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A metropolitan landscape: the Late Punic port of Carthage

Henry Hurst and Lawrence E. Stager

Study of the port of Carthage has moved into a new phase with the research now being carried out under the overall direction of the Institut National d'Archéologie et d'Art of Tunis in the international Save Carthage campaign. The argument about the identification of the naval and commercial harbours described by Appian has finally been resolved and attention can be focused on the problems of the historical development of the port and its character and environmental setting at successive stages (Hurst 1978 and Stager 1978). Here we make a first attempt to do that, drawing upon the necessarily patchy information which has come from our excavations up to this point: thus rather than offering solutions our purpose is to define some of the problems which researchers now face.

The problem of the original harbour

While we can now talk with some conviction of the port of Carthage for the last century of the Punic city's existence, we still do not know the location and character of the original harbour – the natural feature which is presumed to have attracted settlement to the site in the first place and made possible the subsequent growth of the city. It is, however, possible to use a better understanding of the later port to place this problem in a fuller environmental and historical perspective.

From the fourth–third century onwards the port was sited to the south-east of the nucleus of the city in a coastal stretch of naturally flat or very gently undulating land, which lies at an average level of 2–3 m. above the present sea level (figs 1 and 2). Taking into account both the stratigraphic accumulation on land and a rise in sea level of c. 1 m. since the third century B.C., sea and land levels probably then had much the same relationship as now. The main alignment of the coast in this area is north–south with the prevailing wind coming from the north-east. The two inland harbours of the port occupy an area some 1 km. north–south by 300 m. east–west with their entrance at the south end from the Bay of Kram, where the coast swings westwards making a naturally sheltered bay. As with much of the coastline north-west of Tunis, this is an area undergoing natural change through erosion and the aggradation of silt. The most striking changes since antiquity have been the growth of the La Goulette–Le Kram tombolo or sand-bar with the increased closing off from the open sea of the Lake of Tunis (until the cutting of the ship canal at La Goulette), and a similar process to the north-west of the ancient city

