1982

Marea: a Byzantine port in northern Egypt

MAREA: A BYZANTINE PORT IN NORTHERN EGYPT

By Karl Petruso and Creighton Gabel

W.P. No. 62

African Studies Center

1982

WORKING PAPERS
NO. 62
AFRICAN STUDIES CENTER

Boston University
125 Bay State Road
Boston, MA 02215

MAREA: A BYZANTINE PORT IN NORTHERN EGYPT

By Karl Petruso and Creighton Gabel

This contribution summarizes the results of two additional seasons of work at the archaeological site of Marea, a large complex of ruins about 45 kms. west of Alexandria, with particular attention to the ancient harbor installations. The known history of the site and the results of excavation there through 1979 were outlined in an earlier paper in this same series.[1]

Briefly, Marea is an abandoned commercial and administrative center on the south shore of Lake Maryut, known in antiquity as L. Mareotis (Fig. 1). Its harborworks lie exposed and substantially intact on an earlier shoreline, the water level of the basin having been much reduced by the silting up, centuries ago, of the canals which once supplied it with fresh water from the Nile. The preservation of such port structures, if not unique, is certainly unusual for the Mediterranean and offers an excellent opportunity for detailed examination of early aids to shipping and navigation.

From historical sources dating as early as Thucydides and Herodotus, it is known that Marea existed at least as far back as the 6th century B.C. and functioned as a strategic garrison on Egypt's northwestern frontier.[2] After Alexandria was founded, and on through the Ptolemaic and Roman periods, it continued to be an important agricultural center and a transshipment point for goods moving between Alexandria and the higher reaches of the Nile. Most of the antiquities thus far identified by survey and excavation, however, are Byzantine and therefore date mainly from the 4th or 5th to 7th centuries A. D. A major question which arises from this fact is where the earlier, pre-Byzantine, town was actually located. The assumption originally made - not illogically - was that remnants of such occupations would be found underlying those of Byzantine age, but this no longer seems as justifiable a conclusion. Those structures which are of greater age are situated off the main perimeter of the site some kilometers to the southwest and consist of a Late Dynastic chambered tomb, some Graeco-Roman shaft graves, and anthropoid (mummiform) pit graves belonging to pre-Christian worshippers of Osiris. Their location vis-a-vis that of the town would be consistent with the burial pattern of these earlier periods, when tombs and cemeteries were always placed outside the settlement boundaries, but no traces of structures or artifacts of that age have been found in the harbor area. The superabundant ceramics, for example, are entirely of Byzantine or local late Roman manufacture, and the same is true of the architecture, building materials, and construction techniques observed there.

Further confirmation of this has derived from extended surface survey, especially along the southern and western peripheries of the site, and from soundings near the waterfront designed to explore the underlying stratigraphy.

One of the latter consisted of a large trench placed across the eastern extension of what had been termed a "Roman" road, which runs along the waterfront in the central part of the port (see Fig. 2). At the southern end of

