Phoenician and Greek Ashlar Construction Techniques at Tel Dor, Israel

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This study describes the ashlar construction techniques used at Dor from the late Iron Age through the Hellenistic period; the primary typological criterion used is the pattern in which the blocks are set in the wall. The study then attempts to reevaluate the question of Palestinian ashlar construction using the new data and the proposed typology. Two ashlar construction traditions are identified within the Palestinian assemblage. The first originated in Phoenicia and was used continuously from the tenth to the second century B.C. No clear case can be made for the diffusion of this style to the Phoenician colonies in the western Mediterranean. Although some influence of Greek construction styles is first discernible in the third century B.C., it does not become predominant until after the middle of the second century.

INTRODUCTION

Stern's excavations at Tel Dor from 1980 to 1985, on behalf of the Hebrew University and the Israel Exploration Society, revealed abundant use of ashlar masonry for both public and private purposes. Ashlar construction appears to span the entire period of Phoenician occupation of the site.* It begins, as far as can be seen at the moment, with a few examples dating to the late Iron Age; it was widely used throughout the Persian period and continued into Hellenistic times.

A major goal of the Tel Dor project is to trace the change of orientation of the material culture of the coast from east to west during the Persian–Hellenistic era. This paper studies change and continuity of ashlar construction techniques during these periods. Apparently similar techniques have been ascribed to Israelite or Phoenician origin in works dealing with Iron Age masonry, and to Greek influence in the Hellenistic period. This prompted a reexamination of ashlar building techniques in Palestine and the Levantine coast.

The sphere of contacts of Dor in the relevant periods (Stern 1982a; 1982b), and its ashlar building assemblages, indicate that the following cultures need to be examined for possible influence on, or contacts with, the ashlar architecture at Dor:

1. Iron Age ashlar building in Palestine and elsewhere in the Levant;
2. Achaemenid ashlar construction;
3. Greek ashlar construction;
4. Egyptian hewn masonry;
5. Anatolian ashlar construction (insofar as it differs from the Greek);
6. Cypriot ashlar construction; and
7. Ashlar building in the western Phoenician colonies.

The method used here to classify the ashlar building techniques takes as the major typological criterion the pattern in which the stones are laid in the wall. This method is commonly used in classical studies (e.g., Lawrence 1957: 225–27; Martin 1965: 371–409; Scranton 1941: 16–24). In contrast, most works on Palestinian ashlar architecture (primarily those dealing with the Iron Age) define the ashlar building techniques using the shape of the stones and the manner of their dressing as the main attributes. The notable exception is Fisher's pioneering work in the report of

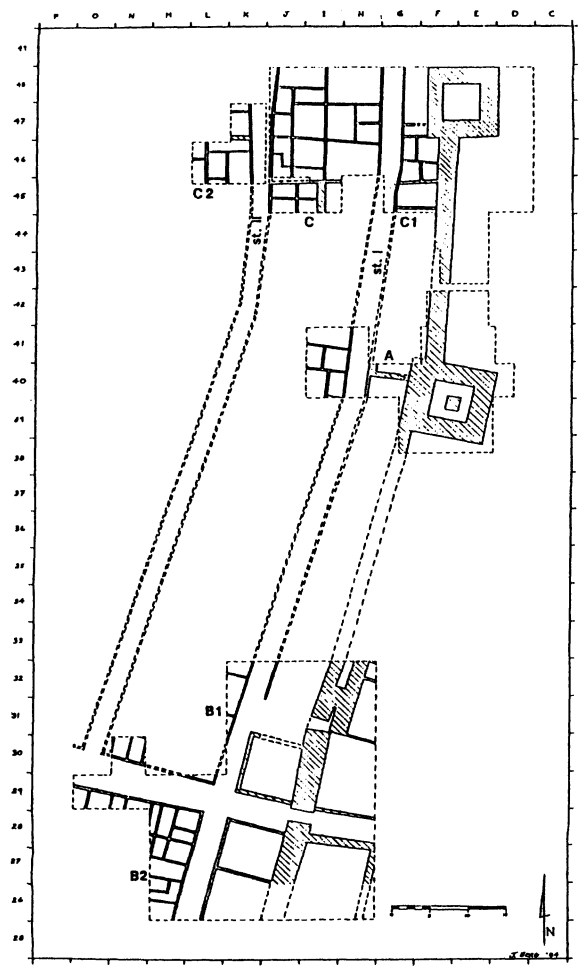

Fig. 1. Tel Dor, Plan of the Eastern edge of the tell: Areas A–C in the Hellenistic period.

the Harvard excavations at Samaria (Reisner and Fisher 1924: 93–133), which used the approach described here. The seemingly distinctive marginal drafting has wide geographical and chronological distribution (Laperrousaz 1974; 1979; Van Beek 1958), and can best be explained on technological, rather than stylistic, grounds. It should therefore not be used indiscriminately to indicate cultural connection. The problem was discussed by Shiloh (1974: 109; 1979: 78), who pointed out several other significant features, among them the type of raw material (see also Shiloh and Horowitz 1975), mason's marks, the technique in which the foundations are laid, the technique of joining course lines of uneven heights, and gap lines between courses (Shiloh 1974: 53 for references concerning their use).

After giving a brief description of the site in the relevant periods and presenting the method of classification and the types of ashlar walls which appear in it, we shall explore each of the cultures mentioned above and their possible influences, and then discuss the impact of the new data on the questions of source, chronology, cultural identity, and influence of Palestinian ashlar architecture.

HISTORY AND ARCHITECTURE OF PHOENICIAN DOR[1]

One of the questions the Tel Dor expedition set out to resolve is when and how Dor came under Phoenician domination, but so far we have no definitive answers. After the biblical reference to Dor as the capital of one of Solomon's provinces in the tenth century B.C. (1 Kings 4:11), there is a gap in textual information, which stretches to the town's destruction by the Assyrians in 732 B.C. (Forrer 1920: 60–61). From the earlier reference, it appears that Dor was not yet Phoenician in the tenth century. An anonymous fourth century geographical treatise, usually referred to as "Pseudo Scylax," mentions Dor as having been "founded by the Phoenicians" (*Geographi Graeci Minores*, I, ed. Muller, 1853: 79). While this statement is obviously erroneous, it may reflect the fact that by the fourth century Dor had already been Phoenician for some generations.

The most impressive structures from this historically "dark" period are a massive mudbrick town wall, uncovered in Areas B and C (fig. 1), and a city gate in Area B. The gate is of the "four-chamber" type, similar to that at Megiddo Stratum IVA. Gates of this type have been found in Israel, Judah, Philistia, and Syria (Herzog 1976: 144–45, 168–69). Though none have been found so far in Phoenicia, the typology of the gate cannot, in all probability, indicate the ethnic or cultural identity of the town at the time.

Smaller than other city gates of this type, the Tel Dor gate is unique in that it is constructed of huge limestone boulders, probably brought at great effort from Carmel. The inner side of the gate, and its connection to the wall, are lined with ashlar blocks hewn from the local soft *kurkar* sandstone.

Little is known at this stage about the domestic architecture relating to this fortification system, which is dated to about the ninth century B.C., since the uppermost Iron Age strata in Area B

were greatly disturbed by subsequent pit excavations and construction. One ashlar wall, opposite the gate square, may relate to this town.

Following the destruction of Dor by Tiglath-pileser III, the town was rebuilt as an Assyrian provincial capital (Forrer 1920: 60–61). Striking confirmation of the written sources is found in two Assyrian seals, the quality of which may indicate the residence of imperial officials at Dor. Architectural evidence for this phase is scant, however. It is not even clear whether the use of the former fortifications continues into this period, whether the "Persian" wall and gate (below) were actually built by the Assyrians, or whether the town was completely unfortified.

Written sources and archaeological evidence agree that by the following Persian period Dor was a Phoenician city. The Eshmunezer inscription records a treaty by which the town was annexed to the autonomous kingdom of Sidon (Gibson 1982: 104–14). Many of the small finds of this period display the hallmarks of Phoenician craftsmanship and have corollaries in coastal sites of Israel and Lebanon (Stern 1982a).