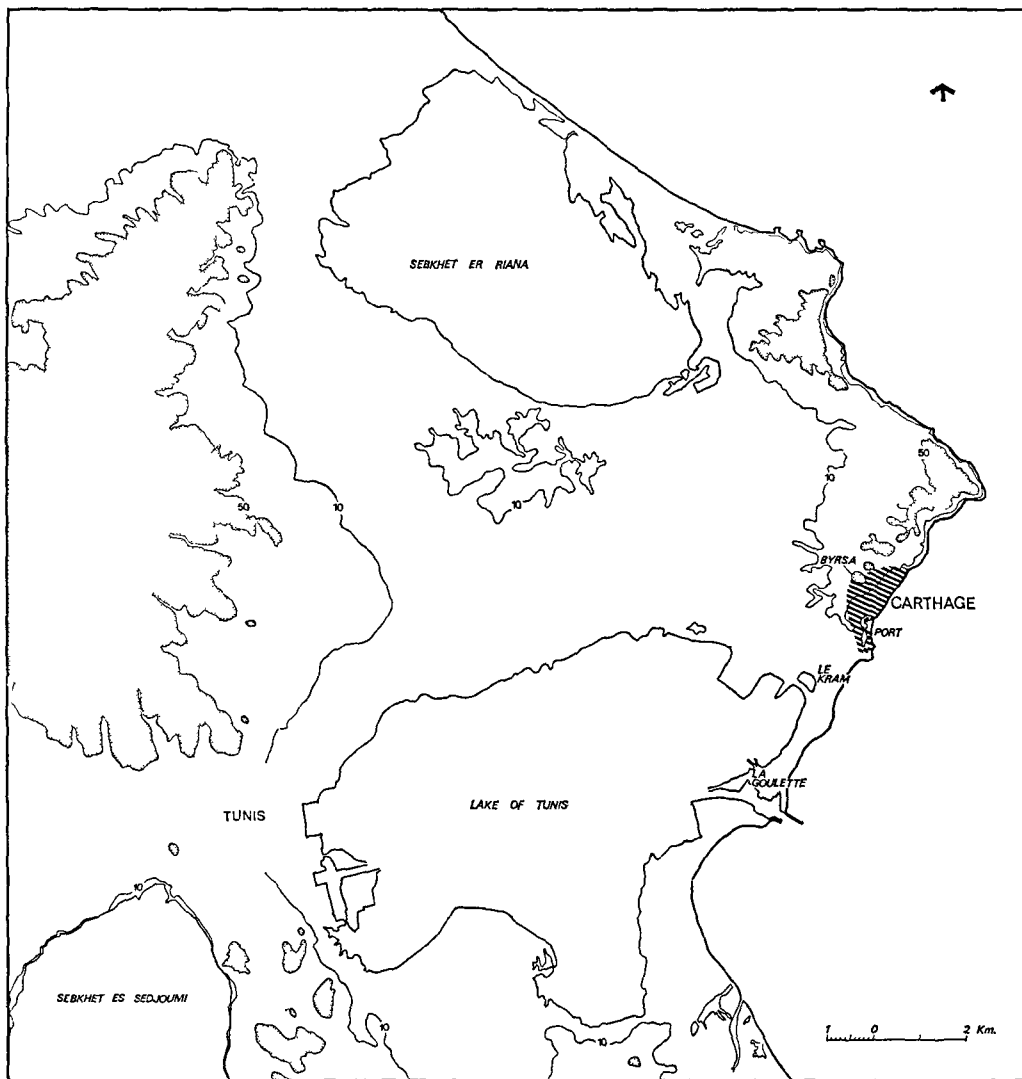


Figure 1 Carthage in its natural setting. The modern coastline is shown. Contours in metres above sea level

where a former bay is now wholly cut off from the sea as the saltlake Sebkhēt er-Riana (fig. 1: Appian, *Libyca* 95; Pimienta 1959). The eastward-facing sea front of Carthage has meanwhile been eroded with the result that there is now a shallowly submerged strip of land averaging 60 m. wide extending the whole length (north-south) of the ancient city (fig. 2: Little and Yorke 1975). Comparison between the eroded Roman and Byzantine structural remains in this stretch and the adjacent intact land stratification would suggest that the sea has removed a depth of soil averaging upwards of 2 m.

Study of the natural sedimentation sequences beneath the ancient occupation levels shows that in antiquity also the area of the late Punic port underwent major changes. Material has been examined from three sites, the *Ilôt de l'Amirauté* at the centre of the circular harbour, the west side of the rectangular harbour some 300 m. to the south of this

