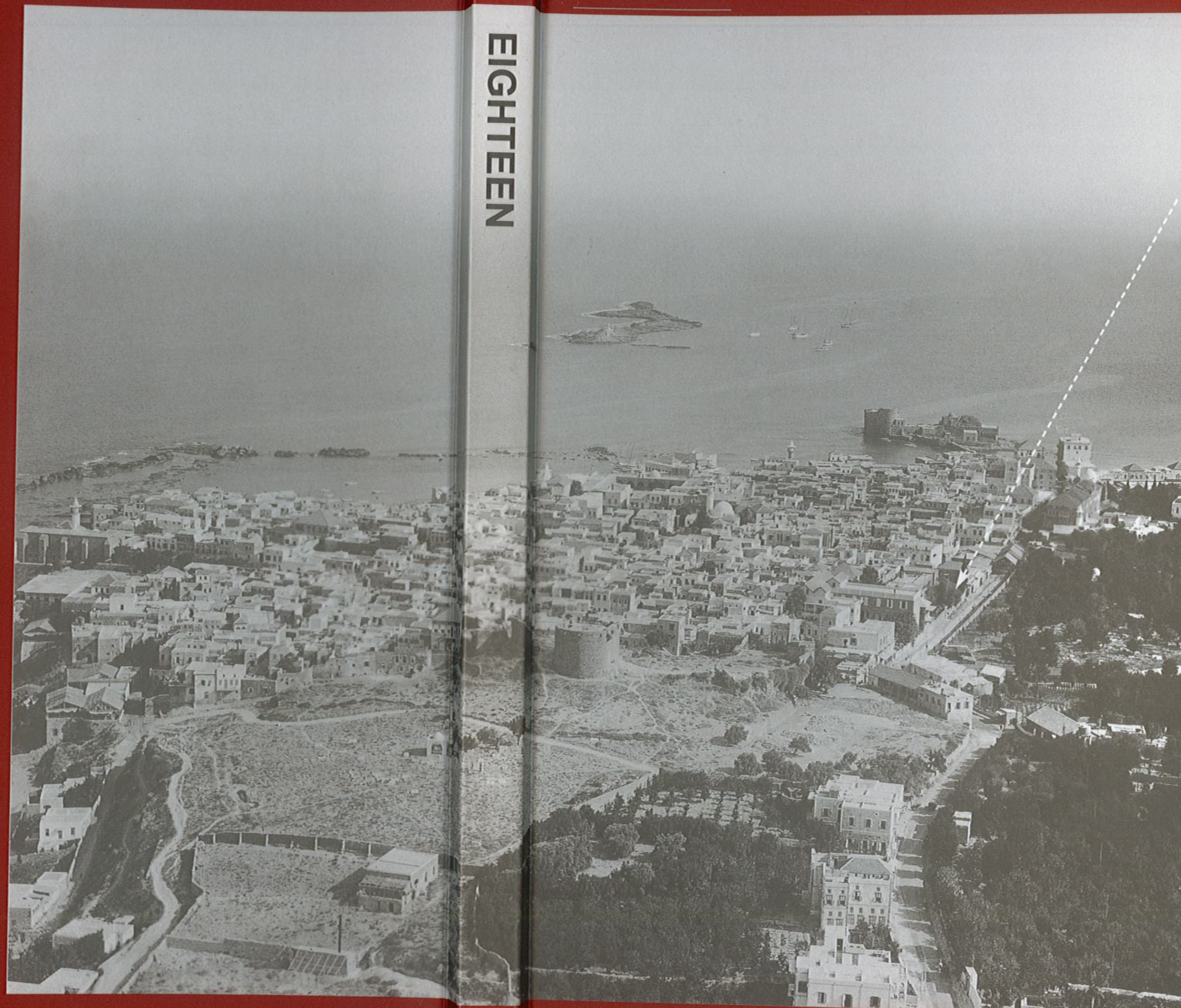
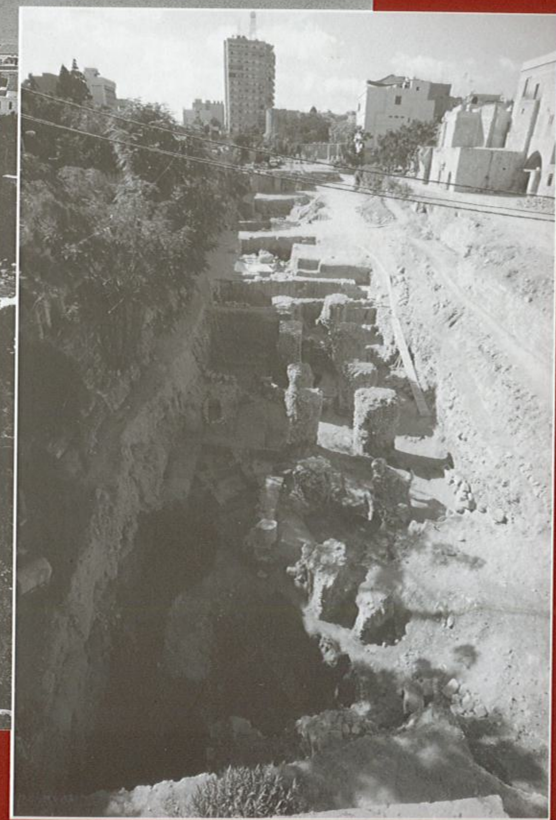
ARCHAEOLOGY & HISTORY IN LEBANON

AUTUMN 2003
ISSUE EIGHTEEN

EIGHTEEN





SIDON-BRITISH MUSEUM EXCAVATIONS 1998-2003

Pierre Bordreuil

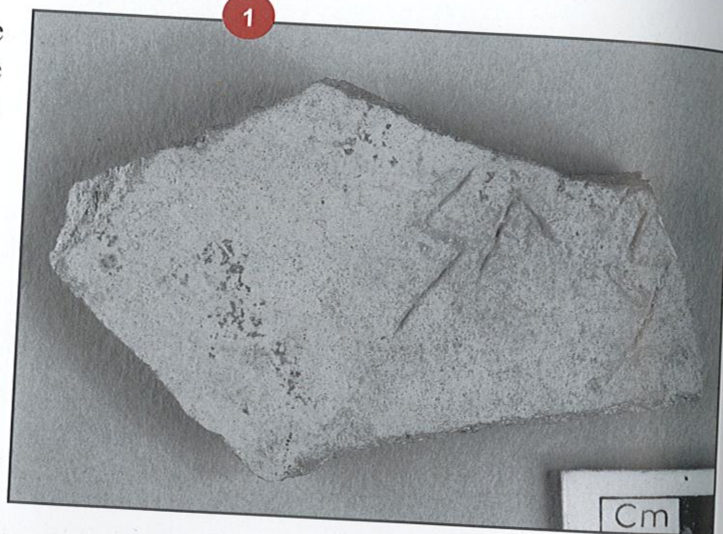
Two Inscribed Sherds from Sidon

Two Phoenician inscriptions were found at Sidon in area 1c excavated by Sarah Collins in the 2002 season of excavation. The two sherds inscribed before firing measured 6. 4 cm x 3. 2 cm x 0. 6cm (S/4093) and 8. 2 cm x 4. 9 cm x 0. 8cm (S/(S/4015).

