

## COASTAL SETTLEMENT IN CYRENAICA

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(Plates II-IX)

The location of the majority of major sites in Cyrenaica is well established. This has obscured the fact that our knowledge of the detailed topography of the area is in reality highly fragmentary, and can only be increased by detailed work in the field. The purpose of this article is to review the archaeological evidence from the area between Benghazi and Derna as it has been collected by the authors in recent years, and to give an account of its more important implications. On this basis one may examine the complex interrelation of local climate and geography that has controlled the development of settlement between the northern edge of the Cyrenaican plateau and the sea.

The administrative unit known to the Romans as Cyrenaica lies on the coast of North Africa between longitude 19° east and 24° east. Its southern limits were never defined, but any route to the south was effectively blocked by the Calanshu sand sea and the wastelands of the Jebel Zelten. The only part of Cyrenaica suitable for settlement is the coastal strip, or 'sahel',<sup>1</sup> at the northern extremity between Benghazi and Derna, together with the adjoining limestone plateau (the Jebel Ahkdar), that rises in two successive escarpments to c. 800 m.

From this height it falls gently away over 100 km towards the southern steppe and desert region without any clearly defined escarpments (Fig. 3). The plateau's fertility is ensured by an average annual rainfall of c. 50 cm. Although there are several minor wadis running south, the plateau is mainly drained by deep ravines, such as the Wadi Kuf, that run east-west before cutting northwards through the escarpments to meet the sea, thereby breaking up the continuity of the plateau. To the east and west the Marmaric and Syrtic deserts, although not impassable, determined that the sea on the north remained the most viable means of communication with the rest of the North African mainland. Isolated thus from direct contact with the remainder of the African continent, Cyrenaica was unable to share with Egypt and Tripolitania in the wealth derived from easy penetration of the lands to the south. Communication lines in Cyrenaica have run east-west throughout recorded history, until the discovery of oil in the Calanshu region in the early 1960's necessitated the construction of a road south from Tobruk. During the Arab period, the province was an important staging-point on the route from Egypt to the Mahgreb. Prior to this Cyrenaica was an outpost of Greek and Roman civilization on the southern shores of the Mediterranean, assuming a strategic importance only in time of general war when a fleet based on Apollonia was in a position to menace the sea-lanes between Egypt and the west. Both Caesar and Octavian appear to have maintained large fleets in Cyrenaica during the civil wars.<sup>2</sup> A similar situation appears to be developing in the area since 1970.

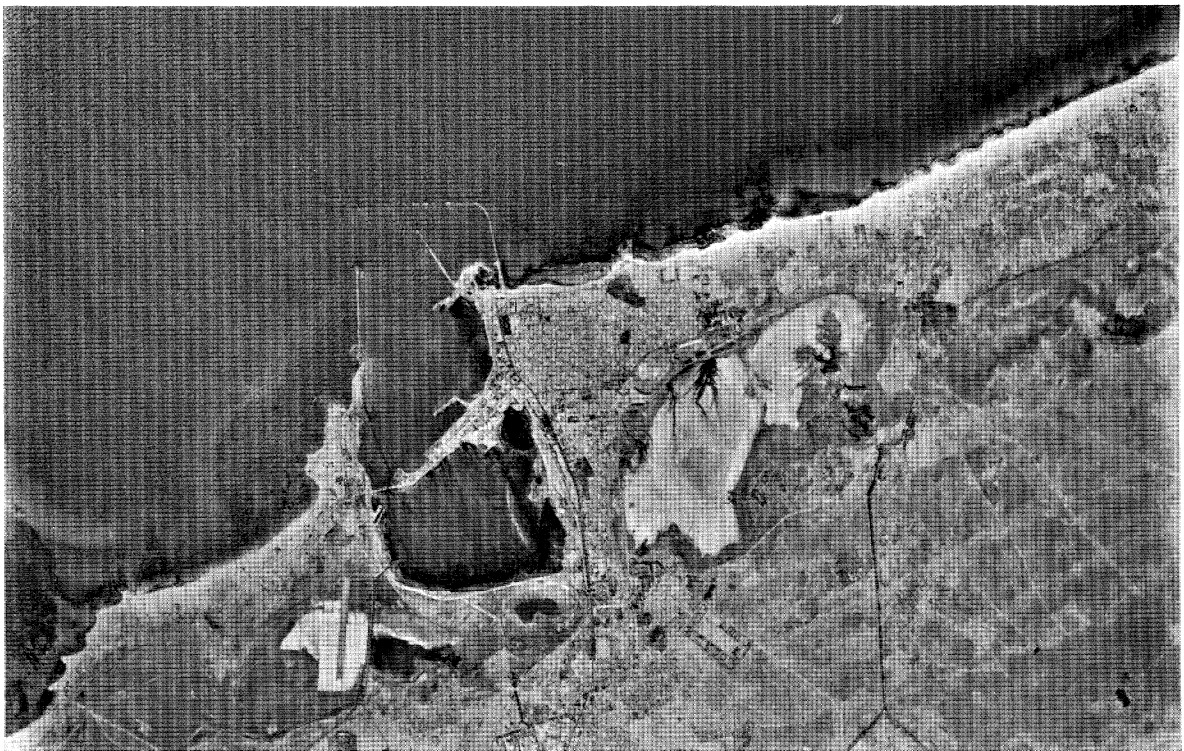
The Cyrenaican *sahel* can be divided into three distinct zones. The first of these extends westwards from Tocra, where the lower escarpment of the jebel reaches the sea.

\* Acknowledgements: The authors are grateful to the British Academy, the British School at Rome and the British School at Athens for grants towards the cost of excavation at Euhesperides and Tocra, which prompted this ancillary field survey. The Libyan Department of Antiquities also contributed towards the expenses, and we are grateful to Mr. Awad Sadawya (at the time Controller of Antiquities for Cyrenaica and now Director-General of Antiquities in the Libyan Arab Republic) for the personal interest he took in the work. Of the archaeological staff in 1968 and 1969 it is a pleasure to record our thanks to: Mrs. V. A. Jones, Dr. and Mrs. A. R. Birley, Mr. D. G. Bird, Miss R. N. Deeves and Mr. Q. Terry. The Inspectors of the Department of Antiquities, Ali Salem Letric (Benghazi), Fadlallah Abdussalam (Tocra) and Abdussalam Bazama (Tolmeta), all played an important part in the programme by contributing their personal knowledge

at one time or another. Mrs. J. Lockett kindly typed the text.

<sup>1</sup> The Arabic term 'sahel' signifies any strip of land lying between mountains and the sea, and it is used throughout this article as the most convenient way of denoting the coastal strip. English transliterations of Arabic place names are not standardized, and the spellings adopted here are those of the Army Map Series 1:50,000 Sheets covering coastal Cyrenaica. The most useful account of the area's topography, climate and tribal structure will be found in E. Evans-Pritchard, *The Samusi of Cyrenaica* (1949), 1 ff., cf. most recently A. Thwaites, *The Deserts of Hesperides* (1969), esp. 27 ff.

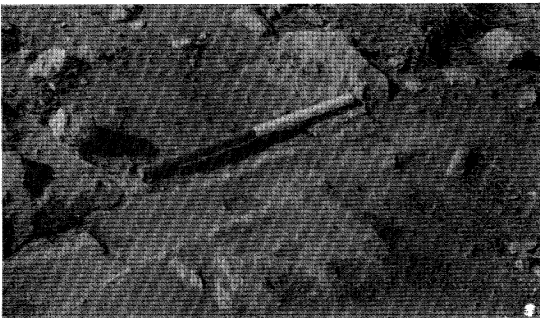
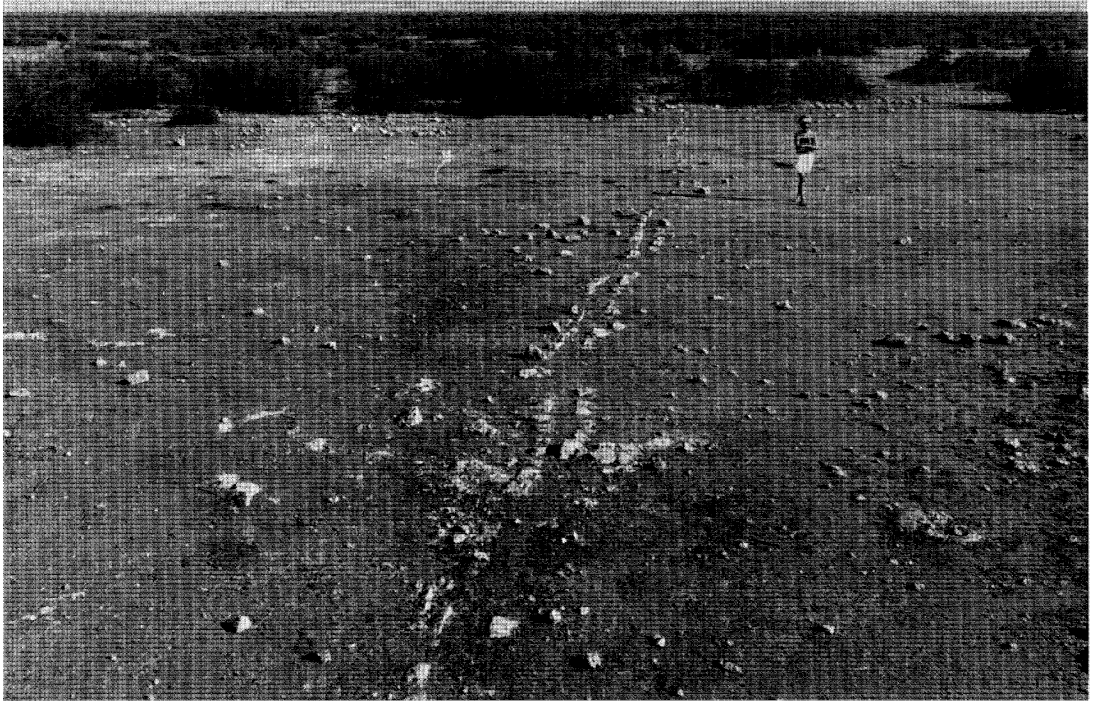
<sup>2</sup> For a discussion see A. Alföldi, 'Commandants de la flotte romaine stationnée à Cyrène sous Pompée, César et Octavien', *Mélanges offerts à J. Carcopino* (1966), 25 ff.



1. OBLIQUE VIEW OF THE BENGHAZI AREA FROM THE WEST ACROSS THE MODERN HARBOUR. THE OLD NUCLEUS OF BENGHAZI OVERLIES THE SITE OF BERENICE. THE SITE OF EUHESPERIDES (ARROWED) IS AT THE EASTERN EDGE OF THE SILTED LAGOON OF THE SEBKA ES SELMANI (see p. 65-6)