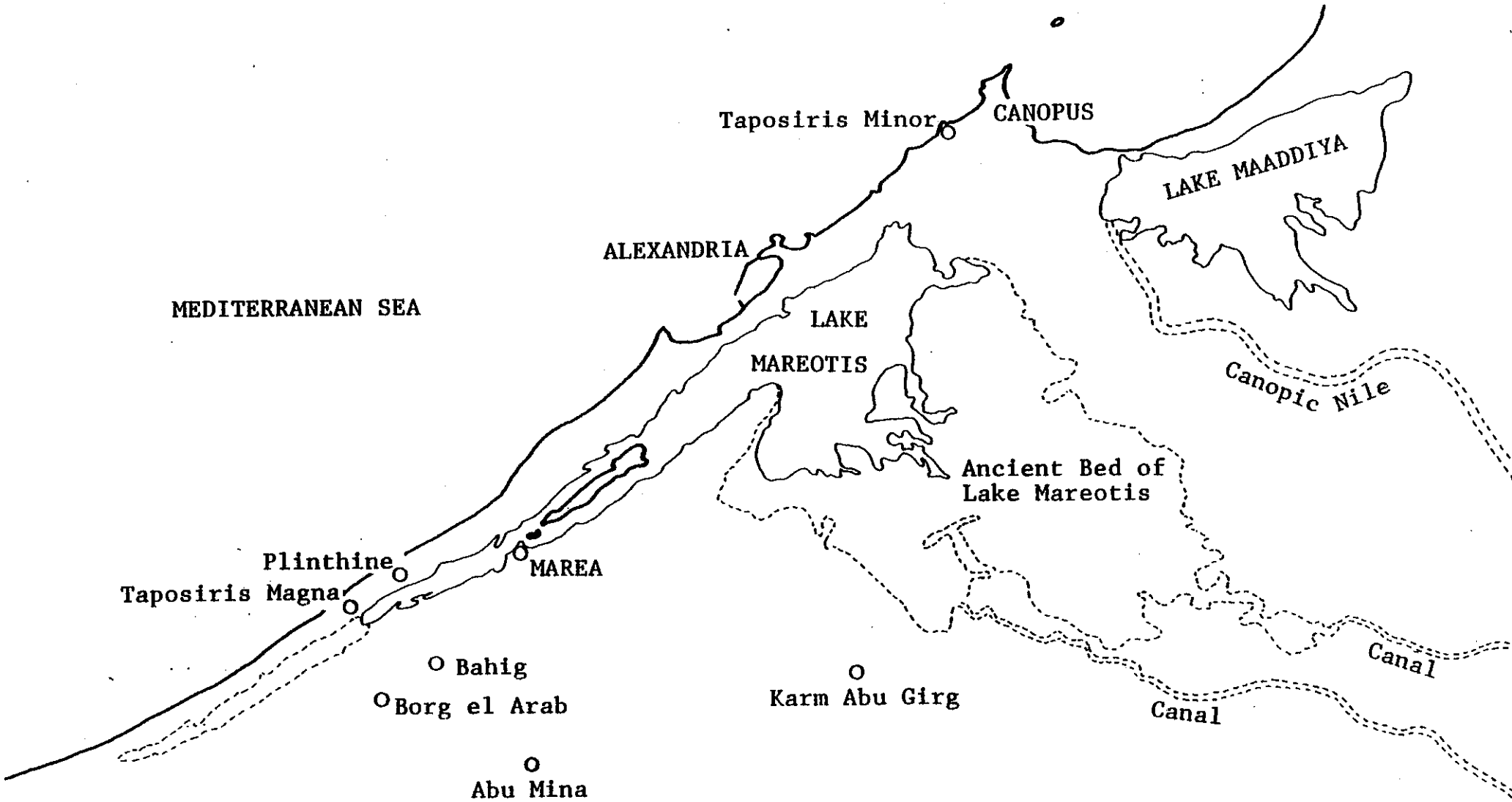


Fig. 1

M A R E A A N D

E N V I R O N S

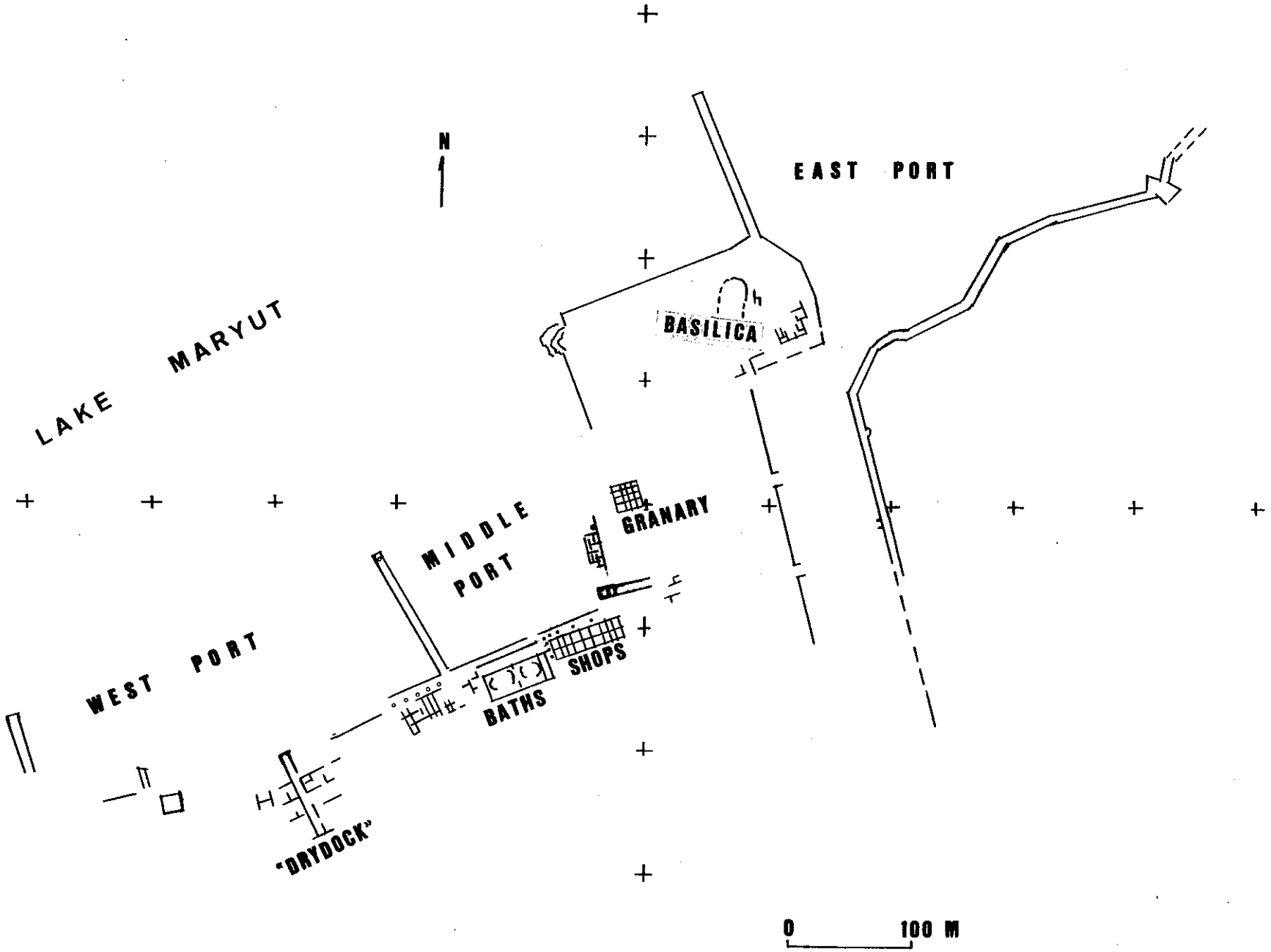


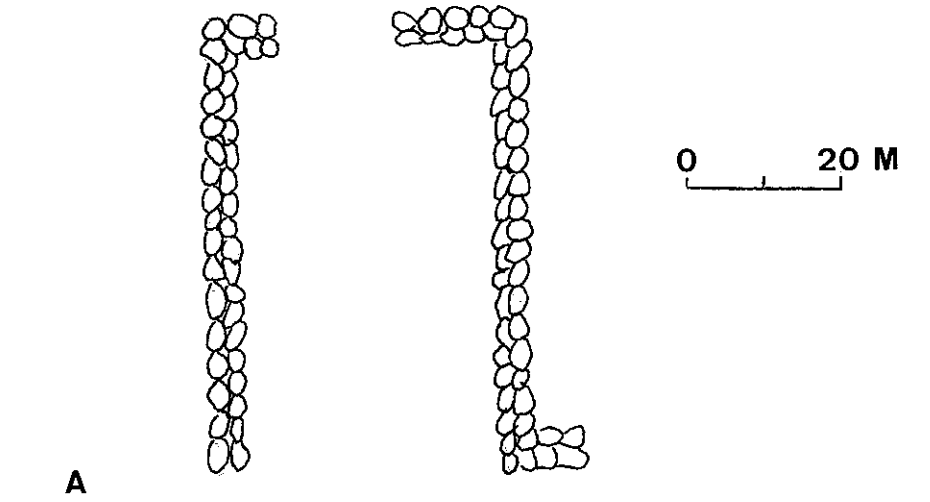
Fig. 2: Marea harbor (based on a 1:500 plan prepared by T. Boyd, 1980-91).

the trench, part of the foundation of an abutting building was exposed. The structure in question is clearly Byzantine in construction and goes below the level of the limestone blocks forming the road metal. The presumption is that the building already existed when the street was surfaced, removing any likelihood that the latter was really an earlier feature which continued in use during the early Christian period, as suggested in earlier reports.

Likewise, a deep sounding behind the foundation of one of the buildings in the waterside shop arcade (Fig. 2) struck bedrock at a depth of about 2.7 meters without a trace of anything earlier than the 4th or 5th century. On one of the highest elevations at the harbor, just behind the shops, part of a Byzantine building had been previously excavated and the floor removed. This seemed an ideal place to explore to a greater depth again without damage to an existing structure. Consequently, a trench was sunk to a point 4.6 meters below the present ground surface, and about two meters below the foundation rubble. The underlying deposit consisted entirely of sterile sand. Thus, neither these nor any other deeper trenches excavated for different purposes in the harbor area produced indications of earlier occupation.

Where, then, was the "original" Marea situated? The answer to this has not been forthcoming, although a few clues may be in hand. The visible changes in lake level during more recent times, for one thing, imply that such events also occurred in the more distant past. Several portions of the main site do contain areas of silty deposit with small shells which may reflect inundation by the lake. The present harbor, as defined by the Byzantine structures, lies at a low elevation, while the tombs mentioned above are situated on a higher limestone ridge to the south. If pre-Byzantine lake levels were substantially higher, the earlier town and port may have been located on and along the ridge.

That it may not have been quite that simple, however, is demonstrated by a discovery made during the 1980 season. While exploring an area along the lake some 3-4 kms. west of Marea, we encountered a previously unreported group of shipping installations. This includes a stone-built jetty similar to those at Marea, although shorter and narrower in dimensions, and a boxlike "wharf" open in the center and largely or entirely enclosed on the three lakeward sides (there is an opening in the outer wall but it is not clear whether it was built that way or had material removed from it later). A number of the upper blocks in this structure have either cylindrical bollard holes drilled in them or mooring rings (made by cutting intersecting holes through the block edge from side and top) for ships' hawsers. There is nothing to indicate that the jetty, at least, is not Byzantine, but the wharf may have been built earlier. In basic construction, employing large "cyclopean" blocks of essentially undressed limestone, and in its shape it seems pre-Byzantine. Only the uppermost course of the walls has any of the reddish waterproofing cement commonly used in early Christian structures of this type, suggesting repair and re-use of an existing (Ptolemaic or even earlier?) facility. It is possible that the rectangular plan belongs to a more ancient building tradition.[3] (It might be noted that this kind of three-sided structure - in this case about 30.5 meters wide and 57 meters long - would have provided a mooring area with a total length of approximately 138 meters on the outside alone without the necessity of building a footing out into deeper water, as a linear jetty of that length would have required.)



