'Atiqot 111, 2023

A Ravelin Outwork Uncovered in the Ottoman Fortifications of the Old City of 'Akko

Joppe Gosker[1]

A small salvage excavation in 'Akko exposed the remains of a previously unknown ravelin outwork in the counterscarp of the Ottoman-period fortifications—a previously unknown military feature—which cut through earlier Crusader and Hellenistic layers. Ravelins are known components of city fortifications in Europe from the late sixteenth and seventeenth centuries, continuing in use in the nineteenth century. In 'Akko, it seems that the construction of the ravelin was not completed.

Keywords: Acre, Ottoman period, Galilee, fortifications, Al Jazzâr Pasha, Louis XIV

Introduction

When Napoleon breached the walls of 'Akko in 1799, his army encountered a second inner wall hurriedly built by the defenders during the siege, and the attack was repelled (Schur 1990:225). Following this narrow escape, Al Jazzâr Pasha, ruler of 'Akko (1777–1804 CE), undertook the construction of new defenses, comprising a new wall with seven bastions built around the old wall, reusing stones from the ruins of Crusader 'Akko. A moat (20–50 m wide, 4.5–6.0 m deep) was dug, and its outer slope was faced with a stone counterscarp, on top of which a covered way with transverses was built. The fortification works initiated by Al Jazzâr Pasha were completed under his successor, Suleiman Pasha (1804–1819 CE; Seetzen 1854:77). This small excavation exposed some evidence for a ravelin outwork in the counterscarp, a previously unknown military feature of these fortifications.

The Excavation

In June 2015, a small archaeological excavation was conducted at a collapsed section of the counterscarp on the northern side of the moat surrounding the Ottoman city of 'Akko

[1] Dr. Joppe Gosker, Israel Antiquities Authority.

(Fig. 1: No. 1), prior to restoration work on the collapsed wall.[2] The excavation was located about 100 m northeast of the Hospitaller Compound (Fig. 1: No. 2; Avissar and Stern 1995), and 150 m north of the present-day Knights' Hotel, where part of a thirteenth-century CE domestic quarter was excavated (Fig. 1: No 3; Syon 2010). A previous small excavation

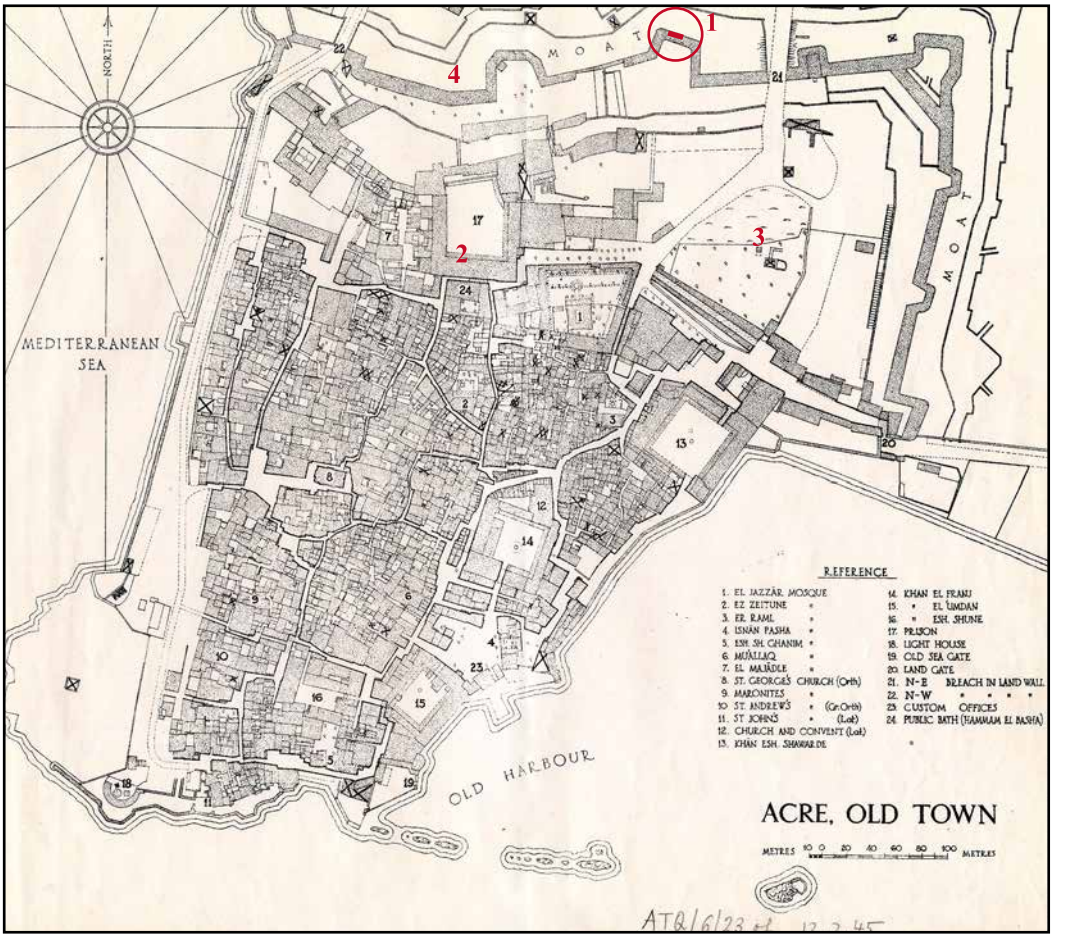


Fig. 1. Location of the excavation on the British Survey Map of Western Palestine (Winter 1944: Pl. 1) (1), and nearby excavations in the Hospitaller Compound (2), the Knights' Hotel (3) and inside the moat (4).

[2] The excavation (Permit No. A-7455; map ref. 20695–701/75886–90), undertaken on behalf of the Israel Antiquities Authority, was directed by Joppe Gosker (field photography), with the assistance of Basam Zidan (administration), Zach Horowitz and Karen Covello-Paran (consultation), Rivka Mishayev and Roy Liran (surveying), Edna J. Stern (pottery reading), Gerald Finkielsztejn (Hellenistic amphorae and scale weight), Hagit Tahan-Rosen (pottery drawing), Marina Shuiskaya (pottery plates), Danny Syon (numismatics), Yael Gorin-Rosen (glass), Ma'ayan Lev (archaeozoology), Jacques Neguer (fresco), Anastasia Shapiro (GPS, petrology), Leah Di Segni (inscription), Elizabeth Belashov (drafting), Clara Amit (studio photography), Yelena Kupferschmidt (metal cleaning) and laborers from the Old Acre Development Company. Thans are due to Yardenna Alexander for her professional editing.

Fig. 2. The excavation area seen from the city wall, looking north.

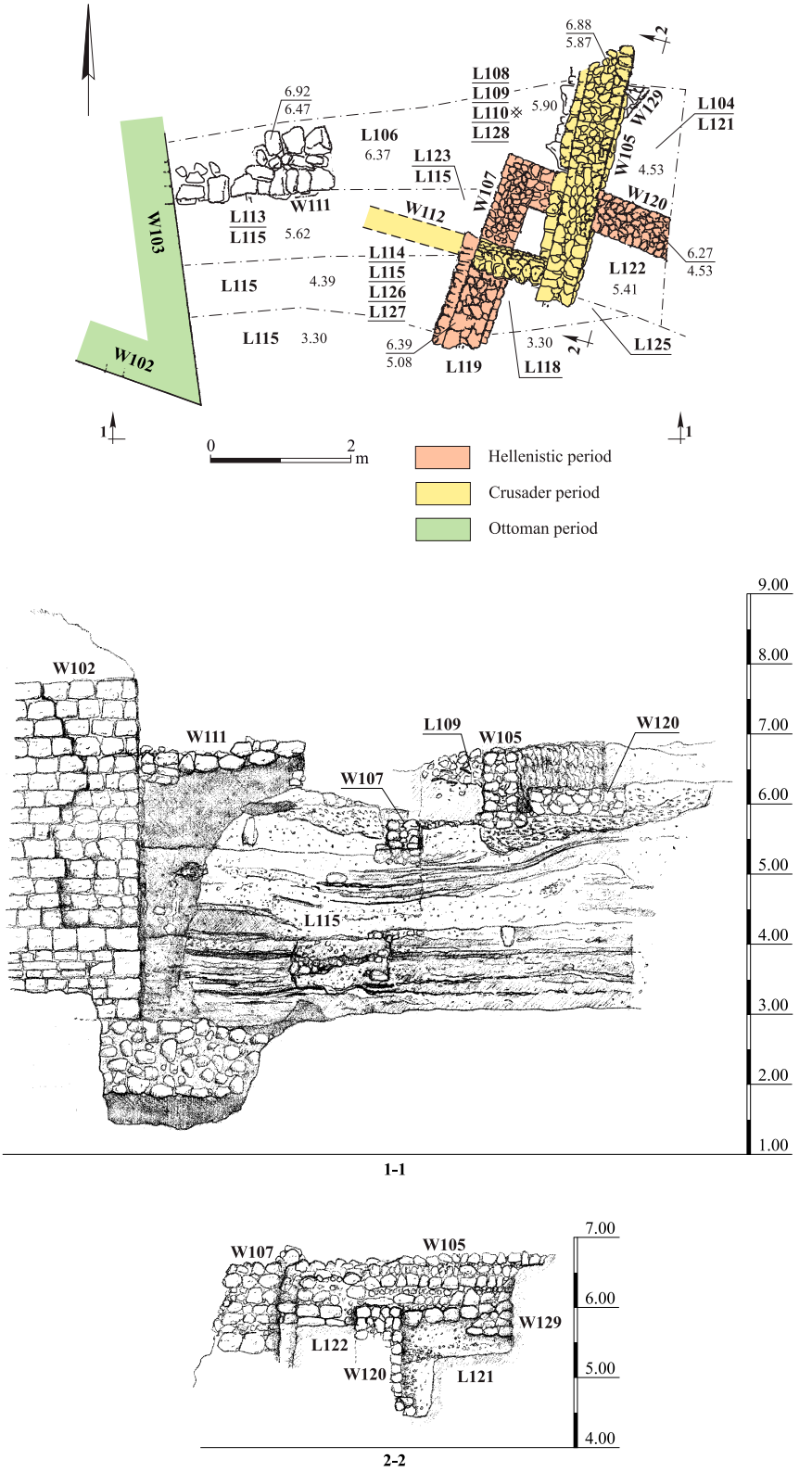
carried out inside the moat, 200 m to the west, yielded limited Hellenistic- and Crusader-period remains (Fig. 1: No. 4; Tatcher 2007).

The moat was originally dug in the Ottoman period, cutting into earlier Hellenistic- and Crusader-period settlement layers. When a section of the counterscarp wall, built against the moat’s northern slope, collapsed, a four-meter-high section of these earlier layers was exposed (Fig. 2). The section was excavated stratigraphically, exposing architectural remains dating to the Hellenistic, Crusader and Ottoman periods. Only part of the thick Hellenistic layer was excavated, but the entire section was photographed and drawn. The Hellenistic- and Crusader-period remains were domestic in nature, whilst the Ottoman remains comprised part of a massive wall that was a component of the early nineteenth-century city fortifications. Some sporadic Roman-period pottery was also retrieved in the accumulation layers, without architectural remains.

Architecture and Stratigraphy (Plan 1)

Stratum 3: The Hellenistic Period

Behind the collapsed section of the counterscarp wall (W102), three-meter-thick accumulation layers yielded pottery sherds and fresco fragments dating to the Hellenistic



Plan 1. The excavation, plan and sections.

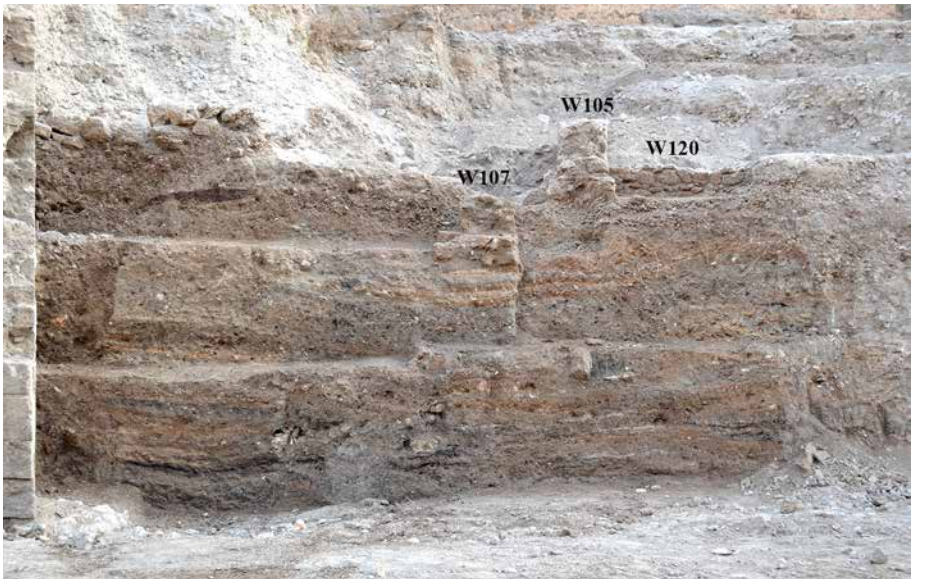


Fig. 3. The section behind the collapsed counterscarp, after cleaning, looking north.

