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The maritime archaeological survey at Tell el-Burak and nearby environs

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In 2004, an underwater archaeological survey was conducted at Tell el-Burak, a Middle Bronze Age site ten kilometers south of Sidon (Pedersen, in press). The objectives of the survey were to ascertain the existence of an associated harborage; to discern reasons for the placement of the settlement as it relates to the maritime environment; and to examine the evidence of seafaring activities in the vicinity of the site to further our understanding of the ancient maritime exploitative strategies of the Levantine peoples. Investigations at this seaside tell have yielded new information on the Lebanese Bronze Age, and insights on the relations between humans and the sea. Understanding the nature of the seafront at Tell el-Burak requires first an overview of ancient harborages.

Harbors are safe places that include areas behind a headland or in the lee of islands (Frost, 1963: 69, 89, fig. 19; Muckelroy, 1980: 162-163); estuaries (Vann, 1997: 315); and low-energy zones such as deltas and lagoons (Blue, 1997: 32, and fig. 2). Ships moored in exposed, or nominal locations can only do so via anchoring techniques to safeguard the ships. Good, or even just adequate, harborage also depends the availability of potable water, suitability for anchoring, a local economic base, routes from the harbor to the hinterland, an accessible shore, and a defensible or fortifiable area (Vann, 1997: 308, 309). It should be assumed that safe locations were always preferred. Even the best protected harbors are no guarantee against accident as a number of ships have gone down within harbors particularly when severe storms arise.

Depth of water within the harborage and its approaches is an important consideration. Shallow areas are unusable by large ships due to their greater draft, while smaller craft, which draw less water, can access less than ideal areas. Bronze-Age texts, such as those from Ugarit, give us an idea about the size of ships in the Levant although he exact meaning of the texts is unclear (Monroe, 2007). Egyptian and Greek iconography depict the styles and shapes of Early and Middle Bronze Age watercraft but interpretation is problematic as the representations are not technical in nature (Guttandin, 2009; Johnston, 1985: 5-34; Wachsmann, 1998: 9-38). It is probable that there was an overall trend towards larger ships during the Bronze Age, a good representative sample of which is the shipwreck at Uluburun (Bass, *et al.*, 1989). If ships of the Early and Middle Bronze Ages were indeed smaller than those of the later era, then the harborages of the time may have been shallower than their later counterparts, permitting less than ideal areas to be utilized for maritime trade.

The need for harbors where none existed or where conditions were nominal eventually led to environmental modification to improve an area. Through engineering and construction techniques marginally useful places can be made safe for ships and usable for commerce. The Phoenicians in the Early Iron Age are traditionally viewed as the first to alter the natural shore-scape to protect their anchorages through the cutting of rock walls, as evidenced at Sidon and Batroun, although recent investigations at Sidon indicate possible environmental modification for the protection of ships in the Late Bronze Age (Frost, 1963: 81-82; Marriner, Morhange, & Doumet-Serhal, 2006: 1520; Pedersen, 2011).

Tell el-Burak

When analyzing Tell el-Burak for its maritime nature, the above-mentioned parameters for harborages need to be considered along with the general character of the site. Under investigation by the American University at Beirut and the University of Tübingen since 1998, the excavations at Tell el-Burak have revealed five occupations reaching from the Early Bronze Age to the Ottoman, with the Middle Bronze Age (MBA) being the "most impressive" (Sader and Kamlah, 2010: 131), perhaps fitting with the re-urbanization of the Levant in the period as typified by the growth of cities and palace complexes (Akar, 2009: 2). There is no apparent occupation in the Late Bronze Age as the site was seemingly abandoned, while Sarepta, four kilometers to the south, became a Late Bronze Age harbor city (Kamlah and Sader, 2003:145). Unlike many, if not most, mounds in the Near East, the tell at Burak is not the result of the accumulated debris of collapsed settlements. The mound was purposely built as the base for a fortified palace (Kamlah and Sader, 2003: 165-166). Excavations have revealed parts of the walls and tower bases of the structure, including a room containing a fresco depicting trees and a gazelle. It was clearly a center of power in the MBA IIa and IIb periods (Kamlah and Sader, 2003: 166; Sader and Kamlah, 2010: 132).

