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The Status of Dor in Late Antiquity: A Maritime Perspective

by Kurt Raveh and Sean A. Kingsley

Above: *Early Roman Imperial iron anchor 1.1 meters long dating to the first century C.E. found at a depth of 3 meters in the main bay at Dor. The saltwater triggered a chemical reaction of the iron that caused it to attract the surrounding sand, stone or pottery, which created a hard crust that stabilized the artifact. In contrast to identical anchors examined off the coasts of Turkey and the south of France, the iron within the encrustations of the Dor collection is perfectly preserved as a consequence of both the low presence of oxygen in shallow waters and the thick mantle of sand that engulfed the anchor soon after its deposition. Unless otherwise noted, all photos courtesy of the authors and the Dor Maritime Archaeology Project.* ***Left:*** *This T-shaped Byzantine anchor from the south bay at Dor is a mere 77 centimeters (roughly 30 inches) long and, after conservation, weighed 7.6 kilograms (about 17 pounds). An anchor of this size would have been sufficient for use only on a small fishing boat. Although several contemporary iron stocks have been examined within the harbor, this item was isolated. Remnants of wood within the stock aperture revealed why so few anchor stocks were found: while the durable encrustation preserved the general dimensions of the anchor, the wooden bar would have rapidly decayed.*

Research into ancient harbors and port complexes has tended in the past to concentrate on assessing a site's morphological plan either in a specific period or over a larger time bracket (see Flemming 1972; Oleson 1985; Yorke 1986). Two related reasons caused harbor archaeology to drift in this direction. First, practical considerations caused most of the underwater and coastal surveys to be conducted in months when submerged sediments were relatively stable, undisturbed by the turbulence of storms, which are most punishing in the winter months. The accumulation of sand layers and limited time-scale of most examinations, therefore, provided little indication of the nature of remains that may have existed beneath the surface interface. Second, submerged architectural features were often the most prominent parts of the harbor available for study, so sea-moles were mapped, breakwaters measured and the configuration of quays chronicled.

Dor, 13 kilometers (approximately 8 miles) north of Caesarea on the Israel coast, is a port by no means typical of this trend. Along a 1-mile length of shore an intriguing array of maritime installations, including anti-silt channels, ancient fish ponds, coastal warehouses and the only known dry dock in the eastern Mediterranean (Raban 1981: 17), were constructed and quarried out of the rocky kurkar (carbonate-cemented quartz sandstone) surface. But it is the plethora of multi-period material recovered from within the shallow waters that has earned the site a greater reputation. One of the most intense and extensive studies of its kind, the Artifact Deposition Survey of the Dor Maritime Archaeology Project has established a balanced cross-section of the city's fortune and associated level of trade as it ebbed and flowed from the beginning of the second millennium B.C.E. to the modern day.

Traditional Impression of Dor in Late Antiquity

To scholars engaged in plotting the progress of Dor in Late Antiquity, the year 390 C.E. represents a watershed in the site's long history: in a translation of Eusebius's *Onomastikon*, Saint Jerome records that by this date, Dor was deserted (Dahl 1915: 99). According to popular opinion, Dor's downfall began around 22 B.C.E. with the urban and maritime development of neighboring Caesarea, which eventually cornered the region's commercial market.

A major element in this argument is Josephus's description of Caesarea's rise in prominence. He described Jaffa and Dor as "small towns on the seashore and are poor harbours because the south-west wind beats on them and always dredges up sand from the sea upon the shore, and thus does not permit a smooth landing . . ." (*Jewish Antiquities*, book 15: verse 333; Marcus 1980). Considering this, along with the fact that in 10 years of excavations on land at Tel Dor nothing postdating the mid-third century C.E. has been found (Stern and Sharon 1987: 209), it is understandable why assumptions about the city's decline are constantly reiterated (Baly 1974: 127; Meshorer 1986–87: 60).

Aerial view of the natural harbor of Dor, situated beside the modern settlement of Kibbutz Nahsholim. South of the tel are a chain of offshore islands protecting the ancient city's main anchorage, which is obstructed by the encroachment of sand. Beyond this southern zone extends the straight coastline toward Caesarea and the Sharon Plain. Photo courtesy of Spectra.