2. A VERTICAL AIR PHOTOGRAPH OF THE BENGHAZI AREA SHOWING THE PRESENT HARBOUR AND THE SEBKA ES SELMANI (see p. 65-6)

*Photographs by Hunting Surveys. Copyright reserved*



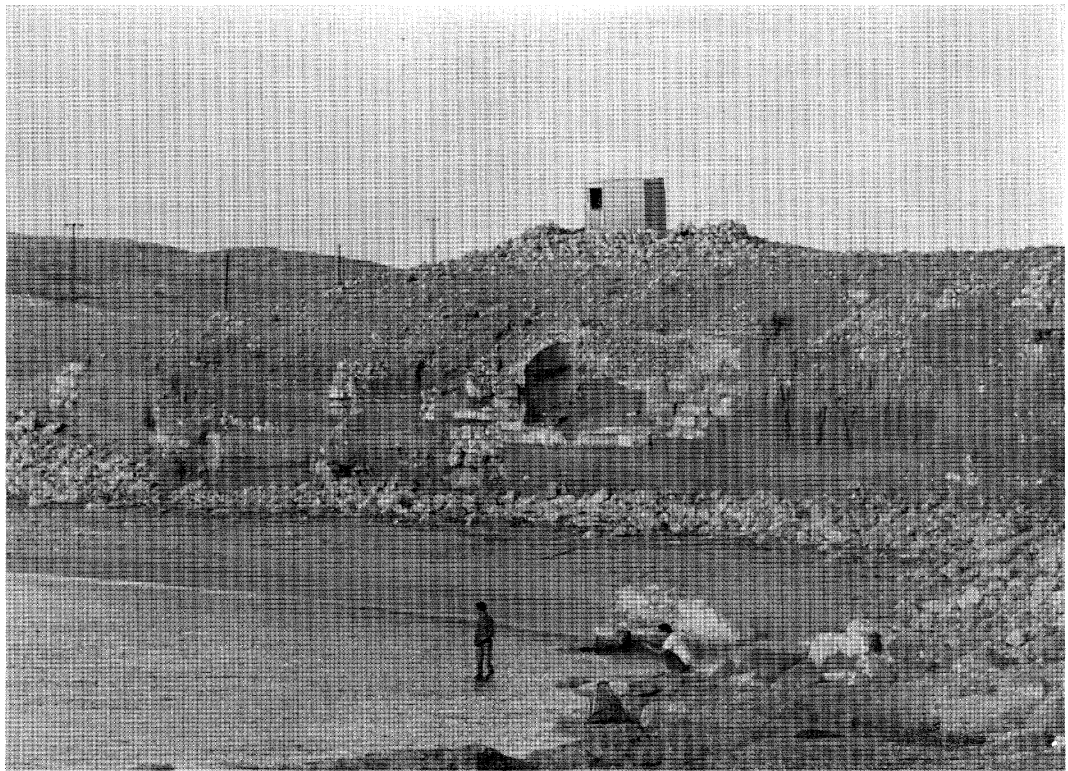
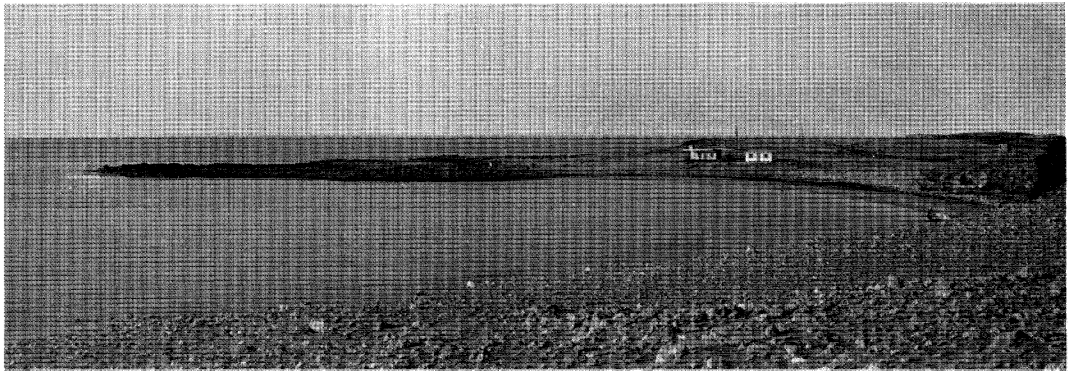
I. HADRIANOPOLIS: PART OF THE MAIN QUARRY. THE CITY SITE LIES IN THE BACKGROUND NEAR THE PRESENT MOSQUE (CENTRE) (see p. 67 f.). 2. LINE OF THE AQUEDUCT SHOWN BY DOUBLE LINE OF STONES FORMING THE *SPECUS*: IN THE SCRUB *c.* 5 KM SOUTH OF THE CITY SITE (see p. 68 f.). 3. ROCK-CUT SECTION OF THE AQUEDUCT WITH THE MORTAR OF THE *SPECUS* SURVIVING *in situ*: *c.* 1 KM SOUTH OF THE CITY SITE (see p. 68 f.). 4. INSCRIPTION FROM SMALL QUARRY, TOMB III (see p. 69)

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1. PHYCUS (MOD. ZAWIET EL HAMAMA): GENERAL VIEW FROM THE CREST OF THE FIRST SCARP TO THE SOUTH-WEST (see p. 73 f. with fig. 17). THE SETTLEMENT SITE LIES ON THE PROMONTORY, THE ZAWIA (MOSQUE) TO THE FAR RIGHT  
 2. PHYCUS: VIEW OF THE HARBOUR SHOWING ROCK-CUT TANKS IN THE FOREGROUND ABUTTING THE WAREHOUSES (cf. p. 74 and fig. 7) WITH THE ZAWIA IN THE FAR RIGHT

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1. MERSA EL HANIA (AUSIGDA?): GENERAL VIEW ACROSS HARBOUR AREA (see p. 74 and fig. 8). THE TOWN SITE LIES ON THE RIGHT
2. MERSA EL HANIA: LIMESTONE WALL LYING BELOW STRATUM CONTAINING POTTERY SHERDS OF 5TH-6TH CENTURIES (see p. 74)
3. MERSA EL HANIA: VAULTED CISTERN SHOWING IN THE ERODED NORTHERN FACE OF THE TOWN SITE (see p. 74)

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The wedge-shaped plain so formed reaches 120 km to a line south-west from Benghazi where the *jebel*, at that point 30 km from the sea, swings away to the south and the *sahel* merges with the eastern edge of the Syrtica.<sup>3</sup> A similar overall pattern occurs in eastern Cyrenaica, where the inhabitable coastal fringe east of Derna gradually merges with the Marmaric desert. It has become commonplace to write of the paucity of good harbours offering shelter from the prevailing onshore winds (generally from the north-west) as the factor governing settlement in coastal Tripolitania and Cyrenaica. This is correct so far as

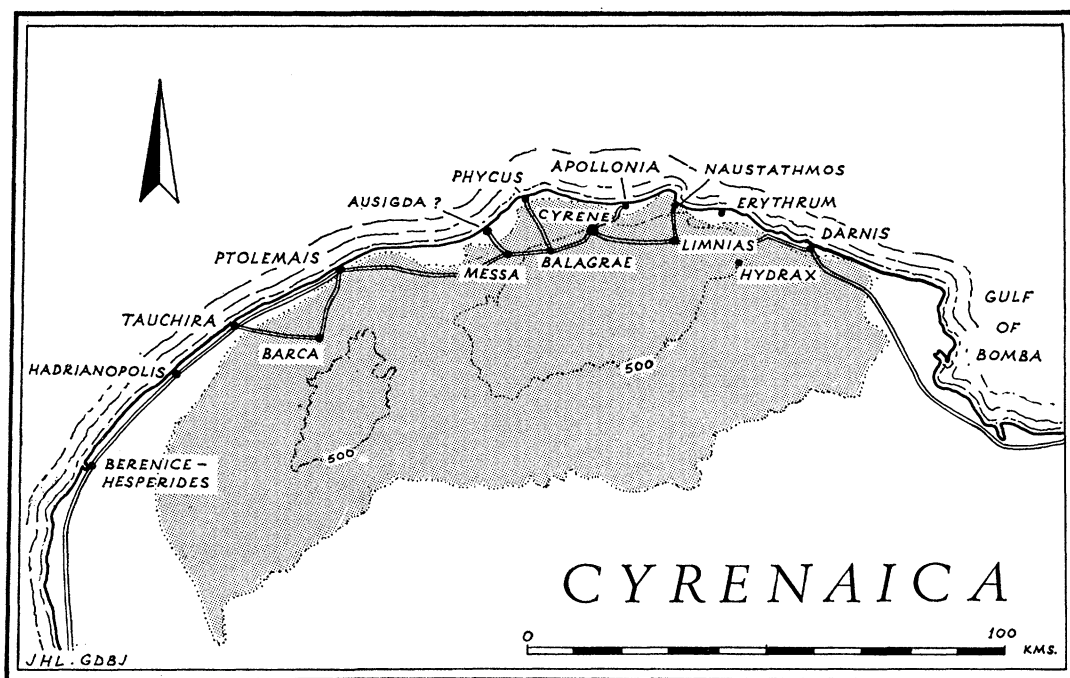


FIG. 3. GENERAL MAP OF CYRENAICA. CONTOURS AT 200 m AND 500 m

concerns Tripolitania and the two Cyrenaican sectors so far mentioned. The third sector however, the central section of Cyrenaica, where the lower scarp abuts the sea throughout, is in reality very different. Along the deeply indented coast there is no shortage of good harbours. The difficulty lies in securing adequate communications between the litoral and the major settlement-areas on the middle and upper plateaux of the hinterland. This has led to a complex interchange of settlement-patterns along the varying sectors of the Cyrenaican coastline. Generally speaking the need for harbours is dictated in the central sector by the location of the rich farming centres of the middle and upper plateaux. The harbours and associated settlements in turn were affected by such local factors as silting, or the effect of strong onshore winds on a rapidly shelving shore—all this set against background needs of fresh water supplies and cultivable land. Ultimately such geographical elements in the situation helped to shape history, particularly in the Byzantine period, and determined, for instance, the choice of Tocra as the last stronghold of the Byzantine governor against the Arab invasion of A.D. 643.

This survey begins at Benghazi, the major settlement in the area behind the approaches to the Syrtica (Fig. 4). In this case the geographical factors are writ large and have been known in principle for several years. The city of Euhesperides was founded by Greek settlers from Cyrene or Barce perhaps as much as a quarter of a century before 515 B.C. on the northern bank of the sheltered lagoon known as Sebka es Selmani (Fig. 4; Pl. II, 1, 2).

<sup>3</sup> R. G. Goodchild, 'Libyan Forts in South-West Cyrenaica,' *Antiquity* xxv (1951), 131 ff. gives a

summary of the archaeological remains in the area.

The nucleus of the city lay on the slight eminence now occupied by the Moslem cemetery of Sidi Abeid. Sometime during the fourth century B.C. the city was extended south-westward across the dried-up bed of the lagoon by the addition of a suburb laid out on Hippodamean lines. Pottery dated to the sixth century B.C., found stratified in a layer of marine-deposited kaolin during the author's recent excavation beneath one of the Hellenistic insulae,

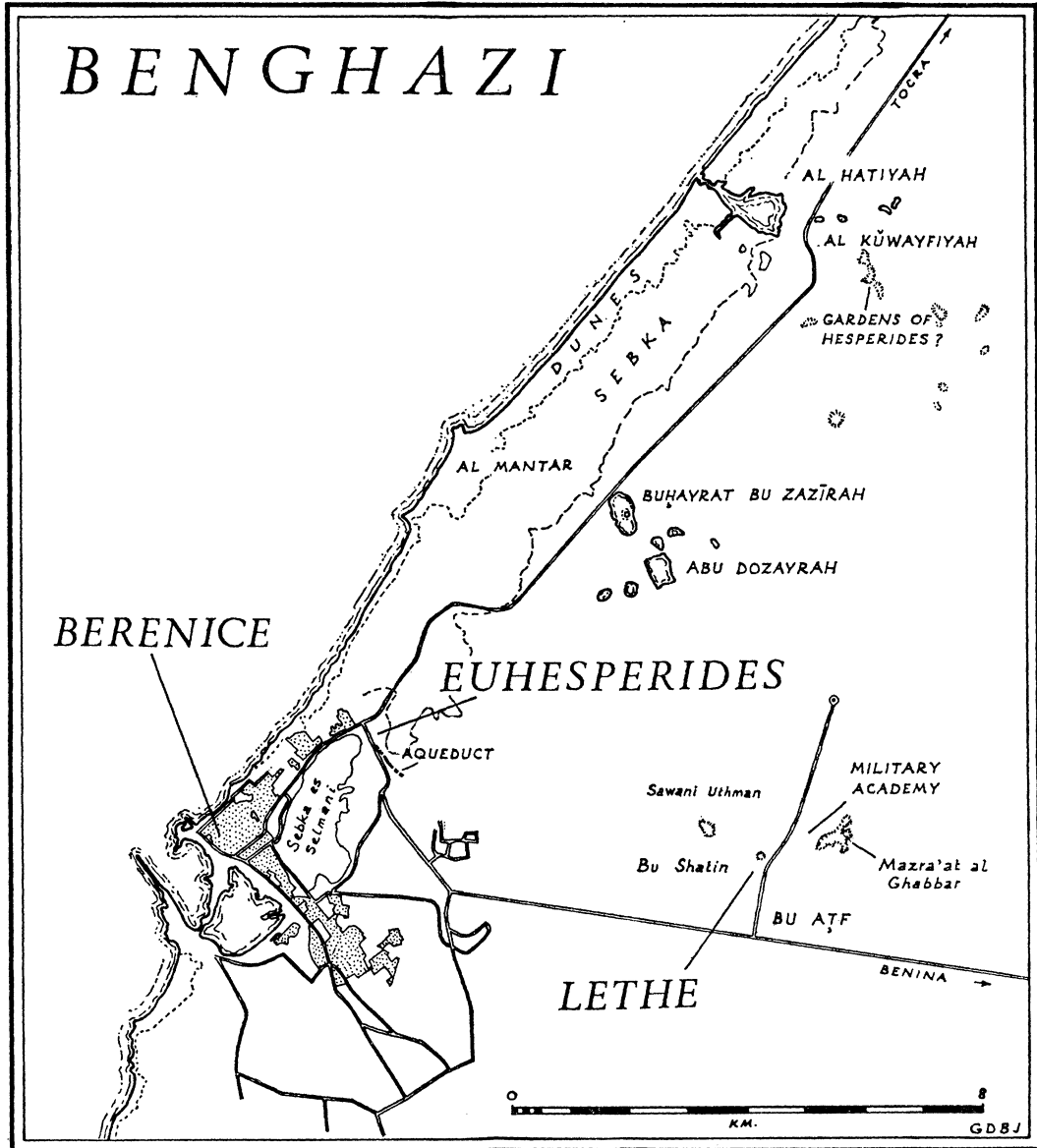


FIG. 4. GENERAL PLAN OF THE BENGHAZI AREA

indicates the speed with which the lagoon was drying out in antiquity.<sup>4</sup> The process is confirmed by inference from the geographer Scylax, writing during the early fourth century B.C., who made a clear distinction between the city and port of Euesperides.<sup>5</sup> The importance of the harbour to the life of the city is most dramatically revealed by the total

<sup>4</sup> Full publication in *Libya Antiqua*, forthcoming.