Tell el-Burak (**Fig. 1**) stands at the edge of the sea on a flat agricultural plain, rising above the land approximately 19 meters (Kamlah and Sader, 2003: 147). The tell is readily visible from both land and sea, and from its top Sidon can be seen to the north, while to the south Sarepta is visible (Kamlah and Sader, 2003: 166). Two streams, one north of the tell and the other to the south, run through the farmlands into the sea. The dynamics of the Burak seafront have been disturbed by a modern groin that traps sand to its south, which hangs in the sea in clouds of silt. North of the groin, the sand-starved beach is eroding, moving the shoreline eastward. A reef lies in front of the tell and extends out to sea approximately fifty meters where it drops to a sandy bottom. The sea breaks over the reef edge creating an area of turbulence and dangerous rocky spikes. While the reef prevents normal wave action from reaching the base of the mound, erosion along its base shows that waves from storms can reach the tell. Indeed, Burak is a high-energy zone with waves rolling steadily from the west and a prevailing current running from the south. Wave action affects the gently-sloping sea bottom to depths of at least 4 meters at some 150 meters from shore even in normal weather. The sea floor consists mainly of bedrock, scattered rocky outcrops, boulders, ledges, and gullies.

North of the groin, a few large slabs of sedimentary rock lie close to shore in shallow water. A scattering of pottery sherds was found throughout the area. Whether they are the remains of whole vessels or trash cast into the water is not possible to ascertain, but whole pottery cannot survive long in the high-energy environment at Burak. The artifacts found in the northern area appear to be Late Roman, scattered about in areas from the surf-zone to over 400 meters from shore. The farther area is indicative of a fishing ground in the Roman/Byzantine period.

The shoreline running south from the tell is sandy and eventually yields to a narrow cobble-strewn shore. The sea floor off this strand is littered with cobbles and gently slopes downward with no sudden depth changes. At least five blocks, or ashlars, lie in the water near the southern extremity of the beach. There is no pattern to their positions, nor do they appear to be part of any construction (**Fig. 2**). They seem to have been dumped there.

