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The Iron Age Maritime Interface at the South Bay of Tel Dor: results from the 2016 and 2017 excavation seasons

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The aim of the Tel Dor joint Sea and Land Project is to reassess and expand understanding of the maritime interface of Iron Age Dor. During 2016 and 2017 five features excavated under water provided new data about the development and chronology of this interface. The results support a revised dating and interpretation of previously excavated structures and the identification of several new stone-built coastal fortification and maritime features, dating to the Early Iron Age. A later phase of construction attributed to the 7th century BCE Assyrian period at Dor was also documented. The outcome of the excavation is the introduction of new aspects of the development of Dor in the Iron Age, including what is likely part of the Iron Age II city's harbour. This may encourage revisiting current views of harbour evolution in the eastern Mediterranean.

Key words: Tel Dor, Levantine harbours, Iron Age, Phoenicians, Assyrian period, Coastal fortifications.

The study of Mediterranean connectivity and networks is tightly connected with the ongoing discussion on the development of harbours in the eastern Mediterranean (for example Leidwanger *et al.*, 2014; Yasur-Landau, 2018; Greene *et al.*, 2019; Shaw, 2019). A recent paradigm, the foundations of which were laid by the works of Raban (1995a), Frost (1995) and others, recognizes three stages in the development of harbours: i) Bronze Age proto-harbours, based on natural anchorages with minimal or no human modifications; ii) Iron Age harbours, defined as semi-artificial, with maritime installations appended to natural features; and iii) artificial harbours of the Classical to Byzantine periods, in which significant maritime structures were built (Marriner *et al.*, 2014).[1] The understanding of Iron Age harbours is pivotal not only to the reconstruction of diachronic patterns in maritime technology but also to processes of commercial and cultural integration during the Iron Age, which culminated in the creation of the 'Middle Sea', from Tyre to Cadiz (Broodbank, 2013: 508–509). It is rather dismaying therefore that remains of Iron Age harbour structures along the Levantine coast are somewhat scarce (Fig. 1). No physical remains

Figure 1. Main sites mentioned in the text.

of maritime architecture have been identified at Tell Abu Hawam (Balensi, 1985: 68–69), Akko (Morhange *et al.*, 2016: 80), or Achziv (Yasur-Landau *et al.*, 2016). However, a number of structures identified as somewhat later quays, jetties, and piers, all incorporating ashlar blocks laid as headers, were attributed to the 9th–7th centuries BCE. At 'Atlit twin mole-and-quay structures built of ashlars were dated to the late 9th or early 8th century BCE by radiocarbon dating of wooden

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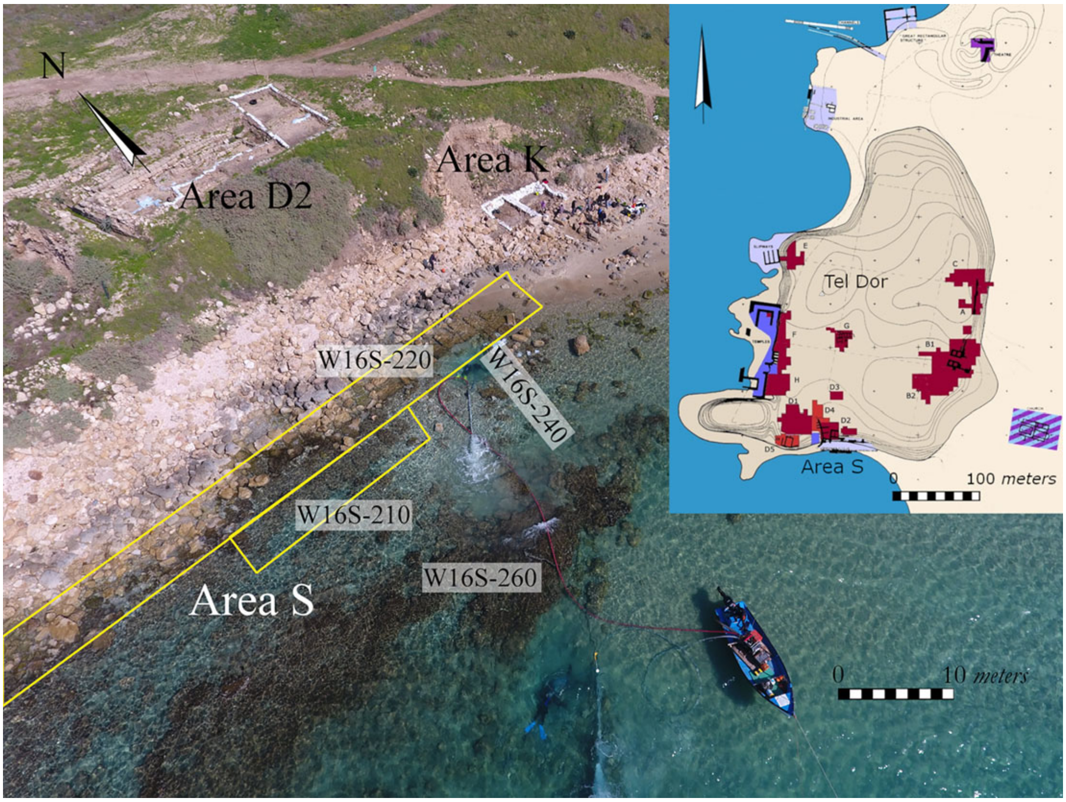

Figure 2. Aerial image of excavation area S (inset map by S. Matskevich; aerial image by A. Pesso).

samples extracted from the northern mole (Haggi, 2006; Haggi and Artzy, 2007). The ashlar-built jetty at Tyre was attributed by style to the Iron Age, possibly to the 7th century or earlier, in any case predating a Hellenistic construction (Castellvi *et al.*, 2007: 57–69; Noureddine, 2010). The Tabat el-Hammam quay in Syria is sometimes dated to the 9th century BCE (Haggi and Artzy, 2007: 80; Noureddine, 2010: 179). Among the best-known architectural remains of 'early' coastal structures are those at the South Bay of Dor, which were interpreted by their excavator, Avner Raban, to be those of a Late Bronze Age ashlar quay, renovated in the Early Iron Age by the *ŠKL*, one of the so-called Sea Peoples (Raban, 1995b: 310–341, fig. 9.12: W9, Area G, Area E, W66; 316, photo 9.50). According to this interpretation, the Dor structures are the connecting link between the harbours of the Bronze Age and those of the Iron Age and also the earliest excavated evidence of an Iron Age harbour (Raban, 1995a; 1995b: 335–340). Several aspects of this interpretation warrant re-examination:

The underwater trenches that provided the pottery used to date the walls interpreted as quays (Raban, 1995b: 339) were excavated by a mechanical excavator operated from the land, which significantly reduced stratigraphic control over the underwater finds (Raban, 1995b: 339; Raban's unpublished excavation notebooks: entries for 10.12.82 and 13.4.83; basket list for 12–17.12.82).

As noticed by Galili and Rosen (2008: 1930), the east-west reef (Raban, 1995b: 312, fig. 9.12, shaded area south of the tell) adjacent and parallel to the structures excavated by Raban would have effectively blocked any possibility of approaching the would-be quays from the sea.

