David Ilan

DAN IV
THE IRON AGE I SETTLEMENT
The Avraham Biran Excavations (1966-1999)

HEBREW UNION COLLEGE
JEWISH INSTITUTE OF RELIGION

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by
David Ilan

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PREFACE

In this fourth volume in the final report series of the Tel Dan excavations directed by Avraham Biran (ז"ל), David Ilan presents the findings from the early Iron Age (Iron Age I) levels of Tel Dan. The scholarly community was given a glimpse into these levels (Strata VI, V and IVB) by two preliminary articles published by Biran in 1989 and in his popular account (English version published in 1996). Ilan himself has also published several papers concerning these remains with emphases on specific aspects of the early Iron Age settlement (Ilan 1999, 2008, 2011).

The early Iron Age levels at Tel Dan have particular resonance in light of their perceived association with the biblical account of the migration of the tribe of Dan, described in Judges 18. The degree to which the archaeological finds agree with the biblical account is a question of scholarly debate. Whatever stand the scholar takes, the publication of new archaeological data enriches the debate and encourages the formulation of new questions relevant for a deeper understanding of the history of ancient Israel. Indeed, there is much in this volume that speaks to broader anthropological questions of human behavior in the ancient Near Eastern milieu.

Much of what is portrayed in this volume is still visible at Tel Dan, in the national park located in the far north of modern-day Israel. The visitor to the tel will encounter these well-preserved ruins as he or she enters the city gate from the south. Since the 1990s the Hebrew Union College-Jewish Institute of Religion has been a partner in the restoration of the Tel Dan antiquities: the Iron Age II gate, fortification system and cultic sanctuary, and the Middle Bronze Age mudbrick gate. It is our great hope that the remains of the early Iron Age, still quite visible, will soon be subject to the same kind of careful restoration, which will insure that future generations will have access to physical evidence for a period in Israel's history that is rarely visible.

Finally, I would like to take this opportunity to thank Dan Canaan, his successor Yoav Ben-Moshe — administrative directors of the Jerusalem campus —and Rabbis Michael Marmur and Na'ama Kelman-Ezrahi, former and current deans of the Jerusalem campus — for their ongoing efforts at making sure that our archaeological publications go to press. We have more in the pipes — stay tuned.

Andrew Rehfeld,
President
Hebrew Union College-Jewish Institute of Religion
August 2019

ACKNOWLEDGMENTS

I must first express my gratitude to the staff of the Nelson Glueck School of Biblical Archaeology (NGSBA) of the Hebrew Union College-Jewish Institute of Religion in Jerusalem. The late Dr. Avraham Biran, who preceded me as director, extended the privilege of preparing the Iron Age I material from Tel Dan for publication and its use in my PhD dissertation. His preliminary work is the foundation upon which my own is built. Dalia Pakman relinquished the Iron Age I material after having spent some time studying it herself. Gila Cook prepared some of the plans and discussed with me problems of stratigraphy and presentation. Dov Porotsky and Slava Pirsky continued where Gila left off; most of the final product is theirs. Rachel Ben-Dov, who has published the Late Bronze Age material in *Dan II* and *Dan III*, shared her perspective of the period preceding mine. Nili Cohen, our restoration expert, found the joins that establish stratigraphic and contextual connections. Noga Ze'evi put together the material culture plates and illustrated part of the objects portrayed in the plates. Alona Ruban also illustrated the special finds in recent years. Hanni Hirsh, followed by Levana Zias, the NGSBA administrative assistants, helped in locating data and objects, organizing the illustrative material and many other logistical chores.

The Hebrew Union College administration has been both generous and proactive. Presidents David Ellenson and Aaron Panken worked tirelessly to preserve the NGSBA's academic integrity and to raise funds for publication. The deans of the Jerusalem campus, first Rabbi Dr. Michael Marmur and then Rabbi Na'amah Kelman-Ezrahi, have always been encouraging and interested (if sometimes frustrated at the pace of progress!). The Jerusalem campus' administrative directors, first Dan Canaan and then Yoav Ben-Moshe, cracked the whip and demanded accountability in the publication process. For myself, as the chief author, this was one of the hardest parts of preparing the manuscript, but I am convinced that if more of us had administrators demanding a detailed accounting of our progress, most of us would be more efficient.

In their capacity as student interns Kirsten Drummond of Edinburgh University and Rachel Perkins of University College, London, helped me greatly in classifying and cataloguing the Iron Age I ceramics. Ted Schvimer helped with weighing and cataloguing small finds. Marina Rassovsky of the Israel Museum generously granted me access to the digital precision scale at the Israel Museum Conservation Laboratory. Liora Kolska Horwitz spent several hours with me and the bone tools, sharing her specialized knowledge and microscope. Yorke Rowan and Jennie Ebeling contributed valuable input on matters of ground stone. Naama Yahalom-Mack discussed with me questions about metallurgy and metal object typology. Dr. Zvi Gal shepherded the initial process of transferring a dissertation into a much more extensive excavation report, a complicated process. Sherry Whetstone did a terrific job of carefully editing this tract.

On the financial side, I owe a great debt to Richard Scheuer, of blessed memory, who over the years supported my work at the NGSBA. He was one of the great friends of Near Eastern archaeology. More generally, the Skirball Foundation is the reason the Nelson Glueck School has been able to carry out its long-term research projects. More recently, I am ever so grateful to Michael and Suzy Gelman and the Morningstar Foundation for their unflagging support of the NGSBA final publication series. They are making sure that Avraham Biran's scholarly legacy reaches fruition. The

Goldhirsch-Yellin Foundation is the newest supporter of our publication efforts. I cannot express the depth of my gratitude to you all.

This report began as a wider ranging dissertation supervised by Prof. Israel Finkelstein of Tel Aviv University. Israel was warm and unflagging in his encouragement and sagacious criticism. He is an advisor in the best tradition and a role model for fecund scholarship. Prof. Benjamin Sass was also of immense help in matters of methodology, organization and presentation of data; at one point he showed me how to jump-start a stalled investigation. He also advised me regarding aspects of the metal jewelry—one of his fields of expertise. My lovely wife, Ornit Ilan, discussed with me matters within the purview of her own expertise and was an effective sounding board. Just as important, she found the means of giving me the extra time needed to complete my dissertation, despite her own busy schedule and research projects. I am sad that she missed out on the final scientific publication. My kids, Yoav, Guy and Michael reacted to my long hours and testiness with humorous understanding and classy demeanor; Yoav and Guy contributed to the cataloging of finds and the cutting and pasting. Michael entered some of the data into my database. Eli and Tova Powitzer, my parents-in-law, baby-sat, ferried children and did many other things that freed me for my labors. My own parents, Leon and Sybil Goldenblank, extended welcome encouragement from afar. My partner Lilach Peled-Charny has been a great listener to extravagant ideas and a source of control in matters of the Hebrew Bible. She was also my well of encouragement when things seemed out of control.

Finally, I thank all those who contributed chapters to this volume. I know how frustrating it was waiting for me to get back to you and then having me tell you I needed your final version by the end of the week. I believe that the result was worth the trouble.

CHAPTER 1
THE NATURAL ENVIRONMENT

Tel Dan (Tell el-Qadi, Map grid reference 2112 2949, Fig. 1.1) is located at the headwaters of the Dan tributary of the Jordan River, in the northeastern Hula Valley. It is one of the three major settlement sites of the Huleh Valley, the others being Hazor on the southern margins and Tel Abel Beth Ma'achah on the northwest margin. Only Hazor is larger (and only in the Middle and Late Bronze Ages).

The tel occupies an area of *ca.* 20 hectares, including the massive ramparts first constructed in the Early Bronze Age and supplemented in the Middle Bronze Age.[1] Settlement remains begin at a level of *ca.* 192 m (Pottery Neolithic under the ramparts and later remains outside the exterior slope) and reach an elevation of *ca.* 211 m—the highest point on the tel.[2]

The following is an account of Tel Dan's natural surroundings, written in hindsight, from the perspective of an archaeologist who wishes to reconstruct the environment that ancient people contended with.

Climate

Tel Dan is located in a Mediterranean climate zone, with hot dry summers and cool rainy winters (precipitation generally occurs from November to April). It does, however, rain occasionally in the summer, unlike areas further south in Israel.[3] The northern part of the Hula Valley receives 600-800 mm of rainfall per annum (compare this to the 400 mm at the southern part of the valley). Not far away, Mt. Hermon benefits from up to 1500 mm per annum, resulting in a plethora of springs and in somewhat longer growing seasons. In the Golan Heights, less than a day's walk to the east, greater rainfall and cooler temperatures allow lush green pasture to maintain into the early summer months. This factor is likely to have enhanced the availability of animal products to consumers at Tel Dan.

The prevailing wind pattern is northwesterly. In the summer, in particular, strong northwesterly winds blow in the afternoons, created by temperature and pressure differences between the littoral and highlands, on the one hand, and the eastern deserts and valleys on the other. Northeasterly wind events, termed *sharav* in Hebrew and *sharkiyah* in Arabic, occur mainly in the periods of transition between wet and dry seasons, bringing dry, hot, dusty desert air into the region.

The immediate environs of Tel Dan receive *ca.* 120 dewy nights a year (Goldreich 2003: 130). This is relatively low for a Mediterranean climate regime and advantageous in that crop diseases and rust are discouraged. Since precipitation is plentiful in the winter and irrigation is easily executed throughout the year, dew is not a critical factor in the moisture balance, where cultivation is concerned.

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1 In the forthcoming *Dan V* volume Biran prefers a Middle Bronze Age date for the earthen embankment and an Early Bronze date for the underlying stone fortifications (Biran forthcoming, and see already Biran 1994: 70 and Greenberg 2002: 32-35.). In a future publication the present author will present a more detailed case for an Early Bronze Age date for the earlier phases of the earthen embankment as well.

2 All elevations are meters above sea level.

3 The author recalls three separate occasions of short but intense rainfall during excavation seasons in the summers of 1991, 1999 and 2005.

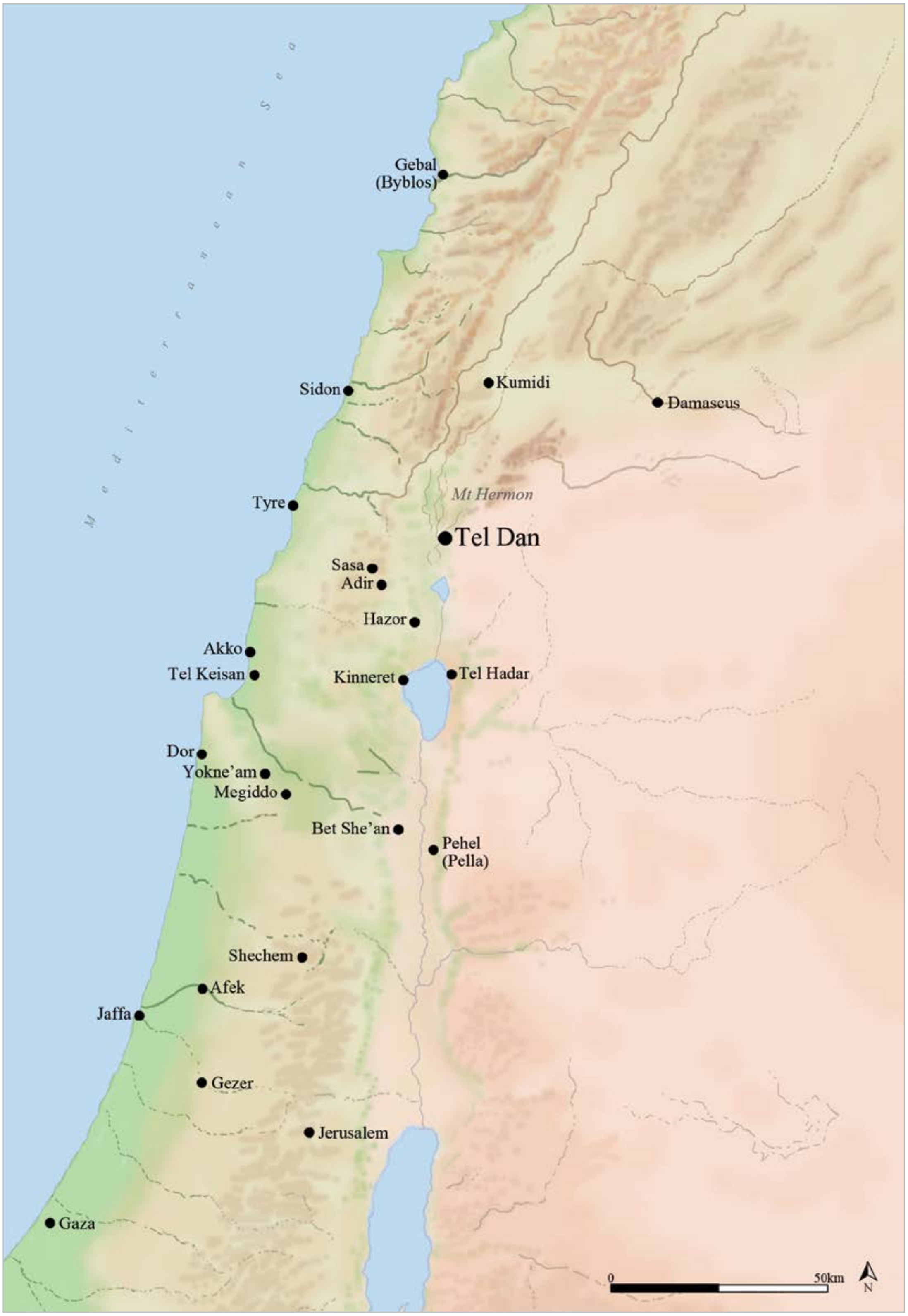

Fig. 1.1. The location of Tel Dan in its Levantine context.

Geology

Located as it is in the northern part of the Hula Basin, the landscape of Tel Dan is subject to tectonic processes and the patterns of sediment accumulation that are influenced by those processes (Mor 1987). The Hula Valley (Fig. 1.2) is a "pull-apart" basin, or graben, formed by faulting and by the creation of a bend in the strike-slip fault system (e.g. Belitzky 2002; Feibel *et al*. 2009; Heimann and Ron 1987). The Jordan River itself flows along the Jordan Fault Line. Both the southern and the northern parts of the valley have been subjected to a series of lateral faults as a result of the bend in the larger, longitudinal strike-slip Rift system. These lateral faults have resulted in steps that are visible in the southern part of the Hula Valley but are covered by sediment in the north, where Tel Dan is located. Transcurrent border faults establish the steep escarpments where the Naphtali Mountains rise up west of the valley and Mt. Hermon and the Golan Heights to the east, near Tel Dan (Fig. 1.3).

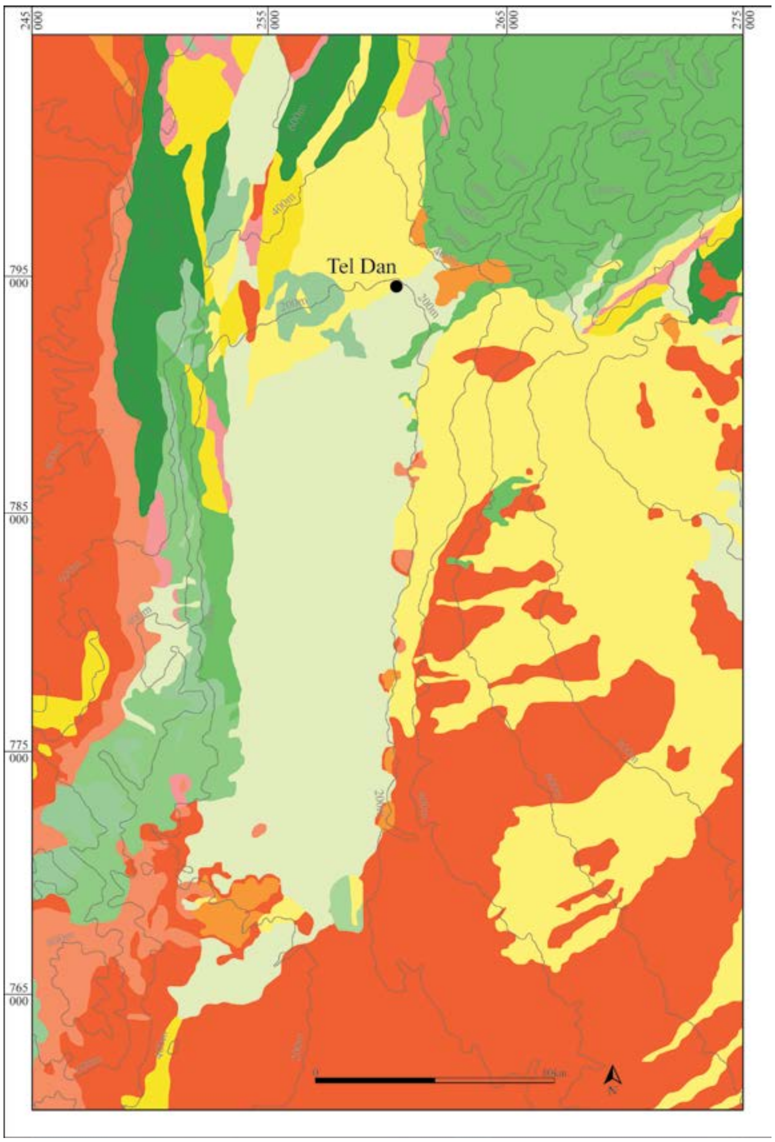

Fig. 1.2. A geological map of the Hula Valley (Sneh *et al.* 1998).

Subsidence accompanies the Hula Valley tectonics. "If sediment supply equals or exceeds subsidence, the basin will be filled, with no room for a significant body of standing water, hence no lake. If subsidence exceeds sediment supply, space is available for filling by water, and a lake is possible" (Feibel *et al*. 2009: 26). The consistent presence of Lake Hula, a shallow lake—probably since the formation of the valley in the Pliocene or early Pleistocene—suggests that subsidence proceeds at a rate similar to, or slightly greater than, sediment aggregation. It is of course the basalt flow barrier at the southern end of the valley that caused the lake's formation and that of its attending marshes.

Basalt bedrock (possibly the eastern edge of the mid-Pleistocene Hasbani Basalt) and coarse clastic material (boulders resulting from the erosion of the bedrock) are found only a few tens of meters to the north of Tel Dan, on the other side of the channel formed by the effluence of the large Dan spring (Fig. 1.4). It would not have been a good place for cultivation, save perhaps for limited horticulture or viticulture in the soil-bearing depressions. It is however, fine pasture, even today. This area would have been the main source of building stone and a place where megalith building would have been straightforward. There are a few megaliths still in evidence today; it is possible that an entire

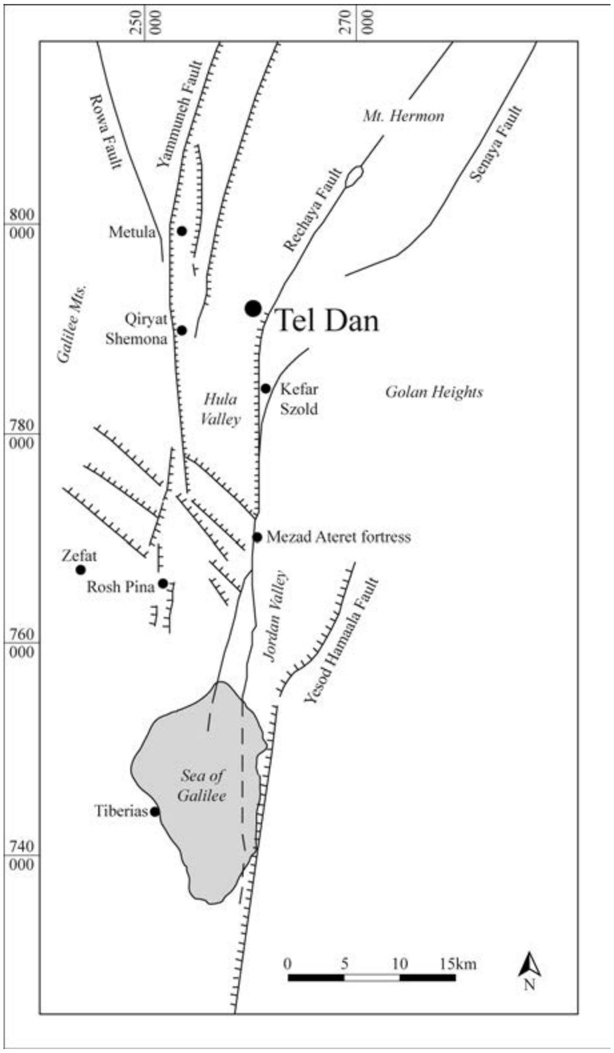

Fig. 1.3. A schematic map showing the main faults in the northern Jordan Rift Valley (after Heimann 1990; Zilberman *et al.* 2000).

field was dismantled in antiquity. One might go so far as to suggest that dismantled megalith stones were utilized in the construction of the massive Middle Bronze Age fortifications and temple (to be discussed in *Dan V* and *Dan VI*).[4]

Basalt occurs in differing degrees of density and vesicularity. Lava that cooled closer to the surface resulted in more vesicular and less dense basalt, while lava that was deeper, subjected to more pressure and less exposure to air resulted in dense, non-vesicular basalt (Sahagian 1985; Sahagian and Maus 1994). Different varieties were used for different purposes. Millstones, for example, are made of vesicular basalt (see below, Chapter 7). Building stones tend to be unworked basalt boulders and cobbles of non-vesicular basalt with a high specific gravity. Many of the basalt stones used in the Tel Dan buildings would have been too heavy for humans to move unassisted. Donkeys and oxen would have been harnessed for the transport of building stones.

The tel itself was established on an extensive travertine terrace (the late Pleistocene/Holocene Dan Travertine formation) that stretches to the south and east (e.g. Horowitz 1973: 132-133; Heimann and Sass 1989). This travertine was probably the source of some of the building stones and the crushed, off-white, plaster-like layers found in the ramparts encompassing the tel. However, many travertine blocks, particularly of the later periods, originate in the Banias travertines exposed in the Snir ridge a little more than a kilometer from the tel (Perath forthcoming).

Travertine is a secondary deposit of calcium carbonate that originates in limestones that have been dissolved by water in karstic environments. The travertine in question has its origins in the limestones and dolomites of the Mt. Hermon massif. The travertine was deposited by the Dan springs, whose waters originate in the snowmelt and rainfall of Mt. Hermon (see below). It is a fairly soft stone, harder than chalk but softer than native limestone. It is easy to carve but also somewhat friable, especially compared to the alternative building stone: basalt. Related to travertine is tufa—generally a softer, more porous freshwater spring deposit not conducive to masonry (Perath forthcoming).

A third geological entity, the Pliocene Bira Series, is represented primarily by conglomerates and freshwater limestones, chalks and shales to the northeast of the tel (Horowitz 1973: 110-116). This series is intercalated in places with the Intermediate Basalt and Fejjas Tuff. It is likely that most of the

4 For a discussion of the megalith fields of the Hula Valley, though not specifically at Tel Dan, see Greenberg 2002: 79-80.

Fig. 1.4. The rocky fields north of Tel Dan with Tel Dan in the background. Note the lack of cultivation.

limestone and flint cobbles, and some of the basalt, originate in this group, mostly accessible in fluvial terrace conglomerates exposed along the riverbanks (Sneh and Weinberger 2004).

Finally, Tel Dan is located amidst the Quaternary alluvium of the Hula Group (Kafri and Levy 1987; Sneh and Weinberger 2004), the foundation of the arable soil for agriculture.

Hydrology

The most abundant source of the Jordan River, and the largest karstic spring in the Middle East, the Dan (Arabic *al-Leddan*, Fig. 1.5) issues at the northwestern flank of the tel at an average rate of 238 million m^3 per year (8.5 m^3 per second). This spring emerges along a stretch of ca.100m at the foot of the northern flank of the tel. Its waters originate in the snowmelt and rainfall of Mt. Hermon that percolate down through the sedimentary rocks of which the mountain is composed. Much of this rock is Jurassic limestone, i.e. the spring has karstic origins (e.g. Gilad and Bonne 1990) and this is the source of the Tel Dan travertine. Gravity draws the groundwater downwards through subterranean crevasses, fissures and caverns into the upper reaches of the Hula Valley. It is not certain why the fountain emerges here, due to a lack of geohydrological data (Rimmer 2006: 6-7). However, the most plausible scenario presented so far posits that the Dan spring emerges along an underground fault line (Fig. 1.6). This results in the aquifer, which moves through in Jurassic carbonates, coming up against less permeable rock strata (the aquilude/aquitard) and being thrust upwards into the Lower Cretaceous sandstones, marls and later basalts above, and up to the surface in the form of an artesian spring (Gilad and Schwartz 1978).

A much smaller spring, Ein Leshem (Arabic *Ayn el-Qady*), issues on top of the tel itself (its output has not yet been accurately measured) and joins the Dan further downstream (Plan 1). This last spring was encompassed by the Early Bronze Age fortifications and incorporated into the settlement (Kempinski 1992). It can be surmised that drainage was maintained by allowing the effluent of this smaller spring to flow though the basalt boulder foundations of the rampart.

The abundance of fresh flowing water was clearly a major factor influencing the settlement, its agricultural production, and its wealth. Given the region's benign climate, two yearly crop cycles could have been easily achieved (Karmon 1953: 18-22)—no small matter in the fickle Mediterranean climate zone. There can be little doubt that irrigation was part of the economic and organizational picture. We know for example, from travelers' reports of the early 19th century, that the Hula swamps nearly reached Tell el-Qadi (=Tel Dan, Karmon 1953: 7, 12). But at the time of the American Civil War cotton was cultivated in the Hula Valley, irrigation channels and drainages were constructed and much swampland was reclaimed. New settlements cropped up, population increased and landowners derived an income.[5]

Irrigation, however, was not always completely benign; if not properly maintained, it could deprive downstream consumers of water and increase social conflict, or conversely, poorly managed irrigation could create marshes where none had been before and increase exposure to malaria (Karmon 1953: 19-24; Greenberg 2002: 21-23). Just 15 years after the end of the American Civil War, the population of the Hula Valley was once again poor and decimated, the swamps having returned to much of their former extent (Karmon 1953: 13). It must also be remembered that deforestation will increase sedimentation of the basin, increase swampland at the expense of both lake and dry land, and reduce the flow of springs (Shalit 1973).

Any discussion of settlement viability and growth must take into consideration the malaria factor. In his review of the evidence for malaria in the Hula Valley, Greenberg (2002: 21-23) has

Fig. 1.5. The Dan River, the most voluminous source of the Jordan River.

5 The landowners mostly resided in the hill-country villages of Nabatiyeh and Marj Ayoun, and the distant cities of Beirut and Damascus (Karmon 1953:16)

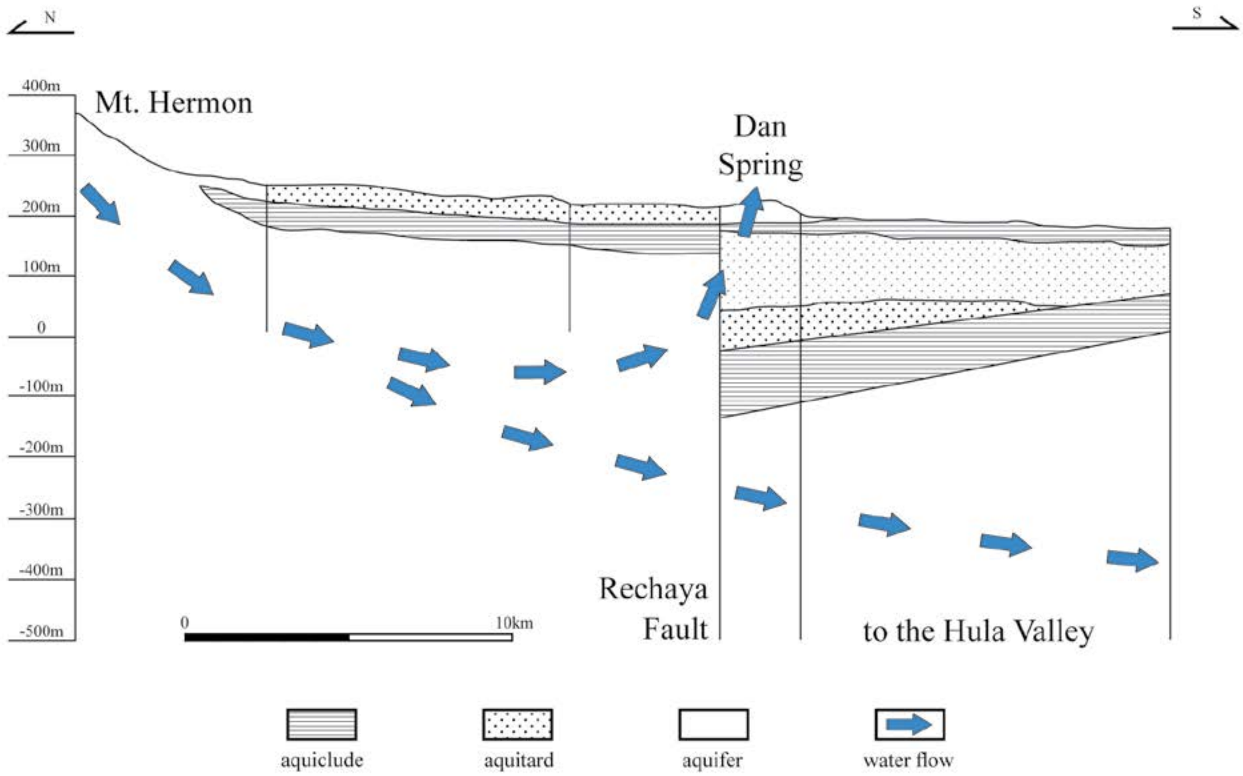

Fig. 1.6. A schematic geological section showing a hypothetical mechanism for the Tel Dan spring's effluence (Gur *et al.*, 2003 adapted from Gilad and Schwartz 1978).

shown that signs of malaria are not in evidence in the human remains reported from the Hula Valley until the Byzantine period. He does not, however, rule out the possibility that malaria existed and impacted negatively on the demographics of Hula Valley populations in more distant antiquity. From another perspective, the large, long-lived settlements of the valley's margins—Tel Dan, Tel Abel Beth Ma'achah and Hazor—comprise evidence for malaria not being a critical factor effecting growth and prosperity. It remains possible that periods of sociopolitical collapse—the end of the Early Bronze Age, the end of the Late Bronze Age and the end of the Byzantine Period, for example—marked periods of malarial influx, brought on by swamp expansion due to lack of drainage and irrigation maintenance.

Soils

The travertine terrace upon which the tel rests is mostly covered with coarse mineral soil, mainly calcareous *terra rossa*, but also containing clays and volcanic minerals, washed down from the Hermon massif by the seasonal watercourses: Nahal Sion, Wadi el-Hamam and Wadi el-Maghrar (Fig. 1.7). This brownish alluvial soil is quite fertile and aerated (Fig. 1.8). It is ideal for orchards and for olive trees in particular; no fertilizer is required. The fields to the east and south of the tel would have comprised the primary cultivation zone, mainly the land between the Banias and the Dan watercourses.

The basaltic plain to the north of the tel bears some brown volcanic soil, but only in isolated depressions. As noted above in the section dealing with geology, this would allow for horticulture or viticulture in a dispersed plant/tree array, but it would not be the first zone chosen for planting. Grazing would be the preferred utilization.

Clays were readily available in several forms. The field soil itself contains red ferrous clays that can be easily levigated in settling pools. The watercourses and springs contain grey erosional clays that derive from field soil, basalt and travertine sources. Finally, Greenberg and Porat (1996: 16-17) have identified Lower Cretaceous clay beds in the Hermon massif and Lebanon that produce a siliclastic formation of noncalcareous clays, siltstones and mature sandstone. Kaolinite is the dominant clay mineral. This clay was used in the production of Early Bronze Age Metallic Ware and some of the Middle Bronze Age wares, though not early Iron Age pottery (see the petrographic studies in Chapter 6).