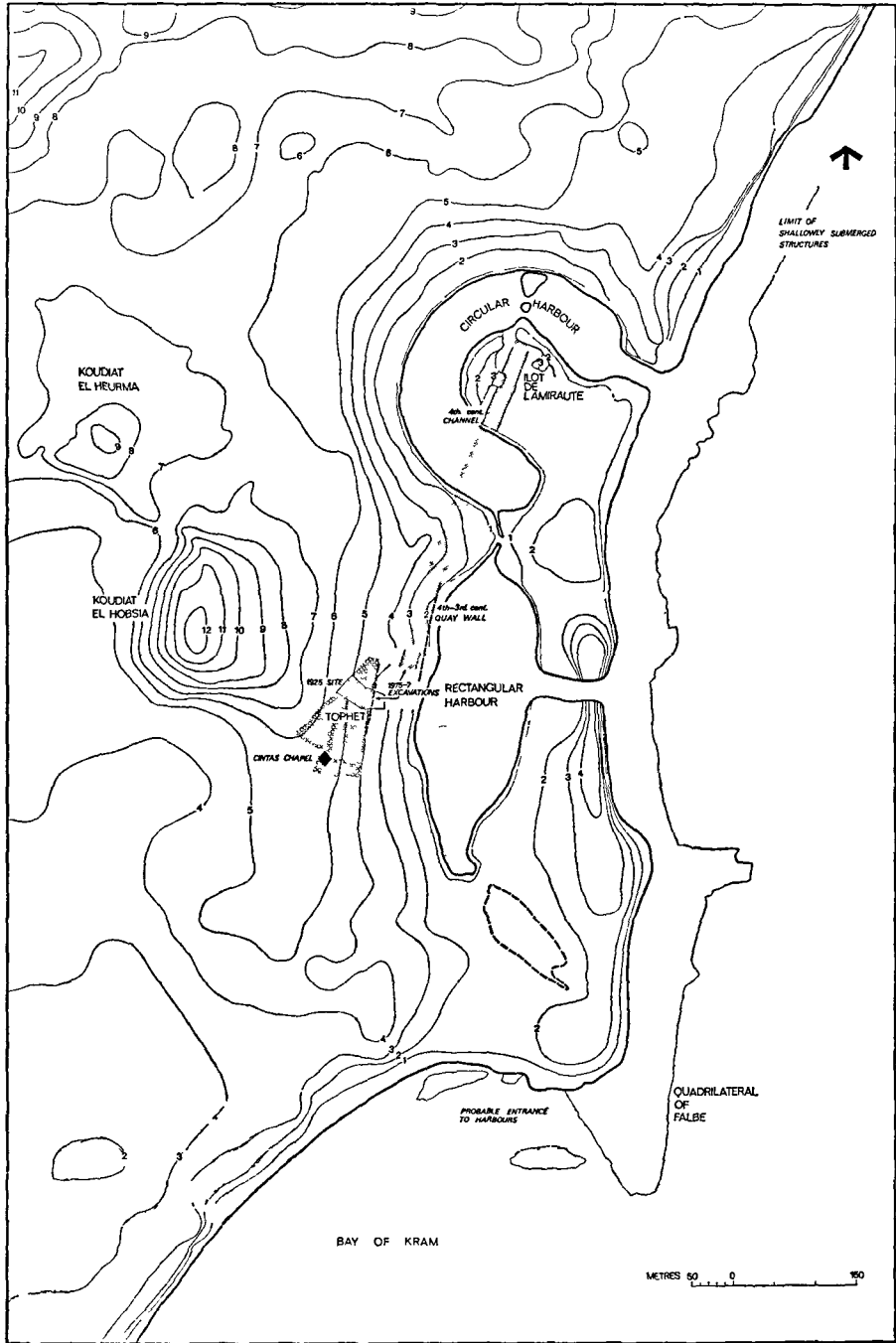


Figure 2 Carthage: the topography of the harbour area. Contours in metres above sea level

and in the so-called Tophet or sanctuary of Tanit¹ 50 m. to the west of the rectangular harbour (fig. 2). Since the evidence from these sites is virtually identical it is here combined into a single overall sequence.

In outline it appears that the area was successively dry land, submerged in lagoonal conditions, a marsh and finally dry land again. The earliest level, a fine yellow quartz sand, observed at one point to be at least 2 m. thick, is shown from particle size analysis to be composed of wind-blown sand with a smaller proportion of silt. Although the conditions in which this layer was formed are uncertain, it seems most likely to have been a dune sand (Evans 1973: 102); and has in any case been observed to be distinct from local beach sands. A lithified crust of caliche, usually only a few centimetres thick but at one point up to a metre in thickness, lies at the top of the sand, producing an undulating upper surface which is level to within 25 cm. on all three sites where it has been recorded. This would indicate exposure to sub-aerial conditions (Evans 1973: 102). The surface of the caliche varies from 0.25 m. to 0.52 m. above the present sea level.

Above this was a 10–20 cm. thick layer of dark brown-blackish calcareous clay containing marine molluscs such as *Cerastoderma glaucum*. This suggests a shallow-lagoon type environment; and consequently a sea-level rise above the level of the caliche crust. The absolute level at which it occurred, some 30–50 cm. above the present sea level, was also appreciably higher than the estimated sea levels in the fourth century B.C. of c. 35 cm. below present sea level and in the third century B.C. of c. 1 m. below present sea level. (See below. These and all subsequent references to ‘rises’ or ‘falls’ in the sea level mean simply local changes in the relationship between sea and land, without prejudice as to the causes.) Since the existence of this lagoonal environment implies the presence of an obstacle inhibiting the flow of the open sea, it may be noted that there is a north–south ridge to the east of the rectangular harbour. This seems to have been natural in origin (although excavation would be needed to prove the point) and as such may be a similar formation to the Le Kram–La Goulette sandbar situated a short distance to its south-west (fig. 2).

The marsh phase, which succeeded the lagoon, is characterized by a layer of black clay rich in organic remains, especially decayed seaweeds and marsh grasses, and containing land snails. On the Îlot de l’Amirauté this layer was succeeded by a wind-blown sand prior to the first layer containing human artefacts. These layers presumably mark a decline in sea level which may have continued into the chronological record in the fourth–third century B.C.

The dating for the end of this sequence of natural change is given in the current Tophet excavations where fourth-century cremation urns were set in pits cut through the lagoonal and marsh clays, on the rectangular harbourside site where levels of the same date containing metal-working debris overlay the marsh clays, and both on this site and on the Îlot de l’Amirauté by a silted up channel which cut the marsh levels and contained fifth–mid-fourth-century pottery in its fill.

The only pre-fifth century evidence of human activity in this area has come from the Tophet (fig. 2). This has formed the basis of a widely accepted view that ‘the earliest settlement of Carthage was at and near Le Kram. The existence of the Tanit precinct

¹ The sacrificial precinct with urn burials containing the cremated remains of human infants associated from the fourth century B.C. onwards with stelae dedicated to the deities Ba’al Ḥamon and his consort Tanit.