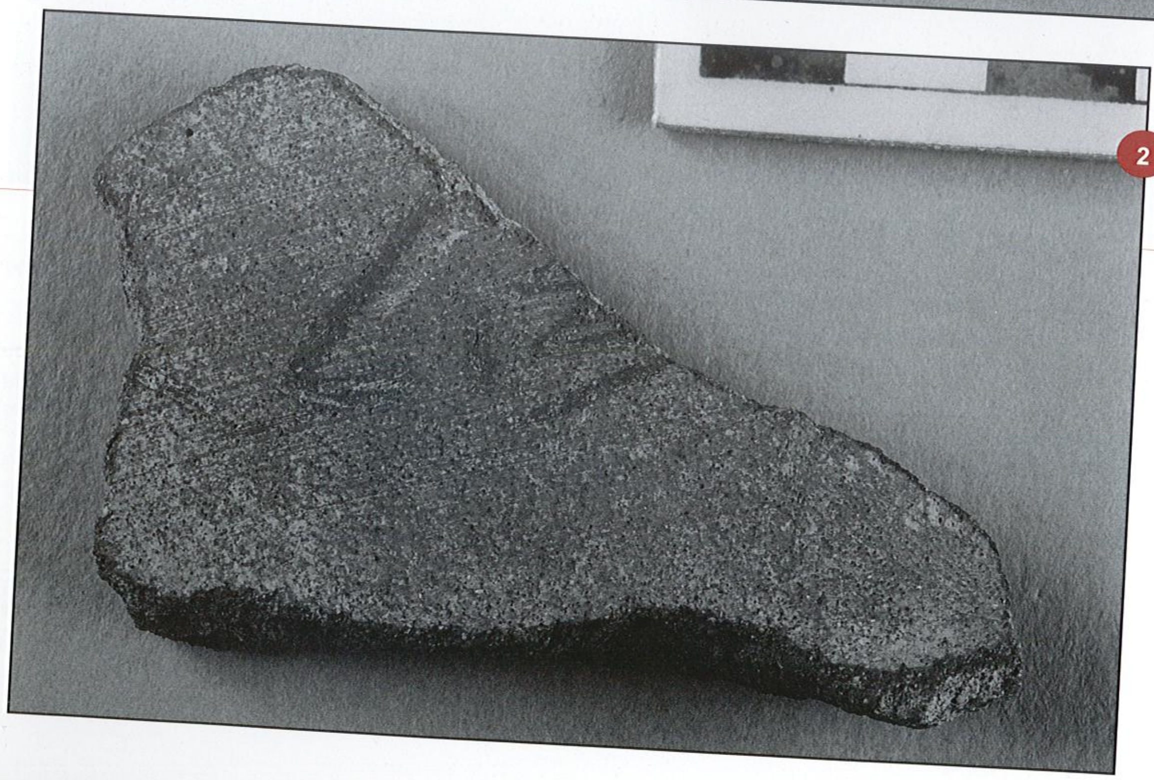
First fragment (fig. 1, S/4093). The first letter could be a /P/. It is difficult to see whether the dot to the left of this letter is part of the inscription or whether it is due to abrasion of the surface. The marks visible at the edge of the break could possibly belong to the top of an /S/.

Second fragment (S/4015) (fig. 2). The second of the three visible letters is certainly a shin, which is attested at Sidon on the inscriptions of Eshmunazor (#450) and Bodashtart (second half of the fifth century BC). The first and the third letters can only be read as a type of /L/ that appears in the fifth century. We thus have the sequence L ShL(...). The first /L/ is certainly an indication of property, and the two following letters apparently represent the beginning of the name of the owner of the ceramic vessel of which this sherd is the only remaining fragment. The proper name may be reconstituted as: L SHL(M), another occurrence of a root well known in Phoenician personal onomastics. It could be vocalized as Shillem or Shallum, thus: 'the property of Shillem/Shallum'.

1



2



The Ancient Harbours of Sidon Attempt at a Synthesis (1998–2002)

Christophe Morhange [1]
Kathia Espic [1]
Claude Doumet-Serhal [2]
Michel Bourcier [3]
Pierre Carbonel [4]

Within the framework of the British Museum archaeological excavations at Sidon, the Franco- Lebanese CEDRE co-operation agreements and with the help of the Lebanese British Friends of the National Museum, the paleo-environmental history of the ancient harbours of Sidon has been defined. Three campaigns of core sampling in 1998, 2000 and 2002 were undertaken with the help of the Forex company (Doumet-Serhal 1999). In total fifteen cores were taken making Sidon one of the most studied of ancient harbour sites.

The dates obtained were based on shell material from a first core (Bore Hole I) and led to a provisional date for the foundation of the northern harbour around 4900 BP, that is around 3000 BC (Morhange *et al*., 2000 a and b; Espic *et al*., 2002). This estimate now seems a little premature since no significant remains of harbour installations had ever been excavated in the Levant (Frost, 1995; Raban, 1995). It was therefore deemed necessary to re-confirm these first dates. The study of a new core taken near BH I (core BH IX taken in 2000) made it possible to define and to re-evaluate the various phases of sedimentation in the ancient northern harbour of Sidon thanks to five new radiocarbon dates.