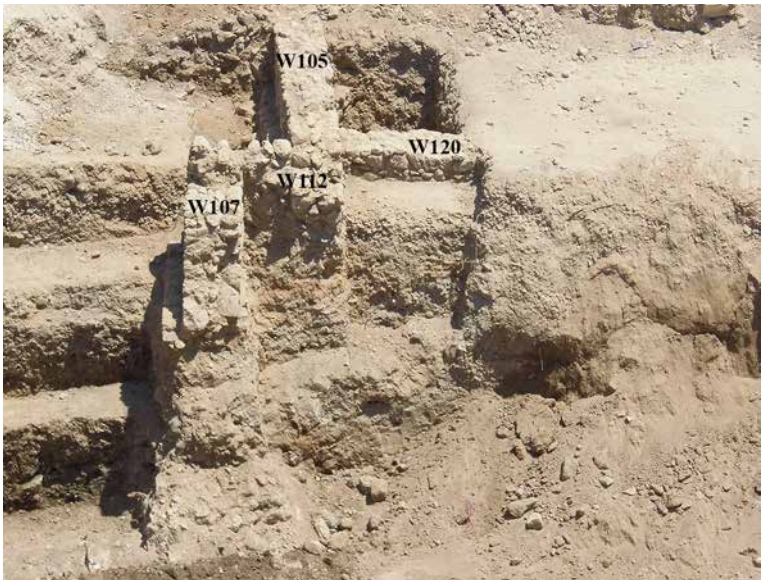


Fig. 4. Hellenistic- and Crusader-period walls, looking north.

period (L115, L126, L127; Plan 1; Fig. 3). Two walls (W107, W120) forming a corner, built on the accumulation layers, were also dated to the Hellenistic period (Fig. 4). The base of W107 was reached (Plan 1: Section 1–1), but the base of W120 was not exposed, and it probably lay lower than the base of W107. The connection of a very partially uncovered

third wall (W129) was not clear, and no associated floors were found. These walls represent two building phases in the Hellenistic period, whilst architectural remains were not exposed in the earlier accumulation layers. Due to the limited exposure of the walls and the absence of sealed loci, the thick Hellenistic stratum can only be dated generally, from the third to the early first centuries BCE. A well-preserved, rare scale weight was found in the adjacent Hellenistic accumulation layer (L121; see Finkielsztejn, this volume).

STRATUM 2: THE CRUSADER PERIOD

The limited architectural remains attributed to Stratum 2 comprised part of a room consisting of two collapsed walls (W105, W112) and the fragmentary remains of an associated plaster floor (L110; Plan 1; Figs. 4, 5). Wall 105, built of hewn stones, partly overlying Stratum 3 W120, was abutted by W112, a row of smaller unhewn stones, partly leaning against Stratum 3 W107.[3] The upper courses of Stratum 3 W120 and W107 must have been partially removed when the Stratum 2 Crusader structure was built. Plaster Floor 110 adjoined W105, but the floor was not preserved next to W112. Crusader-period material was found in the fill (L128) below Floor 110, and in spots where the floor was not preserved (L123). Several stone artifacts were found on the floor, and a coin dated to 1187–1193 CE was found in the plaster. The floor was overlain by a layer of collapsed stones and burned debris (L109; Fig. 6),

Fig. 5. Walls 105 and 112 of the Crusader room, looking south.

[3] Wall 112 could not have been freestanding, and it must have been built against the earth fill; it was removed at an early stage of the excavation for safety considerations.

Fig. 6. The collapsed debris layer (L109) next to W105, looking north.

containing plaster, animal bones, large pottery sherds, many nails and a copper tack, the nails and the charcoal indicating that the ceiling was made of wood. The bones represented mainly food waste and some bone working (see *Faunal Remains*, below). A fill layer (L104) overlying the Stratum 3 layer east of W105 was dated by the pottery assemblage to the thirteenth century CE. The evidence points to the destruction of this building at the end of the thirteenth century, probably when ‘Akko fell to the Mamluk forces in 1291 CE.

Stratum 1: The Ottoman Period

A massive fortification wall (W103; Plan 1; Fig. 7) was exposed on the western side of the excavation. Wall 103 bonded with counterscarp W102, and its foundation trench cut through the Crusader and Hellenistic layers (see Fig. 3). Walls 102 and 103 were built on an 0.8 m thick foundation layer of small fieldstones that was laid on the earth, and that continued to the east, evidently also supporting the collapsed part of the counterscarp wall (Plan 1: Section 1–1; Fig. 8). This shared foundation layer indicates that W103 was built as part of the same Ottoman-period defense works as the moat and counterscarp W102, thus revealing a previously unknown element of these fortifications (see *Discussion: The Ottoman-Period Fortifications*, below). An Ottoman-period accumulation layer (L106, L113, L119), including the remains of a very poorly constructed wall (W111) abutting W103, was uncovered above the Stratum 2 Crusader layer.

Fig. 7. The eastern wall (W103) of the ravelin, forming a sharp angle with counterscarp W102, looking west.

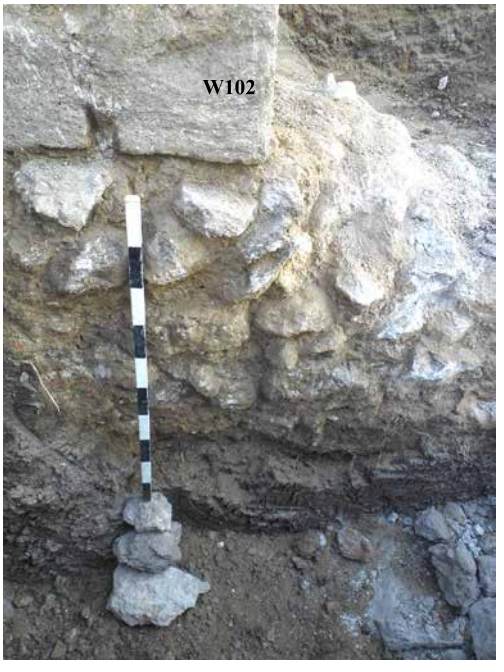


Fig. 8. The stone foundation layer of W102, W103 and the collapsed part of the counterscarp, looking north.

THE POTTERY

Selected representative pottery from the Hellenistic, Roman and Crusader periods is presented here. Parallels with their dating are cited in the figure description tables.

THE HELLENISTIC PERIOD (Figs. 9–13)

The Hellenistic pottery came from the thick accumulation layer (L115), from some disturbed loci (L114, L118, L122, L125) and residually from later loci. The assemblage, comprising local and imported vessels, and including many amphorae, is dated from the third to the early first century BCE. The parallels cited in the figure description tables are predominantly from previous excavations in ʻAkko. The local vessels include a krater (Fig. 9:1) casseroles, lids and closed cooking pots (Fig. 9:2–8), a bottle or unguentarium (Fig. 9:9), storage jars (Fig. 9:10–13) and a jug (Fig. 9:14). The imported pottery, mainly from Greece, includes a brazier (Fig. 10:1) a frying pan (Fig. 10:2), a locally produced skyphos (Fig. 10:3), fishplates or saucers (Fig. 10:4, 5) and an incurved bowl (Fig. 10:6).

Two oil lamps were found: one, imported (Fig. 11; third century BCE; see Berlin 2015: Fig. 6.1.1:13), and the other, locally produced (Fig. 12; early second century BCE; see Berlin 2015: Fig. 6.1.22:9–11).

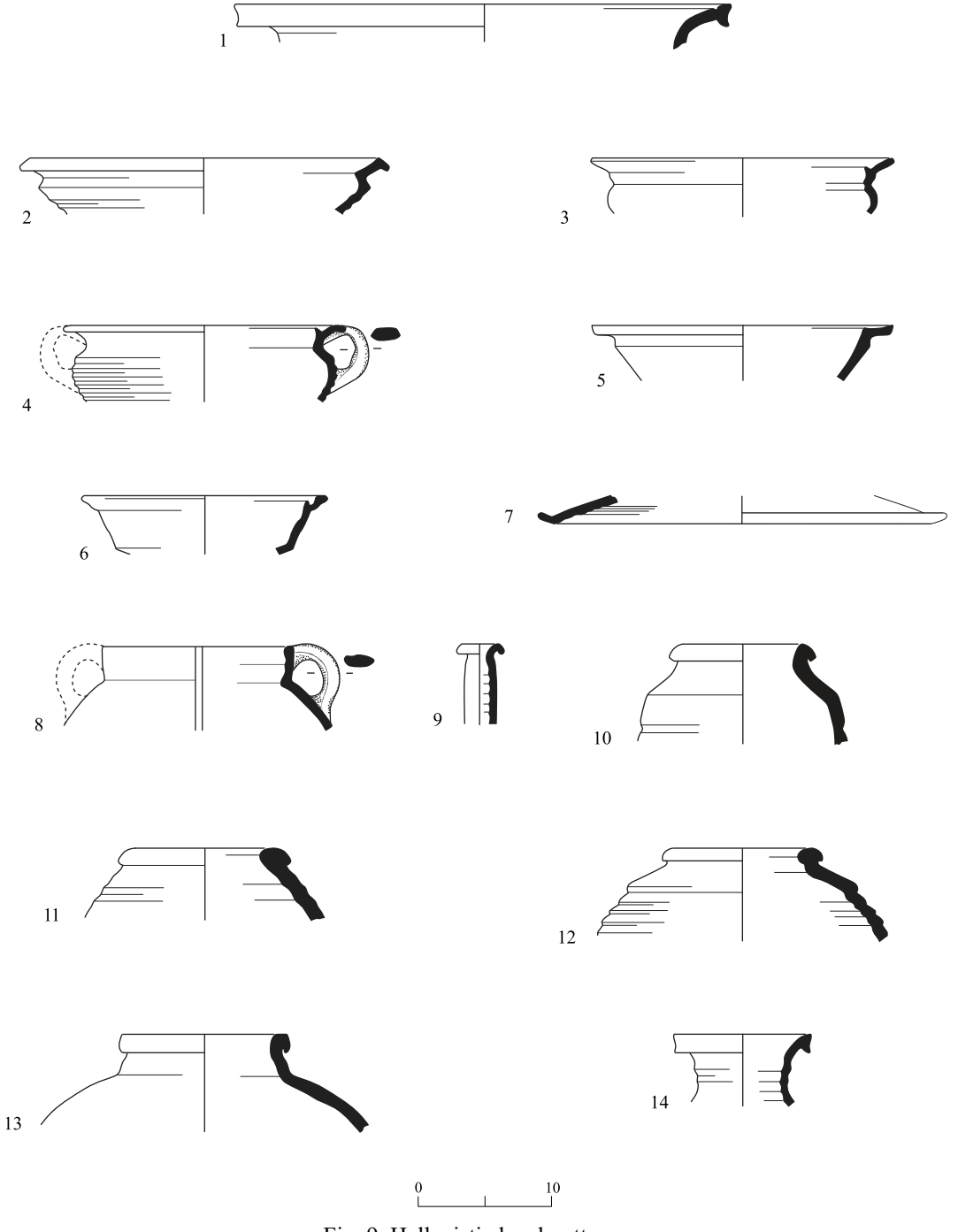


Fig. 9. Hellenistic local pottery.