An approach that unequivocally associates Early Iron Age Dor with the Sea Peoples has now given way to more complex propositions, and a re-reading of the published pottery from the Raban excavations suggests a later dating than that originally proposed (Artzy, 2006: 76; Sharon and Gilboa, 2013: 402).

The current paper presents the results of the 2016 and 2017 underwater seasons, a part of the Tel Dor joint Sea and Land Project and an excavation of the Department of Maritime Civilizations. Our goal is to revisit the past interpretations of previously reported structures in the South Bay, supplying more chronological and architectural data on the coastal and underwater Iron Age structures in Dor's South Bay.

The 2016–2017 excavations

In 2016 a new excavation area, Area S, was defined (Figs 2, 3). It currently spans the intertidal and subtidal area directly south of the tell's southern face, near Areas D2, D5 and K. This was performed as part of a larger project aiming to understand the relation of Dor's coastal architecture to the tell's

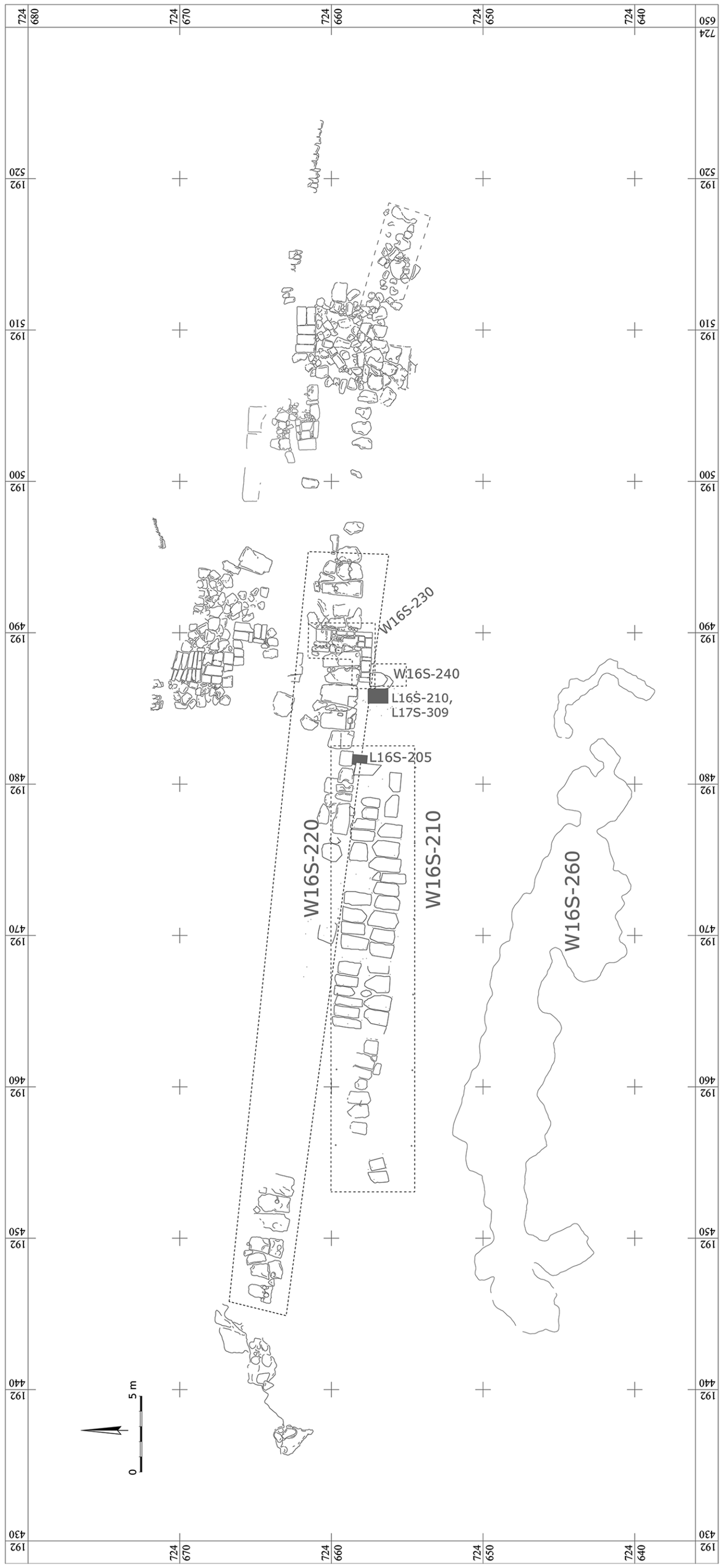

Figure 3. Area S stone-built features discussed in the text (plan by S. Pirsky and S. Matskevich).

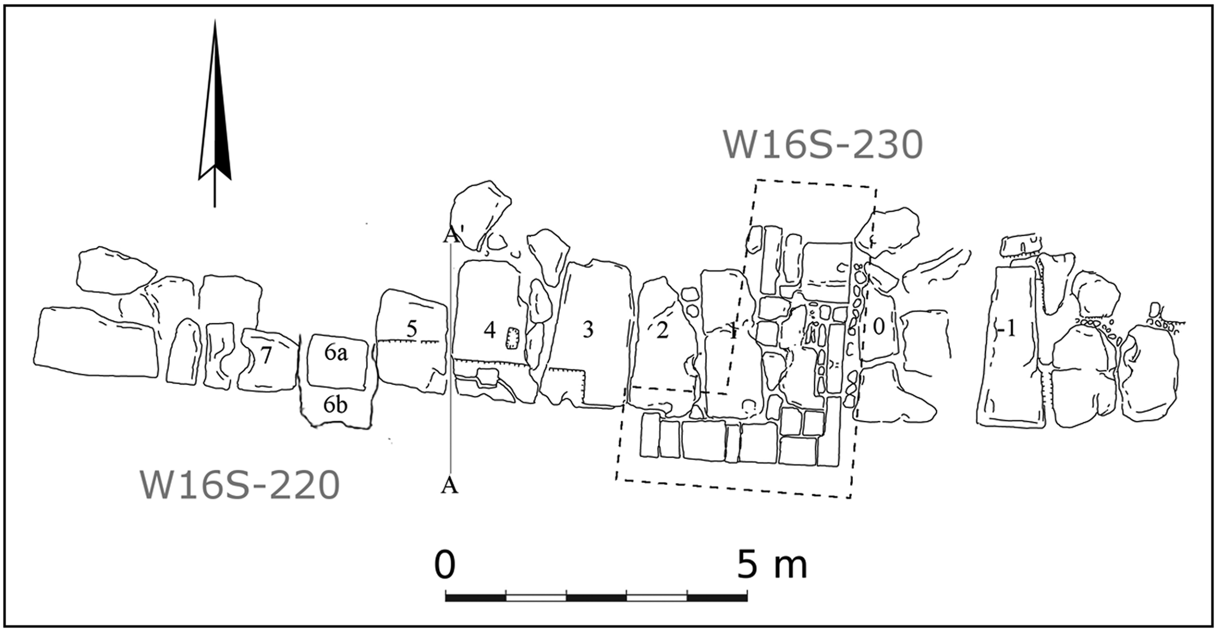

Figure 4. Plan of walls W16S-220 and W16S-230 (plan by S. Pirsky).

