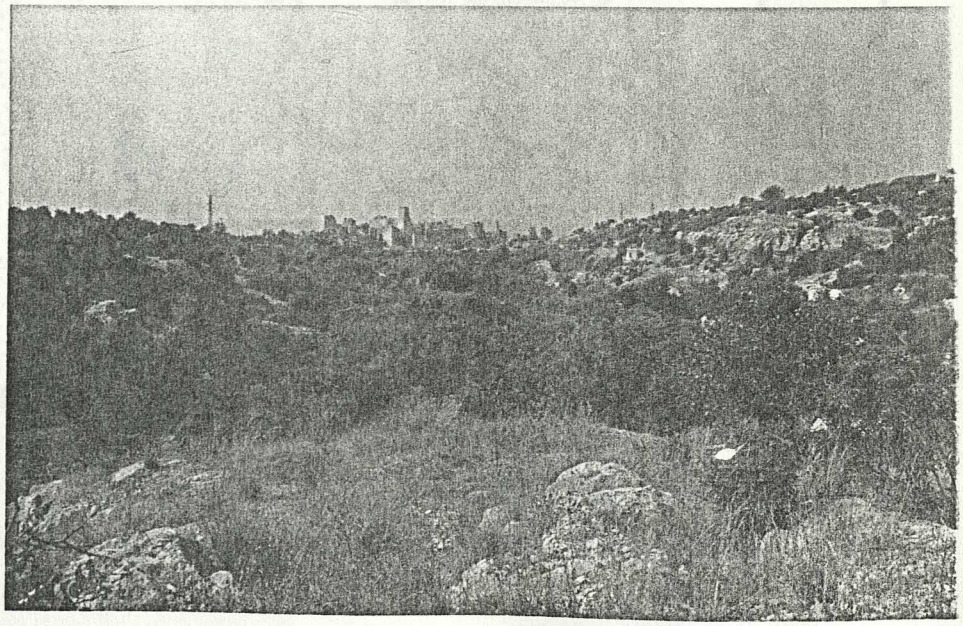


Fig. # 63.1

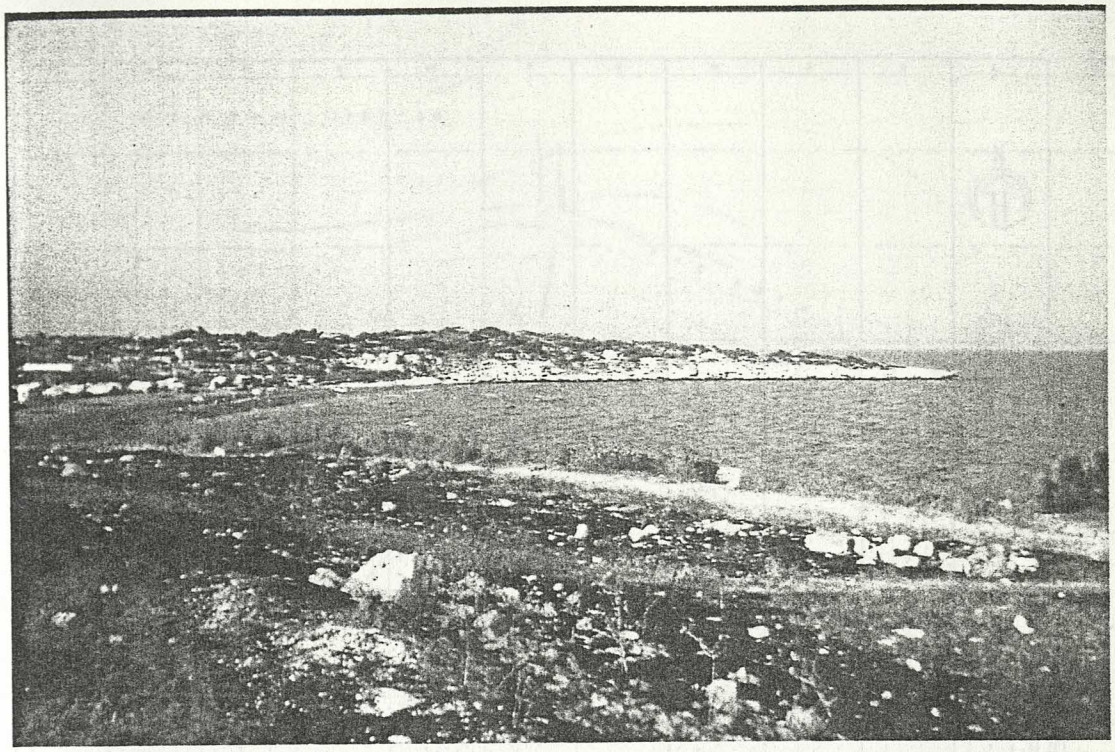


Fig. # 64

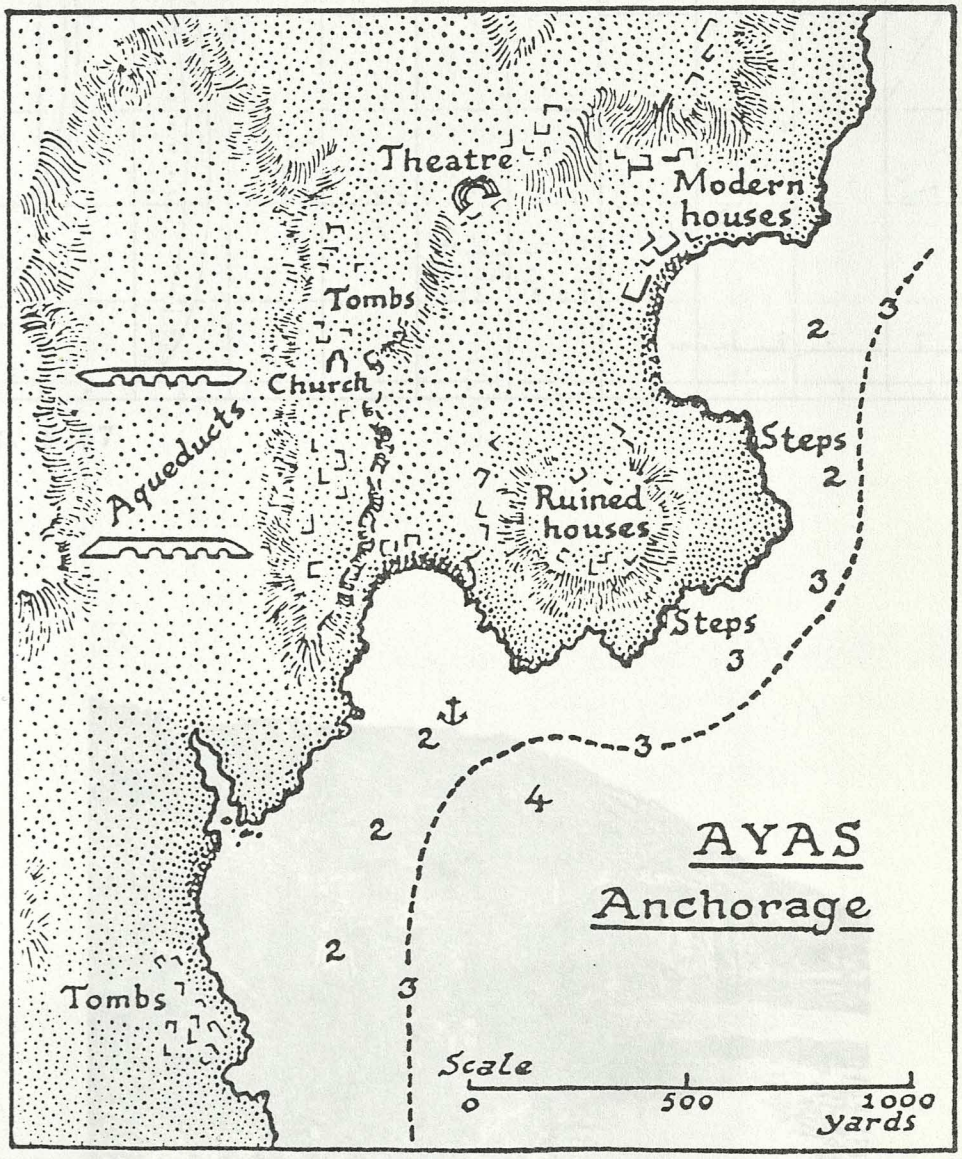



Fig. # 64.1

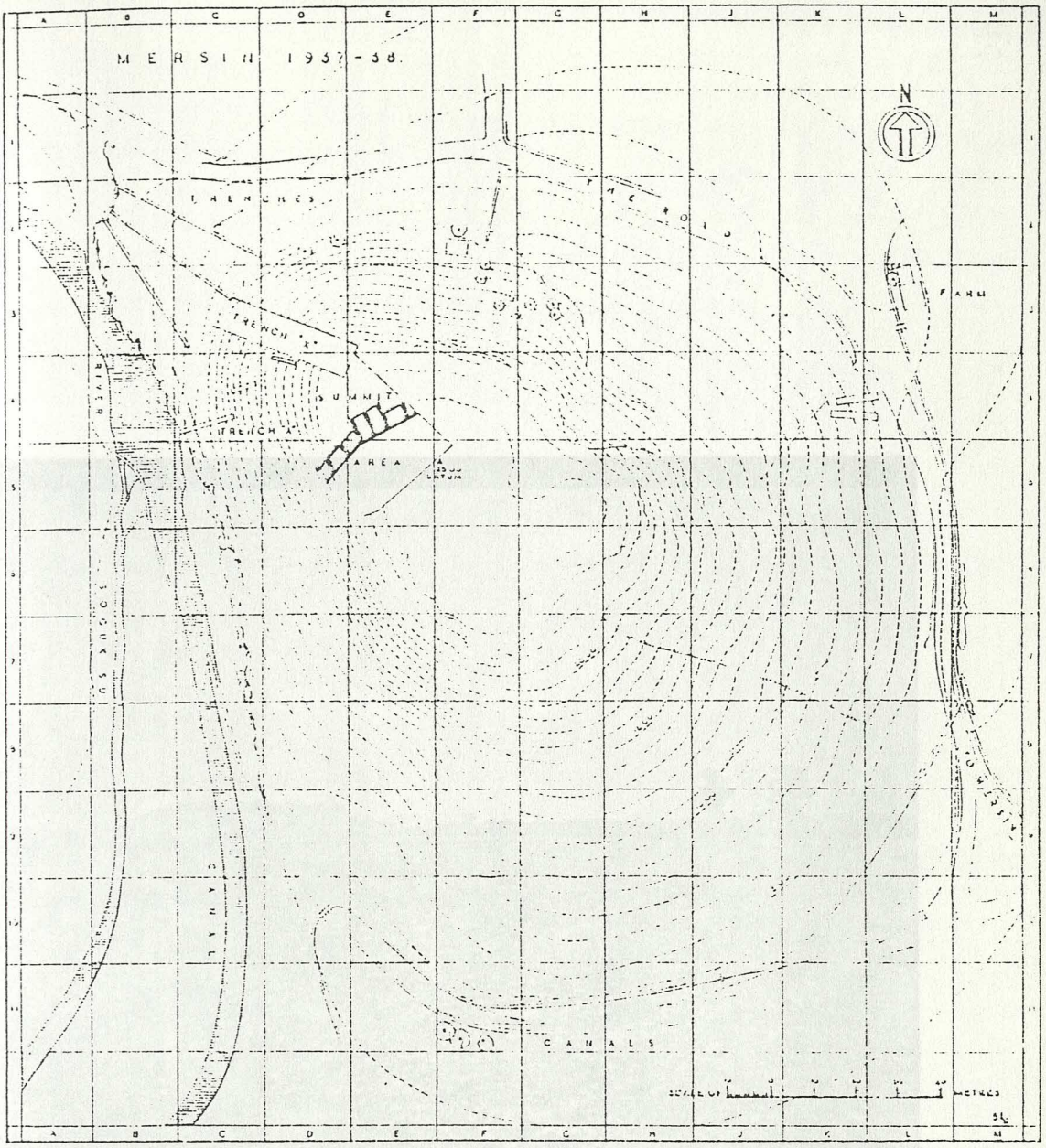



Fig. # 67

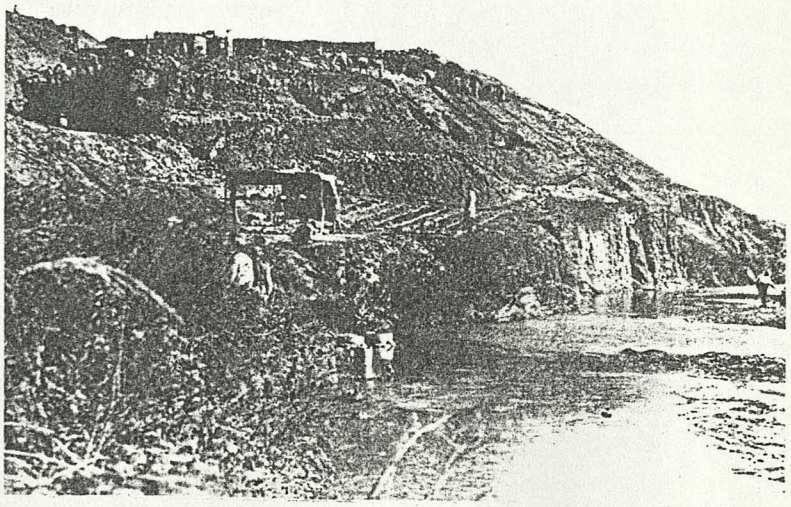


Fig. # 67.1

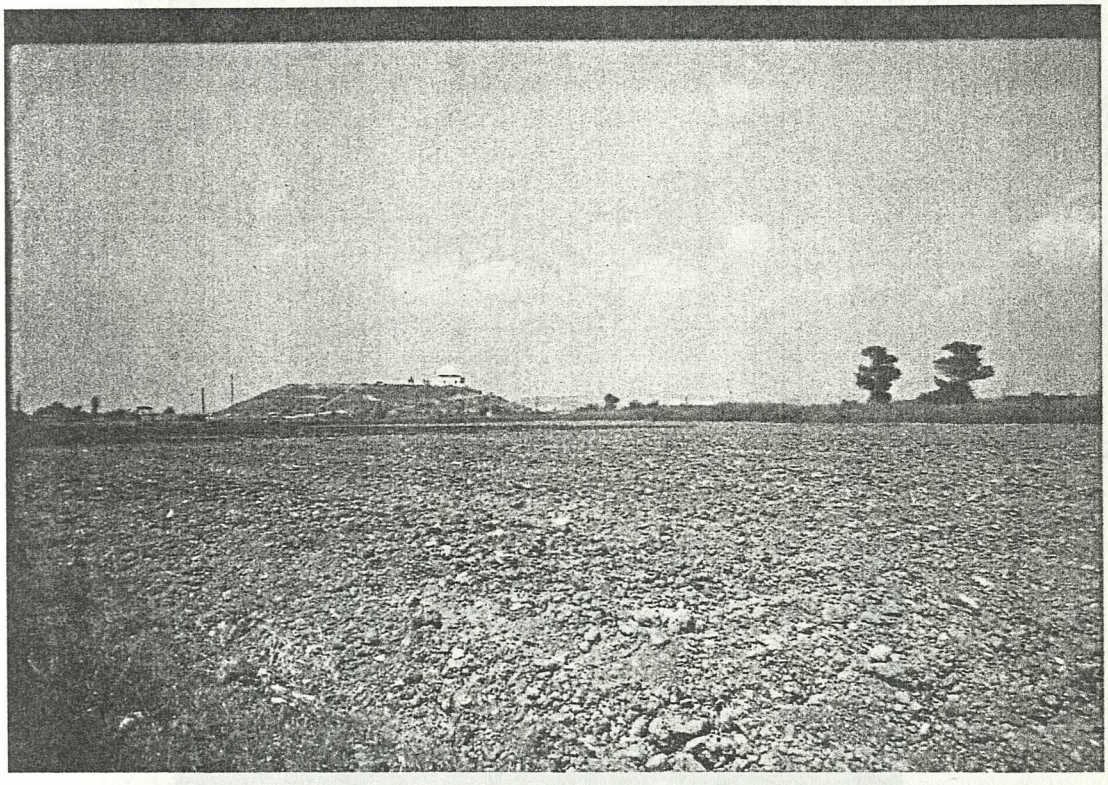


Fig. # 68

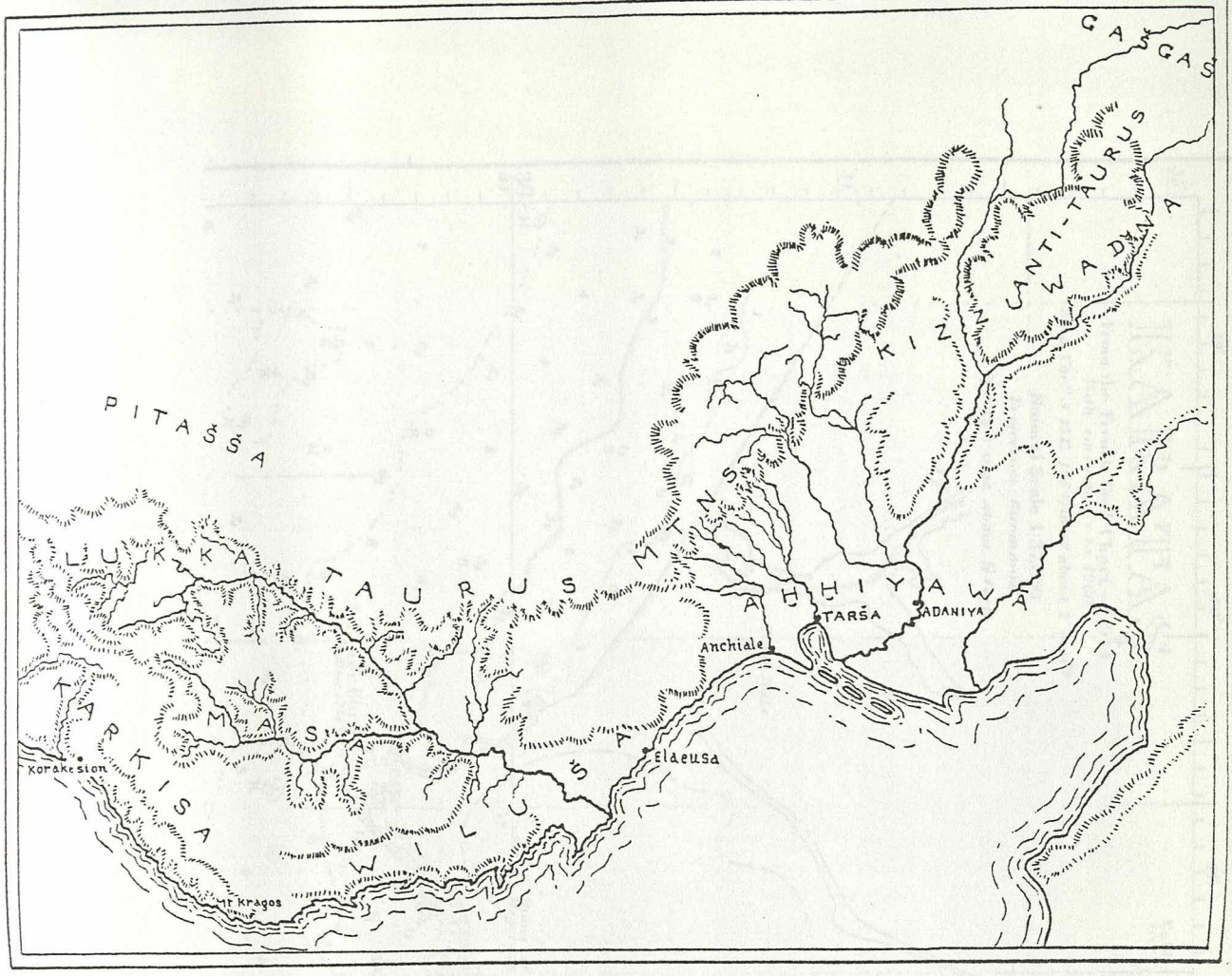



Fig. # 69



Fig. # 69.1

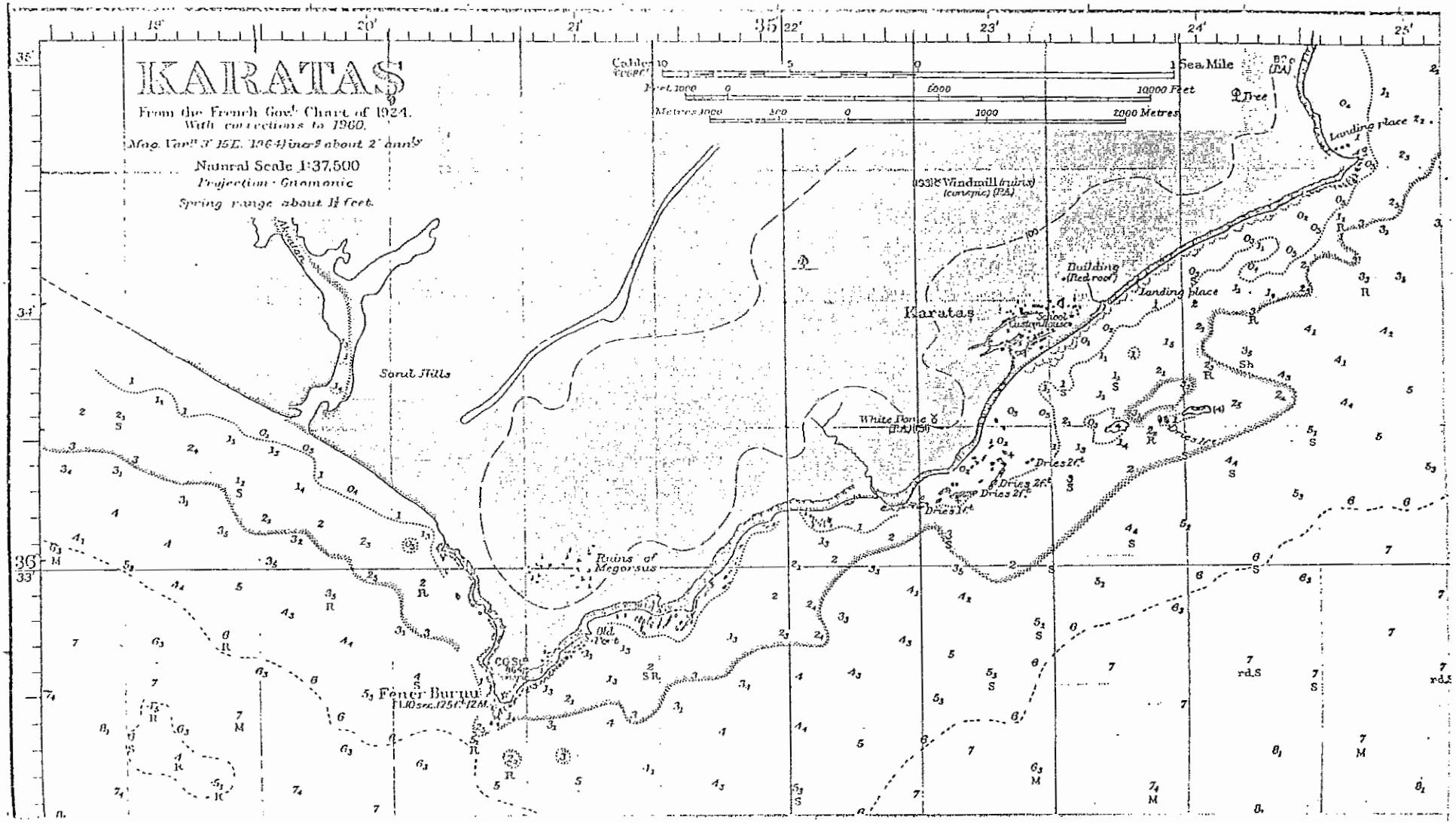

KARATAS
From the French Govt Chart of 1924.
With corrections to 1960.
Mag. Var.n 3° 15E. 1964 increasing about 2' annly
Natural Scale 1:37,500
Projection - Gnomonic
Spring range about 14 feet.
Cables
Sea Mile
Feet 1000 0 5000 10000 Feet
Metres 1000 500 0 1000 2000 Metres
Windmill (ruins)
(conspic) (PA)
Tree
Landing Place
Building
(Red roof)
Landing place
Karatas
School
Custom House
Sand Hills
White Dome
(PA) (Ch)
Dries 2ft
Dries 1ft
Ruins of
Megorsus
Old
Pier
CG St
Fener Burnu
FL10sec.12ft 12M.
rd.S
Sh

Fig. # 71

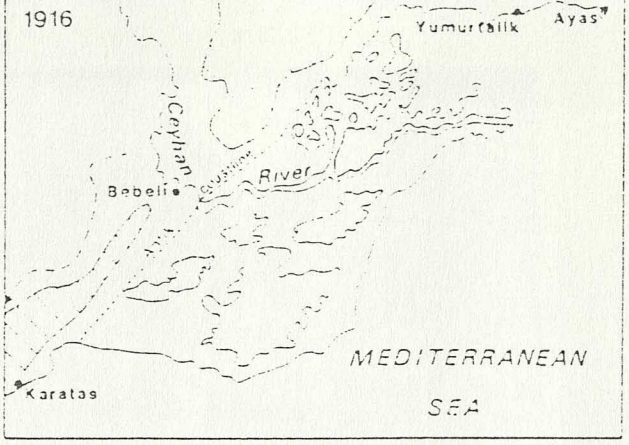



Fig. # 72

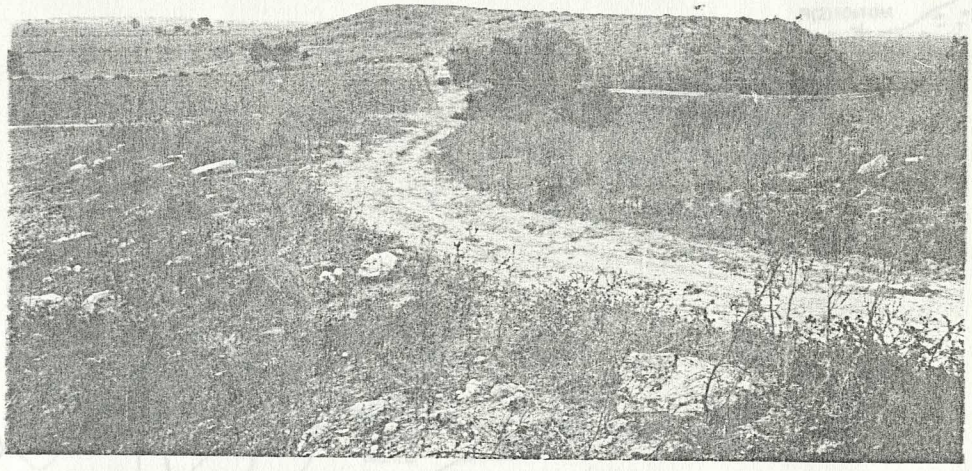
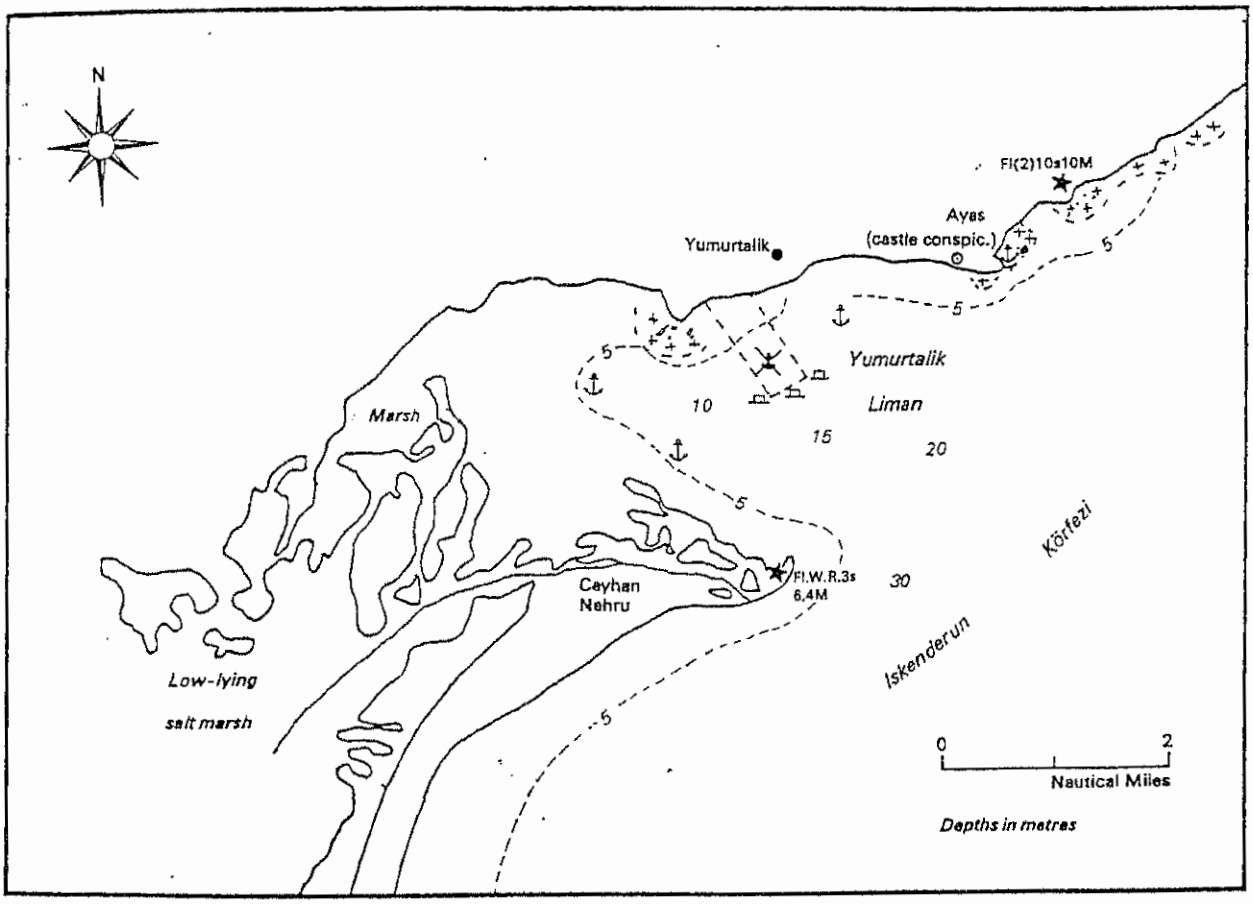


Fig. # 72.1



Fig. # 72.2




YUMURTALIK LIMAN 36°42'N 35°44'E

Fig. # 73

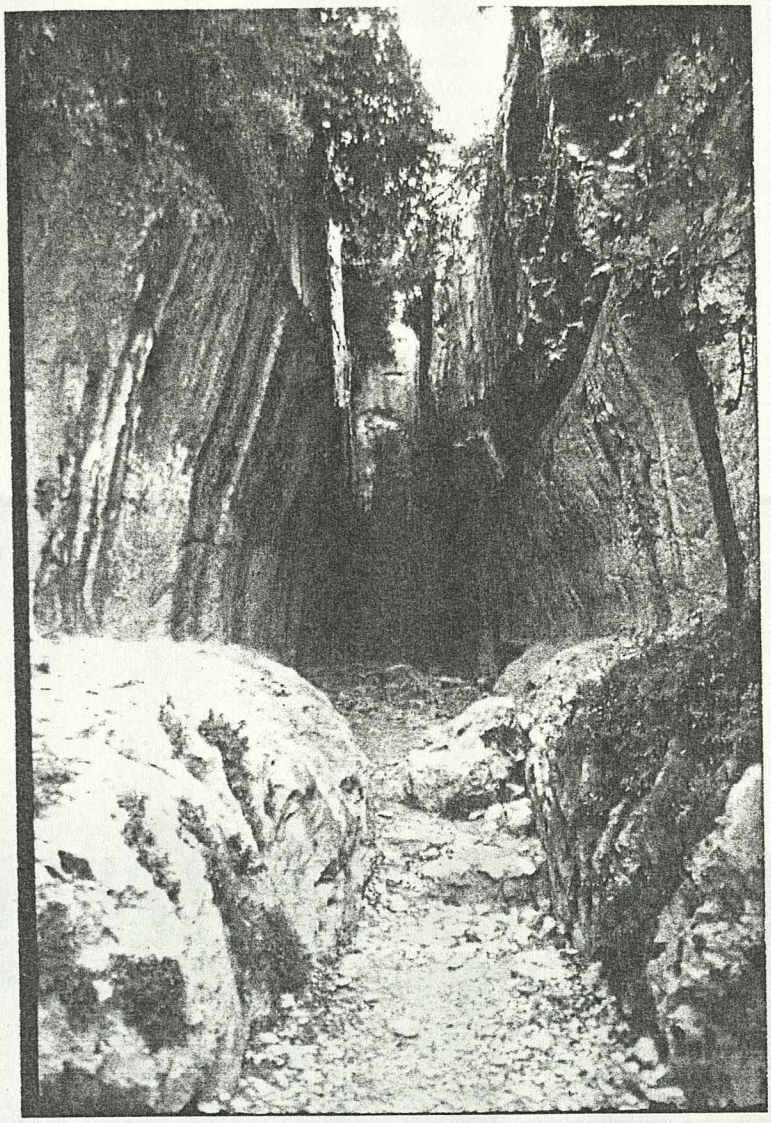


Fig. # 80

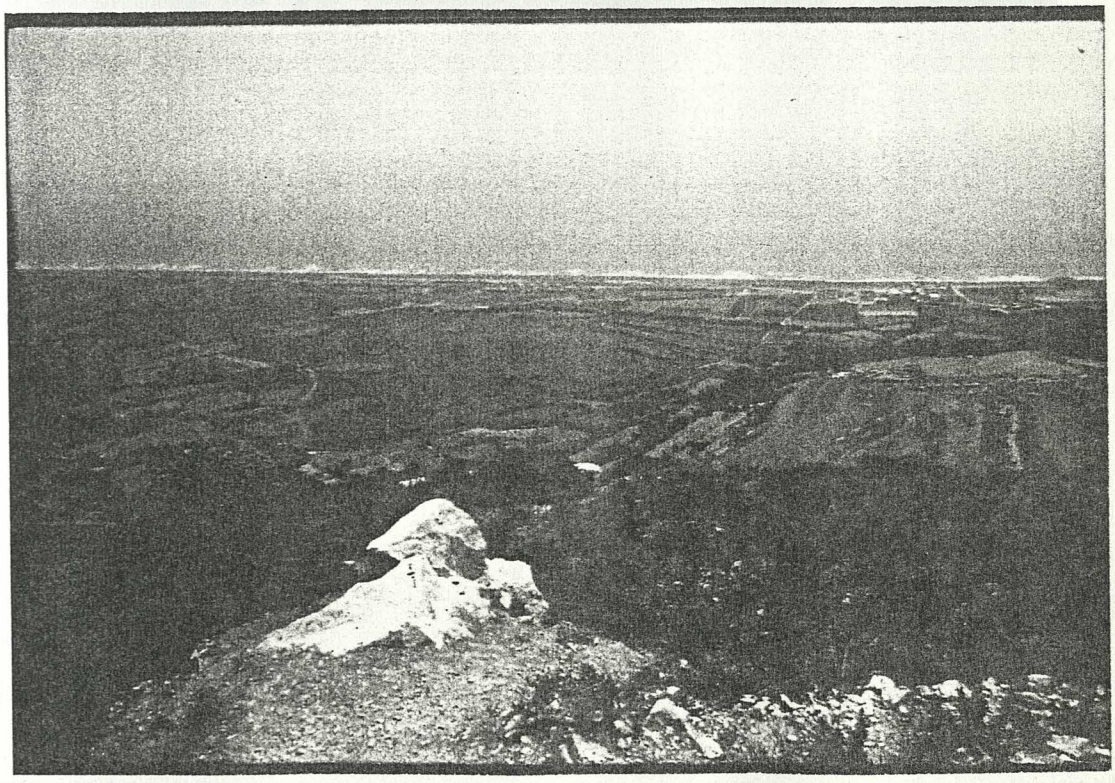


Fig. # 80.1

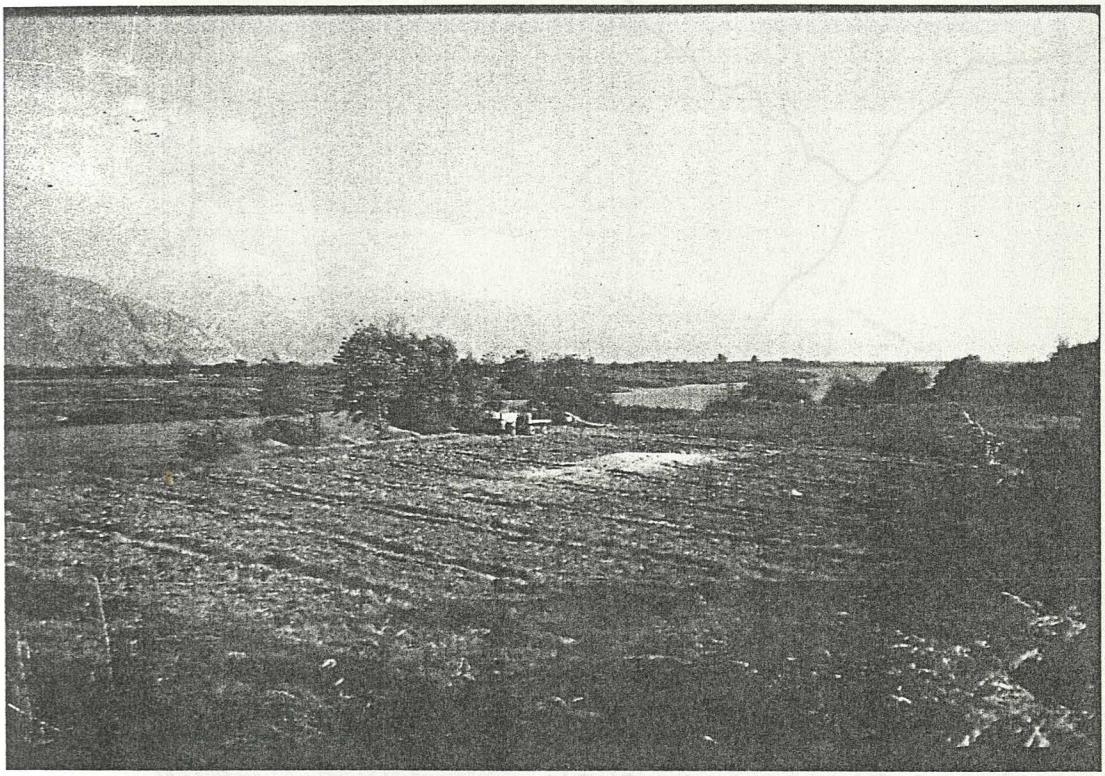


Fig. # 81

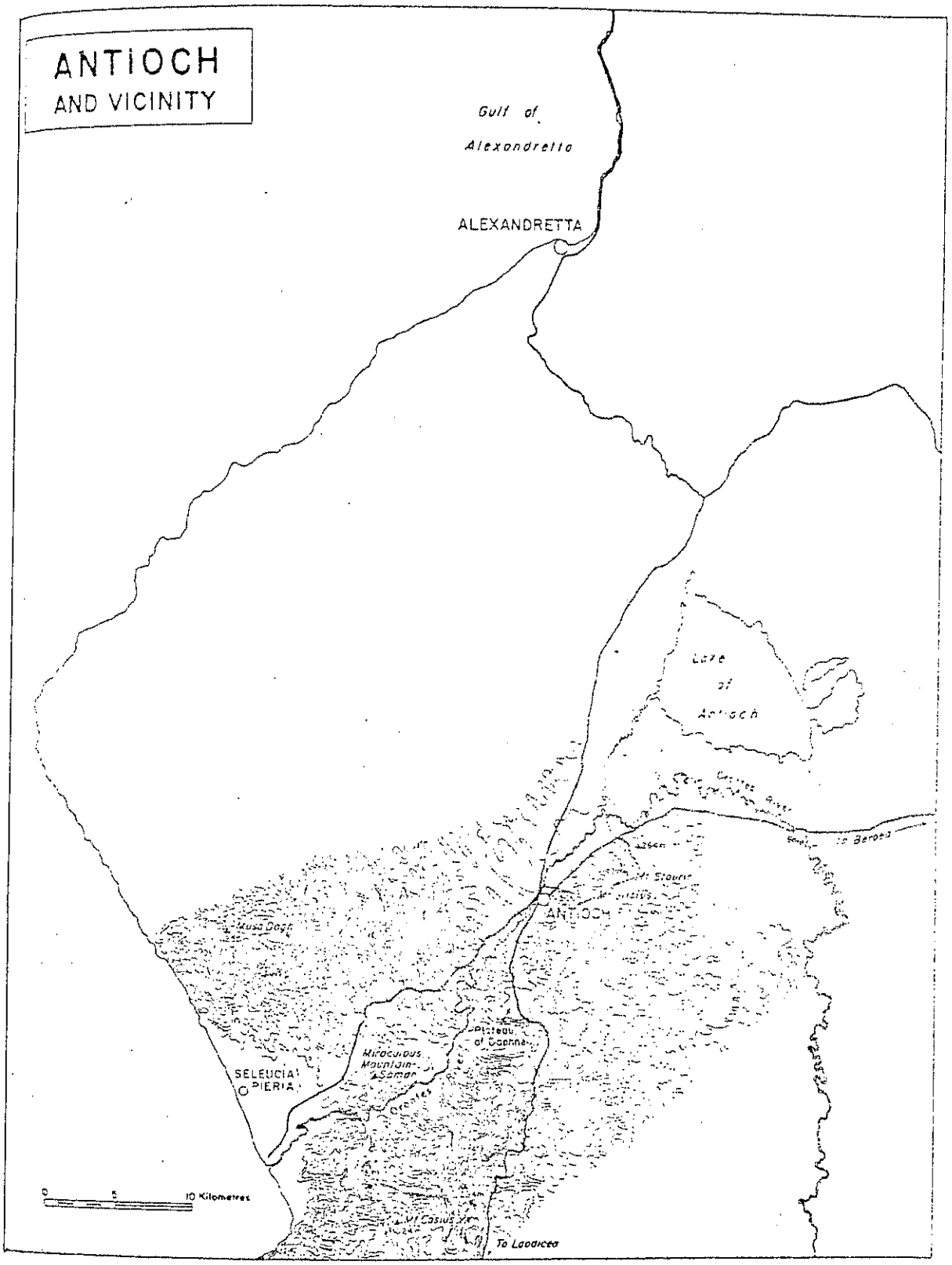
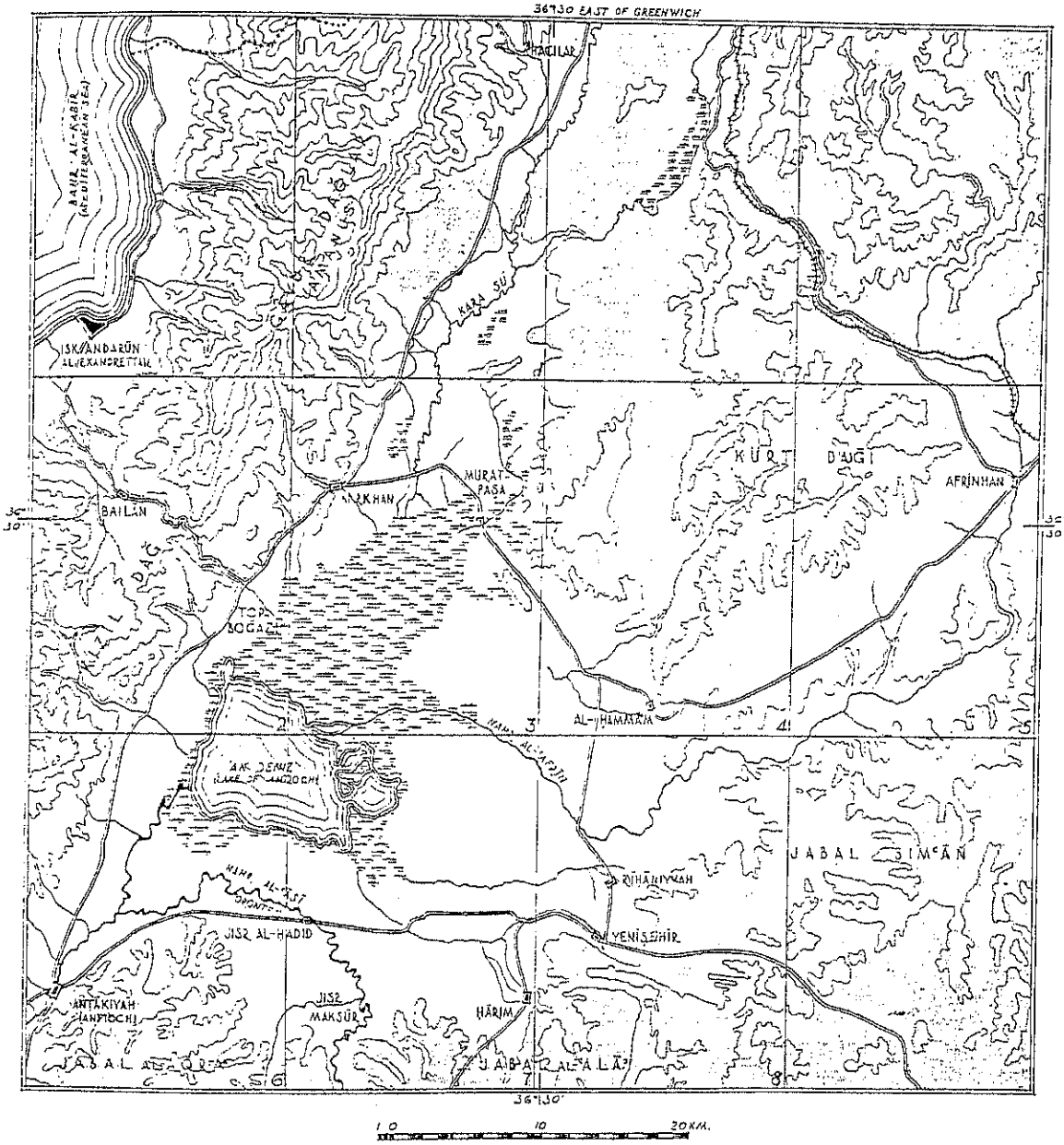

ANTIOCH
AND VICINITY
Gulf of
Alexandretta
ALEXANDRETTA
Lake
of
Antioch
ANTIOCH
Musa Dagh
SELEUCIA
PIERIA
Miraculous
Mountain
Plateau
of Cyprus
0
5
10 Kilometres
To Laodicea

Fig. # 82




THE PLAIN OF ANTIOCH AND ITS ENVIRONS. KEY MAP. SCALE, 1:400.000

Fig. # 82.1

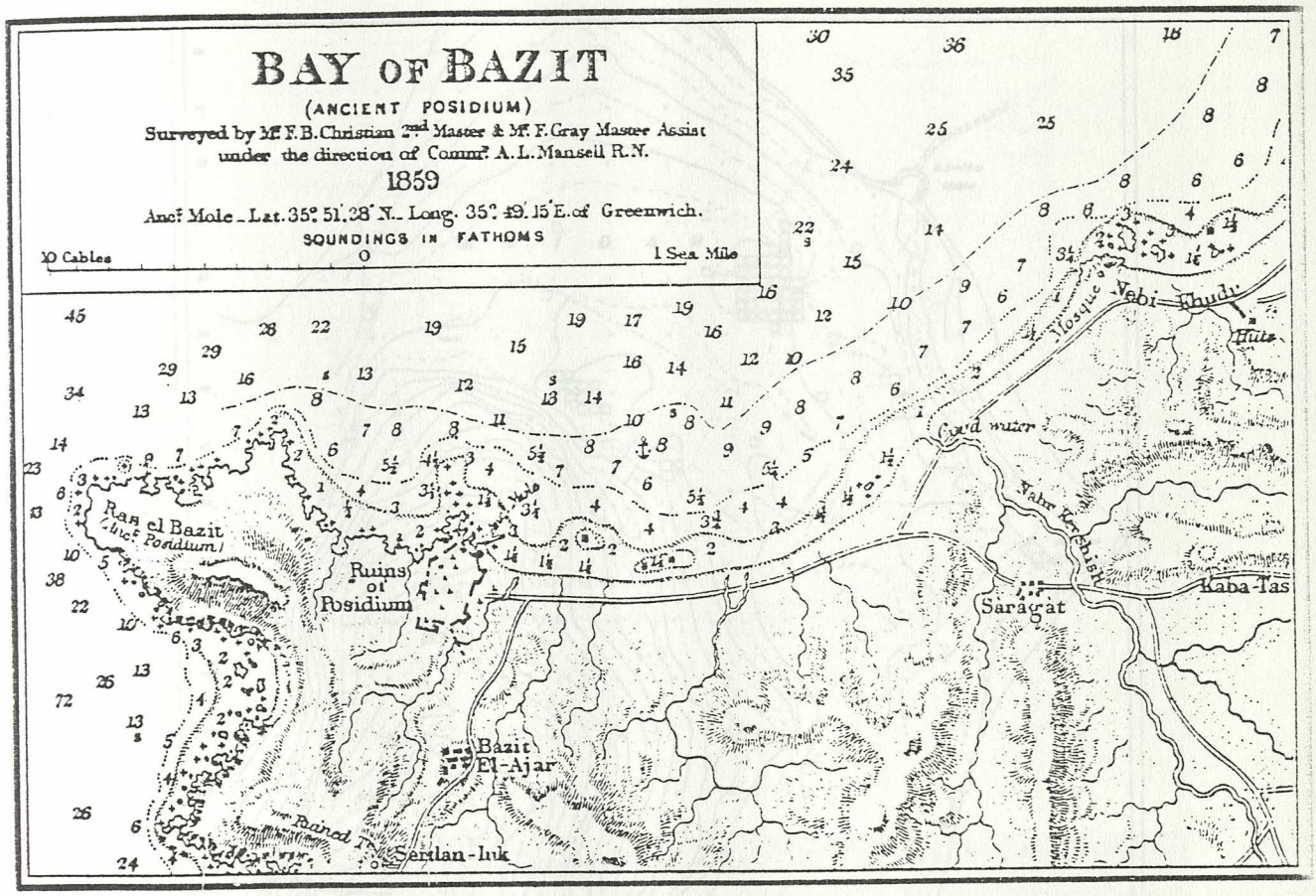



Fig. # 85

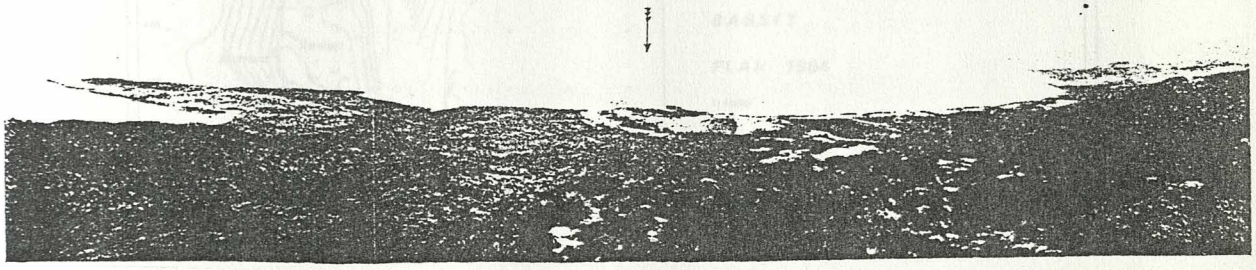


Fig. # 85.1

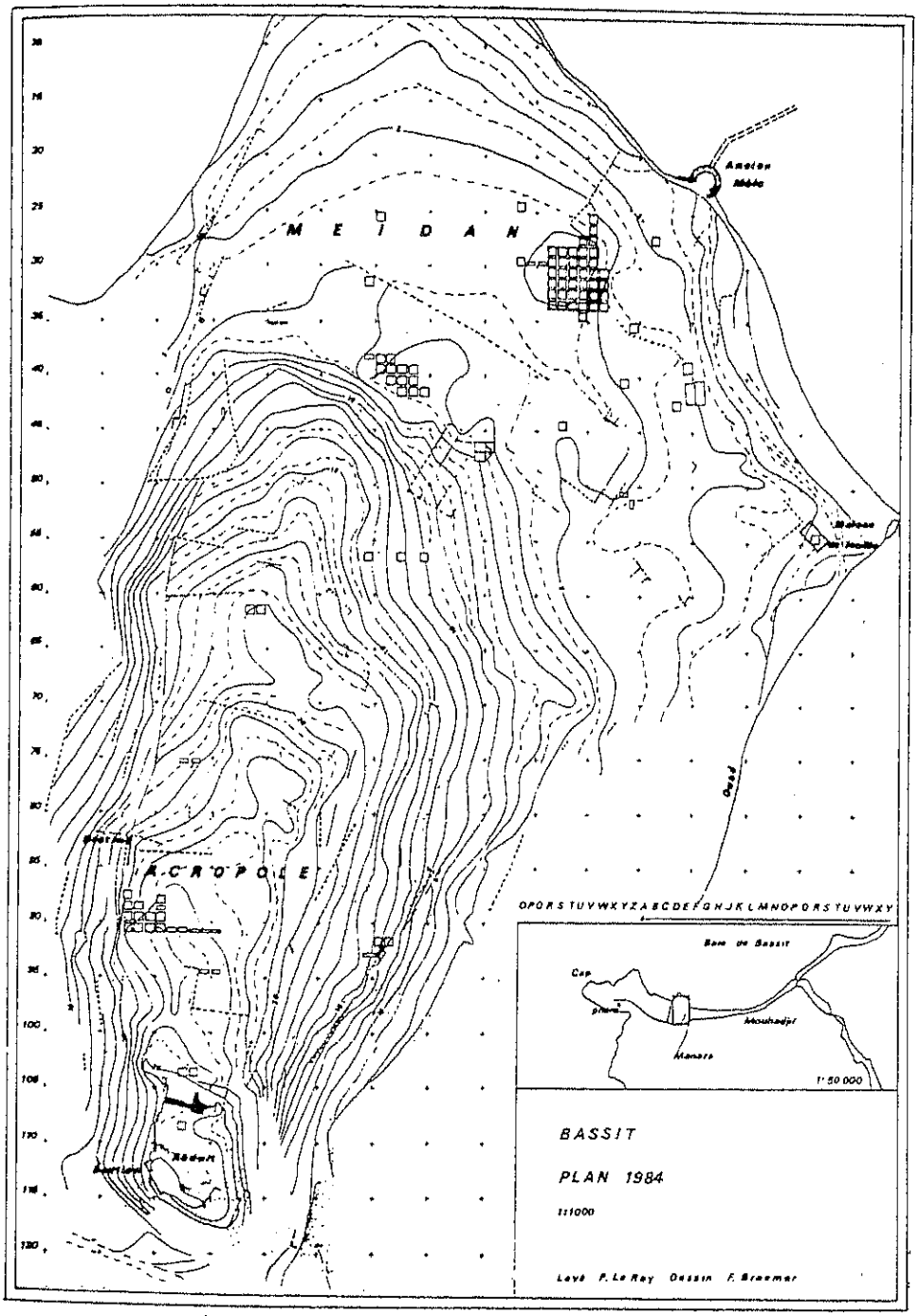

M E I D A N
A C R O P O L E
Amalon
Mosquée
Oued
Bain de Bassit
Cap
phare
Mouhadjir
Manara
1' 50 000
BASSIT
PLAN 1984
1:1000
Levé P. Le Roy Dessin F. Braemer

Fig. # 85.2

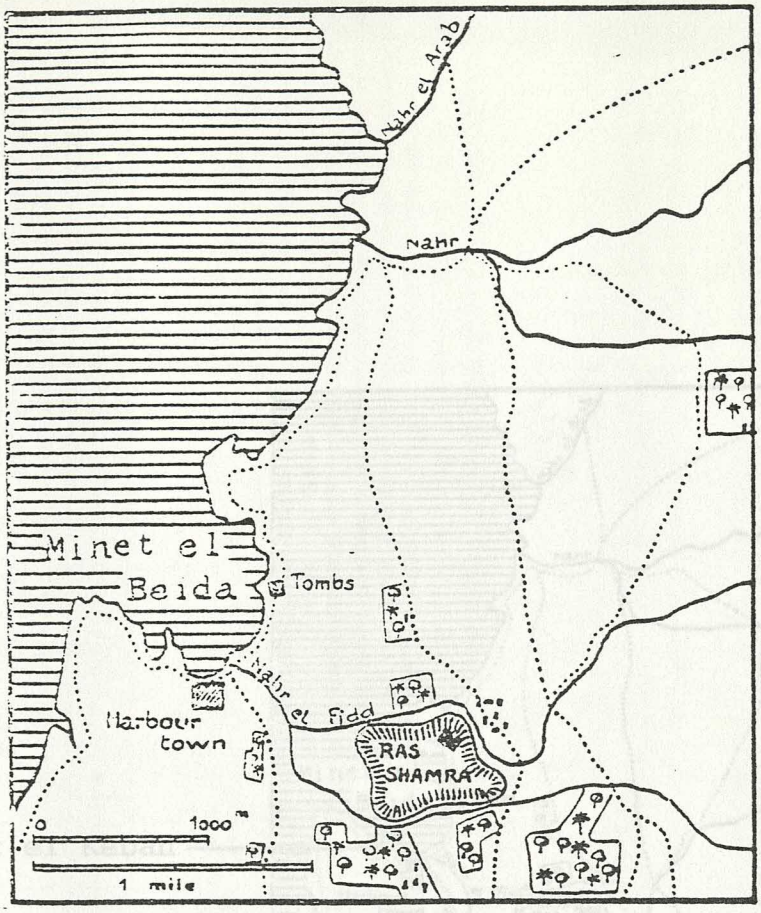



Fig. # 89

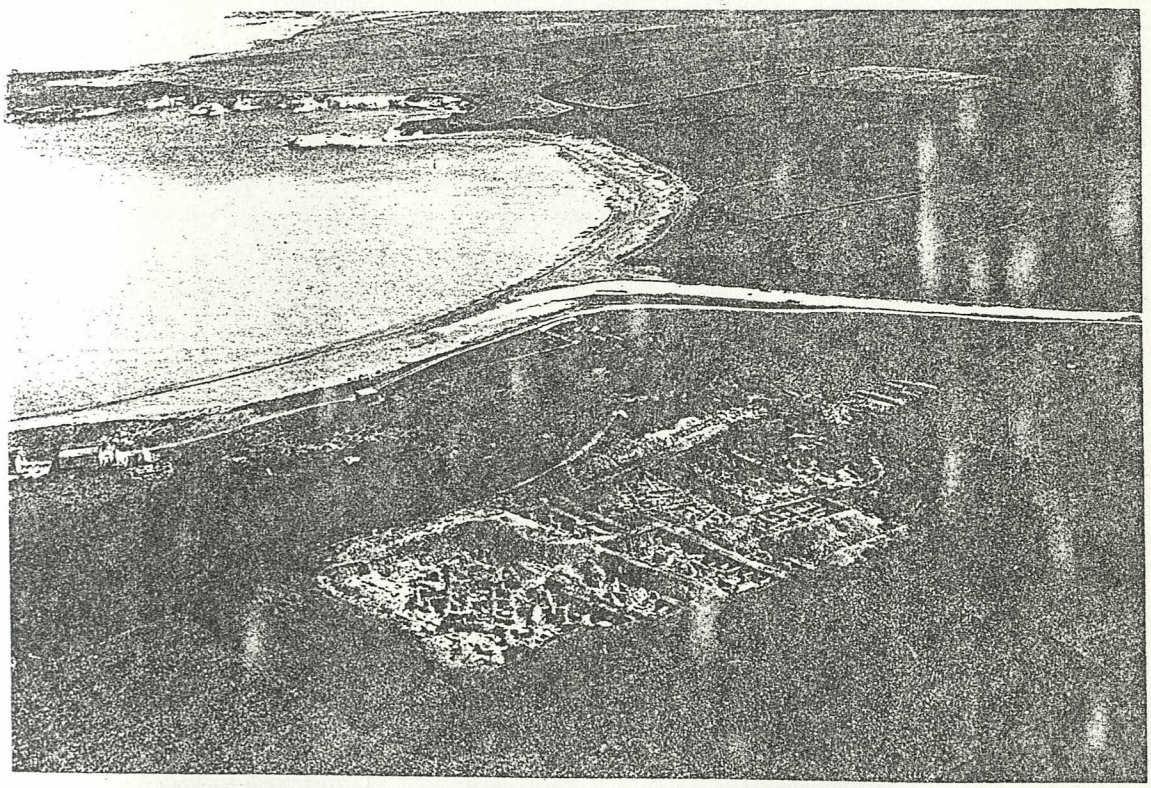


Fig. # 89.1

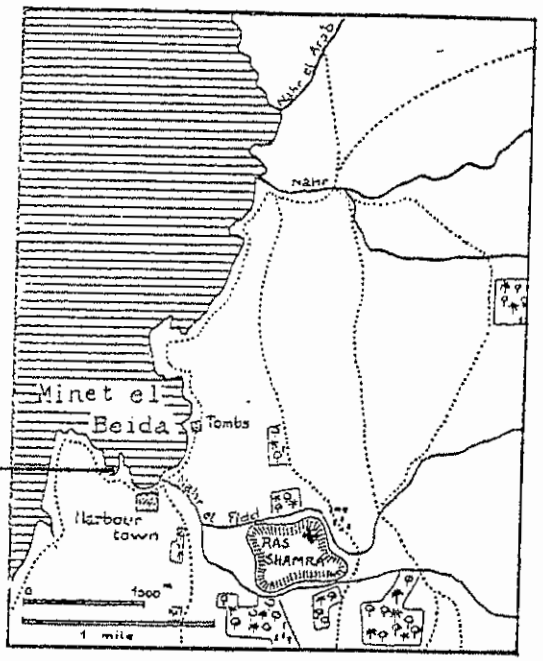

Minet el Keban
Minet el Beida
Tombs
Harbour town
RAS SHAMRA
1500
1 mile

Fig. # 90

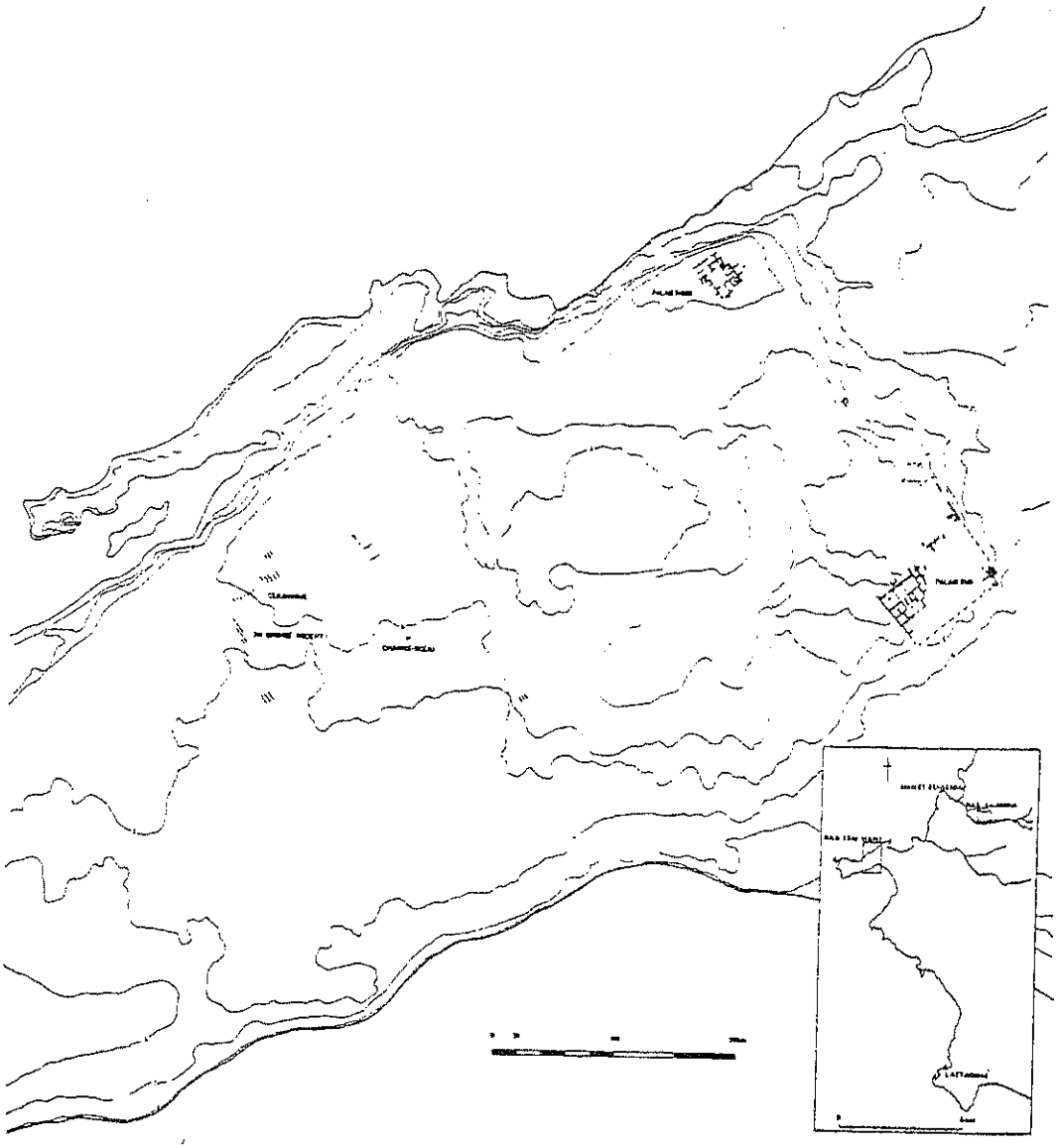


Fig. # 91

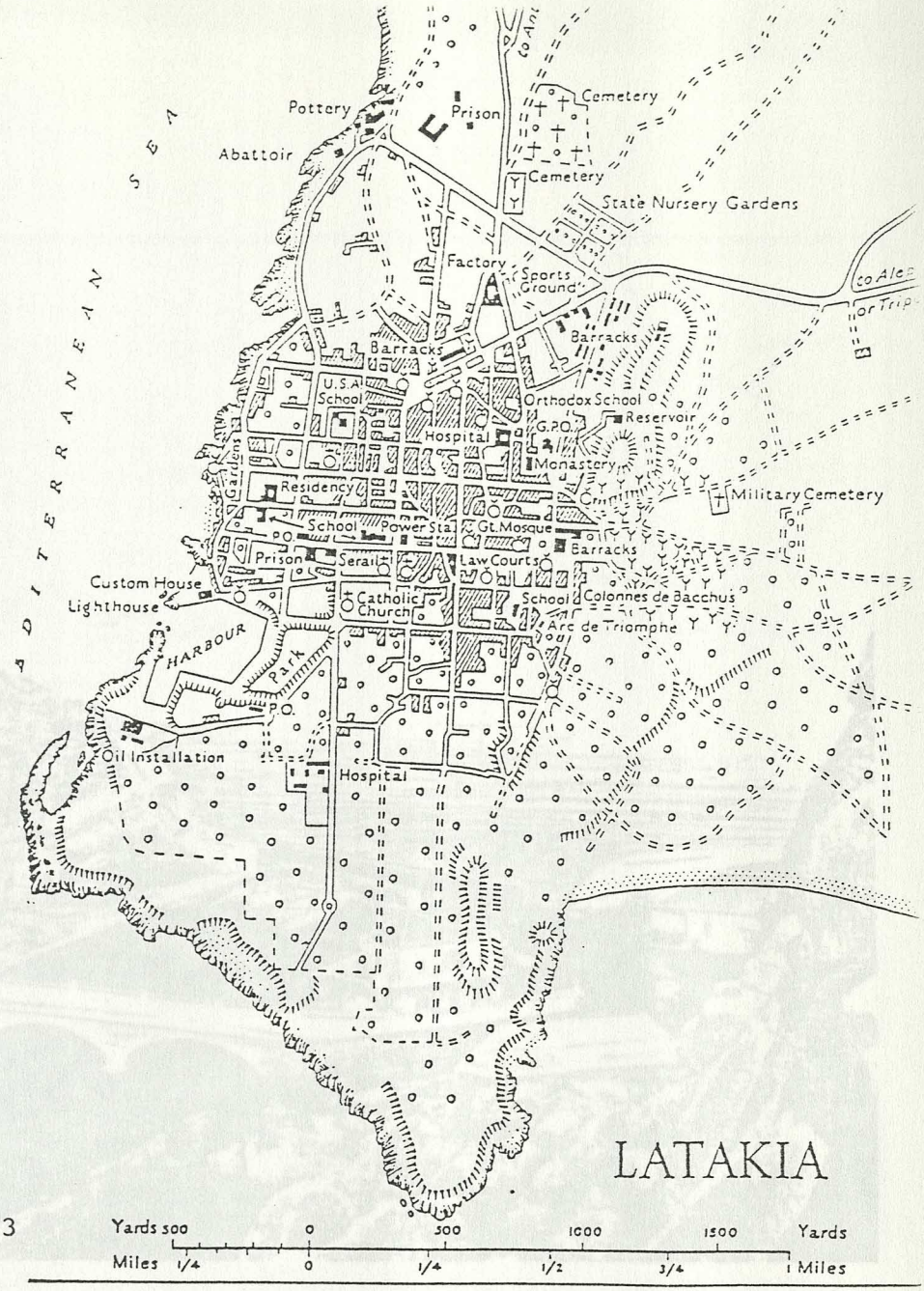



Fig. # 93

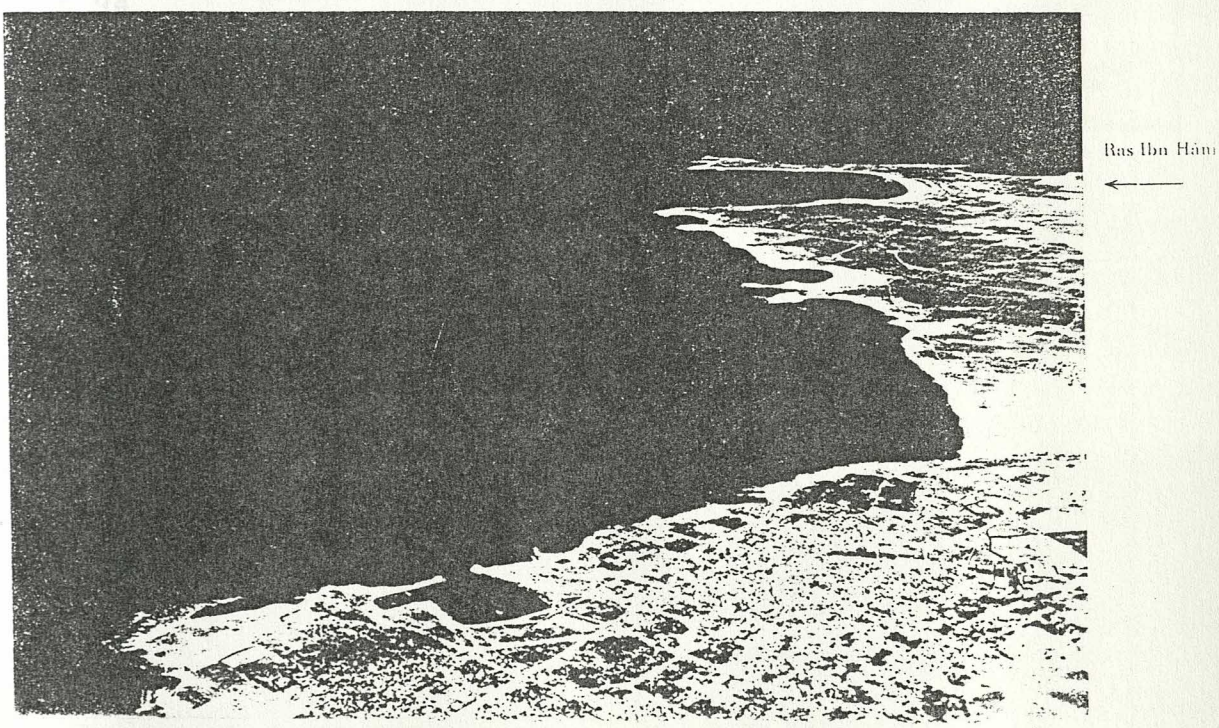



Fig. # 93.1

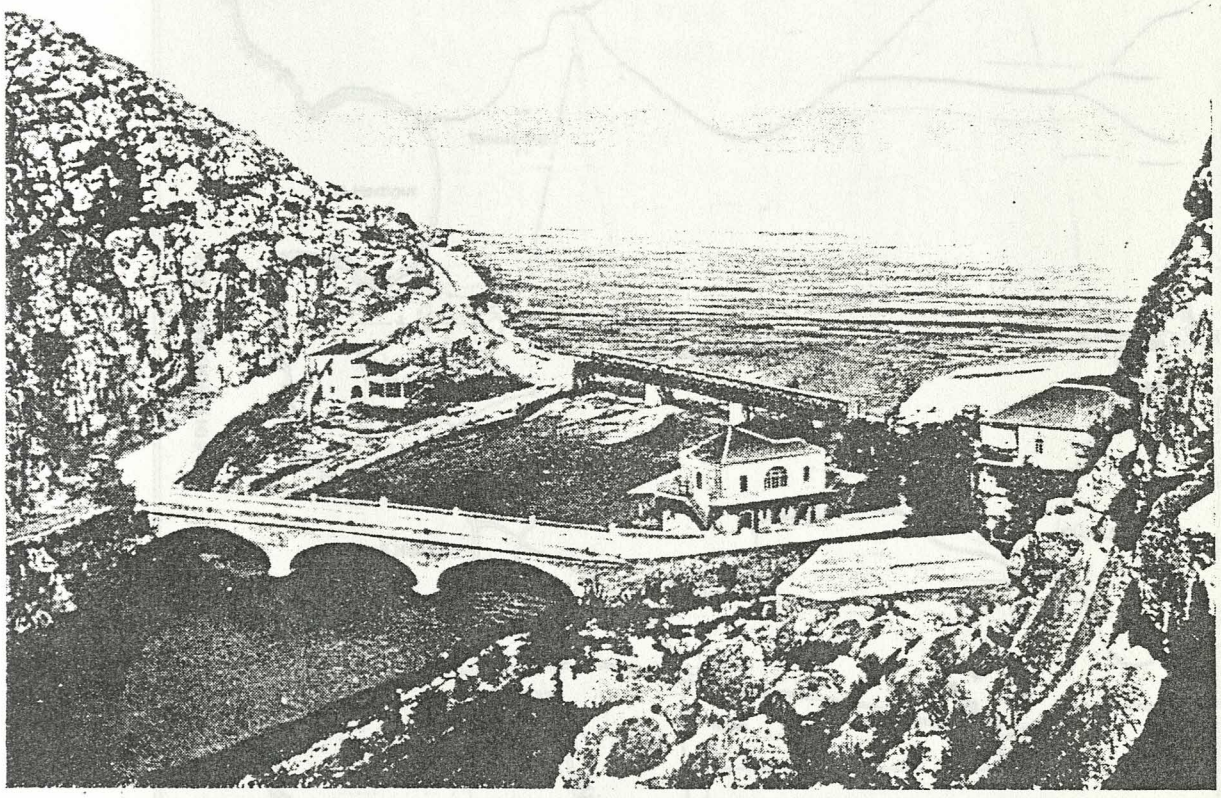


Fig. # 94

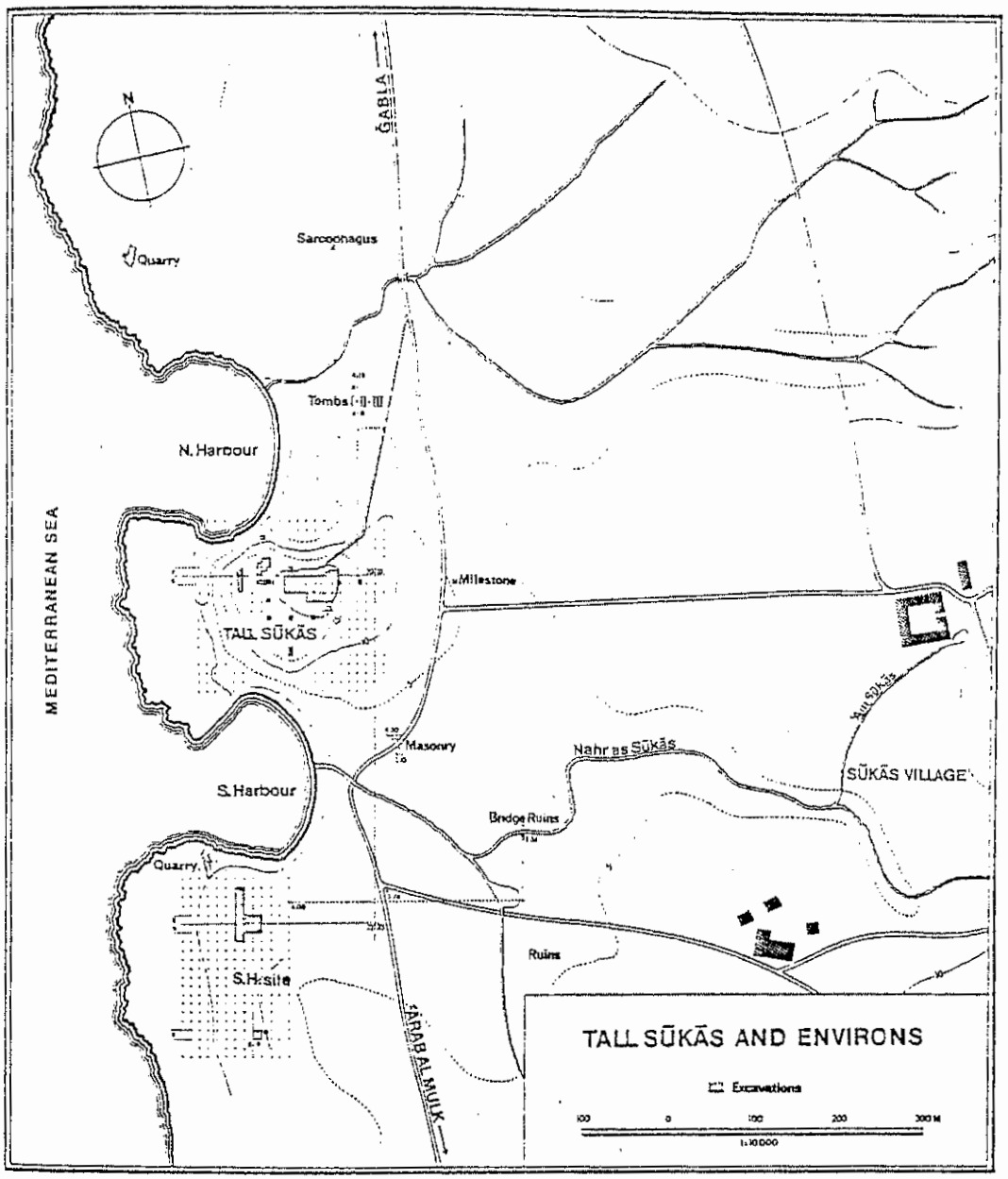

N
ĞABLA
Quarry
Sarcophagus
Tombs I-II-III
N. Harbour
MEDITERRANEAN SEA
Milestone
TALL SŪKĀS
Masonry
Nahr as Sūkās
SŪKĀS VILLAGE
S. Harbour
Bridge Ruins
Quarry
Ruins
S. H. site
ʿARAB AL MULK
TALL SŪKĀS AND ENVIRONS
Excavations
100 0 100 200 300 M
1:10000