Flora and Fauna

The modern-day environment cannot be used to interpolate the native flora and fauna of Tel Dan and its surroundings. The tools for reconstructing the floral environment of antiquity consist of charcoal, phytoliths and pollen derived from archaeological excavations and boreholes. Such work has been carried out by Horowitz (e.g. 1971), Baruch and Bottema (1991), Bottema and van Zeist (1981), and Lipschitz (e.g. 1986, 1990), among others.

The edges of the Hula Valley, the alluvial fans, floodplains and the northern terraces were characterized by a climax vegetation of Mediterranean park forest consisting mainly of Tabor oak (*Quercus ithaburensis*, Fig. 1.9) and terebinth (*Pistacia atlantica*), together with Irano-Turanian vegetation such as the jujube (*Ziziphus spini-christi*). This savannoid Mediterranean biotope includes grasslands that feature wild wheat, barley and oats (Danin 1995: 32). Thus the valley margins and floodplains were fine grazing areas and sources of timber.

Larger riperine flora species consisted of poplars (*Populus euphratica*), Syrian ash (*Fraxinus syriaca*) and Italian buckthorn (*Rhamnus*

Fig. 1.7. Aerial view of Tel Dan looking northeast, with Mt. Hermon and its foothills in the background.

Fig. 1.8. Fruit trees growing in the terra rossa soil just west of Tel Dan. The vegetation of the tel can be seen across the middle of the picture and the northern Golan Heights in the distance.

alaternus)—a large, thorny, thicket-like plant. These are Euro-Siberian in origin. Mediterranean trees are also found in this biotope: the Atlantic terebinth (*Pistacia atlantica*) and laurel (*Laurus nobilis*). These too, would have been a source of timber and firewood.

The islands in the Dan River are home to marsh fern, a northern fern which disappeared from the Hula Valley and can only be found in Israel along the Dan River. It might have provided padding material. Other examples of typical riverbank vegetation are holy bramble, loosestrife, common hemp grimony, galingale, bedstraw, cynanchum, and willow herb. Mint would have grown near water sources as well.

The lake and swamp environment has been extensively documented, most completely by Dimentman *et al*. (1992). Giant and Common Reeds (*Arundo donax, A. plinii* and *Phragmites australis*) would have been a useful resource for basketry and matting (*ibid* 110-113). One intriguing question regards the introduction of papyrus (*Cypreus papyrus*). Isotopic and playnologic analyses from boreholes in the Hula Valley give evidence that papyrus only became dominant in the marsh *ca*. 4000-5000 years ago, i.e. in the Early Bronze Age (Bein and Horowitz 1986). Perhaps the central question is whether this introduction was accidental (spread by the use of cane, for example) or intentionally imported. Gadot (2010), citing the work of Bein and Horowitz, has recently proposed that papyrus was introduced intentionally at Aphek in the Middle Bronze Age, at the headwaters of the Yarkon River in the Plain of Sharon. But this is a question to be pursued elsewhere.

The aquatic fauna of the lake and its surrounding springs represent, in many cases, the southernmost distribution of northern, cold-water species, and the northernmost distribution of tropical species (Dimentman *et al*. 1992: 97-99). This is one of the factors that made, and still makes the lake an attractive way station for migratory fowl. In terms of human consumption, the endemic *Cichlidae*, especially the blue tilapia (*Oreochromis aureus*), and North African catfish (*Clarias gariepinus*) were plentiful sources of protein. It is also quite likely that molluscs were too, as mollusca shells are frequent finds at Tel Dan in general, though not in the Iron Age I (for species see Dimentman *et al*. 1992: 103).

The variety of phytoenvironments found within a short distance from Tel Dan also means that numerous aromatic and condiment plants were available. In addition to the mint and laurel

Fig. 1.9. A Mt. Tabor Oak, the largest local tree and an important source of timber in antiquity.

mentioned above, these include coriander, cumin, salvia, thyme, oregano, marjoram and savory. The last four are frequently grouped under the generic term *za'atar*, often identified with the biblical *hyssop* (Fleisher and Fleisher 1988 and for condiments more generally see for example: Heine 2004 and Seidemann 2005).

Given the variety of environments, faunal resources were quite substantial as well. Hunting was certainly a means of acquiring protein. Deer and gazelle bones are part of the faunal assemblage at Tel Dan. Fish bones are also present, though certainly underrepresented due to the lack of fine sieving. Bird bones are underrepresented for the same reason. Wild boar would have been plentiful, though there was close to no consumption in the Iron I. The faunal remains from the archaeological context are discussed in Chapter 17.

Agriculture

The traditional crops of the Hula Valley, until the drainage of the lake and swamp in the 1950's were rice, cotton, sugar-cane, sorghum and maize. These are later crops, however. Rice was probably introduced in the Hellenistic period, cotton in the Hellenistic or Roman period and sugar cane in the early Islamic period. Maize was obviously introduced sometime after European contact with America.

Archaeological remains of cultivated crops are unfortunately sparse. At Tel Dan they include carbonized emmer wheat, olive, and lentils thus far (see Chapter 18). One would expect additional varieties of wheat, barley, pulses such as chickpeas and peas, fruits such as grapes, pomegranates, figs and raspberries, nuts (at least almonds) and oil and fiber crops such as flax and possibly poppies (Zohary and Hopf 1994). Vegetables and tubers were certainly important as well, though archaeological evidence for them is extremely rare (Zohary and Hopf 1994: 181-187). The concluding chapter will discuss the implications of subsistence agriculture, animal management and transhumance on Iron Age I economy and society at Tel Dan.

Roads

It is difficult to be sure about the precise routes taken by ancient roads. Topography, natural obstacles, water sources, settlement locations and markets are factors that determine the route a road will take and such common-sense criteria are one means of inferring these routes. Like anywhere, the central places of the northern Hula Valley—Tel Dan and Tel Abel Beth Ma'achah—were nodes connected by roads (Fig. 1.10). Smaller settlements would have been accessed from these nodes by local roads and paths or via the major routes. Major watercourses and the marshes were obstacles; watercourses could be forded or crossed by bridge but marshes needed to be circumvented.

One means of determining the routes of distant antiquity is to utilize the indications of more recent periods, namely the Roman-Byzantine and medieval periods. In the northern Hula Valley at least one actual road has been identified that dates to these periods, and milestones and other inscriptions allow the inference of others (Di Segni 1997; Hartal 2009; Shaked 1998).[6] This approach assumes, of course, that Roman-period roads follow routes that existed in earlier periods, a general principle adopted by scholars of ancient transit (cf. Dorsey 1991: 52-56). Another method, perhaps more dubious, is to "connect-the-dots" by surmising routes between sites inhabited in the same period, as identified by excavation and survey (e.g. Dorsey 1991: 156-158; Zwickel 2007).

The nearest major route to Tel Dan appears to have been the road between the coast of Lebanon and the plain of Damascus (Aviam 1993: 455; Maoz 1993: 137). An old Roman bridge is known on the Hasbani River at the village of Ghajar (Shaked 1998: 100-101). In the Roman and medieval periods this road apparently passed north of Tel Dan on the way to Banias, and from there climbed up the southeastern foothills of Mt. Hermon and then cut northeast towards Damascus (Hartal 2009: 21). Circumstantial evidence suggests that this was an important route at least as far back as the Middle Bronze Age—the paved road leading out of the mudbrick arched gate in Area K (on the eastern side of the tel) shows a clear northern turn.[7] In the Iron Age II, by which time the town gate was situated on the south side, a paved road runs along the southern revetment wall toward the east.

It stands to reason that this main trunk route met major north-south roads at the east and west edges of the Hula Valley. One of these would have connected Tel Dan with the settlements along the eastern foot of the Golan escarpment, such as Tel Anafa, Tel Qalil, Sheikh Mahmoud and Darbashiyeh (for now see Ilan 1999: 160-171). To get to the sites on the western side of the valley the traveler would probably have preferred (or been forced) to take the northern road across the higher terraces and intermittent watercourses, to a road that ran along the foot of the Mt. Naphtali escarpment (Ilan 1999: 160-171). Both of these north-south roads would have brought one to Hazor, at the southwestern end of the valley. Feeder roads leading west and east of the north-south roads would have integrated the Hula Valley's small villages into the transport system. Other roads would have led up the western escarpment to the settlements of Mt. Naphtali, such as Tel Qedesh, Tel Rosh and Har Adir (e.g. Dorsey 1991: 156-159, Routes G3 and G3a).

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6 One of these milestones is displayed in the Beit Ussishkin museum of Kibbutz Dan (Hartal 2009: 21, note 4).

7 In the plan published by Biran (1984: Fig. 1; 1994: 1996: 78, Fig. 46) this is not yet clear. More recent excavation seasons (2006, 2008) have uncovered further paving stones of a road that turns northeast.

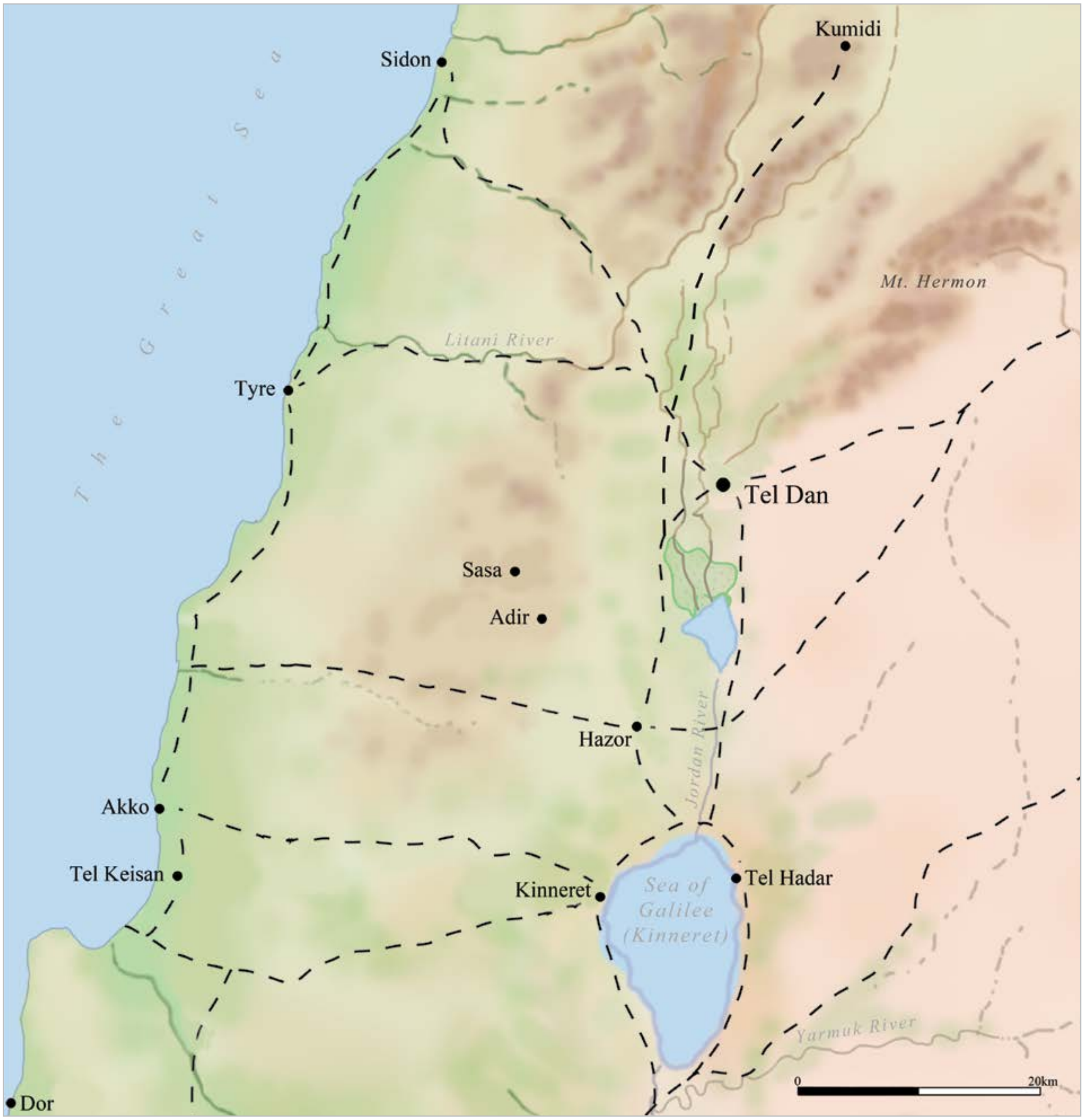

Fig. 1.10. A map of ancient roads in the area of Tel Dan.

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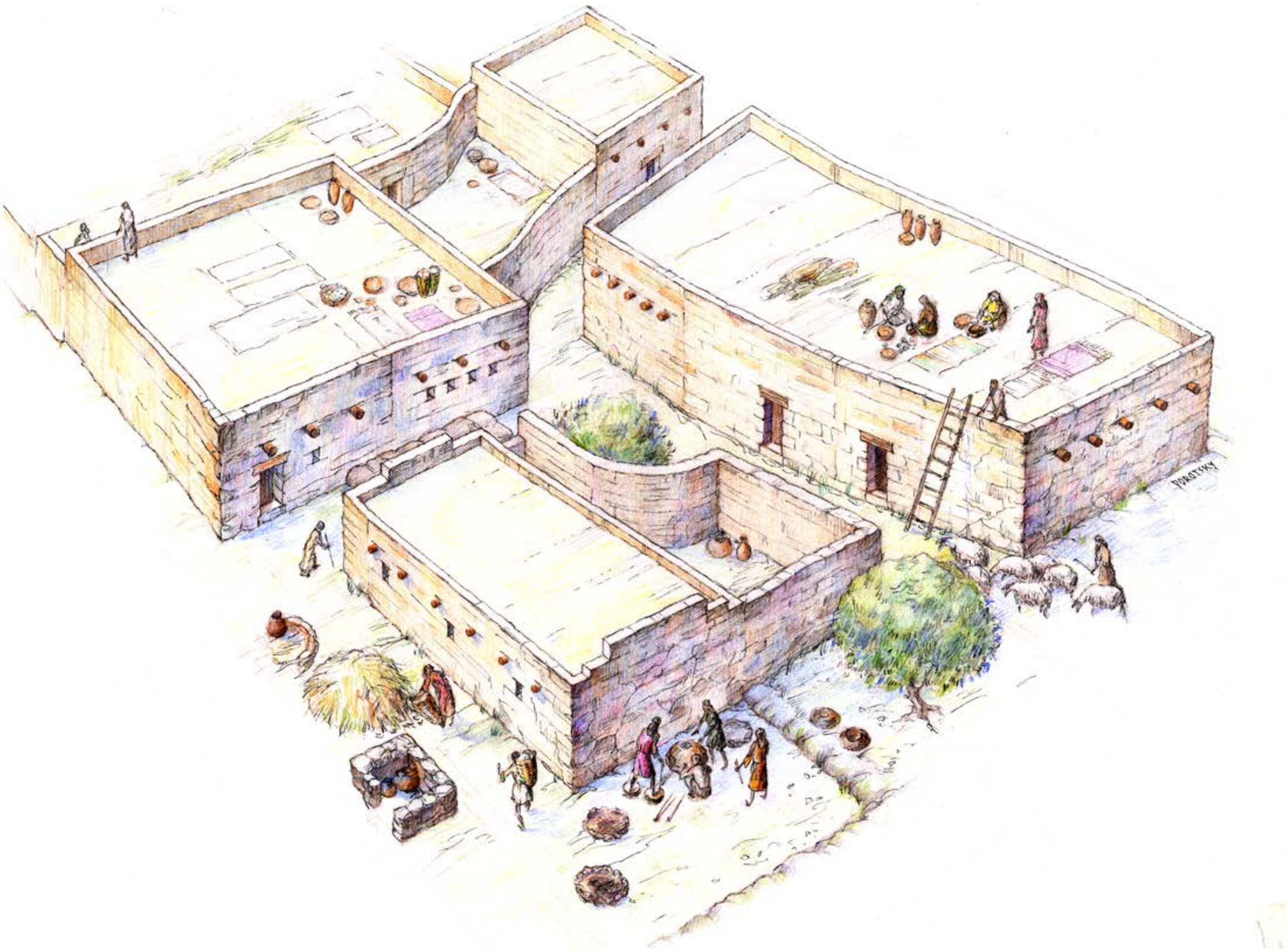

An artitist’s reconstruction of the structures and activities in Area B Stratum V, Phases B9-B10 (D. Porotsky)

CHAPTER 2

STRATIGRAPHY AND ARCHITECTURE

Excavation Methods and Strategy

The Tel Dan excavations began in 1966 under the direction of late Avraham Biran and continued for 33 seasons until 1999 (a new phase of excavations under the author's direction began in 2005). Initially this was a rescue project, aimed at evaluating the damage wrought by the Israeli Defense Forces in the construction of defensive installations (Biran 1996: 1, 9). Following the Six Day War of 1967 the project became a full-fledged research excavation under the auspices of the Israel Department of Antiquities (later the Israel Antiquities Authority).

In the first years, much of the excavation was oriented toward trenches on the mound's perimeter on the southern flank, in Areas A, B and H (Plan 1). These north-south trenches began with the width of the bulldozer's shovel—approximately three meters wide (e.g. Figs. 2.95, 2.116 below). The trenches of Areas K, T and Y, opened in the 1970's and 1980's were oriented to the slope on the eastern and northern flanks. As architecture was revealed, first in Areas A and B in 1966, a grid of five meter squares was extended to include anticipated exposures. In this way, the excavation area grew in size, as they so often do, following the developments from season to season.[1]

Biran avoided opening large horizontal exposures in any given season. The large areas that the visitor sees today are the result of many small exposures that were later connected, sometimes many years later. He was also wary of removing architecture and balks in general; Iron Age II architecture was usually left in place and the spaces between walls subjected to further excavation. This resulted in very high balks under the later walls and fairly confined probes further below—the deeper the probe the smaller the exposure (e.g. Figs. 2.38, 2.81A-B below). It was less a problem for interpreting the Iron Age I remains, since they were closer to the surface. Still, matching the stratigraphy of balks with that of squares excavated years earlier has proven to be time consuming, though worthwhile in the end.

Much time has passed since the early excavation seasons when a great deal of the data was accumulated. This was before the advent of digital registration and documentation. The field notes and logs are not always as comprehensive as one might wish; in some cases they have even gone missing. As in all long-term excavations where the staff changes, sometimes from season to season, problems arise in coordinating the data from adjacent or proximate squares excavated at different times. In places, elevations seem not to mesh properly. Moreover, in Area B-east the grid orientation changed in the 1970's, creating difficulties in matching up architectural remains. Also, the data gleaned in earlier seasons were often not integrated properly into that obtained in subsequent seasons, particularly when separated by large blocks of time. In this way, discrepancies developed that have sometimes proven difficult to rectify. In places I have relied on ceramic assemblages to correlate contexts that are not otherwise endorsed by elevations or other stratigraphic criteria.

1 This process can be followed in Biran's chronicle of excavations (Biran 1996; 2002).

Stratigraphic Nomenclature

Tel Dan was occupied almost continuously from the late Early Bronze Age II until the late Roman period (Biran 1994; 1996). It appears to have been occupied throughout the Iron Age, apparently on all parts of the tel.[2]

Preliminary stratigraphic analysis of the Tel Dan levels in the 1960's resulted in a coarse scheme of strata using Roman numerals, the highest recognized stratum being Stratum I (Iron Age IIC) and the earliest being, eventually, Stratum XVI (Pottery Neolithic; e.g. Biran 1994; 1996: Table 1.1). This proved to be premature since subsequent seasons revealed later Persian, Hellenistic, Roman and Medieval levels, as well as additional horizons between the given strata which deserved separate stratigraphic designations. Stratum XI (MBIIB) for example, needed to be subdivided into Strata XIA and XIB. Most important for the present volume, Stratum IV required a subdivision, where Stratum IVB was late Iron Age I and Stratum IVA was Iron Age IIA.

Individual excavation areas were not generally given their own internal stratigraphy by area supervisors. Moreover, contrary to accepted practice, the uppermost strata were not those first subjected to detailed analysis (this is currently being carried out); the earliest levels were. For this reason, in their treatment of the Neolithic and Early Bronze Age levels, Gopher and Greenberg (1996: 68) and Greenberg (1996: 98, Table 3.1) were forced to create internal phasing schemes for each area, divorced from the layers above. The basal Pottery Neolithic level (that immediately above bedrock) was Phase B1 and the latest Early Bronze Age phase was B10.

Since I began my work on the Middle Bronze Age after Greenberg, I adopted this method, identifying my own series of phases for each excavation area (Ilan 1996: 164, Table 4.1). Thus, the earliest Middle Bronze Age phase in Area B was MB Phase B1 and the latest MB Phase B10.

In her study of the Late Bronze Age remains, Ben-Dov (2002; 2011) has elected to maintain the general strata designations across all the excavation fields. Relying on contexts where the internal stratification was better preserved, Ben Dov arrived at subdivisions of the general strata into Strata VIII, VIIB, VIIA2 and VIIA1.

Given this somewhat unruly state of stratigraphic terminology, and given the fact that the Iron Age I levels are relatively well defined in each area and fairly fecund of finds, I was forced to make a decision as to how to approach the question of internal stratigraphic phasing. I decided to reach beyond the purview of my mission and to determine the entire sequence of each area, from the surface down to the Late Bronze Age levels. This is the method that should have been adopted from the very beginning. Table 2.1 presents the correlation of area phases with the general strata for the Iron Age I levels.

Table 2.1. The Iron Age I stratigraphy: a correlation of area phases.

General Stratum	Area B	Area M	Area Y	Area T	Area H	Area K	Area A
VIIA1	12	—	8-7	17	—	VIIA1	—
VI	11	10	6	16	Pit 609b	VI	—
V	9-10	9b–c	4-5	15	L609a	—	Pit 5009, L7527
IVB	8	9a	3b	14	—	—	—

2 Arie's (2008) suggestion of a possible lacuna in the Iron Age IIA has been reviewed and proven to be unwarranted (Thareani forthcoming).

Table 2.2. Nature of construction and destruction of Late Bronze Age to early Iron Age IIA strata.

Stratum	B-west	B-east	M	Y	T	H	K	A
VIIA1	fragmentary remains	truncated architecture	truncated architecture	truncated architecture, installation	truncated architecture	no remains	truncated architecture	no remains
end VIIA1	not clear	scattered destruction remains	no sign of destruction	light destruction remains	destruction	no remains	destruction	no remains
beginning VI	some reuse of VIIA architecture many pits	reuse of VII architecture, some pits	pits, some reuse of VII architecture	reuse of VII architecture, some pits	pits, some reuse of VII architecture	pit	pits	no remains
end VI	destruction	destruction	destruction	destruction	destruction	?	?	no remains
beginning V	new construction and leveling of VI	reuse of VI and new construction	new construction and leveling of VI	reuse VI and new construction	reuse VI and new construction	new construction	no remains	pit 5009
end V	massive conflagration/ destruction.	massive conflagration/ destruction	massive conflagration/ destruction	massive conflagration/ destruction	massive conflagration/ destruction	massive conflagration/ destruction	no remains	?
beginning IVB	construction over V	construction over V	construction over V	construction over V	construction over V (fragmentary)	construction over V	no remains	no remains
end IVB	earthquake?	earthquake?	destruction	earthquake?	?	?	no remains	no remains

General Comments about the Architecture of Iron Age I Tel Dan

This discussion of stratigraphy and architecture begins with the areas with the largest Iron Age I exposures (Areas B and M) and continues to those areas with smaller exposures (T, Y, K, H and A). Each of the relevant strata (VI, V, IVB) shows a general homogeneity in architecture and material culture, though there are some processual differences, expressed schematically in Table 2.2.

There was much architectural continuity from stratum to stratum in these levels. Old walls were reused and built up and new ones added in places, with a tendency to subdivide existing spaces. The progression of strata is defined by these supplements and by the raising of floors over previously destroyed remains.[3]

Most of the construction at Tel Dan was carried out with locally available basalt fieldstones. Because the local basalt is harder to mason than other types of stone, it was not modified much, which would seem to make it somewhat less stable than other kinds of construction. Moreover, basalt has a much higher specific gravity than does mudbrick, limestone or travertine. When it falls, it falls hard. These aspects of construction at Iron Age I Tel Dan may have influenced the severity and frequency of destruction and the debate by ancient occupants over whether to clear the resulting debris or to build over it. Still, the state of preservation is surprisingly good; perhaps the binding mortar was quite strong. In any case, though, a new building technique was adopted in Stratum IVB, with foundations of double rows of smaller stones, usually surmounted by mud bricks (see below). Regarding mudbrick features in general, some of these may have been missed.

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3 cf. the stratigraphy of the Iron Age levels at Tel Qiri, where the architecture and its organic changes are very similar to what is observed at Tel Dan (Ben-Tor and Portugali 1987: 53).

Table 2.3. Comparative chronology with selected sites (schematic).

Site	Late LBIIB, Egyptian 19th Dynasty (ca. 1300-1200)	Transitional LB-Iron I, Egyptian 20th Dynasty (ca. 1200-1150)	Iron 1A (ca. 1150-1100)	Iron IA (ca. 1100-1000)	IAIB (ca. 1000-950)	IAIIA (ca. 950-850)
Tel Dan	VIIA2	VIIA1	VI	V	IVB	IVA
Hazor	XIII	—	XII	XI	—	X-IXb
Tell Keisan	—	13	12-10	9c	9a-b	8
Tell Abu Hawam	Vc	Vc?	IVa	—	IVb	III
Dor	—	—	Early Ir1a	Ir1a/b (destruction)	Ir1b (post destruction)	Ir1/2, Ir2a
Kinrot	—	—	VI	V	IV	III
Tel Hadar	—	—	V	V	IV	III
Beth Shean	VII, N-4, Q-2	VI lower, N-3b, S-5-4, Q-1	VI, N-3a, S-3b,	VI upper, N3a, S-3a	VI upper, N-2, S-2,	V lower, N-1, S-1
Megiddo	VIIA	VIIA	VIB	cont.	VIA	VA–IVB
Yoqneam	XIX	—	XVIII	XVIII	XVII	XVI-XIV
Tel Qiri	—	—	IX	IX	VIII	VII
Ta'anach	IA	IB	—	—	IIA	IIB
Mt. Ebal	II	II	IB	—	—	—
Shiloh	—	V	V	L.623	—	—
'Izbet Sartah	—	III	III	II	I	—
Aphek	X12	X11	—	—	X10-9	X8
Tel Qasile	—	—	—	XII	XI-X	IX-VIII
Tyre	XV	XIV	XIV	XIII	XII-X	IX-VIII

Certainly, the Tel Dan exposure of Iron Age I levels is one of the largest and most complex in the southern Levant. Table 2.3 has been inserted here to give the reader a sense of stratigraphic equivalency and relative chronology with other sites and assemblages, mainly in northern Israel and along the coast.

Area B

Area B is located on the southern part of the tel on the gentle interior slope of the crater formed by the Bronze Age ramparts (Plan 1). As one might expect, this slope created the necessity for terraced foundations. The field was opened initially (Fig. 2.1) as a northward extension of the Area A trench, cut into the exterior slope (Biran 1996: 17). It was here that the main strata of Tel Dan were identified in the 1960s and where the first Iron Age I levels (Strata IVB, V and VI) were encountered. In 1974 another extension was made to the west, with an intervening strip (Row D in the grid) left unexcavated. This later extension became known as Area B1 (Fig. 2.2) and was excavated for a number of seasons thereafter (Biran 1996: 20). In 1976, an adjacent subarea, called Area AB, was opened up to explore the Iron Age II upper gate complex. Over the years this area was extended in a northerly direction down the inner

Fig. 2.1. Area B-east in 1969, looking north: W130 runs obliquely down the center of the photo, into the balk. W188 runs from right to left in the middle. In the center, the top of the larger massebah in L343 is visible just north of W188.

slope of the tel crater and by 1986 had connected up with Area B1 (Biran 1996: 26).[4] Combined, these subareas provide the broadest exposure of the Iron Age I levels. In the present account, the field east of the unexcavated strip of squares (Row D, Plan 2.4) is called Area B-east, while that west of the strip is Area B-west.

Wall foundations are always of fieldstones, mostly basalt, some *tufa*, and superstructures are usually made of stone, sometimes with brick. The stone walls are almost always a single row wide and mostly laid in headers. As in other areas, one of the features that typifies the three general strata under discussion is the reuse of walls, which can occur from the Late Bronze Age through the Iron Age IIA and beyond. Phase B8 (Stratum IVB) marks the first appearance of walls built of double rows of smaller stones used as foundations for mudbrick (e.g. Walls 4005, 4011, 4377 [Plan 4], though in some cases it is not certain whether the walls belong to Stratum IVB or Stratum IVA). This was to become the typical building technique of the Iron Age II, from Stratum IVA onwards—at other sites as well.

With the reuse of walls over long periods of time, a room may have several succeeding floors, each bearing its own destruction/debris layer with restorable pottery and other artifacts. Floors are either of tamped earth or slab-paved; the rare white plaster surfaces seem confined to Phase B12

4 Excavation was continued in Squares A–B/19-20 in the 1984 and 1985 seasons after a hiatus of nine years, during which time the area had been left exposed, resulting in the collapse of several walls and balks and the expected contamination. There was no large-scale removal of upper layers in order to investigate deeper strata. Rather, debris was cleared away and certain balks and walls removed, such that excavation was now taking place in narrow probes. I have combined the loci that resulted from the excavation of balks and probes with the larger loci from previous seasons.

Fig. 2.2. Area B-west, in 1975, looking south.

(Stratum VIIA1), our transitional Late Bronze-Iron Age I stratum (below).

The following is an account of the Area B stratigraphy from Stratum VIIA1 to Stratum IVB. Section drawings are found in Figs. 2.58-2.65.

Phase B12—Stratum VIIA1 (Plan 2)

This is the level of transition between the Late Bronze Age and the Iron Age I, in both historical and material culture terms. Its remains are cut by the Phase B11 (Stratum VI) pits above, which are in turn covered by the Phase B9-10 (Stratum V) floors and buildings. Viewing this as the last Late Bronze Age level, Ben-Dov (2011: 81-82, Fig. 54) has published the stratigraphy and its accompanying material culture, presenting an assemblage that is generally coherent, if disturbed in places. The associated pottery appears to be made up of Late Bronze Age forms with a foreshadowing of Iron Age I types (see the ceramic discussion in Chapter 3 and Ben-Dov 2011).

In Area B-west Ben-Dov (2011: Fig. 21a) was not able to identify a clear Phase B12/Stratum VIIA1 horizon, but a few wall stubs and surface patches should probably be attributed to this phase, at least continuing the Stratum VIIA2 occupation. In Squares A/19 and B/19, W5502's orientation is different from that of the underlying Stratum VIIA2 architecture and appears to be cut by Phase B11 Pit 4628. The orientation foreshadows that of the Stratum V architecture. Plaster or tamped earth floors cut by Phase B11 (Stratum VI) pits are L1202, L1212 (=L1223) (Fig. 2.58), L1228 (Fig. 2.3), L4325, L4670 and L7168. L4727 in Square U/18 is a tamped earth floor bearing two *tabuns* (L4728 and L4729). Its relation to Pit L4690 is not clear; it may have been cut by the pit, just missing the *tabun*—assigning it Phase B12—or, the floor may have run over the pit—making the pit Phase B13 (Stratum VIIA2).

In Squares U-B/14-16 (part of Area AB in Ben-Dov 2011: Fig. 81a) Phase B12 is even more difficult to isolate. L7146b is a fragmentary slab pavement that appears to belong to this phase (Fig. 2.4) and what appears to be a contemporaneous white plaster surface in L7078. It was difficult to differentiate Phases B13 and B12 stratigraphically and some of the surfaces and installations attributed to Phase B12 (below) may belong to the earlier phase.

The only clear Iron I (or terminal Late Bronze IIB) assemblage (Fig. 3.29:1-2) is from L4264 a probe in the southwestern chamber of the Iron Age II gate (in Square S11—not in our plans—but see Ben-Dov 2011: Figs. 82, 90-91). This has been

Fig. 2.3. Area B-west, Square C18, looking south: Remains of slab pavement (L593 of Stratum V, the strip at center right), a plaster surface below (L1228, Stratum VIIA1) and Pit 1201 (Phase B11, Stratum VI).