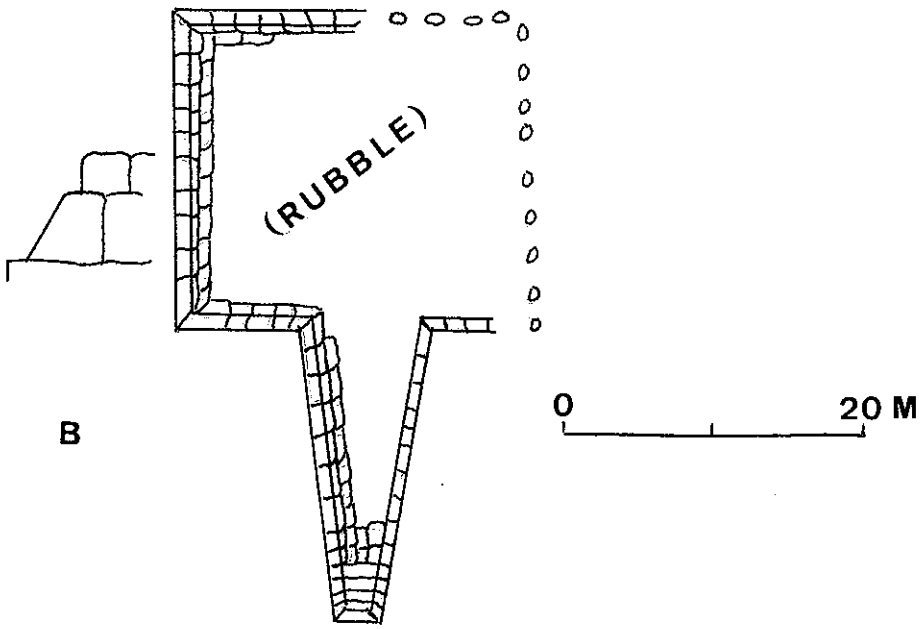


Fig. 3. Limestone wharf (A) and platform (B) west of Marea (not to exact scale).

The most peculiar and interesting structure in this group, just west of the wharf, is a rectangular platform of truly monolithic proportions that appears to have served as the base for a substantial, but now vanished, building of some kind. The sides of the upper courses are battered at about a 30° angle and these rest on a slightly larger foundation with squared edges. Some of the blocks are two meters or more in length, carefully cut and fitted together without mortar. The entire platform measures approximately 21 x 24 meters, and on the landward side a 20-meter ramp of similarly dressed and fitted stones leads up to it. Whether this structure provided the base of a temple, citadel, mortuary building, or lighthouse cannot be determined, but it is agreed that it is of Pharaonic style even if only of Ptolemaic date.

Therefore, this complex seems to represent different periods of construction, however long it was used, and suggests the lake level has not simply progressively declined but has been subject to oscillation. While it is certainly premature to infer that we have here an earlier version of Marea, at about the same elevation but further west on the lake, it is interesting that these structures lie almost immediately below the Dynastic and Graeco-Roman tombs on the upper ridge.

It may well be that there were several Mareas, their locations coincident with changing lake levels over many centuries. There is no assurance that the various citations of Marea in the ancient literature refer to exactly the same spot, and furthermore there was often some confusion in the use of "Marea" and "Mareotic" for either the town or the lake district. Nonetheless, it is tempting to visualize a dichotomy in changing settlement pattern between the almost featureless lake plain on which the present harbor lies and the elevated ridge above the plain.

It had been our intention during the 1981 campaign to initiate a wide and systematic archæological reconnaissance of the lake shore around Marea, with a view toward relocating antiquities mentioned in early publications and plotting on a regional map hitherto unreported remains, such as the "new" port just described. Unfortunately our efforts to undertake such a survey were frustrated by several factors, not the least of which is that the region has several military reservations. In spite of this, however, we were able to carry out sporadic ground investigations beyond the periphery of the harbor area, and the results of even this modest survey were encouraging.

On high ground to the east and west of the harbor we located several examples of a conspicuous class of structures, namely cisterns, wells, and shallow basins. The last - for the production of wine - included both rectangular rock-cut types and stone-built ones with plaster linings. Rock-cut basins are especially difficult to date (cf. Ahlström [1978] on Palestinian examples.) In only one instance, about 2 1/2 kms. southwest of the harbor, was chronologically diagnostic pottery found in association with a plasterlined basin (measuring approximately 12.25 x 6.75 m). This dates to the 4th - 7th centuries, perhaps slightly earlier than and contemporary with the use of the harbor. The masonry of the other cisterns and basins found is comparable to that observed on the site, and it seems reasonable to conclude that these structures belong to the late Roman and Byzantine periods, by which time Marea's reputation as a wine-producing area had been long established.

Aside from these rather expected finds, we were able to add nothing very substantial to the ancient architectural corpus of the region. However, on a

hillock which is now the site of a Moslem cemetery, about 4 kms. southwest of the harbor, we observed fragments of several narrow, unfluted marble columns of Byzantine type built into a pair of gabled Islamic tombs. From the surface of the same mound were recovered three fragments of small plates (kantharoi). The black glaze on these is characteristic of Attic (mainland Greek) ware made in the 4th-5th centuries B.C. While we know that a Greek community had been established at Naukratis, south of Marea, in the late 7th century B.C. and have ample testimony of Greek occupation west of Alexandria, these sherds are the first archaeological evidence we have recovered which dates to the Classical (pre-Hellenistic) period. With the earlier tombs found not far away, they perhaps provide another reason to seek the location of pre-Byzantine Marea on higher ground to the south and west.

Mention also should be made of a stamped amphora handle from the same cemetery which has a bull's head in relief on a round field. Greek letters are visible on the field, but the piece is worn and the inscription illegible. Nonetheless, the stamp is of a type well known from Alexandria and Athens; the bull's head is the device of the city of Knidos in western Asia Minor, recognized as a prolific exporter of wine throughout the eastern Mediterranean in the Classical and Hellenistic periods (for comparanda, see Grace, 1934: 271-174; 1961: Fig. 65). Our piece seems closest in style to published examples dating from the 1st century B.C. to the 1st century A.D. Two other stamped amphora handles (one rectangular and one circular) were recovered near the lakeshore just west of the harbor, but these also are poorly preserved and illegible. These finds do seem to suggest that a systematic reconnaissance of the vicinity may be expected to produce at least some evidence of both earlier settlement in the region and specific economic relationships between Marea and foreign lands.

Finally, with the assistance of Mr. Robert Kraft from the Schutz American School in Alexandria, we were able to relocate the site of Abu Seif Hasan, which is situated not far from Marea, near the 205-km. marker on the desert road to Cairo. The site was recorded by De Cosson (1935: 135) in his survey of Mareotis and consists of a great mound composed of hundreds of thousands of fragments from transport amphoras dating from the Byzantine era. The sheer quantity of pottery here, in a mound up to five meters deep, suggests it was a dump for either factory rejects or for damaged vessels offloaded from ships at the shore nearby.

It almost goes without saying that further archaeological survey of the region must be coupled with geomorphological investigation. Unless we can reach a better understanding of hydrographic patterns prevailing in the lake basin through time, it will be almost impossible to unravel its settlement history. The latter appears to have been far more complex than was envisioned originally.

With respect to the Byzantine harbor itself we find ourselves in a less speculative and frustrating position, and we can now turn to a description of the port facilities as they are presently understood.

One of the major objectives of the Boston University group from the outset was to produce an accurate plan of the entire harborside area and couple that with a more detailed study of its actual construction. In 1980, we were fortunate to add to our staff Dr. Thomas Boyd from the University of Texas, an experienced architectural surveyor specializing in Classical sites of the

Mediterranean. During the last two seasons, he was able to map the harbor, with associated buildings, at a 1:500 scale (as shown in Fig. 2, at a much-reduced scale).