<sup>5</sup> Scylax Caryandensis, *Periplus* 108 (ap. C. Müller, *Geographi Graeci Minores*, 1882). For recent notices of Euesperides, R. G. Goodchild, 'Euesperides—a

devastated city site', *Antiquity* xxvi (1952), 208 ff.; R. C. Bond and J. M. Swales, 'Surface finds of Coins from the City of Euesperides', *Libya Antiqua* II (1965), 91 ff.

removal of Euesperides to a new site nearer the sea in 246 B.C. Strabo notes that the new city, renamed Berenice after a Ptolemaic princess, lay on a promontory between the lagoon and the sea.<sup>6</sup> The obvious site of the new city at present lies beneath the old core of Benghazi (as shown in Pl. II) where the coastal reef offers deep-water shelter from the prevailing onshore winds. Practically nothing, however, is known about Berenice except from sporadic finds, particularly during clearance work in the small Moslem cemetery of Sidi Chrebish on the eastern side of the old nucleus. The pottery from this site indicates an extended life for the settlement, as one might expect, for it is now the most populous in modern Cyrenaica; indeed there is written evidence<sup>7</sup> for the construction of a public bath building under Justinian, a development that may perhaps be associated with similar construction work at Tocra and Ptolemais and possibly Apollonia. During the life of Berenice the continued silting of the lagoon is implied by the author of the *Stadiasmus Maris Magni* who warns that the harbour behind the promontory at Berenice was suitable only for small ships.<sup>8</sup> In recent years the *sebka* has become completely silted and its mouth blocked by the development of the modern city of Benghazi. Clearly the whole settlement pattern of the Benghazi area in antiquity was determined by the advantage of a natural harbour on an otherwise inhospitable coastline. The problem of the water-supply for both of the city-sites has yet to be fully resolved, though wells are known in the original nucleus of Euesperides. Exploration in 1968 produced the remains of an apparently Roman water-supply system. It comprised an underground piped supply located on the neck of higher ground that runs towards the site of Euesperides from the direction of the Benina road. It cannot have existed in the period when the lagoon was largely filled with water, because in that case the system could have only used an inverted syphon method under the sea. It is to be presumed, therefore, that a later date is in question, and that the aqueduct ran past the derelict Hellenistic city to its successor. The source of the aqueduct supply brings us to a group of topographical phenomena in the Benghazi environs. It must almost certainly lie in the area of Lethe, one of the three legendary features located in the region by various ancient writers, the other two being Lake Triton and the Gardens of Hesperides (Pl. VIII, 2).<sup>9</sup> Their location presents further detailed topographical problems that do not admit of a final solution, and are discussed separately in Appendix I.

Moving eastwards from Berenice, the Antonine Itinerary places the next site, Hadrianopolis, a little over half way to Tocra.<sup>10</sup> The position of this Hadrianic foundation, perhaps, as pottery evidence suggests, made on a smaller, pre-existing site, was until recently in doubt; the apparent possibilities for its site were either the village of Tansoluch or, further to the south-west, the old nucleus of Driana, a name that can now be seen to relate etymologically to its Roman predecessor. Goodchild preferred to locate the site at Tansoluch on the basis of his discovery there of 'a probable Christian church'.<sup>11</sup> Recent fieldwork by the authors, however, has located the remains of a street grid with a major *decumanus* at Sidi Ibrahim al Ghamari, a small mosque marking the site of Driana prior to its re-location a kilometre away in the Italian period (Fig. 5). The identification was prompted by analysis of the problems of water-supply. With the exception of Cyrene and Tocra (see p. 72), the coastal cities of Cyrenaica were all apparently dependent on a water-supply brought in by aqueduct. The slight and seasonal rainfall of the Jebel Akhdar, however, meant that the aqueducts in question were far smaller than one might imagine, particularly when reckoned against the great size of cities. At Ptolemais, for instance, at the north-eastern entrance to the city, the aqueduct comprised two parallel lines of stone containing a central *specus* or channel; the waterproof mortar of which it was composed was set in a U-shaped profile no

<sup>6</sup> Strabo 17, 3, 20; Solinus, c. 23. For a summary of the historical and archaeological development of the Benghazi area see R. G. Goodchild, *Benghazi—the story of a city* (2nd ed., 1963), *passim*.

<sup>7</sup> Procopius, *De Aedificiis* VII, 2, 5.

<sup>8</sup> *Stadiasmus Maris Magni*, 57, ap. G. Müller (op. cit. above, n. 5).

<sup>9</sup> For the relevant sources see p. 78.

<sup>10</sup> The text is as follows: 1. Beronice m.p. xxx.

2. Adriane xxviii. 3. Theucira xviii. 4. Ptolemais xxvi etc. (*Itinerarium Antoninum*, ed. O. Cuntz, 67). Other references to the site are rare: *Synecdemus of Hierocles* 733, 2; *George of Cyprus*, 793; *Tab. Peut. s.v.* Hadrianopolis.

<sup>11</sup> R. G. Goodchild (ed.), *Tabula Imperii Romani*, Sheet H.I. 34 Cyrene (1954), 11; cf. *idem*, 'Mapping Roman Libya', *Geog. J.* cxviii (1952), 150.



more than a few centimetres deep and *c.* 30 cm across.<sup>12</sup> It is clear that the city subsisted not directly on the aqueduct supply, which would clearly have been inadequate for most of the year, but on the enormous reserve built up in the rainy season and stored in the cisterns beneath the Piazza delle Cisterne.<sup>13</sup> Observation of this pattern at Ptolemais gave the authors a clue to the means of locating Hadrianopolis, particularly after the discovery of a range of collapsed cisterns immediately south of the Driana mosque; this was confirmed by

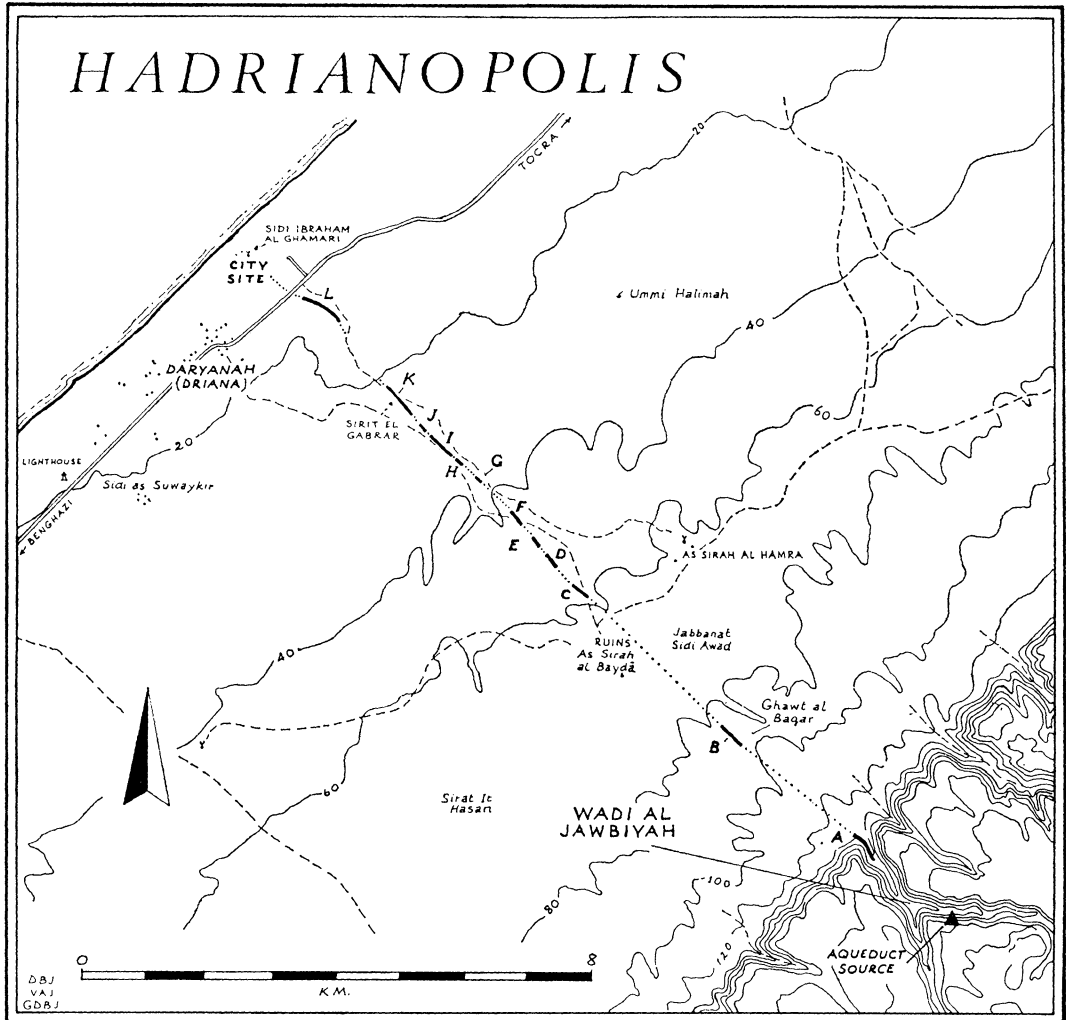


FIG. 5. HADRIANOPOLIS. GENERAL MAP OF THE AQUEDUCT SYSTEM AND THE CITY AREA

the discovery of stretches of the aqueduct 1 km south of the site. Attention then turned to the location of the aqueduct source.

Possible water sources of sufficient volume to supply a city are extremely limited in the area. One has to search in the limestone outcrop of the Jebel Akhdar delineating the south-eastern edge of the coastal plain. The limestone mass is normally horizontally bedded, so that the hydrological pattern of the spring that issues from the upper scarp at Cyrene is sometimes repeated at a lower level. Only one such point is known in the section from

<sup>12</sup> The course of the Ptolemais aqueduct has been traced in recent years by C. Arthur and Abdussalam Bazama of the Libyan Dept. of Antiquities. For the aqueduct's entry into the city area, C. H. Kraeling,

*Ptolemais: City of the Libyan Pentapolis* (1962), 35, fig. 2.

<sup>13</sup> C. H. Kraeling, *op. cit.*, 62 ff.