◂ **Fig. 9**

No.	Vessel	Locus	Basket	Fabric	Parallels
1	Krater	125	1069	10R 4/6, granular, white inclusions	Berlin 2015: Fig. 6.1.6:10 (early third c. BCE) Berlin and Stone 2016: Fig. 9.17:12 (mid–late second c. BCE)
2	Casserole	115	1029	10R 4/6, granular, quartz inclusions	
3	Casserole	115	1029	10R 4/6, granular, white inclusions	Berlin and Stone 2016: Figs. 9.13:15 (mid–late second c. BCE); 9.22:9 (first half of first c. BCE)
4	Casserole	125	1069	2.5YR 4/8, granular, quartz and white inclusions	As No. 3
5	Casserole	123	1043	10R 5/6, granular, quartz inclusions	Berlin and Stone 2016: Fig. 9.5:5 (third c. BCE)
6	Casserole	123	1043	10R 4/6, granular, quartz inclusions	Berlin and Stone 2016: Fig. 9.13:13 (mid–late second c. BCE)
7	Casserole lid			2.5YR 4/8, white inclusions	Berlin and Stone 2016: Fig. 9.13:20 (mid–late second c. BCE)
8	Cooking pot	125	1054	10R 4/6, granular, black and white inclusions	Berlin 2015: Fig. 6.1.8:6 (second to early first c. BCE) Berlin and Stone 2016: Fig. 9.16:1, 3 (mid–late second c. BCE)
9	Unguentarium	123	1043	5YR 7/4, quartz inclusions	Berlin and Stone 2016: Fig. 9.20:7 (mid–late second c. BCE)
10	Phoenician storage jar	125	1061	5YR 7/6, white and quartz inclusions	Berlin and Stone 2016: Fig. 9.3:3–5 (third c. BCE)
11	Phoenician storage jar	104	1015	5YR 7/6, quartz inclusions	Avshalom-Gorni and Getzov 2002: Fig. 5.2:1 (third–second c. BCE)
12	Phoenician storage jar	115	1046	5YR 7/8, quartz inclusions	Berlin and Stone 2016: Fig. 9.11:9 (late third–mid-second c. BCE)
13	Bag-shaped storage jar	125	1054	5YR 7/6, quartz inclusions	Smithline 2009: Fig. 4.8:5 (third c. BCE)
14	Jug	115	1046	5YR 7/6, white and quartz inclusions	Berlin and Stone 2016: Fig. 9.1:14 (third c. BCE)

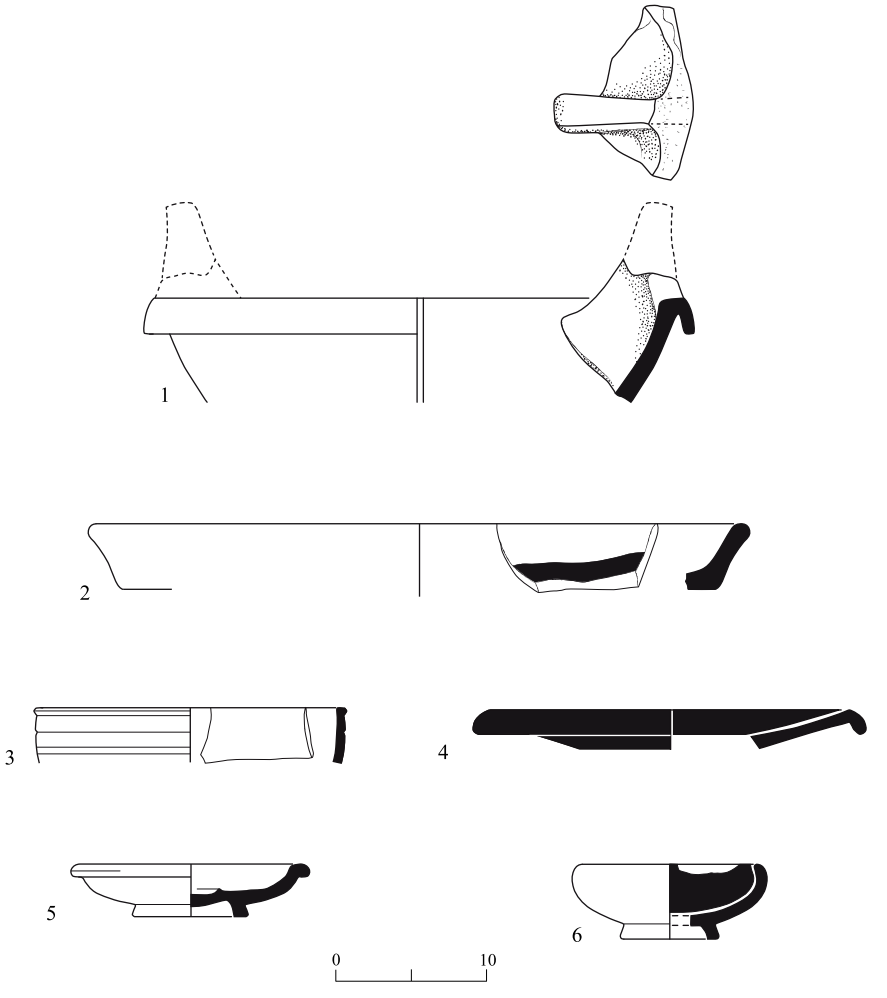


Fig. 10. Hellenistic imported pottery.

No.	Vessel	Locus	Basket	Fabric	Parallels
1	Brazier		1085	5YR 8/3, red grog, white and gray inclusions	Berlin and Stone 2016: Fig. 9.14:1 (mid–late second c. BCE) Rosenthal-Heginbottom 2015: Fig. 6.2.9 (second–mid-first c. BCE)
2	Frying pan		Dump	2.5YR 6/6, mica, gray and white inclusions	Berlin 2015: Fig. 6.1.10 (third c. BCE) Berlin and Stone 2016: Fig. 9.8:9 (third c. BCE)
3	Skyphos(?)	115	1046	2.5YR 6/8, white inclusions	Berlin 2015: Fig. 6.1.4:1–3 (second–early first c. BCE)
4	Fish plate	115	1046	2.5YR 7/6, no visible inclusions	Berlin and Stone 2016: Fig. 9.10:7 (third c. BCE) Rosenthal-Heginbottom 2015: Fig. 6.2.5:3 (third–second c. BCE)
5	Fish plate	115	1046	5YR 6/6, white inclusions	Berlin and Stone 2016: Fig. 9.1:4 (third c. BCE) Rosenthal-Heginbottom 2015: Fig. 6.2.5:8 (third–second c. BCE)
6	Incurved bowl		1022	5YR 6/6, white and black inclusions	Berlin and Stone 2016: Fig. 9.6:6–8 (third c. BCE) Rosenthal-Heginbottom 2015: Fig. 6.2.5:18, 19 (fifth–late third c. BCE)

0 2

Fig. 11. Attic oil lamp (L115, B1038).

0 2

Fig. 12. Mold-made oil lamp (L115, B1038).

Hellenistic Amphora Fragments and Stamped Handles
Gerald Finkielsztejn

Twenty-five diagnostic amphora fragments and nine stamped handles were retrieved from the excavation, with a chronological range from the early fourth to the beginning of the second century BCE. The amphorae came from several locations in the Eastern Mediterranean, including Chios, Thasos, Cyprus, the southeastern Aegean, Knidos, Rhodes and Kos, also including some western Mediterranean amphorae from sites not specifically identified.

Chios
1. Rim (L115, B1076/3; Fig. 13:1).
Fabric: Light yellowish red, light yellowish red to light brown surface, occasional fine shiny and fine white inclusions.
Parallels: Monakhov 2003:24, 241, Pl. 11:4, 6; 242, Pl. 12:3 (Type V-B).
Date: 400–325 BCE.

2. Toe (L115, B1065/1; Fig. 13:2).
Fabric: Brownish red, light brown surface, fine shiny and light brown inclusions.
Parallels: Monakhov 2003:241, Pl. 11:4 (Type VB).
Date: 400–325 BCE.

Thasos
3. Rectangular stamp (L115, B1065/3).
Ἀισχρίων
HB→ Zither→
Θασίων
There is a fang above the zither. Lunate *sigma* (C). Monogram HB. Eponym Ἀισχρίων II.

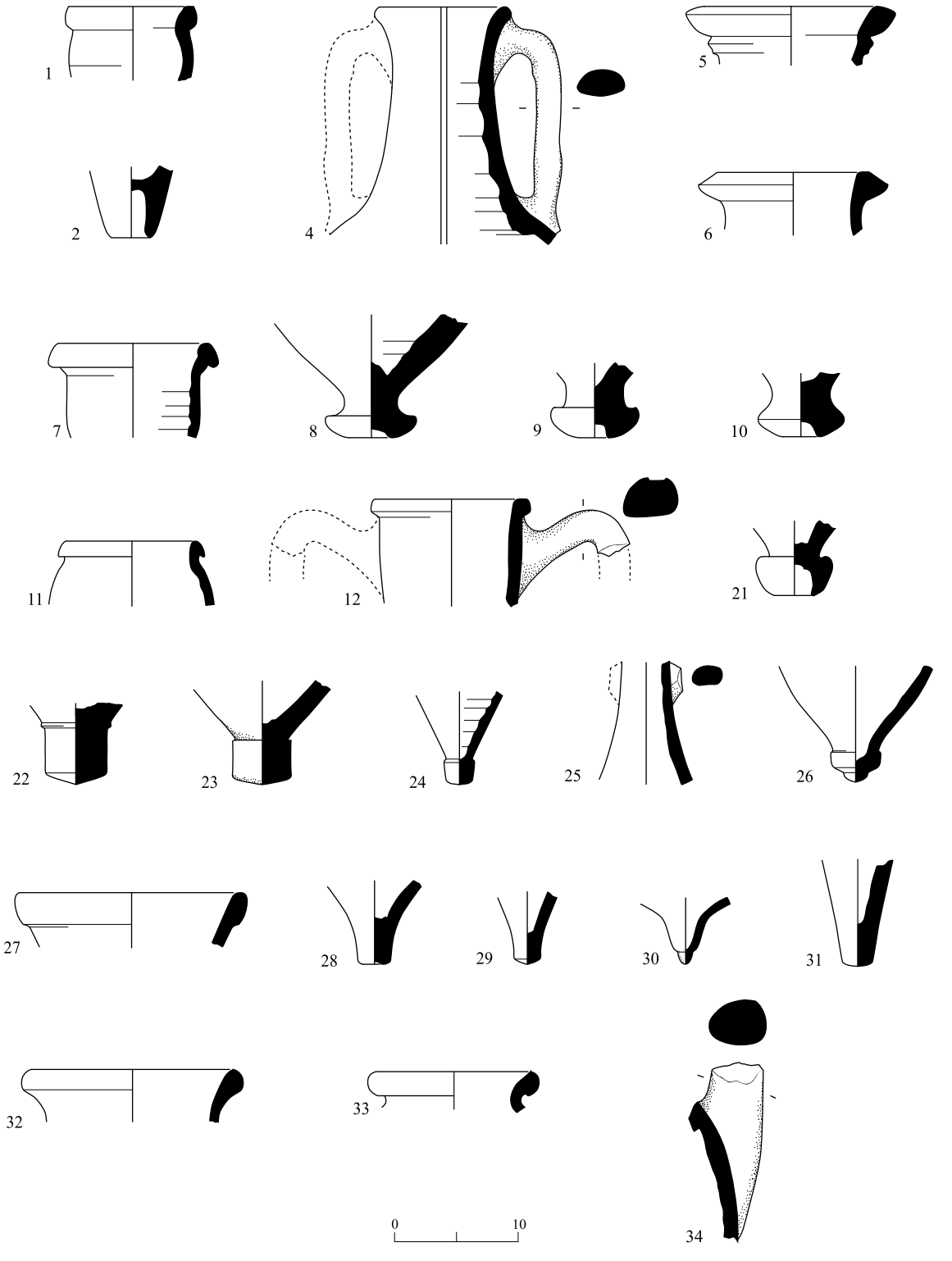


Fig. 13. Hellenistic amphorae (according to Catalogue Numbers).

Date: 281–272 BCE (Garlan 2004–2005; the homonym Ἀισχρίων I is dated c. 299 BCE); early in 241–227 BCE (Tzochev 2016:170–171, No. 341, c, one fang, same die; the homonym Ἀισχρίων I is dated c. 292 BCE).

Cyprus
4. Top with one handle (L115, B1076/7; Fig. 13:4).
Cypriot neck form with flared rim and one complete handle; the other handle may have been stamped.
Fabric: Brownish red, very light yellowish brown surface, many brown, gray and white inclusions, some visible on surface.
Parallels: Finkielsztejn 2013:94, No. 42a–b; 100: No. 72a–b, with additional references therein; Meyza 2004:273–275.
Date: 250–200 BCE.

Southeastern Aegean
5. Rim (L123, B1043/1; Fig. 13:5).
Fabric: Light brown, very light yellowish brown surface, occasional fine shiny and fine white inclusions.
Parallels: Lawall 2004: Pls. 197:19; 198:23.
Date: 325–300 BCE.