Fig. # 97

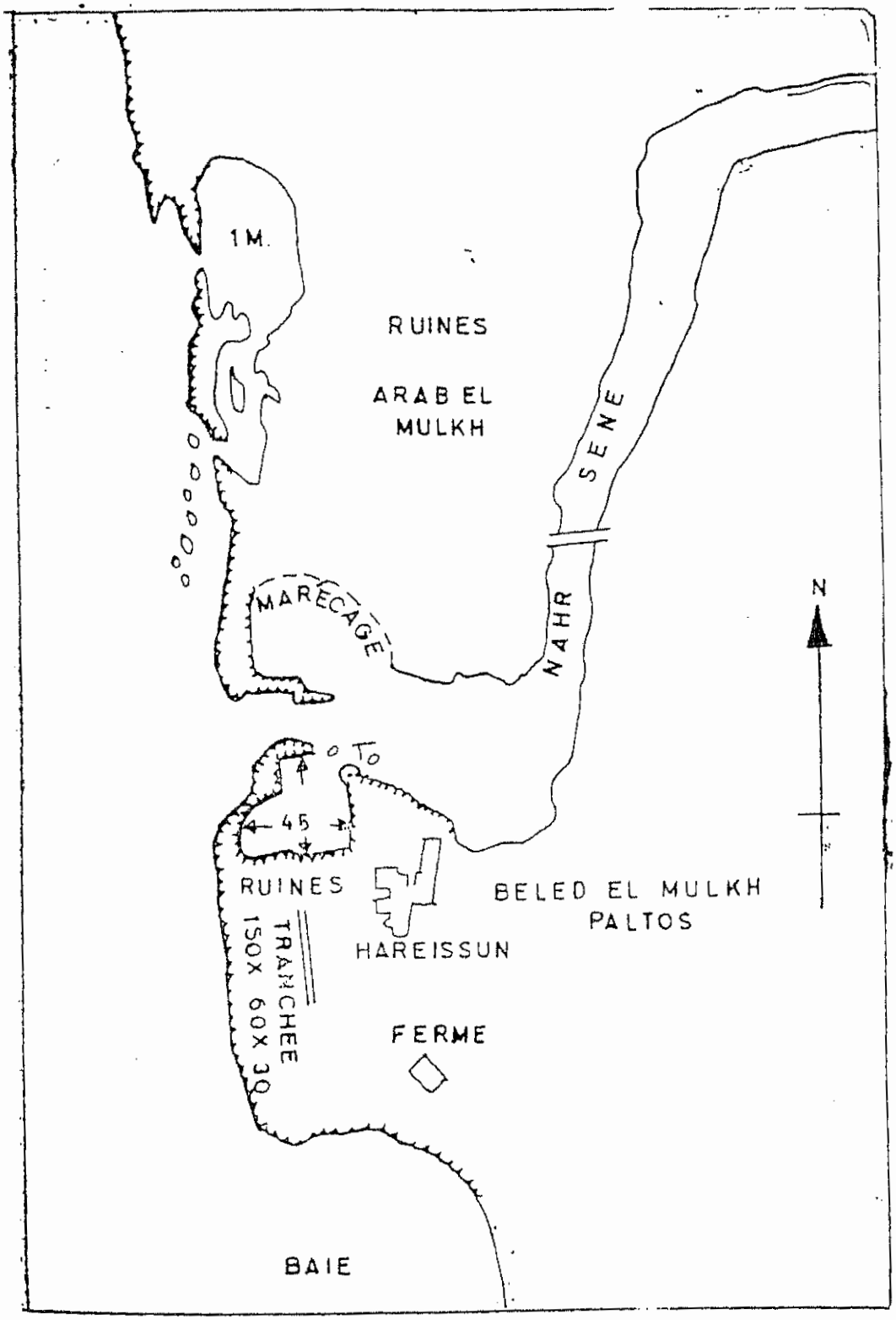

1M.
RUINES
ARAB EL
MULKH
SENE
MARECAGE
NAHR
N
To
45
RUINES
BELED EL MULKH
PALTOS
HAREISSUN
TRANCHEE
150X 60X 30
FERME
BAIE

Fig. # 98

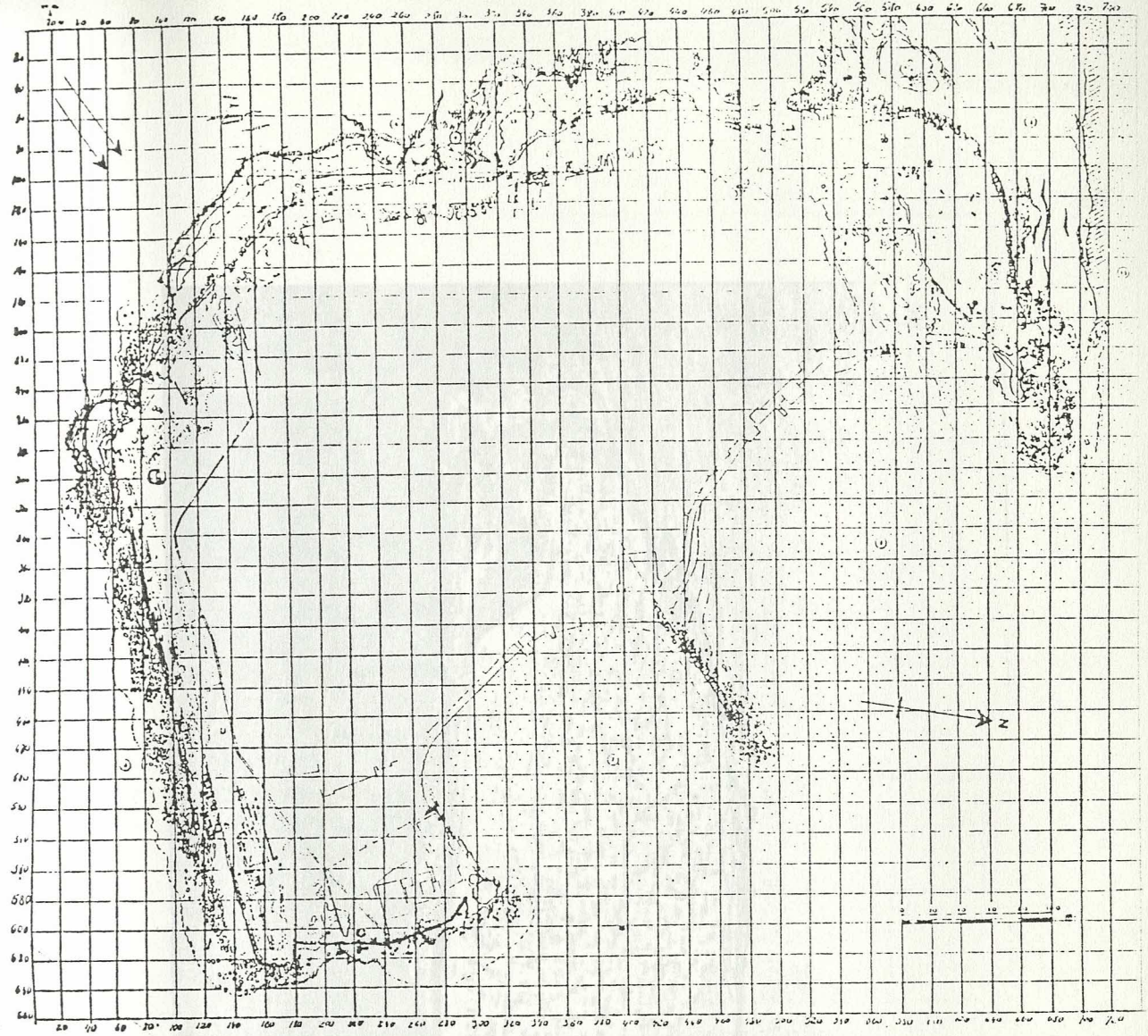


Fig. # 102

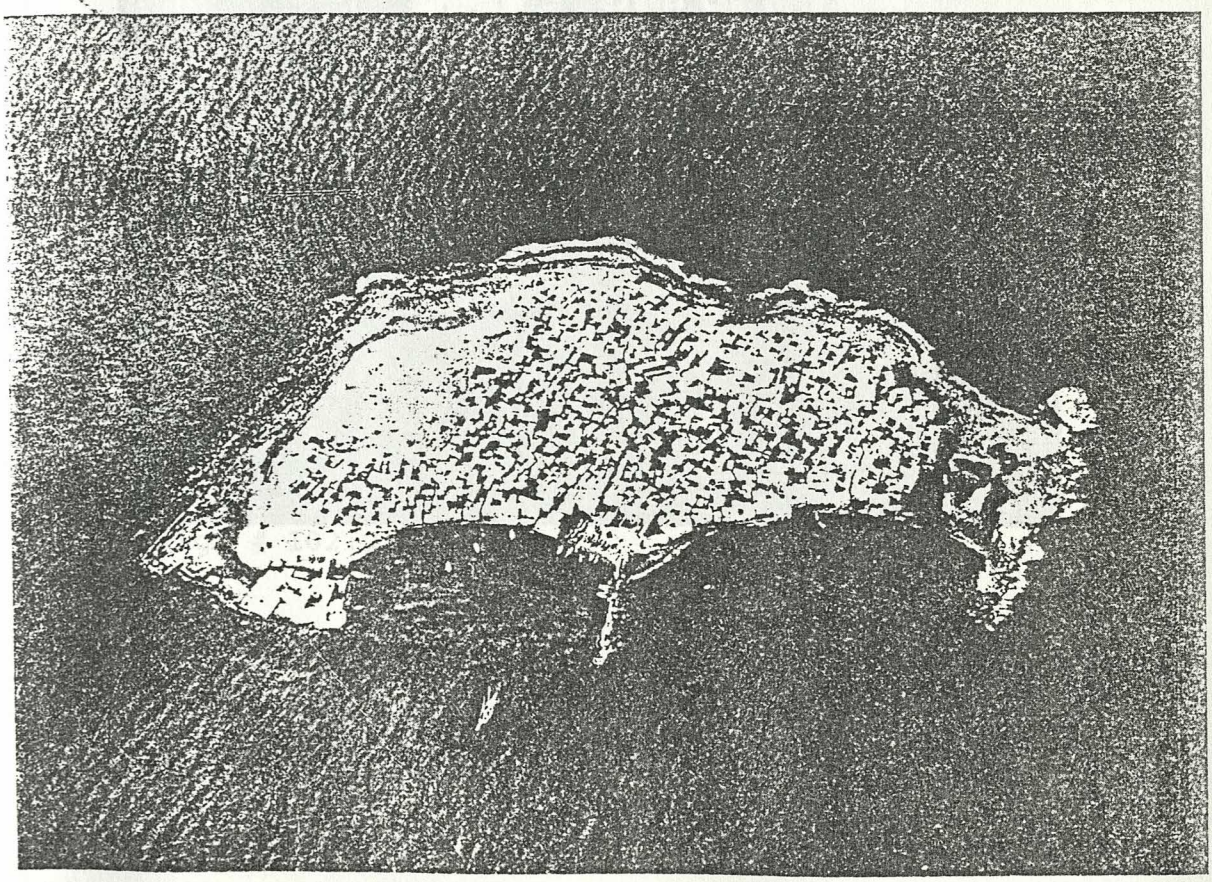


Fig. # 102.1

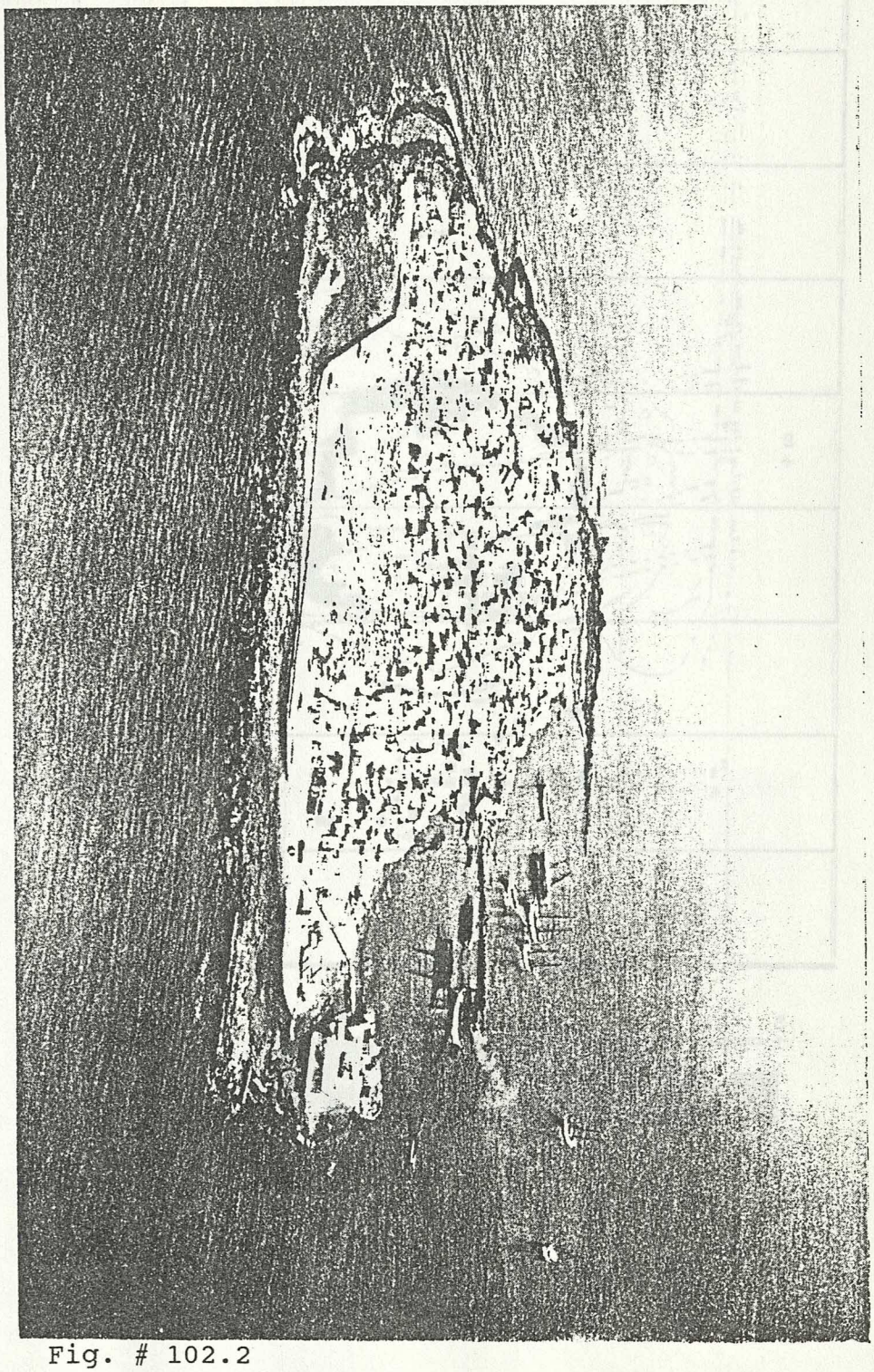


Fig. # 102.2

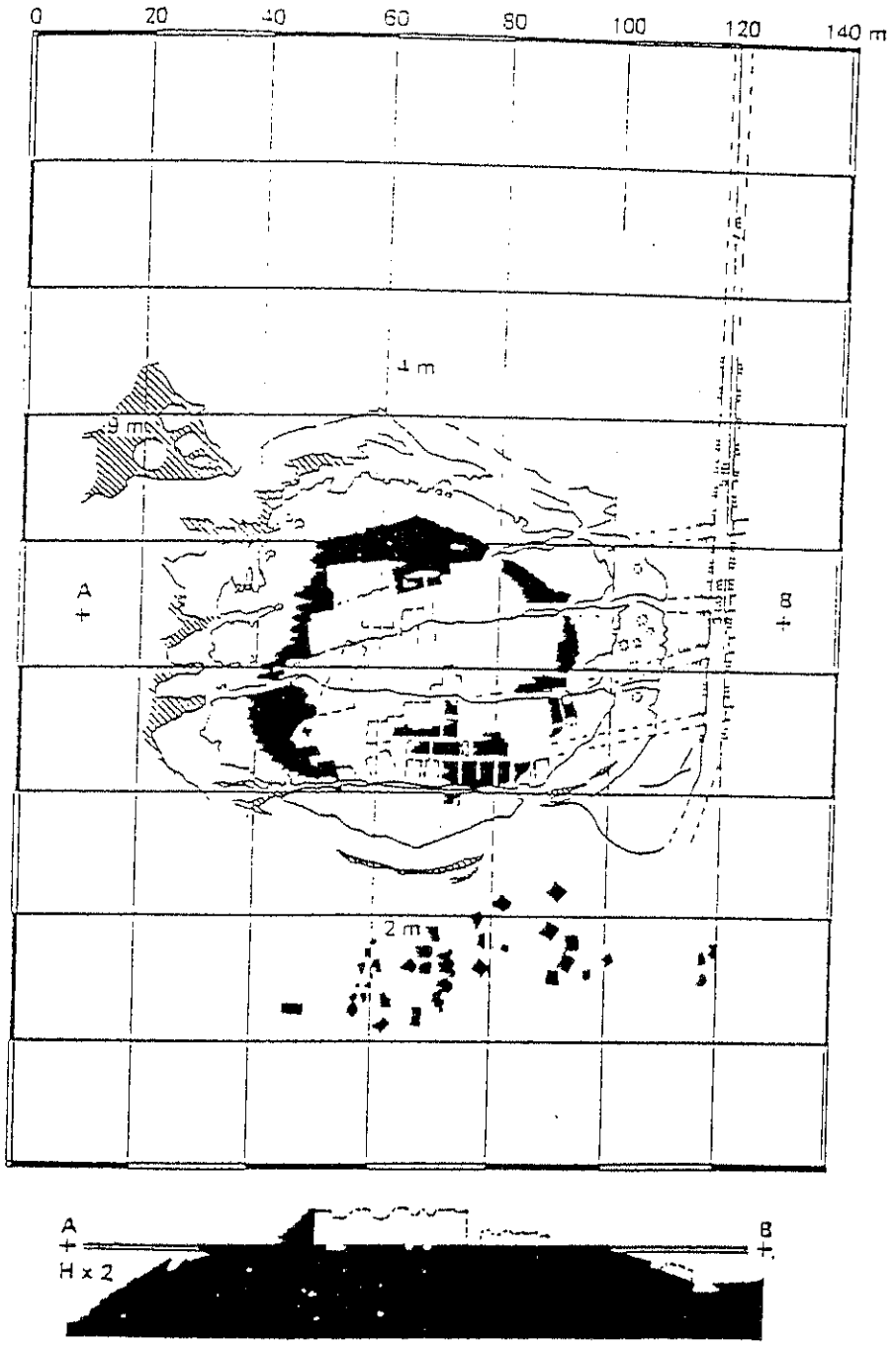



Fig. # 104

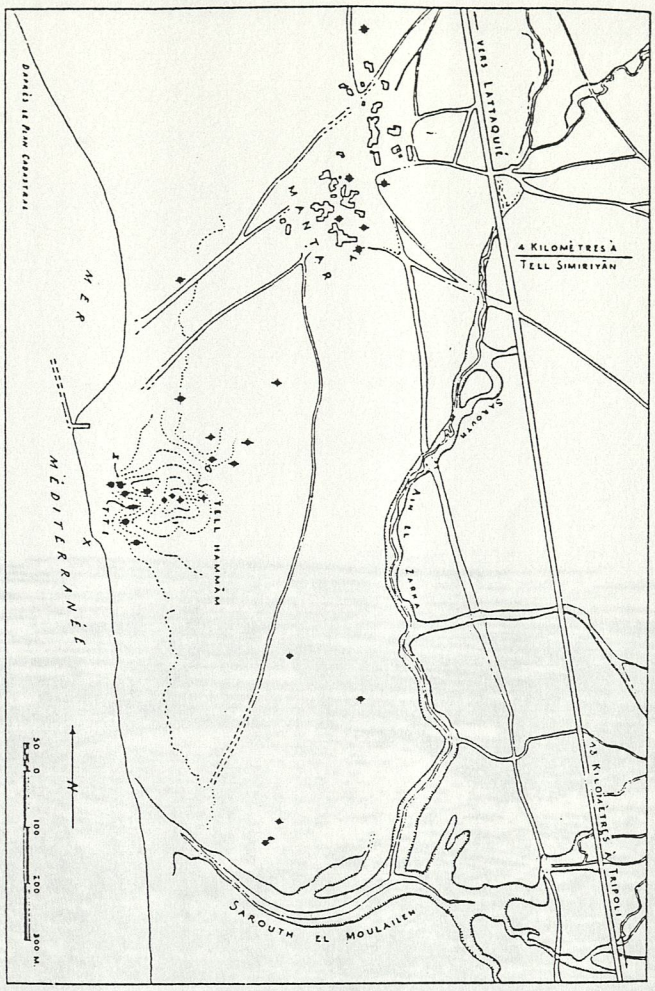



Fig. # 105



Fig. # 105.1

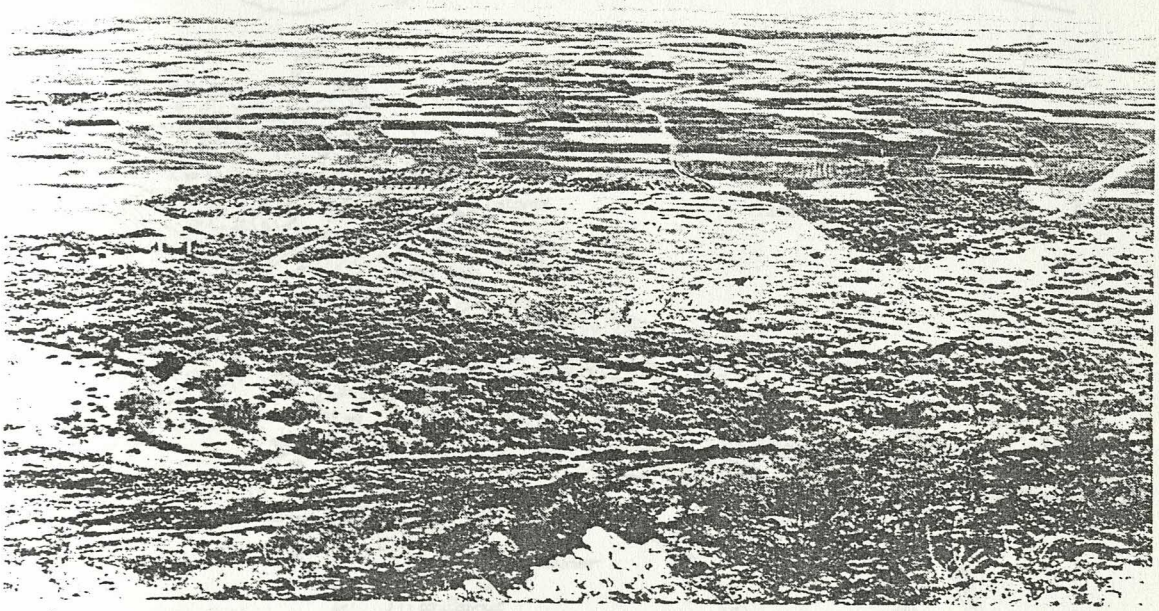


Fig. # 109

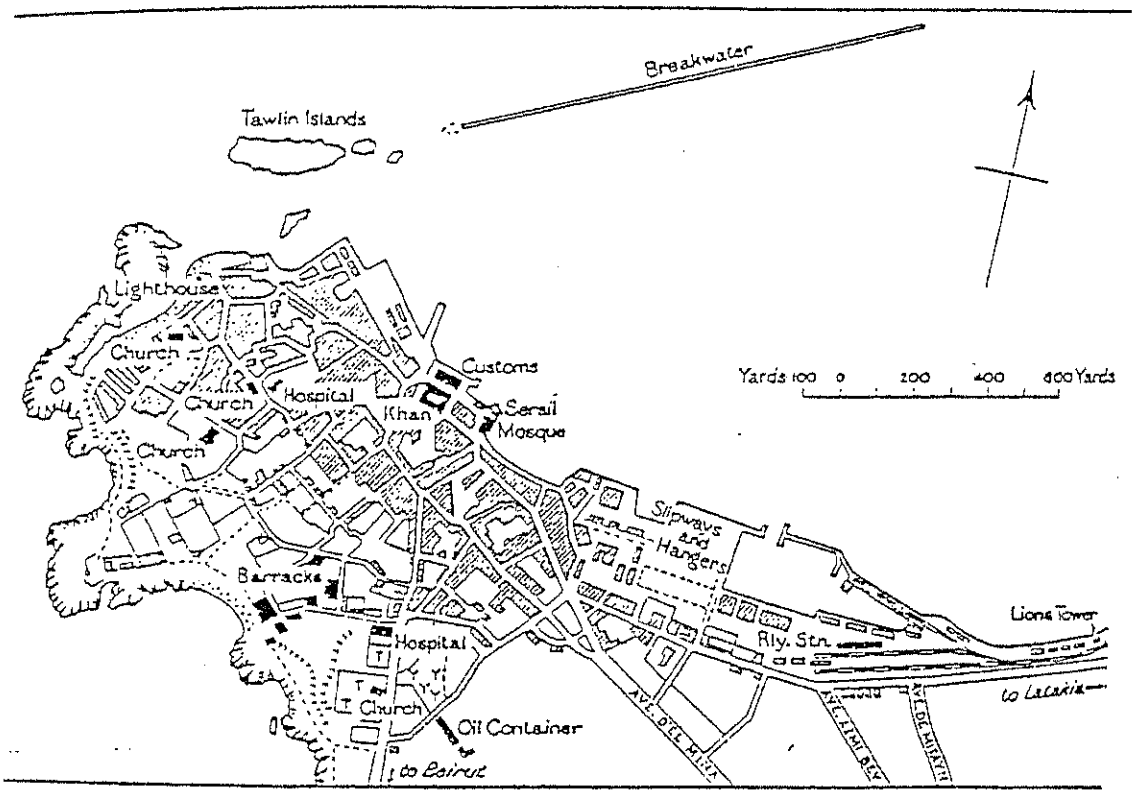

Breakwater
Tawlin Islands
Lighthouse
Church
Church
Church
Hospital
Khan
Customs
Serail
Mosque
Yards 100 0 200 400 600 Yards
Slipways and Hangers
Barracks
Hospital
Church
Oil Container
to Beirut
Rly. Stn.
Lions Tower
to Lacaria
AVE. DE LIMA
AVE. DE MIRAFLORES

Fig. # I11

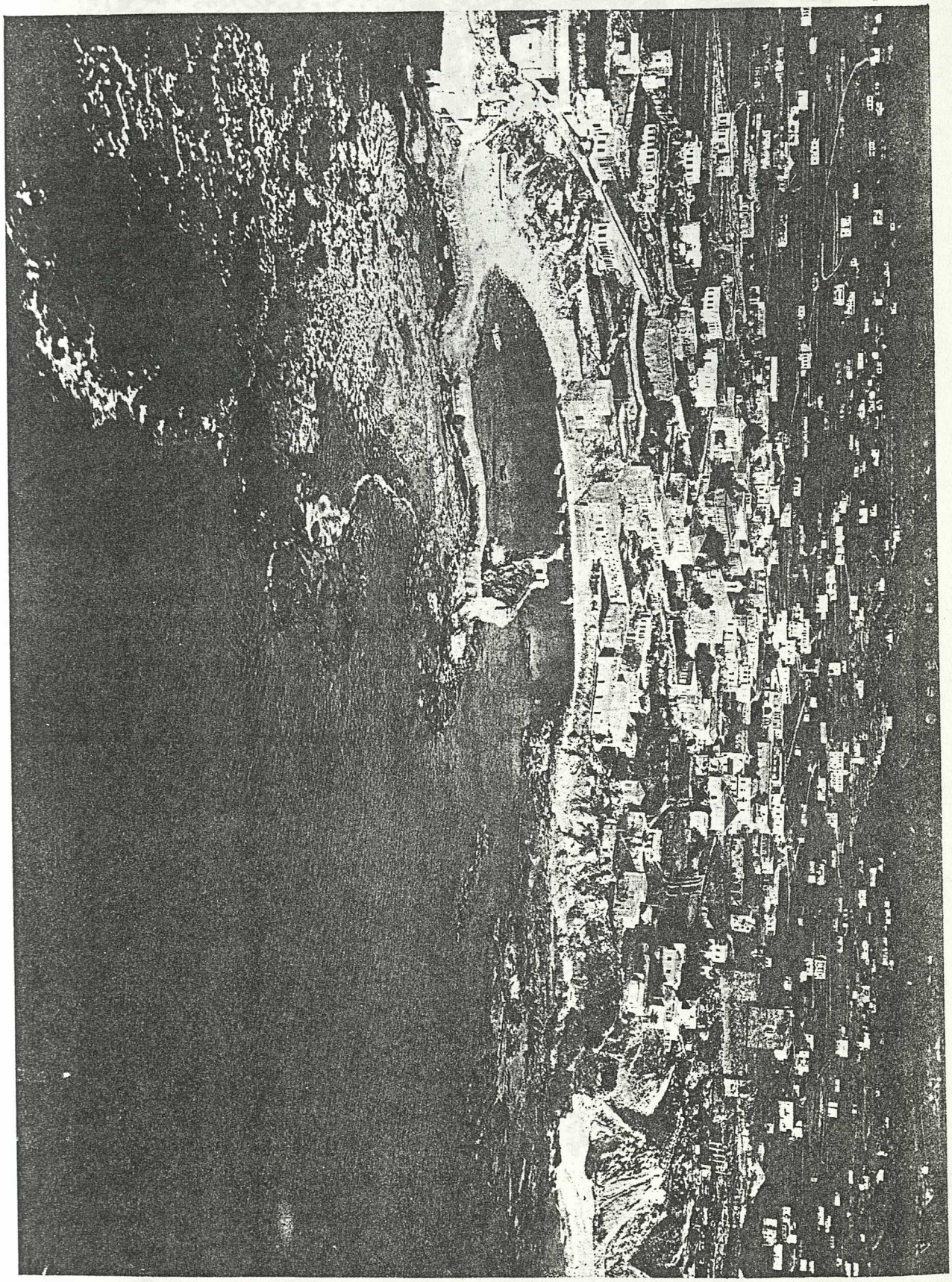


Fig. # 116

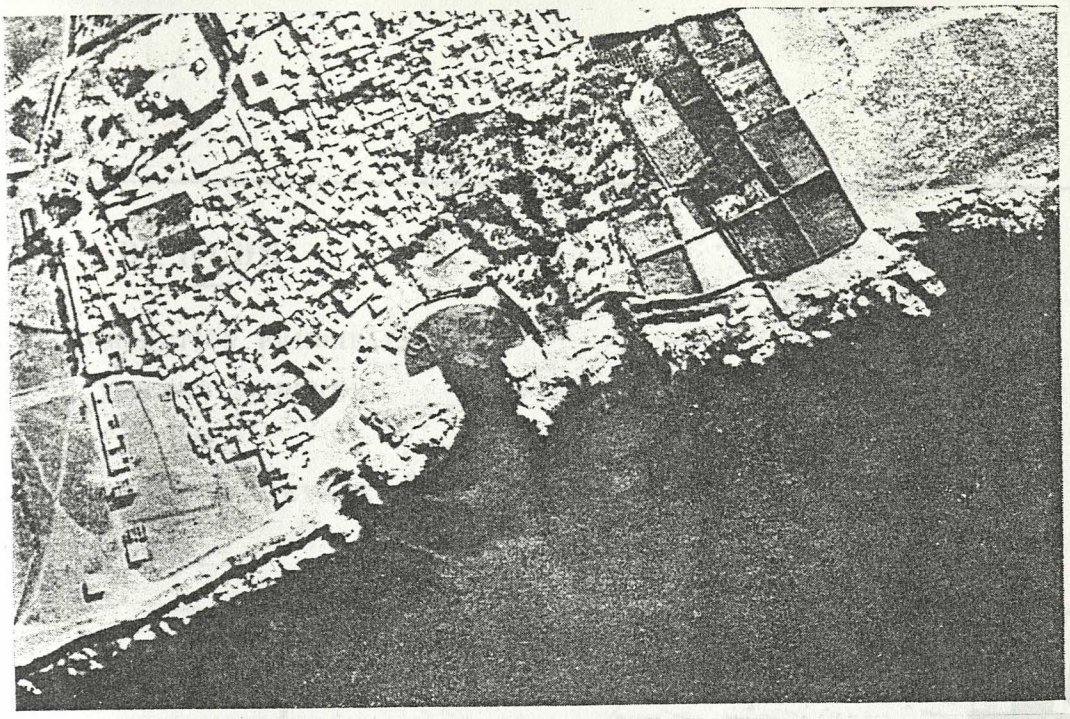


Fig. # 116.1

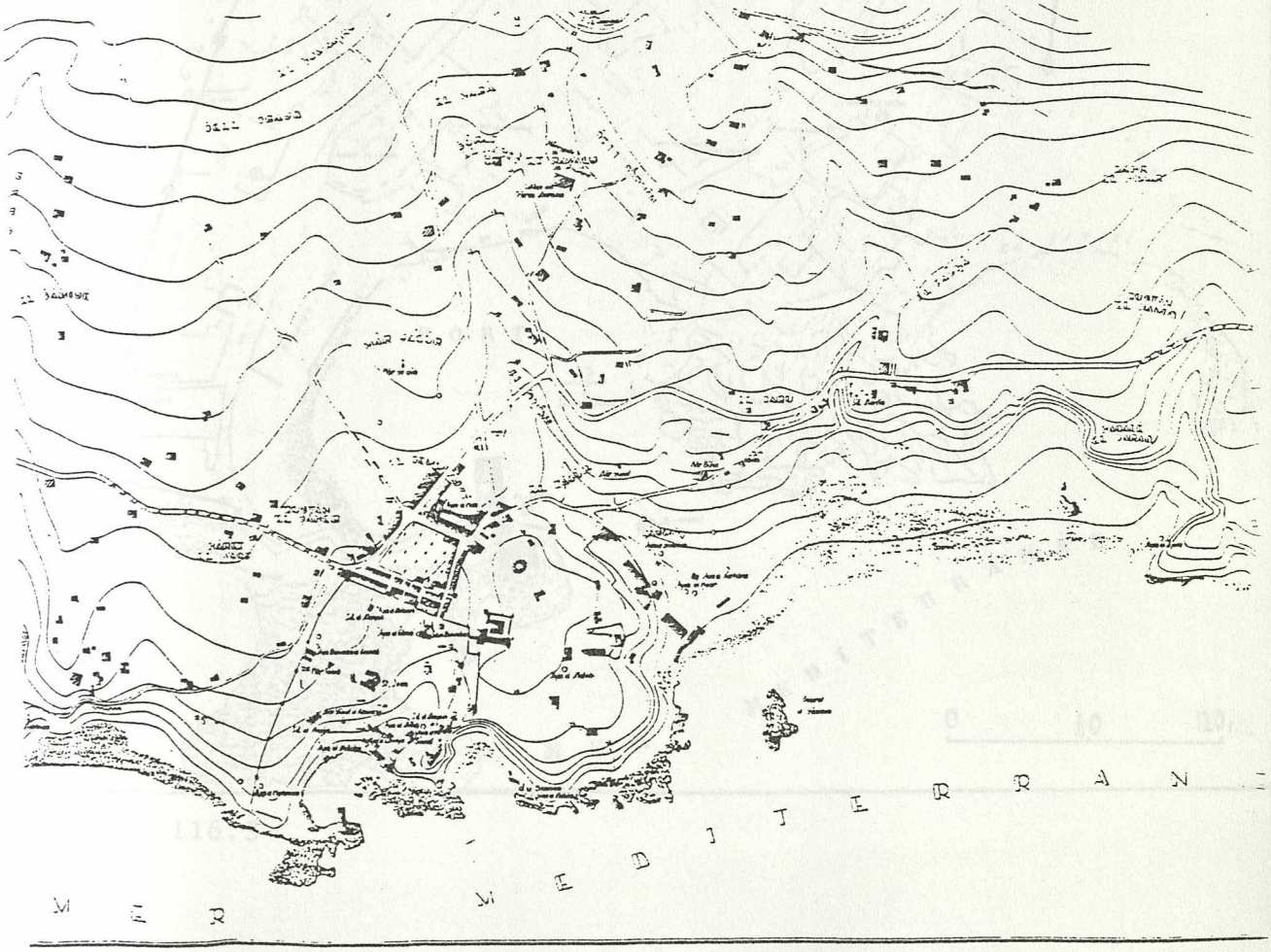



Fig. # 116.2

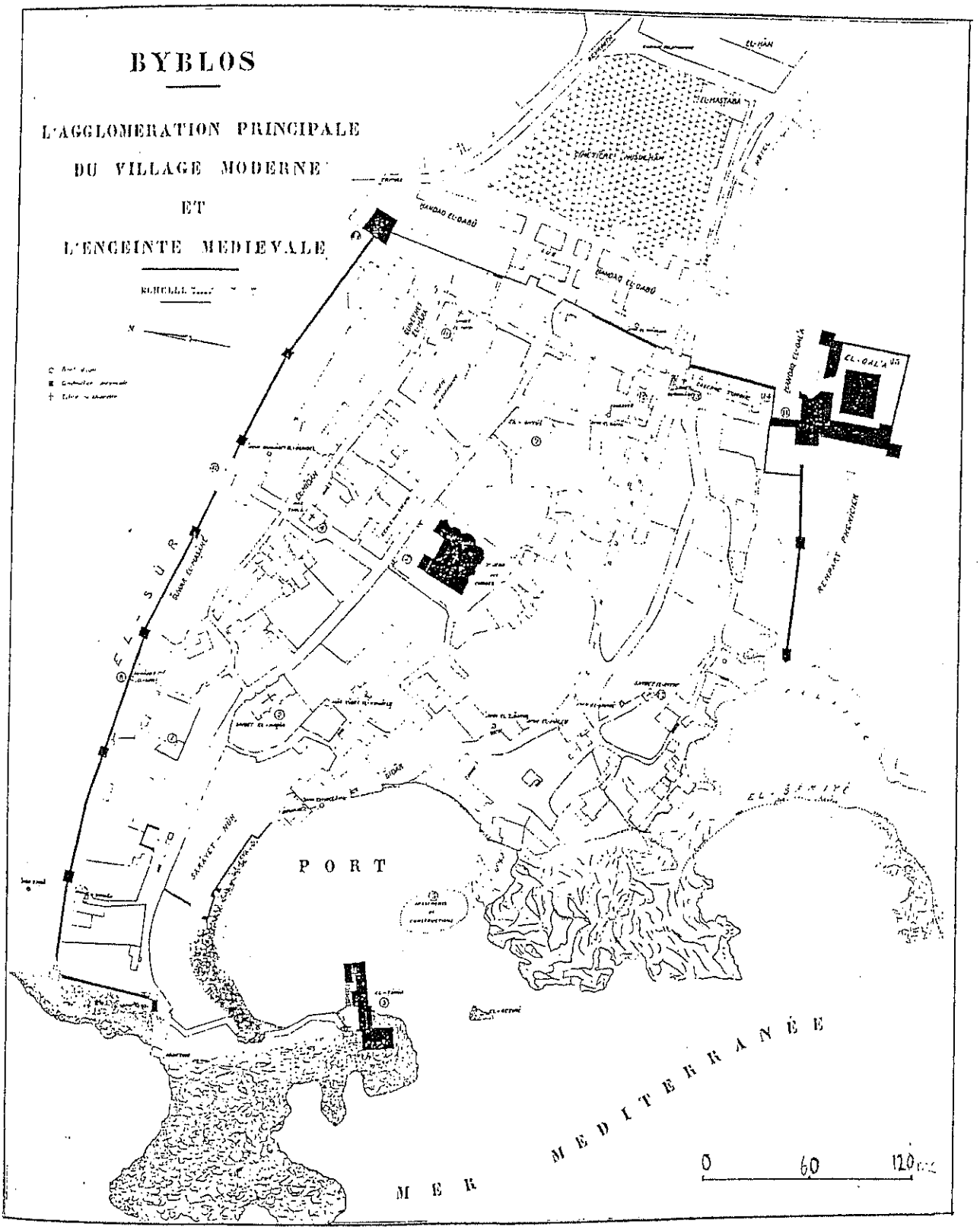

BYBLOS
L'AGGLOMERATION PRINCIPALE
DU VILLAGE MODERNE
ET
L'ENCEINTE MEDIEVALE
PORT
M E R
M E D I T E R R A N É E
0 60 120

Fig. # 116.3

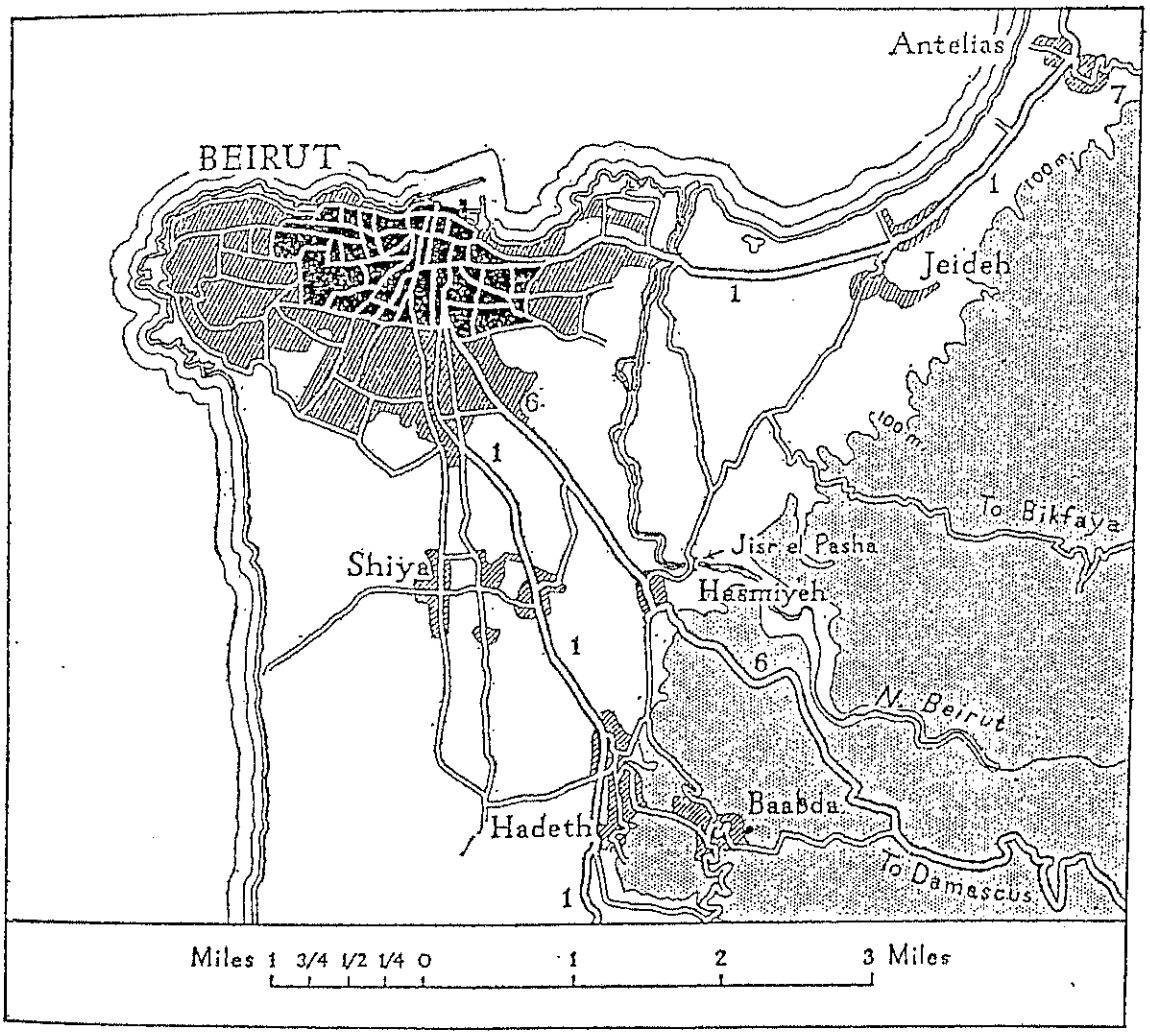

Antelias
BEIRUT
Jeideh
Shiya
Jisr el Pasha
Hasmiyeh
N. Beirut
Baabda
Hadeth
To Bikfaya
To Damascus
Miles 1 3/4 1/2 1/4 0 1 2 3 Miles

Fig. # 120

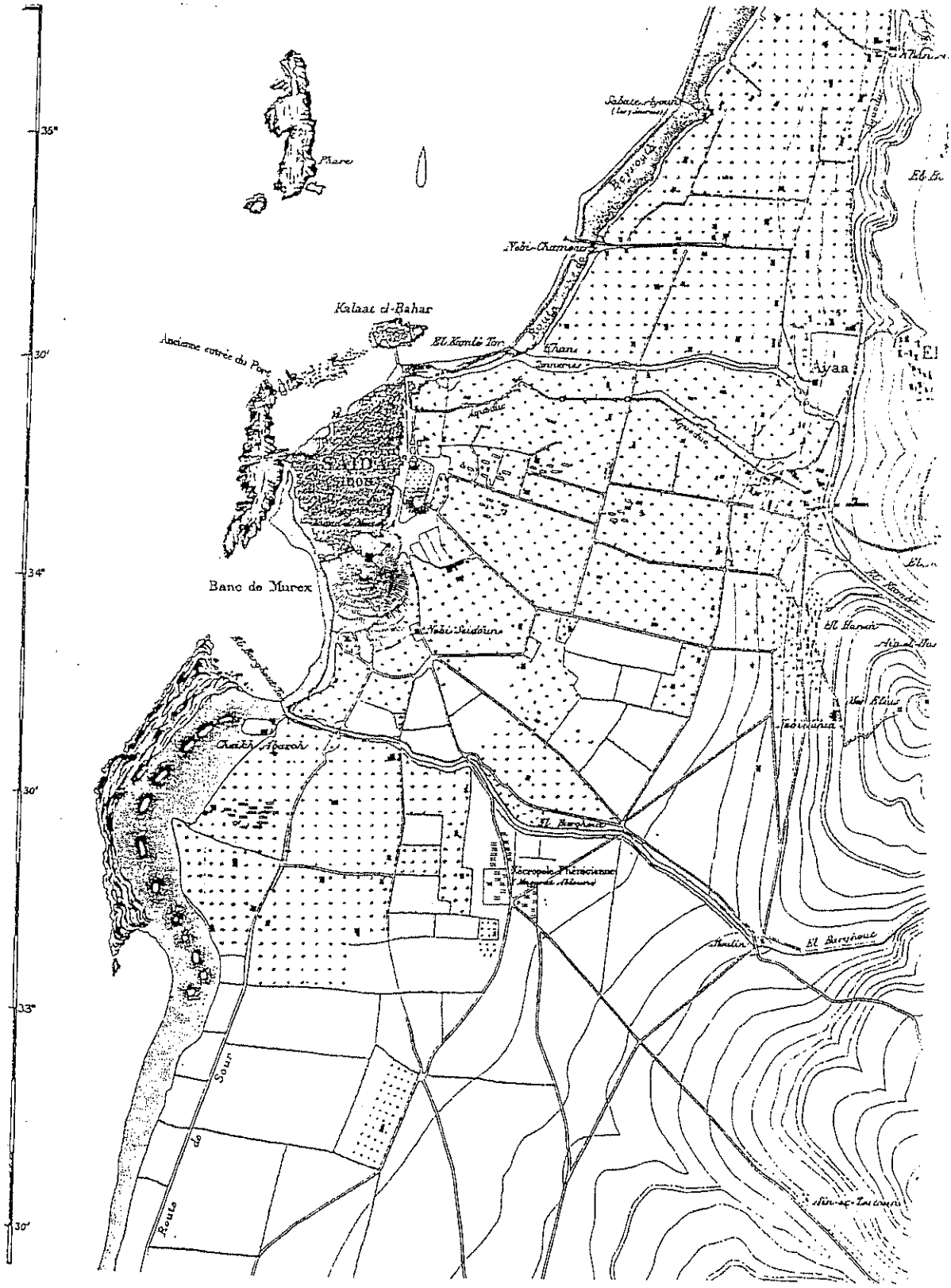
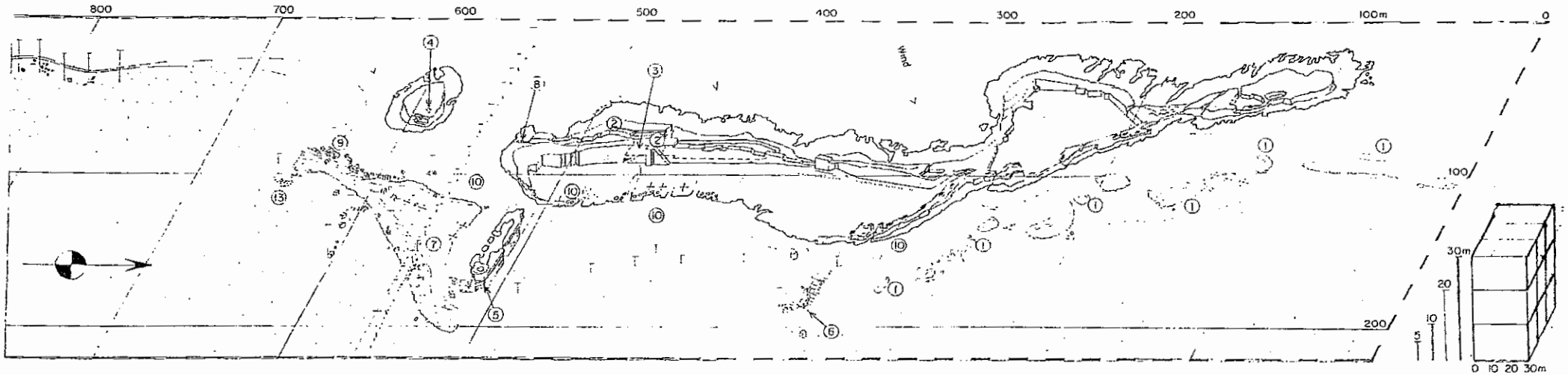

35°
30'
34°
30'
33°
30'
Phare
Kalaat el-Bahar
Ancienne entrée du Port
Bane de Murex
Ayaa
Nécropole Phénicienne
Route de Soukr

Fig. # 122

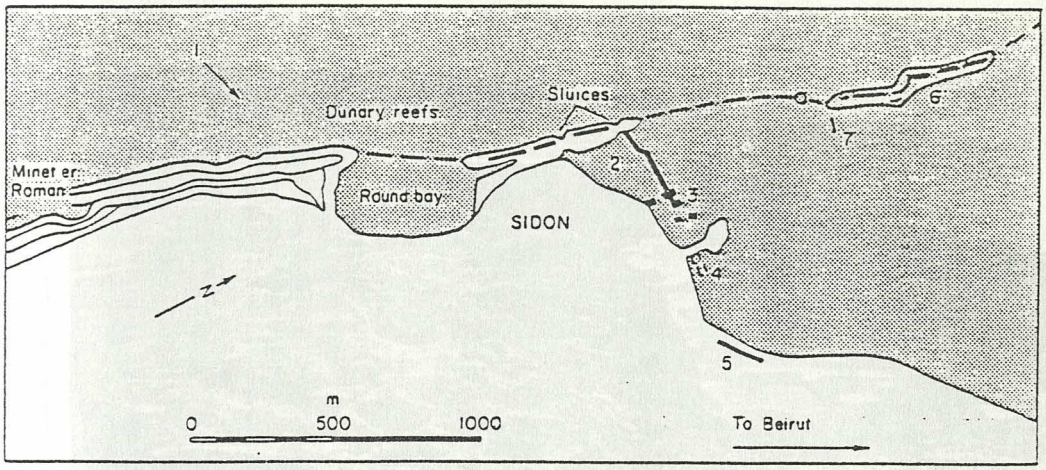



Sidon Island: Key: stipple, Areas above water. 1, Piles of rubble, largely quartzite revetment plaques from dismantled quays and other installations. 2, Rock-cut sea walls: hatching. 3, 'Bain des femmes': the paved rock-cut chamber. 4, Rock-cut emplacement for winch. 5, The southern jetty with portions still above water. 6, Foundations of northern jetty; note two cuboid blocks remaining from its upper course. 7, 10,200m³ of masonry washed down from between the islet and the Island. 8, Eroded trace of the rock-cut wall that once joined the islet to the Island. 9, Alignment of 3m blocks at the edge of the rock-shelf between the islet and the Island. 10, Paving stones. 11, Mooring bitts: upper level ○ ○. 12, Mooring bitts: lower level ● ●. 13, Column base and dovetailed blocks (see Fig. 6).

Fig. # 122.1



Fig. # 122.2




Sidon: the closed port within the city walls, and the island anchorage for foreign ships. Remains of ancient harbour works are shown in solid black. Key: 1, direction of prevailing wind; 2, the closed ports; 3, blockships sunk in 1634; 4, artificially deepened channel connecting the closed ports with the landing quay that served the outer anchorage; 5, this landing quay; 6, the island anchorage for foreign ships; 7, jetty, probably Roman.

Fig. # 122.3

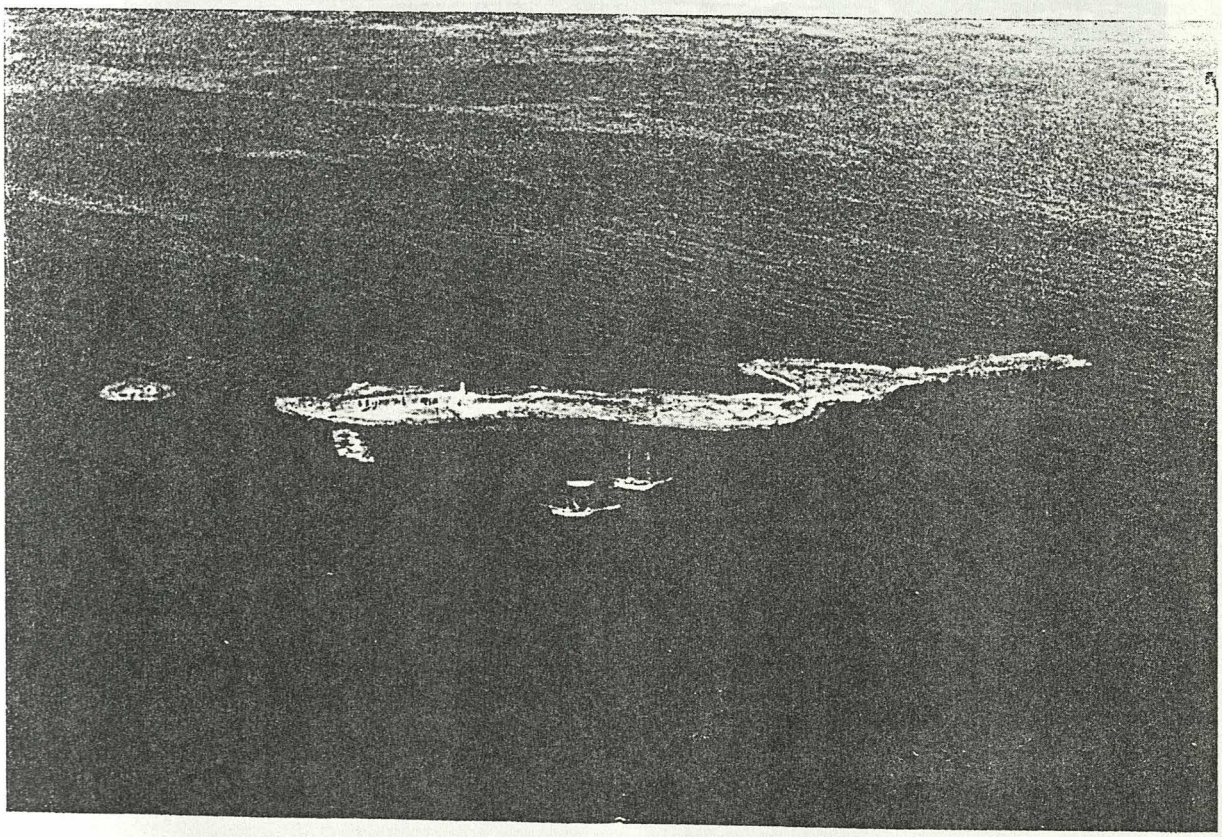


Fig. # 122.4




Fig. # 122.5

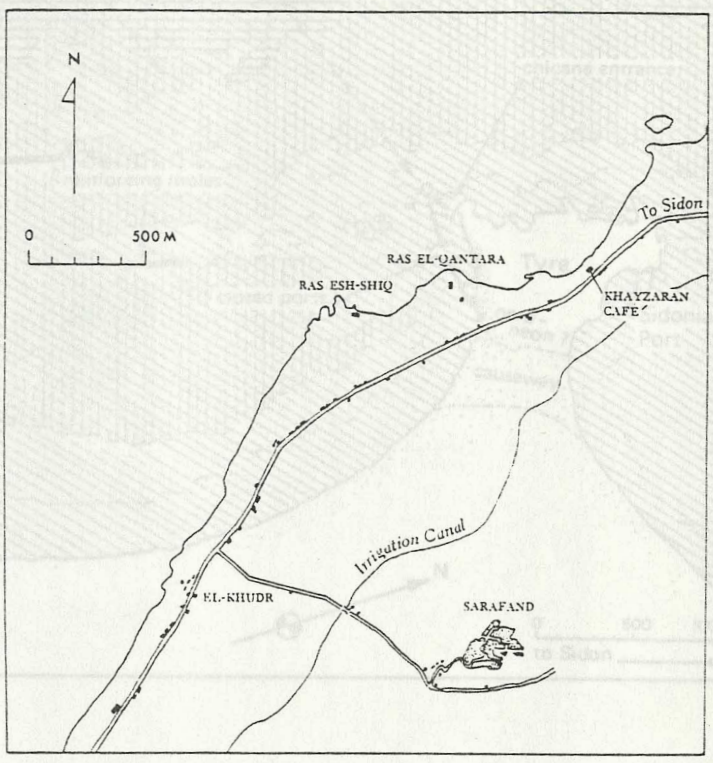



Fig. # 124

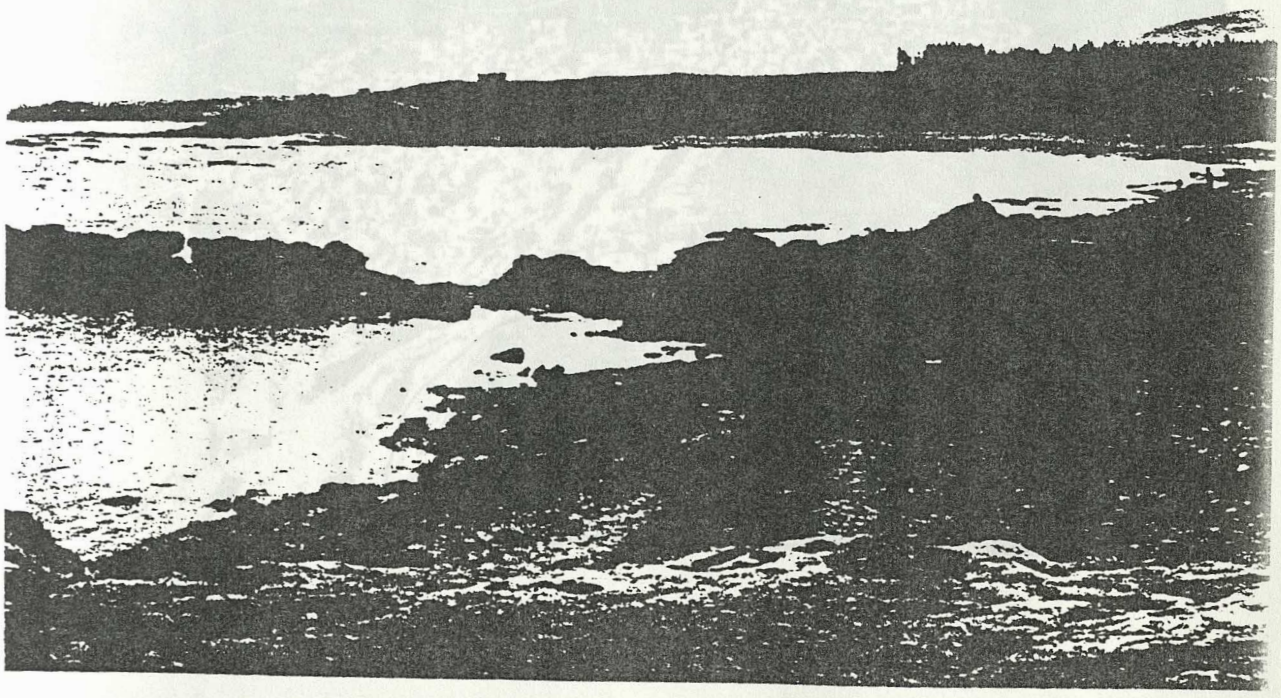


Fig. # 124.1

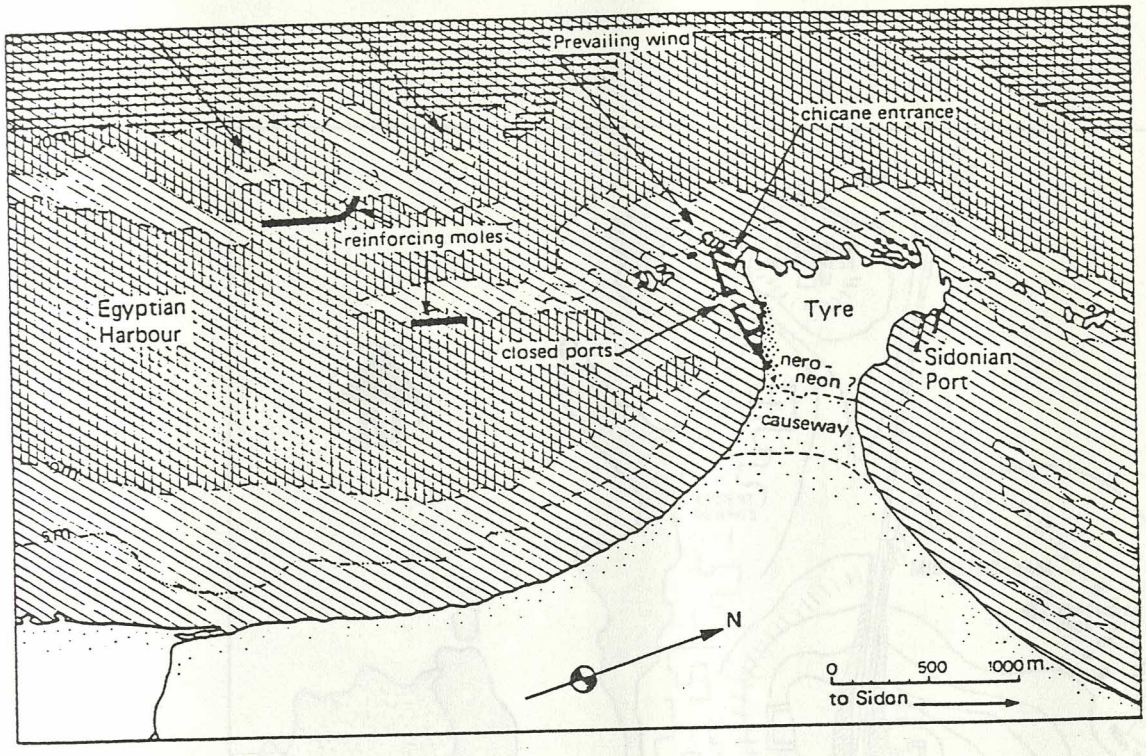



Fig. # 125

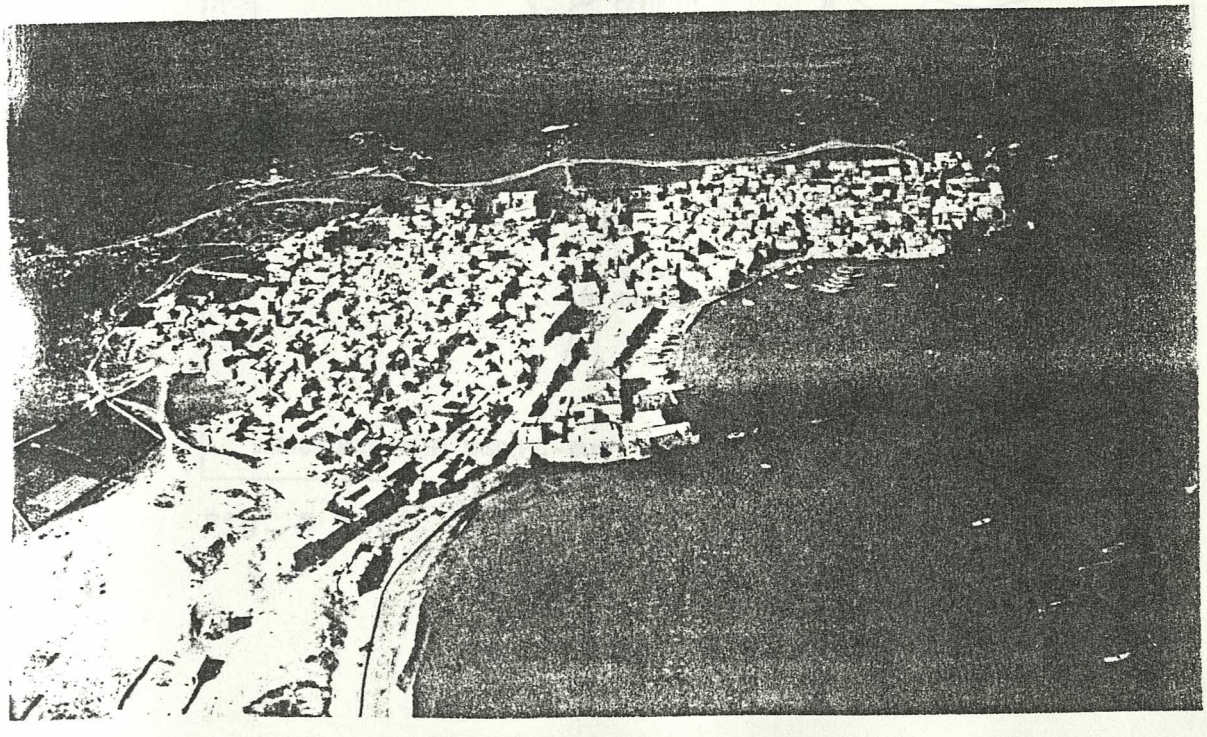


Fig. # 125.1

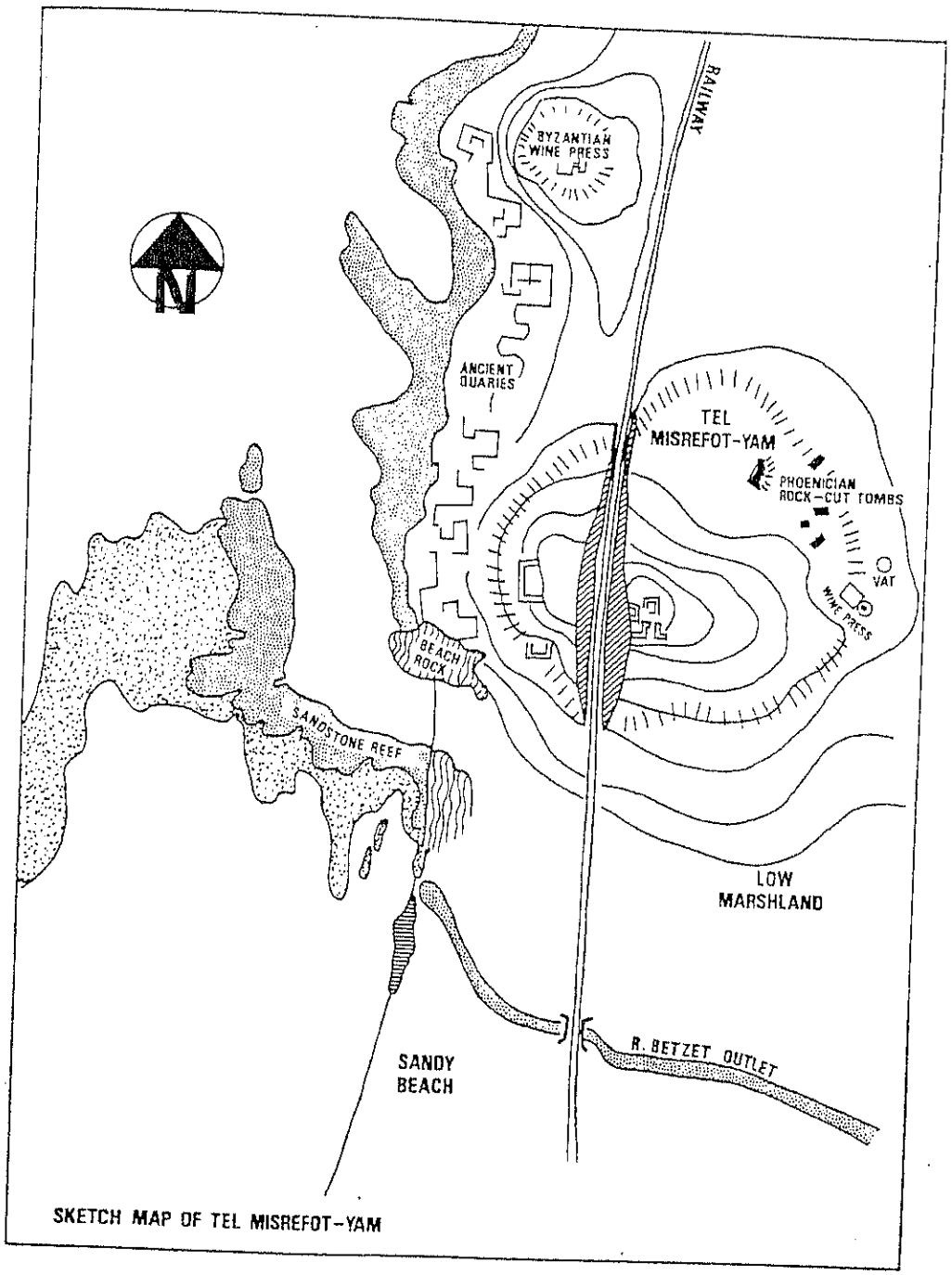

RAILWAY
BYZANTIAN WINE PRESS
ANCIENT QUARIES
TEL MISREFOT-YAM
PHOENICIAN ROCK-CUT TOMBS
VAT
WINE PRESS
BEACH ROCK
SANDSTONE REEF
LOW MARSHLAND
SANDY BEACH
R. BETZET OUTLET
SKETCH MAP OF TEL MISREFOT-YAM