Benghazi to Tocra, and it lies some 17 km east of Hadrianopolis in the area known as the Wadi al Jawbiyah.<sup>14</sup> A kilometre and a half up the northern branch of the Wadi a cave in the southern rock face contains a perennial water-source modified by seasonal variations. From the mouth of the cave the water was canalized in a rock-cut channel that can be traced intermittently along the edge of the Wadi. Towards the end of the Wadi, the aqueduct adopted the form that characterizes it throughout its central section, namely a layer of stones *c.* 45–50 cm wide containing a central *specus c.* 16–17 cm across, and normally aligned at roughly a bearing of 315°. One of the best sections (J) in the coastal plain is shown in Pl. III, 2 and the details of the surviving portions of the overall course are set out in Fig. 3. As the aqueduct crosses the final rock scarp south of the city site, it reverts to a rock-cut channel containing at one point an intact mortar *specus* (Pl. III, 3). Immediately south of the Benghazi-Tocra highway the aqueduct course has been destroyed by stone collection for road construction. We may be sure, however, on the analogy of the Ptolemais aqueduct, that the destination of the water was the series of collapsed cisterns that now lie beneath the moslem cemetery at Sidi Ibrahim al Ghamari. The incline of the aqueduct course can easily be underestimated owing to the deceptively flat appearance of the coastal plain. A vertical drop of over 100 m is involved across *c.* 17 km, in other words an average gradient of *c.* 1 : 120. From this it is possible to calculate the maximum and minimum capacities of the aqueduct (some allowance is made for evaporation even if a covering of stone slabs was present) at 1.3 million litres and 220,000 litres *per diem* respectively.<sup>15</sup> Not all this volume necessarily flowed into the cisterns of Hadrianopolis proper. A cistern alongside section L of the aqueduct (Fig. 5) suggests that some of the flow was diverted for agricultural purposes in the hinterland, where traces of field-systems were discovered over several square kilometres. In any case, it is clear that an appreciable population could have been directly supported at Hadrianopolis in the winter months, while the accumulated storage system offered a means of coping with the summer drought.

The cisterns themselves proved to have been sited roughly in the centre of the city, where ground survey had produced the elements of a street grid and, in several places, the outline of substantial buildings in the form of ashlar walls visible in the sand. On current evidence the principal feature of the layout appears to be a major *decumanus* running north of the cistern area and aligned at a bearing of 229°. South of the cistern area two areas where the street plan cannot be traced do, however, contain numerous orthostats surviving above ground level that testify to the standard building tradition in North Africa. In places the orthostats can be plotted in terms of rectilinear house plans relating to buried street alignments.

While further details of the city's layout and history must await excavation, there are two further areas of importance in the environs. Two quarries that provided Hadrianopolis with limestone were found *c.* 1 km south-west of the city nucleus (Pl. III, 1). The larger southern quarry covers an area of some 600 sq. m. and can be compared with examples from Tocra and Ptolemais. The smaller quarry lies *c.* 70 m to the north-west and is rhomboidal in shape. It had been re-used as a cemetery, four tombs being cut into each of the principal sides. Three of the four inscriptions there are incised over tomb entrances; the most important of them, associated with Tomb III, is dedicated to ἐλεύθεροι ἐκ τῆς πόλεως (Pl. III, 4), corroborative evidence for the presence of Hadrianopolis nearby.<sup>16</sup> On the opposite side of the city the crest of a small hill *c.* 40 m from the nucleus marks the site of a pottery kiln. This was apparent from the spread of wasters around the collapsed dome of a circular kiln with a diameter of 6.8 m. The *prae-furnium* lay on the south-eastern side where the remains of low walls also suggested that the kiln had stood within a walled working

<sup>14</sup> This term follows the Army Map Series nomenclature. The variant Wadi al Aguihya is also known locally.

<sup>15</sup> These calculations were kindly provided by Dr. P. R. Lewis, Dept. of Metallurgy, Manchester University, the joint author (with Dr. G. D. B. Jones) of a fuller discussion of ancient hydraulics in *Britannia* (forthcoming). For published calculations of aqueduct capacity in closed and open channels,

see *PBSR* xxx (1962), 200 and *Bull. Board of Celtic Studies* xix (1960), 78 ff.

<sup>16</sup> The inscription may henceforth be cited as *IRC* 28 (= R. G. Goodchild and J. M. Reynolds, *Inscriptions of Roman Cyrenaica*, forthcoming). The authors are grateful to Miss Reynolds and Dr. A. R. Birley who gave advice on this and other epigraphic questions.

area. Like its counterpart at Tocra,<sup>17</sup> the Hadrianopolis kiln stood on an eminence to catch the available breeze during firing. The type of kiln-structure is one that can be paralleled in Roman Africa<sup>18</sup> and indeed finds a close modern parallel in kilns on the south-eastern side of Kairouan in Tunisia. The bulk of the kiln products were coarse-ware types in red or buff fabric; lack of stratigraphic excavation in Cyrenaica makes it difficult to offer any close dating at present, but close parallels from the Saniat Gibril site at Germa in the Fezzan<sup>19</sup> suggests a date somewhere in the Antonine-Severan period, which would corroborate the picture of a production centre rapidly expanded to satisfy the demands of the Hadrianic settlement.

The word 'expanded' is preferable to 'created', because this area also produced pre-Hadrianic material, in particular a samian fragment probably of c. A.D. 60 and not later than A.D. 80.<sup>20</sup> This raises the question of the possible earlier history of the settlement. Scylax mentions a site known as *Cauculi Vicus* between Benghazi and Tocra.<sup>21</sup> On the other hand the *Stadiasmus*, which is usually dated to the late second century A.D. (though there are some reasons for doubting this concession), mentions neither Hadrianopolis nor any other intermediate site.<sup>22</sup> This may be explained by the fact that, while Scylax is prone to mention places that are not necessarily ports, the *Stadiasmus* lists only harbours. It would confirm the absence in antiquity of any adequate harbourage along the featureless coastline flanking the city, a factor that helps to understand the site's relatively rapid decline. Although Hadrianopolis is mentioned by several late geographers, the use of the term *Hexapolis* to describe Cyrenaica, as known from an inscription at Ptolemais,<sup>23</sup> seems to have been short-lived, before it reverted to *Pentapolis*. There remains the possibility that Hadrianopolis was actually founded on the site of the *Cauculi Vicus* listed by Scylax. One should bear in mind, for instance, that the area of the aqueduct source in the Wadi al Jawbiya was inhabited during the Hellenistic period, since there is evidence of black-glazed material. For a later period the first-century material found near the Hadrianopolis kiln clearly implies pre-Hadrianic occupation in the area. Hadrianopolis may therefore represent a Hadrianic re-foundation on a pre-existing settlement halfway between Benghazi and Tocra.

Twenty-five kilometres to the east of Hadrianopolis the lower escarpment of the *jebel* approaches to within 2 km of the sea at Tocra, the site of the ancient city of Tauchira/Arsinoe founded as a colony from Cyrene or Barca c. 525 B.C.<sup>24</sup> The city lies on the sea-shore, immediately below the first major pass east of Benghazi leading from the *sahel* up to the plateau, a point emphasized in recent times by the siting at Tocra of an Italian fort and airstrip. The city's history is almost as long as Greek and Roman involvement in Cyrenaica, and it was chosen by the Byzantines as the site of the final defence of the province against the Arab invasions of the seventh century A.D. The position at Tocra at the apex of the western *sahel* stopped the exit from the pass, while allowing an easy overland retreat for the last defenders; this must have been a major consideration in the face of Arab supremacy at sea. There is also the question of water-supply. As yet no evidence exists for an aqueduct supplying the city with water and in the absence of any known source none need be expected. It has not been sufficiently emphasized that Tocra is in fact an oasis, and its abundant vegetation is still largely watered by a single big well situated within the city limits close to the site of the Byzantine fortress. This intramural water-supply goes a long way to explain

<sup>17</sup> G. R. H. Wright, *Palestine Exploration Quarterly* 1963, 22 ff.

<sup>18</sup> R. G. Goodchild, *PBSR* xix (1951), 43 ff.

<sup>19</sup> Mr. C. M. Daniels kindly made the comparison. The details of the pottery kiln and its products, together with the full list of inscriptions and a survey of the city site, will appear in *Libya Antiqua*, forthcoming.

<sup>20</sup> For a comparable fragment see *Arch. Journ.* xciii (1936), 102, fig. 1, 1. Prof. E. Birley kindly examined this and other fragments.

<sup>21</sup> *Periplus* 108. The *cauculus* is an umbelliferous plant. The umbelliferae (which comprise *inter alia* hemlock and parsley) produce flowers that radiate in

umbrella-shaped clusters like the common cow parsley. Such plants are very similar to those found on the coinage of Cyrene in the Greek period and assumed to represent silphium.

<sup>22</sup> *Stadiasmus Maris Magni*, 57. For other sources, above n. 10.

<sup>23</sup> R. G. Goodchild, *Quaderni di Archeologia della Libia* iv (1961), 87 f.

<sup>24</sup> For the historical background, see C. H. Kraeling, *op. cit.*, 1 ff. For an archaic pottery deposit from the eroded foreshore of the city, J. Boardman and J. W. Hayes, *Excavations at Tocra* (British School at Athens, 1966).

the elaborate re-habilitation of the walls of Tocra in the late Byzantine period and its choice as the site of the final stand against Amr Ibn el Asi in A.D. 643.<sup>25</sup>

At that time the absence of any natural harbour-facilities may have been an important factor in reducing the effects of Arab naval supremacy. No feature of the coastline provides any shelter for shipping in bad weather, the effects of which are accentuated by a deeply shelving seabed, although in fine weather there is ample space for the beaching of ships. The city's strategic position, however, guarding the approach to the western 'sahel', and also the mention of Tocra in the *Stadiasmus Maris Magni*, must be set against the apparent lack of any artificial harbour, however small in scale it may have been.<sup>26</sup> Recent work now suggests that some such arrangement existed. The seaward end of the western city-wall is in a state of almost total delapidation, but enough of the foundation-courses survive to allow interpretation and reconstruction to be made. Fourteen metres north of the seaward tower the lower courses of the sea-wall leave the city-wall at right angles, and run eastwards following the curve of the beach, where they are partly hidden by the breaking surf. The city-wall continues its original line to seaward beyond this junction. A confused mass of large masonry blocks extends *c.* 100 m from the shore, turns sharply east and continues for a further *c.* 15 m. The quantity of heavy masonry littering the seabed cannot be entirely explained by the collapse of the sea-wall or the seaward extension of the city-wall, and may represent a collapsed breakwater lying at a depth of 4 m, 100 m offshore. A breakwater 150 m long, placed at this point, would have given a considerable degree of protection from the prevailing north-west winds to the entire length of the city's foreshore.

With the exception of the minor *sahel* in the vicinity of Apollonia and Darnis (modern Derna) further to the east, that part stretching westwards from Tocra is the most amenable to large-scale agricultural exploitation; it is probably in this area that the first of the three annual corn-harvests attributed to Cyrenaica by Herodotus was concentrated.<sup>27</sup> The other two harvests came respectively from the shelf between the two escarpments, e.g. the plain of Barce, and the uplands of the plateau itself.

The second section of the Cyrenaican coast lies between Tocra and Apollonia, where the *sahel* shrinks in width to a few hundred metres. The litoral itself contrasts sharply with the exposed regularity of the western sector, as already emphasized. The central section is characterized by many indentations in the coastline that offer natural harbour facilities. It is in this sector, therefore, that the towns and settlements of the plateaux lay in closest contact with those on the narrow litoral below, and consequently it is here that the overall pattern of settlement is most clearly marked.

Ptolemais, the third city of the *pentapolis*, demonstrates the overall pattern. It lay on the coast *c.* 45 km east of Tocra. The *sahel* at this point is less than 1 km wide, and the city limits extend right across it, both the Greek theatre and the hippodrome being actually excavated from the slopes of the lower escarpment. The city was founded as a harbour-town for Barca, which stood on the plateau between the two escarpments. The site lies at the foot of an easy pass up to the plateau, and controlled the line of the Roman road to Cyrene. These considerations are again emphasized by the existence of an Italian fort and airfield near the modern village of Tolmeta. The city's water-supply was brought by an aqueduct from a spring debouching from the lower escarpment at a point *c.* 8 km to the east of the city.<sup>28</sup> The aqueduct *specus* is very narrow, *c.* 30 cm. in width, and thus bears close similarity to the example found at Hadrianopolis. Despite a large water storage capacity in the city's cisterns, the total dependence of Ptolemais, and the other coastal settlements, on their water-supply is demonstrated by Procopius' statement that the city was for many years uninhabited as a result of the aqueduct falling into a state of disrepair.<sup>29</sup> The extreme displacement of Ptolemais from the source of its water is to be attributed to the great importance that the settlers attached to the qualities of the natural harbour.