Occupation levels of the Persian period can be grouped into those that relate to the Persian fortification, and later ones; we shall call the latter the late Persian/early Hellenistic phase.

Above the four-chamber gate and the associated mudbrick wall are a thick offset-inset wall of large limestone boulders with some ashlar blocks facing the offset corners, and a gatehouse with two wide rectangular rooms. As mentioned, this fortification system may have already been built during the Assyrian occupation. It was certainly in use, however, till late within the Persian period, and all clear living horizons thus far excavated inside it date to that time. We shall therefore refer to it here as the Persian fortification. Although the Persian gatehouse was built right on top of the Iron Age one, the two differ in that the rooms of the Persian gate appear to have been walled off from the passage. This represents a considerable conceptual and functional difference (Herzog 1976: 141), and such a gate is apparently not in the local Iron Age tradition. Like its predecessor, however, this gate is lined with ashlar blocks.

Two important features of the residential architecture at Dor first appear in the Persian period. Apparently the town plan, which remained unchanged until late Roman times, was first conceived early in the Persian period. Evidence from Areas A and C indicates that Streets I and II (fig. 1) were already in use at that time. Adjoining these streets are orderly insulae, built with orthogonally laid-out walls of standard thickness.

Unlike the Iron Age, in which most walls were made of rubble or mudbrick, the walls of Persian Dor were largely built of *kurkar* ashlar blocks or of combined ashlar and rubble construction.

Sometime within the Persian period, the massive offset-inset boulder wall went out of use. This event may be correlated with one of the Phoenician revolts of the first half of the fourth century. The subsequent town was unfortified. In place of a town wall, the outside wall of the outermost insula, which is excellently preserved in Area C1, was made somewhat thicker than standard and the houses were interconnected so that they presented a continuous blank wall to the outside. At this stage the town plan underwent its final crystallization. One change was the moving of the axis of the town entrance some 3 m to the north, where it remained for the next 600 years. The houses of this phase closely resemble in plan and construction both those of the previous, walled, town and those of the subsequent phase.

Alexander's conquest of Palestine (332 B.C.) seems not to have caused changes at Dor. The intermediate Persian/Hellenistic unfortified town continued to flourish until the middle of the third century B.C. There had been a steady increase in influx of Greek goods and in the manufacture of local imitations since the beginning of the Persian period; by the arrival of Alexander's armies the local inhabitants were probably thoroughly Hellenized.

In the middle of the third century B.C. the town was refortified by a massive ashlar wall with square towers at 45-m intervals. The monumental temple platform at the western edge of the tell, excavated by Garstang (1924b: 65), may have been built at the same time.

The town reached the peak of its prosperity in the Hellenistic period. Dor took an active part in the turbulent politics of the era, figuring, among other episodes in the 219 B.C. campaign of the Fourth Syrian War (Polybius, *Historiae* 5: 66), and in the 139 B.C. civil war between Antiochus VII Sidetes and Tryphon (I *Macc.* 15; Josephus, *Ant.* XIII 7:2). Stern (1982c) gives an ample description of the town in this period and it suffices here to point out the continuity in plan, culture, and building techniques from the previous phase.

The closing years of the second century saw the fall of Dor by treachery to Ptolemy Latiros, king of Cyprus, and his ally, Alexander Jannaeus of Judah (Josephus, *Ant.* XIII 12:2–4). It is not clear if, and for how long, the town was under Hasmonean control, but it was one of the towns granted autonomy by Pompeius at the onset of Roman rule in Palestine (Josephus, *Ant.* XIV 4:4). A further decline occurred, however, when shortly after being annexed to Herod the Great's kingdom, the new port of Caesarea was built on the site of Straton's Tower, a former dominion of Dor (Josephus, *Ant.* XV 9:6). Economic rivalry from this new maritime center was to prove the final downfall of Dor.

This intermediate Hellenistic/Roman phase probably marks the end of Phoenician Dor. Occupation by the Hasmoneans, refounding by the Romans, and annexation to Herod's polyglot kingdom, had probably left few of the original inhabitants in place, and the newcomers were of different ethnic groups. A general mood of neglect is evident in the architecture. Although they still used whatever old ashlar walls remained standing (including the city wall), most of the new walls built in the first century B.C. and the first century A.D. were shoddy rubble constructions. They often reused the handsome ashlar blocks of the previous phase, but invariably overturned them so they lay on their wide face, rather than on their long edge as they originally were meant to.

The description of Dor as a Phoenician town ends here. The town flourished again, but briefly, in the late first and the second centuries A.D. Architecturally, this period is marked by the introduction of massive concrete foundations, and building with square sectioned ashlar blocks, lying wide face down in courses of a single row of stretchers. By the mid-third century A.D., however, the town was reduced to a mere fishing village.

TYPOLOGY OF ASHLAR CONSTRUCTION PATTERNS

All of the construction patterns at Tel Dor have the following common properties:

1. They are made of ashlar blocks, i.e., cuboid-shaped blocks dressed on all sides.
2. All stones in the wall are of the same dimensions.
3. The stones are laid in orderly courses.
4. All of the blocks except for foundation courses are set on their long, thin edge.[2]
5. The height of all courses is equal; this property is derived from points 2, 3, and 4 and is called in classical architecture "isodomic" construction.
6. The wall is built entirely of ashlar blocks, in dry construction.
7. The thickness of the wall is more than the width of a single block, ruling out the simplest of all possible construction patterns—a single row of stretchers, which did not appear at Dor before the Roman period.
8. Bonding is used to prevent the collapse of the wall. A bonding element, connecting the two faces of the wall, is called a "diaton" in classical terminology.

It will be shown below that none of these distinctions are redundant, since most other dressed-stone construction techniques do not possess one or more of these properties. Naturally, where difficulties imposed by the terrain, plan, or raw material occurred, not all of the conditions could be satisfied. In such cases, however, the builders tried to deviate from these rules as little as possible.

Within the class defined above, the following stone-setting patterns are found at Dor:

Header-Stretcher

In this study the designation header-stretcher refers only to a wall in which the blocks are arranged with two stretchers and one header alternating in each course (fig. 2:a). The thickness of the wall is the length of one standard building stone, somewhat more than twice its width. The headers are used as the bonding element and their position is staggered between courses. In the best cases, the headers in all odd and even courses are placed one above the other. At Tel Dor this type of masonry is found in the Persian period—e.g., in the western facade of the house by the gate in Area B—and in the Hellenistic period—e.g., in the eastern facade of Insula C0 in Area C (fig. 3).

Headers Out

The header masonry at Dor can be divided into three subtypes:

Single row of Headers (fig. 2:b1). This type can be found in the Hellenistic period—e.g., the

