

Honoring the Lady of Byblos

Martine Francis-Allouche and Nicolas Grimal***

**Affiliated researcher, Collège de France; mfrancis.archeo@gmail.com*

***Member of the Académie des Inscriptions et des Belles-Lettres, Professeur, Collège de France; ncgrimal@orange.fr*

At the beginning of the 3rd millennium BC, Byblos became a fortified city-state, founded to accommodate a millennia-long timber trade, mainly to ancient Egypt, as mentioned in numerous historic sources. From the late 1950s until the dawn of her passing in 2010, maritime Byblos was explored and surveyed by the British pioneer in marine archaeology, Honor Frost. Since then, a multi-disciplinary investigation programme 'Byblos & the Sea', has taken up the reins of Frost's research, under the direction of Martine Francis-Allouche and Nicolas Grimal. Funded by the Honor Frost Foundation, this archaeological research programme has, to date, conducted ten field missions, reinvestigating the entire coastline of Byblos and its maritime approaches, primarily focusing on identifying the ancient harbour of the city. In 2013, the location of a harbour basin was finally confirmed at the southern foot of the city.

Keywords: Byblos, maritime archaeology, timber trade, Egypt, ancient sources, ancient harbour installation.

Maritime trade between Levantine coastal cities over the millennia is attested in numerous ancient sources (Elayi, 2007: 14-41). Both textual and iconographic works describe timber being felled in the hinterlands and traded, mostly between Byblos and Egypt (Gardiner, 1932: 61-76; Wreszinski, 1934: 86-87, Pl. 35; Kees, 1938: 3-4; Briquel-Chatonnet, 2001: 43). It started in the 5th millennium BC, during the Neolithic period, when fishermen settled on the Byblian headland (Dunand, 1950: 55-60; Jidejian, 1971: 13) in simple shelters which evolved into more sophisticated, circular domestic houses during the Chalcolithic period (Jidejian, 1971: 16).

By the middle of the 4th millennium BC, a prosperous and rich Bronze Age city rose on the foundations of the Chalcolithic settlement; explained by economic growth (Grimal, 2009: 339-360; Breyer, 2010: 67-100). Ancient Byblos, called *Gbl* in Phoenician,

Gubla in Akkadian, and *kpn* in Egyptian (Jidejian, 71: 1-2), traded and exchanged goods with every part of the Mediterranean Sea. Towards the end of the 3rd millennium BC, and more specifically in the 2nd millennium BC, Byblos played an important role in the trade network of ancient Egypt (Breyer, 2010: 67-100): archaeological artefacts found in the excavations of Byblos provide evidence of the commercial connections that the Bronze Age city entertained with Egypt (Grimal, 2009). From the 2nd millennium BC, textual and iconographic testimonies are even more abundant; these sources attest the

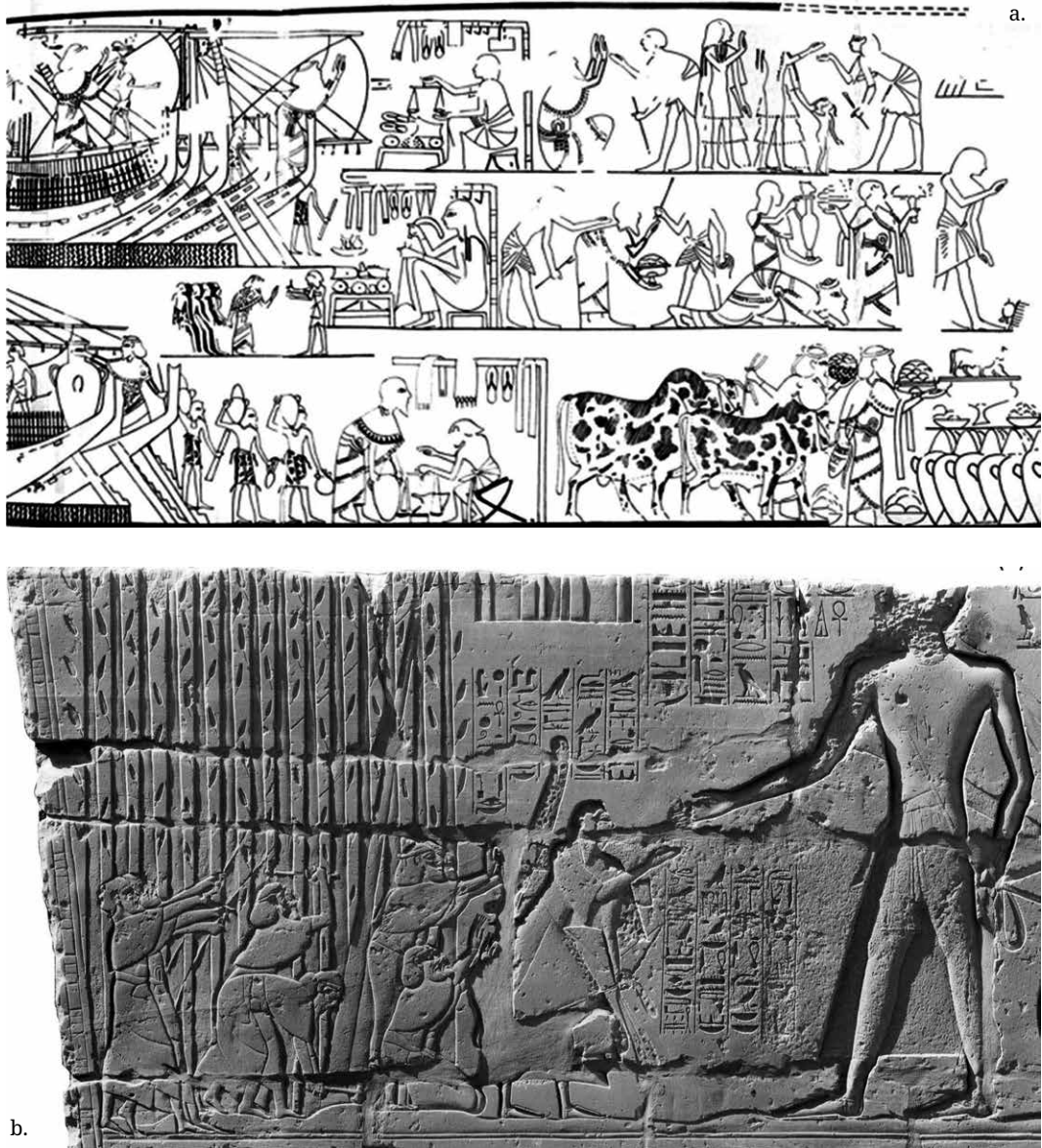


Figure 1. a) Syro-Canaanite merchants unloading goods on Egyptian land, Qenamun tomb, mid 2nd millennium BC; b) The 'chiefs of Lebanon' cutting trees for Sethi I, temple of Amon in Karnak, bas-relief on the outer northern facade of the hypostyle room. (Photos N. Grimal).

exploits and the conquests of the powers that ruled over the Levant. Generally, they describe the ancient sea trade (Sauvage, 2012: 265-266), the ships, the traded goods, and, more particularly, the exploitation of the hinterland forests and the export of timber from the Levant to ancient Egypt, the kingdom of Israel, or to the Assyrian and neo-Babylonian kingdoms.

In the annals of Thoutmosis III (1490-1436 BC), we find a description of the land as well as the goods that were imported to Egypt, and the ships and missions sent to fetch them (Bardinet, 2008: 120). The ships and the nature of the goods traded in the 2nd millennium BC are represented in iconographic sources such as the Kenamon Tomb dating to the XVIII Dynasty, depicting seagoing ships with Syro-Canaanite merchants unloading goods on Egyptian land (de Garis Davies, 1963: pl. XV) (Fig. 1a). Another important iconographic source is the bas-relief on the facade of the Temple of Sethi I, on the North Wall of the Temple of Amon at Karnak (1294-1279 BC). This shows dignitaries from Lebanon cutting wood to be offered to Sethi I (Pritchard, 1969; Linder, 1986: 27-281; Salvini, 1995: 15-45) (Fig. 1b). These iconographic representations are evidence of commercial transactions between the Levant and Egypt.

In the 1st millennium BC, a literary text confirms the existence of a harbour installation in ancient Byblos itself: the Pushkin Papyrus 120 tells the story of Wenamon, an Egyptian high dignitary who had been sent to Byblos by Ramses XI to buy wood to repair Amon's sacred vessel in the temple of Thebes (Lefebvre, 1976). This account of this expedition (1075 BC) is the most explicit and vivid evidence for the existence of a harbour installation in Byblos. After a difficult sea journey, which led Wenamon from Upper Egypt to Byblos, the Egyptian envoy faced difficult negotiations with Tjekerbaal, the Prince of Byblos, who agreed, at last, to the felling of trees and their transport to the harbour of Byblos where ships would be loaded with the timber that Wenamon was charged with bringing back to Egypt (Gardiner, 1932: 61-76).

In spite of such abundant testaments to commercial maritime activity in Byblos, archaeological investigation remained exclusively land-based (Renan, 1864; Dunand, 1939; Montet, 1962; Lauffray, 2008) until the 1960s when Frost undertook a long-term maritime survey programme, looking mainly for the well-attested Bronze Age harbour of the city.

Frost's investigations at Byblos

From the 1960s on, Frost travelled regularly in her Volkswagen Beetle from London to discover the history of the Levantine coastline (Fig. 2a-b). She had taken onboard research by Antoine Poidebard, Jean Lauffray, and René Mouterde in southern Lebanon (Poidebard *et al.*, 1951; Nordiguian & Salles, 2000: 232; Lauffray, 2008), where she explored the ancient harbours of Tyre and Sidon up to the 1975 Lebanese Civil War. This was also the start of Frost's interest in stone anchors (see Votruba, this volume), which led her, much later, to work at Byblos. Researching maritime Byblos was among her most important projects; it was there that she pursued maritime research till the dawn of her passing.

In Byblos, besides studying stone anchors unearthed from excavations carried out in 1960, in 1998 Frost resumed an investigation of the sea front: this area, prior to the Civil War, had remained *terra incognita*. She started by looking for any significant marks



a.

Figure 2. a) Temple of Ba'al Eshmun, Sidon. Honor Frost, Maurice Dunand, Director of the French Archaeological Mission in Lebanon (right), and an attendant (1960). (© Honor Frost Archives); b) Honor Frost on the roof top of the medieval castle during her last visit to Byblos (2008). (M. Francis-Allouche).



b.

or indications along the coastline and in the sea that could lead her to locate the city's main Bronze Age harbour installation (Frost, 1998: 29). Up to this point, the scientific community had taken for granted that the smaller, medieval harbour cove had served this purpose (Dunand, 1939; Montet, 1962: 79-83; Lauffray, 2008: 27).



Figure 3. Aerial view of the southern maritime approaches of Byblos (Photo C. Tannouri). Circled in red is the location of the so-called 'proto-lighthouse' overlooking the south and (inset) the votive anchors forming a step in a flight possibly leading to the roof of the building. (Photo M. Francis-Allouche).

Frost carried out five campaigns at ancient Byblos, as distinct from the medieval Jbeil, for the Directorate General of Antiquities. These started in 1998 as a result of a UNESCO plan to protect the medieval harbour of Byblos and the Byblian coastline, not least in the face of recurrent threats of modern development. For example, in 1970 a jetty was built to be developed into a fully fledged marina, just outside the medieval harbour mouth. The limits of the protected area at sea also needed to be defined. Frost was called upon because she had studied the Levantine coast from Tyre to the Turkish frontier before the Lebanese Civil War, when she was based at the Institut Français d'Archéologie, initially under the scientific direction of Henri Seyrig.