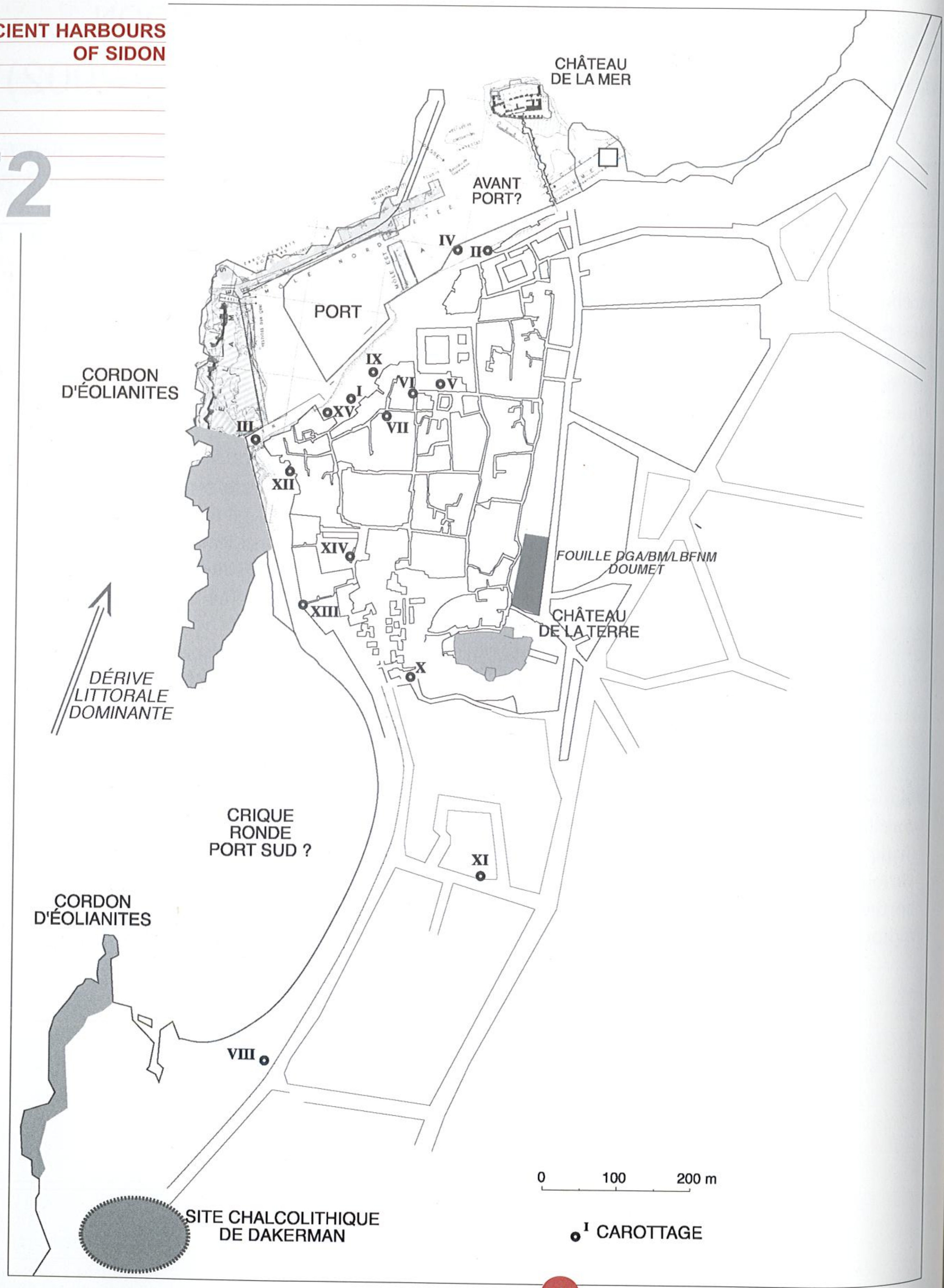
We were also able to obtain information from another core (BH VIII) taken on the southeastern shore of the southern harbour, namely – the circular inlet, or '*Crique Ronde*' of Poidebard and Lauffray (1951) – to try to verify whether it could have constituted a second sheltered harbour at the foot of the tell of Murex Hill, and of the Chalcolithic site of Dakerman (fig. 1-2).

I. Northern harbour shoreline mobility.

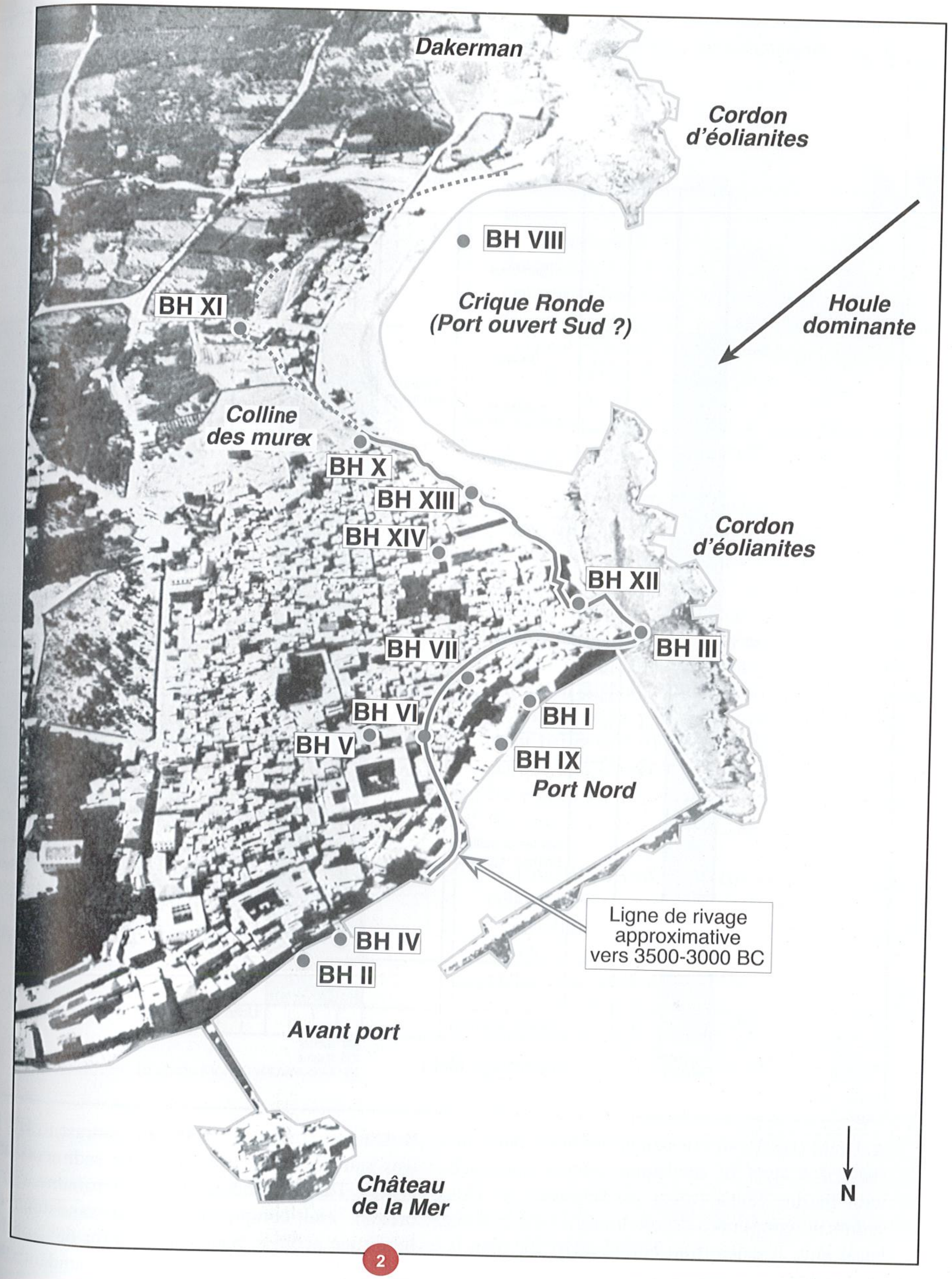
We studied BH IX, taken from the very heart of the ancient harbour, immediately next to BH I (fig. 3-4). The analyses of the sediments consisted of particle size analysis and the determination of the fauna notably the Ostracoda assemblages, making it possible to define the sedimentary environment (Espic *et al*. 2002).