Fifteen years of underwater surveys carried out by the Dor Maritime Archaeology Project have collated a

body of contrary evidence that recommends these views be readjusted. Focusing on the large Late Roman and Byzantine assemblages that form the basis of the argument, we shall thus examine the evidence of the region's trade in Late Antiquity and attempt to demonstrate that the emphasis was one of stability followed by upward growth, rather than continuous demise.

Reassessing the details. The first serious doubts over this traditional scenario arose when a unique episcopal basilica was excavated at the foot of Tel Dor by Claudine Dauphin in 1979. The edifice was used from the time of Constantius the Second (337–361 C.E.) or slightly earlier, to some time after 649, when Bishop Stephen of Dora was introduced to Pope Martin as vicar of the see of Jerusalem (Dauphin 1982–83: 31). Along the *via maris*, the "way of the sea" of antiquity, weary pilgrims could regain strength and contemplate the basilica's proud possession, a piece of holy rock from Golgotha, before moving on towards the prime destinations, the Galilee or Jerusalem. Rather than an isolated outpost, it seems evident that the part church, part rest-house was an important *foci* within a larger nucleus. Whether the relocation of the main settlement at the eastern foot of Tel Dor was the cause or effect of a major social upheaval is uncertain. Nevertheless, this particular chapter is a significant landmark permitting us in terms of general topography to speak of continuity rather than total dislocation.

Throughout the basilica excavation, a cosmopolitan repertoire of pottery was examined: white Egyptian storage jars and Late Roman C and North African Red Slip bowls, which were recognized as proof of "the role of Byzantine Dora as a major port and road junction on the trade and pilgrim routes linking Egypt and North Africa to the Syro-Cilician hinterland" (Dauphin 1981: 118–19). With an estimated 8 hectares (approximately 20 acres) of territory, contrasted to Caesarea's 95 hectares (237.5 acres) and Ascalon's 52 hectares (130 acres), Byzantine Dor may well have been a small city (Broshi 1980: 4–5) but seems to have been particularly active for its size.

A body of water protected by a string of offshore islands and reefs, a continuation of the Carmel Mountain terrain, was a major catalyst for this activity. The majority of the Israel coastline is relatively hostile and not endowed with features favorable for refuge or for conducting trade. Collectively, the small islands operated as natural breakwaters, repelling the full force of the sea, and the available geographical opportunism was exploited by ancient mariners as early as 1900 B.C.E. A small secondary harbor lay to the north of Tel Dor while the main anchorage was to the south, today represented by two separate bays divided by a sandbar. In the southernmost sector of this area, Byzantine vessels dropped anchor and transferred merchandise from ship to shore and vice versa.

> It has long been believed that the port at Dor was rendered obsolete by the larger port at Caesarea.

Anchors. As the most effective tool capable of saving life and cargo if a vessel was caught in one of the Mediterranean's sudden storms, the anchor was valued by ancient mariners not only for its functional ability but also as a piece of psychological, reassuring equipment. Dor is one of the few Mediterranean harbors where it is possible to trace the complete evolution of anchors. Initially made of stone, they were constructed out of lead/wood or iron at the time when Herod drafted grandiose plans for Caesarea, and exclusively of iron after the first century C.E. Amongst the repertoire of iron examples recorded over the years at Dor, the largest proportion emanate from the Byzantine period and can be identified by the positioning of the arms at right angles to the shank in a T-shaped arrangement. In several cases, the arm profile is not fully developed, a transitional feature of Late Roman/Early Byzantine date. All 15 of the Dor collection, weighing between 7.6 and 32.4 kilograms (17 and 71 pounds), come from between and on the shore side of the two southernmost islands and were discovered at depths of no more than 4 meters.

Within the secure confines of the Dramont F and Yassi Ada wrecks excavated off the south of France and Turkey, respectively, (Joncheray 1975; Bass and van Doorninck 1982) anchors identical to those used at Dor were found, indicating that the range of the form spans from about 350 to at least 626 C.E. In these examples the iron had dissolved and the dimensions were formulated on the basis of the void within the surrounding concretions. The Dor collection, however, suffered negligibly from oxidation so that not only iron but rope adhering to the stock and vicinity is also frequently discerned during conservation.