It will be seen that among the primary features are three long jetties extending from the shore out into the lakebed, the easternmost one being set on a small promontory between the so-called Middle and East Ports (the West Port being defined as the area between the middle and western jetties). The western jetty is about 40 meters long, while each of the others is closer to 120 meters. Just east of the former is a remnant of a much smaller quay or dock which may have had a more specialized function. At several points along the shore, segments of retaining seawalls survive (these perhaps having helped compensate for minor oscillations of lake level during different flood years of the Nile as well as counteracting wave erosion during storms), although the shore on the western side of the West Port is defined only by an irregular outcropping of limestone bedrock. At some points, the seawall is interrupted by either steps or stone ramps leading directly down to the water. Examples include one on the north face of the Middle Port promontory and another on its west side near the "granary"; an additional one was excavated in 1981 as part of a large building complex located on the southeast edge of the West Port. Others probably existed and may be detected by further excavation. Both jetties and walling, like most of the buildings on the site, were built of soft limestone blocks likely quarried at Mex, on the other side of the lake near Alexandria. Many of the blocks are moderately to severely eroded; others have been eroded away completely or robbed out by later builders. Up to now, excavation has been conducted mainly along the Middle Port where many, if not most, of the public buildings were erected - ranging from a large basilica on the west to a pair of public baths on the east.

The jetties are constructed of dressed blocks whose size and exact shape varies somewhat, even within some of the same individual courses. These are held together by a reddish cement, waterproofed according to the formula of the Roman architect Vitruvius by adding ground potsherds. The maximum size of the blocks on two of the piers is about 1.2 x 0.55 x 0.40 meters (0.264 cubic meters) but scarcely exceeds 0.5-0.7 meters in greatest dimension on those of the eastern one. The laying of courses was also somewhat irregular. On the middle jetty the top course - or what remains of it - has blocks placed in directionally alternating rows, end-to-end in one and side-by-side in the next (Fig. 4A). The course below that seemingly has mostly parallel rows running transversely across the pier. The top course of the western jetty, the shortest one, has some rows of blocks laid perpendicular to others but with anywhere from one to four longitudinally parallel rows occurring in sequence (Fig. 4B). Only toward the landward end are there single rows with blocks perpendicular to those in the next. The course below appears to have been laid in much the same fashion, rather than in fully parallel rows as one sees in that unit of the middle jetty.

The eastern jetty, rather more eroded and silted up along the sides as well as being built of smaller-sized material, is generally similar in construction but even combines longitudinally and horizontally laid blocks in some of the same courses (Fig. 4C). This may simply reflect the shorter length of constituent members, which made a "domino" arrangement more feasible. Whether it also reflects a difference in date of construction cannot be ascertained on the basis of present evidence, but it probably does not.

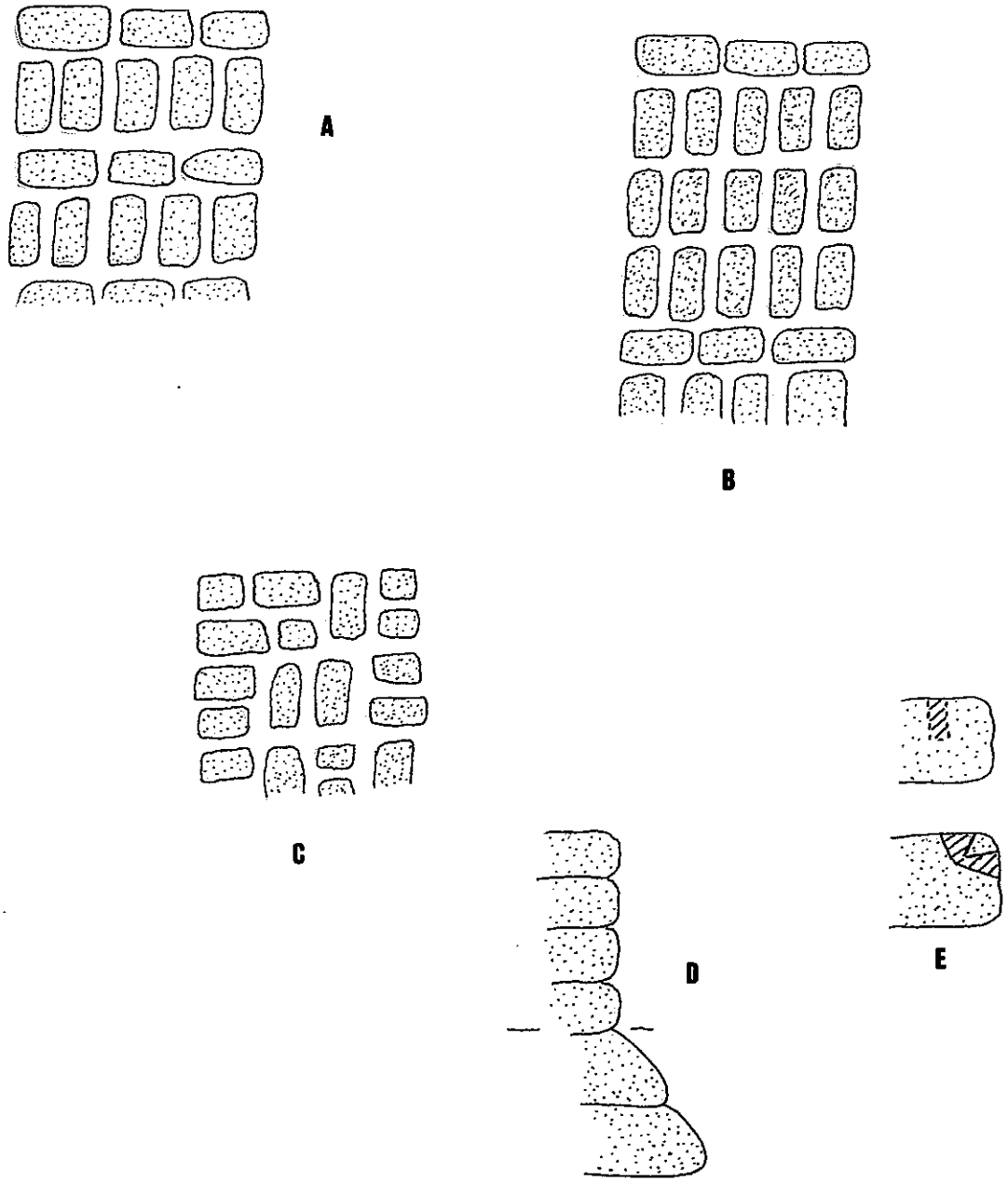


Fig. 4. Details of jetty construction (not to scale). A-C: uppermost courses seen from above; D: side profile of middle jetty; E: bollard hole and mooring ring.

In order to examine the underlying foundation of these structures, a pair of trenches was excavated on the western and eastern faces of the middle jetty, along with another at the landward end. There proved to be at least a double course of large stretcher blocks running parallel to the jetty face beneath the cross-blocks of the higher courses. Sloping outward, these extend somewhat beyond the vertical face of the higher units to provide a solid footing (Fig. 4D). Whether there are additional courses below this in the substructure could not be determined, since the water table was reached well before the bottom of the second (lowest) support-course was exposed.

It will be noted on the plan that the western jetty is not rectangular in outline but forms a long, narrow trapezoid whose distal end is the broader. When the foundation of the middle jetty was partially uncovered, it was found to be narrower at the proximal end also (±4.9 m vs. ± 5.7 m in the section further out). In addition, it can be seen that the piers were not built exactly perpendicular to the shoreline, even when that was defined by artificial walls, but rather give the impression of having been laid out "by eye."

These details, as our architect remarked, seem to be in keeping with the relatively haphazard nature of much Byzantine building, which contrasts with that in Roman and earlier periods. Neither planning, materials, nor construction techniques were always subjected to the same degree of control and standardization any longer. While the extraction, shaping, and transport of materials in the jetties no doubt represent a great deal of time and labor investment, the size of the blocks and their erection along a level surface probably did not require use of mechanical devices such as rollers and tackle. The greatest problem would have been that of positioning the support-courses below water level - a feat that perhaps entailed construction of cofferdams.

On the upper course of the middle jetty can be identified a few cylindrical bollard holes of the type described earlier for the wharf west of Marea. These are not well preserved, nor are there any of the mooring rings seen on that other structure. An even more interesting feature is a circle at the end of the pier, formed of curved blocks and about four meters in diameter, which is thought to possibly have been the base of a light beacon aiding nighttime navigation. That neither these nor mooring features can be clearly identified on the remaining jetties may be due to the erosion or collapse of blocks along their ends and sides. It may be that all three piers were lighted at night to signal obstructions to shipping.