The study of sample BH I revealed three main sedimentary units which reflect two types of evolution in the environment (Morhange *et al.* 2000 a and b). At the bottom, a sandy deposit may be distinguished. The second sequence (BH I-IV and V) relates to a progradation of the shores, of terrigenous origin, culminating in the infilling of the harbour with muddy sands. Within core BH IX, five main units can be identified (fig. 3).

1 CEREGE, IUF, University of Provence
2 Special Assistant, the British Museum
3 COM, UMR 6535, University of Méditerranée
4 CNRS, UMR 5805 EPOC, University of Bordeaux

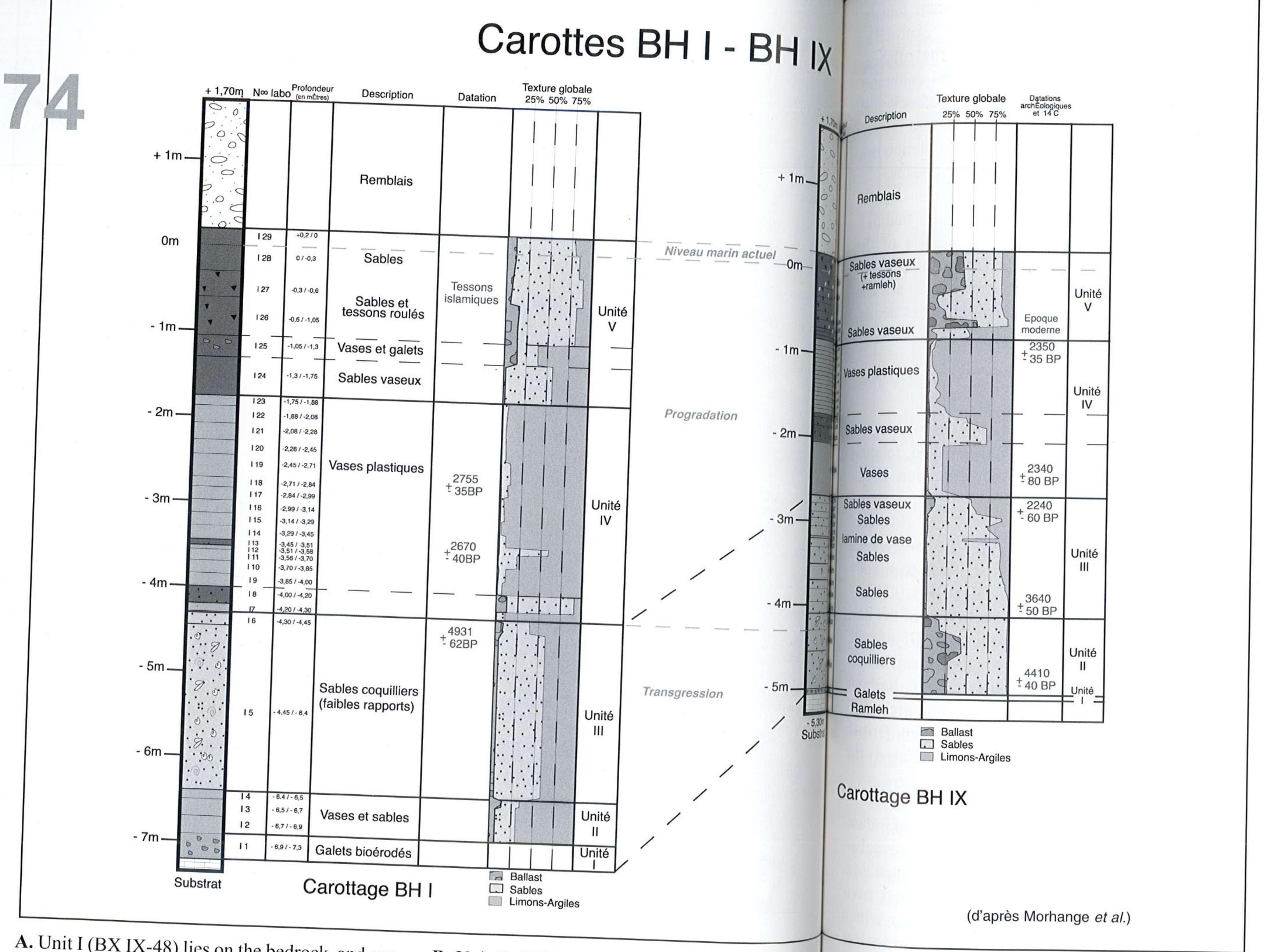

CHÂTEAU
DE LA MER
AVANT
PORT?
PORT
CORDON
D'ÉOLIANITES
IV
II
IX
I
VI
V
XV
VII
III
XII
XIV
XIII
X
FOUILLE DGA/BM/LBFNM
DOUMET
CHÂTEAU
DE LA TERRE
DÉRIVE
LITTORALE
DOMINANTE
CRIQUE
RONDE
PORT SUD ?
XI
CORDON
D'ÉOLIANITES
VIII
0
100
200 m
SITE CHALCOLITHIQUE
DE DAKERMAN
I CAROTTAGE