besides the rectangular port as early as the eighth century clinches the matter, for it is highly improbable that such a precinct, which enshrined all that was deepest in Carthaginian religious feeling and observance would have lain outside the settlement area' (Harden 1971: 31). This view is now open to serious question, both with regard to the port – the rectangular harbour did not exist, at least in its Late Punic form, in the eighth century – and because of new evidence which raises problems about the Tophet or Tanit precinct. The Greek imports found in 1946–7 at the so-called 'Cintas chapel' (Cintas 1948) and the protocorinthian skyphos from the 1925 excavations (Harden 1937: 86–7) leave no doubt that there was eighth (-seventh) century activity at this site, but a question arises over its use *as the sanctuary of Tanit* at this date and over its use at all in the later seventh and probably sixth centuries. This is not the place for a full discussion (see Stager 1978) but there appear to be two main difficulties: no urn burials characteristic of the Tophet were discovered in association with the 'Cintas chapel' so that its functional relationship with subsequent Tophet sacrifices has yet to be proved; and, more importantly, the middle 'stratum' of sanctuary burials (Tanit II), dated by Harden in his pioneering study of the chronology to seventh–fourth centuries B.C., is dated in the present excavations not earlier than the fourth century. In the current excavation (situated immediately east of the 1925 site on which Harden's dating was based) the stratum is divided into five phases, the earliest of which consists of burials in pits cut into bedrock. A sherd of Attic black glaze pottery of the first half of the fourth century was found in association with one of the bedrock-cut burials and several sherds of this date occurred in the layer of sand dividing the first phase burials from those of the second phase. This makes the single protocorinthian skyphos found in the same stratum in 1925, which is a key element in the early dating (Harden 1937: 86–7), look like a residual find from a distinct earlier usage of the site. A late date for Tanit II would also imply a late date for Tanit I since, as Harden observes, there is no typological interruption in the development of urn-types between the two strata (Harden 1937: 60).

The earliest possible harbour work in the area is a water channel some 15–20 m. wide and c. 2 m. deep (fig. 2). This was cut into the natural sand without any stone lining to its sides and bottom. Its final silting can be dated to the fourth century B.C., but its cutting is undated; and it is also uncertain whether it was first cut through the area in its marshy state and was therefore instrumental in changing the environment or whether it was subsequent to the marsh phase. It is, however, clear that this channel did not relate to the harbour topography which we know for the latest Punic and later periods. It extended north–south across the *Îlot de l'Amirauté* (Hurst 1976) and southwards as far as the west side of the rectangular harbour, since exactly similar stratification to its fill is found on a southwards projection of its line (Stager 1978). Sedimentary and molluscan evidence from its fill shows that the channel was linked with the open sea, so that it can be assumed to have continued further south to the Bay of Kram. The link with the sea and the size of the channel suggest it may have been used for navigation. (The estimated depth of 1.6 m. standing water in it was similar to that in the rectangular harbour adjacent to the west quay wall: see below.) Also a large *cippus* of Cap Bon sandstone which was found at the rectangular harbourside site lying on the bottom of the channel above pieces of hewn timbers can be interpreted as having sunk with its raft or barge en route to the nearby Tophet.

The sediments filling the channel, which may represent only the latest stages of its life, consisted of submarine clays of kaolinite, illite and montmorillite, mostly unmixed with coarser natural sediments; they suggest water movements of insufficient energy for carrying sands. The species of molluscs recovered from these layers indicate a marine environment ranging from brackish to very salty: the limited number of species implies severe living conditions. As the channel silted up there was a continuing degradation of the environment as witnessed by the increase in *Cerastoderma glaucum* and *Abra tenuis*, species at home in muddy marine waters saturated with hydrogen sulphide. A comparison between the environment of the channel and the present knee-deep lagoon of the ancient rectangular harbour (which is fed by a modern channel cut on the east into the open sea) suggests more stressed conditions in the former since *Cerithium vulgatum*, which lives in abundance in the rectangular harbour, was virtually extinct in the ancient channel. In this respect conditions in the channel seem close to the stressed environment of the present Lake of Tunis (Zaouali 1977). The impression of a heavily polluted waterway is given further support by the high concentration of indigestible fruit seeds found in these sediments suggesting that their content was partly effluent flushed from the sewers of Carthage.

The channel might have been connected with other harbour works if, as has been suggested, it was designed for navigational purposes, but there is no hint of where these may have been located. Another possibility, depending on the dating of the marsh phase in the natural sequence, is that its primary purpose was drainage, perhaps in a land reclamation scheme for what was to become the harbour area, and that it was also designed as a navigational route giving access to the Tophet and perhaps other parts of the city.

In either case, a potential determinant or major influence on its use was the contemporary sea level. An indication of this is given by the top level of the channel sediments, c. 35 cm. below present sea level both at the Ilôt de l'Amirauté and at the side of the rectangular harbour some 300 m. away. Above this level in both cases were backfills which show no sign of having been under water. As has already been noted, this would mark a fall in local sea level of more than 70 cm. since the lagoonal phase described above and there is evidence of an even lower sea level in the third century B.C. (below, p. 342). The shallowness of the channel (estimated 1.6 m. standing water: see p. 338 above) would make it vulnerable even to slight fluctuations in the sea level.

Thus while there is no evidence as yet for the date at which the channel was cut, it seems most reasonable to see it as having a comparatively short life, perhaps as the response to a particular set of environmental conditions.