Whether intentionally or not, the jetties may have served another function, namely as groins to inhibit shore erosion. The always-shallow lake basin is likely to have been subjected to severe wave action during storms on the nearby Mediterranean, producing a potential threat to the waterside buildings and shipping facilities.

The remaining major element of the harbor, defining its eastern limit, is a causeway or breakwater which winds for several hundred meters along the shoreline from north to south. Also constructed of limestone blocks, it is about 5.5 meters wide and connects a small natural island (containing as-yet unexcavated architectural remains, and not shown on the harbor plan) lying offshore to the northeast of the harbor with a stone-built platform and then continues onward adjacent to the shore. At its narrowest approach to the latter (about 40 meters), it probably originally swung inward to close off

that part of the port but was later re-opened and diverted further southward to provide a (one-way?) exit or entrance to the East Port by way of the southern body of the lake, which extended considerably inland at this point. This hypothesis stems from construction details visible at the juncture where the causeway veers toward shore and then swings sharply away in another direction. If this was altered to create a one-way channel, its purpose was likely to have been to alleviate growing ship traffic.

The function of the platform is not clear, since the original superstructure, if any, has vanished. One contention is that it supported a lighthouse marking the eastern extremity of the port. If so, it seems rather strange that it would not have been placed on the island further out to allow ships to circumvent that as well - unless the island was to occupied by other important buildings. But, as noted, its own function has not been clarified; all that can be said at present is that it has a number of structural foundations on its surface as well as a small jetty or two on the north side which could have provided a landing place for small boats or barges.

If the platform was meant to support a structure of this general kind, its location would not be so peculiar if it were essentially a signal beacon. We know historically that a system of this type linked Alexandria (and its famous Pharos Lighthouse) with the coast of the northwestern frontier at one time, and there is one possible surviving example, the "Arab's Tower" at Abu Sir, some kilometers west of Marea. This, however, is closer to the coast, and its own function has been disputed. Moreover, it is of Ptolemaic date, not Byzantine.

One part of our excavation program in 1980 and 1981 may shed some additional light on maritime facilities at Marea. Survey and subsequent excavation at one point along the shore between the middle and western jetties revealed a pair of walls sloping down from higher ground into the original lakebed. The two parallel runners extend altogether for a length of 20 meters or more, flanked at their upper ends by room-walls belonging to various-sized structures. The runners consist of three courses of "header and stretcher" blocks (laid criss-cross) which at the landward end have massive stone foundations going down to bedrock, at a depth of about two meters. The topmost blocks are worn away at an angle of about 15° toward the center of the aisle formed by the walls. Between the two runners is a stratigraphically well-defined V-shaped trough of gray silt containing 5th-6th century sherds and a St. Menas flask (associated with the shrine and burial place of that early Christian saint located at Abu Mina, in the desert about 20 kms. south of Marea). This item dates to the late 6th or early 7th century (cf. Hayes, 1972: 52 [no. 270]).

It is hypothesized that this "slip" served as a drydock on to which ships could be hauled for servicing and repair, or on which such vessels could have been built. Our reconstruction (Fig. 5) suggests how it may have been used, employing rollers and hand labor. The width of the runners, just over 7 meters, would have been sufficient to accommodate shallow-draft, narrow-beamed ships such as the 7th-century Yassi Ada example (recovered in the eastern Mediterranean a few years ago [see Bass, 1971]) depicted here. The gradient of the runners (slip) is approximately 1:16, not far different from one of 1:14 at the Roman port of Apollonia in Cyrenaica (Morrison & Williams, 1968: 183 ff.; Taylor, 1966: 168-178). Either would have allowed use of manpower and log rollers alone to haul ships out of the water.

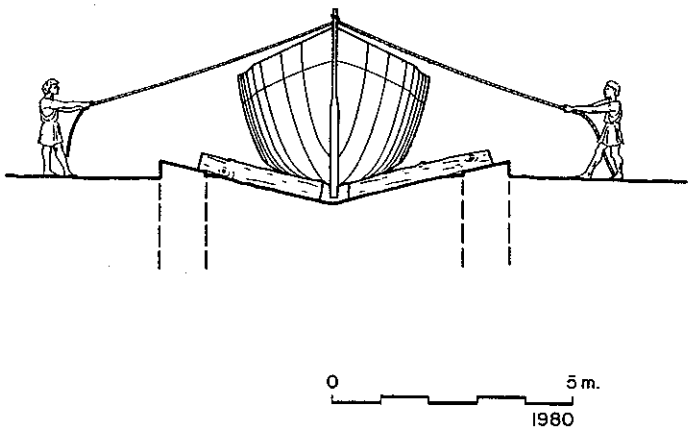


Fig. 5: Reconstruction of West Port "drydock"

Further excavation of very limited scope has not allowed us to ascertain the nature of the structures associated with the proposed drydock. One of these, reported in earlier literature (e.g. De Cosson, 1935: 135) as a "glassworks" because of the amount of slag and burned brick on the surface, proved not to be a manufactory site at all when cleared to the floor; more likely it was nothing but a later dump. Furthermore the slag, when analyzed for us at M.I.T. was found to be more similar to residues from pottery-making than glass manufacture. On the southern end of the slip, while more construction details were being sought, we uncovered three 10-cm. holes roughly hewn out of the ashlar mansonry. Each is slightly above the floor of the slipway and may have served to drain it in times of high water. In the last few days of the 1981 season was found a stretch of rudely-made ashlar limestone walling, one course deep, extending from the rear of the slip into a flat expanse beyond (which, we have suspected for some time, could have been a former warehouse area). Its function, like that of other structures visible on the surface, remains to be determined - as does the relative chronology of construction in this complex. Its complete excavtion would no doubt provide a great deal more information on maritime architecture and technology. Also, it may ultimately be found that the West Port as a whole was more industrial than civic in nature as compared with the eastern harbor areas.

The curious labyrinthine building on the western side of the promontory along the Middle Port (between the shop arcade and the millhouse) has been seen by some to represent another possible drydock, mainly because it has a distinct lakeward slope and a large part of it clearly had once lain under water (as seen in both its elevation relative to the ancient shoreline and the condition of the foundation blocks). If so, its construction was entirely different, and its unusual, interlocking interior walls make little sense at all. Alternative explanations include its possible function as a fish pound (piscina) or a fishermen's shrine, the latter hypothesis because of the many fishhooks and small coins (offerings?) recovered from its base during excavation.

After extending the surface survey of the immediate port area, it is our conclusion that Marea was substantially smaller as a discrete urban settlement than originally supposed, even if surrounding villages and agricultural estates (many of which became large and rich in Byzantine Egypt) contributed to its economic, civic, and political life. South of the harbor, between the lake and the upper ridge, surface traces of occupation are scant, and the same is true of most of the area between the West Port and the recently discovered lakeside structures described above, which lie quite some distance to the west and may not have belonged to the same settlement and/or time period. The heart of the Byzantine town, then, may not have exceeded several hundred meters along the shore and a few hundred inland. This would not be suprising if the town's functions - by then long subsidiary to those of Alexandria - were primarily agricultural and commercial, with many of the retail goods being produced or processed in outlying villages and estates (as perhaps seen at Abu Seif Hasan, with its pottery works).

An additional use of the East Port area came to light in 1981, when several rock-cut tombs (slightly off the harbor plan in Fig. 2) were identified near the lakeshore south of the eastern jetty and adjacent basilica. One of these was largely excavated and found to have well-built steps leading down into a partly natural limestone cavity which also incorporates some stone-block facing in the interior. The fill along the steps and in the tomb itself contained so many fragments of human skeletons - adult and juvenile - that it almost resembled an ossuary. No doubt the deposits had been previously disturbed, however, and the condition of the bones suggests not all were of the same period, some specimens being quite fresh-looking and others heavily weathered. All pottery was Byzantine; otherwise the date of the tomb's original construction and use is unknown.