6. Rim (L113, B1018; Fig. 13:6).
Profiled junction between rim and top of neck.
Fabric: Light brown, very light brown surface, occasional medium-sized brown inclusions.
Parallel: No exact parallel found.
Date: 300–250 BCE.

7. Top of neck with rim (L127, B1064/1; Fig. 13:7).
Fabric: Light brown, light yellowish red surface, fine and medium-sized brown inclusions, gritty ware.

Parallel: None found.
Date: Possibly 300–250 BCE.

8. Base with toe (L115, B1022; Fig. 13:8).
Fabric: Brownish red, light brown to light red surface, occasional fine brown and light brown inclusions.
Parallels: Monakhov 2003:301, Pl. 71:5, 7 (Type IB). This type of toe was a common form on amphorae with mushroom rims; Monakhov 2014:199–205, Figs. 2–4 for Kos).
Date: 350–325 BCE.

9. Toe (L125, B1061/2; Fig. 13:9).
Fabric: Light red, outer edge light yellowish brown, very light yellowish brown surface, many fine shiny and occasional light brown inclusions.
Parallels: Monakhov 2003:301, Pl. 71:5, 7 (Type IB).
Date: 350–325 BCE.

10. Toe (L121, B1085/2; Fig. 13:10).
Fabric: Reddish brown, light brown to light red surface, many very fine shiny inclusions on surface.
Parallel: None found, some similarity to Southeastern Aegean amphora toes.
Date: 300–200 BCE.

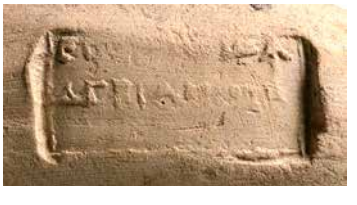
Knidos
11. Rim (L121, B1085/1; Fig. 13:11).
Rounded break at upper attachment of one handle, and trace of a string line 1 cm below rim.
Fabric: Light reddish brown, light brown surface, occasional fine shiny copper-colored flakes, occasional fine white and brown inclusions.
Parallels: Empereur and Tuna 1988:345, Fig. 4: d–e; Monakhov 2003:307, Pl. 77:2–4 (Type II-F).
Date: c. 250 BCE.

Knidos(?)
12. Rim with handle and circular stamp (L126, B1057/3).
A→ E↑ Monogram
The arrow after a letter indicates its orientation: top of *alpha* against the center of the back of the *epsilon*. Other letters that may be comprised in the monogram, intentionally or not (with orientation of the letters on the monogram): Γ↑, I←, K← (retrograde), Π←, T←, Y→. A possible abbreviated name (of a fabricant?), i.e., Ἑκατ(. The handle profile is early Rhodian rather than Knidian, but the stamp is not Rhodian, and it is very similar to early Knidian stamps (Monakhov 2003:309–311, Pls. 79:5, 7, Type I-B; 80:2, 3–6; 81:1, 2, 4, 5, Types I-C to I-E-1).

Fabric: Light yellowish brown, very light reddish brown surface, many very fine brown inclusions.
Parallel: No parallels were found the for stamp. Combinations of E with other letters exist on stamps from the workshop of Reşadiye on the Knidos Peninsula (Şenol 1995:65, No. 24 (K[nidian]T[ype] 5011, reading like ours, but the A is inserted inside the E by translation to the right, so that the two slanted bars of the former are based inside the corners of the latter); however, all the monograms and letters in Knidos are in square stamps.
Date: c. 275–230 BCE.

Rhodes
13. Rectangular stamp (L115, B1048)
Διονύ
σιος
Lunate *sigmas* (C). Fabricant Διονύσιος 1st.
Date: c. 240–230 BCE.

14. Rectangular stamp (L115, B1076/1)
Ἐπ̣[ὶ Ἀριστων]ίδ̣ᾳ
Ἀγριανίου
Very fine frame. The eponym Ἀριστωνίδας dates this amphora.
Date: c. 208 BCE (Finkielsztejn 2021:206, Table 11.1).



15. Circular stamp (L121, B1005).
Ἐπ’ [ἰ]ερέ[ως] Δορκυ[λ]ίδα
Rose
The eponym priest Δορκυλίδας dates this amphora. This stamp may be identical to Cankardeş-Şenol 2015:90, RE-ΔΟΡΚΥΛΙΔΑΣ-016. Based on the appearance of the handle and the style of the rose, the amphora was endorsed by one of the fabricants Κλεισιμβροτίδας or Ἀντίγονος 2nd.
Date: c. 197 BCE.

16. Rectangular stamp (L125, B1054)
Σωκρ[άτ]ευς Torch↑
Fabricant Σωκράτης 2nd.
Date: c. 201–172 BCE.

17. Rectangular stamp (L125, B1059)
Ἀρτα̣μι[τ(ίου]
Ἀγ[αθοκλε(ῦς]
Flaked surface. The appearance of the handle and stamp, and the citing of the month suggest the name of the fabricant Ἀγαθοκλῆς 1st, associated with dating eponyms from the beginning of Period III.
Date: c. 195–189 BCE.

18. Rectangular stamp (L115, B1029/1)
Illegible.
Very eroded surface of handle, whose appearance dates it to early Period III.
Date: 200–175 BCE.

19. Rectangular stamp (L114, B1021)
]OY
Caduceus→
The appearance of the handle and stamp dates this amphora to Period V. There are a few fabricants whose name ends in –ος, the most common one being Εὔκλειτος (Finkielsztejn 2001:135–137), other less common ones in the region being Νύσιος, Εὔϊος or Πρῶτος (Ariel and Finkielsztejn 1994:213, SAH 75).
Date: 150–110 BCE; Εὔκλειτος c. 145–127 BCE.

20. Non-stamped handle (L115, B1029/2; not illustrated)
The appearance of the handle dates the amphora to late Period III–Period IV.
Date: c. 160–140 BCE.

21. Base with toe (L115, B1076.4; Fig. 13:21)
Fabric: Light brown, very light brown to light red surface, many fine shiny inclusions and few white inclusions.
Parallels: This toe form is known in Chios (Monakhov 2003:24, 240; Pl. 10:6[-8], 241, Pl. 11:3, Type VA). The earliest known Rhodian amphora type has a similar toe (Monakhov 2003:122, 309, Pl. 79:2, Type I-A), possibly inspired by the Chios toe, which is dated a century earlier, but its mushroom rim was different than that of Chios, and so was the toe (Finkielsztejn 2001:47–48, nn. 51, 52, Pl. A:1 [Chios], 2 [Rhodes]; Lawall 2011:674, Pls. 281, 680; Pl. 284a [A-B], Rhodes). Based on the fabric and the context in the ʻAkko Moat, the toe is probably early Rhodian.
Date: c. 310–275 BCE.

22. Complete toe (L127, B1064; Fig. 13:22)
Fabric: Light brown, very light brown surface, some fine brown inclusions.
Date: Late third–second centuries BCE.

23. Base with toe (L115, B1076/6; Fig. 13:23)
Fabric: Light brown, very light brown surface, occasional medium-sized brown and white inclusions.
Date: Late third–second centuries BCE.

24. ‘Amphorette’ base with toe (L115, B1076/5; Fig. 13:24)
The amphorettes are the smallest amphorae in Rhodes.
Fabric: Light reddish brown, very light reddish brown surface, occasional fine brown inclusions.
Parallels: Such small-sized Rhodian amphorae have pseudo double-barreled handles, stamped either with the head of Helios in a round dies, or with a rose in a square dies (Monakhov 2003:311, Pl. 81:3; 313–314, Pls. 83:7, 8; 84:7; 2005:83–84, Figs. 6:3–5; 7:4). The flaring body could tentatively date this vessel to early Period III. Due to their small size and very narrow neck and rim, they may have transported honey, known to be produced in Rhodes, rather than wine, a suggestion that could be verified with chemical tests.
Date: Possibly 200–175 BCE.

25. Lagynos (L113, B1006/2; Fig. 13:25)
Neck and upper handle attachment, without rim; probably Rhodian based on fabric appearance.
Fabric: Reddish brown, very large, brown flaking surface, occasional fine brown inclusions.
Date: 200–100 BCE.

Kos
26. Base with toe (L115, B1065/2; Fig. 13:26).
Probably a fractional (half) vessel. Discreetly marked ring with rounded tip.
Fabric: Reddish brown, grayish white surface, occasional white inclusions, and copper-colored shiny flakes.
Parallel: Probably a transitional type between Monachov’s Types IIIC and IV (Monakhov 2014:212, Fig. 10:47, 48, Type IIIC, very marked ring; Type IV no toe illustrated; 213–214, Fig. 11:55, Type V-A variant, ring replaced by a short cylinder).
Date: Second half of third century BCE.

Unidentified Western Types
27. Rim (L126, B1057/1; Fig. 13:27).
Two-facetted outer rim, with the junction at mid-height.

Fabric: Light reddish brown, brown to light brown edges, light reddish brown surface, occasional very fine, brown and white inclusions.

28. Base with toe (L115, B1029; Fig. 13:28)
Fabric: Brownish red, light grayish brown surface, some very fine, shiny and occasional brown inclusions.

29. Base with toe (L114, B1021; Fig. 13:29).
Fabric: Brownish red, light brown surface with small gray stains, many fine, very light brown and some fine brown inclusions.

30. Toe (L125, B1052/1; Fig. 13:30).
Hollow cone ending in rounded solid irregular button.
Fabric: Light brownish red, very light brown surface, no visible inclusions.

31. Base with toe (L118, B1032; Fig. 13:31).
Elongated conical base, solid at tip.
Fabric: Light brownish red, very light brown to very light red surface, no visible inclusions.

32. Rim (L125, B1061; Fig. 13:32).
Hard well-made ware.
Fabric: Brownish red, greenish brown surface, some very fine light brown inclusions.

Southern Levant Bag-Shaped Amphora
33. Rim (L115, B1076/2; Fig. 13:33)
Fabric: Thick gray core with thin dark red edges, light reddish brown surface, many large and medium-sized white and some fine brown inclusions.
This rim profile is often found in late Persian–early Hellenistic period contexts in the Southern Levant.
Date: Late fourth–early third century BCE.

Eastern Mediterranean Basket-Handle Amphora
34. Lower handle attachment of shoulder (L115, B1076/8; Fig. 13:34).
Basket-handled amphorae in the late Persian-early Hellenistic period in Israel are varied in forms and fabric. This handle fragment can only be dated by its context.
Fabric: Brownish red with brown edges, very light greenish brown to light red surface, some large brown and white inclusions.
Date: Fourth–early third centuries BCE.

The Roman Period (Fig. 14)

Although no Roman-period building remains or accumulation layers were exposed in the excavation, a few Roman pottery sherds were found in Stratum 2 contexts and in disturbed loci. The finds include mortaria (Fig. 14:1, 2), Phoenician-type cooking pots (Fig. 14:3, 4), Galilean Kefar Ḥananya-type cooking pots (Fig. 14:5, 6) and Phoenician-type storage jars (Fig. 14:7, 8).

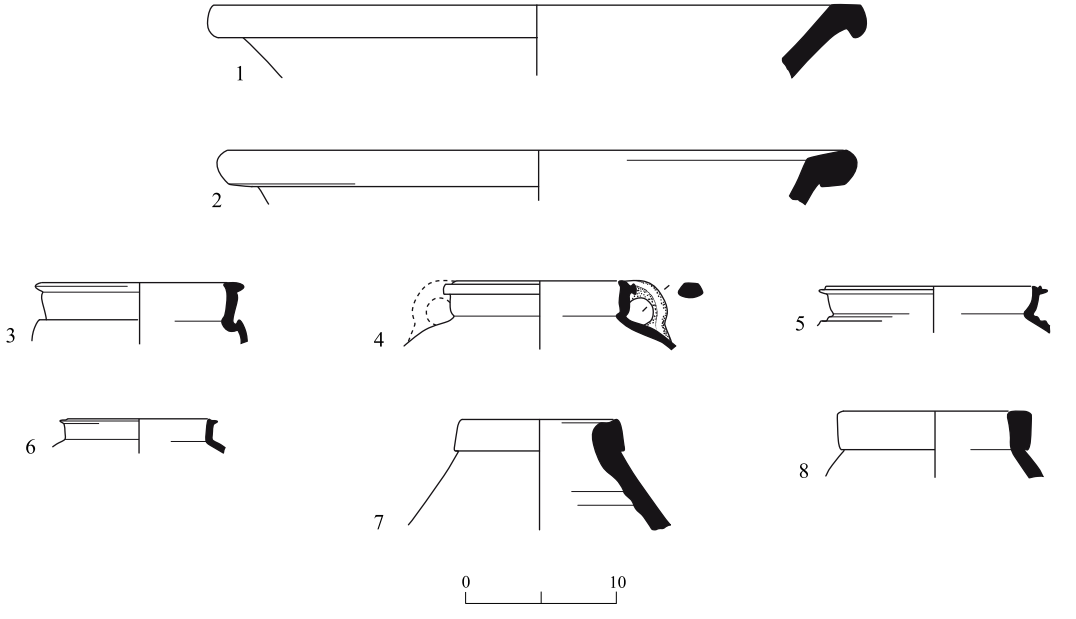


Fig. 14. Roman pottery.