Although the anchors were one of the most prominent classes of artifacts found during the surveys at Dor, just how much significance may be attributed to the assemblage? After all, perhaps this large sample was deposited as a result of nautical inexpertise coupled by the silting of the harbor, which made navigation hazardous. A valid case, however, exists to propose that seafaring conditions improved in the Byzantine period. The sea level at Dor began to rise in the early third century C.E. and peaked around 600 C.E. (Raban and Galili 1985: 349) when naviga-

tion of the region's waterways would have been facilitated by a sea level 1.2 meters higher than today.

In relation to the dimensions of the anchors from the Yassi Ada ship (which ranged from 2–2.565 meters long for a vessel slightly less than 20 meters with a 5.22 meter beam) and those of Dramont F (1.36–1.8 meters on a ship whose maximum dimensions were 5 by 12 meters) the examples from Dor were relatively small, varying in length from .77–1.59 meters. The most plausible conclusion based on these statistics is that Byzantine vessels operating in the waters of Dor probably did not exceed 12 meters in length on average.

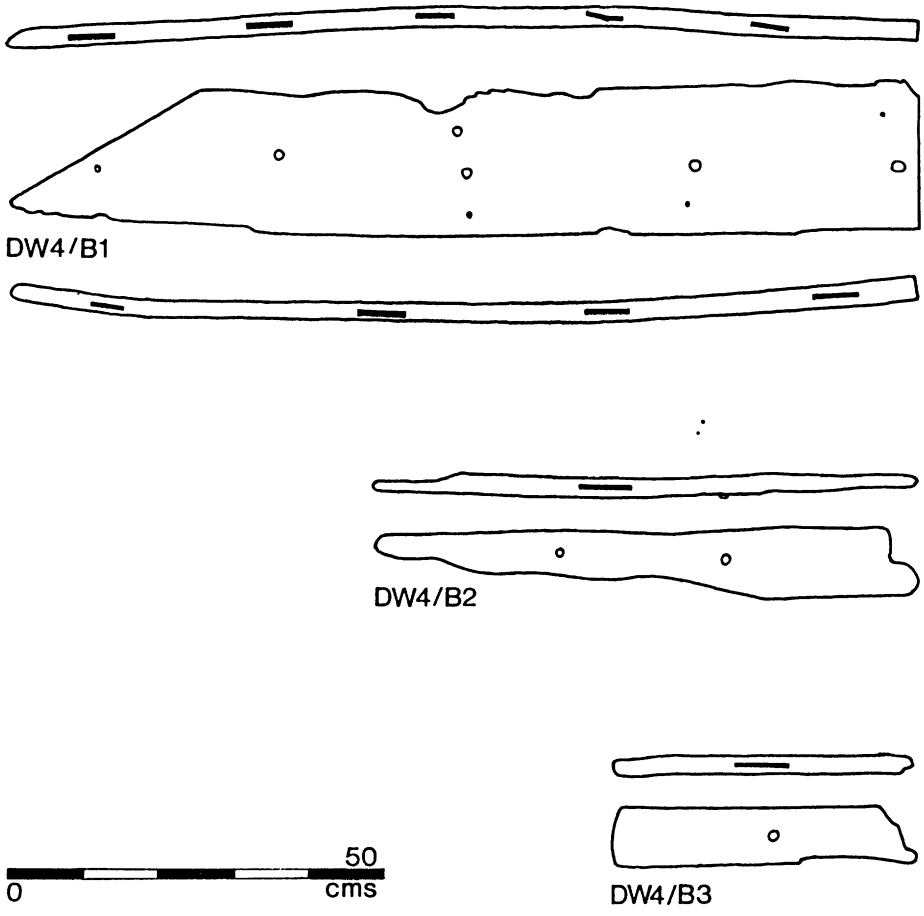
Merchant vessels in late antiquity. Traffic was not necessarily restricted to local craft and small fishing boats. A wooden stock covered with lead 90.1 centimeters (almost 1 yard) in length and recorded underwater at Dor weighed as little as 25.6 kilograms (roughly 56 pounds), yet its core of European Oak confirms it belonged to a vessel that began its journey on the other side of the Mediterranean in the first century C.E. According to literary and archaeological sources, one of the distinguishing factors of Byzantine trade was a reduction in the size of merchant ships. Names such as the gazelle and the swordfish, evocative of swifter and lighter craft, are mentioned in seventh century texts (Lopez 1959: 71), and the Palestinian monk John Moschus, who died in 620 C.E., described an individual who built an unusually large vessel of 230 tons that he could not launch, even with the assistance of 300 men (Jones 1964: 843).