Nearby, a small building of miniature basilica shape, with a barrel vault and an east-facing apse, was partially excavated at the same time. Some of the interior architectural detail (including a series of extremely small cells nearly blocking off the apse) seems to imply redesign and re-building at a later time. Perhaps originally a small chapel (connected with the tombs?), it was later employed quite differently. There is little evidence to support one contention that it was, initially or subsequently, a tomb or mausoleum constructed in basilica style.

To understand Marea as a commercial and maritime center is, of course, to also understand the kinds of goods passing through its harbor. Most such information we possess stems from historic sources (many applying to Mareotis as a whole rather than to Marea specifically), although these are confirmed or amplified by archaelogical findings as well. The economic importance of wine-making and -export was the one thing which most captured the attention of early writers. Mention was made in our previous report of the fine winery and nearby villa with its own wine-processing facilities excavated some years ago by Prof. Fakharani on the ridge south of the harbor. These, together with the other wine-basins discovered on survey, further testify to the region's fame for vineyards.

The import or export - probably mainly the latter - of olive oil is attested by the many oil-storage jars represented on the site and, more particularly, in two or three of the shops excavated. Marea likewise is known to have been a primary supplier of fruits and vegetables to Alexandria, even into early Islamic times, and the lake district was a major source of papyrus used elsewhere in Egypt and in other parts of the Mediterranean. The region also

was well known in late antiquity for its figs and almonds, both of which are still being grown there today.

Unfortunately, the limited range of artifactual material recoverd thus far in excavation does not enhance the economic picture as much as might be expected. Part of the problem may be the continuous scavenging by local Bedouin, which has probably gone on ever since the site was finally abandoned. Aside from many fragments of transport and storage jars, ubiquitous at all contemporary Roman and Byzantine sites, the most common items are pieces of colored Byzantine glass and badly-corroded bronze coins whose origins and dates cannot usually be determined. Finer pottery (mostly Egyptian buff ware) such as pitchers and domestic crockery make up only a small percentage of the total ceramic inventory, and even the occasional late Roman sherds come from locally-manufactured ware.

Preliminary pollen analysis has been gratifying to the extent that its great potential here has been amply demonstrated. Preservation of pollen grains is excellent, with 2-15 times the amount per unit volume than in most sites of the arid Southwestern U.S. and no single specimen so distorted as to be unidentifiable. On the other hand, most of the (very limited) initial investigation results have been environmental rather than economic (suggesting somewhat moister conditions at the time the site was occupied and confirming changes in lake level via the nature of shore vegetation). One exception is that manure from one of the shops (which has apparent feed-bins and is thought to have temporarily housed small livestock for sale) contains large amounts of Gramineae and seems to indicate that something like marsh grass was commonly used as fodder.

Certainly one aspect of the economy contributing to Marea's prosperity, and presumably its maritime activities as well, was fish and livestock. Our last two seasons' work yielded quite substantial amounts of fauna, almost all of it in an excellent state of preservation (right down to fish scales and mouse bones). Although we are a long way from having an adequate sample for the entire site, some notion of animal-food production is beginning to emerge. Fish remains, representing individuals or species nearly as small as minnows up to ones of a size similar to Northern pike, altogether constitute about half of these collections. The majority belong to a fish comparable in size to a bluegill, probably the same species as one still being taken in quantity at the eastern, freshwater end of the lake outside Alexandria.

Among mammalian species, pig is most prevalent, followed (in descending order) by sheep, goat, donkey, and cattle. Examples of the last are not very numerous, which may indicate they were less important than small stock. That beef was not being imported, unless "on the hoof," is inferred from the presence of foot bones, cranial bones, and other skeletal elements from less useful parts of the body. Chickens as well as cat and dog are quite well represented. Apparently an occasional gazelle was killed, as were ducks - for which Mareotis was famous earlier in this century. Several species of shellfish, including oysters, are present but so far never in the quantities or concentrations to suggest they played a significant role in the diet.

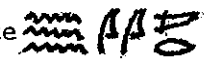
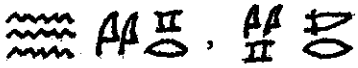
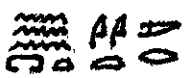
The production and acquisition of animal foods through husbandry and fishing is an aspect of the economy less well documented by writers of antiquity (although hieroglyphic accounts from the Old and New Kingdoms cite enormous numbers of livestock, including cattle, being raised by the original Libyan inhabitants of the region). So in this instance archaeology is able to supplement as well as substantiate the written record.

In summary, it must be emphasized that the greater portion of Marea remains unexcavated. Decades of work are ahead before anything approaching a complete picture emerges, and no doubt future work will alter and expand many of our present perceptions. The only exception is the harbor installations (although further details can be obtained from excavation of subsidiary features), which have lain largely exposed for years, even if not thoroughly mapped before this. Without question, this is the most interesting and important part of the site, since so little is known, comparatively speaking, of ancient Mediterranean ports, Byzantine or otherwise. That this is a lake port, associated with both Mediterranean and Nile shipping, makes it all the more intriguing in some respects. Even then, a great deal more needs to be learned about the production and exchange of specific commodities which played a role in Marea's commercial life.

Perhaps the major question concerning Marea at this point, however, is where its pre-Byzantine forerunner(s) may have been located. Historically, we know it existed even before Alexandria and flourished for a long period afterward. To answer this question, more intensive regional groundwork is required, probably including utilization of geomorphological and remote-sensing data which are not currently available, partly due to security restrictions. In a broader sense still, Marea's own history must eventually be tied in with that of the entire lake region, for virtually none of the antiquities around its shores has been subjected to scientific investigation.

Historical Notes on Mareotis

There is good, if disparate, evidence that the toponyms Marea and Mareotis are of great antiquity. Fakharani (unpublished ms.) has suggested a connection with the ancient Egyptian word  mr, canal or artificial lake;  mryt, bank, shore or quay; and the plural  mrw, harbors (cf. Faulkner 1967:111-112). All these terms refer to a body of water and to facilities built on a waterfront, which are indeed prominent at Marea.

H. Brugsch, in his corpus of Egyptian toponyms (1880:1184) recognized clearly in a funerary papyrus of the XXVI dynasty (Louvre no. 3079) two names in the western Delta region, one of which was named after the lake  ,  mari, in the district of Pa-mar or Pi-mar, "'the country' or 'the city' of the lake" (cf. also Brugsch p. 1177), which gave its name to the entire nome. One of the two cities of renown in this western nome was  mar-t or  mari-t, which Brugsch identified as the root of later Greek Μάρεη, Μάρεια, Μαρία, Μαρεώτις, and Latin Marea, all of which are toponyms used by the classical geographers.

Athenaeus, a Greek native of Naukratis to the south of Marea, related in his Deipnosophistae (3rd cent. A.D.) his own fascinating theory on the etymology of the toponym (I:33): "The Mareotan wine - also called Alexandreotic - gets its name from Lake Mareia in Alexandria and the city so named near it ... The city took its name from Maron, one of the members of Dionysus's conquering train" (Loeb tr.) Maron was a legendary priest of Apollo. According to Homer (Odyssey IX: 195-201) Maron gave Odysseus the powerful wine which made the Cyclops Polyphemos drunk. Athenaeus has here drawn a false cognate, perhaps because he was so impressed by the fine wine produced in the Mareotis in his day (q.v. below).