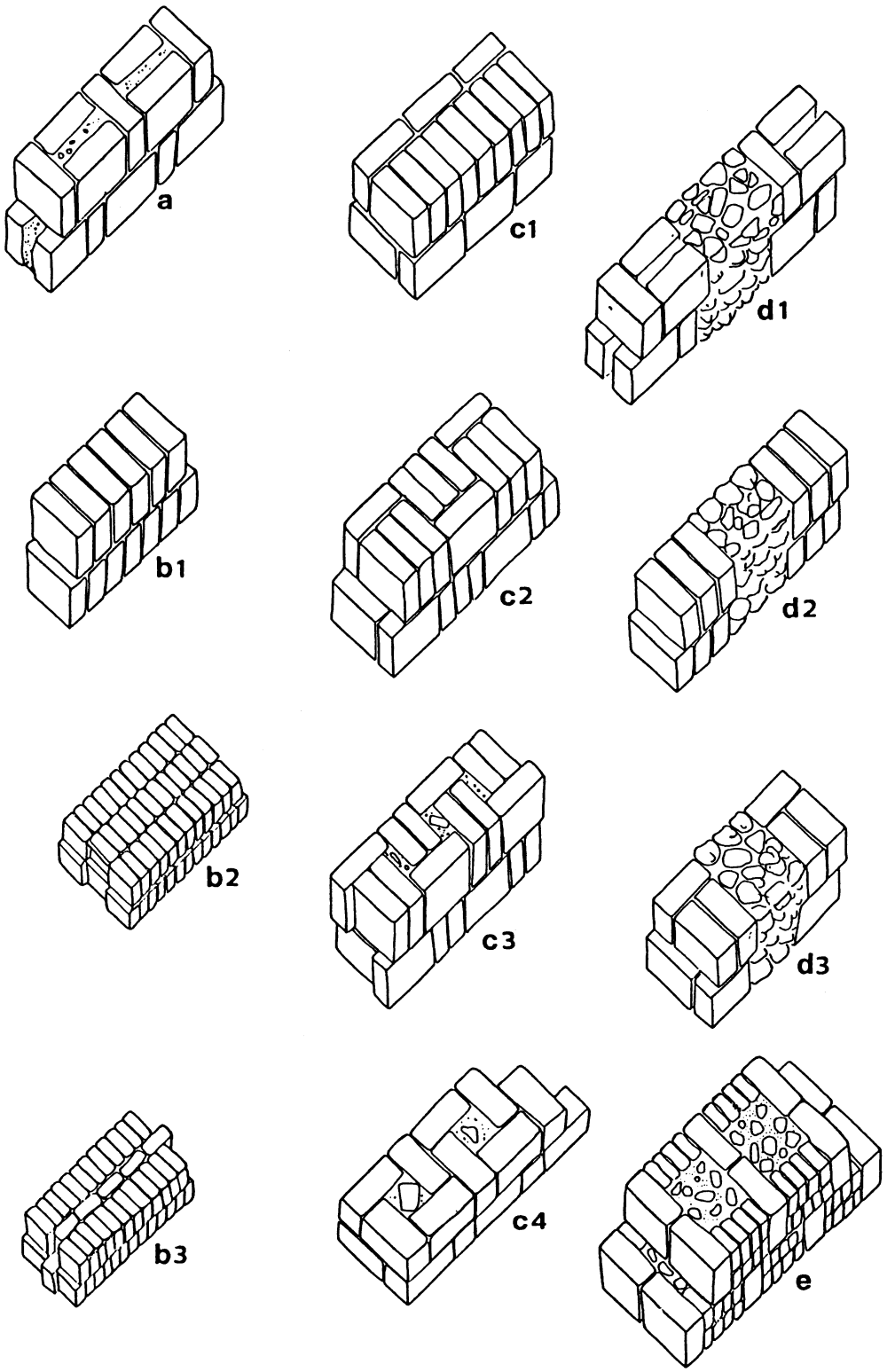

Fig. 2. Ashlar construction patterns, a schematic view. The general patterns are as follows: a = header-stretcher; b = headers-out; c = headers-against-a-stretcher; d = ashlar piers.

Fig. 3. Tel Dor, Street I and the central insula of Area C, Hellenistic period. Note header-stretcher construction of the facade, ashlar piers in most inner partitions, and headers-out at the back right.

wall of the "stairwell" in the central structure of Insula C0 (fig. 3). It was popular in the Persian period; most of the walls in the house by the gate are built that way (fig. 4). One wall built in this technique may date back to the Iron Age, as its level and orientation coincide with those of the four-chambered gate.

Several (usually three) Rows of Headers (fig. 2:b2). Seen from the side, such a wall looks identical to the former, but it is thicker. The sea wall of the Hellenistic temple was built using this technique (Garstang 1924b: pl. 2). Another example of a wall of this type exists in Area B, attributable to the intermediate Persian/Hellenistic phase.

Headers with a Core of Stretchers. This type also looks like "only headers" from the side and it is therefore classified here (fig. 2:b3). It is rare at Tel Dor. A solitary wall of this type is found in Area B in the intermediate Persian/Hellenistic phase.

Headers Against a Stretcher

In this technique headers are set on one face of the wall, with a stretcher against them on the other face. The thickness of the wall is thus one length plus one width of a standard building block. Bonding is achieved by switching the side on which the stretchers are set between courses. Several subtypes can be discerned in this technique also:

Fixed Side. The side on which the stretchers are set is fixed along each course (fig. 2:c1). Seen from the side, the effect is one of alternate courses of headers and stretchers only. The superstructure of the Hellenistic city wall in Area A was built in this style (fig. 5).

Fig. 4. Tel Dor, Area B, house adjacent to the city gate, Persian period; headers-out construction.

Alternate Sides. The wall is divided into units of one stretcher against a number (two to four) of headers. In each such unit, the side on which the stretcher is set is reversed (fig. 2:c2). From the side, a single stretcher is visible, followed by several headers alternately in each course.

"Braid" Pattern. This technique is similar to the former, except that the bonding is improved by interlocking each two adjacent units together (fig. 2:c3). Some ashlar piers in the thick outside wall of the intermediate Persian/Hellenistic town were constructed in this manner (fig. 6).

Interlocked squares (fig. 2:c4). This technique is similar to the last, except that each unit is laced within itself rather than bonded to adjacent units.

Ashlar Piers in Rubble Walls

In addition to the above types of pure ashlar construction, some techniques were seen that mixed ashlar blocks with rubble construction.

Fig. 5. Tel Dor, Hellenistic city wall and tower in Area A. Headers-against-a-stretcher pattern is seen at the back of the tower, headers-out in the central pilaster. The foundations are constructed in the compartment building technique; note the "diatons"—large headers projecting from both faces into the rubble fill, dividing it into a series of constructional compartments.

Fig. 6. Tel Dor, Area C1, outer wall of the town in the intermediate Persian–Hellenistic phase, with "braided" header-against-a-stretcher ashlar piers. In the front is a section of the Hellenistic city wall, which cuts the outer insula of the intermediate phase, constructed in the compartment building technique.

The wall was built of alternating segments of ashlar and rubble, retaining the strength and durability of ashlar construction at a considerable discount of raw material. To improve the bonding between segments, the "stitch" between them was dovetailed. This technique can also be divided into subtypes, according to the pattern in which the blocks are set in the ashlar pier:

Header–Stretcher (fig. 2:d1) was the most common type of ashlar pier construction. Most of the walls of the Hellenistic residential insula in Area C were built that way (fig. 3), as well as most walls in the Persian insulae in Areas A and C2 (fig. 7).

Ashlar piers built in the ***header only*** pattern (fig. 2:d2) are found at Tel Dor mainly in the Persian strata. Area A contains some fine examples of them.

The pattern of ***headers against a stretcher*** in an ashlar pier (fig. 2:d3) is rare at Tel Dor. One example has already been cited, for the "braid" subtype. Another appears in Area B in the Persian period.

Ashlar Facing of Corners and Doorjambs

This use of ashlar blocks has a wide chronological and geographical distribution, and its value as a cultural indicator is therefore low. It is mentioned here only to complete the picture of use of ashlar masonry at Tel Dor. In both the Persian and the four-chamber Iron Age gates the gate pilasters were faced with ashlar blocks, as were the offset corners of the Persian town wall.