Just west of the silted channel, on the rectangular harbourside site, was an occupational level dated to 400–350 B.C. producing evidence of iron smelting and/or processing: fragments of terracotta tuyères, slags rich in iron oxide, pieces of fired mud-brick and fused sandstone – probably furnace walls – were all present in some quantity. A similar range of material in a contemporary context was found on the Ilôt de l'Amirauté above the east side of the channel.

Meanwhile in the Tophet burial urns were being deposited sometimes with necklaces included as offerings with the cremated human remains. Beads and amulets of imported amber, gold, silver, carnelian and steatite all occurred, giving a reminder of the range of

Carthage's trade connections at this time, although such luxury items may not reflect any significant part of the city's commerce.

A view of the wider landscape around Carthage at this time as well as an idea of the Carthaginian's daily fare is given by the seeds found in the channel. The fruits included pomegranate, fig, grape, olive, peach, plum, melon, Cyrenean lotus; there were also the remains of almonds, pistachios and filberts and the cereals were also present in small quantities (Stewart 1977). Particularly striking is the horticultural component, including many fruits which are best propagated by grafting. This is testimony to the advanced state of Punic agriculture which the Romans themselves acknowledged in the respect they paid to the twenty-eight-book treatise on agriculture by Mago (Pliny XVIII. v. 22-31; Columella I.1.10-13).

Suddenly, then, we have Carthage the metropolis: a polluted stretch of man-made waterway in an urban site with international trade connections set in countryside where advanced agriculture was being practised. The fourth-century archaeological evidence richly confirms the picture which can be made of the city at this date from historical sources, but its very abundance only serves to emphasize the lack of evidence for earlier historically attested periods. How is such an abrupt change to be explained both for the port and for the city as a whole?

Environmental change could be part of the answer in the case of the port, as has been shown: sea-level changes might have made a change of site desirable; the drying out or deliberate draining of former marshland might have made the present site attractive. But the most plausible overall explanation is urban expansion. The sudden burst of activity in the harbour area in the fourth century can be set beside a growing body of evidence from elsewhere in Carthage of probable fourth-century urbanization: an inscription recording a new gate and streets (Mahjoubi and Fantar 1966); buildings laid out according to a grid pattern on the slopes of the Byrsa hill, where they cover an earlier cemetery (Picard 1952; 1958; Ferron and Pinard 1955; 1961; Lancel 1976; excavations in progress under the direction of S. Lancel), and on a coastal site some 800 m. north of the Late Punic port (at present being excavated by a German team under the direction of F. Rakob); and, not least, the reference by Diodorus Siculus to an Old City and a New City at the time of Bomilcar's attempted coup in 308:

When Bomilcar had reviewed the soldiers in the place called the New City, a short distance from Old Carthage, he dismissed most of them but kept back those that were in the plot, five hundred citizens and a thousand mercenaries; he then proclaimed himself 'tyrant'. His men were divided into five groups who attacked and killed anyone in the streets who resisted. In the tumult which spread throughout the city, the Carthaginians at first believed that the city had been betrayed (to Agathocles) but when the true situation became known, the young men joined together in groups and proceeded against Bomilcar. But he swept them aside and rapidly advanced to the main public square in Old Carthage where he slaughtered many unarmed citizens. However, many of the Carthaginians occupied the tall buildings which surrounded the square and showered missiles on the rebels below, who were all within range. After suffering many losses, the rebels closed their ranks and forced their way through the narrow streets back to the New City, though under continued fire from the houses they passed. They then occupied a position on a hill, but the Carthaginians had by now taken up their arms and were drawn up against them (Diodorus Siculus. *Bibliotheca Historica*. Vol. 10, p. 261. Loeb Classical Library).

The Late Punic port and the grid pattern buildings might all be part of New Carthage, the Old City perhaps lying towards the north since the earliest cemeteries have been found on the Byrsa and to its north and north-east (Harden 1939: 5; 1971: 31); in any case, the indications are of a major planned urban development in the Hellenistic tradition. With the port this amounted to the transformation of an area which had once been, or perhaps was until that time, unsuitable for human habitation.

Late fourth century – 146 B.C.

The well-known description by Appian, following Polybius, of the two harbours of Carthage at the time of the Roman siege of 146 B.C. now has firm archaeological support:

The harbours had communication with each other, and a common entrance from the sea seventy feet wide, which could be closed with iron chains. The first port was for merchant vessels, and here were collected all kinds of ships' tackle. Within the second port was an island, and great quays were set at intervals round both the harbour and the island. These embankments were full of shipyards which had capacity for 220 vessels. In addition to them were magazines for their tackle and furniture. Two Ionic columns stood in front of each dock, giving the appearance of a continuous portico to both the harbour and the island. On the island was built the admiral's house, from which the trumpeter gave signals, the herald delivered orders, and the admiral himself overlooked everything. The island lay near the entrance to the harbour, and rose to a considerable height, so that the admiral could observe what was going on at sea, while those who were approaching by water could not get any clear view of what took place within. Not even incoming merchants could see the docks at once, for a double wall enclosed them, and there were gates by which merchant ships could pass from the first port to the city without traversing the dockyards. Such was the appearance of Carthage at that time (*Libyca*, 96).