No.	Vessel	Locus	Basket	Fabric	Parallels
1	Mortarium	123	1043	5YR 7/6, black, white and red inclusions	Porat, Frankel and Getzov 2012: Fig. 12:2, 3 (Roman)
2	Mortarium	122	1040	7.5YR 7/6, black, white and red inclusions	Berlin and Stone 2016: Fig. 9.26:6 (early first c. CE)
3	Cooking pot	110	1029	5YR 7/6, black and white inclusions	Bikai, Fulco and Marchand 1996: Fig. 95:12 (uncertain date)
4	Cooking pot	125	1054	Dark gray, white inclusions	As No. 3
5	Cooking pot	110	1068	Dark gray, white inclusions	Berlin and Stone 2016: Fig. 9.26:11 (early first c. CE) Adan-Bayewitz 1993:126–128: Kefar Ḥananya Form 4B (late first c. BCE–mid-first c. CE)
6	Cooking pot	114	1021	2.5YR 5/10, no visible inclusions	Adan-Bayewitz 1993:128–130: Kefar Ḥananya Form 4C (second–fourth c. CE)
7	Phoenician storage jar	128	1075	2.5YR 7/8, quartz inclusions	Avshalom-Gorni and Getzov 2002: Fig. 5.2:2 (Early Roman)
8	Phoenician storage jar	125	1054	2.5YR 7/8, quartz inclusions	Avshalom-Gorni and Getzov 2002: Fig. 5.2:3 (Early Roman)

THE CRUSADER PERIOD (Figs. 15, 16)

The Crusader pottery comprises local and imported wares. The parallels cited in the figure description tables are predominantly from the pottery published from the excavations of the Hospitaller Compound, the Knights' Hotel, and the Messika Plot in 'Akko, where the vessels are defined by types (Stern 2012). The local wares include vessels from 'Akko, the western Galilee and Beirut, and date mainly to the thirteenth century CE. A basin (Fig. 15:1) was probably manufactured in western Galilee (Stern 2012:48), whilst the origin of a large jar (Fig. 15:2) is not known. The plain 'Acre bowl' (Fig. 15:3) is found in large quantities in 'Akko, and it is almost absent elsewhere. The cooking vessels, all manufactured in Beirut, comprise an earlier and a later group. The baking dishes (Fig. 15:4, 5) and a thick-walled cooking pot (Fig. 15:6) are dated to the thirteenth century CE, whilst the thin-walled cooking pots (Fig. 15:7, 8) are dated to the twelfth century CE, earlier than most of the pottery assemblage, and possibly residual. An unusual glaze-painted twin vessel made of two bowls (Fig. 15:9) is also from Beirut ware; its specific use is unknown, but a similar monochrome green vessel was found in the Hospitaller Compound (Stern 2012:46–47). A water pipe fragment (Fig. 15:10), made of the same fabric as the 'Acre bowls', is similar to the water pipes found in the 'Akko bathhouse (Smithline, Stern and Stern 2013:99).

The imported pottery comprises bowls and amphorae dating from the thirteenth century CE. A slip-painted bowl with a carinated body, a slightly concave vertical rim, and a high flaring-out ring base (Fig. 16:1) comes from Cyprus. Two other Cypriot bowls have the same characteristic high ring base; one is green-glazed (Fig. 16:2), the other is white-slipped with green and yellow dabs (Fig. 16:3). A Syrian Fritware bowl is made of a soft-paste fabric with a transparent blue glaze (Fig. 16:4). An amphora with handles rising above the rim (Fig. 16:5) probably originates from the northern coast of Asia Minor. The other two amphorae (Fig. 16:6, 7) were probably produced in the Black Sea region.

A body sherd, found in the Crusader-period collapsed debris layer (L109) above Floor 110, bore an inscription incised before firing (Fig. 17). The exact vessel form is not known, but the shape and fabric are consistent with thirteenth-century Crusader jars (Anastasia Shapiro, pers. comm.). The inscription in late Byzantine cursive form—the contemporary script in the Byzantine Empire—is composed of three complete letters (left to right): *epsilon*, *iota, omega*, and part of a fourth, possibly *kappa* (on left). The inscription may be related to the manufacturing workshop, possibly the island of Kios (Κείῳ), or to the receiving establishment, πανδοκείῳ (Greek for inn).[4]

[4] I wish to thank Leah Di Segni for identifying the language and reading the inscription, and for proposing the possible interpretations.

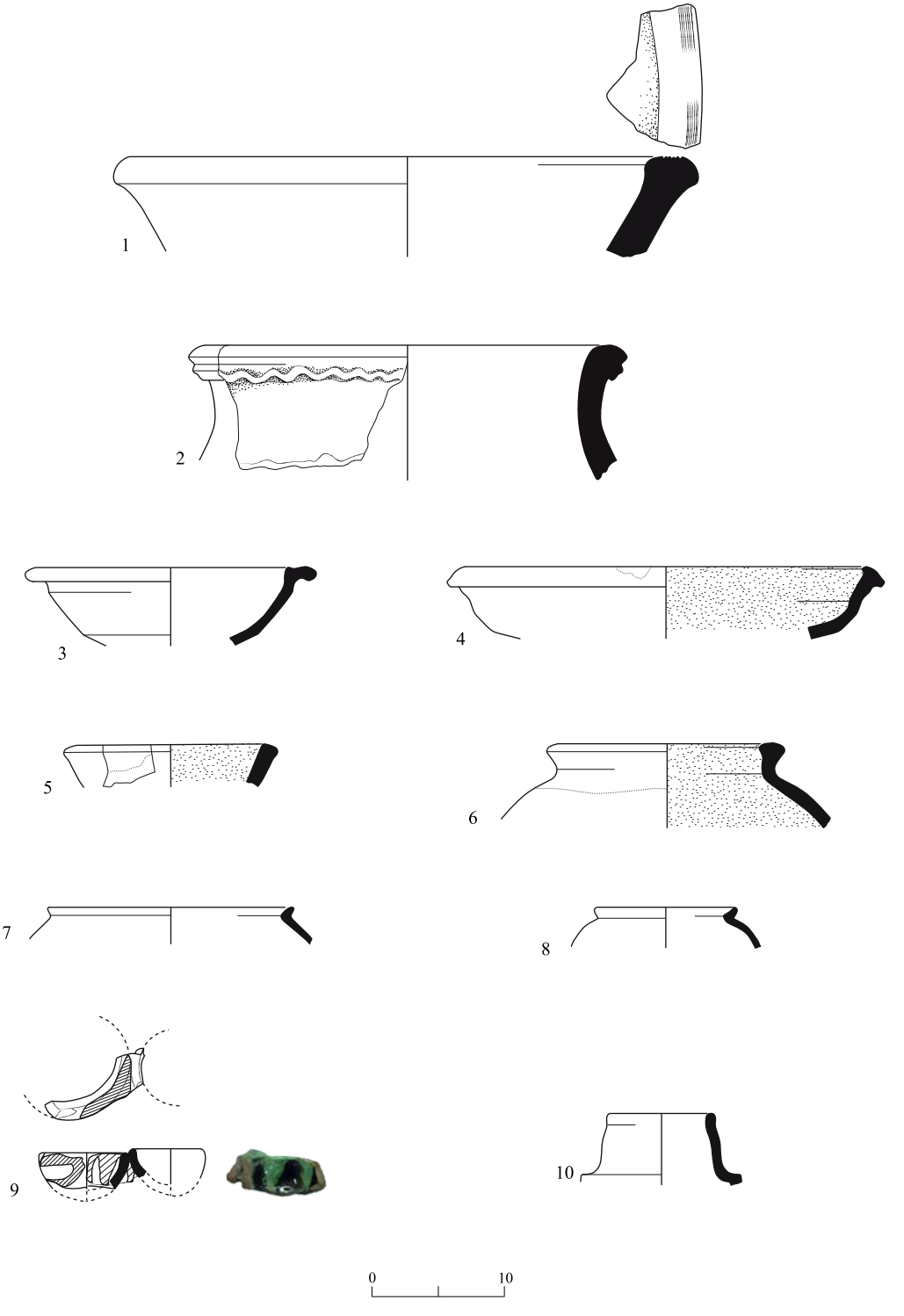


Fig. 15. Crusader local pottery.

◂ Fig. 15

No.	Vessel	Locus	Basket	Fabric	Parallels
1	Basin	100	1087	5YR 6/6, gray core, quartz, gray and white inclusions, and voids	Stern 2012: Pl. 4.24:1–3, Type VL.PL.1
2	Jar	108	1041	5YR 6/4, gray core, mica, quartz, gray and white inclusions, and voids	Stern 2012: Pl. 4.25:3, Type VL.PL.1
3	Bowl	123	1043	2.5YR 5/8, white and gray inclusions, some very big, and voids	Stern 2012: Pl. 4.1:9, Type AC.PL.1
4	Baking dish	123	1043	10YR 3/2, quartz inclusions	Stern 2012: Pl. 4.14:7–17, Type BE.CW.2
5	Baking dish	114	1015	2.5YR 5/8, quartz inclusions	Stern 2012: Pl. 4.14:15, Type BE.CW.2
6	Cooking pot	101	1001	2.5YR 4/8, quartz inclusions	Stern 2012: Pl. 4.16:4, Type BE.CW.2
7	Cooking pot	106	1006	2.5YR 4/8, quartz inclusions	Stern 2012: Pl. 4.15:8–12, Type BE.CW.1
8	Cooking pot	108	1014	5YR 2/1, quartz inclusions	As No. 7
9	Twin bowl vessel	110	1068	2.5YR, white inclusions	Stern 2012: Pl. 4.20:2, Type BE.GL.4
10	Water pipe	106	1006	5YR 8/2, white inclusions and voids	Smithline, Stern and Stern 2013: Pl. 28:24, 25

Fig. 16 ▸

No.	Vessel	Locus	Basket	Fabric	Parallels
1	Bowl	100	1011	5YR 5/8, white inclusions	Stern 2012: Pl. 4.42:7–9, Type CY.GL.2
2	Bowl	109	1009	10YR 4/1, white inclusions	Stern 2012: Pl. 4.47; Type CY.GL.5
3	Bowl	110	1033	2.5YR 6/6, white inclusions	Stern 2012: Pl. 4.41:1–4, Type CY.GL.1
4	Bowl	110	1033	10YR 8/1, many quartz inclusions	Stern 2012: Pl. 4.28:9, Type SY.GL.3
5	Small Amphora	106	1006	5YR 5/6, white inclusions and voids	Stern 2012: Pl. 4.50:1, Type TUR/GR.PL.3
6	Amphora	108	1008	5YR 6/6, many mica and some quartz inclusions and voids	Stern 2012: Pl. 4.51:3, Type TUR/GR.PL.3
7	Amphora	108	1014	7.5YR 6/4, many mica and some white inclusions	Stern 2012: Pl. 51:5, Type TUR/GR.PL.3