Compartment Building

This technique appears at Tel Dor in the foundations of the Hellenistic city wall. The face of the wall was built of ashlar stretchers, or medium-sized semihewn stones set as headers, while at fixed intervals two large headers were set, one

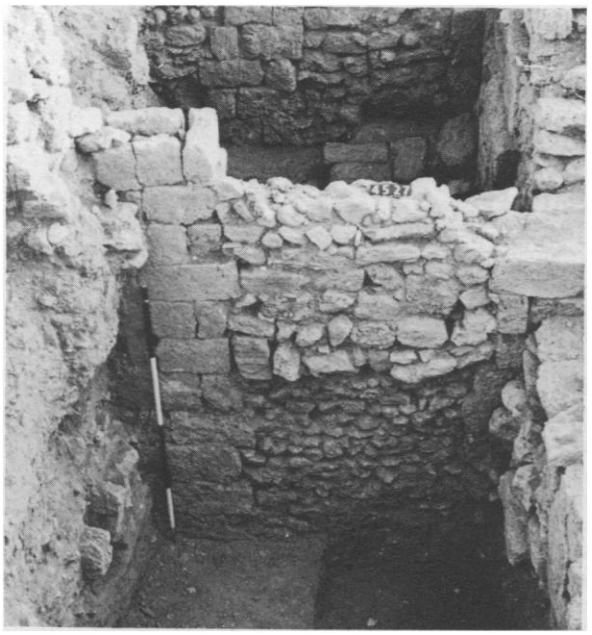

Fig. 7. Tel Dor, ashlar pier construction in the Persian period, Area C2.

from the outer face and one from the inner, so that they crossed the rubble core of the wall and met at its center, forming a construction partition that divided the wall into a series of rubble-filled compartments. The height of the headers forming the partitions was usually twice that of the small ones forming the face of the wall. Where the length of the two headers was not sufficient to cross the width of the wall, additional headers were inserted into the partition. The position of these inner partitions was staggered every course (fig. 2).

CONSTRUCTION COROLLARIES IN PALESTINE AND THE PHOENICIAN COAST

The question of Palestinian ashlar construction in the Iron Age has been discussed by several researchers in the last decade. Three such studies that are extensively dealt with here are: Shiloh (1979) on the protoaeolic capital and Israelite ashlar architecture; Stern (1976; 1978) on Phoenician elements in architecture; and Van Beek and Van Beek (1981) on Canaanite and Phoenician architecture.

Shiloh's monograph (1979: 50–86), based on his doctoral dissertation (1974), is the most extensive research on the subject, containing a full corpus up to the date of publication; it is the cornerstone for any subsequent treatment of the earlier period. Shiloh's main argument is that, notwithstanding the contrary interpretation of the literary references, the weight of archaeological evidence points to an Israelite origin for the Palestinian ashlar building culture of the Iron Age. Its geographical distribution is limited to the kingdoms of Israel and Judah, and its chronological span to the tenth–ninth centuries B.C. Shiloh recognizes the affinity of the "pure" ashlar building technique with ashlar piers in rubble wall construction, the appearance of the latter technique in Phoenician sites, and its continuity from the tenth to the third century B.C. In spite of this he concludes that Israelite ashlar architecture is unrelated to other ashlar techniques and has no connection with or continuity in foreign cultures (Shiloh 1979: 114).

Ashlar piers in rubble walls is the subject of Stern's discussion (1976: 17–27 and again, with only slight changes, 1978: 71–75). He lists occurrences of this technique in Israel and Phoenicia and quotes Pritchard (1971: 17, 19–20) for its existence in the Phoenician colonies in the west. Stern argues that this technique is Phoenician. He does not, however, extend this argument to full ashlar construction.

Stern's reasoning, and his conclusions, are closely followed by Elayi (1980), whose main innovation is the introduction of a typology of ashlar pier construction techniques, similar to the subtyping proposed above for ashlar pier walls. She confuses the issue somewhat, in our opinion, by discussing ashlar pier construction and ashlar facing of rubble walls together. The resulting chronological and geographical ranges are too broad (see below).

Van Beek and Van Beek (1981) equate the ashlar pier in rubble wall technique with monolithic column construction, arguing that both are Phoenician in origin and that they spread from Late Bronze age Phoenicia all over Palestine, to the western Phoenician colonies, to Greece, and to Roman North Africa, where they can be found as late as the sixth century A.D.

These arguments can now be evaluated in light of the Tel Dor material, using the typology proposed above. The material is summarized in Tables 1–3. Table 1 lists the occurrence of construction patterns found at Tel Dor in sites in present day Israel, Jordan, Lebanon, and Syria. This table is based on Shiloh's work (1979) and on additional

TABLE 1. Locations and Types of Ashlar Construction

Site	*Stratum*	*Period*	*Types of Construction*	*Reference*
Megiddo	IVB/VA IVA	10th–9th century B.C.	header-stretcher; headers-out, one row; ashlar piers-header stretcher	Yadin 1970: pl. 9 Schumacher 1908: pl. 29
Samaria	I–II	9th century B.C.	header-stretcher; headers-out, one row; headers-out, several rows; headers-against-a-stretcher, alternate sides; headers-against-a-stretcher, braided.	Reisner and Fisher 1924 vol. I fig. 26, 38; vol. II: plan 5. Crowfoot 1942: figs. 47–50
Samaria		4th–3rd century B.C.	header-stretcher; headers-out, several rows; headers-against-a-stretcher, fixed side; headers-against-a-stretcher, interlocked squares.	Reisner and Fisher 1924, vol. 1: figs. 53, 57; Crowfoot 1942: 117–21.
Beth-Shan	V	9th century(?)	header-stretcher	Rowe 1940; vol. II: fig. 2 James 1966: 151
Dan	Stages III–V	10th (end)–9th century B.C.	header-stretcher; headers-out, single row	Biran 1982: figs. 4, 12
Dan		Hellenistic	header-stretcher; headers-against-a-stretcher	Biran 1982: 15, fig. 2
Tyre		8th century B.C.	header-stretcher; ashlar piers	Bikai 1978: pl. 89:2
Sarepta	"first Iron Age stratum"	8th–7th century B.C.(?)	ashlar piers.	Pritchard 1971: 20
Ramat Raḥel	VA, VB	8th–7th century B.C.	headers-against-a-stretcher, alternate sides; headers-out, single row	Aharoni 1964 figs. 22, 23, 25
Ḥesban		7th century B.C.	headers-against-a-stretcher, alternate sides	Boraas and Horn 1975: pl. 4
Jaffa		Persian	headers-out, several rows; ashlar piers; header-stretcher	Kaplan 1959: 78, pl. 17; Ritter-Kaplan 1982: 64
Jaffa		3rd century B.C.	header-astretcher	Kaplan 1959
Makmish (Tel Miḥal)		Persian	ashlar piers; header-stretcher	Avigad 1960: pl. 9
Tel Kudadi (Metsad Ha-Yarkon)		Persian	ashlar piers	Sukenik 1938: 167
Tel Mevorakh		4th century B.C.	ashlar piers; header-stretcher; headers-against-a-stretcher, alternate sides.	Stern 1978: fig. 8
Tel Mevorakh		2nd century B.C.	headers-against-a-stretcher, fixed side; headers-against-a-stretcher, interlocked squares	Stern 1978: pl. 8
Yoqneam	7	Late Persian	ashlar piers	Ben-Tor, Portugali, and Avishar 1983: 33
Tel Abu Hawam	II	6th(?)–4th century B.C.	ashlar piers; headers-against-a-stretcher	Hamilton 1934: pl. 1, 2
Akko		Late Persian	ashlar piers	Dothan 1976: 21, 27, fig. 29
Akko		3rd century B.C.	headers-out, several rows; header-stretcher core; headers-against-a-stretcher	Dothan 1976: 41 figs. 43–44

TABLE 1, *continued*

Site	*Stratum*	*Period*	*Types of Construction*	*Reference*
Kharayeb		4th century B.C.	ashlar piers, headers-against-a-stretcher.	Chehab 1952: Plan B.
Tel Kazel		Persian	ashlar piers	Dunand, Bounni, and Saliby 1964: pl. 4
Tabaat el-Hammam		Persian	ashlar piers	Braidwood 1940: pl. 21
Amrith		5th–4th century B.C.	ashlar piers, headers-against-a-stretcher	Dunand, Saliby, and Kirchian 1955: 193–196, pl. 1
Ashkelon		Hellenistic	?	Garstang 1924a: fig. 4
Oum el-Amed		Hellenistic	header-stretcher; headers-out, single row; headers-against-a-stretcher, alternate sides	Dunand and Duru 1962: pls. 8, 44
Tel Sukas	E	Hellenistic	headers-out, single row; ashlar piers	Riis 1970: fig. 39, pl. 4
Arwad		?	headers-out	Savignac 1916: fig. 7; Frost 1966: fig. 1
Athlit		?	headers-out	Raban 1984: 250–53
Beiruth	V	?	headers-out, single row; ashlar piers; header-stretcher	Forest and Forest 1982: figs. 29–34

data published after his corpus. Table 2 summarizes the chronological range of these patterns. Table 3 shows the connections among the different techniques by listing joint occurrences of two or more in the same building assemblage. Figure 8 shows the geographical distribution of these techniques.

