PHOENICIAN ATLIT AND ITS NEWLY-EXCAVATED HARBOUR: A REASSESSMENT

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Abstract

During 2002−2003 underwater excavations, our team dated the artificial harbour at the ancient Phoenician settlement of Atlit to the first half of the Iron Age II. We accomplished this by ^{14}C testing a number of wooden samples extracted from the submerged northern mole of the harbour.

In this article we question why such an artificial harbour was constructed just a few miles north of the main port city of Dor. We suggest that no harbour facilities existed at Iron Age II Dor. The quays at the southern bay of Dor, which served during the Bronze Age and during the Iron Age I, were blocked during the 10th century BCE and no alternative quay was built at Dor until the Persian period.

The ancient settlement at Atlit, first excavated in the 1930s by C.N. Johns of the Department of Antiquities in Palestine, is one of the best examples of Phoenician presence in Israel. It is situated on a kurkar ridge adjacent to a natural bay, the second largest on the coast of Israel (see Fig. 1), with most of the city buried beneath a Crusader settlement and fortress known as the *Chastel Pelerin.*

Although Johns uncovered Phoenician remains and an Iron Age/Persian period necropolis, he devoted most of his efforts to the physical remains of the Crusader occupation. Despite his thorough research of the area, he virtually ignored the harbour north of the promontory (Figs. 1, 2), which was discovered only 30 years later by the Underwater Exploration Society of Israel (UESI). During the 1970s the harbour was surveyed by the Center for Maritime Studies (CMS) of the University of Haifa, headed by Elisha Linder and Avner Raban.

Between 2002 and 2003 excavations were renewed by A. Raban and the author. This article attempts to summarize what is currently known about the Phoenician settlement and harbour at Atlit.

THE ANCIENT TELL

During the construction of Johns' base camp (Fig. 2), three separate living strata were identified. The lowest level lay roughly 4 m below the surface, and was dated to between the Middle and Late Bronze Age (Johns 1934: 146−147). Among the more

interesting finds was a jar intended for a child's burial. A similar jar was discovered much later on the sea-bed north of the site (Raban 1997: 503).

The next stratum was 2.25 m below the surface. It contained remains from the Persian and Hellenistic periods (5th–2nd centuries BCE).

The topmost stratum was 75 cm below the surface, and dated to the Crusader occupation. Coins, pottery and other finds associated with the Templar Order, which occupied the fortress from 1217 to 1291 CE, were found in this stratum (Johns 1934: 148–149).

Based on the finds in these three strata, Johns surmised that occupation at Atlit had commenced about 1500 BCE and that the earliest part of the tell was located on the northern part of the promontory, east of the Crusader wall, among the modern salt ponds (Fig. 2).

In addition to the Phoenician graves he found in the southeastern corner of the Crusader settlement, Johns discovered a Phoenician gate with two towers and an ancient wall on the shoreline north of the tell (Johns 1934: Fig. 4). The remains of the ancient quay adjacent to the gate area went unnoticed. Johns assumed that the Phoenician harbour was situated within the large bay to the south of the promontory (Johns 1934: 136; see Fig. 1).

Cremation Burials

Johns expended a great deal of effort at Atlit on ancient burials, especially on the Phoenician necropolis he uncovered there. Although his chronology would prove imprecise, his work set the stage for dating the cremation burials at Atlit, and thus dating the Phoenician presence there.

Recent excavations across Phoenicia, such as at cemeteries around Tyre, suggest that cremation burials began in Phoenicia early in the first millennium BCE (Markoe 2000: 139–140). Nonetheless, inhumation maintained its absolute dominance across the northern parts of the Levantine coast, with Beirut (Khaldé necropolis) marking the southern border of this practice (Aubet 2001: 65).

Phoenicia introduced cremation burial to her colonies in the central and western Mediterranean starting in the early 8th century BCE and it remained the dominant burial practice until the 6th century BCE, at which time it was replaced by inhumation (Markoe 2000: 139–140; Aubet 2001: 66).

Atlit was no exception; Johns uncovered Iron Age II cremation burials at the site, with the shift to inhumation burials occurring in the 6th century BCE (Johns 1938: 135–137).