The first campaign in 1998, on land, was a search for a long-forgotten building, called the 'Tower-Temple' by French archaeologist Maurice Dunand. Several indications led Frost to describe it as a 'proto-lighthouse' (Frost, 2002: 52-57), primarily its situation in a commanding position overlooking the southern Egyptian approaches to Byblos (Fig. 3). She drew a comparison between the Byblian 'Tower-Temple' and the temple of the weather god Ba'al at the site of Ugarit in Syria (Frost, 1991; 2002; 2004). Both Bronze Age structures yielded pierced stone anchors, which have a symbolic aspect at Byblos, as proven by other anchors found in the Sacred Enclosure and in the Obelisk Temple (Frost, 2000). At Ugarit, stone anchors were found inside the 'Tower-Temple' and in Byblos, they formed the first steps of a flight of stairs (Fig. 3) that possibly led up to the roof of that very structure; the association of such votive anchors, combined with the discovery of an Ugaritic clay tablet mentioning sacrifices on temple roof tops – the fire or fumes of which possibly served as navigation signals or sightings – led scholars to believe that such tower-like structures were sited at Bronze Age proto-harbours, leading seafarers into safe moorings (Yon, 1984; Callot, 1987 b; Frost, 2000, 2002: 52-55).

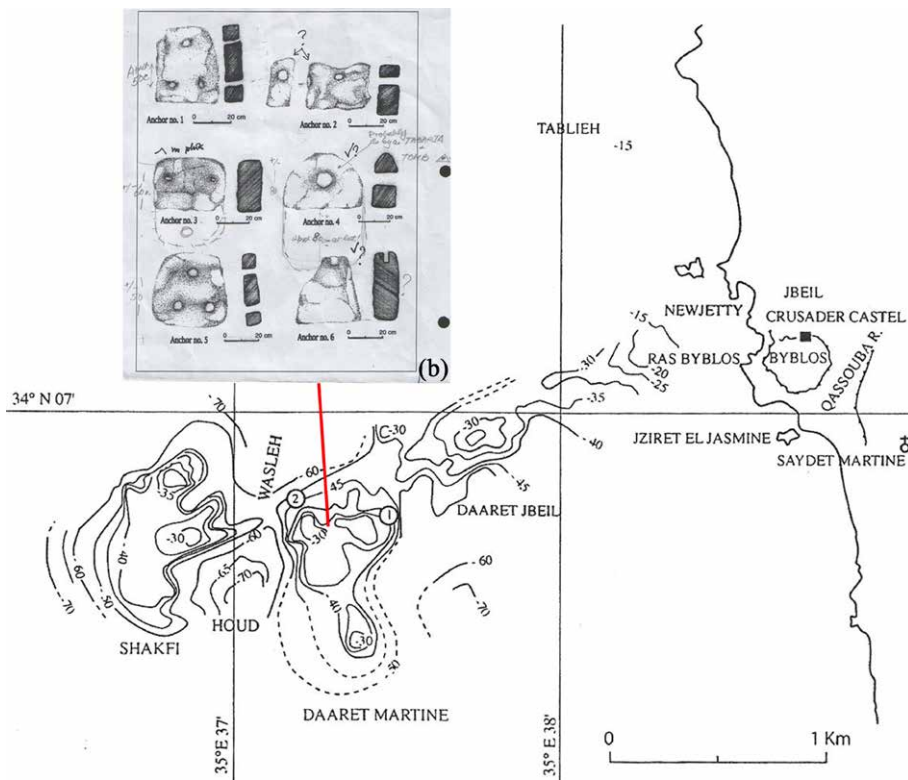


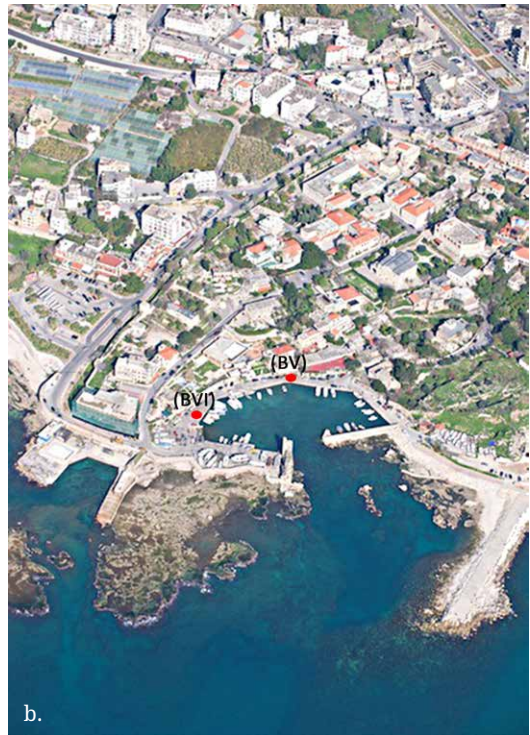
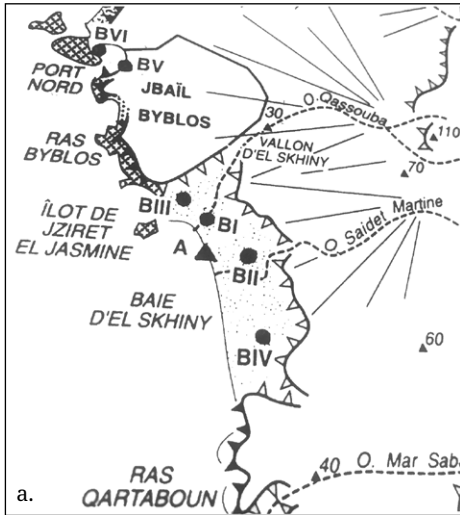
Figure 4. The offshore submerged reefs of Byblos, charted by J. Collina-Girard in 2002; inset: A series of pierced stone anchors located on 'Dahret Martine'. (Collina-Girard et al., 2002).

Also in 1998, while searching for the ancient harbour in the vicinity of the headland, Frost requested the involvement of French geomorphologist Christophe Morhange to study possible indicators of sea-level change. He undertook a survey along the Byblian coastline to the mouth of the Fidâr river, south of Byblos (Morhange, 1998: 261-265).

Since Bronze Age engineers had not yet invented substantial harbour installations, Frost generally believed that vessels were anchored offshore along the Levantine coast, since the shore presented a rather straight and rocky strip lacking safe shelters and was therefore unsuitable for mooring larger commercial vessels (Frost, 1995: 1-21; Frost, 2004: 322-324). Therefore, the third part of the 1998 campaign was dedicated to a first exploratory offshore survey (Frost, 1998 b: 21-23), in collaboration with one of the present authors, marine archaeologist M. Francis-Allouche, who assisted Frost in subsequent research seasons at Byblos and to whom Frost was both mentor and inspiration.

The maritime survey consisted of diving and filming the seascapes of a series of underwater reefs (Frost, 2004: 333). These three deep reefs or shallows, lying between two and three kilometres offshore, still used as fishing grounds today, are known as 'Dahret Jbeil', 'Dahret Martine' and 'Al-Chakfi'. Lying today at an approximate depth of 30 m, these reefs had never figured on any marine chart. In 2002, Frost launched a marine survey, directed by geologist Jacques Collina-Girard, to chart these three

Figure 5. a) Location of six cores taken during the Project CEDRE. (Schematic plan by H. Frost & C. Morhange after Sanlaville, 1977); b) aerial view of the medieval harbour basin of Byblos with core locations marked. (Photo C. Tannouri); c) view of the southern bay of El-Skhinyeh. (Photo M. Francis-Allouche).



offshore shallows using a Global Positioning System (Fig. 4), in order to provide the basis for future archaeological research (Collina-Girard *et al.*, 2002: 317-324; Frost, 2002: 309-316; Frost, 2004: 334). For Frost, there was a particular interest in understanding these shallows and if they served ancient Byblos as an offshore mooring. A series of seven stone anchors was identified scattered on one of the shallows, 'Dahret Martine', possibly indicating an ancient anchorage (Fig. 4).

As alluded to before, archaeologist Dunand – like Egyptologist Pierre Montet – believed the Bronze Age harbour of Byblos was located in the same position as the medieval harbour, the fishermen’s harbour of Byblos, and that the earlier Bronze Age harbour had been built over by the medieval harbour basin (Dunand, 1939; Montet, 1962: 79-83). The quest to verify this began in 2000, within the ‘Opération Cèdres’ (CNRS-L), in collaboration with Frost, Morhange, and Mountaha Saghieh-Beydoun; a series of core samples (Fig. 5a) was taken to try to locate the much-attested Bronze Age harbour of the city (Frost & Morhange, 2000: 101-104; Morhange and Saghieh-Beydoun, 2005). The two first auger cores (BV and BVI) drilled across the quay of the medieval harbour of Byblos (Fig. 5b), north of the Byblian headland, finally confirmed an unprotected, shallow, narrow, rocky cove, unsuitable for mooring larger vessels. Additional core samples (BII, BIV) were taken across the sandy El-Skhyneh Bay (El-Skhiny Bay) (Fig. 5c), south of the headland, confirming it to be a shelterless open bay with no possible moorings.

According to Frost, cedar logs and other conifers were floated down from the hinterland on the Qassouba river, nowadays just a trickle of water (Frost, 2002: 342) located at the southern foot of the headland. To verify this theory, another auger core (BI) (Fig. 5a) was extracted from what used to be the riverbed within the Qassouba

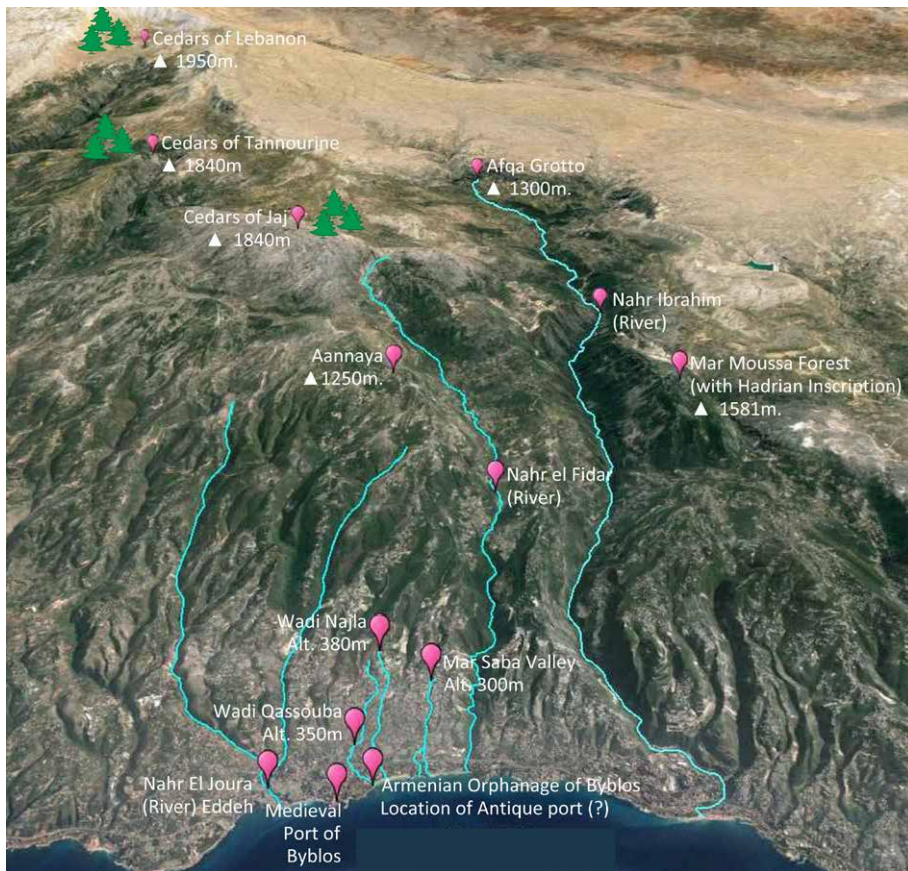


Figure 6. The main river courses and altitudes of forest areas in the hinterland of Byblos. (Francis-Allouche & Grimal, 2014).

valley. The core sediments included a large amount of river pebbles, flattened by erosion, indicating the existence of quite a large riverbed to the south of the city of Byblos in antiquity (Frost, 2004: 341-342). Frost's proposal has since been revised, subsequent field investigation has put limits on the use of this river for two practical reasons: a) the course of its riverbed is rather rough and bumpy, and it presents narrow turns that would have hampered driving down timber logs; and b) the upper course of the Qassouba river only reaches 325 m, an altitude too low for cedar and juniper trees to grow. Of course, smaller-sized goods may have been transported on the river. An alternative important role the Qassouba river may have played during antiquity was the provision of a fresh-water supply to the harbour basin and more generally to the coastal area.