Fig. # 130

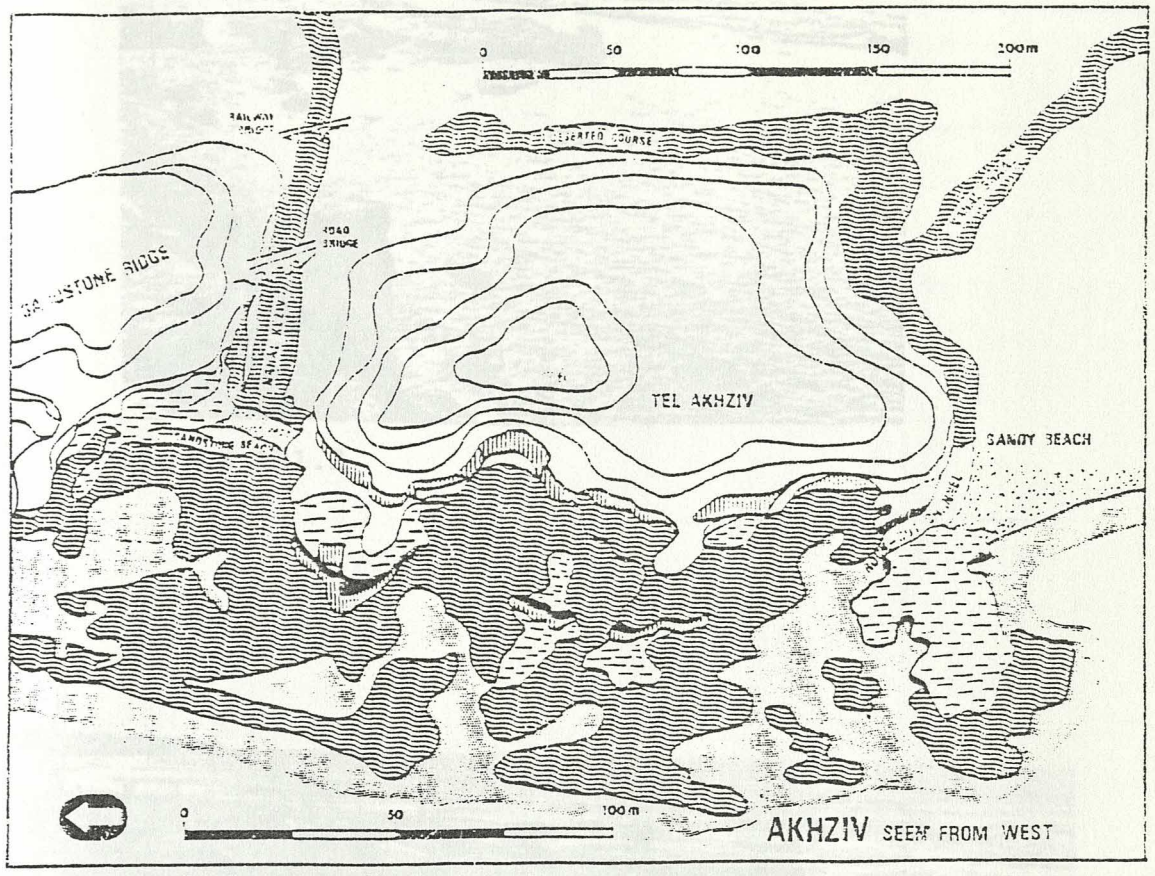



Fig. # 131

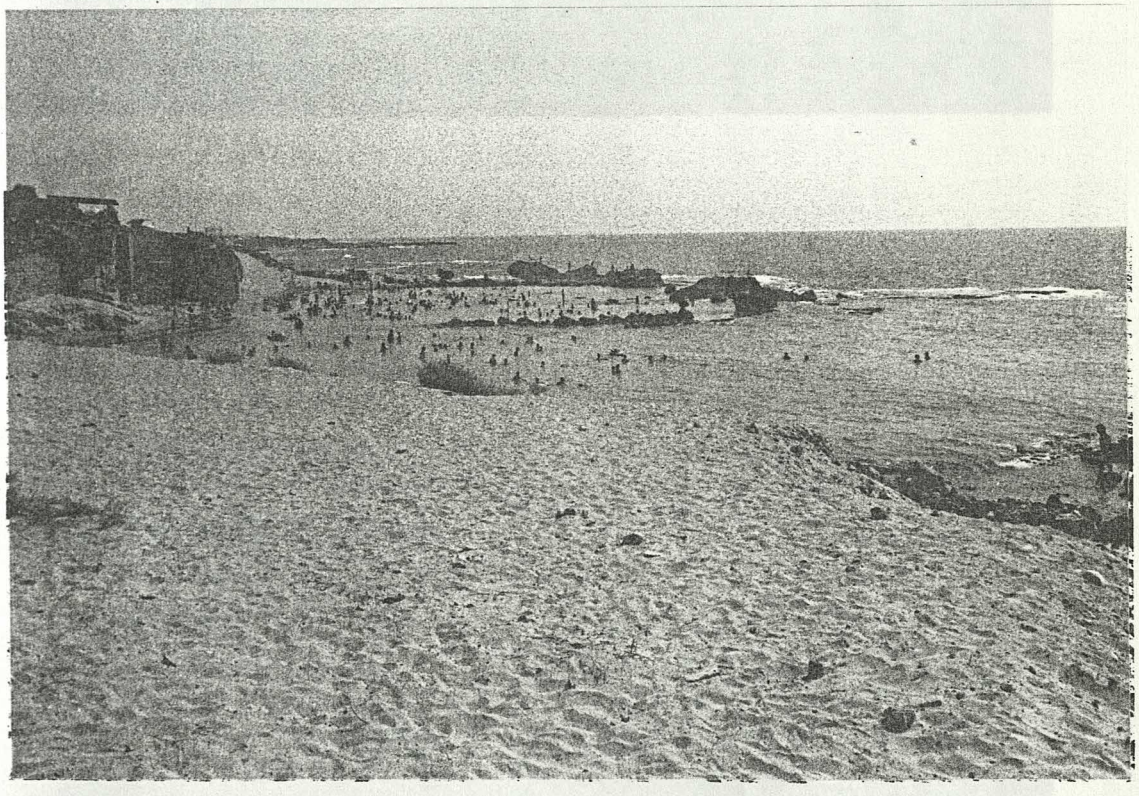


Fig. # 131.1

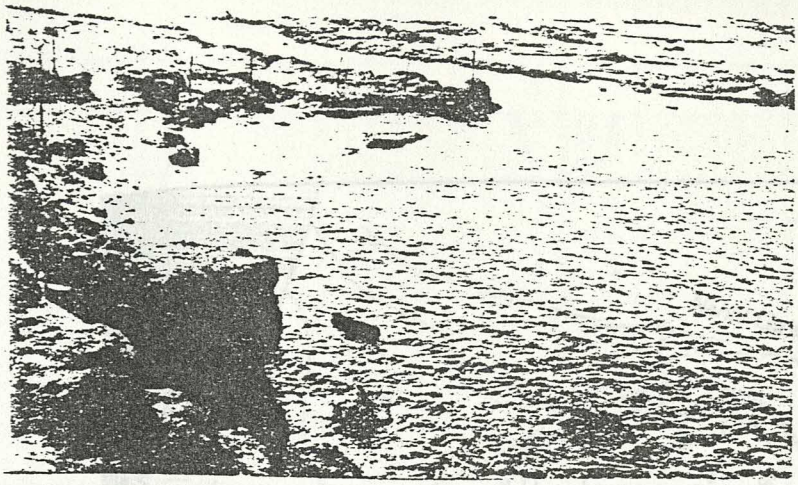


Fig. # 131.2



Fig. # 131.3

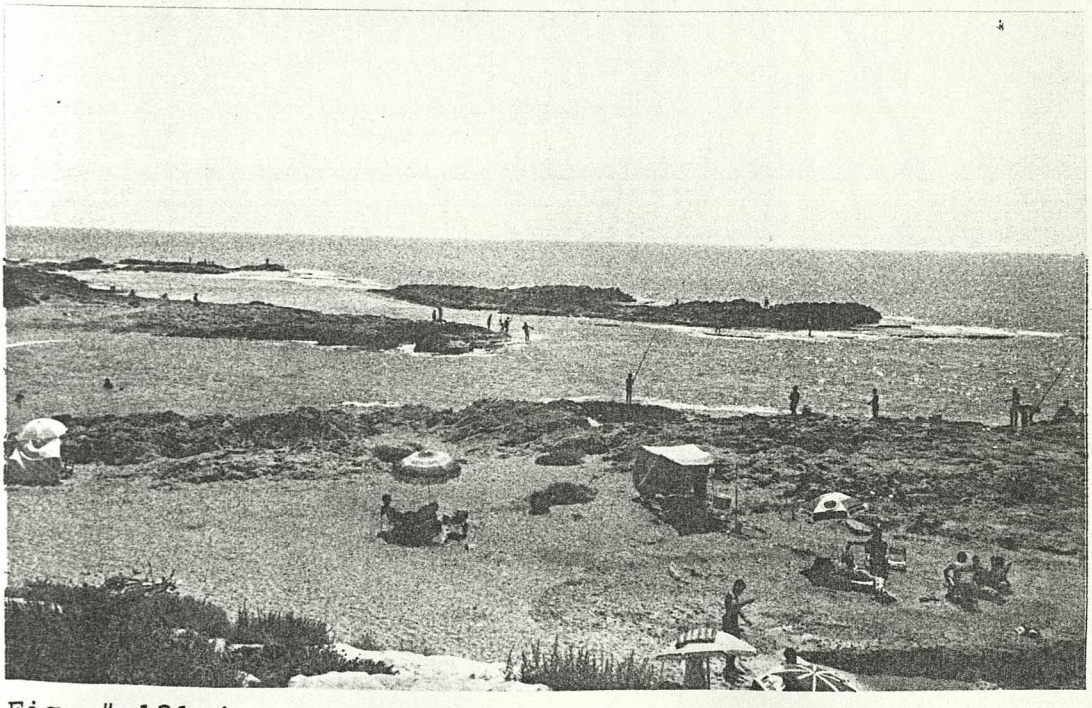
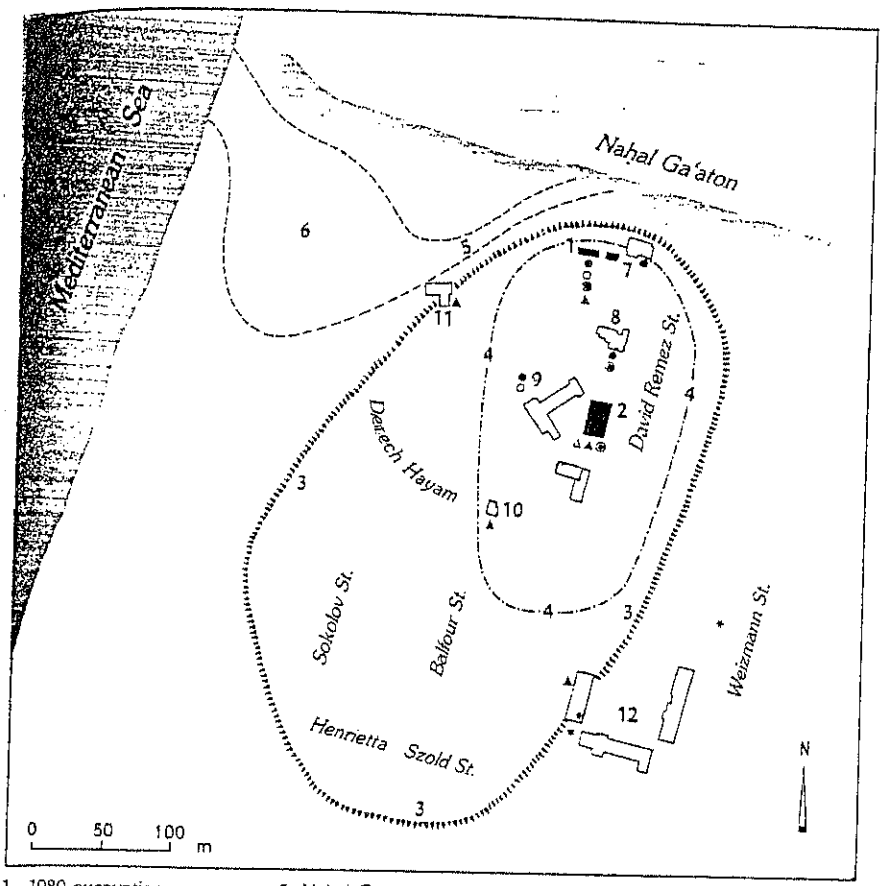


Fig. # 131.4




1 1980 excavation
2 1982 excavation
3 Conjectured boundary of the mound
4 Conjectured boundary of the early settlement
5 Nahal Ga aton — ancient riverbed
6 Ancient anchorage (?)

• Middle Bronze Age IIA
○ Middle Bronze Age IIB
⑨ Late Bronze Age
▲ Persian period
△ Hellenistic period
* Roman-Byzantine period

Fig. # 133

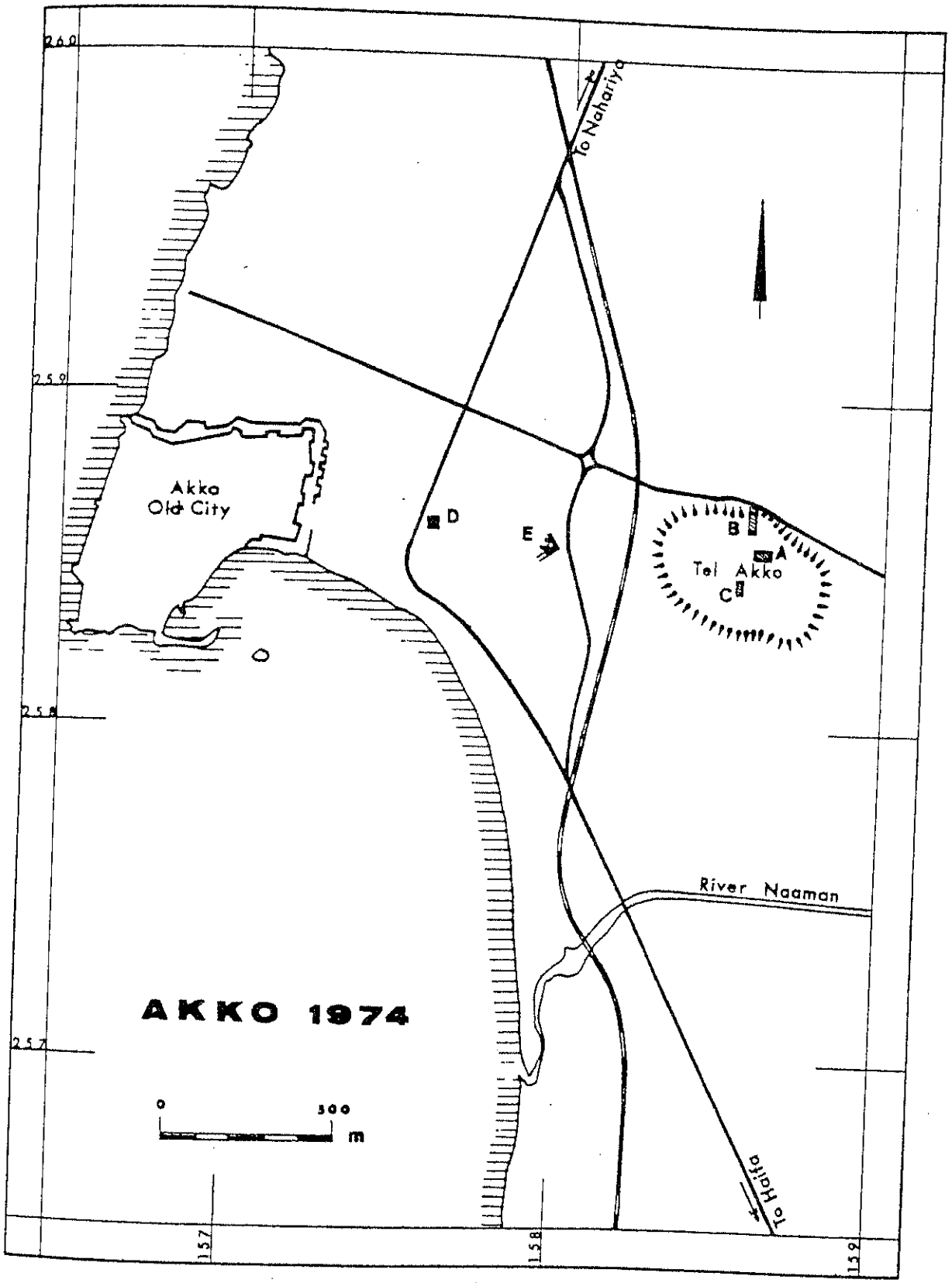

260
259
258
257
157
158
159
To Nahariya
To Haifa
Akko
Old City
D
E
B
A
Tel Akko
C
River Naaman
AKKO 1974
0
500
m

Fig. # 134

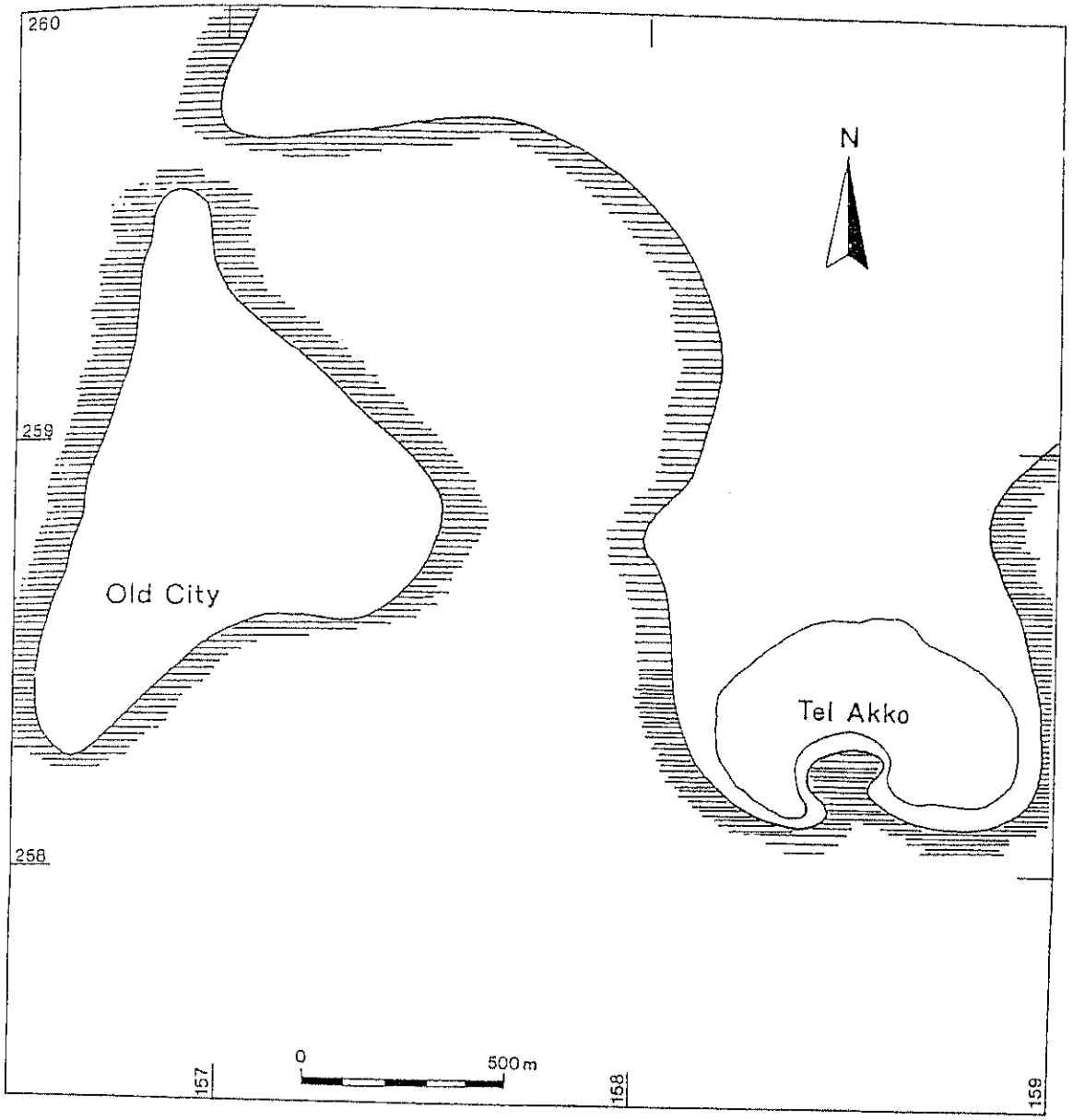



Fig. # 134.1

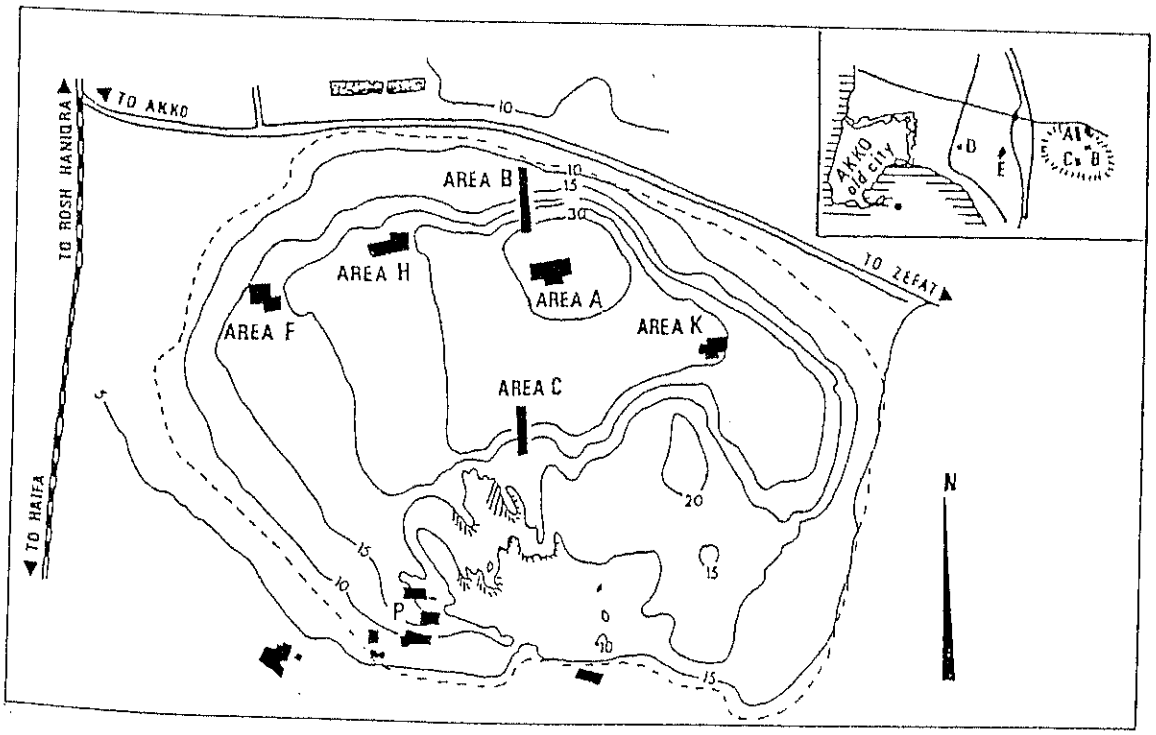



Fig. # 134.2

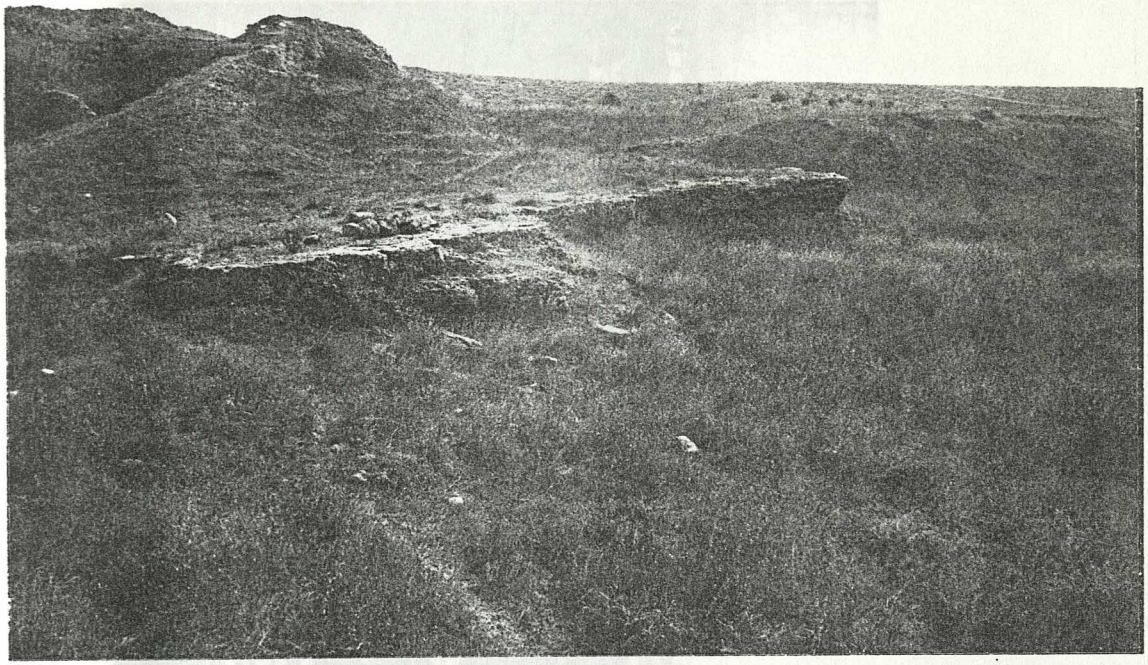


Fig. # 134.3

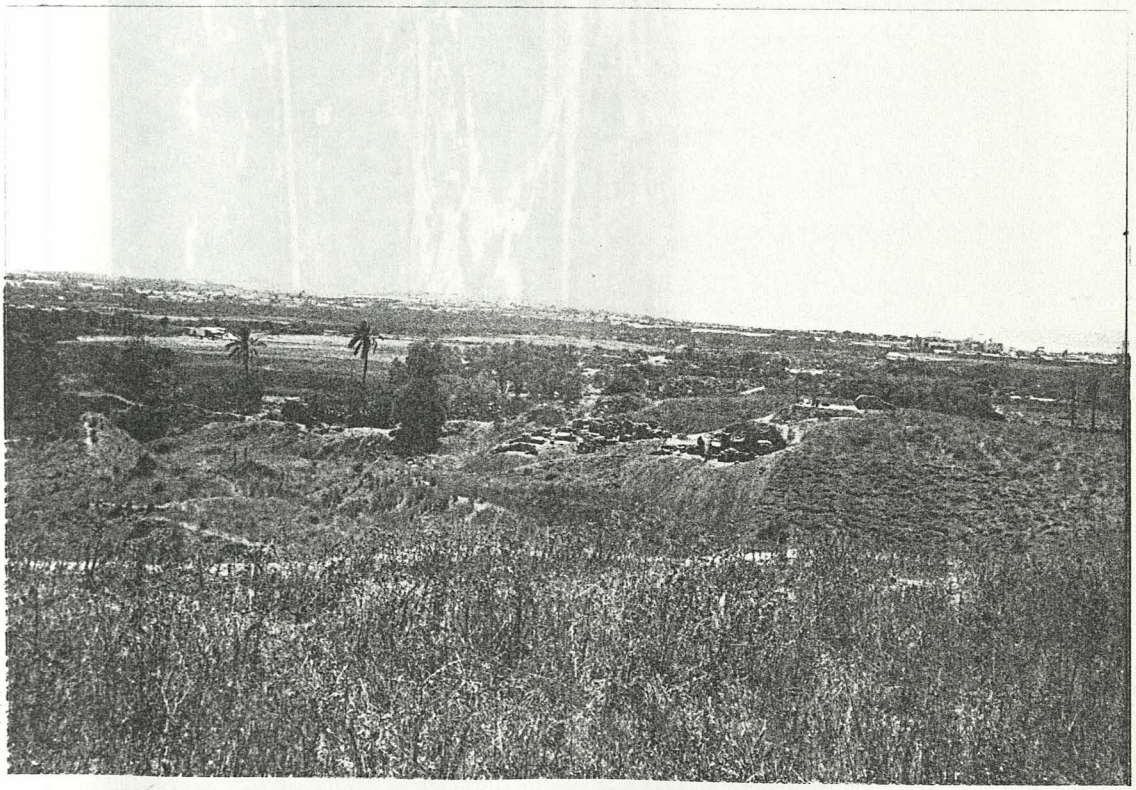


Fig. # 134.4

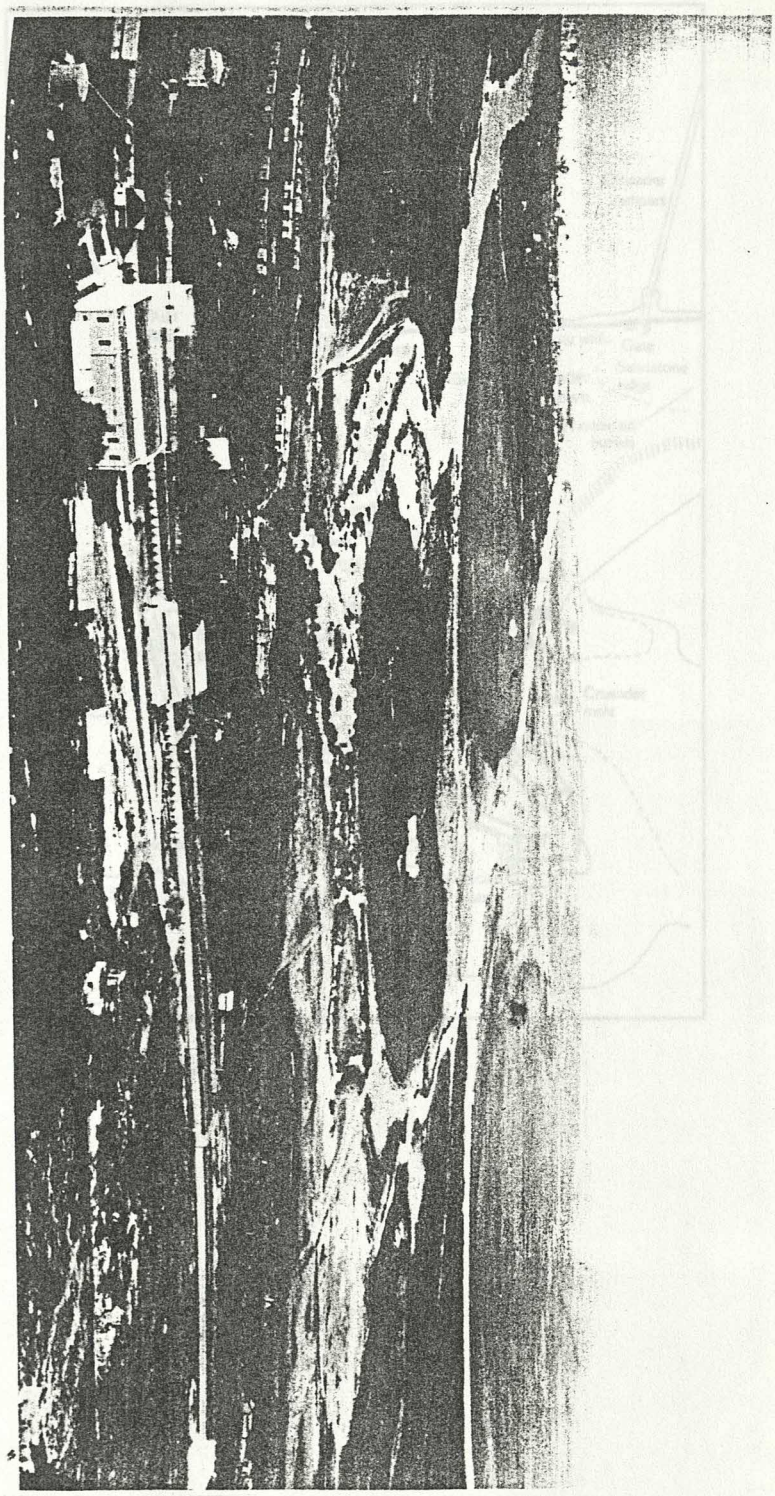


Fig. # 137

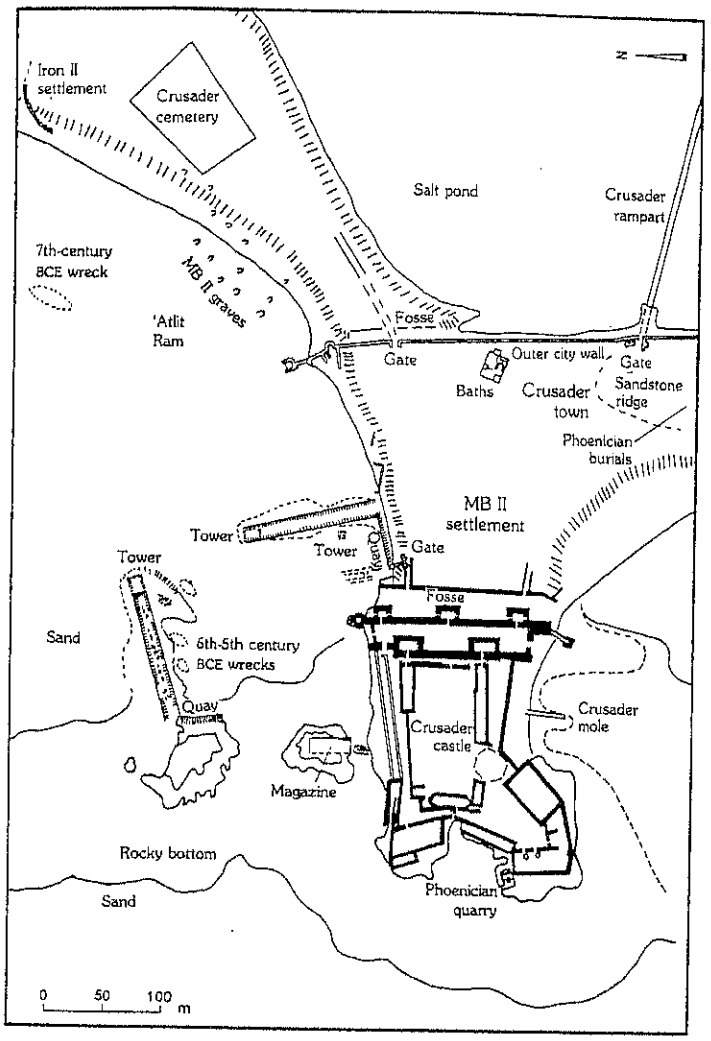

Iron II settlement
Crusader cemetery
Salt pond
Crusader rampart
7th-century BCE wreck
MB II graves
'Atlit Ram
Fosse
Gate
Outer city wall
Gate
Baths
Crusader town
Sandstone ridge
Phoenician burials
MB II settlement
Tower
Tower
Quay
Gate
Tower
Fosse
Sand
6th-5th century BCE wrecks
Quay
Crusader castle
Crusader mole
Magazine
Rocky bottom
Sand
Phoenician quarry
0 50 100 m

Fig. # 142

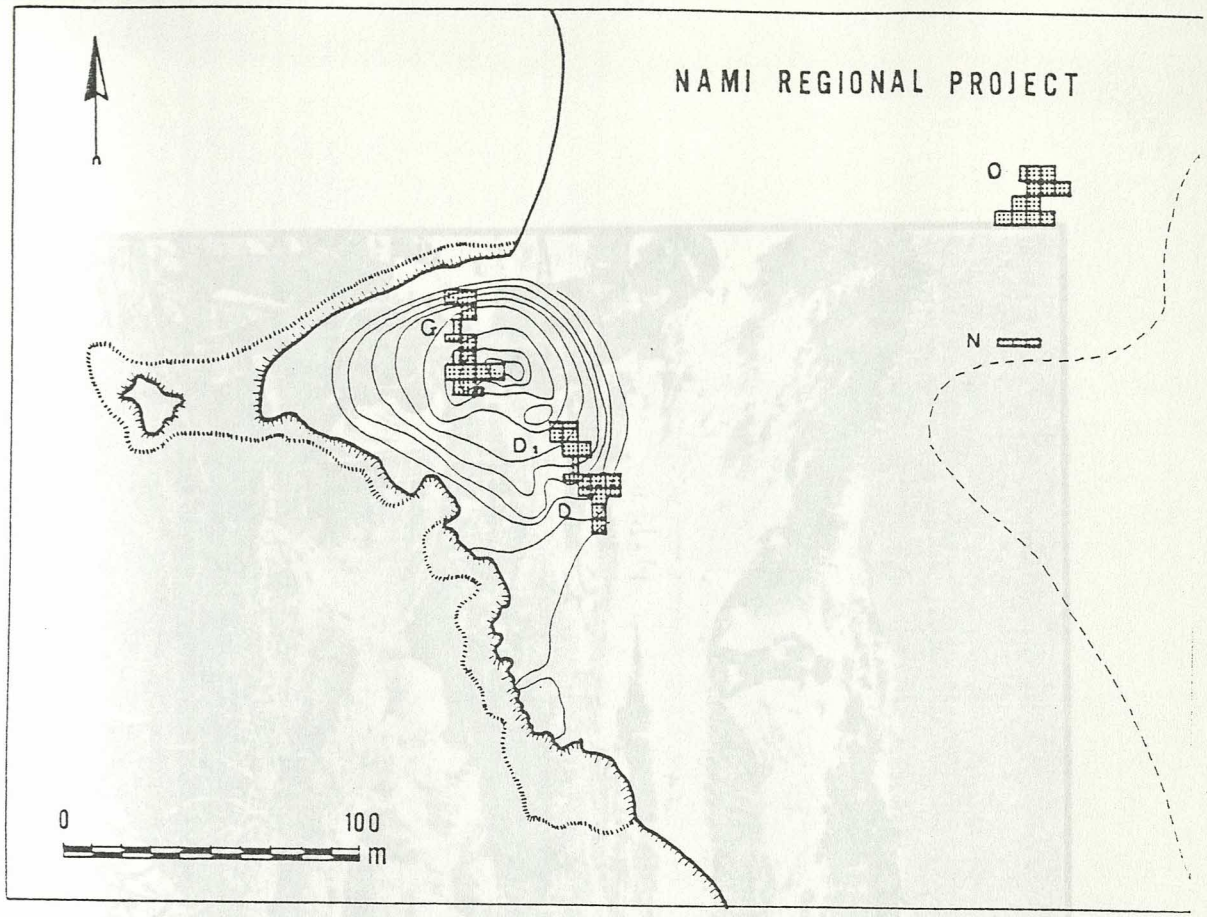



Fig. # 144

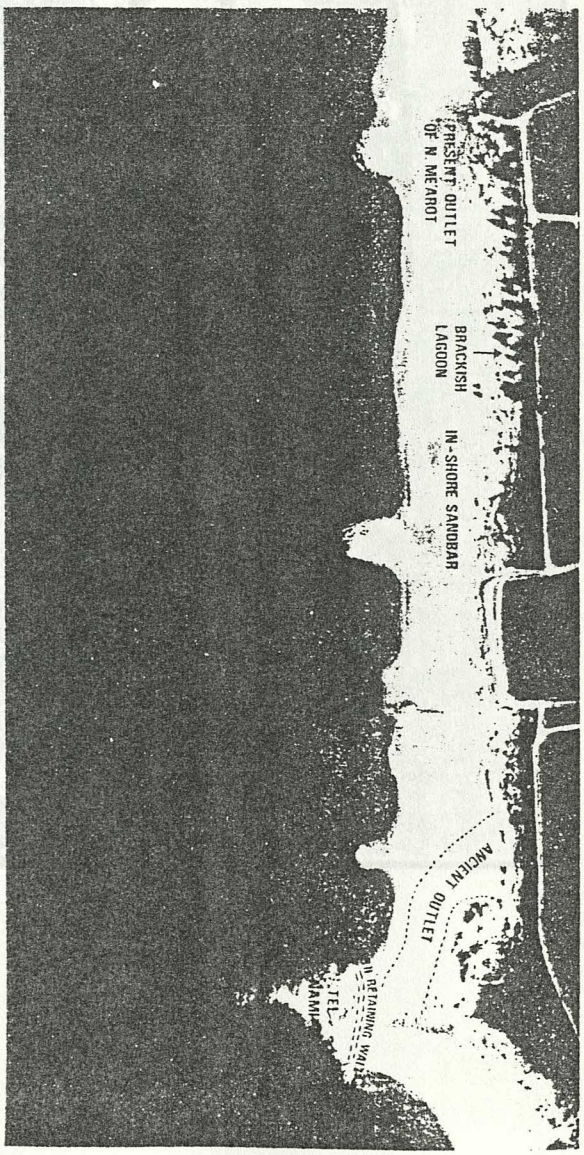



Fig. # 144.1

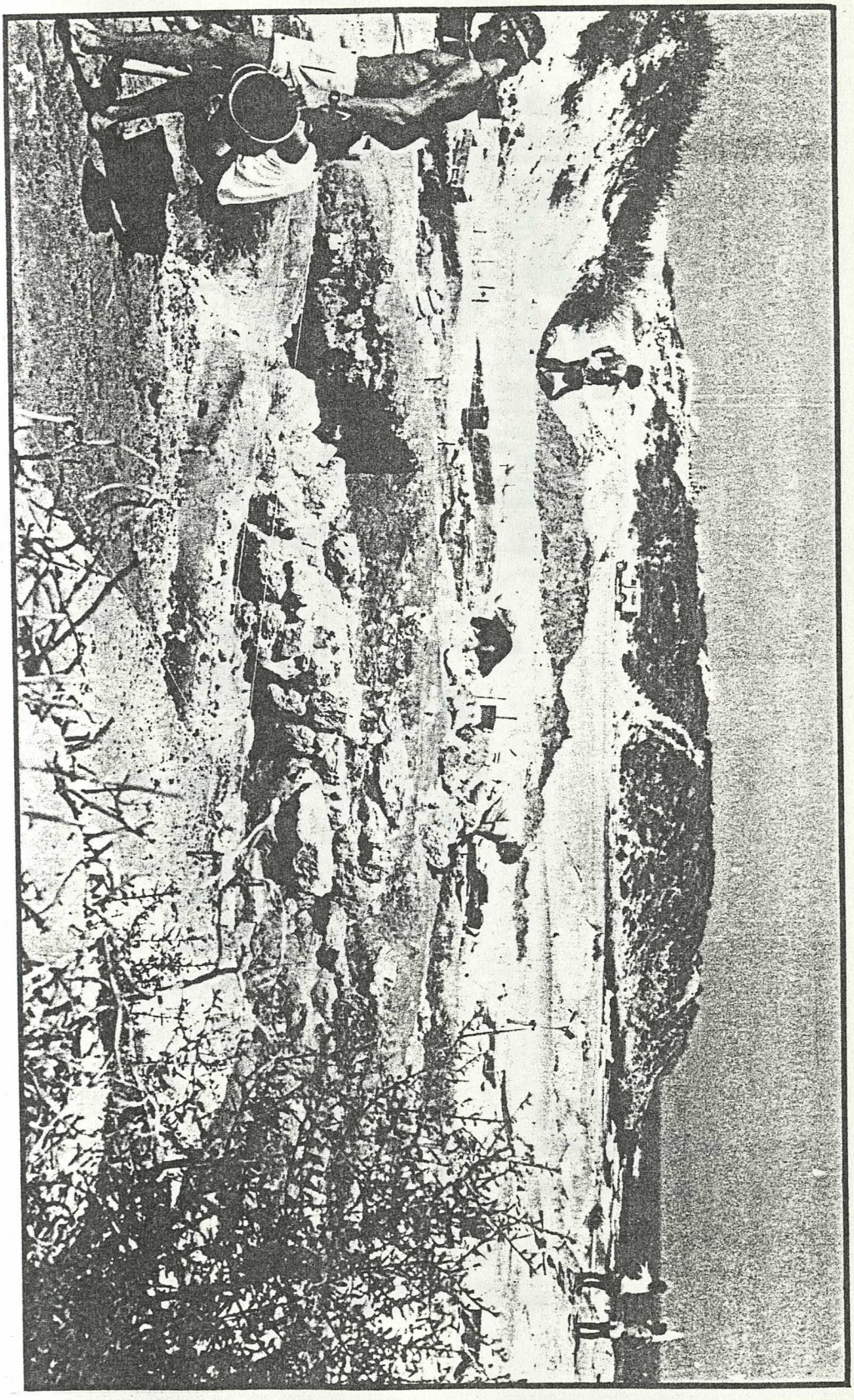


Fig. # 144.2

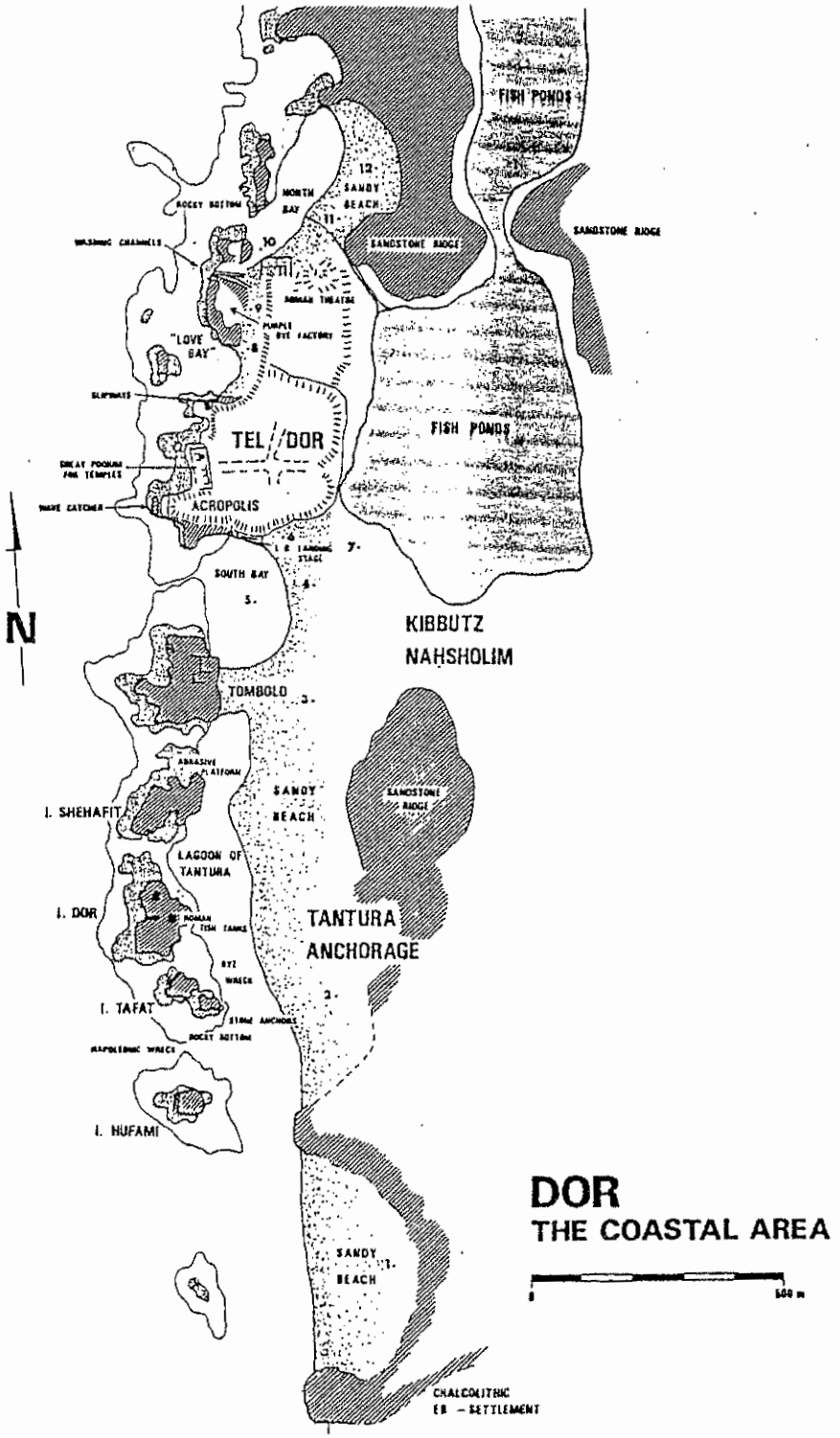
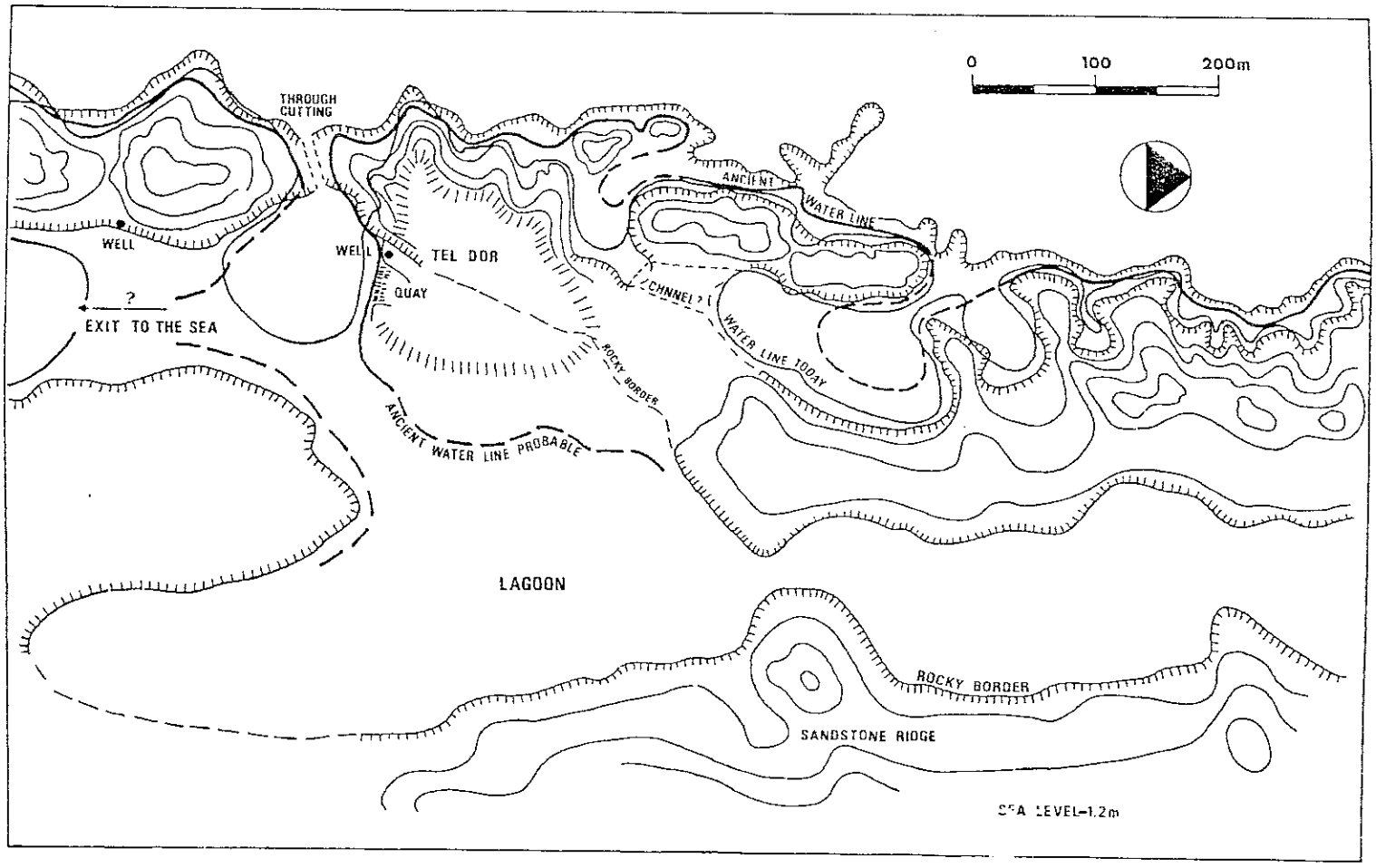
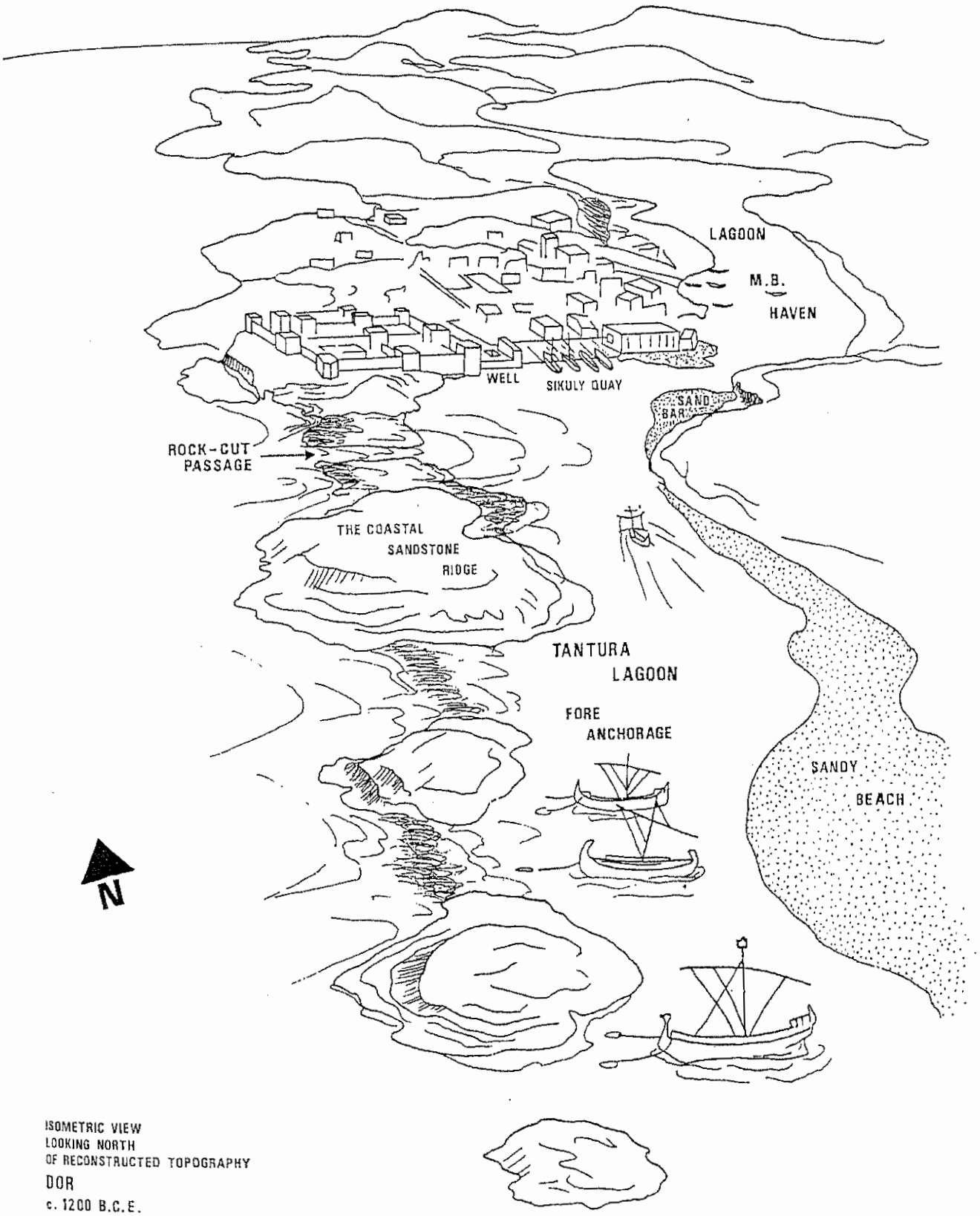

FISH PONDS
SANDY BEACH
NORTH BAY
ROCKY BOTTOM
SANDSTONE RIDGE
SANDSTONE RIDGE
"LOVE BAY"
ROMAN THEATRE
PURPLE DYE FACTORY
SLIPWAYS
TEL DOR
FISH PONDS
GREAT PODIUM AND TEMPLES
WAVE CATCHER
ACROPOLIS
SOUTH BAY
N
KIBBUTZ
NAHSHOLIM
TOMBOLO
ABRASIVE PLATFORM
I. SHEHAFIT
SANDY BEACH
SANDSTONE RIDGE
LAGOON OF TANTURA
I. DOR
ROMAN FISH TANKS
TANTURA ANCHORAGE
BYZ WRECK
I. TAFAT
STONE ANCHORS
ROCKY BOTTOM
NAPOLEONIC WRECK
I. HUFAMI
SANDY BEACH
CHALCOLITHIC EB - SETTLEMENT
DOR
THE COASTAL AREA
0
500 m

Fig. # 145

Fig. # 145.1


0
100
200m
THROUGH CUTTING
WELL
WELL
TEL DOR
QUAY
?
EXIT TO THE SEA
ANCIENT WATER LINE
?CHANNEL?
WATER LINE TODAY
ROCKY BORDER
ANCIENT WATER LINE PROBABLE
LAGOON
ROCKY BORDER
SANDSTONE RIDGE
SEA LEVEL-1.2m




ISOMETRIC VIEW
LOOKING NORTH
OF RECONSTRUCTED TOPOGRAPHY
DOR
c. 1200 B.C.E.

Fig. # 145.2

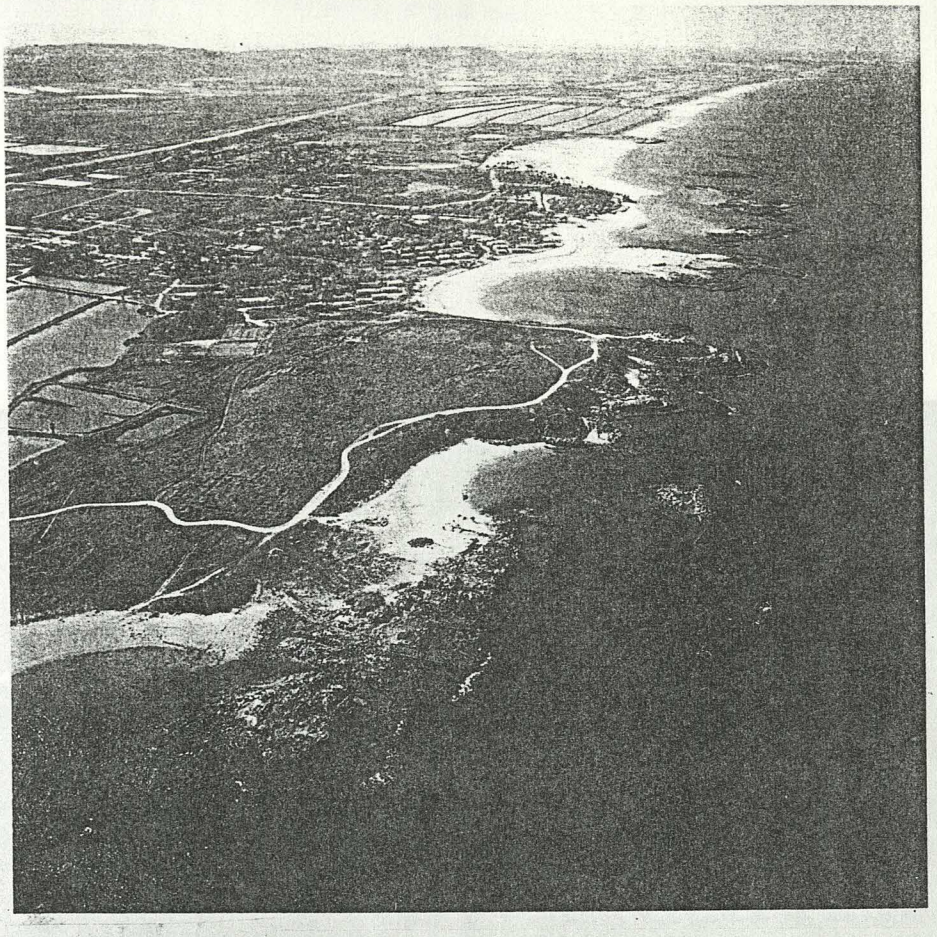
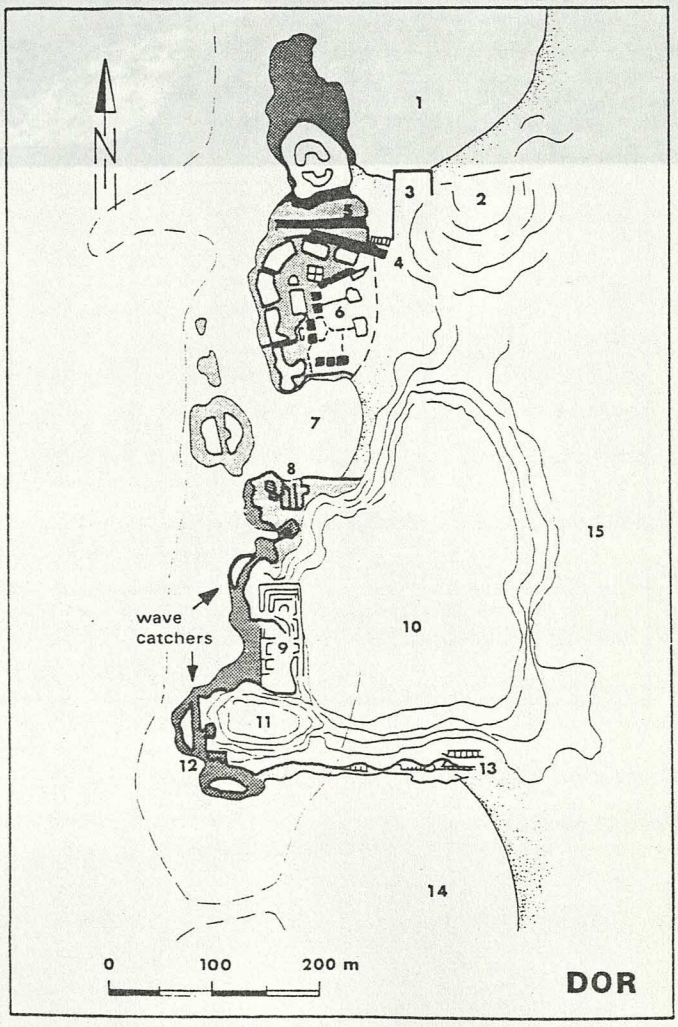


Fig. # 145.3




1. Northern anchorage; 2. Roman theater; 3. Storerooms and quay; 4. Upper-level flushing channel; 5. Lower-level flushing channel; 6. Soaking installation for dying cloth with purple; 7. Central anchorage; 8. Slipways, Persian period; 9. Large retaining structure; 10. Tel Dor; 11. Acropolis; 12. Wave trap and rock-cut fish ponds; 13. LB and Iron I quays; 14. Southern harbor

Fig. # 145.4

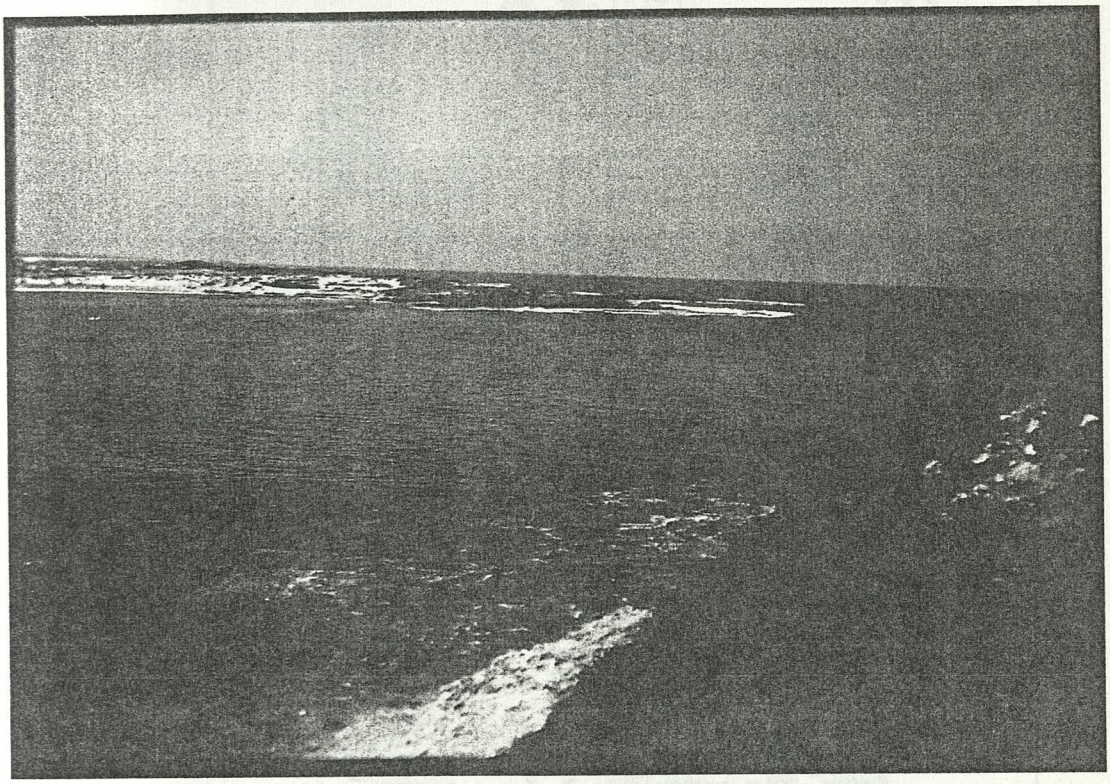


Fig. # 145.5

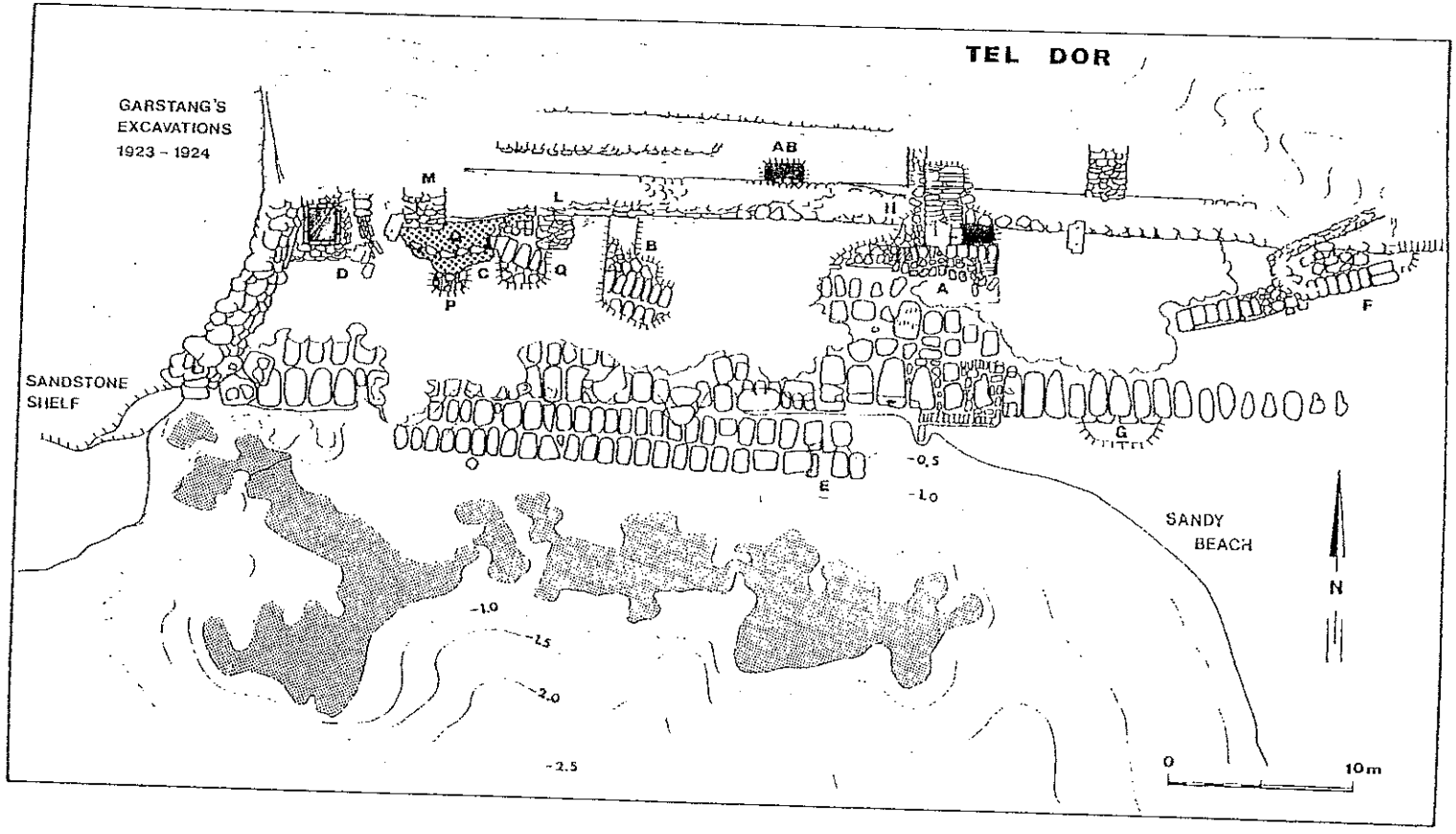

TEL DOR
GARSTANG'S
EXCAVATIONS
1923 - 1924
SANDSTONE
SHELF
SANDY
BEACH
AB
M
L
H
B
D
C
Q
P
A
F
G
E
-0.5
-1.0
-1.5
-2.0
-2.5
N
0
10m