While Johns was excavating the Phoenician necropolis in 1930–1931, he noticed that part of this area had been disturbed by later Crusader construction, and that soil had been removed. Furthermore, he found that a number of shaft

graves from the Persian period had been reused to form part of the Crusader stables (Johns 1934: 42).

In 1933 Johns resumed excavation of the southeastern corner of the Crusader settlement, adjacent to the Persian-period shaft graves. In all, he discovered 20 burials at the site: 18 graves containing cremated remains, one grave with cremated remains in a jar and one inhumation burial (Grave II). Johns attributed the inhumation burial to the Persian period, although modern analysis of the archaeological evidence shows that it is contemporaneous with the cremated remains. While Johns dated the cremation graves to the period between the end of the 8th and the 6th centuries BCE (Johns 1938: 135−137), it is now assumed, based upon evidence from sites such as Khaldé, 12 km south of Beirut, that these inhumation burials, which were contemporaneous with the cremation burials, date to the Iron Age (Aubet 2001: 40−43).

The cremation burials at Atlit were of the open pit type, with corpses and offerings laid upon a pile of twigs and branches. After the cremation, the remains were covered with sand. Johns found the remains placed between two large pieces of charred wood that clearly outlined a funeral pyre (Johns 1938: 126).

Each of the burials was found to contain the remains of only one individual. In most of the burials, offerings were laid at the feet or head of the corpse. Offerings in inhumation Grave II, which held the remains of a young girl, included bronze bracelets, a bronze earring and various beads. In other graves bronze and silver earrings were discovered, and in two graves cornelian beads were found.

There are several cemeteries in Phoenicia that are similar to the one in Atlit. On the mainland adjacent to Tyre a number of Iron-Age necropolises were found. These include Tell er-Rashidiyeh, situated 4 km south of Alexander's mole, which contains both cremation and inhumation remains. Ceramics, scarabs and stone weights from the 9th and 8th centuries BCE were found in the cremation graves (Doumet 1982). Another cemetery that dates from the 9th−8th centuries BCE is situated at the same spot as the subsequent Roman–Byzantine necropolis on the mainland.

Other cemeteries situated close to Tyre, which contain cremation graves, include Qasmieh, Joya and Khirbet Salim (Chapman 1972). The largest Iron Age Phoenician cemetery that has been excavated is the one at Khaldé (Saidah 1966). The Khaldé necropolis was in use during two main periods: Khaldé IV, dating between the 10th and late 9th century BCE; and Khaldé III, dating between the late 9th and late 8th century BCE. Similar examples of cremation burials along the Israeli coast have been found at Achziv (Mazar 1996; Dayagi-Mendels 2002), Tell el-Farᶜah (S) (Petrie 1930), Tell el-Ajjul (Petrie 1932) and at Tell er-Reqeish (Culican 1973).

It seems that from the 9th to the end of the 7th century BCE, cremation prevailed