1


Dakerman
Cordon
d'éolianites
BH VIII
Crique Ronde
(Port ouvert Sud ?)
Houle
dominante
BH XI
Colline
des murex
BH X
BH XIII
BH XIV
Cordon
d'éolianites
BH XII
BH III
BH VII
BH I
BH VI
BH V
BH IX
Port Nord
Ligne de rivage
approximative
vers 3500-3000 BC
BH IV
BH II
Avant port
Château
de la Mer
N

2

3 **Stratigraphic comparison of core samples BH IX and BH I.**



A. Unit I (BX IX-48) lies on the bedrock and consists of a layer of sandstone pebbles encrusted with marine fauna (tubes of *Serpulae*…). This sediment represents a classic transgressive marine basal unit. It dates from before 4410 BP (that is 2705-2474 BC, Lyon 1877-Poz-1002).

B. Unit II (BH IX-47 to 45), in contrast to BH I, was sampled with precision. The sediments are coarse. The ballast consists of macrofauna, often broken, and comprising angular sandstone or limestone pebbles. Sands account for 68% of the texture. The macrofauna is very abundant; the species present are those found in fine infralittoral sands (*Nassarius pygmæus*, *Neverita josephinia*…). A reworked stock represents species imported from infralittoral rocks and sub-littoral meadows, such as *Bittium reticulatum* or *Conus mediterraneus ventricosus*. Layer BH IX-47 was dated to 4410 BP ± 40 years (that is 2705-2474 BC, Lyon 1877-Poz 1002). Layer BH IX-44 was dated to 3640 BP ± 50 years (that is 1694-1451 BC, Lyon 1876-Poz 1004).

C. Unit III (BH IX-44 to 35) is less coarse. The ballast has virtually disappeared and sands predominate (on average 80% of the total dry weight of the samples). The bottom is characterized by the presence of a macrofauna typical of biocenoses in fine infralittoral sands (*Tricolia pullus*, *Donax semistriatus*). The top represents an environment of muddy infralittoral sands notably containing *Odostomia conoidea*.

Layer BH IX-44 was dated to 3640 BP ± 50 years (that is 1694-1451 BC Lyon 1876-Poz 1004). It represents the base of this unit. The top of the deposit (BH IX-35) was dated to 2240 BP ± 60 years (that is 12 BC/ 260 AD, Lyon 1797-GrA 20858). The sediments were thus deposited from the second millennium BC until the period of the Roman conquest. The environment is consistent with a harbour sheltered by an offshore sand bar. The date of the foundation of the northern harbour of Sidon is about 1700-1450 BC and not five thousand years ago as we originally proposed. That being said, the sediments do not indicate a particularly confined harbour. The harbour would have been semi-sheltered, but still largely open to the sea.

D. Unit IV (BH IX-36 to BH IX-24) represents a deposit of grey muds. The ballast, of which there is very little (always less than 3% of the total dry weight of the sample), consists exclusively of shells and shell debris. The texture is muddy (more than 80% fine-grained material). Only one sandy layer (BH IX 5, 6 and 7) attests to the effects of possible storms (Espic *et al.*, 2002).

The microfauna represent lagoonal environments (*Cerastoderma edule glaucum*) and muddy infralittoral sands (*Tellina tenuis*…). A monospecific population of *Cyprideis torosa* characterizes the top of the unit (BH IX 15 et 24), reflecting environmental stress.

The bottom of this unit has been dated, in sample BH IX-36, to 2340 BP ± 80 years (that is 183 years BC – 195 years AD, Lyon 1796-GrA 20859). The top of this deposit has been dated, in sample BH IX-24, to 2350 BP ± 35 years (that is 91 BC – 83 AD, Lyon 1878-Poz 1016). This harbour facies was deposited very rapidly between the second century BC and the second century AD. The sedimentation attests to an original management of the port, and of a significant rearrangement of the protective structures, resulting in a marked enclosure of the harbour. This is the period in which the harbour was most sheltered from the open sea.

E. Unit V (BH IX-25 to 1) represents the recent past, as attested by the Islamic sherds found in sample BH IX 27. Just as in BH I, the samples are muddier near the bottom. The gravels consist of fragments of limestone and sandstone. The macrofauna is not very abundant. The species represented are most frequently those associated with infralittoral sands in brackish waters, such as *Pirenella tricolor* or *Cyclope neritea*. Fine sands are predominant in the lower part (BH IX 25 to 27), whereas in samples BH IX 28 to 31 medium sands are better represented. The coarser character of the sandy fraction towards the top of the unit is indicative of a shoreface deposition.

II. The Paleo-Environmental history of the Northern Harbour

Cores BH IX and BH I present similar stratigraphies (fig. 3). Analysis of BH IX made the recovery of two main sequences possible: this means it is transgressive at the base and characterized by progradation at the top of the core.

A. Transgressive Phase (units I, II and III of core BH I and units I and II of core BH IX) (fig. 3).

Stratigraphically, these units represent the transgressive interval. The top of the sequence is linked to the high holocene relative sea level.

The infralittoral bottom reflects a 'natural' coastal environment prior to any major human impact. The deposit represents a pocket beach, exposed to the swell and poorly protected by the offshore sand bar. The macrofauna of the well calibrated fine sands reflects the proximity of bedrock and of marine plants. The marine environment is open and oxygenated, with good water circulation that leads to an absence of fine-grained deposits.