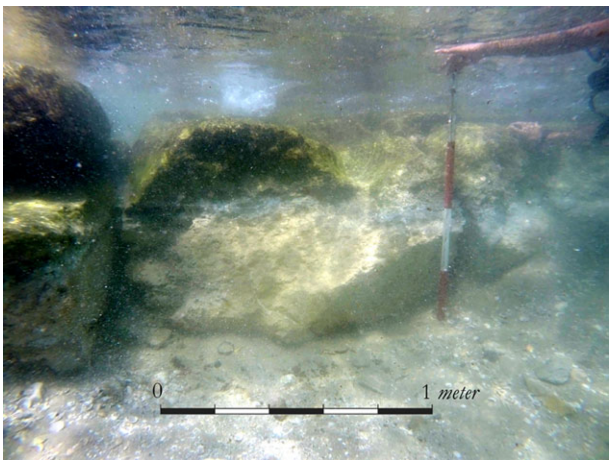

Figure 5. Wall W16S-220's southern face, looking north (photo by E. Arkin Shalev).

stratigraphy and chronology. Parts of this area were originally surveyed under water by Raban (1995b: 311), Wachsmann, Raveh, and Kingsley (Wachsmann and Raveh, 1984; Kingsley and Raveh, 1996), as well as Lazar *et al.* (2017), all of whom documented evidence of maritime activity in the form of stone anchors and concentrations of ashlars.

We focused mainly on two ashlar-built features: W16S-220, Raban's W9, interpreted by him to be an Early Iron Age quay, and W16S-210, located south of W9/W16S-220, interpreted by Raban to be a Late Bronze Age quay (Fig. 3; Raban, 1995b: 312, fig. 9.12). To understand the relation between these walls we excavated under water south of them in an area not excavated by Raban.

Another focus of excavation was 20m to the south of the above-mentioned features: the middle, outer (southern and seaward) area of a reef, which blocks access from the actual submerged bay to the features on the coastal stretch. The excavation of this reef, which we denoted W16S-260 (Figs 2, 3), was aimed at exploring whether it could have indeed prevented the docking of boats in antiquity.

Wall 16S-220

Wall 16S-220 (Figs 3, 4) was previously interpreted as a Late Bronze Age and Early Iron Age I quay (Raban, 1995b: 339). This feature, which we have excavated to its foundation, was found to be composed of a single course of rectangular, coarse ashlars measuring up to 2.3m long, 1.4m wide and 1m thick (Fig. 5). Stones 1 and 2 of this wall are couched in smaller, highly worked stones that we attribute to a later construction, W16S-230 (Fig. 4; and see below: The Dor sea-gate). Stones 3, 4 and 7 include features that may be later modifications of W16S-220 that relate to W16S-230: a possible dowel hole (Fig. 4, Stone 4) and a rectangular depression, perhaps for setting an orthostat (Figs 3 and 6; Stones 3, 4 and 5).

The top of W16S-220 is at an elevation of 0.26m and its base, founded in sand, was reached at -0.76m.[2] Below it was a layer of clay deposits. Stone 6b, the westernmost stone that we excavated, protrudes south from the line of the wall (Figs 3 and 7).

The wall continues both east and west of the excavation area. To the east it disappears beneath the coastal sand, where a recent geophysical frequency-domain-electromagnetic (FDEM) survey suggested that it carries on towards the south-east (Lazar *et al.*, 2017: fig. 4B). The wall also continues westwards, where

Figure 6. Possible orthostat depression in wall W16S-220 (photo by E. Arkin Shalev).

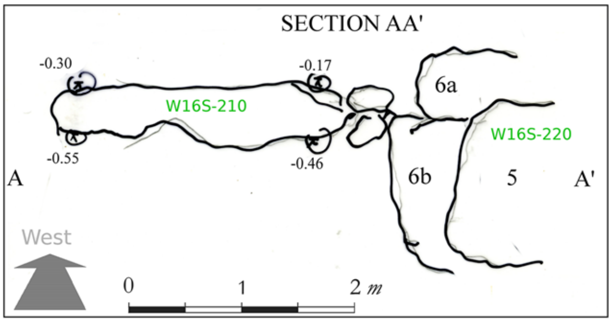

Figure 7. Section AA' of wall W16S-220 (plan by E. Arkin Shalev).

it is partially buried beneath later collapse, until it reaches the base of the 'Bastion'—a massive structure in Area D2 constructed in Ir1a, in Dor terminolgy (Sharon and Gilboa, 2013: fig. 26; Gilboa *et al.*, 2015a: 59, fig. 4). The distance between the two currently exposed ends of W16S-220 measures 50m. Raban (1995b: 312, fig. 9.12) understood this wall to be three separate features: 1) the western part of his Area G, which is adjacent to the part we excavated (Raban, 1995b: 313); 2) another portion to the east of his Area G, which he ascribed to a later construction phase (Raban, 1995b: 315); and 3) the western end of our W16S-220, near the Bastion, interpreted by Raban as a 'flanking ashlar header structure' (Raban, 1995b; 335 [W66]) to our W16S-210 (see below). However, as detailed above and based on the similarity of building techniques, stone dimensions, and wall orientation, we interpret all of these as part of a single massive wall.

Platform W16S-210

Platform W16S-210, a feature previously interpreted by Raban as the first phase of the would-be Late Bronze Age quay, W16S-220, abuts the latter from the south (Figs 3 and 8). It comprises two rows of elongated slabs laid as headers. The slabs are all approximately 2m long, 1m wide, and 0.3m thick, and they were laid down in a foundation trench which was dug in the sand and filled with unworked fieldstones (Fig. 9).

The platform's north-eastern extremity forms a corner with Stone 6b of W16S-220. From there it continues westward for 27m, covering an elongated area of 108sqm south of W16S-220. Based on the ceramic evidence (see below), Platform W16S-210 is roughly contemporaneous with W16S-220. The top of the platform is at −0.2m and its foundation, higher than that of W16S-220, was reached during the 2016 season at −0.5m.

Feature W16S-240

Feature W16S-240 (Fig. 3), not encountered by Raban, was discovered during the 2016 season. It is perpendicular to W16S-220 and comprises two large rectangular stones situated one atop the other—possibly a wall stub (Fig. 10). The stones are white limestone rather than the local sandstone, which together with their megalithic size indicates a considerable investment of effort. The lower stone is the larger of the two, measuring 1.5m long and 0.6m tall, while the top stone has a flatter profile and measures 1.5m long and 0.3m tall. The wall's preserved top is currently at −0.22m, with its base situated in a clay sediment layer at an elevation of −1.26m, which is the lowest point of any stone-built wall in Area S known to date, and it is 0.5m lower than the base of W16S-220. It may therefore represent an earlier construction phase than that of W16S-220 and W16S-210.