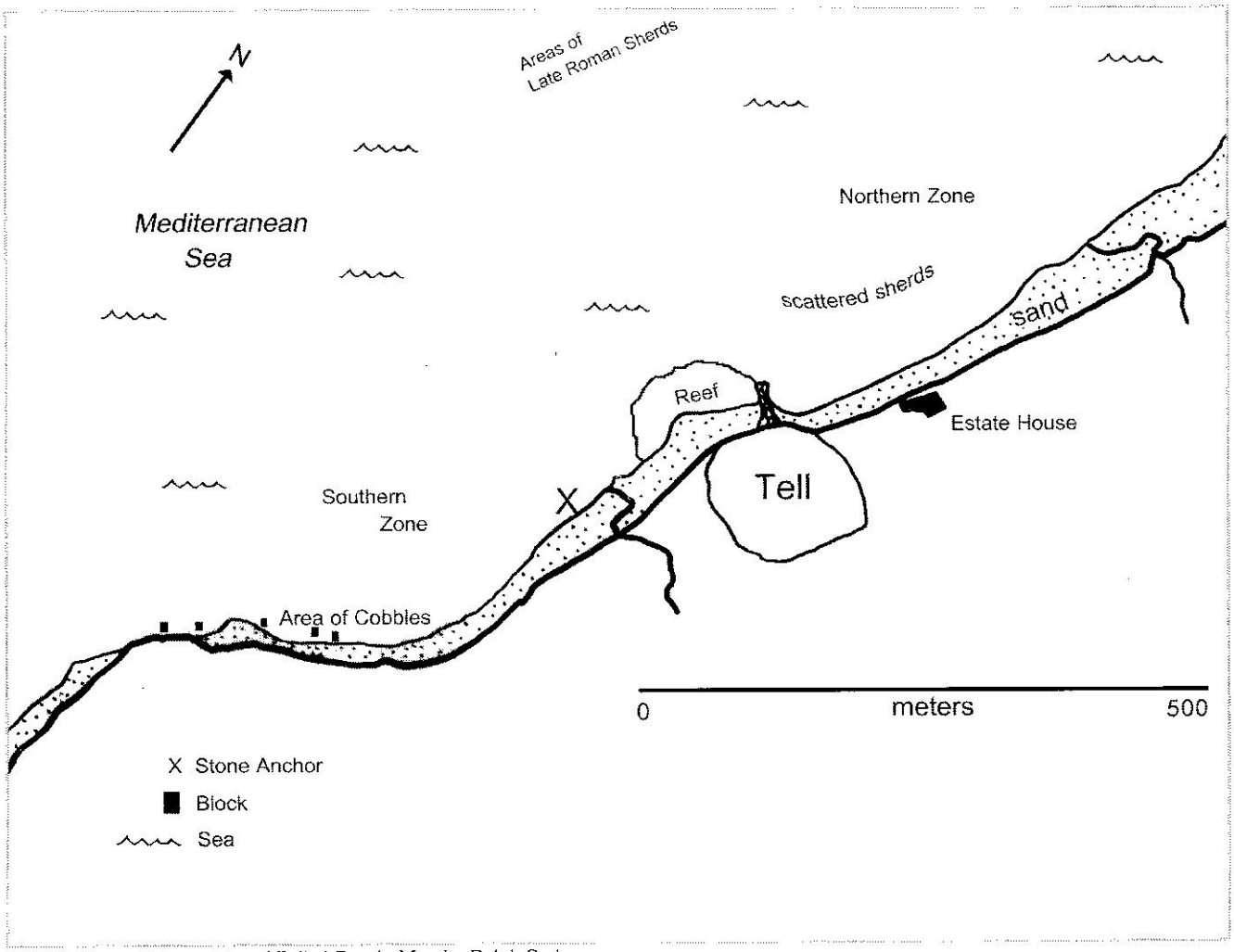

Fig. 1- A map of the vicinity of Tell el-Burak. Map by Ralph Pedersen.

No ceramics were found in the southern zone, but this is possibly due to the poor visibility caused by suspended silt. However, a stone anchor (**Fig. 3**) was found lying close to the shore in water less than one meter deep. Heavy concretions on the anchor indicate it has been in the sea for a long period. Its weight after partial cleaning is approximately 22 kilograms. With only a single hole it is a weight anchor, relying on its heaviness rather than grabbing capabilities (Wachsmann, 1998: 255).

A similar anchor was found in 2008 just north of the groin. These two finds indicate the use of the seafront, but their small size indicates the presence of local fishing craft, not sea-going merchant ships.

Fig. 2- A view of the tell (center background) from the southern end of the strand. At this location a number of cut blocks lay in the sea. Photograph by Ralph Pedersen.