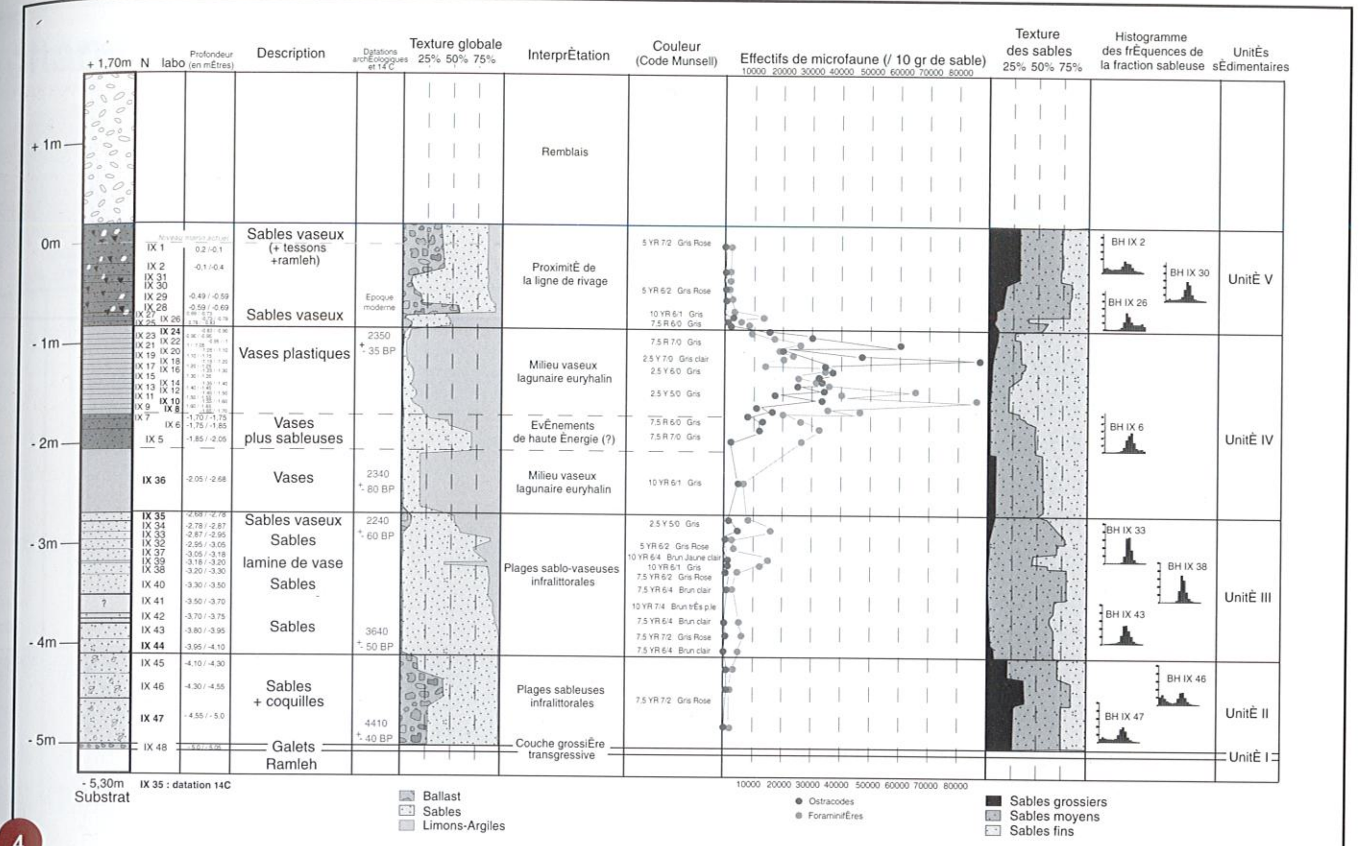
These deposits are thus a reflection of a 'natural' coastal environment before the creation of the northern harbour. This is an infralittoral environment subject to the dynamics of the open sea and only slightly protected by a discontinuous aeolianite bar acting as a breakwater.

B. Progradation Sequence (units IV and V from BH I and units III to V from BH IX)

Three main periods can be distinguished, relating to three different stages in the protection of the harbour:

From the Middle Bronze Age the biocenoses move from the infralittoral fine sands to muddy sands. The appearance for the first time of fine-grained material represents a sheltering of the bay. The sanding up observed within unit III of core BH IX represents a change in sedimentary conditions. This artificial protection of the harbour around 1700–1450 BC corresponds to a great deal of activity in the harbour. The current British Museum excavations have demonstrated the importance of this period.

In the Roman period, the sedimentological indicators of the muddy unit IV of core BH IX reveal an environment well protected from the open sea. The fauna are typical of confined lagoonal environments. This unit represents a harbour in which significant low energy sedimentation processes are at work. The silting of the harbour intensifies until the end of the Byzantine period. After this, true plastic muds indicative of low energy bottoms are deposited. This confinement of the harbour was brought about by protective structures far more effective than any previously built, and



4 **Sedimentological analysis of core sample BH IX.**

similar to the interior mole discovered by Poidebard and Lauffray (1951).

In recent and contemporary times the environment of the harbour has been much more open to the influence of the sea (unit V of core BH IX). The end of the silting is perhaps linked to a lack of maintenance of the protective structures, facilitating the circulation of stronger currents and a coarser detrital flux. The base of unit V represents sandy, brackish bottoms near the shoreline, whereas the upper part of the unit represents the zone of the beach where boats were hauled up on to the shore before the construction of a jetty in 1935–1936. It is covered by various recent fills. Core sample BH IX therefore attests to the deposition of fine sands in the Middle Bronze Age and then of low energy in the Roman period. These sediments, resulting mainly from anthropogenic inputs, bring about a rapid progradation of the shore, culminating in the diminution in size of the harbour.

As in Tyre, nearly half of the ancient port of Sidon lies beneath the souk in the old city (fig. 1-2). We recommend that this entire urban area be protected. Any excavation for building purposes – for foundations, basements, underground car parks or the like – should be preceded by an archaeological rescue excavation in view of the exceptional archaeological potential. It is quite conceivable that the Bronze Age, Phoenician, Roman and Byzantine ports could be excavated in proximity to the Khan of the Franks.

III. Southern harbour shoreline mobility

This bay is situated to the south of the old city of Saïda, between two segments of quaternary aeolianite that stretches the length of the shore (Poidebard and Lauffray, 1951; Sanlaville, 1977). This bay is largely open to the prevailing south-westerly winds.

The role of this inlet among the port installations of ancient Sidon has long been a matter for conjecture, because of the proximity of the mound known as Murex Hill and of the archaeological sites of the Dakerman area (Saidah, 1969 and 1979). Two theories have been proposed. Renan (1864) thought this harbour was the 'Egyptian port' of Sidon. Poidebard and Lauffray (1951) doubted the existence of a sheltered port in the circular inlet, as no archaeological evidence had been found. Moreover, a corniche road had recently been built around the circumference of the inlet, burying any possible traces of putative port installations and wrecks. A core (BH VIII) was therefore taken near the present shoreline in order to determine whether the circular inlet had been, in a previous period, sufficiently protected to serve as the sheltered 'southern port' of the city of Sidon.