However, further to the south are the seasonal river of the El-Fidâr valley and the Nahr Ibrahim or Ibrahim river (Bardinet, 2008: 23-49) (Fig. 6), two other rivers that reach the high plateaux of the hinterland of Byblos, where evergreens are prevalent. The cedar tree, for instance, needs higher mountains of no less than 1000 m, and ideally 1500 m, such as the high plateau of Jaj (or Arz Jaj) and the Jabal Mar Moussa Forest, where an inscription by Emperor Hadrian confirms this hypothesis (Abdul-Nour, 2001: 64-95). This engraved inscription was aimed at protecting four species of evergreens, which still grow at these altitudes.

Further research conducted in 2004 in the valley of the El-Fidâr river revealed traces of human activity such as rock-cuttings along the riverbanks (Dalix & Chaaya, 2007: 11-15). The study discusses the use of rivers as a means of transportation, floating logs downstream from the felling sites to the river mouth using a method in which logs are assembled in rafts that are then steered down on the current, as depicted in the Khorsabad bas-relief of the Palace of Sargon II (722-705 BC) (Linder, 1986: 271-281; Fontan, 2001) (Fig. 7). Clearly, all rivers and streams of the Byblian area may have been used for the transportation of goods from the hinterland to the coast; however, only the streams immediately to the south of ancient Byblos are taken into consideration here because the sea currents, which flow predominantly from the south-west, would have guaranteed the flotation of logs up the coast to the harbour facility that was located in the direct vicinity of ancient Byblos, according to Wenamon's report.

In the quest to locate any vestiges of an artificial harbour construction (Frost, 1998 b), one last coring session (BIII) was carried out at the southern foot of the ancient city, in a plot that now houses the Armenian Orphanage of Byblos (Frost & Morhange, 2000: 101-104). However, after an unfortunate loss of the finer core sediments, and judging from the remaining coarse ones, it was agreed by Frost and Morhange to discard the area as a possible location for a harbour facility (Stefaniuk *et al.*, 2005: 19-41). Another reason that made Frost pull away from this southern area as a possible maritime installation was the underwater configuration of the Jouret Osman Bay (Fig. 8), just in front of the Armenian Orphanage plot, which today has the appearance of a rocky, shallow cove.

It was at this point, when Frost had eliminated all contenders for the location of the ancient harbour along the coastline of Byblos, that she adopted the offshore-anchorage theory, where large commercial vessels would anchor at sea and wait for smaller service-crafts (*kpnt*) to commute from the sandy bay of El-Skhyneh, towing logs from shore out to the cargo vessels at sea for shipping to Egypt (Frost, 2002).



Figure 7. A bas-relief from the palace of the Assyrian king Sargon II, Khorsabad (721-705 BC), depicting different methods of timber transportation, towing of assembled rafts, and loading of logs on ship.

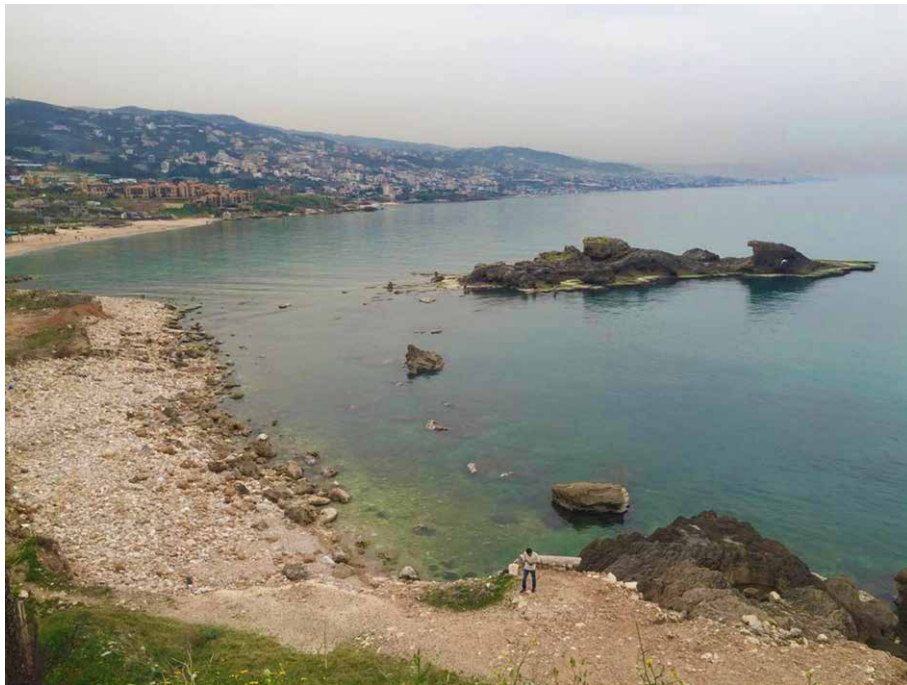


Figure 8. The bay of Jouret Osman in front of the Armenian Orphanage plot, showing the island of El-Yasmine protecting the bay from the predominant south-west currents. (Photo M. Francis-Allouche).

In 2001, the town's seafront, which had never been investigated, needed to be surveyed to understand any possible connection between the city on the headland and its shore. A basic topographical survey of the seafront, from the medieval harbour area to the island of El-Yasmine, was undertaken by Hugh Barnes, assisted by Francis-Allouche (Frost, 2001: 195-217; Frost, 2004: 335-340). Interesting man-made rock-cut features such as a trench complex, a fish tank, and door jambs, appeared along the coastal strip. The most notable discovery, however, was the remains of a necropolis with rock-cut single graves, which have become increasingly eroded over the years, weathered by the elements. Other rock-cut chamber tombs appeared at the back of a restaurant bordering the medieval harbour: these were measured, recorded, and included in Frost's general plan (Frost, 2001: 195-217; Frost, 2004: 335-340). A photographic record was also made of the surveyed area, under water and on land.

In 2003, a fifth campaign took place on the Byblian headland, to update the stone anchor study that Frost had started in 1969 and revise the first catalogue of votive temple anchors she had published *The Stone Anchors of Byblos, Revised and Compared* (1969, and in press). Frost classified the many stone anchors unearthed in urban contexts or extracted from the sea according to different functional types corresponding to their use in different seascapes (Frost, 2004: 329-331).

Between 2004 and 2006, the five archaeological research missions conducted by Frost on coastal Byblos were reviewed with the aim of producing texts for panels to mark significant historic features along the rocky base of the headland for a coastal tourist trail of Byblos for the Lebanese Directorate General of Antiquities. After 2006, the insecure political situation put a hold on Frost's research in Lebanon. After her unfortunate passing her team, led by the authors, resumed work in 2010 within the framework of the 'Byblos & the Sea' project, in collaboration with the Lebanese Directorate General of Antiquities. Funded by the Honor Frost Foundation, 'Byblos & the Sea' has conducted ten field investigations to date as part of her legacy, striving to explore and progress her work as she would have done herself.

Byblos & the Sea: taking on Frost's agenda

The 'Byblos & the Sea' project's main objectives are to link the antique city to its seafront, to understand the maritime approaches to Byblos, and finally to locate the harbour installation that provided the stimulus for the economic growth of the city in antiquity. All the data from previous scientific research was gathered in an attempt to synthesize the different approaches. The field study covered the entire coastal rocky strip of Byblos and its maritime approaches from the medieval harbour to the bay of El-Skhyneh, at the southern foot of the ancient city, and reaching out to sea some 3 km.

Topography and mapping

The different options that Frost had considered as possible Bronze Age harbour locations have been reconsidered one by one within the 'Byblos & the Sea' field survey, with the objective of confirming or invalidating former results, in order to progress research.

The first 'Byblos & the Sea' field mission, conducted in 2011, delivered a complete topographical survey of the coastline of Byblos, establishing its different zones; a baseline requirement to understanding the functionality of the exploited areas as well

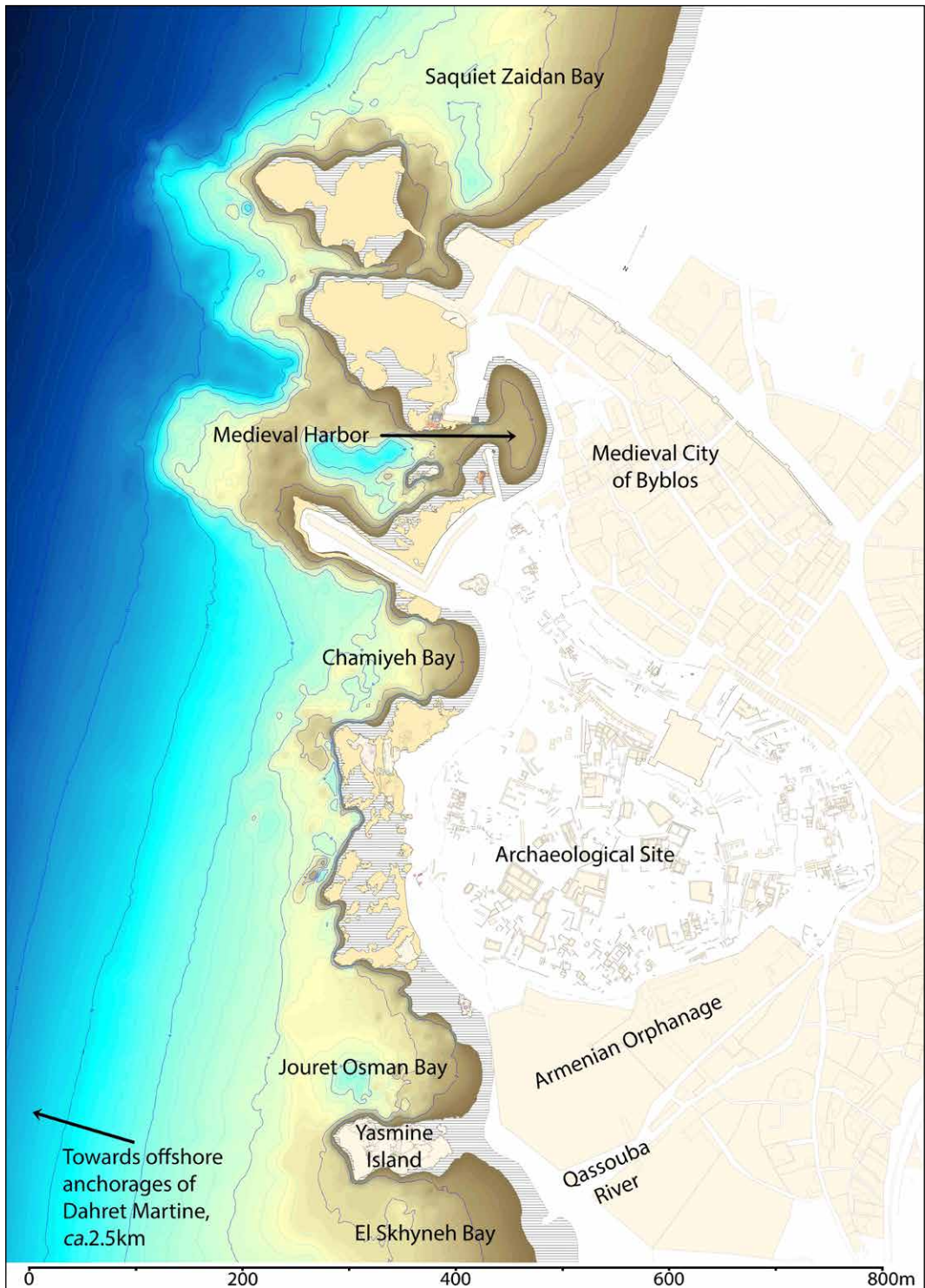


Figure 9. Topographical plan of the coastal area of Byblos and bathymetric survey of the near shore area. (Francis-Allouche & Grimal, 2014).

as potential harbour configurations. This first step resulted in an overall master plan of the land, which was later enlarged to cover the maritime area of Byblos through a bathymetric mapping survey conducted in 2014 (Fig. 9).