Excavation has revealed the quayside of the merchant harbour and the shipsheds and a central building on the island in the naval harbour. The shipshed identification, already suggested by the distinctive plan of the structural remains (Hurst 1974: 20), has finally been confirmed by the discovery of the earth and timber slipways leading from the water's edge to the centre of the island (Hurst 1978) and this after more than a century vindicates the claim made by Beulé following his first discovery of these remains on the island and on the side of the circular harbour (Beulé 1861).

The two harbours were man-made landscape on impressive scale. From the flat former marshland an estimated 120,000 m.³ of earth had been excavated to make the rectangular harbour (assuming dimensions of 150 × 400 m. and a depth of 2 m.) and a further estimated 115,000 m.³ had been removed to make the circular harbour (assuming the same extent of water as in the Roman period and a depth of 2 m.): most of this soil was dug from below the contemporary sea level. An estimated 10,000 m.³ of soil had been deposited on the *Îlot de l'Amirauté* to give this the conical shape required for the slipways of the naval shipsheds; and a similar effort must have gone into making the ramps for the shipsheds at the harbour's edge.

Apart from the earthmoving, the structures associated with the harbours also represent a considerable feat of engineering. This was true of the whole shipsheds complex of the

naval harbour but also of the quaysides of the merchant harbour. The western quay wall (plate 1b), which has been traced for *c.* 50 m., was built of large ashlar blocks of Cap Bon sandstone, its lower courses being constructed below sea level without hydraulic cement, presumably using the double coffer-dam technique described by Vitruvius (V.xii.5–6).

This structure is of particular interest in giving information about contemporary sea level. The wall's lowest course rests on unexcavated natural sand at -2.50 m. from the present sea level. Since the face of the wall is unweathered for the lower two courses and part of the third up to about -1 m. from present sea level, it seems likely that this was always below the sea level. The much battered and weathered fourth course of the wall at *c.* -50 to -85 cm. seems to have stood clear of the water, but could in the present state of knowledge be either Punic or Roman. Above it is a Byzantine rebuild of the wall and there is independent evidence that by this period the sea level was as high as -15 cm. from its present level (Stager 1977). There was, therefore, an overall rise in sea level during the lifetime of the quayside but it is uncertain whether the minimum level of *c.* -1 m. occurred in the Punic period or later. Possible evidence obtained in the 1977 excavation of a Punic quayside level at the top of the third course of the quayside wall at -85 cm. would, however, suggest that the sea level was at -1 m. in the Punic period. In any case it seems unlikely that the Punic quayside could have been higher than the top of the fourth course of the quay wall and so unlikely that Punic sea level could have been higher than -70 cm (Stager 1978). These levels mean a depth of harbour water above unexcavated natural sand ranging from 1.5 to 1.8 m. (compare the so-called 'Cothon' at Motya: Isserlin 1971) and they also indicate a fall in sea level from the fourth century as has already been mentioned.

A major problem now is the chronology of these harbours: at what point in the sequence following the backfilling of the channel were they made and at what date? On the Ilôt de l'Amirauté a fill of clean yellow sand which covered the latest sediments in the channel and the metalworking levels on its east side was followed by successive timber building phases marked by individual round postholes or trenches designed to carry lines of posts (plate 2). The concentration of these features at the centre of the island is very high and it is apparent that at least six successive phases of construction are represented. The building plans to which they relate have still to be established, partly because of the limited area excavated but also because of the large amount of later disturbance and intrusive structures in the area. There are, however, sufficient similarities between the plan of the latest timber phase and that of the stone shipsheds to suggest that the function of both buildings was probably the same (fig. 3); but until this is proved there will be uncertainty over the precise moment at which the naval harbour was made.

The dating of this sequence is a further difficulty, since it depends essentially on imported south Italian and Sicilian pottery (coins are a rarity): apart from the problems of dating this material, the imports form only a fraction of the pottery assemblage and in this particular sequence have a high chance of occurring residually. Thus although the beginning of the period, marked by the backfilling of the channel, seems well fixed at mid fourth century, its end, which is signalled by the construction of the stone shipsheds is more uncertain: the pottery would suggest a date some time in the third century.