As state control splintered at the end of the Roman period, a new form of organization replaced it, more independent and perhaps unable or unwilling to maintain the facilities the larger constructions required. By the fourth century C.E., the emphasis had shifted from the 340 to 1,300 ton juggernauts used in the run from Alexandria to Rome towards ships with a standard length of about 20 meters (Eiseman and Ridgway 1987: 109).

Within a concise area of 150 meters in the southern bay at Dor, we have recorded eight wrecks, three of which are of Byzantine date. DW4 (Dor Wreck 4) lies in 1.3 meters of water and is characterized by a 15-meter spread of amorphous ballast stones, beneath which remnants of the hull were preserved. The interval between adjoining mortise and tenons, which served to pin the outer planking on top of one another, is relatively far apart, varying between 17.3 and 31.8 centimeters (approximately 7 to 12 inches). This feature, in addition to the omission of treenails to secure the respective tenons within their mortises, is highly comparable to the seventh century C.E. wreck from Yassi Ada and the Pantano Longarini ship dated to 600–650 C.E. (Throckmorton and Throckmorton 1973: 263), which is the earliest known vessel to exclude treenails in this fashion. More labor efficient and cost-effective than Greco-Roman ship construction, the assembly of Byzantine vessels such as DW4 may reflect the modest amounts that the private sector was willing to invest in shipping (Bass and van Doorninck 1982: 312).

What were the causes, however, that attracted merchant vessels from around the Mediterranean to the humble port of Dor, which in many respects lacked the superior technological attributes of other ports?

Above right: *Kurt Raveh examines an area of exposed Byzantine planking that emerged from beneath a layer of ballast stones on DW4, one of three Byzantine wrecks that foundered in an 80-meter stretch of sea at the southern part of Dor. Although much of the structure was preserved, the general state of the timbers underlines the rapid deterioration of the vessel after it struck a sandbank. Traces of its cargo littered the sea bed up to 20 meters before the ship finally lay to rest.* ***Right:*** *The initial appearance of the hull of DW4 after a winter storm. Outer strakes were attached to each other horizontally by mortise-and-tenon joints interlocked on diagonally cut scarfs such as the one protruding at top left.*



Planking from DW4, a Byzantine merchant vessel of the sixth-seventh centuries C.E. that ran aground on the sand banks of the south bay. In contrast to Greco-Roman ships where the distance between neighboring mortise-and-tenon joints rarely exceeded 10 centimeters (almost 4 inches), a fundamental change occurred during the early fourth century C.E. when connections are positioned farther apart. DW4 illustrates this feature as well as the staggering of treenail holes (used to attach wooden pegs to the inner frames), which was a common method of trying to minimize damage if a plank developed a crack.

Dor was certainly not a modern, state-of-the-art complex like Caesarea had been in Herod's heyday. Part of the answer has already been touched upon: the dawn of pilgrimage in the Holy Land was during the fourth century C.E., and as a major mode of transportation, shipping benefited. The enlightenment of the biblical past enhanced the magnetism of the city through the display of a holy relic in the Dor basilica (Dauphin 1982–83: 31). Not surprisingly, therefore, at least one strata of merchants operating in the waters of Dor were of the Christian faith: two sixth-century-C.E. bronze steelyards found in association with a second late Byzantine wreck at Dor (DW7) are incised with crosses and evoke "Jesus Christ the Savior" in Greek in an attempt to secure a hazard-free voyage. But this is only one side of the equation; the other is submerged at a depth of 2 meters in the southern bay.