The W16S-260 'Reef': a possible mole

Directly south of W16S-210, dominating Area S and the whole northern part of the South Bay of Dor, is a rocky reef (Figs 2, 3; W16S-260). As previously noted by others (for example Galili and Rosen, 2008: 1930) this reef, if contemporaneous with habitation on the tell, would have prevented any possibility of docking next to the coastal features previously identified by Raban as quays (equalling our W16S-210 and W16S-220). As the sandstone reefs along the Carmel Coast were formed in the Late Pleistocene (Shtienberg *et al.*, 2017: figs 4 and 5 and references therein), it was imperative to ascertain whether the reef was indeed a natural feature.

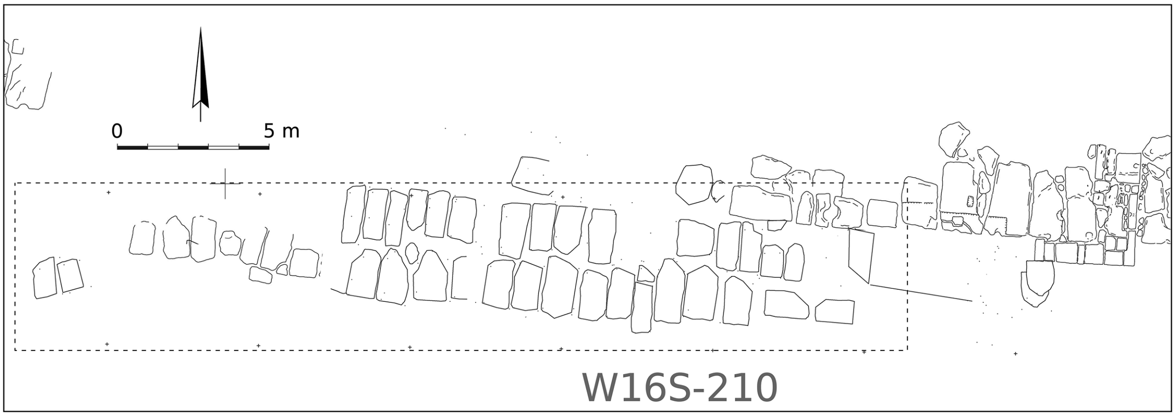

Figure 8. Plan of wall W16S-210 (plan by S. Pirsky and S. Matskevich).

Figure 9. The foundations of wall 16S-210, currently submerged, looking north (photo by E. Arkin Shalev).

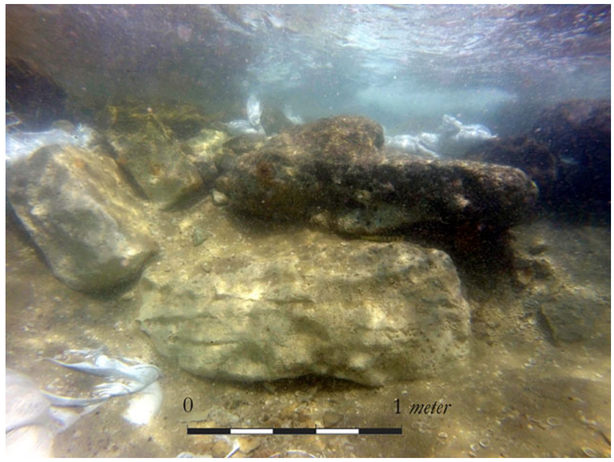

Figure 10. Feature W16S-240's western face, looking east (photo by E. Arkin Shalev).

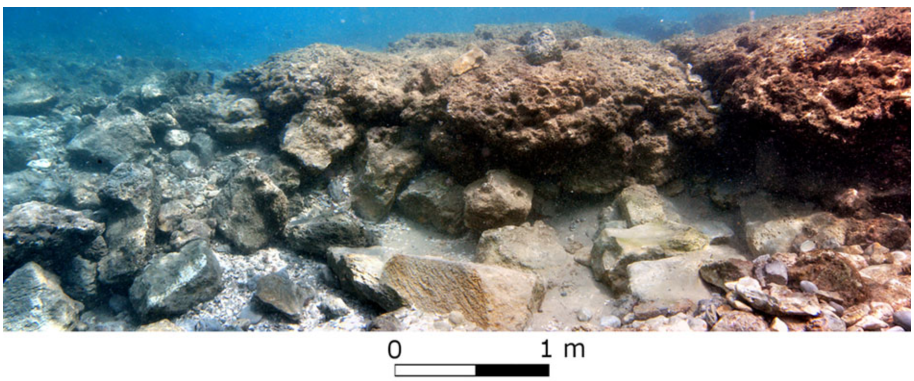

Figure 11. Feature W16S-260's southern face, looking north (photo by E. Arkin Shalev).

During the 2016 season, an excavation of the southern face of this 'reef' revealed it to be a mass of hewn stones varying in size from 0.2 × 0.3m up to 0.25 × 0.6m (Fig. 11). It covers an overall area of a minimum of 450sqm and its maximum height is 2.5m above sea bottom, at an elevation of 0.6m. Capping the stones is a layer of rock approximately 0.5–0.7m thick. The stones below it are piled on the sandy sea-floor at an average depth of −1.44m, and their lowest point, deposited in a clay sediment layer, is at −1.9m. Ceramics and lithic remains were found in this clay layer, all dating to no later than Ir2a (see below).

Discussion: maritime architecture?

We suggest that W16S-210 and W16S-220 fulfilled no maritime function (*contra* Raban, 1995b: 339). As noted earlier, W16S-220's foundation is at −0.76m. Given that sea levels during the Bronze and Iron Ages, despite a vertical uncertainty of over 1m, are estimated to have been similar to or lower than modern sea levels (Sivan *et al.*, 2001: 114, Fig. 6), this is insufficient depth for the draught of most vessels, even with a minimal under-keel clearance. This would make safely docking a sea-going vessel next to this wall unfeasible in antiquity, as it still is today, though coasters may arguably have been able to approach it as they required a very shallow berth. Instead, the massive construction of W16S-220, into which some of the largest megaliths at Dor were incorporated, its location at the exact edge of the tell's southern extent, and its length of a minimum of 50m, hint at it being a terrestrial element. This assumption is further strengthened by the incorporation of later elements into it (for example W16S-230, and see below: The Dor sea-gate) in a manner that did not cancel but rather enhanced the previous phases. Finally, W16S-220's landward location in comparison to W16S-210, a feature even less likely to have had a maritime function, lends credit to the interpretation of W16S-220 as a massive, east-to-southwest, curving terrestrial wall erected sometime during Ir1b or Ir2a (and see below: Chronology: the pottery from the underwater excavations), possibly even the southern city wall of Iron Age Dor.

The base of W16S-220 is at an even higher elevation and is therefore an even poorer candidate for a maritime quay. Given that the large, flat slabs it is made of are only 0.3m thick, with a foundation above the estimated Iron Age sea level it is unlikely that this structure functioned as anything other than a terrestrial platform/pavement of sorts.