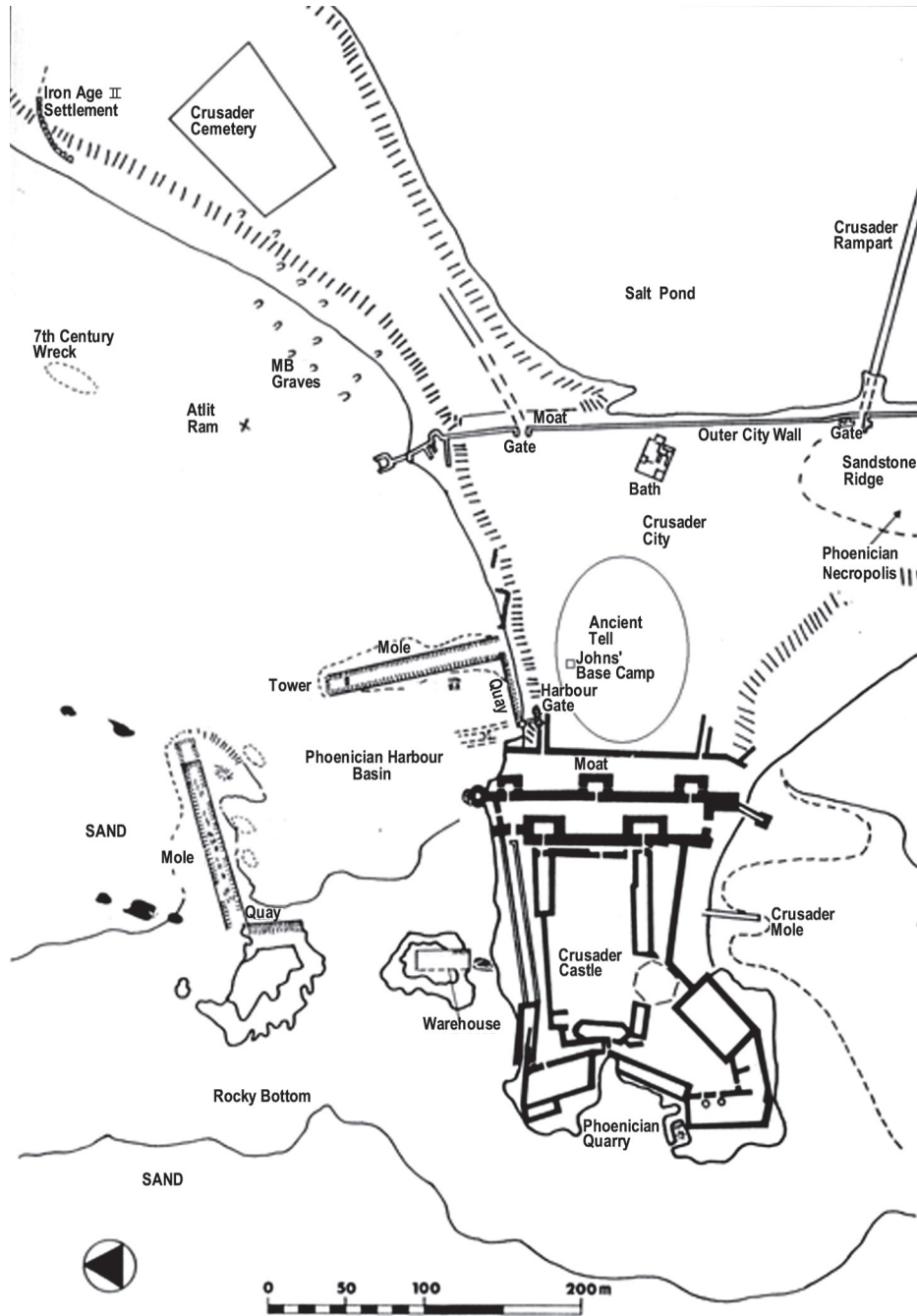Fig. 1.   Aerial photo of Atlit at the end of World War I.

Fig. 2. Plan of ancient Atlit and the Phoenician harbour.

as the predominant method of burial along the coast of southern Lebanon and northern Israel, and in particular, in the territory of Tyre and Sidon (Aubet 2001: 65).

Dating of the Cremation Burials

Based on the ceramics found in the burials (Fig. 3), and despite the discovery in Grave XIV of an earlier Egyptian scarab (Fig. 3: 9), Johns dated the beginning of the Phoenician presence at Atlit to the first half of the 7th century BCE. The scarab was first attributed to Shoshenq IV by Rowe (1936: 203 no. 865). It is now possible to attribute the scarab to the 'Lotus head' scarab group, which was a common imitation of earlier Iron Age II scarabs that appeared between 900−700 BCE. The hieroglyphs on the scarab do not actually represent any royal name (Keel 1997: 768–769; Keel and Münger 2003).

Analysis of the pottery points to an earlier date than that suggested by Johns, whose conclusions were based on the assumption that red-slip ware began to appear at the end of the 8th century BCE (Johns 1938: 134). It is now believed that this type began to appear as early as the mid-9th century (Markoe 2000: 161).

An example of a common jug of the red-slip family found in Atlit in Grave IV (Johns 1938: 142) is the trefoil-mouth jug (Fig. 3: 1), type JG2 (Dayagi-Mendels 2002: 122−124). Similar examples were found in Achziv in Grave 979, Stratum III. Red-slipped vessels were also discovered at Achziv (Prausnitz 1997: 24), and in Al-Mina Strata X−VIII. These layers are dated to the end of the 9th and the beginning of the 8th centuries BCE (Taylor 1952: 83, Fig. 7: 7), or to the first half of the 8th century (Boardman 1999). Similar vessels dating to between the late 9th and early 8th centuries were found in the cemetery of Khaldé in Grave III (Saidah 1966: Fig. 61: 9; Aubet 2001: 64−66). A red-slipped bowl dating to the late 9th century BCE was found in Cyprus (Karageorghis 1988: 188).

