

THE EARLY BRONZE AGE IB BURIALS IN THE CHALCOLITHIC— EARLY BRONZE AGE I CEMETERY IN THE PALMAḤİM QUARRY

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INTRODUCTION

The protohistoric site of Palmaḥım is located on a *kurkar* ridge (36.00 m asl) c. 1.5 km east of the Mediterranean coastline and one kilometer south of Naḥal Soreq. The ancient remains are located on two hills separated by a saddle: an EB IB settlement spread over the southern hill, and a Chalcolithic cemetery, on the eastern slope of the northern hill (Fig. 1). The existence of the EB I site on the *kurkar* ridge was first noticed by Jacob Kaplan, and archaeological excavations were conducted at the site during the development of the Palmaḥım Quarry on the northern hill.

Between 1966 and 1971, ten burial caves were examined on the northern hill, and most were entirely excavated under the direction of Ram Gophna.¹ It transpired that the ten burial caves were hewn in the Chalcolithic period, and they were reused in EB IB for burial or domestic use. Another burial cave was originally hewn in EB IB (Gophna 1968; 1974: 46–47).

The settlement on the southern hill was investigated, and several areas were excavated before the *kurkar* ridge was demolished by the Palmaḥım Quarry. In a trial excavation (60 sq m) conducted by Gophna in 1971, three consecutive strata were unearthed: Stratum III, from the Chalcolithic period; Stratum II, from EB IA, contemporary with a large pit excavated in 1969;² and Stratum I, comprising wall remains of rectangular buildings dated to EB IB (Gophna 1974:48, Pls. 11, 12).

¹ The excavations (A-160/1968, A-260/1970, A-318/1971) were directed by Ram Gophna with the assistance of Shmuel Liphshitz, Menashe Busheri, Moshe Brosh, Dov Meiron and kibbutz volunteers. This article is the publication of an old excavation that was carried out many years ago and remained unpublished. The maps were prepared by Elena Delerzon, the final plans were redrawn by Bracha Zilber, the pottery was redrawn and the plates were prepared by Marina Shuiskaya.

² In 1969, a large pit (diam. 2.5 m, 1.2 m deep), containing pottery dated to EB IA, was discovered on the southern hillslope (Gophna 1974:47, Pl. 10).

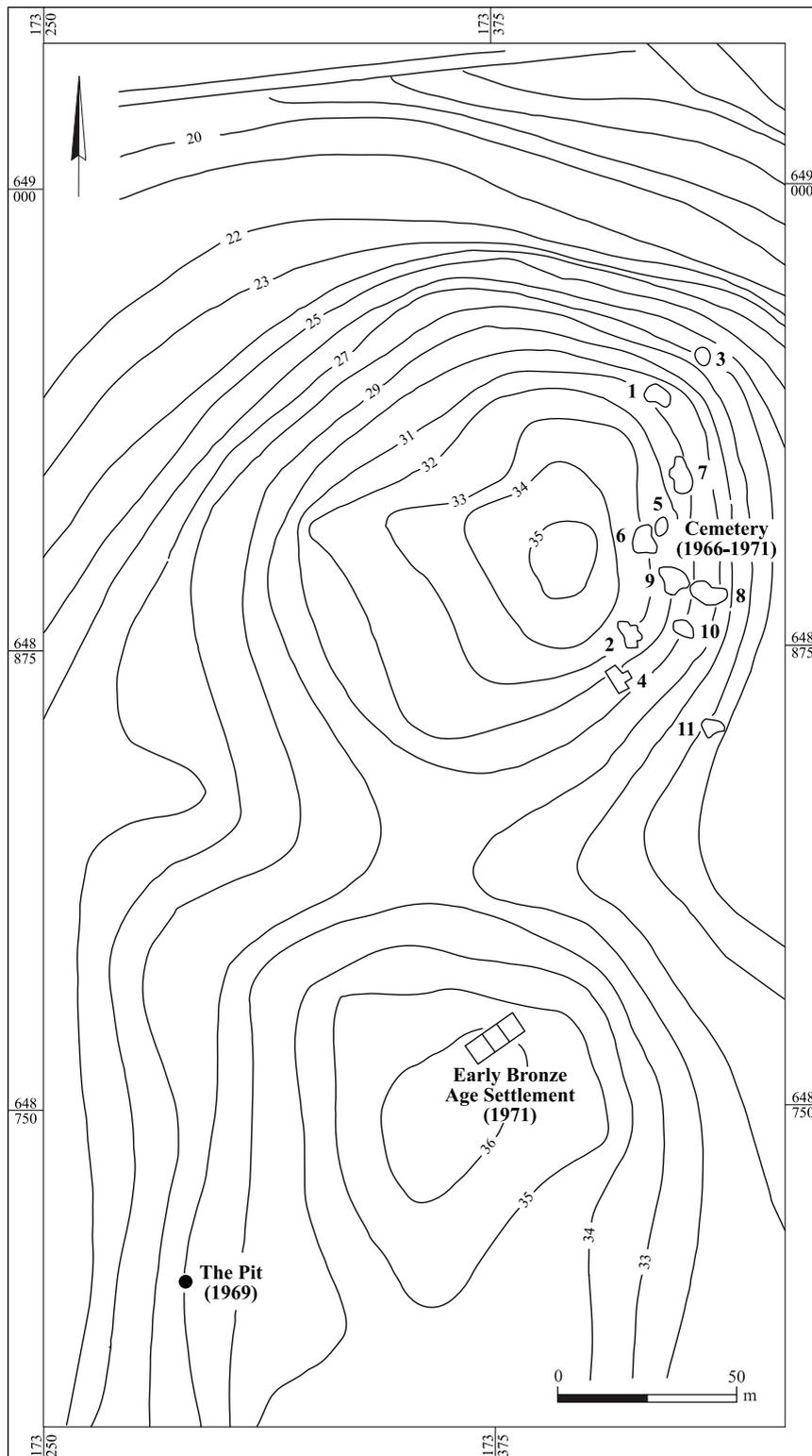


Fig. 1. Location map.

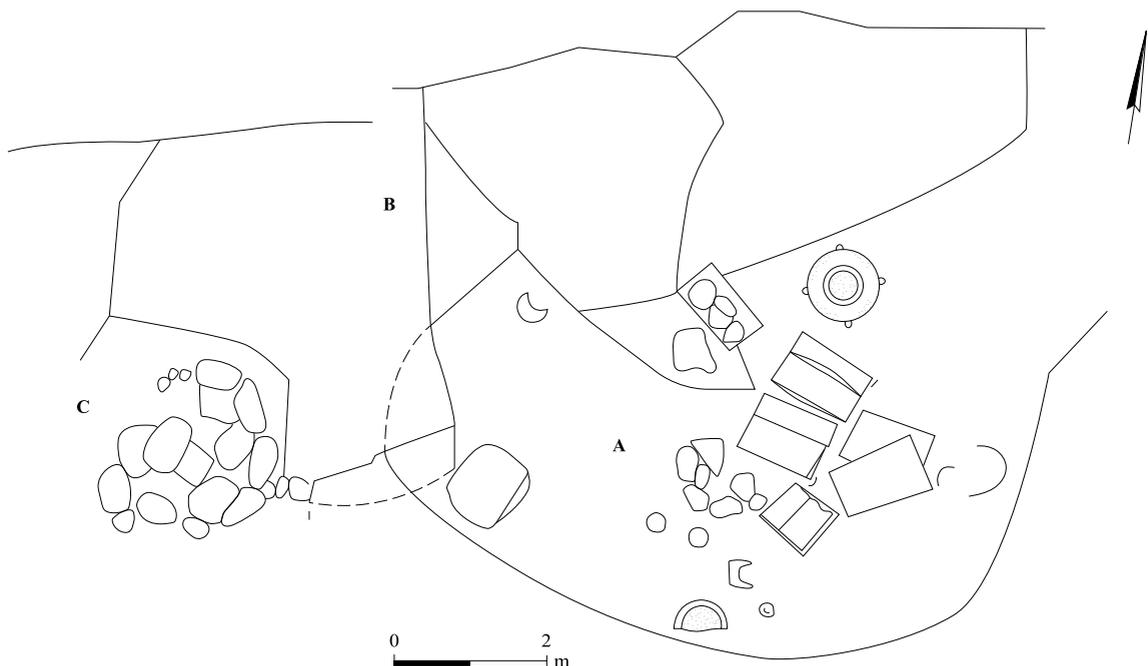
In 1988–1989, a small-scale excavation was carried out by Ronny Reich (1990) in an area badly damaged by mechanical works, precluding an accurate reconstruction of the local stratigraphy. Large-scale salvage excavations located south of the area excavated by Gophna were conducted by Braun (2008b), exposing three consecutive strata: Stratum 3, dated to EB IA, and Strata 2 and 1, dated to EB IB.

The present report focuses on the Chalcolithic–EB IB burial caves excavated on the northern hill. The paper discusses the EB IB remains, thus constituting the final report on the EB IB excavations on the northern hill.³

THE EXCAVATION OF THE CEMETERY

The six better-preserved caves, from which pottery assemblages were retrieved (Caves 1, 2, 6, 7, 8, 10), are presented here. Regarding the other four caves: no documentation was extant on Caves 3 and 4; Cave 5 was found entirely destroyed; and Cave 9 was published previously (Gophna and Liphshitz 1980). It transpired that the six caves were predominantly used for burial in EB IB, whilst some evidence for domestic use was also detected.

Cave 1 (Plan 1; Fig. 2).— The cave was hewn in the *kurkar* bedrock; its entrance, located on the northeastern side, was destroyed. The cave included two round chambers (A, B) and



Plan 1. Cave 1.

³ The Chalcolithic burials and all their finds will be published separately by Na'ama Scheftelowitz.

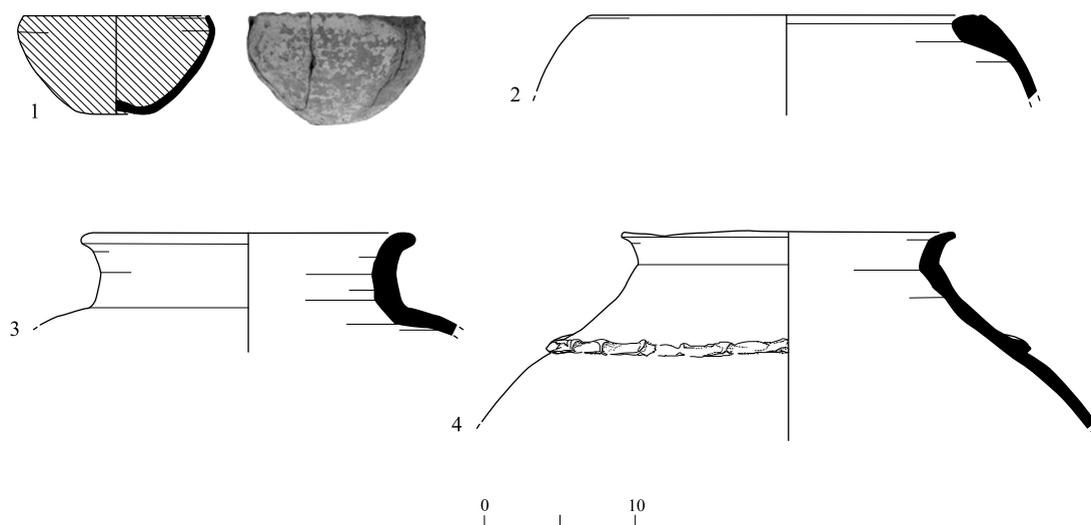


Fig. 2. Cave 1: bowl, holemouth jar and pithoi.

No.	Vessel	Reg. No.	IAA. No.	Description
1	Bowl	100	69-500	
2	Holemouth jar			Brown clay, gray core, poorly fired
3	Pithos			Pink-orange clay, white-wash, medium-fired
4	Pithos			Pink clay, white-wash traces, plastic decoration

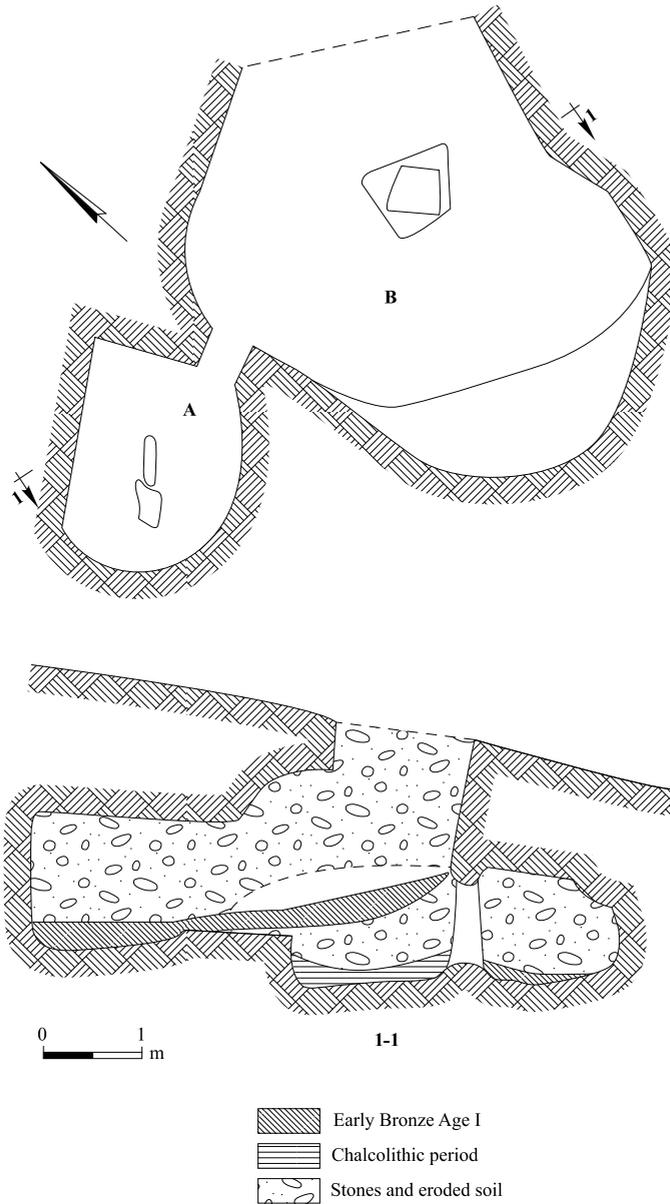
a small rectangular chamber (C). In the center of Chamber A, fragments of Chalcolithic-period ceramic ossuaries resembling rectangular and round structures were found on a *kurkar* stone-slab paving. Adjacent to the ossuaries, sherds of rounded bowls and straight-sided V-shaped bowls were retrieved, along with a large holemouth vessel with four lug handles, containing human bone fragments. Only a few Early Bronze Age sherds were found here.

The entrance between Chambers A and B was sealed with stone rubble. In Chamber B, a thick (0.3 m) black layer, containing ash, soot, small stones, burned bones and Early Bronze Age sherds, overlay the bedrock.

Chamber C was a rectangular chamber with a hewn bench in its back wall. On the floor was a patch of *kurkar* paving slabs, bonded with clay and surrounded by rubble. Large sherds of Early Bronze Age holemouth and pithoi jars (Fig. 2:2–4) retrieved here attest to a domestic use of the cave in EB IB (see *Discussion*, below).

The sequence of use in the cave, originally hewn for burial in the Chalcolithic period and reused for domestic activities in the Early Bronze Age, is a well-known phenomenon, with parallels at Shoham (North) and Mazor (Brink and Gophna 2005:99, 170).

Cave 2 (Plan 2; Figs. 3–9).— This cave, lying c. 55 m south of Cave 1, was used for burial in the Chalcolithic period, and again for burial in the Early Bronze Age.