<sup>25</sup> R. G. Goodchild, 'Byzantines, Berbers and Arabs in seventh-century Libya', *Antiquity* XLII (1967), 115 ff.

<sup>26</sup> *Stadiasmus Maris Magni* 56.

<sup>27</sup> Herodotus IV, 198.

<sup>28</sup> Above n. 12. For the pioneer account of the site,

see R. Murdock-Smith and E. A. Porcher, *Discoveries at Cyrene* (1864), 66 ff. For an up-to-date account of the whole city-site, C. H. Kraeling, *op. cit.* (n. 12).

<sup>29</sup> Procopius, *De Aedificiis* VI, 2.

Ptolemais is referred to specifically as the harbour of the Barceans by Scylax, who gives no further details.<sup>30</sup> The author of the *Stadiasmus Maris Magni*, more expansive, says that the place is safe for shipping and that there is an anchorage and beaching-place, made more secure by an offshore island which he names as Ilus.<sup>31</sup> Given this information, and the configuration of the ground itself, it is surprising that the position of the harbour has long been mistaken. The Beecheys<sup>32</sup> and Kraeling,<sup>33</sup> in agreeing to place it to the west of the promontory, ignore the exposed nature of this position and the sheltered site to the east of the promontory; the latter is lent additional protection by the offshore island, as well as being within the city walls (Fig. 6). Recent examination of the seabed by the authors between the island and the shore has revealed a line of large masonry blocks disposed as

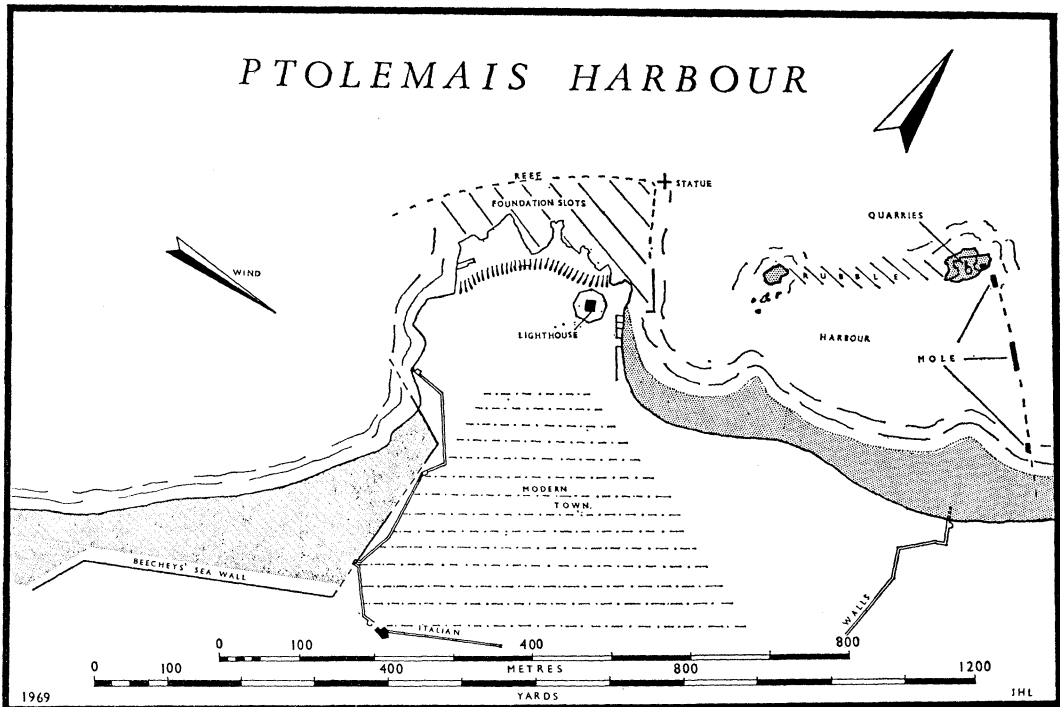


FIG. 6. PTOLEMAIS: THE HARBOUR

alternating headers and stretchers and probably cut from the quarries on the island.<sup>35</sup> Clearly these represent the remains of a mole flanking the eastern side of the bay and forming an enclosed harbour for the city. References by Synesius to the harbour imply its artificial nature and ease of access.<sup>36</sup> The mole may thus have been constructed between the date of the compilation of the *Stadiasmus* and the early fifth century A.D.<sup>37</sup>

Eastwards from Ptolemais the character of the coastline undergoes a change. The surface of the narrow *sahel*, elsewhere flat and monotonous, is broken up by gentle undulations and small hills, while its edge is indented by numerous small coves and bays. Although there is evidence on the hillsides above El Haniya of cultivation terraces<sup>38</sup> the area does not

<sup>30</sup> *Periplus* 108.

<sup>31</sup> *Stadiasmus Maris Magni* 55.

<sup>32</sup> F. W. and H. W. Beechey, *Proc. of Expedition to Explore the N. Coast of Africa* (1828),

<sup>33</sup> *op. cit.*, 48; cf. Murdock-Smith and Porcher, *op. cit.* (n. 28), 67.

<sup>34</sup> Furthermore in antiquity greater protection was afforded by the extent of the present lighthouse promontory. Part has now dropped below sea level but traces of building foundations can be discerned underwater during calm periods.

<sup>35</sup> C. H. Kraeling, *op. cit.*, 50.

<sup>36</sup> Synesius, *Catastasis* (ed. Fitzgerald) p. 54.

<sup>37</sup> The date of the former has never been satisfactorily established. Most commentators follow C. Müller (*Geographi Graeci Minores*, 1882) in ascribing it to the early second century A.D. There are suggestions, however, that the work may be a palimpsest.

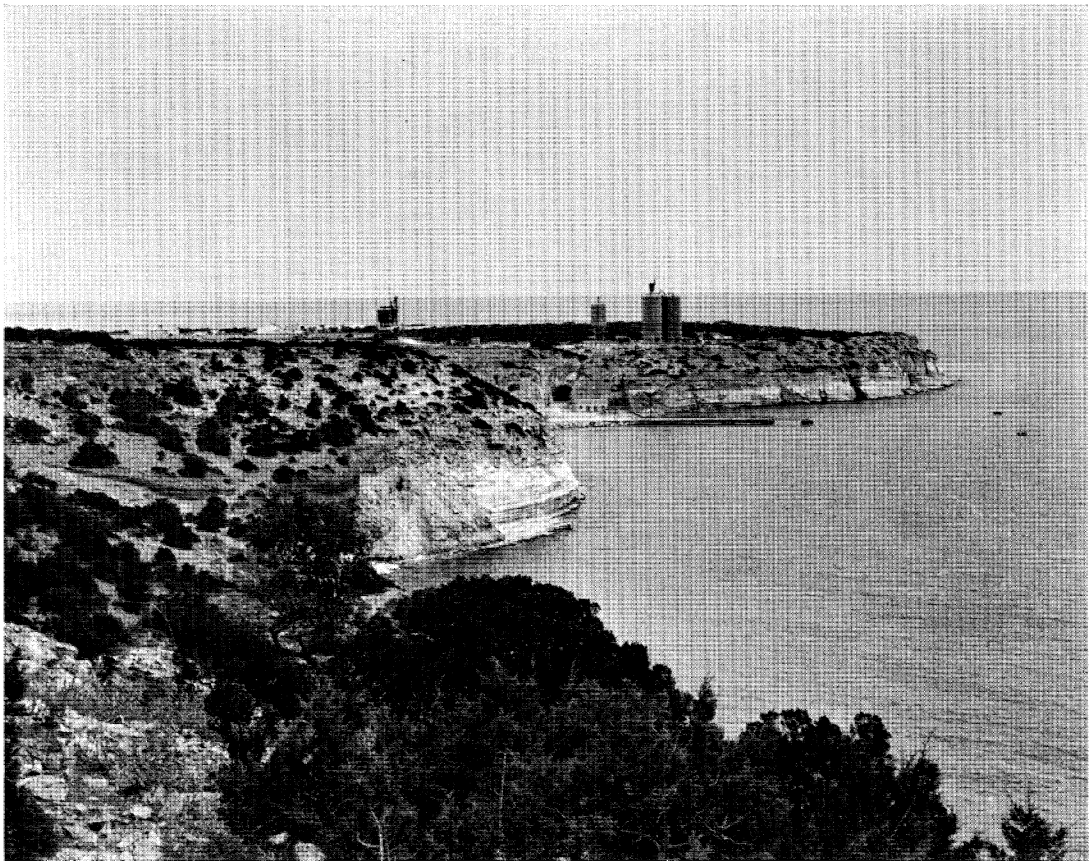
<sup>38</sup> Observed by the authors in 1969.



1. APOLLONIA. OBLIQUE AERIAL VIEW LOOKING WEST ACROSS THE SITE OF APOLLONIA AND TOWARDS THE FIRST ESCARPMENT, WHICH IN THE CENTRAL SECTION OF THE CYRENAICAN COASTLINE DROPS DIRECTLY INTO THE SEA (see p. 74)

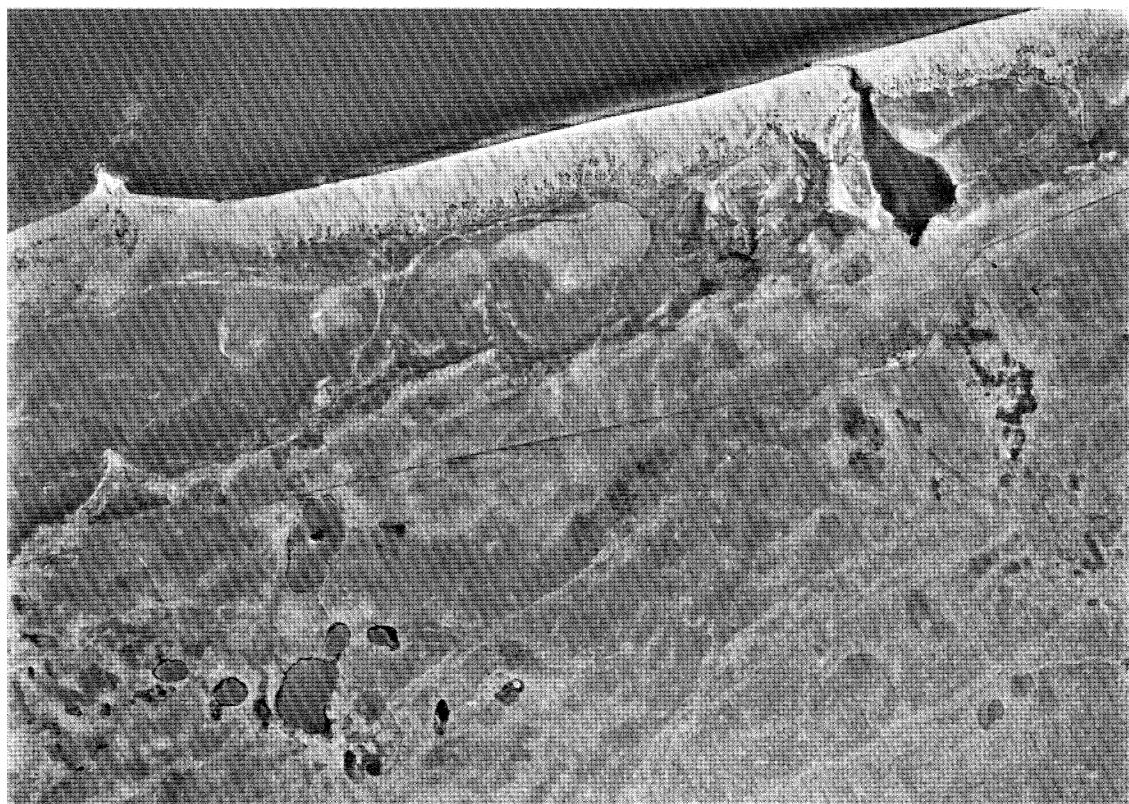
2. APOLLONIA, VERTICAL VIEW. THE STRUCTURES ASSOCIATED WITH THE ANCIENT HARBOUR ARE VISIBLE BENEATH WATER IN THIS PHOTOGRAPH. A = WEST MOLE, B = EAST MOLE, C = SLIPWAYS WITH QUARRY TO NORTH, D = SLIPWAYS AND WHARVES, E = LIGHTHOUSE SITE (see p. 75)