Ashlar facing of walls, doorjambs and corners has been excluded from discussion here. Shiloh (1979: 52, 56, 58) noted its appearance in Hazor, Taanach, Jerusalem, and Gezer. Ashlar facing of mudbrick walls appears at Tel Sharia (Oren 1982: 162–63) and Ashdod (Dothan and Porath 1982: 19). This technique is found already in the Late Bronze Age, a most significant example being in the Strata X–VIII gate of Megiddo (Shiloh 1979: pl. 35). Most of the ashlar construction in Late Bronze Age Ugarit should also be classified under this heading (Shiloh 1979: 73). Shiloh surmises that ashlar facing in the Late Bronze Age formed a variant of the more common orthostat construction, differing only in the height/thickness proportion of the blocks (Shiloh 1979: 79–80). However, we can detect no architectural difference between these instances in the Late Bronze, and the Iron Age ashlar facing that may be derived from them or alternatively, as Shiloh claims, may form a part of the assemblage typified by the techniques discussed above, which are not found before the tenth century B.C.

ASHLAR CONSTRUCTION ABROAD

Egypt

Egyptian construction techniques have been extensively studied by Clarke and Engelbach (1930). The following points are summarized from their work:

1. Walls one stretcher thick are most common.
2. Usually, the shape of Egyptian building stones is not cuboid, but trapezoid. Bonding within the wall is achieved by the oblique shape of the joints between the stones in each course (Clarke and Engelbach 1930: 97).
3. Uncoursed walls (hewn stones of different heights) are widely used (Clarke and Engelbach 1930: 100).
4. Dowels and clamps are commonly used to improve the bonding within the walls.

TABLE 2. Chronological Range of Types and Locations

Type	*Iron Age*		*Persian*	*Hellenistic*
	10th–9th century B.C.	*8th–7th century B.C.*	*6th–mid-4th century B.C.*	*Mid-14th–2nd century B.C.*
header-stretcher	Megiddo Samaria Beth Shan Dan	Tyre	Kharayeb Dor	Jaffa Dan Oum el-Amed Dor
headers-out	Megiddo Samaria Dan	Ramat Raḥel Dor(?)	Jaffa Kharayeb Dor	Oum el-Amed Tell Sukas Dor
headers-against-a stretcher	Samaria	Ramat Raḥel Hesban	Tel Mevorakh Dor	Tel Mevorakh Dan Oum el-Amed Dor
ashlar piers	Megiddo	Tyre Sarepta	Jaffa Makmish Tel Kudadi Tel Mevorakh Yoqneam Tel Abu Hawam Akko Amrith Tel Kazel Tabaat el Hammam Dor	Sarepta Tel Sukas Dor
compartment building				Samaria Dor

None of the construction patterns found at Dor appear in Egypt. Indeed, one of the striking peculiarities of Egyptian construction is the absence of bonding between the faces and the core of the wall (Clarke and Engelbach 1930: 113). Real ashlar construction (including the header–stretcher pattern) appears in Egypt rather late, at the end of the Hellenistic era or the beginning of the Roman.

Greece

Recent research has pushed back the reappearance of hewn-stone architecture in Greece to the Geometric period (e.g., Old Smyrna; Winter 1971: 135). Still, such construction appears in Greece rather later than Iron Age ashlar construction in Palestine.

Facades of temples and public buildings were usually built with single-stretcher thick walls from the Archaic period on. The blocks are bonded with metal dowels and clamps (Martin 1965: 239–96). Other characteristics are the marks left by the lifting and adjusting tools (Martin 1965: 231–38), and the "anathyrosis" jointing technique—flat drafting on the margin, with rougher work in the slightly concave center (Martin 1965: 190–200, fig. 81). Such construction did not appear in Israel before the middle of the Hellenistic period, and rarely afterwards. Araq-el-Emir is probably the earliest monument constructed with a single stretcher wall bonded with clamps (Dentzer, Villeneuve, and Larché 1982: 202) and it is dated to the first half of the second century B.C.

Looking for possible corollaries to the construction patterns discussed here, we turn to functional walls such as fortifications, retaining walls, and residential architecture. The basis for the typology of Greek construction techniques is supplied by Scranton (1941: 16–24) whose terminology is still used, although his chronological conclusions are no longer accepted (Winter 1971: 80–82). Scranton classified the hewn stone architecture according to the following scheme: Multilateral—curvilinear (Lesbian) or polygonal;

TABLE 3. Joint Appearance of Two Types in the Same Building Complex

	Headers-out	*Headers-against-a-stretcher*	*ashlar piers*	*compartment building*
header-stretcher	Megiddo Samaria Dan Oum-el-Amed Dor	Samaria Dan* Oum-el-Amed Dor	Megiddo Tyre Dor	Samaria* Dor*
headers-out		Samaria Ramat Raḥel Akko* Oum el-Amed Dor	Tell Sukas Megiddo Jaffa Beirut Dor	Samaria* Dor*
headers-against-a-stretcher			Mevorakh Dor	Samaria* Dor*
ashlar piers				Dor*

* Hellenistic

and Quadrilateral—trapezoid or cuboid (ashlar). With the cuboid subgroup are irregular (uncoursed), isodomic (with all courses of the same height), and pseudoisodomic (courses of different heights). All of the patterns found at Tel Dor can be classified within the "isodomic" subtype.

Scranton himself later added another type and coined the term "compartment building" to describe the construction of a late fourth century B.C. wall in Athens (Scranton and Thompson 1943: 303–4). Winter (1971: 135) claims that the use of this technique began somewhat later than other Greek construction techniques, and that earliest examples being datable to the early fourth century B.C. Tomlinson (1961: 135) argues for the delineation within ashlar masonry of the header-stretcher pattern, which he claims is what Vitruvius (II 8.7) called "Emplekton" masonry. The term means "interwoven" and indeed, a well-built header-stretcher wall, seen from the side, looks not unlike woven cloth. Vitruvius maintained that the advantage of this construction was in the superior bonding between the faces, achieved by the "diatons" connecting the two faces of the wall. Several authorities interpret "interwoven" as reflecting not the appearance of the wall but the fact that both faces and the fill are thus "woven" together. Martin (1967: 52–53) shows several methods of achieving such bonding within ordinary isodomic or pseudoisodomic construction, other than header-stretcher. Even if we accept Tomlinson's arguments, header-stretcher and compartment building both fit Vitruvius' description.

Of all these techniques, only header-stretcher and compartment building appear at Tel Dor—or in Palestine—before the latter part of the Hellenistic period. None of the various "more headers than stretchers" techniques, abundant at Tel Dor and in Palestine, are found in the Greek world, at least not systematically, although a possible appearance of "headers against a stretcher" is in the "White Poros Wall" at Athens ca. 200 B.C. (Scranton and Thompson 1943: 341).

Anatolia

Architecture in Anatolia in the second half of the first millennium B.C. was heavily influenced by Greece, particularly in the west. (Phrygian or Urartian architecture will not be discussed here.)