Fig. 2.4. Square A15, looking west, from bottom to top: remains of pavements 7146b (lower = Stratum VIIA2) and 7146b (upper = Phase B12 of Stratum VIIA1) and W4327 of Phase B10 above them.

attributed by Ben-Dov to Stratum VIIA1 (my Phase B12) but could also belong to Stratum VI (Phase B11) or Stratum V (Phases B10-9).

In Area B-east, the Phase B12 remains are clearly present, if not substantial (Ben-Dov 2011: 81-82, Fig. 54; and see section Fig. 2.65). Walls 4021, 4022 and 4025 remained in use from the previous Late Bronze Age phase (B13=Stratum VIIA2), with an added row of stones to thicken W4021. Loci 435 and 436 in Squares G–H/16, were bordered by W4023/4025 to the south (continuing from the previous period). Further to the west, in Squares E-F/16, Loci 182 and 7212 have been attributed to this phase though no architecture could be associated. This horizon is comprised of an earth surface bearing a layer of ashy debris containing sherds and several complete vessels (Figs. 3.27-3.28 = Ben-Dov 2011: Figs. 74-75).

The squares further north (Squares E-G/17-18), excavated in the 1960's, probably include remains of this phase as well. Unfortunately however, neither the available documentation, nor the pottery, allows us to isolate the phase here. The interpretation presented in Plan 2 associates most of the architecture with Phase B11 (Stratum VI), but much of this probably goes back as far as Phase B12.

Summary: Phase B12 is poorly preserved, being comprised of only wall stubs, patches of floor and a few installations. It seems to have utilized the architecture of the previous phase, B13 (=Stratum VIIA2) and added little of its own. The poor preservation is the result of stone scavenging and reuse in subsequent Phases B11 and B10-9, together with the damage done by massive pit digging in Phase B11. Still, it has been possible to isolate the material culture from this phase, and to compare it to better contexts (especially in Area T). Whether this material should be read as terminal Late Bronze Age or inchoate Iron Age I is open to interpretation, a subject we shall return to in Chapters 3 and 21.

Phase B11—Stratum VI (Plan 2)

In this phase there a stark dichotomy between the western and eastern parts of Area B. Area B-west is characterized by pits, at least 29 of them, accompanied by very little architecture. Late Bronze Age walls were still visible and utilized—Walls 5820, 5830, 6111 and 6114—all in the southern part of the exposure near the top of the slope. Area B-east is the opposite, including fairly substantial architecture with only a few pits. A number of walls may have in fact been built previously in Phase 12 (e.g. 4363, 5857, 130 and 131). In any event, the remains are of modest structures.

In Plan 2 parts of two or three buildings can be discerned. One is in Area B-west (Walls 4363, 5857 and 4380) and the other one or two are in Area B-east (Walls 131, 139, 130, 133b, 159, 191). The plans of the latter can be reconstructed in several ways, but it seems likely that there is more than one unit here.

One puzzling feature is a massive stone-constructed platform, L561 in Squares U/A17. It supersedes W5857 and in the succeeding phase (B10 or B9), W4317 (Plan 3) clearly is built up against it. Perhaps this had a function related to the grain pits arrayed all around (below), or perhaps it had a ritual function. It may also have been constructed at the beginning of later Phase B10.

Area B-west

Between the two blocks of architecture, was an open space of perhaps 500 m^2 pocked with pits, probably used for grain storage in the main, that were originally sealed and hidden from view (see below Chapter 19). The pits penetrate the floors and walls of Phases B12 and B13 (Stratum VII) below. It is usually difficult to know exactly where the top of a pit was. In most cases the pit is not immediately discerned in excavation and the top is probably the first part to collapse inwards. There are times when a Stratum VI pit was used again in later levels; it would seem that as the unconsolidated contents settled over time, the surface above subsided, leading the occupants to put their own pits in the same place. This is thought to be true for Pits 1219 (placed in Phase B9), 1209, 430/444 and 7081 for example.[5]

Several were completely lined with stones (e.g. Figs. 2.5-2.6; indicated in Plan 2). Many others (e.g. 1201, 1208, 1233, 1234, 7081, 7150, 7155) were cut down into a thick layer of pebble fill that dates to the Late Bronze Age I (Ben-Dov 2011: Fig. 10). It would seem that stone lining was only inserted where this pebble layer was not intact (note the partial lining of Pit 1201).

One strip of four pits (1225, 4628, 4622 and 4619) appears to comprise a single, probably contemporaneous "assemblage". All are placed along the old Late Bronze Age Wall 5500 and all are stone lined. Obviously the builders knew about W5500 and avoided it, or utilized it; the consolidated Late Bronze Age pebble layer that served other pits as an adequate lining was not available here, where the Late Bronze Age pavement 4626 abutted W5500, making a stone lining expedient. Pit 4628 lies under Phase B9-10 W4331 (Plan 3), making it one of the instances where the Phase B11 designation is unassailable.

Pit 4349 was inserted alongside W4386 of Stratum VII, which was used as one of its sides (Fig. 2.59). Other Phase B11 pits (1209, 1229, 4732b, 7273), too, utilized Late Bronze Age walls as facing, or else this was simply a means of avoiding having to dig into a wall. But several instances were met where

5 The best example is pit L3127 in Area Y (see below).

Fig. 2.5. Area B-west, Square B19: A Galilean pithos in the upper part of Pit 1225 (Stratum VI).

Fig. 2.6. Area B-west, Square B19: A collared-rim pithos in the lower part of Pit 1225 (Stratum VI).

Fig. 2.7. Square A18, looking west: Pit 1229; lower part of a collared-rim pithos standing upright (no plate drawing).

Fig. 2.8. Collared rim pithoi from Pit 4349 (Phase B11, Stratum VI, cf. Fig. 3.38:1-2).

Fig. 2.9. The lower portion of pithos 19762/1 from Pit 1243. Note the plaster horizons adhering to the base which are remnants of successive plaster floors laid down without moving the pithos.

Stratum VI pits came down directly onto Late Bronze Age walls: P7055, and probably others. A number of pits, like P4628, lay under Phase 9-10 walls: Pits 1235, 7055, 1231, 4349, 1229, 1241, 1240.

Several of these pits contained a plethora of artifacts while others contain very little. Some (e.g. P1229) gave up significant quantities of Late Bronze Age pottery. It is possible that such pits belong to Phase B12 and that the LB material represents discarded Phase B12 rubbish. But it is more likely that sherds originated in floors and other primary contexts that collapsed inward from the sides, or were reached at the base.

A few pits contained pottery that could be mended into whole vessels, especially Pits 1225 (Figs. 2.5-2.6), 1229 (Fig. 2.7), 1241 and 4349 (Fig. 2.8). Since it seems likely that these were discarded destruction debris, it follows that there must have been a fairly substantial occupation in Phase B11 to account for them. We can infer that the pits were made earlier in the life of the stratum and the debris represents the destruction that marked its end. The founders of Phase B10 (probably the same population as B11) deposited the refuse in the pits. One jar, found in Pit 1243, showed the accretions of successive plaster surfaces on its lower outer wall (Fig. 2.9). This demonstrates that pithoi of Stratum VI, like those of Stratum V, were often stationary and not even moved when floors were resurfaced with lime plaster (cf. Phases B9–B10, below pp. 36-39).

Metallurgical Remains[6]

Despite the dearth of architecture in this phase, metallurgy was extensively testified to in Area B-west—particularly in the southern portion, next to the remains of the massive Bronze Age walls in Squares U, A, B/14-16 (Biran 1989b; 1994: 147-157). Unlike the earlier Phase B13 surfaces—made of slabs and white plaster—these squares' surfaces were of tamped earth laid at slightly higher elevations (Loci 7066, 7079, 7093, 7134, 7145).

Numerous circular or semicircular installations were made of small fieldstones and fired clay: Loci 4736, 7169, 7165, 7174, 7177, 7179, W5815. They tend to be partially sunk into the surface, but they are never well preserved; only the lower sections are discernible. These are metal melting furnaces and they were probably dismantled in order to extract crucibles containing molten metal to be poured into molds (Ben Dov 2018, and see the description of furnace 7068 in Phases B9–B10 below). Often, only the shallow pits are left (Loci 4734, 7174, 7177, 7179), filled with ash, calcined clay, remains of pottery sherd linings, and facets of metal working (slag, metal pieces, crucible and blowpipe fragments, basalt pounders).

Other features are associated with the furnaces. Stone slab surfaces are often found next to them, perhaps to facilitate the breaking up of materials such as metal (to quicken the melting), bone (which may have served as a flux material), or slags containing nodules of metal. In the walls of several furnaces (L7174, L7177) were found blowpipe nozzles (cf. Figs. 3.24, 3.127; Table 3.11) by which blasts of air were directed from bellows into the fuel heaped in the furnace so as to maintain temperatures of at least 1000 degrees centigrade (Coughlan 1975: 28-30). Plan 2 shows that in many cases furnaces are associated with shallow pits and it may be that the furnaces were themselves built down into such pits much like the reconstruction suggested by Tylecote, Lupu and Rothenberg (1967) for the smelting furnaces of Timna. This would have increased the insulation of the furnace, allowing it to better maintain a high temperature and, at the same time, insulate the workers from heat extremes. Moreover, it would have been easier to place the bellows at surface level and direct the blowpipe nozzles' angled ends downward, thus maximizing the effect of the compressed air (Tylecote 1981). A few pot bellow fragments were recovered as well (e.g. in Loci 7140, 7165; cf. Fig. 3.128; Table 3.12).

Several stone circles, smaller than the other furnaces, were identified in a number of places (L7066 [Fig. 2.10] and one between Installations 7169 and 7165). Two, at least (L7066, L7140), were supports for storage jars or pithoi (Fig. 3.29:10). Some were sunk down to slab bases with small stones lining the shaft (Fig. 2.10); perhaps they were postholes.

Two deeply-sunk pithoi were found in relation to surfaces of this phase, one in L7140—a Galilean pithos (Figs. 2.11, 3.29:10)—and the other a collared-rim pithos in L7083. These were sunk down into the underlying Late Bronze Age pebble fill. This practice contrasts with the observation that the succeeding phases' pithoi were mainly found to be standing up against walls rather than sunk (though in places, the raising of floors did encase their bottoms). Though found broken, both still had their rims (collapsed inward to the base), suggesting that they were sunk as complete vessels. The one in L7140 was surrounded by small stones forming a sort of encasement on three sides (the west side bordered the balk and may also have been enclosed). This does not seem to be a stabilizing technique since the vessel was partially sunk. Perhaps it was a protective technique. The pithos in L7083 was apparently sunk deeper, with perhaps the upper 30-40 cm. protruding above the floor of L7079 (the elevations given in Plan 2 represent the height of preservation). This floor also bore signs of metallurgy: slag, crucibles, metal fragments.

6 Squares U, A, B/14-16 were excavated mainly by R. Ben-Dov who recently published much of the material (Ben-Dov 2018).

Fig. 2.10. Area B-west, Square U14, looking southwest: Phase B11 (Stratum VI) stone installations in L7060 and 7066 (upper right and center); perhaps foundations and support for wooden columns or posts.

Fig. 2.11. Square U16, looking west: L7140, the partially sunk Galilean pithos (broken, top center) surrounded by protective walls (Phase B9-11).

Fig. 2.12. Area B-west, Square U14, looking northwest: Pit 7125 of Phase B11-12. Note the rectilinear shape of the construction. The west side is in the balk. A broken but near-complete crucible lies at the base.

Perhaps the sunken pithoi contained water for drinking, for the dousing of superheated furnaces and the quenching of heated metal items.

At least four pits of the depth and diameter typical of Stratum VI occurred in these squares (L7081, L7150, L7155, L7179), penetrating down into the Late Bronze Age pebble fill. Their alignment and spacing show clearly that they were dug by the same workers, perhaps in sequence. They contained brick fragments, much ash, charcoal fragments, some animal bones, broken ground basalt vessels (a mortar, a few grinding slabs) and the usual Iron Age I sherds, but no complete vessels—very much the same as most of the other pits. It is possible that they served as grain pits, like most of the rest, but it is also possible that they functioned as part of the metallurgy process, storage facilities perhaps.[7] Pits have been determined to be associated with metal workshops at Kition, for example (Karageorghis 1976).

A rectangular shaped pit L7125 was found in Square U/14 (Fig. 2.12). This is an anomalous shape for a pit. It contained many stones—larger ones at the base—together with much brick and plaster and fragments of crucibles, slag, pottery, bones and a bronze spear butt. All this is probably debris that originated in the surfaces of Phase B11. The pit was covered by the fragmentary pavement of Phase B9, L7060 (Plan 3).

Though most of the metallurgical remains from this phase were recovered from the southern part of Area B-west, in Squares U, A, B/14-16, other related finds—fragments of bellow pots, crucibles and blowpipe nozzles—came from Pits 1225, 1231, 1241, and 4349, which is probably a sign that metallurgy was practiced down-slope too, as it was in the succeeding levels.

Area B-east

Our analysis of the eastern portion of Area B is hampered by factors of excavation approach, weak documentation and problems of stratigraphy, all of which allow for only equivocal conclusions. Several salient observations can be made however.

For one thing, there is architecture here. The plan of the buildings is not clear, but two or three structures may be inferred. On the other hand, only four pits were discerned, all told. Some of the existing pits in Area B-east may have gone undetected since, in the expedition's early years (the 1960's) the excavators were less acquainted with the phenomenon of pitting. But the number of pits is small compared to the 28 or so counted in Area B-west, with approximately the same size exposure, but with substantially less architecture. Obviously, space in Area B-east was used differently from space in B-west. Pit 374 may, in fact, belong to Phase B9–B10 (note the high elevation), which would leave no pits whatsoever inside the walls of the structure formed by walls W130, W133b and W159.

Pit 336 was sunk alongside W159 (Fig. 2.13). During the 1968 season, the excavators, feeling that they had reached the bottom because they were finding clean baskets of Middle Bronze Age pottery, changed locus numbers. But directly "under" Pit 336, at an elevation of 199.66, they encountered a large quantity of carbonized grain (Basket 1555). To this they gave another locus number (L352). The location, elevations and contents all suggest that this grain was contained in Phase B11 Pit 336. If so, it is one of the few Iron Age I examples of grain actually found in a pit (see Chapter 19).[8]

Very little could be attributed to this phase in Squares G–H/15-16. Following the patterns observed in Area B-west, we believe that Pit 444 should be assigned to it (Fig. 2.14). It contained a large Galilean pithos and a few other vessels (Fig. 3.32:2). The stones of underlying Late Bronze Age W4024 served as its base (Ben-Dov 2011: Fig. 54).[9]

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7 It is also possible that the pits belonged to ritual Building 7082 of Phases B9-10 (see below).

8 I thank Rachel Ben-Dov for pointing out this possibility to me. Unfortunately, the grain sample has not been located. In the winter of 1992(?) Vernon and Sherry Whetstone observed a pithos filled with carbonized wheat that had been exposed in the north balk of Square E16, next to W131 (as I reconstruct it). This grain was collected and brought to the Nelson Glueck School offices, but it, too, has not been located.

9 Pit 439 (seen in the section in Fig. 2.65) was not a grain pit, but a collapse of the floor and its makeup into the remaining cavity of Tomb 387 from Stratum VII (Ben-Dov 2002). The resulting pit was filled to make a level surface, perhaps in Phase B9–B10.

Fig. 2.13. Area B-east, looking southwest: in the lower right hand corner is stone-lined Pit 336 (Phase B11, Stratum VI) containing most of a collared rim pithos (the pit's outline is visible under the shovel handle and is in the balk next to the buckets).

Fig. 2.14. Square G16, looking northeast: Galilean pithos at the bottom of Pit 444 (Phase B11, cf. section Fig. 2.65)

Summary: Though plainly a distinct level of occupation, this layer is fragmentary and rather difficult to isolate. The pits are the clearest features, but their attribution to Phase B11 is usually only certain when Phase B9-10 walls run directly over them. Likewise, it is rarely possible to match a given pit to a floor that either went up to its rim or first covered it. Pits are often well aligned to the architecture above them; it often seems as if they were made after the walls were already in place and, in fact, some were clearly assignable to Phases B9 or B10 (Pits 1219, 430, see Plan 3). It is possible that the Stratum V builders recognized the pits and purposely avoided building over them.

For the most part the pottery from the pits is very similar to what is found on the floors and in the destruction debris of Stratum V. Clean, sealed contexts are few. The key, apparently sealed, groups are from pits L1208, L1225, L1229, (Figs. 3.32-3.34). The first two of these were published previously, specifically because they were from such contexts (Biran 1989a). The subtle typological differences between Stratum VI and Stratum V are discussed in Chapter 3, and can be discerned in Table 3.14. A total of 34 complete vessels was recovered from Area B-west in Phases B11-12 (Strata VI-VIIA1) and 20 vessels in B-east. The relative lack of architecture in Phase B11 can be attributed to several factors:

- Phase B11 was probably short-lived and rather sparsely built-up. It reused some of the Phase B12 and B13 architecture, the more massive structures in particular.
- Unlike Phase B11, Phase B9–B10 was densely and deeply constructed. Much of what underlie its foundations was either erased or incorporated.
- Most significantly, Area B-west was probably a "silo field" in Phase B11, akin to what has been observed at 'Izbet Sartah (Finkelstein 1986), Tell Beit Mirsim (Greenberg 1987) and Tel Hazor (Ben-Ami 2001; Ben-Ami and Ben-Tor 2012). This would not prevent the open area from also functioning as, for example, a livestock corral or an open industrial area.

It is due to these factors that the Stratum VI finds come mostly from the pits. Nonetheless, it must be noted that several pits contained pottery that could be joined, and sometimes restored as complete vessels, with material in fills under the floors and in the walls and benches of Phases B9–B10. Did all of this material come from the structures we reconstruct on either side of the grain-pit field, with some of the sherds remaining on the surface above? Perhaps; but we must consider the possibility that there was more architecture in the intervening expanse than was preserved or discerned.

Phases B9 and B10—Stratum V (Plan 3)

This phase saw the development of a much denser and more complex architectural weave than the previous one. Two phases (B9 and B10) were ascertained in some places. Where discerned, the two phases are identified by two levels of floor and the accumulation above, both exhibiting broken vessels, charred wood, collapsed brick and ash that suggest violent destruction. These successive layers are not the collapse of two-storied structures; sometimes the upper phase includes slab pavements and other heavy stone features. Another indication of multiple phasing within Stratum V is the phenomenon of blocked-up doorways (see below).

What follows is a general account of the Phases B9–B10 stratigraphy and architecture that focuses on salient features rather than being a thick description of context.

The Layout of Area B in Phases B9–B10

The inner slope of the tell, originally formed by the Middle Bronze Age rampart, made it necessary to build in series of low terraces, running east-west, so as to create level living surfaces. In Area B-west at least three of these "terrace walls" were detected: W4305, W4316+4331+4324, and W4372. In Area B-east, W133a serves the same function. These terraces were incorporated into the houses' superstructures. As a result, floor levels descend ca. 50 cm. from terrace to terrace. The regularity of this terracing implies a planned infrastructure meant to accommodate fairly large numbers of people.

In the higher, southern part of Area B-west (Squares U, A–B/14-16), closer to the apex of the old MBII fortifications and gates, the layout was influenced by the remains of massive Late Bronze Age architecture. The massive stone platform of L561 was either constructed at an early point in this phase or left in place from previous Phase B11. On its northern side, a terrace was cut and W4317 was built up against it. To the south W4362 was built over it and formed the north wall of Structure 7052. In other words, there was no level thoroughfare between the two buildings on the northern and southern sides of the platform. But the layout of the buildings makes more sense if people were able to

Fig. 2.15. Square B17-18, looking west: Stratum V, the pavement of L668 (right) and Street L630 (left), separated by W4305. The street is bordered on the south (further left) by W4342, stones of which have collapsed into the street in a linear fashion.

pass over Platform 561, so perhaps there were steps up to it on either side that have gone undetected.[10]

It is difficult to identify room and court agglomerations that might comprise discrete dwellings of the type that have been documented in excavated hill country sites further south (e.g. Braemer 1982; Faust 2006: 71-84; Finkelstein 1988: 237-260; Stager 1985). No classic four- or three-roomed, pillared structures were detected. Rather, the picture is one of complex insulae whose spaces have been rearranged and recombined over time, so that the original open spaces between buildings are no longer distinguishable. This aspect will be discussed further in Chapter 21, in the section that deals with architectural organization and its social implications. We can hypothetically identify five or six separate agglomerations in Area B-west and maybe four in Area B-east (Plan 3, capital letter designations, and see the reconstruction on p. 16.). It is abundantly clear that in these phases there were no large open spaces in this area.

It is not usually clear which of the rooms were roofed and which were open courtyards. Obviously, the small rooms were most likely roofed and belonged to the houses' closed spaces. Examples are found in the row of rooms in Squares U, A–C/19, on the middle terrace. The same probably holds true for the rooms in Rows E and 17 in Area B-east. None of the spaces exceeds a width of 6 m, so that all are potentially indoor spaces. The presence of a *tabun* does not automatically imply an open space. The question is: must small metal melting furnaces be located outdoors? If so, L1204 in Square B/20 must be outside. But the metallurgy remains are so widespread that one might infer that metallurgy was often conducted indoors. Perhaps the larger, bounded, square-shaped spaces, such as Loci 7065, 591/1207, 1213, 114, 356a and 431 can be understood as open-air courtyards; but I do not think there is compelling evidence to this effect.

Alleys and Drainage

As intimated above, there seems to have been an east-west alley running through the middle of Area B-west: L4706, L561 (platform), L691, L1203 (slab paved, Fig. 2.15) and L593 (perhaps a terminal room). The existence of north-south thoroughfares located precisely in the unexcavated strips might also be surmised: Row T to the west and Row D between Areas B-west and B-east. This would leave approximately 25 m. between them for large family compounds or smaller back-to-back insulae (see reconstruction on p. 16). It is also possible that the north-south space bordered by W130 and

10 A thoroughfare went over Platform 561 in the next phase (B8, see below).

W131—long walls constructed in parallel—was the original alley, later taken over and integrated into domestic space.

No drains, gutters or ceramic pipes were observed. In the rainy season, this would have been one muddy town. Most of the drainage must have been directed downslope, i.e. to the north, probably through the alleys (note that Alley 1203 was paved, Fig. 2.15). Still, drainage must have been a big problem; a heavy rainstorm, or a close series of them, would certainly have caused the collapse of walls and roofs from time to time.

Walls

There seem to have been a few walls that were reused from the last phase—some originating in the Late Bronze Age phases (Walls 6111, 5820, 6114 belonging to earlier monumental structures, see Plan 2), others in Phase B11 (Walls 130, 131, 159, 4380, 5857, see Plan 2). But it seems that all the architecture in the former open space of Phase B11, between Rows U and D, dates to Phases B9–B10 and developed organically through time. As a result, the orientation of the Stratum V structures is different from that of the Late Bronze Age Stratum VII architecture; north-south as opposed to the earlier northwest-southeast alignment (Plan 3).

The walls of Phases B9–B10 tend to avoid the pits of Phase B11, probably for reasons of structural stability. These pits of the previous phase had been back-filled and were covered by floors. In some cases, a wall's foundations would be built down to the bottom of the pit to assure stability (e.g. W4305 over Pit 1231 in C/17-18).

One rather odd architectural feature that I have not encountered elsewhere is the short gap often present where stone walls would be expected to meet cross walls. Examples of this can be found in Walls 4330, 4344, 4372, 4382 (Plan 3). In at least one case, observed during my own tenure excavating Squares U/17-18 in 1988, I observed that W4344 (Phase B8, Plan 4) was finished off in mudbrick at the point where it abuts W4375 (schematically illustrated in Fig. 2.16). It may be that this "stop-gapping" was used elsewhere as well. What was the function of this technique? The gaps are too narrow to be blocked-up doorways. Perhaps it was a mechanism of absorption for earthquake temblors. Another explanation for at least some of the numerous gaps is that they indicate the thickness of mud plaster coating the abutted wall. If this reconstruction is correct it was not removed when the later wall was added. This might be a useful tool in tracing the organic growth of domestic compounds.

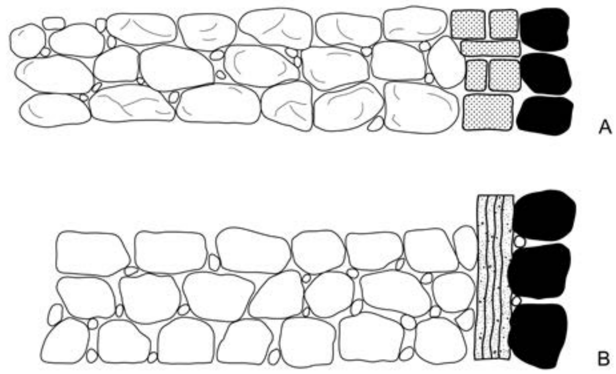

Fig. 2.16. Wall, brick and plaster construction in Area B-west explaining gaps in abutting walls; (a) mudbrick join, (b) wall abutting mudplaster covering and not masonry.

Doorways

When doorways are present, the doorposts consist of stacked fieldstones rather than monoliths. There does not seem to be sufficient width to allow for the addition of wooden doorposts. Thresholds were mainly of large basalt slabs (e.g. in Walls 4316 [Fig. 2.17], 5528, and 5105), but sometimes of a stone and tamped earth paving (e.g. in W4344 in Square U/18). Lintels must have been of wood, since long stone candidates are not present.

A major problem exists in reconstructing doorways—there are not enough of them. Where excavation failed to uncover all the walls of a room—a not infrequent occurrence—we can infer doorways in the unexcavated balks. But there are some rooms in which all four walls were uncovered where no doorways could be discerned—e.g. the series represented by Loci 685, 688, 607 and 698 in Row 19; or L128. In some rooms, doorways were observed

Fig. 2.17. Squares A17-18, looking north: Pavement 1213 (Phase B9-10) and Phase B8 W4348 above it, abutting W5600 to its east (right); note the doorway in the center. In the upper center poorly constructed W4316 can be made out, with a probable blocked-up doorway near its junction with W5600 (over the large stone).

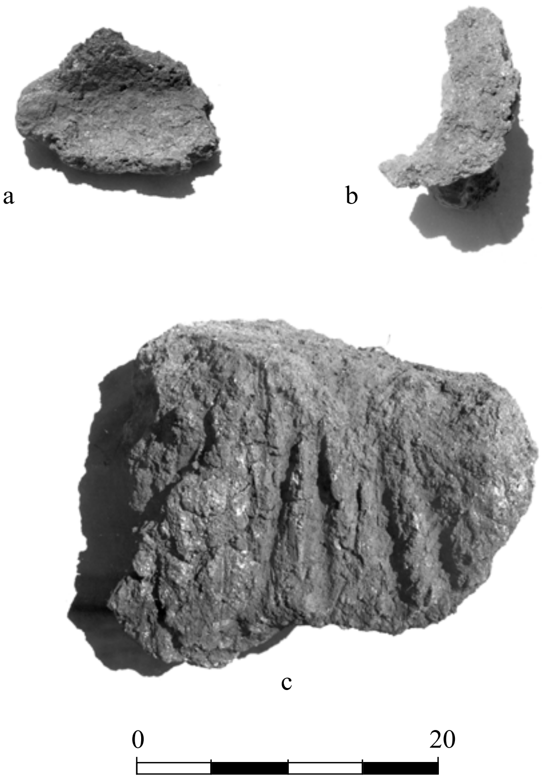

Fig. 2.18. Mudplaster (a-b) and ceiling (c) fragments from L586 (Stratum V). Note the reed or branch impressions in the ceiling daub fired hard by the Stratum V conflagration. The curvature of the mudplaster fragments represents the meeting of the floor and the wall.

in Phase B10 but not in Phase B9: L356a (doorway in W130), L4716 (doorway at the southern end of W4363). It is conceivable that some of these Phase B10 rooms became basements in Phase B9. It is also possible that successive reconstructions removed evidence of early doorways. In Squares U/18-19, room L4711 (Phase B10) was transferred from Compound A to Compound B in Phase B9 by blocking up the doorway in W4316 and opening a new one in W4344 (also canceling the use of trough or bin L4710). It then became L673 in Phase B9. Other blocked doorways were observed in Walls 130, 4327, 5829, 4353, 4363. In places (L4716) pithoi were even stood up against walls in the place of blockage. This example brings to life the dynamic nature of household affiliations.

Roofing, Second Stories and Basements

Locus 586, one of those with a thick destruction layer, also revealed many roof fragments and mudbrick that had been fired hard by the conflagration (Fig. 2.18). The roof fragments show the imprint of reeds, twigs and branches—and in one case, of a wooden beam that supported the roof (cf. Briend and Humbert 1980: Fig. 8). In most of the roof fragments a number of layers could be distinguished—as many as seven—implying repeated weatherproofing over time.

Column bases and post holes were not observed in these phases. I would surmise that wooden columns were inserted into floors but that these have gone undetected. Some of the pavement disturbance may have to do with roof posts being dislodged (see below). On the other hand, since none of the rooms is more than 6 m across, and most are less than 4 m. across, it is quite possible that at least some roofs were spanned from wall to wall. Large trees were probably accessible from Tel Dan.

It is doubtful that these houses had second stories. While it has been shown that walls of their thickness—*ca.* 50 cm.—can support a second story (Stager 1985), and Holladay (1995: 389) has concluded that typical pillared houses must have had two stories, the use of basalt fieldstones and the building technique observed at Tel Dan seem to have resulted in a somewhat unstable structure, in contrast to the more easily squared-off limestone used at most Iron Age I sites. Moreover, foundation trenches are often lacking or very shallow, suggesting that walls were not intended to reach great heights. Ideally, a two-story building can be identified by staircases, or by lower floor material crushed under clearly identifiable roof debris, superimposed by plaster flooring, upon which lies another layer of occupational debris that includes complete vessels. This ideal situation was not encountered.

Fig. 2.19. Square C18, looking south: the pavement of Stratum V L593 and W4305 in back (top). The lower portion of W4305 (W9305A) is abutted by the pavement while the upper portion (W4305B) is tilted to the north, probably the result of slope pressure.

Floors

The floors of this phase are either tamped earth (e.g. Loci 586, 698, 1218), or basalt slab pavements (e.g. Loci 343, 426, 593, 660, 668, 680b, 1203, 1213, 1218, 4196, 4197). White lime-plaster floors are rare (only in Loci 7208, 7209 and 7082b), though what we are calling tamped earth may also be more of a mud plaster.

Most of the pavements show irregular gaps. While not all pavements need have covered the entire wall-to-wall expanse of a space, these gaps are evidence of disturbance (e.g. Figs. 2.3, 2.15, 2.17, 2.19). Much of this can probably be blamed on subsidence into old grain-pits. This subsidence may also explain the fact that a number of floors in the central area slope in odd directions and are slightly lower in places than the foundation courses of surrounding walls. Alternately, some disturbed floors may be explained by roof posts collapsing and bringing up the slabs.

Pits

As noted in the Phase B11 description, more of the pits may belong to these later phases than what we have discerned, especially in those cases where a clear sealing surface is lacking. But only three—Pit 1219 (Fig. 2.20), Pit 624 and Pit 430—have been assigned with certainty to Phases B9–B10. These assignations are based on the relatively high levels of their upper stone courses, which actually appear to have rims that rise above the floor levels, making them bins. But it is quite likely that they are earlier Phase B11 pits, marked by subsidence that were built up and reused, perhaps with less depth and perhaps more as bins than as sealed pits. Pit 430 at least, was located directly over Phase B11 Pit 444 (Plan 2) and a similar reuse was observed for Pit 3127 in Area Y (see below).

Fig. 2.20. Area B-west, Square A19, looking south: Pit 1219 (Phase B10, Stratum V).

Tabun Ovens

These are usually put up against or near walls, preferably in corners. Contrary to what the modern researcher might expect, they do not always seem to be located in open courts. Many in fact, are placed in small, narrow spaces, which, more likely than not, were roofed (e.g. L7209, L628). The ethnographic literature provides ample evidence for indoor cooking and baking ovens (Kramer 1982) and the same has been observed at Early Bronze Age Arad and ʻAi (Ilan 2001: 327-328). It is worth remembering that ovens were also a source of heat in the winter.