Potential harbours revisited

Byblos' northern coast

In 2014, a bathymetric survey in the nearshore maritime area of Byblos confirmed former results, invalidating the northern part of the coastline of Byblos as a potential harbour location; whether it is the northerly Bay of Saquiet Zaidan, the medieval harbour, or the Bay of Chamiyeh.

Saquiet Zaidan today presents an unprotected, open, and straight pebble stretch, bordered by steep cliffs and exposed to major sea currents.

The medieval harbour of Byblos, prior to the construction of the modern harbour in 1968, presented rocky outcrops and geological terraces at mean sea-level inside the basin, as seen from a 1930 photograph (Fig. 10a); the basin was subsequently deepened and enlarged to accommodate larger boats. In 2014, the medieval basin area was reinvestigated: an underwater bathymetric survey revealed an unsuitable underwater configuration for mooring ships inside the medieval harbour basin, confirming former auger-coring results (Projet CEDRE, Frost & Morhange, 2001). Moreover, the bathymetric map showed rocky and shallow maritime approaches to the harbour mouth. It further confirms that larger vessels had to moor elsewhere (Fig. 10b-c).

The Bay of Chamiyeh, located south of the medieval harbour, presents the same intricate underwater configuration; this third location would also have been too rocky and shallow for the manoeuvring of larger cargo vessels in antiquity.

Based on these indications, the 'Byblos & the Sea' project has enabled any hypothesis of an ancient anchorage in the northern zone of Byblos to be ruled out, at least for use by large cargo ships. The field investigation therefore confirmed Frost's hypothesis that the ancient harbour was most likely located towards the south of the city, in the sandy bay of El-Skhyneh.



Figure 10. a) The medieval harbour of Byblos in the 1930s, a natural cove with geological outcrops visible at mean sea-level inside the basin. (Courtesy of the Max Van Berchem Foundation).

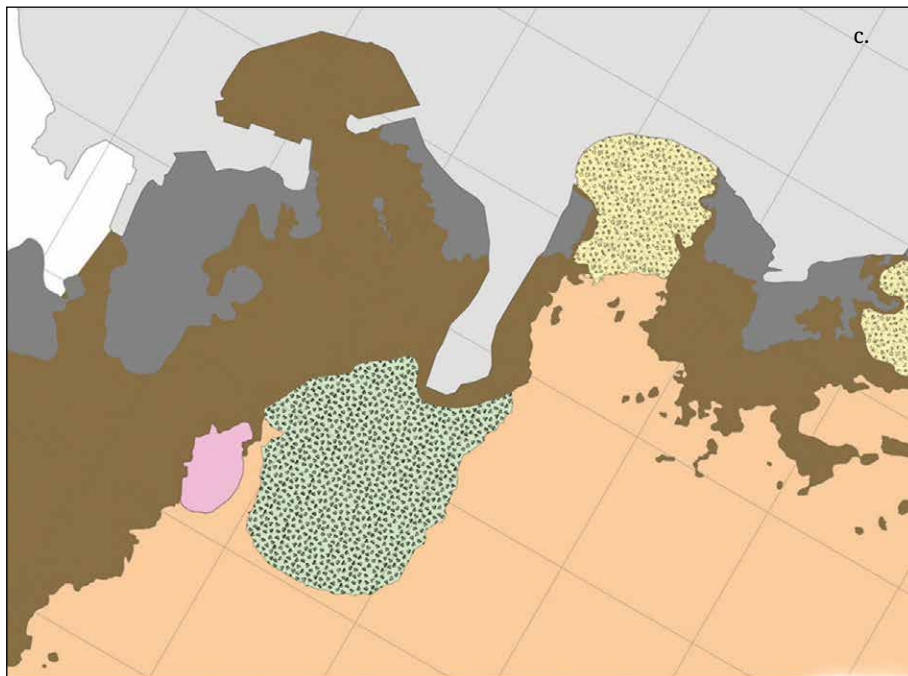
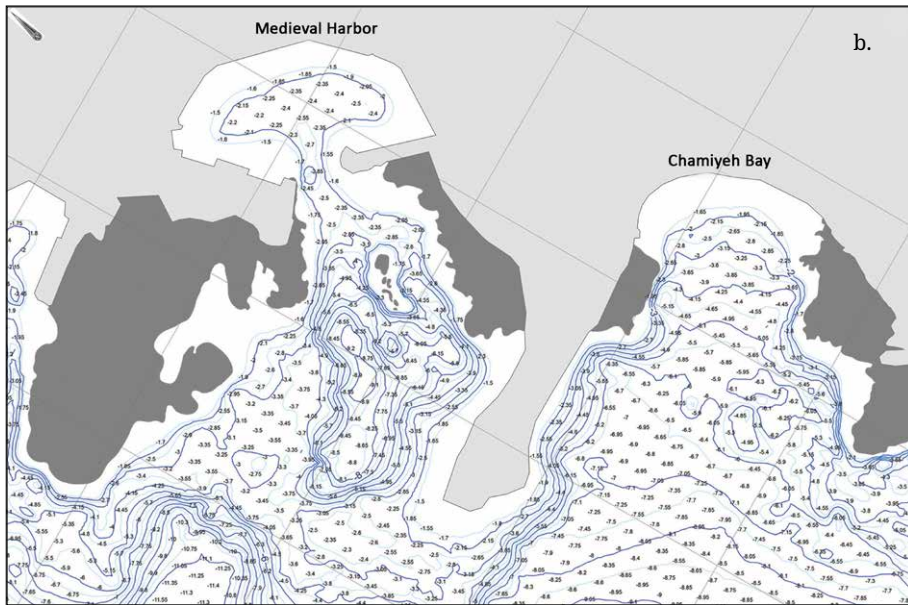


Figure 10. b) Bathymetric survey of the medieval harbour area, indicating shallow and narrow seaward approaches; c) seabed composition of the medieval harbour area, showing in brown the shallow rocky seabed, making mooring difficult for large vessels. (Francis-Allouche & Grimal, 2014).

Byblos' southern area

Despite the fact that Frost had finally ruled out the southern sandy area of Byblos as a possible mooring for large vessels and adopted instead the offshore-anchorage theory,

as explained above, 'Byblos & the Sea' opted to reconsider her initial idea, which was the immediate area to the south of the archaeological tell of Byblos. Primarily, the main reason for discarding the offshore-mooring theory was the exposure of the three reefs to seasonal winds. Mooring and loading are not easy tasks to perform in exposed conditions, specifically loading long logs, as mentioned in the ancient annals and as illustrated in the Cheops pyramid (Nour *et al.*, 1960; Jenkins, 1980). Therefore, the 'anchorage at large' theory had to be revised. Nevertheless, the pierced stone anchors which were found scattered on the reef known as 'Dahret Martine', as mentioned (Fig. 4), may indicate a possible temporary anchorage for cargo ships waiting to moor in the harbour basin of ancient Byblos, as explicitly described in Wenamon's account (Egberts, 1991: 57-67). Wenamon's account also gives an indication of the nature of the location where the timber was stored before it was loaded on to ships:

I went to the seaside, where the timber logs had been piled up, and I saw 11 boats
 (īw-ī šī n-ī <hr> spr <n> p3 ywm r p3 nty n3 ht īm w3h, īw-ī nw r 11 n br)
 (Wenamon: 2, 62-63).

The storage area seems to have been close to an important mooring basin, since Wenamon saw 11 boats. Another conclusive indication about the existence of a harbour facility, is the recurrent references to the word *mrīt*, meaning a built harbour (Fig. 11), which is differentiated from the word *spt*, which means seashore (Gardiner, 1932). It is a space in which ships are moored: 'The harbour of the sea (*n p3 ywm*)' (Wenamon: 2, 74); 'the sea shore of the harbour of Byblos', 'Are there not 20 ships (*mnš*) here, in my harbour' (1, 33 etc.). Within the same text, the same terms are used for the city of Dor, where the location of the harbour has been clearly identified (Carayon, 2008: 1022-1023). References to the harbour of Dor are the following: 'I was robbed in your harbour' (1, 13); 'I spent nine days moored in your harbour' (1, 21-22), and 'wait until you have left the harbour' (1, 27).


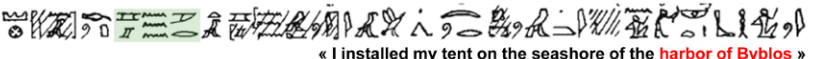
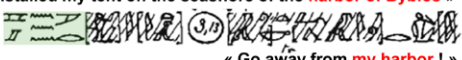
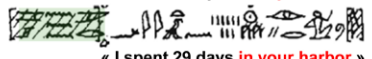
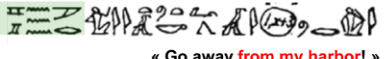
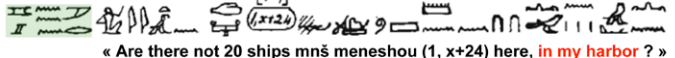

Not only is it clear that Bronze Age Byblos had a built harbour with a dock along which at least 20 cargo ships (*mnš*) could be moored simultaneously, but it seems to have been located in the immediate vicinity of the Byblian city, itself nested on a 25-m-high promontory.

When he reached Byblos, Wenamon installed a tent on the seashore of the harbour (probably meaning outside the mooring basin) waiting for the Prince of Byblos to give him audience.

When the morning came, he [the prince] sent someone to escort me to the top [to the city which lay on top of the promontory], leaving the statue of the God Amon in the tent where he had been at seashore. I found him [the prince] sitting at his desk, his back to the window: the waves of the large Syrian Sea were unfolding up to his neck [probably an optical illusion]. (Wenamon: 1, 13-16)

Based on these first indications, 'Byblos & the Sea' pursued the investigation in the quest for the ancient harbour location in this southern area of Byblos.

Harbor of Byblos

		2. 74
	« the harbor of the sea »	
	1. 33	
	« I installed my tent on the seashore of the harbor of Byblos »	
	1. 35	
	« Go away from my harbor ! »	
	1. 37	
	« I spent 29 days in your harbor »	
	1. 37-38	
	« Go away from my harbor ! »	
	1. 58-59	
	« Are there not 20 ships mnš meneshou (1, x+24) here, in my harbor ? »	
	2. 26-27	
	« You left this great God for 29 days moored (in) your harbor »	

Harbor of Dor

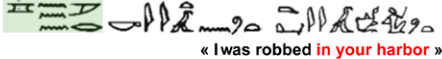


	1. 13	
	« I was robbed in your harbor »	
	1. 21-22	
	« I spent 9 days moored in your harbor »	
	1. 27	
	« [Wait until you have left] the harbor »	

Figure 11. The use of the word *mrīt* for 'harbour' in Wenamon's report. (Translation by N. Grimal).