Thus, red-slipped trefoil-rimmed jugs of the type found in Atlit can be dated to between the second half of the 9th and the beginning of the 8th centuries BCE.

Other Phoenician vessels found at Atlit are Samarian bowls (Fig. 3: 2, 5, 6, 7, 8). These bowls began to appear at other sites as early as the 10th century and were in use throughout most of the Iron Age. Most bowls of this type found in Atlit can be dated to the 9th−8th centuries BCE (Dayagi-Mendels 2002: 111−117).

In Atlit there are hardly any remains of bichrome ware or black-on-red type vessels. Two juglets, however, can possibly be attributed to the black-on-red family (Fig. 3: 3, 4). Similar vessels were found in Achziv and date to the 10th−8th centuries (Mazar 1996: 87; 2004 : 75, Fig. 16: 2–4).

One of the main Phoenician characteristics of the 10th and first half of the 9th centuries is the cylindrical juglet, type CP9 (Dayagi-Mendels 2002: 138−140). According to Prausnitz, this type of vessel became obsolete in Achziv during the

intermediate period between Stratum II and Stratum III (925±15 to 850±15 BCE) (Prausnitz 1997: 26). A similar juglet was found in E. Mazar's excavation of Achziv Grave Z. Corresponding vessels were discovered in Sarepta D (Anderson 1988: 277, Pl. 32: 20), and in the graves of Khirbet Salim (Chapman 1972: 146, 172, Fig. 31: 165, 167). This type of juglet can be dated to the 10th and early 9th centuries BCE. It is possible that their use was discontinued at the beginning of the 9th century (Mazar 1996: 84−85).

No cylindrical juglets have been found in Atlit to date. This is possibly due to the fairly small scope of Johns' land excavation, or because the Phoenician presence at the site began only after this type of vessel had become obsolete. In light of other finds in the Atlit graves and taking into account Phoenician pottery discovered elsewhere during the last few decades, it is possible to date the beginning of the cremation burials at Atlit to the late 9th−early 8th centuries BCE.

THE HARBOUR AND ITS FACILITIES

The Phoenician harbour at Atlit is divided into two similar sectors that are laid out symmetrically. Each of these sectors consists of a mole (protruding jetty) perpendicular to a quay, which together create a closed rectangular area (Fig. 2). The southeastern section is connected to the coast at the foot of the ancient tell, slightly to the east of the Crusader moat. The 38-m-long southeastern quay was constructed on the shore in typical Phoenician style—with the narrow side of the ashlars (headers) facing the sea (Raban 1997: 501) (Fig. 4). A mole about 100 m long and about 10 m wide is attached to its eastern end (Raban 1985: 31). The mole, too, was constructed in Phoenician style, this time with two parallel walls of ashlar headers enclosing a fill of field stones. At the tip of the mole are remains of a 20 × 12 m tower. This may have been used as either a watch-tower or a lighthouse. The ashlars forming the mole were laid on a rubble fill, probably to prevent the waves from undercutting the construction (Raban 1993, 156). Johns later exposed a gate that may have been used as an entrance to the harbour (see above). The gate consisted of a stone-paved surface and two flanking towers. Johns named this the 'Northern Gate' (Johns 1934: Fig. 4).

The northwestern section of the harbour is attached to two sandstone islets in the western part of the harbour. The surface of the smaller, southern islet was quarried and levelled. Clearly discernable on this islet are the remains of a structure that was probably used as a warehouse. The narrow passage between this islet and the main sandstone peninsula was dammed. The dam was probably used to bridge between the warehouse and the town, and also to prevent the flow of water in that part of the harbour.