Grinding Stones

Large numbers of basalt grinding stones were found in the structures (see Chapter 7). The majority are broken and in secondary use in furnace or oven walls or as building and pavement stones. The larger items at least, were usually found next to walls, rather than in the centers of rooms. There do not appear to be more than two intact lower grinding stones per room/court and no more than one mortar. The fact that such objects are not registered in the excavation records for a given space does not necessarily mean that they did not exist. Many balks within rooms, and especially next to walls, were never removed; ground stone utensils may still wait within.

Pithoi

The phenomenon of upright pithoi standing in corners or against walls is especially prominent in this phase. *In situ* examples were found in Loci 586, 692, 698, 1213, 343 and 432 (Figs. 2.21-2.26; Plan 3).[11] In this context it is worth repeating the find of a pithos filled with carbonized wheat that had been exposed in the north balk of Square E16, next to W131 in Area B-east (above n. 8).

The many restorable pithoi from this phase generally had their bases inserted into the floors, so that their original positions were marked despite being crushed by the collapsing ceilings and walls. It is possible that this was done from the outset so as to stabilize the vessels, but it seems equally possible that the jars became sunk over time by the resurfacing of floors and the accumulation of debris in corners and against walls. Unlike the two examples from the previous phase however, pithoi do not seem to have been deeply sunk from the outset.

Numbers of pithoi vary from solitary examples to a group of five (L586). This last small room may have contained even more pithoi (only minimum counts are cited here) and it also contained a number of other items (Figs. 3.46-3.47). It is likely to have been a storeroom. This configuration of pithos storage and positioning is highly reminiscent

11 The substantial numbers of large pithos sherds, many of which form joins, indicate that there were many other pithoi that had collapsed and fragmented, whose *in situ* location might have been recovered with sufficient documentation and restoration.

Fig. 2.21. Squares B-C18-19, looking north: L698 of Phase B9-10 to left and L605 of Stratum IVB (right). Note the *in situ* pithoi in the corner of Walls 4347 and 4372 (upper left).

Fig. 2.22. Square B19, looking east: L698. Stratum V. The *in situ* pithoi in the corner of Walls 4347 and 4372 are bottom left; the added buttress to W4372 can be seen at upper left. To right of this the negative of Stratum IVB Pit 645 can be made out (cf. Fig. 2.46).

Fig. 2.23. Square B19, looking north: Galilean pithos in Phase B9-10, (Stratum V) L698, in the corner of W4347 and W4372.

Fig. 2.24. Square B19, looking northwest: two Galilean pithoi in Phase B9-10, (Stratum V) L698, in the corner of W4372 and W4347b (cf. Fig. 3.50:3-4).

Fig. 2.25. Square B20, looking southwest: Stratum V L692 (was L4328) and the corner made by Walls 4372 (left) and 4353 (right). Note the two crushed pithoi (cf. Fig. 3.49:11-12) that were originally propped up in the corner.

Fig. 2.26. Square C19, looking east: six collared rim pithoi on the floor of Stratum V L586, set up against W4355. W4324 is to the left.

of the famous groups recovered at Shiloh both by the Danish expedition and the more recent Israeli excavations (Bunimovitz and Finkelstein 1993).

In all except one of the rooms the *in situ* pithoi were collared-rim pithoi. The exceptions were three Galilean types (my PG1-2, see Chapter 3) in L698 (Figs. 2.21-2.24, 3.50:3-4). Perhaps they contained a different commodity?

Other Domestic Contents

As expected, the major artifact component was pottery. Fortunately, large numbers of complete vessels were found in the destruction layers of Phases B9–B10 (Stratum V). A sample of these is presented by locus in Figs. 3.40-3.57. A total of 81 complete vessels from Area B-west has been counted for Phases B9-10 (Stratum V) and a total of 21 vessels from Area B-east.

As with *tabuns*, installations, pithoi and large stone objects, the great majority of the complete pottery vessels was found near walls. The centers of rooms appear to have been much cleaner of finds. Often, the vessels found in the middle of the rooms are jugs and juglets, which are less liable to break upon impact and more likely to roll across the floor. Not surprisingly, there often seems be an association between pithoi, jugs and juglets. In L1213, at least two jugs and one juglet (not illustrated) were found which seem to have been lined up along W4363, or set into the mouth of one of a pair of collared-rim pithoi. The jugs are too large to dip inside the pithos mouths, but sit comfortably in the mouths. The juglet could rest in the mouth of a jug and could be the dipper for the pithos. Thus, they may even have been stacked in three tiers from largest to smallest vessel. If this reconstruction is correct, these particular pithoi contained liquids.

L1218, a large room, contained at least five chalices, together with many cooking pots, several baking trays and a variety of other items (Fig. 3.51).

Structure 7052b

A stand-alone rectangular building, Structure 7052b was revealed in Squares U-A/15-17. It is 7.5-10 m. long (depending on whether or not poorly preserved W4362 is the northern exterior wall) and 3.8 m. broad (Figs. 2.27 and 16.3). It included stone and mudbrick benches along parts of its walls, partitions and a small chamber (L7082) in the southwest corner (Fig. 2.28). Locus 7063, in the southeast corner contained a storejar, several jugs and a bowl (Figs. 2.29-2.30; 3.53). Locus 7082b had a plaster floor bearing a collection of objects that have been assigned a ritual function (Figs. 2.28; 15.2; Fig. 3.55). Several indicators of ritual were present (Renfrew and Bahn 1996: 390-391):

1. Special objects of a symbolic nature were present that served as focusing devices—the model

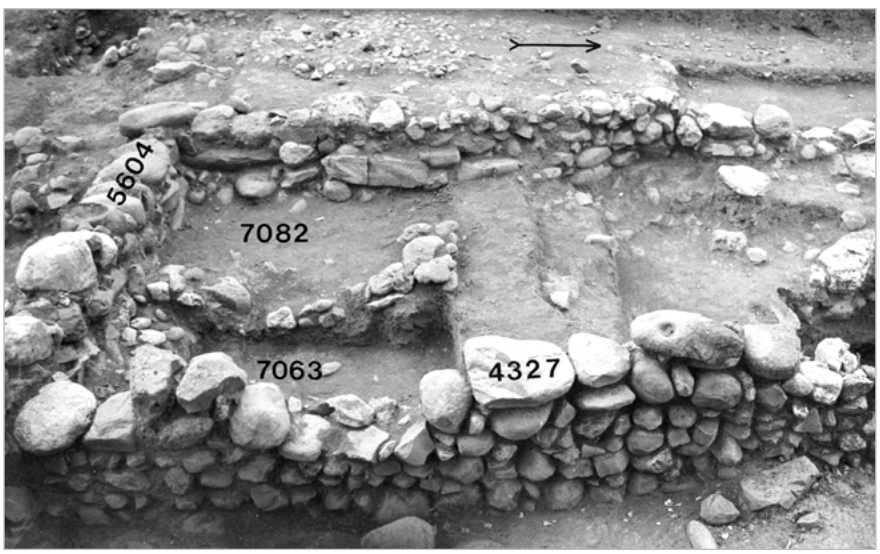

Fig. 2.27. Area B-west, looking west: Sanctuary 7052b and cella L7082b.

Fig. 2.28. Area B-west: excavating the assemblage from L7082b

silo vessel in particular (Figs. 15.1; 3.55). Evocative natural stones—geodes—were also part of the assemblage (Fig. 7:16).

2. These objects were found in a corner chamber of a type known from ritual structures in the Aegean and Cyprus (see Chapter 16). Benches lined the walls, a feature also characteristic of ritual structures (Mazar 1992).
3. Structure 7052b seems to be a single, self-contained unit, surrounded by open-air metal workshops. But the structure itself contains no vestiges of metallurgy. This configuration is paralleled in contemporaneous sanctuaries at Kition and Enkomi in Cyprus (e.g. Karageorghis 1973, 1976).
4. A large stone platform—L561, possibly an altar—existed at the northern end of the structure.
5. The building is located near the old Bronze Age gateway, defunct by this time, which must have continued to serve as a thoroughfare, a logical place for the locus of ritual activity.

I am interpreting this structure as a temple. Analysis and parallels are carried further in Chapter 16. I have attributed Structure 7052b to Phases B9-10 but the upper portions may belong to Phase B8 and the lower wall segments may be those that should be assigned to Phases B9-10. It is also worth noting that the complete vessels were preserved in the southern part of the building; the rest of it was truncated by later leveling (for the Iron Age II road leading into the town from the upper city gate; Biran 1994: 250-253).

Metallurgy[12]

As in Phase B11, evidence for metallurgy was present in almost all the rooms and courtyards of the area—ceramic bellow pots, crucibles, blowpipe nozzles, slag, bronze nodules, fragmentary metal objects and basalt pounders (below). In the higher, southern part of Area B-west (Squares U, A-B/14-16) metallurgy was clearly a dominant activity at the time of destruction. This is also the best preserved and best excavated phase of the metal workshops. Clear signs of metallurgy, however, were also found in other loci down-slope, further north: a furnace containing a complete crucible in L1204 (Fig. 2.31), large quantities of crucible, bellow pot, blowpipe nozzle and slag fragments in L607, and somewhat smaller numbers of the same types in Loci 593, 690, and 698 (see Tables 3.11-3.12).

12 This is a summary report of the metallurgy contexts. Ben-Dov, who excavated these contexts, has analyzed this material and recently published much of it (Ben-Dov 2018)..

Fig. 2.29. Area B-west, Square A15, looking north: Phase B9-10 L7063, W4327 (bottom) and W5604 (right). Note the bench along W5827, the jugs and storage jar along W5828 (cf. Fig. 3.53:3-6), and the blocked-up doorway of W4327 (Phase B8).

Fig. 2.30. Area B-west: finds from L7063.

Structure 7052b was surrounded by what appear to be outdoor workshops (Loci 7061, 7131 and 7065), though they may have had roofs or awnings. A number of installations were found in these workshops and identified as furnaces. Generally these are only sketchy outlines, but, in contrast to the Phase B11 remains, a few are well enough preserved to describe them in some detail (Plan 3 and Figs. 2.32-2.37). They are rings approximately 60-70 cm. in diameter with foundations constructed of smallish fieldstones and broken basalt grinding querns. The interior lining is of clay and plaster that have become hardened by calcination. Pottery sherds, mainly of cooking pots with preferred pyrotechnical properties, were used as an additional lining around the outer circumference, perhaps as an insulating factor. No furnaces were found with the upper sections intact, but in Furnace L7068a coarse, clay, *tabun*-like fragments with smooth curved walls covered the installation. This suggests a dome-shaped clay roof. The upper portions were probably dismantled after each firing

Fig. 2.31. Square A/B20, looking north: foundations of a metallurgy installation in L1204 (Stratum VB) next to W4353, containing a crucible.

Fig. 2.32. Area B-west, Square A15, looking east: Furnaces 7068a and 7068b of Phase B9 or B10 up against W5604. Note the broken grinding slabs used as construction material for 7068b.

Fig. 2.33. Area B-west, Square A15, looking east: Furnace 7068a. A blowpipe nozzle lies *in situ* in the wall to right and remains of the pottery lining lie in the center.

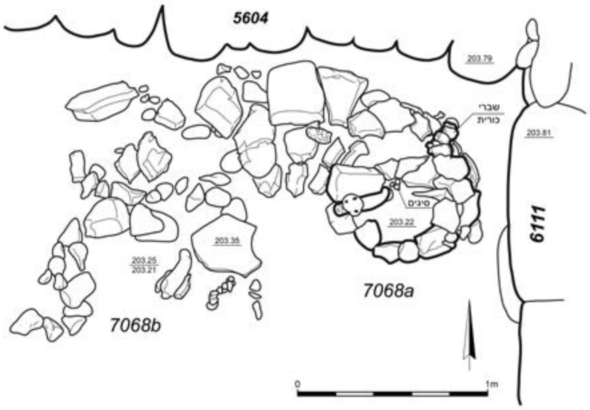

Fig. 2.34. Area B-west, Square A15, Furnaces 7068a and 7068b of Phase B9 or B10 up against W5604. Note the broken grinding slabs used as construction material for 7068b.

cycle to extract the crucibles containing the molten metal, which was then to be poured into molds.[13] Inside Furnace L7068a, at its sunken base, pebbles of quartz and hematite, slags, and fragments of green-colored animal bone were recovered (the bone was possibly used as flux). Crucible fragments and a blowpipe nozzle were found integrated into the furnace wall.

Being the best preserved example (Figs. 2.32-2.34), Furnace 7068a may have also been the last, or one of the last, used, prior to the settlement-wide destruction of Stratum V. Adjacent Furnace 7068b may have been used shortly before. Elsewhere, the industrial remains are poorly preserved and more scattered, allowing us to infer, that in this phase at least, in any given compound only one furnace was being operated at a time. It would then be partially dismantled to extract the crucible. The next time a furnace was required, one was constructed anew, often in a different location. As in the previous phase, the furnaces were associated with crucibles, blowpipe nozzles (tuyeres), slags, and broken and dulled fragments of bronze tools and weapons.

Large numbers of ground basalt objects — mainly loaf shaped, one-handed grinders, pestles and cuboid pounders — were found in association with the metal workshop (Fig. 2.30). These are discussed below in Chapter 7.

Animal bones, mostly fractured, were found throughout the area. Many of those in and around the furnaces were stained a green color, suggesting contact with cupreous minerals. In this context it is suggested that they served either as a fluxing agent, furnace lining or as a combustible material.

Quantities of flint were recovered throughout this area in particular. These include tools (almost all denticulated sickle blades), blade blanks, flakes and some debitage. One large group was stored as a cache in L7117, under Phase B8 W5801 (Fig. 9.9). This implies that there was a sickle-making workshop here. The nature of the flint assemblage and the L7117 cache are discussed in more detail below in Chapter 9.

Masseboth

One of the striking features of the Stratum V architecture is the presence of upright stone slabs in L132 and L343 that have no discernable physical function (Figs. 2.38-2.41, 2.64). These may be termed stelae, baetyls, or *masseboth*. Like the *masseboth* of later strata (e.g. Biran 1996: Figs. 5-6) these appear to have been stood up against standing walls. One is a single *massebah* and the other instance is a duo. The single *massebah* is set up against W133a, (exactly over W133b [Plan 2] of Phase B11) and associated with a floor (L132) bearing several complete vessels (Fig. 3.40:1-3). Though the *massebah* is clearly an attention-focusing device, nothing in the assemblage pointed ostensibly to cultic behavior—there was no iconic material, no vessel arrangements or other special objects. Stratigraphically, the initial placement of the upper duo of stelae in L343 could be attributed to several phases. The Iron Age I floors from this room had eroded away save for the pavement that remains flush against W188. But it seems

13 Alternately, an ingot could have been formed at the bottom of the furnace, without the use of a crucible (cf. Tylecote, Lupu and Rothenberg 1967). But no clear evidence for ingot production has asserted itself.

Fig. 2.35. Area B-west, Square U15, looking west: Furnace 7126 (Phase B9-10). Note the calcined clay and plaster walls and the blowpipe nozzle imprint.

Fig. 2.36. Area B-west, Square A, B15, looking northeast: L7067 and W5603 in background (both Phase B9-10). Note the complete crucible and pottery fragments—probably furnace lining.

Fig. 2.37. Square B19, looking south: crucible and ash pit in Phase B9, Stratum VA L591.

Fig. 2.38. Area B-east, looking south. The *massebah* of L132 is at center with W130 to its right. Further right and running parallel to the right edge of the photo is W131. W130 tilts west and a balk was left to support it. Note the black destruction debris of Stratum V in this balk.

Fig. 2.39. Area B-east, looking east. Stratum VIIB Tomb 387 is center top. Note the *massebah* (bottom center) up against W133a (Stratum V).

Fig. 2.40. Looking east: Square F16, pavement of L343 (Stratum V?), W129 (top), W188 (right), and the *massebah* set up against W188. The second *massebah* is tilted forward, just in front of the surveyors rod.

Fig. 2.41. Looking south and down: L343, *masseboth,* and collared rim pithos that originally stood in the corner between the large *massebah* and W130 as it fell.

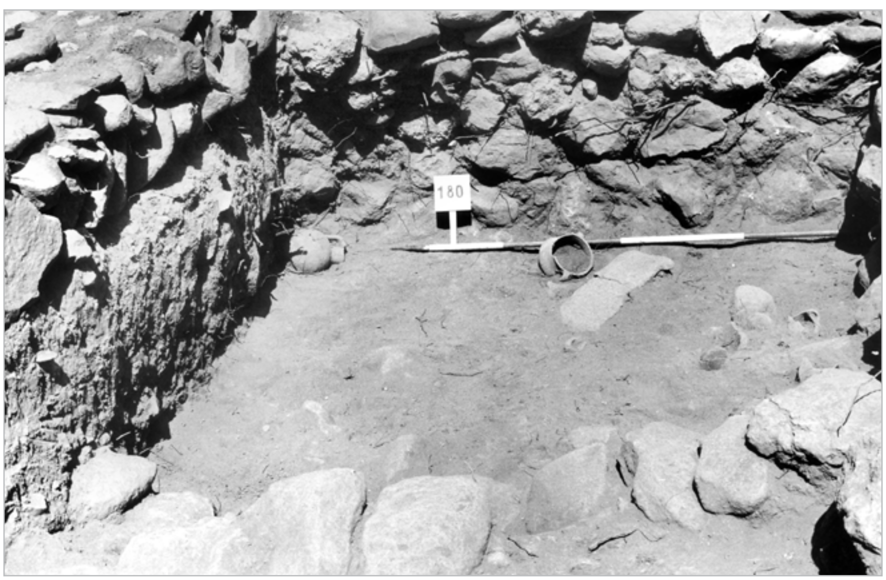

Fig. 2.42. Area B-east, looking south: Floor L326 (Phase B8, Stratum V) with *in situ* vessels in the destruction layer (see Fig. 3.43:3-9). W170 is at back (top). Note pavement remains in foreground.

that they should be associated with Phase B9 based on: (a) the parallel *massebah* of L132, (b) the remnant pavement in the southeast corner of the locus which envelopes them in part, and (c) on the collared-rim pithos that had stood next to it in the southwest corner of the room (Fig. 2.41). The pair may have been in use over more than one phase. A further element of doubt is raised by the double-row construction of W188, a feature that usually appears in Phase B8 (Stratum IVB) and after. It is quite possible the slabs used for the *masseboth* originated in the roof of Stratum VII Tomb 387 ("the Myceanaen Tomb", Ben-Dov 2002). Further discussion can be found in Chapter 16.

Destruction

Phase B9 was obliterated in a massive conflagration that entrapped a great quantity of *in situ* living floor material, as can be seen in many of the photographs and sections. The burnt layer is generally *ca.* 40-70 cm. thick and comprised of stone and brick wall collapse and wattle and daub roof fragments which apparently supplied much of the fuel for the conflagration. The end of Phase B10 also seems due to destruction, though not so thick. The upper conflagration at least is the same destruction found in the contemporaneous phases of all the other areas. No human remains or signs of armed conflict were identified. Obviously, the inhabitants of this neighborhood were out of their homes when the fire swept through.

Phase B8—Stratum IVB (Plan 4)

In this phase new floors were placed over the massive destruction layer of Phase B9, leaving much of the debris *in situ*, though some of it must have been removed to prepare level surfaces. There are some loci where the differentiation between Phases B8 and B7 is problematic, due to the reuse of structures and the similarity of material culture, when certain key features are lacking. This issue will be addressed by Y. Thareani in her forthcoming report on the Iron II material from Area B.

Layout

In Area B-west, two clear blocks of building can still be discerned, separated by east-west street Loci 665-561-570S-571E. In Area B-east, a north-south row of rooms L4185, L116 and L7203 separated the architecture into east and west units. As we noted in the description of the previous phase, this may originally have been a north-south alley, but was by now blocked off and co-opted into the surrounding buildings. The poor preservation and lack of documentation from this area makes it difficult to determine whether there is an east-west division here as well.

One visible trend was the subdividing of spaces with new walls, e.g. W4348, W4377 and the eastern part of W4372, east of W4332. The point of contact between underlying Phase B9 walls with Phase B8 is often discernible. North of the east-west street, in Squares A–C/17-19 and A/16, some of the Phase B9 walls were reused (W4305, W4326), but others not (e.g. W4346). Overall, there is a tendency to subdivide the larger spaces of the previous phase and for individual rooms (e.g. L571 and L584) to have one doorway leading out to the alley. This last is a development not seen in previous phases.

Streets

Street Loci 665-561-570S-571E was composed of a mixture of soil, bricky debris, weathered potsherds and small pebbles. In its L561 section, it ran over the huge stones of the old stone platform (altar?), which served as a pavement by this stage. In the westernmost part of the street's exposure, three surfaces were determined—possibly attempts to maintain a level, passable surface. At the eastern end of the its excavated portion the street opens out into a court or porch of sorts (L542c). It is logical to suggest that the street made a junction with north-south street L116, but this is not demonstrated.

Construction

The building technique is still mainly that of the previous phase—single courses of basalt fieldstones. However, walls constructed of double rows of smaller stones begin to make an appearance (e.g. W4005, 4377, W5602), though it is possible that these have been misattributed and belong to the next phase up. Conversely, one of these walls, W188 (Plan 3), has been assigned to Phase B9; it may be that it was reused and rebuilt in Phase B8 as well.

The technique of leaving gaps where walls abut other walls at right angles, and filling in the gap with a mudbrick completion, (observed already in Phases B9-10), was observed in this phase as well (W4332 where it abuts W4372 and W4344 where it abuts W4375).

Only one building displayed what were obvious column bases; the core room of the metallurgy area in Squares U–A/15-16. In fact, this is the only place, and the only phase, in which stone column bases (surely for wooden columns) are clearly in evidence (in line with W6108). The underlying W4327 (Plan 3) served as their foundation. The addition of the columns changed the nature of the structure; it was no longer enclosed as it had been in the previous level. One would expect that other columned buildings must have existed at Tel Dan, perhaps not discerned. Wooden posts may have rested on disused grinding querns or on agglomerations of smaller stones. As in the previous phase, it is hard to know whether the larger bounded spaces (e.g. Loci 571, 547/595) are courtyards or closed, roofed spaces.

Floors

Fragmentary stone slab pavements are not uncommon (Loci 427, 542c, 584, 595, 678, 686, 4704 and 7015; see for example Fig. 2.53), but tamped earth floors were more common.

Doorways

Doorways are sometimes a question mark; in several rooms none were observed. In the case of smaller rooms it is conceivable that they were basements or storage facilities accessed only from above, by ladder or from the roof (e.g. L605). Perhaps some were silos, taking the place of subfloor and pithos storage from the previous level. In at least one case though, a two-room unit (Loci 563/, L594/674 in Squares A/17-19) was excavated in which no doorway leading out of the room was found from this phase, only from the previous one. Possibly it is a large basement, or something was missed in excavation—perhaps a well disguised blockage from a subsequent level (see Fig. 2.17 in which a possible doorway is seen in W4316). Elsewhere, not all walls of rooms were excavated and the missing door may have been located in the unexcavated wall(s). Of the doorways that were discerned, a new feature appears in this phase: their location in the center of a wall rather than at its end—e.g. in W4342. This phenomenon was almost unheard of in the previous stratum.

Room and Courtyard Contents

A number of loci (129, 161, 179, 210, 423, 547, 574, 601, 605, 7015, 7062) preserved good ceramic assemblages from floors (Figs. 2.52-2.55; 3.58-3.73). As noted above, this stratum is much better preserved in Area B-west that in Area B-east. Higher up the slope, living floor remains are mainly preserved against the southern faces of east-west walls, i.e. those running parallel to the slope (e.g. Loci 129, 161, 7015, 7062). Material accumulated in this zone and was left intact despite the construction of new surfaces in subsequent phases.A total of 101 complete vessels were recovered from Phase B8.

In situ pithoi are less common in this phase and only as single vessels (see Plan 4). All the *in situ* pithoi are of the Wavy-Band type: L574, L663 (Fig. 2.44), L678 (Fig. 3.70:6, the best example in this area). The collared-rim and Galilean pithoi are now preserved only as fragments and upside down, in secondary use, as installations (see Plan 4 and the typological discussion of pithoi in Chapter 3). This development in pithos use has chronological, social and economic implications (see discussion in Chapter 19).

Basalt grinding slabs, pounders, mortars and pestles are found in some of the spaces, but they are not as frequent as might be expected. Certain other types of finds that one might expect are conspicuous in their absence—loom weights and whorls for example; two loom weights were found on the floor of L547. Others may have gone undetected. But the lack of loom weights has either to do with the distribution of specialized activity areas (no weaving here), or the weaving technology did not require loom weights (see below p. 621).

Fig. 2.43. Square A19, looking north: mudplaster floor of Phase B8, Stratum IVB L574 with W4316 (bottom) and W4372 top.

Fig. 2.44. Square A-B18-19, looking northeast: material on the earthen floor of Phase B8, Stratum IVB L571/663.

Fig. 2.45. Square B18, looking west: jugs and jar fragment on tamped earth floor of Phase B8, Stratum IVB L571.

Fig. 2.46. Square B20 looking southwest: Pit 645; note the contrast between the darker, softer material of the pit (containing the pottery) and the harder, lighter colored surrounding matrix.

Fig. 2.47. Square C19, looking south: L605 of Phase B8, Stratum IVB. Note the large number of cooking pot pieces (Fig. 3.67) and the upper section of a Galilean pithos (Fig. 3.68:5) next to W4332 (right), apparently recycled as a stand, seat or shallow receptacle.

Fig. 2.48. Square A16, L582 (attributed to Phase B8, Stratum IVB but could be Phase B9-10) with Tabun ovens 580 and 581. Note the use of cooking pot fragments to line tabun walls.

Fig. 2.49. Square E19, looking east: Phase B8 tabun oven in L4185, between W6059 (bottom) and W6060 (top).

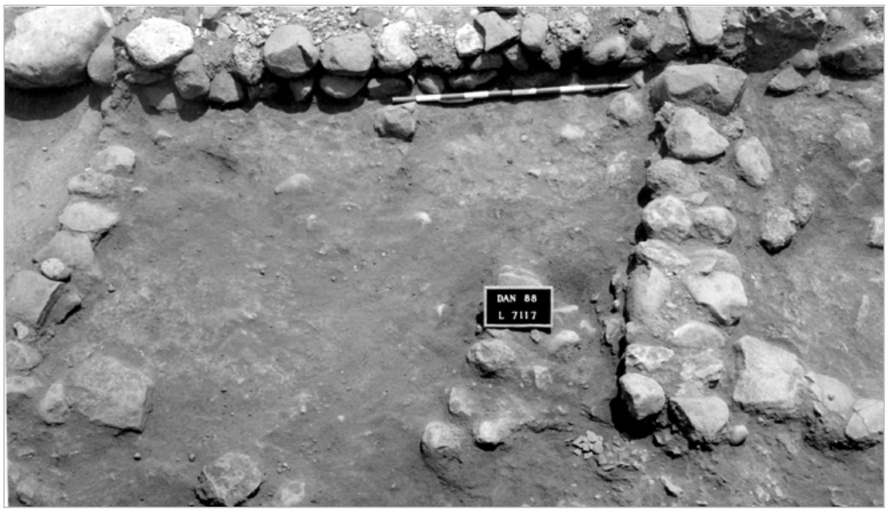

Fig. 2.50. Square U15-16, looking east: cell L7114a (Phase B8). The sign (which reads L7117) sits on W5817 of Phase B9 or B10. Note the cache of flint tools and blanks at the west end of W5801; it may have been deposited in Phase B8, B9 or B10.

Metallurgy

The area south of the east-west street, in Squares U, A–B/14-16, is of an architectural concept that differs from that of the building(s) north of the street. The central core structure was retained from the previous phase (now Loci 7082a and 7052a), but may have lost its previous ritual function. As described above, it appears to have become an open, columned structure.

In contrast to the former Phase B9–B10 array of a few circular metal furnaces surrounding the building, a number of small square cells were constructed to the west and to the south. These were defined by rather flimsy walls made of small stones (Fig. 2.50). Perhaps they contained metallurgy furnaces, since within them and alongside were found much ash, charcoal, fired clay fragments, metal slags and metal objects broken or worn to various degrees. But unlike the previous phases no clear furnaces could be reconstructed. The form of the cells however, resembles the metal furnace chambers of contemporaneous Deir ‘Alla Phase B (Franken 1969: Fig. 6).

Large Pit 7102 contained much ash, a crucible, blowpipe nozzle fragments, green tinted bone fragments and chunks of burnt clay furnace lining—probably of a dismantled furnace. Around this pit were paved surfaces (L7132), fragmentary stone contours of dismantled furnaces (L7015, L7099), and a number of crucibles, slags, basalt pounders, splintered animal bones, flint tools and

Fig. 2.51. Area B-west: objects from L7062, Phase B8, Stratum IVB (Figs. 3.72-3.73).

debitage, more fragments of metal tools and weapons and a number of pottery vessels, chalices and kraters being most frequent (Fig. 3.71).

Just east of this jumbled assemblage derived from metallurgy installations, in one of the small cells south of the central building, L7062, was a concentration of more metallurgy artifacts (crucibles, slags) and a further group of pottery vessels dominated by cooking pots and chalices, but also including a storejar and a perforated "incense bowl" goblet (Figs. 2:51; 3.72-3.73). As noted elsewhere, the cooking pot fragments were used as linings in pyrotechnic installations.

While the zones north and south of street Loci 561-570S-571E seem to differ in the nature of their plans, both contain extensive remains of metallurgical activity—especially crucible and blowpipe nozzle fragments—continuing the pattern of the previous phase. Certainly other activities were carried out here but it is clear that metallurgy was a dominant feature, perhaps even making the sector an industrial quarter. Area B-east, on the other hand, seems devoid of metallurgical finds.

Tabuns and Installations

Two inverse pithos installations were uncovered; one in L547 was the top of a broken Wavy-band pithos placed upside-down on a low platform of tamped earth in the room's northeast corner and the other was found in L605—in this case the inverse top of a Galilean pithos.

Only four *tabuns* have been identified in the entire area in this phase; two in Area B-east in L4185 and L7202, and two in Area B-west, in L582 next to the columns of Building 7052/7082a. Further, the stratigraphic position of the latter two is in doubt; they may belong to Phase B9–B10. It is striking then that *tabuns* are so totally lacking in at least the northern part of Area B-west. It is hard to imagine that they were all missed by the excavators. This may be another instance of activity area specialization.

Pits

Continuing the pattern observed for Phases B9–B10, very few pits were discerned in this phase as well (they are Pits 420, 645, 683, 7102); perhaps

Fig. 2.52. Square F17, looking northeast: concentration of broken pottery vessels in L161 up against W170 (see Fig. 3.61 for pottery drawings). Note the dark ash remains of a localized Stratum IVB conflagration.

Fig. 2.53. Area B-east, Square H16 looking west: the slab pavement of L427 between W4012 and W4009. Phase B8 (Stratum IVB).

no more than one per house. Pit 645 shows a stone lining, partially collapsed inward Pit 7102 was, as noted above, probably the remains of a sunken metallurgy installation.

Destruction

The destruction of Phase B8 is not always well preserved, but it clearly differs from the one that struck Phase B9. For one thing, burning is localized. A burnt level with a large assemblage of complete vessels was found in L129 and L161 for example (Figs. 2.52; 3.59-3.61), but elsewhere, evidence for conflagration is minimal or non-existent. In L423 and L427, and in several other places, the walls seemed to have collapsed en masse (Figs. 2.54-2.55) and an earthquake must be suspected.

Area B after the Iron Age I

The following Phase B7 (Stratum IVA, dated to the 10th-9th centuries BCE) is not the subject of this study. A few remarks are in order however, mainly to highlight contrasts and to explain the state of

Fig. 2.54. Looking southeast: Square H16, L423 of Phase B8 (Stratum IVB). Note the northward collapse of W4009.