On the side of the rectangular harbour the excavations have not yet produced any

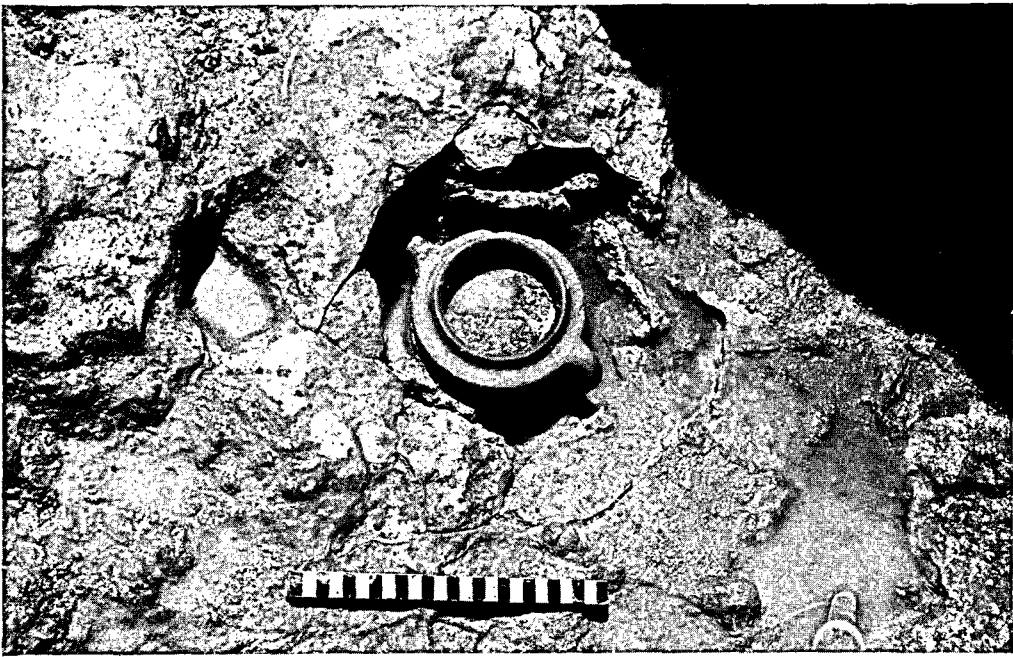


Plate 1a Cinerary urn of Tanit II type set in a pit cut into the 'bedrock' of calichiated sand

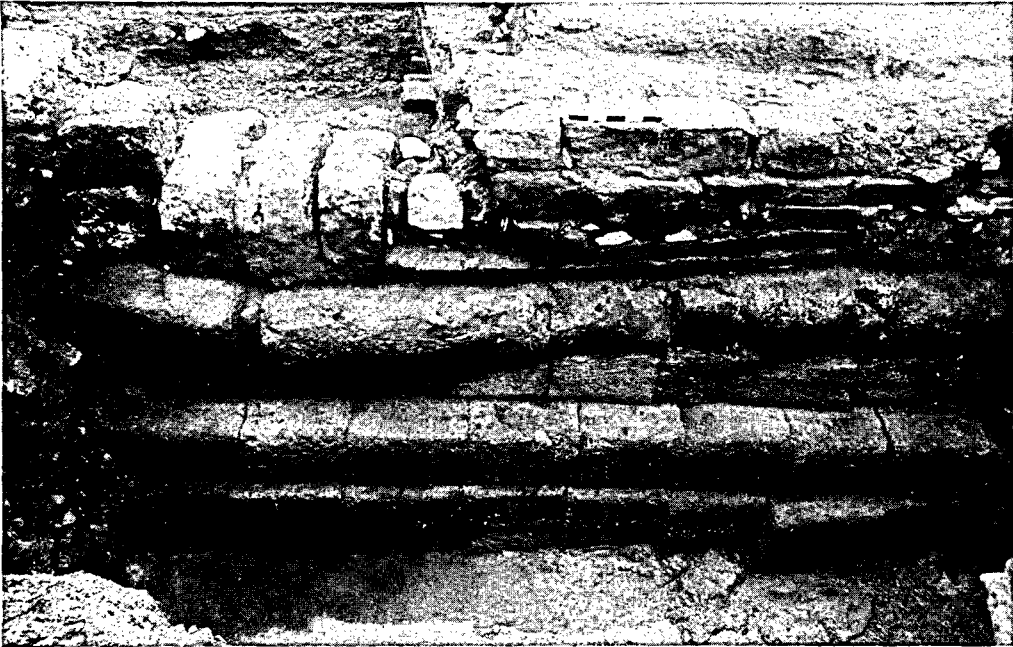


Plate 1b Face of quay wall along western side of rectangular harbour. Bottom three courses (and possibly the fourth) are Punic. Fifth course and above are Byzantine. Yellow sand at base of wall formed floor of harbour