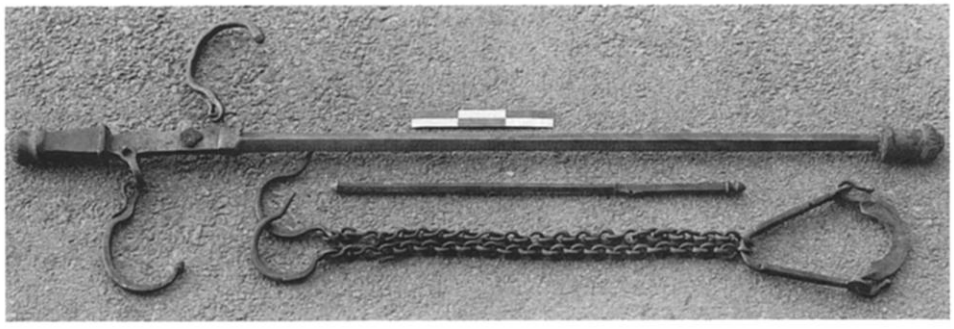
During the last 30 years the local waters have been used as a laboratory testing ground to examine the potential and feasibility of working underwater in Israel. In the progress of a survey at Dor in 1983, the first of the three Byzantine ships so far examined in the southern harbor (designated DW0) was discovered buried in the sand. Excavation two years later proved the vessel was remarkably well-preserved and at least part of its cargo still intact. A sounding lead, used to measure the depth and nature of the seabed, and a copper pitcher were among the vestiges, but the characterizing feature of the wreck consisted of an assembly of amphorae carefully packed in the hull with rope and straw in between to prevent breakage.

Dor is one of the few Mediterranean harbors where it is possible to trace the complete evolution of anchors.

At first glance the wreck posed little interpretive problems. The small ring handles and deep ribbings covering the lower three-quarters of the surface were indicative of the latest model of a long line of bag-shaped amphorae produced locally (Riley 1979: 223). A large body of similar jars from Caesarea were estimated to have been in use most widely in the early to mid-sixth century C.E. (Keay 1984: 358), a conclusion complemented by results at Carthage that suggest a "floruit" from 450–530 C.E. (Fulford and Peacock 1984: 121).

The shape of the Dor examples differed subtly, however. Most notable were the narrow grooving on the upper quarter of the body and neck and a shorter rim, features of the sixth-seventh centuries of the Late Byzantine period (Tubb 1986: 60). A close parallel is a container from Theodotus's store at Emporio in Chios (Ballance, Boardman, Corbett and Hood 1989) dated numismatically to around 610–613 C.E. Although the Weizmann Institute of Science in Israel carbon-14 dated the wood from the wreck to 410 C.E. ± 110 years, it would be unwise to use this figure

Effective trade during the Byzantine period relied on both a shrewd mind and the possession of a steelyard that evaluated the true weight of an article. Two steelyards, found on a second Byzantine wreck of the sixth-seventh centuries C.E. (DW7) in the southern bay at Dor, are similar to steelyards found on a seventh century wreck at Yassi Ada, Turkey. The addition of lead on the sleeve of the larger example from Dor suggests the precision of steelyards was frequently tested to ensure accuracy during transactions.



as an absolute date range because it is highly likely that the vessel was decades old when wrecked. At some time, therefore, most probably between 520 and the first quarter of the seventh century C.E., the ship met its fate.

The thick, oxygen depleting blanket of sand that soon engulfed the Byzantine wreck protected the hull and coils of rope. Surprisingly, therefore, little indication was gleaned about what produce the bag-shaped amphorae contained. Given the assumption that this particular jar was the standard container for white wine in the Byzantine period, based upon examples found in wine-presses (Zemer 1977: 69), how can we explain the absence of seeds or pitch-lined interiors in the Dor collection?

Not all of the shapes of amphorae from the wreck were identical, and their fabric suggests a number of differing points of origin. The round fermentation holes of several were breached prior to shipment, providing speculation that the vessel was heading for Dor with a secondhand, empty cargo, not to deliver but to purchase. Unlike many ships of the Roman period, whose sets of amphorae were consistently identical, a growing body of evidence begins to depict the reuse of jars as a necessary practice in the trade of the Late Byzantine period as availability decreased (van Doorninck 1989).

The dendroarchaeological remains from the Byzantine wreck were analyzed by Nili Lipshiptz and S. Lev-Yadun from Tel Aviv University, revealing two principle materials of construction: cyprus for the ceiling planking and birch for the frames. Alien to Israel but common in the Mediterranean region of Europe and Turkey, the inclusion of birch suggests the ship was not a local craft. Barbara Johnson (1986: 590) recently pointed out in a study of bag-shaped amphorae from Corinth and Athens that we ought to be cautious in assuming the distribution of the type was restricted to the Syro-Palestinian homeland, a statement reinforced by the wreck at Dor. Despite the reduction in the size of the merchant ship, the region's trade contacts remained wide, and the class of amphorae in question penetrated as far as Sara-