Plan 2. Cave 2, plan and section.

In the Chalcolithic period, the cave consisted of one chamber (B; 5 × 4 m, c. 1 m high), with a rock-hewn pillar in the center to support the ceiling. Fragments of several ossuaries and shattered long bones and skulls were found on the floor north of the pillar. Two ossuaries were rounded and jar-shaped, the others were rectangular and house-shaped. Thirty-five bowls were found, most with straight walls (V-shaped), some intact, others complete and restorable. The Chalcolithic pottery assemblage also included fragments of a handle-less amphoriskos, a chalice and a churn fragment. Other finds included a copper rod with a rectangular section (4.5 cm long) and a rectangular limestone palette (12.0 × 8.5 cm).



Fig. 3. Cave 2, looking north.



Fig. 4. Cave 2, *in situ* vessels.



Fig. 5. Cave 2, *in situ* vessels.

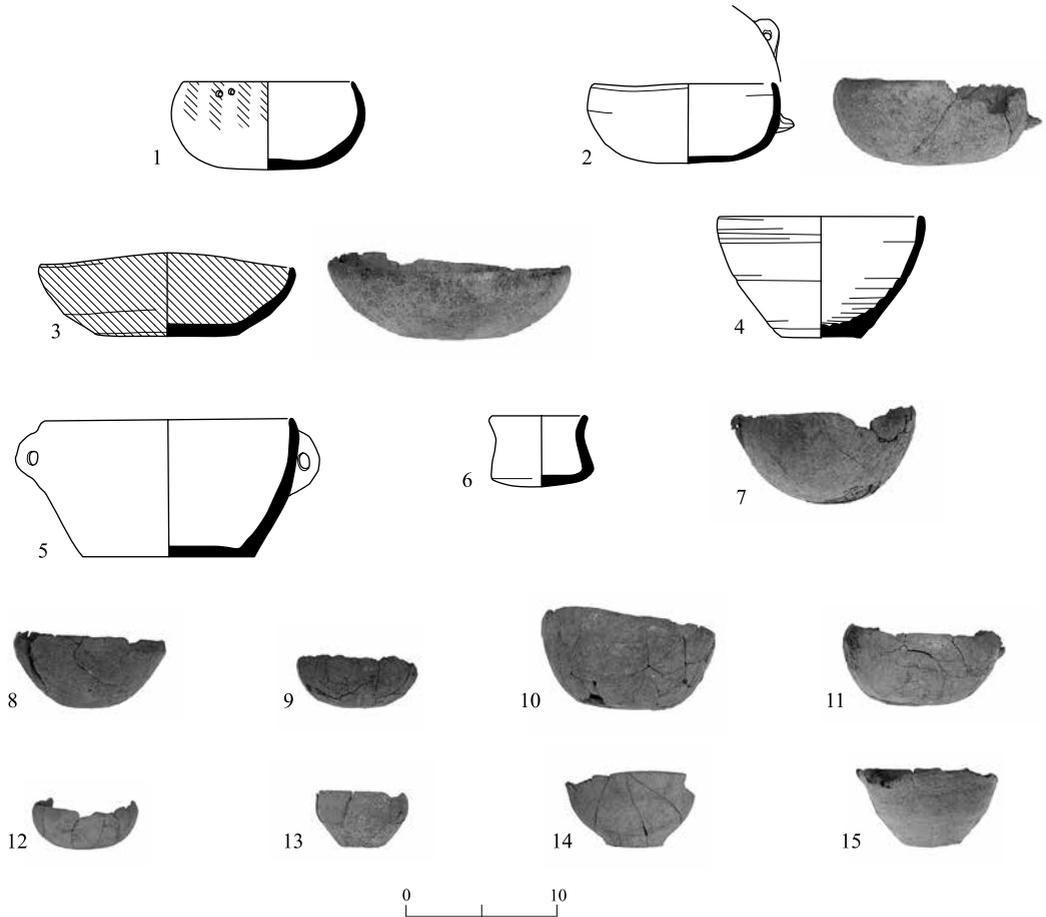


Fig. 6. Cave 2: bowls.

No.	Reg. No.	IAA. No.	Description
1		69-3072	
2	232	69-9046	Pink clay, small light grits
3	233	69-5068	Light brown clay, red slip
4	250	69-5085 69-5083	Brown clay, brown core with wash
5	260	69-5035 97-2788	Pink clay, white lime wash
6		69-5061	Buff clay, poorly fired
7	212	69-5056	Brownish gray clay
8	213	69-5071	Reddish brown clay
9	214	69-5045	Buff-pink clay, soot marks
10	235	69-5078	Buff clay
11	226	69-5052	Light brown clay, poorly fired
12	223	69-5033	Buff clay
13	209		
14	204	69-5054	Chalcolithic?
15	229		

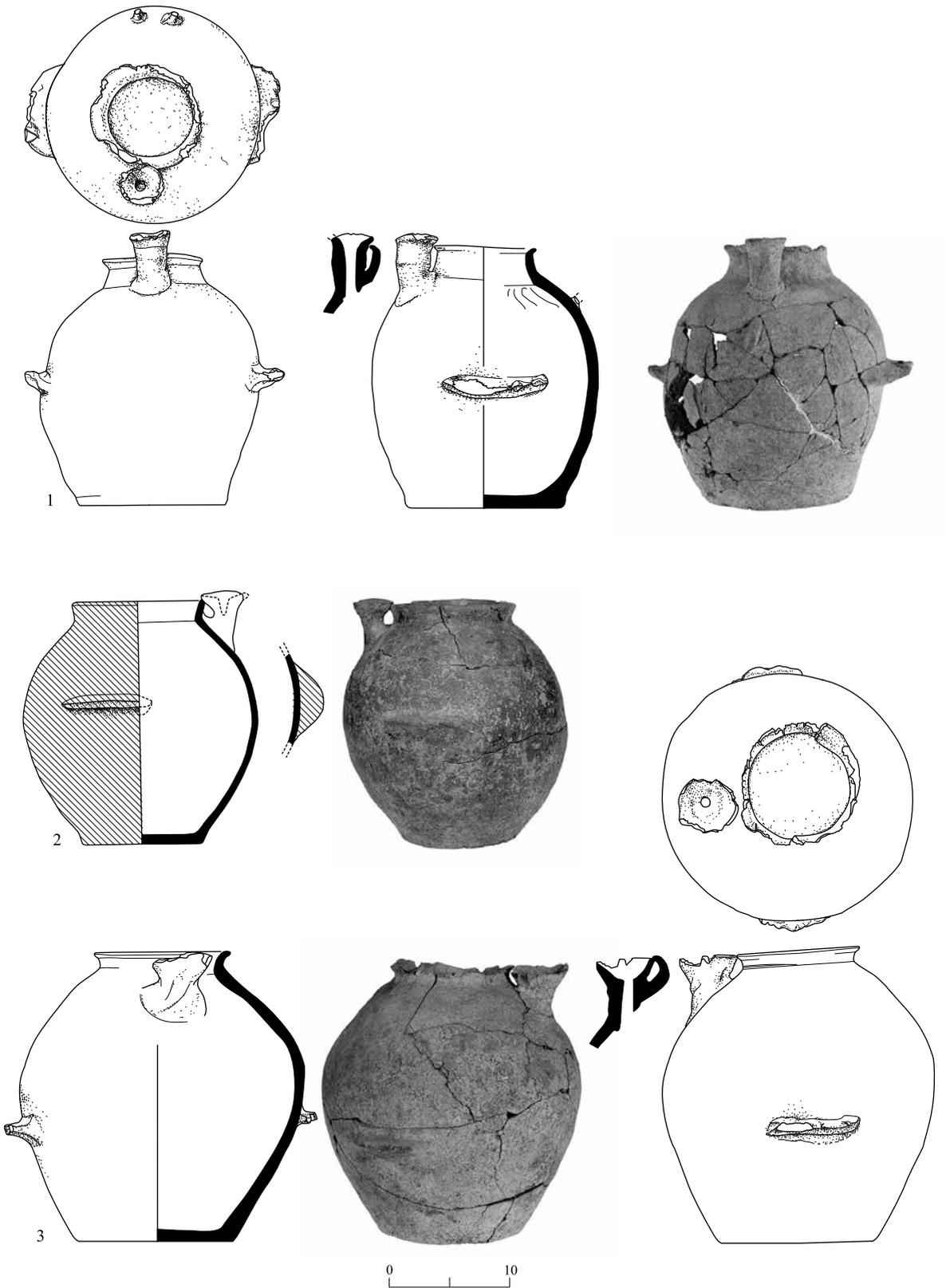


Fig. 7. Cave 2: funnel-spouted jars.

◀ Fig. 7

No.	Reg. No.	IAA. No.	Description
1	248	69-5076	Orange clay, gray core, knob decoration
2	252	69-5060	Red clay, well-fired
3	220	69-6075	Buff clay, gray core, white lime wash

Fig. 8 ▶

No.	Vessel	Reg. No.	IAA. No.	Description
1	Funnel-spouted jar	200	69-5032	Orange clay, well-fired
2	Funnel-spouted jar	221	69-5091	Orange clay, white grits, white wash
3	Everted-rim jar	249	69-5066	Orange clay, white grits, well-fired
4	Funnel-spouted amphoriskos		69-5040	
5	Everted-rim jar	261	69-5036 97-2779	Orange clay, white lime wash

A Chalcolithic-period *kurkar*-stone ossuary and an intact jar with four lug handles were found next to the entrance, indicating that the cave was probably robbed in antiquity. The Chalcolithic remains were covered by a 0.75 m thick layer of stone collapse from the ceiling and by eroded soil, on top of which the EB I remains were found. This testifies to a hiatus between the two periods of use in the cave.

It is evident that the cave was adapted for burial in EB I, as an opening was cut in the northwestern side of Chamber B, and another chamber (A) was hewn in the *kurkar* sandstone. Chamber A was partially destroyed by modern quarrying activities. In both chambers, EB I remains were found on the floors, including scattered bones and 36 pottery vessels, amongst which were bowls, jars, amphoriskoi and juglets (Figs. 6–9). Although damaged by humidity and salinity, some of the vessels still bear remnants of red slip and burnishing, and others are decorated with red-painted bands (see *Discussion*, below).

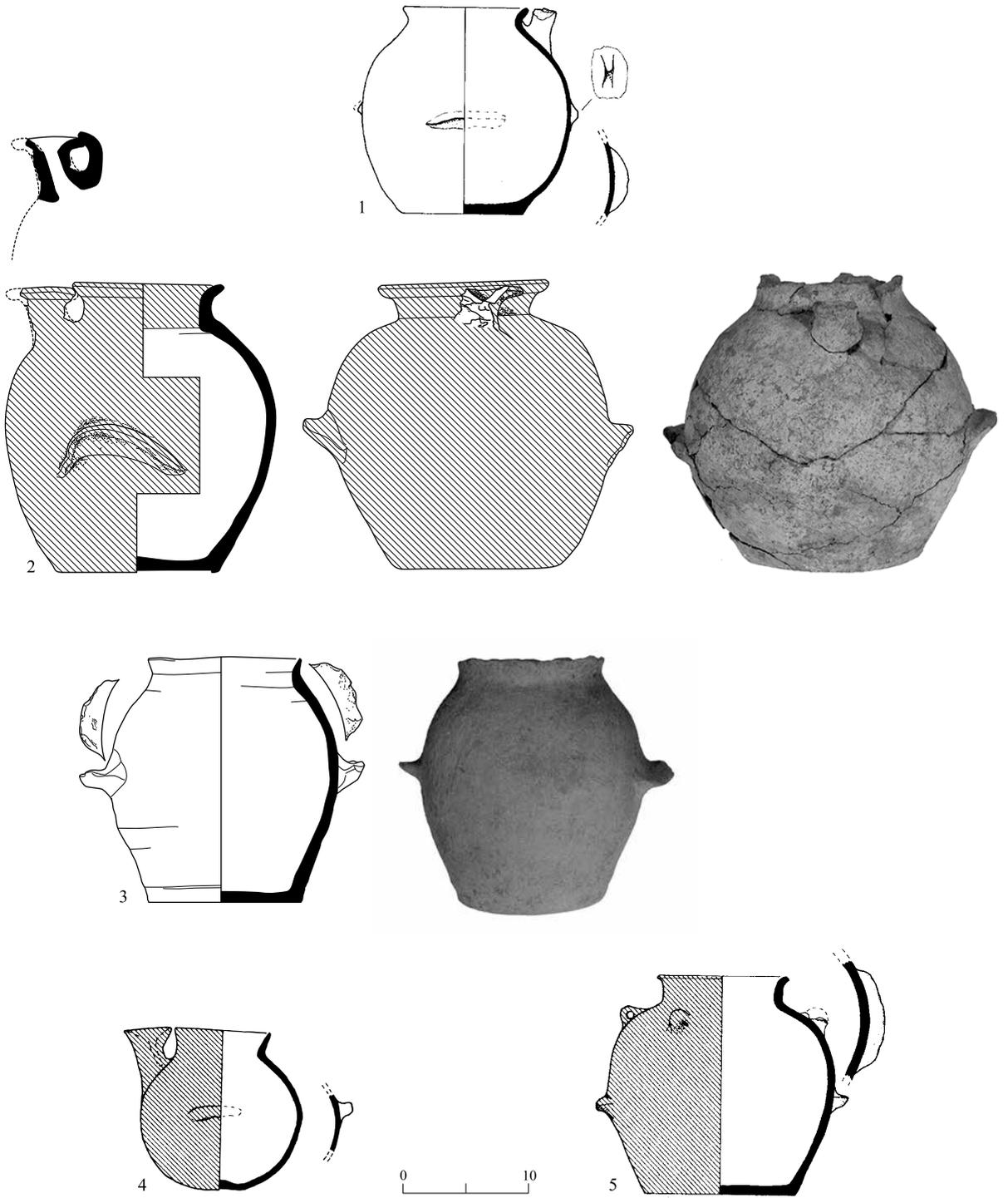


Fig. 8. Cave 2: jars and amphoriskos.