On the larger, northern islet, there is no evidence of quarrying or levelling,
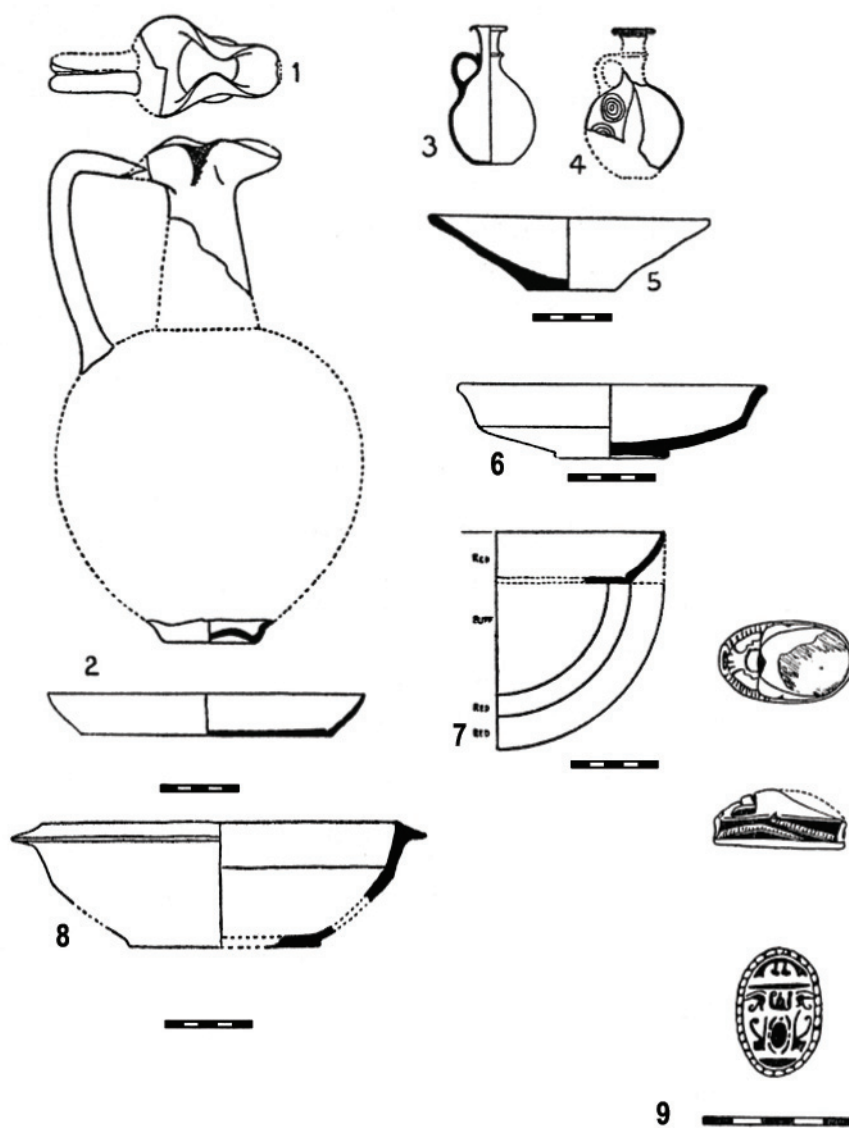
Fig. 3. Finds from the cremation burials.

FINDS FROM CREMATION BURIALS[1]

	Object	Source	Description
1	Trefoil-mouth jug	Burial IVa	Dull-red slip, carefully burnished
2	Bowl	Burial IVa	Traces of red slip
3	Juglet	Burial IVa	Smooth buff, traces of decoration
4	Juglet	Burial IVa	Fine grey, traces of smooth buff slip, part of neck red
5	Bowl	Burial IVa	Coarse buff ware with white grits
6	Bowl	Burial IX	Rough reddish ware
7	Bowl	Burial X	Red body with buff slip
8	Bowl	Burial VII	Fine buff ware, burnished and coated with darker slip
9	Scarab	Burial XIV	Steatite

save for the construction of the quay on the eastern side, which is about 43 m long (Fig. 5). This quay is constructed of ashlar headers, three of which are still *in situ* (Fig. 6). This quay is on the average about 4 m wide and is well protected from winds and waves from the west by the natural rock of the islet which forms a sea-wall.