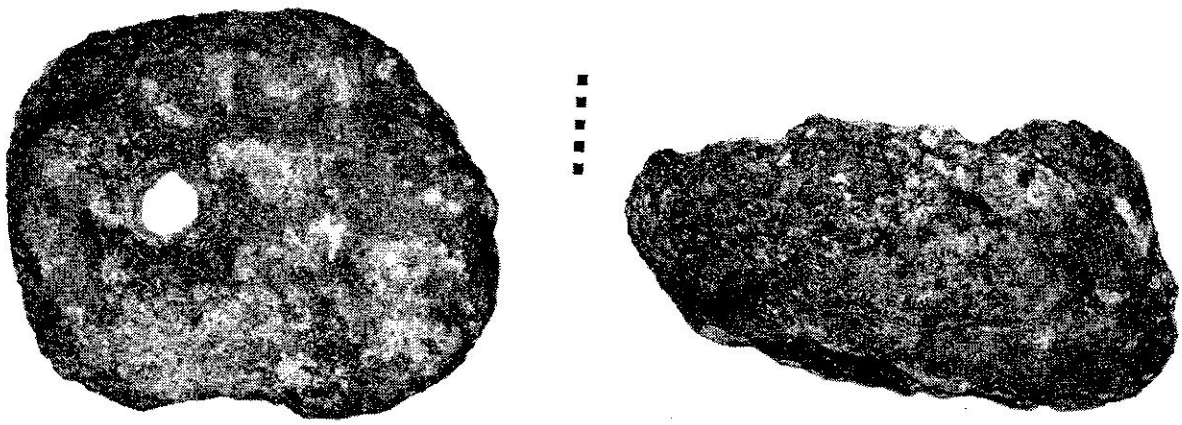

Fig. 3- The stone anchor discovered in 2004. Photograph by Ralph Pedersen.

Sarepta

Comparative analysis of the underwater environment of Sarepta was conducted to aid in defining the maritime situation at Tell el-Burak. The Roman quay of Sarepta was partially excavated by James Pritchard and the University of Pennsylvania in the early 1970s as part of their wider studies of the earlier periods of the city (Pritchard, 1978: 49-70; Pritchard & *et al.*, 1975). The Pennsylvania team excavated substantial features, including a quay, a system of pools for supplying ships with drinkable water, and a stone-carved mooring ring, all of which demonstrate the use of the harbor by ships other than local craft (Pritchard 1978: 49-70). One particularly interesting underwater feature recorded by the Pennsylvanians was a large L-shaped mole lying across the Roman harbor's mouth (**Fig. 4a**). This would indicate an important effort in underwater engineering. My investigation, however, reveals the mole does not exist: There is no trace of a mole L-shaped or otherwise, and there are no indications of any man-made construction in the vicinity. What does exist there is a natural reef complex (**Fig. 4b**) that provides natural protection for the harbor. Currently, the highest reef tops often protrude above the water, but whether they did so in antiquity is unknown. The Roman quayside is now on dry land, but a small stone jetty, possibly of earlier date, lies underwater, which is indicative of the variable relative sea level in the area. Nevertheless, Roman ships accessed the harbor, and it is a safe assumption that vessels of earlier eras would have been able to do so as well. Indeed, just outside the Roman Harbor the sea bottom quickly reaches a depth of 3 meters and deeper, making Sarepta a good harborage. This topography lies in contrast to that at Burak with its shallows and gently sloping sea bottom.

The "Sunken City" of Yarmuta

In the sea southwest of Tell el-Burak is a shallow area with rocky outcrops and flat tables of rock. Occasionally, the highest points of the rocks protrude above the waves. The area was noticed by sport divers in the opening years of the 21st century and was proclaimed to be Yarmuta, an ancient "lost" city believed to be located somewhere south of Beirut (Singer, 2008: 183) and mentioned several times, often in connection with grain shipments, in texts from Tell el Amarna, such as EA 68, EA 85, and EA 97, as "Iarimtu." The area under the sea was said to contain plazas, streets, stairways, and walls. Investigations