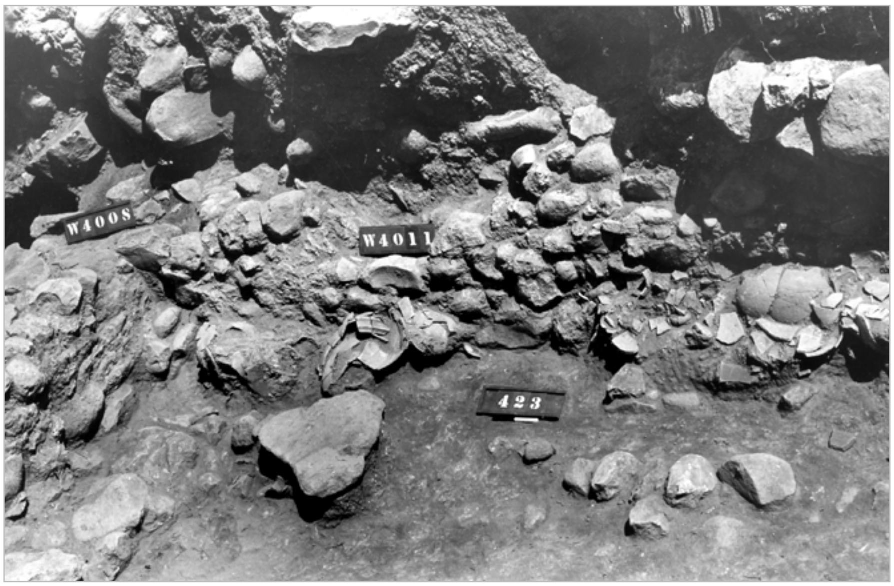

Fig. 2.55. Looking north, Square H16, L423 of Phase B8 (Stratum IVB). After removal of collapsed walls, vessels along the walls (e.g. Fig. 3.64:2).

preservation. While not well preserved, the plan retained much of the same orientation and, in places, the same architecture. As with contemporaneous levels elsewhere on the site, new walls were built solely with two rows of smaller stones, rather than one row of larger stones characteristic of the previous Iron Age I levels. It is also in this phase that Phoenician Black-on-Red pottery and Samaria Ware first appear.

One of the features responsible for the decimation of the Strata IVA and IVB remains in this area was the massive building, or set of buildings with alternating slab paved surfaces that have been attributed to Stratum II (Biran 1996: 21, 23), though I think they belong to Stratum III (Figs. 2.56-2.57). Only the foundations remain, but they look suspiciously like the tripartite stables and storehouses of contemporary levels at Hazor, Tel Hadar, Megiddo, Beer Sheva and so on.

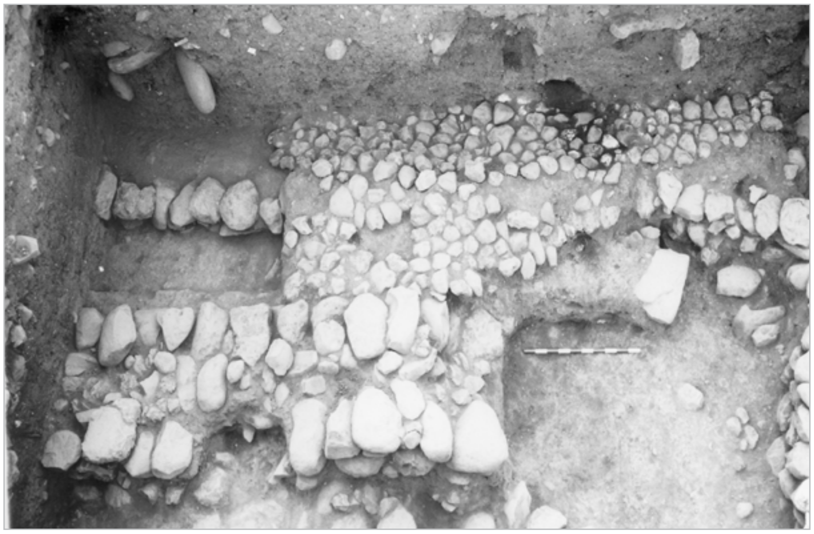

Fig. 2.56. Square A17-18, looking east: Cobble surface of L560 (Stratum III or IVA) and underlying W4315 (Stratum IVB).

Fig. 2.57. Square B17-18, looking west: pavement L595 and W4305 to right (Phase B8, Stratum IVB).

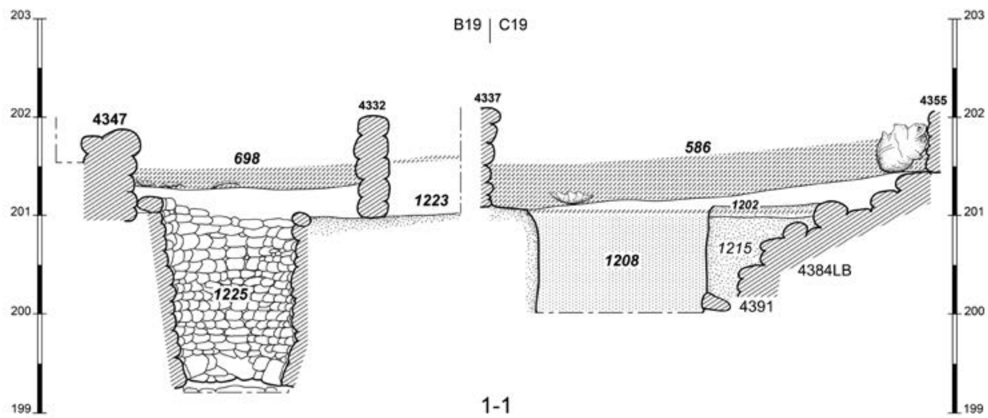

Fig. 2.58. Area B-west, Squares B-C19: balk section drawing showing Phases B9-B12, view to north (1-1).

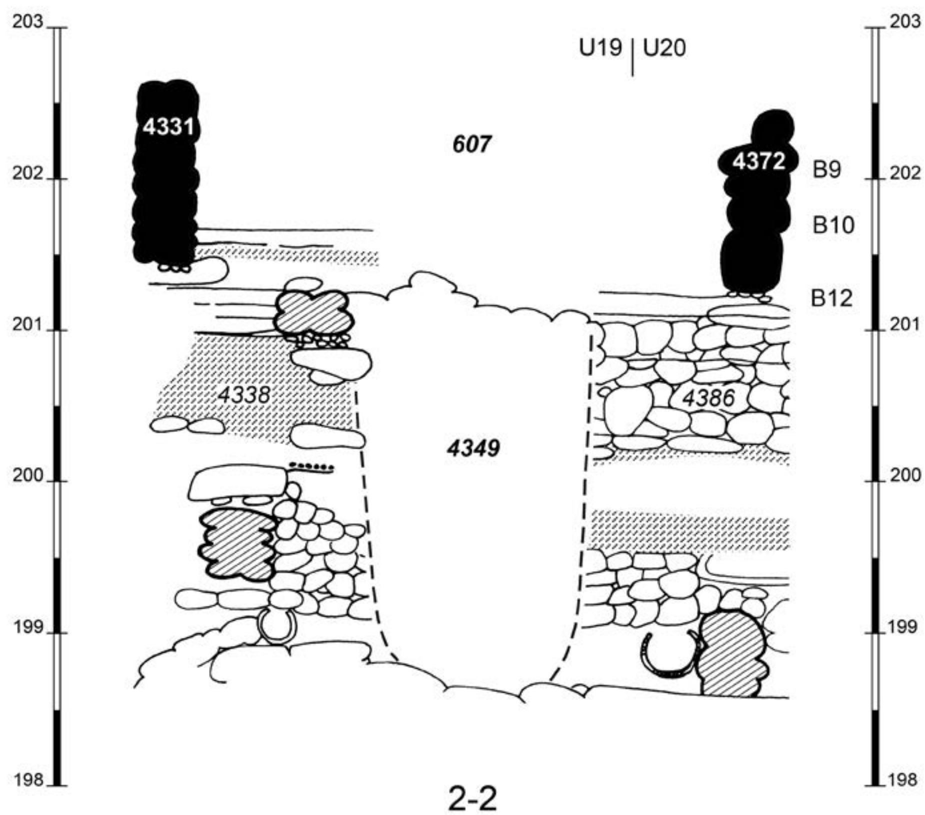

Fig. 2.59. Area B-west Squares A19-20, section drawing, view to west (2-2).

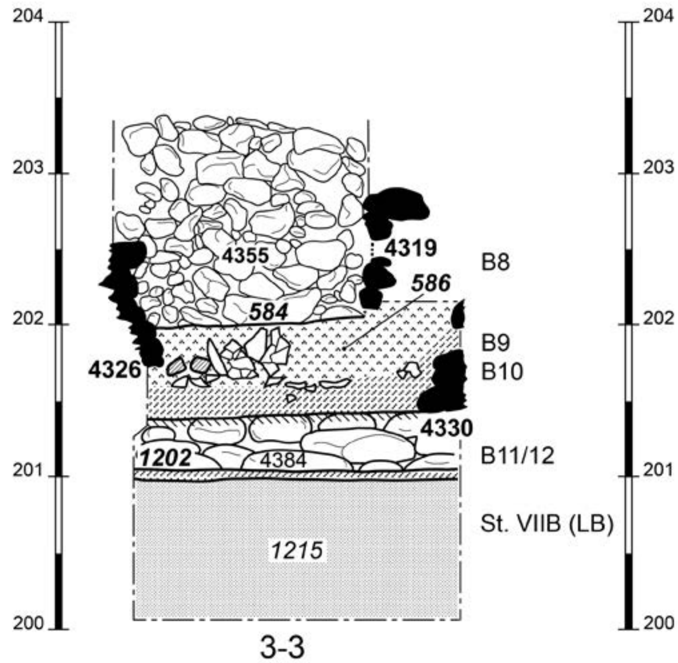

Fig. 2.60. Area B-west, Square C19: section drawing of east balk (3-3).

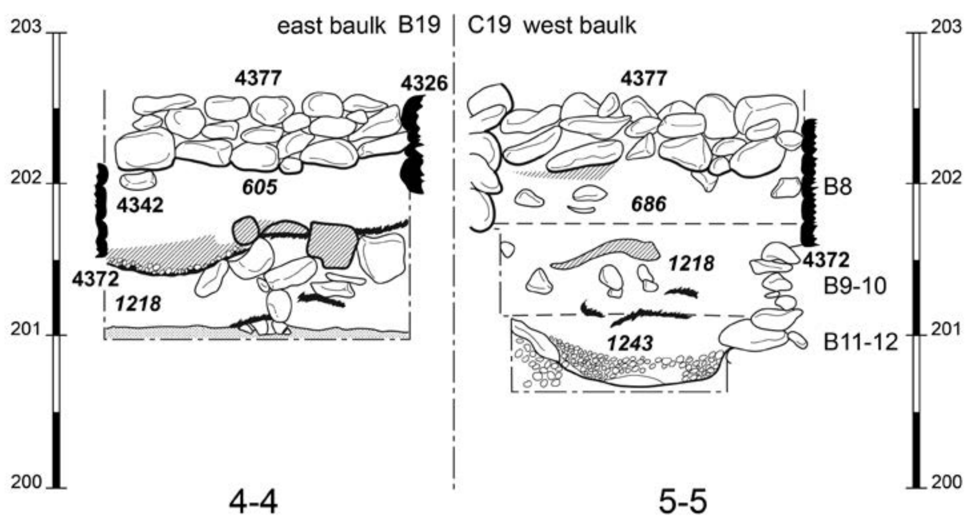

Fig. 2.61. Area B-west, section drawings of Squares B19 (east balk, 4-4) and C19: (west balk, 5-5).

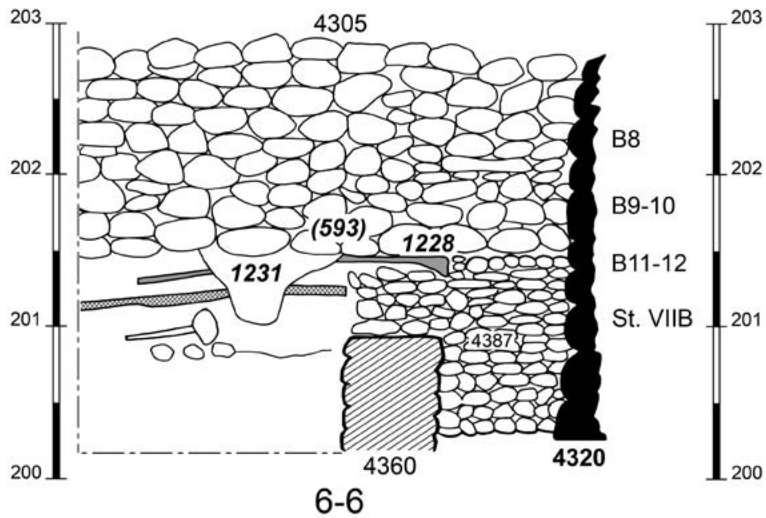

Fig. 2.62. Area B-west, Square C18: section drawing of balk under W4305, looking south (6-6).

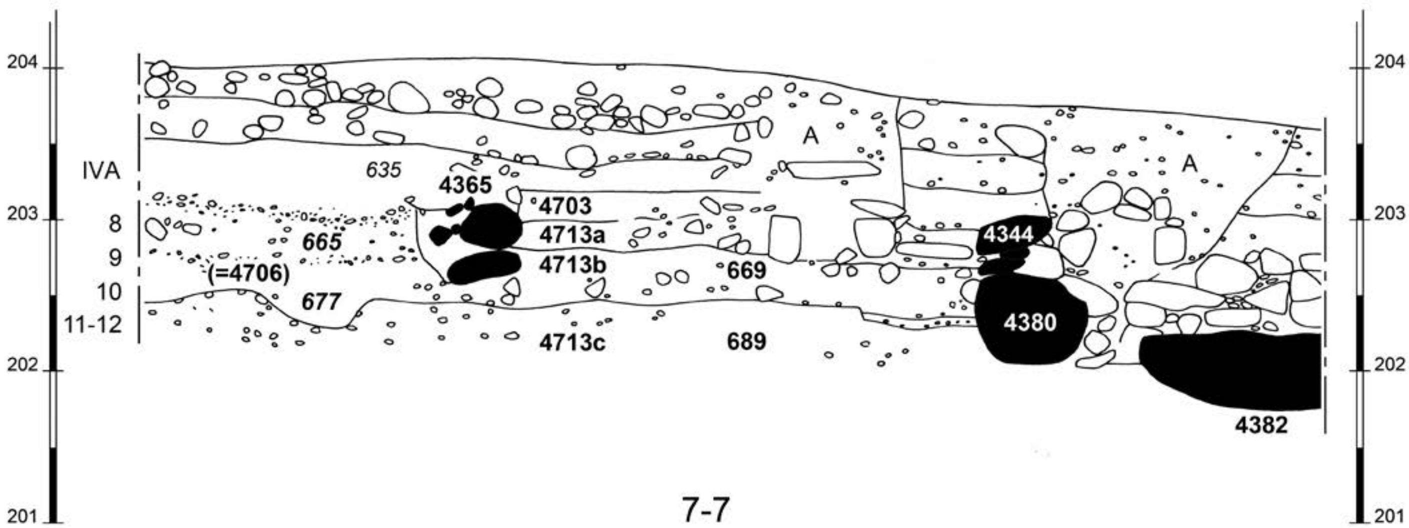

Fig. 2.63. Area B-west, Squares U17-19: west balk section (7-7).

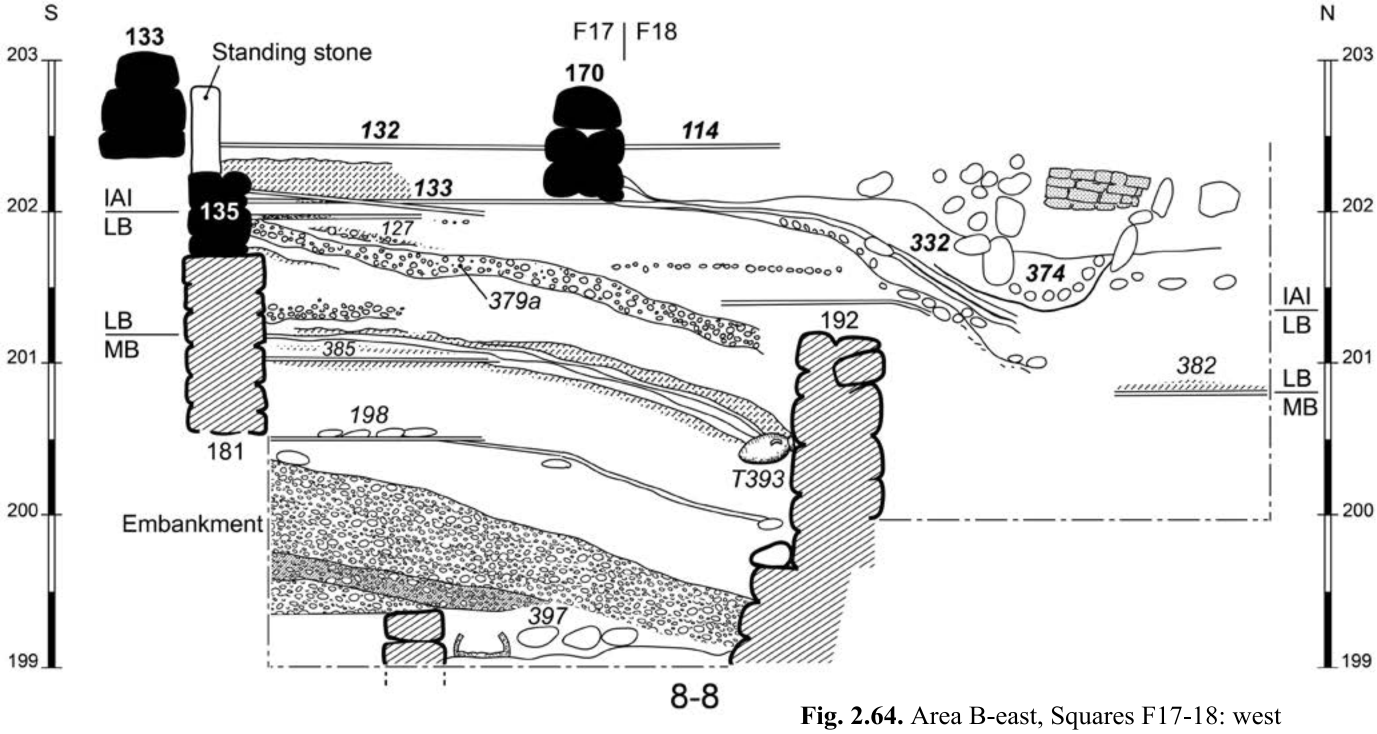

Fig. 2.64. Area B-east, Squares F17-18: west balk section drawing showing Stratum V and below (8-8).

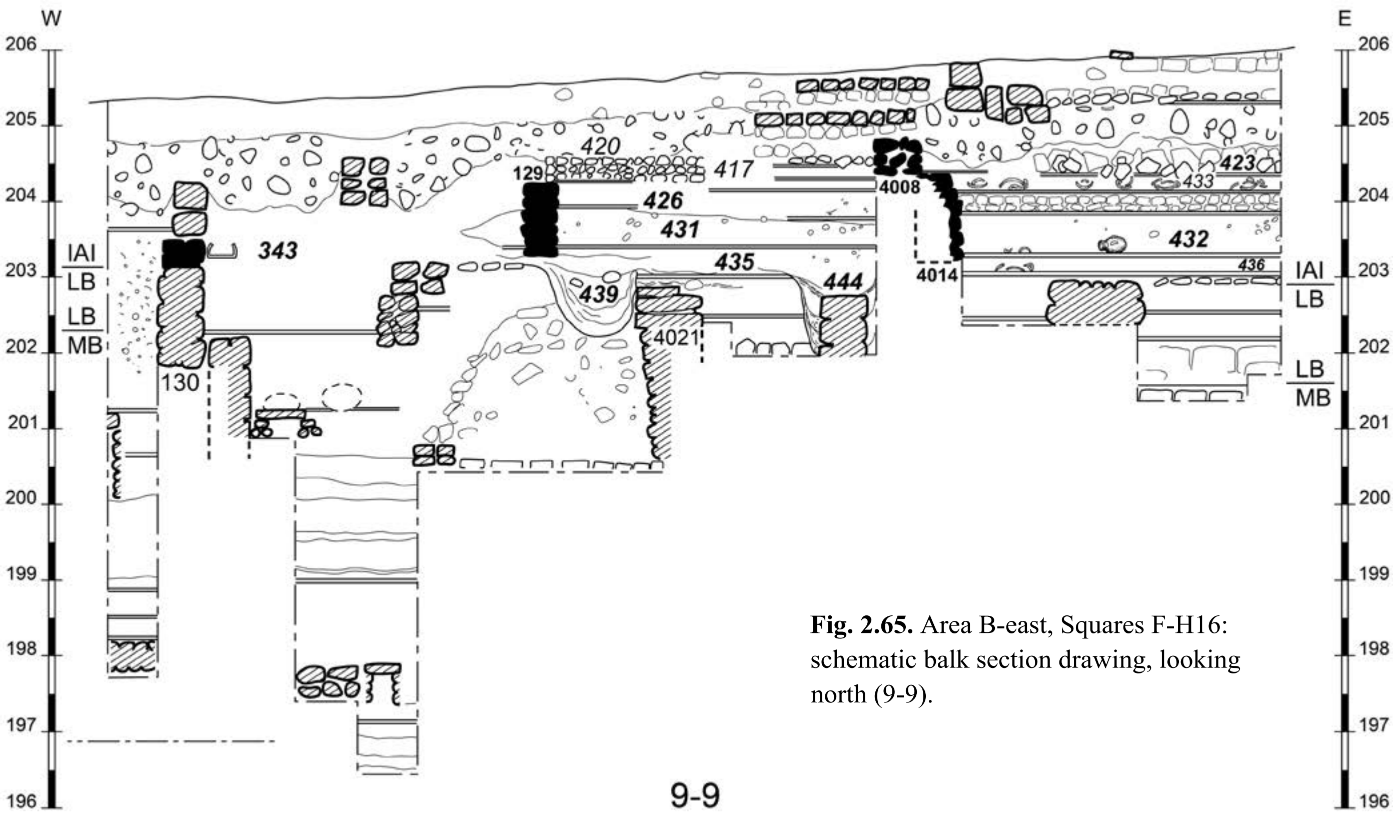

Fig. 2.65. Area B-east, Squares F-H16: schematic balk section drawing, looking north (9-9).

Fig. 2.66. Area B-east, looking north: the north balk of Square H16. The bottommost tag marks the floor of L436 (Phase 6=Stratum VIIA), the next one up the floor of L432, W4018 (right center) and the destruction debris above (all Phase B10 = Stratum VB). The third tag up represents the surface of L 424 (Phase B9 = Stratum VA, not in plan). The fourth tag up is L423/433 of Phase B8, Startum IVB.

Area M

As the reader will divine from the photographs, the Iron Age I levels of Area M were also encountered in deep probes, between balks left under the architecture of higher levels. The area was first tested in 1971, when 44 m^2 were opened up (Biran 1996: 30). Between 1981 and 1985 this area was expanded. The exposure of the Iron Age I remains eventually totaled *ca.* 70 m^2 in aerial extent—similar to the Iron Age I exposures of Areas T and Y (see below). The Area M remains also suffer from an added difficulty: the stratigraphic sequence previous to the Stratum II (Iron Age IIB) pavement was disjointed or tilted by a natural disturbance—perhaps an earthquake, or a karstic sinkhole (Figs. 2.67, 2.75). Since this phenomenon was only detected after excavation was executed in horizontal layers, mixing of true layers occurs in the baskets. We have attempted to rectify this problem by realigning baskets according to the elevations of the slope.

Phase M10 (and M11?)—Stratum VI (and VIIA1?), (Fig. 2.72)

This phase is comprised almost solely of pits, 11 in number: three larger stone-lined ones (8185a, 8087, 8235), one smaller stone-lined example (8115) and seven unlined pits (488, 489, 8098, 8104, 8195, 8224b, 8225). These occurred in agglomerations and penetrated the Phase M11 material below. They were covered by the white plaster floors of Phase M9c at *ca.* 197.45.

Pit 8087 was much larger and contained more restorable pottery. The smaller appended Pit 8115 contained soil, rocks and settlement debris, but very little pottery or bones. Pit 8104 was unlined and quite shallow (40 cm.). It was discerned by its fine, dark, ashy material—perhaps it was a cooking pit. Pit 8185a (Fig. 2.70) seems to have happened upon a rectangular Middle Bronze Age tomb (T8185b, Fig. 2.76, Ilan 1996: 200-201) during its construction.

Fig. 2.67. Area M, looking south at the south balk; at center is L8178 (Phase M10-11) bordered on the right (west) by W4609 (Phase 9a-b). Note the west-to-east slope in the upper part of the balk.

Fig. 2.68. Area M, Squares E-F13, looking north; at bottom is Stratum VIII W4621 and a Stratum VII tabun (L8110, in baulk). Above this stratum lie the single-course-wide Walls 4615 (parallel to bottom), 4609 (parallel to right side) and 4657 (parallel to top) of Phase M9, (Stratum V).

Fig. 2.69. Area M, looking west; W4609 (upper center from left to right), slab pavement L491 (Phase M9b-c) and cobble floor L493 (Phase M10-11). Note the ashy deposits at lower left—remains of a hearth.

Fig. 2.70. Area M, looking west; Phase M10 (Stratum VI) Pit 8185a (center). Phase M9 W4609 was constructed directly over it; a fragment of Bin 8181, originally appending W4609, can be seen in the balk just above the pit, still appending W4615.

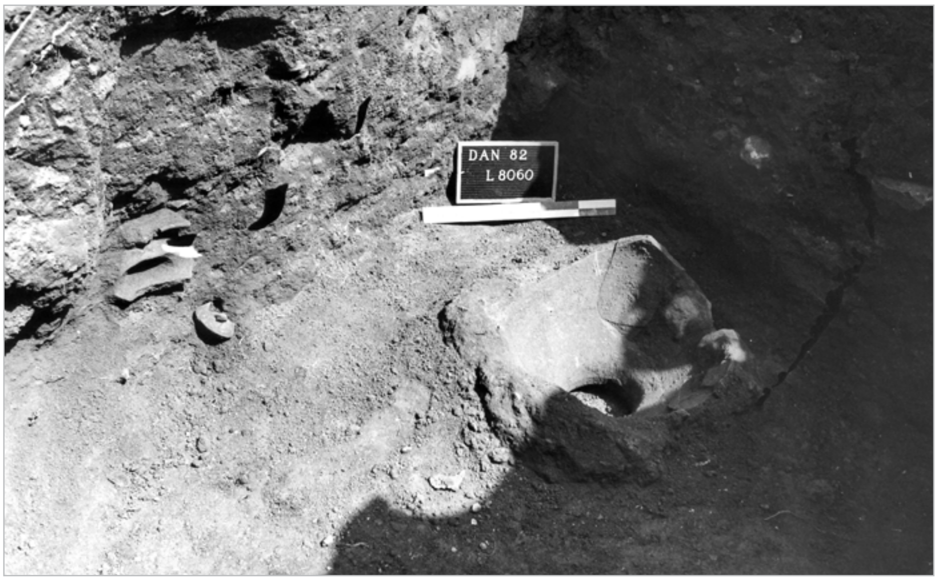

Fig. 2.71. Area M, Square E13, looking northwest: L8060 with the upper section of a broken collared rim pithos placed upside down and used as an installation. Note the pyxis off to the left (Fig. 3.76:7).

This resulted in a deeper-than-usual pit (2.25 m.), an anomalous rectangular shape and an opening that narrows toward the top rather than the usual simple cylindrical shape (Ilan 1996: Figs. 4.54-4.56 and here: Figs. 2.70, 2.76). This pit also contained large parts of a number of vessels, though none were intact or complete. Joins were found between pottery in this pit and L8070 of Phase M9c (see below). As with the joins detected in other areas these finds should probably be explained as destruction debris (of Phase M10) thrown into empty grain pits, while scattered sherds remained in the higher levels to be incorporated into the make-up of the Phase M9 occupation.

Another small pit (488) was cut down alongside existing W4657b, whether that wall belonged to Phase M11, Phase M10 or both. One further pit, 8235, was found in Square D/12. It contained debris similar to the others.

A few tamped earth surfaces were ascertained that may go with these pits, e.g. Loci 8178 (Fig. 2.69), 8180a, 8224a, but their exact relation to the pits could not be determined. Indicative sherds of both Iron Age I and the Late Bronze Age were found on them, though the Iron Age I items were preserved as larger sherds—almost always cooking pots. It is possible that these belong to Stratum VIIA1—what should be designated Phase M11, similar to the stratigraphy in Areas B, T and Y. Certainly the material from L480 gives this impression.A total of six complete vessels were recovered from Phase M10-11 contexts.

Phase M9—Stratum V-IVB (Figs. 2.73-2.74)

This, the most substantial IAI phase in Area M, is a portion of a rather large building whose plan is only partly known due to the limited area of excavation. Three sub-phases were discerned, represented by the raising of floors, reuse, cancellation or new construction of walls and other changes. Only one wall, W4609, was in use through all three phases. As is the case in the contemporaneous levels of the other areas, the walls in this phase are all a single course thick of mostly basalt fieldstones (Fig. 2.68).[14]

Phase M9c (Stratum Vb)

Many of the building's walls were constructed at this time. In this first sub-phase a number of "rooms" or spaces can be identified. Two or more walls are probably hidden in the balks between the squares of Rows 13 and 14. Floors abutting the walls were found in all the excavated squares at similar elevations. In several places these floors are surmounted by those of Phase M9b.

L491 seems to be an open court since it has no cross-walls (in later sub-phases as well) and was paved with flagstones in its eastern part (Fig. 2.69). In the corner formed by walls W4615 and W4609 a bin was constructed (L8181, Fig. 2.70) of smaller fieldstones directly over pit L8185a (Fig. 2.72) of Phase M10.

The best pottery assemblage was found in L8060 (Fig. 3.76). The upper section of an upturned pithos had been placed in the center of the room (Fig. 2.71) and used as an installation of the sort described in Areas B (above) and Y (below). These floors were covered by *ca.* one half meter of destruction/conflagration debris. But this was neither the only nor the last destruction of Phase M9. A total of 11 complete vessels were recovered from Phases M9b-c.

Phase M9b (Stratum Va)

This is a less substantial phase characterized by the raising of surfaces in all spaces except for what we are calling the courtyard (L491). A pebble surface or make-up was found in L8059 between walls W4609 and W4514a, which was truncated in the southern part of the room. Wall 4514a was constructed in this sub-phase; its lower section was preserved two courses high and its upper portion, mainly brick, had collapsed onto the surface of L8059 together with another layer of destruction debris. Wall 4657a was built directly on the stub of its predecessor W4657b, but slightly off-kilter. At the west end of the exposure in L8175b, a stone-built installation (another bin or trough?) was constructed. The other loci shown on Fig. 2.73 are less observable floors than living surfaces determined by horizons of pottery, among which the "anchor" seal was found (L8051; see Fig. 13.1). In L486 of the previous phase, no new floor was detected.

Phase M9a (Stratum IVB)

This phase (Fig. 2.74) is somewhat better preserved than the underlying phase. Wall 4080 was built over W4083 and W4657a of the previous phase (W4080 also continued into Phase M8). A new wall was constructed directly over W4609-W4082. West of W4082, W4513 was rebuilt.

The surfaces of this phase are of white lime plaster, patchy in places but readily discernible in the balk sections and picked out in most of the rooms (Figs. 2.75-2.79); in places (Loci 8020, 8175a) it was 6-7 cm. thick. A tamped earth floor (L8174) was placed over the debris of the suggested courtyard, over the paved section. A small pit containing ash was found next to W4082. This sub-phase too, appears to have been terminated by conflagration. Four complete vessels were found in this phase.

14 Many of the walls in the plan from Phase M9b-c (Fig. 2.73) lack stone-by-stone resolution because the stones were covered by the walls from later Phase M9a (Stratum IVB).