It is noteworthy that the elements mr and mrw occur in ancient Berber proper names. Oric Bates (1914:80) cites particularly Mry(u) (usually rendered Meryey in English), who was a leader of one of the great Libyan invasions of Egypt during the XIX-XX Dynasties (cf. also Kees [1961:132] on these incursions). The possibility must be considered, then, that the root of the toponyms Marea and Mareotis was of non-Egyptian origin and was attached to this region in the early second millennium B.C., if not before that. Whatever its original linguistic affiliation or source, by the Roman Imperial period the word Mareotae was commonly used to refer to the population of Mareotis (cf. Pliny, Historica Naturalis v. 6, and Ptolemy, Geographica iv. 5:4, 12). By this time though, it seems that the word had more geographic than ethnic connotations (Bates, 1914: 57, 61). Finally, it is interesting that the root of the toponym has been faithfully transmitted down to the present. The Arabic name of the lake is Maryut, and there is a village a few kilometers east of Marea named Al 'Amriya, which preserves the m-r-y phonemic sequence. It seems, therefore, that the toponym may date back some three thousand years.

The issue of linguistic and ethnic affiliations of the Mareotis inhabitants is a problematic one. Neither within the Delta proper nor fully within the Libyan Desert, the region in which Marea is located seems to have occasioned a certain ambiguity of ethnic identity in antiquity. This ambiguity came to the attention of the Greek historian Herodotus, who visited Egypt in the 5th century B.C. and related in his Histories (ii:18), rather incidentally, that

> The people of Marea..., on the Libyan frontier, took a dislike to certain religious observances... accordingly they sent to the shrine of Ammon and said they were in no way bound by Egyptian custom as they considered themselves not to be Egyptians at all, but Libyans; they lived outside the Delta, had nothing in common with Egypt, and wished to be allowed to eat what they pleased (De Selincourt tr.).

The oracle, Herodotus continues, refused to grant the request of the Mareans, declaring that all regions irrigated by the Nile constituted Egyptian territory.

Bates (1914:79-80) argued that the Berber language was spoken throughout ancient Libya, to the west bank of the Nile. This conclusion is supported by the Roman geographer Pomponius Mela (De Chrorographia i:8), who recorded the lifeways of the coastal tribes between Cyrenaica and Alexandria in his own day (1st century A.D.): "The coastlines are inhabited for the most part by people whose customs are similar to ours, except that some of them differ in their

languages, and in serving their gods, and worship them according to the custom of their native lands" (Petruso tr.). Mela goes on to describe a pastoral people who eat game and drink milk and fruit juice, wear hides, and follow their cattle. He furthermore states that there were no cities in this region, merely clusters of mapalia (nomads' hovels?). Finally, he echoes the story related by Herodotus in proclaiming that Africa is actually bounded on the east by the Nile. Thus he believed that the Libyan Desert was wholly non-Egyptian territory (i:4).

The route between Cyrenaica and Alexandria along the coast was a popular one among early European travelers to North Africa (e.g., Browne, 1799; Scholz, 1822; St. John, 1849). These intrepid adventurers frequently commented on ruined buildings observed in their travels. In many cases it is possible to identify with certainty the ancient sites they visited, and the antiquities of Mareotis - especially the impressive tower and temple at Abu Sir (Taposiris Magna) - were often mentioned in their journals. Judging from these accounts (and from our own limited excursions in recent years) antiquities of all periods abound. Early historical sources testify to occupation of the region well before the Classical period, and occasional references by Arab authors such as Maqrizi (15th century) attest to post-Byzantine occupation. Quatremère (1811) describes Marea as a large hamlet which produced fruit and almonds for the Alexandrian market, and the Baedeker guide to Lower Egypt (1885: 223-224) lists an astonishing forty ancient villages in the hills to the south of the lake.

The archaeological site under consideration was first identified as ancient Marea by the Khedive astronomer Mahmoud el Falaki (1872:96-97). This identification, aided by calculations of its longitude and latitude by the ancient geographer Ptolemy, was challenged by J. Ewald Falls of the Menas Expedition (1913:199-200) but has been accepted by other scholars - most notably Breccia (1914:122-123), De Cosson (1935:131-135), Rowe (1953:131), and Fraser (1972:143-146). It was De Cosson who first drew a sketch of the lakefront at Marea with its jetties.

Authors ancient and modern have commented at length on the strategic importance of this area. Herodotus (ii:30) designates Marea as one of the three major frontier checkpoints critical to the defense of Egypt against foreign invaders: "The Egyptians had guardposts in various parts of the country: one at Elephantine against the Ethiopians, another in Daphnae at Pelusium against the Arabians and Assyrians, and a third at Marea to keep watch on the Libyans" (de Selincourt tr.).

This vigilance at the western tip of the Delta was certainly justified. The main route from Cyrenaica to the western gate of Alexandria was via the fertile Mediterranean coastal belt today called Abu Sir (Taposiris) Ridge, and popularly known in Classical antiquity by the Greek name Taenia, or "strip." Because the Taenia was the most direct land route between Libya and Egypt, border defense posts were an absolute necessity; indeed, several border fortresses have been located along this frontier zone, the best known among them at Khashm el Eish, approximately 24 kms. southeast of Alamein (plan and description in De Cosson 1935: 120-122). This site, at the western tip of the Mareotis on a ridge a hundred meters above sea level, would have been an excellent outpost from which to defend the western flank of the Delta. It has been suggested that among the massive buildings on this high ridge was a signal tower which was part of a chain of lighthouses or heliographs stretching

along the coast. For the Egyptians to have established outposts such as this along the route to the west would have been quite logical. Khashm el Eish is within sight of the tower at Taposiris (about 12 kms. west of Marea on the north shore of the lake), which owing to its elevation and splendid view of the Taenia and the lake, is itself a good candidate for an intermediate relay station.[4]

The strategic significance of the Mareotis requires little further comment. Libyan incursions into Egypt are well attested, in several waves beginning at least as early as the XIX Dynasty. In later periods, according to el Falaki (1872:97), the Taenia and the parallel depression of the western finger of the lake constituted the route of access to the Delta by the armies of Julius Caesar, Nicetas, and Napoleon.

Mareotis enjoyed great, if uneven, renown in Classical times for its wine. On the whole, Egypt was not a major producer; to judge from the relatively scarce Pharaonic references to viticulture, wine was not an economically significant product until Ptolemaic times. One interesting early inscription, found in a tomb at Meir dating to the XII Dynasty (Middle Kingdom), mentions wines presented to the deceased, Ukh-hopt, from each of these regions of Egypt: the Delta, eastern Buto, Syene, an unspecified region, and Mareotis (Blackman 1915: 29-30). Wilkinson (1879:441) suggests that the reason for the relative insignificance of wine production in Egypt is related to the nature of the soil. Only in restricted areas (notably Mareotis) was there gravel to provide proper drainage for vines; the dense black alluvium along the Nile was simply not suitable. It might be noted here that even today Mareotis is one of the few parts of the country which can support vineyards.

Much is to learned about this topic by examining the works of Classical authors familiar with Mareotan wines. Virgil (Georgics ii: 91-92) commented on the soil of the region: "Nor our Italian vines produce the shape, or taste, or flavor of the Lesbian grape. The Thasian vines in richer soil abound; the Mareotic grow in barren ground" (Dryden tr.).

Greek and Roman writers give us glimpses of the reputation of Mareotic wines. Athenaeus' intriguing but unconvincing oinological derivation of the toponym was mentioned above, but to this we may add his statement (op. cit.) that "Vines are plentiful in this country. The grapes are very palatable for eating, and the wine made from is very fine. It is white and sweet, has a good bouquet, is digestible and light, does not affect the head, and is diuretic" (Blake-Reed tr.). The Deipnosophistae ("Gourmets") from which this passage is excerpted is pedagogical; hence the wealth of detail. Horace, on the other hand, considered the Mareotic wine to be anything but light. In his Odes (i.37, 12-21), he uses the locative to describe a wine which induces delusions of the mind, thereby stressing its intoxicating quality.