Exploring the southern foot of the Byblian tell

Several additional reasons reoriented research to the area immediately south of the ancient city of Byblos, based on the following data: a) the proximity of the ancient city of Byblos; b) the area at the foot of the ancient tell presented a deep inward gulf prior to silting and subsequent construction; c) the protection the Island of Yasmine offers to the area; d) the location of the two main rivers to the south of Byblos, enabling the predominant south-westerly sea currents to carry towed logs or rafts northwards to this possible harbour location (as described above); and e) as mentioned, the significant references in Wenamon's account that the Prince Tjekerbaal of Byblos could see 20 boats moored in the harbour from his office on the headland (Wenamon: 1, 33).

Geophysical survey

Prior to any invasive intervention on the ground, a geophysical resistivity survey was conducted in October 2013 on the lower plot of the Armenian Orphanage by geophysicist Tomasz Herbich (Institute of Archaeology and Ethnology, Polish Academy of Sciences, Warsaw, Poland). The grid was set by the topographer Damien Laisney (Maison de l'Orient et de la Méditerranée, Lyon). The data was processed by Herbich. The main objective of the survey was to locate possible buried harbour structures. The results were quite outstanding; the geophysical readings (2D images) allowed the detection of a silted-up basin buried under this plot, with an ancient shoreline 100 m further inland (Fig. 12) (Francis-Allouche & Grimal, 2014: 54-59). The result of the survey produced a good basis for further research: verification by auger coring was necessary at this point.

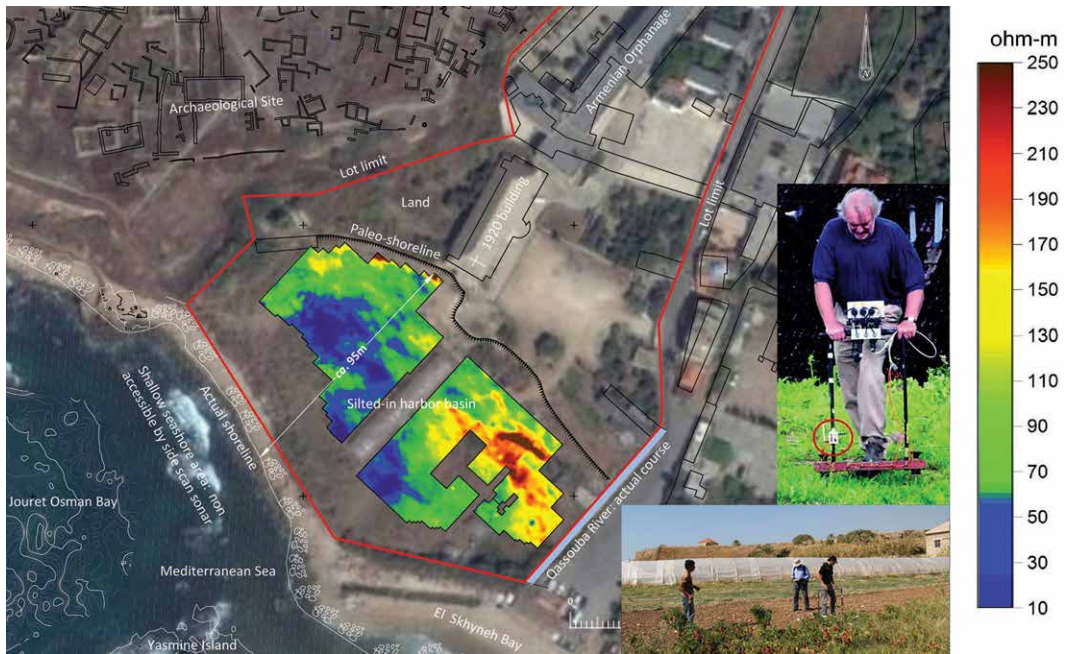


Figure 12. Results of the resistivity survey conducted by Tomasz Herbich (insets) on the Armenian Orphanage plot, revealing a buried basin with a paleo-shoreline c.100 m inland (Francis-Allouche & Grimal, 2014).

Auger-coring survey

To verify the results of the geophysical survey readings, an auger-coring mission was carried out under the scientific direction of sediment specialist Nicolas Carayon (CNRS UMR 5140: Archéologie des Sociétés Méditerranéennes, Montpellier-Lattes, France) in the Armenian Orphanage plot (Fig. 13). The 2014 mission added to the core samples taken in 2000 in the framework of the Project CEDRE (Francis-Allouche & Grimal *et al.*, 2017).

As a result, the existence in the past of a body of water was confirmed, and a silted-up harbour cove was corroborated. The nature of the sediments filling this harbour cove have been analysed in the laboratory and all 29 core samples attest that this area, at the foot of the ancient city, offers adequate conditions to afford a well-protected harbour basin (Francis-Allouche & Grimal *et al.*, 2017). In fact, based on the analyses of the extracted sediments, the process of transformation from a natural coastal space to a man-made artificial installation can be understood through the several different phases traced, almost recreating the harbour space. The construction of artificial harbour structures, built to protect the confined space from the sea currents, transformed the nature of the sediments from very coarse, transported by the sea, to very fine and silty sediments that were trapped in the basin. Such changes in the nature of sediments typically occur in confined spaces and indicate very clearly a protected harbour space (Goiran & Morhange, 2001; Carayon, 2013).

According to the different units (layers) found in the core samples, the basin below and to the south of the Byblian promontory was large enough (c.8000-12,000 m²) and of sufficient depth (1.5-4 m) to accommodate a fleet of commercial boats, as stated in the



Figure 13. a) Location of auger cores collected in the Armenian Orphanage plot (Nicolas Carayon, 2014); b) auger in action: 291 kg of sediments were cored with 80 kg sampled, processed and analysed in the laboratory. (Photos M. Francis-Allouche & N. Grimal).

ancient Egyptian annals and in Wenamon's account (Fig. 14) (Francis-Allouche & Grimal *et al.*, 2017). Several phases of seashore modification have been identified: two paleo-shorelines were located, showing a progradation exceeding 100 m since the maximum rise in sea-level (marine *transgression*) around 6000 BC (Goiran & Morhange, 2001). Such silting could have occurred as a result of the abandonment of possible structures that protected the harbour from the swell and from major winds, which would have caused rapid silting of the basin, leading to a rapid progression of the ancient shoreline, totally integrating the basin and original shoreline into the urban tissue.

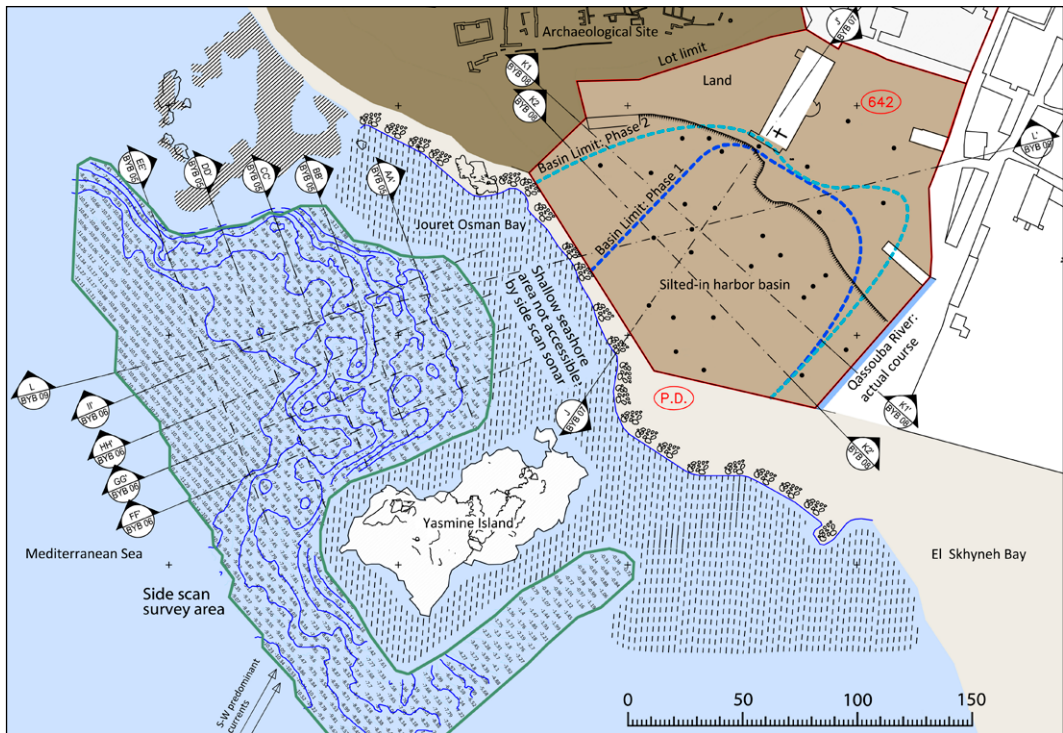


Figure 14. General plan showing the Armenian Orphanage plot and the core survey; the extent of two phases of siltation in the harbour basin (areas of 8000 m² and 12,000 m²); and the transects recorded on land and at sea. (After Francis-Allouche & Grimal, 2014).

Bathymetric survey

An extensive marine remote-sensing survey was also conducted within the framework of the ‘Byblos & the Sea’ research project by the marine geology department of Patras University in Greece, directed by Prof. George Papatheodorou (Papatheodorou *et al.*, 2014) (Fig. 15). The maritime approaches to Byblos were surveyed, covering a total area of 8 km² with a total track-line length of 250 km, from the medieval harbour of Byblos to the El-Fidâr River canyon south of El-Skhyneh Bay, for the nearshore area (Fig. 9), and reaching the offshore shallows of Dahret Jbeil, Dahret Martine and Al-Chakfi (Fig. 16).

The survey resulted in: a) a bathymetric map of the actual seabed; b) a paleo-bathymetric map of a deeper-lying seafloor; c) a seafloor composition map; and d) a target map, identifying anomalies for future investigation.

In Joureit Osman Bay (Fig. 8), results of this bathymetric survey indicated an extremely shallow and rocky seabed with a shoreline practically linked to Yasmine Island, almost forming a headland. However, further investigations located a paleo-bathymetric level – that is, a deeper seabed – buried beneath the present one. A 5-m-thick layer of loose sediments accumulated over years covers the deeper, earlier seabed (Fig. 17).

Moreover, the depth of this buried seabed perfectly matches the depth of the inland silted-up harbour basin on the Armenian Orphanage site, meaning that the entire profile of the Qassouba valley seems to have been much deeper, and perfectly suited to mooring boats (Fig. 18).

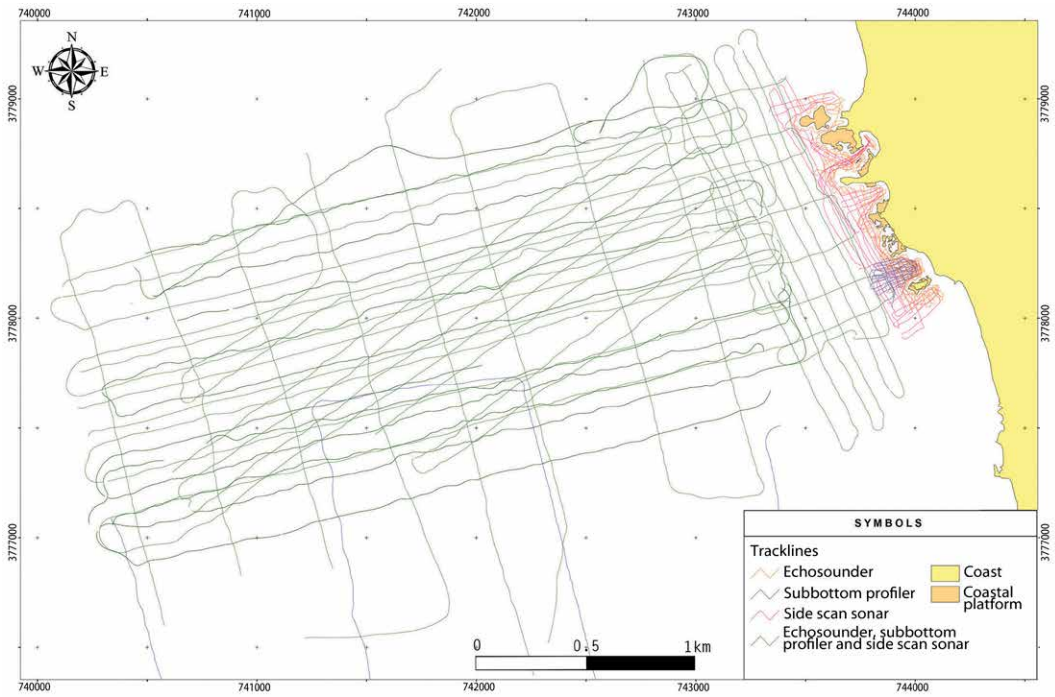


Figure 15. Marine remote-sensing survey (George Papatheodorou, Patras University, Greece).