A mole about 130 m long and about 10 m wide juts out perpendicularly from the northern tip of the quay (Raban 1985, 31). It is similar to its southern counterpart, with two parallel walls enclosing a rubble fill. The mole ends to the east with a rampart of partly-worked sandstone ashlars that were laid, as in the other parts of the mole, on pebbles and broken pieces of sandstone that appear to have been originally used as ballast. The sandstone was probably brought from the nearby quarry, but geological analysis of the pebbles shows that they were composed of basalt, ophiolite and gabbro, non-local stones that were most likely brought from northern Syria and Cyprus, attesting to the maritime traffic of Atlit. Entrance to the harbour was from the east, between the two moles. This entrance is about 200 m wide and could not be blocked. Its width may indicate that the inhabitants of Atlit felt secure in their maritime supremacy and were not concerned with invasions from the sea or with piracy. The western part of the mole was laid on bedrock that was levelled by divers at the time of its construction (Raban 1984: 250−253; 1995a: 153−154).

Wooden wedges were discovered by the author and the excavation team between the quay's southern wall ashlar stones and stones that collapsed from its upper courses. An archaeobotanical examination carried out by Nili Liphschitz of Tel Aviv University showed that the wooden wedges were of two species: 1) *Cedrus libani*

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[1]   Based on Johns 1938: 142, 149.

Fig. 4.   The southern quay.

(Lebanese Cedar), which grows only in Lebanon and 2) *Olea europaea* (European Olive), which grows throughout the Mediterranean area. The cedar wedges were smaller and not as well preserved as the olive wood. The wedges were most probably used during the construction of the harbour to level the stone courses.

The location of the wooden wedges inside the inner wall of the quay, deep between the ashlars, enables us to date the construction of the quay and the harbour. ^{14}C tests carried out by Elisabetta Boaretto of the Weizmann Institute of Science on three samples show that they date to the late 9th or early 8th century BCE (Table, p. 57). This suggests that the harbour was constructed at least 100 years earlier than the 709−663 BCE date Johns proposed for the founding of the settlement (Johns 1938: 137).

It is noteworthy that European olive and Lebanese cedar are both long-life trees. Thus, the age of the wood (as indicated by the ^{14}C dating) could have considerably predated the actual use in construction of the harbour. Nevertheless, other factors such as the pottery found in the burials (see above), indicate, too, that the harbour dates to the late 9th and early 8th centuries BCE.

Atlit and Other Phoenician Harbours

The harbour at Atlit is the foremost and most complete example of Phoenician harbour construction technique extant. It is in a good state of preservation, which may be due to the fact that it was used exclusively by the Phoenicians over a period

Fig. 5.   The quay at the lee of the northern islet, looking north.

of a few centuries, between the Iron Age II and the Persian period. The harbour basin contained pottery mainly from these periods.

The technology and the harbour planning of Phoenician heritage are not unique to Atlit. There are similar harbours dating from the Iron Age and the Persian period along the coast of the Levant at Tyre (Poidebard 1939; 1951; Marriner and Morhange 2005), Sidon (Poidebard 1939; Frost 1973; Marriner and Morhange 2005), Acco (Raban 1986; 1995a; 1997: 503, Fig. 17: 18), Arwad (Frost 1966; 1970), Beirut and Amathus in Cyprus (Empereur and Verlinden 1987). Yet Phoenician moles in the Mediterranean are mostly covered with remains of breakwaters from the Hellenistic to the modern period. Present-day harbours at Acco, Tyre, Sidon, Beirut and Arwad are built along the lines of the Phoenician plan, and it is extremely difficult to distinguish the different layers.