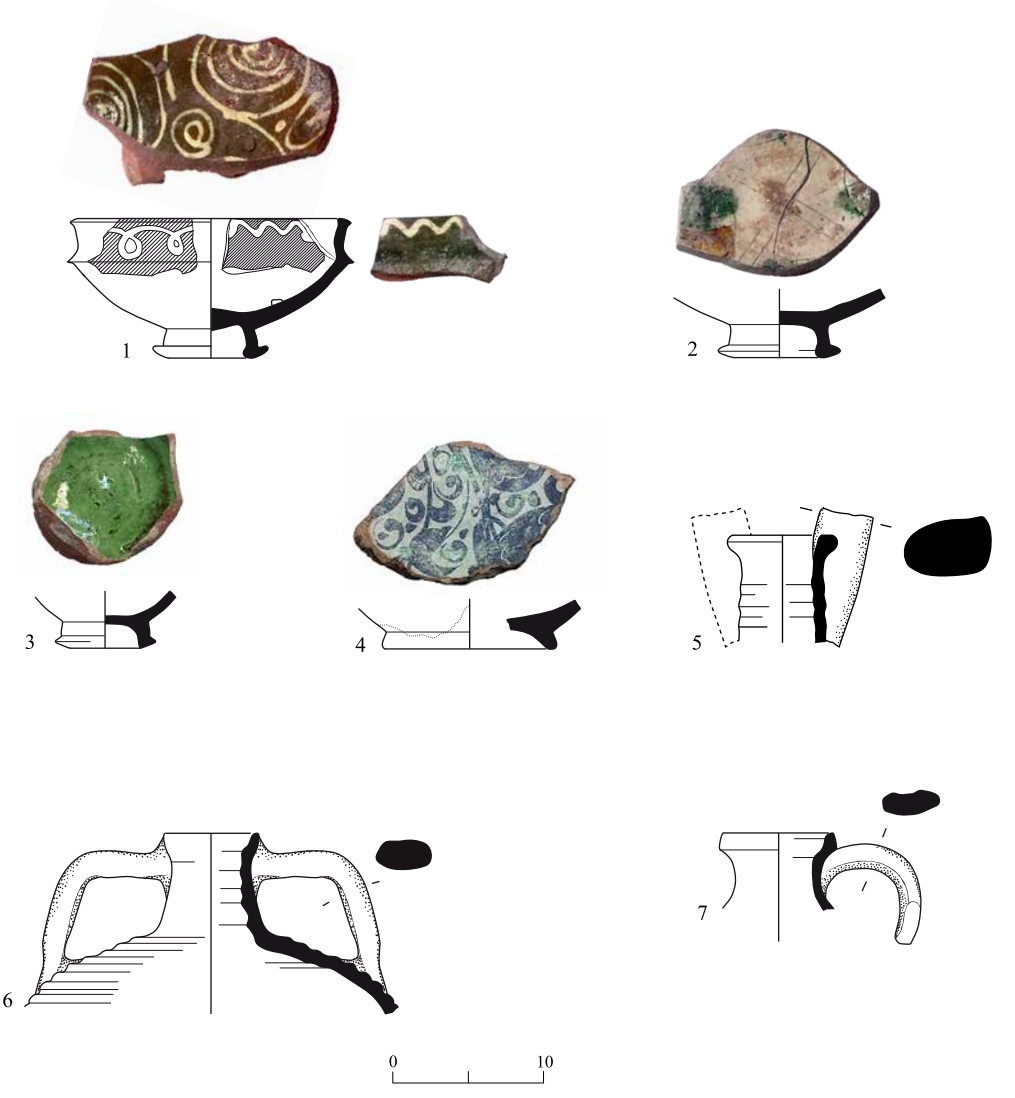


Fig. 16. Crusader imported pottery.

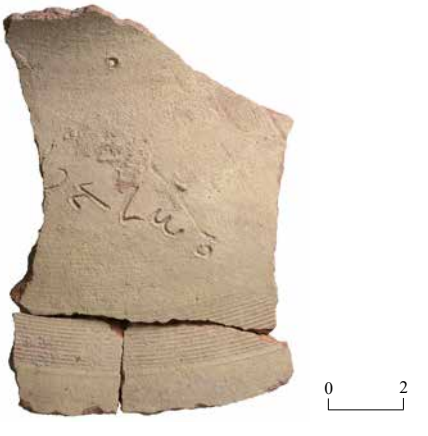


Fig. 17. Crusader inscribed body sherd.

OTHER FINDS

A variety of finds, predominantly from the Hellenistic and Crusader periods, was retrieved in the excavation. For a scale weight, see Finkielsztejn, this volume.

Terracotta Figurines (Fig. 18)
Two figurine fragments were found. A grotesque head of a baldheaded man, found in topsoil (L101), was made of pinkish clay and was broken at the neck (Fig. 18:1). Such heads are often found without the body as the head and the body were made in separate molds. These grotesque heads usually depict baldheaded men, but minor changes were sometimes made after they were removed from the mold and before firing (Süvegh 2014). This head has a small stroke where the forehead meets the hair, and it seems that the hair was added after its molding. This figurine is stylistically attributed to the Hellenistic period.

A fragment of a standing figurine made of whitish clay was found with Hellenistic pottery (L115) and probably dates to the Hellenistic period (Fig. 18:2). Only the toes of the feet and what appears to be the beginning of a garment are visible, as in similar figurines (Erlich and Kloner 2008: Pl. 14:67). Thirteen Hellenistic-period terracotta figurines were found in the Hospitaller Compound, and hundreds more were retrieved in other excavations in ʻAkko (Messika 2016).

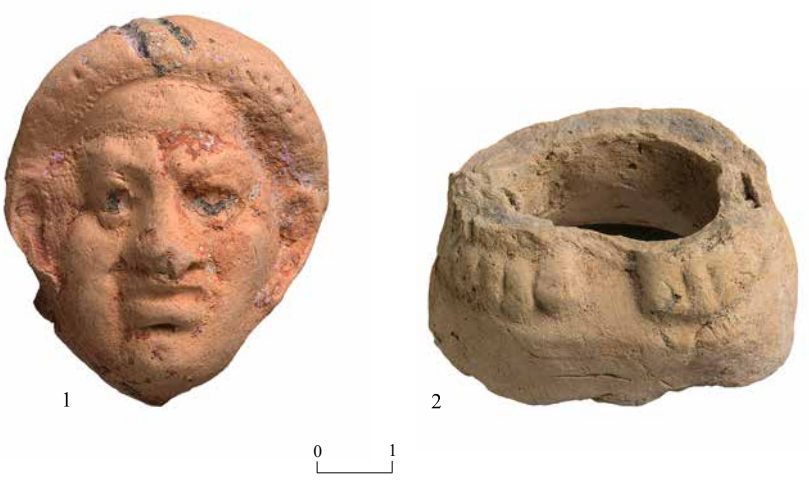


Fig. 18. Hellenistic terracotta figurines: (1) grotesque head; (2) fragment of standing figurine.

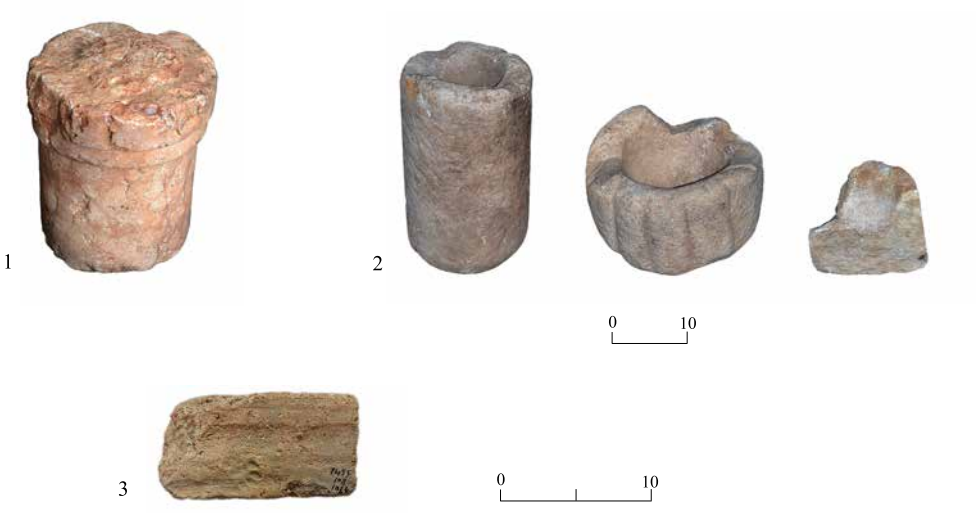


Fig. 19. Crusader-period finds: (1) small limestone pillar; (2) three marble basins; (3) brick with cat footprint.

Stone Artifacts (Fig. 19)

Several stone items were found, some coming from Stratum 2 Floor 110, below the collapsed debris layer (L109) associated with the end of Crusader-period occupation. The stone artifacts probably fell over, cutting the plaster floor due to the impact (see Fig. 5). A small broken pillar of pink-brown limestone breccia, with dressing marks on the sides and a bulge on the top, may be an unfinished artifact (Fig. 19:1). Three differently shaped marble basins (Fig. 19:2) were possibly intended for crushing substances; a pillar-shaped one may have secondarily been turned into a basin. The concentration of the three stone basins in a small (4 sq m) area in a room with a simple plaster floor, may indicate that the room served as a stone workshop.

Brick (Fig. 19:3)

A complete clay brick embedded with a cat’s footprint was found in the collapsed stone layer (L109) on Stratum 2 Floor 110. The brick may have been part of the Crusader-period building, as broken pieces of bricks were found in adjacent loci.

Fresco Fragments (Fig. 20)

Several small fresco fragments were found in the Stratum 3 Hellenistic layer (L126).[5] The fragments include white and colored pieces, with combinations of white, yellow, pink and red, a recurring pattern being a double red line on a white background bordering a yellow area; some of the colored fragments were covered with a layer of white plaster. No reconstruction of the fresco design could be made due to the small size of the fragments.

[5] I wish to thank Jacques Neguer of the IAA Conservation Department for examining the fresco fragments.

Fig. 20. Fresco fragments.

Fig. 21. Crusader-period gilded copper alloy tack.

Glass Finds

Eight glass fragments were found, five of which were diagnostic (none illustrated).[6] The rim of a cast bowl with engraved lines (L114, B1021) and a simple small bead (L127, B1063) date to the late Hellenistic period. A wineglass base is an isolated Byzantine-period find (L109). A hollow pushed-in ring base of a jug (L123) and a bottle neck fragment (L109) date to the Crusader period.

Copper Tack (Fig. 21)

A gilded copper tack was found in the Stratum 2 debris layer (L109). The tack head is shaped schemtically as a four-petal flower, and the shaft has a square cross-section. Such decorative tacks were used on wooden furniture, and similar tacks were found in ʻAkko in the Hospitaller Compound (Khamis, forthcoming) and in the Knights' Hotel excavation (Gosker, forthcoming; Gosker and Tatcher, forthcoming).

The Coins

Danny Syon[7]

Five coins were retrieved in the excavation, all identifiable to some extent but in a generally poor condition, apart from No. 3. This coin is excellently preserved but cannot be identified to mint or specific ruler. If there was a legend or any identifying clue on the reverse, it must have been on the part of the coin that is off-flan. The style points to a Phoenician mint in the Hellenistic period and it is tentatively suggested that this coin is a so-far unknown civic type of ʻAkko-Ptolemais in the late second century BCE.[8]

Three coins found in the Stratum 3 accumulation layer (L115; Nos. 1–3) date from the Hellenistic period, and a coin from a disturbed locus (L114; No. 4) dates from the Late

[6] I wish to thank Yael Gorin-Rosen, IAA, for examining the glass finds.
[7] Dr. Danny Syon, Israel Antiquities Authority.
[8] Photograph by Clara Amit, IAA.

Roman period. The single coin found in the Stratum 2 Crusader floor (L110; No. 5) dates from the end of Salaḥ al-Din’s reign.

1. L115, B1027, IAA 106978.
Ptolemaic, Egypt, early third century BCE.
Obv.: Head r. (of Ptolemy I?).
Rev.: [---] Eagle standing l., wings outspread.
Æ, ↑, 3.62 g, 14 mm.

2. L115, B1081, IAA 106981.
Seleucid, early second century BCE.
Obv.: Obliterated.
Rev.: [---] Obliterated
Æ, 5.90 g, 17 mm. Serrated edge.

3. L115, B1066, IAA 106979.
Civic, ‘Akko-Ptolemais(?), late second century BCE(?).
Obv.: Head of Tyche r. with turreted crown.
Rev.: Apparently no legend. Two parallel cornucopia with a bunch of grapes hanging down. Partly off flan. Dotted border.
Æ, ↑, 2.64 g, 15 mm.

4. L114, B1026, IAA 106980.
Late Roman, 395–408 CE.
Obv.: [---] Bust r.
Rev.: [Virtus Exerciti] Victory crowning emperor.
Æ, ↘, 1.53 g, 14 mm.

5. L110, B1045, IAA 106982.
Salaḥ al-Din, Damascus, AH 583–589/1187–1193 CE.
Obv.: [---] In center: الملك الناصر
Rev.: Obliterated.
Æ, 5.17 g, 28 mm.
Cf. Balog 1980:94 No. 148.