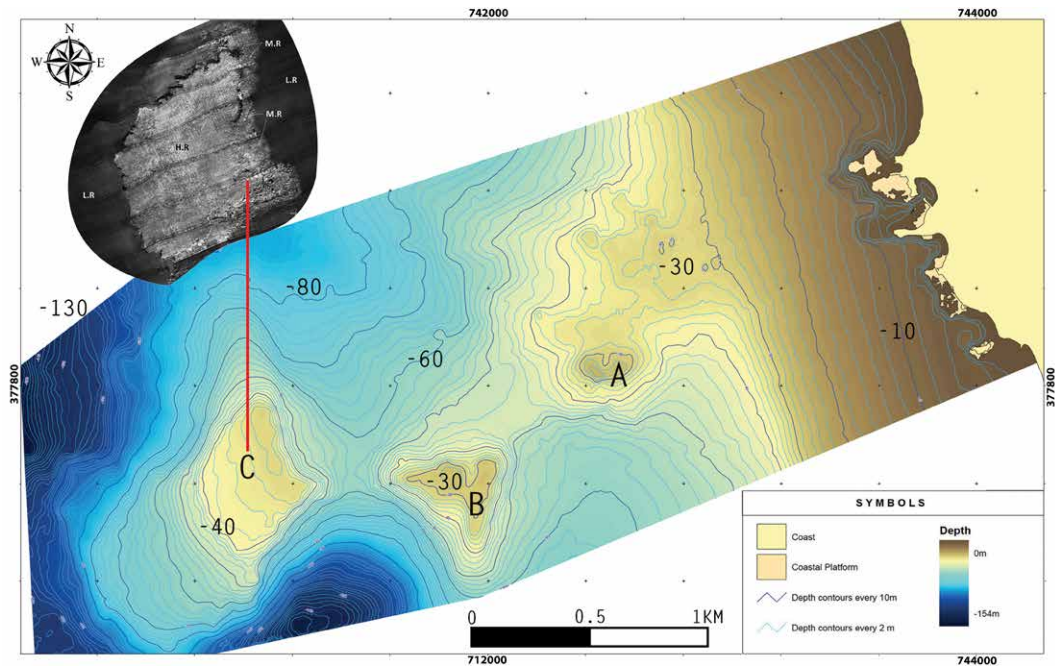


Figure 16. Detailed bathymetric map of the offshore anchorages c.2-3 km off the coast of Byblos. (Francis-Allouche & Grimal, 2014).

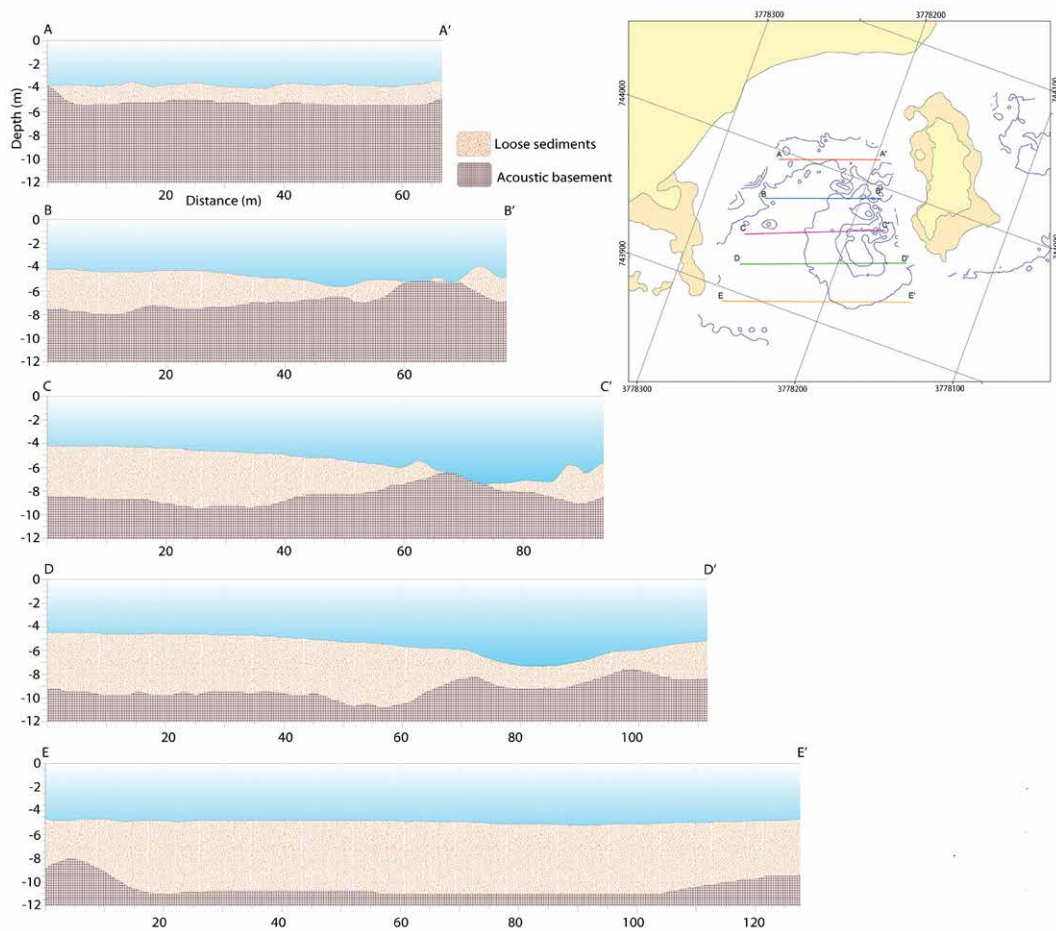


Figure 17. Cross-sections in the Jouret Osman Bay, showing a 5-m-thick layer of loose sediments covering a deeper seabed. (Papatheodorou et al., 2014).

Geophysical mission

In March 2015 a second survey was carried on the Armenian Orphanage site by geophysicists Vivien Mathé and Adrien Camus (University of La Rochelle, France). In the framework of Byblos and the Sea, the objective of this last mission was to survey the areas that are outside the harbour basin: a) to fine-tune previous results obtained by the geophysical resistivity survey; and b) to identify possible man-made structures possibly associated with harbour structures. This tomography survey included 13 parallel north-east/south-west and north-west/south-east pseudo-sections across the land, giving results in section and elevation (Fig. 19), whereas former resistivity results had provided only two-dimensional images or plan views. These highly efficient and complementary techniques were used to optimize results by cross-referencing them to present a three-dimensional image of the harbour basin (Fig. 20) (Francis-Allouche & Grimal, 2017: 54-59).

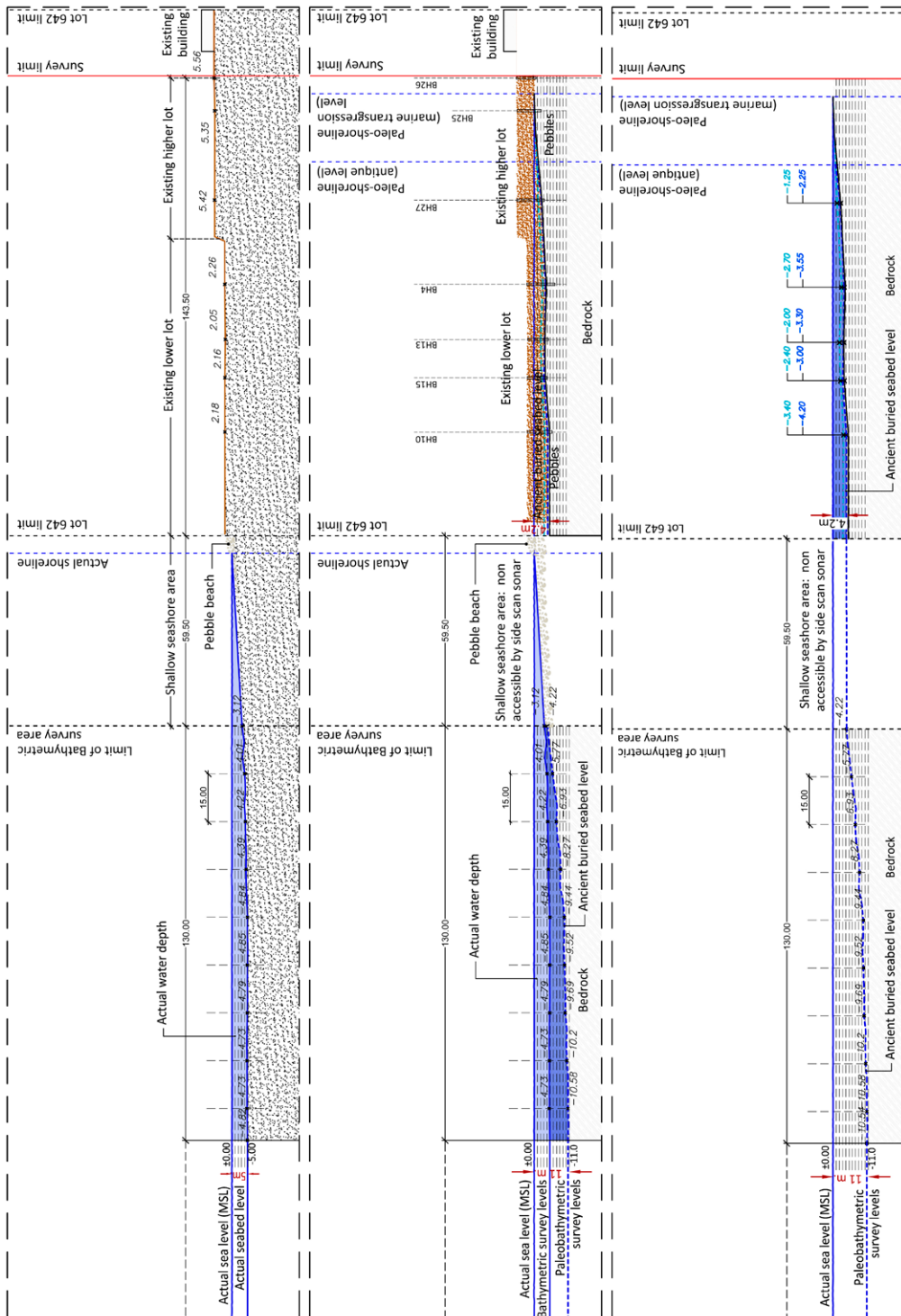
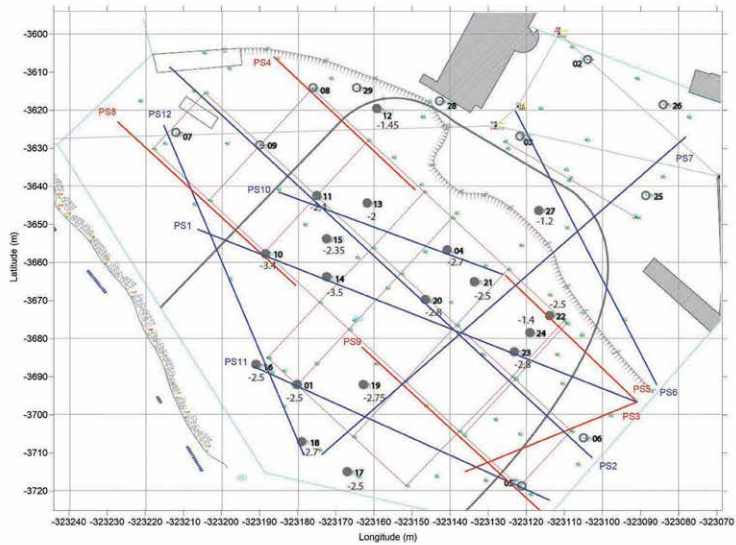
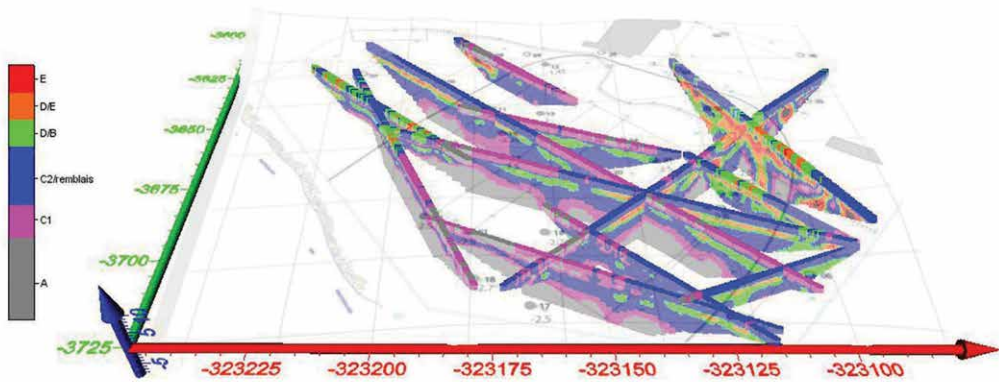