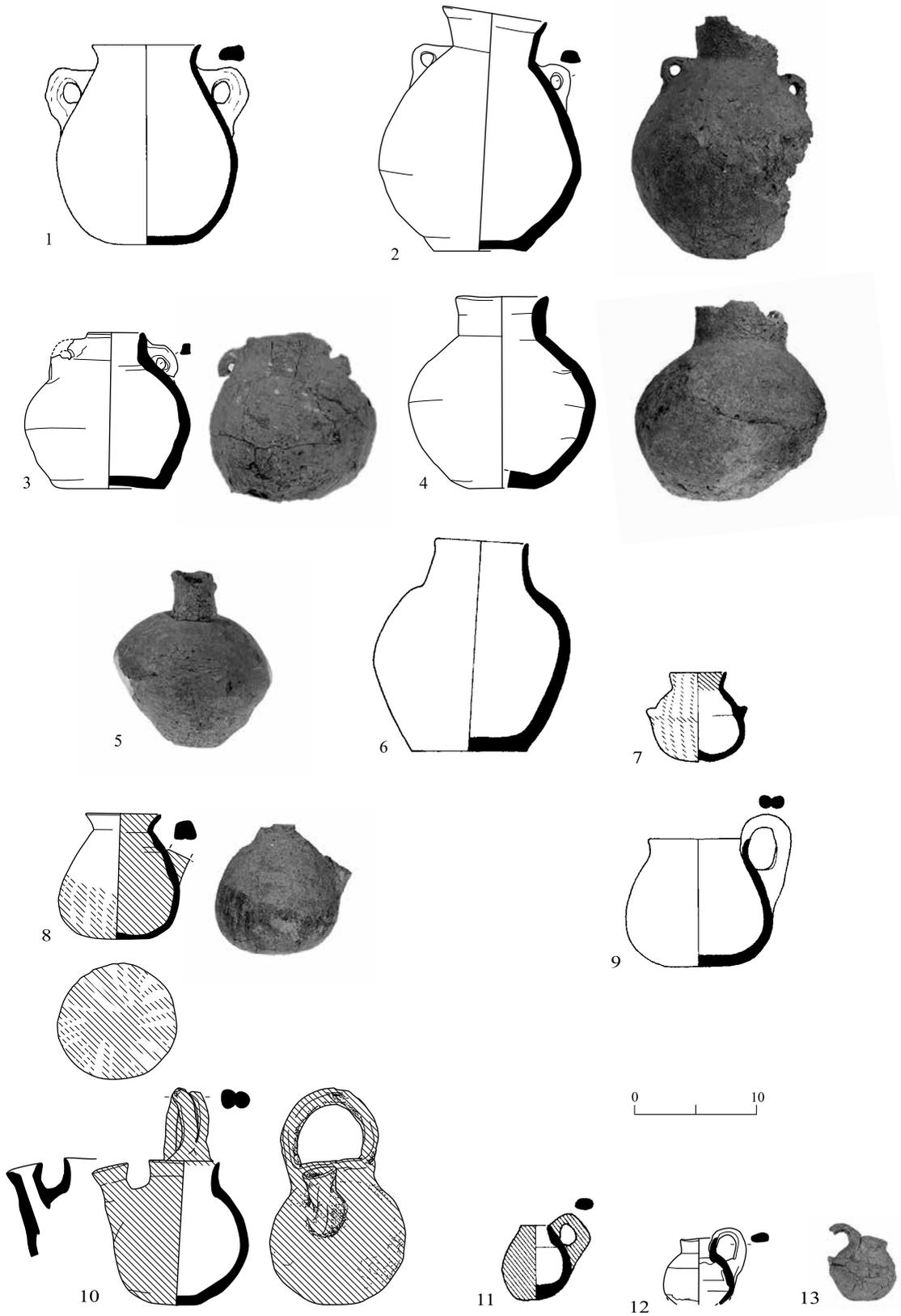


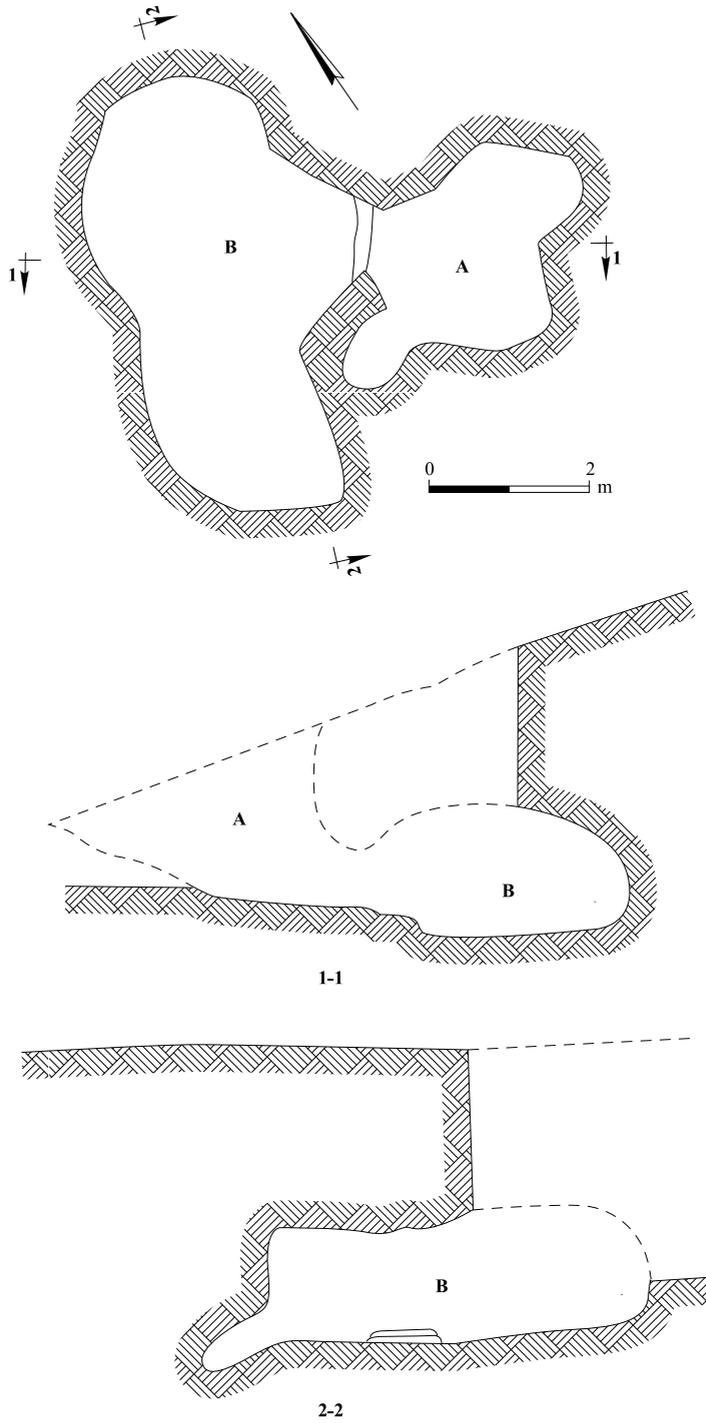
Fig. 9. Cave 2: jugs, juglets and amphoriskoi.

◀ Fig. 9

No.	Vessel	Reg. No.	IAA. No.	Description
1	Amphoriskos	626	69-5033 97-2736	Orange clay, light grits, soot mark on side
2	Amphoriskos	206	69-5074	Buff clay, very poorly fired
3	Amphoriskos	222	69-5059	Buff clay, gray core, badly fired
4	Handle-less amphoriskos	211	69-5062	Buff clay, poorly fired
5	Handle-less amphoriskos	228	69-5036	Light brown clay
6	Handle-less amphoriskos	201	69-5063	Brown clay, white wash
7	Amphoriskos	260	69-5064 97-2782	Light brown clay, white lime wash, red-painted band decoration
8	Jug/juglet	225	69-5051	Brown clay, red-painted band decoration, burnished
9	Juglet	261	69-5057	Red-brown clay
10	Amphoriskos with basket handles	202	69-5050	Buff clay, poorly fired, red-painted decoration
11	Juglet		69-5043	
12	Juglet	224		Light brown clay
13	Juglet	227	69-5053	Buff clay, poorly fired

Cave 6 (Plan 3; Figs. 10–12).— The cave was entered from the east via a forecourt (A; 2.0 × 2.5 m). Two low quarried stairs (0.4 m wide) descended into a narrow, elongated chamber with a partly preserved arched ceiling (B; 3.0 × 5.7 m, max. height 1.8 m). In Chamber B were found 18 pottery vessels, some complete, including bowls, amphoriskoi, jugs, jars with funnel spouts and a teapot. The small funnel-spouted jars, as well as the jugs and amphoriskoi, are at home in EB I mortuary contexts. Most revealing are the many red-slipped funnel-spouted jars that are similar to vessels found in burial caves at Giv‘atayim (Sussman and Ben-Arieh 1966; Yitzhak Paz, personal observation).

A complete holemouth cooking pot with a round base (Fig. 10:3) retrieved from the cave is a unique vessel in EB I assemblages in Israel (see *Discussion*, below). The presence of this cooking pot in a burial cave may indicate that the cave was used also for habitation. However, since the cooking pot is the only clearly domestic vessel found in the cave, one may speculate that it may have played a role in a mortuary ceremony that took place inside the cave. As far as heretofore known, no cooking activities took place inside Early Bronze Age burial caves, and no cooking vessels have ever been found inside burial caves, even when they were used for cooking outside the caves (Ben-Ari 2010, and see discussion therein). Only a few human bone fragments were found in the cave, which was probably robbed in antiquity.



Plan 3. Cave 6, plan and sections.

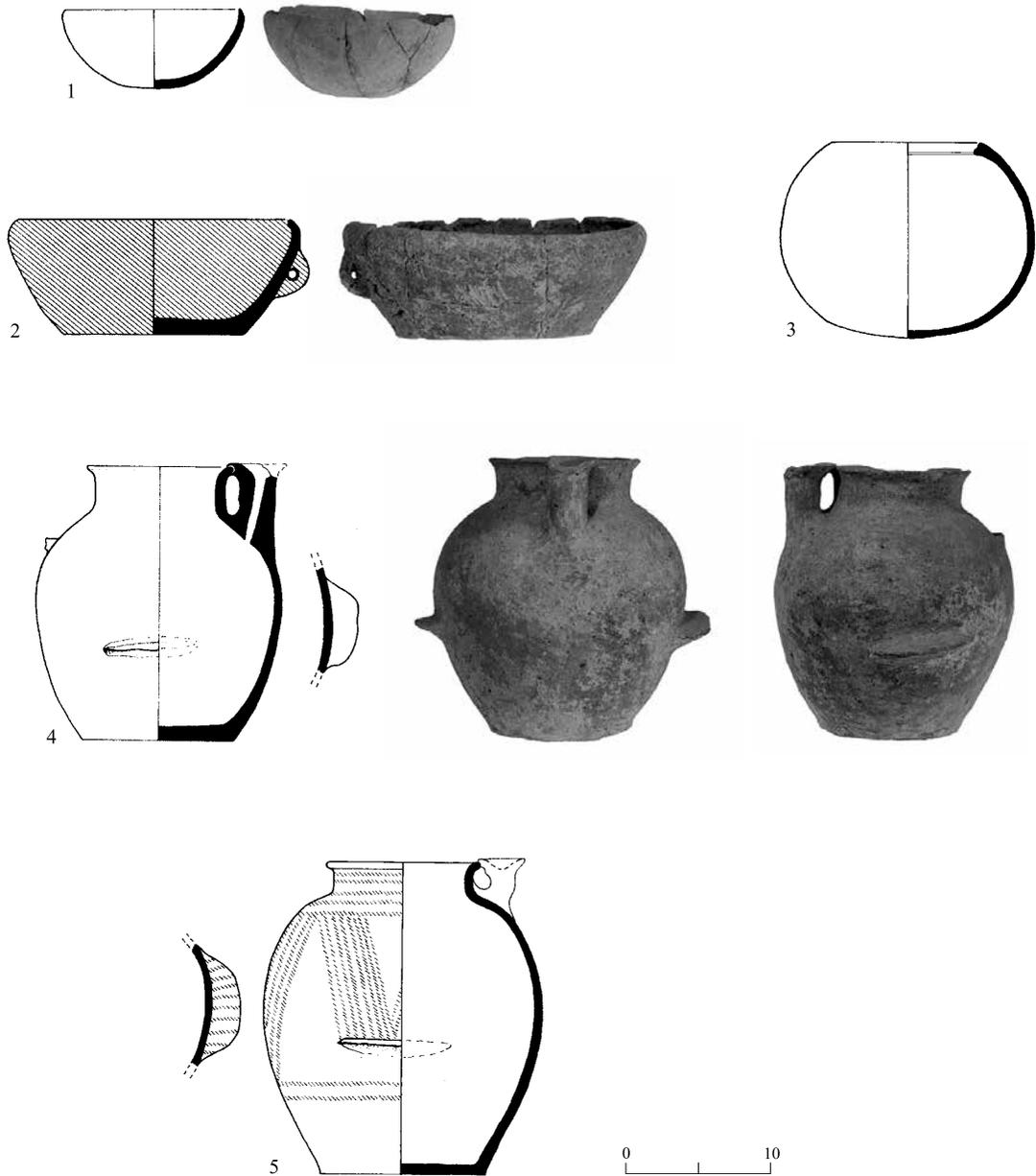


Fig. 10. Cave 6: bowls, cooking pot and jars.

No.	Vessel	Reg. No.	IAA. No.	Description
1	Bowl	604		Orange clay
2	Bowl	605		Orange clay, gray core, red slip, poorly fired
3	Holemouth cooking pot	660	97-2790	Brown clay, white grits, burned on the lower part
4	Funnel-spouted jar	606		Orange clay, white lime wash, well-fired
5	Funnel-spouted jar	661	97-2685	Orange clay, white lime wash, red-painted band decoration, soot marks on side

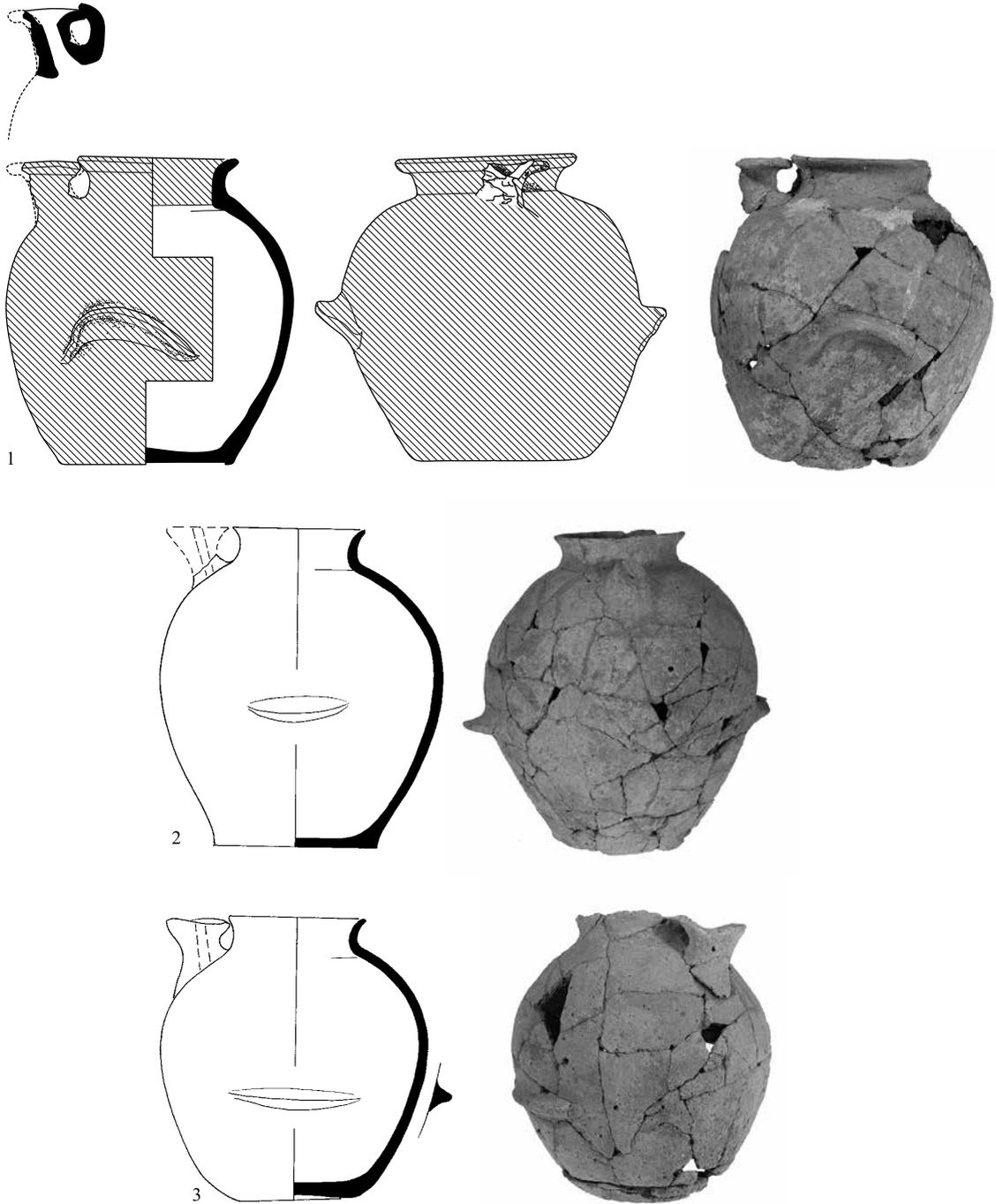


Fig. 11. Cave 6: funnel-spouted jars.