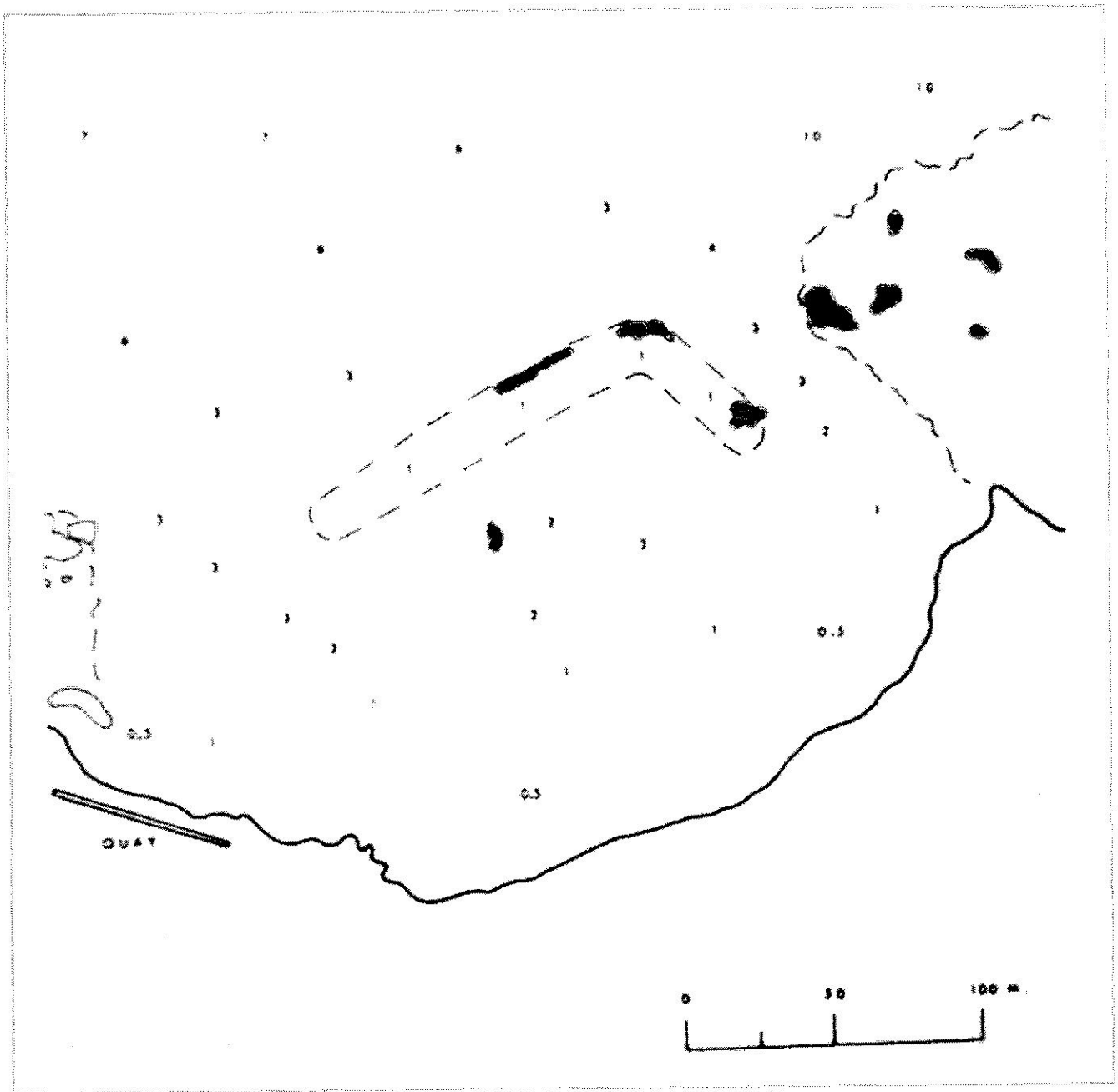

Fig. 4a- The L-shaped mole recorded by the Pennsylvania expedition. After Pritchard, 1978, fig. 31.

were conducted to ascertain the existence of man-made structures, and to see whether the area was an offshore anchorage for Tell el-Burak.