Fig. # 145.6

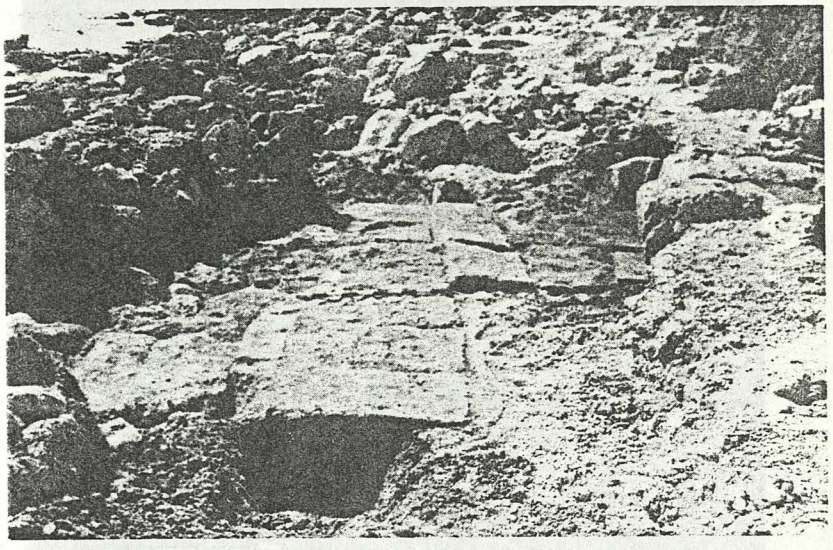


Fig. # 145.7

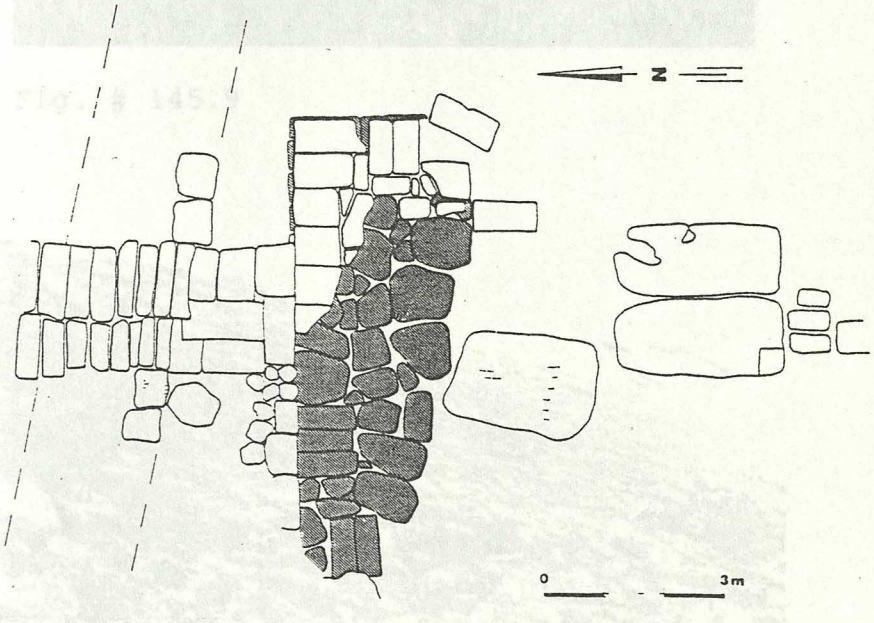



Fig. # 145.8

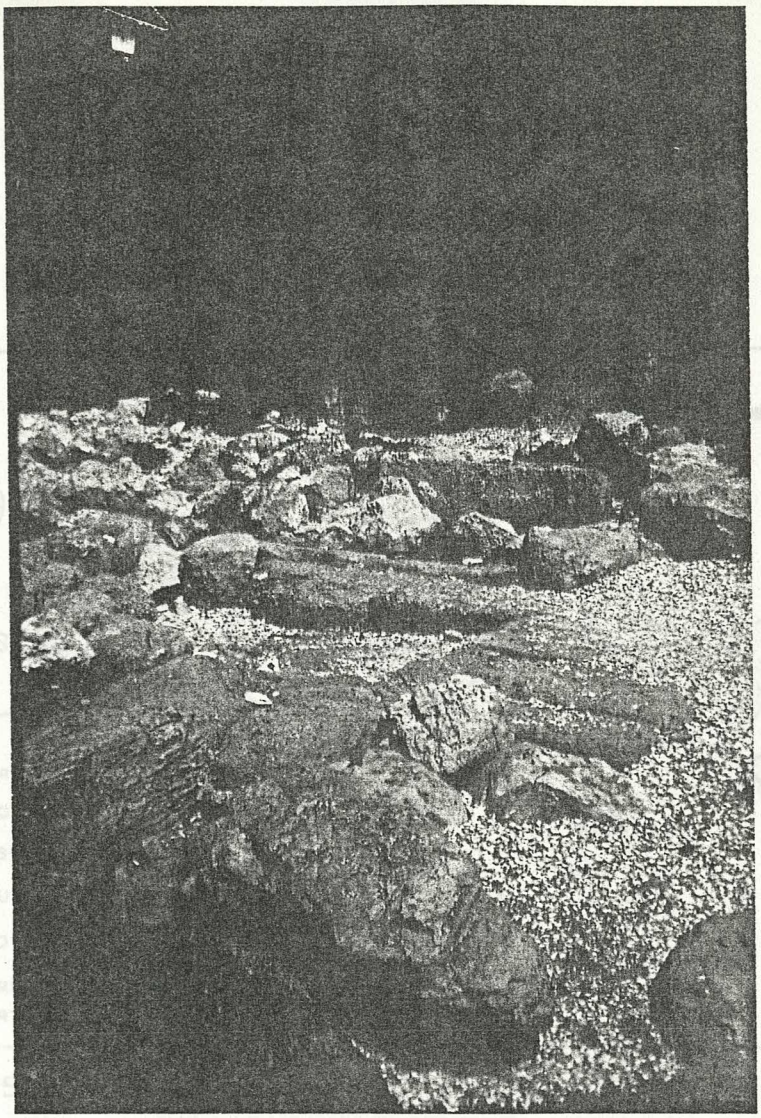


Fig. # 145.9

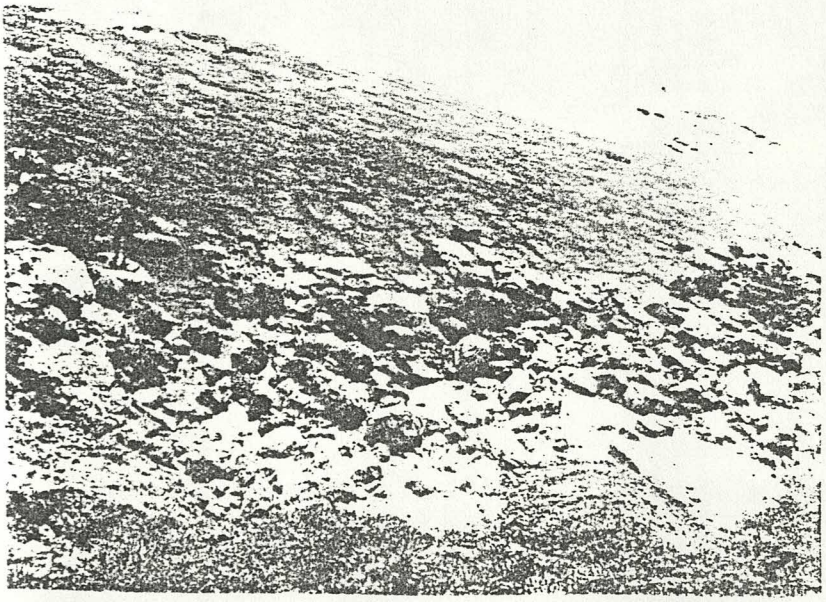


Fig. # 145.11

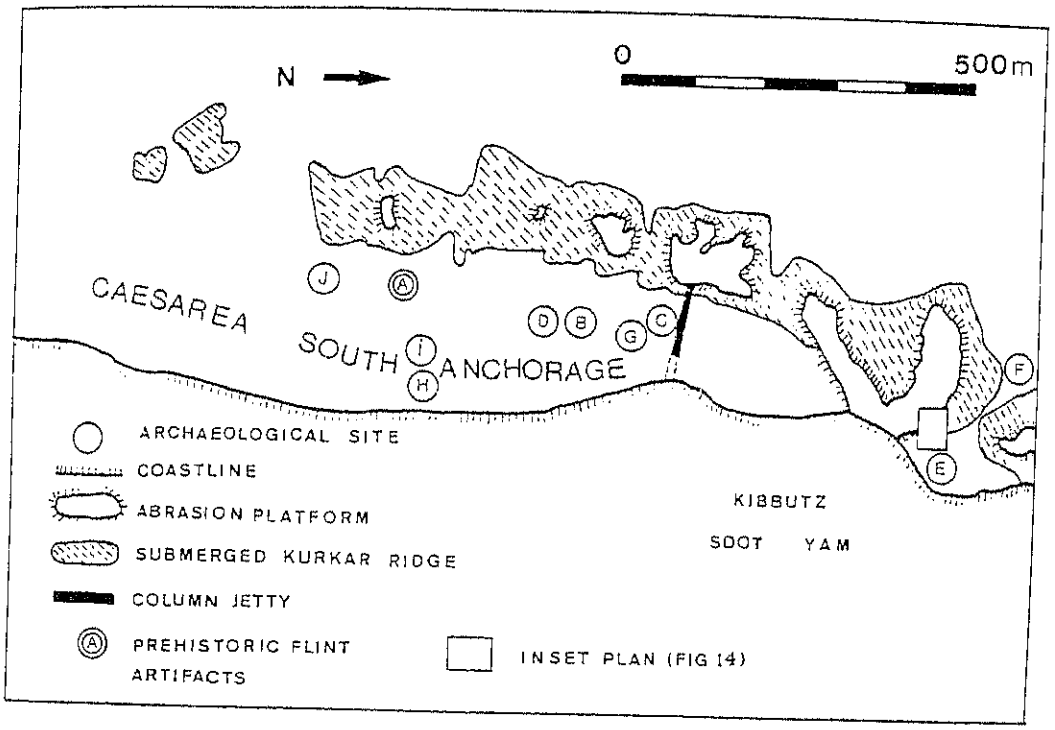

N
0
500m
CAESAREA
SOUTH ANCHORAGE
J
A
D
B
G
C
I
H
F
E
KIBBUTZ
SDOT YAM
ARCHAEOLOGICAL SITE
COASTLINE
ABRASION PLATFORM
SUBMERGED KURKAR RIDGE
COLUMN JETTY
PREHISTORIC FLINT ARTIFACTS
INSET PLAN (FIG 14)

Fig. # 150

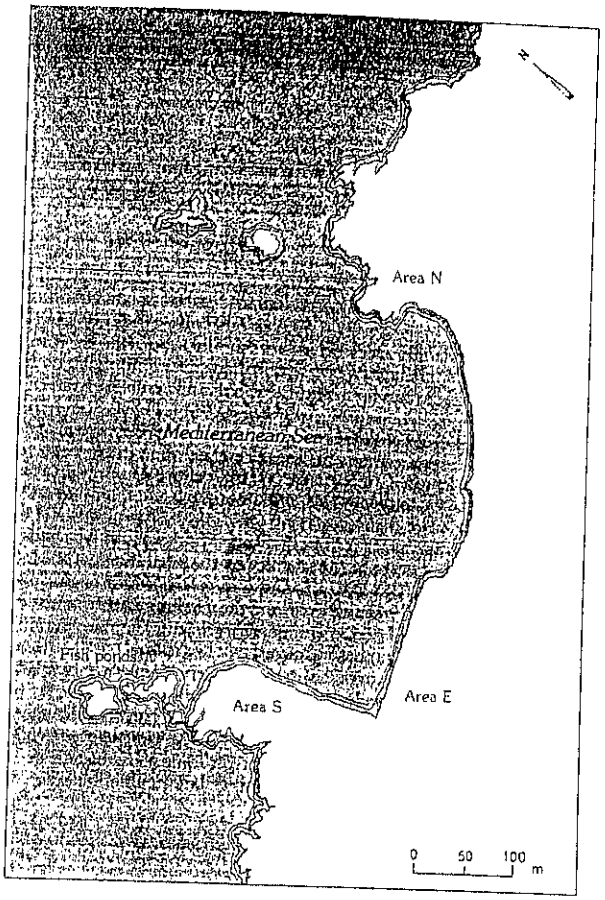



Fig. # 153

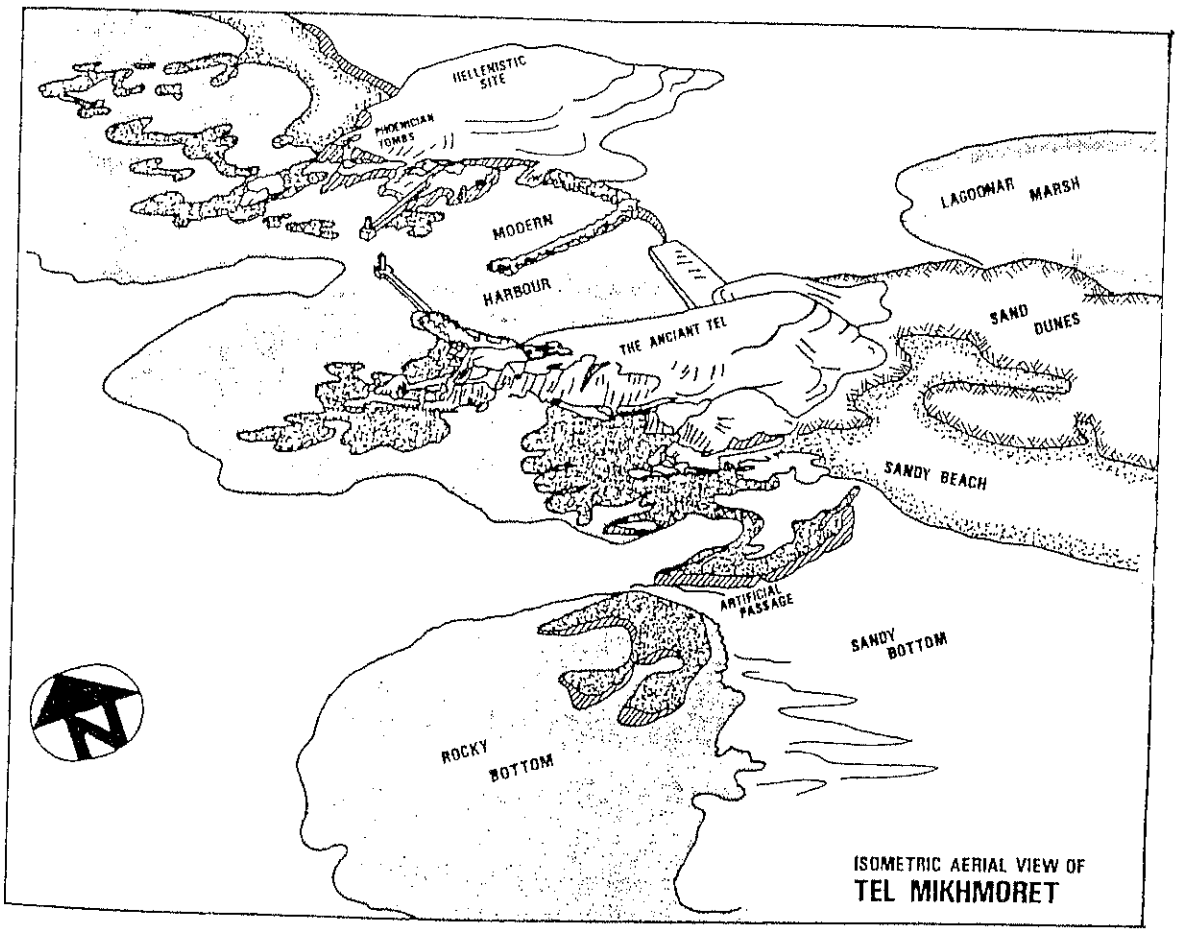



Fig. # 153.1

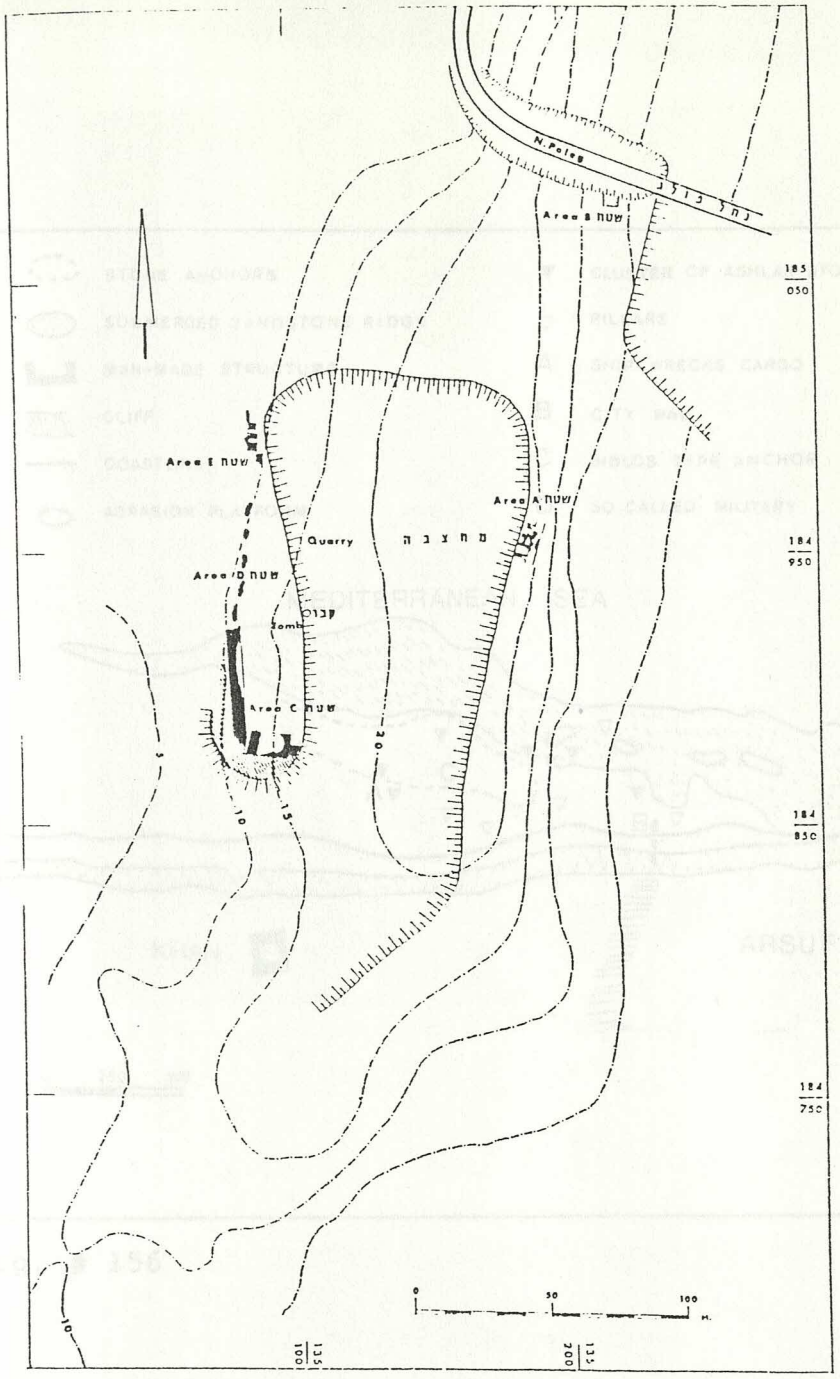



Fig. # 155

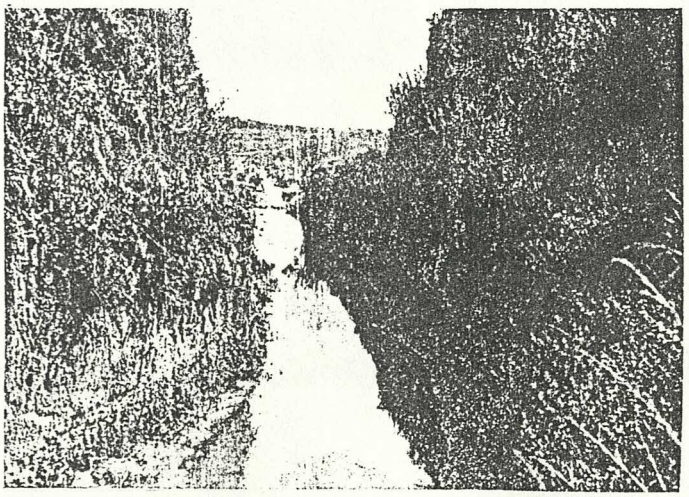


Fig. # 155.1

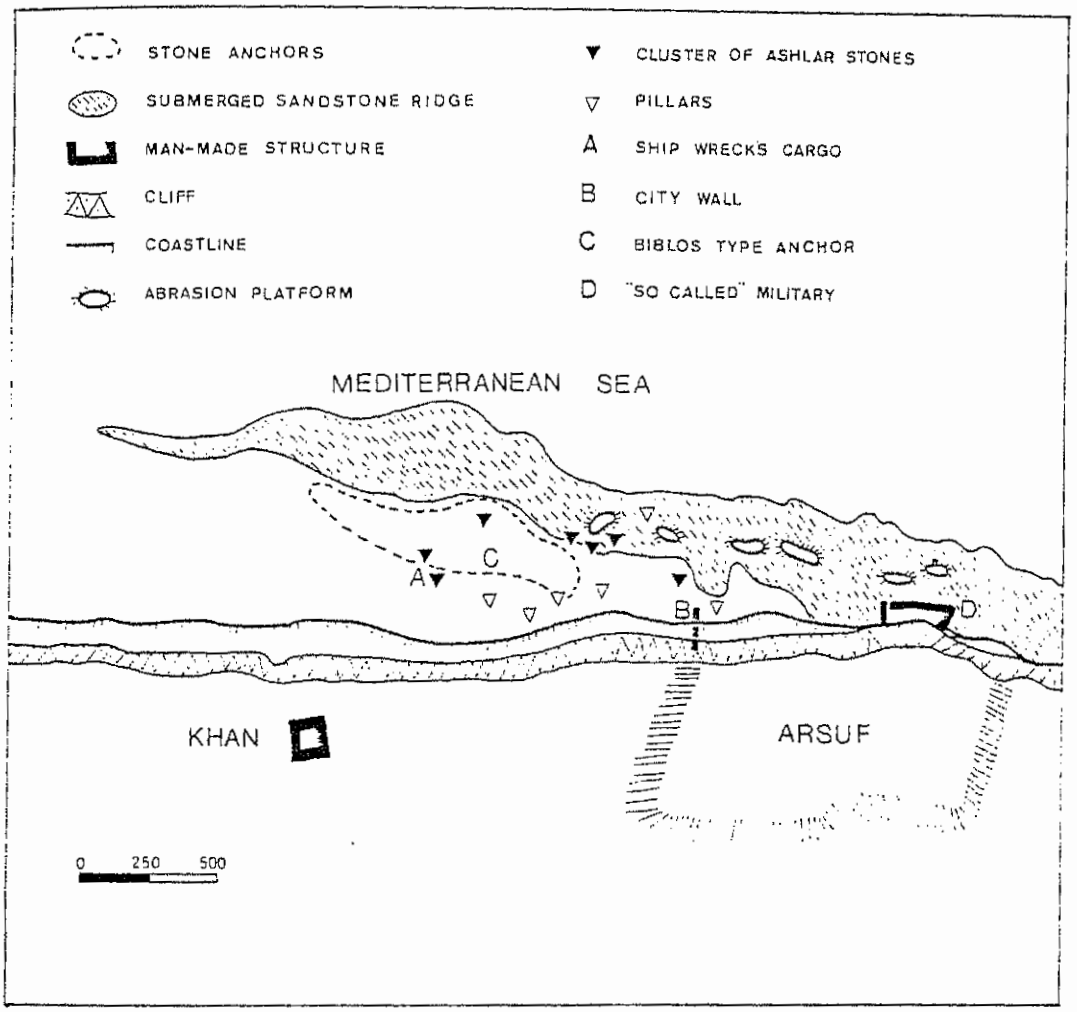

STONE ANCHORS
SUBMERGED SANDSTONE RIDGE
MAN-MADE STRUCTURE
CLIFF
COASTLINE
ABRASION PLATFORM
CLUSTER OF ASHLAR STONES
PILLARS
A SHIP WRECK'S CARGO
B CITY WALL
C BIBLOS TYPE ANCHOR
D "SO CALLED" MILITARY
MEDITERRANEAN SEA
A
C
B
D
KHAN
ARSUF
0 250 500

Fig. # 156

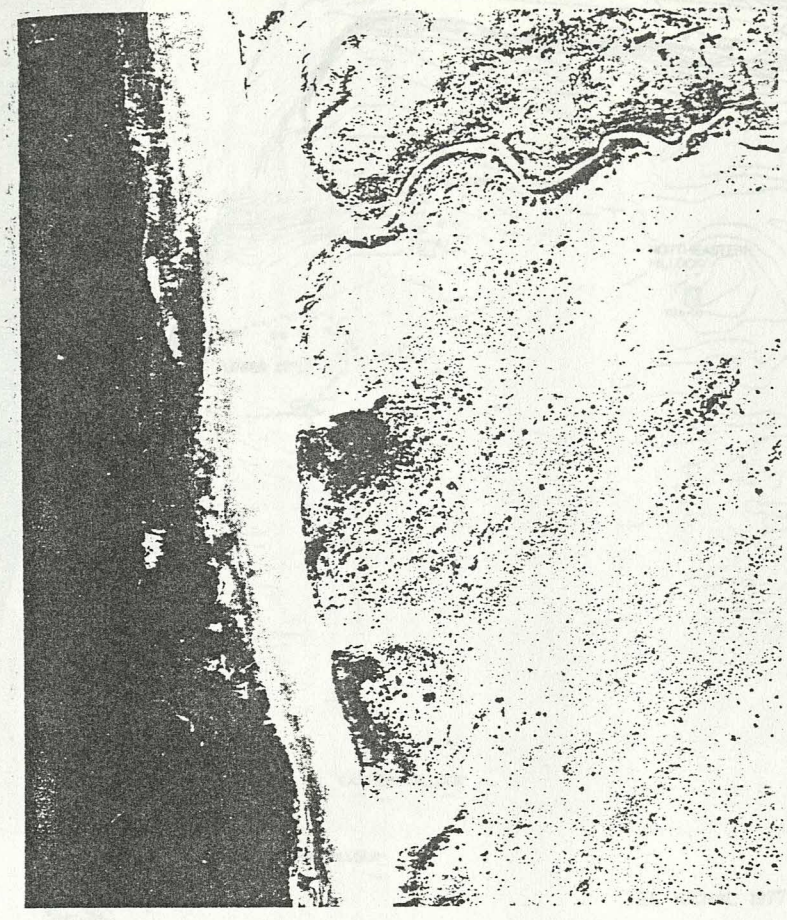


Fig. # 157

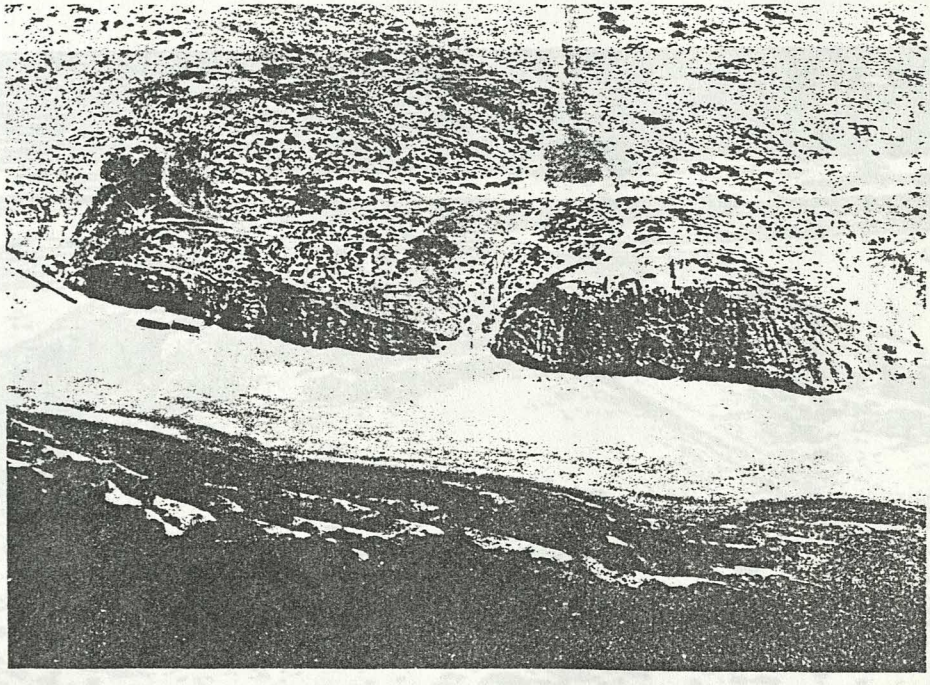


Fig. # 157.1

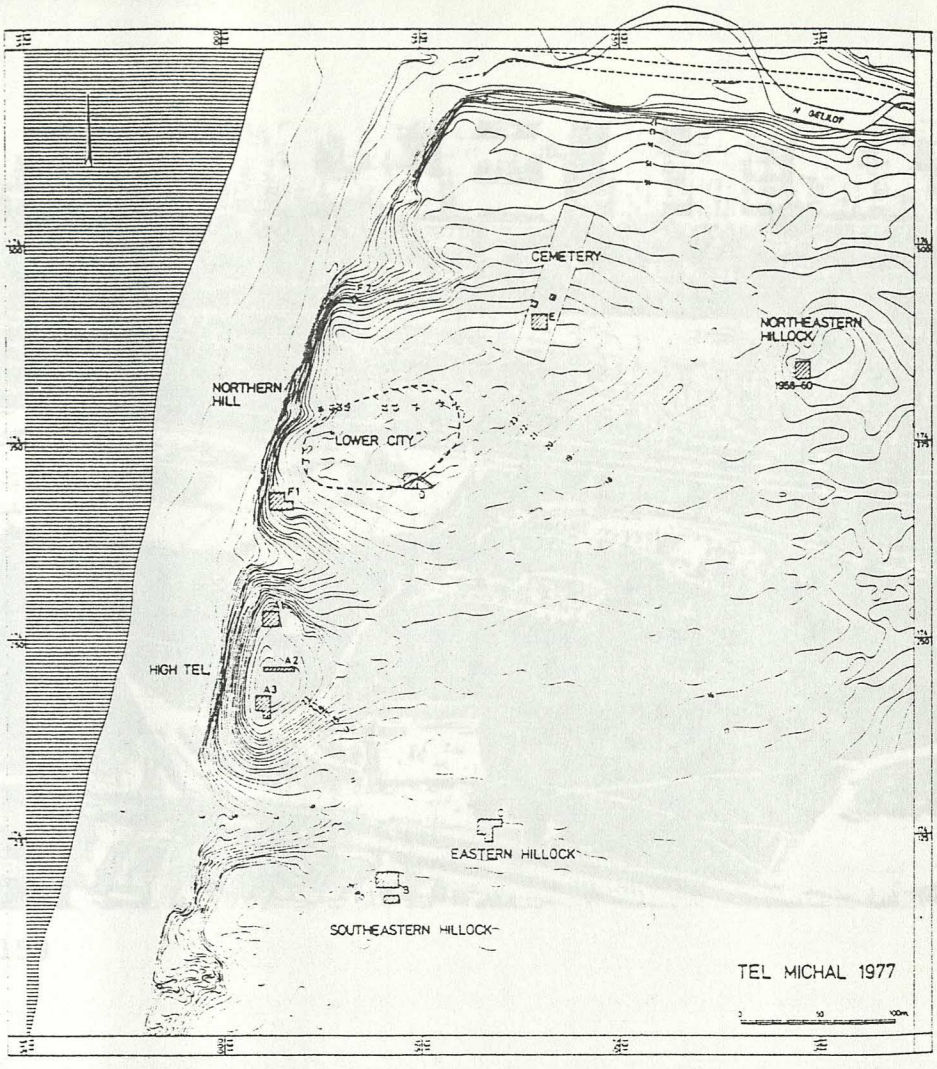



Fig. # 157.2

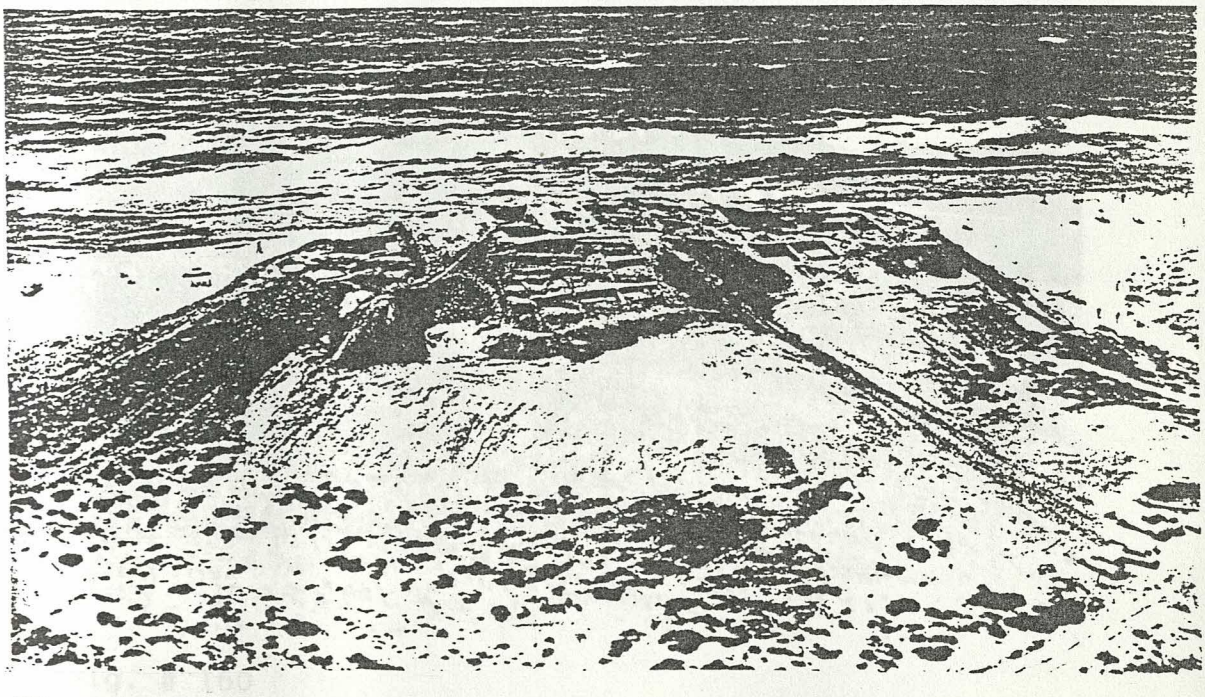


Fig. # 157.3



Fig. # 159

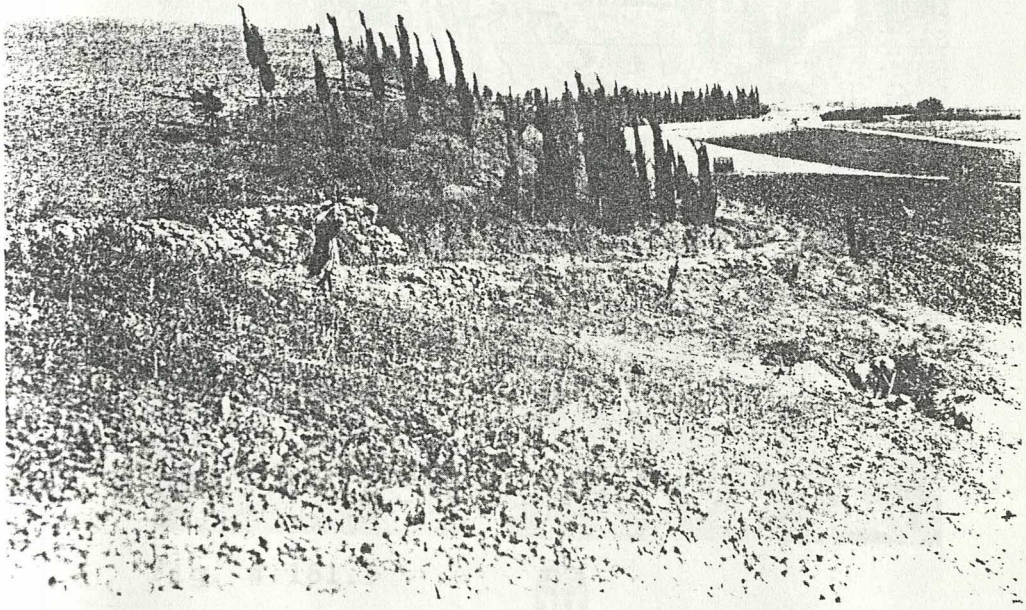


Fig. # 160

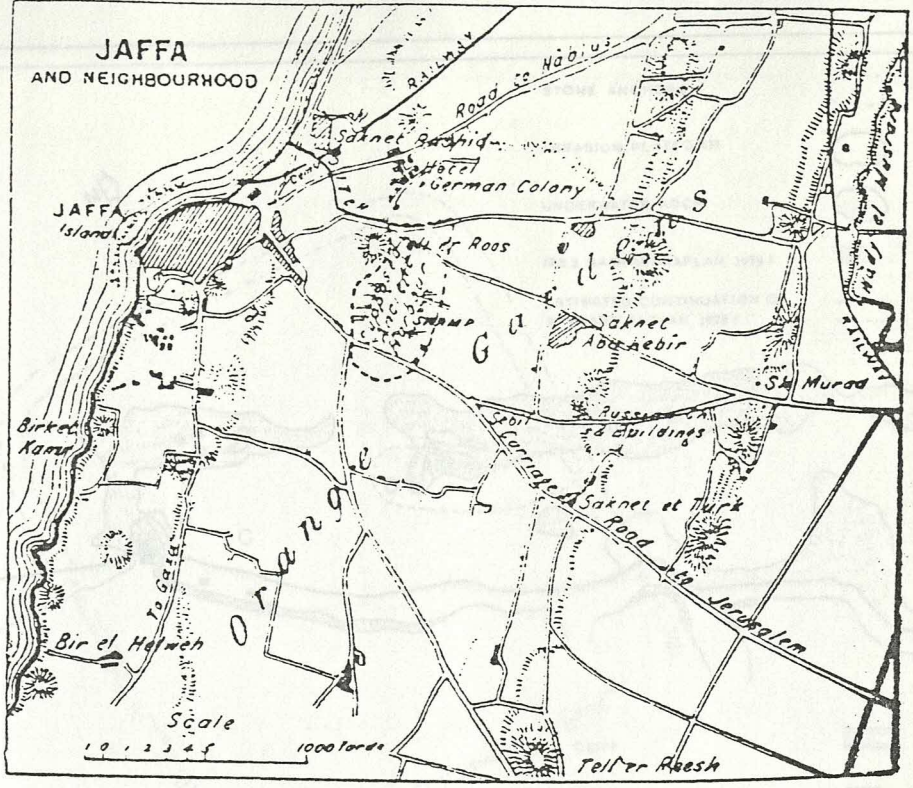



Fig. # 161




Fig. # 161.1

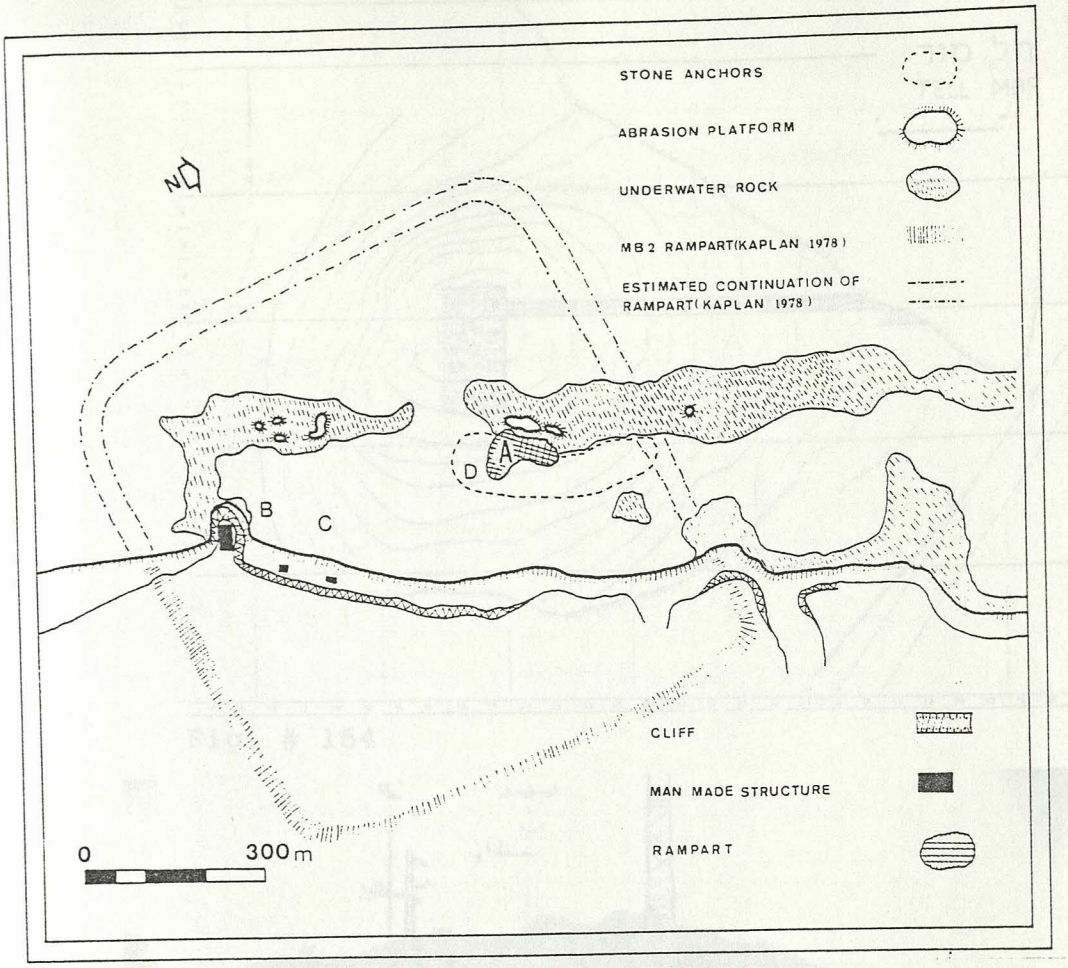



Fig. # 163

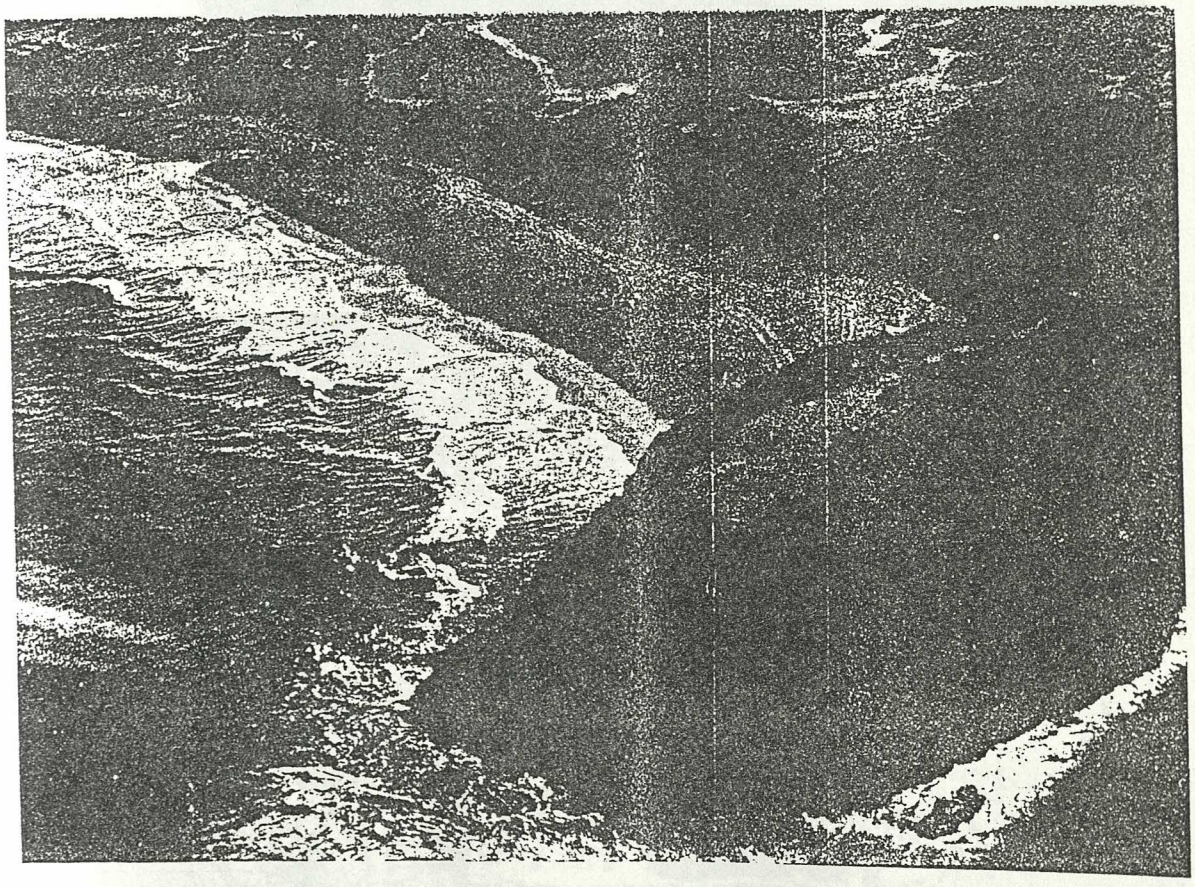


Fig. # 163.1

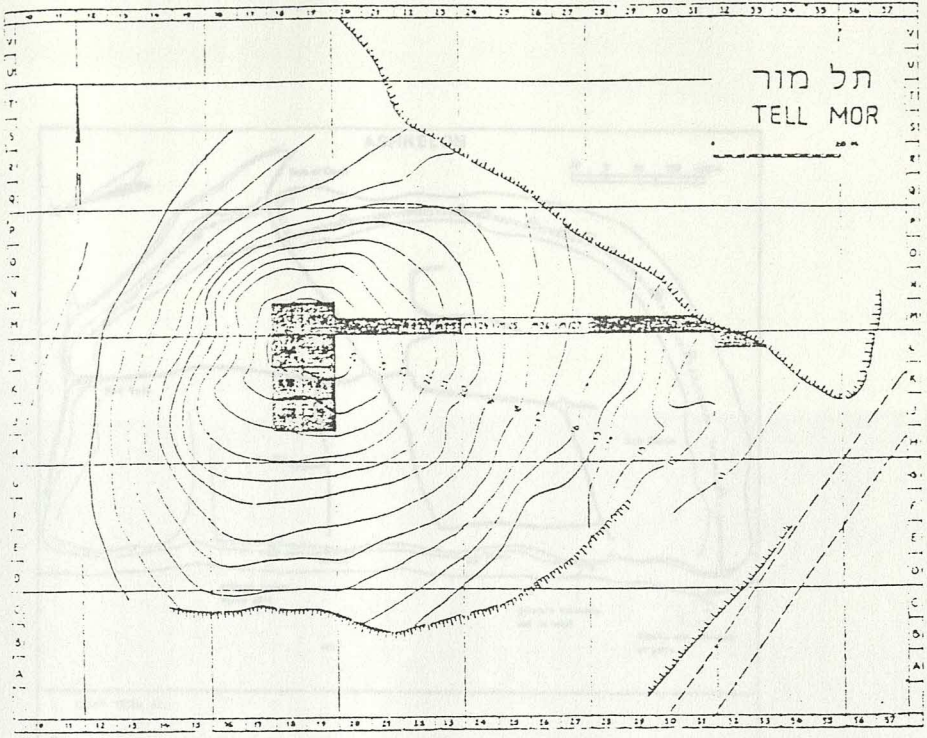



Fig. # 164

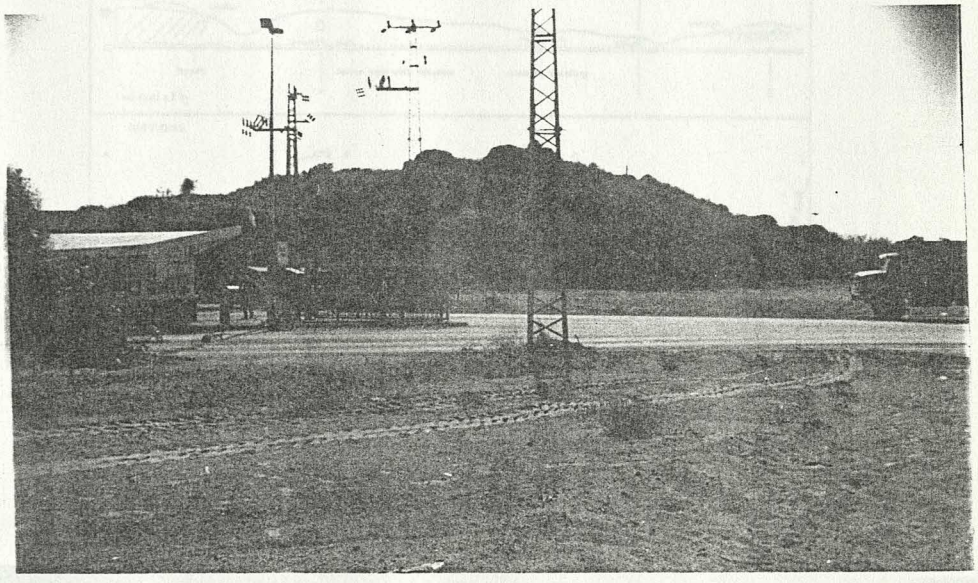


Fig. # 164.1

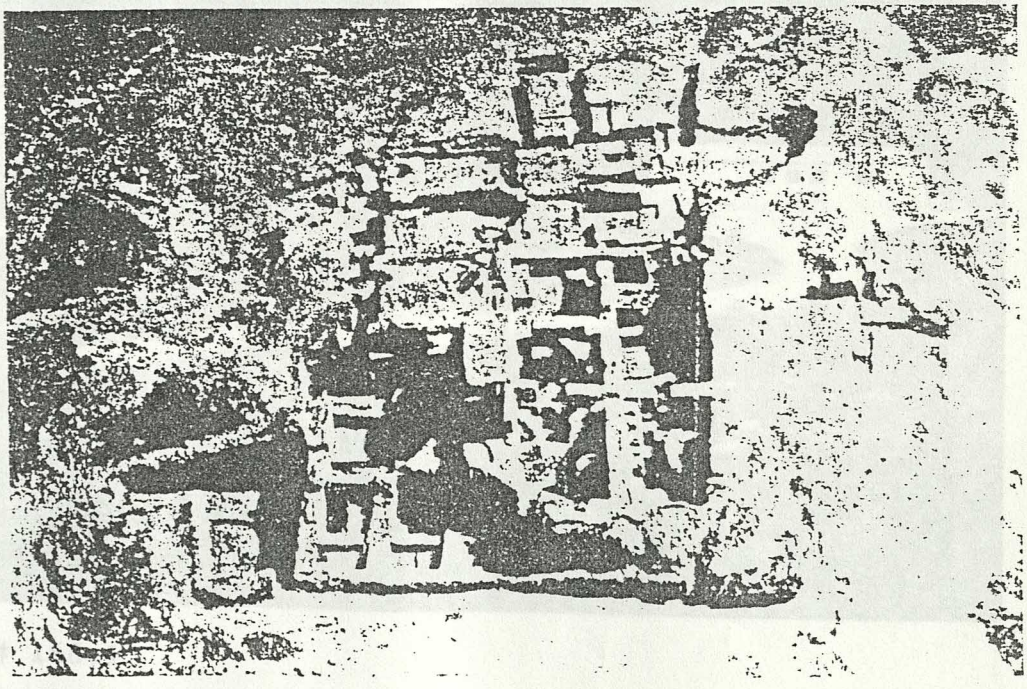


Fig. # 164.2

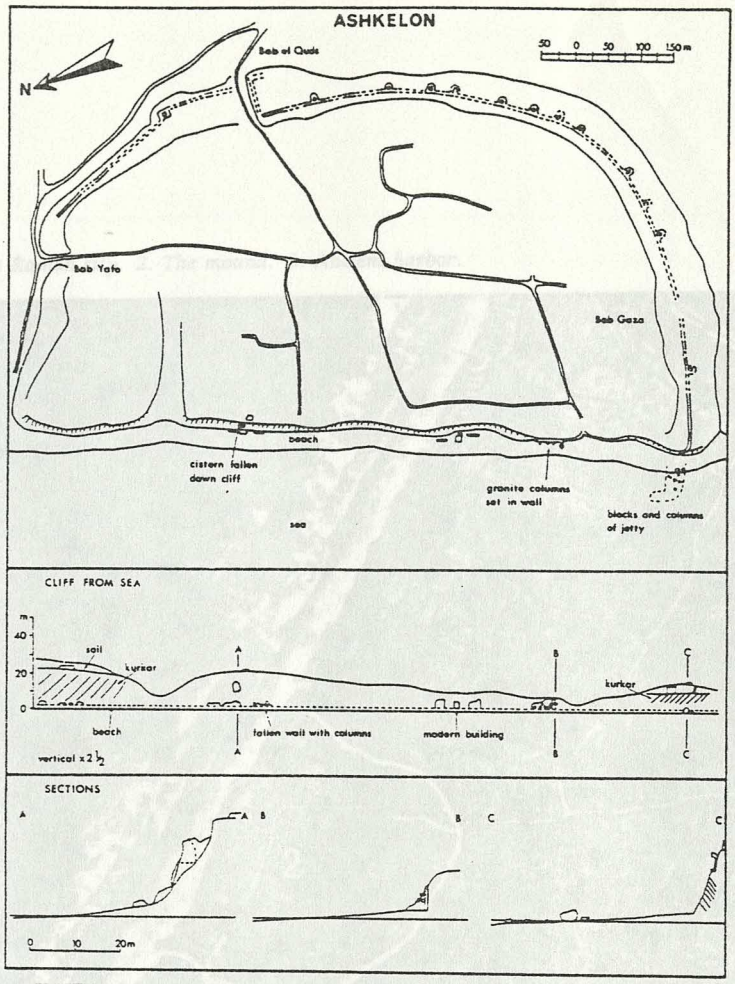



Fig. # 166

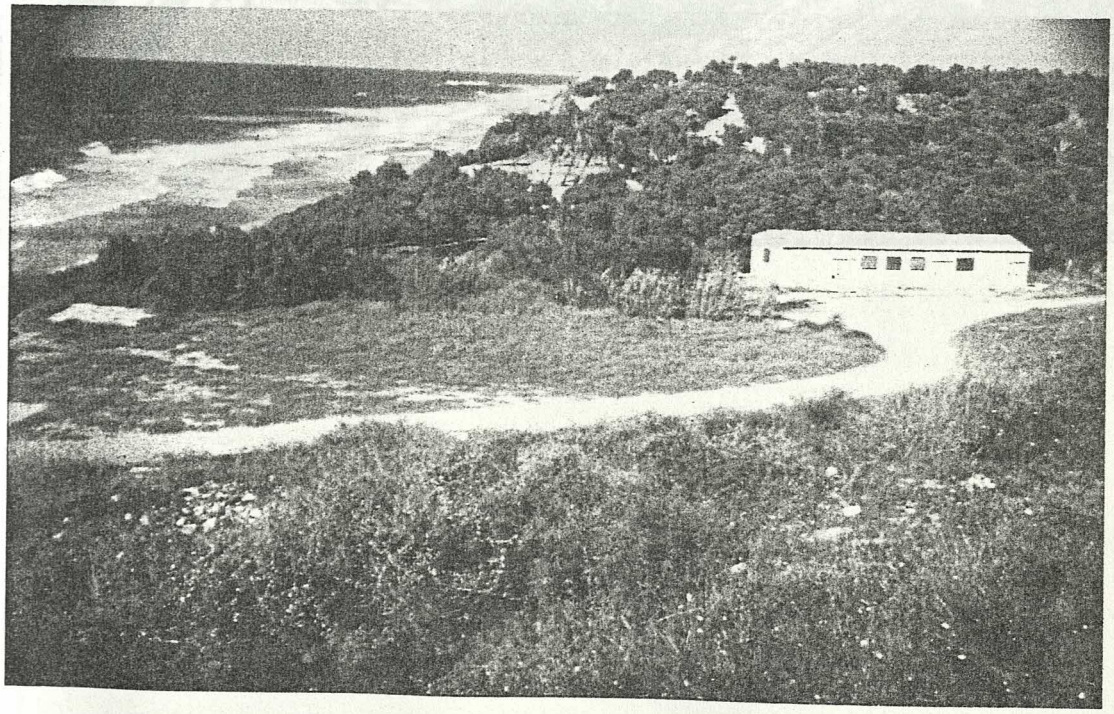


Fig. # 166.1

*Aerial view. 1. Area of the Roman city. 2. The mound. 3. Ancient harbor.*

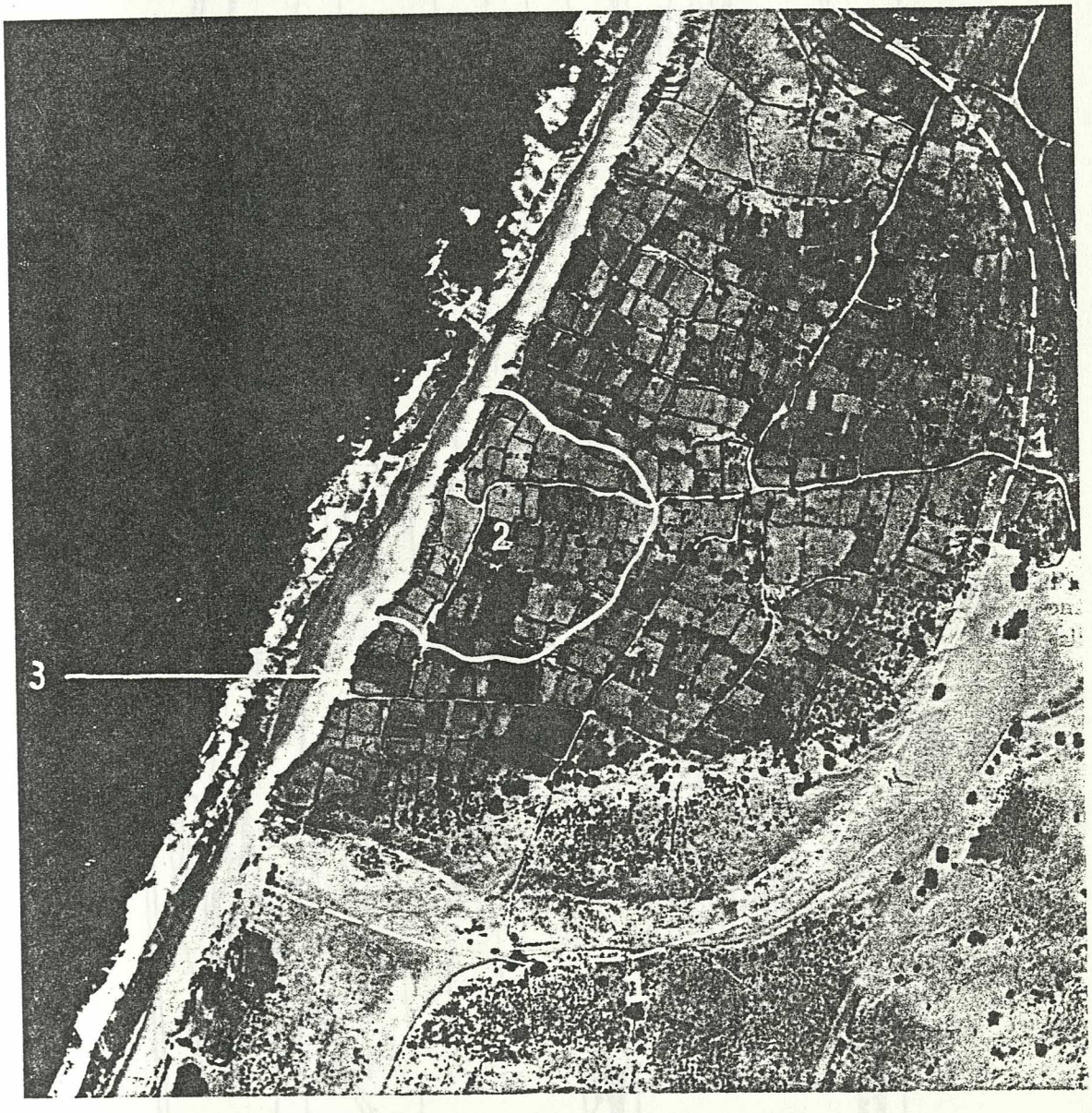
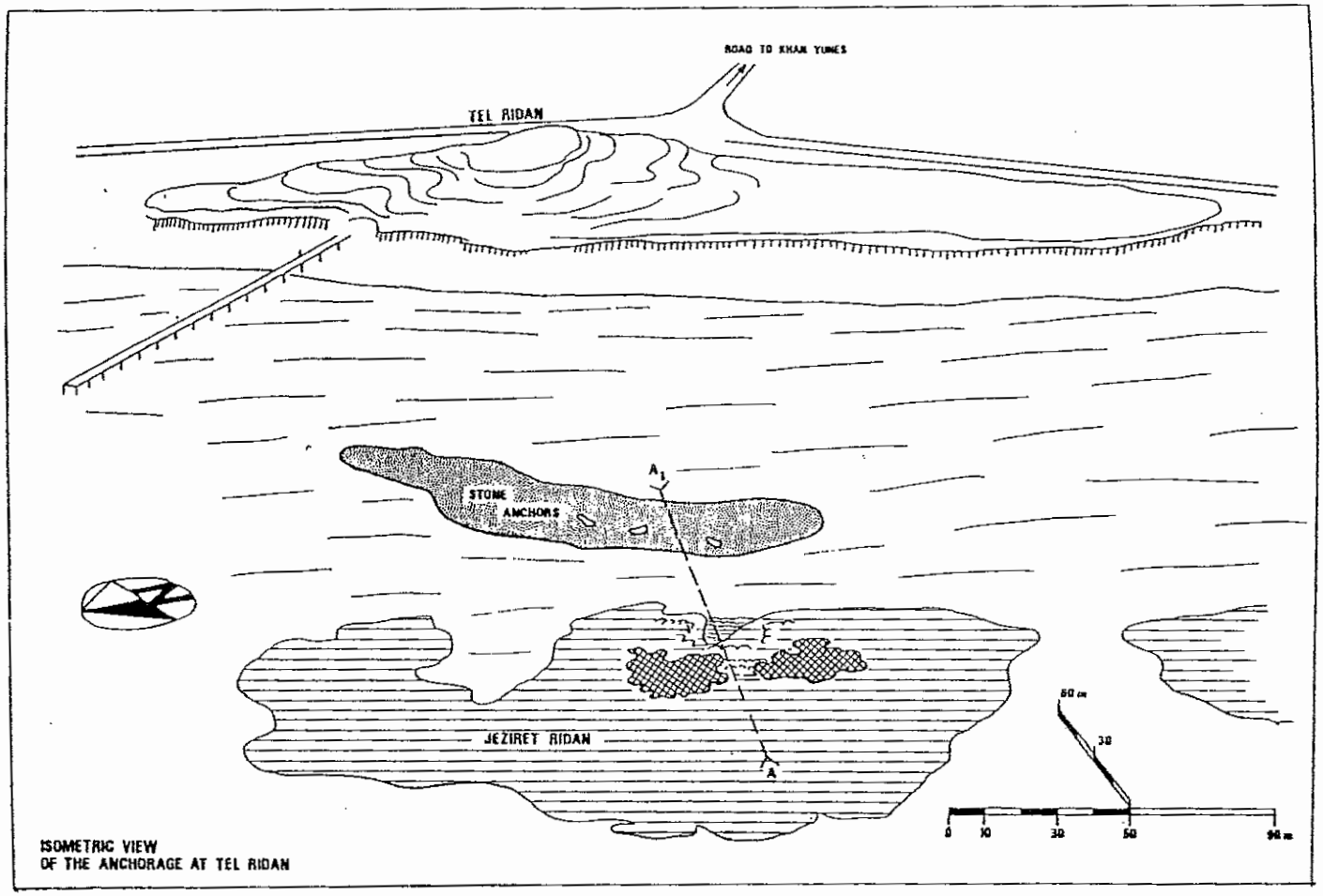



Fig. # 166.2

Fig. # 171




ISOMETRIC VIEW
OF THE ANCHORAGE AT TEL RIDAN

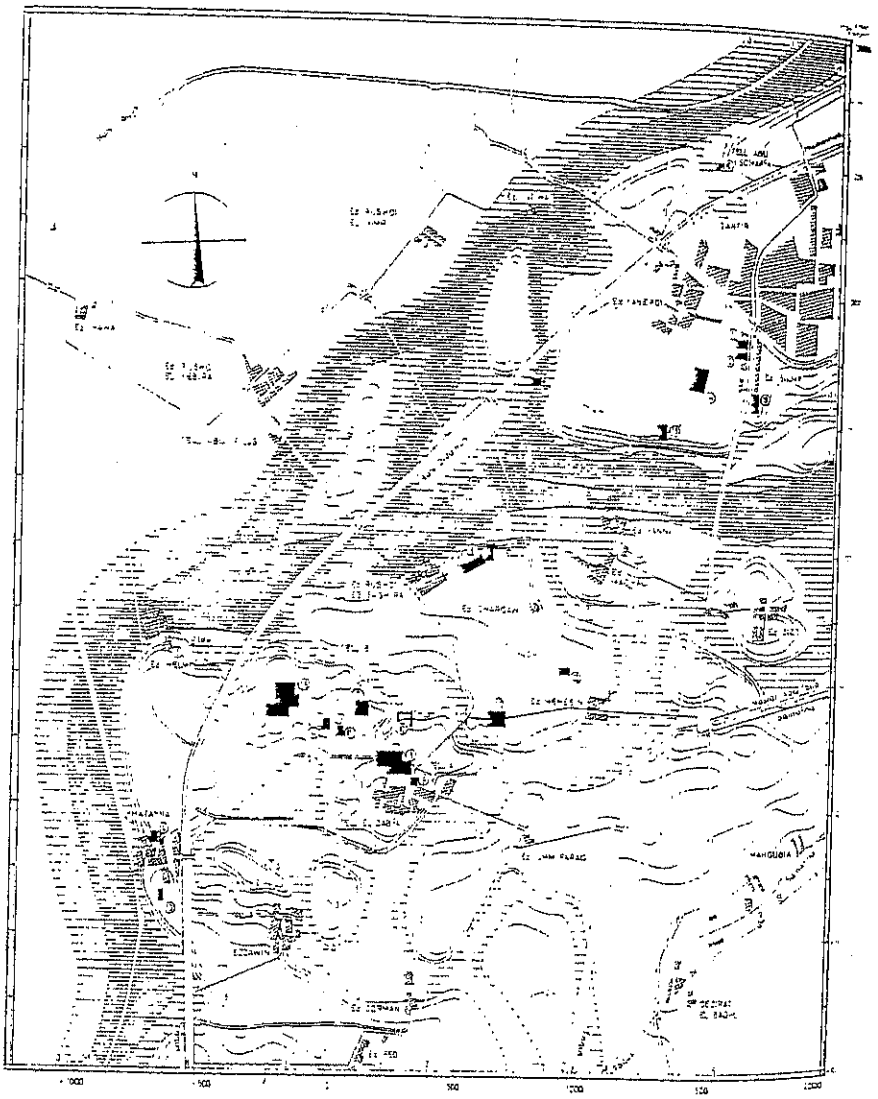


Fig. # 182

Fig. # 183

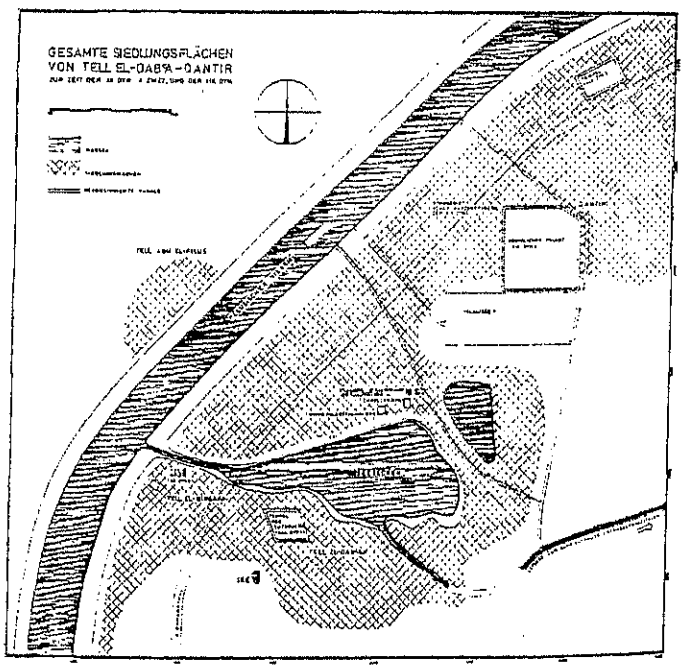



Fig. # 182.1

Fig. # 183.1

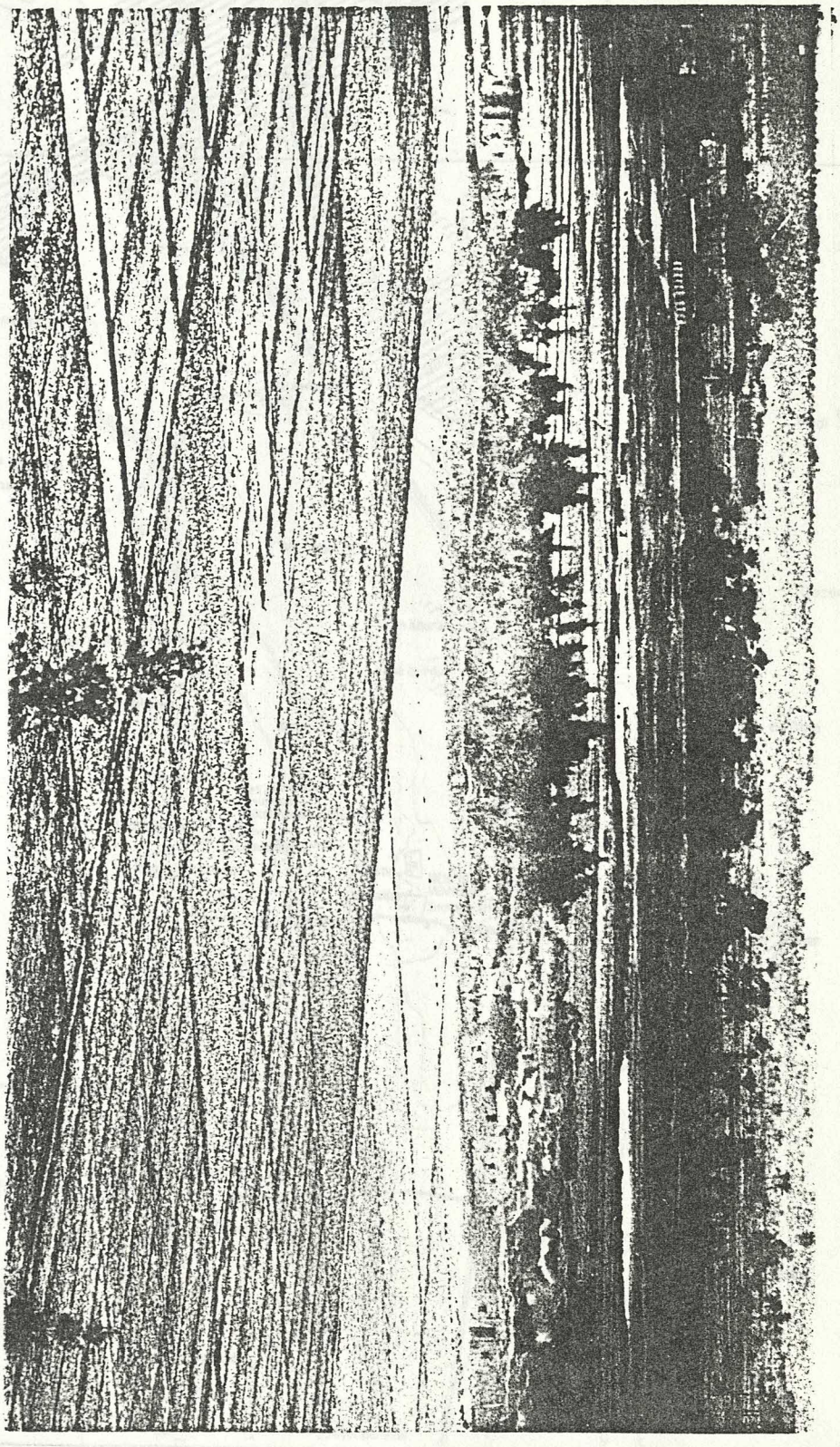


Fig. # 183.2

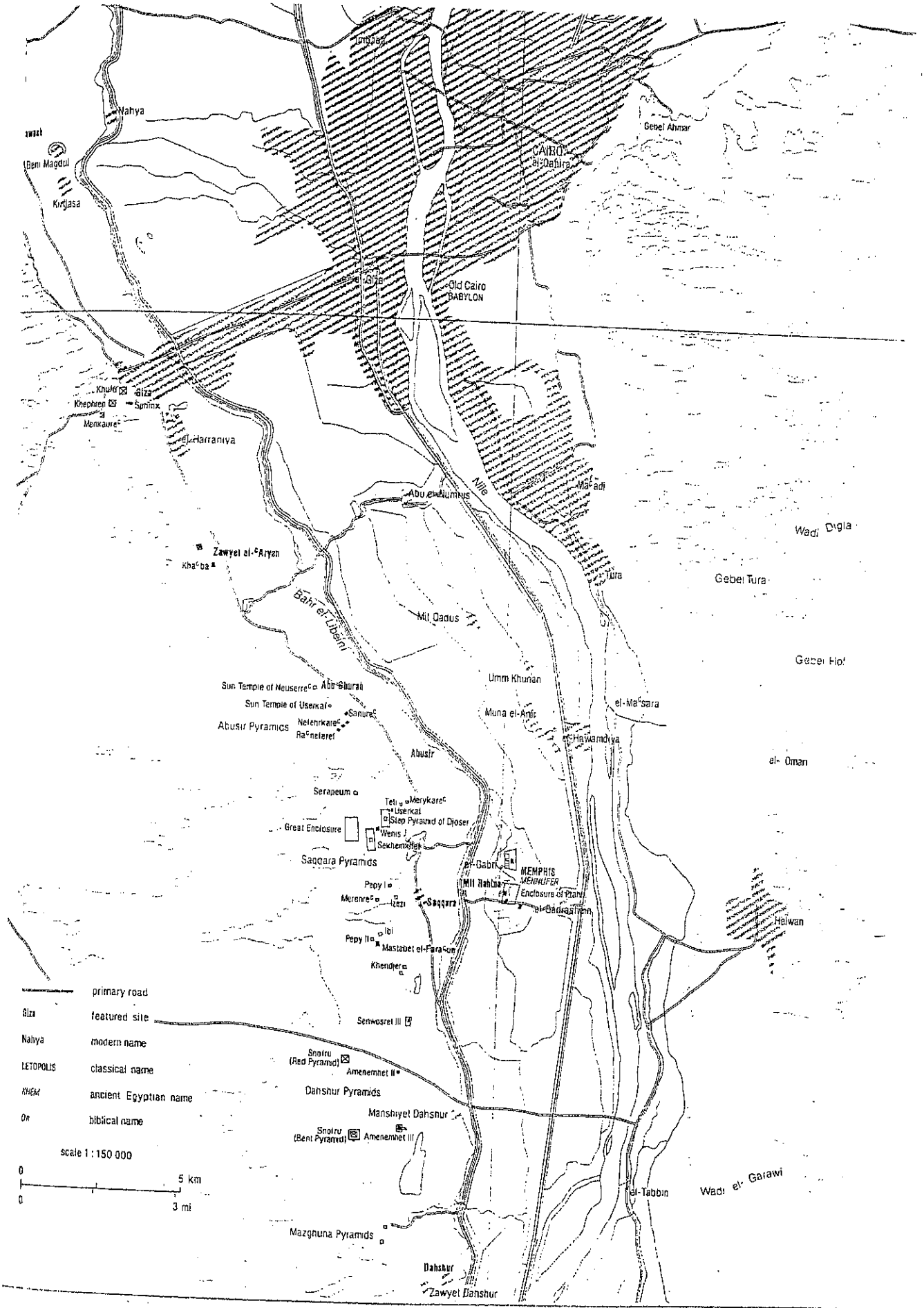

Imbaba
Nahya
Gebel Ahmar
CAIRO
el-Qahira
Old Cairo
BABYLON
Giza
Khufu
Khephren
Sphinx
Menkaure
el-Harraniya
Nile
Abu el-Numrus
Ma'adi
Wadi Digla
Zawyet el-'Aryan
Kha'ba
Gebel Tura
Tura
Bahr el-Libeni
Mit Qadus
Gebel Hof
Umm Khunan
Sun Temple of Neuserre
Abu Ghurab
Sun Temple of Userkaf
Sahure
Abusir Pyramics
Neferirkare
Ra'neferef
Muna el-Anir
el-Ma'sara
Hawamdiya
Abusir
el-Oman
Serapeum
Teti
Merykare
Userkaf
Step Pyramid of Djoser
Great Enclosure
Wenis
Sekhemkhet
Saqqara Pyramics
el-Gabri
MEMPHIS
MENNUFER
Mit Rahina
Enclosure of Ptah
el-Badrashein
Pepy I
Merenre
Izezi
Saqqara
Helwan
Ibi
Pepy II
Mastabet el-Fara'un
Khendjer
primary road
featured site
modern name
classical name
ancient Egyptian name
biblical name
Giza
Nahya
LETOPOLIS
KHEM
On
Senwosret III
Snofru
(Red Pyramid)
Amenemnet II
Dahshur Pyramids
Manshiyet Dahshur
Snofru
(Bent Pyramid)
Amenemnet III
scale 1 : 150 000
0
5 km
0
3 mi
el-Tabbin
Wadi el-Garawi
Mazghuna Pyramids
Dahshur
Zawyet Dahshur