Most of the observations about Greek construction hold true for western Anatolia, but some regional peculiarities do exist: The discovery of very early ashlar construction in Old Smyrna has been mentioned. Hewn stone architecture may have been introduced to Greece from Asia Minor, but evidence for this is insufficient to draw the conclusion unequivocally. At Sardis, the excavators have pointed out a characteristic masonry style, found in the strata of the sixth and seventh

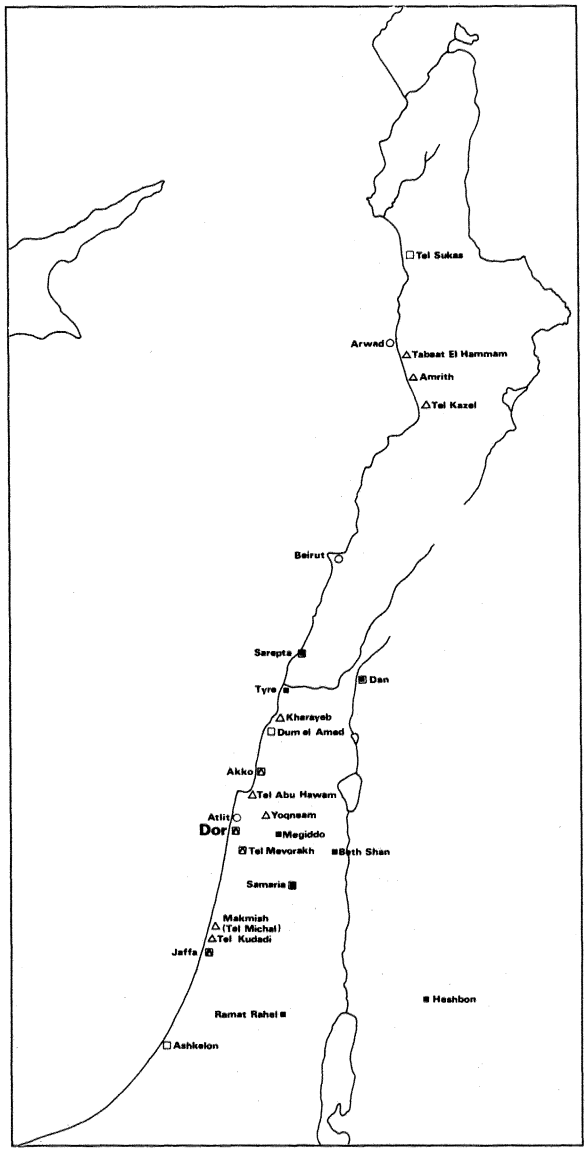

Fig. 8. Sites in the eastern Mediterranean in which construction patterns discussed in this study appear. ■ = Iron Age; Δ = Persian; □ = Hellenistic; O = undated.

centuries, which they call "Lydian Masonry" (Ramage 1972: figs. 5, 6). We see here long, thin, orthostat-like ashlar blocks facing a rubble wall. The margins are finished with a flat tool, while the flat center is pecked. The joints between blocks are in the "anathyrosis" technique (Hanfmann 1965: 33). Similar construction is found in the tombs of Bin Tepe. Nylander (1970: 86) brings corollaries from Monodendri, Naxos, Miletus, Chios, Ephesos, Samos, Paphos, and Lesbos. Martin (1965: 406–9) claims that header–stretcher construction appears more often in Asia Minor than elsewhere. He attributes this phenomenon to Eastern influence, and points to Assyrian ashlar architecture as a possible source of the technique.

Persia

Ashlar masonry is found in Achamenid Persia only in royal monuments such as the temples and palaces in Persepolis and Pasargadae, or in tombs such as Cyrus' tomb monument at Pasargadae. Nylander (1970) published an extensive monograph on Persian ashlar masonry, and his conclusions are as follows:

1. Ashlar masonry appeared suddenly, fully developed, in the sixth century B.C.
2. Due to the state of preservation, ashlar construction is known only in podia and tomb monuments, only as facing to massive stone fills.
3. The blocks were always set as stretchers and no attempt was made to bond the facing with the fill.
4. The usual finish was marginal dressing with a flat chisel. The margins appeared on all four sides and were of uniform width. The center was either left raised and rough, or flattened and pecked with a toothed instrument. Nylander claims that the former style was not intentional, but was the result of unfinished construction.
5. The jointing of the blocks was achieved with the aid of anathyrosis.
6. The blocks bear the marks of lifting and adjusting instruments.
7. There was extensive use of claims and dowels for bonding.

The last five findings are common in Greek construction but are altogether missing in the masonry style we are discussing. The similarity between Persian and Lydian construction is particularly striking. Nylander concludes that royal Achamenid construction was done under Greek influence, perhaps by Lydian craftsmen.

Cyprus

Ashlar construction in Cyprus in the first millennium starts in the seventh century B.C., with the exception of the "Phoenician" temples in Kition, which were reconstructed Bronze Age structures (Karageorghis 1976: 96–97).

Ashlar architecture was fairly widespread in the sixth to fourth centuries. Fine examples can be

seen in tombs in Salamis (Karageorghis 1967: 24, 53, pl. 4.39) and elsewhere (Gjerstad, 1948: pls. 12, 13), all dated to the Archaic period. It is also found in residential architecture in the palace of Vouni (Gjerstad 1937: 111–229), dated to the fourth century B.C. The characteristics of Cypriot ashlar construction in the first millennium are:

1. The blocks were usually long and thin.
2. In a large number of the walls stones of different sizes were used, with no regular courses.
3. The usual construction pattern is mainly stretchers, though some headers are found, along with a few examples of regular header–stretcher construction.
4. Pseudoisodomic construction (bonding by a thin course of lying blocks) was used occasionally.
5. There are some cases of marginal drafting, with a pecked central boss. All of these attributes are found in Greek construction of the same period. There is a special affinity between the late Cypriot ashlar construction and "Lydian" construction. On the other hand, of all the construction patterns common in Palestine and on the Levant coast, we find in Cyprus only header–stretcher.

Western Phoenician Colonies

Punic architecture was heavily influenced both by local building traditions, which varied from colony to colony, and by Greek construction techniques. Only those techniques that can perhaps be claimed to have an eastern origin will be discussed here.

Header-only construction. The German excavations at Toscanos in southern Spain (Niemayer and Schubart 1973: 224–25, fig. 76), uncovered a town wall, dated to the eighth to seventh century and built of a single row of headers. Some of these headers have irregular marginal dressing along two or three sides. The excavators claim that the closest parallels to such a wall are found in Samaria and Ramat Raḥel (Barreca *et al.* 1971: 55).

Some other header-only construction occurs at Phoenician sites in the western Mediterranean, notably the "Cothon" at Motya (Isserlin and Du Plat Taylor 1974: 17.2) and the quay of the commercial harbor of Carthage (Stager and Hurst 1978: pl. 1b). However, harbor installations should perhaps be excluded from this discussion as their construction was dictated by special problems.

Compartment building. This type of construction appears in Motya (Ciasca 1976: fig. 15:2, pl. 5; 1977: fig. 46:1), where it is dated to the sixth or fifth century B.C. The unusual dressing (Ciasca 1968: pl. 11) has oblique margins. Such dressing is occasionally found in the Greek world. The only corollary in Israel is at Hellenistic Samaria (Crowfoot, Kenyon, and Sukenik 1942: 25–27).

"A telaio." This is a term given by Italian excavators (it is somewhat freely translated as "in frames") to a technique that incorporates columns of large ashlar blocks standing on their shortest face in a rubble wall. In Nora, southern Sardinia, the extraordinary preservation shows several such "monoliths" standing one on top of the other (Pesce 1961: pl. 57). Some well preserved examples have been found at Motya, identified as Phoenician construction by Whitaker (1921: 160). This technique appears both in inner walls and facades, and even in free-standing walls. Isserlin and Du Plat Taylor (1974: 90–91) claim that all *a telaio* walls in Motya date to the latest Phoenician occupation of the colony, during the fifth to fourth century B.C.

The same style is found at other Phoenician sites in Sicily. Among them are Selinunte, in the third century (Di Vita 1953: 39–40) and Solunto (Tusa 1966: pls. 20, 21). It is also found in Sardinia, at Cagliary (Di Vita 1953: 44), Tharros (Ciasca 1975: pl. 25.3), and Nora (Pesce 1961: 76), where it is dated to the seventh to the second century B.C.