*Photographs by Hunting Surveys. Copyright reserved*



1. APOLLONIA: VIEW FROM FIRST ESCARPMENT ACROSS THE SAHEL TOWARDS THE TOWN SHOWING ANCIENT FIELD-SYSTEMS IN THE MIDDLE GROUND (see p. 75 f.)
2. PROMONTORY OF RAS-EL-HILAL GIVING SHELTER TO SHIPPING THAT USED THE ANCIENT ANCHORAGE OF NAUSTATHMOS (see p. 76)

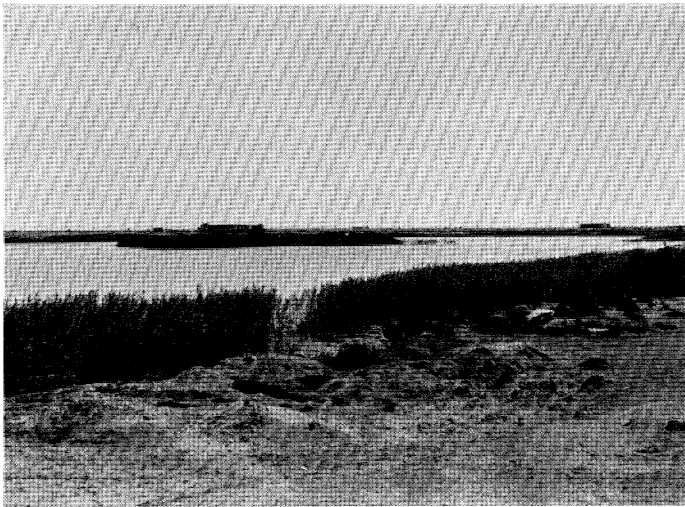
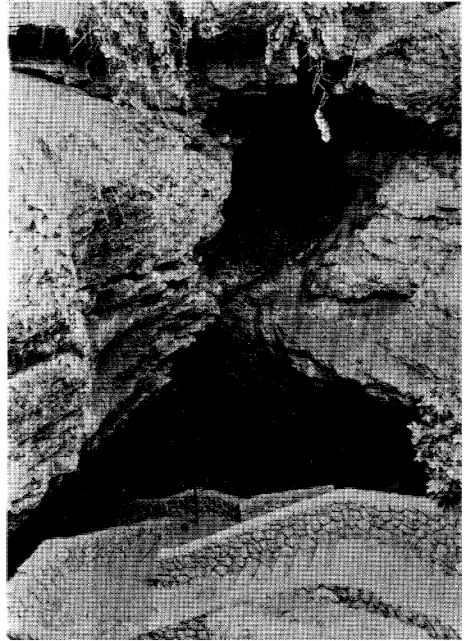
*Photographs by G. D. B. Jones. Copyright reserved*



1. DERNA: VIEW FROM THE SOUTH ACROSS THE HARBOUR AND TOWN. THE ANCIENT DARNIS LIES BENEATH THE MODERN TOWN (see p. 76)  
2. VERTICAL AIR PHOTOGRAPH OF AREA IMMEDIATELY EAST OF BENGHAZI, SHOWING THE LAKE OF BU DZIRA SOUTH OF THE ROAD (LEFT) AND (RIGHT) THE DEPRESSIONS OF AL KUWAYFIYAH (EL TARA), THE SUGGESTED SITE OF THE GARDENS OF THE HESPERIDES (see p. 78 and fig. 2)

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1. BU SHATIN: AERIAL VIEW OF COLLAPSED *POLIE* FORMATION (ARROWED) MARKING THE SITE OF LETHE. THE LIBYAN MILITARY ACADEMY IS SET AMONG TWO LARGER DEPRESSIONS (RIGHT) AT MAZRA'AT AL GHABBAR (see p. 78 f.)
2. THE APPROACH TO BU SHATIN (LETHE)
3. VIEW FROM THE WEST ACROSS THE LAKE OF BUHAYRAT BU ZAZIRAH SHOWING THE CENTRAL ISLAND (see p. 78 and fig. 4)
4. AL KŪWAYFIYAH (EL TARA): THE OVERGROWN CENTRE AND PERIMETER WALL OF THE MAIN DEPRESSION (see p. 78 and fig. 4)

*Photographs by G. D. B. Jones. Copyright reserved*

lend itself to large scale agricultural exploitation. Such settlements as are known are small and hug the coves, which provide excellent harbours for small ships.<sup>39</sup>

Scylax indicates a change in the nature of the coastline between Ptolemais and Apollonia when he states that in this region there are many small harbours and towns on the shore sheltered by islands and headlands.<sup>40</sup> The author of the *Stadiasmus*, however, confines himself to giving the names of two harbour settlements on this section, namely Ausigda and Phycus.<sup>41</sup> Both suit the general description of the coast given by Scylax, but he includes the names of Cherronesus and Zenertis between Phycus and Ptolemais.<sup>42</sup> The geographer Ptolemy adds Aptuchi Fanum to the list for this section of the coast.<sup>43</sup>

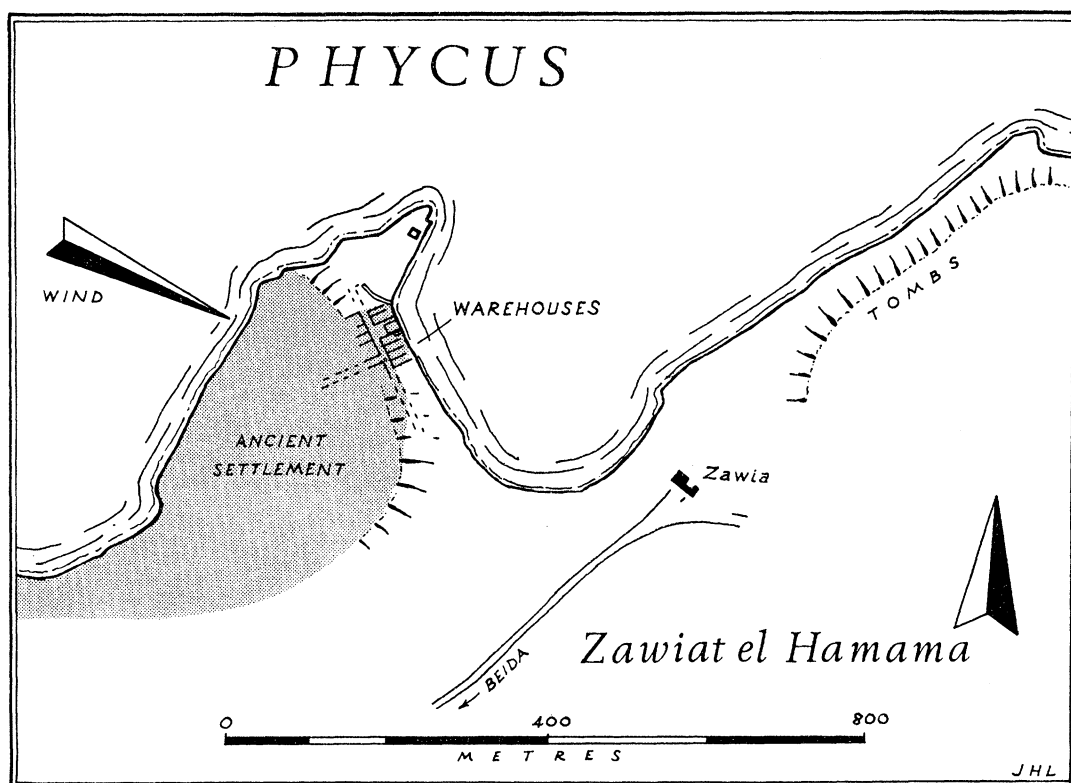


FIG. 7. GENERAL PLAN OF PHYCUS (ZAWIAT EL HAMAMA)

Two major coastal sites can now be located at Zawiet el Hamama and Zawiet el Haniya, which lie below the escarpment sites of Balagrae and Messa respectively. Strabo's statement that Phycus lay close to the western flank of Phycus promontory, the northernmost point in Cyrenaica and thus identifiable with Ras Amer, allows the identification of El Hamama with Phycus.<sup>44</sup> Synesius, writing in the early fifth century A.D., remarks that ships sailed from here to Constantinople and Alexandria with cargo and mail, and that the former was stored in warehouses while awaiting trans-shipment.<sup>45</sup> The implication is of a thriving port and township. The poet Lucan records that the younger Cato landed here during the civil wars and razed the town to the ground as punishment for an attempt on the part of the citizens to deny their harbour to his fleet.<sup>46</sup> Phycus appears to have survived this disaster, to be thought by Synesius to rival Apollonia as the second port of Cyrene.<sup>47</sup>

<sup>39</sup> Possible settlements can be suggested by the only adequate map coverage of the coastline, namely the Army Map Series 1:50,000 Sheets, available in the library of the Society for Libyan Studies.

<sup>40</sup> *Periplus* 108.

<sup>41</sup> *Stadiasmus Maris Magni* 54.

<sup>42</sup> Scylax, loc. cit.

<sup>43</sup> Ptolemy IV, 4.

<sup>44</sup> Strabo 17, 3, 20 (837).

<sup>45</sup> Synesius, *Letters* 129; 133, cf. 61.

<sup>46</sup> *Pharsalia* IX, 300.

<sup>47</sup> *Letters* 101.

The site lies on rising ground on the south-west side of a small bay, *c.* 0.75 km wide and open to the north, and the remains of low walls extend over an area of *c.* 24 hectares (see Fig. 7). On the water-front traces of warehouses, served by an alleyway to the rear, are quite distinct, although the frontage has been seriously eroded by the sea (Pl. IV, 1, 2). On the extremity of the western promontory a square masonry structure, perhaps the remains of a lighthouse, stands to a height of *c.* 2 m. Nearby a series of vertical oval storage-tanks, of the type known at Apollonia, are cut into the rock.<sup>48</sup> Sherding across the site yielded pottery ranging from black-glazed ware to Byzantine coarse wares, indicating an occupation from the fourth century B.C. to the sixth century A.D. This and other archaeological details are set out in Appendix II.

Phycus lies at the foot of an easy pass across both the escarpments below the agricultural settlement of Balagrae (modern Beida), which it conveniently served as port, a topographical sequence repeated *c.* 20 km to the west at Zawiet el Haniya. From El Haniya an easy pass through the escarpments leads to the upper plateau, a route guarded in recent times by an Italian fort and airstrip. At the head of this route the site of ancient Messa lies astride the east-west Roman road, and is surrounded by a maze of classical field-boundaries of the type found to the south of Cyrene and around Lamluda. The present newly-built road, flanked in many places by rock-cut tombs, follows the line of the natural pass to join Messa with the harbour settlement.

Final identification of the site of El Haniya must await further field survey in the area, but the choice lies between the four sites named by the sources between Phycus and Ptolemais, namely Aptuchi Fanum, Ausigda, Cherronesus and Zenertis.<sup>49</sup> The distances, where given, are at variance with one another, and on internal evidence it is impossible to calculate the length of the Greek 'stadia' used by both Scylax and the author of the *Stadiasmus*. A tentative identification of the site with Ausigda is possible, since the long life of Ausigda, attested in the sources, corresponds well with the pottery record from El Haniya.

The site lies on an eminence above a sheltered cove near the disused Italian airfield *c.* 1 km west of the modern village. It is largely desolate, and is covered by a thick spread of sherds amongst the vestigial remains of masonry walls (Pl. V, 2). The cove is protected from the north-east by a low promontory and from the north-west, the most dangerous quarter, by a second short promontory and an island; it thus offers a safe refuge for small ships against all but the most severe of the winter's north-westerly gales (Fig. 8; Pl. V, 1). The southern limit of the settlement follows the course of a small wadi which debouches on to a wide beach immediately to the west; there, facing the harbour, the exposed limestone substrata have been cut to form a jetty, to the rear of which are rock-cut storage tanks similar to those found at both Phycus and Apollonia.<sup>50</sup> Towards the eastern end of the harbour the stratigraphy of the site is exposed; a notable feature is the remains of a masonry structure capped by a concrete vault (Pl. V, 3). The sides and floor of this cavity are thickly plastered, like the cisterns below the Piazza delle Cisterne at Ptolemais.<sup>51</sup> Traces of a floor immediately above it may indicate that the structure served the same function, as its solid construction implies. Sherding across the site produced pottery ranging from black-glazed ware to late Byzantine red wares, the latter of which were found in considerable quantity. This and other material will be found listed in Appendix II.