Core BH VIII was taken in the southeastern part of the inlet (fig.1-2), near the site of Dakerman. The sandstone bedrock was reached at 10.9 metres below the surface. Three sedimentary units are juxtaposed up to the recent infill at the top (fig. 5).

A. Unit A (BH VIII–17 to 14) consists, at the bottom, of limestone marine pebbles resting directly on the bedrock. This is a transgressive marine unit identical to that found in the northern harbour. Above this unit, sandy, shelly and muddy sediments are found (BH VIII–16). There is relatively little ballast. The histograms of the sandy fraction reflect the poor sorting of the samples.

The macrofauna includes many species reworked from the bedrock or from marine plants such as *Bittium reticulatum* and barnacle plates. The autochthonous populations are representative of sandy infralittoral bottoms notably including *Cerithium vulgatum* or *Rissoa venusta*.

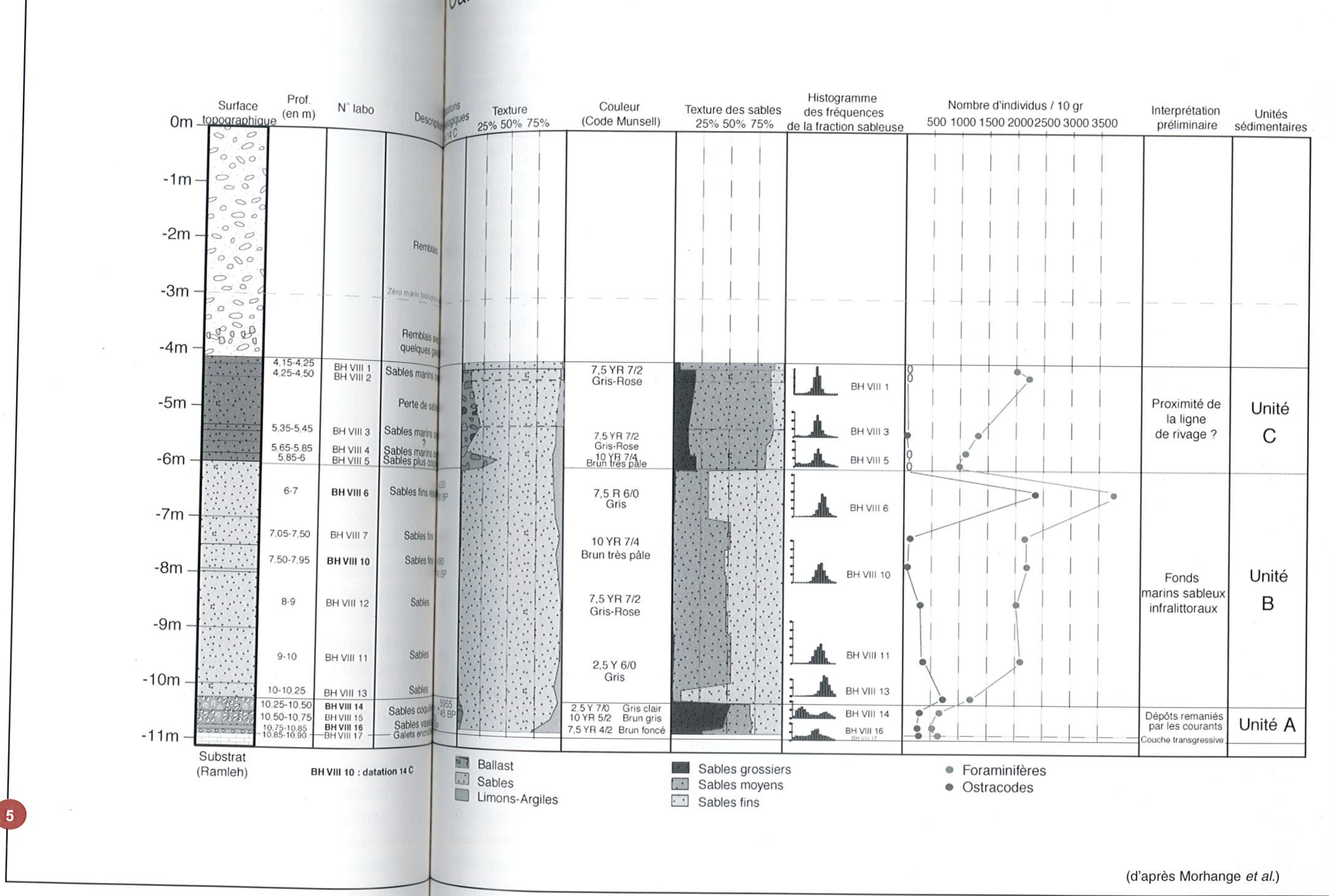
Samples BH VIII-15 and 14 consist of a biodeposition of juvenile shells. The ballast consists almost exclusively of broken macrofauna. The gastropods are either from species that live attached to a hard substrate or from those that live among seaplants such as *Bittium reticulatum*; or in muddy infralittoral sands: *Cerithium vulgatum*, *Smaragdia viridis, Neverita josephinia*. The pelecypods indicate the same type of environment, including *Chama gryphoides* (infralittoral rocks) or *Ctena decussata*.

BH VIII-16 has been dated to 6030 BP ± 45 years (that is 4588–4383 BC, Lyon 1730-OxA). The top (BH VIII-14) was dated to 5955 BP ± 45 years (that is 4499–4326 BC, Lyon 1729 Ox).

B. Unit B is very sandy, containing at least 90% sand throughout. Broken and reworked shells may be observed within the ballast. The macrofauna reflects sandy infralittoral environments of the Upper Level and well calibrated fine sands, notably containing *Donax semistriatus*, *Lentidium mediterraneum*, *Neverita josephinia* and *Smaragdia viridis*. Species that inhabit hard infralittoral substrates such as rocks, or seaplants are present throughout. Also found are juvenile specimens of *Venus* cf. *verrucosa*, *Bittium reticulatum*, *Bullaria* cf. *striata* and *Chama* cf. *gryphoides*.

The sandy fraction may be subdivided by its contents. At the bottom and at the top of the unit (BH VIII 13 and 6), fragments of shells are numerous,

Figure 5 : Sedimentological analysis of core sample BH VIII.



5

with sponge spicules. The sands in the central part of the unit (BH VIII 12, 10 and 7) contain little bioclastic material. Particle size analysis shows the prevalence of fine sands. All the levels are infralittoral, with a significant water circulation.