In North Africa this technique is somewhat scarcer. Instances can be found in Kerkuan, Tunisia (Fantar 1970: pl. 21), dated to the fourth to third century. Stager (1984: 41) notes evidence for the use of this technique in the robber trenches left of the harbor warehouses at Carthage (third century). A very similar construction, called "Opus Africanum" is found in the Late Roman period (second to sixth centuries A.D.) along the North African coast, from Ptolemais in Libya to Djamilla in Algiers (Van Beek and Van Beek 1981: 72).

Isserlin and Du Plat Taylor (1974: 90–91) conclude that the *a telaio* technique appears late (fourth century B.C. or later) in the western Phoenician colonies (they apparently disregard the early dating at Nora).

In the Monte Sirai report, Barreca *et al.* (1964: 17) identify a technique that they call "*pseudo a telaio*" and raise the possibility that true *a telaio* developed from it.

DISCUSSION

Origins

Several facts emerge from the last two sections: First, the three pure ashlar construction patterns—header-stretcher, header only, and headers-against-a-stretcher—are all variants of a single construction style, evidenced by their joint appearance in all sites except those in which ashlar construction has but few occurrences. The "ashlar pier" technique is also part of the same tradition, both because of joint distribution, and because the ashlar piers themselves are always constructed in one of these three patterns. These techniques are found in sites in Israel and along the Lebanese and Syrian coast, at least from the Iron Age II. If we use these patterns as the typological criterion for ashlar construction, we can rule out Egypt or the East as a possible source of this construction in Persian-Hellenistic Dor.

"Header-stretcher" and "compartment building" appear in Greek architecture (and satellite building cultures such as the west Anatolian and Cypriot) as part of a different complex of techniques. "Headers out," "headers-against-a-stretcher," and "ashlar piers" are not found in Greece. Conversely, Greek techniques other than "header-stretcher" and "compartment building" are not found in Dor or Palestine before the middle of the Hellenistic period.

The fact that a single technique is found both in the local and the Greek building traditions does not seem to imply a connection between the two, since there is no way to explain such selective imitation. Rather, it is possible to view the "header-stretcher" technique as the common optimum point of two different lines of development, the "mainly stretchers" tradition in Greece and the "more headers-than-stretchers" Palestinian architecture.

If some sort of a connection is nonetheless assumed, its direction would have to be from Palestine to Greece, because such masonry appeared earlier in Palestine and because of the postulated eastern origin of Greek "header-stretcher" technique (Martin 1965: 406–9). Martin's parallel is from Assyria, where bonding does not appear to have been a major factor. In fact, a Palestinian origin would be a better choice in this case. That at least one integral part of the Palestinian ashlar construction tradition did find its way to Greece is obvious from the introduction of the Aeolic capital there. Shiloh (1979: 50) discusses the connection between the proto-Aeolic capital and Iron Age ashlar architecture, and Betancourt (1977: 115–17) traces its diffusion to Ionia.

Compartment building is found in Greece, Italy, and Sicily (including the Phoenician colonies) in the sixth and fifth centuries B.C., but it appears in Palestine (Dor and Samaria) only in the third. It is therefore best explained as a Greek import and it remains the only evidence for the use of a Greek construction technique at Dor before the first century B.C. Other early instances of Greek influence on construction techniques in Palestine may include the obliquely beveled margins for ashlar blocks in Hellenistic Samaria, found in Greece and the Phoenician colonies in Sicily in the fifth century B.C., and the occasional use of dowels and clamps, as in Araq-el-Emir. Such influence before the mid-second century B.C., however, remains sporadic.

Chronology

The focus on the pattern of stone setting, rather than on shape or dressing, supports Shiloh's contention (1979: 83–86) that "Israelite" ashlar construction starts in the tenth century B.C., as opposed to the view that it had Late Bronze Canaanite, Cypriot, Syrian, or Anatolian antecedents (Van Beek and Van Beek 1981: 71). While scattered cases of ashlar facing to rubble walls may be found during the Late Bronze Age in all of these regions alongside the more common orthostat construction, none of the other patterns existed before Iron Age II. Contrary to Shiloh's opinion (1979: 68), however, there was no gap in ashlar construction between the ninth century and the Hellenistic period (Table 2). The gap observed by Shiloh in 1979 was an artifact of the few excavations of coastal sites available at that time and the scarcity of ashlar architecture in the kingdom of Israel in the eighth through sixth century B.C. The monumental architecture of the beginning of the Hellenistic period then, is not evidence of Greek influence but rather a continuation of local traditions.

Development

Thus far this study has stressed the homogeneity of the building tradition throughout the 700 years of its existence. The question now is if any stylistic

development may be traced in it. There seems to be no straightforward answer. The following are but possible directions of evolution.

1. Whereas the "header-stretcher" and the "headers-out" patterns are found already in the tenth century (Megiddo stratum IVB–VA) the "headers-against-a-stretcher" technique is first found, as far as is now known, only from the ninth century, in Samaria.
2. Within the "headers-against-a-stretcher" pattern the subtype in which the stretcher side is fixed is found only in the Hellenistic period.
3. There may have been a tendency to use thinner, higher blocks in the later periods. The popular cross section in the tenth and ninth centuries B.C. was nearly square, while the height:width ratio may be 2:1 or even 3:1 in the Hellenistic period.
4. Shiloh (1979: 78) discusses the phenomenon of "gap lines" between ashlar courses. No such gap lines are recorded in buildings later than the ninth century.
5. The later the construction, the less use was made of irregular marginal drafting, in favor of a smooth finish. Marginal dressing was found at Dor in the Persian period, but is rare. It seems even rarer in the Hellenistic period, although some examples may be cited. In contrast, regular-width margins with a "rusticated" boss were popular in late Hellenistic ashlar architecture in Palestine.

Geographic Distribution

As can be seen in fig. 8, the center of ashlar construction was on the northern coast of Israel, so far as can be established by current data. It reaches as far north as Tell Sukas at the mouth of the Orontes and as far south as Ashkelon. It is not found, however, in inland Syria or in the Lebanon valley. In Palestine, evidence of ashlar construction diminishes, both in number of sites and in scope of construction, as one moves south or east from the valley of Acco and the Sharon.

Examination of the temporal changes in distribution reveals the following picture: During Iron II, ashlar architecture appeared on the Lebanon coast and in royal centers in Israel, Judah, and Moab. Of the latter three, it was most prevalent in Israel. Ashlar construction disappeared in the Kingdom of Israel with the beginning of Assyrian pressure in the eighth century B.C, but it continued in Judah and Moab until the Babylonian conquest. In the Persian period ashlar construction—mainly the economic ashlar pier technique—was common in the small sites along the coast, reaching as far south as Jaffa. Unlike in the Iron Age, there is not a single instance recorded outside the coastal plain and the western Jezreel Valley. The pattern established in the Persian period persisted to the early Hellenistic period. More cases of pure ashlar construction are found alongside the ashlar pier technique, and ashlar architecture spread also to some Hellenized centers outside the northern coastal strip, e.g., Samaria and perhaps Ashkelon.

The Cultural Attribution

Shiloh (1979: 83–84) holds that the archaeological evidence is that Iron Age ashlar architecture was Israelite, rather than Phoenician. The results of this reexamination tend to support the more common opposing view, for several reasons: It is impossible to ignore the explicit biblical references to Phoenician masons' involvement in the building of royal monuments in Israel and Judah (2 Sam 5:11; 1 Kings 5:30). The excellence of Phoenician stone construction in later periods is attested in Greek sources (e.g., Arianus, *Anabasis* II 21.4). The geographical distribution of ashlar construction is markedly coastal (with the exception of royal centers in Israel, Judah, and Moab in the Iron Age and Samaria in the Hellenistic period). The chronological range, and especially the flourishing ashlar construction in the Persian and early Hellenistic period, fit that of Phoenician culture.

It is reasonable to suppose that a tradition will be kept through hard times where it has the deepest roots, but will be abandoned where it is only superficial. After the eclipse in building activity in the Assyrian and Babylonian periods, ashlar architecture reappeared at Phoenician sites, but never inland.