The feature designated as W16S-260, jutting out further south into the bay, is both structurally and morphologically different from W16S-210 and W16S-220. Also, in contrast to these other two structures, the foundation of W16S-260 was laid down in the clay sediment layer that is deeper than the coastal and sea-floor sands and predates them (Sivan *et al.*, 2004). Given estimated Iron Age sea levels (Sivan *et al.*, 2001: 114, Fig. 6) it was likely partly submerged. Along with its overall height of more than 2m, this hints at an actual maritime function. Its dimensions support an interpretation of a massive stone mole, serving as a breakwater, mooring point, loading platform, or any combination of these functions. While massive, the top of this structure is approximately level with platform W16S-210 and the later sea-gate (W16S-230), would not have blocked access to these, and would have allowed access to the coastal architecture north of the mole.

Chronology: pottery from underwater contexts

The ceramics presented below originate from our 2016 and 2017 underwater seasons. All ceramic remains identified underwater were collected and analysed. Sherds were grouped into units of 'baskets', with all finds in each basket originating from a specific locus and from similar elevations. Certain key baskets were identified from secure contexts with clear stratigraphic relation to architectural features. Such baskets typically contained pottery that was not wave worn and tended to be temporally uniform. As can be seen below, pottery from these baskets supports an Ir1b date for W16S-240 (the limestone marine structure constructed outside the tell's habitation area), W16S-220, and W16S-210. Non-indicative pottery from the same contexts did not contain any fabrics or wares that post-date the Iron Age. Most of the pottery found has parallels in the ceramic assemblage from Tel Dor, which has been typologically analysed and dated based on a contextually secure sequence supported by radiocarbon dates (preliminarily Gilboa and Sharon, 2003; fully in Gilboa, 2018).

The pottery from W16S-210 and W16S-220

Locus 16S-205 is located at a corner below the foundations of both wall W16S-210 and W16S-220, where the two structures adjoin (Fig. 3). The ceramic assemblage discussed here was collected from basket B16S-2010, the only basket retrieved from locus L16S-205.

The vessels comprising this basket include a late Ir1b Type BL2a plain shallow bowl with a square rim (B16S-2010.15, Fig. 12.1; Gilboa, 2018: 106, pl. 20.i), a Type BL31a carinated bowl (B16S-2010.16, Fig. 12.2; Gilboa, 2018: 108, pl. 20.iii), and two additional carinated bowls of Type BL33a (B16S-2010.14, Fig. 12.3; B16S-2010.12, Fig. 12.4; Gilboa, 2018: 109, pl. 20.iii).

Type BL31 bowls are found almost exclusively in Ir1b contexts at Dor, while Type BL33a bowls appear throughout the Early Iron Age; however, the form found here is dominant in Ir1b and Ir2a ceramic horizons (Gilboa and Sharon, 2003: 25, table 2). Closed forms include a storage jar similar to an exemplar from Stratum XIII at Tel Michal for which an overall 10th–9th-century-BCE date range has been suggested (B16S-2010.8, Fig. 12.5; Singer-Avitz, 1989: 81, fig. 7: 14); a Type SJ6 storage jar that appears frequently in Ir1b contexts at Dor (B16S-2010.4, Fig. 12.6; Gilboa, 2018: 115–6, pl. 20.xiv); and a Type PT1 collared-rim pithos, abundant in the Ir1a (late) and Ir1ab, found also in Ir1b–2 contexts (B16S-2010.11, Fig. 12.7; Gilboa, 2018: 119–20, fig. 20.23; Gilboa and Sharon, 2003: table 5). Also found here was a late Ir1b Type PJ23 Phoenician monochrome jug with painted red decoration (B16S-2010.10, Fig. 12.8; Gilboa, 2001: 140, pl. 5.37.3). In all, nothing in this pottery is necessarily later than Ir1b, and this is therefore the date suggested for W16S-220. However, given the lack of supporting quantitative information, a slightly later date in Iron Ir1/2 or even Ir2a cannot be ruled out but is less likely.

The pottery of W16S-240

The pottery used to date W16S-240 comes from within the wall and from its foundation trench. Basket

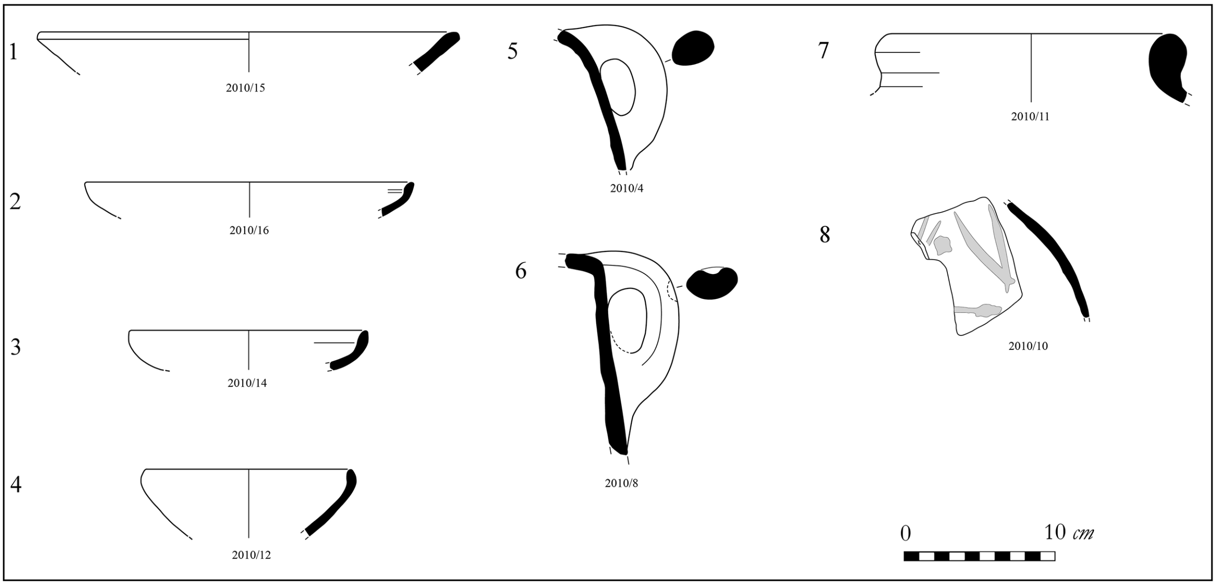

Figure 12. Pottery from walls W16S-210 and W16S-220 (drawing by S. Haad).

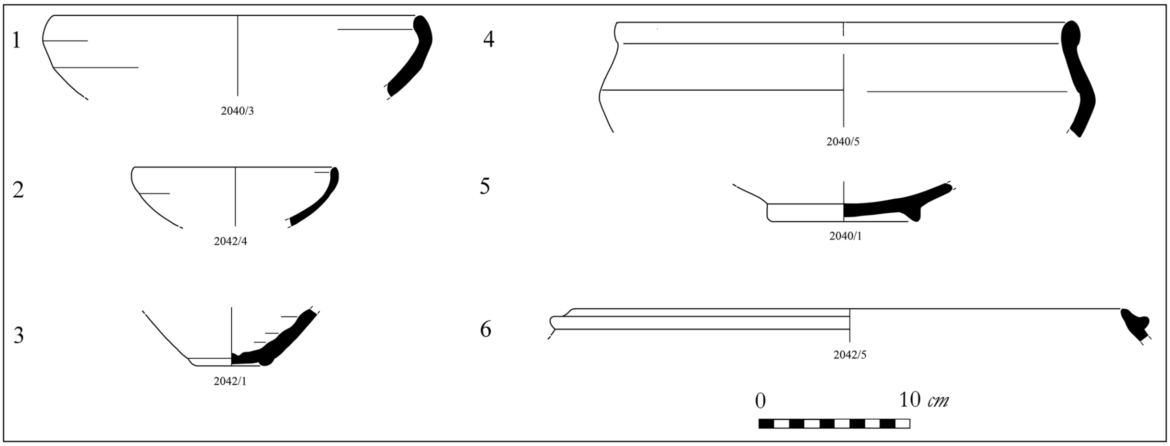

Figure 13. Pottery from feature W16S-240 (drawing by S. Haad).