CARTHAGE 1975
 ILÔT DE L'AMIRAUTÉ

4th-2nd CENTURY B.C. - INTERPRETATION

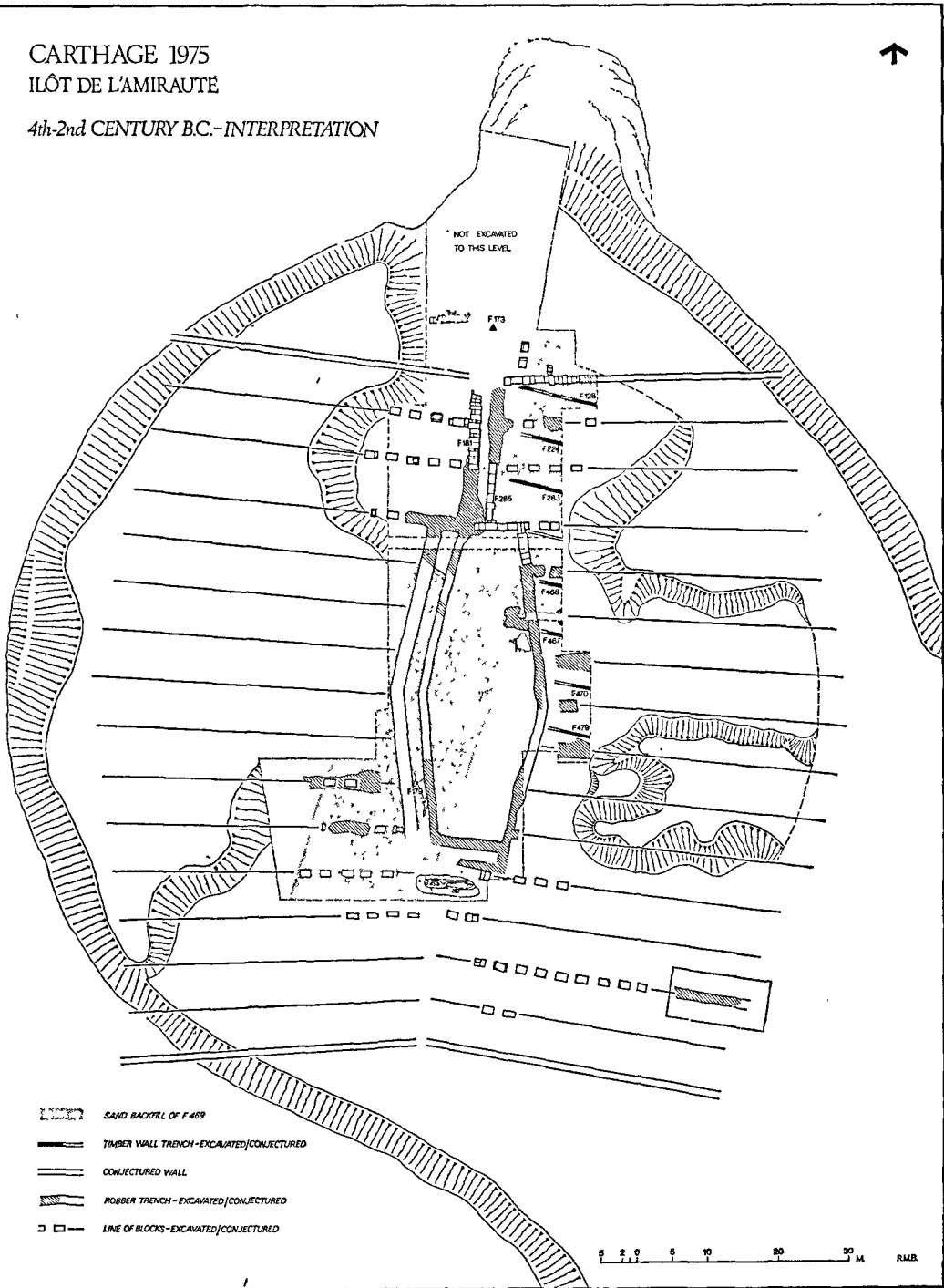


Figure 3 Carthage. The sequence in the Ilôt de l'Amirauté. Reproduced by kind permission of the Society of Antiquaries

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6.ix.1977

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Abstract

Hurst, H. and Stager, L. E.

A metropolitan landscape: The Late Punic port of Carthage

Study of the sequences of environmental change and human occupation in the vicinity of the Late Punic port of Carthage shows the two harbours of the city besieged by Scipio to be man-made and, in their fully developed form, dating only from the late fourth or third century B.C. There is further archaeological and historical evidence to suggest that the siting of a port in this area may be associated with a fourth-century expansion of the urban area of Carthage and consequently have no relationship with the original harbour and habitation area of the Phoenician colony.