Fig. # 187

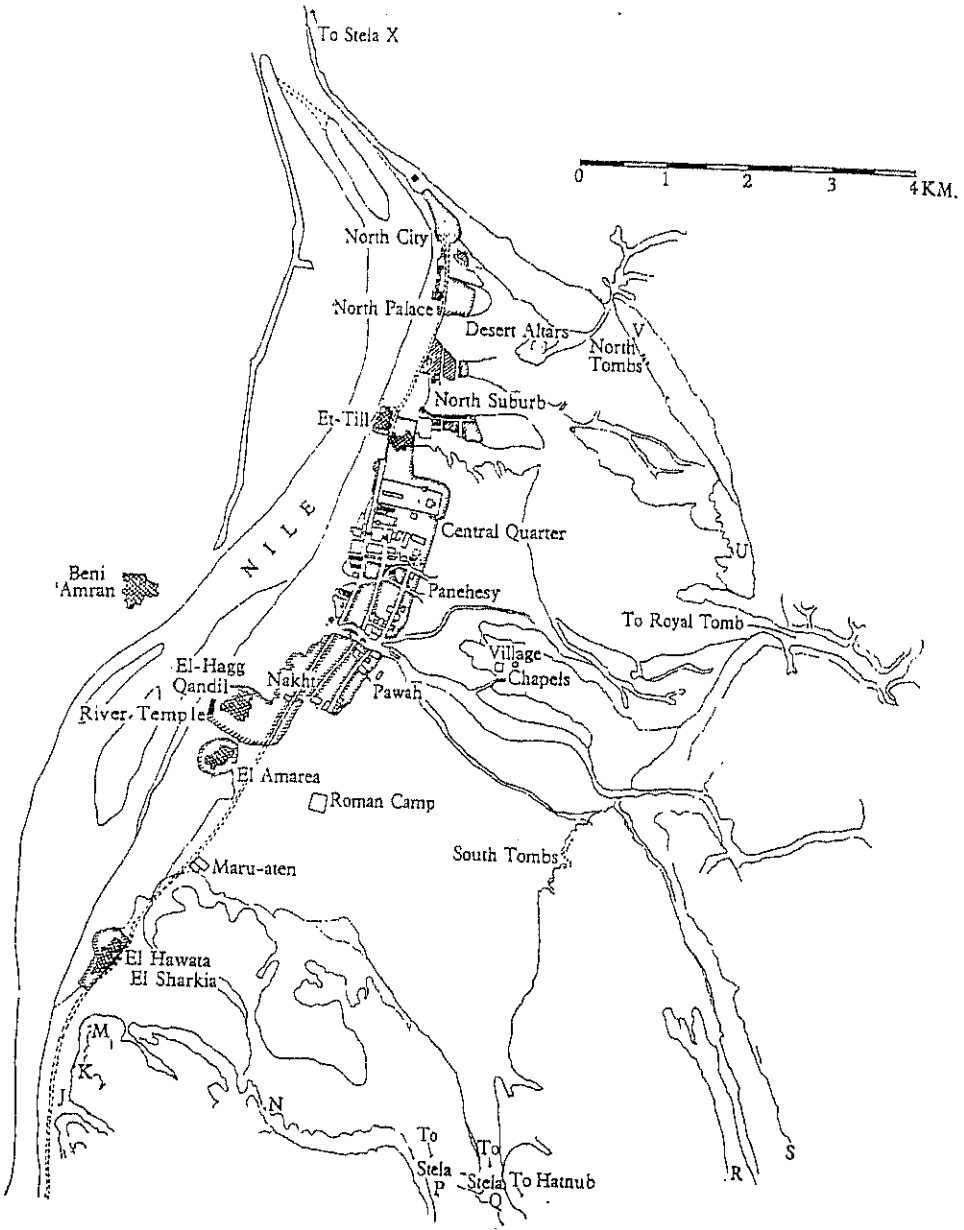
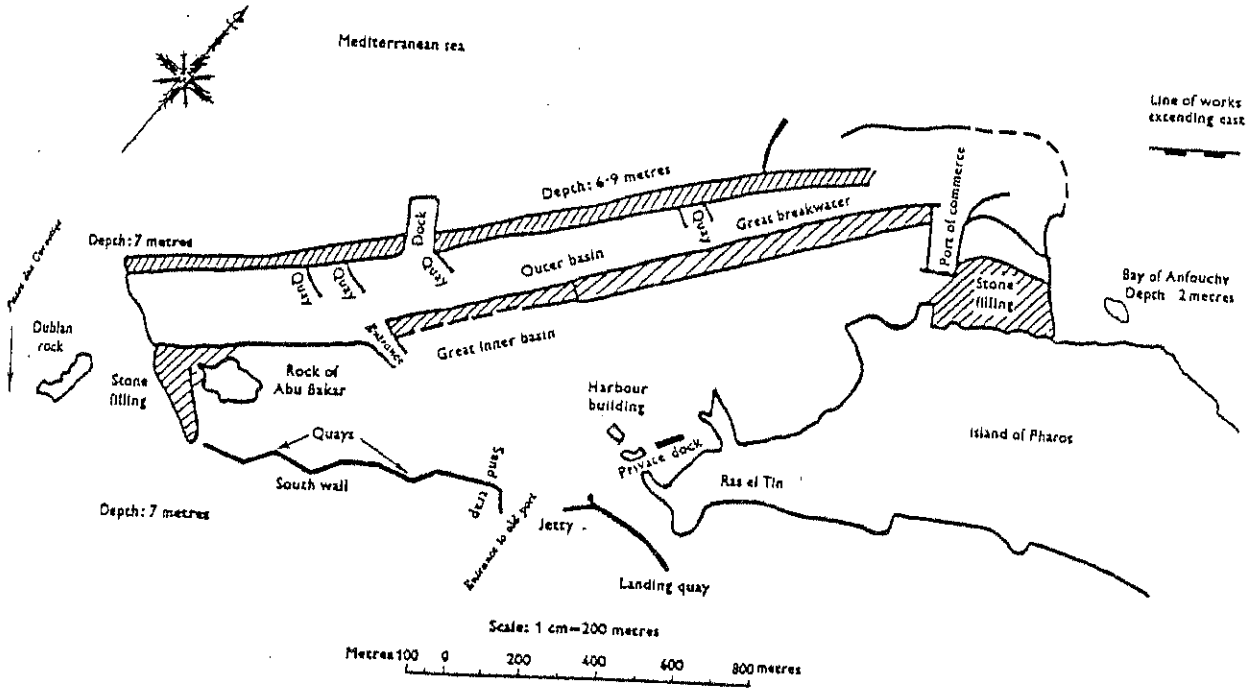

To Stela X
0 1 2 3 4 KM.
North City
North Palace
Desert Altars
North Tombs
North Suburb
El-Till
NILE
Central Quarter
Beni 'Amran
Panehesy
To Royal Tomb
Village
Chapels
El-Hagg Qandil
Nakht
Pawah
River Temple
El Amarea
Roman Camp
South Tombs
Maru-aten
El Hawata
El Sharkia
M
K
J
N
To Stela P
To Stela Q
To Hatnub
R
S

Fig. # 188




PRE-HELLENIC PORT OF PHAROS

Fig. # 193

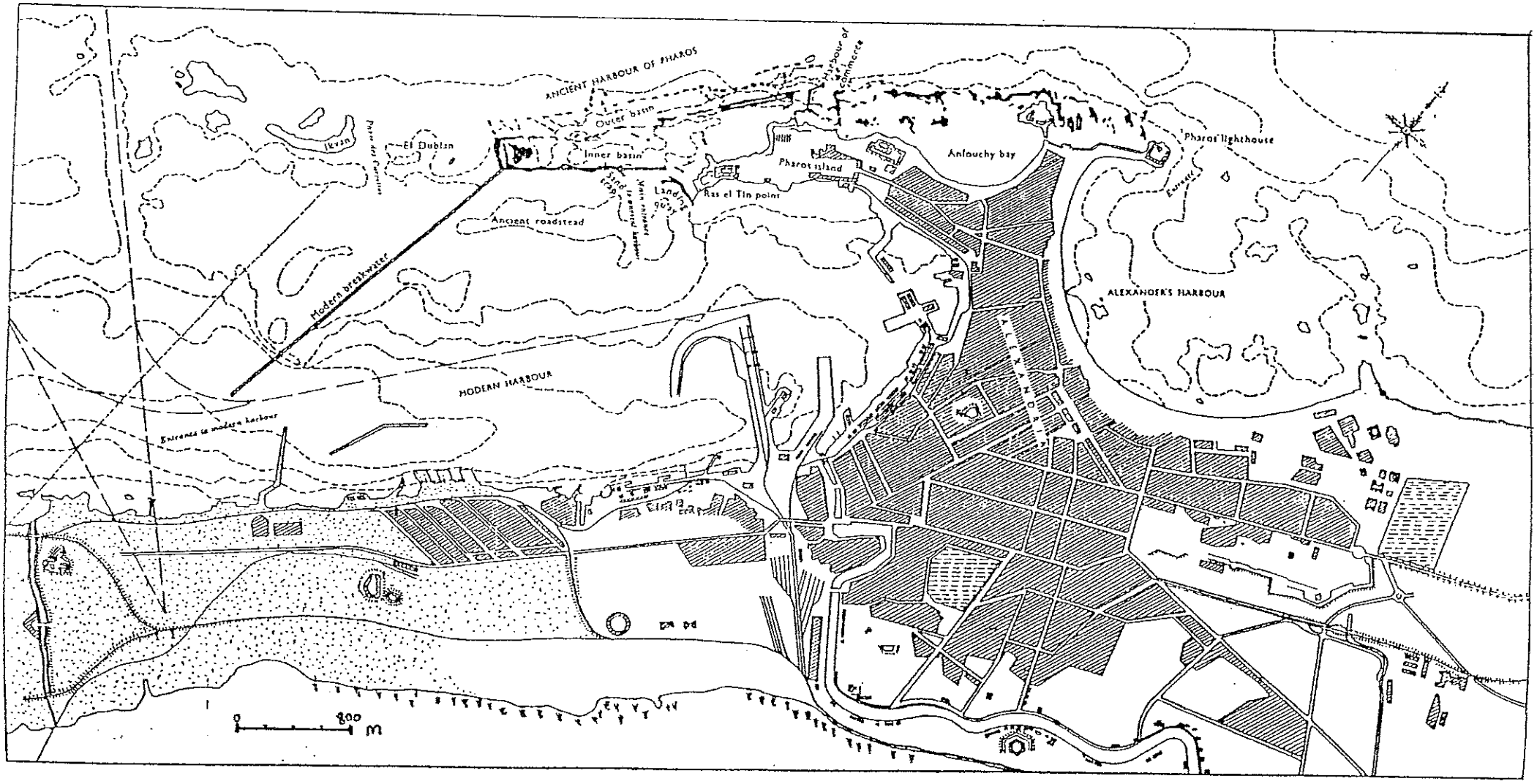

ANCIENT HARBOUR OF PHAROS
Harbour of Commerce
Outer basin
Inner basin
El Dublan
Ikrah
Pharos island
Anfouchy bay
Pharos lighthouse
Ras el Tin point
Ancient roadstead
Modern breakwater
MODERN HARBOUR
ALEXANDER'S HARBOUR
ALEXANDRIA
Entrance to modern harbour
0
800
m

Fig. # 193.1

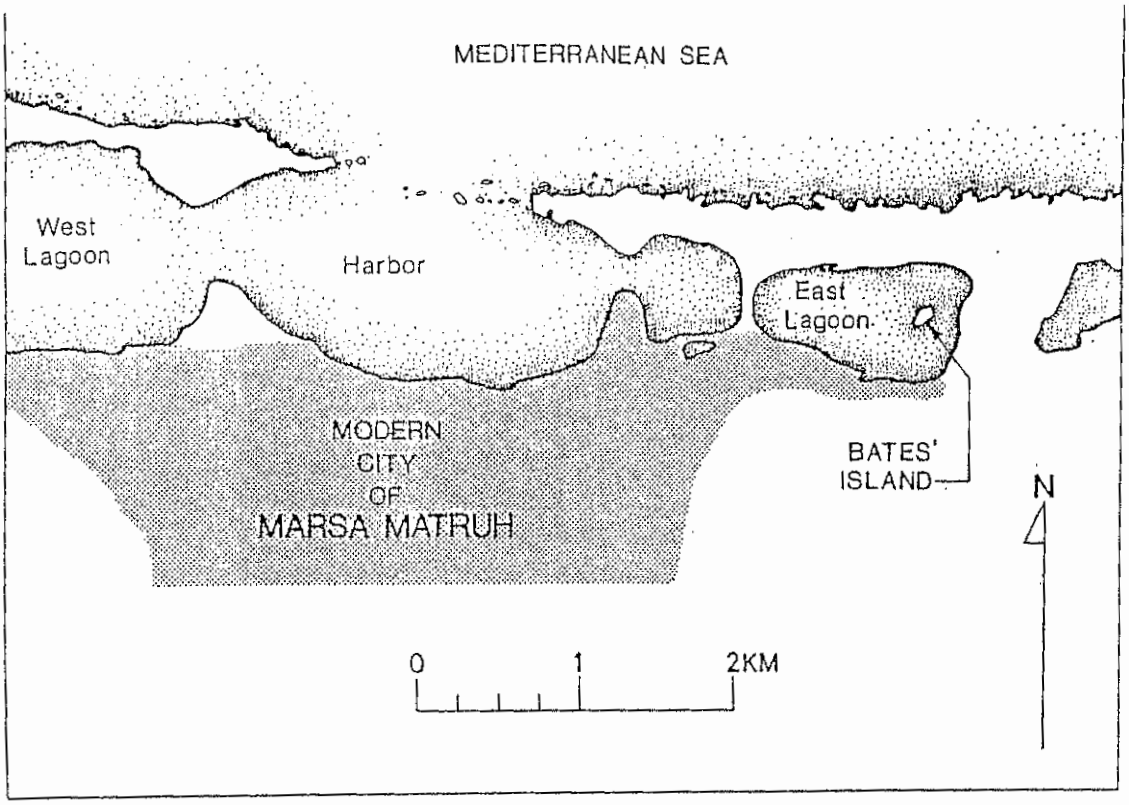



Fig. # 198

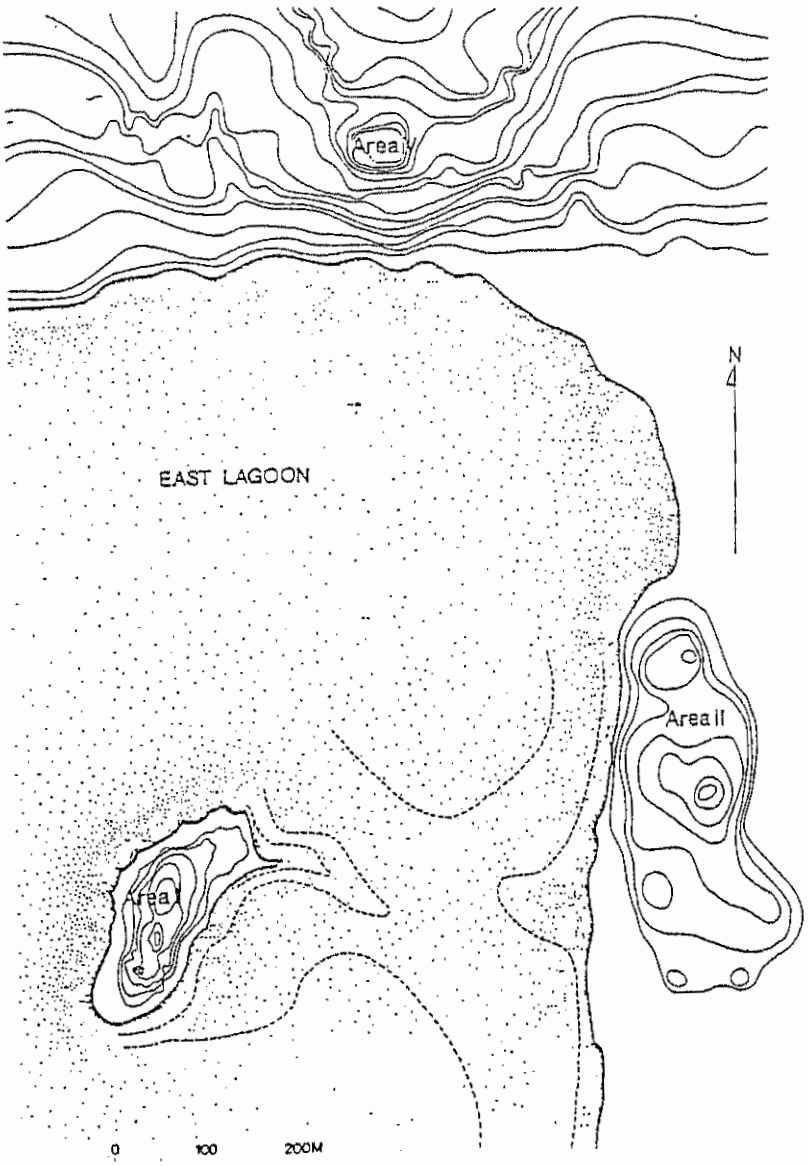



Fig. # 198.1

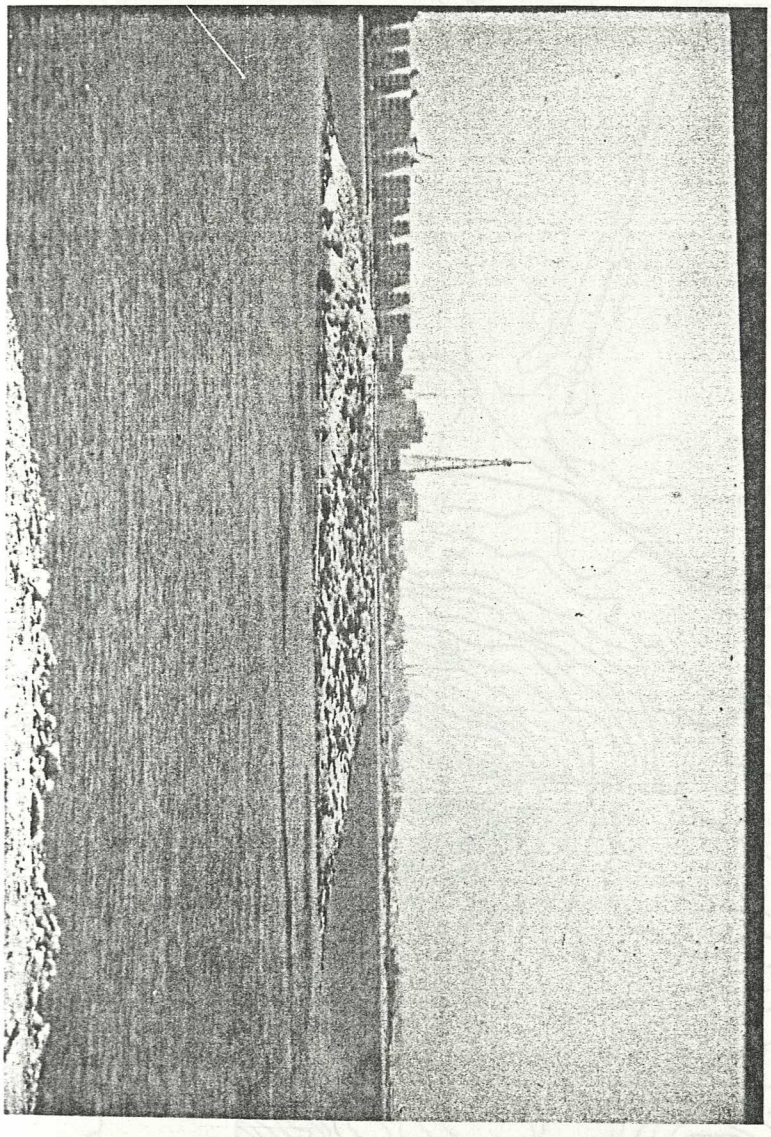


Fig. # 198.2

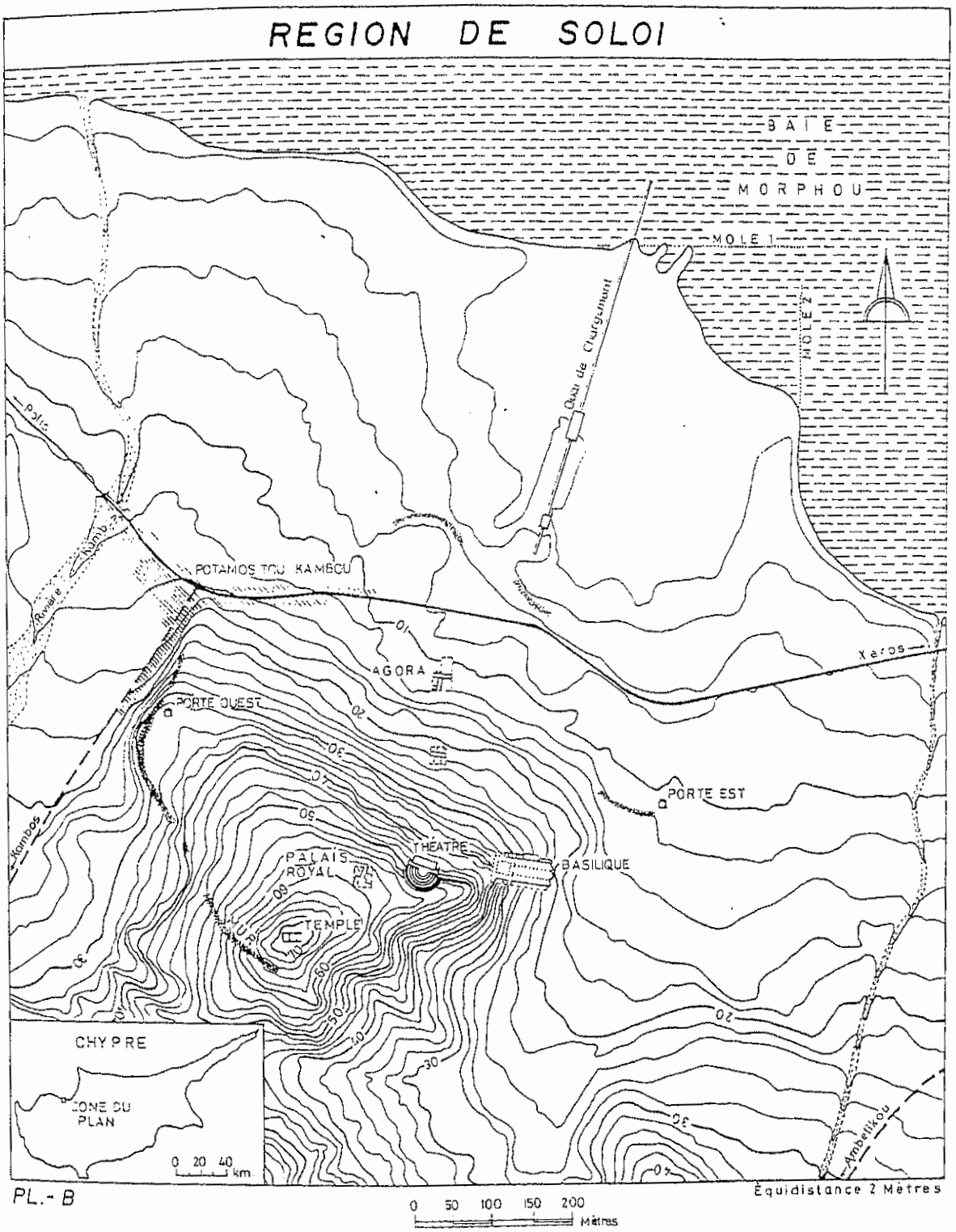
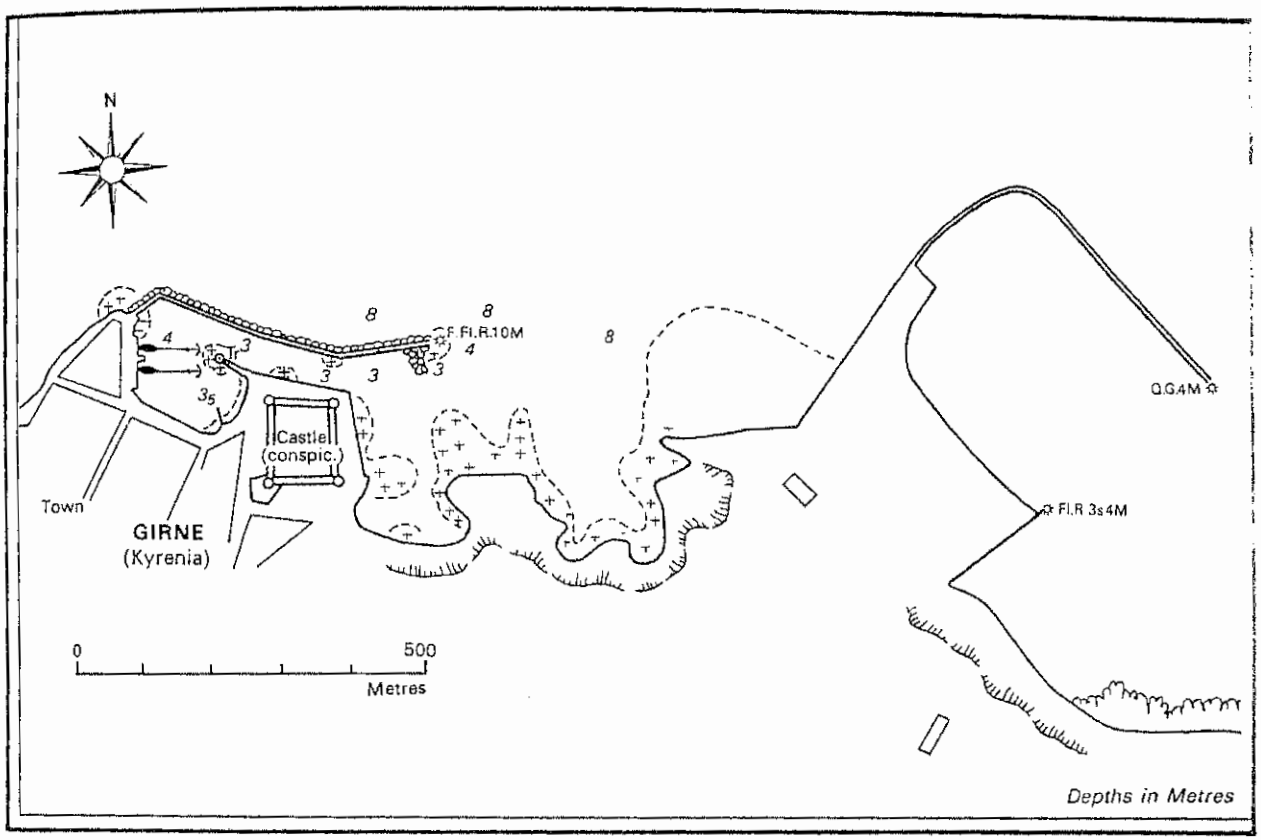

REGION DE SOLOI
BAIE DE MORPHOU
MOLE I
MOLE II
Quai de Chargement
Route
Rivière
POTAMOS TOU KAMBOU
AGORA
Xeros
PORTE OUEST
PORTE EST
Kambos
PALAIS ROYAL
THÉATRE
BASILIQUE
TEMPLE
Ambelikou
CHYPRE
ZONE DU PLAN
0 20 40 km
PL.- B
Équidistance 2 Mètres
0 50 100 150 200
Mètres

Fig. # 201




GIRNE (KYRENIA) 35°20'N 33°19'E

Fig. # 209

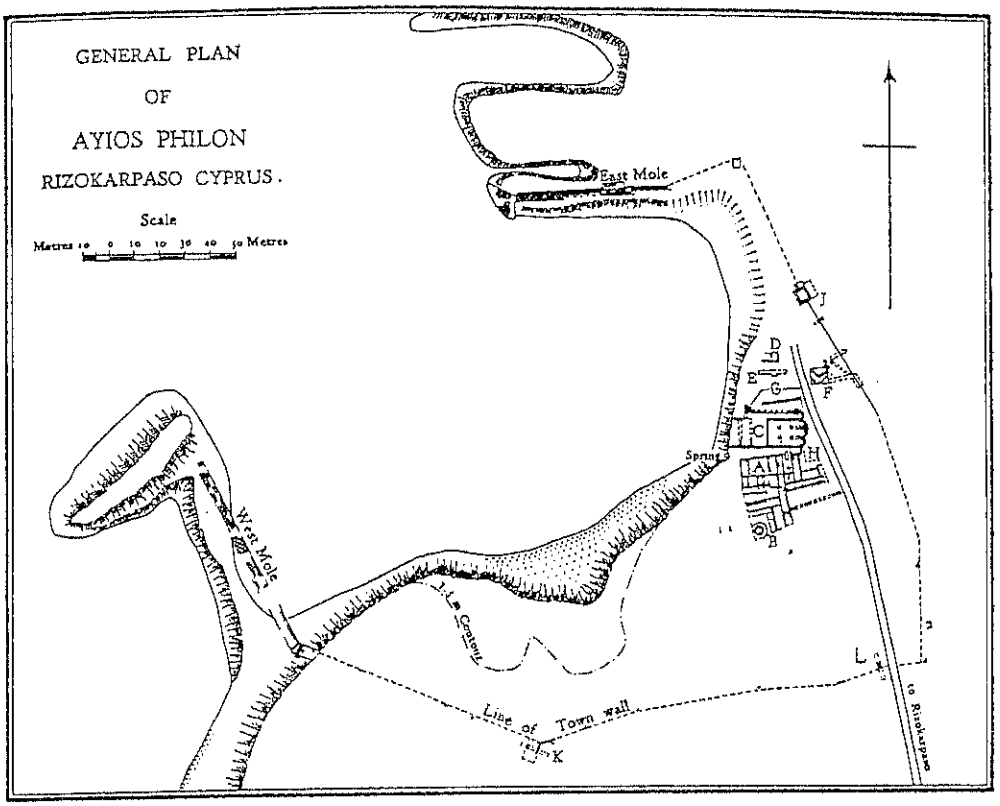



Fig. # 216

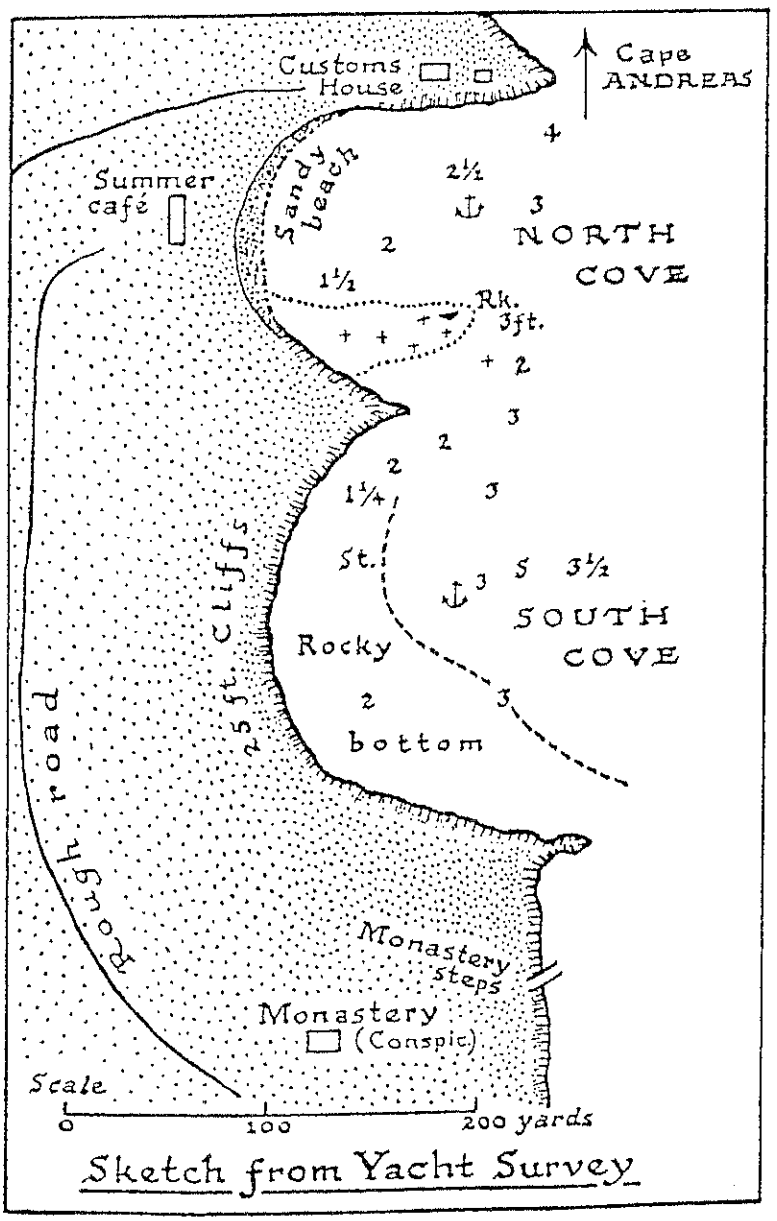



Fig. # 219

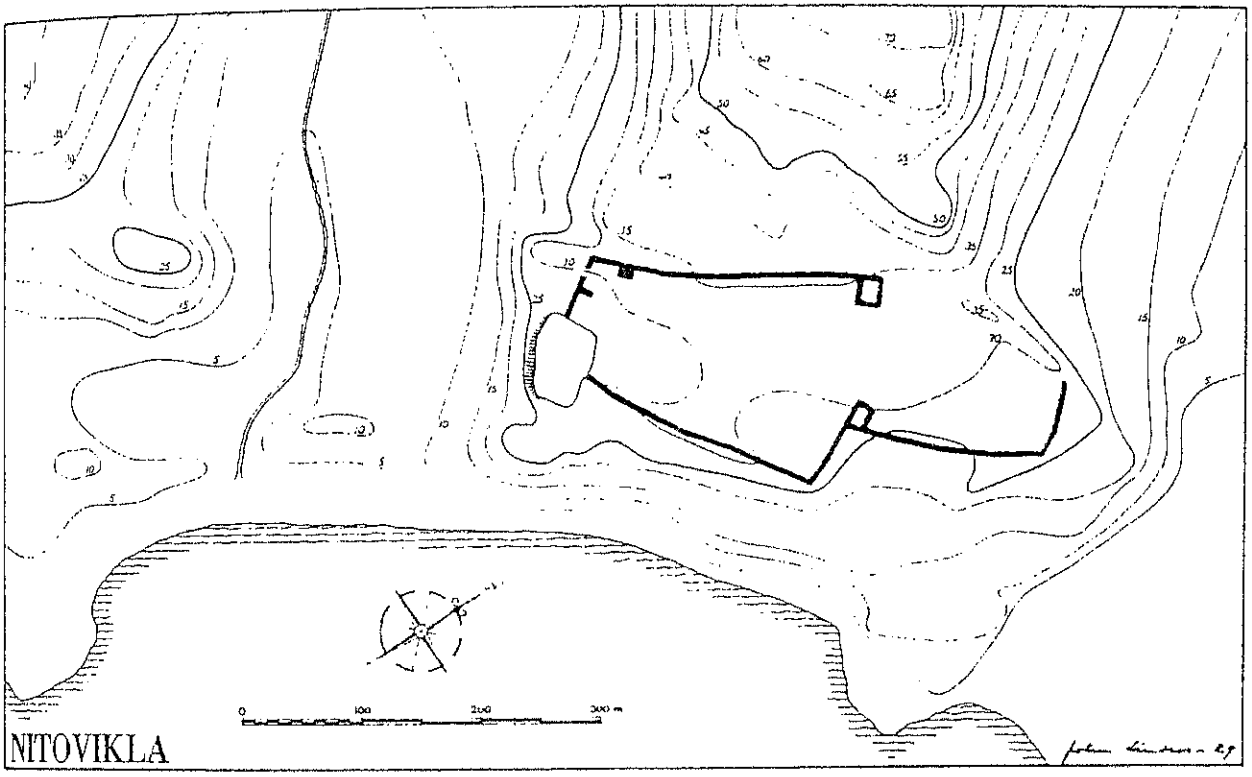



Fig. # 222

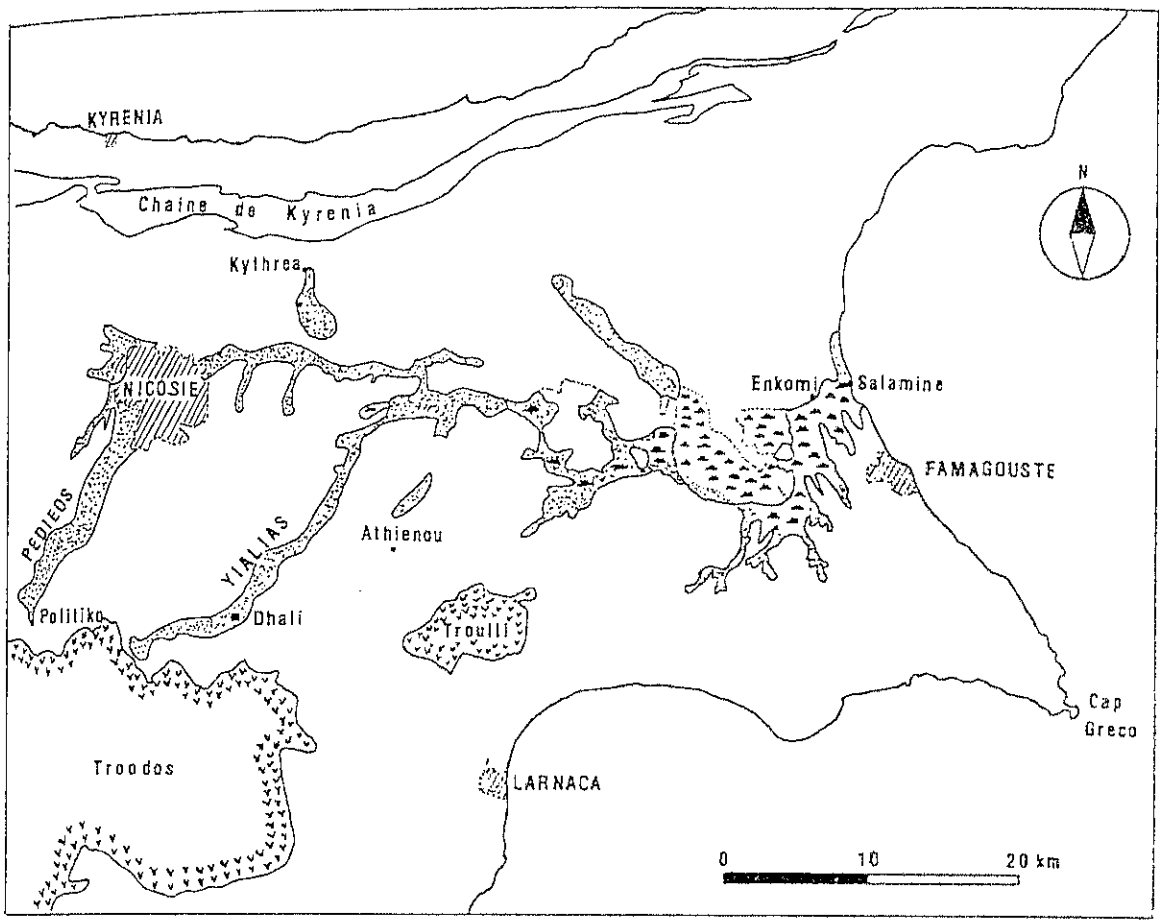



Fig. # 224

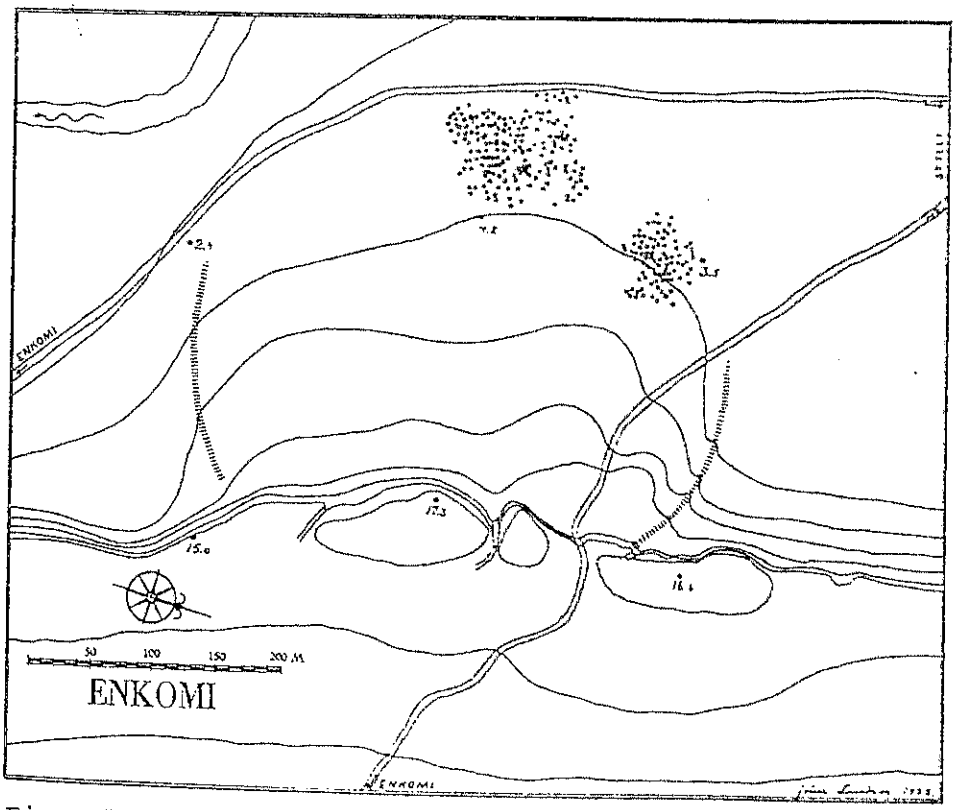



Fig. # 224.1

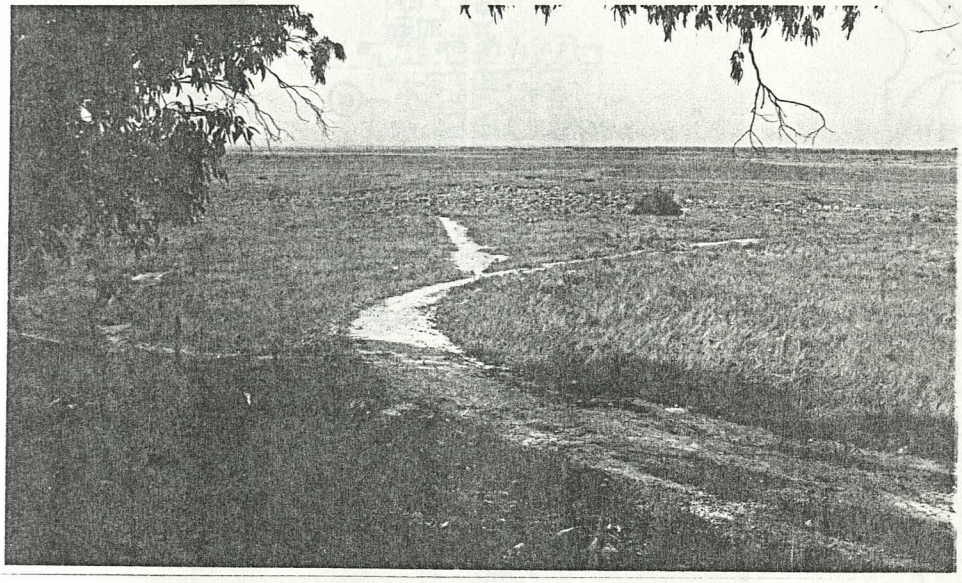


Fig. ≠ 224.2

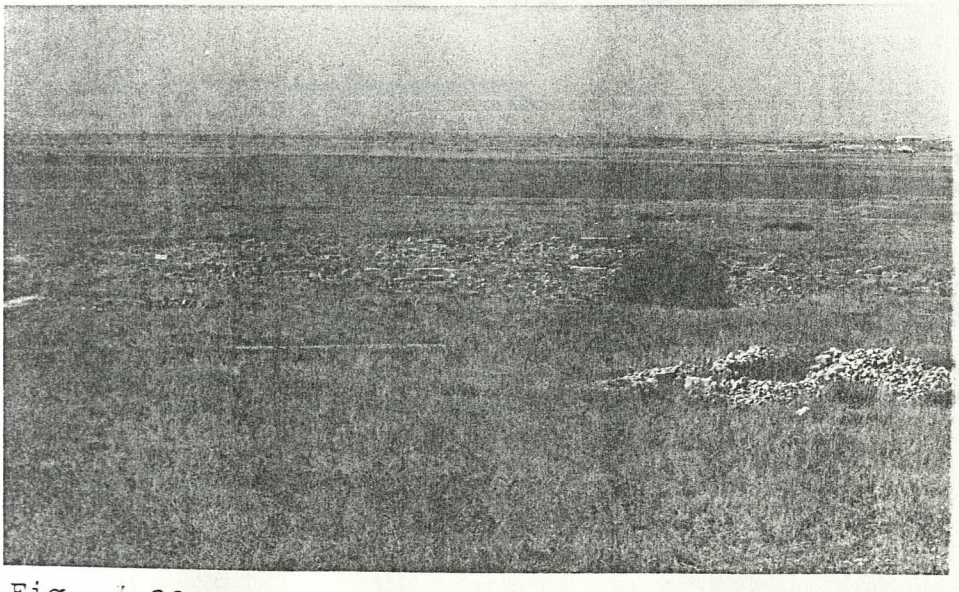
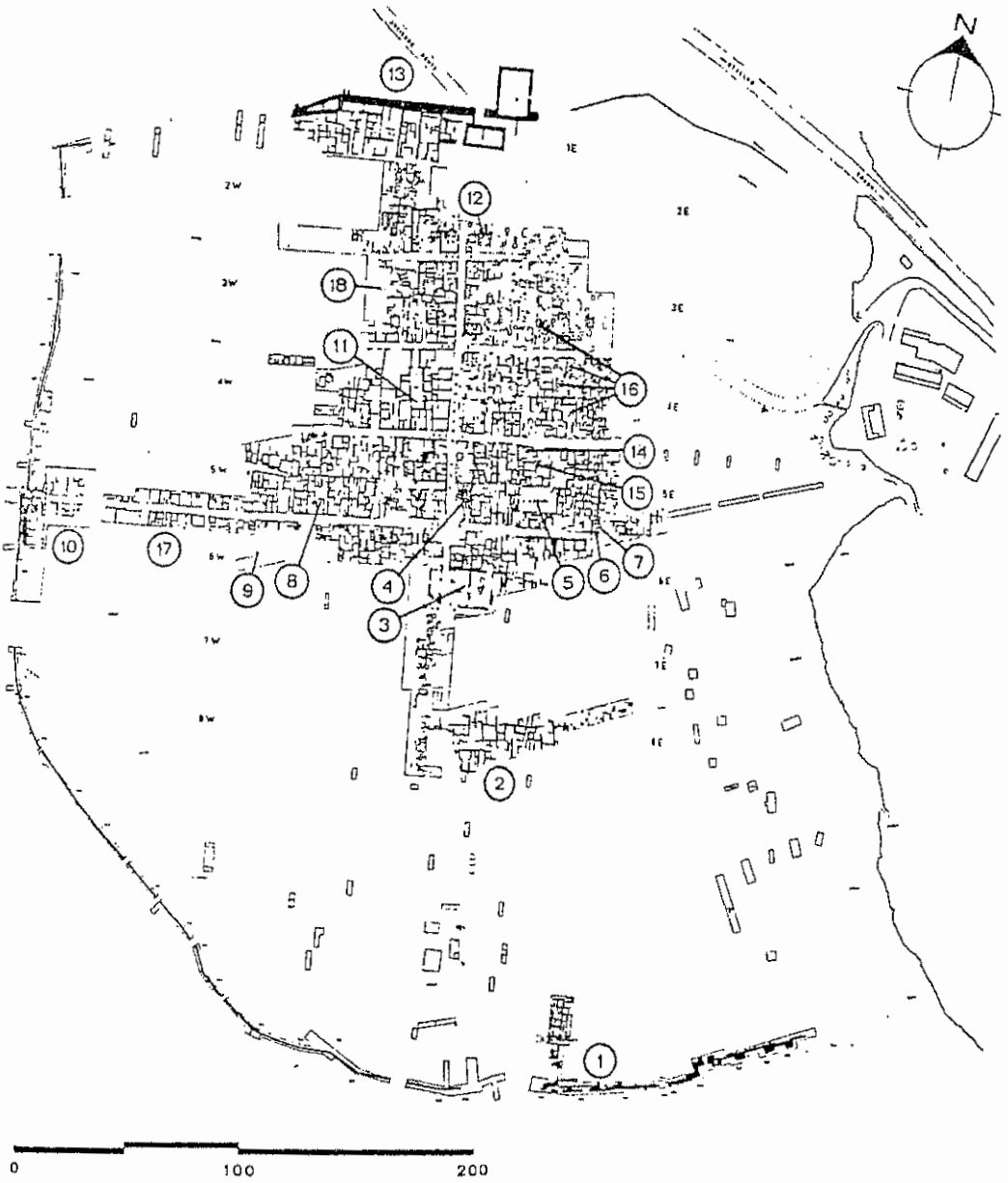


Fig. ≠ 224.3




Plan d'ensemble schématique des fouilles d'Enkomi (document de la mission française, complété par J. Lagarce d'après la publication de P. Dikaios pour l'Area III des fouilles de celui-ci, n° 13).

1. Rempart méridional. 2. Maison des bronzes de 1934. 3. "Sanctuaire à la colonne". 4. Place dallée centrale. 5. Hall du sanctuaire du Dieu au lingot. 6. Tombe 5 des fouilles françaises. 7. Tombe 2 des fouilles françaises. 8. Bâtiment 18. 9. Chantier "des Ateliers". 10. Porte occidentale. 11. Sanctuaire du Dieu cornu. 12. Maison du trésor des bronzes de 1947. 13. "Area III" de la fouille du Département des antiquités: quartier industriel et porte septentrionale. 14. Puits 212 de 1967. 15. Tombe en "tholos", en briques cuites (1336). 16. Tombes à chambre en pierres de taille. 17. Quartiers domestiques et artisanaux le long de la rue n° 5 (fouilles 1969-1971). 18. Tombe 5 des fouilles suédoises.

Fig. # 224.4

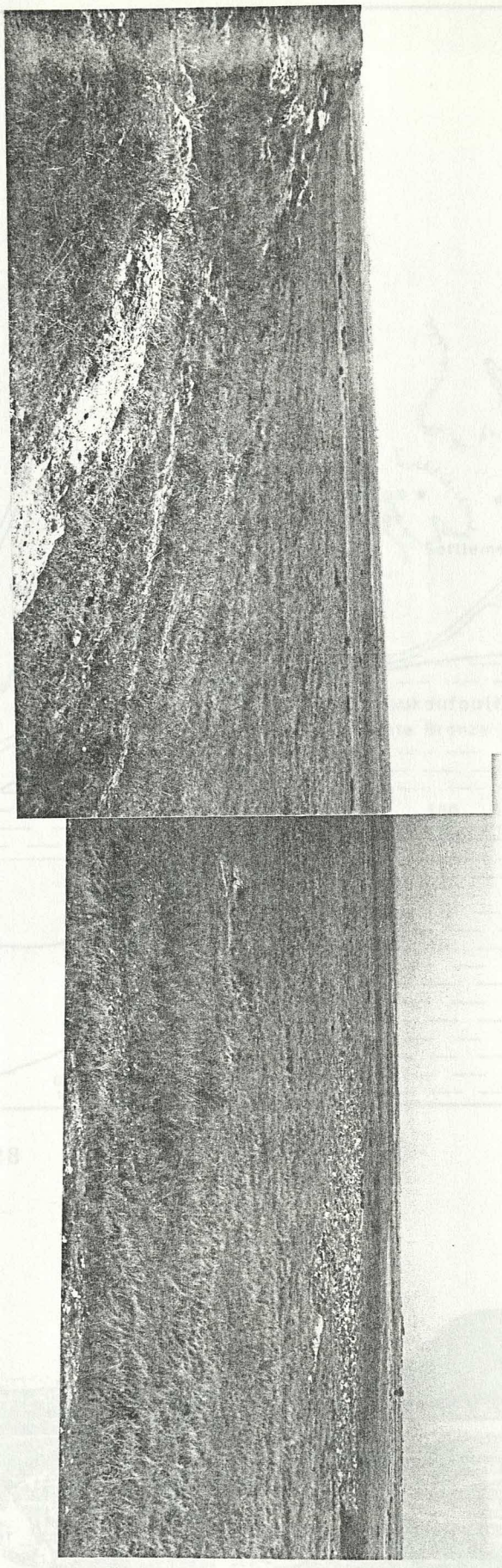


Fig. # 224.5

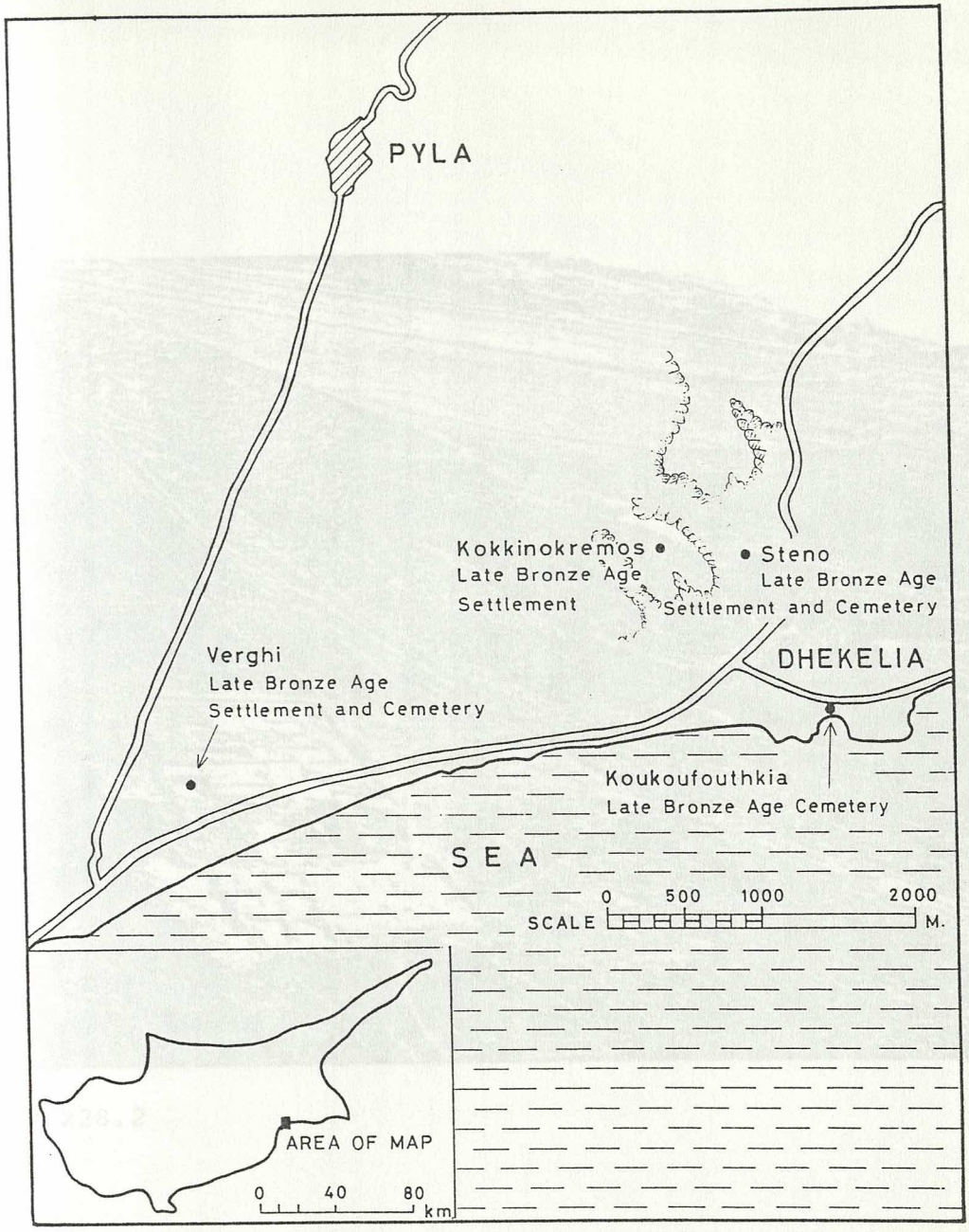



Fig. # 228

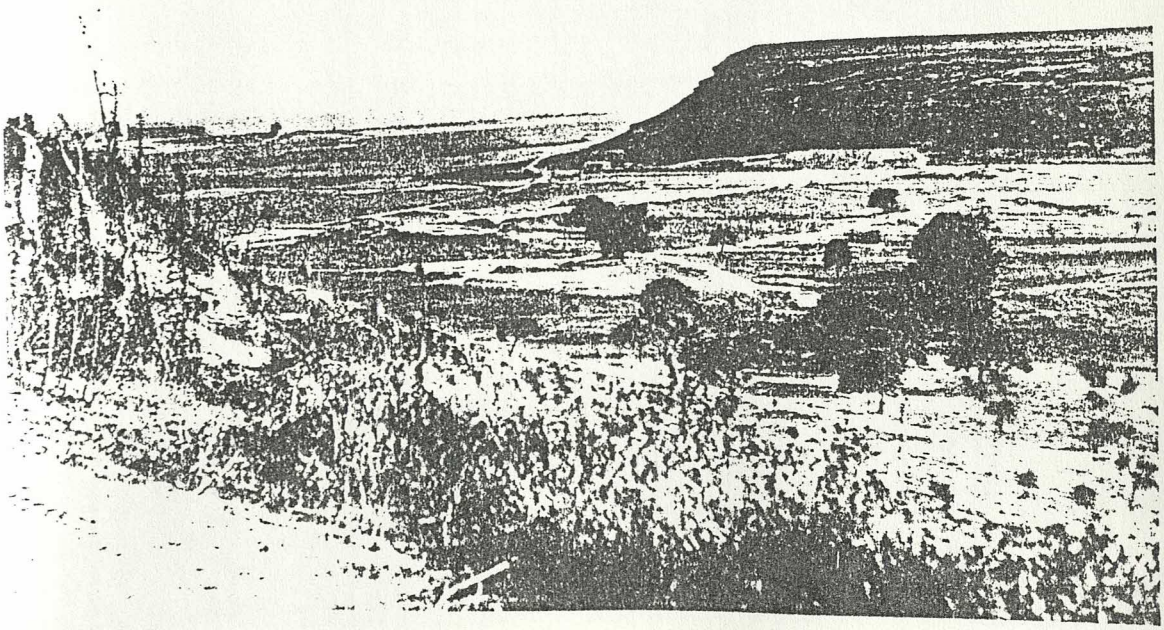


Fig. # 228.1

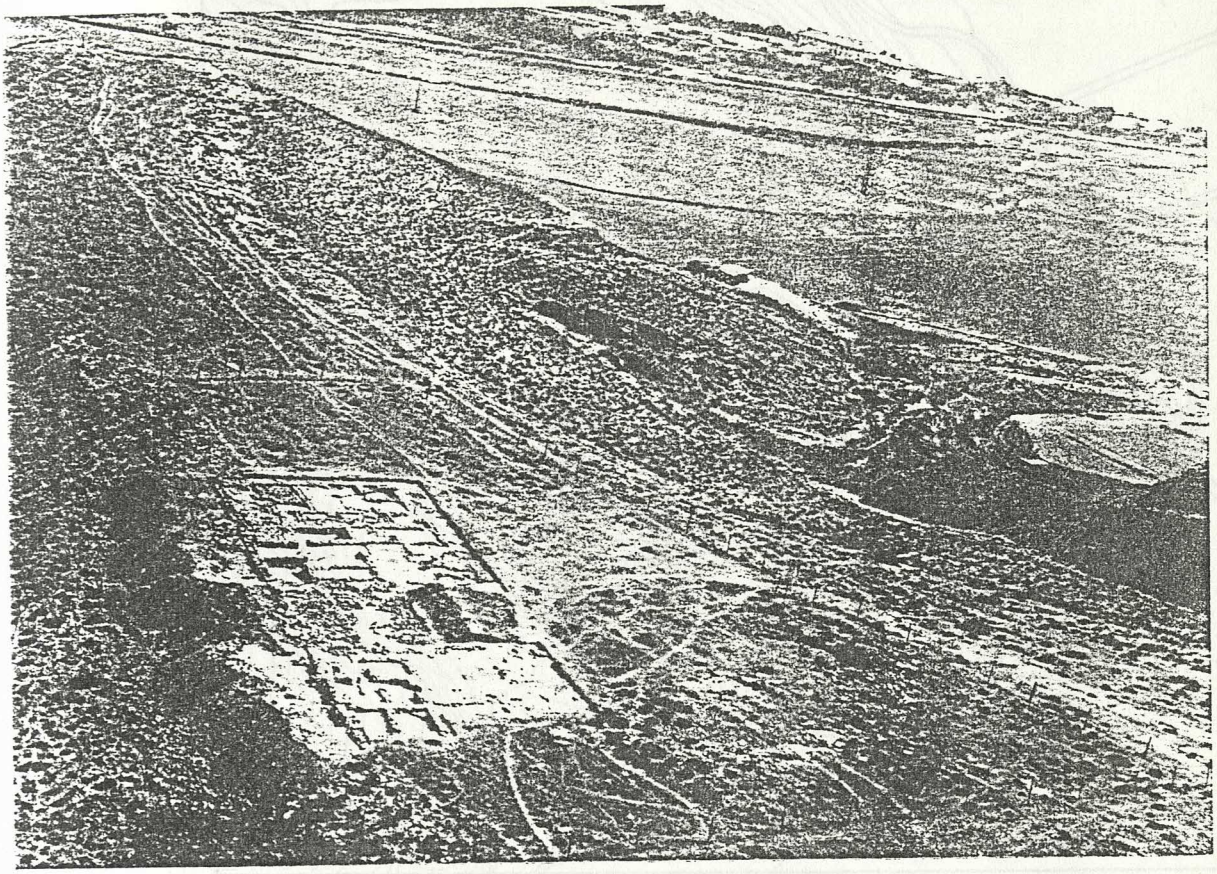


Fig. # 228.2

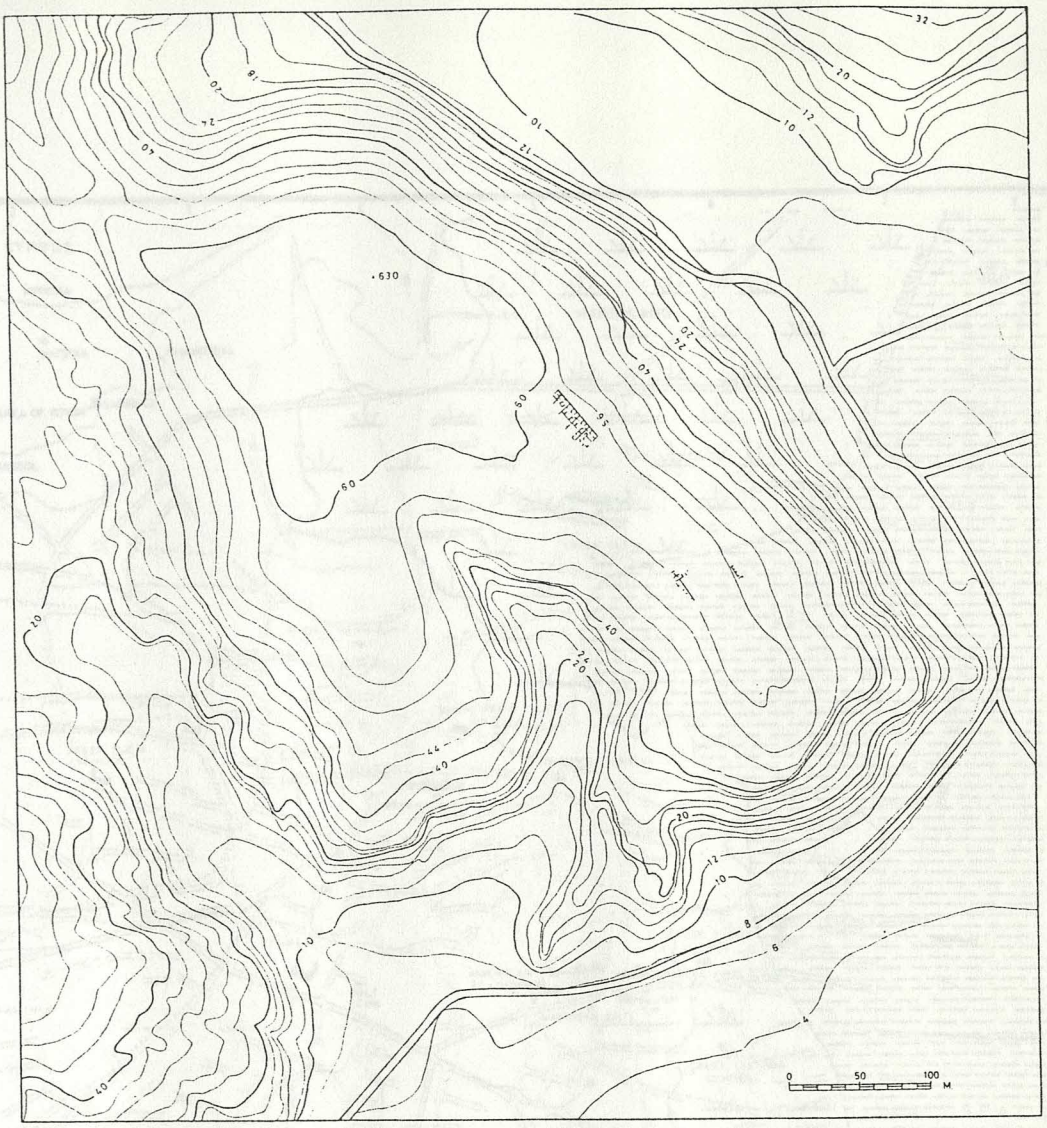



Fig. # 228.3

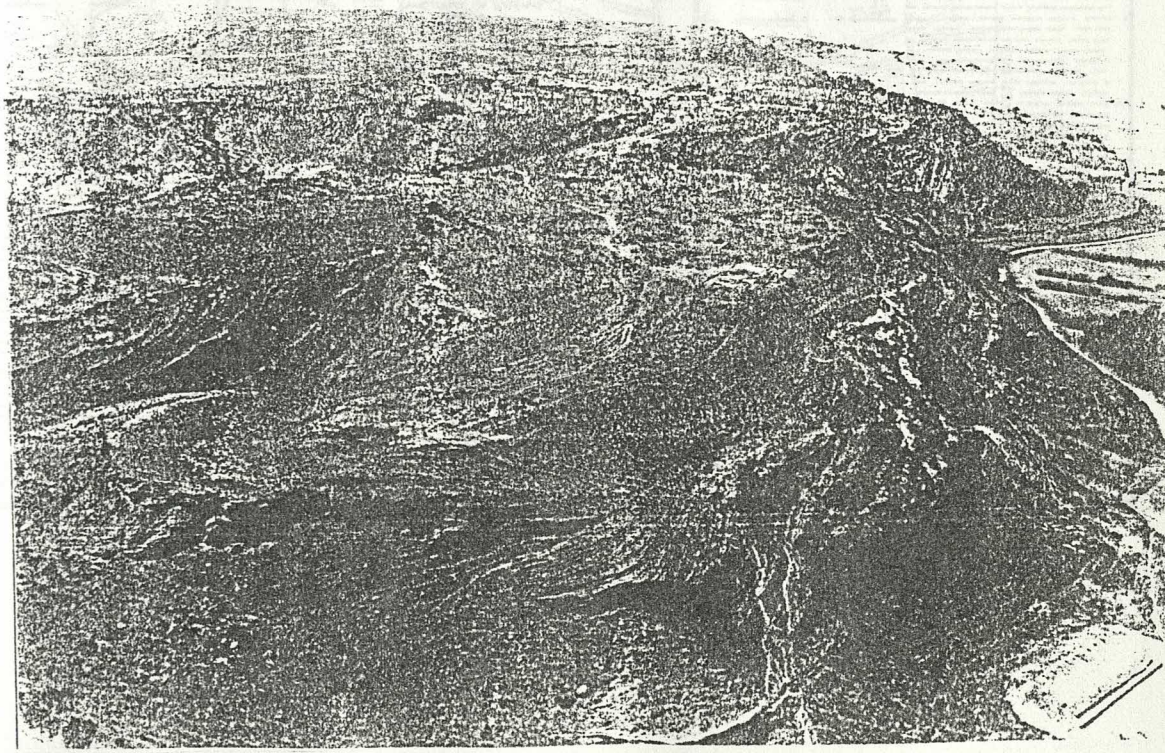


Fig. # 228.4

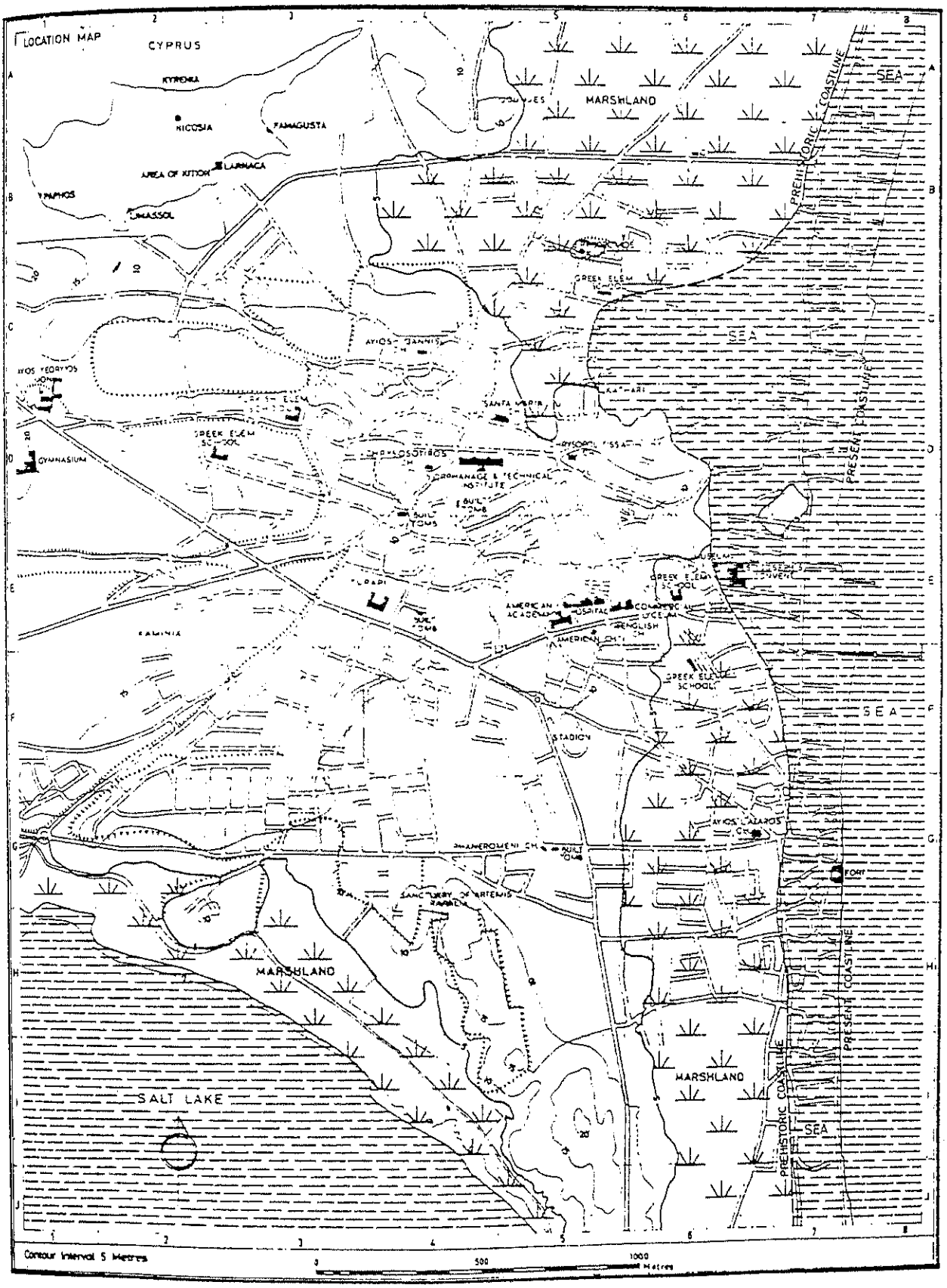

LOCATION MAP
CYPRUS
KYRENIA
NICOSIA
FAMAGUSTA
AREA OF KITION
LARNACA
LIMASSOL
MARSHLAND
SEA
PREHISTORIC COASTLINE
PRESENT COASTLINE
GREEK ELEM SCHOOL
AYIOS IOANNIS
AYIOS YEORYIOS
SANTA MARIA
GYMNASIUM
PHILOSOPHOS
GYMNASIUM & TECHNICAL INSTITUTE
BUILT UP AREA
KAMINIA
AMERICAN ACADEMY
HOSPITAL
COMMERCIAL LYCEUM
ENGLISH CH.
AMERICAN CH.
STADION
AYIOS LAZAROS CH.
FORT
SANCTUARY OF ARTEMIS
SALT LAKE
Contour Interval 5 Metres
0
500
1000
Metres