Faunal Remains
Ma'ayan Lev[9]

Seventeen animal bones were found in the Stratum 2 Crusader-period remains, and 32 bones came from mixed contexts.

The Crusader-period faunal assemblage included 17 bones, ten of which were identified to biological taxon (Table 1). The identified bones included hip and thigh bones of sheep/goat (NISP = 3), representing at least two individuals; equid bones (NISP = 3); the head, forelimb and foot of at least one cattle (NISP = 2); and a pig bone (NISP = 1). The remains of non-domestic animals included the bone of a mole rat (*Spalax ehrenbergi*) two sea snail shells (*hexaplex trunculas*) and a fish vertebra.

Taphonomic observations on the 17 bones are summarized in Table 2. Most of the assemblage (n = 10) exhibits bone weathering (following Behrensmeyer 1978), with Stage 3 severe bone weathering in four bones, and lower weathering stages (Stages 2 and 1) in two and four bones, respectively. The differing intensity of weathering observed indicates either that part of the assemblage was subject to prolonged sub-aerial exposure, possibly due to slow rates of garbage accumulation, or that the deposition of bones came from various sources. Only one bone, a calcined caprine pelvis, was burned. Carnivore gnawing marks were identified on two bones. Bone fracture morphology includes three bones with fractures that affected the bones while they were fresh, and two bones showing morphological attributes of both dry- and fresh-breakage scenarios. This observation suggests that bones may have been cracked for marrow during food preparation and consumption, and then

Table 1. Bone Counts (NISP)[i] by Taxon from the Crusader-Period Faunal Assemblage

Bone	Sheep/Goat (*Ovis aries/ Capra hircus*)	Equid (*Equus assinus*)	Cattle (*Bos Taurus*)	Pig (*Sus scrofa*)	Other
Mandible		1			
P2		1			
Radius			1		
Pelvis	2				
Femur	1			1	1 (rat)
Tibia		1			
Metapodial			1		
Total	3	3	2	1	1
%	30%	30%	20%	10%	10%

[i] NISP = Number of identified specimens.

[9] Laboratory of Archaeozoology, University of Haifa.

Table 2. Taphonomic Observations on the Bones from the Crusader-Period Faunal Assemblage

Feature	Degree	N
Weathered	Stage 1	2
	Stage 2	4
	Stage 3	4
Burned	Calcined	1
Gnawed	Carnivore	2
Fracture morphology	Dry	
	Fresh	3
	Mixed	2
Shaft length	Third	2
	Two thirds	1
Shaft circumference	>50%	1
	<50%	1
	100%	2

broken again by diagenetic (post-burial) processes. It thus seems that the Crusader-period bones mainly represent food waste, and that the animals were probably cooked rather than roasted, cracked for marrow, and gnawed by dogs, and the assemblage was exposed to the elements in different degrees, suggesting slow rates of garbage accumulation.

Apart from the food waste, and possible use of marine resources, a bone dice (L109) and a sawn cattle metapodial (L104) were also found (not illustrated), reflecting the use of bone as craft material at the site.

The faunal remains from the mixed contexts comprised 32 bones, 25 of which were identified to biological taxon (Table 3). These represent livestock animals: sheep and goats (NISP = 12), cattle (NISP = 8), pig (NISP = 4) and equids (NISP = 1). The sheep/goat, cattle and pig include bones from the head, forelimbs and feet, the forelimb and hind limb bones representing food waste, and the head and feet bones representing slaughter waste.

Taphonomic observations of 22 bones are summarized in Table 4. The assemblage (n = 22) exhibits bone weathering of different degrees. Carnivore gnawing marks were identified on two bones. Bone fracture morphology includes seven bones with fractures that affected the bones when they were fresh, three bones with fractures that affected the bones when they were dry, and three bones showing morphological attributes of both breakage scenarios.

Discussion: The Ottoman-Period Fortifications

Although only a short segment of the Ottoman fortification walls was exposed in the excavation, the peculiar feature of the walls—specifically the sharp angle of W103 and the counterscarp wall—demands an explanation. About 20 meters west of this angled corner, a

Table 3. Bone Counts (NISP)[i] by Taxon from the Mixed Contexts

Bone	Sheep/Goat (*Ovis aries/ Capra hircus*)	Cattle (*Bos Taurus*)	Pig (*Sus scrofa*)	Equid (*Equus assinus*)
Mandible	1		2	
P4		1		
M1/2		1		
M3	1			
Scapula	1			
Humerus	4		1	
Radius	2	3		
Pelvis	1			
Calcaneus	1			
Metapodial			1	
Metatarsal	1	2		
Phalanx 1				1
Phalanx 2		1		
Total	12	8	4	1
%	48%	32%	16%	4%

[i] NISP = Number of identified specimens.

Table 4. Taphonomic Observations on the Bones from Mixed Contexts

Feature	Degree	N
Weathered	Stage 1	12
	Stage 2	7
	Stage 3	3
Burned	Calcined	
Gnawed	Carnivore	2
Fracture morphology	Dry	3
	Fresh	7
	Mixed	3
Shaft length	Third	3
	Two thirds	5

break line observed in the lower courses of the counterscarp wall (Figs. 25, 26) is a strong indication for the existence of another sharply angled corner. It is proposed that these angled walls (Fig. 27: W102, W103, W130, W131) were part of a ravelin—a walled outwork structure constructed in the defense line of the counterscarp and surrounded by a small moat or ditch that linked back to the main moat (Griffith 2013:63). Ravelins were components of city fortifications that comprised ramparts, walls and ditches, reflecting a military concept of ‘defense in depth’ as opposed to ‘linear defense’, comprising only a wall and moat. This conceptual transition took place in Europe in the late sixteenth to seventeenth centuries, and it was exemplified by Sébastien Le Prestre de Vauban, a military engineer who worked under Louis XIV of France. The “in-depth” fortifications, comprising ramparts and outworks, continued to be built into the nineteenth century (Denman 2020:238). The northern side of the ‘Akko ravelin was not exposed in the excavation, but the identified elements align with a possible plan. In the excavation, the narrow foundation trench of W103 was visible cutting through the earlier Crusader and Hellenistic layers (see above; Plan 1: Section 1–1). In a completed ravelin, the ravelin stone walls would have been built, and then the moat would have been dug around the walls, removing evidence of the foundation trench, and probably

Fig. 25. The location of the break line in the counterscarp, looking northwest.

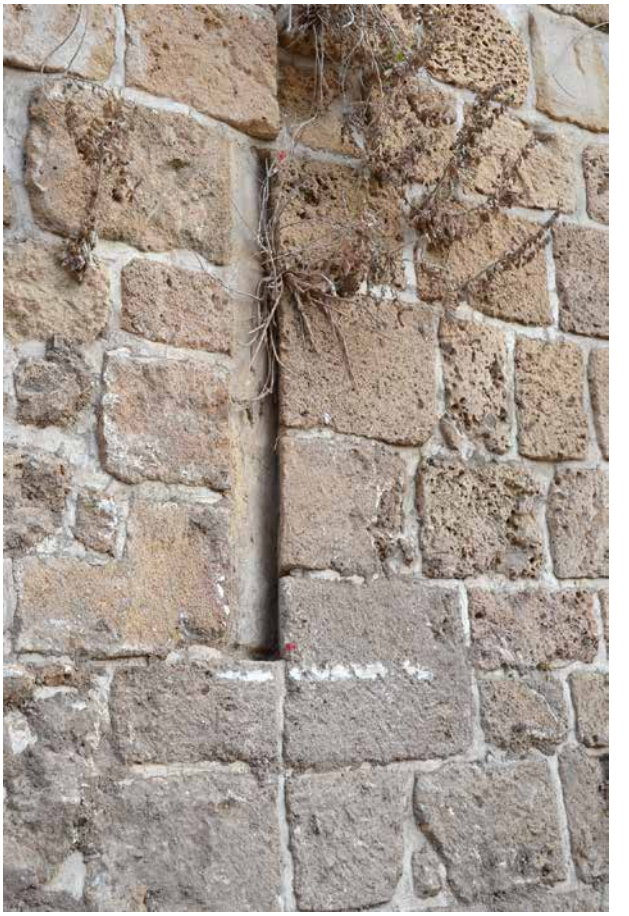


Fig. 26. The break line, probably the southwestern corner of the ravelin, looking west.

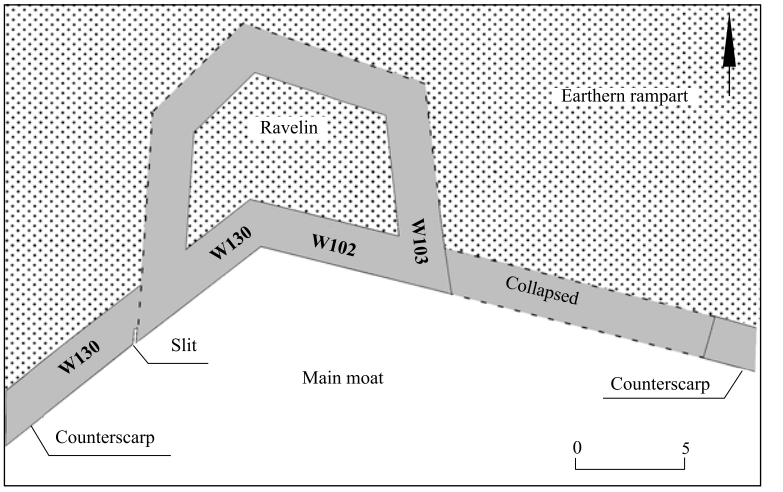


Fig. 27. Proposed reconstruction of the ravelin in the counterscarp.

using the removed earth to raise the height of the ravelin interior. In the case of the ʻAkko ravelin, it seems that the construction of the ravelin was not completed, and the moat around the ravelin was not dug.

A historical source (Ibrahim Awra 1936) attributed the major defense works in ʻAkko, including the fortification walls, to Al Jazzâr Pasha, who built the outer wall after Napoleon's retreat in 1799. During the siege of Napoleon, Al Jazzâr was assisted by the British fleet commanded by Sidney Smith. Smith's engineers took an active role in constructing the defenses of Yafo (Jaffa; *CIAP* VI: 32), and they were therefore probably also active in ʻAkko. Al Jazzâr himself was deeply involved in the construction of the ʻAkko defenses until he died in 1804 (Philipp 2001:58), and his successor, Suleiman Pasha, completed the construction of the main moat and the counterscarp. In 1806, a German traveler Ulrich Seetzen recorded that the work on the moat and the counterscarp was almost complete (Seetzen 1854:77). Seetzen and Awra both mention that Suleiman built three defensive buildings on the counterscarp. Asad Jibrail Rustum places one at the extreme south of the counterscarp, and he suggests a location west of our excavation for a second defensive building (Rustum 1926:18). When Ibrahim Pasha captured ʻAkko in 1832, he repaired the defenses and expanded them. In 1841, the city was eventually taken by a combined force of the British, Austrian and Turks, following which little was done to repair the walls.

On a plan of the ʻAkko fortifications from 1843, a small, angled structure marked by two lines, is visible on the spot of the ravelin, and there is a covered way on top of the counterscarp (Fig. 28; detail enlarged by the author). This covered way is a structure with thick traverse walls providing protection against enemy fire from the sides. Notwithstanding the similar orientation of the traverse walls, they have no connection with the walls of the ravelin. It is most probable that the ravelin was part of the earliest construction phase of the counterscarp, undertaken under Al Jazzâr Pasha, and that the plans were changed under his successor Suleiman Pasha.

CONCLUSIONS

The small excavation, instigated by the collapse of a section of the Ottoman counterscarp wall of the moat, exposed limited architectural remains and a variety of finds predominantly from the Hellenistic and the Crusader periods. The unusual location of the excavation behind the later fortification wall, yielded many and varied artifacts without building remains or secure stratigraphical contexts. The thickness of the Hellenistic-period accumulation layers reflects the intensity of the occupation in this period, and the imported pottery, the fresco fragments, the scale weight (see Finkielsztejn, this volume), and the imported stamped amphorae, all indicate that this area lay within the polis of ʻAkko-Ptolemais.

The presence of limited Roman-period pottery but the absence of a Roman occupation layer aligns with the current understanding of the Roman period in ʻAkko, namely that the Roman city was not situated on the ʻAkko peninsula.