The theory of offshore anchorages is an important one for understanding how ships arriving in the Levant accessed settlements with no natural features for the protection of watercraft. Offshore anchorages have been postulated for Byblos/Gebeil in the north of Lebanon, where some strata are contemporaneous with Tell el-Burak (Jidejian, 2000: 7). While the small harbor at Byblos affords adequate protection, the shorelines north and south of the city, Saqiet Zaidane

and the bay of El Skhiny respectively, are postulated to have borne most of the maritime traffic of the city. These strands, however, are unprotected and exposed (Semaan, 2007: 88-89). Hence, the proposition that underwater geography provided the necessary protection for anchoring ships. Indeed, surveys have revealed an underwater "cape" fronting El Skhiny, and father out at approximately 2 km. from shore, an underwater ridge. These have been claimed to be anchorages for ships of the Bronze Age waiting to load cedar logs for transport to Egypt (Collina-Girard, *et al.*, 2002; Frost 2002; Semaan 2007). This idea is based, at least in part, on the presence of an unknown number of stone anchors lying atop the ridge. Thus, parallels between poor anchoring conditions at Byblos and Tell el-Burak led to the investigation near Burak for indications of a possible offshore anchorage. The survey, however, revealed no evidence of offshore anchoring - there were no stone anchors, or even anchors of other types, nor were there the discarded broken ceramics one expects at anchorages.

Investigations into the "sunken city" aspect of the shallows revealed undersea features that are decidedly curious but are properly interpreted as geological formations. Reported "pavers" in the "plazas" are without pattern, "streets" start and lead nowhere, and