Fig. # 229

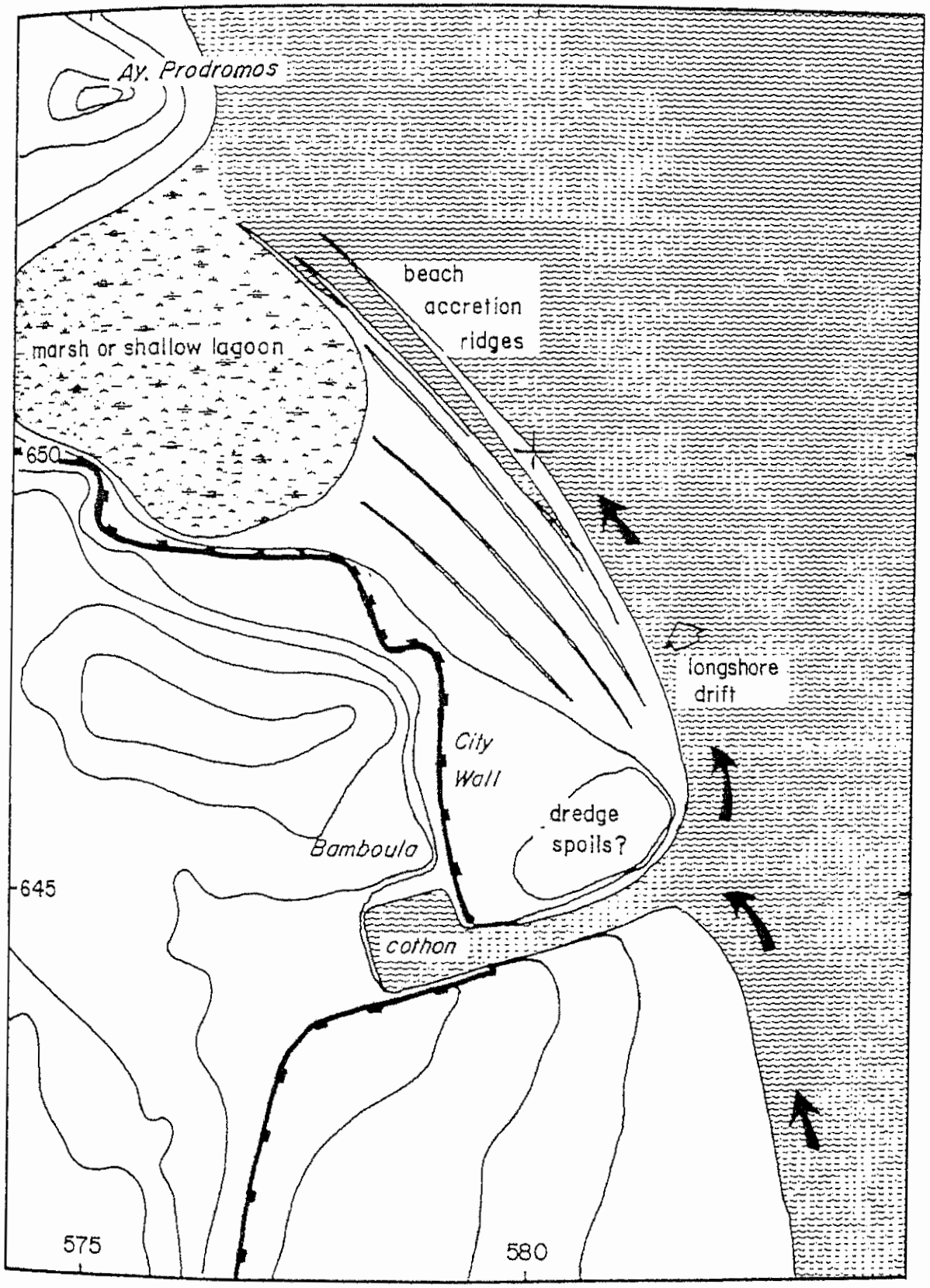

Ay. Prodromos
beach
accretion
ridges
marsh or shallow lagoon
650
longshore
drift
City
Wall
dredge
spoils?
Bamboula
645
cothon
575
580

Fig. # 229.1

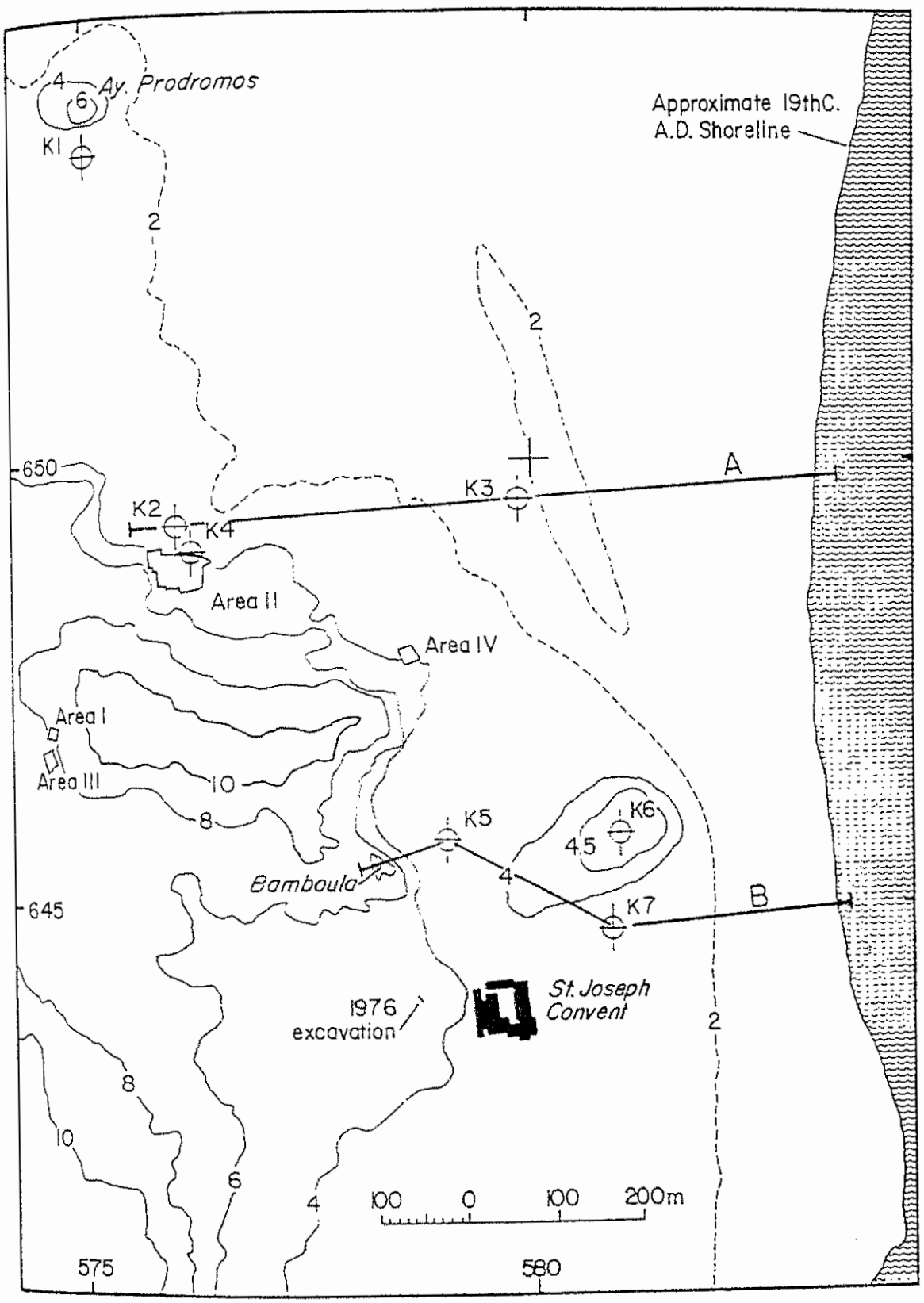

Ay. Prodromos
Approximate 19thC.
A.D. Shoreline
K1
K2
K3
K4
K5
K6
K7
A
B
650
645
575
580
Area I
Area II
Area III
Area IV
Bamboula
1976
excavation
St. Joseph
Convent
100 0 100 200m

Fig. # 229.2



Fig. # 229.3

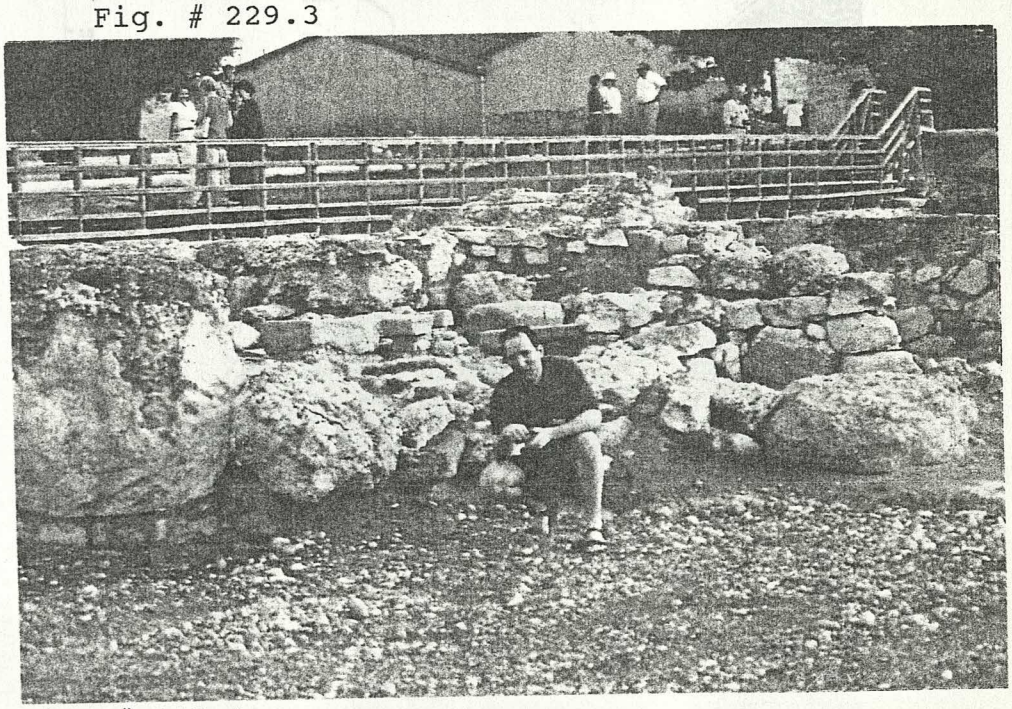


Fig. # 229.4

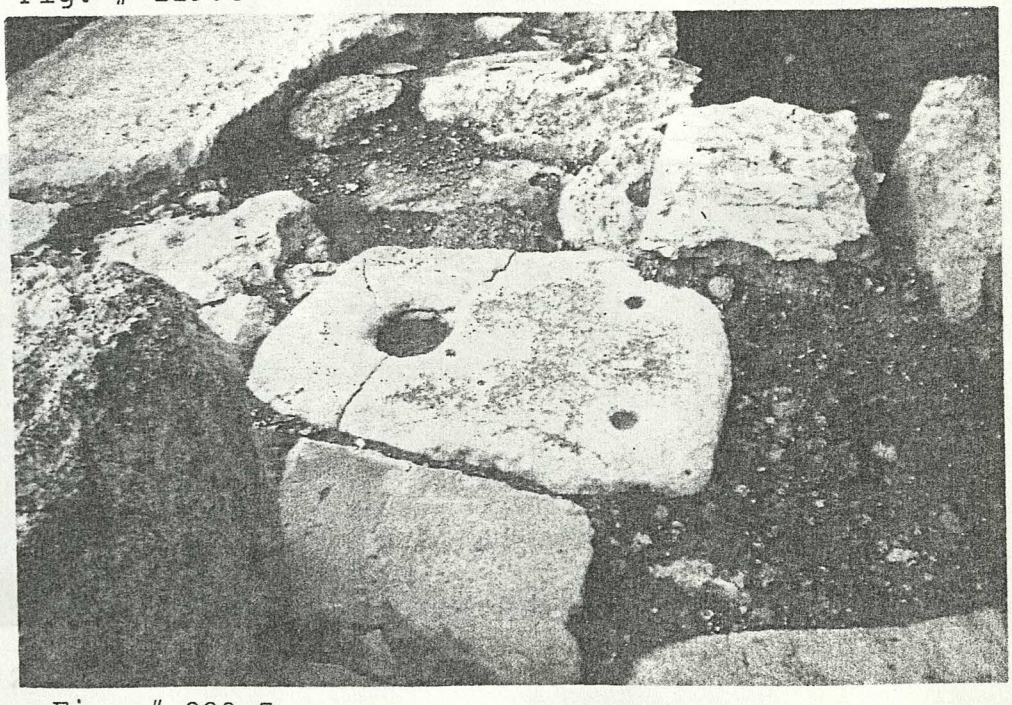


Fig. # 229.5

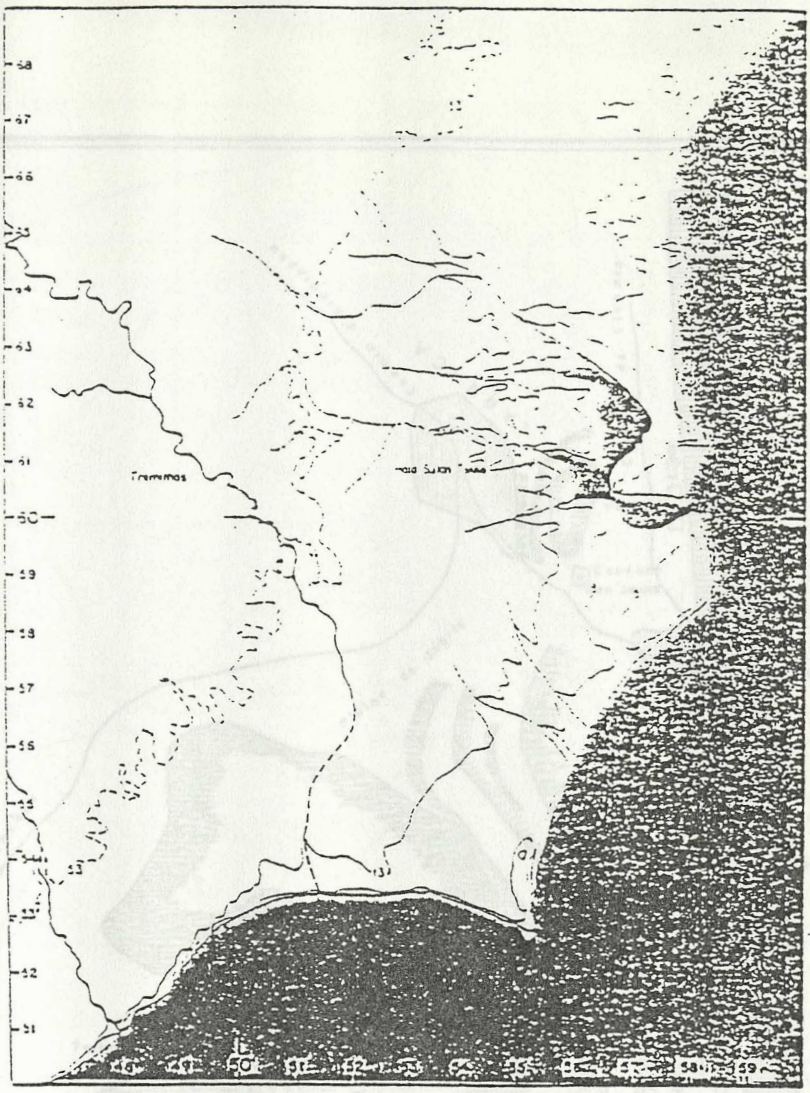


Fig. # 230



Fig. # 230.2

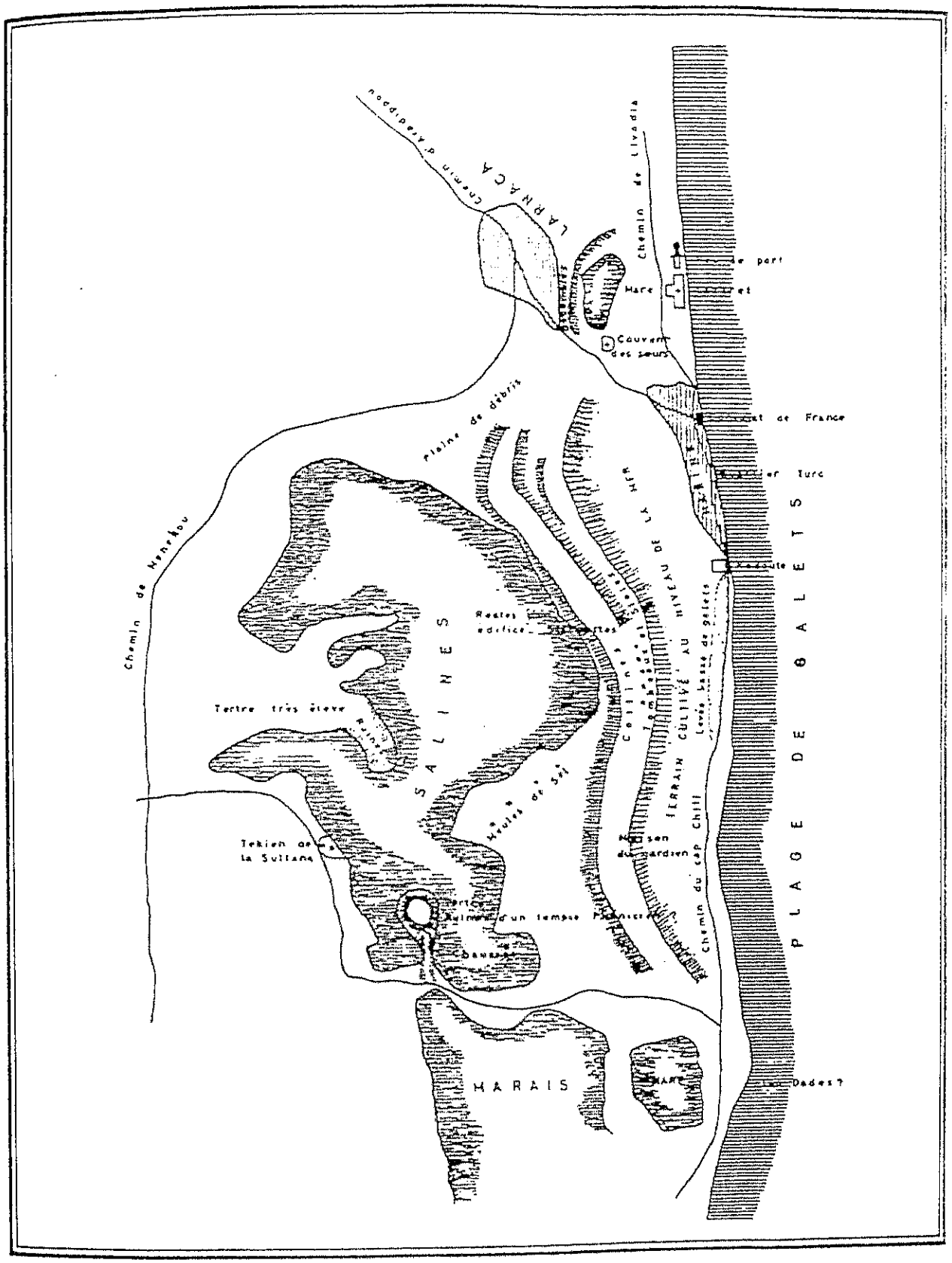

LARNACA
Chemin de Livadia
Mare
Couvent des sœurs
Plaine de débris
Chemin de Hendrikou
SALINES
Tekiès de la Sultane
Tertre très élevé
Restes d'édifice
Chemin du cap Chilli
HARAIS
PLAGE DE GALETS

Fig. # 230.1

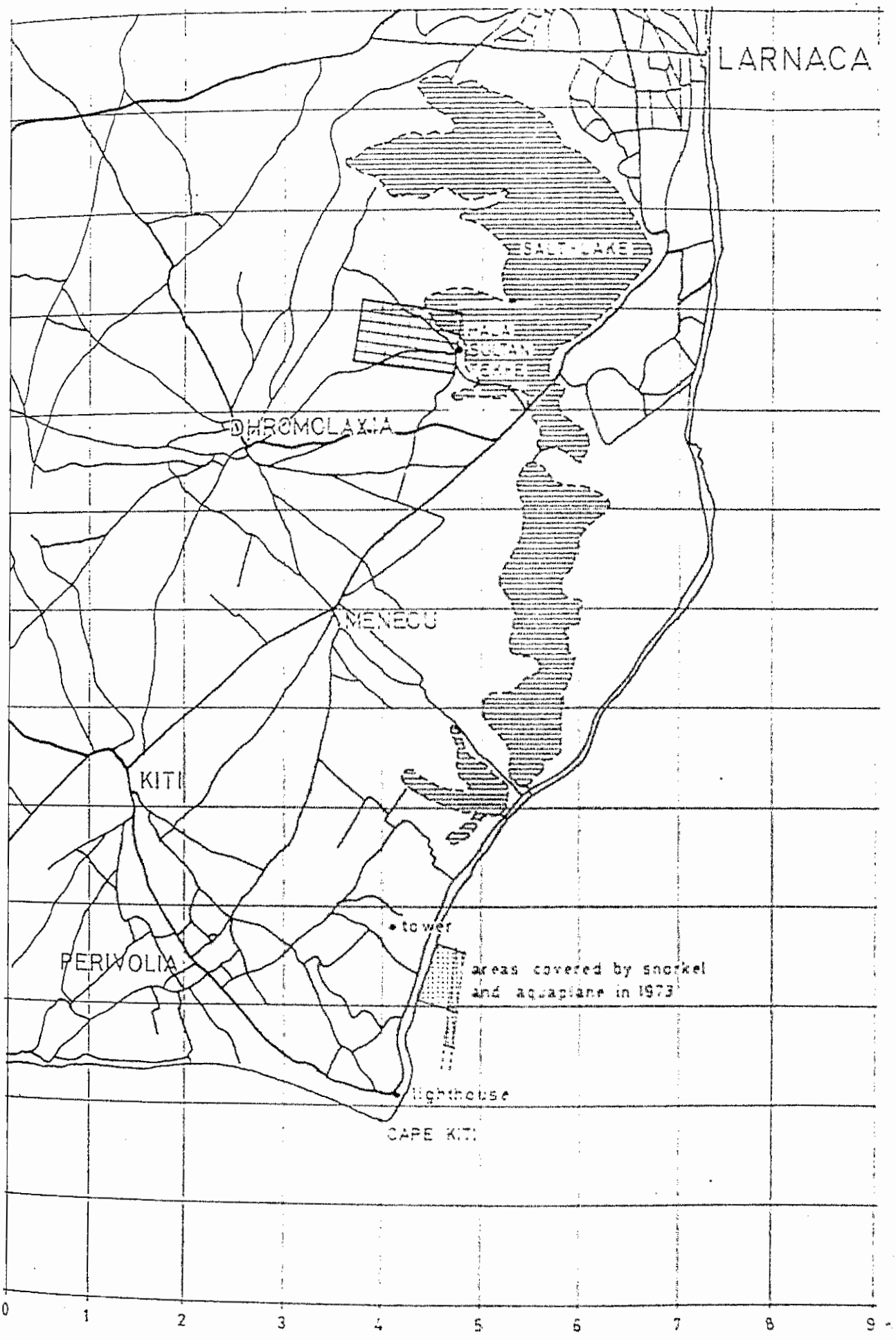

LARNACA
SALT LAKE
DHROMOLAXIA
MENEOU
KITI
PERIVOLIA
tower
areas covered by snorkel and aquaplane in 1973
lighthouse
CAPE KITI
0
1
2
3
4
5
6
7
8
9

Fig. # 231

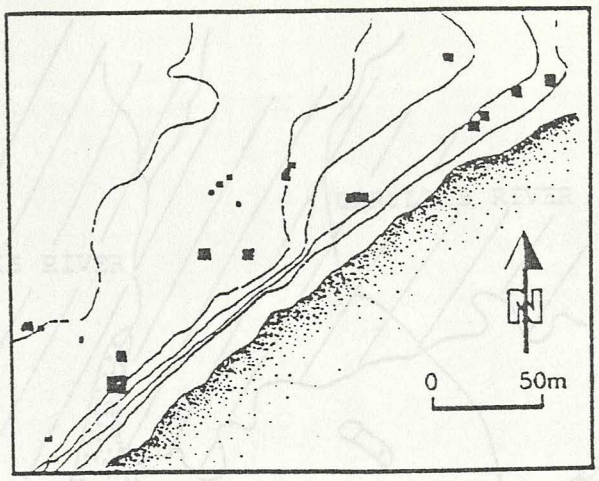



Fig. # 234

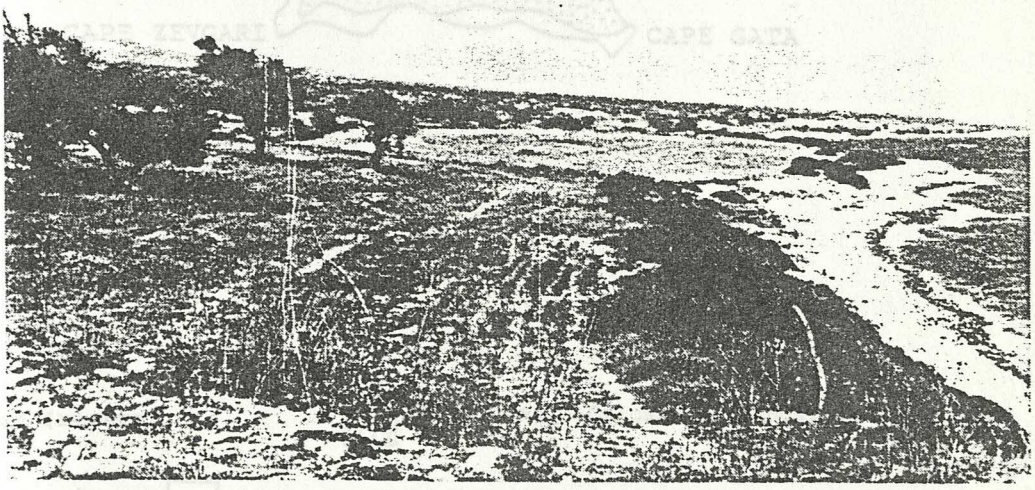
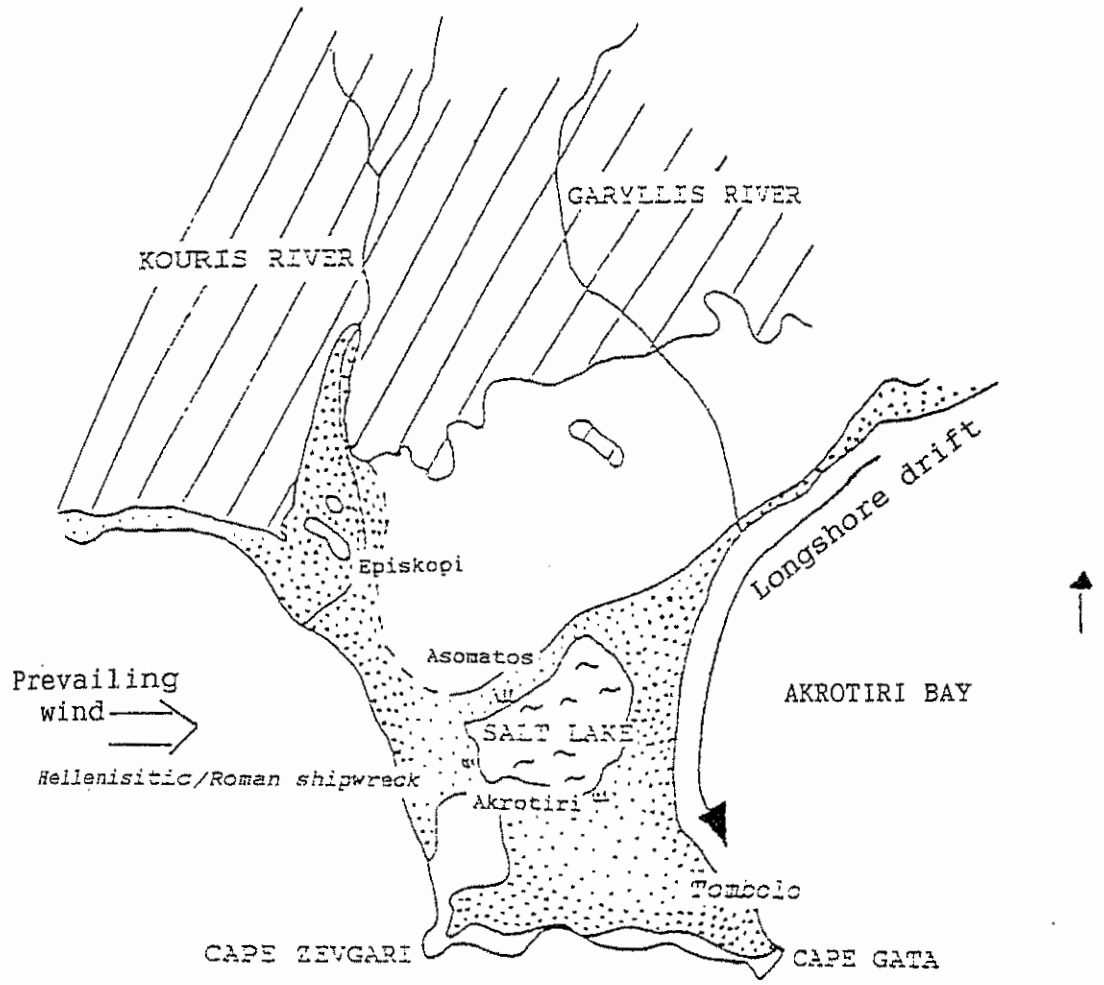


Fig. # 234.1




Alluvium (recent)

Chalk, marl/ Calcareous sandstone (Pliocene)

Marine deposits (Pleistocene)

Fig. # 237

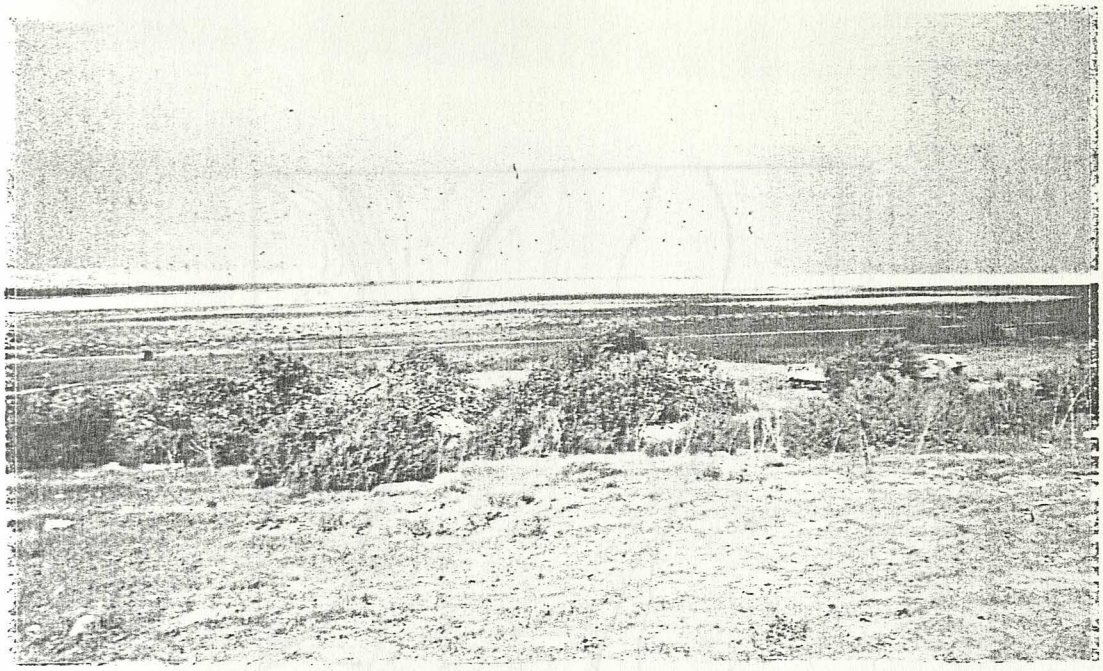


Fig. # 237.1

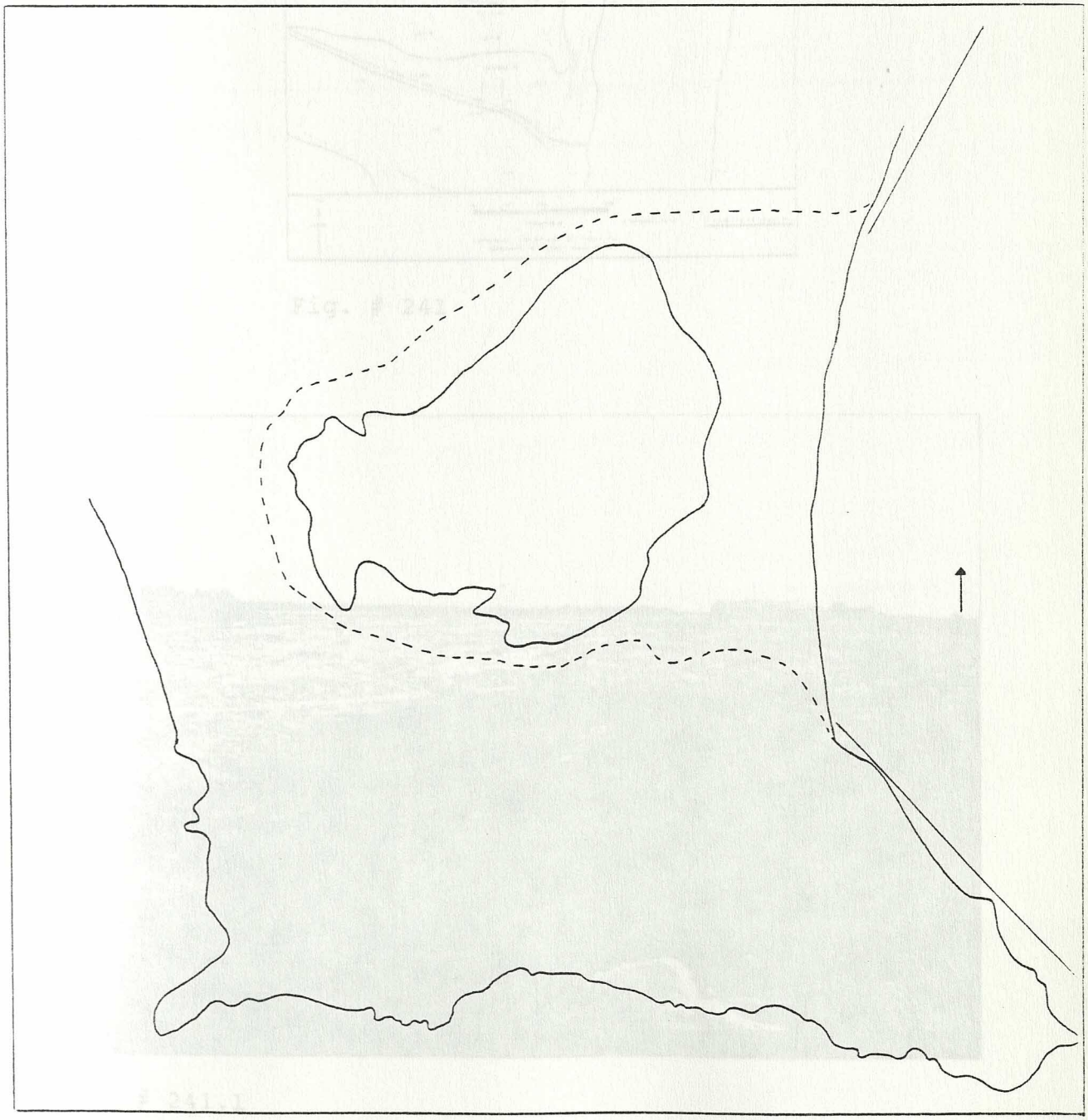


Fig. # 237.2

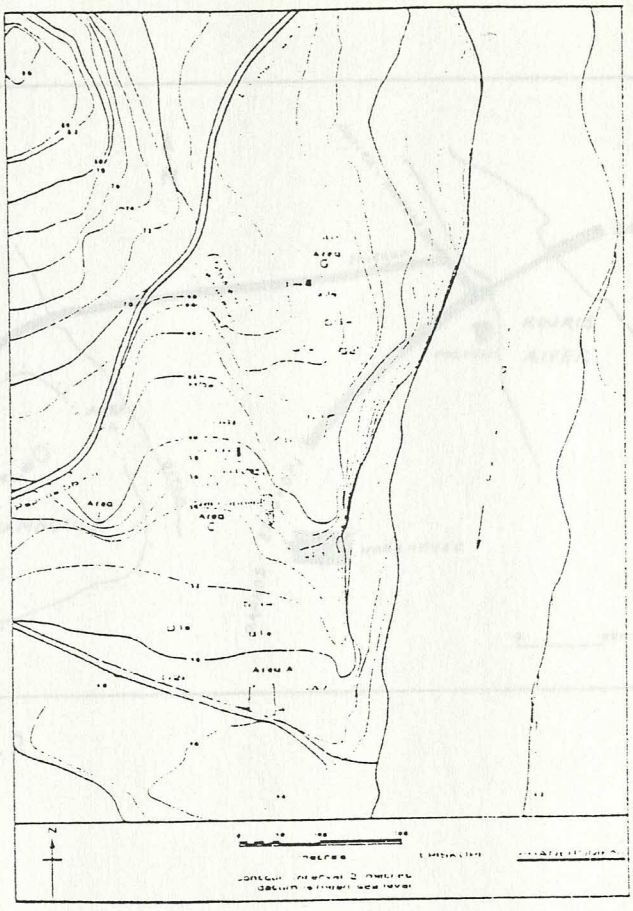


Fig. # 241

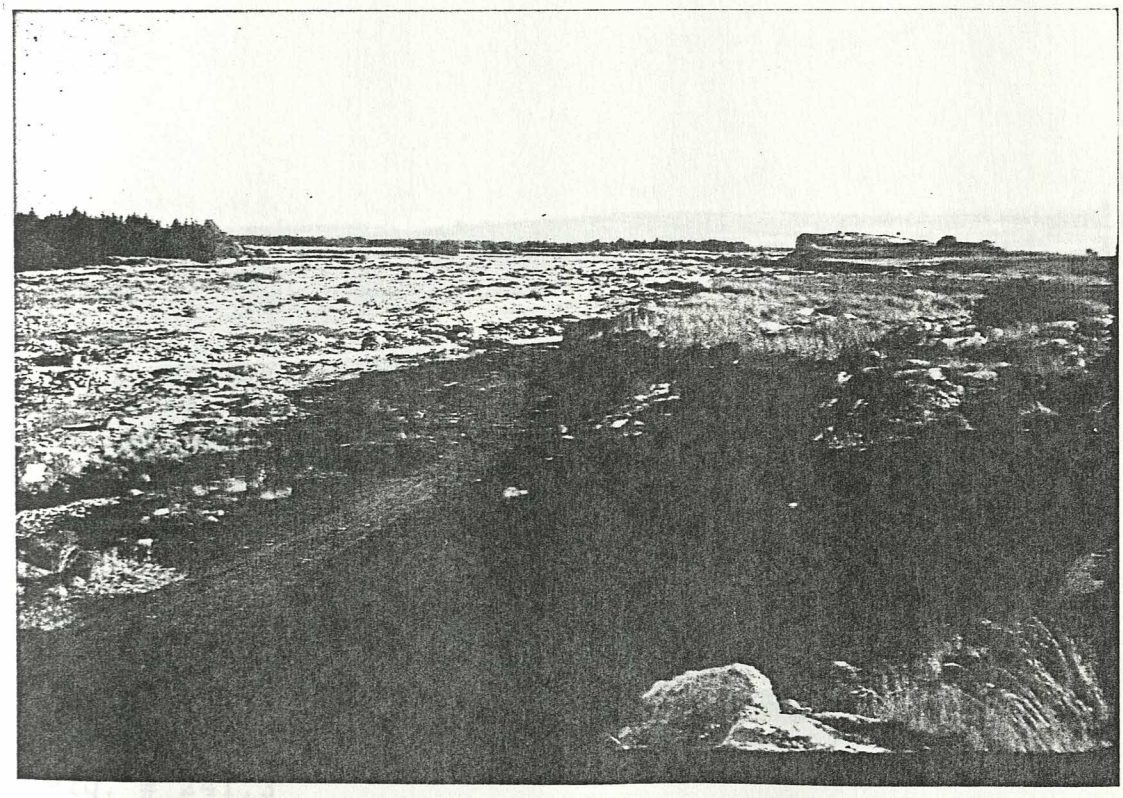


Fig. # 241.1

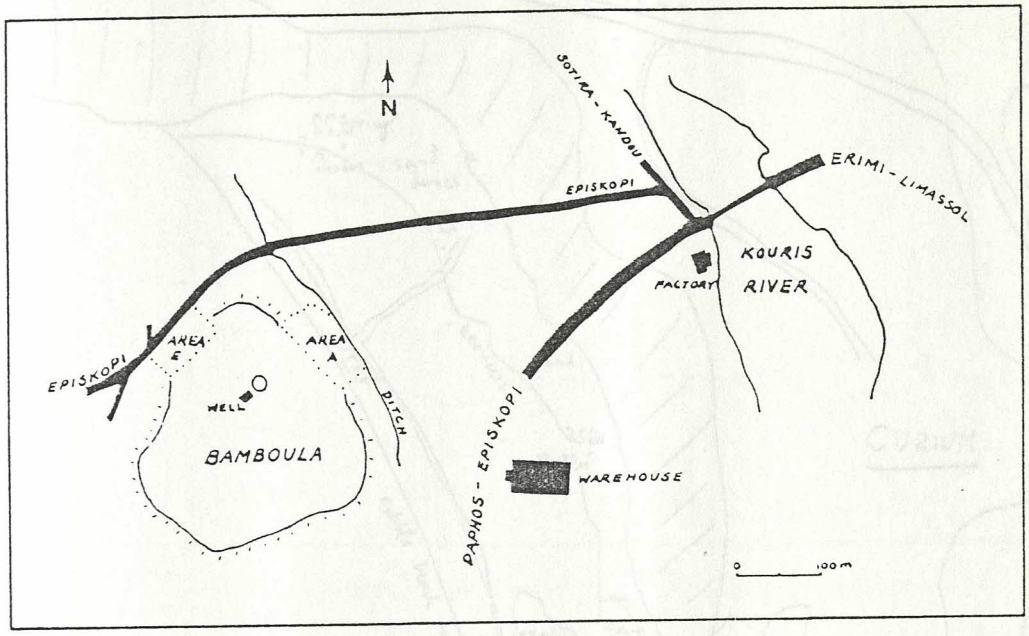



Fig. # 241.2



Fig. # 241.3

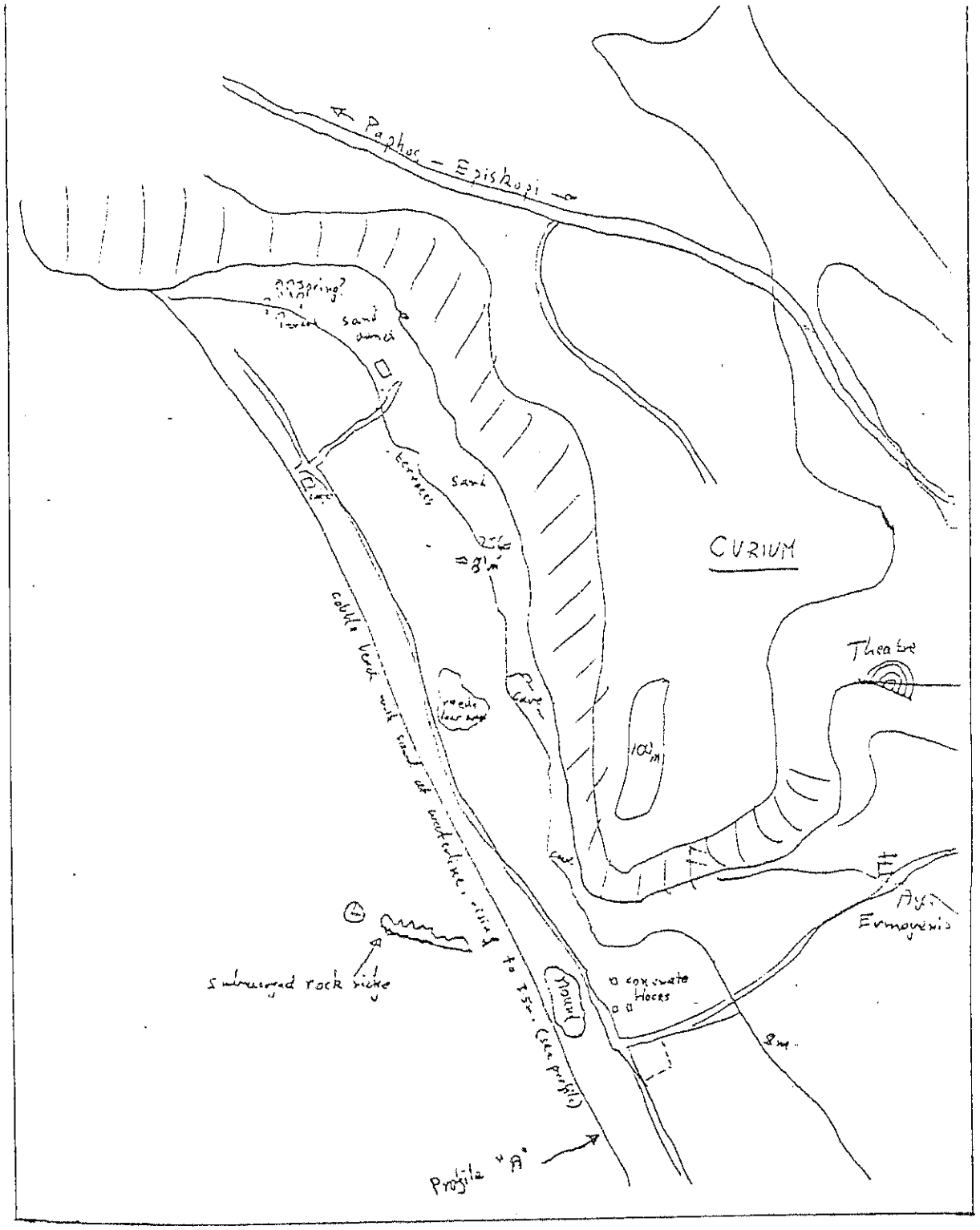



Fig. # 241.4

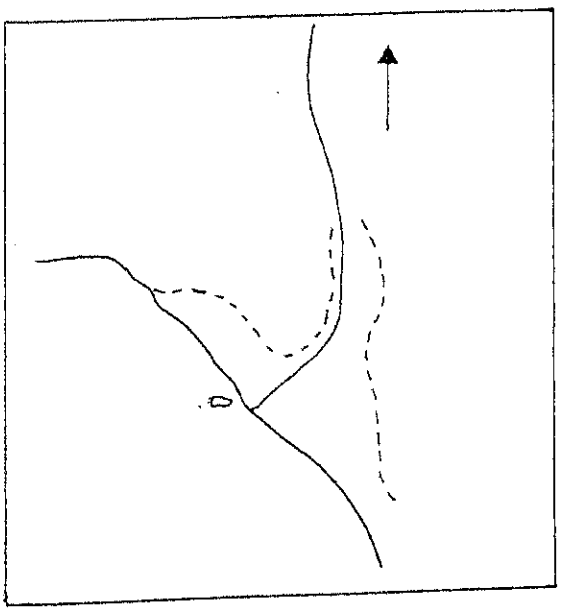
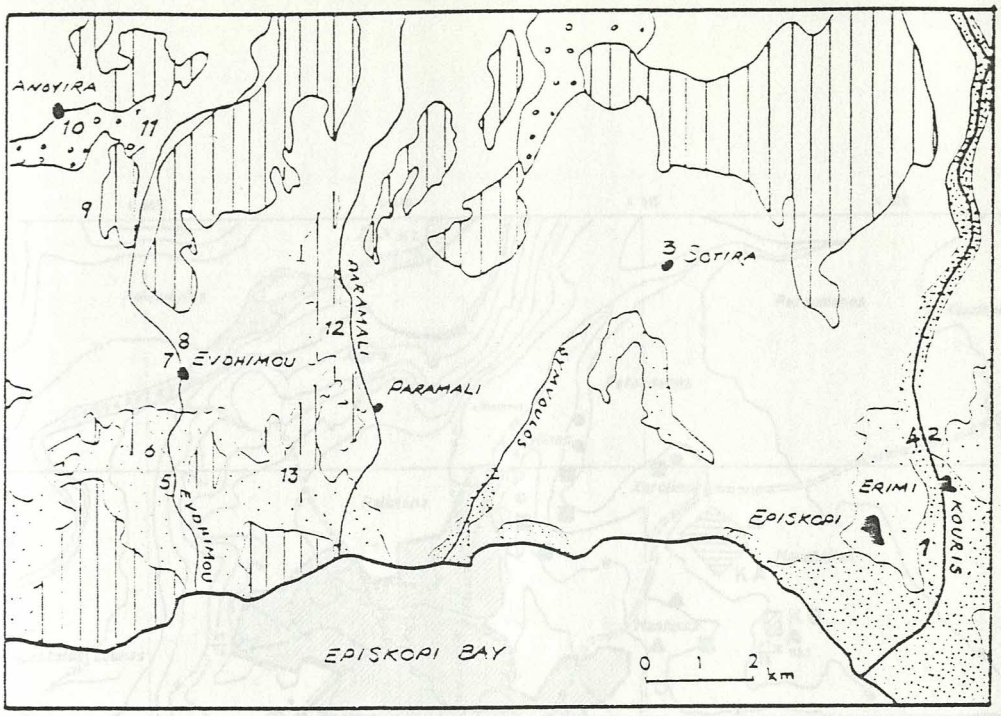


Fig. # 241.5




Immature Terra Rossa on Kafkalla

Shallow Calcareous Raw Soil

Deep Calcareous Raw Soil

Xerorendzina

Alluvial Soil

1. Episkopi Phaneromeni
2. Erimi Kafkalla
3. Sotira Kaminoudhia
4. Kandou Baliés
5. Evdhimou Stymbouli
6. Evdhimou Alatomi
7. Evdhimou Ambelovounos
8. Evdhimou Bayouki Tanka
9. Anoyira Kammavokambos
10. Anoyira Livadhia
11. Anoyira Peralidjithias
12. Paramali Mandra t. P.
13. Evdhimou Chilies

Fig. # 242

Fig. # 243

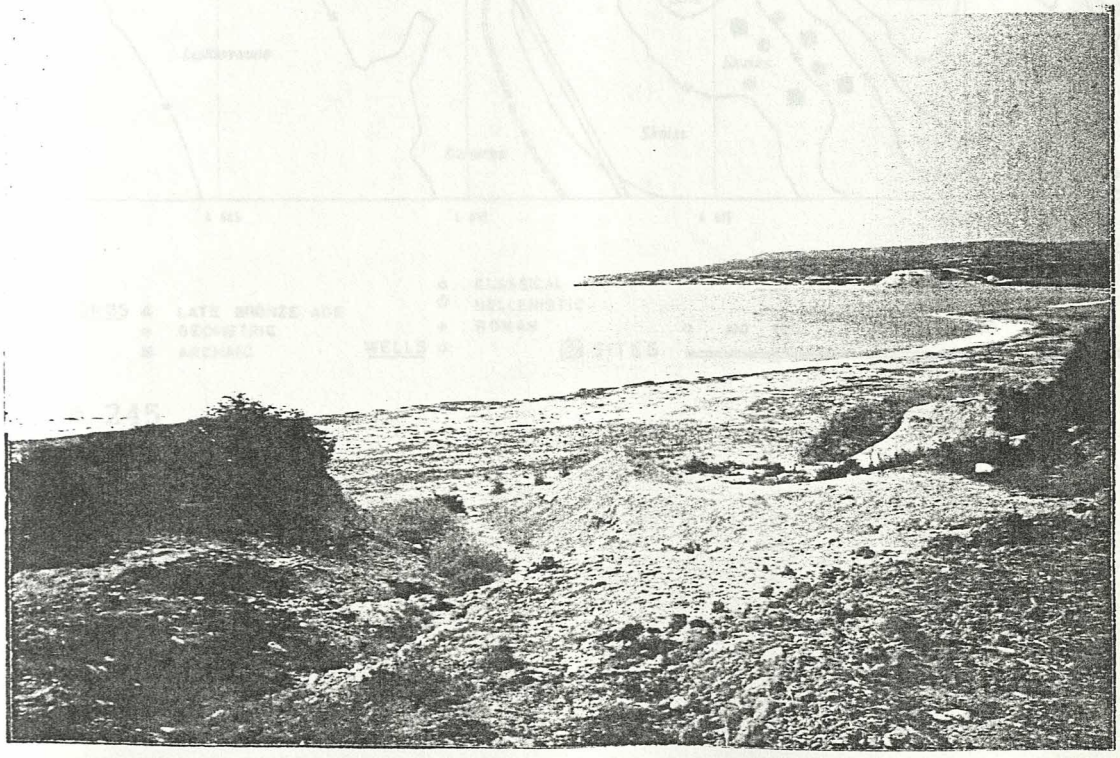


Fig. # 243.1

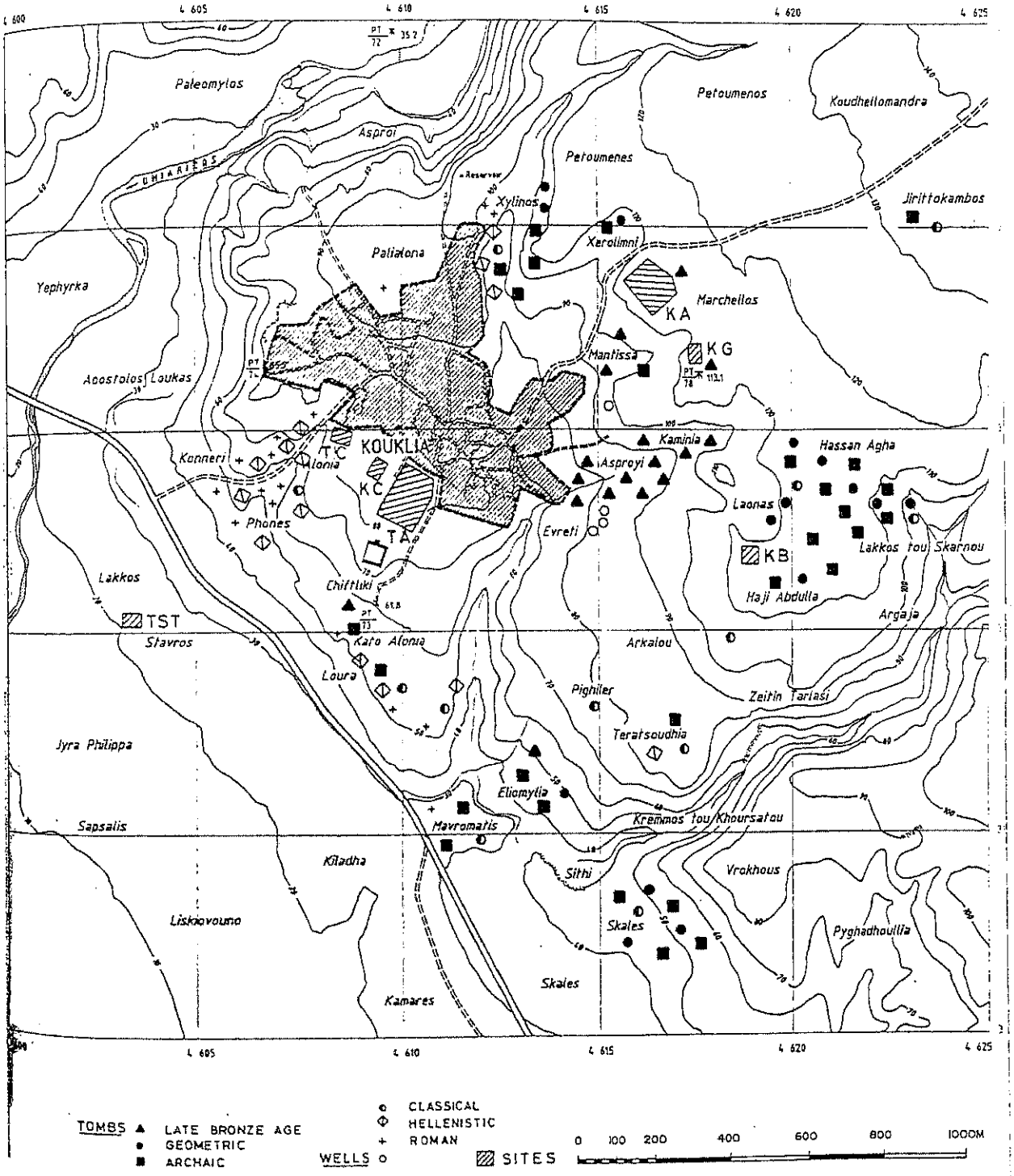

4 600
4 605
4 610
4 615
4 620
4 625
Paleomylos
Asproi
Petoumenos
Koudheilomandra
Petoumenes
Xylinos
Jirittokambos
Paliakona
Xerolimni
Yephyrka
Marcheilos
KA
KG
Mantissa
Agostolos Laukas
Kaminia
Hassan Agha
Konneri
Alonia
KOUKLIA
KC
TC
TA
Asproyi
Laonas
Evreti
KB
Lakkos tou Skarnou
Phones
Haji Abdulla
Argaja
Lakkos
Chiftluki
TST
Stavros
Kato Alonia
Arkalou
Laura
Pigniler
Zeitin Tariasi
Jyra Philippa
Teratsoudhia
Eliomylia
Sapsalis
Mavromatis
Kremmos tou Khoursatou
Kiladha
Sithi
Vrakhous
Skales
Pyghadhoullia
Liskiovouno
Skales
Kamares
TOMBS
LATE BRONZE AGE
GEOMETRIC
ARCHAIC
CLASSICAL
HELLENISTIC
ROMAN
WELLS
SITES
0 100 200 400 600 800 1000M

Fig. # 245

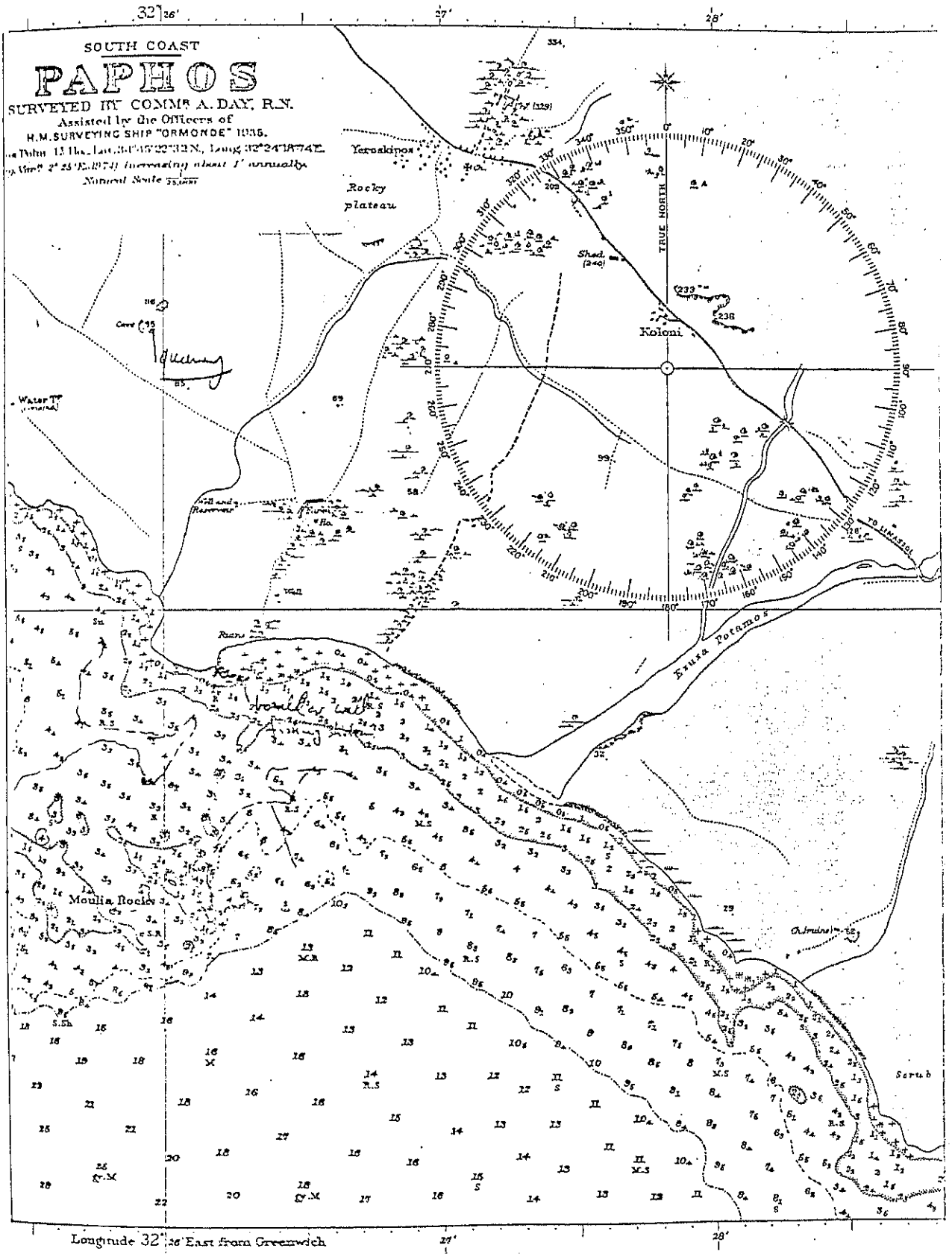

SOUTH COAST
PAPHOS
SURVEYED BY COMMR A. DAY, R.N.
Assisted by the Officers of
H.M. SURVEYING SHIP "ORMONDE" 1935.
Natural Scale
Yeroskipos
Rocky plateau
Koloni
TRUE NORTH
TO LIMASSOL
Xyliatos Potamos
Moulia Rocks
Longitude 32° 26' East from Greenwich

Fig. # 246

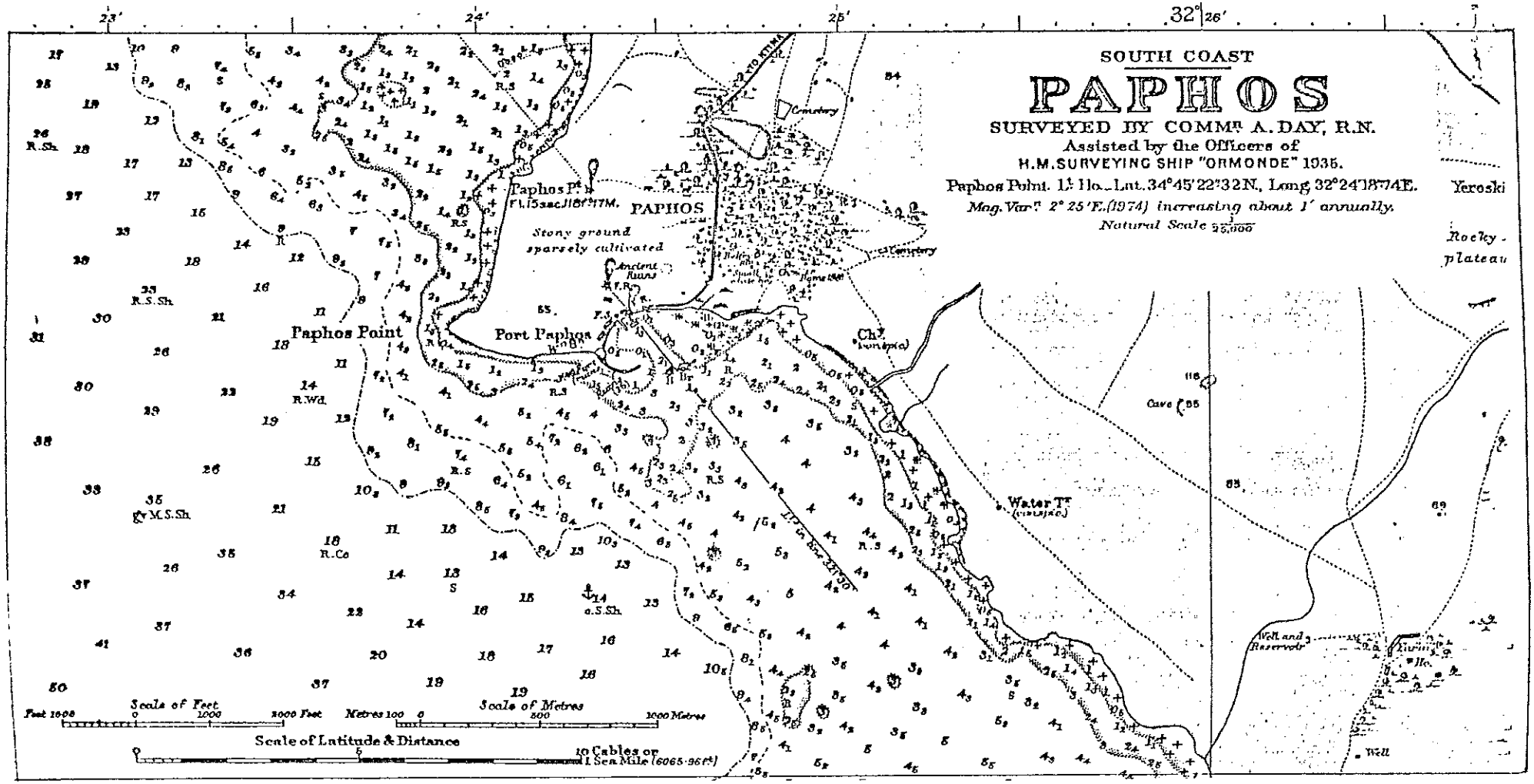

SOUTH COAST
PAPHOS
SURVEYED BY COMMR A. DAY, R.N.
Assisted by the Officers of
H.M.SURVEYING SHIP "ORMONDE" 1935.
Paphos Point. 1½ Ho. Lat. 34°45'22"32N., Long. 32°24'18"74E.
Mag. Var.n 2° 25'E.(1974) increasing about 1' annually.
Natural Scale 1/25,000
Paphos Point
Port Paphos
PAPHOS
Stony ground sparsely cultivated
Ancient Ruins
Water T.
Cave
Well and Reservoir
Well
Yeroski
Rocky plateau
Scale of Feet
Scale of Metres
Scale of Latitude & Distance
10 Cables or 1 Sea Mile (6065·96 ft.)
23'
24'
25'
32° 26'