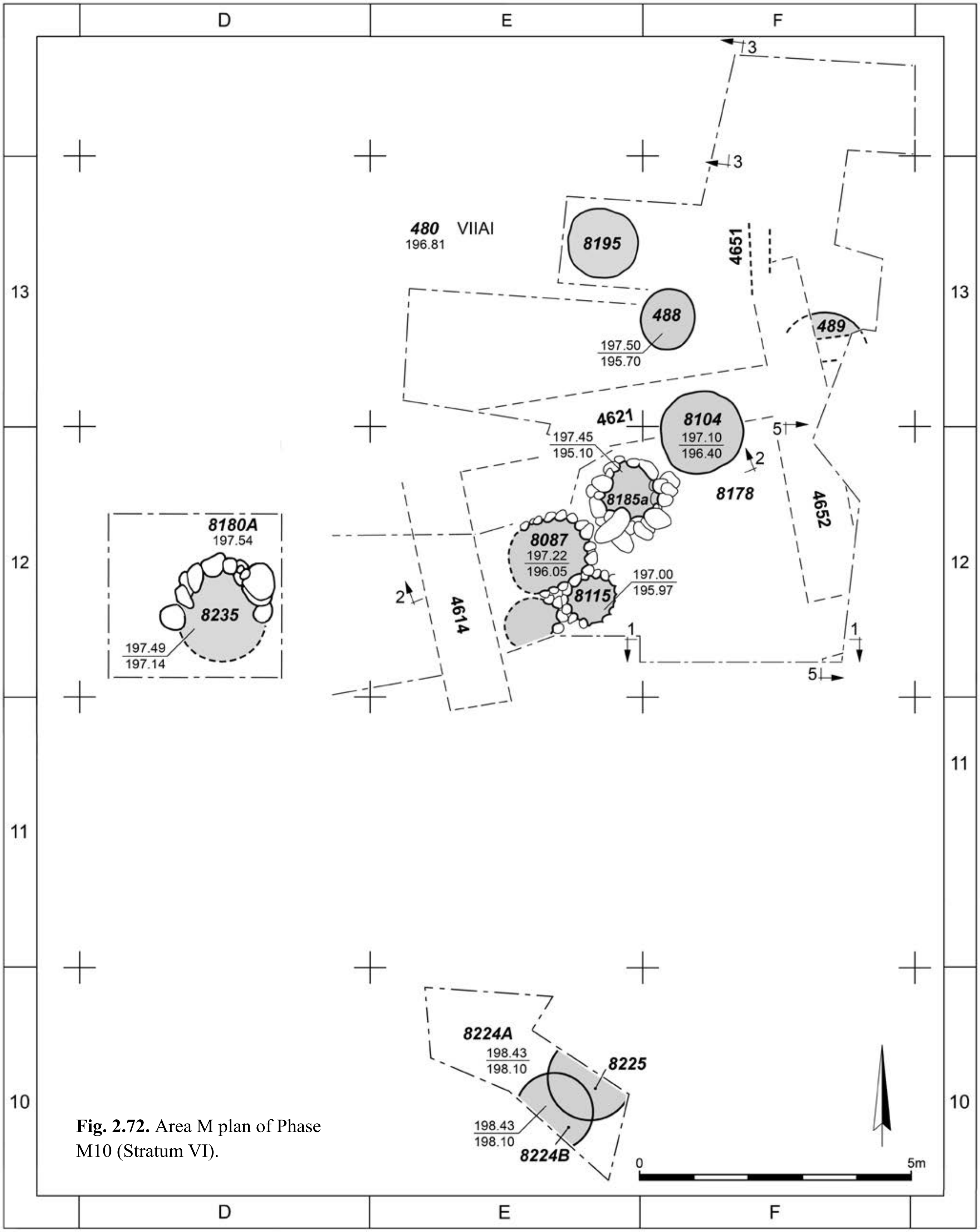

Fig. 2.72. Area M plan of Phase M10 (Stratum VI).

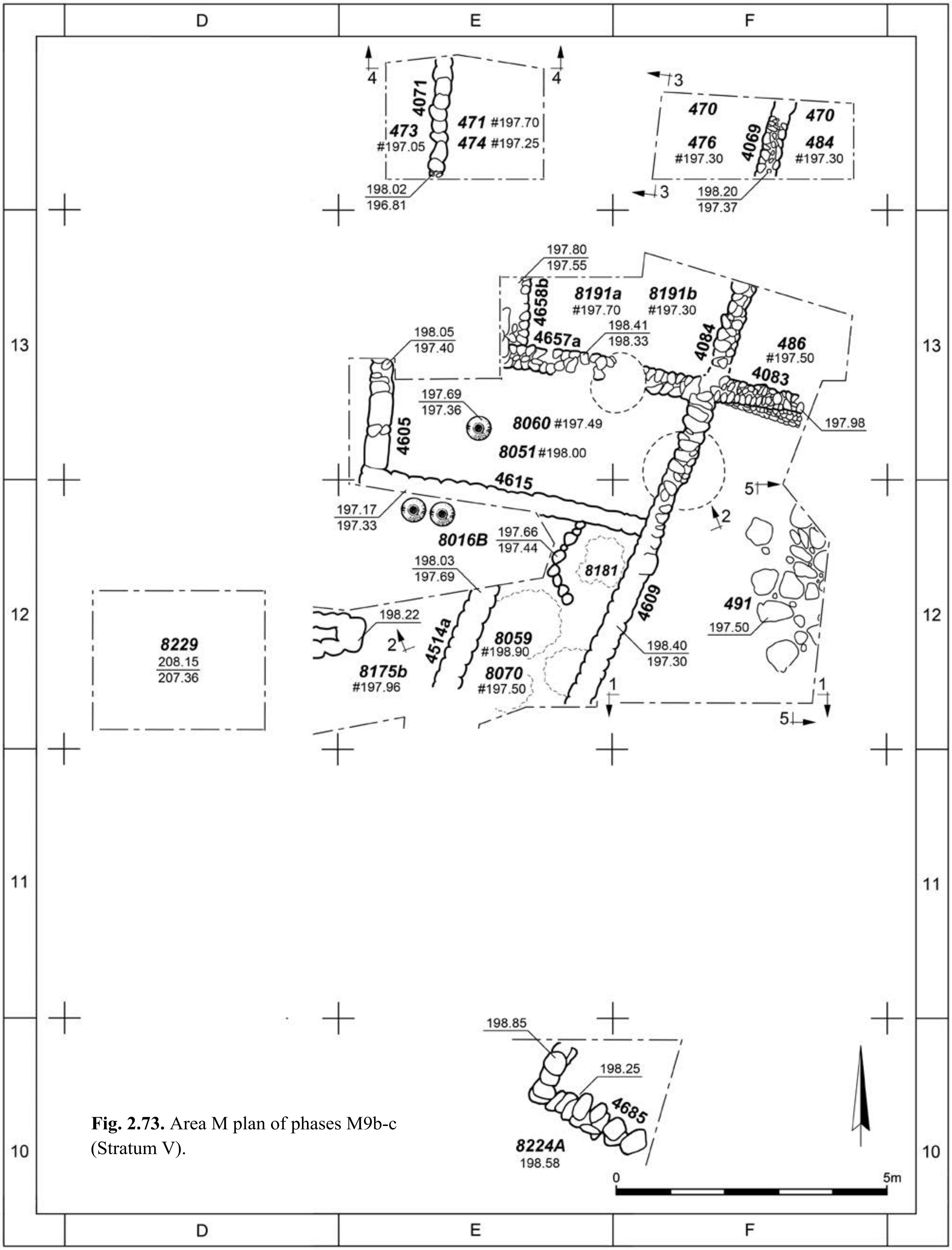

Fig. 2.73. Area M plan of phases M9b-c (Stratum V).

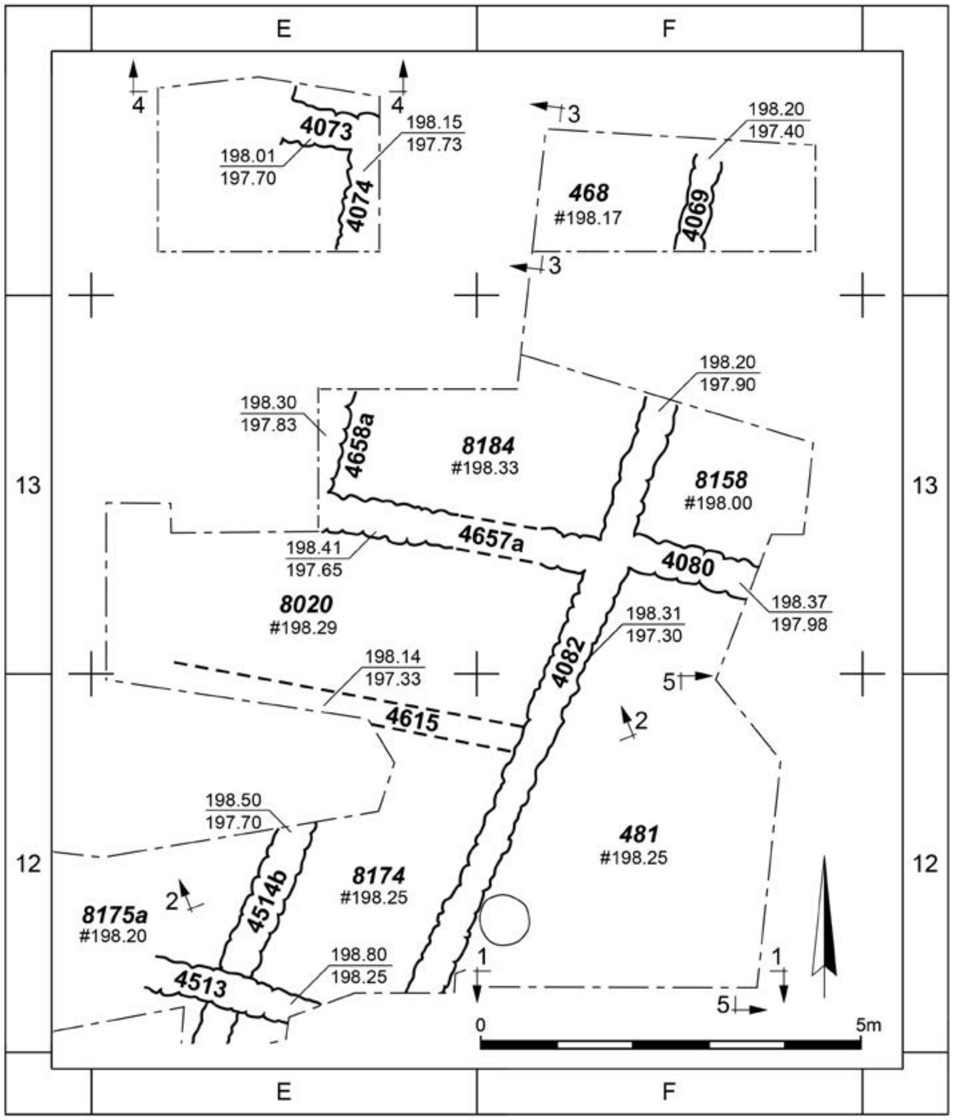

Fig. 2.74. Area M, plan of Phase M9a (Statum IVB).

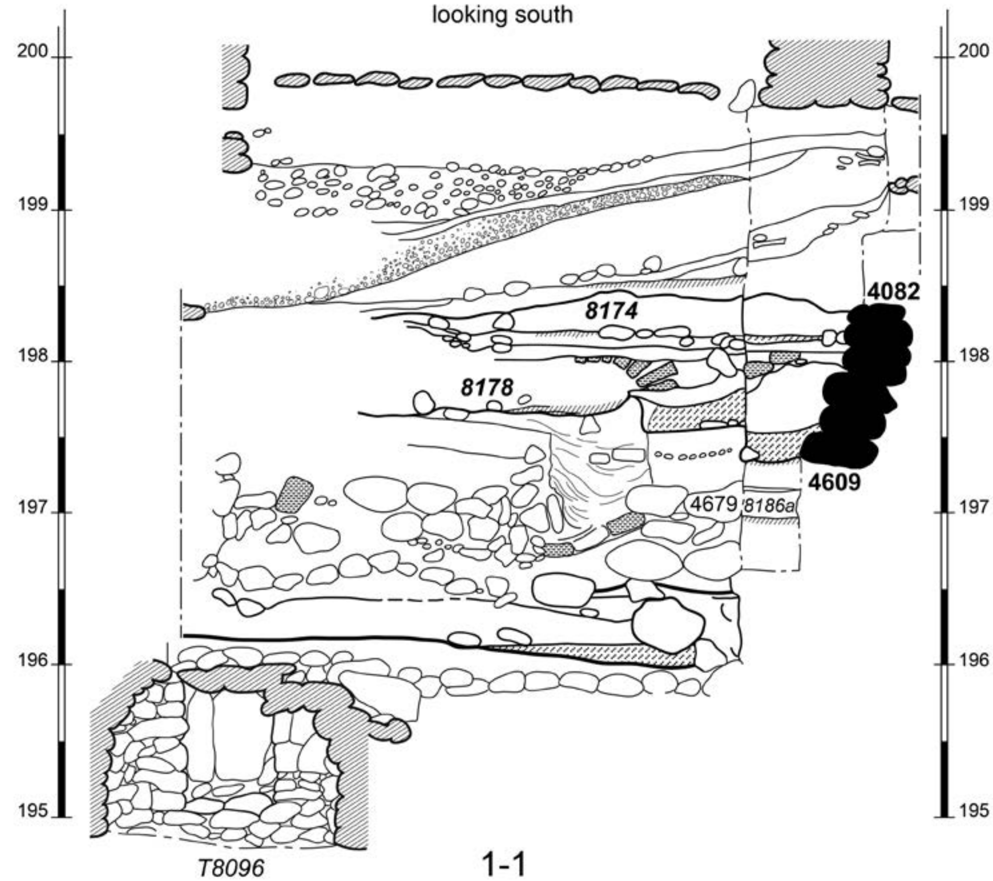

Fig. 2.75. Area M, Square F12: south balk drawing (1-1).

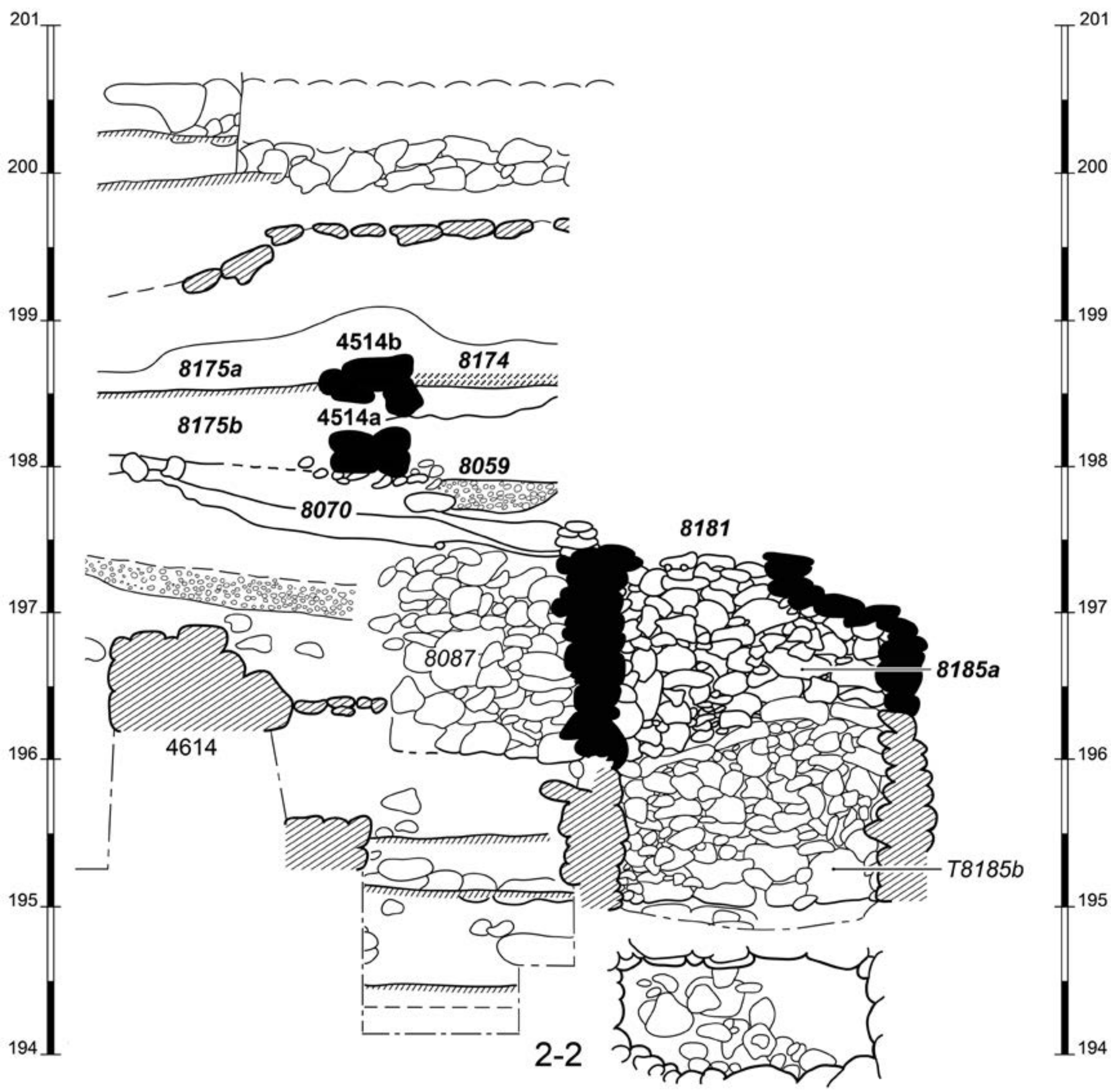

Fig. 2.76. Area M, Square F12: north balk drawing (2-2).

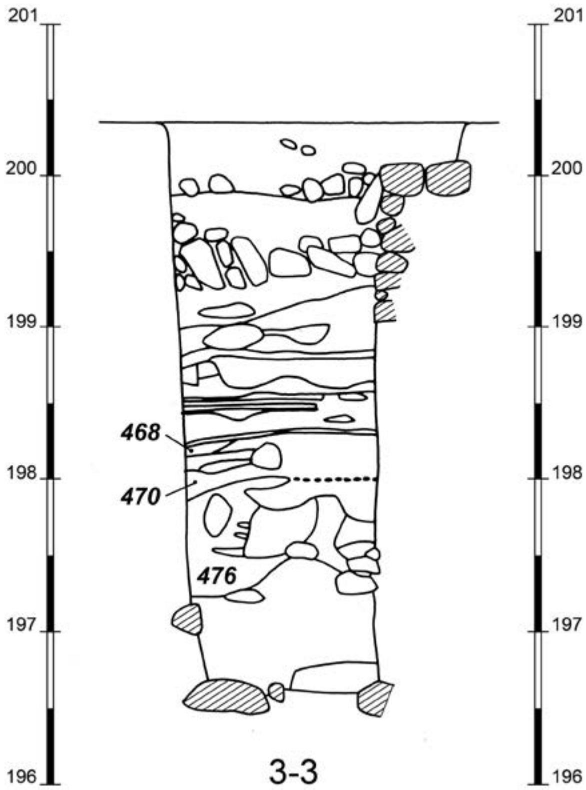

Fig. 2.77. Section drawing, Square F14, west balk (3-3).

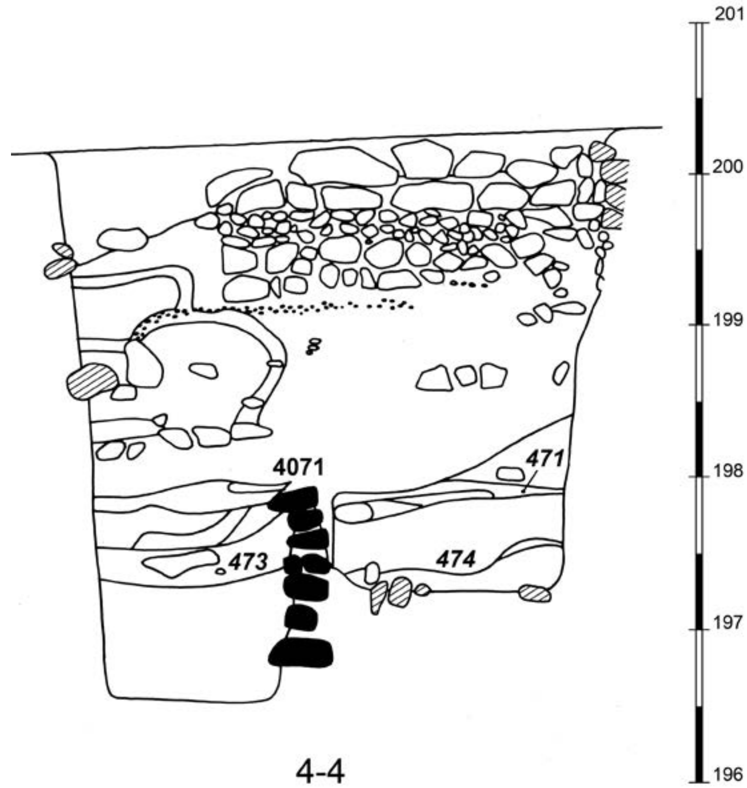

Fig. 2.78. Section drawing, Square E14, north balk (4-4).

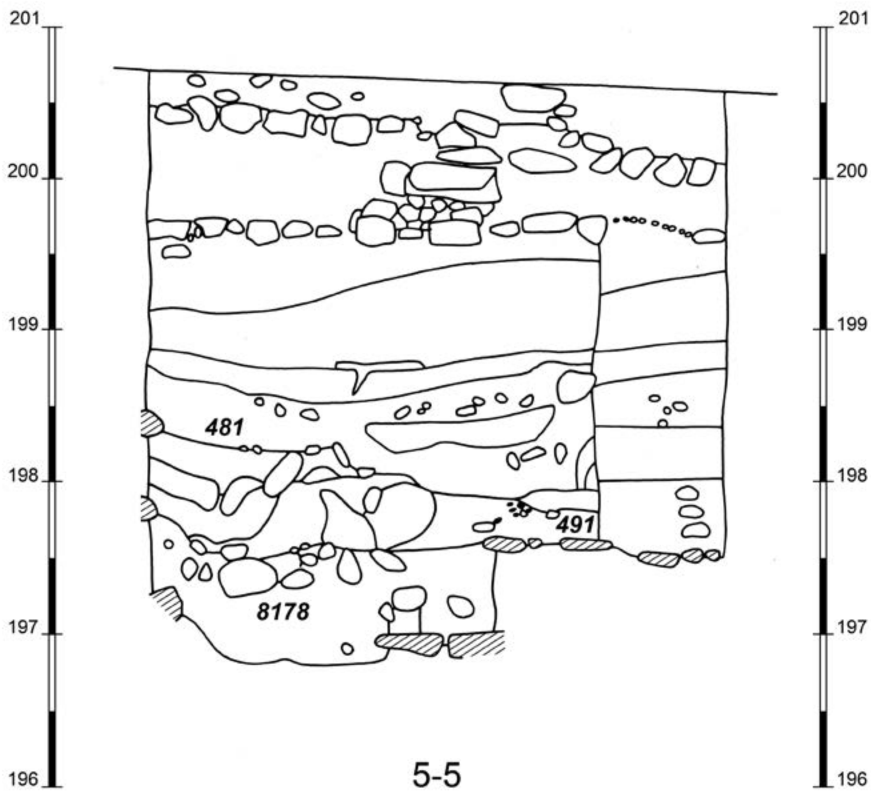

Fig. 2.79. Section drawing, Square F12 east balk (5-5).

Area T (with Ross Voss)

Iron Age I material was exposed mainly in Squares B–D/18 and B–F/19-20, in several deep probes amongst the ritual structures of the Iron Age II in a zone at the approximate midpoint between the northern and southern edges of the excavation area (see Biran 1996: 42-47 *passim* and here Fig. 2.80). The surface elevation of Area T ranges from approximately 204.00 MASL at the area's northern extreme to 200.00 MASL at its southern edge and *ca.* 202.00 MASL in the middle. The Iron Age I remains are encountered ca. 3-5 m. below the surface under substantial Iron Age II, Hellenistic and Roman strata, at elevations of 199.00-197.00 MASL, following the aforementioned slope.[15] The extent of the excavated Iron Age I levels in Area T totals approximately 60 m^2.

Similar to the other excavation fields, architectural features of the higher strata were not removed by the excavators. This resulted in balks being formed under foundations which acquire depths of up to 4 m. deep. The resulting narrow exposures limit our ability to derive coherent plans of the Iron I architecture; the exposures are simply too small. Plans 5a-c are the best that we can do. Section drawings (Figs 2.89-2.94) are of greater utility in discerning the stratigraphic sequences.

Iron I material was also recovered in one pit (Pit 9343) to the north, near the periphery of the tell, delimited by MB fortification Wall 700, which must have still been part of the Iron I townscape (Fig. 2.94).[16] At the southern side of the excavation area, Squares C–E/12-14 were excavated down to Stratum IVA (Iron Age II). Below this they were waterlogged (Biran 1996: 44). The question remains as to whether Iron Age I (and earlier) horizons lie under what is now a higher water table or, conversely, terminated at this point where the spring once emanated (see the Hydrology section in Chapter 1).

Phase T17—Stratum VIIA1 (Plan 5a)

The meager remains of this phase have been discussed by Ben Dov (2011: 159-161). They are sketchy due to the probes' narrow exposure and the disturbance created by the Phase T16 pits (see below). Be that as it may, most of the probes revealed a destruction layer of burnt mudbrick, charcoal and a rich material culture (considering the small exposure), including a number of restorable vessels (N=20, Figs. 3.79-3.81:1-9). The structures were constructed of both brick and basalt and had floors of plaster or basalt cobbles.

Phase T16—Stratum VI (Plan 5a)

A total of seven pits were identified in the Iron Age I strata of Area T, all attributed to this phase (Table 2.4). Most were cut down into burnt mudbrick detritus and a layer of pebbles below that, both dated to the Late Bronze Age (see Ben-Dov 2011: 159-161). Pit 9343 was dug into the Middle Bronze Age interior embankment material (Fig. 2.94). Four pits-9343, 2900, 2897, 2893—were not stone-lined.[17] Three of the pits-2428, 2468 and 7901—were constructed with a stone lining (Figs. 2.81A, 2.82). The upper part of this lining usually collapsed into the pit, the stones generally collecting somewhere at the midpoint of the interior elevation. The contents seem fairly consistent: the soil is fine and silty, containing small bone fragments, sherds, ash, charcoal and other organic material. None contained complete or intact ceramic vessels; those vessels that appear to derive from the pits originate in the Stratum VIIA levels below them (Ben-Dov 2011: 159-161). The lower portions of the pit interiors show accumulations of darker material and sometimes there is a clear black horizon identified as ash (Pit 7901 is a striking case, Fig. 2.81A). It now seems more likely that these horizons are the remains of decayed grain, compost or cess.

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15 As one goes down the slope from north to south the elevations of coeval surfaces are successively lower (see, for example, the plan of Phase T15, in Squares F19 and F20). However, the lower elevations of coeval surfaces in Row E (relative to Row F) suggest either a basement in Square E19-20 or a possible change in benchmark measurement between the 1982 and 1985 seasons.

16 And see Biran, Ilan and Greenberg 1996 Plans 7 and 8, at the south (right) end of the section.

17 A Phase T16 pit may have been missed in Square D19 and its contents may be part of L2304b or 2304c.

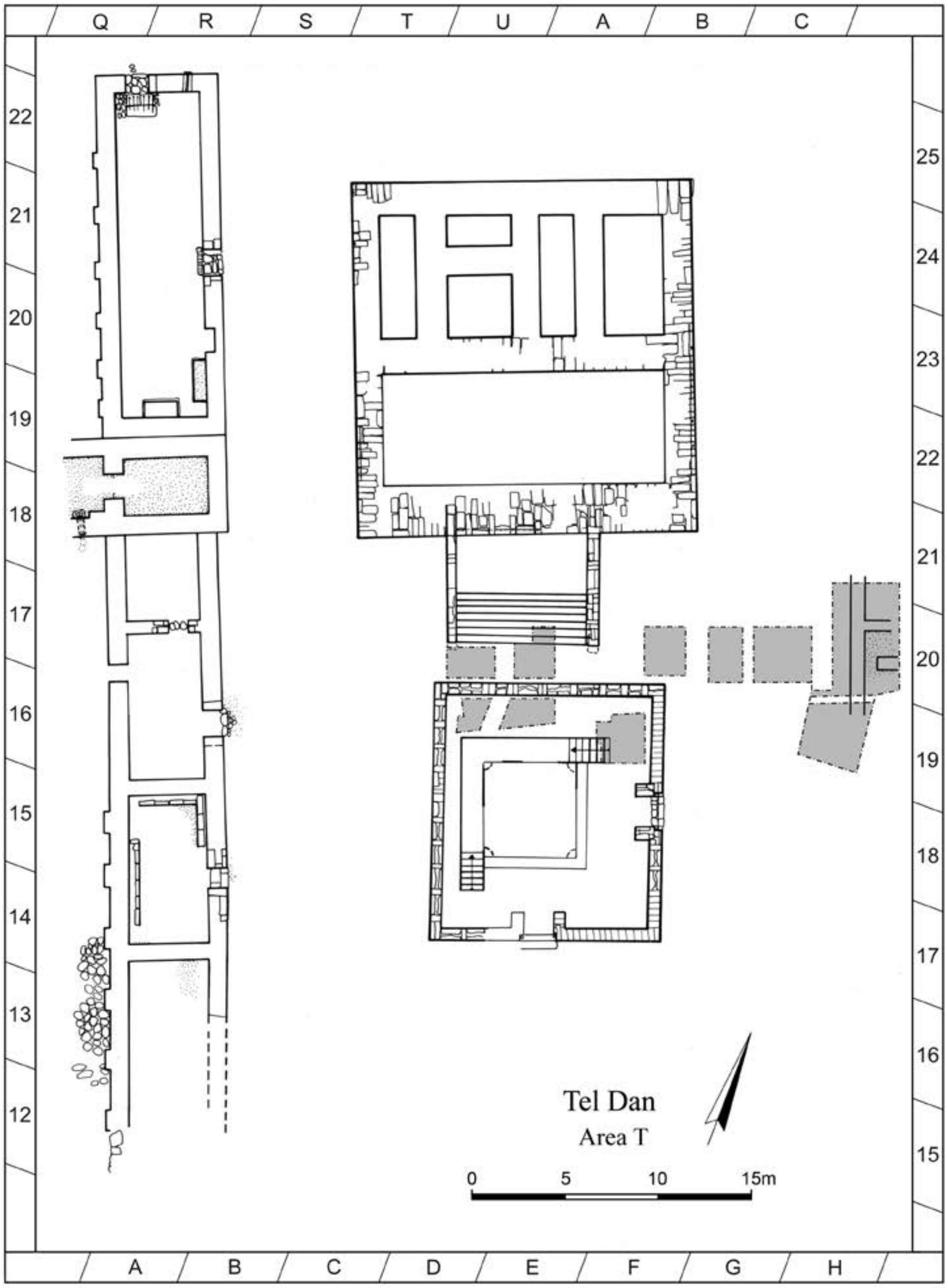

Fig. 2.80. Area T, general plan showing location of deep probes that reached Iron I levels.

The sherds in the pits occur in greater or lesser quantities, with varying proportions of Late Bronze Age pottery relative to the IAI pottery. These pits, too, were backfilled, perhaps immediately prior to the next construction phase, like those in Areas B, M and Y. For the most part only the bottom half or so of the pits is preserved; their upper sections appear to have been shaved down by the subsequent construction of Stratum V.

Almost nothing of the Phase T16 surfaces remain—as elsewhere, this area seems to have been leveled, and architecture dismantled, to construct the buildings of the following Phase T15 (Stratum V).

Fig. 2.81A. Area T, deep probe in Square D18, looking west. Pit 7901 (Stratum VI) is at the bottom.