BH VIII-10 has been dated to 4060 BP ± 40 years (that is 2245–1998 BC, Lyon 1728-OxA). The top of this unit (BH VIII-6) was dated to 4220 BP ± 50 years (that is 2470–2197 BC, Lyon 1799-GrA20809). These dates attest to the circular inlet having remained a pocket beach until the beginning of the second millennium BC.

C. Unit C displays a coarser texture. The percentages of ballast are variable, up to 40%. Sands of medium grades prevail throughout. The proportion of silts diminishes from the bottom to the top of the unit. The ballast consists of fragments of sandstone and limestone. Samples BH VIII 1 and 2 are distinguished by the fragmentary angularity and the regular size of the limestone fragments, suggesting infill. The macrofauna provides little information.
It is important to emphasize the sandy character of the sedimentary environments in the southern bay. Core BH VIII does not display low energy facies characteristic of an enclosed port. Conversely, the accumulation of fine sands is characteristic of a pocket beach open to the sea.

IV. Dynamics of the Open Southern bay of Sidon

The areas studied are open to the dynamics of the sea, but several phases of sedimentary depositition in the southern harbour can nonetheless be shown to have existed. Three stages can be distinguished (fig. 5).

A. Sedimentary accretion of the bay from 4500 years BC.

Overlying the pebble unit is a layer indicating exposure of the environment to the open sea. The fauna, which are from varied environments, suggest reworking of the sediments by marine currents and swells. *Dentalium rubescens*, a bioindicator of sedimentary instability, reflects agitation of the water in the bay and alternating episodes of sediment deposition. Between 4500 and 2000 BC, the conditions prevailing in the southern bay of Sidon were thus unfavourable for its use as sheltered mooring.

B. Poorly protected sandy bay bottom, before 2000 BC.
The sandy character of this unit is indicative of the presence of an infralittoral bottom subject to marine currents. The infralittoral bottom is well oxygenated and in communication with the open sea. The biocenoses represent seabeds of the upper infralittoral level, between 2.5 and *ca.* 20 metres (Pérès and Picard, 1964). The presence of species representing biocenoses from different depths implies significant transport and reworking of shells, and therefore an active current system.

C. Proximity of the Shoreline (Unit C).
There are many indications that unit C was deposited in immediate proximity to the shoreline. The textures are thus distinguished by a higher proportion of coarser fractions (ballast and coarse sands). The scarcity and condition of the usually broken shells as well as the relative absence of the Ostracoda also confirm agitation of water.

Renan's 'Egyptian port' has proved to be a bay that was poorly protected from the dynamics of the open sea for 6000 years. Poidebard and Lauffray (1951) were thus right when they concluded that the circular inlet was not a well-protected port. It must now be considered to have been an open harbour, as already indicated in Espic *et al.*, (2002). At the time when sites such as that of Murex Hill and Dakerman were inhabited, the landscape would have included an inlet widely open to the sea. The ships, of modest size, were apparently hauled up on the beach. The poor facilities of this open southern bay would in part explain the relocation of the centre of Sidon

towards the shelter of the northern harbour, much larger and better protected, and hence more attractive, and which is today the only functioning port of Saïda several millennia later.

Acknowledgments

This research, undertaken within the framework of the archaeological excavations of the British Museum at Saïda, is a contribution to the research programmes of PICG 437 (*Coastal Environmental Change During Sea-Level Highstands*) and to Research Topic 4 (Past Settlement/Sea Level) of the INQUA commission (*Sea-Level Changes and Coastal Evolution).* We would like to thank Messrs Habib Fayad and Rony Malek (société de carottages Forex) who have greatly contributed to the technical success of this operation. The work was financed by the Lebanese British Friends of the National Museum and the programme franco-libanais CEDRE. The team would particularly like to thank the Directorate General of Antiquities of Lebanon

Bibliographie

Doumet-Serhal, C., (1999), 'Discoveries around the Harbour', *National Museum News*, 10, p. 40-41.

Espic K., Morhange C., Bourcier M., Bruzzi C., Nammour T. and Doumet-Serhal, C, (2002), 'Les Ports antiques de Sidon: Nouvelles données paléo-environnementales', *Archaeology and History in Lebanon:* A Tribute to Ziad Beydoun, pp. 28–36.

Frost H., (1995), 'Harbours and Proto-Harbours; Early Levantine Engineering', in *Proceedings of the International Symposium Cyprus and the Sea*, Nicosia, 1993, ed. V. Karageorghis and D. Michaelides, Nicosia, pp. 1–22.

Morhange C., Dubuquoy O., Prunet N., Ribes E., de Beaulieu J.L., Bourcier M., Carbonel P., Oberlin C. and Doumet-Serhal C., (2000 a), 'Etude paléo-environnementale du port antique de Sidon: Premiers résultats du programme CEDRE', *Méditerranée* 1–2, pp. 91-100.

Morhange C., Dubuquoy O., Prunet N., de Beaulieu J-L., Bourcier M., Carbonel P., et Oberlin C., (2000 b), 'Nouvelles données paléo-environnementales sur le port antique de Sidon. Proposition de datation', *National Museum News* 10, pp. 42–48.

Pérès J. M. et Picard J., (1964), *Nouveau manuel de bionomie benthique de la Méditerranée,* Revue des travaux de la Station Marine d'Endoume, Marseille.

Poidebard A. and Lauffray J., (1951), *Sidon, aménagements antiques du port de Saïda: Etude aérienne, au sol et sous-marine (1946–1950)* (Beyrouth: République libanaise, ministère des Travaux Publics.

Raban A., (1995), 'The Heritage of Ancient Harbour Engineering in Cyprus and the Levant', in *Proceedings of the International Symposium Cyprus and the Sea, Nicosia*, 1993, ed. V. Karageorghis and D. Michaelides, Nicosia, pp. 139–189.

Renan E., (1864) *Mission de Phénicie,* Paris.

Saidah R., (1969) 'Archaeology in the Lebanon' 1968–1969, *Berytus* 18, pp. 119–142.

Saidah R., (1979), 'Fouilles de Sidon-Dakerman: l'agglomération chalcolithique', *Berytus* 27, pp. 29–55.

Sanlaville P., (1977), *Etude géomorphologique de la région littorale du Liban*, 2 vols. (Beirut: Publications de l'Université libanaise, Section des études géographiques.