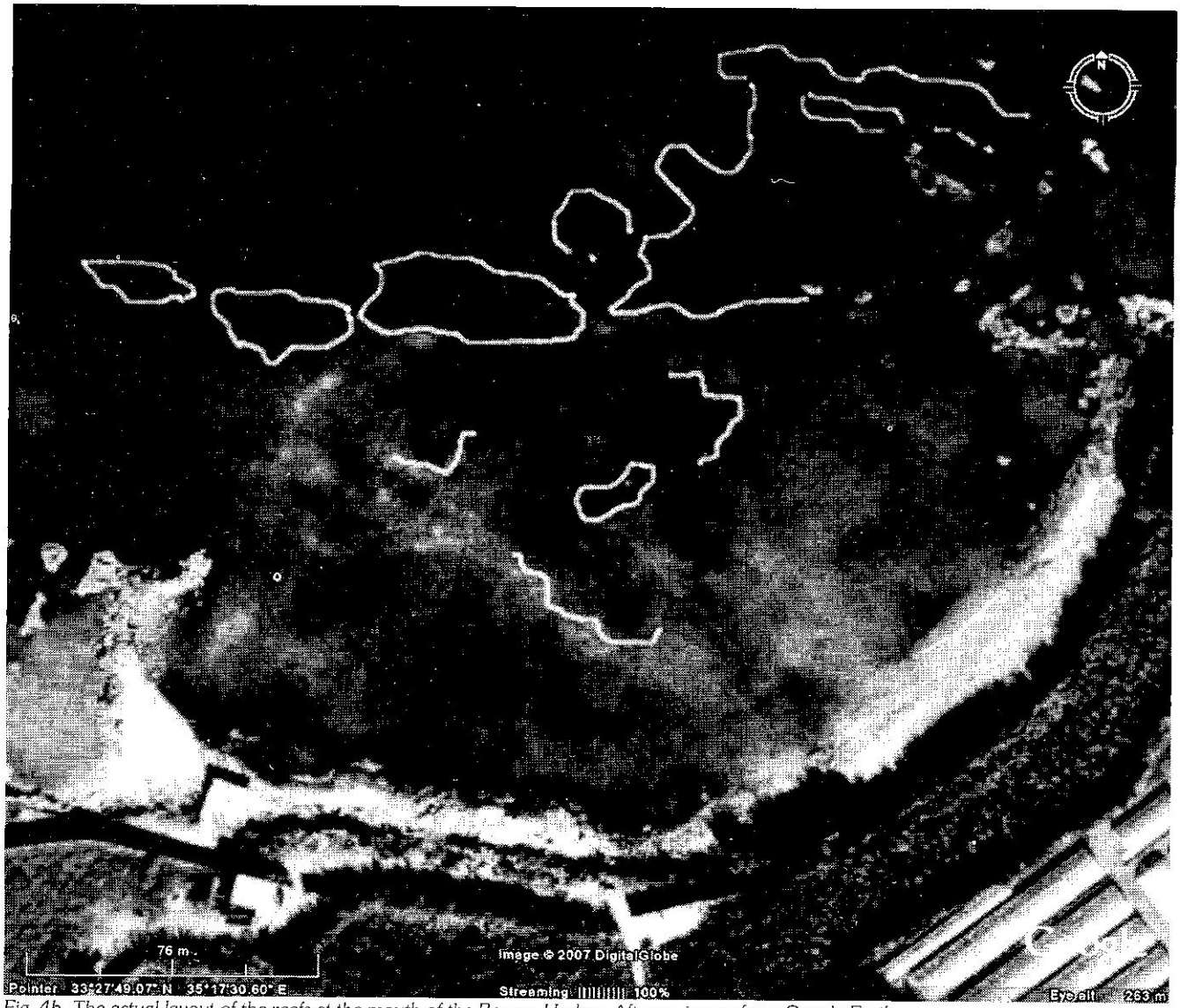

Fig. 4b- The actual layout of the reefs at the mouth of the Roman Harbor. After an image from Google Earth.

"steps" have uneven risers and landings and lead into blank rock faces. Perhaps most interesting are the "walls" made of cobbles stacked up to 50 cm high in lengths of one or two meters: Yet none of these have adjoining walls as expected in settlement construction, nor is there any pattern to their occurrence. Other so-called walls that appear to be cut blocks are actually the smooth, worn upper surfaces of limestone split into natural geometric patterns. Similar geological features can be found along the nearby shoreline, farther inland, and under the sea as at Sarepta outside the Roman Harbor. Clearly none of these features are man-made constructions and the area is not Yarmuta or any other sunken settlement.

Conclusions

The coast of Lebanon is a linear, narrow strip of land sandwiched between the mountains and the Mediterranean Sea. This pushed the early inhabitants toward a life that looked to the sea for food and commerce. We know, of course, of the prowess of the Phoenicians as Iron Age seafarers (Stieglitz, 1984: 140), and a clearer picture of the maritime capabilities of the Canaanites and other peoples of the Late Bronze Age has emerged thanks to the archaeological investigation of sites like the shipwreck at Uluburun (Bass, 2005). We also know that at least since the Neolithic period Egypt and Lebanon were connected by sea via the trade centering on cedar (Frankenstein, 1979: 264; Stieglitz, 1984: 137). Undoubtedly, the ships of the cedar trade passed the shores of Tell el-Burak, which lies on the sailing route linking south to north. Tell el-Burak, however, was most likely not directly involved in international trade or traffic. While Burak has a number of the components of a maritime nexus, such as potable water, an economic base, security, and connections to the hinterland, the site lacks both shelter for ships and good anchorage. These it may be argued trump all other factors. Without natural shelter, sailors would have had to rely on anchoring in open water, the practicality of which is questionable for Burak. Large ships anchoring in the area would have had to stay offshore at least 50 meters to avoid damaging their hulls and this only in the best of sea and weather conditions. There is no evidence of this. Beaching, an alternative method, would have been certainly detrimental to sea-going ships, given their large size and the mix of rocks, reefs, and sand lying in the area. The potential for damage would have been great, and it is unlikely that this was a common practice at Burak for any but the smallest of boats. The area is simply not environmentally conducive to the safety of ships.

Burak with its fortified palace probably existed at a practical level as royal compound and a protective element for Sidon, the most powerful political entity in the area (Sader and Kamlah, 2010: 139). The two anchors at Burak attest to the use of small boats, which may have been vessels for fishing in the Middle Bronze Age, the Phoenician era, or perhaps other periods. The inhabitants probably used the sea at a nominal level for sustenance and perhaps local transport. The lack of any harborage yet found combined with lack of good anchorage indeed argues that Burak did not exist as a maritime center.

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