No.	Reg. No.	Description
1	610	Orange clay, gray core, badly fired, red slip
2	608	Buff clay gray core, badly fired, red slip
3	600	Orange clay, gray core, badly fired

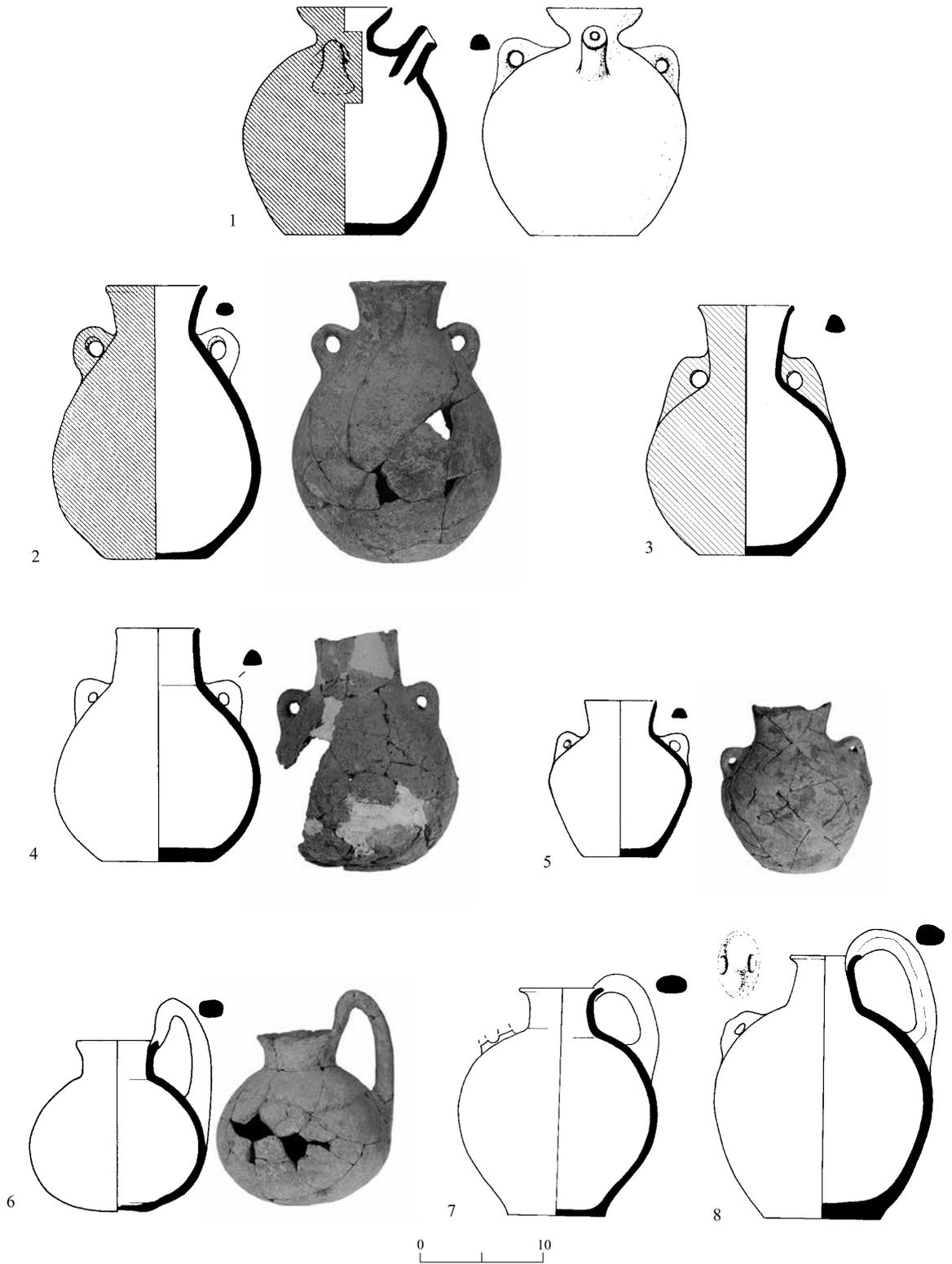


Fig. 12. Cave 6: teapot, amphoriskoi and jugs.

◀ Fig. 12

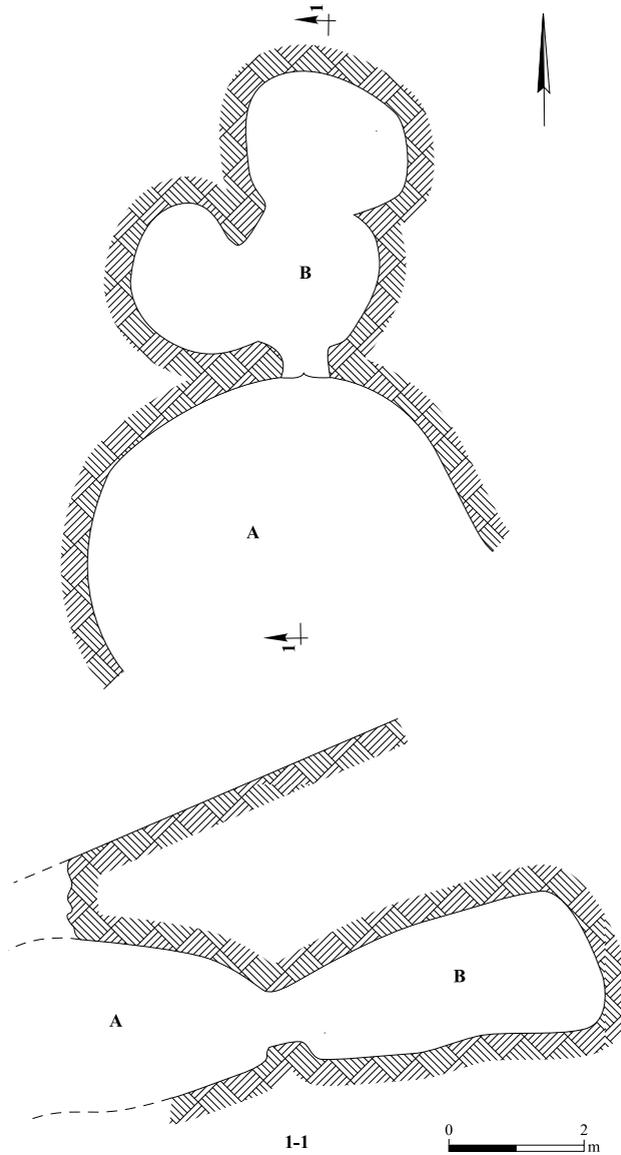
No.	Vessel	Reg. No.	IAA. No.	Description
1	Teapot	662		Pink clay, buff core, red slip
2	Amphoriskos	607		Pink clay, gray core, poorly fired, red slip
3	Amphoriskos	663	97-2789	Orange clay, red slip
4	Amphoriskos	601		Pink-brown clay, gray core, poorly fired
5	Amphoriskos	603		Buff clay, grog grits
6	Jug	602		Pink-buff clay
7	Jug	609		Orange clay, white grits
8	Jug	664	97-2791	Orange clay, white grits



Fig. 13. Cave 7, looking north.

Cave 7 (Plan 4; Figs. 13–15).— The cave lay 10 m northeast of Cave 6, and its opening faced south. The cave was used in three periods. It was first hewn in the Chalcolithic period (Chamber A; diam. more than 3 m; ceiling collapsed in antiquity). A burial was discovered here next to Chalcolithic ossuary fragments and alongside other Chalcolithic finds, such as a hearth, human bones, a bowl and flint fan scraper fragments.

In EB IB, a second chamber (B; 3.7 × 4.5 m; max. height 2 m) was cut into the northern side of the Chalcolithic cave, connected to it by a narrow (width 0.7 m) entrance. The chamber, whose ceiling was intact, incorporated two small cells on its northern and western sides. Chamber B was used for dwelling. The floor was composed of a thick (1 m) accumulation layer of black soil, which contained remnants of hearths mixed with EB IB



Plan 4. Cave 7, plan and section.

pottery, including bowls, some with red-painted bands, juglets, jars and amphoriskoi (see *Discussion*, below). Other finds included animal bones and copper pin fragments.

The final use of the cave was in the Intermediate Bronze Age, when the cave was used for both dwelling and burial. An articulated burial was unearthed adjacent to the entrance, and a necklace made of hundreds of thin, circular limestone beads was found next to the thigh bones.

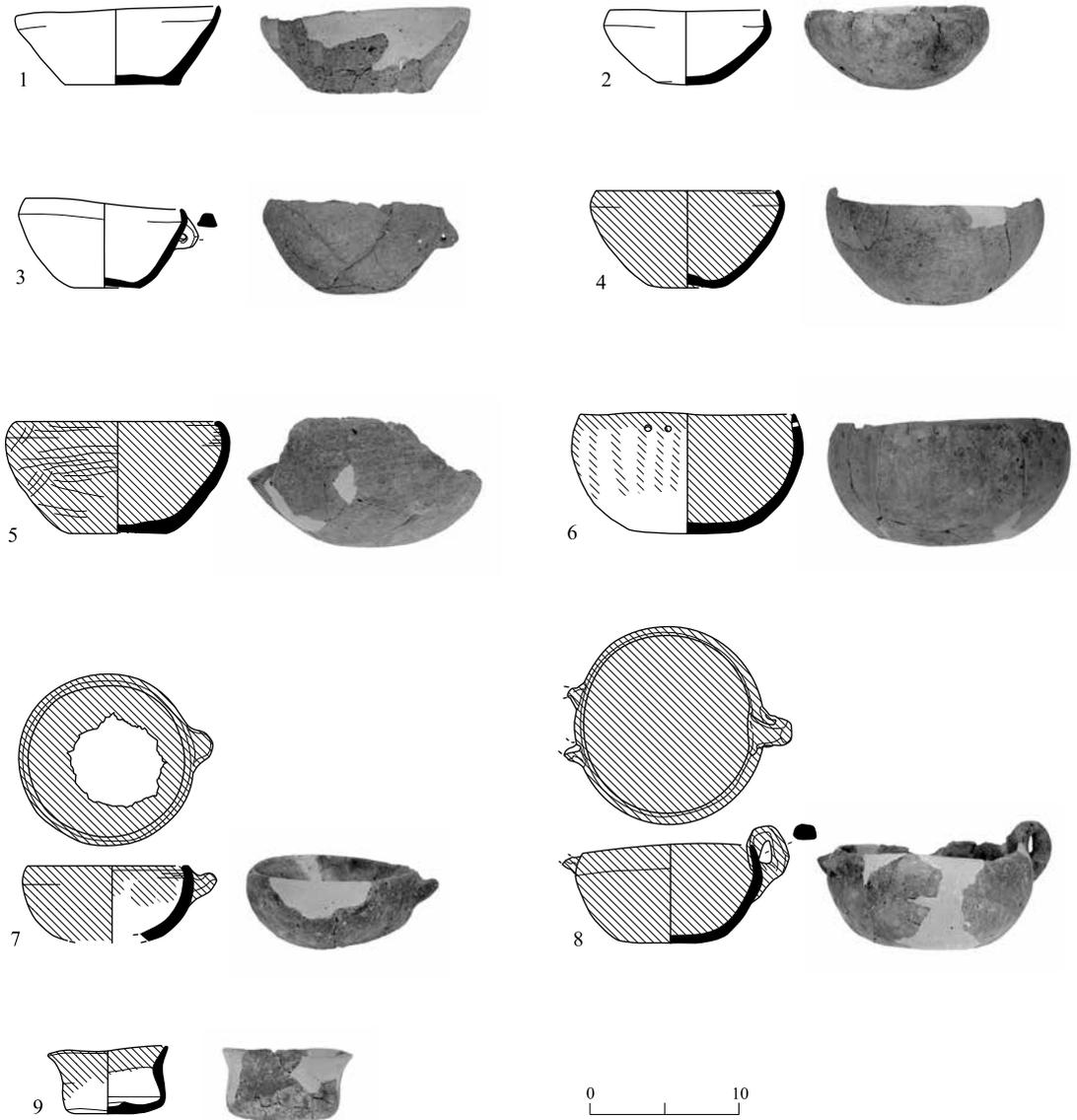


Fig. 14. Cave 7: bowls.

No.	Reg. No.	Description
1	704	Buff clay, poorly fired
2	710	Buff-gray clay
3	703	Orange clay
4	711	Orange clay, red slip, well-fired
5	709	Buff clay, red slip, burnished
6	712	Orange clay, red-painted bands
7	707	Brown clay, gray grits, brownish wash
8	705	Brown clay, black soot on ext.
9	706	Buff clay