Fig. # 247

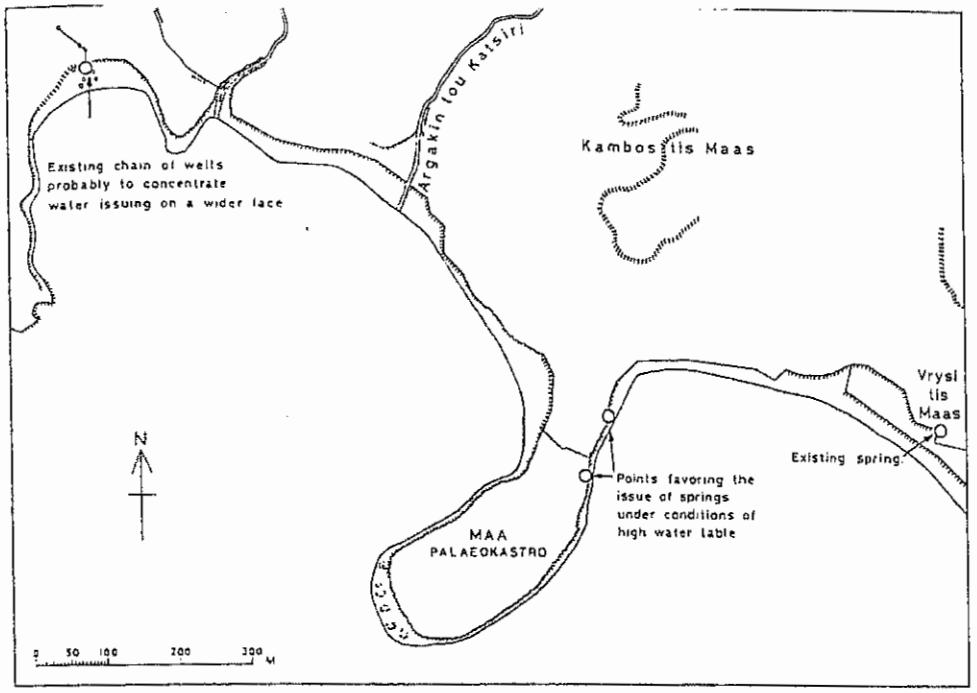



Fig. # 248

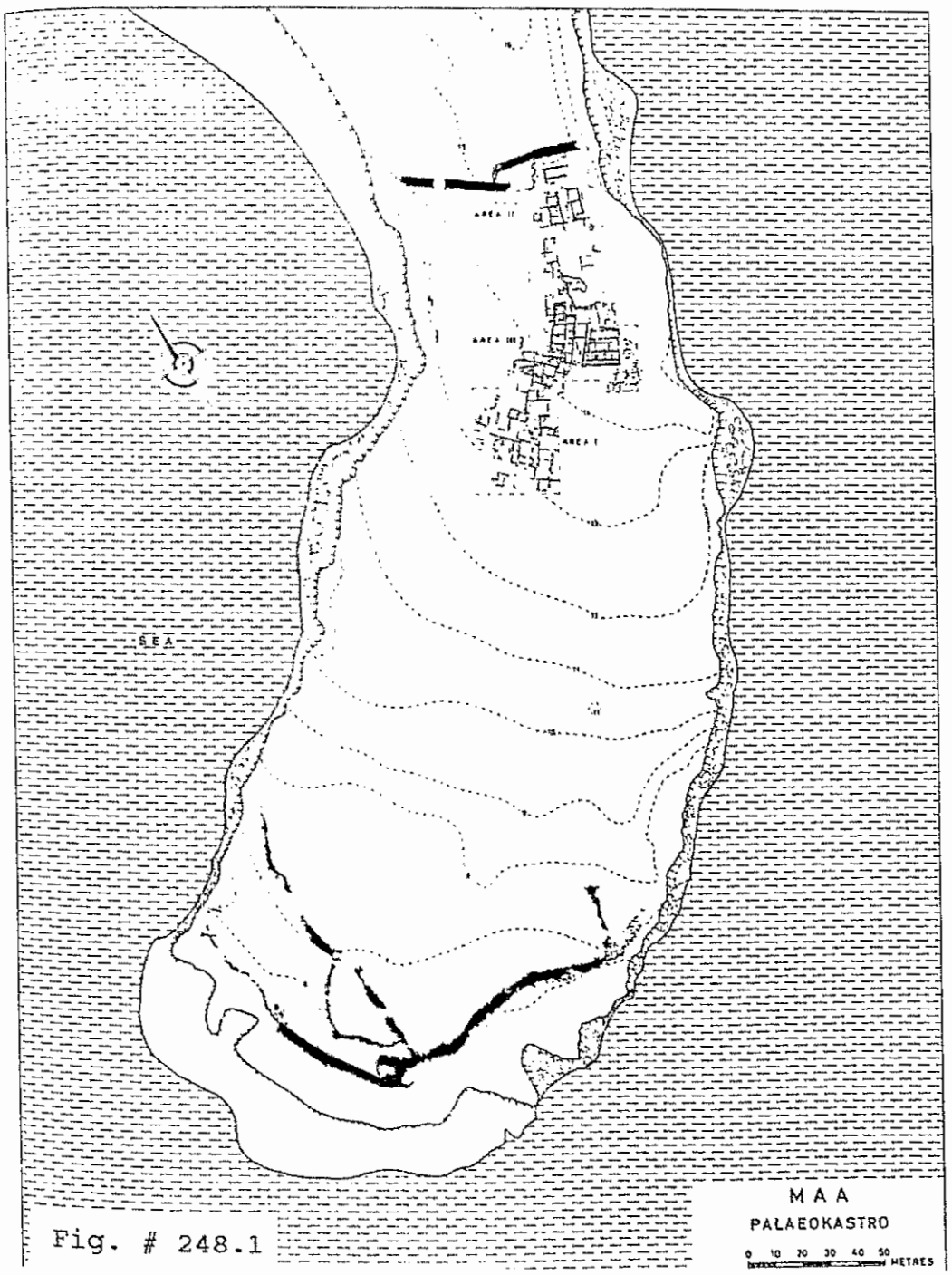



Fig. # 248.1

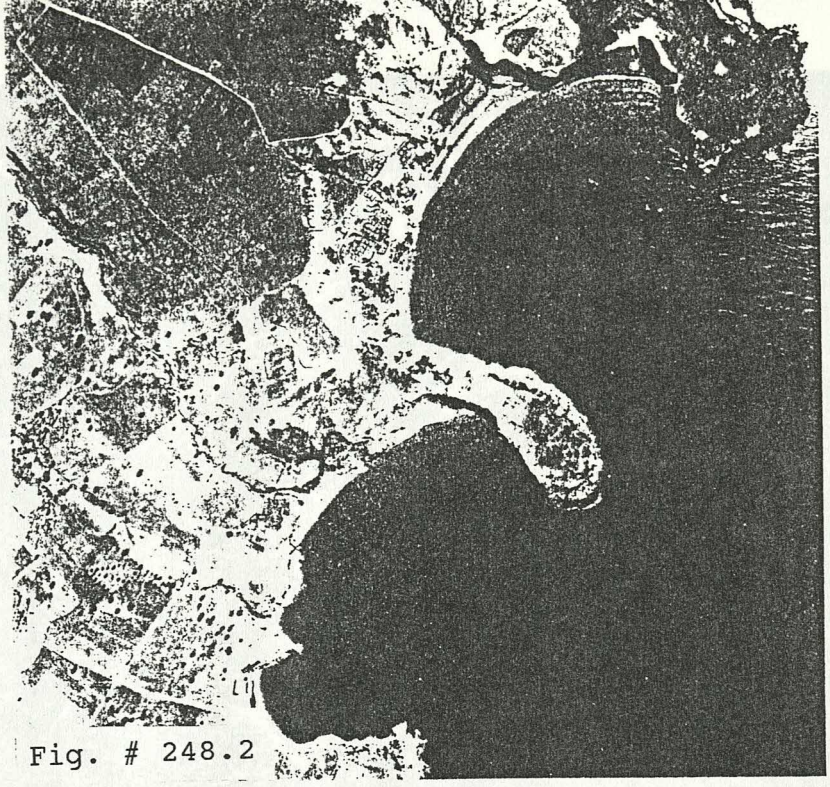


Fig. # 248.2

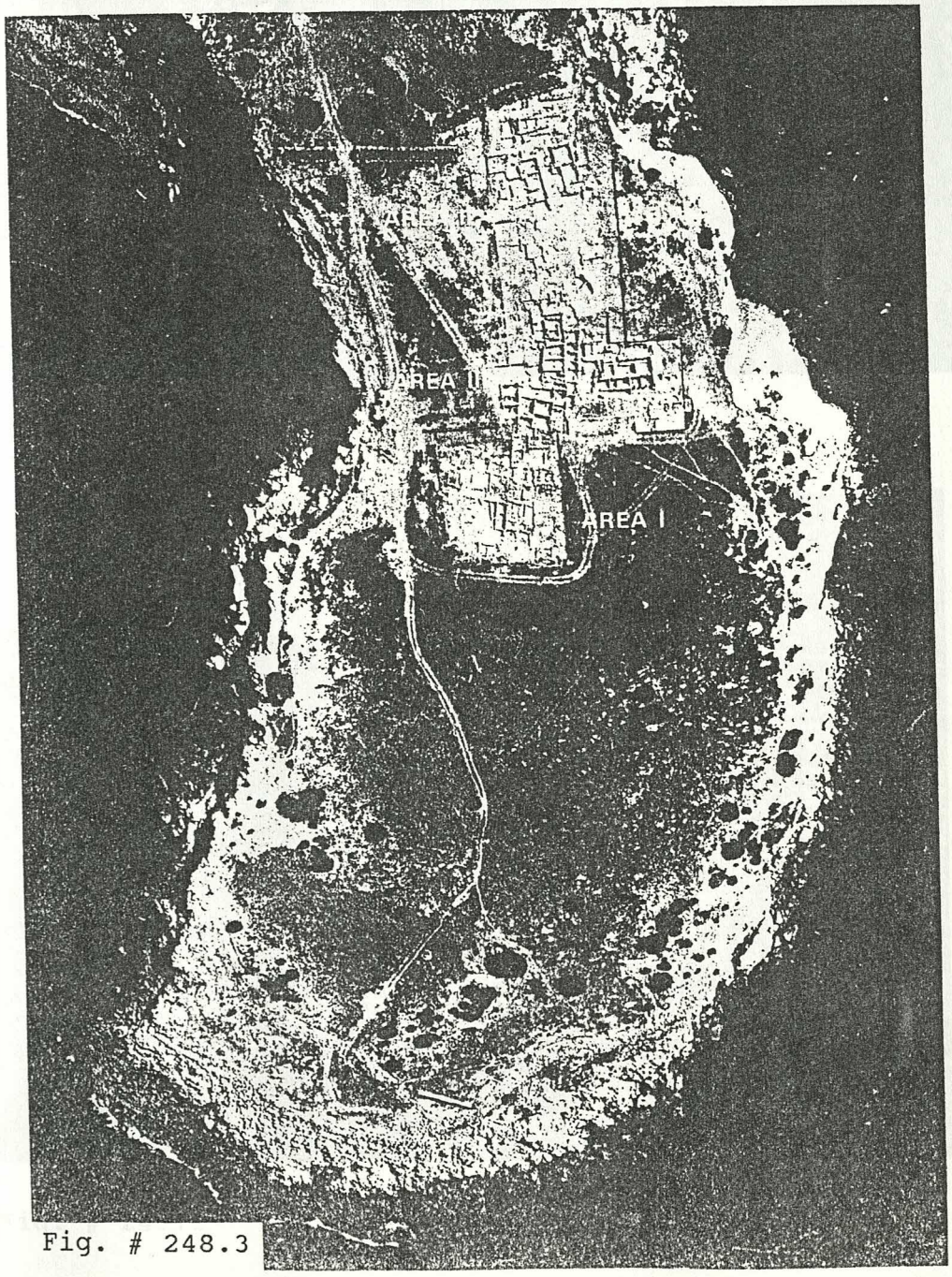



Fig. # 248.3

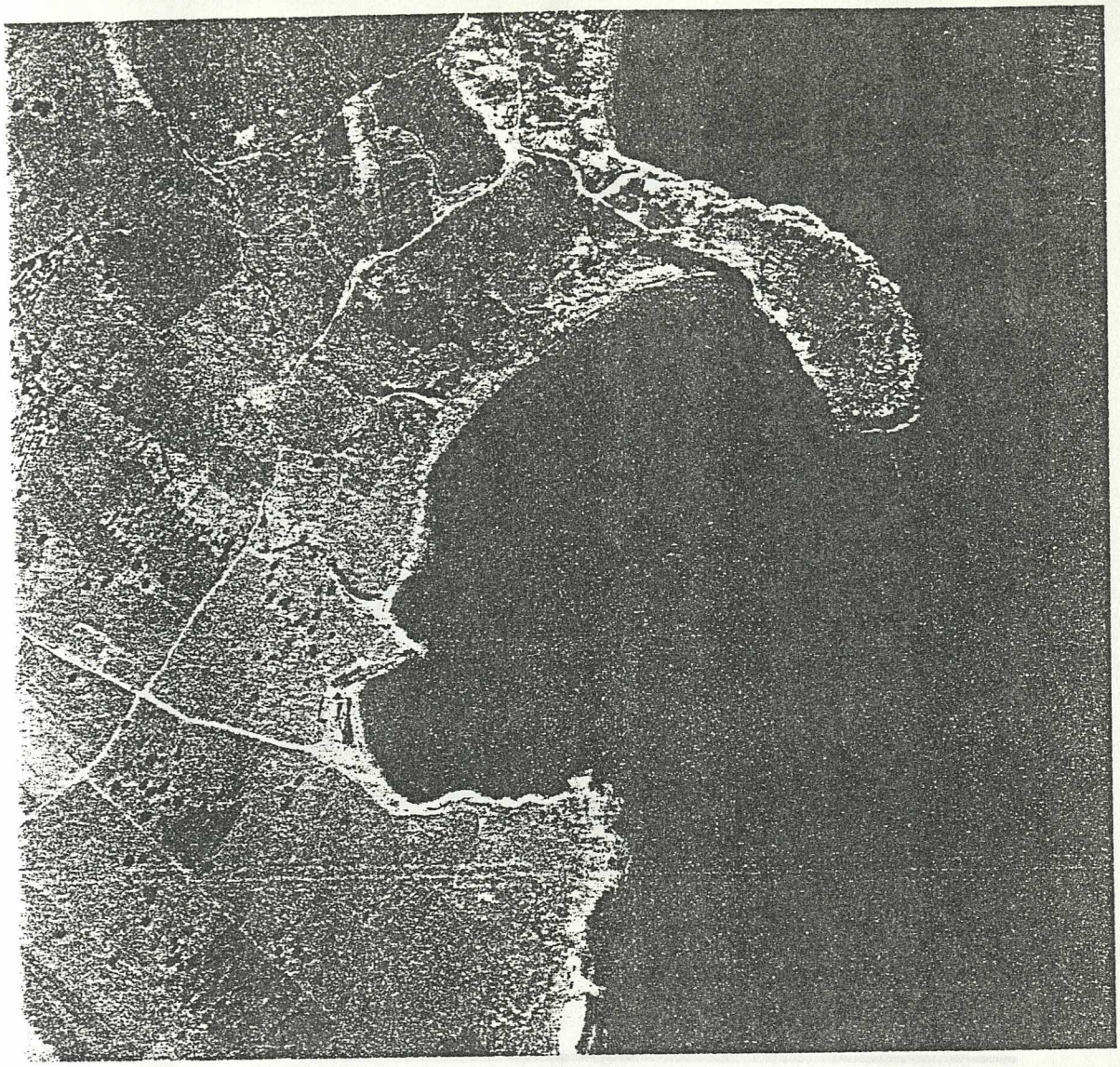


Fig. # 249

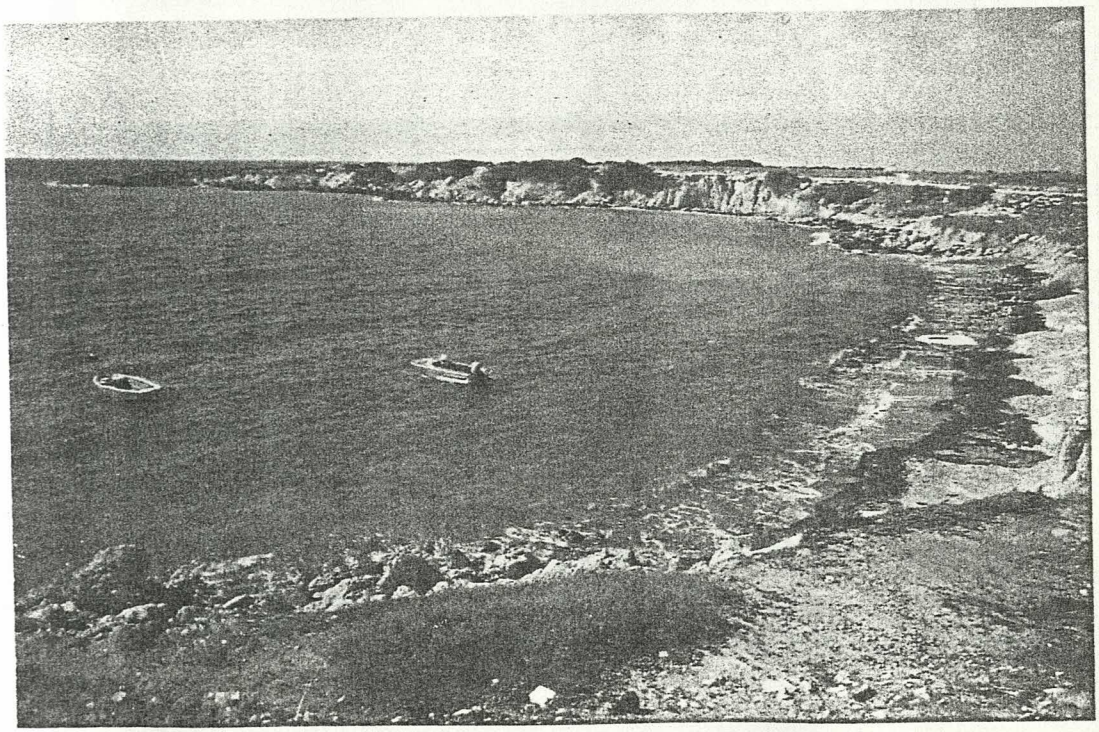


Fig. # 249.1

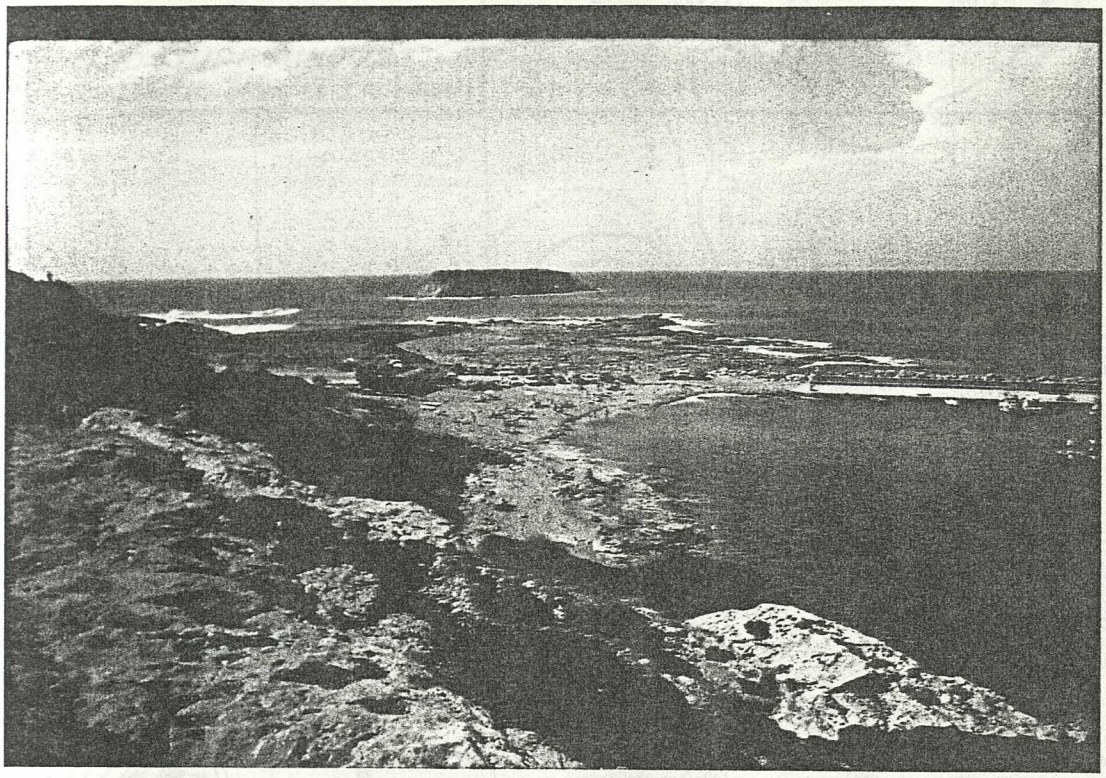


Fig. # 251

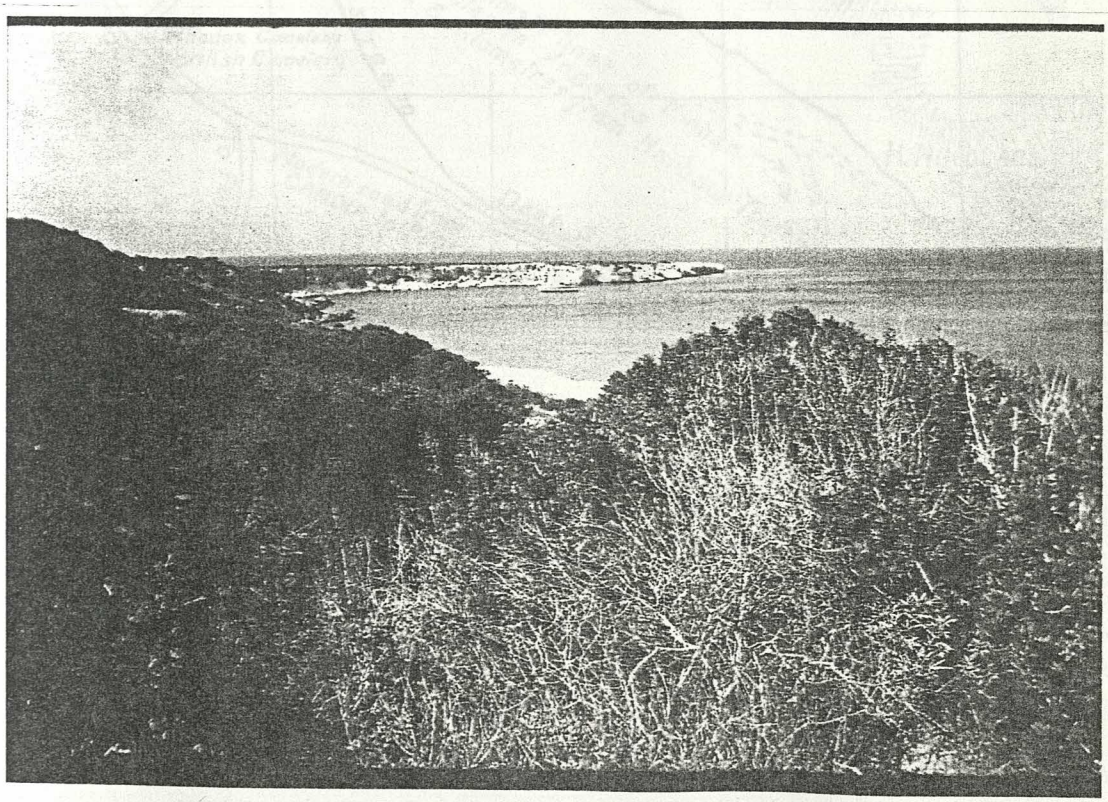


Fig. # 252

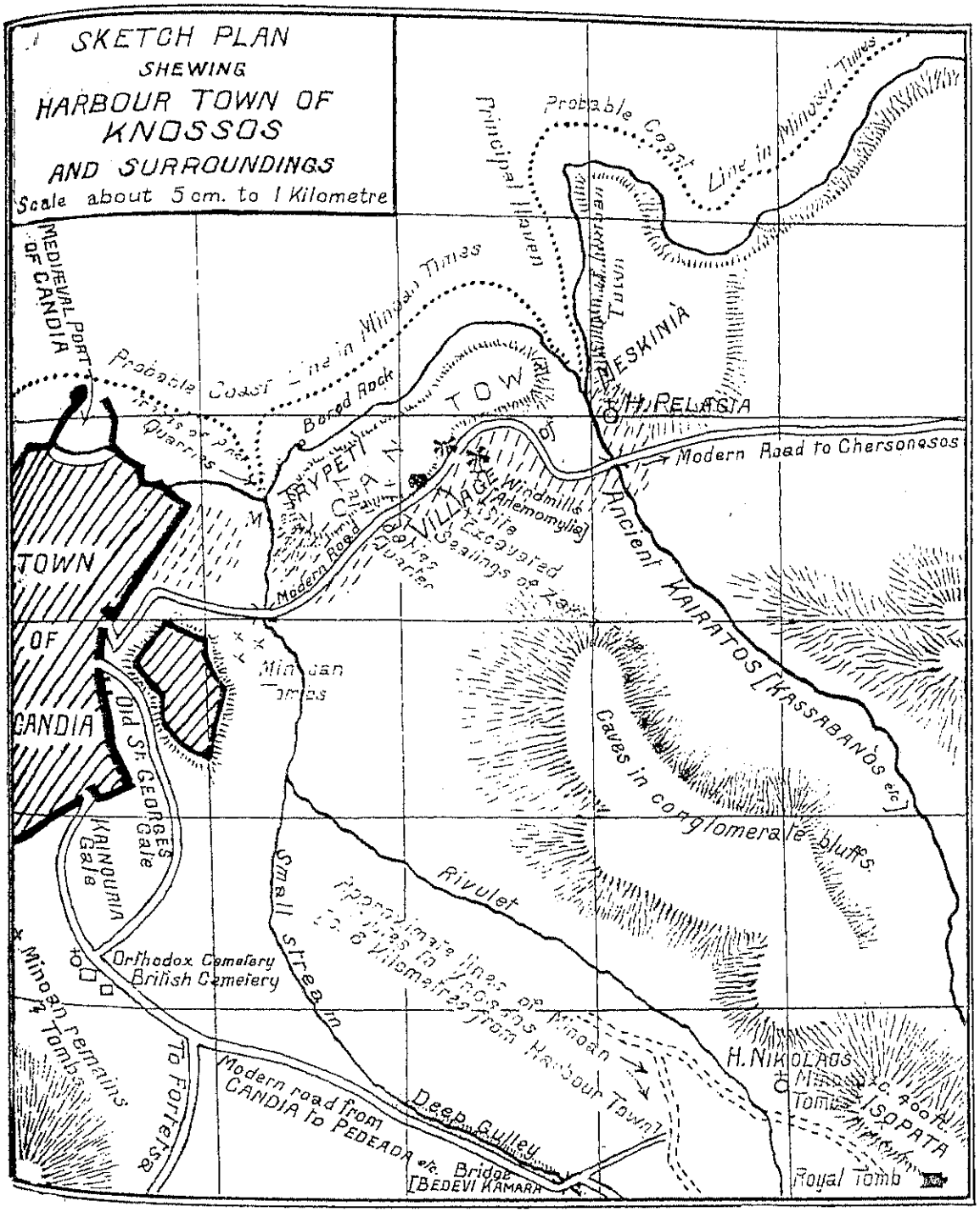

SKETCH PLAN
SHEWING
HARBOUR TOWN OF
KNOSSOS
AND SURROUNDINGS
Scale about 5 cm. to 1 Kilometre
Probable Coast Line in Minoan Times
Principal Haven
Inner Harbour
Canal
Probable Coast Line in Minoan Times
MEDIEVAL PORT OF CANDIA
Bored Rock
Quarries
HARBOUR TOWN OF KNOSSOS
PESKINIA
H. PELAGIA
Modern Road to Chersonesos
TRYPETI
CANEA
VILLAGE
Site Excavated
Windmills [Anemomylai]
Gaillings of Zaros
Modern Road
Ancient KAIRATOS [KASSABANOS etc.]
TOWN OF CANDIA
Minoan Tombs
Old St. GEORGES Gate
KAINOURIA Gate
Caves in conglomerate bluffs.
Small stream
Rivulet
Approximate lines of Minoan roads in Knossos
1 to 2 Kilometres from Harbour Town
Orthodox Cemetery
British Cemetery
Minoan remains & Tombs
To Fortezza
Modern road from CANDIA to PEDEADA etc.
Deep Gulley
Bridge [BEDEVI KAMARA]
H. NIKOLAOS
Minoan c. 400 A.
Tombs
ISOPATA
Royal Tomb

Fig. # 264

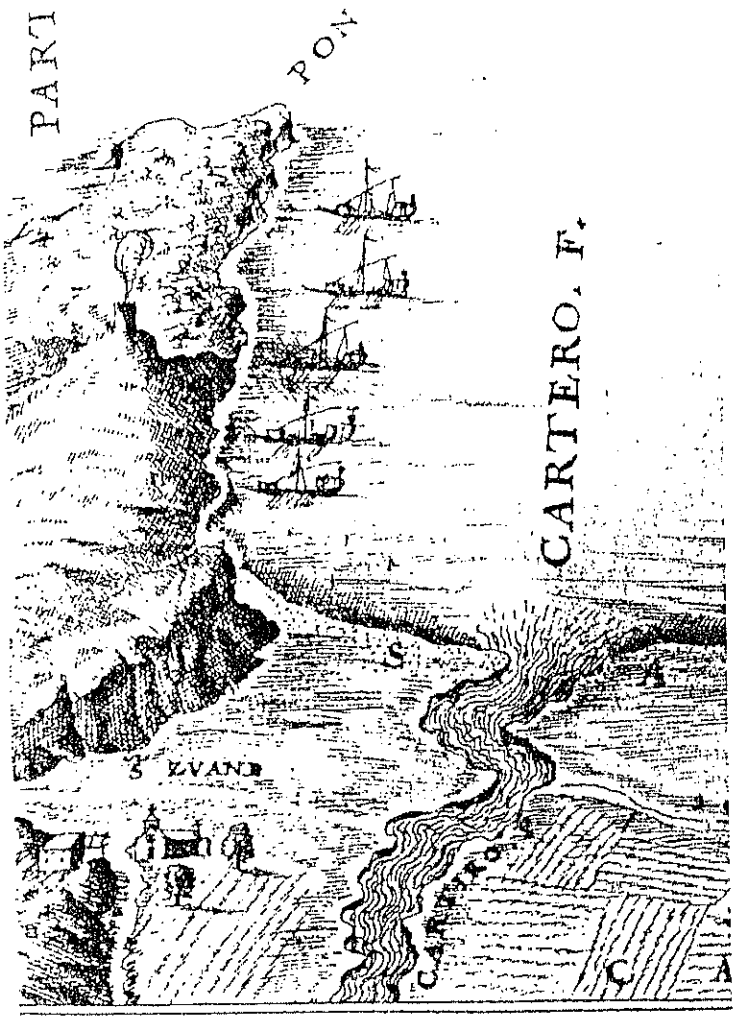



Fig. # 265

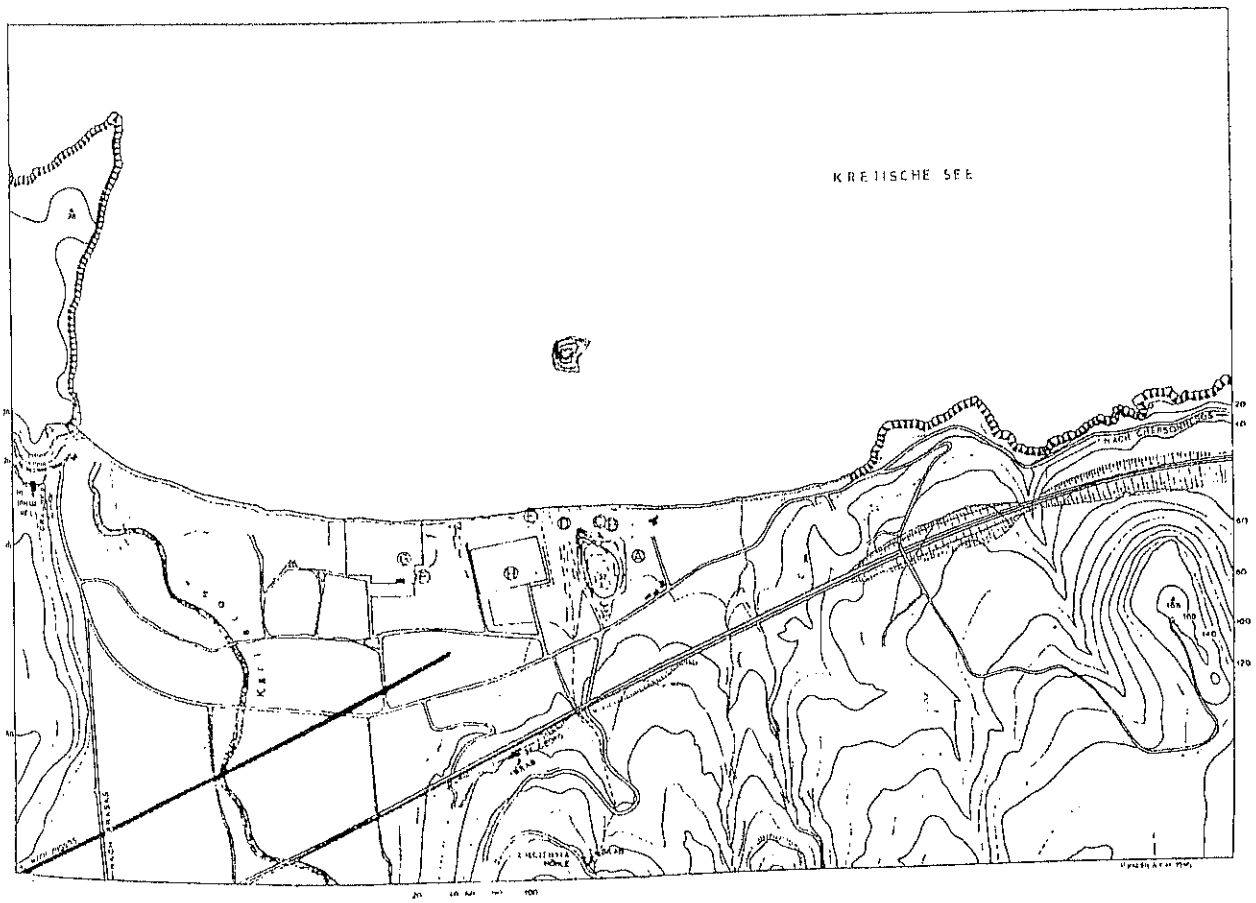



Fig. # 265.1

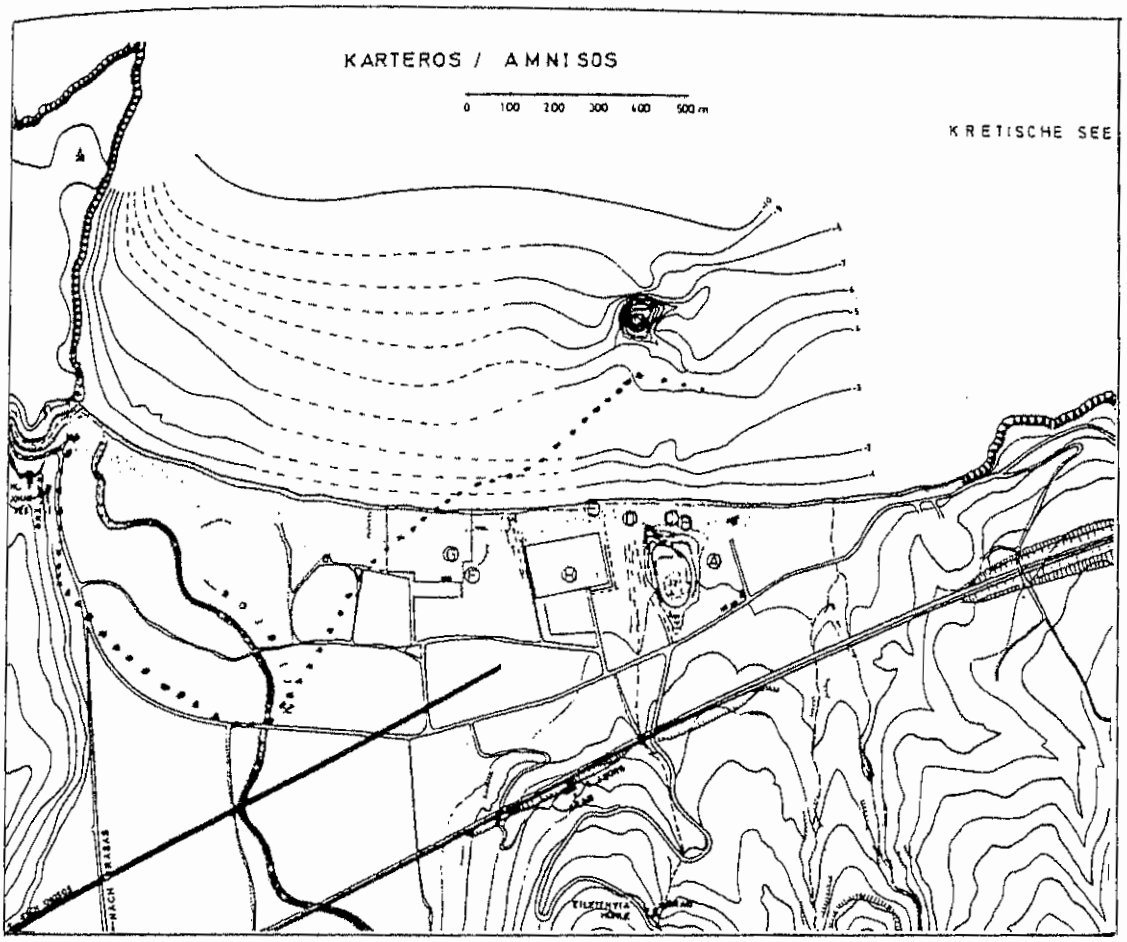



Fig. # 265.2

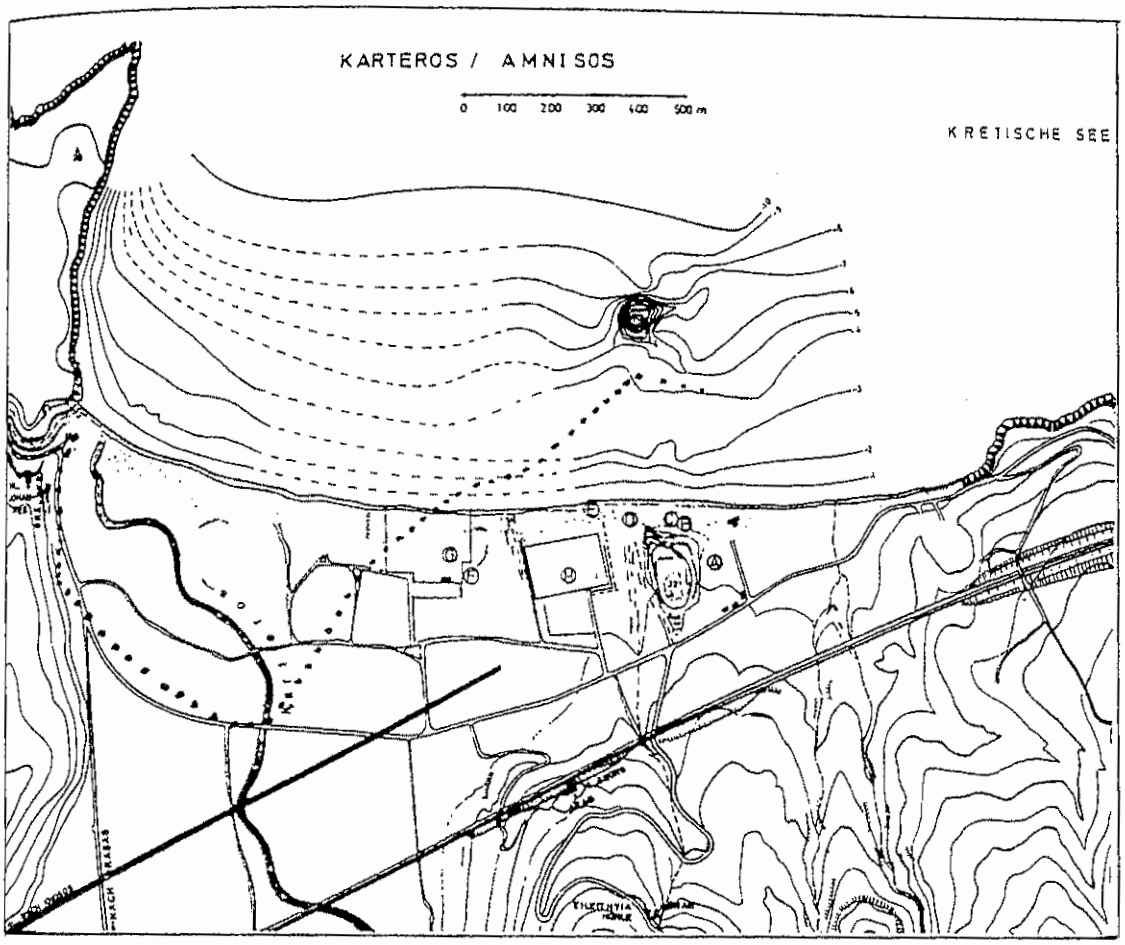



Fig. # 265.2

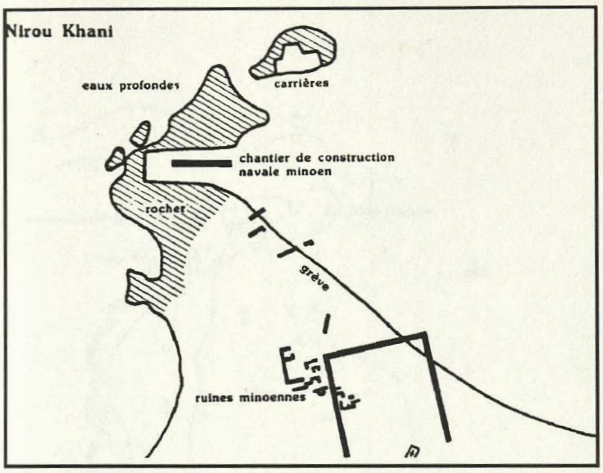



Fig # 266



Fig # 266.1



Fig # 266.2



Fig # 266.3

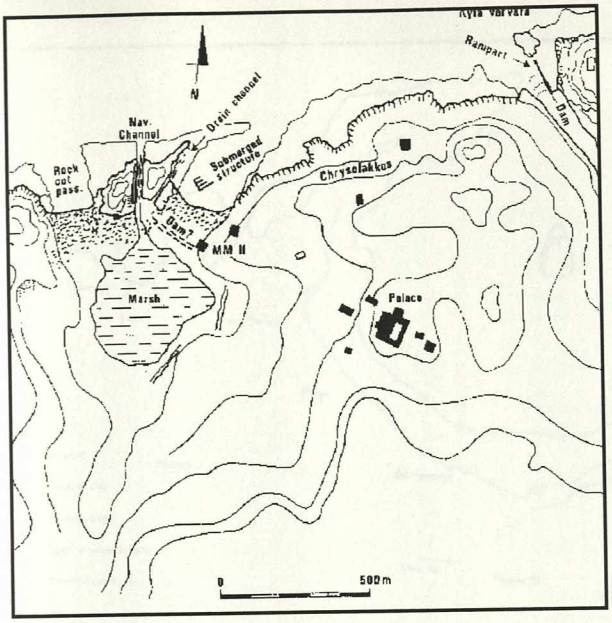



Fig # 268

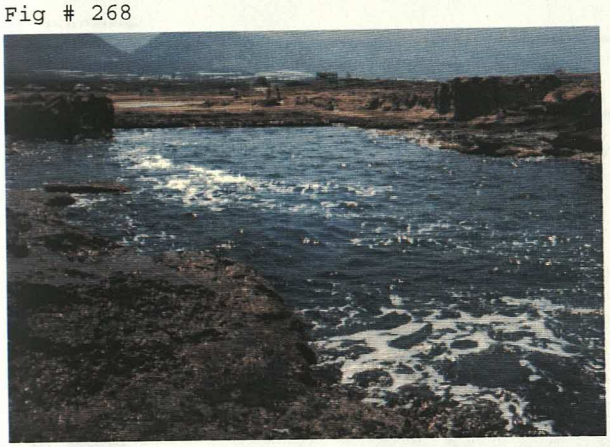


Fig # 268.1

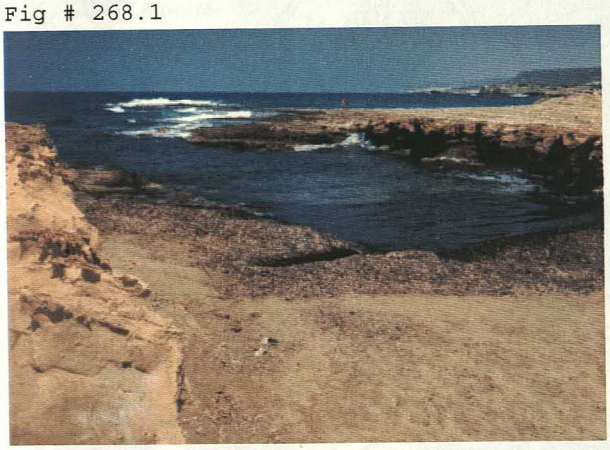


Fig # 268.2



Fig # 268.3

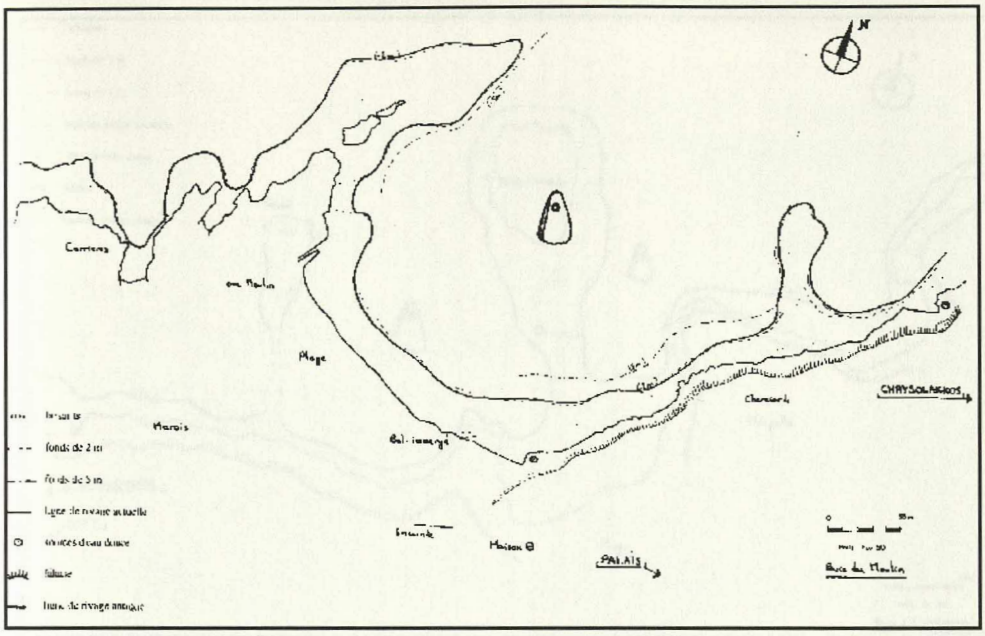



Fig # 268.5

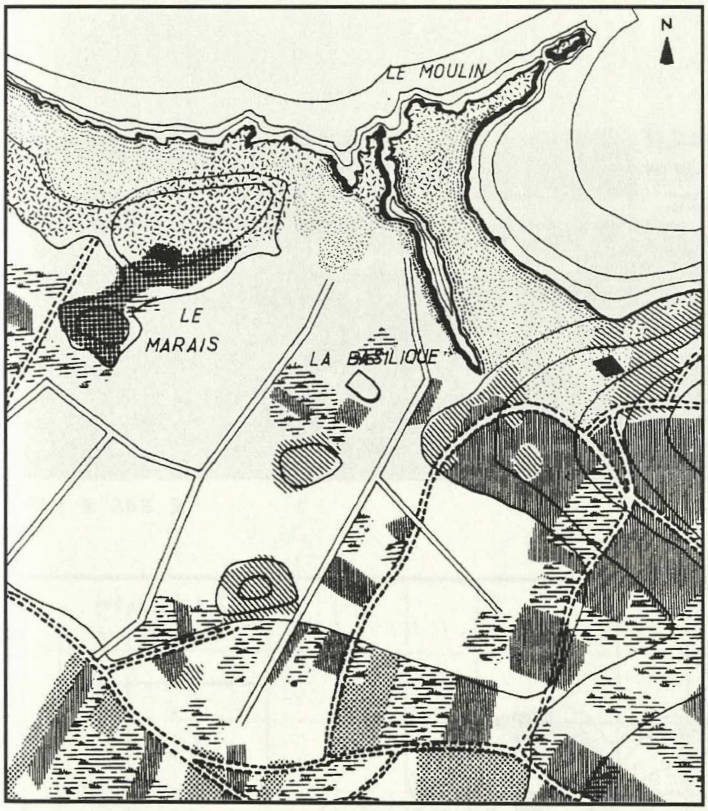



Fig # 268.6

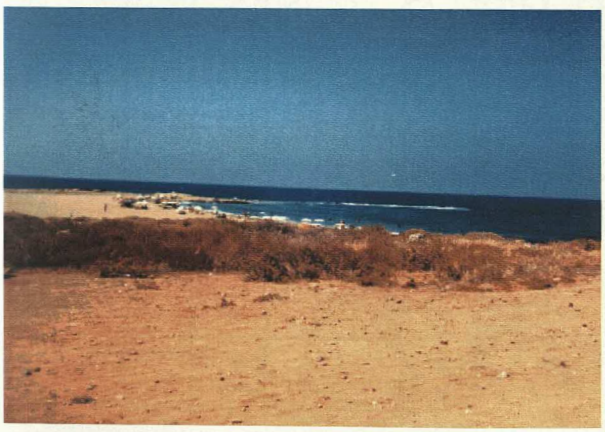


Fig # 268.7

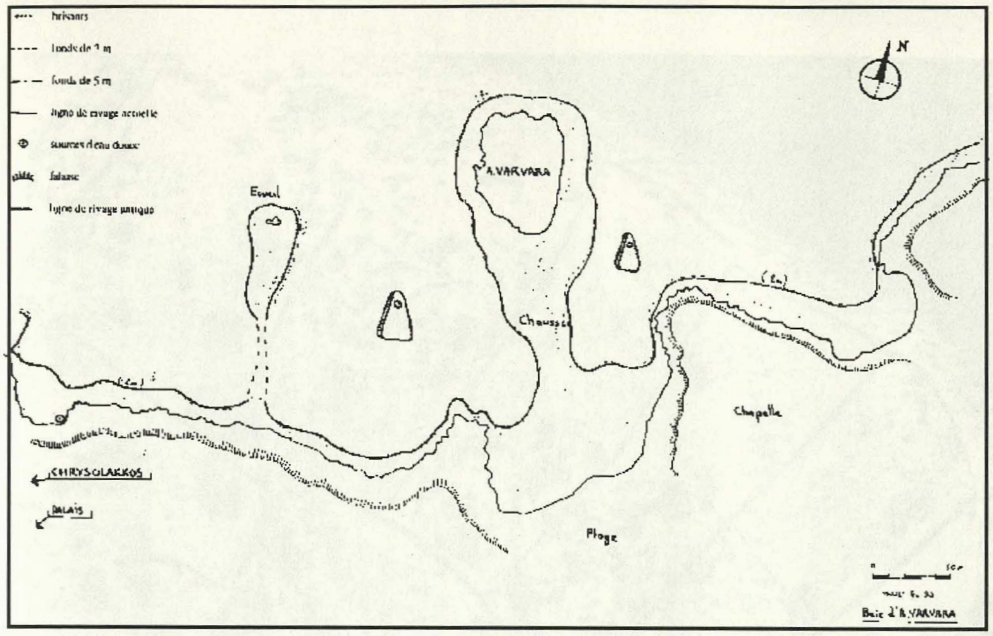



Fig # 268.8



Fig # 268.9

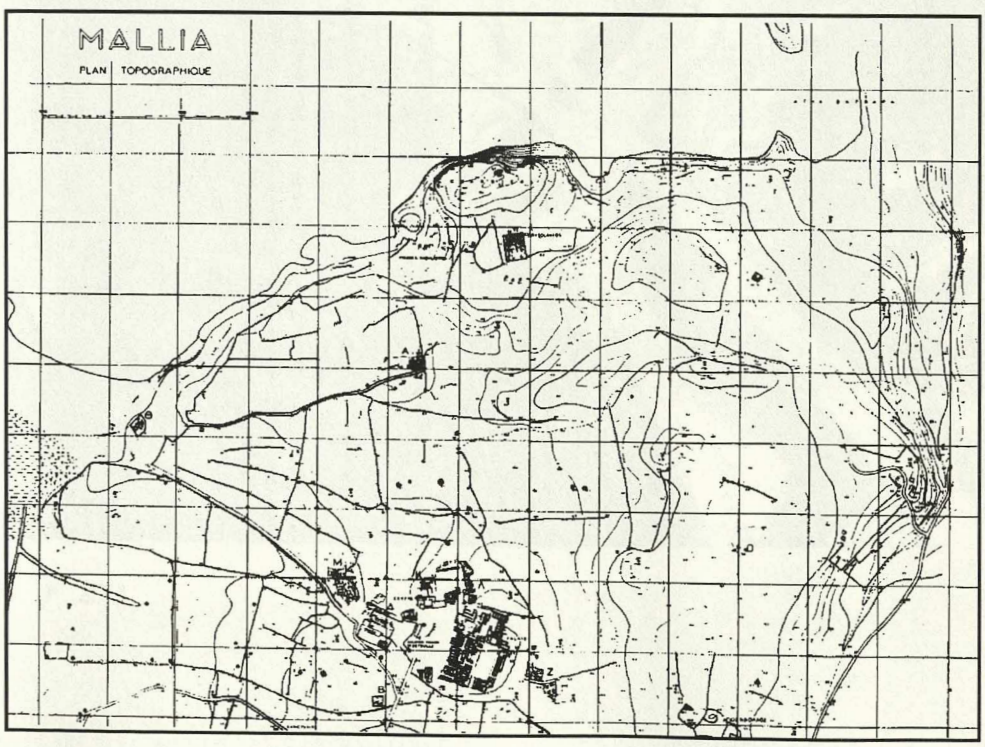



Fig # 268.11

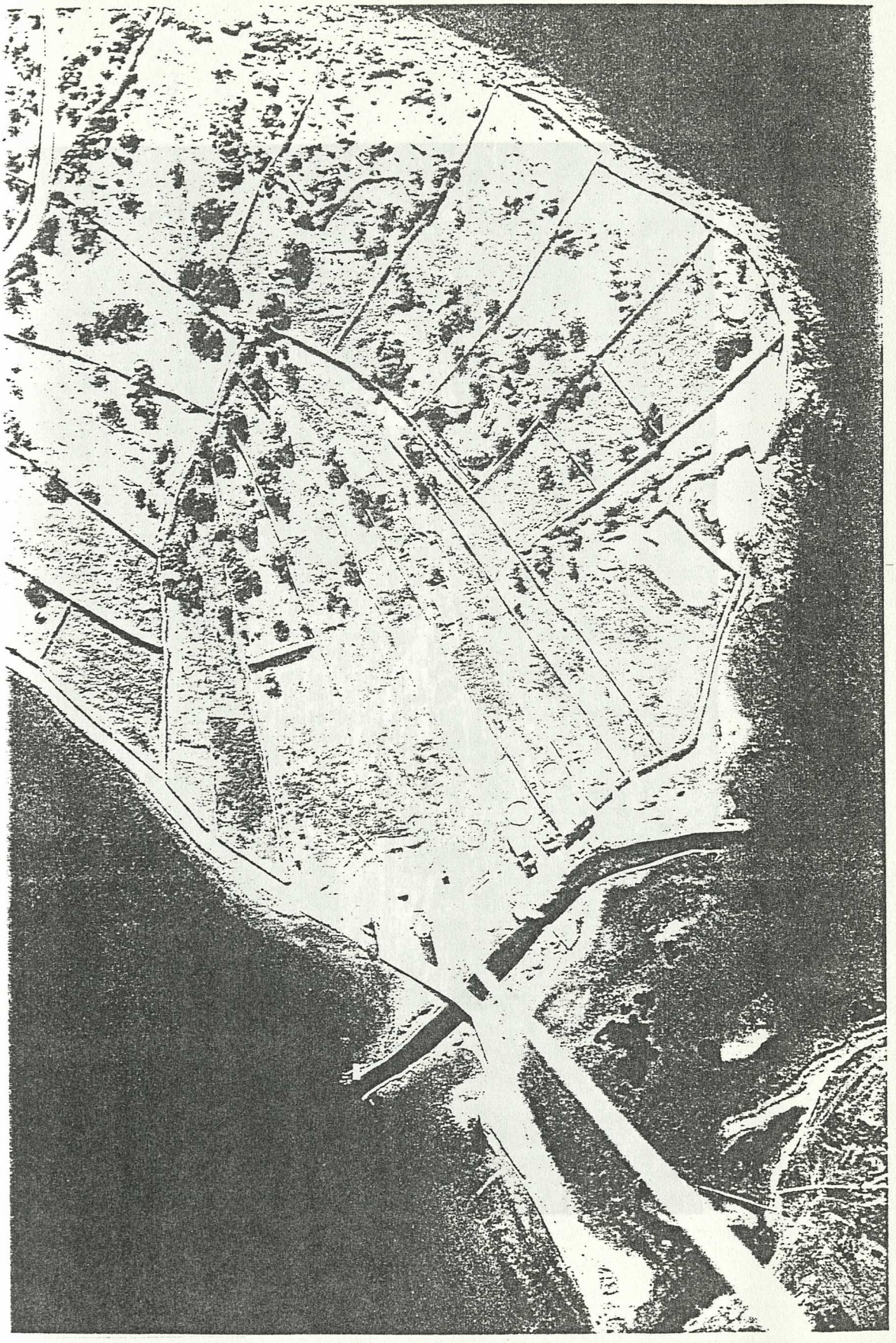


Fig. # 271

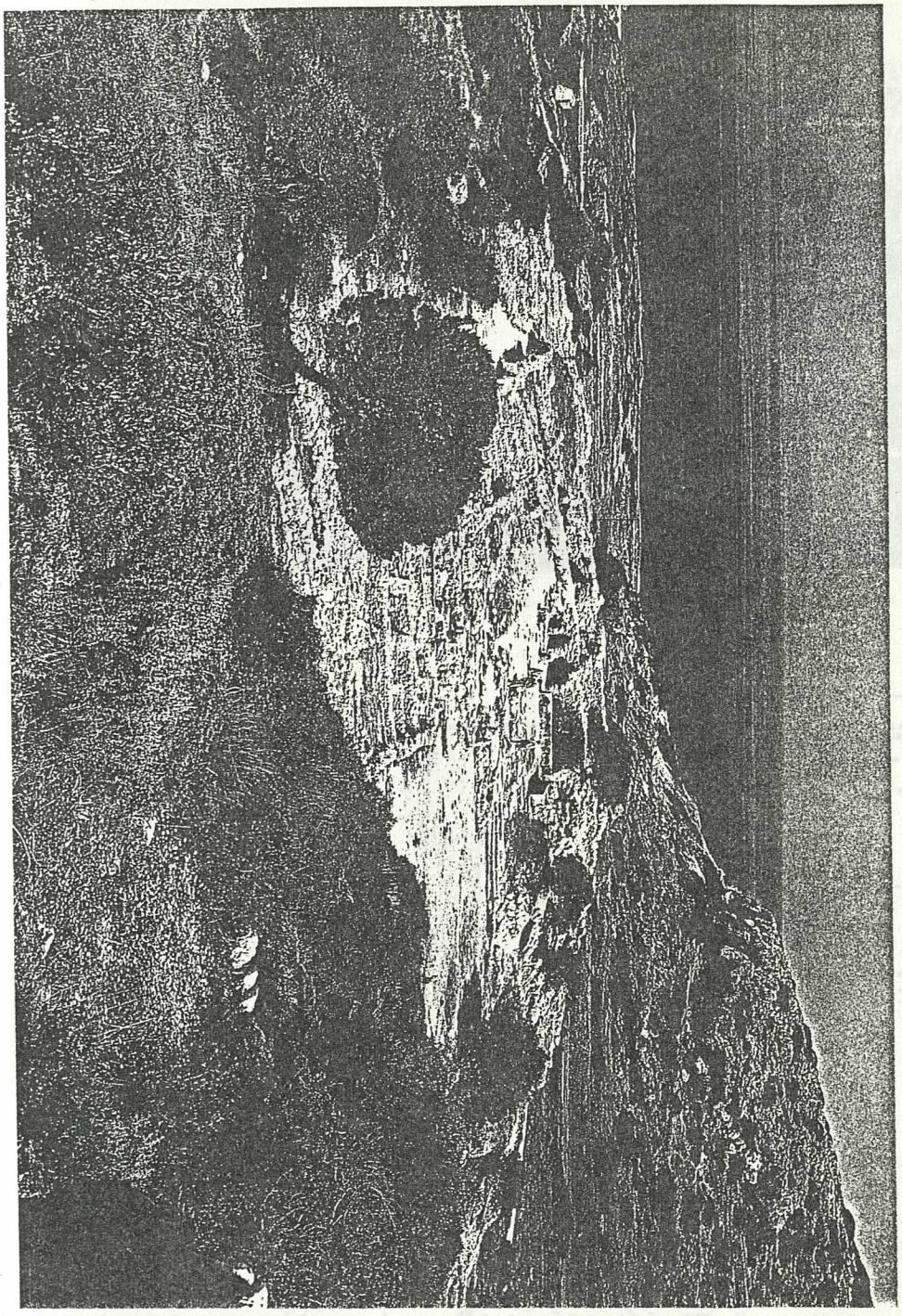


Fig. # 274

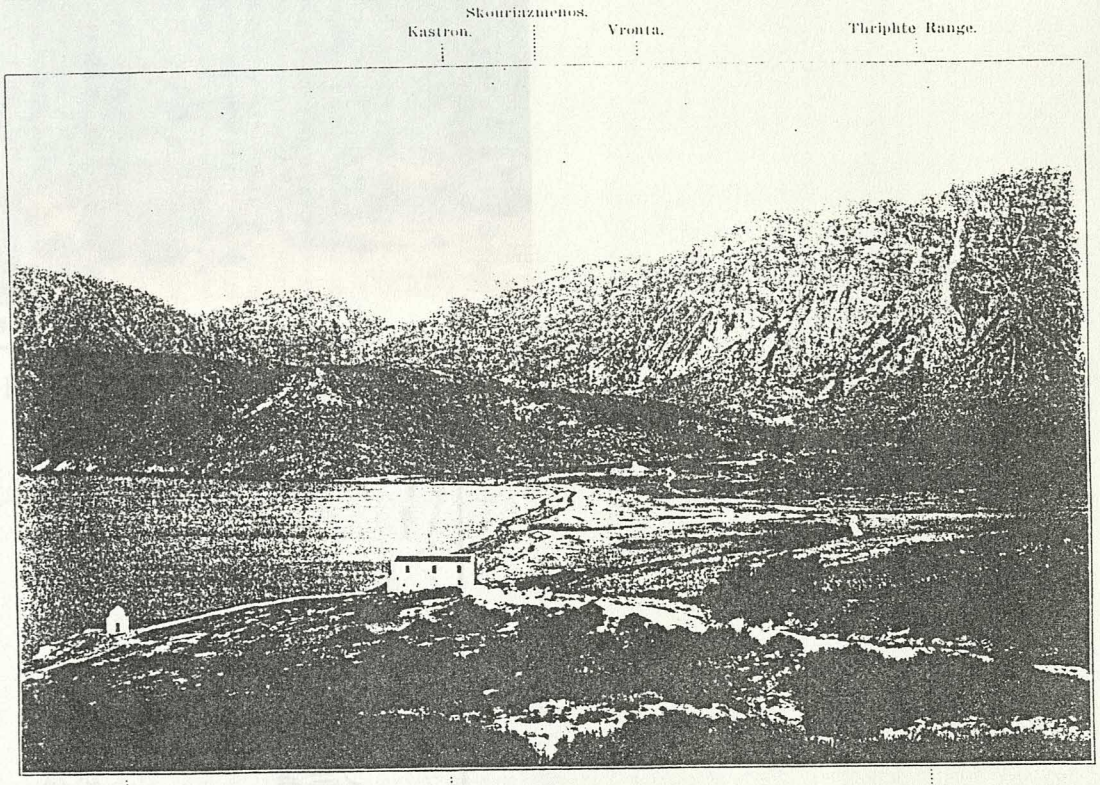



Fig. # 275

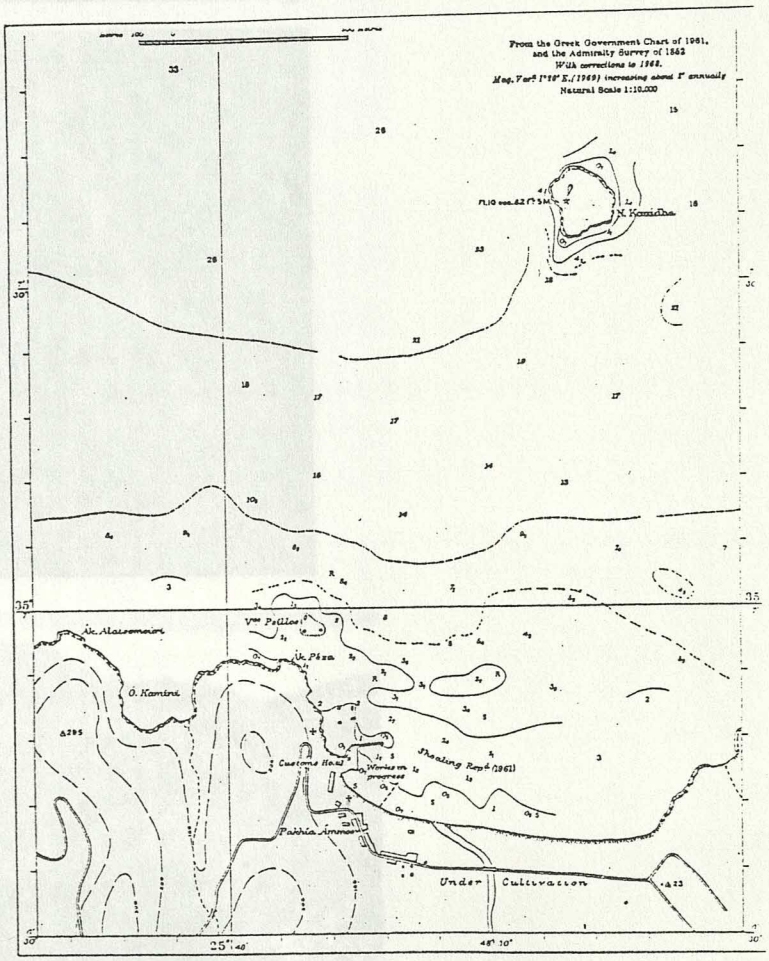



Fig. # 275.1



Fig # 277

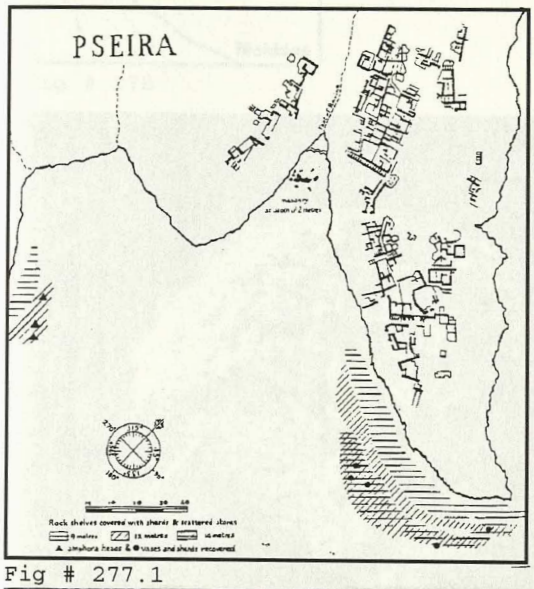



Fig # 277.1



Fig # 277.2

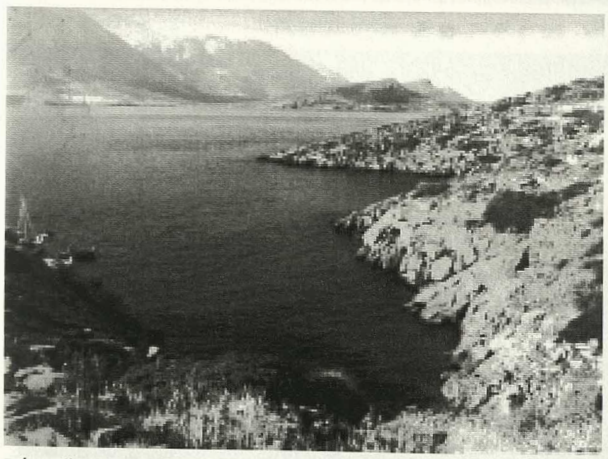


Fig # 277.3

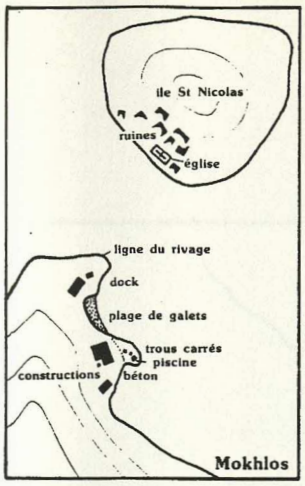



Fig # 278

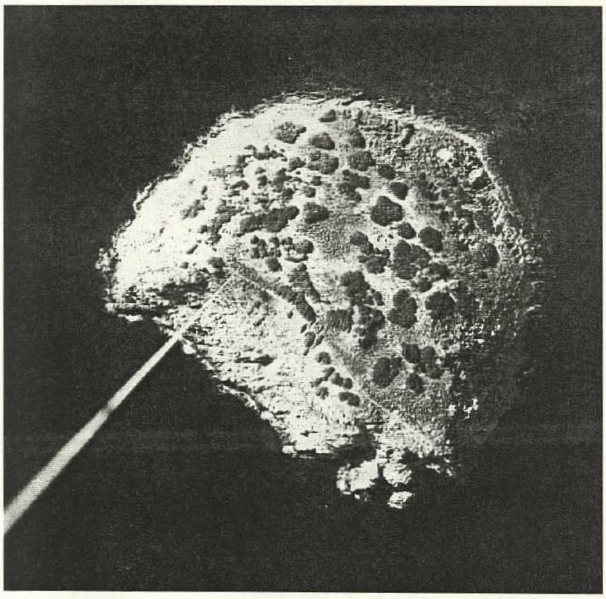


Fig # 278.1



Fig # 278.2

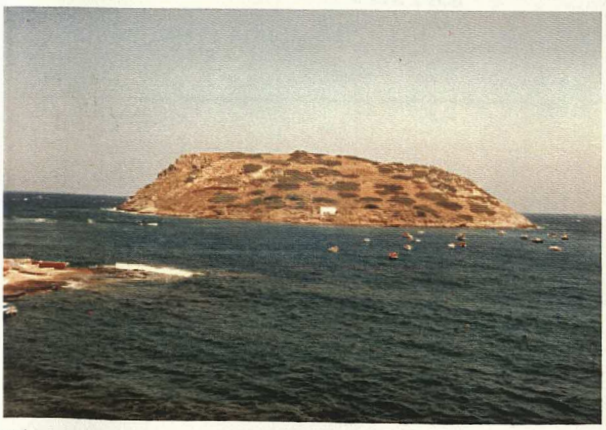


Fig # 278.3

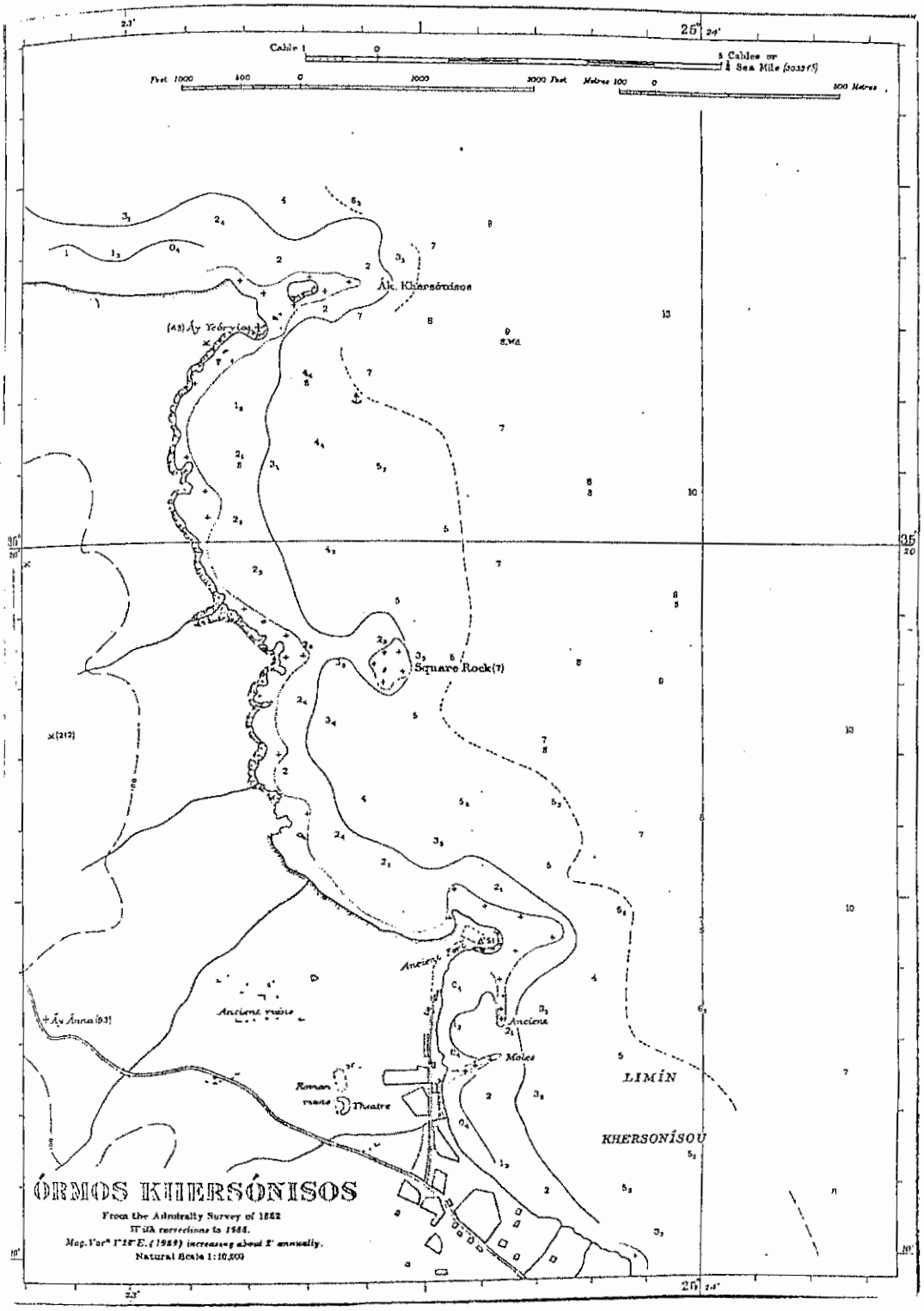

Cable 1
5 Cables or
1 Sea Mile (6080 ft)
Feet 1000 400 0 1000 2000 Feet
Metres 100 0 500 Metres
Ák. Khersónisos
(43) Áy Yeórvios
Square Rock(7)
Ancient quay
Áy Ánna (93)
Ancient
Moles
Roman remains
Theatre
LIMÍN
KHERSONÍSOU
ÓRMOS KHERSÓNISOS
From the Admiralty Survey of 1862
With corrections to 1888.
Mag. Var° 7°18' E. (1889) increasing about 8' annually.
Natural Scale 1:10,000