The harbour most similar to Atlit is the one at Tabbat el-Hammam, dated by Braidwood to the 9th−8th centuries BCE (Braidwood 1940: 207−208). Tabbat el-Hammam is a coastal site that probably served as the port of ancient Simirra (Ṣumur–Tell Kazel). During Braidwood's excavation, an L-shaped mole was discovered. Part of the mole is on land (Braidwood 1940: Pl. xxv), with its longer leg projecting into the sea (*ibid*.: 204). Despite the fact that the mole has never been excavated, one can see the ashlar blocks in the inner part of the mole, which were placed in the sea in the traditional Phoenician manner (Frost 1972: Fig. 59), very similar to the Atlit moles and quays.
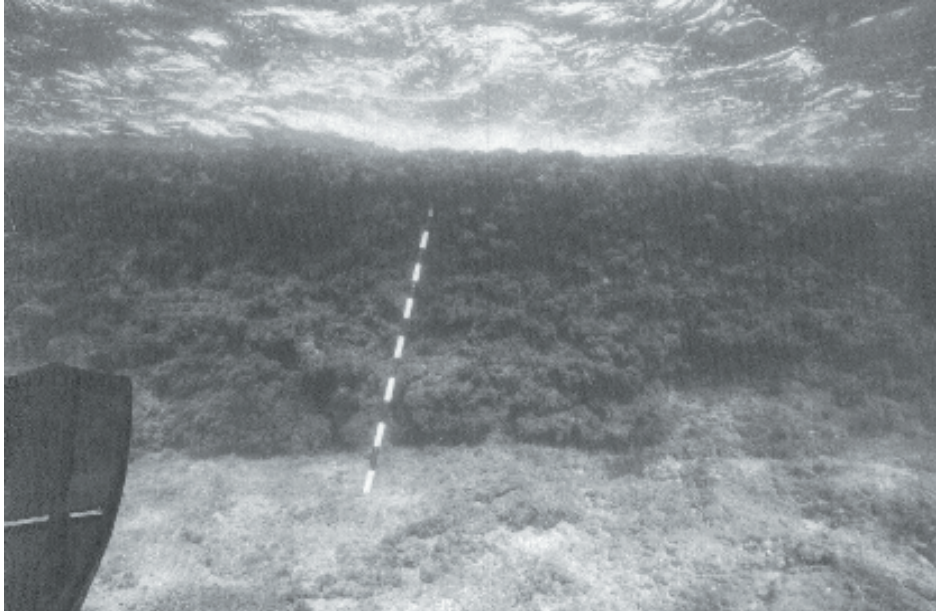
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Fig. 6.   Underwater view of the quay at the lee of the northern islet (Stephen Breitstein).

There are no signs of renovation at the Atlit harbour moles and quays that date to the 7th to 4th centuries BCE. But from the large quantity of pottery found in the harbour basin, we can say that the harbour was in use during the Persian period. The finds from the rock-hewn shaft graves of Phoenician type in the necropolis in the southeastern corner of the settlement (Johns 1933: 41−104) support this supposition.

The current data show that Atlit harbour was in use from the end of the 9th until the 4th century BCE. The harbour was not subsequently renovated, and it appears that most of the maritime activity in Atlit was relocated to the southern bay on the other side of the promonotory.

The Context of the Construction of Atlit Harbour

Atlit's northern bay is an optimal location for an artificial harbour on Israel's coast. The promontory provides excellent shelter from the southwest winds, and the two islets break the westerly waves. Entrance to the harbour basin from the east is relatively easy and safe.

Two central issues must be considered regarding the construction of the harbour:
 (1) Why would a harbour be built on the Carmel coast so close to the major port at Dor?
 (2) What kind of commercial system would require the construction of an artificial harbour on the Carmel Coast in the 9th/8th centuries?

The harbour at Dor was surveyed in the 1980s by the University of Haifa under the direction of A. Raban (1983; 1995). The southern bay was used as the main harbour of the city from the Middle Bronze Age to the 10th century BCE. Fluctuations in the sea level at Dor (Raban and Galanti 1987: 179−181; Raban 1995: Fig. 9: 34) led to several renovations of the southern quay in the 13th−11th centuries BCE (Raban 1983: 229−241).

During the 10th century BCE a large ashlar wall (Wall M) was constructed atop the 11th-century BCE quay, projecting southwards from the shoreline (Raban 1995, Fig. 9: 16). The continuation of this wall (W. 5340) was discovered during the 1994−1995 excavation (Stern *et al*. 1997: 38). No maritime structures or even maritime depositions from the Iron Age II up to the Hellenistic era were found in the southern harbour of Dor (Raban 1995: 351).

In his conclusion about the absence of Iron Age II harbour facilities, Raban wrote (*ibid*.):

> There is some circumstantial evidence that Dor's harbor was transferred to the north during the Iron Age II, though no maritime structures can be dated to a time prior to the Persian period. In view of the lack of archaeological remains from this period on the seabed too, one wonders how important the harbor of Dor was during the first half of the first millennium BCE. The land excavations have revealed a flourishing walled city with what seems to be a Phoenician material culture, but the location of the harbor facilities of this presumed Phoenician colony remains an enigma.