Figure 18. NE-SW general section, reconstituting the water depth of the ancient basin buried in the Armenian Orphanage plot and extending into the sea beneath the bay of Joutet Osman: a) current configuration; b) the survey area; and c) the antique configuration of the basin. (Francis-Allouche & Grimal, 2014).



a.



b.

Figure 19. a) Tomography survey performed by geophysicists Vivien Mathé and Adrien Camus across the Armenian Orphanage plot covering the buried harbour basin area south of ancient Byblos; b) Thirteen parallel N-E/S-W and N-W/S-E pseudo-sections resulting in a 3D N-S view of the basin: the grey colour represents the bedrock; magenta and blue represent the buried basin, the red and orange tones represent possible structures. (©Byblos et la mer, 2015, Vivien Mathe).

Archaeological soundings

Based on the results of the last geophysical mission, some archaeological soundings and trenches were undertaken in 2015 by the Lebanese Directorate General of Antiquities on the Armenian Orphanage plot (Fontan, 2015). A team of archaeologists confirmed the existence of a silted-up basin in the lower part of the plot. However, deeper archaeological layers, contemporaneous with the harbour basin, were only reached in one of the test excavations, confirming an old shoreline with finds such as a mooring weight and a series of typical copper ship nails. Anchors were also found in the harbour vicinity (Francis-Allouche & Grimal *et al.*, 2017) (Fig. 21).

In the upper area, excavation validated the high resistivity readings obtained by the tomography survey, unearthing a concentration of medieval and Roman structures.

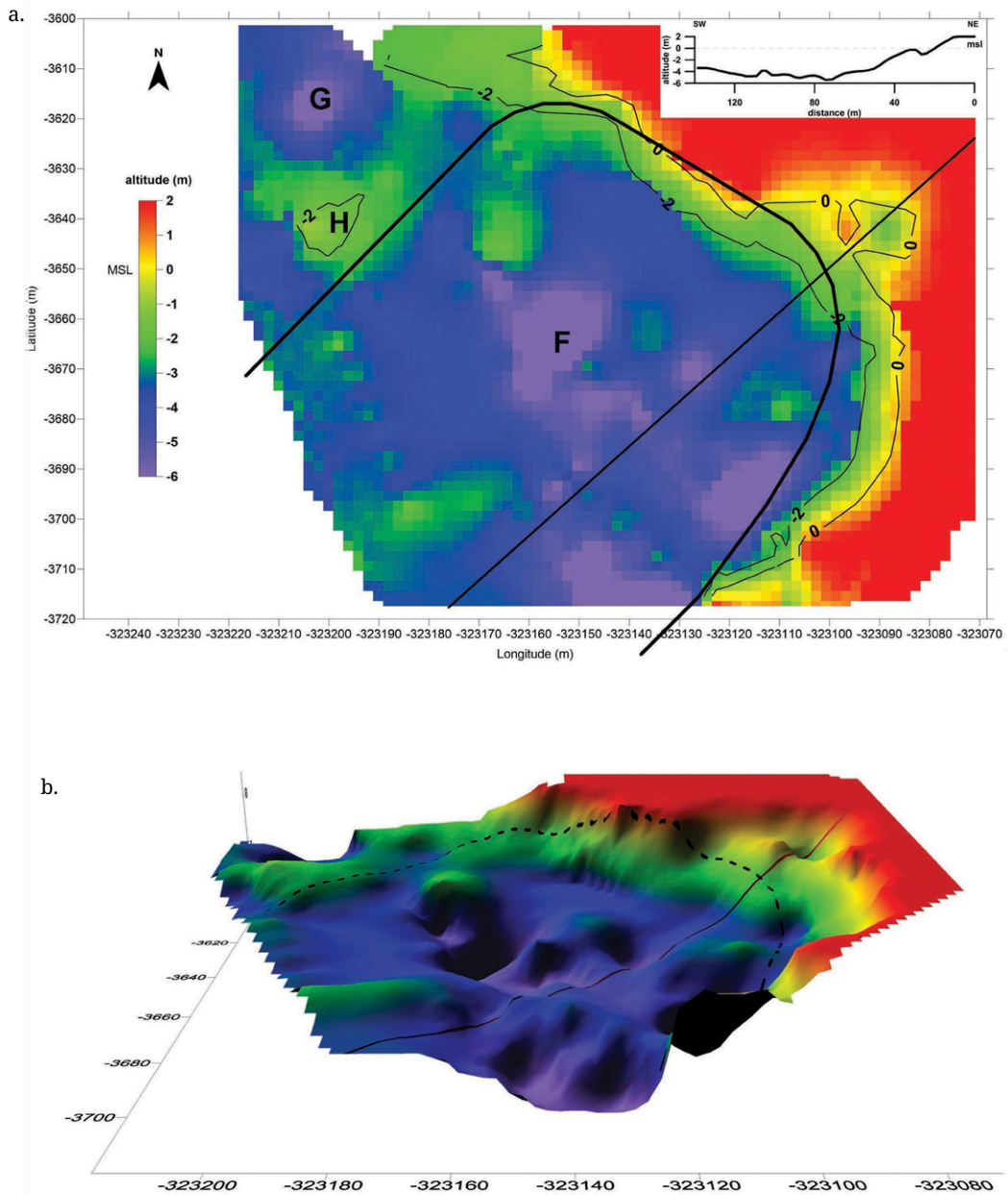


Figure 20. The tomography survey resulting in a) a 2D image of the silted-up harbour basin and b) 3D reconstruction of the harbour basin, without the siltation. (©Byblos et la mer, 2015, Vivien Mathe).

However, no older harbour structures have as yet been located. What might be expected? Would these be rather spectacular structures, or should we expect a natural cove enhanced with lighter installations, perhaps only a simple dock?

At last, after 17 years of recent research into maritime Byblos, Frost's quest is nearing fulfilment through the use of different scientific approaches that indicate the possible

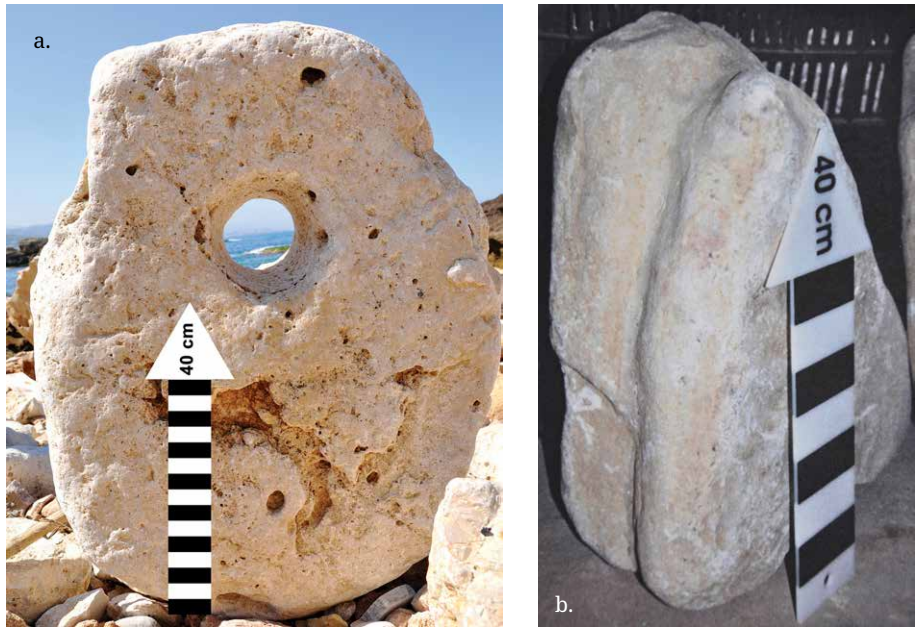


Figure 21. a) A stone anchor found in Jouret Osman Bay, the presumed antique harbour of Byblos, and b) an anchor weight found on the Byblian shore. (Photos M. Francis-Allouche).



Figure 22. Aerial photograph of ancient Byblos nested on top of the headland, showing the maritime approaches, its harbour installations, and harbour gates to the city. (© Byblos et la mer, 2017, drone photography by Rami Yassine).

location of the Bronze Age harbour at the southern foot of the ancient city. Further archaeological investigations have to be conducted at this location to understand the overall configuration of the harbour installation, define the limits of the basin, and unearth possible harbour structures.

In conclusion, the present study has shed new light on the overall configuration of the historical city of Byblos. Substantial progress has been made over the years to understanding the maritime approaches to the city. One can affirm today that Bronze Age Byblos was endowed with two harbours. One is a smaller fishermen's cove, which is still in use today, lying at the northern foot of the promontory. This small harbour was connected to the Bronze Age city via the north-western 'maritime gate', so-named by Dunand (Dunand, 1939; Jidejian, 1971). A second much larger harbour is also hypothesized, that could have served the well-attested maritime timber trade between ancient Byblos and Pharaonic Egypt over millennia. Today this large harbour lies completely silted up at the southern foot of the promontory (Fig. 22). Current investigations conducted in the southern area of the archaeological site of Byblos within the framework of the 'Byblos & the Sea' project (2010-2018), have established and defined the existence of a southern Bronze Age monumental gate overlooking the basin area (work ongoing), most certainly the access point to and from the antique harbour to the city of Byblos on top of the Byblian Peninsula (Fig. 22).