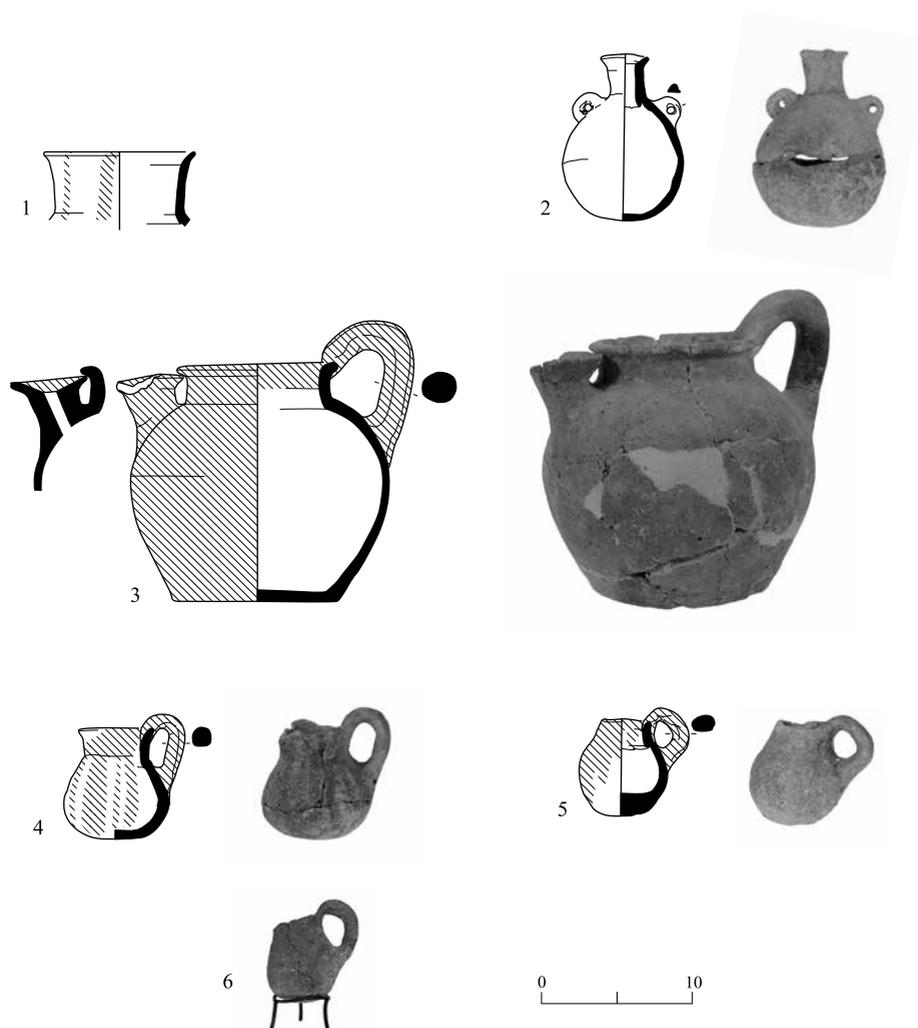
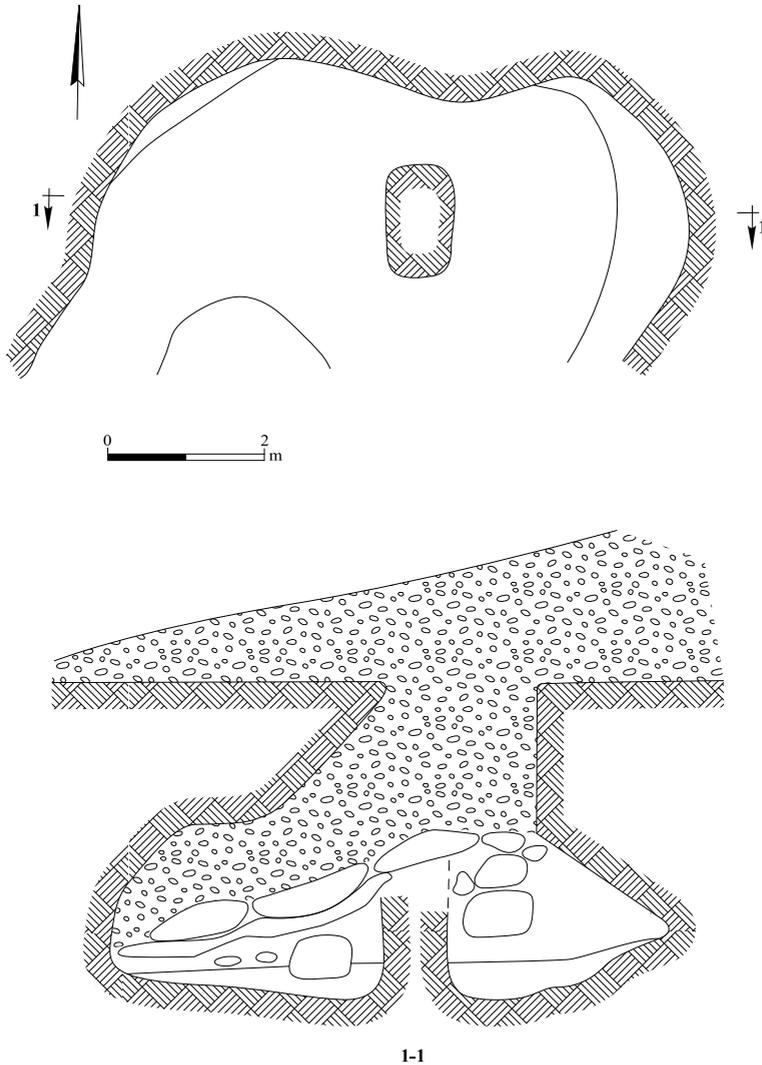


Fig. 15. Cave 7: jar, amphoriskos, jugs and juglet.

No.	Vessel	Reg. No.	IAA. No.	Description
1	Jar			Brown clay, gray core, red-painted band decoration
2	Amphoriskos	702		Pink clay
3	Funnel-spouted jug	794 714	74-1982	Buff clay, red-brown slip
4	Jug	708	74-1989	Buff clay, gray core, red painted band decoration
5	Jug	701	69-5043	Buff clay
6	Juglet	700	69-5069	Buff clay, poorly fired

Cave 8 (Plan 5; Figs. 16–18).— *Cave 8* had an irregular kidney-like shape (8 × 4 m; max. height 2 m). A rock-hewn pillar (1.5 × 1.0 m) in the middle of the cave supported the ceiling. The cave was full of stone debris and soil erosion.

The lowest layer in the cave dated to the Chalcolithic period, and the later use of the cave dated to EB I. Although no written documentation was found in the excavation records, the EB I pottery, including bowls and holemouth jars, attests to both mortuary and domestic use of the cave, the chronological sequence of usage remaining unclear. It is noteworthy that at least one holemouth jar (Fig. 17:2) may represent an early EB IA horizon, while most of the pottery conforms with the EB IB phase, contemporary with the rest of the finds from the Palmaḥim cemetery.



Plan 5. *Cave 8*, plan and section.

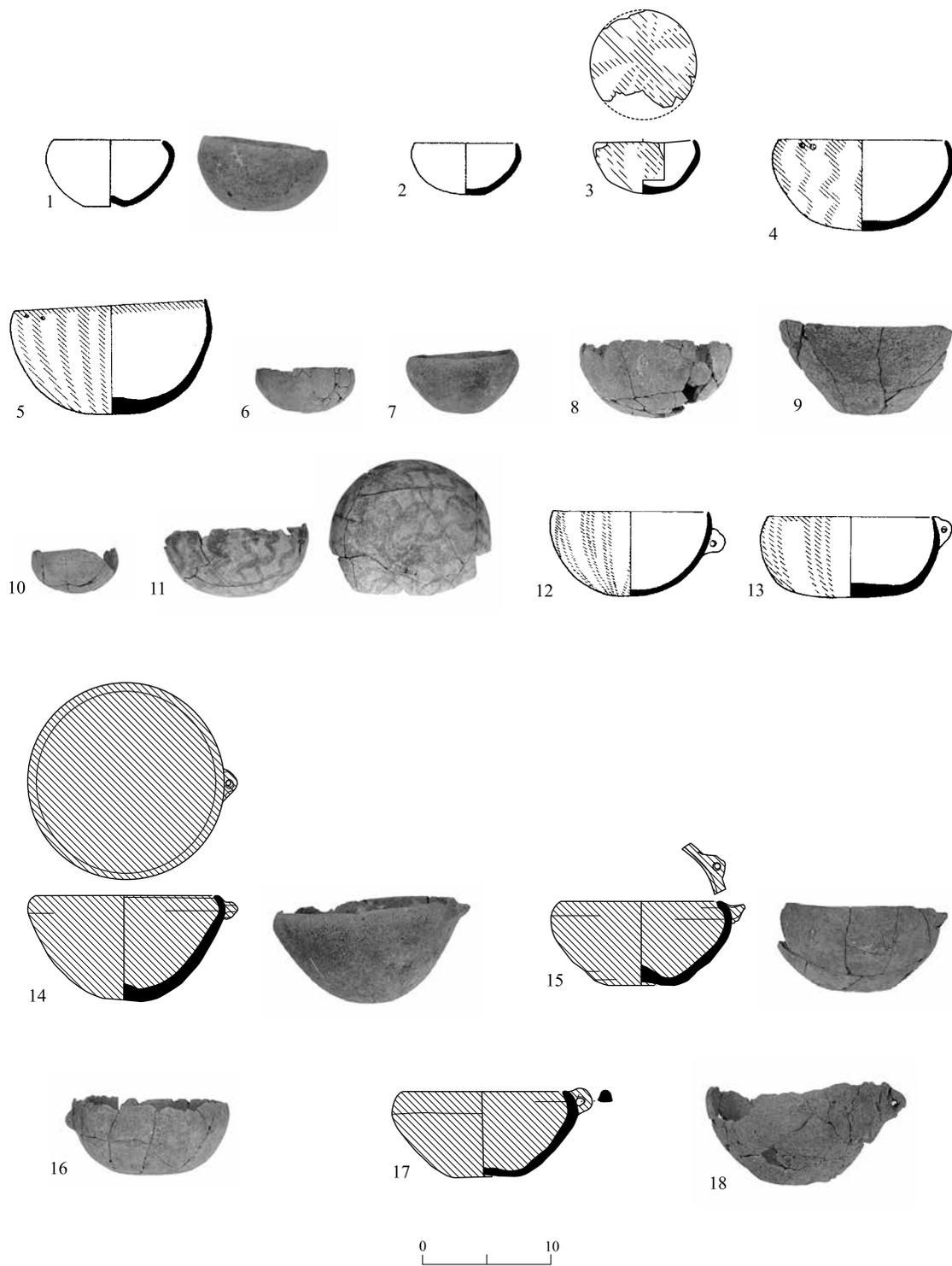


Fig. 16. Cave 8: bowls.

◀ Fig. 16

No.	Reg. No.	IAA. No.	Description
1	804		Orange clay, well-fired
2	830		Red-brown clay
3	822		Buff clay, red-painted band decoration
4	863	97-2683	Light brown clay, red-painted decoration, soot on base
5	860	97-2681	Light brown clay, red-painted band decoration
6	817		Pink clay
7	800		Orange clay, well-fired
8	809		
9	808		
10	801		Buff clay, tiny white grits
11	811		Buff clay, red painted decoration
12	862	97-2684	Light brown clay, red-painted band decoration
13	861	97-2682	Light brown clay, red-painted band decoration
14	802		Orange clay, small black grits, burnished
15	837		Orange clay
16	819		Buff clay, red-painted band decoration, soot marks
17	828		Red clay
18	836		

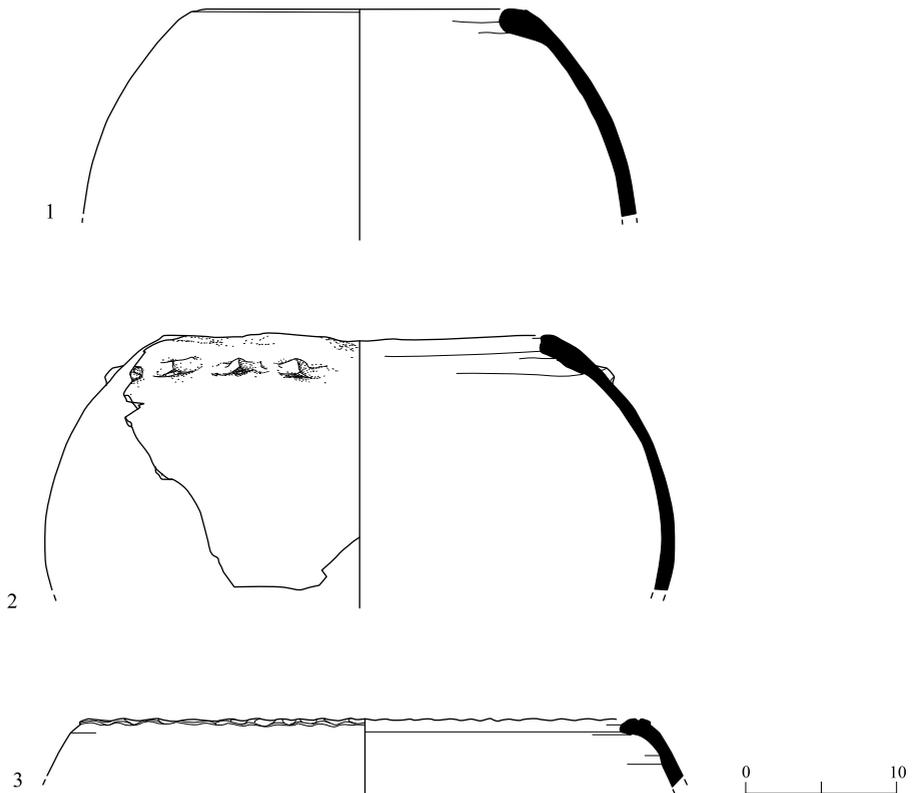


Fig. 17. Cave 8: holemouth jars.

◀ Fig. 17

No.	Reg. No.	Description
1	850/2	Brown clay, gray core, poorly fired
2	850/1	Orange clay, gray core, white grits, poorly fired
3	850/3	Gray clay, black core, poorly fired

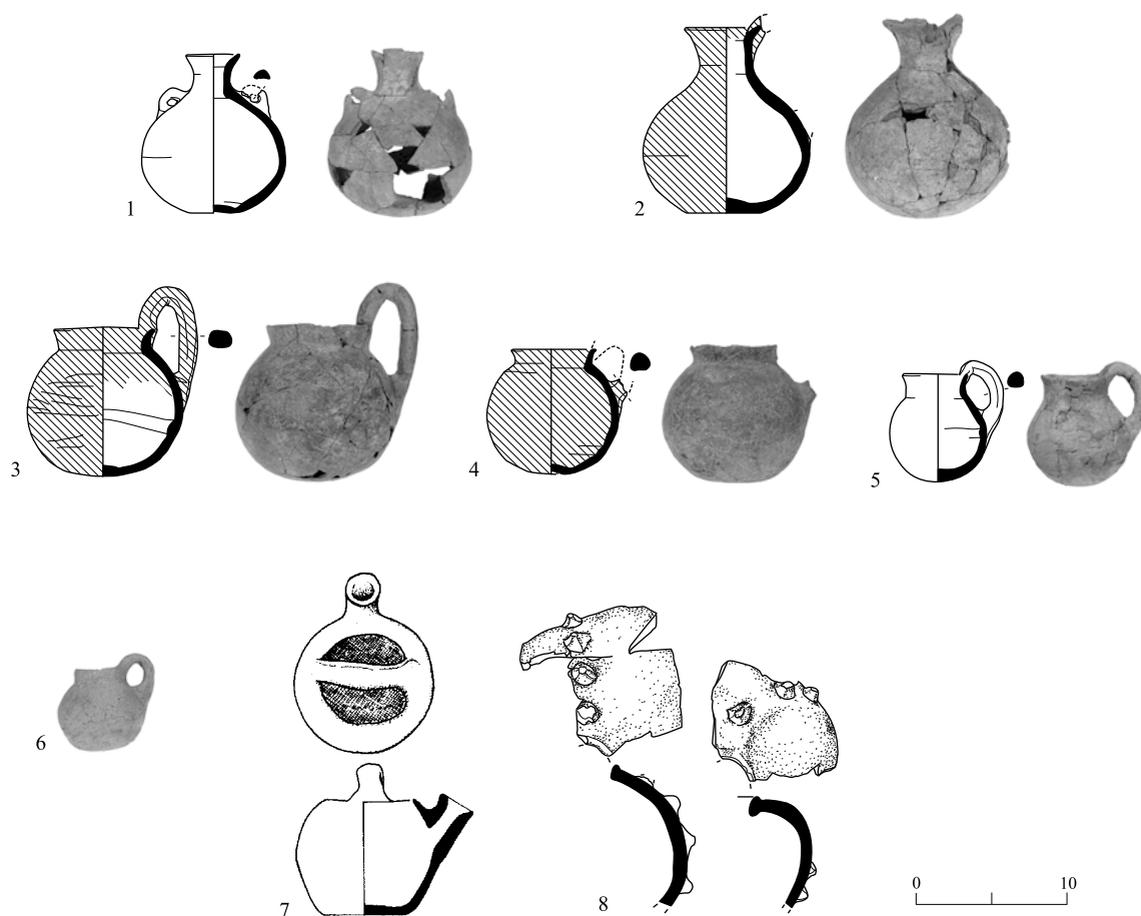
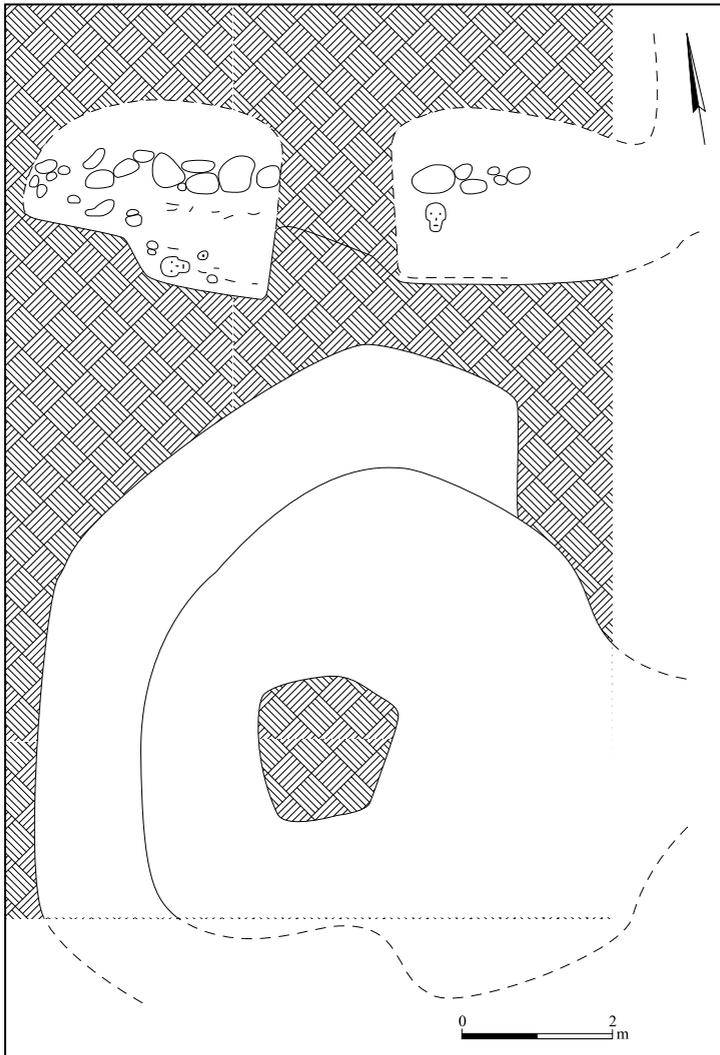


Fig. 18. Cave 8, amphoriskoi, jugs and juglets.