Fig. # 267

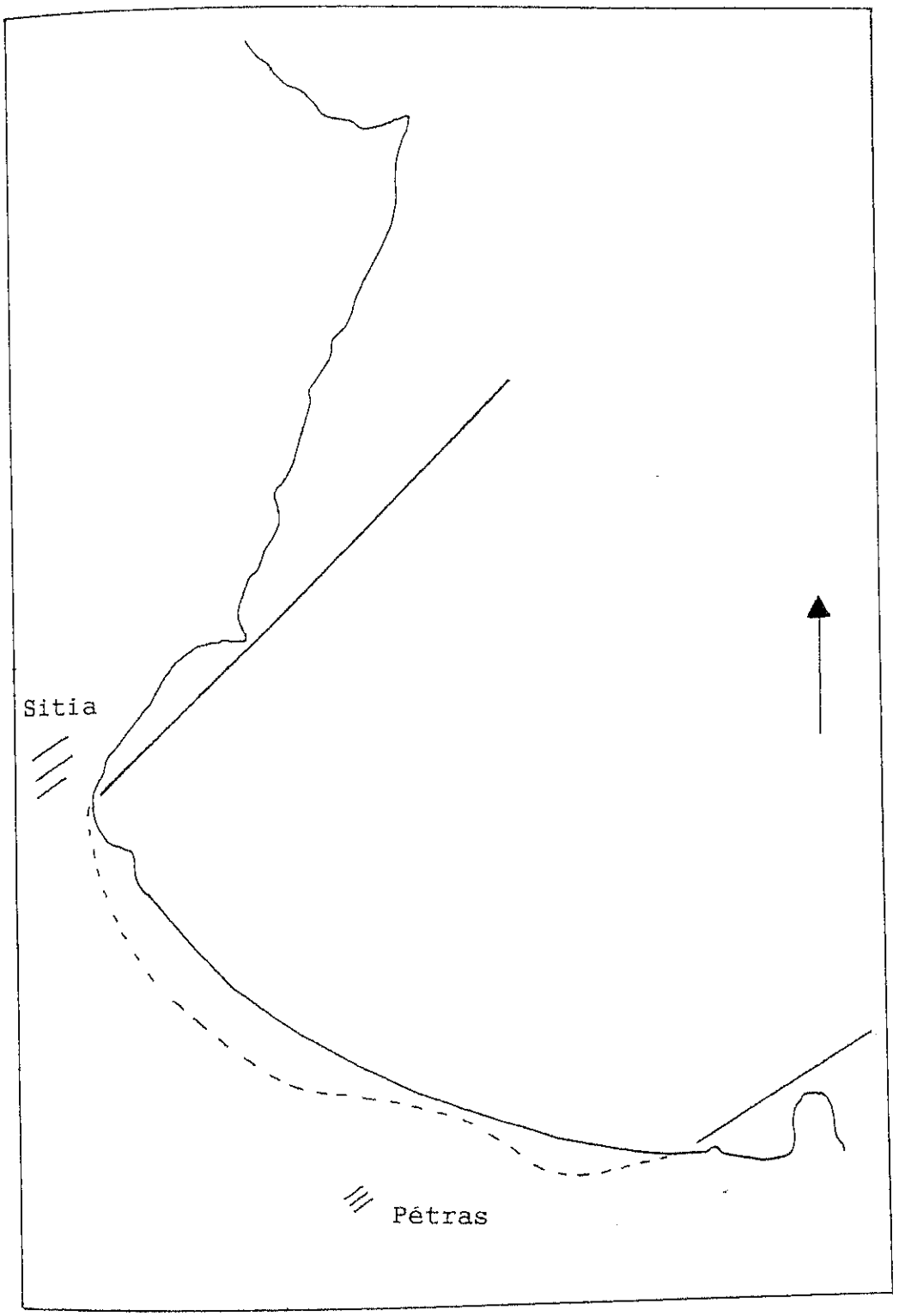



Fig. # 279

Fig. # 280

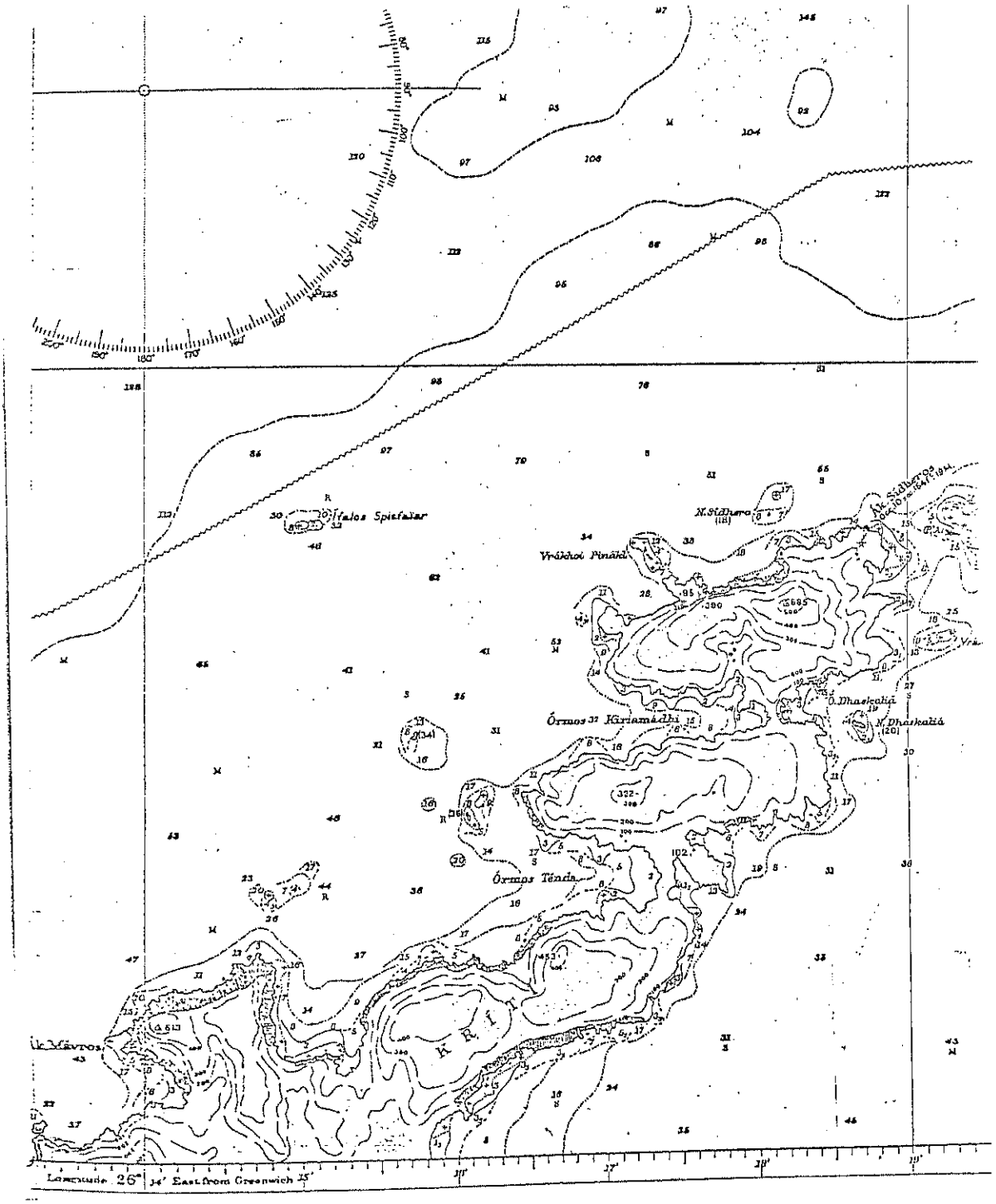



Fig. # 282

Fig. # 284

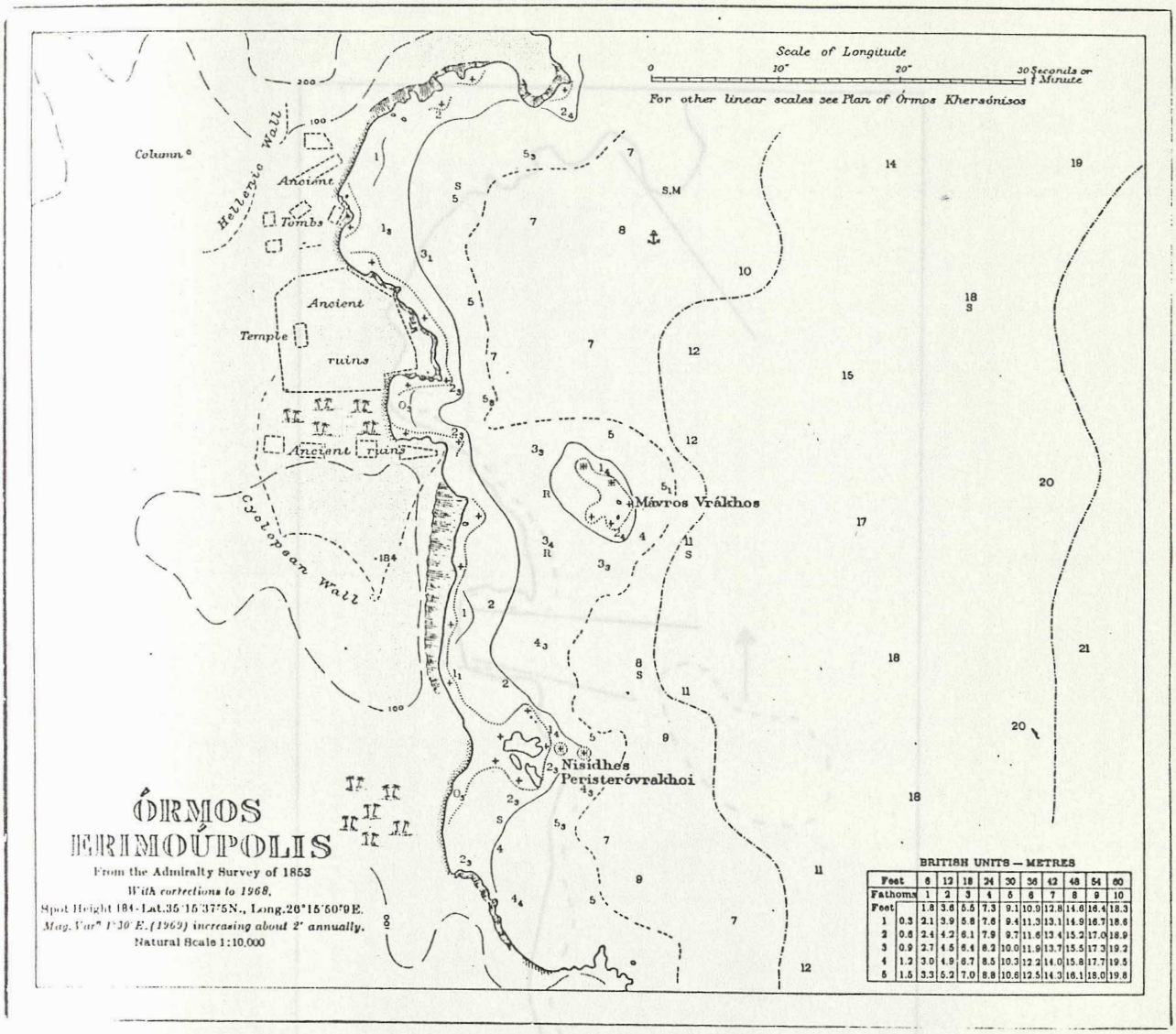



Fig. # 285

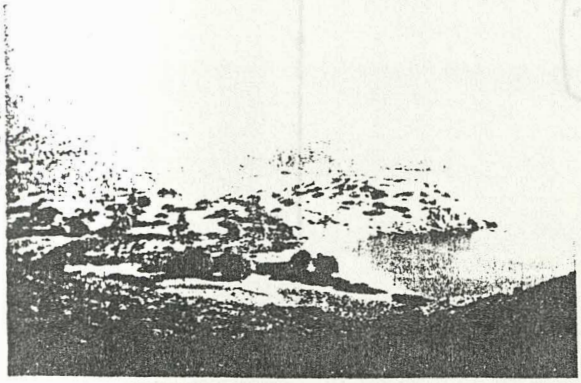


Fig. # 285.1

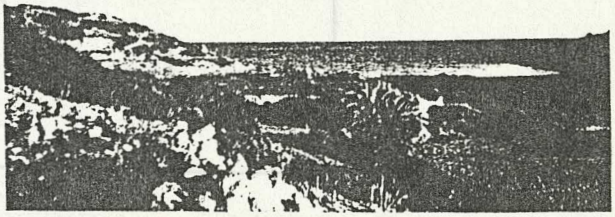


Fig. # 285.2

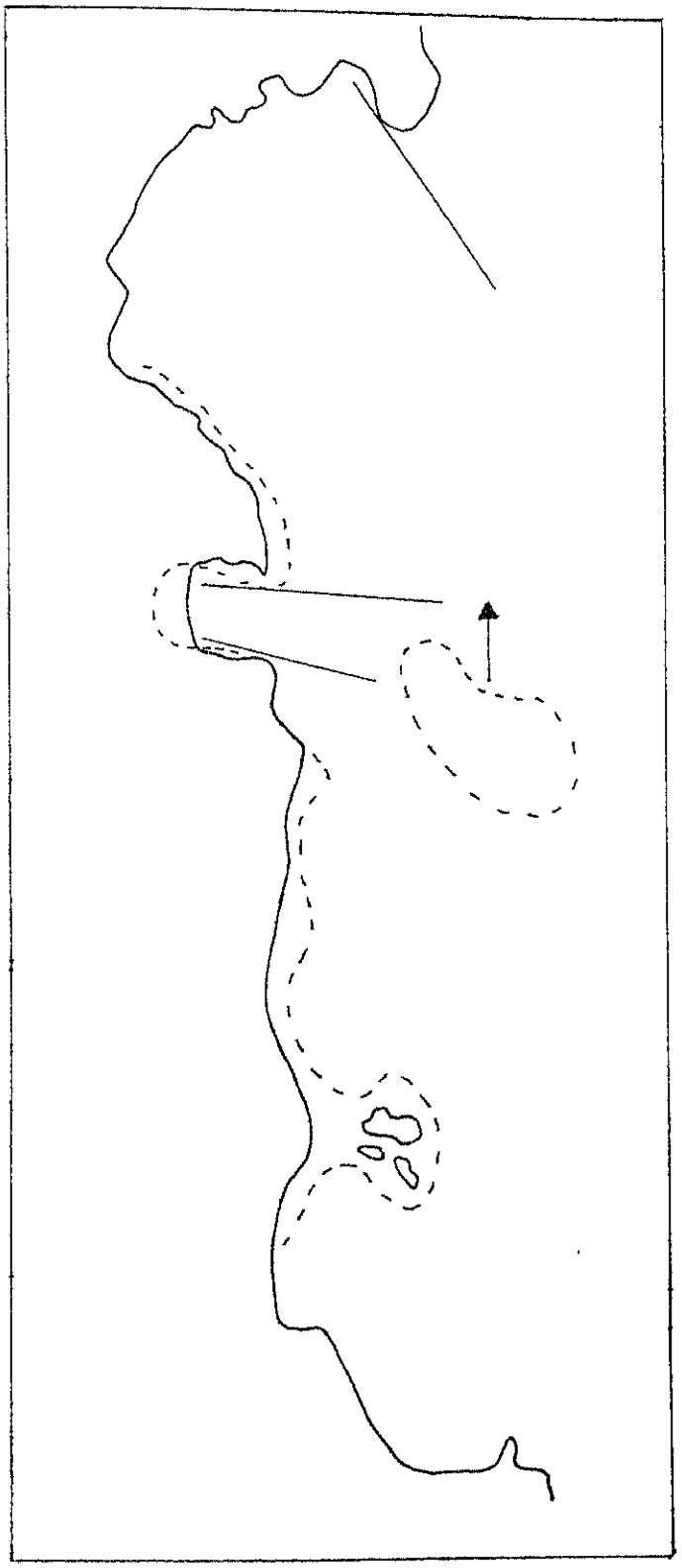


Fig. # 285.3

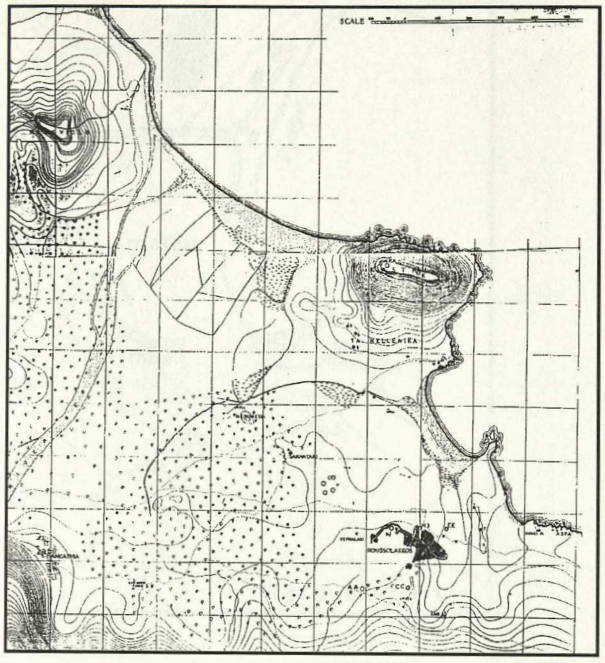



Fig # 288



Fig # 288.1



Fig # 288.2

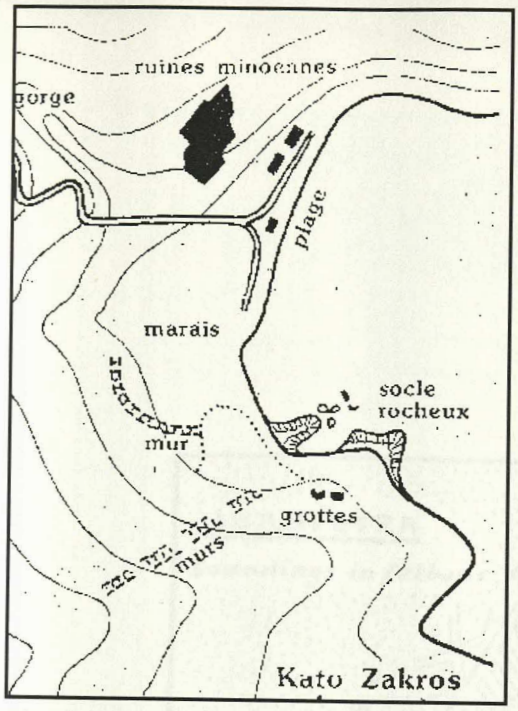



Fig # 290



Fig # 290.1

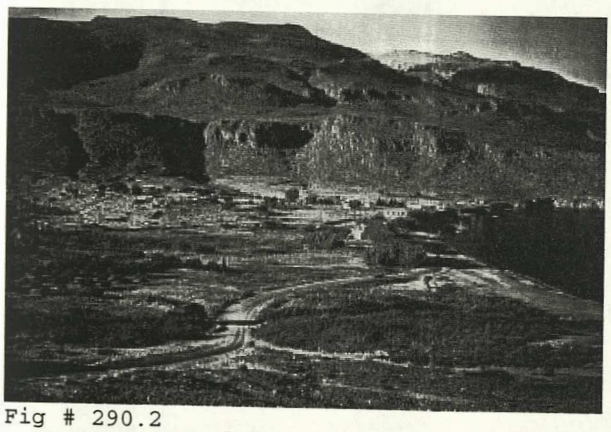


Fig # 290.2



Fig # 290.3

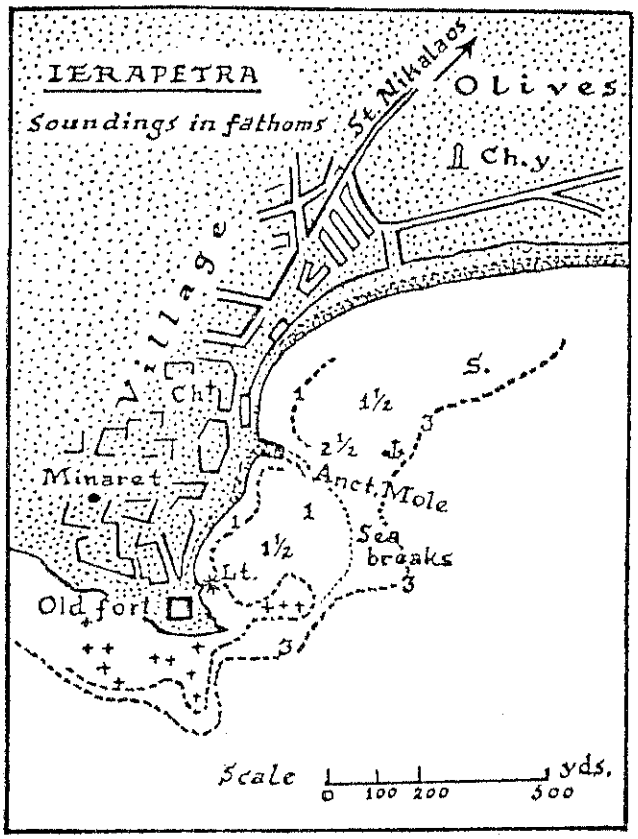

IERAPETRA
Soundings in fathoms
St. Nikalaos
Olives
Ch.y
Village
Ch.
Minaret
Anct. Mole
Sea breaks
Lt.
Old fort
S.
1½
2½
1
3
Scale
0 100 200 500 yds.

Fig. # 296

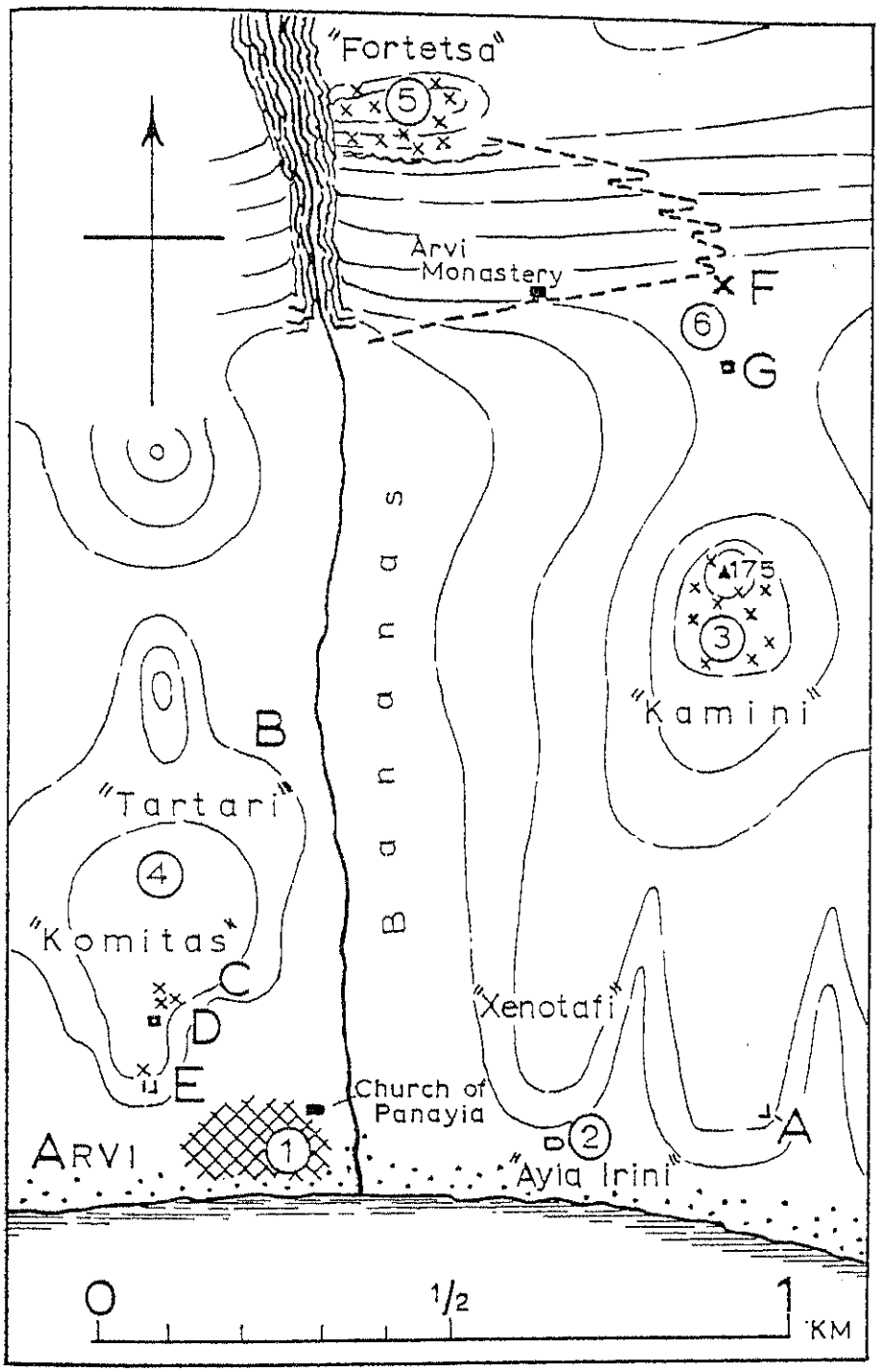

"Fortetsa"
5
Arvi
Monastery
F
6
G
Bananas
▲175
3
"Kamini"
B
"Tartari"
4
"Komitas"
C
D
E
Church of
Panayia
"Xenotafi"
2
A
ARVI
1
"Ayia Irini"
0
1/2
1
KM

Fig. # 298

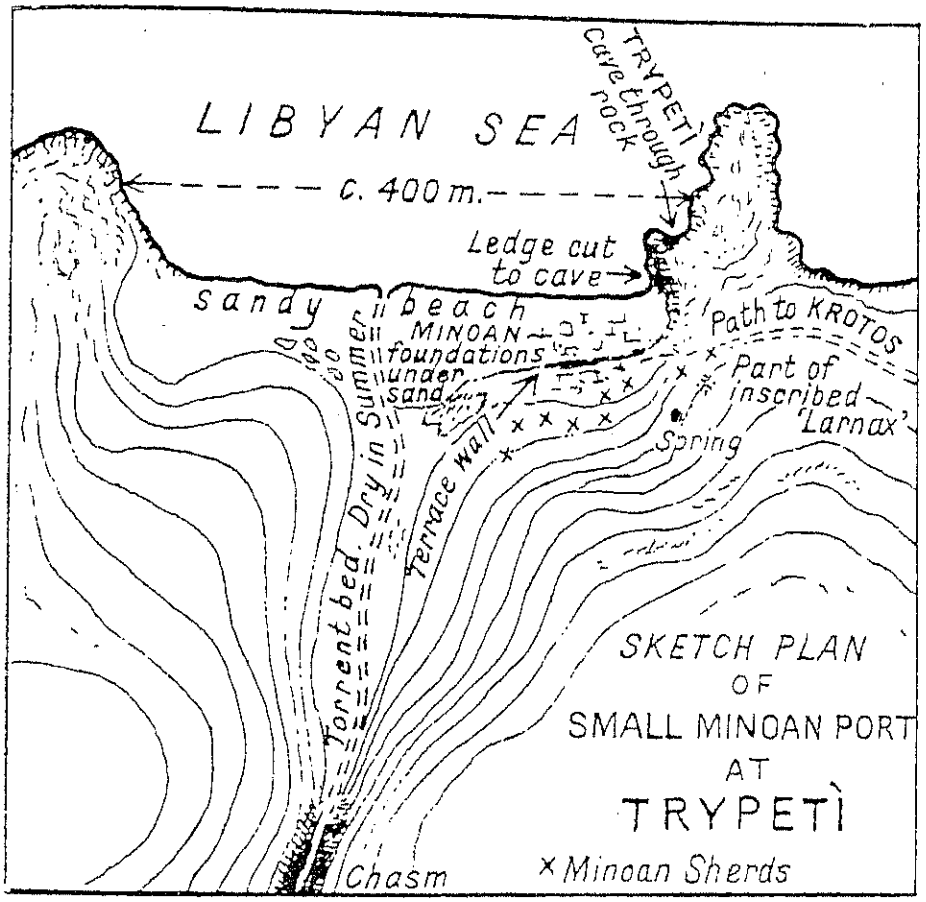

LIBYAN SEA
TRYPETÌ
Cave through rock
c. 400 m.
Ledge cut to cave
sandy beach
MINOAN foundations under sand
Path to KROTOS
Part of inscribed 'Larnax'
Spring
Terrace wall
Torrent bed. Dry in Summer
SKETCH PLAN
OF
SMALL MINOAN PORT
AT
TRYPETÌ
Chasm
× Minoan Sherds

Fig. # 303

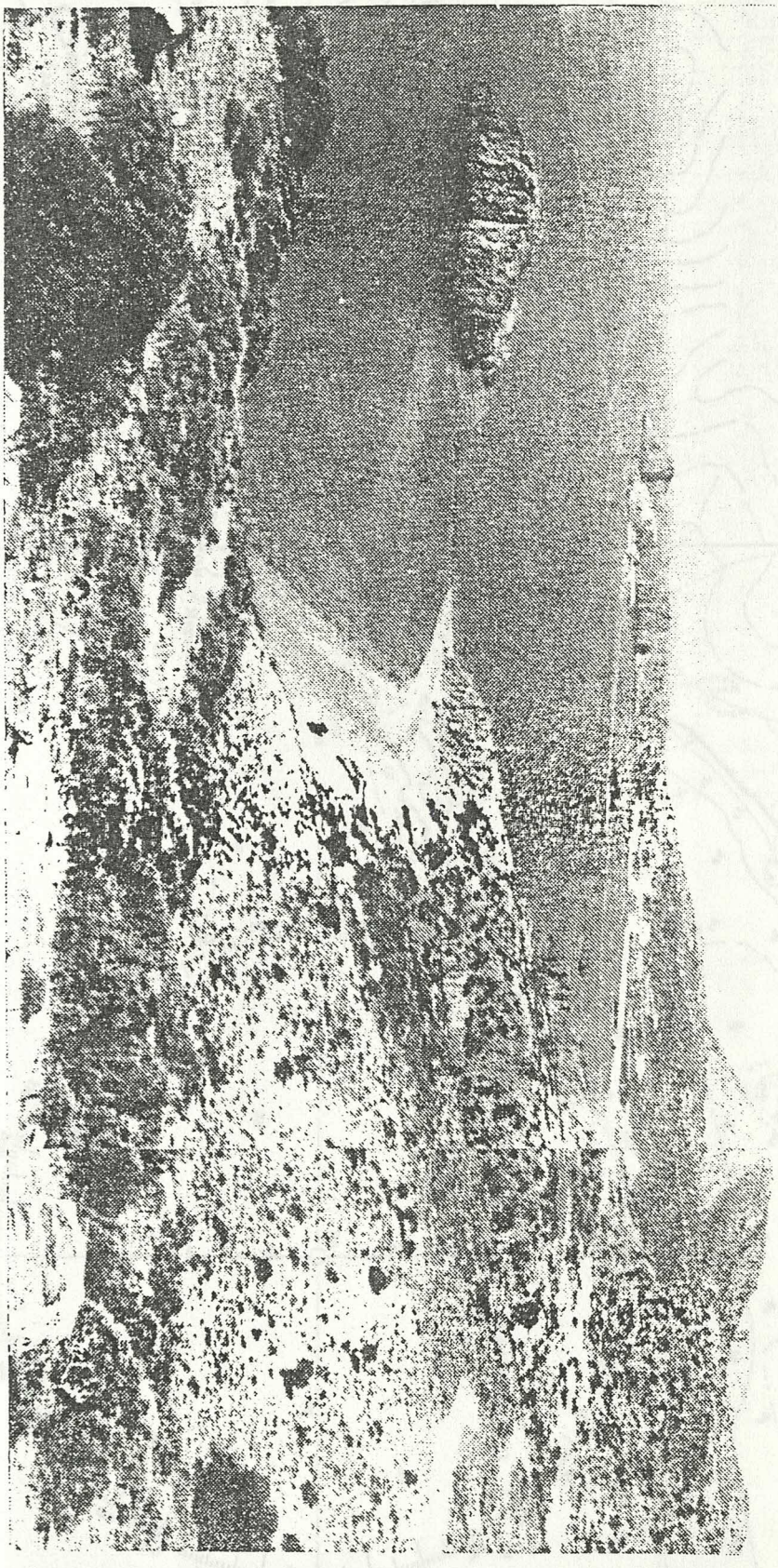


Fig. # 304

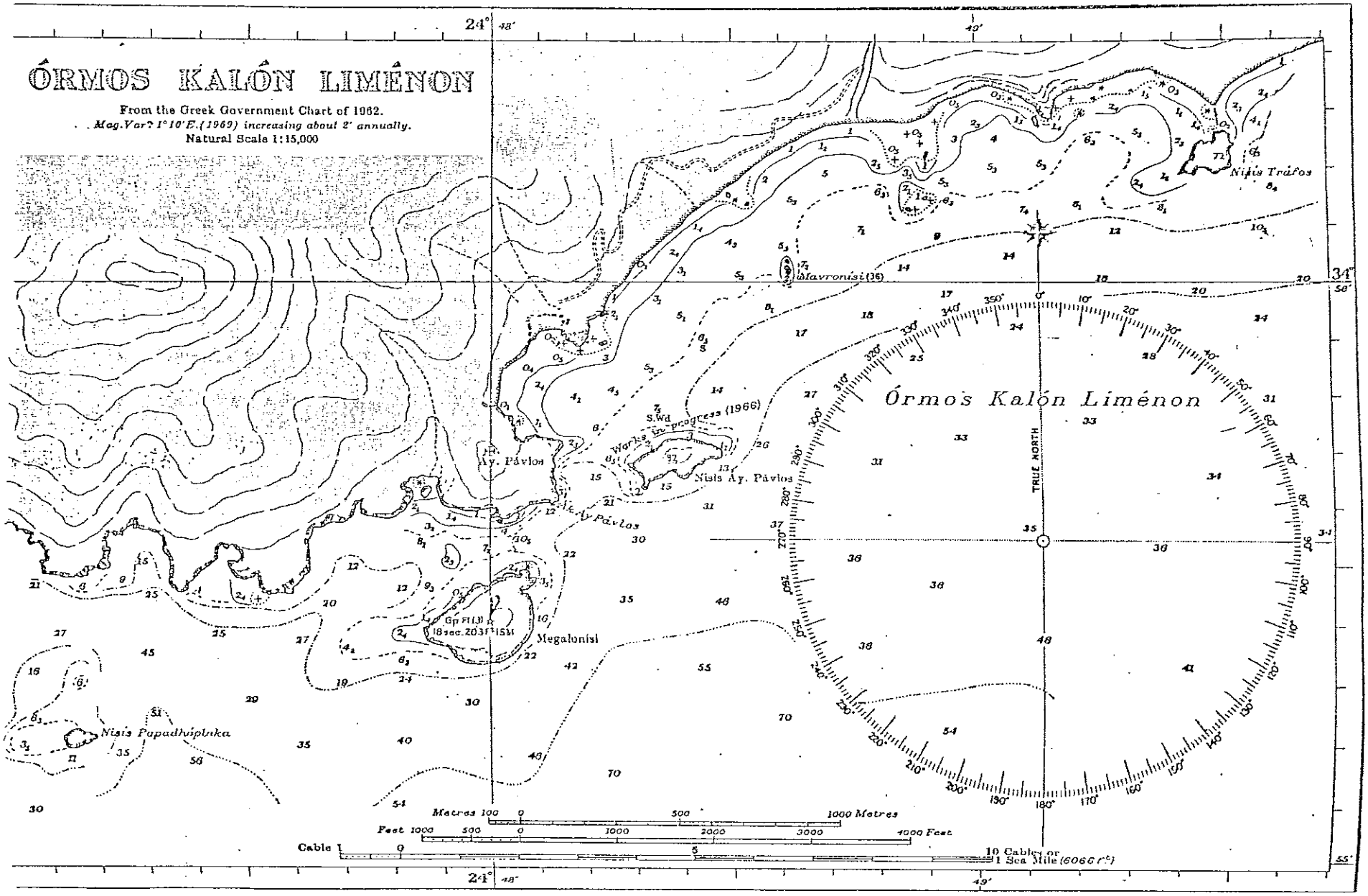

ÓRMOS KALÓN LIMÉNON
From the Greek Government Chart of 1962.
Mag.Var? 1°10'E.(1969) increasing about 2' annually.
Natural Scale 1:15,000
Órmos Kalón Liménon
Nisís Tráfos
Mavronísi (36)
Ay. Pávlos
Nisís Ay. Pávlos
S.Wd
Megalonísi
Nisís Papadhiplaka
TRUE NORTH
Metres 100 0 500 1000 Metres
Feet 1000 500 0 1000 2000 3000 4000 Feet
Cable 0 5 10 Cables or 1 Sea Mile (6066 ft)

Fig. # 305

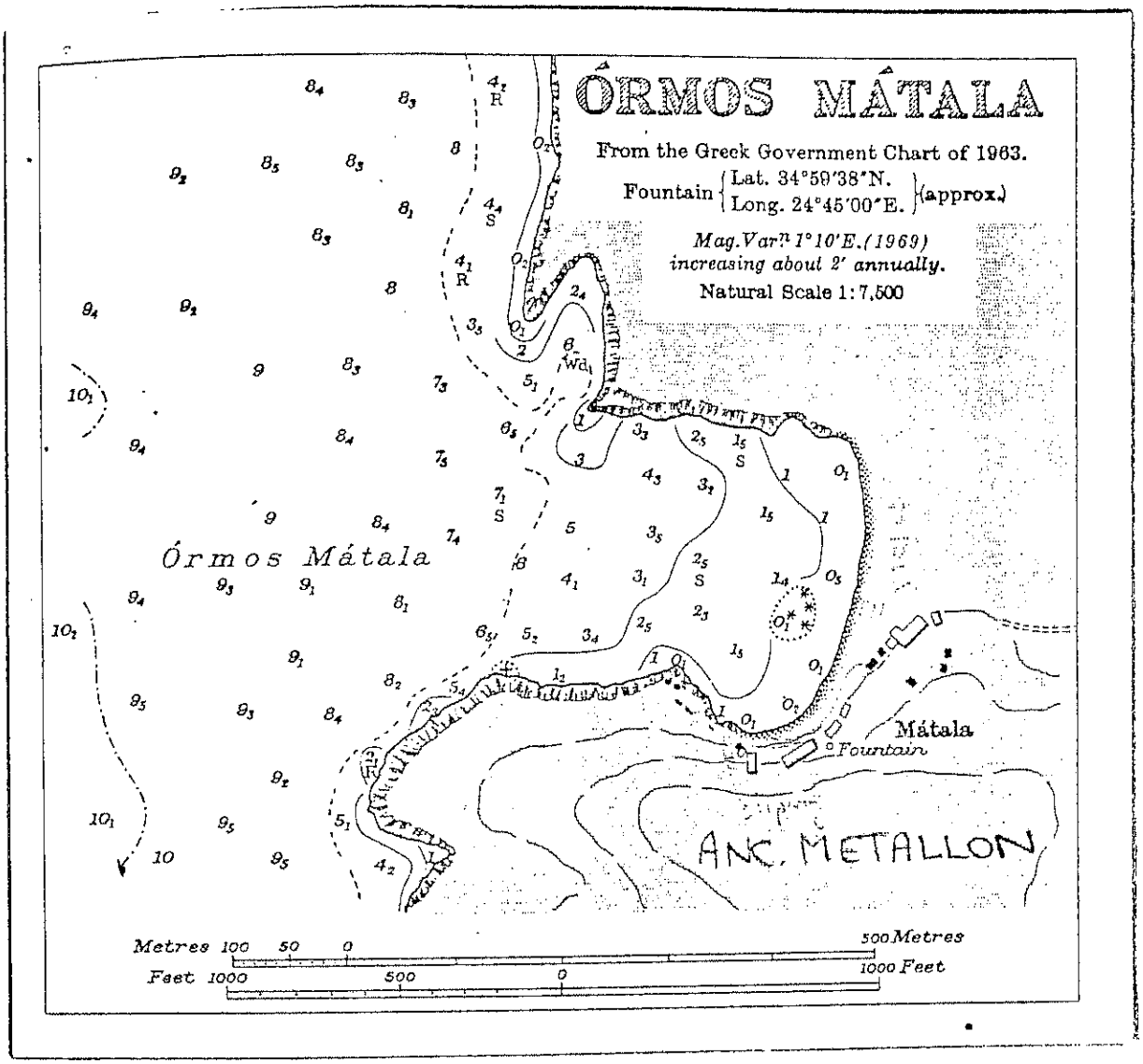

ÓRMOS MÁTALA
From the Greek Government Chart of 1963.
Fountain { Lat. 34°59'38"N. Long. 24°45'00"E. } (approx.)
Mag.Varn 1°10'E.(1969)
increasing about 2' annually.
Natural Scale 1:7,500
Órmos Mátala
Mátala
Fountain
ANC. METALLON
Metres 100 50 0 500 Metres
Feet 1000 500 0 1000 Feet

Fig. # 307

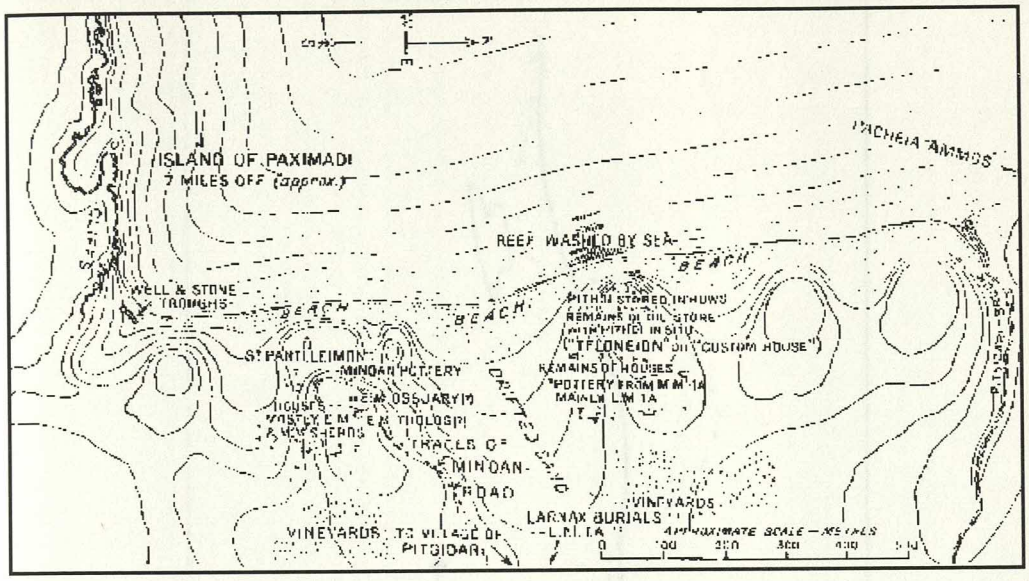



Fig # 308

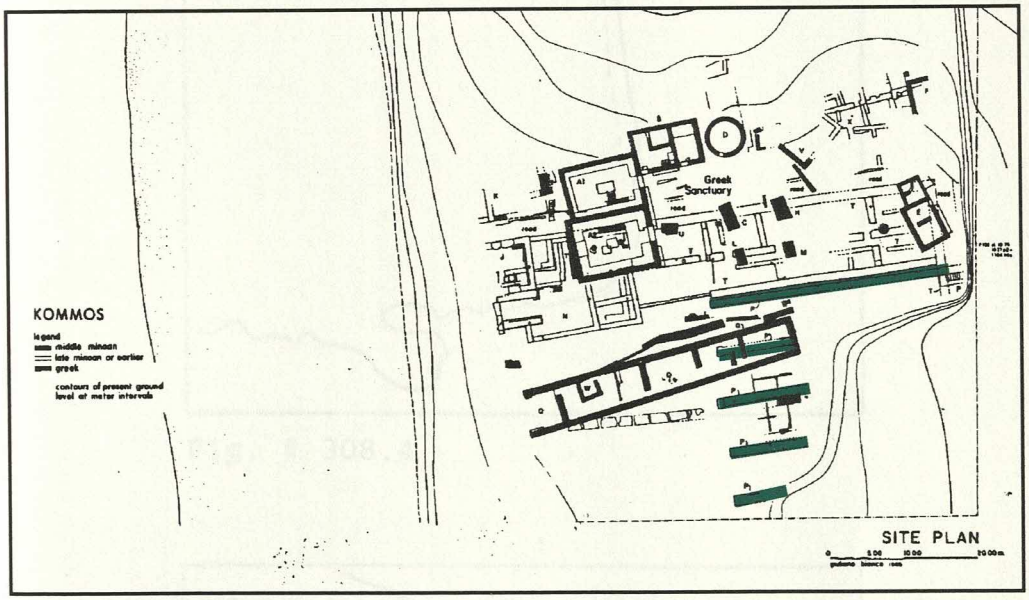



Fig # 308.1

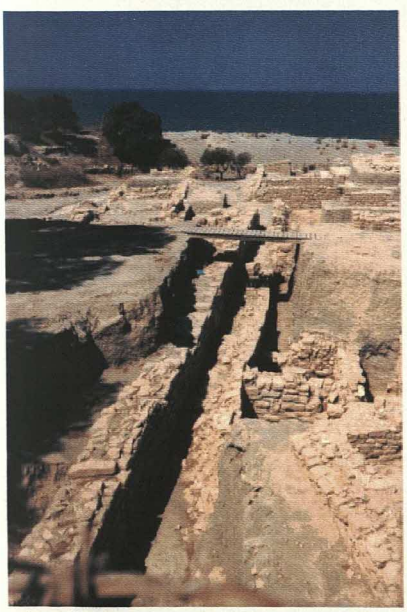


Fig # 308.2



Fig # 308.3

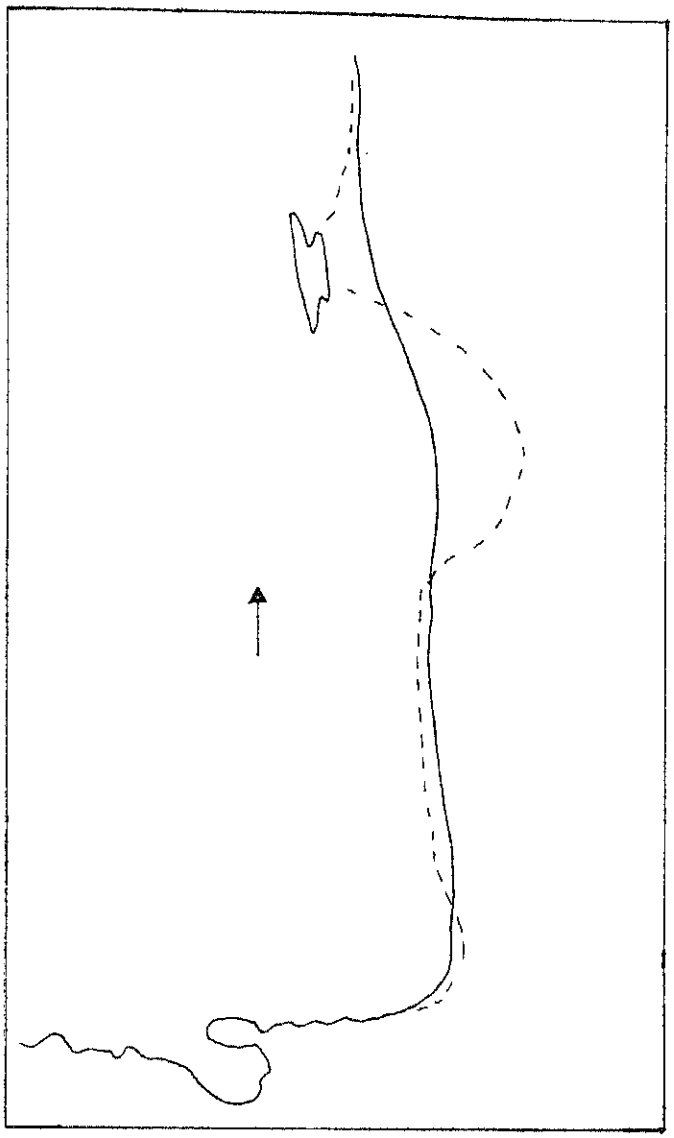


Fig. # 308.4

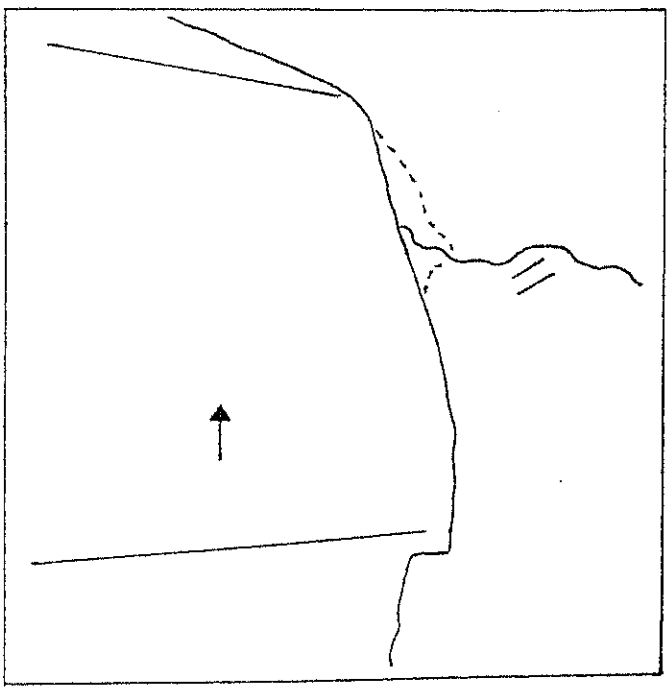


Fig. # 309

MADARA
MTS

IDHRI
MTS

DHIKTI

Dhio
260
Cape Dia
261
Panagia Point
262
Gulf of Iraklion
263
Mt Stromboli
IRAKLION
264
Knossos
Mt Iukta
River Kairatos
River Kairatos
265
266
Ak Khersonisos
Ak Dhrapanos
267
Kolpos Malion
268
269
Trapani Point
Ak Ay Ioannis
270
Khersonisos Spinalongas
271
Ak Pleora
KOLPOS
MIRABELO
272
Ay Nikolaos
Ak Kastellos
277
N. Petra
276
Makhites
278
Ak Faneromeni
Ak Vamvakia
O. Sitias
Sitia
279
280
281
Ak Sidheros
282
283
Tenda Bay
Cape Mavro
284
285
Kolpos
Grandes
286
Island of Elasa
Cape
Tenda
287
Grandes
Island
Ak Ploka
288
O. Karoumbes
289
Armathia
Bay of Vlichada
KASOS
Bay

WESTERN
TAURUS
MOUNTAINS

KINIK
PLAIN

LYCIAN PENINSULA

SIMI

Kanaburun

RHODES CHANNEL

Triandа

ALINIA

KHALKI

RHODOS

Vlika Bay

Kizil Br.

Boycegiz

Koycegiz Golu

Dalaman Nehir

Dalyan Br.

Dalyan

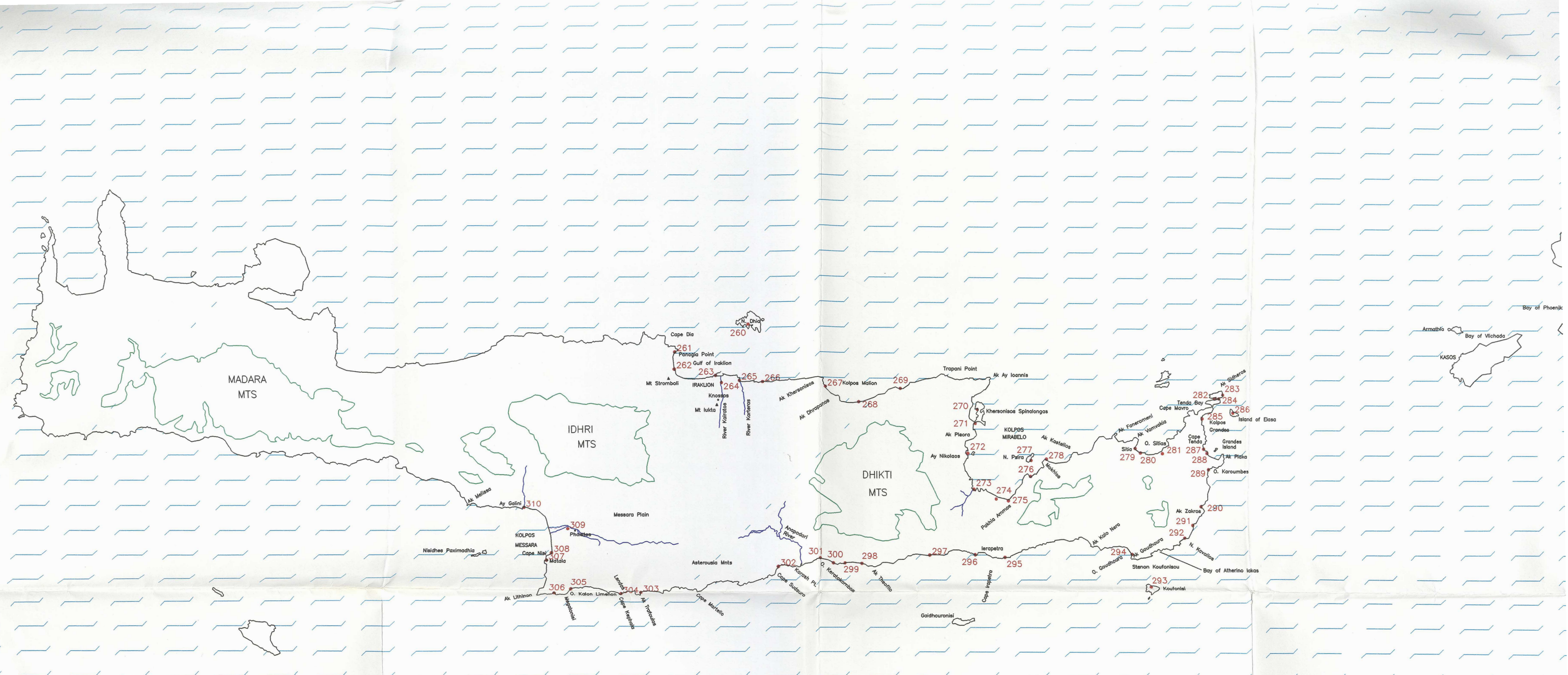
Dalyan Kanal

Dalyan Ic Kanal

Dalyan Ic Kanal

Dalyan Ic

# MAIN MAP (North West Quadrant)



SARO

Tristoma Bay

KARPATHOS

Bay of Phoenix

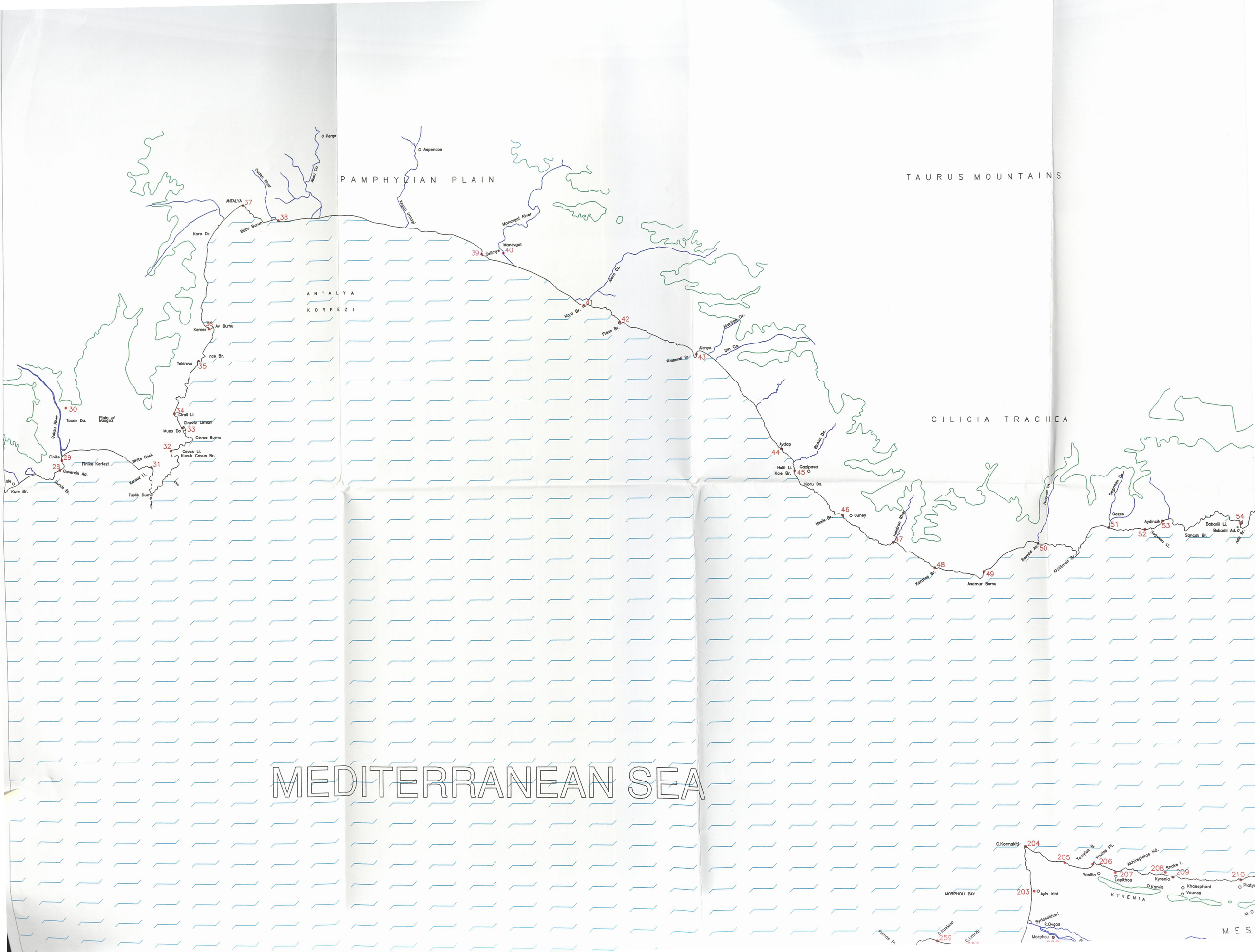
Armathia

Bay of Vlichada

KASOS

MEDITERRANEAN SEA

N


PAMPHYLIAN PLAIN
TAURUS MOUNTAINS
ANTALYA KORFEZI
CILICIA TRACHEA
MEDITERRANEAN SEA
MORPHOU BAY
KYRENIA
O Perge
Aksu Ca.
Duden River
ANTALYA
37
Kara Da
38
Baba Burnu
O Aspendos
Magyu Irmagi
Manavgat River
Manavgat
39
Selimye
40
Alara Ca.
41
Kara Br.
42
Fidan Br.
Alaiyye De.
Alanya
Din Ca.
Kalecardi Br.
43
Kemer
36
Av Burnu
Ince Br.
Tekirova
35
34
Cirali Li
Cirali Limani
Musa Da
33
Cavus Burnu
32
Cavus Li.
Kucuk Cavus Br.
Finike
29
30
Tocak Da.
Plain of Basgoz
Goksu River
28
Guvercin Ad.
Finike Korfezi
White Rock
31
Karaoz Li.
Tasilk Burnu
Kum Br.
Bumbu Br.
Aydap
44
Bicakci De.
Hasi Li.
Kale Br.
45
Gazipasa
Koru Da.
46
Guney
Kesik Br.
Kestros River
47
Karadas Br.
48
49
Anamur Burnu
Bozpasi Ad.
50
Kizilliman Br.
Bozyazi De.
Degirmen De.
Gozce
51
Aydincik
53
52
Soguksu Li.
Sancak Br.
Babadil Li.
Babadil Ad.
54
Ada Br.
C.Kormakiti
204
205
Yeorjios B.
Vorilias Pt.
206
Akhirepiotos Hd.
Snake I.
208
209
210
Vasilia
207
Lapithos
Kyrenia
Karvia
Khasaphani
Vounos
Platyr
203
Ayia Irini
Syrianokhari
R.Ovgos
Morphou
C.Kokkino
259
C.Limniti
Plomos Pt.
M E S

TAINS

RACHEA

CILICIA PEDIAS/PLAIN

ADANA PLAIN

MISIS DAG

ANAMUS MTS

GAVUR MTS

PLAIN OF ISSUS

BAYLAN PASS

AMUQ PLAIN

ANTAKYA KORFEZI

İSKENDERUN KORFEZI

JEBEL ANSARIYEH

KARPAS MOUNTAINS

KYRENIA MOUNTAINS

MESSARIA PLAIN

70 ADANA

69 Tarsus

Rhegma Lake

Akyatah Golu

68 Kazanli

MERSIN

67

Viransehi 66

Mersin Korfesi

Kalli Dre.

Karaka Dre.

Tamlik

65 Erdemli

Deli Br.

SEYHAN DELTA

Seyhan Nehri

Tuz Golu

Akyatan Golü

Fener Br. 71

Karatas

72

Ceyhan Nehri

Bebeli CEYHAN DELTA

Akyatan Lagünü

Portakal Br.

74

75 Kara Huyuk

Deli Co.

76 Kinet Huyuk

77 Payas

Yumurtalik

Ayas 73

Bittern Pt.

Yumurtalik Li.

Ceyhan Bogazi

78 ISKENDERUN

79 Arsus

Resulhinzir Burun

Karaklises Dre.

Beric Dre.

AMUQ PLAIN

Amuq Golu

ANTAKYA 82

Orontes River

80 Suveydiye

81

Qasab Bay 83

Mt Casius

Cebeli Akra

Pigeon I. 84

Mt Anticasius

Ras el Basit 85

86

Ras et Fasart 88 87

Borj Islam

Minet el Beida 90

Ras Ibn Hani 91 89

92

93

Nahr el Kabir

94

95 Nahr er Rous

96 Jeble

97 Tell Soukas

98

99

100 Banyas

Nahr Es-Sane

Ra's al Burj

Orontes River

Susanoglu 61

Akdam Li.

Kizkalesi 62 63

Ayas 64

59 Silifke

Goksu Nehri 60

58

57 Agalimani

Tasucu Korfezi

Kd. Golu

Paslanmaz Golu

Incekum Br.

55

56 Ovacik Ad.

Dana Ad.

Ovacik Br.

Ovacik Ada Br.

54

Babadil Li.

Babadil Ad.

Ada Br.

Sancak Br.

53

51 Aydincik

52 Bogazkale Li.

Gozce

Dagpinari Dre.

Bayrasi Ad. 50

Kizilman Br.

Bayrasi Br.

204

205 Yeroskipos B.

Vouna Pt.

206

Vasilia

207 Lapithos

Akhirepiskopos Rd.

208 Kyrenia

Snake I. 209

Khasaphani

Younos

210 Platymatis

Stazousa Pt. 211

Akanthou

212

213 Dhavlos

214 Ayios Photios

Korovia

222

Ronnas B.

215 Ayios Thyrsos

C.Plakoti

216 Ayios Philos

Risokarpaso

220

221 Kheloues Pt.

Exarkhos B.

217

Ayios Dimitrios

218

Galounopétra Pt.

219

CAPE ANDREAS

223 C.Elaea

FAMAGUSTA BAY

Salamis

Enkomi 224

River Pedhieos

R.Ovgos

Syrianokhari

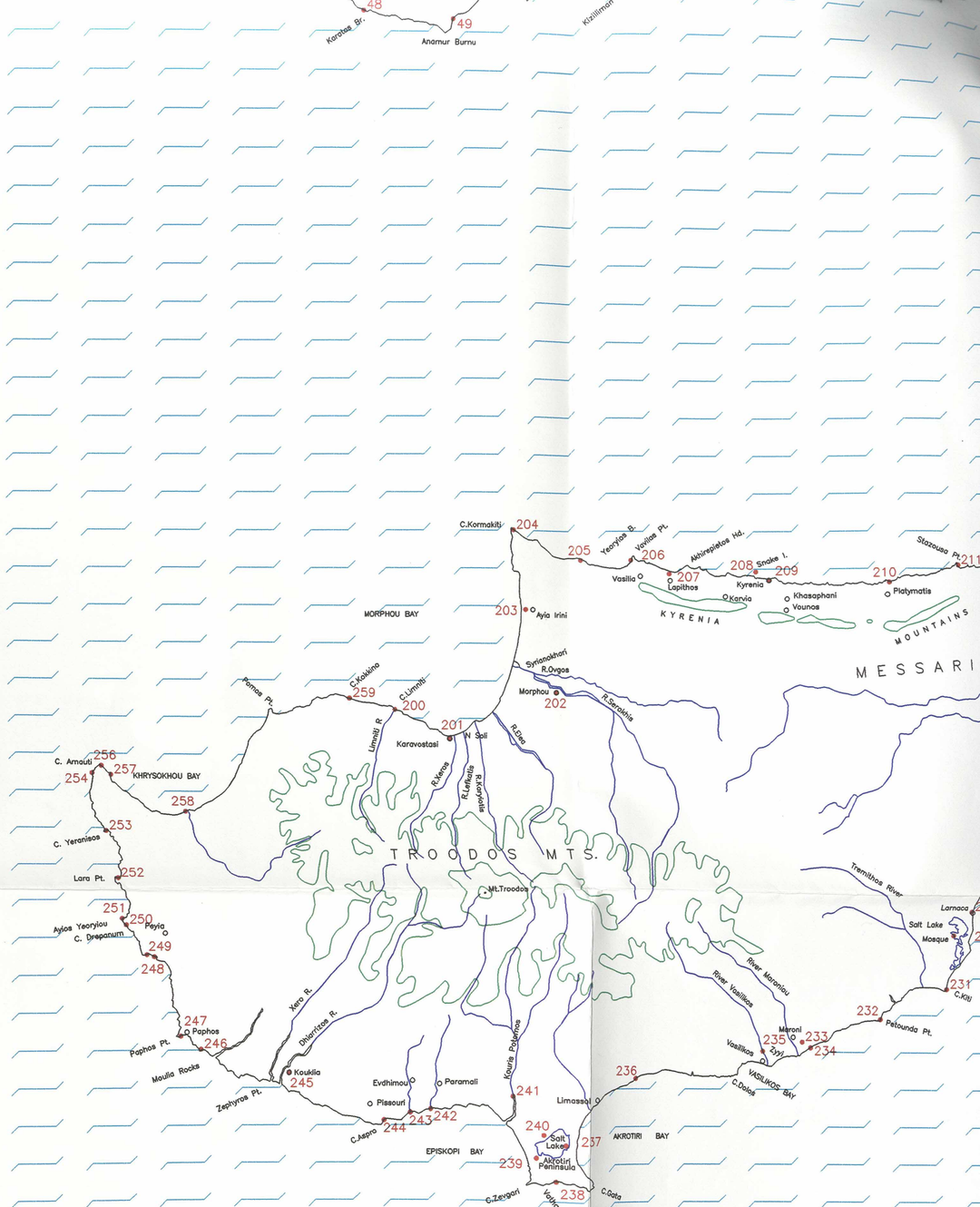
Morphou 202

R.Serrakhis

Ayia Irini

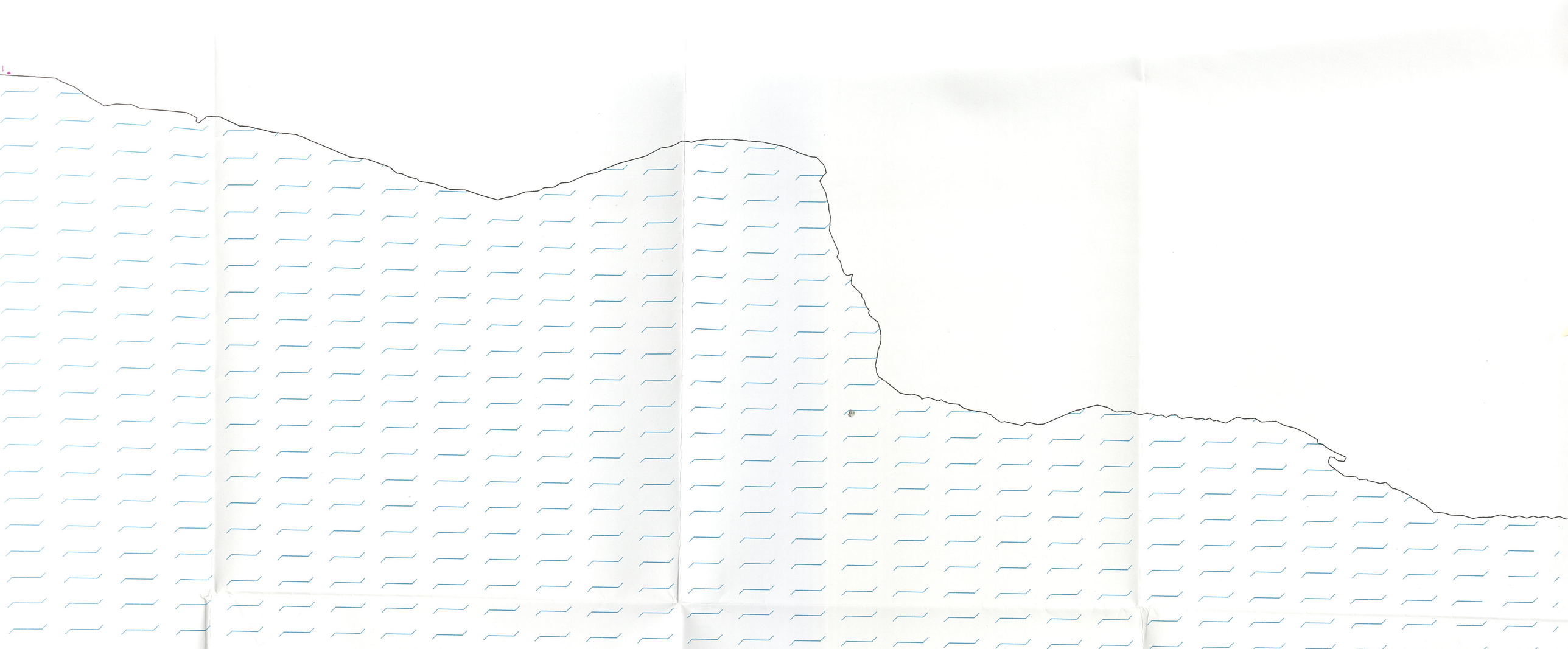
03

MEDITERRANEAN SEA




# MAIN MAP (North East Quadrant)

ANTAKYA
KORFEZI
Mt Casius
Çebeli Akra
Mt Anticasius
Qasab Bay
Pigeon I.
Ras el Basit
Ras el Fasori
Borj Islam
Minet el Beida
Ras Ibn Hani
Nahr el Kebir
Nahr er Rous
Jebla
Tell Soukas
Nahr Es-Sane
Ra's al Burj
Banîyas
Ras Hasan
Tartus
Jazirat Arwad
Nahr Marqiah
Plain of Akkar
N el-Kebir
Nahr el Aroka
Tripoli-Roads
Nahr el Baird
Jabal Tourbol
EL MINA
TRIPOLI
El Qalamun
IL HURI BAY
Enfeh
Chekka
Ras esh Chaqaa
Ras Sei'ata
BATROUN
Nahr Abou Ali
JBAIL (Byblos)
Nahr Ibrahim
Ras Ma'ameltain
Baie de Jounie
JOUNIE
Ras et Tair
Ras el Kelb
Nahr el kelb
Ouadi Baraliya
Nahr el Kelb
St. Georges Bay
Ras Beyrouth
BEIRUT (Beyrouth)
MOUNT LEBANON
LEBANON MOUNTAINS
JEBEL ANSARIYEH
Orontes River
CAPE ANDREAS
Galounopétra Pt.
Aylos Dimitrios
Exarkhos B.
Aylos Philos
Ronnos B.
Risokarpaso
Khelones Pt.
Aylos Thyrsos
C.Plakoti
KARPAS MOUNTAINS
Korovio
Aylos Photios
Dhavlos
Akanthou
Stazousa Pt.
Yeorjios B.
Vasilia Pt.
Akhirepiotos Hd.
Snake I.
Vasilia
Lapithos
Kyrenia
Kervia
Khasaphani
Vounos
Platymatis
KYRENIA MOUNTAINS
MESSARIA PLAIN
River Pedhieos
R. Serakhis
C.Elaea
FAMAGUSTA BAY
Salamis
Enkomi
Famagusta
River Yialias
C.Greco
Ayia Napa
C.Pyla
Dhekelia
Larnaca
LARNACA BAY
Salt Lake
Mosque
Tremithos River
River Maroniou
River Vasilikos
C.Kiti
Petounda Pt.
Meroni
Zyyi
Vasilikos
VASILIKOS BAY
C.Dolos
AKROTIRI BAY
C.Gata
T S.



MEDITERRANEAN SEA

199

Mersa Matruh

198

Ras Alam el Rum

199

# MAIN MAP (South West Quadrant)

199

Meras Matrun

198

Ras Alam el Rum

Gulf of Kanayis

193

196

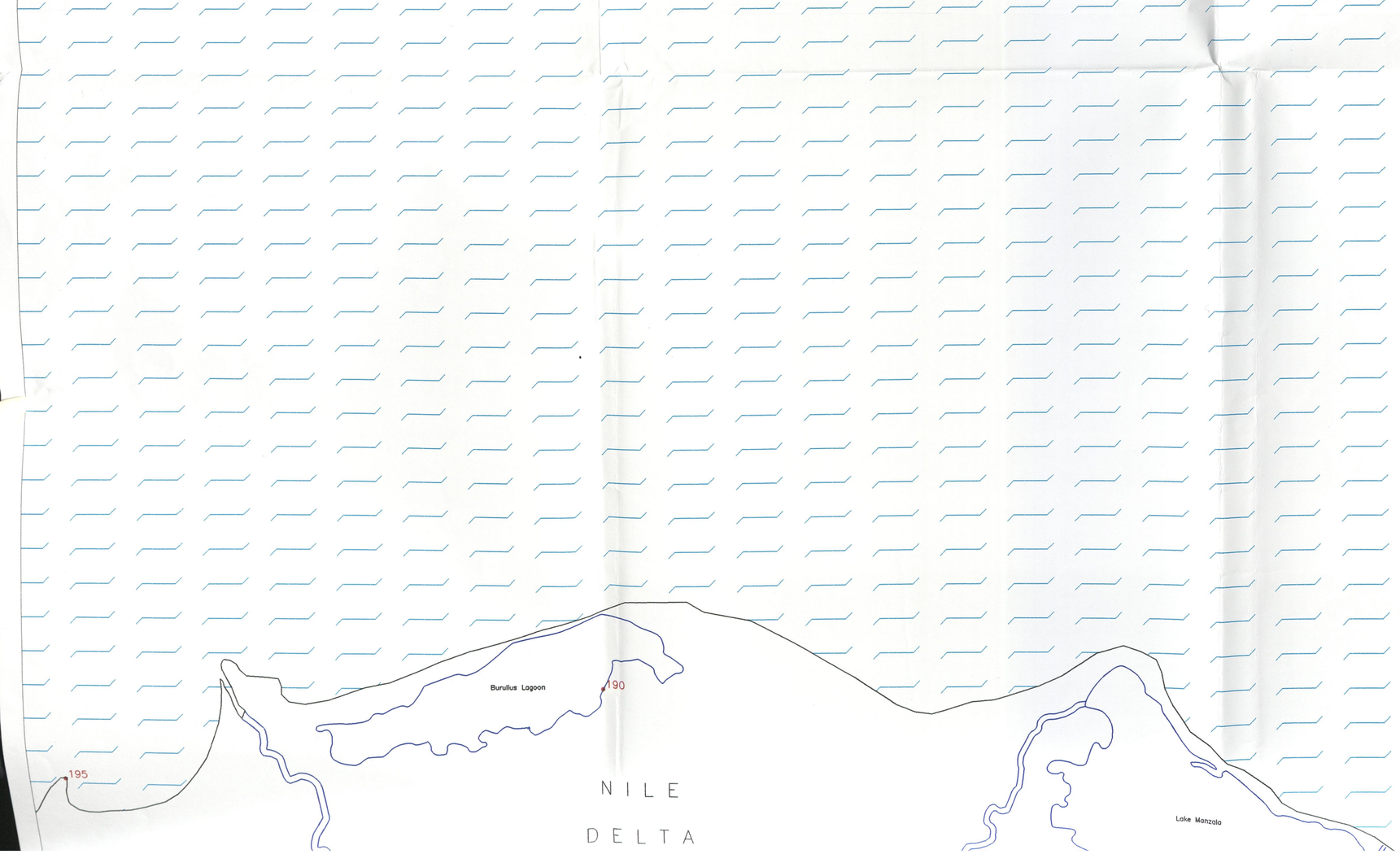
197

Arabs Gulf

El Hamman

N

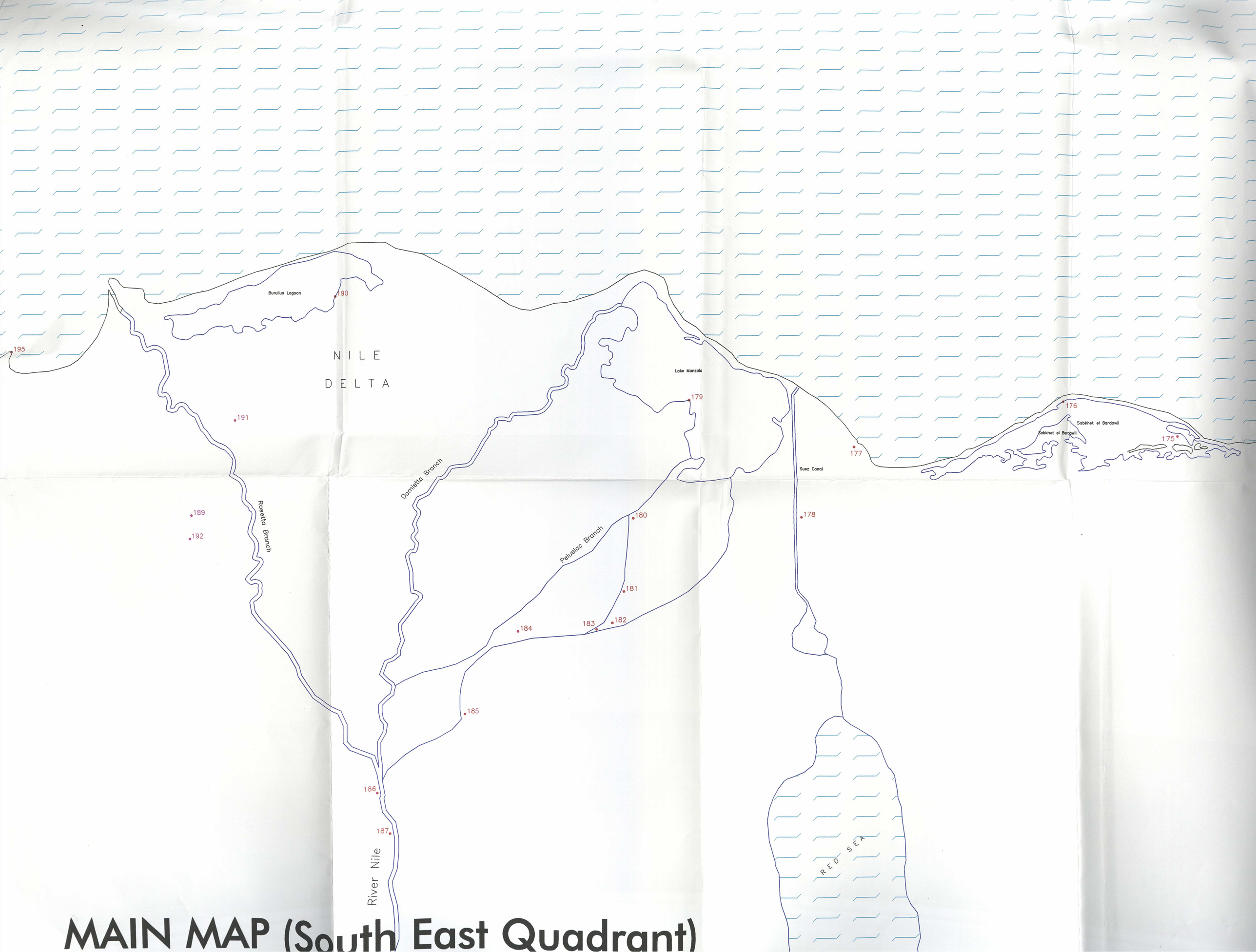
MEDITERRANEAN SEA



SEA

121
Nahr el Awauli
SAIDA (Sidon)
122
123
Nahr es Zahrani
Ras ech Chaq
Sarafand (Sareptal)
124
Ras Minat Bou Zeid
Nahr el Litani
SOUR (Tyre)
125
126
Ras el Biyada
127
129
128
130
Ras Hanqra
River Betzet
River Keziv
132
131
Achzib
River Sha'al
Nahariyeh
133
River Ga'aton
Acco
134
River Na'ama
Haifa Bay
139
138
135
T. Shiqmona
137
T. Abu Hawam
136
140
141
142
Nahal Oren
Afridi
143
144
River Mer'arot
145
Dor (et-Tantura)
River Dalia
146
147
River Taninim
148
149
Caesarea
150
Hadera
151
River Hadera
152
153
Alexander River
154
Poleg River
155
156
Rishpon
157
T. Makmish
159
T.el-Qasileh
158
160
161
Joppa (Jaffa)
162
Ayalon River
163
Sorek River
T.Mor
164
Ashdod
165
166
Ashkelon
Lachish River
167
River Shiqma
168
Gaza
169
170
171
172
River Besor

Sea of Galilee
CARMEL RANGE
SHARON
PLAIN
Jordan River
Yarkon River
River Qishon
Dead Sea




# MAIN MAP (South East Quadrant)

Rishpon
156
T. Makmish
157
159
T. el-Qasileh
158
160
161
Joppa (Jaffa)
162
Yarkon River
Ayalon River
PLAIN
163
Sorek River
T.Mor
164
Ashdod
165
166
Ashkelon
Lachish River
167
River Shiqma
168
Gaza
169
170
171
172
173
River Besor
194
176
Sabkhet el Bardawil
Sabkhet el Bardawil
175
174
El 'Arish
Dead
Sea
River
N