As to the second question, it is suggested that Atlit harbour served the commerce between Tyre and Israel. Israel was one of Tyre's main sources of oil, grain and wine (Aubet 2001: 76). Oil- and wine-producing settlements were prevalent along the Carmel Ridge. In the town of Shiqmona, Atlit's northern neighbour, industrial olive presses and warehouses were found in Layer X (beginning of the 8th century). Storage jars, crushed murex shells and other leftovers from the purple dye industry were also discovered in this layer (Elgavish 1994: 64). Despite Shiqmona's location on the shore at the foot of the Carmel, it was exposed to the winds and waves and this made it an unsuitable location for a port. At most, therefore, it could have served as an anchorage for small boats.

Thus, according to the new standard of harbour-building techniques that had probably developed in Phoenicia in the first half of Iron Age II, probably in the 9th century BCE, Atlit was the most suitable location on Israel's northern coast for the construction of an artificial harbour.

In terms of commerce, archaeological surveys show that agriculture, especially oil and wine production, flourished in the Kingdom of Israel in the first half of the 8th century. This phenomenon was not unique to the Carmel. Many agricultural

settlements with installations for the production of oil and wine have also been discovered in the Samarian Hills (Broshi and Finkelstein 1992). The harbour at Atlit served as the main port for exporting these products. In exchange for agricultural products, the Phoenician boats brought necessary materials such as metals to the harbour. This assumption is supported by the finding that the pebble fill used in the construction of the harbour originated in northern Syria or Cyprus, two of the main exporters of metals.

It has been suggested that Atlit Harbour was built in order to satisfy the growing demand for metals in the Kingdom of Israel, which was then flourishing economically and militarily under the regime of Joash and his son Jeroboam II (800−747 BCE) (Finkelstein and Silberman 2001: 205−206).

CONCLUSIONS

According to dates obtained from ^{14}C testing of wooden wedges removed from the northern mole of the harbour at Atlit, and re-evaluation of the ceramic remains from the cremation burials, we suggest that the Phoenician settlement at Atlit was founded during the late 9th or early 8th century. This predates Johns' suggestion by at least 100 years.

The harbour was built using a new technique that developed in Phoenicia during the first half of the Iron Age II, probably in the 9th century BCE. Atlit Harbour replaced the old port at the southern bay of Dor, which had served as the main port of the area from the Middle Bronze Age II until the beginning of Iron Age II. The new location on the northern bay at Atlit was a much more suitable location for an artificial harbour, able to serve and shelter larger vessels.

The imported pebble fills in the foundation layer were probably brought to Atlit as ballast stone from northern Syria or Cyprus, indicating existing maritime commercial traffic.

We still have little knowledge of the various types of goods traded at Atlit. However, since Northern Syria and Cyprus were the main sources of metal in Tyre's economic system during the 9th−8th centuries BCE, a time of increasing demand for metals in Israel, it would seem that Atlit Harbour served as a trading post for the import of metals, in exchange for local agricultural goods such as olive oil and wine.

TABLE 1
RADIOCARBON DATES

Measurement ID #	Type of Sample	^{14}C Age ± 1σ BP	Calibrated Age BCE	Archaeological Context	Sample ID	$\delta^{13}C$ ‰
RT 4450	Wood: Olive	2790±45	1000–840	Area K1, Wall 100, Basket 1	W. 100	-25.8
RT 4451	Wood: Cedar	2655±45	895–875 (8.3%), 840–790 (59.9%)	Area K1, Locus 101, Basket 2	L. 101/2	-25.0
RT 4452	Wood: Olive	2710±60	905–805	Area K1, Locus 101, Basket 1	L. 101/1	-25.7

^{14}C ages are reported in conventional radioC years (before present =1950) in accordance with international convention (Stuiver and Polach 1977. Discussion Reporting ^{14}C Data. RadioC 19/3: 255). Thus all calculated ^{14}C ages have been corrected for the fractionation in order for the results to be equivalent to the standard $\delta^{13}C$ value of -25‰ (wood).

Calibrated ages in calendar years have been obtained from the calibration tables in Stuiver *et al*. 1998. RadioC 40(3): 1041−1083 by means of the 1999 version OxCal v. 3.3 of Bronk Ramsey using the 10 yr. terrestrial calibration curve.

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