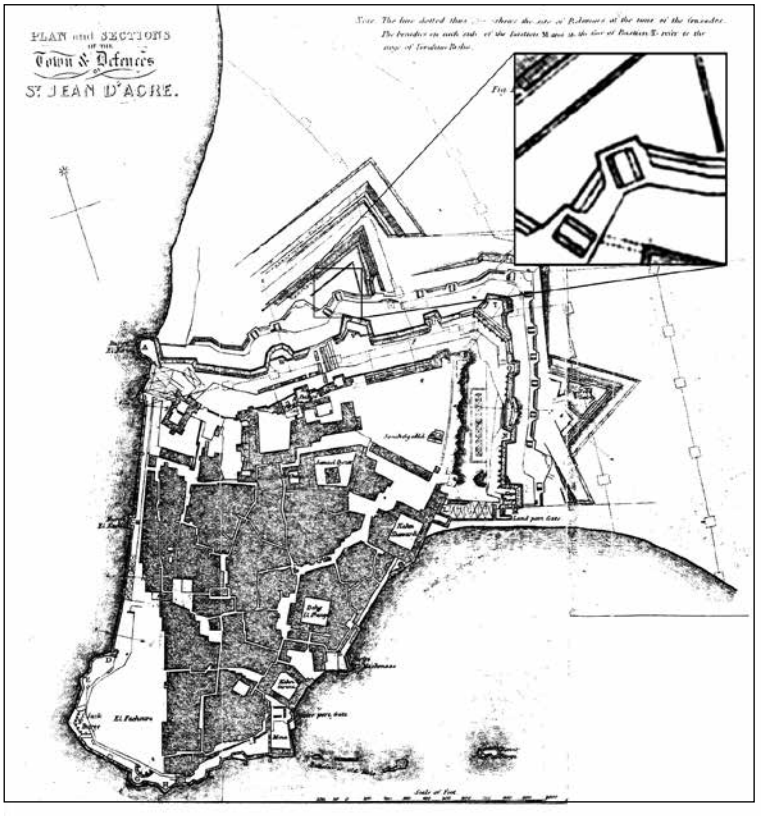


Fig. 28. Map of the ʻAkko fortifications in 1843 (after Symonds 1843: Plan 1), including an enlarged detail by the author.

The limited Crusader-period remains are part of a simple building, possibly a workshop for stone basins and small pillars. The destruction layer in the Crusader room may be dated to the last days of Crusader ʻAkko, to the Mamluk conquest in 1291, when the city was destroyed and abandoned. Since this area lay outside the Ottoman city, the Crusader remains were undisturbed until the moat was dug.

The Ottoman defense works of ʻAkko are described in historical sources; however, there may be building phases that are not documented in the written record. The current excavation seems to have uncovered remains of previously unknown elements of the Ottoman defenses, namely the unfinished ravelin, incorporated in the counterscarp wall of the moat. The change in the fortification plans may have coincided with the death of Al Jazzâr and the transferal of power to Suleiman Pasha at the beginning of the nineteenth century.

References

Adan-Bayewitz D. 1993. *Common Pottery in Roman Galilee: A Study of Local Trade.* Ramat Gan.

Ariel D.T. and Finkielsztejn G. 1994. Stamped Amphora Handles. In S.C. Herbert. *Tel Anafa* I, i: *Final Report on Ten Years of Excavation at a Hellenistic and Roman Settlement in Northern Israel* (*JRA* Suppl. S. 10). Ann Arbor. Pp. 183–240.

Awra I. al-. 1936. *Tarikh wilayat Sulayman Basha al-Adil (History of the Reign of Suleiman Pasha the Just)* (Constantine Pasha al-Mukhlasi ed.). Sidon.

Avissar M. and Stern E. 1995. ʻAkko, the Citadel. *ESI* 14:22–25.

Avshalom-Gorni D. and Getzov N. 2002. Phoenicians and Jews: A Ceramic Case-Study. In A.M. Berlin and J.A. Overman eds. *The First Jewish Revolt: Archaeology, History and Ideology*. London–New York. Pp 74–83.

Berlin A.M. 2015. Hellenistic Period. In S. Gitin ed. *The Ancient Pottery of Israel and Its Neighbors from the Iron Age through the Hellenistic Period* 2. Jerusalem. Pp. 629–671; 744–745.

Berlin A.M. and Stone P.J. 2016. The Hellenistic and Early Roman Pottery. In M. Hartal, D. Syon, E. Stern and A. Tatcher. *ʻAkko* II: The 1991–1998 Excavations; The Early Periods (IAA Reports 60). Jerusalem. Pp. 133–202.

Behrensmeyer A. 1978. Taphonomic and Ecologic Information from Bone Weathering. *Paleobiology* 4:150–162.

Bikai P.M., Fulco W.J. and Marchand J. 1996. *Tyre: The Shrine of Apollo*. Amman.

Cankardeş-Şenol G. 2015. *Lexicon of Eponym Dies on Rhodian Amphora Stamps* 2: *Eponyms B to K* (Études alexandrines 35; AmphorAlex 4; Corpus international des timbres amphoriques 22). Alexandria.

CIAP VI: M. Sharon. Corpus Inscriptionum Arabicarum Palaestinae VI: J (1) (Handbook of Oriental Studies 1; The Near and Middle East 30). Leiden–Boston 2017.

Driesch A. von den. 1976. *A Guide to the Measurement of Animal Bones from Archaeological Sites* (Peabody Museum Bulletin 1). Cambridge, Mass.

Empereur J.-Y. and Tuna N. 1988. Zénon de Caunos et l'épave de Serçe Limani. *BCH* 112:341–357.

Erlich A. and Kloner A. 2008. *Maresha Excavations Final Report* II: *Hellenistic Terracotta Figurines from the 1989–1996 Seasons* (IAA Reports 35). Jerusalem.

Finkielsztejn G. 2001. *Chronologie détaillée et révisée des éponymes amphoriques rhodiens de 270 à 108 av. J.-C. environ: Premier bilan* (BAR Int. S. 990). Oxford.

Finkielsztejn G. 2013. Cypriot Amphora Stamps of the Hellenistic Period Found in Israel. In M.L. Lawall and J. Lund eds. *The Transport Amphorae and Trade of Cyprus* (Gösta Enbom Monographs 3). Aarhus. Pp. 86–100.

Finkielsztejn G. 2021. Contribution of the Rhodian Eponyms Amphora Stamps to the History of the Maccabees: The Data. In A.M. Berlin and P.J. Kosmin eds. *The Middle Maccabees* (Archaeology and Biblical Studies 28). Atlanta. Pp. 193–214.

Finkielsztejn G. This volume. A Hellenistic Lead Scale Weight from the ‘Akko Counterscarp Excavation.

Garlan Y. 2004–2005. En visitant et revisitant les ateliers amphoriques de Thasos. *BCH* 128–129: 269–329.

Gosker J. Forthcoming. ‘Akko, The Knights’ Hotel Excavations II: The Metal Objects. *‘Atiqot.*

Gosker J. and Tatcher A. Forthcoming. The Knights’ Hotel Site: The Metal Objects. In E. Stern and D. Syon. *‘Akko* III: *The Excavations of 1991–1998; The Late Periods* (IAA Reports). Jerusalem.

Khamis E. Forthcoming. The Hospitaller Compound: The Metal Objects. *‘Atiqot.*

Lawall M.L. 2004. Amphoras without Stamps: Chronologies and Typologies from the Athenian Agora. In *Proceedings of the Sixth Scientific Meeting on Hellenistic Pottery, Volos, Greece, April 17–23 2000*). Athens. Pp. 445–454.

Lawall M.L. 2011. Early Hellenistic Amphoras from Two Closed Contexts: Kerynia Shipwreck and Ephesos Well LB. In *Proceedings of the Seventh Scientific Meeting on Hellenistic Pottery, Aigio, Greece, April 3–9 2005*). Athens. Pp. 673–682.

Messika N. 2016. The Hospitaller Compound: Terracotta Figurines. In M. Hartal, D. Syon, E. Stern and A. Tatcher *‘Akko* II. *The 1991–1998 Excavations: The Early Periods* (IAA Reports 60). Jerusalem. Pp.121–126.

Meyza H. 2004. *Kouriaka* Again: Amphora Stamps from the Kourion Acropolis Excavations. In J. Eiring and J. Lund eds. *Transport Amphorae and Trade in the Eastern Mediterranean (Acts of the International Colloquium at the Danish Institute at Athens, September 26–29, 2002)* (Monographs of the Danish Institute at Athens 5). Aarhus. Pp. 273–284.

Monakhov S.Y. 2003. *Греческие амфоры в Причерноморье* (*Greek Amphoras in the Black Sea*). Moscow–Saratov (Russian).

Monakhov S.Y. 2005. Rhodian Amphorae: Developments in Form and Measurements. In V.F. Stolba and L. Hannestad eds. *Chronologies of the Black Sea Area in the Period c. 400–100 BC* (Black Sea Studies 3). Aarhus. Pp. 69–95.

Monakhov S.Y. 2014. Косские и псевдокосские амфоры и клейма (Koan and Pseudo-Koan Amphoras and Stamps). *Stratum Plus* 3:195–222 (Russian; English summary).

Nørskov V. 2004. Amphorae from Three Wells at the Maussolleion of Hallikarnassos: Something to Add to the Typology of the Mushroom Rims? In J. Eiring and J. Lund eds. *Transport Amphorae and Trade in the Eastern Mediterranean (Acts of the International Colloquium at the Danish Institute at Athens, September 26–29, 2002)* (Monographs of the Danish Institute at Athens 5). Aarhus. Pp. 285–291.

Philipp T. 2001. *Acre: The Rise and Fall of a Palestinian City, 1730–1831*. New York.

Porat L., Frankel R. and Getzov N. 2012. The Lever Presses of Eretz Israel in the Light of the Alone Abba Oil Press. *‘Atiqot* 70:51–81 (Hebrew; English summary, pp. 84*–86*).

Rustum A.J. 1926. *Notes on Akka and Its Defences under Ibrahim Pasha*. Beirut.

Rosenthal-Heginbottom R. 2015. Hellenistic Period Imported Pottery. In S. Gitin ed. *The Ancient Pottery of Israel and Its Neighbors from the Iron Age through the Hellenistic Period* 2. Jerusalem. Pp. 673–708; 746–747.

Schur N. 1990. *History of Acre*. Tel Aviv (Hebrew).

Seetzen U.J. 1854. *Ulrich Jasper Seetzen's Reisen durch Syrien, Palästina, Phönicien, die Transjordan-Länder, Arabia Petraea und Unter-Aegypten* 2 (F. Kruse ed.). Berlin.

Şenol A.K. 1995. *Erken Knidos Amphoralarında (i. ö. III. yüzyıl) Monogram Mühürler* [*Monogram Stamps on Early Knidian Amphorae (3rd century BC)*]. M.A. thesis. Izmir University. Izmir (Turkish).

Smithline H. 2009. Pottery and a Small Find from the Persian and Hellenistic Periods. In N. Getzov, R. Lieberman-Wander, H. Smithline and D. Syon. *Ḥorbat ‘Uẓa. The 1991 Excavations* I: *The Early Periods* (IAA Reports 41). Jerusalem. Pp. 136–149.

Smithline H., Stern E.J. and Stern E. 2013. A Crusader-Period Bathhouse in ‘Akko (Acre). *‘Atiqot* 73:71–108.

Stern E.J. 2012. *‘Akko* I: *The 1991–1998 Excavations: The Crusader-Period Pottery* (IAA Reports 51) (2 vols.). Jerusalem.

Süvegh E. 2014. Hellenistic Grotesque Terracotta Figurines: Problems of Iconographical Interpretation. In D. Bartus. *Dissertationes Archaeologicae: Ex Instituto Archaeologico Universitatis de Rolando Eötvös Nominatae. Ser. 3 No. 2.* Budapest. Pp. 143–156.

Symonds J.F.A. 1843. Plan and Sections of the Town & Defences of St. Jean d'Acre Surveyed & Drawn by Lieut. Symonds, R.E.; Engraved by B. R. Davies. In R.C. Alderson. *Notes on Acre and Some of the Coast Defences of Syria.* London. Pl. 9.

Syon D. 2010. ‘Akko, the Knights' Hotel. *HA–ESI* 122 (September 5). http://www.hadashot-esi.org.il/report_detail_eng.aspx?id=1481 (accessed February 2, 2019).

Tatcher A. 2007. ‘Akko, the Northern Moat. *HA–ESI* 119 (December 18). http://www.hadashot-esi.org.il/report_detail_eng.aspx?id=649&mag_id=112 (accessed February 2, 2019).

Tzochev C. 2016. *Amphora Stamps from Thasos* (The Athenian Agora XXXVII). Princeton.

Winter P.H. 1944. *Preservation and Reconstruction of Acre: Acre Report* 2. Jerusalem.