A third merchant vessel (DW0) was wrecked at Dor between 520 and the first quarter of the seventh century C.E. Its cargo included bag-shaped amphorae that were made locally with subtle variations. ***Below right:*** *A pitcher of high copper content that was also found in the vestiges of this ship. It was probably the personal property of one of the crew.*

Quantification of amphorae collected at Dor during the last 15 years indicates that trade peaked at Dor once during the Persian period, but more substantially from 380–626 C.E. ***Right:*** *Parts of Byzantine jars covered by sand are well preserved while the exposed areas developed a coating of marine growth.* ***Next page, from left:*** *a fourth-century C.E. carrot-shaped container that probably originated in Syria; a variant of the sixth-seventh century C.E. bag-shaped amphora from the main bay at Dor; Gazan amphora of the fifth–sixth centuries C.E. from the sea at Dor.*

chane in Turkey (Hayes 1968: 215), Histria on the western edge of the Black Sea (Scorpan 1977: 274), and the south of France (Bonifay and Villedieu 1989: 31). Whether or not the containers within DW0 had been transported from one of these locations is difficult to sustain without further analysis of the wreck.

Agricultural Prosperity. In addition to the bag-shaped jars from the site and the copious quantities of identical material found in the three bays at Dor, another 12 distinct classes of amphorae found in the harbor and dated to between 380–626 C.E. underline the wide network of communications established at Byzantine Dor. A possible attraction for this commerce was the procurement of local agricultural produce for which the area, lying inside the biblical region of Asher, seems to have been renowned: "Blessed above sons of Asher, let him be the favorite of his brothers, and let him dip his foot in oil" (Deuteronomy 33:24). Today on the outskirts of Dor, a yearly average of approaching 600 millimeters (roughly 23 inches) of rain (Baly 1974: 123) supports the growth of avocados, lemons, bananas and, of course, grapes.

Approximately 2 kilometers (1.3 miles) northeast of the Dor basilica, recent surveys have recorded a large complex of winepresses hewn out of a soft rocky outcrop. Of the eight examined so far, many were plastered on the floor, walls and within channels connecting the treading floors to the collecting vats, probably to prevent liquid from seeping into the porous rock. Rarely does the individual press conform to an identical layout, and nearly all differ in size, either indicating individual ownership or that each was used for a different quality of wine. During a trial excavation in 1989, samples of bag-shaped amphorae comparable to those encountered in the bays at Dor were recovered, and it is tempting to propose that it was here that this type of jar was filled with local produce before shipment from the harbor. This connection will be examined further in future seasons.

Caesarea in Relation to Dor

Metaphorically speaking, the interpretation of archaeological remains is analogous to a theatrical play in which a number of adaptations are possible (Tilley 1989: 278). Before, insufficient evidence existed to oppose the theory of Caesarean thalassocracy (maritime supremacy) in regional trade. In 30 B.C.E., Octavian's victory in Egypt established a new form of territorial order as all the states of the eastern Mediterranean were drawn into a Roman orbit (Beebe 1983: 202). Perhaps this is the reason why Caesarea and Dor are often contemplated within a single geographical and political framework.

The proximity of the two cities precluded any possibility that once Caesarea became the equal in size of the large and well-known Greek port Piraeus (*Jewish Antiquities*, book 15, verse 332; Marcus 1980), the harbors of Dor could have continued to function in any effective manner. Certainly this view is no longer supportable. A purple dyeing factory seems to have been founded in the Herodian period at Dor (Raban and Galili 1985: 343) and the presence of a mint in the city producing groups of coins from 33/32 B.C.E. to 68/69 C.E. depicting a galley or the goddess Tyche holding either a ship's rudder or a cornucopia, the symbol of prosperity (Meshorer 1986–87: 67–69), underlines the significance of Dor's maritime connection within the city's economy. A coin of Trajan dated to 111/112 C.E. leaves little doubt concerning the prestigious position of the city slightly later: the reverse of the coin depicts a bust of Doros, son of Posoidon and legendary founder of Dor, above whom is written "year 175 of Dora, holy, city of