B16S-2040 was retrieved from a cavity between wall W16S-240's two courses and includes an early Type BL31 bowl (B16S-2040.3, Fig. 13.1) of the dominant form at Dor in Ir1b, which declines in number rapidly in the Ir1b/2 pottery horizon (Gilboa, 2018: 108; Gilboa and Sharon, 2003: 25, table 2 no. 34); and two type KR21e kraters (B16S-2040.5, Fig. 13.4; B16S-2040.1, Fig. 13.5), which appear throughout Ir1 and the IrIb/2a transitional period at Dor (Gilboa, 2018: 111–2, fig. 20.9, pl. 20.58: 1).

Basket B16S-2042 comes from locus L16S-210, located beneath W16S-240's bottom course (Fig. 3), excavated during the 2016 season. The vessels include another early Type BL31 bowl (B16S-2042.4, Fig. 13.2), an Ir1 Type BL22 or BL23 bowl (B16S-2042.1, Fig. 13.3; Gilboa, 2018: 106, fig. 20.4, pl. 20.16: 5) and a CP12 cooking pot which appears throughout Ir1 and the Iron Ir1b/2a transitional period at Dor (B16S-2042.5, Fig. 13.6; Gilboa, 2018: 113, pl. 20.ix).

Locus L17S-309 was excavated during the 2017 season. It is located next to locus L16S-210 and sealed beneath the bottom course of W16S-240 (Fig. 3). Baskets B17S-3021 and B17S-3051, originating from locus L17S-309, each contain one large body sherd. Both sherds are similar in dimensions, morphology and fabric to collared-rim pithoi of the Early Iron Age horizon at Dor (Fig. 14). Body sherd B17S-3021.1 is wheel made, has a cream-coloured slip, and shows traces of hand burnishing in a criss-cross pattern.

The pottery of W16S-260

The pottery used for tentatively dating W16S-260, which we suggest was actually a maritime infrastructure and served as a mole, comes from stratified clay sediment layers located beneath and directly south of the feature's foundation. Before reaching these sediment layers, several Hellenistic and Roman-period body sherds were collected from the sand above them. These are not thought to be associated with W16S-260 as, according to our observation, this sand layer is clearly removed and re-deposited on site on a daily basis. Accordingly, these sherds appear wave worn and tumbled and should not be associated with any specific feature. On the other hand, the ceramic material coming from the lower clay sediment layers dates to the Early Iron Age, no later than Ir2 in Dor terminology, with some earlier material from the Middle and Late Bronze Ages. The finds originating from these layers are not wave worn, indicating that they were not subject to re-deposition by wave action.

The Iron Age pottery includes Types KR12 and KR13 kraters (B17S 3052.6 + 3, Fig. 15.1; B17S-3047.1, Fig. 15.2, respectively). Type KR12 appears at Dor in Ir1a (late) and Iron Ir1a|b contexts (Gilboa, 2018: 110–1, pl. 20.37: 15), while the KR13 form was abundant in Ir1b (Gilboa, 2018: 111, pl. 20.v). A Type SJ10 storage jar found here is frequent in the Ir1/2 and Ir2a horizons at Dor (B17S-3052.5, Fig. 15.3; Gilboa, 2018: 116, pl. xv).

Ceramic remains predating the Iron Age are also found in the clay sediment layers abutting W16S-260's base. These finds include two vessels from the Late Bronze II–III: a conical diagonal knob base of a Type JRVIII Canaanite storage jar with an 18-mm-thick layer of organic residue (B16S-2032.1, Fig. 15.4; Stidsing and Salmon, 2018: 15, pl. 17.iv: 6) and a Type JG20 jug rim with a cylindrical neck of undecorated, brittle, grey fabric and a slightly beaded rim (B17S-3018.1, Fig. 15.5; Stidsing and Salmon, 2018: 34–5, pl. 17.3: 21).

Earlier finds from the clay sediment include two ubiquitous Middle Bronze I types: a bowl with a disc base (B16S-2037.8, Fig. 15.6; Amiran, 1970: 112, pl. 27.6) and part of a krater wall with a 35mm-wide horizontal band of clay with an incised herringbone pattern, similar to an example from the early Middle Bronze IIa fill associated with the construction of Palace I at Aphek Area X, Stratum X18 (B16S-2037.1, Fig. 15.7; Yadin, 2009a: 7; 2009b: 123, fig. 7.2 no. 17).

Figure 14. Body sherds of two collared-rim pithoi from feature W16S-240 (photo by E. Arkin Shalev).

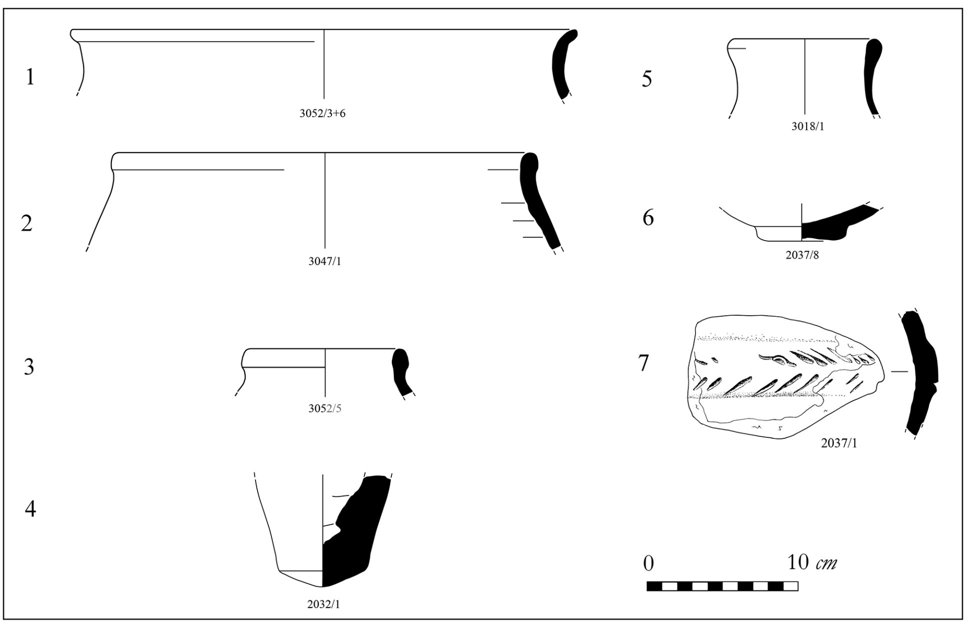

Figure 15. The pottery of feature W16S-260 (drawing by S. Haad).