The topographical relationships of the towns on the northern edge of the plateau to those on the coast below (i.e. ancient Messa and Ausigda (?), Balagrae and Phycus) represent two further examples of the pattern already known at Cyrene and its port of Apollonia. The latter was sited to take advantage of a natural harbour that Scylax describes as a *panormos*,<sup>52</sup> at a point where the *sahel* broadens to a width of 2 km over a distance of *c.* 10 km (Pl. VI, 1). The harbour area has sunk since antiquity, for the greater part lies submerged beneath *c.* 3 m of water, and only three offshore islands now stand above

<sup>48</sup> Oric Bates, *The Eastern Libyans* (1914), 171.

<sup>49</sup> For references, above nn. 41-4.

<sup>50</sup> Observation by the authors in 1969.

<sup>51</sup> C. H. Kraeling, *op. cit.*, 7.

<sup>52</sup> A comparison of those harbours that are individually designated as a 'panormos' in the various *periploi* and the actual physical remains

suggests that the term was used with a specific meaning. A 'panormos' was thus a harbour surrounded by protective headlands in such a way as to leave only a narrow entrance orientated away from the direction of the prevailing wind. All other harbour types were measured against the ideal 'panormos' type.

sea-level. Under calm conditions, however, aerial photography can recover the details of the submerged harbour installations (Pl. VI, 2). The fortified harbour was developed, probably in the late Roman and Byzantine period, east of the natural haven forming the present small harbour. The western sea wall was a direct extension of the land wall surrounding the city. The break that formed the entrance was sited well out towards the first of the three islands, around which the outer mole was constructed. The middle and largest island is also the most informative. The eastern mole ran from it towards the city with a clearly defined deep-water entrance one-third of the way across to the shore. Material for the

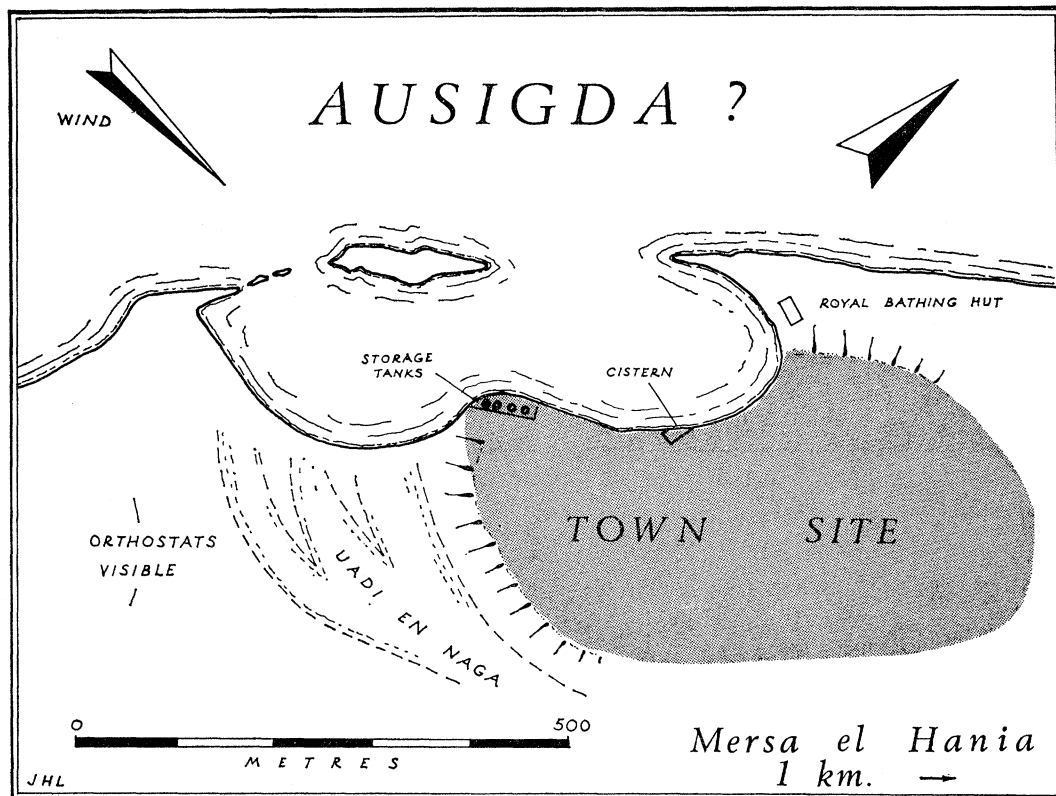


FIG. 8. GENERAL PLAN OF MERSA EL HANIA (AUSIGDA?)

mole was partly derived from a substantial quarry cut in the island itself, as already exemplified at Ptolemais. The southern side of the island was adapted to provide at least ten slipways, seven of which can clearly be recognized from the aerial photograph, and lie both above and below water level. The third and most easterly island was the site of a small lighthouse. The landward side of the enclosed harbour is visible in greater or lesser detail, depending on the degree of silting. At least two-thirds of the length was given over to wharves and slipways, as the photograph shows.

While Apollonia was primarily developed as an ancillary of Cyrene, in the later period it seems to have grown at the expense of the larger site, ultimately becoming the capital of the Byzantine province and the seat of the governor.<sup>53</sup> This was perhaps only possible because, unlike Ptolemais, for instance, Apollonia possessed an agriculturally viable hinterland on which the city population could depend. The widening of the *sahel* already mentioned created nearly 20 sq km of cultivable land, mainly on the western side of the site. Some of this area must have been watered from the aqueduct that served the city by tapping a spring at the foot of the lower escarpment. Traces of its line across the *sahel* were

<sup>53</sup> R. G. Goodchild, 'A Byzantine Palace at Apollonia', *Antiquity* xxxiv (1960), 246 ff.

discovered and destroyed during levelling operations for the Italian airfield in the 1930's.<sup>54</sup> More recently an inscribed boundary from the city lands has also been located.<sup>55</sup> It was found south of the ancient city, in an area of modern settlement and cultivation. For evidence of the ancient field-system one has to turn elsewhere. Scattered remains of stone field boundaries can be seen round the perimeter of the now disused airfield, the construction of which destroyed much potentially useful information. For the fullest evidence, however, one has to look *c.* 2 km to the west, where there has been no post-classical cultivation. Seen in low oblique view from the first scarp, the pattern of rectilinear field boundaries, preserved as stone piles and lines of bushes, can be seen with clarity (Pl. VII, 1). On examination the area yields a scatter of Roman and Byzantine pottery that seems conclusive evidence of date. We may therefore contrast the remains of field boundaries as stone banks in this instance with boundaries marked by orthostats, a form more commonly found associated with the sites of the upper plateaux.

The settlement-pattern is once again repeated 30 km east of Cyrene on the third section of the coast, where the settlement of Limnias (modern Lamluda) stands on the edge of the upper escarpment above a pass leading down to the anchorage at Naustathmos (modern Ras el Hilal),<sup>56</sup> sheltered by the cliffs of the cape 100 m high (P. VII, 2). A Christian church stands in isolation above the cliffs, overlooking the bay to the east.<sup>57</sup> Any associated settlement, however, is more likely to have lain below the cape to the east, where the Wadi Gaai debouches across the narrow *sahel* onto a wide beach; at this point the author of the *Stadiasmus* records an abundant spring of water.<sup>58</sup> Land boundary-stones have been found in the area.<sup>59</sup> A similar watering point for shipping lay 15 km to the east of Naustathmos at Erythrum (modern Wadi el Atroun).<sup>60</sup> Synesius informs us that the town was the seat of a bishopric in the late fourth century, and that the settlements on the plateau at Hydrax (modern Ain Mara) and Palaebisca (modern Bet Tamer) were dependent upon it.<sup>61</sup> Both these places stand in an area at the head of a pass leading up from the harbour settlement at Erythrum. The most direct communication from Hydrax to the sea lay, however, eastwards towards Darnis (modern Derna). The modern city of Derna overlies the ancient site, of which little is known.<sup>62</sup> The site is well watered by both springs and the Wadi Derna, which debouches a little to the west of the harbour (Pl. VIII, 1). The latter consists of a small bay only barely protected by a promontory, which has been extended in recent times to form a long mole giving much greater degree of shelter to the bay. Agriculture is possible on the narrow *sahel* to the west of the town, but to the east the escarpment falls away directly into the sea. Synesius mentions his settlement of a dispute over the ownership of a church between the bishops of Darnis and Erythrum by reference to the boundary-stones of the city lands of Darnis.<sup>63</sup>

This account has offered a revised description of Cyrenaican coastal settlement, taking into consideration the three additional major settlements. It remains to examine the development of that settlement-pattern. This is clearly brought out by Herodotus' description of the original Theran colonization of Cyrene.<sup>64</sup> The story is well known, but it is worth drawing attention to the underlying geographical elements in it. The requirements for achieving the Theran objective, to found a city in Libya that would absorb surplus population, were threefold: an adequate water-supply, a large area of exploitable agricultural land and an adequate harbour for the maintenance of communications with the Aegean and the mother city. The advance party made a first landfall, under the guidance of a Cretan merchant who knew the coast,<sup>65</sup> on the island of Platea in the Gulf of Bomba, one of the finest natural harbours on the North African littoral (Fig. 3).<sup>66</sup> Three years on Platea saw no improvement of their economic situation and, reproached by the Delphic oracle, the

<sup>54</sup> Idem (with J. M. Reynolds), 'The City Lands of Apollonia', *Libya Antiqua* II (1965), 105.

<sup>55</sup> *ibid.* 103.

<sup>56</sup> Scylax 108; *Stadiasmus Maris Magni* 51.

<sup>57</sup> R. M. Harrison, *PBSR* xxxii (1964), 1 f.

<sup>58</sup> *Stadiasmus Maris Magni* 51.

<sup>59</sup> Goodchild and Reynolds, *op. cit.* (n. 54), 106, n. 6.

<sup>60</sup> *Stadiasmus Maris Magni* 50.

<sup>61</sup> Synesius, *Letters* 67.

<sup>62</sup> *Stadiasmus Maris Magni* 47.

<sup>63</sup> Synesius, *Letters* 67.

<sup>64</sup> Herodotus IV, 150-9.

<sup>65</sup> Today Cretan fishermen, sometimes operating within a few hundred metres of the shore, have an intimate knowledge of the coast and a percentage of the population of Apollonia-Sousa appears to be Cretan in origin.

<sup>66</sup> Herodotus IV, 151.

settlers moved across onto the mainland to establish themselves at Aziris.<sup>67</sup> Herodotus describes the place as flanked by a water-bearing wadi, but hemmed in on all sides by the escarpment, which does not lend itself to cultivation so far to the east. During the six-year stay at Aziris conditions did not improve.<sup>68</sup>

The settlers eventually moved westward, under Libyan guidance, to the spring of Apollo on the lip of the upper escarpment, there to found the city of Cyrene. The Libyan guides were quick to point out the advantage of this site on the open uplands, where the 'sky leaks', a reference to rainfall and the agricultural potential of the area.<sup>69</sup> So Herodotus' account underlines the three requirements for settlement; harbourage, water-supply and cultivable land. Cyrene prospered, and, in response to offers of free land-grants, settlers flowed in from the Aegean in such numbers that new cities were founded at both Barca on the rich steppeland to the west, and at either end of the western *sahel* at Tauchira and Euhesperides, where the rich soil produced corn a hundredfold.<sup>70</sup> These four centres were thus strategically placed for optimum exploitation of the cultivable land. Apollonia and Ptolemais were not primarily agricultural settlements; they are referred to by Scylax simply as 'the harbour of the Cyrenaeans' and the 'harbour of the Barceans' respectively.<sup>71</sup> Both sites are natural harbours like Hamama and Haniya, and lie below easy routes to the cities they served.