Acknowledgements

Professor Nicolas Grimal and Martine Francis-Allouche would like to thank the Lebanese Directorate General of Antiquities, particularly the former Minister of Culture, Mr Salim Wardy, who entrusted us with the research project 'Byblos & the Sea' from its inception in 2011, and for his unflinching support and encouragement ever since. Special gratitude is also expressed to former Minister of Culture, Mr Raymond Araygi, who supported and valued our work throughout 2015 to 2017. Our gratitude extends of course to the Director General of Antiquities, Mr Sarkis El-Khoury, for ongoing support and personal involvement in our project and as much to Ms Tania Zaven, to whom we owe particular thanks for her kind and unflinching help in our daily efforts and for her trust and friendship throughout the years. Very special thanks and appreciation are also due to the different teams, many colleagues and friends in Byblos (too numerous to name individually) who have conducted or contributed to the many surveys within our multi-disciplinary research project. Not only has the work been remarkable but collaboration has been friendly with each and every one of them; our achievements have been made possible only by joining forces.

Last but not least, we are unendingly grateful and indebted to the Honor Frost Foundation and the honourable Trustees for their constant support of our ongoing research campaigns in Byblos, none of which would have been possible without generous and continuous HFF funding. Personal gratitude is extended to Ms Alison Cathie for her trust, her personal support, and her friendship.

Finally, it is heart-warming to think that 'Byblos & the Sea' was able to complete a quest that was first set by Honor Frost with the means that she generously provided after her passing. This achievement is dedicated and much indebted to Honor, the Lady of Byblos.

References

- Abdul-Nour, H., 2001, Les Inscriptions Forestières D'Hadrien: mise au point et nouvelles découvertes. *Archaeology and History in Lebanon* 14, 44-95.
- Bardinet, T., 2008, *Relations économiques et pressions militaires en Méditerranée orientale et en Libye au temps des pharaons, Etudes et Mémoires d'égyptologie* 7, 23-49. Paris: Cybèle.
- Breyer, F., 2010, Ägypten und Anatolien. Politische, kulturelle und sprachliche Kontakte zwischen dem Niltal und Kleinasien im 2. Jahrtausend v. Chr. *Contributions to the Chronology of the Eastern Mediterranean* 25, *DÖAW* 43, 67-100.
- Briquel-Chatonnet, F., 2001, Les textes relatifs au cèdre du Liban dans l'Antiquité. *Archaeology and History in Lebanon* 14, 43.
- Carayon, N., 2008, Les ports phéniciens et puniques. Géomorphologie et infrastructures. PhD thesis Université Strasbourg II-Marc Bloch, U.F.R. Des Sciences Historiques, Umr CNRS 7044, Etude Des Civilisations De L'antiquité
- Carayon, N., 2013, Les ports phéniciens du Liban, milieux naturels, organisation spatiale et infrastructures. *Archaeology and History in Lebanon* 36-37, 1-137.
- Carayon, N., 2014, Rapport préliminaire sur la campagne de carottage à Byblos, in N. Grimal & M. Francis-Allouche (eds), Project 'Byblos et la mer'. Unpublished scientific report presented to Directorate General of Antiquities, Beirut, Lebanon.
- Collina-Girard, J. Frost, H., Hérou, M. & Nouredine, I., 2002, Un promontoire sous-marin au large du port antique de Byblos: cartographie, interprétation géologique et implications archéologiques. *Bulletin d'Archéologie et d'Architecture Libanaises* 6, 317-324.
- Dalix, A-S. & Chaaya, A., 2007, L'activité forestière au Liban dans l'antiquité pré-classique de l'exploitation à l'exportation. *Archaeology and History in Lebanon* 26-27, 234-257.
- de Garis Davies, N.M.C., 1963, *Scenes from some Theban tombs (no. 38, 66, 162, with excerpts from 81)*. Oxford.
- Dunand, M., 1939, *Fouilles de Byblos, tome I, 1926-1932*, Paris: P. Geuthner.
- Dunand, M., 1950, Rapport préliminaire sur les fouilles de Byblos en 1948. *BMB* IX, 55-60; Rapport préliminaire sur les fouilles de Byblos en 1949. *BMB* IX, 68-71.
- Egberts, A., 1991, The Chronology of the Report of Wenamun. *Journal of Egyptian Archaeology* 77, 57-67.
- Elayi, J., 2007, L'exploitation des cèdres du Mont Liban par les rois assyriens et néo-babyloniens. *Journal of the Economic and Social History of the Orient* 31, 14-41.
- Fontan, E., 2001, La frise du transport du bois, décor du palais de Sargon II à Khorsabad, in Cl. Doumet-Serhal (ed.), *Cedrus Libani, Archaeology and History in Lebanon* 14, 58-63.
- Fontan, E., 2015, Evaluation du patrimoine archéologique maritime enfoui de la parcelle de l'Orphelinat arménien/Byblos, lot 642.2012. Unpublished scientific report presented to Directorate General of Antiquities, Beirut, Lebanon.
- Francis-Allouche, M. & Grimal, N. (eds), 2014, Project 'Byblos et la mer'. Unpublished scientific report presented to Directorate General of Antiquities, Beirut, Lebanon.
- Francis-Allouche, M. & Grimal N. et al., 2017, Byblos maritime: une installation portuaire au piémont sud de la ville antique. *Bulletin d'Archéologie et d'Architecture Libanaises* 17, 133-138.

- Frost, H., 1991, Anchors sacred and profane. Ugarit-Ras Shamra, 1986, the stone anchors revised and compared., in M. Yon (ed.) *Ras Shamra-Ougarit VI: Arts et Industries de la Pierre*, 355-410. Paris.
- Frost, H., 1995, *Harbours and Proto-harbours. Early Levantine engineering*, in V. Karageorghis & D. Michaelides (eds), *Cyprus and the Sea: Proceedings of the International Symposium organized by The Archaeological Research Unit of the University of Cyprus and The Cyprus Ports Authority, Nicosia 25-26 September, 1993*, 1-21. Nicosia.
- Frost, H., 1998, *Byblos: 'Wen-Amon's' Harbour*. National Museum News 8, 29.
- Frost, H., 1998 b, Marine Prospection at Byblos. *Bulletin d'Archéologie et d'Architecture Libanaises* 3, 21-33.
- Frost, H., 2001, The Necropolis, the Trench and other Ancient Remains: A Survey of the Byblian Seafront. *Bulletin d'Archéologie et d'Architecture Libanaises* 5, 195-217.
- Frost, H., 2002, The Lost Temple, the Cedars and the Sea. A Marine Archaeological Survey. *Archaeology and History in Lebanon* 15, 52-56.
- Frost, H., 2002, Four Season of Marine Investigation: Preliminary charting of the Offshore Shallows. *Bulletin d'Archéologie et d'Architecture Libanaises* 6, 309-316.
- Frost, H., 2004, Byblos and the Sea in C. Doumet-Serhal (ed.), *Decade: A Decade of Archaeology and History in Lebanon*, 316-347. Beirut.
- Frost, H. & Morhange, C., 2000, Proposition de localisation des ports antiques de Byblos (Liban). *Méditerranée* 94.1, 101-104.
- Gardiner, A.H., 1932, Late Egyptian Stories: Misfortunes of Wenamon. *Bibliotheca Aegyptiaca* I, 61-76. Bruxelles.
- Goiran, J.-P. & Morhange, C., 2001, Géoarchéologie des ports antiques de Méditerranée. *Topoi* 11, 647-669.
- Grimal, N., 2009, Quelques réflexions sur la géopolitique du Levant au deuxième millénaire av. J.-C., in A.M. Maïla-Afeiche (ed.), *Interconnections in the Eastern Mediterranean Lebanon in the Bronze and Iron Ages*, 339-360. Beirut: Bulletin d'Archéologie et d'Architecture Libanaises Hors Series VI.
- Jenkins, N., 1980, *The Boat Beneath the Pyramid: King Cheops' Royal Ship*. Holt, Rinehart and Winston.
- Jidejian, N., 1971, *Byblos through the Ages*. Beirut: Librairie Orientale.
- Kees, B.H., 1938, Herihor und die Aufrichtung des thebanischen Gottesstaates. *NAWG* 1936-1938, 1-20.
- Lefebvre, G., 1976, *Romans et contes égyptiens de l'époque pharaonique. Traduction avec introduction, notices et commentaires*. Paris.
- Lauffray, J., 2008, *L'urbanisme et l'architecture. Fouille de Byblos Tome VI*. Beirut: IFPO, Bibliothèque archéologique et historique 182.
- Linder, E., 1986, The Khorsabad Wall Relief: A Mediterranean Seascape or River Transport of Timbers? *Journal of the American Oriental Society* 106.2, 271-281.
- Montet, P., 1962, Notes et documents pour servir à l'histoire des relations entre l'Égypte et la Syrie: VIII, Ounamon chez Zekerbaal. *Kémi* 16, 79-83.
- Morhange, C. 1998, *Étude géomorphologique du littoral de Byblos. Résultats de la mission de terrain de 1998*. *Bulletin d'Archéologie et d'Architecture Libanaises* 3, 261-265.
- Morhange, C. & Saghieh-Beydoun, M., 2005, *La mobilité des paysages portuaires antiques du Liban*. Beirut: Bulletin d'Archéologie et d'Architecture Libanaises Hors-série 2.

- Nordiguan, L. & Salles, J-F., 2000, *Aux origines de l'archéologie aérienne, Antoine Poidebard (1878-1955)*. Saint-Joseph University Press.
- Nour, M.Z., Mohammad, S.O., Zaky, I. & Ahmad, Y.M, 1960, *The Cheops Boats*. Cairo: General Organization for Government Printing Offices.
- Papatheodorou, G. *et al.*, 2014, Interim Technical, Report Marine remote-sensing survey in Byblos, Lebanon, in N. Grimal & M. Francis-Allouche (eds), *Projet 'Byblos et la mer'*. Unpublished report presented to the Directorate General of Antiquities, Beirut, Lebanon.
- Poidebard, A., Lauffray, J., Mouterde, R.P.R. & 'Abd-el-'al, I., 1951, *Sidon. Aménagements du port de Saida. Étude aérienne, au sol et sous-marine, précédée d'un Aperçu historique sur les ports anciens de Méditerranée orientale*. Beirut: Ministère des Travaux Publics.
- Pritchard, J.B., 1969 (3rd edn), *Ancient Near Eastern Texts Relating to the Old Testament*. Princeton: Princeton University Press.
- Renan, E., 1864, Campagne de Byblos in *Mission de Phénicie, Livre II*, 181-183. Paris: Imprimerie Nationale.
- Salvini, A., 1995, Remarques sur les inscriptions des reliefs du palais de Khorsabad, in A. Caubet (ed.), *Khorsabad, le palais de Sargon II, roi d'Assyrie. Actes du colloque organisé au musée du Louvre par le Service Culturel les 21-22 janvier 1994*, 15-45. Paris: Conférences et colloques du Louvre.
- Sauvage, C., 2012, *Routes maritimes et systèmes d'échanges internationaux au Bronze récent en Méditerranée orientale*. Lyon: Travaux de la Maisons de l'orient et de la Méditerranée.
- Stefaniuk, L., Morhange, C., Saghieh-Beydoun, M., Frost, H., Boudagher-Fadel, M. Bourcier, M. & Noujaim-Clark, G., 2005, Localisation et étude paléoenvironnementale des ports antiques de Byblos, in C. Morhange & M. Saghieh-Beydoun (eds), *La mobilité des paysages portuaires au Liban*, 19-41. Beirut: Bulletin d'Archéologie et d'Architecture Libanaises, Hors-série 2.
- Yon, M., 1984, Sanctuaires d'Ougarit in G. Roux (ed.), *Temples et sanctuaires. Séminaire de recherche 1981-1983*, 37-50. Lyon.
- Wreszinski, W., 1934, *Atlas zum Altegyptischen Kulturgeschichte, tome II*. Leipzig.