No.	Vessel	Reg. No.	IAA. No.	Description
1	Amphoriskos	813		Orange clay, white wash
2	Jug	810		Orange clay, red slip, white wash
3	Jug	807		Red clay, well-fired, red wash
4	Jug	803		Orange clay, red wash
5	Juglet	806		Buff clay
6	Juglet	805		Pink clay, white grits
7	Amphoriskos with basket handle	864	97-2783	Brown clay, poorly fired
8	Knob-decorated vessel	850/4		Orange clay

Cave 10 (Plan 6; Fig. 19).— *Cave 10* had an irregular shape (4 × 4 m), with a central rock-hewn polygonal pillar to support the ceiling. Two phases of use were observed in the cave, the earlier belonging to the Chalcolithic period, and the later, to EB IB.



Plan 6. Cave 10.

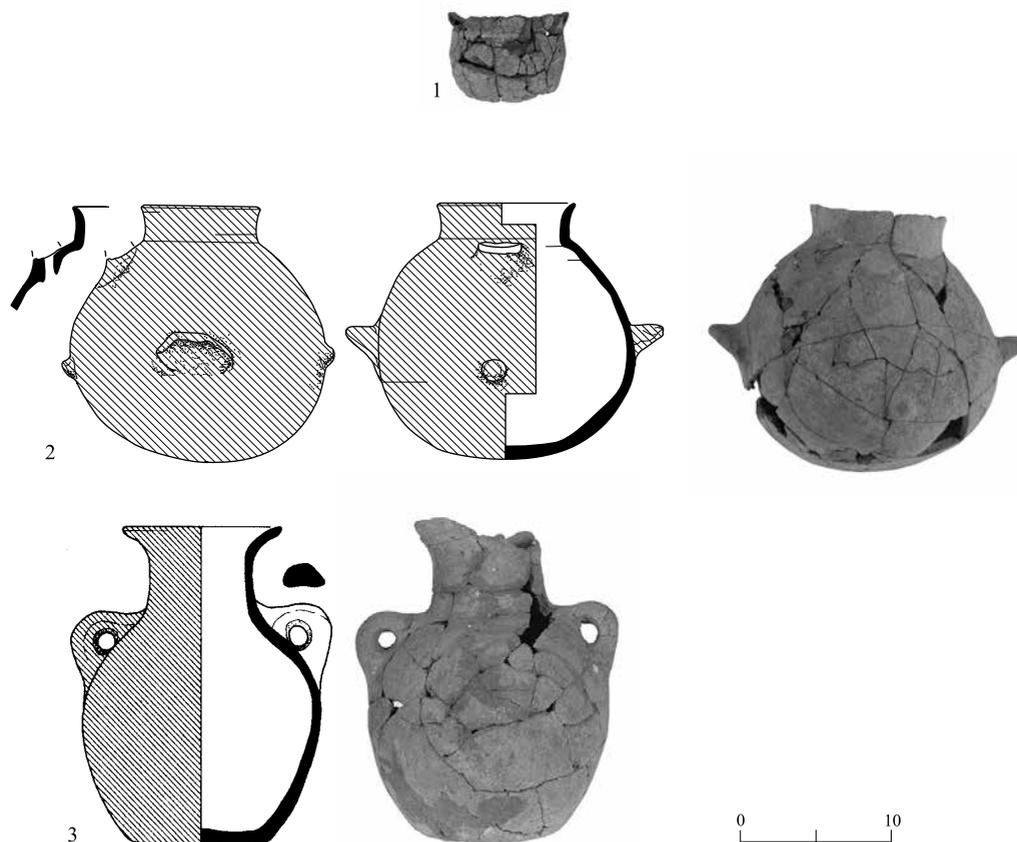


Fig. 19. Cave 10: bowl and amphoriskoi.

No.	Vessel	Reg. No.	IAA. No.	Description
1	Bowl	1018		
2	Funnel-spouted amphoriskos	1020	69-5042	Orange clay, gray core, red slip, poorly fired
3	Amphoriskos	1019		Pink clay, red wash

THE EARLY BRONZE AGE POTTERY ASSEMBLAGES

Methodology

The discussion of the pottery from the six Palmaḥim burial caves is presented typologically, as similar vessel types were found in several caves. The typological discussion comprises two sections: mortuary vessel types and domestic types. The vessels are illustrated in the figures according to the caves in which they were found, this being essential in attempting to interpret the nature of each cave assemblage.

The spatial distribution, and the possible identification of 'burial kits' in the various caves, is discussed separately. The study of the ceramic assemblages made it evident that, in

addition to the typological discussion, the spatial distribution of the vessels within each cave is significant. The traits of each cave's assemblage may contribute to the reconstruction of burial rites in the EB IB cemetery. Albeit beyond the scope of this report, some significant socio-political implications on the Early Bronze Age may be deduced from the thorough study of the pottery (see *Discussion*, below).

Technological Aspects

The vessels in the Palmaḥım caves were mostly locally manufactured of orange, pink, buff or light brown clay, in which quartz and grog were often identified as grits. A petrographic study conducted on eight vessels, however, revealed that six were manufactured in the central hill country, indicating that at least some of the vessels were imported from other regions (see below).

Most of the vessels in the assemblage, both mortuary and domestic, were handmade by coiling. The walls of large vessels were subsequently smoothed by hand, whilst small vessels, mainly amphoriskoi and small bowls, appear to have been finished on a slow wheel.

The mortuary repertoire is also characterized by a technique designated 'the bivalve technique', which was used to create the bodies of some of the jugs and amphoriskoi, whereby two bowls were made and subsequently attached to form a closed vessel (see Brink and Grosinger 2004; Braun 2012:17). Omphalos bases were common in vessels manufactured in this technique.

The external treatment of the vessels included red slip, and often burnishing. Some vessels, mainly bowls, were sometimes decorated with red-painted bands. Some bowls were decorated with knobs and lug handles. Jugs and amphoriskoi had small ledge or loop handles, lug handles, and also, basket handles. The firing quality of the vessels varied from very good to very poor; the amphoriskoi were generally poorly fired.

Mortuary Repertoire

Bowls

Four main bowl types were distinguished.

Rounded Bowls (Figs. 6:1, 2, 7, 9, 10, 12; 10:1; 14:6–8; 16:4–6, 8–13).— Rounded bowls with plain rims were found in Caves 2, 6, 7 and 8. One bowl has two small holes in the upper part, close to the rim (Fig. 6:1), others have a horizontal or a vertical lug handle (e.g., Figs. 6:2; 16:12), or even a raised handle (Fig. 14:7, 8). Three main subtypes or variants of the rounded bowls were discerned: undecorated bowls (e.g., Fig. 6:7–12)—a common bowl type found both in mortuary contexts and in settlement sites, for example in the Azor tombs (Ben-Tor 1975: Fig. 5:8, 9) and at Tel Dalit (Gophna 1996: Fig. 39:2); red-slipped bowls (e.g., Fig. 14:5), sometimes also burnished—a type common both in burial contexts, such as at Azor (Ben-Tor 1975: Fig. 5:5) and al-Maghar (Gophna, Paz and Taxel 2010: Fig. 7:4),

and also in settlement sites, as at Tel Lod (Paz, Rosenberg and Nativ 2005: Fig. 23:1); and red-painted band bowls (e.g., Fig. 14:6), decorated with either irregular, straight or wavy bands, which are most common in mortuary contexts, such as at Ḥorbat Ḥani (Lass 2003: Fig. 20:26), Azor (Ben-Tor 1975: Fig. 5:5–8) and al-Maghar (Gophna, Paz and Taxel 2010: Fig. 7:1).

Bowls with In-Turned Rims (Figs. 2:1; 6:13; 10:2; 14:2–4; 16:1–3, 7, 14–18).— Bowls of this type are small to medium-sized, usually characterized by rounded walls ending in a slight carination that creates a sharp, in-turned rim. These bowls are often red-slipped; lug handles and omphalos bases are also common. Parallels may be sought at sites such as Azor (Ben-Tor 1975: Fig. 5:10). One bowl (Fig. 10:2) has a pronounced flat base. This bowl type appears in EB IB tombs such as at ‘En Esur (Yannai and Grosinger 2000: Fig. 9.1:2), and also in settlements and other domestic contexts as at Lod (Paz, Rosenberg and Nativ 2005: Fig. 23:3).

Deep Carinated Cup-Bowls (Figs. 6:6; 14:9).— Two examples of this bowl type were found at Palmaḥim. The bowls are made of buff clay, and they have thin walls and a sharp carination close to the middle of the vessel. This type was rather common in mortuary sites, such as at Azor (Ben-Tor 1975: Fig. 5:22–26), Ḥorbat Ḥani (Lass 2003: Fig. 20:4–7) and ‘En Esur (Yannai 2016: Fig. 2.57:21). A similar vessel was also found in a probable domestic context at the site of Rishpon-4, located in the northern Tel Aviv region (Gophna and Paz 2017).

Large, Slightly Curved-Sided Bowls (Figs. 6:3–5, 8, 11, 14, 15; 14:1, 5).— This bowl type has thin walls, a flat base and a sharp rim. The bowls are almost never slipped; one bowl has vertical lug handles (Fig. 6:5). Parallels may be sought in mortuary contexts, such as at Azor (Ben-Tor 1975: Fig. 5:21).

Cooking Pot

Round-Based Holemouth Cooking Pot (Fig. 10:3).— A small, ovoid holemouth cooking pot (max. diam. 25 cm, rim diam. 10 cm) is a unique vessel that was found in a clear mortuary context in Cave 6. The cooking pot is made of brown clay, and soot marks are visible on its rim. Since it was the sole ‘domestic’ vessel in Cave 6, it seems plausible that it does not reflect a usage for domestic purposes, but rather, that it was somehow connected with the mortuary rites that took place in the cave (see *Discussion*, below). Apart from its location in the cave, this cooking pot is unique, being the only EB IB cooking pot with a rounded base found to date throughout Israel. Round-based holemouth cooking pots are considered to have appeared not before EB II (Greenberg 2006). The intriguing question is whether the know-how for the manufacture of such round-based cooking pots was already available in EB IB, and if so, why is the Palmaḥim cooking pot the only specimen found. A similar case appears to be the Metallic Ware pottery industry, that was previously considered not

to begin before EB II, yet it has since been found in EB IB assemblages (Paz, Shoval and Zlatkin 2009).

It should be noted, however, that miniature holemouth vessels of this type were produced by EB IB potters. Complete vessels of this type were discovered both in mortuary and domestic EB IB contexts at Tell el-Far‘ah North (Vaux and Stève 1949: Fig. 1:17) and at Tel Dalit (Gophna 1996: Fig. 40:3). Assuming that the round-base technique appeared in small vessels in EB IB, albeit probably on a limited scale, one can only ponder whether this round-base feature was already employed in cooking pots, enabling faster and more efficient cooking, and thus generating a whole set of social implications that promoted the emergence of urbanization and urban life, as discussed by Greenberg (2006).

Jars

Short Everted-Rim Jar (Fig. 8:3).— This jar is a small squat vessel (height 20 cm, max. diam. almost equal to height), with a symmetrical form that is emphasized by a pair of ledge handles located mid-body. The vessel has a short, plain everted rim; no decoration is evident. The vessel type is not common along the coastal plain, being absent in burial caves, such as Azor, Ḥorbat Ḥani and ‘En Esur Cave 80 (Gorzalczany and Sharvit 2010), but is more common in the hill country burial caves, such as Tell el-Far‘ah North (Vaux and Stève 1949: Fig. 1:26).

Short Everted-Rim Jar with Lug and Ledge Handles (Fig. 8:5).— This short squat jar has the same symmetrical form as the jar discussed above. In this type, however, the height and the maximum diameter are equal (both 16.5 cm). The jar is red-slipped, and it exhibits two sets of handles: four lug handles on the shoulder, and two narrow ledge handles at mid-body. Jars with two sets of similar handles are known from EB IB domestic contexts, where the jars are more elongated and slender, as well as much larger, as at the settlement of Ḥorbat ‘Illin Taḥtit (Braun 2008a; Be’eri et al. 2020), and at Tell el-Far‘ah North (Vaux and Stève 1947: Fig. 3:1). These jars seem to continue to appear during EB II, as at Tel Bareqet (Paz and Paz 2007:87).

Small Funnel-Spouted Jars (Figs. 7:1–3; 8:1, 2; 10:4, 5; 11:1–3).— Funnel-spouted jars were only found in Caves 2 and 6, where they represent the vast majority of the jars (see *Discussion*, below). The jars were small to medium in size (height of largest jar: 25 cm; the smallest: 13.5 cm), and may thus be designated as small jars. All the jars have everted rims, ledge handles, and perforated funnel spouts. Two also exhibit a knob decoration parallel to the funnel spout. Six of the jars have no decoration, three were red-slipped and one was decorated with red-band stripes arranged in parallel lines according to a geometric pattern (Fig. 10:5). Funnel-spouted jars were a common funerary offering, and they were found at many sites, e.g., at Tell el-Far‘ah North (Vaux and Stève 1949: Fig. 8:31), Giv‘atayim (Yitzhak Paz, personal observation of the pottery) and Azor (Ben-Tor 1975: Fig. 9:6).

One jar (Fig. 10:4) represents a variant of the type. It has an ovoid, almost completely rounded body, and two pairs of plastic decorations: two ledge handles and two round knobs. It is also red-slipped. A possible parallel may be found at Ḥorbat Tinshemet (Brink and Grosinger 2004: Fig. 2:23).

The petrographic analysis conducted on three of the funnel-spouted jars produced a surprising result: all were probably manufactured in the central hill country, and they were thus ‘foreign’ at Palmahim (see below). The parallels from Tell el-Far‘ah North (see above) further consolidate this understanding.