Figure 16. Aerial image of the Dor sea-gate (wall W16S-230) (aerial image by A. Pesso).

The Dor sea-gate?

Stones 1 and 2 of W16S-220 (Fig. 4) are enveloped by smaller, well-hewn ashlars creating a rectangular feature *c.*4m long (N to S) and 3.5m wide (E to W). This feature was referred to by Raban as W20 (Raban, 1995b: 312, fig. 9.12) and we renamed it W16S-230 (Figs 4 and 16).

These finely cut stones were carefully fitted to enclose the contours of W16S-220 and laid in a pattern that matches no construction methods of other walls in Dor (that is headers or a mix of headers and stretchers; see Sharon, 1987). They were laid in an interlocking pattern, each stone fixed in place by contiguous stones laid in different orientations. In order to allow the creation of this pattern, the stones are not uniform in size but rather each was cut to a specific size and shape, and they thus range from 1.15 × 0.25m and 0.8 × 0.3m for stones laid down as both headers and stretchers to nearly square stones measuring 0.7 × 0.6m. The stone in the south-western corner is cut in an L-shape. Raban (1995b: 316) has argued that the interlocking stones are the foundation of a 'rectangular structure of unknown date', which is 'considerably later' than its surroundings.

The best parallel to this form of stonework comes from Dor itself, not from wall foundations but rather in the threshold of the two-chambered gate found in Area B on the eastern limits of the tell. It shows not only the combination of interlocking stones of different sizes, but also displays L-shaped ashlar stones (Stern, 1994: fig. 78). The gate was dated to the late 8th/7th century BCE, the period of Assyrian domination in Dor (Stern, 1994: 140–141; 2001: 66; Gilboa and Sharon, 2016: 243–244). The gate contained a socket carved in a style typical of Assyrian architecture (Stern, 2000: 132–139; Gilboa and Sharon, 2016: 244).

Another example of ashlar paving in a gateway comes from Megiddo Stratum III's outer gate, which is furnished with four piers. The threshold between each pair of these stone piers (*c.*2 × 4m) is paved with ashlars that are laid in an interlocking pattern—a mix of headers and stretchers (Lamon and Shipton, 1939: fig. 89). Megiddo Stratum III also dates to the period of Assyrian domination, the late 8th/7th century BCE (Peersman, 2000; Stern, 2001: 67).

A final example comes from the sea-gate at 'Atlit, where the paved passage between the gate towers also shows a similar pattern of ashlars laid in an interlocking pattern (Johns, 1934: figs 4 and 5). Raban (1996: 499) suggested that the 'Atlit gate connected the town and the harbour. While its date has not been established by excavations, the gate's connection to a harbour active mainly during the Iron II to the Persian period, hints at a date in the late Iron Age (cf. Raban, 1996; Haggi and Artzy, 2007: 76–77).

The use of interlocking ashlars laid in different orientations in gate thresholds was likely intended to provide extra stability for surface that had to withstand the daily passage of hundreds of people, pack animals, and wagons.

We therefore suggest preliminarily that the ashlar feature built on top of W16S-220 is a paved gateway that belongs to the southern sea-gate of Dor. Its similarity in construction method to the two-chambered gate in Dor Area B and, to a lesser degree, to the Megiddo Stratum III outer gate, both from the period of Assyrian domination in the late 8th/7th century BCE, may suggest that this gate was part of Tel Dor's fortifications in that period and served as the sea-gate for the South Bay. Dor, whether it was the capital of an Assyrian province or not (Gilboa, 1996; Gilboa and Sharon, 2016), played an important part in the Assyrian efforts to regulate trade along the Levantine coast. Thus, the 7th-century-BCE treaty between Esarhaddon, King of Assyria, and Baal, King of Tyre, clearly granted Tyre significant trade rights connected with Dor:

> These are the ports of trade (KAR^{meš}) and the trade routes (KAŠKAL^{meš}) which Esarhaddon, king of Assyria, en[trusted] to his servant Baal: to Akko, Dor, to the entire district of the Philistines, and to all the cities within Assyrian territory on the seacoast, and to Gubla, the Lebanon, all the cities in the mountains. (Na'aman, 1994: 3; see also Gilboa, 1996; Gilboa and Sharon, 2016)

What we see as the new, Assyrian-period sea-wall of Dor was thus likely built on top of the foundations of an earlier wall. Another modification that may be connected to the insertion of the new gate is the rectangular depression cut into the stones of W16S-220, which may have been intended for inserting a long orthostat to decorate the exterior of the gateway.

City gates held a unique symbolic place in Iron Age Syro-Anatolian urban society, which often identified the king with the gate and the gate with the city (Osborne, 2018: 198). This idea is clearly reflected in the royal Assyrian iconography of the 9th and 8th centuries BCE (Osborne, 2018: 199), where several Phoenician sea-gates appear within the narrative of royal conquest. Two come from the Balawat Gates showcasing the campaigns of Ashurnasirpal II (Jacoby, 1991: Fig. 7) and Shalmaneser III (BM 124661; King, 1915: pl. XIII). The gates appear there together with other emblems connected with Tyre, such as flat-bottomed boats used to cross between the island on which Tyre was situated and the mainland, elephant tusks, gold ingots, and other valuable tribute items, and characteristic depictions of high-ranking local officials. Another example is found in a relief from Sennacherib's palace in Nineveh, showing the flight of King Luli from Tyre in 701 BCE (Jacoby, 1991: fig. 9). Here, centred on the sea-gate, are several powerful symbols: the city fortifications, a quintessential Phoenician temple, an adjoining paved quay, and massive, two-banked sea-going warships and transport ships (Casson, 1995: 56, fig. 78), with pavesades on their gunwales created by shields matching those on a parapet in the fortifications. A possible fourth instance in which the Tyrian sea-gate appears is in the Nimrud reliefs, which may depict Tiglath-Pileser III's western campaigns (Jacoby, 1991: 120–121).

Towards a renewed chronology

Establishing an accurate chronology for the construction of the various features of the maritime interface of Dor will be a long-term effort, bearing in mind the technical difficulties of the project. These result from excavation of stone features in shallow water and rough sea conditions, which require that excavations be conducted only on days of calm sea with waves lower than 0.50m. Diving in calm conditions ensures better underwater visibility and also enables better control over identifying, recording and reacting to changes in the sediment excavated. We can, however, supply initial results and directions for further study.

The stone feature or W16S-240 was likely built during Ir1b, as Ir1b pottery was found below it. It may be interpreted as a wall. It predates the fortification wall W16S-220 as it is cut by it (Fig. 17).

We would interpret Walls W16S-220 and W16S-210 as terrestrial features: the foundations of a massive coastal fortification and an adjacent ashlar paving. The fact that none of the pottery found at the base and between the stones of W16S-220 is later than Ir1b or transitional Ir1b|2 may suggest that it was constructed before Ir2a or at its very beginning.