Of Shiloh's arguments against a Phoenician origin, the only one that remains valid is the assertion that the earliest ashlar-built sites (tenth century), are found not in Phoenicia, but in Israel. The same is true, however, for most other material remains of the Phoenician culture (no major group of "Phoenician" ivories, for instance, has ever been found in Phoenicia proper).

Ashlar and A Telaio *Construction*

Frequently quoted opinion notwithstanding (Pritchard 1971: 17–20; Stern 1976: 22; Isserlin

(Pritchard 1971: 17–20; Stern 1976: 22; Isserlin and Du Plat Taylor 1974: 91), there seem to be no exact parallels to the western *a telaio* techniques in the east, nor are there cases of real "ashlar pier" construction in the west. There is some justice in Van Beek and Van Beek's (1981: 72) equation of the *a telaio* with Palestinian monolithic column construction, but again, the two are not identical. In all three techniques the wall that is constructed will bear weight only at certain points rather than along its entire length. There, however, the resemblance among the three techniques ends. In *a telaio* and monolithic column construction the piers are made of large upright-standing stones. This is never the case with ashlar pier architecture. On the other hand, in *a telaio* and ashlar pier construction, the pier and the fill are built at the same time and dovetailed together, something that is never done in monolithic column construction, where the column is structurally independent and the rubble partition is added later, if at all. Also, whereas *a telaio* and ashlar piers are found in all types of structures and in internal, external, and free-standing walls, the monolithic column technique is limited to the longitudinal divisions of the four- or three-room house, and in the longitudinal divisions of standard stable or storeroom buildings, as has been shown by Shiloh (1970: 182; 1971: 278).

In addition to structural differences, other factors also argue against equating any two of these three techniques. The lack of any joint occurrences of *a telaio* and ashlar pier has already been mentioned. The same holds true for *a telaio* and monolithic column construction; we know of no free-standing columns in *a telaio* buildings.

The separation is not as clear between ashlar pier and monolithic columns, both of which appear in Iron Age Palestine; but here also there are differences in geographical distribution, a northern–coastal center for the ashlar piers as against a primarily southern and inland distribution for monolithic columns. There may also be chronological differences; Shiloh (1970: 180) argues for an eleventh to sixth century range for monolithic columns. The beginning of this technique may actually be stretched back, following recent discoveries, to the 13th or 12th century (Mazar 1985: 180). Ashlar pier construction, on the other hand, ranges from the tenth to the second century B.C. In two cases only—Megiddo and Tel Abu Hawam—the two techniques appear side by side, but even there they never appear in the same building.

Late Hellenistic Building Techniques

Present data indicate gradual disappearance of the ashlar building tradition described in this work during the second century B.C. The striking examples are Dor and Samaria. In Samaria the "Gabinian" stratum (first century B.C.) is characterized by the disappearance of all ashlar patterns except the "header–stretcher" and by the appearance of several new techniques. Among these are walls built with ashlars outside and rubble on the inside face, and the first appearance of "pseudo-headers," defined below. In Araq el-Emir (mid-second century B.C.) is found the first use of single row stretcher construction with clamps and dowels. Tsafrir (1980: 36, fig. 6) identifies two pairs of stones with nonvertical joint lines north of the "stitch line" in the east wall of the temple platform in Jerusalem.[3] He takes these to indicate trapezoid construction, common in Greece in the classical and Hellenistic periods. In the absence of other cases of noncuboid hewn stone architecture in Palestine, such an identification may be somewhat premature.

The usual ashlar building technique of the first century B.C., commonly called "Hasmonean," has been extensively dealt with elsewhere (Maoz 1985; full bibliography in footnote 8). It differs structurally from the techniques described in the present study in several ways:

1. It seems to be confined to fortification walls.
2. The walls are thick, with ashlar facing and rubble or unordered ashlar core.
3. The common construction pattern is alternate courses of headers and stretchers.
4. Pseudo-headers (short blocks, set as headers but projecting little, or not at all, into the core) are common.
5. The dressing is characterized by a "rusticated" central boss, with regular width margins.
6. Denticulated drafting tools are regularly used.

CONCLUSIONS

This study defined ashlar building styles according to a typology of the pattern in which the blocks are set in the wall. These styles were then used to define the cultural identity of Tel Dor and to map out processes of cultural change at Dor

and in the rest of Israel from the Late Iron Age to the Hellenistic period. The following conclusions may thus be stated:

1. Most patterns of ashlar construction at Tel Dor, including headers-only and headers-against-a-stretcher, were of local Phoenician tradition.
2. The header–stretcher pattern is found both in Phoenician architecture from the tenth century B.C., and in the Greek from the fifth century. Nonetheless, the technique was probably developed independently in those places as a result of two different lines of evolution. The header–stretcher pattern at Tel Dor is more likely to be interpreted as Phoenician than Greek.
3. Compartment building appears in Israel in two sites—Samaria and Dor—in the third century B.C. This technique probably originated in Greece or its colonies and it was the first Greek building technique to be emulated in Palestine.
4. Beginning with the tenth century B.C., the Phoenicians exported their building expertise along with other arts to neighboring royal centers. This export to Israel stopped in the eighth century B.C., with the beginning of Assyrian pressure upon this state, but continued in Judah and Moab until the Babylonian conquest. Ashlar building did not become firmly planted outside Phoenicia proper, and did not reappear at all outside it after the Babylonian period.
5. In the beginning of the Persian period, ashlar construction was restricted to Phoenicia proper. With Phoenician expansion on the coast of Israel, this architecture spread as far south as Jaffa.
6. Phoenician ashlar architecture, rather than Greek, dominated both public and private structures in the Hellenistic city-states of Palestine until the second century B.C.
7. Phoenician ashlar construction went out of favor in the second century and was replaced by the "Hasmonean" style.
8. At this stage of research we have no proof of any exportation of building techniques to Phoenician colonies in the west. *A telaio* construction cannot be equated with ashlar piers. Headers-only construction is found in Phoenician port installations; but except for those, the only parallel is in Toscanos, in Spain. Some of the missing stepping stones would have to be found for a convincing case of direct influence to be made.

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*A major drawback for the use of Tel Dor as a key site for the definition of Phoenician ashlar construction, as well as for our assertion that there exists a direct continuity of the Iron Age ashlar construction tradition into the Hellenistic, has been the fact that no true ashlar construction has been found at Dor in the Iron Age (except ashlar facing of the corners of the city gate and the offsets of the city walls). The 1986 season of excavations has enabled us to close this gap. In both areas D and E (on the southern and western edges of the tell, respectively) ashlar pier walls that definitely date to the Iron Age have been found.

NOTES

[1]An extensive history of Tel Dor is given by Dahl (1915). Results of the excavations can be found in various preliminary reports, e.g., Stern 1980; 1982b; 1983; Stern and Sharon 1983; Raban 1983; Wachsman and Raveh 1984.

[2]Purely for the distinction necessary for this work, I have used the following terminology: A block set upon its long wide face is called *lying*. A block on its long thin edge is referred to as *set*; and a block on its short thin edge is called *standing*.

[3]The "stitch" in the eastern wall of the podium of the temple in Jerusalem is a joint-line where a southern extension, built of "Herodian" masonry, abuts a wall constructed in the "Hasmonean" style. This earlier wall has been variously dated to the Hasmonean, Seleucid (Tsafrir 1980: 34), Persian (Dunand 1969: 98; Kenyon 1970: 143), and Iron Ages (Laperrousaz 1973). Most of the arguments in this debate are historical and do not concern us here. However, Dunand, followed by Kenyon and Laperrousaz, equates the construction technique of this wall with those of the podium of the Eshmun temple in Sidon, and the podium of the monumental Persian building in Byblos, both of which he dates to the sixth century B.C. If this assertion is true, it means that Hasmonean type construction begins in Phoenicia many centuries before any well-dated corollaries in Israel, in Dura Europos, or in Greece. It would then represent a chronologically parallel, but constructionally foreign, ashlar tradition to the one described above.

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