Amphoriskoi

Funnel-Spouted Amphoriskoi/Jarlets (Figs. 8:4; 19:2).— A small, red-slipped globular vessel from Cave 2 has an everted rim, ledge handles and a perforated funnel spout (Fig. 8:4). It may be considered typologically related to the spouted amphoriskos with the basket handle (see below). Similar vessels were found in other burial contexts, such as at Azor (Ben-Tor 1975: Fig. 9:8).

The other vessel of this type, from Cave 10, has a red-slipped rounded body, two small ledge handles attached to the lower part of the body, and visible remnants of a spout (Fig. 19:2). Parallels are found at Azor (Ben-Tor 1975: Fig. 9:7).

Spouted Amphoriskoi with Basket Handle (Figs. 9:10; 18:7).— Two examples of this type were found at Palmahim: one has an everted rim and a double basket handle, and is red-slipped (Fig. 9:10); the other is a simple, undecorated holemouth vessel (Fig. 18:7). Parallels to this vessel type come from burial caves along the coastal plain, e.g., at Giv‘atayim (Sussman and Ben-Arieh 1966: Fig. 9:26) and Azor (Ben-Tor 1975: Figs. 8:14, 15; 10:5).

Handle-Less Amphoriskoi (Fig. 9:4–6).— Three undecorated, handle-less amphoriskoi with straight upright necks were found in Cave 2. One (Fig. 9:5) has an ovoid body, the others, a barrel-shaped body. Handle-less amphoriskoi were found in mortuary contexts, e.g., at sites ‘En Esur Cave 80 (Gorzalczany and Sharvit 2010: Fig. 12:1–5) and Tomb T20 (Yannai 2016: Fig. 2.24:4), and at Ḥorbat Ḥani (Lass 2003: Fig. 21:9).

Squat Amphoriskos with Short Neck (Fig. 9:3).— One squat vessel, whose maximum diameter equals its height, has a short upright neck and two lug handles from rim to shoulder. This vessel, from Cave 2, has parallels in burial caves, e.g., at al-Maghar (Gophna, Paz and Taxel 2010: Fig. 7:5), Ḥorbat Tinshemet (Brink and Grosinger 2004: Fig. 3:8), Azor (Ben-Tor 1975: Fig. 11:27), as well as in settlement sites, such as at Khirbat Abu Ḥamid/Shoham North (Paz, Segal and Nadelman 2018).

Bag-Shaped Amphoriskoi (Figs. 9:1, 2; 12:2, 4).— These vessels have everted or upright rims, with two lug handles placed on the uppermost part of the shoulder. Some are not decorated, while one is red-slipped (Fig. 12:2). Their general shape, apart from the handles,

resembles Egyptian vessel forms. Parallels may be found at Azor (Ben-Tor 1975: Fig. 7:13) and Ḥorbat Ḥani (Lass 2003: Fig. 21:3).

One plain amphoriskos with a long upright neck (Fig. 9:2) may have a parallel at Azor (Ben-Tor 1975: Fig. 7:1).

Amphoriskoi with Long Neck and Everted Rim (Figs. 12:3, 5; 15:2; 18:1; 19:3).— These vessels have everted rims and various long necks. They vary in body shape and dimensions, from small and globular to more elongated and ovoid. One vessel has the most extreme, out-flared high neck (Fig. 19:3). Parallels to this vessel may be found at Ḥorbat Tinshemet (Brink and Grosinger 2004: Fig. 3:6) and at Azor (Ben-Tor 1975: Fig. 7:3).

Amphoriskos with Knob Handles (Fig. 9:7).— A small vessel (7.5 cm high) has a small knob, handle-like decoration, and a red-painted band decoration. Similar vessels were found at Azor (Ben-Tor 1975: Figs. 8:8; 9:14).

Jugs and Juglets

Jugs and Juglets with High Loop Handle (Figs. 9:8, 9, 11–13; 12:6; 15:4–6; 18:2–6).— The 19 jugs and juglets with high loop handles are amongst the most common vessels found in the burial caves. The vessels vary in size and body form, some having an ovoid body and others, a more elongated body. Some are red-slipped, others are not decorated. This vessel is common in mortuary contexts in many regions in Israel, including along the coastal plain, e.g., at Ḥorbat Ḥani (Lass 2003: Fig. 21:22–25), the northern Sharon plain, e.g., ‘En Esur (Yannai 2016: Figs. 2.27, 2.28), in the hill country, e.g., at Tell el-Far‘ah North (Vaux and Stève 1949: Fig. 1:11–14), and in the Jordan Valley and the Golan, as at Dhamiyah (Yassine 1985) and Leviah (Paz 2003: Pl. 1:5–7).

Double-Handled Jugs (Fig. 12:7, 8).— Two globular jugs with flat bases have a high loop handle and a smaller handle on the opposite shoulder. This vessel type was the focus of a disagreement concerning the exact dating of the PalmaḤim pottery assemblage. The controversy was triggered by a rather early dating of similar vessels from Qustul, Nubia, and Minshat Abu Omar in the Nile Delta, to Naqada IIIb, or ‘middle to late EB I’ (Gophna and Brink 2002:280, Fig. 18:3–5). It should be noted, however, that the examples of this vessel type known in Israel do not necessarily support this early date. At Azor, a similar vessel (Ben-Tor 1975: Fig. 6:19) was found together with the latest EB IB pottery.

Funnel-Spouted Jug with High Loop Handle (Fig. 15:3).— This vessel, found in Cave 7, is similar in form to the double-handled jug, except that, instead of the small handle, it has a spout. The specimen is red-slipped. Parallels from the coastal plain of Israel are lacking.

Teapot (Fig. 12:1).— One vessel of this type was found, in Cave 6. It is a closed vessel, with two lug handles and a narrow spout. A close parallel may be found at Ḥorbat Tinshemet

(Brink and Grosinger 2004: Fig. 4:2). This vessel type is also very common at 'En Esur (Yannai 2016: Fig. 2.52) and in the hill country, at Tell el-Far'ah North (e.g., Vaux 1951: Fig. 12:1–3).

Knob-Decorated Vessel (Fig. 18:8).— Sherds of a vessel of an unknown form, possibly a holemouth, were found in Cave 8. The fragments are decorated with knobs that may have covered the entire vessel.

Domestic Repertoire

Clear domestic contexts, exhibiting domestic pottery vessels, were found in Caves 1 and 8.

Holemouth Vessels

Holemouth Jars with Plain Thickened Rim (Figs. 2:2; 17:1).— Two vessels of this type, made of brown clay and badly fired, were retrieved from Caves 1 and 8. Parallels are found in EB IB settlements, e.g., at Tel Dalit (Gophna 1996: Fig. 41:14) and Lod (Paz, Rosenberg and Nativ 2005: Fig. 24:7–9).

Holemouth Jar with Fragmented Rope Decoration (Fig. 17:2).— A large sherd of a holemouth vessel decorated with a fragmented plastic rope decoration was found in Cave 8. This decoration is considered a hallmark of EB IB, and its EB IB context at Palmaḥim is contemporary to other settlements exhibiting similarly decorated vessels, such as Lod (Paz, Rosenberg and Nativ 2005: Fig. 24:14).

Holemouth Jar with Pie-Crust Decoration (Fig. 17:3).— Unlike the two holemouth vessel types discussed above, the pie-crust decorated holemouth vessels, like the one found in Cave 8, are a clear hallmark of early EB I, specifically EB IA, although they are also found in early EB IB contexts, e.g., at Hartuv (Mazar and Miroschedji 1996: Fig. 19.9). This pie-crust decoration has parallels in the pottery retrieved from the large pit excavated by Gophna in 1969 on the southern hill of the Palmaḥim Quarry (see Fig. 1), and also in the pottery retrieved from Stratum II, during the trial excavations conducted on the hill in 1971 (Gophna 1974: Pls. 10:12–14; 12:5). It thus seems that the vessel from Cave 8 may reflect an earlier, domestic use of the cave, probably during the time span of the EB IA settlement at Palmaḥim.

Storage Jars and Pithoi (Figs. 2:3, 4; 15:1).— Two large sherds of pithoi, both with everted rims, and one with a plastic rope decoration, were found in Cave 1. These vessels may reflect the domestic use of the cave during the lifespan of the EB IB settlement on the southern hill of Palmaḥim, as similar vessels were unearthed in the 1971 excavation (Gophna 1974: Pl. 11:11, 12). One jar rim sherd was found in Cave 7 (Fig. 15:1), which may also have been used for habitation.

Petrographic Analysis of the Vessels

Eight pottery vessels from the Palmaḥım caves were examined petrographically. In general, the aims of the petrographic analysis are to identify the raw materials used, describe their variability, determine their geological sources, and assess the possible geographic region at which the vessels were manufactured. In this context, however, the vessels examined were selected according to specific research questions concerning the assemblage. The round-based cooking pot, unique in EB IB, was examined to evaluate its function in the mortuary context at Palmaḥım. Five other vessels—three small funnel-spouted jars, one bowl and one jug—were selected due to their good firing and reddish fabric, that raised the possibility that they came from another region. It was suspected that the vessels were related to the Proto-Metallic Ware industry, which seems to have exploited the Lower Cretaceous clay that was extracted in the Jordan Valley (see Paz, Shoval and Zlatkin 2009).

Geological Setting

The coastal site of Palmaḥım is associated with recent shifting sand dunes, Quaternary to recent alluvium, Upper Pleistocene *kurkar* (calcareous sandstone) ridges (Sneh and Rosensaft 2004) and alluvial grumusols (*Ministry of Agriculture* 1974). About 4 km east of Palmaḥım, red sand (*ḥamra* soil) and loam are abundant (*Ministry of Agriculture* 1974). In Naḥal Soreq, adjacent to Palmaḥım, sediments of eroded rocks, which are exposed in its drainage basin, are bedded (Ravikovitch 1970; Sneh, Bartov and Rosensaft 1998). Paleocene marl and chalk of the Taqiye Formation, and Senonian chalk of the Menuḥa Formation are exposed about 20 km east of the site, along the western slopes of the Judean Hills (Bentor 1966:72–73; Buchbinder 1969). To the east of the site (over 30 km), in the Judean and Samaritan Hills, the Moza and ‘Amminadav Formations are exposed (Yeichieli 2008). The Moza Formation is composed of clay and marl members (Bentor 1966; Arkin et al. 1976).

Results

Round-Based Holemouth Cooking Pot (Reg. No. 660; Fig. 10:3).— The matrix is ferruginous silty. The non-plastic components (f:c ratio {0.062mm} = ~80:20)⁴ comprise rounded to subrounded quartz grains of 250–500µm. This raw material is identified as soil. The non-plastic components suggest a local origin.

Amphoriskos (Reg. No. 201; Fig. 9:6).— The raw material of this small jar or jug is characterized by ferruginous clay, extremely rich in silt-sized quartz grains, and also contains recognizable quantities of silt-sized accessory heavy minerals including hornblende, zircon and biotite, as well as feldspar grains. The non-plastic components (f:c ratio {0.062mm} =

⁴ The f:c ratio expresses the relative proportions of the fine (f) and coarse (c) components of a fabric. In this case, the boundary between these two components is 0.062mm, which is the boundary between silt to sand size (Kemp 1985:22).

~80:20) comprise bimodal quartz grains, mostly ~300 μ m and some coarser grains of ~700 μ m. Secondary non-plastic components are microcline grains, few chert and chalk fragments and rarely discrete foraminifera and polycrystalline quartz grains. This raw material is identified as soil. The coastal character of the non-plastic component suggests a local origin.

Jar (Reg. No. 249: Fig. 8:3), *Bowl* (Reg. No. 830: Fig. 16:2), *Amphoriskos* (Reg. No. 702; Fig. 15:2) and *Funnel-Spouted Jars* (Reg. Nos. 252, 200, 606; Figs. 7:2; 8:1; 10:4).— These six vessels are characterized by ferruginous matrix, optically active with speckled/straited b-fabric, rich in silt-sized opaque bodies of iron minerals. Some ferruginous and argillaceous pellets appear in the clay. The non-plastic components comprise some grog fragments, rarely chert, and rarely fine ghosts of fine sand-sized idiomorphic dolomite. The amphoriskos (Reg. No. 702) is characterized by the same matrix and is rich with non-plastic components (f:c ratio {0.062mm}= ~85:15) comprising ghosts of idiomorphic dolomite (~300 μ m). This raw material is identified as originating from clay of the upper member of the Cenomanian Moza Formation. The sand-sized dolomite in the sample of the amphoriskos was quarried from the capping 'Amminadav Formation. This raw material dominates ceramic assemblages in large areas of the central hill country (Goren, Finkelstein and Na'aman 2004:263–264).

Summary

The petrographic analysis showed that two vessels, namely the small jug and the cooking pot, were locally made from soil quarried in the vicinity of the site. The other six vessels analyzed were made of the Moza Formation clay, and they were imported to Palmaḥim from the Judean or Samarian Hills. Other petrographic studies have indicated a trade and exchange system between the central hill country and the coastal plain during EB IA, e.g., pottery from Azor (Goren 1999) and Ashqelon (Cohen-Weinberger 2004), as well as data from Ashqelon Barne'a (analyzed by Cohen-Weinberger, unpublished). There are no other provenance studies of EB IB pottery from coastal sites that can shed light on the vessel types that were traded, and the extent of the phenomenon.

DISCUSSION

The discussion focuses on three main aspects: statistical and spatial observations of the pottery; the dating of the Palmaḥim settlement and burial caves within EB I; and the EB I settlement pattern in the central coastal plain. The sites mentioned in the discussion are marked on the map (Fig. 20).

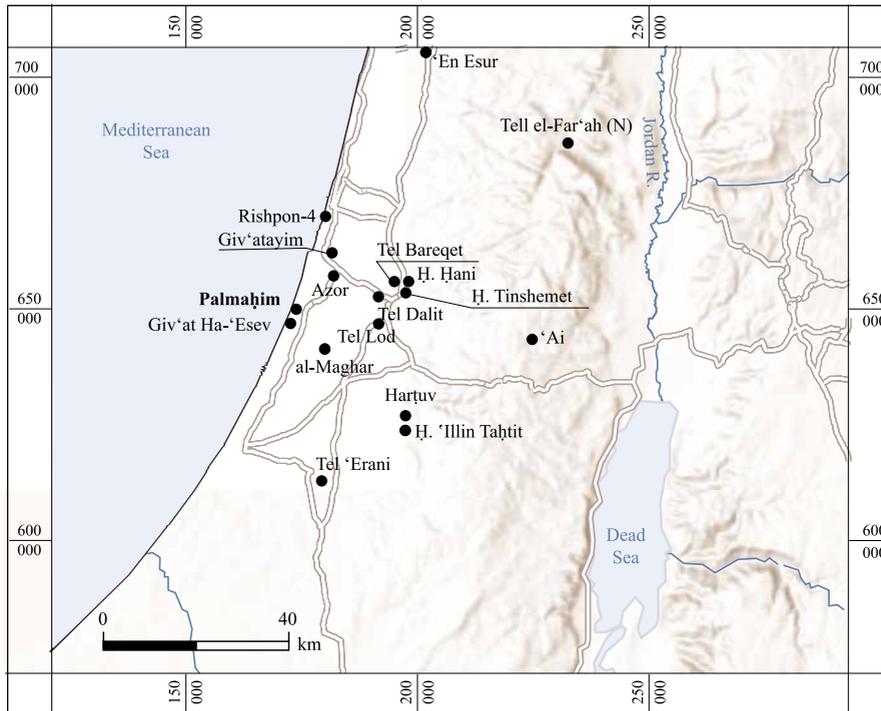


Fig. 20. Map of Early Bronze Age sites mentioned in the discussion.