In his De Rustica (iii:24), Columella gives us some details about the yield of the vines grown in the region: "For those Greekling vines - such as the Mareotic, the Thasian, the Psithian, and the Sophortian - though they have an agreeable taste, still in their localities they yield little juice because of the looseness of the bunches and the small size of the berries" (Loeb tr.). Strabo (Geographica xvii. 1.14) relates that "the vintages in this region are so good that the Mareotic wine is racked of with a view to aging it" (Loeb tr.). This indicates that the quality of the wine was perceived as superior and repaid the trouble and expense of aging it; otherwise it would have been consumed shortly after its production.

Finally, it should be noted that not all ancient commentators shared a high regard for the wine of this region. Lucan writes in the Pharsalia (x: 155-163) of a sumptuous feast at which "wine was poured into great jewelled goblets - no wine of Mareotic grapes, but generous Falernian, to which Meroe [in Nubia] brings ripeness in a few years..." (Loeb tr.). The preceding passage makes sense if we interpret it as unflattering to the Mareotic product; Lucan is calling it pedestrian, if not cheap. Whether or not Lucan's opinion was widely held, it is clear that the beverage of the region was of some international repute.

After the Arab invasion, wine production in Mareotis was eclipsed by production of fruits, olives, and almonds, which were sent to market in Alexandria (Falaki 1872: 93; De Cosson 1935: 134-135). After a period of near-abandonment when the British attacking Napoleon's forces at Alexandria in 1801 flooded the lake with sea-water, the construction of irrigation canals during the late 19th and 20th centuries (e.g., Hume & Hughes 1921; Shafei 1952) has revived the region somewhat. Today, maize and barley are grown along canals recently extended westward to Bahig; otherwise, the most visible crop is the fig, which can be seen growing almost everywhere.

Acknowledgements

We are grateful to the Schutz American School for accommodations provided staff and students in Alexandria. Particular thanks are due George Meloy (headmaster); Bob Kraft; and Kim Murman and Tom Vance, who cheerfully ministered to our comfort at the Fairhaven campus.

At Boston University, Dr. Robert Mayfield, Provost, helped make the initial arrangements for our field program. Mrs. Margaret Bannister (Study Abroad Program) as well as Neil Connell and Donald Dunbar of the Summer Term office gave us continual support and encouragement.

In addition to providing essential services in conjunction with mapping and surveying, Dr. Thomas Boyd was a good and entertaining companion as well as useful critic.

Most of all, we must express our gratitude to Professor Fawzi el Fakharani, Director of the Marea Archaeological Project for the University of Alexandria, for inviting us to participate in the work at the site, making most of the official arrangements in Egypt, and taking part in the instructional side of the program.

And last, but by no means least, we thank the 73 students, graduate and undergraduate, who took part in the field school. Their enthusiasm and good humor, working under sometimes arduous conditions and while subjected to a variety of viral and bacterial complaints, contributed substantially to its success. We learned much from them, and we hope the opposite is also true.

NOTES

1. Creighton Gabel and Karl Petruso, "An Environmental and Cultural Study at Lake Maryut, Lower Egypt," Boston University African Studies Center, Working Paper No. 25 (1980), 25 pp.

2. The ancient and Byzantine history of Marea and Mareotis, with citations to relevant literature, can be found in Kees (1928) and is conveniently summarized in English by De Cosson (1935).

3. Alan Rowe (1953: 128) has equated the predynastic "Nome of the Harpoon" with the Mareotis region, and the "Harpoon Lake" with Lake Maryut. Furthermore, he reads in the famous Palette of Narmer reference to the "Great Door" (i.e. "Port of the Boat"), which would have been in the vicinity (cf. also De Cosson, 1935: 20-21). Therefore, the proposal that this wharf and platform sub-structure might date to the pre-Greek period is not implausible. It is interesting in this regard that within the west port of Alexandria there was in antiquity a man-made harbor, called in the Greek period KIBOTOϵ (literally, "box"; cf. Breccia, 1914:67 and Strabo xvii. I.10). Perhaps, as Prof. Fakharani has speculated (personal communication) there existed from early times a tradition in Egyptian architecture of harbors built according to a rectangular plan.

4. The function, or functions, of the tower at Taposiris, the most famous ancient monument in Mareotis, has been debated by historians and archaeologists for decades. For the excavation report, the reader is directed to Adriani (1952). Fakharani (1974) argues that the tower was a funerary monument rather than a signal station, and he lists the relevant bibliography expounding various interpretations. On border posts in Cyrenaica, see Goodchild (1951a, 1951b, 1953) and Rowe (1954:497-499).

REFERENCES

A. Adriani, "Travaux de Fouilles et de Restaurations dans la Région d'Abousir (Maréotis)," Annuaire du Musée Gréco-Romain 3 (1940-1950): 129-159.

G. Ahlström, "Wine Presses and Cup-marks of the Jenin-Megiddo Survey," Bulletin of the American Schools of Oriental Research 231 (1978):19-49.

G. Bass, "A Byzantine Trading Venture," Scientific American 225 (1971):23-33.

O. Bates, The Eastern Libyans, London, 1914.

A.M. Blackman, The Rock Tombs of Meir, Part III: The Tomb-chapel of Ukh-Hotp, Son of Ukh-Hotp and Mersi (B, No. 4), London, 1915.

E. Breccia, Alexandrea ad Aegyptum, Bergamo, 1922.

W.G. Browne, Travels in Africa, Egypt, and Syria, London, 1799.

H.K. Brugsch, Dictionnaire géographique de l'ancienne Egypte, 1880.

A. De Cosson, Mareotis: Being an Account of the History and Ancient Monuments of the North-west Desert of Egypt and Lake Mareotis, London, 1935.

F. el Fakharani, "The 'Lighthouse' of Abusir in Egypt," Harvard Studies in Classical Philology 78 (1974):257-272.

M. Pasha el Falaki, Mémoire sur l'Antique alexandrie, ses Faubourgs et Environs, Copenhagen, 1872.

J.E. Fells, Three Years in the Libyan Desert, London, 1913.

R. Faulkner, A Concise Dictionary of Middle Egyptian, Oxford, 1976.

P.M. Fraser, Ptolemaic Alexandria, Oxford, 1972.

R. Goodchild, "'Libyan' Forts in South-west Cyrenaica, Antiquity 25 (1951): 131-144.

-----, "Boreum of Cyrenaica," Journal of Roman Studies 41 (1951):11-16.

-----, "The Roman and Byzantine Limes in Cyrenaica," Ibid. 43 (1953): 65-76.

V. Grace, "Stamped Amphora Handles Found in 1931-1932," Hesperia 3 (1934):197-310.

-----, Amphoras and the Ancient Wine Trade, Princeton, 1961.

W. Hume and F. Hughes, The Soils and Water Supply of the Maryut District, West of Alexandria, Cairo, 1921.

H. Kees, "Marea, Mareotis," Paulys Real-Encyclopädie der klassischen Altertumswissenschaft 14 (1928):1676-1678.

-----, Ancient Egypt: A Cultural Topography, Chicago, 1961.

J. Morrison and R. Williams, Greek Oared Ships, Cambridge, 1968.

E. Quatremère, Mémoires géographiques et historiques sur l'Egypte, Paris, 1811.

A. Row, "A Contribution to the Archaeology of the Western Desert: I," Bulletin of the John Rylands Library 36 (1953):128-145.

-----, "A Contribution to the Archaeology of the Western Desert: II," Ibid. 37(1954): 484-500.

J.M.A. Scholz, Travels in the Countries between Alexandria and Paraetonium, London, 1822.

A. Shafei, "Lake Mareotis: Its Past History and Its Future Development," Bulletin de l'Institut Fouad I du Desert 2 (1952):71-101.

B. St. John, Adventures in the Libyan Desert, London, 1849.

J. du Plat Taylor, Marine Archaeology, New York, 1966.

I.G. Wilkinson, The Manners and Customs of the Ancient Egyptians, New York, 1879.