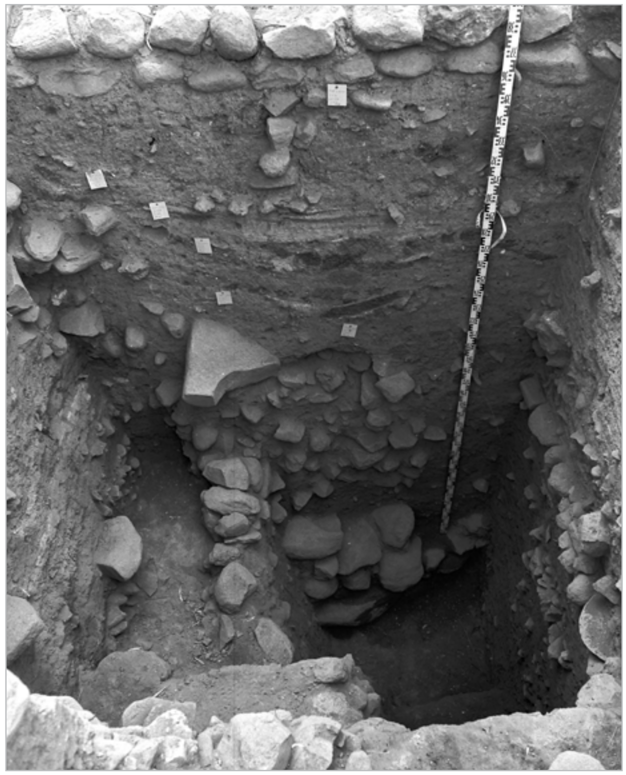

Fig. 2.81B. Area T, deep probe in Square E19-20, looking east. W8224(LB) at bottom.

Table 2.4. A roster of pits in Area T[18]

Pit	Square	Phase (Stratum)	Top elevation	Base elevation	Form	Estimated volume (m³)[18]	Contents
7901 (2426)	D/18	16 (VI)	197.02	196.41	Cylindrical; w/ floor L2426	0.64	Mostly LBII, 2 rims of PG, spheroid stone; black organic layer at bottom
7904 (2428)	C/19	16 (VI)	197.50	196.59	Cylindrical; =L2430-2432	0.22	Many IAI fragments, some LBII; large parts of 4 SJ; 1 P; 1 CH; basal layers have darker soil
2468	C/18	16 (VI)	197.29	196.44	Next to W8006	0.37	2 complete chalices, from L2478 below, and some small LBII and IAI sherds
2897	E-F/20	16 (VI)	197.60	196.82	Cylindrical	0.21	Large fragments of IAI SJ, CP, CJ
2900	F/20-21	16 (VI)	198.50	197.65	Cylindrical	?	Only identified in balk section
2893	F/19	16 (VI)	197.40	197.08	Cylindrical	?	In corner of square
9343	D–C/4	16 (VI)	201.34	200.48	Cylindrical; dug into MBII rampart	0.675	BT, CP, GS, RS

18 This must be considered a minimum figure since the pits' upper portions have collapsed or been shaved down by later building. As a rule of thumb, the volume may have been double.

Fig. 2.82. Area T, Square C18 looking north, Pit 2468 (Stratum VI) and Walls 8006 and 8002a (Stratum V).

Fig. 2.83. Area T, Square C18 looking east, L2464 and W8002b to left (Stratum V). Note the broken tabun, pithos and storejar amongst the ash and burnt brick of the destruction layer of Stratum V.

Phase T15—Stratum V (Plan 5b)

As in the other areas of the tel, this stratum ended with a catastrophic destruction, testimony to which is an up-to 1 m. thick layer of collapsed debris, burnt brick and plaster, stone, charred wood, ash and a number of complete ceramic vessels (N=14, Fig. 2.88) and other artifacts (Figs. 2.83-2.86). The material culture from the living surfaces was covered with burnt wood and ash mixed with burnt mud plaster—apparently from the wattle and daub ceiling/roof (cf. Fig. 2.18). Above this debris rested an uneven layer of collapsed and burnt stones and mudbricks from the upper portions of the walls. These bricks are usually of a whitish color. Here too, there are no human remains, suggesting that the inhabitants escaped or were removed prior to the conflagration.

Walls running east-west appear to occupy the same contours (from north to south: W8507, W7801 and W7902 on one contour, W8517 and W8006 on another and W7916 on a third). W8002 and W8210a were identified as north-south walls. As one can see from the plan (Plan 5b), the floors of this phase are progressively lower from north to south and likewise, from east to west. The floor elevations of this phase in Square F/19 are 70-90 cm. lower than those in Square F/20, indicating that the structural walls double as terraces. The

Fig. 2.84. Area T, Square F20 looking north: W8507 (running parallel to bottom) and destruction layer of L2826 (Stratum V). Note *in situ* broken vessels.

Fig. 2.85. Area T, Square D19 looking east: W7801 (left), L2304a (pavement, Phase T15), and bin (upper left corner).

Fig. 2.86. Area T, Square F20 looking north: large basalt mortar on floor of L2826 (Stratum V).

north-south slope was created by the Early Bronze and Middle Bronze Age inner ramparts while the east-west slope may have something to do with the drainage of runoff water to the west.

The construction techniques parallel those of the other areas in Stratum V: walls *ca.* 40-50 cm. thick made of a single row of basalt fieldstones, chinked with smaller stones. Partition walls abut, rather than bond with, adjoining walls. Collapsed mudbrick in the destruction suggests that the upper wall sections were made of this material; the stone lower walls were generally preserved three to four courses high. Mud plaster was applied as a finish. Despite the confined exposure, undulations can be detected in the walls' courses, suggesting a lack of stability.

The only doorway identified is located in Square F/19 at the north end of W8518, perpendicular to W8517, leaving an opening of 70 cm. Floors could be of stone slabs (e.g. remnants in L2304a, Fig. 2.85), but were most often of tamped earth (L2856).

No pits were clearly associated with this phase; it is possible that some of the pits attributed to Phase T16 belong here, but what was left of them is usually so shallow that this seems unlikely. A stone bin, L8201, was identified in Square E/20, continuing into the northern balk, probably constructed against the continuation of W8507/W7801. Appended to this was the surface of L2599 and a *tabun*. Another bin was discerned in Square D/19, in L2304a, against W7801 (Fig. 2.85). A mortar was recovered on the floor of L2826 (Fig. 2.86).

Phase T14—Stratum IVB (Plan 5c)

Stratum IVB is quite fragmentary in Area T; with remnants mainly in the eastern margins of the excavation area (Fig. 2.80). The logical conclusion is that its remains were cleared away by the monumental building of Stratum IVA—the cultic complex that was to dominate the tell until the Late Roman period.

Where recovered, this phase is deposited over the Phase T15 (Stratum V) destruction layer. As in the other excavation areas, some Phase T15 walls were reused and supplemented in Phase T14 (W8412a). One wall of the two-course-and-fill technique was documented here (Fig. 2.87), something that first appears in Stratum IVB in other areas too. Upper wall courses were made of dark red bricks, with only some of the yellowish-white bricks of the previous phase (reused?). Strangely, these bricks seem to contain little organic material. Walls were faced with reddish or whitish clay of the same texture as the bricks. The net result is that the fills of this phase are grainier and more orange-red than the fills of the previous phase.

Floors are made of yellowish mud-plaster or tamped earth with a straw binder (chaff negatives preserved) *ca.* 2 cm. thick (L2743b, L2748). Only three complete vessels were recovered from this phase.

***

It is regrettable that this area was not more extensively excavated at the level of the Iron Age I occupations. In the later Iron Age this was a major cult place (e.g. Biran 1994: 159-234) and there are signs that this same area already maintained a cultic and/or administrative function in the Bronze Age.[19] Its function in the period between—the Iron Age I —is of great interest. Several items may have a ritual significance (e.g. Figs. 3.93:9-3.96), the same kinds of objects have been identified in ritual contexts in Area B.

19 The present author is of the opinion that the foundations of the Iron Age "high place" rest upon those of a Middle Bronze Age *migdal* temple. In any case the boulder foundations can be shown to date to the Middle Bronze Age (Ilan 2018). Other features also point to this area as being elite or public in character in the Middle and Late Bronze Ages—the Egyptian statues of officials for example (Biran 1994: 160-161).

Fig. 2.87. Area T, Square F20 looking west: Phase T13-14 Walls 8412a (left side) and 8413 (right side) and Phase T15 W8421 (center) and the top of the destruction layer of L2749 (Phase T16-17) below it.

Fig. 2.88. Selected vessels from the Iron I levels of Area T.

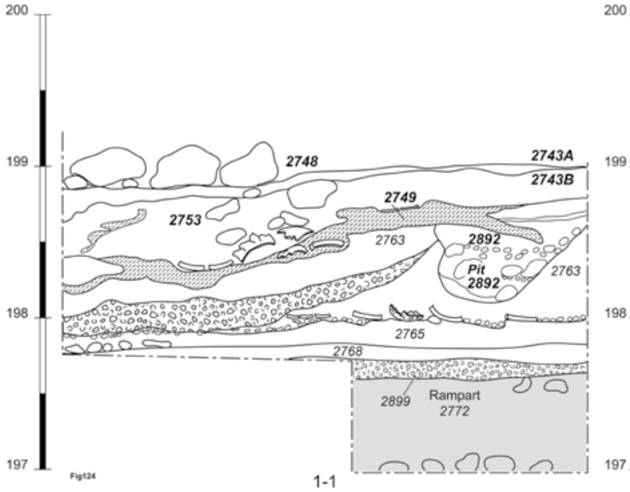

Fig. 2.89. Area T, Square F20, east-west section 1-1, looking south.

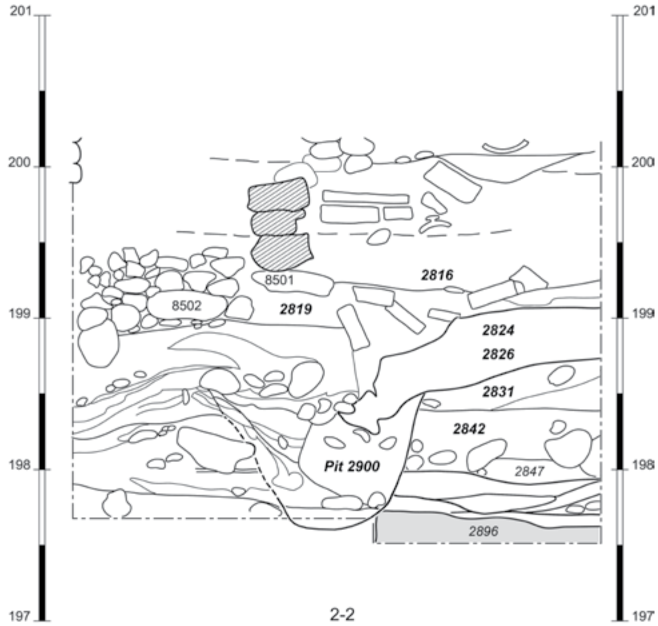

Fig. 2.90. Area T, Square F20, east-west section 2-2, looking north.

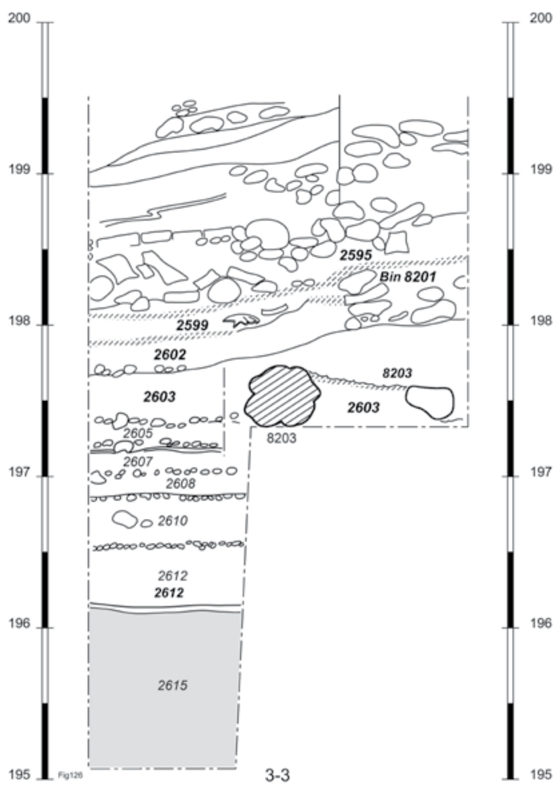

Fig. 2.91. Area T, Square E19, north-south section 3-3, looking west.

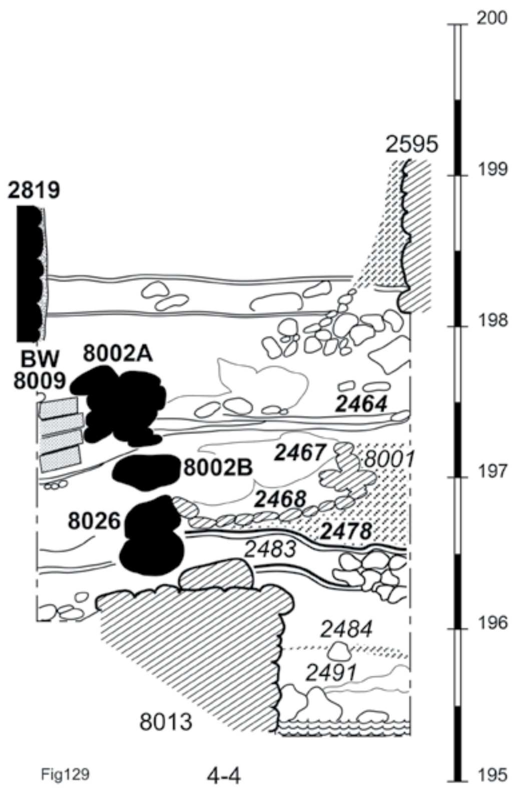

Fig. 2.92. Area T, Square C18, east-west section 4-4, looking north.

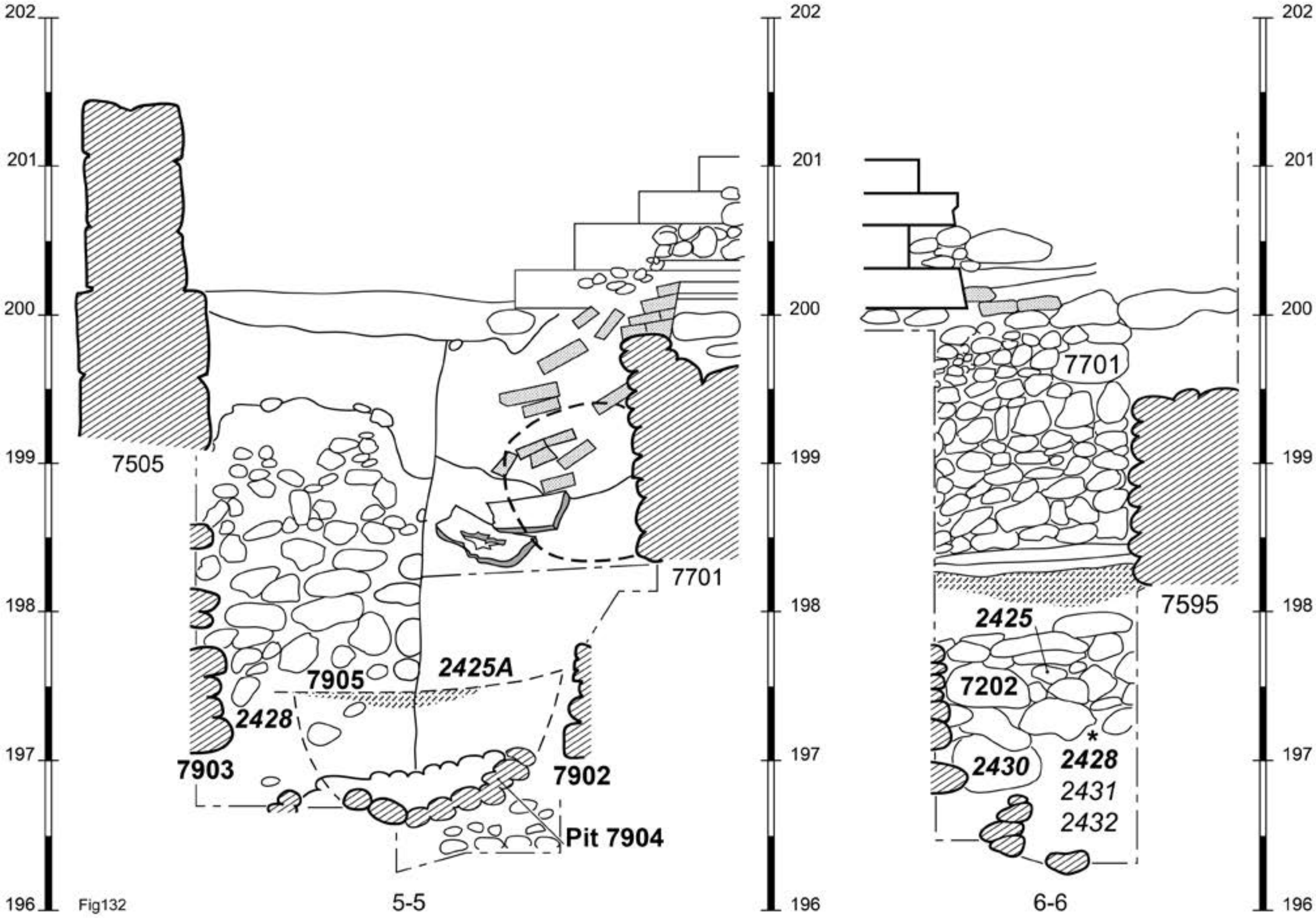

Fig. 2.93. Area T, Square C19, section 5-5, looking west and section 6-6, looking north.

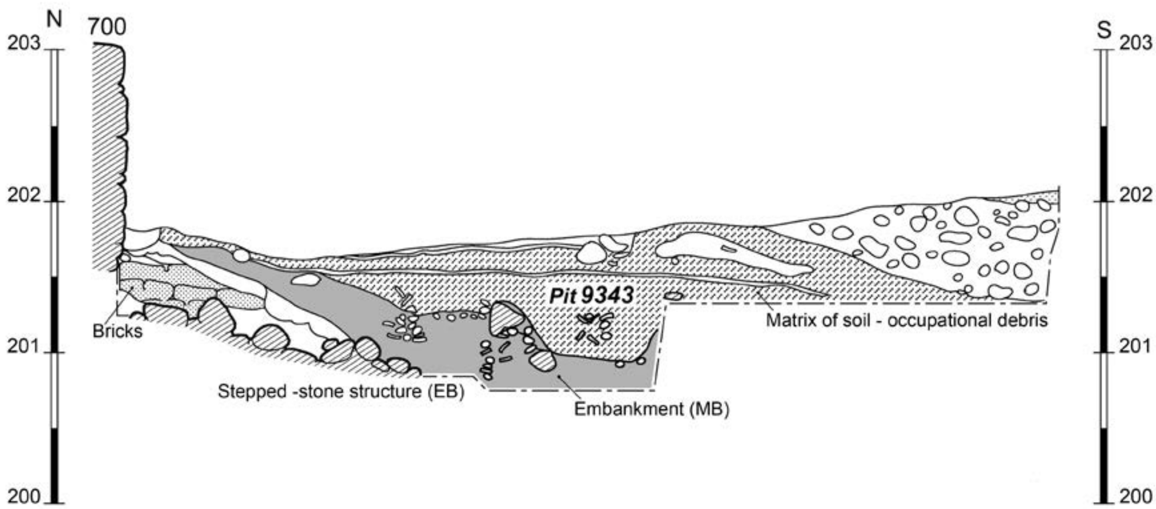

Fig. 2.94. Area T, Squares D4-5, looking east: Pit 9343 cut down into embankment layers

Area Y

Area Y was a trench cut through the northeastern flank of the tell, primarily to investigate the Middle Bronze Age ramparts (Biran 1996: 53-57). Iron Age I remains were first encountered on the crest of the mound in pits L905 and L1018 (Fig. 2.98 and Biran, Ilan and Greenberg 1996: Plan 9, at the 30-40 meter point of the section cut). However, most of the IAI material was recovered in the western third of the trench—a series of superimposed architectural phases in an accumulation generally *ca.* 1 m. thick, underlying the meager Iron Age II remains (Figs. 2.95-2.115).[20]

Being confined to the trench, the Iron I exposure was rather small: *ca.* 6 × 8 m (48 m^2); the result being that no complete structure was excavated (Fig. 2.95). Even this small exposure was dug as a series of deep probes over four seasons in the late 1970's. Thus, plotting find spots and statistical analysis of pottery and other small finds are of limited utility. Moreover, excavation was carried out in a series of steps descending from west to east, following the incline created by the bulldozer and contrary to the original east-west slope of antiquity. In this connection, it is worth noting that, as regards the Iron Age I remains, this slope seems to have ended approximately at the 12-13 m. mark of the trench, at W9401 (see Fig. 2.111 and Biran, Ilan and Greenberg 1996: Plan 9). West of this line the occupation layers are more or less horizontal.

Despite the above limitations the stratigraphy was fairly clear here and the ceramic remains, including 76 complete or near complete vessels, were plentiful enough to make Area Y important as a cross reference for stratigraphy and typological development. A plethora of faunal bones was also recovered, making a contribution to the larger study of animal exploitation on the site (Wapnish, Hesse and Ogilvy 1977 and this volume, Chapter 17).

Though not always well preserved in clear courses, mudbrick was used extensively. It is curious that sections of mudbrick from an earlier wall were sometimes built upon, rather than being cleared away down to the stone foundations (e.g. Fig. 2.99). One would expect the removal of mudbrick so as to limit moisture damage to foundations. Perhaps the builders intended to raise floors to a point above the stone foundations. The stone portions of walls are made of irregular, i.e. generally non-masoned, basalt fieldstones. They are usually a combination of larger stones placed as headers one course thick and smaller stones two courses thick. In any case, walls are rarely more than 0.5 m. thick. Also, walls were often not built up in even courses. Rather, more of a polygonal

Fig. 2.95. Area Y, looking west: a general view of Iron Age I architecture in the trench.

20 The Iron Age I remains of Area Y were mainly excavated and documented under the supervision of Shulah Milstein and Rachel Bar-Nathan.

technique was used. As noted in the Area B discussion, this technique was a means of distinguishing the IAI architecture from that of earlier and later levels. Later Iron Age walls, from Phase Y3 on, are broader and constructed with two courses of smaller stones, the result being more regular and more stable (e.g. W9307, Fig. 2.113).[21] Terminal Late Bronze Age and IAIA walls tend to include larger stones, being only one row wide, without the alternating smaller stones chinked into either face (e.g. W9306 and W9405, Fig. 2.110).

Phases Y8-Y7—Strata VIIA–VI (Fig. 2.110)

To this phase I am assigning four deep pits (3009, 3022, 3033, 3127b) and two shallow ones (3043 and 3213b). Also included are several problematic surfaces that bear ceramics of both the Iron I and the Late Bronze Age, according to traditional typology (Figs. 3.97, 3.100-3.101). Two levels may be present here that are difficult to isolate stratigraphically and it is not clear whether W9306 and W9405 belong to PhasesY7 or Y8 (the latter being LBII). The pottery may be a mixture of two phases or, one phase that includes characteristics of two "cultural horizons".[22] Unambiguous Late Bronze Age levels were encountered only in narrow probes and were not well preserved (Ben-Dov 2011: 188-199).

In L3214a and L3214b we have an indication of the floor being raised some 30-40 cm., but for the most part, there appears to be a common horizon at which some loci contain more Late Bronze Age pottery types (e.g. Loci 3213a-b, 3216, 3214b, 3024) and others more Iron Age I pottery types (e.g. Loci 3112, and 3114). Tamped earth floors are the norm. Some of the remains are indicative of metallurgical activity: crucible, blowpipe nozzle, slag, melted copper fragments and basalt pounders were recovered in small numbers. Curvilinear furnace installations (L3208, L3213b, L3216, L3114) were identified, filled with ash, usually having an internal lining of large cooking pot and storejar sherds. Much of the collapsed debris in and around the installations was fired clay or mudbrick, suggesting that they were largely constructed of this material, perhaps in combination with stone. The shallow pits (L3213b, L3216, L3043) appear to be associated with metallurgy as they contain slag, copper bits and crucible fragments. A fragment of what appears to be a copper ingot was found on the floor of L3018 (Phase Y3a, Stratum IVA) and a blowpipe nozzle occurred in a cleanup locus (L3001/3024) following the initial bulldozer foray (Fig. 3.97:7). Both probably originate in the Phase Y7-8 horizon, since evidence for metallurgy is lacking from the later phases in this area.

Such items, probably refuse, were also found in Pit 3009, a deep one, which also contained charred grain. Most of the other deep pits contained much ash and some animal bone fragments, but very few sherds. It may be inferred that these contained grain that was either burnt away, had decomposed or had been emptied. Charred grain was also found on the floor of L3024 (Fig. 18.1), which was either sealed, or was cut by three pits.[23]

Pit 3127b on the other hand, was full of destruction debris—animal bones, burnt brick and plaster, ash, charcoal, building stones and many sherds that restored into 37 complete vessels (Figs. 2.96-2.97; 3.17; 3.98-3.99). As with several pits containing such debris in Area B-west, this one could not have contained all the vessels as whole objects. They simply would not have fit. Moreover, a number of joins were found with sherds from fills and surfaces in Phases Y4-6 above. The best explanation is that the contents represent destruction debris cleared into the then-empty pit, so as to better reuse existing architecture and surfaces.

However, Pit 3127b also seems to be the earlier of at least two construction phases. Its curious profile (Fig. 2.97) suggests that it too, like Pit 8185a (Fig. 2.72) in Area M, may have happened upon an

21 In the plan for Phases Y4-5 (Fig. 2.112) W9314 is drawn as having double courses. This is mistaken; W9314 underlies W9307 (Fig. 2.113) of Phase Y3, but its courses were not drawn separately. It is unclear whether it was a single or double course wall. If the latter, it is the only one from Phases Y4-5.

22 A total of 44 complete vessels were recorded from these levels, 37 of them from Pit 3127b.

23 Unfortunately, I have not been able to locate this grain either.

Fig. 2.96. Area Y, looking east: the upper part of Pit 3127 (Phase Y7, Stratum VI) surmounted by Phase Y6 (Stratum V) Walls 9330, 9316, 9336.

old Middle Bronze Age constructed tomb. Some Middle Bronze Age sherds were found at the base, though these are not necessarily support for the hypothesis. After being plastered over by the floor of L3123 (Fig. 2.111) in Phase Y6, the fill seems to have settled further—perhaps due to an earthquake—and in Phase Y4 to have been constructed up to the level of the L3174 pavement (Fig. 2.112) and reused, perhaps as a more shallow Pit 3127a (see below). A radiocarbon sample giving a date consistent with the Stratum V destruction (Chapter 20, Table 20:3) apparently fits this later phase.

The Pits at the Crest of the Mound

Three pits were found at the top of the ridge formed by the old Middle Bronze Age rampart—Pits 905, 1018 and 3163 (see Biran, Ilan and Greenberg 1996: Plan 9).[24] They have no stratigraphic connection with the western portion of the trench, or with each other, but they are discussed here because throughout the site, the majority of such pits can be attributed to Stratum VI.

All of them were stone-lined. Pit 905 was a composite affair (Fig. 2.98). The lower section had a cobblestone lining and a slab base. The upper portion

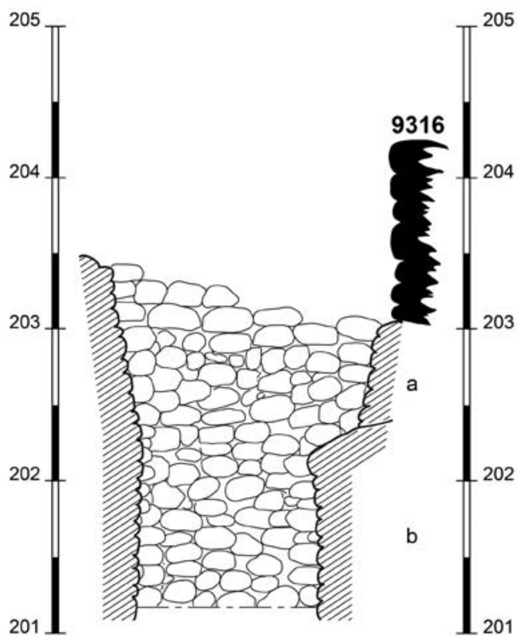

Fig. 2.97. Area Y, section drawing of Pit 3127 looking north.

24 Pit 905 is located at the 30-32 m. point of the trench partly in the south balk, Pit 1018 at the 30-34 m. point partly in the north balk and the probe just north, and Pit 3163 (not labeled in Biran, Ilan and Greenberg 1996: Plan 9) is located at the 37-39 m. point in a probe just south of the trench.

Fig. 2.98. Area Y, Pit 905, looking southwest: contents. Note the stone lining coming down to the stone slab at bottom. This lining was originally vertical but has moved downhill with the slope.

was comprised of the upper part of a Galilean pithos. Given this configuration one assumes that the mouth protruded above the original surface, though it was probably covered by some of the fragments found inside the installation. The pit contained large fragments of smaller vessels, including two "Philistine" vessels (Fig. 3.102:14-15). None, however, rested at the base of the pit; rather they were found amongst the soil fill about half-way up, i.e. they were not deposited in an empty container. The pottery may simply be a component of refuse, or the pit may have contained some material that transformed into, or was replaced by, soil. Perhaps it was a latrine; a pithos mouth seems about the right size. Unfortunately, the soil contents were not kept for analysis.

Typologically, all three pits could be associated with any of the assemblages from Phase Y7 to Phase Y4 (Strata VI-V). The debris they contain, which includes large sherds, suggests that this part of the slope was occupied in the IAI—much like Area B—but none of this occupation has been preserved, only the pits associated with it.

Phase Y6—Stratum VI (Fig. 2.111)

This is the first level in which new walls were constructed of a certainty, rather than possibly being reused Late Bronze Age walls. Phase Y6 walls use smaller stones, combined into single and double rows. The tops are flat and appear designed to support brick superstructures (cf. Fig. 2.103: W9402 of Phases Y4-5).

This is a phase of white plaster floors—that of L3204 was *ca.* 5 cm. thick. Locus 3082/3212 on the other hand, was a mud plaster floor abutting walls W9401, W9402/9316 and the mudbrick bench or platform L3066 set up against W9328. Three or four re-plasterings were discerned in parts of the floor.

Further west was a room (L3123) contained within W9316, W9330 and W9336 with a plaster floor that covered Pit 3127. The field supervisor (R. Bar-Nathan) was of the opinion that the pit's stone-lined circumference was built up to form flimsy partition walls. It seems more likely that the floor merely subsided, giving the appearance of walls. Be that as it may, the surface of L3123 lying over the pit bore no complete vessels and relatively few sherds. Locus 3123 also had a semicircular installation built of small fieldstones in the center—probably a cooking range of sorts—that contained a complete cooking pot (Fig. 2.111, pot not illustrated). As mentioned above, several other complete vessels were recovered too (Fig. 3.100:3-6) as was a basalt pestle.

On the tamped earth floor of L3212 a complete collared-rim pithos was found on its side, partly in the north balk. Given observations made elsewhere, it was probably propped up against a wall one

Fig. 2.99. Area Y, looking south: W9328 (sign is wrong) and L3082 (both Phase Y6). Note use of mudbrick in conjunction with fieldstone. W9314 was constructed over the brick of W9328.

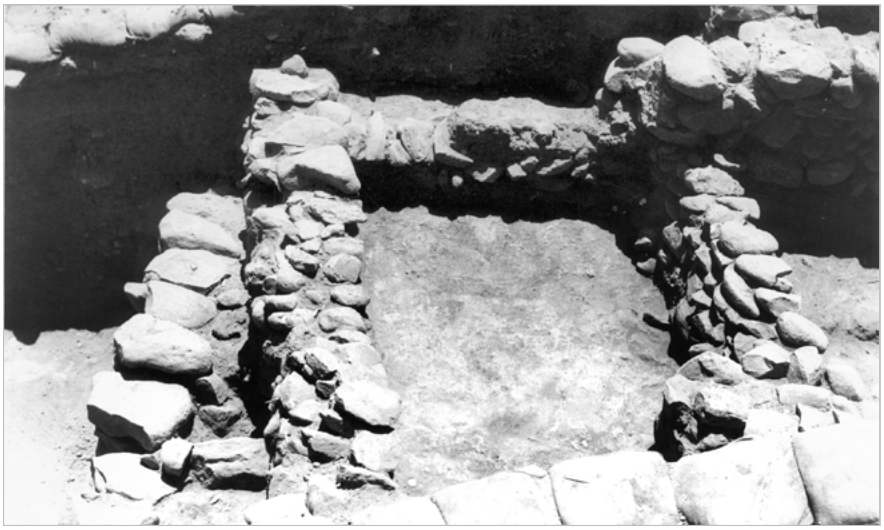

Fig. 2.100. Area Y, looking south: L3082, 3097, W9328, W9316/9402 (Phase Y6); note the mudbrick remains above the stone base of W9328. At far left W9306 (Phase Y7, Stratum VI-VIIA).