Statistical and Spatial Observations

The discussion here focuses on the pottery found in clear mortuary contexts in the burial caves, not in the domestic contexts. In total, 99 vessels were found in the five caves (Caves 2, 6, 7, 8, 10). Bowls constitute the largest proportion of the vessels, with 45 bowls representing 45% of the vessels. The bowls are mainly concentrated in Cave 2 (15 bowls out of 36 vessels, more than 40%), and in Cave 8 (18 bowls out of 29 vessels, no less than 62% of the pottery). In Cave 7, bowls constitute c. 60% of the assemblage (9 bowls out of 15 vessels), while in Cave 6 they reflect only c. 12% of the vessels.

The second-most common vessel type was the amphoriskos. Eighteen amphoriskoi represent c. 18% of the whole assemblage of the cemetery. In Cave 2, they constitute c. 19% of the drawn assemblage, and in Cave 6, 25%.

Jugs (17 specimens from the five caves) represent c. 17% of the cemetery's ceramic assemblage, and the 13 jars that were concentrated in Caves 2 and 6 represent some 13% of the drawn cemetery's assemblage.

The spatial distribution of the rich ceramic assemblages that were retrieved in the burial caves does not reflect a homogenous, or systematically repetitive, procedure that accompanied each burial. Nonetheless, three important observations can be made:

(1) The dominance of specific vessel types within specific caves requires an explanation. One of the most predominant types is the funnel-spouted jar. In Cave 2, seven funnel-spouted jars were found, while in Cave 6, the six jars of this type, representing c. 33% of the cave's assemblage, are the predominant vessel type. At the same time, this popular funnel-spouted jar is absent from Cave 8, where bowls are more common (18 bowls). Squat plain jars were only retrieved from Cave 2, where the richest and most varied assemblage was found.

(2) The unique round-based holemouth cooking pot was the only 'everyday' vessel in the mortuary context of Cave 6. Whilst uncommon in coastal plain burial sites, holemouth vessels do appear in mortuary contexts in the hill country. In Tomb T3 at 'En Esur, a single holemouth vessel with a flat base was found, and the author suggested that it was not used as an offering for the dead, but rather as a container in which an infant burial was placed (Yannai 2016:25, Fig. 2.10:8).

The assemblages of the Tell el-Far'ah (North) burial Caves 5, 9, 11, 12, each include only one holemouth vessel, while other vessel types that are well-known 'mortuary' vessels, appear in larger numbers. It is revealing to note that the same type of holemouth vessel—a flat-based, barrel-shaped vessel decorated with plastic applied knobs, and often red-slipped and burnished—appears in all of these caves (Vaux 1951: Figs. 4:10; 6:7; 11:23). While it is evident that the Tell el-Far'ah (North) holemouth vessels were not used for cooking (they can be termed 'holemouth jars'), the vessel from Palmaḥim Cave 6 does have the characteristics of a cooking pot, including soot marks. It may have had a role in the mortuary practices at the cave.

The round-based holemouth cooking pot from Palmaḥim may contribute to our understanding that the holemouth vessel was a utensil that was associated with the burial cave, although not with an individual burial. Whilst grave goods may have accumulated in the cave, the single original holemouth remained the only vessel of its type, for use within or outside the cave. The association of the coastal site of Palmaḥim with the Samaria Hill country, as reflected in the similarity of its mortuary paraphernalia to that retrieved in the tombs at Tell el-Far'ah (North), is revealing, yet also puzzling, as burial caves east of Palmaḥim and much closer to the Samaria Hills, such as Ḥorbat Tinshemet and Ḥorbat Ḥani, do not exhibit such an affinity. It is, however, important to state that the Palmaḥim cooking vessel was not imported from the Samaria region, and it was probably locally made, as indicated by the petrographic analysis (see above).

(3) The present state of our knowledge does not enable a clear definition of the 'burial kit' with which each deceased was buried, especially as we do not know how many individuals were interred in each of the caves. In addition, the partial state of preservation of some of the caves may have resulted in the incomplete information regarding the material culture in the caves. The available data seems to reflect a variety of burial rites, or at least a flexible placement of burial goods. Thus, while in Cave 8, bowls were predominant, in Cave 6, funnel-spouted jars and amphoriskoi formed the majority of the assemblage.

The Dating of the PalmaḤım Settlement and Burial Caves within Early Bronze Age I

The domestic use in EB IA and EB IB of Chalcolithic burial Caves 1 and 8 may be paralleled to the EB IA and EB IB settlement sequence revealed in Gophna's 1971 excavations at the PalmaḤım Quarry site (Strata II and I respectively; Table 1). This is mainly illustrated by the EB IA holemouth jar found in Cave 8, which can be clearly associated with the Stratum II settlement (Gophna 1974:48).

It is not clear whether the use of the caves, both for burial and domestic purposes, fully overlaps the life span of the Stratum I settlement. Was the EB IB settlement contemporaneous with the burials in the caves, or with the reuse of the caves for domestic purposes? Did it exist continuously, during both the burial and the domestic phases of the caves? It is unfortunate that the meager pottery retrieved in the 1971 excavations does not permit determining which scenario is most plausible.

In this context, the salvage excavations conducted at PalmaḤım by Braun south of the 1971 excavation may provide us with some vital data (Braun 2008b). In this excavation, three consecutive strata were identified. Stratum 3, with a sausage-shaped structure and Gray Burnished Ware pottery, was clearly assigned to EB IA (early EB I, as designated by Braun), and the two overlying Strata 2 and 1, were both dated to late EB IB. Since, according to Braun, both these strata contained the same pottery types (not yet published), it is plausible that they reflect two phases of the same settlement that was contemporary with the time span of the reused caves. This reconstruction, however, encounters an obstacle concerning the date of the PalmaḤım settlement. When discussing the pottery of Strata 2–1,

Table 1. History of Occupation at PalmaḤım during the Chalcolithic and Early Bronze Age I, with Comparison to Sites Discussed in the Article (based on Gophna, Paz and Taxel 2010: Table 1)

Site (Excavator)	Chalcolithic	EB IA	EB IB	Egyptian Finds in EB IB
PalmaḤım Quarry Caves (Gophna)	Burial only	Domestic reuse of Cave 8	Burial and domestic reuse of caves	No Egyptian finds
PalmaḤım Quarry (Gophna)	Settlement Stratum III	Settlement Stratum II	Settlement Stratum I	No Egyptian finds
PalmaḤım Quarry (Braun)		Settlement Stratum 3	Settlement Strata 2–1	Schematic <i>serekh</i> , no other Egyptian finds
PalmaḤım Giv'at Ha-'Esev (Gophna)			Small occupation	Egyptian finds
Ḥorbat 'Illin Tahtit			Settlement Strata IV–III	Schematic <i>serekh</i> ?
Al-Maghar	Only sherds		Settlement and Egyptian 'colony'	Egyptian finds
Azor	Occupation	Settlement	Settlement and burials	Egyptian finds
Lod	Settlement		Settlement and Egyptian 'colony'	Egyptian finds

Braun presented an incised sherd of a large pithos whose rim reflects Egyptian influence. The incision was identified by Braun as an Egyptian *serekh* that bears a royal name of a ruler (Braun et al. 2001: Fig. 4.2:6). Based on stylistic considerations and Egyptian parallels, Braun dated it to Naqada IIIb1 (c. 3100 BCE), a date that antecedes by a few decades the end of Dynasty 0 and Narmer's reign (Braun et al. 2001:66–71). Braun assumed that the pottery from Strata 2–1 reflects the same horizon, later than 'Erani-C' pottery, that can be dated to Naqada IIIa2, which is considered to be rather early in EB IB (EB IB₁; Mazar and Miroschedji 1996; see Yekutieli 2000; 2002; see also Hartung 2002; Hendrickx 2006), but earlier than the final EB IB horizon. Braun further concludes that the Palmaḥim burial caves reflect the same mid-EB IB horizon due to the resemblance of the pottery in the caves to the pottery from his excavation (Eliot Braun, pers. comm.).

Possible support for this argument may be the fact that no Egyptian finds were retrieved from the Palmaḥim caves. Furthermore, if the double-handled jugs from Cave 6, which have parallels in Egypt and Nubia, do indeed reflect a Naqada IIIb horizon (Gophna and Brink 2002), then the caves and the settlement should be dated accordingly to a mid-EB IB phase, which prevailed slightly prior to the large-scale Egyptian royal involvement in southern Canaan in the reign of Narmer (see also Braun et al. 2001:82). Having said this, another point should be considered. The small site of Giv'at Ha-'Esef, located about one kilometer south of the Palmaḥim Quarry, yielded a score of EB IB sherds, but most importantly, an Egyptianized bottle, similar to many such others that were abundant in late EB IB tombs (see Braun et al. 2001: Fig. 4.3:1; Gophna and Liphshitz 2009). Also, according to our detailed typological discussion (see above), the vast majority of the pottery vessels found in the caves accord well with the latest EB IB burial, as well as with domestic repertoires from other sites in Israel, rendering Braun's early dating for the EB IB settlement and caves less plausible. As noted by Gophna and Liphshitz (2009), the site of Giv'at Ha-'Esef was contemporary with the EB IB Palmaḥim Quarry settlement and its associated cemetery (see also Braun et al. 2001:82).

Braun's claim for a mid-EB IB date for Palmaḥim is also based on another incised sherd, which depicts an Egyptian *serekh* similar to that of Palmaḥim, that he found in his excavation at the EB IB site of Ḥorbat 'Illin Taḥtit in the Judean Shephelah, c. 35 km southeast of Palmaḥim (Braun 2008a). While the excavator clearly dated Strata IV–III at this site to late EB IB, the incised sign was similar to that found in the Palmaḥim Quarry settlement, and it could thus be speculated to be earlier. This is not acceptable, for several considerations: (1) The assemblage of Ḥorbat 'Illin Taḥtit Strata IV–III reflects the latest EB IB horizon, and some of its vessels resemble those of EB II assemblages at other sites, such as Tel Bareqet (Gophna and Paz 2014, and see discussion therein); (2) A rather considerable quantity of Egyptian and Egyptianized finds, e.g., pottery, a palette and a macehead, were found at Ḥorbat 'Illin Taḥtit (Braun et al. 2001:74–79, Figs. 4.5–4.7), and some of the finds, such as a ceramic bottle bearing a 'potmark,' have parallels dating to Dynasty 1, a much later date than that assigned to the *serekh* from Palmaḥim and from Ḥorbat 'Illin Taḥtit (Braun et al. 2001:75).

Another site that supports our proposed later EB IB date for PalmaḤım is al-Maghar, situated c. 10 km southeast of PalmaḤım, both sites exhibiting a connection between the settlement and the related cemetery. The burial goods at PalmaḤım resemble those at al-Maghar, supporting the later date for the PalmaḤım cemetery. The settlement of al-Maghar reflects the very last stage of EB IB, including unequivocal evidence for a physical presence of Egyptians at the site, attested *inter alia* by ‘baking molds,’ which are characteristic of Egyptian residencies, e.g., at Tell Sakan, ‘En Besor, Tel Ma’āḥaz and Tel Lod (Miroschedji et al. 2001; Gophna, Paz and Taxel 2010, and see discussion therein).

It is thus proposed that the PalmaḤım settlement and its associated cemetery existed until the very end of EB IB (Naqada IIIb1–c), and it is therefore contemporaneous with the sites of Lod, Azor and al-Maghar (see Table 1).

The Early Bronze Age I Settlement Pattern in the Central Coastal Plain

The settlement history of the PalmaḤım Quarry site is summarized here, based on the data available to date.

The earliest occupation at the site took place in the Chalcolithic period. At least ten burial caves were hewn in the *kurkar* bedrock of the northern hill of the site, including finds that correspond to the Ghassulian culture. No clear remains from the Chalcolithic-period settlement that must have existed in proximity to the burial caves have been found so far, apart from pits that contained mixed Chalcolithic and EB I sherds (Braun 2008b).

The second occupation stage at PalmaḤım took place in EB IA, as is reflected in the settlements excavated by Gophna (Stratum II, and the large pit that was assigned to the settlement) and Braun (Stratum 3). Also, a possible reuse of burial Cave 8 for domestic activity in this period was detected (see above).

The most extensive occupation stage of the PalmaḤım Quarry site should be attributed to EB IB, namely the last centuries of the fourth millennium BCE. This stage was characterized by an extensive settlement, its size estimated as at least two hectares (Braun 2008b), and an associated burial ground that consisted of at least ten caves, reusing the Chalcolithic caves. Both the settlement and the burial ground were partially excavated and investigated, rendering PalmaḤım an especially important site for the scholarly research of the fourth to third millennia BCE along the coastal plain of Israel.

Two subsequent phases were detected in the settlement (Strata 2–1 in Braun’s excavation). These phases were also apparent in Caves 1 and 8, which were used for domestic activities.

The PalmaḤım site probably took part in inter-regional trade, as can be deduced from various vessels, specifically the funnel-spouted jar that originated in the central hill country. However, not a single Egyptian imported vessel was found in the PalmaḤım cemetery, whereas Egyptian or Egyptianized vessels were rather abundant in other coastal plain cemeteries, such as at Giv’atayim (Paz, personal observation of the finds from Kaplan’s excavation), Azor (Ben-Tor 1975) and ‘En Esur (Yannai 2016: Fig. 2.16:18, 19). The EB IB settlement and burial caves were abandoned by the end of the fourth millennium BCE and were not resettled within the Early Bronze Age.

Unlike Palmaḥim, the neighboring Early Bronze Age site of al-Maghar (see above) points to a clear Egyptian presence in late EB IB, exhibited both in the settlement ('baking molds', cylindrical vessels) and in the mortuary contexts (see Gophna, Paz and Taxel 2010). Unlike Palmaḥim, al-Maghar continued to exist in EB II, when it probably reached its zenith, and became a fortified town. The town was abandoned sometime during EB II.

CONCLUDING REMARKS

The Early Bronze Age burial caves excavated in the Palmaḥim Quarry site raise a variety of issues that are of great interest for the study of mortuary practices during this period. Whilst most of the issues lay beyond the scope of the current report, one point, however, should be emphasized. The Palmaḥim Quarry site represents a phenomenon that was repeatedly observed along the coastal plain of Israel. In the Chalcolithic period, there was a large-scale exploitation of caves for burial, and organized mortuary practices were employed. At the onset of EB IA, a new material culture was introduced that seemed not to favor burial in caves.

An extensive use of burial caves, and an increasing investment in mortuary paraphernalia, characterizes the subsequent EB IB phase. At Palmaḥim, as well as at other EB IB burial sites, such as Tel Aviv (Ha-Qiryā) and Giv'atayim, Chalcolithic burial caves were reused as burial grounds by the EB IB population. In addition to the practical aspects, we propose that there were symbolic and ideological considerations that affected the decision to reuse 'ancient' caves in EB IB. The socio-political implications of EB IB burial customs along the coastal plain of Israel are extensively discussed by Ben-Ari (2010). The EB IB society, that probably developed and flourished in the late fourth millennium BCE, created a new mortuary milieu, in which burial customs may have reflected increasing social differentiation in the trajectory toward urbanization (Ben-Ari 2010:110–111).

Hence, the publication of the Palmaḥim Quarry cemetery adds data that may encourage future scholarship in this field. The Palmaḥim burial caves should be considered in relation to the nearby EB IB settlement on the southern hill. It is most plausible that the inhabitants of this settlement discovered the Chalcolithic caves that were hewn in the northern hill, adapted them and reused them for burial, and then, reused some of them again for domestic purposes.

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