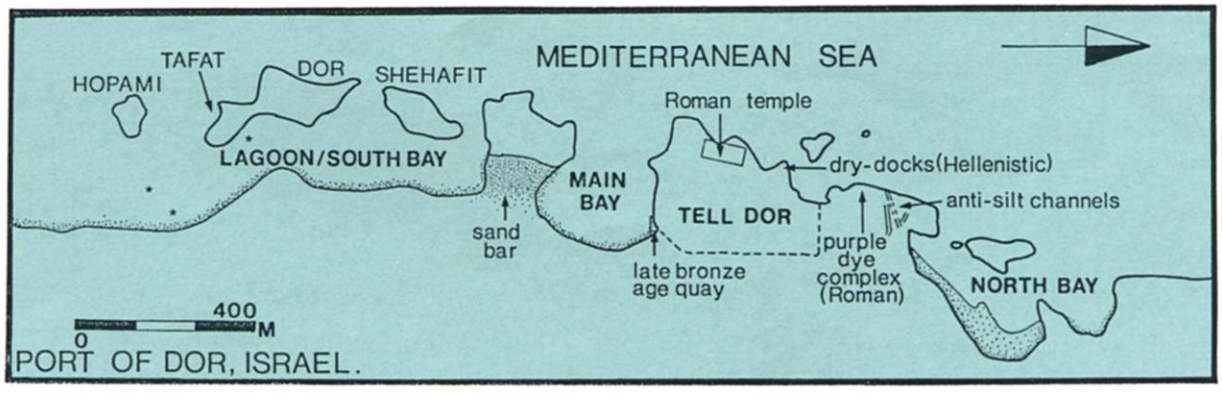
asylum, autonomous, ruler of the seas." The latter part is an extremely rare title known only from the coins of especially large harbor cities like Tripoli and Sidon in Phoenicia (Meshorer 1985: 16).

Conclusion

Other than the specific social stimuli, the predominant factor for the continuation of Dor as a harbor facility was its geographical advantage. Its coastline formed the southernmost section of the Plain of Asher in antiquity and is a mere 9 kilometers (roughly 5.5 miles) from the Crocodile River, usually identified with Shihor-Libnath, where the southern boundary is thought to have existed (Joshua 19:26). To the south extended the coastal fringe of the Sharon, swampy and naturally unattractive for port construction: "only special political reasons could advocate the use of harbors on the Sharon-coast" (Karmon 1961: 51).

The predominant factor for the continuation of Dor as a harbor facility was its geographical advantage.

The earliest harbors in the Near East were often situated on geographical or political border locations because the concept of trade is considered to have initially required neutral meeting places (Revere 1957: 51). Although the ideology behind trade altered dramatically over time, the regional division was maintained to the south of Dor. When Herod founded Caesarea, Dor was outside his sphere of direct control (Avi-



Plan of the natural port of Dor. The location of the three Byzantine wrecks in the south bay are denoted by asterisks.

Yonah 1979: 116). To consider the two harbors as competitive forces within a single geographic frame, therefore, may be oversimplifying the issue. Each may well have circulated distinct merchandise and dealt with a separate clientele, to use modern terminology.

As one of the principal underlying motives in the construction of Caesarea's artificial harbor, the appeasement of Rome and Augustus adequately fulfilled the political requirements of Herod the Great. For at least one-and-a-half centuries Caesarea survived as the only large-scale port on the Israel coast. Contrary to the allusions of literary sources, however, Dor was not reduced to the role of secondary observer. The scale of the city's trade began to increase in the second half of the fourth century C.E. and reached an unsurpassed level of prosperity, perhaps a consequence of the surge in pilgrimage. The Dor Maritime Archaeology Project's Artifact Deposition Survey, conducted underwater in Israel, complements the realization on land that the Byzantine period represents a very high pinnacle of material development (Avi-Yonah 1958; Wilken 1988: 236).

Opinions about the role of Caesarea in Late Antiquity remain divided. The discovery of 10 coins dating to the Byzantine era in the outer harbor basin (Hohlfelder 1985) are hardly conclusive grounds to argue that its waters continued to function as the trade magnate of the region. If, as Charles Fritsch and Immanuel Ben-Dor postulated, an earthquake repossessed this man-made harbor in 130 C.E. (Hohlfelder, Oleson, Raban and Lindley Vann 1983: 134) then, coupled with the general decrease in the magnitude of merchant vessels, perhaps it is not surprising that the ever reliable, modest harbor at Dor was once again judged an appealing option.

Acknowledgments

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