W16S-260 had a clear maritime function; it is a stone mole, which could have had the combined functions of a breakwater, mooring point, and a loading platform. Its date is yet to be accurately determined, but the pottery at is base may provide an Ir2 *terminus post quem* for its construction. We may ask if this material connects it to the same construction episode as W16S-220, or if it belongs to a later construction phase.

The gateway built on top of W16S-220, into the coastal fortification wall, can be attributed by the style of construction to the Assyrian-period fortification projects of the late 8th/7th centuries BCE.

The lack of a clear construction phase in the 9th–8th centuries BCE (Ir2a late and Ir2b), a period of prosperity in Phoenicia, as reflected also in the construction of the ashlar-built harbour at 'Atlit (Haggi and Artzy, 2007), can be closely connected to the unique historical circumstances of Dor. After the beginning of Ir2a there was a noticeable decline in maritime connections, reflected in a steep reduction in imports. This was attributed to the transition at Dor from a Phoenician town to an Israelite administrative centre (Gilboa *et al.*, 2015a: 66; Gilboa *et al.*, 2015b). The ability to conduct maritime activities may have been limited either by the Israelites' technical abilities or by trade agreements with Tyre. Gilboa *et al.* (2015a: 71–72) and Na'aman (2016) argue that the transfer of Dor to Israelite hands happened in the days of Ahab in the Iron Ir2a. The circumstances of this transition are not yet fully understood, but are believed to be closely connected to the rise of the strong Omaride dynasty. Dor may have been annexed to Israel as part of Ahab's expansionist policy; alternatively, it may have been given as a dowry on the occasion of Jezebel's marriage to Ahab (see 1 Kgs 9:16) or bought by Ahab from Tyre (see 1 Kgs 9:11–14). It is likely therefore that the construction of maritime structures in Dor happened during the two episodes in the Iron Age during which

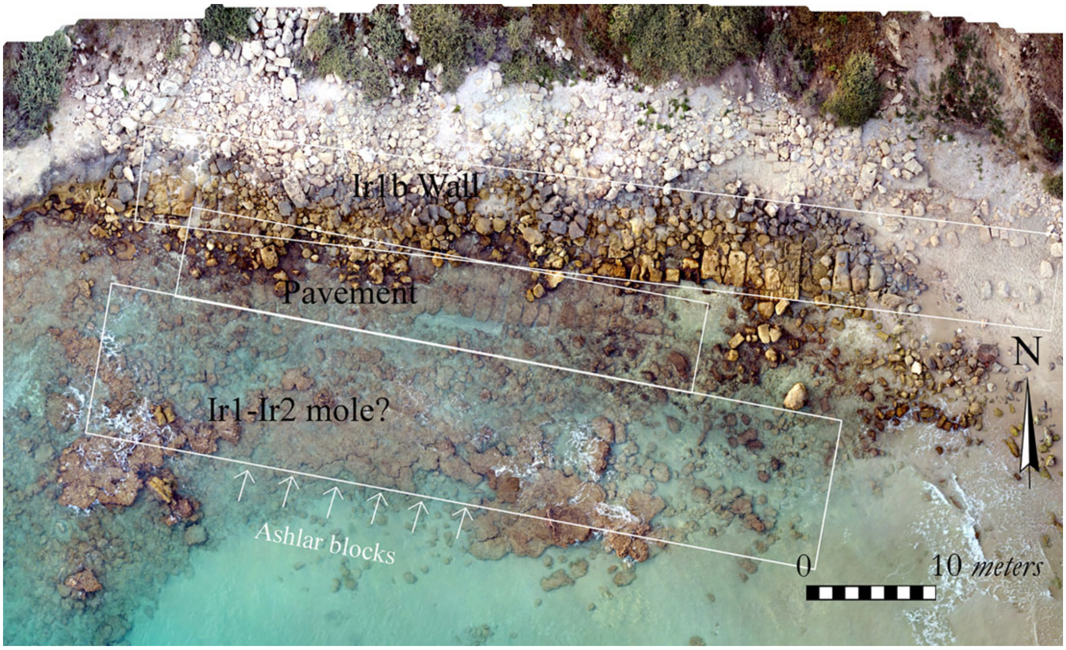

Figure 17. The coastal and maritime features of Iron Age Dor and its harbour in area S (aerial image by A. Pesso).

maritime activity was deemed essential to the economy of the city, thus meriting investment in maritime infrastructure. The sea-wall was first constructed in Ir1b or in the transition between Ir1b and Ir2a, the apex of the city's trade connections city with Egypt and Cyprus (Gilboa, *et al.*, 2015b). This may also be the construction date of the mole. The return of the city's maritime importance under Assyrian rule in the late 8th/early 7th century was followed by new construction projects, including the fortification of the city. This included both the land gate in Area B and the sea-gate in Area S. The sea-gate and perhaps the adjacent paving should be seen as additional evidence of the active attempt of the Assyrians to re-establish the port of Dor under their tutelage after its abandonment in the 8th century (Gilboa and Sharon, 2016: 249). Much later, a line of Hellenistic fortifications was constructed slightly to the north of W16S-220. If this reconstruction is accepted, one can see two technological phases of the maritime interface in the Iron Age at the same site. The use of the header technique for a construction of a wall that can withstand the force of the sea may date back to Ir1b, which dates in the Dor sequence to the late 11th or early 10th century BCE (Gilboa, *et al.*, 2015a: table 2). Essentially, this strongly supports Raban's ideas about the use of this ashlar technique in the Early Iron Age (Raban, 1995b: 337, 339). The possibility that the ashlar construction, perhaps a mole or quay under the reef, may also belong to this period would push the first use of ashlars for quays back to the same period. This would make it the earliest-known Iron Age use of an ashlar-built quay, and it would portray Dor as a very advanced maritime interface equipped with both a massive coastal fortification and an adjacent quay. The later, Assyrian-period, Ir2c reuse of the coastal fortification and the construction of a sea-gate exposed a more refined construction technique for the regulation of the maritime interface, one that can be seen earlier in the Phoenician-style construction in Tyre, Tabat el-Hammam, and 'Atlit. Finally, the results of the Dor excavations conform to the Marriner *et al.* (2014) tripartite model of harbour development mentioned above, in which Iron Age harbours are equipped with maritime installations appended to natural features. Following the discoveries at Dor, the date for the first appearance of such artificial maritime installations should however be pushed back from the late 9th-8th centuries BCE, based on the example of Atlit (Marriner *et al.,* 2014: 6), to the Ir1b at Dor of the 11th and early 10th centuries BCE.

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Notes

1. For chronological terminology and discussion, we refer the reader to Sharon and Gilboa (2013) and Gilboa *et al.* (2015a: table 1).
2. All elevations are stated with reference to the zero-elevation point of the local Israeli Transverse Mercator datum, as supplied by the Survey of Israel. We note that the actual mean seal level (MSL) is not equal to the zero-elevation point, and is dynamic (Shirman, 2004).

[Correction added on 3rd September 2019 after first Online publication on 2nd August 2019: An error occurred in the order of authors published. The correct order is Ehud Arkin Shalev, Ayelet Gilboa, and Assaf Yasur-Landau.]

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