The infrastructure of the settlement-pattern is thus clearly displayed, and the siting of the smaller settlements fits logically around it. On the eastern sections of the coastal region, the ancient villages of Messa, Balagrae, Limnias and Hydrax, centred on springs emerging from the edge of the upper escarpment, were well placed to cultivate the plateau to the south. At the same time they stand above settlements on the shore, El Haniya (Ausigda?), Phycus, Naustathmos and Erythrum, which provided them with harbour facilities for the transport of their produce to the main centres at Ptolemais and Apollonia. A letter to Synesius indicates that the quickest means of communication from place to place in Cyrenaica was by sea.<sup>72</sup> Elsewhere he implies a system of lookout-posts for tunnyfish, thereby indicating one occupation of the inhabitants of the harbour settlements.<sup>73</sup> Certainly, the central section of the coastline is well fitted for the maintenance of a fishing industry, the passing of which Procopius mourns when he speaks of the people of Libya who 'used to make their living from the sea'.<sup>74</sup> These appear, however, to have been relatively late or ancillary developments. The settlement of the coastal regions of Cyrenaica was initially controlled by the lucrative cultivation of agriculturally fertile areas of plain, whether in the steppelands of the plateau<sup>75</sup> or in the cultivable areas of the western *sahel*.

If the overall pattern of settlement is now clearer, particularly following the identification of Phycus, Ausigda? and Hadrianopolis, then much of the detailed topography awaits clarification. Yet this is not for want of surviving material. It is perhaps an irony of recent history that the detailed topography of the Tripolitanian hinterland has received so much attention, while the obvious remains of the ancient countryside in Cyrenaica have remained almost neglected. No visitor to Cyrene can fail to note the surviving tombs, cisterns and field-boundaries along the southern approach to the site. It is more difficult to appreciate that these remains form but a small part of an ancient landscape that survives substantially intact on the second plateau between Lamluda in the east and Messa in the west. The traces of field-systems around the latter two sites offer an amount of surviving evidence unequalled in North Africa. The time is now long overdue for a major field survey of the area, which should be comprehensive both geographically and archaeologically. The unexplored cave sites of the scarps can illustrate the level of indigenous prehistoric settlement.<sup>76</sup> Further harbour sites await identification west of El Haniya and in the Gulf of Bomba. Moreover, the impact of the settlers from the coast must have brought major

<sup>67</sup> The location is not settled. A very doubtful identification was made by C. N. Johns with a site c. 25 km east of Derna, see A. Rowe, 'A Contribution to the Archaeology of the Western Desert', *Bull. of the John Rylands Library* xxxvi (1954), 491 ff. See most recently J. Boardman, *ABSA* LXI (1966), 150.

<sup>68</sup> Herodotus iv, 157.

<sup>69</sup> *ibid.*

<sup>70</sup> Herodotus iv, 198.

<sup>71</sup> *Periplus* 108.

<sup>72</sup> *Letters* 51.

<sup>73</sup> *ibid.*

<sup>74</sup> *Secret History* xviii, 10.

<sup>75</sup> Herodotus, *loc. cit.*

<sup>76</sup> For comparable information, cf. C. B. M. McBurney, *The Haua Fteah (Cyrenaica) and the Stone Age of the S.E. Mediterranean* (1967), *passim*.

environmental changes to the plateau, just as in the last few years the construction of roads in the reverse direction has begun to affect the population and economy of the littoral—and has provided, incidentally, the material on which this account is primarily based.

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#### APPENDIX I: LETHE, LAKE TRITON AND THE GARDENS OF HESPERIDES

The identification of these three areas of mythological importance came to be localized in the Benghazi region. If we accept that such features should be given precise locations—and it is difficult to argue otherwise in view of the details assigned to Lethe and Lake Triton by the sources—then the clue to identification lies in the local geological conditions. The coastal plain between Benina and Benghazi largely consists of permeable limestone with a thin covering of topsoil. The limestone is chiefly notable for a series of mainly circular or oval depressions that were formed when the development of underground drainage systems caused the collapse of the surface beds, a common occurrence in such limestone bedding. These *karst* formations provide the link between all threesites, although the individual characteristics of each depression vary. Sometimes the depression appears to form the start of an underground drainage-system, as happened at Lethe. Alternatively the depression became a lake fed by underground sources. Lastly and most commonly, the floor of the depression is fed by a spring and the rich soil produced a fertile oasis of palms and fruit trees often invisible from the barren rock-beds of the coastal plain.

Strabo, Lucan and Pliny the Elder agree in placing the entrance to the underground river of Lethe not far inland from Berenice.<sup>77</sup> Next to the Libyan Military Academy *c.* 7 km east of Benghazi and 1 km north of the main road to Benina (Pl. IX, 1; Fig. 4) the site may be recognized with confidence. The general name for the area is Bu Shatin; the particular feature involved is a small depression leading directly down into a large subterranean cavern that forms the start of an underground river system (Pl. IX, 2). The steep-sided depression, over 100 m across, lies *c.* 30 m below the level of the plain. The broadening floor of the cave leads, after a further *c.* 80 m, to the underground lake. In view of the unique nature of this particular depression it is logical enough to accept it as the site of Lethe; Murdock-Smith, Porcher and Goodchild arrived at the same conclusion about this mysterious underground pool, known locally as Jekh el Kebir.

The second legendary feature, stated by Lucan and Strabo to be found in the Berenice area, was called Lake Triton, a stretch of water with a small island in the centre on which stood a temple of Aphrodite.<sup>78</sup> Goodchild touched on the possibility of identifying Lake Triton with the pool of Buhayrat Bu Zazirah (sometimes Bu Dzira = Rommel's Pool), 4 km north of Benghazi and immediately east of the Tocra road (Fig. 4). He preferred, however, to identify the legendary lake with the Sebka es Selmani and the island with the promontory of Sidi Abeid, the site of Euhesperides (p. 65).<sup>79</sup> Such an identification is suspect for the reason that Strabo specifies a lake, not a sea lagoon, and an island, not a promontory. Further the geographer adds that the River Lethe flowed into the lake, which should eliminate the Sebka from the reckoning.<sup>80</sup> The requirements are far better satisfied by the first-mentioned pool of Buhayrat Bu Zazirah. At the centre of the lake (Pl. VIII, 2; IX, 3) stands a small island, on which there are masonry remains of uncertain antiquity. Furthermore, although of considerable depth, the pool is remarkable for the freshness of its water, and is in fact the largest freshwater lake on the North African coast between Tunis and Alexandria. As such it would naturally be remarkable enough to attract legend. The constant high level of water, for instance, in a zone of high evaporation-rates would further have aroused curiosity in the probable underground supply by which the lake was fed.

Goodchild suggested that the Gardens of Hesperides were the other depressions associated with Bu Shatin (Lethe).<sup>81</sup> Clearly the luxuriant vegetation found generally on the floor of these features explains the origin of the legend. Yet, if we are to look for a central area in which the gardens may be localized, then perhaps local tradition, followed most recently by Thwaite, can offer a more satisfactory identification. The principal area of depressions in the limestone occurs at a point 4 km further north of the suggested site of Lake Triton, at Al Kuwayfiyah (Coefia). The largest of these is known in Cyrenaica as El Tara ('the wonder'), and its dimensions as seen from Pl. IX, 4 are far easier to reconcile with those of Scylax than are those of Bu Shatin.<sup>82</sup> When viewed from the air

<sup>77</sup> Strabo 17, 3, 20; Lucan IX, 355; Pliny V, 5. A useful summary of the question will be found in A. Thwaite, *The Deserts of Hesperides* (1969), 59 ff. Earlier accounts are: F. W. and H. W. Beechey, *op. cit.*, (n. 32), 333 ff.; Murdock-Smith and Porcher, *op. cit.* (n. 28), 16 ff.; R. G. Goodchild, *Benghazi—the story of a city* 2 ff.

<sup>78</sup> Strabo, *loc. cit.*

<sup>79</sup> R. G. Goodchild, *op. cit.*, 3 ff.

<sup>80</sup> Strabo, *loc. cit.*

<sup>81</sup> R. G. Goodchild, *loc. cit.*

<sup>82</sup> A. Thwaite, *op. cit.*, 59 ff. For measurements (together with an improbable location in the area of Phycus), see Scylax 108. For a magisterial account, see also F. W. and H. W. Beechey, *op. cit.* (n. 32), p. 318.

(Pl. VIII, 2), the geological formation of these depressions at Coefia becomes clearly visible. They lie along the course of the largest underground stream in the Benghazi area and the same evidence may be adduced to explain, on a lesser scale, the features which have been already discussed in the first two parts of this appendix.

## APPENDIX II: POTTERY AND OTHER FINDS

The more important pottery from the various sites is listed here for convenience. The best guide to the sequence of black-glazed material from Cyrenaica is the material from the authors' own excavations at Euhesperides, currently being prepared for publication. The various forms of African red-slipped wares are those identified by Dr. J. W. Hayes, and we are most grateful to him for permission to use his system in advance of publication. The sixth- and early seventh-century examples of this ware have now been amplified by the material from the authors' excavations of the Byzantine fortress at Tocra in 1969.

The material recovered from Berenice is limited to finds from the Moslem cemetery area of Sidi Chrebish. These include some unpublished mosaic fragments that have been conserved by the Libyan Department of Antiquities and stored at the Tocra Depot. Otherwise the only finds now available for investigation are a series of decorated Roman lamps of first-third-century date. Nearly all the decorations relate to classical mythology and the occurrence of several examples of two types strongly suggests that they were the product of local potters working in Benghazi.

The area of the Wadi al Jawbiya in which the source of the Hadrianopolis aqueduct rises was settled long before the foundation of the Roman city. Black-glazed pottery from the fertile wadi floor below the cave goes back as far as the fourth century B.C. and finds of worked flints below the perennial water source make earlier occupation highly likely. Indeed the site would be ideal for an archaeological study of the transition from the pre-historic to the classical periods. Occupation continued into the Roman period. The city site at Hadrianopolis has produced African red-slipped along with coarse wares but none of very late date. This underlines the relative brevity of the city's probable life-span. The details of the products from the pottery kiln will be published in detail in *Libya Antiqua* VI, forthcoming.

The material from both Zawiet el Hammama (Phycus) and El Haniya (Ausigda?) is prolific, as a glance at Pl. V, 3 will show. There is a difference, however, in that the coastal erosion at the latter site has exposed levels from which early material can be extracted. At Phycus on the contrary there has been no erosion, and almost all the surface finds made in 1969 belong to the last period of occupation. Amongst these are fragments of African red-slipped wares of the following forms: 4 basal frags. of Form 89 (late fifth-early sixth century); rim frags. of Forms 99C and 105 (later sixth century), with others of Form 99 of slightly earlier date and form 91 (sixth-early seventh century). The list of ultimate types in the African red-slipped sequence could be multiplied but earlier examples are comparatively rare in surface sharding: frags. of Forms 32 and 33 (early-mid third century) and, from a slightly later date rim frags. of Forms 59 and 61A. Clearly these red-slipped forms played a role in shaping the development of plain wares, just as samian ware influenced coarse wares in other parts of the empire. Thus two coarse vessels are direct imitations of Form 103 (c. A.D. 500-550+) and Form 96 (late fifth-early sixth century). The great amount of late Byzantine material suggests that, like Apollonia (see p. 75) in its later stages, Phycus may have eclipsed the inland sites to which it was originally ancillary. The presence of very coarse globular cooking-pots with crude lug handles as a substantial percentage of the pottery must, however, introduce a note of caution. Excavation by the authors at Tocra in 1969 demonstrated that this locally-produced type did not end with the Arab invasion of A.D. 643, but survived as the basic pottery of the inhabitants of the site probably until the mid-eleventh century, when the incursions of the Beni Hillal provide the next archaeological horizon at some Libyan sites.

At El Haniya black-glazed wares of the fourth-third century B.C. form roughly a quarter of the significant pottery found during surface examination in 1969. As on other Cyrenaican sites, little is recognizable from the early imperial period, largely (it must be suspected) owing to current ignorance of the pottery sequence involved. Amongst later types represented there are fragments of two Form 67s (fourth century), together with several Form 105s (c. A.D. 580-606) and a late Form 91. Some of the coarse wares again imitate these types, the forms imitated in this instance being No. 94 and Late Roman C Ware, Type 3.

At Ras-el-Hilal (*Naustathmos*), the Wadi Gaai appears to have destroyed much, if not all, the settlement associated with the roadstead. Pottery can be found, however, in the environs of the church excavated by R. M. Harrison.<sup>83</sup> Modern quarrying has caused much disturbance in the area, but the sherds probably derive from a few structures near the church. The pottery found in 1969 was exclusively coarse apart from one example of Form 99 (sixth century).

<sup>83</sup> *PBSR* xxxii (1964), 1 ff.