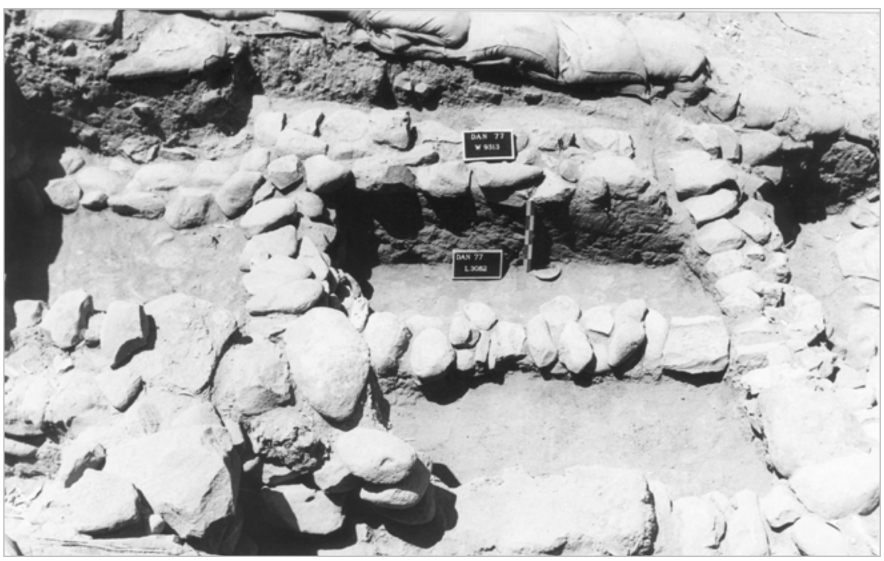

Fig. 2.101. Area Y, looking south: L3082 with *in situ* lamp (Pl. 40:6), Walls 9401 (right), 9316/9402 (all Phase Y6); W9319 (Phase Y5, center); W9313 (top) Phase Y3b.

meter or so into the balk. On the other hand, L3212 and L3082 (Fig. 3.100) still show Late Bronze Age pottery types (Figs. 3.100-3.101A). This is the main reason that the phase has been placed in Stratum VI. A total of 18 complete vessels were recorded from this phase.

Phases Y4-5—Stratum VA–VB (Fig. 2.112)

Most of the walls of the previous phase were reused or rebuilt. None were cancelled and two were added, incorporating and subdividing spaces (e.g. W9334, W9319). Walls 9314 and 9305 meet in what originally may have been a building's exterior corner; they are also thicker than the walls that abut them. *In situ* mudbricks were found placed on the flat top of W9314 (Figs. 2.99-2.100) and it stands to reason that most of the upper wall sections were constructed of brick.

Wall 9319 forms a small cell: L3025b (Fig. 2.101). Perhaps it was a bin or the wall of a platform having a packed-earth fill. Another mudbrick bench (L3065) was constructed against the north face of W9314. West of W9314, W9334 seems to curve—perhaps it is more of a fence—but not enough was exposed to be certain. An upside down pithos was found abutting the south face of W9314 set into a lime-plaster floor (L3107, Fig. 2.102), probably a sort of cooking range or stand like those found in Areas B and M.

The first and only slab pavement found in these levels of this small exposure also belongs to PhaseY4 (L3174, Fig. 2.103). Running into the north balk is installation L3175, perhaps a storage bin. Three separate surfaces were detected in the western part of the area. The lower two of these represent sequential occupations, but the uppermost, represented by L3172 and L3110 at least, seem to be remains of a collapsed second story. It included more charcoal, more fired but broken-up floor fragments and several pieces of mud plaster bearing reed and branch imprints. No pavements or stone installations were associated with it.

Though not indicated on the plan, it was discerned that Pit 3127 seems to have been built up and reused as L3127a (Figs. 2.96-2.97).

Fig. 2.102. Area Y, looking east: W9307/9314 (left, Phases Y3-4), W9305 (back, Phases Y3-5), surface of L3091 (Phase Y3b) and below that, the inverse pithos installation of L3107, Phase 4 (Stratum VA).

Phase Y4, and perhaps Phase Y5 as well, were destroyed in an extensive conflagration, which left a debris layer of stone, brick, ash and charcoal *ca.* 40-60 cm. thick. This was the IAI level richest in artifacts (see Fig. 3.104-3.106:1-5) due to the great and sudden destruction that typifies this layer throughout the tel (Stratum V). A total of 14 complete vessels was recorded from these phases.

Phase Y3b—Stratum IVB (Fig. 2.113)

The size of the exposure is even smaller in this phase due to the bulldozer having cleared the material east of W9305 in its downward swathe. In this phase two *tabuns* were uncovered. One was built up against

Fig. 2.103. Area Y, looking east: Phase Y4 L3174 pavement and doorway in W9402. Pit 3127 is at right. Note the signs of burnt beams in the doorway (left center).

Fig. 2.104. Area Y, looking east: Pit 3127 is at upper right. The remnant of the L3174 pavement (Phase Y4) seems to conform to the pit's curvature, giving the impression of contemporaneity, but the rest of the pavement may have subsided into the pit's settling debris.

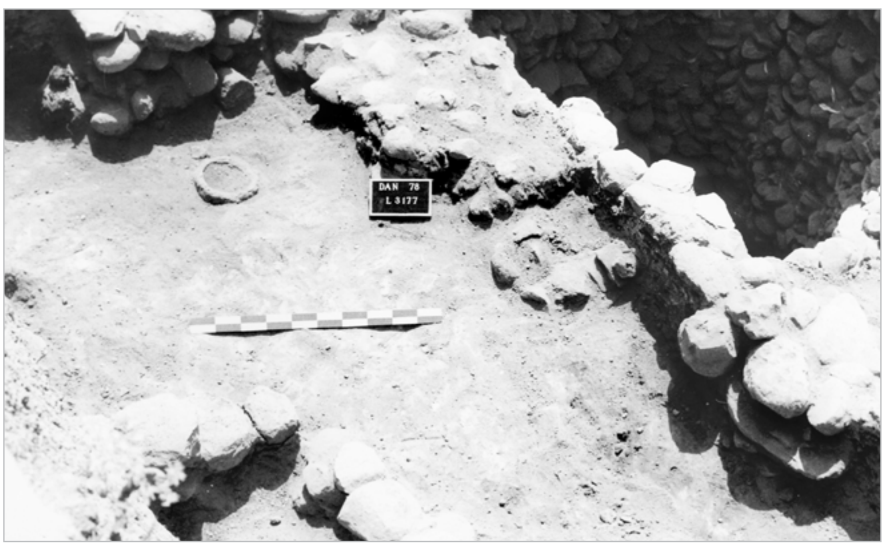

Fig. 2.105. Area Y, looking southeast: Phase Y5 plaster surface L3176/3177, remains of Phase Y4 L3174 pavement above it, abutting the corner of Phase 6 W9336 and W9316. Phase Y4 trough L3175 is at bottom.

Fig. 2.106. Area Y, looking north: Phase Y4 W9402 (right) and mudplaster floor L3172 bearing restorable pottery vessels (Fig. 3.105) and conflagration debris; Phase Y3b W9393 (top).

Fig. 2.107. Area Y, looking south. W9305 (center); on the right, L3020/3046, a Phase Y4-5 fill underlying floor 3102 (Phase Y3b). To left: L3025b and W9319 (Phase Y4).

Fig. 2.108. Area Y, looking north. Phase 3b W9313b and L3025a with Tabun 3025c (top) and Phase Y4 W9319 (center) and L3025b (bottom).

Fig. 2.109. Area Y, looking southwest: W9330/9314/9307 (Phases Y5-4-3 respectively), Tabun 3105 center right (Phase Y3) and the upper portion of Pit 3127 (bottom).

W9313b (L3025c, Fig. 2.108). A complete cooking pot was found next to Tabun 3025c on the plaster floor of L3025a. Tabun 3105, was built against W9307 in L3102 at 204.11, a tamped earth floor (Fig. 2.109). Its upper section was lined with potsherds and its lower portion was simply fired clay. At its bottom rested three stones—perhaps to rest a vessel upon. A lower grinding stone was recovered on the floor.

The foundations of W9307 rested directly upon W9314 and W9330 of Phases Y4-6 (Fig. 2.109). It is interesting that part of the mudbrick superstructure of the Phase Y4 wall was left intact and integrated into the higher phases' stonework (Fig. 2.107). Wall W9307 is the broadest (70 cm.) and longest Iron Age wall uncovered in this area and was preserved four courses high. South of W9307 was another tamped earth floor (L3091) at an elevation similar to that of L3102 on the other side of the wall.

A large pit (1018) was excavated on the interior slope of the embankment, between the 30 and 35 meter points (see Biran, Ilan and Greenberg 1996: Plan 9). The pit contained later Iron IB material thus dating it to this phase (e. g. Figs. 5.6:10; 5.9:7).

As in most of the Iron Age I-IIA phases, cooking pot fragments make up the bulk of the sherds (Fig. 3.106:6-11). This structure was apparently destroyed in a conflagration; a 15 cm.-thick layer of collapsed mudbrick, charcoal and ash was deposited on the floor. Phases Y3a–Y1 are later Iron Age levels (Strata IVA–I) and therefore beyond the scope of the present study. A total of four complete vessels was registered for Phase Y3b.

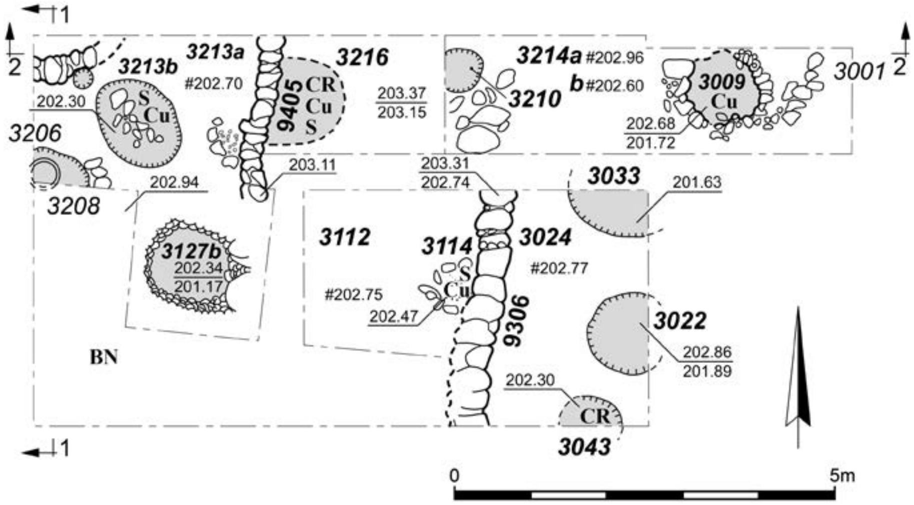

Fig. 2.110. Area Y Phase 7 (Strata VI-VIIA).

Key to metallurgical finds:
Cu = copper or bronze fragments,
S = slag,
CR = crucible,
BN = blowpipe nozzle.

L3206 and L3208 are Late Bronze Age loci (Ben-Dov 2011: Fig. 153).

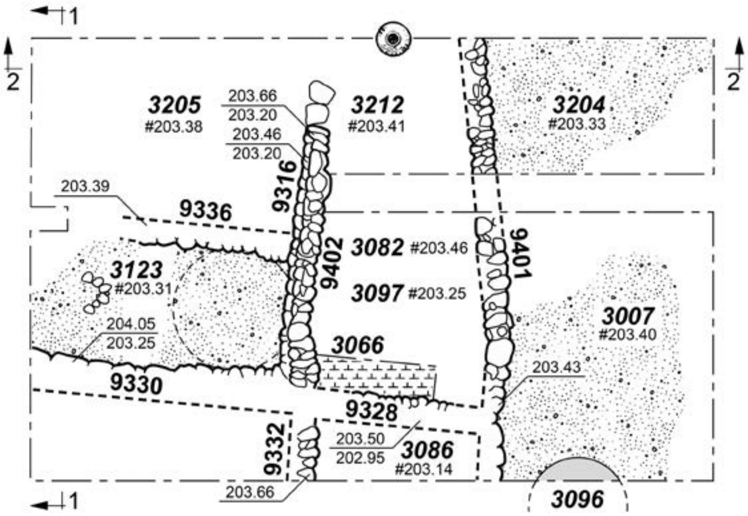

Fig. 2.111. Area Y Phase 6 (Stratum VI)

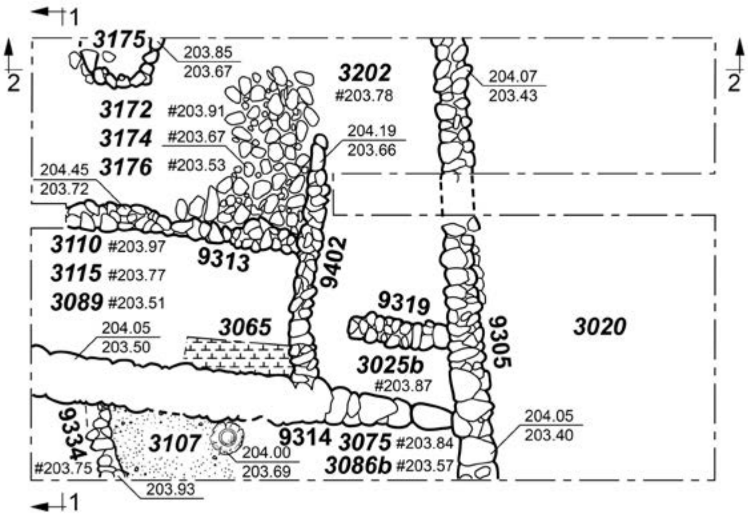

Fig. 2.112. Area Y Phases 4-5 (Stratum V)

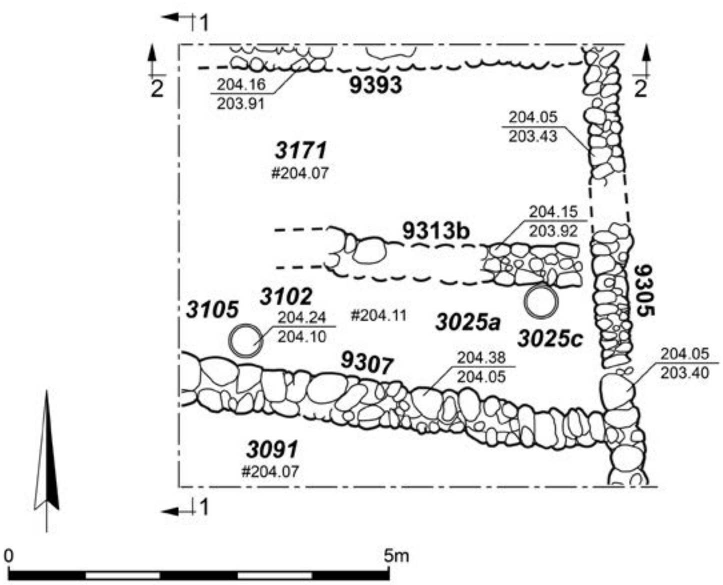

Fig. 2.113. Area Y Phase 3b (Stratum IVB)

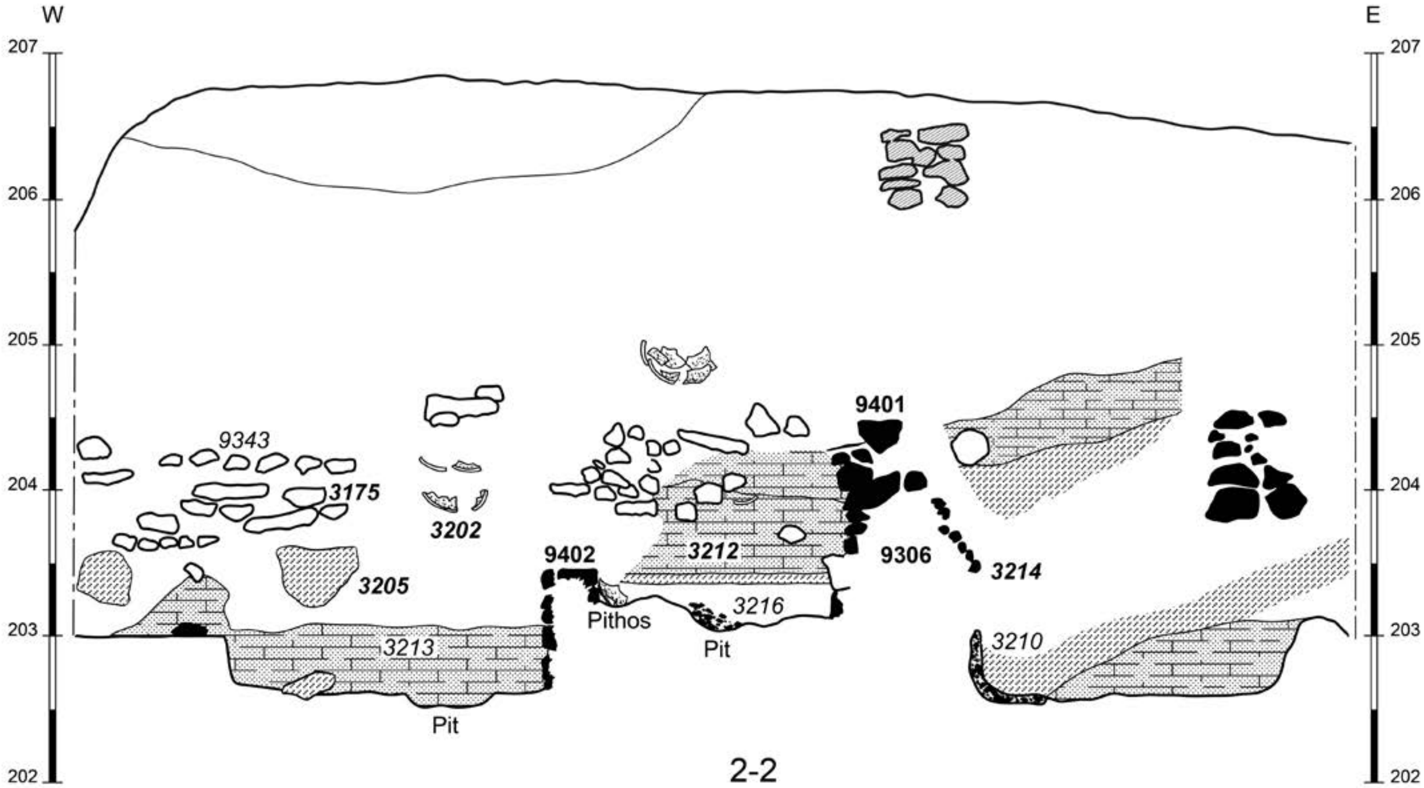

Fig. 2.114. Area Y, north balk drawing, 5-15m point.

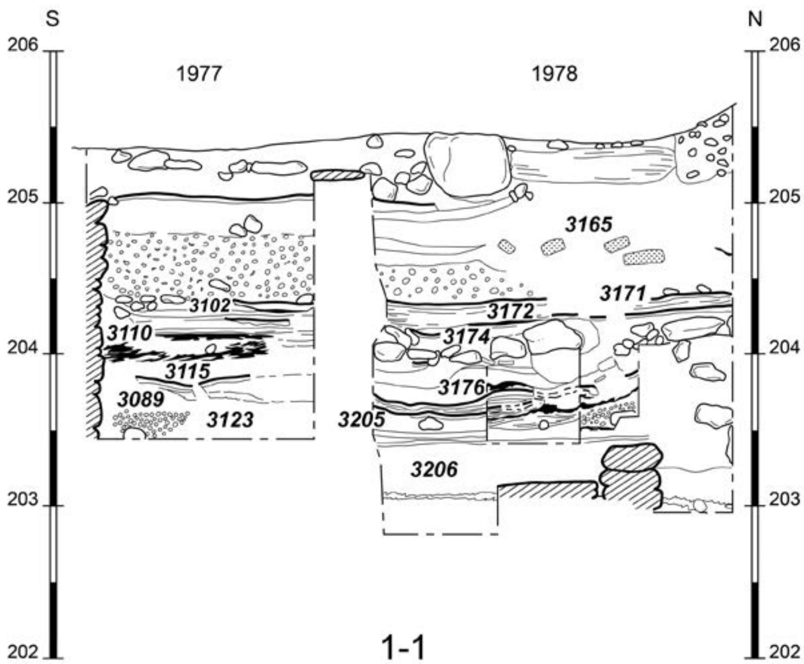

Fig. 2.115. Area Y, west balk drawing.

Area H

Five squares were opened up in this area (Fig. 2.116), on the same contour and side of the tel as Area B (Biran 1996: 29). Walls and surfaces, both paved and of tamped earth, were found under the IAII structures. Since the latter were not removed, the IAI exposure was much smaller and more truncated. Locus 609a yielded the only good pottery assemblage of the Iron Age I and should probably be assigned to Stratum V (Fig. 3.108:7-14). Locus 609b was a mudplaster-lined pit dug down into the Middle Bronze Age embankment. The uppermost part of the pit was apprehended *ca.* 20 cm. under the foundations of Stratum V W610 and it seems to predate the wall. However, since it is located right alongside the wall, traces of the upper part may have been missed or lost. Still, the situation is very much reminiscent of the Stratum VI to Stratum V progression in the other areas.

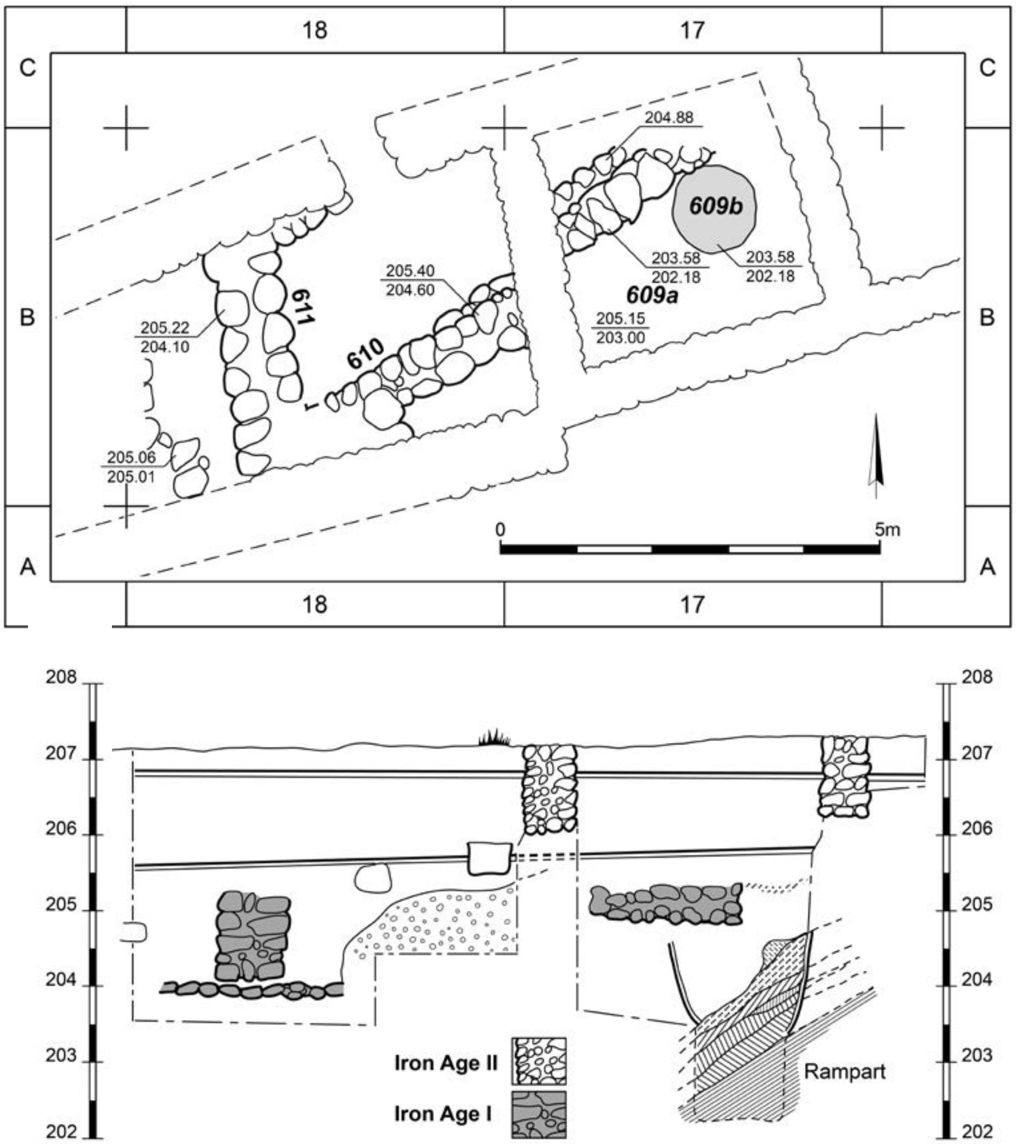

Fig. 2.116. Area H plan and section relating to Iron I levels.

Area K

Iron Age I material is sparse in Area K. Ben-Dov (2011: 135, Fig. 110) has described the Stratum VIIA1 remains as her final Late Bronze Age layer, but many researchers, would consider this an Iron Age IA context (below).

This level (Fig. 2.117) included a beaten earth floor (L6369) covered by a destruction layer of ash and collapsed stones (L6373). The material culture included red-slipped cyma bowls, a bell-shaped bowl with two horizontal handles (Dothan [1982: 95] Type 1), K1 and K2 kraters, a CP2b cooking pot and a flask with monochrome brown painted bands (Fig. 3.107). Further detail is supplied by Ben-Dov (2011: 135).

Ben-Dov (2011: 135) included two pits in her description of Stratum VIIA1 (Pits 6457 and 6448/6377) which contained no diagnostic material. But these would appear to better fit a Stratum VI attribution, since they penetrate the destruction layer of L6373 from above. One further pit (L6090) was found at the foot of the exterior rampart in Square C/3 (Biran, Ilan and Greenberg 1996: Plan 10). It gave up approximately one third of a type CP3a cooking pot. Only two other loci included Iron Age I sherds: L6045a in Square R/6, overlying the Middle Bronze Age rampart core, and L6201, in Square M/4, overlying LBII Stratum VII remains and underlying Stratum IVA (Iron Age IIA) remains (not in Ben-Dov's report).[25] These are both fill loci containing just a few Iron I sherds. Thus, Area K and Area A (below) are the only areas excavated that lack a substantial Stratum V-IVB presence. The presence of Iron Age I pits is interesting in itself and suggests that either grain storage or composting could have been conducted beyond the actual residential zone. In any case, this dearth of finds is too stark to be explained by the destructive effects of later building; perhaps the lack of settlement remains is due to this sector's distance from the springs.

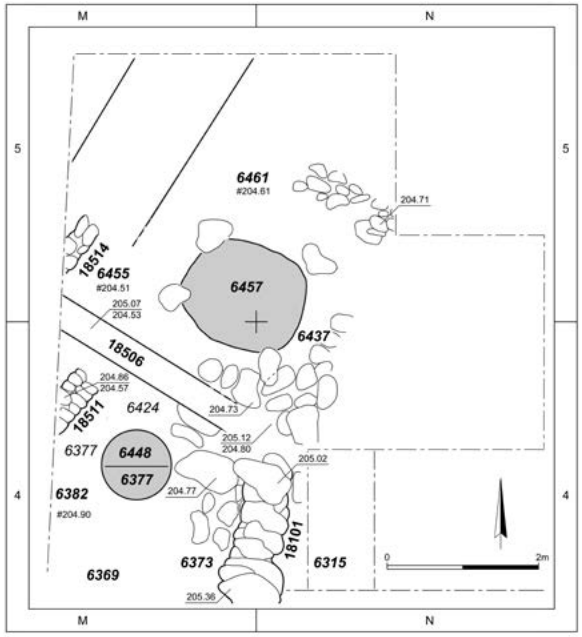

Fig. 2.117. Area K. Plan of Squares M4-5, Stratum VIIA1 remains (from Ben-Dov 2011: Fig. 110)

Area A

Area A is located at the southern, outer flank of the tel (Plan 1). The Iron Age I remains in this area are insubstantial. Two occurrences were noted. One was a concentration of large, restorable sherds (Fig. 3.108:5-6) encountered in a probe in Square A/4 (L7527). No floor or architecture was observed here (Biran 1996:17). Perhaps this was the floor of a hut or tent occupation; or perhaps the leftovers of some other extra-mural activity.

The other occurrence consists of four complete vessels found in L5009 in Square O/8, which appears to have been a pit in the slope behind, i.e. north of, the later Iron Age II fortification wall (W38, see Biran, Ilan and Greenberg 1996: Plan 2).

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25 To locate these contexts see Biran, Ilan and Greenberg 1996: Plan 10.

These vessels are two carinated bowls, a pyxis and a spouted jug with basket handle (a “feeder bottle” Fig. 3.108:1-4). Since the assemblage is made up entirely of complete, even intact, vessels, and since no subsequent Iron Age I architecture or surfaces were discerned, it does not appear to be derived from refuse. I have no supportable explanation; perhaps it is a ritual deposit, an idea that may require further consideration for other pit contents as well.

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CHAPTER 3

THE LOCAL POTTERY

Introduction

This typology was first constructed in the 1990's as part of the author's dissertation work (Ilan 1999). At the time of the dissertation's completion and distribution there were very few detailed typologies published from large Iron Age I sites with sizable excavated pottery assemblages; I noted that there were only two: Tel Qasile (Mazar 1985) and Tel Kinrot (Fritz 1993). Assemblages from other sites were either smaller—for example: Tel Hazor (Yadin *et al.* 1960; 1961), Ta'anach (Rast 1978), Tell Keisan (Briend and Humbert 1980), 'Izbet Sartah (Finkelstein 1986), Tel Qiri (Hunt 1987) and Shilo (Bunimovitz and Finkelstein 1993)—or excavated in the first half of the twentieth century and published in cursory form, at a time when determining a coarse typology was considered sufficient—Megiddo and Tell Beit Mirsim for example (Loud 1948; Albright 1932).

Since 1999 a flurry of sites with more substantial Iron Age I exposures and assemblages have been published in gratifying detail: *Tel Beth-Shean III* (Panitz-Cohen and Mazar 2009), *Yoqne'am II* (Zarzecki-Peleg *et al.* 2005), *Megiddo 3* (Harrison 2004), *Megiddo IV-V* (Arie 2006; 2013) and *Hazor VI* (Ben-Ami and Ben-Tor 2012). And Mazar (2015) has recently published a synthetic overview of Iron I pottery. These have required a reevaluation of my 1999 treatment. But I can report that most of the original typology and conclusions remain valid.

The excavation of contemporaneous levels at Tel Dan, with a fairly clear and continuous stratigraphic sequence from the Late Bronze Age into the late Iron Age, still constitutes one of the most extensive Iron Age I assemblages yet reported. It includes approximately 396 complete or near-complete vessels (see Table 3.1 below).

The typology presented here is based on the principles and methodology formalized first by Mazar (1985) for Iron Age I Tel Qasile and by Hunt (1987) for Tel Qiri. These typologies are neither overly complex nor overly simplistic and have become somewhat normative, adopted in some form by Panitz-Cohen (2009) in *Tel Beth-Shean III*, by Zarzecki-Peleg *et al*. (2005) in *Yoqne'am II*, and by Arie (2006; 2013) in *Megiddo IV* and *Megiddo V*. At the same time, for certain types (cooking pots in particular) I have adopted a more nuanced approach, where it was felt that diachronic development might be discerned. It must be admitted forthrightly that, like all typologies, the present one is based on morphological patterns observed empirically, placed into categories with boundaries that are often flexible, all of which is interpreted intuitively, to some degree.

I have declined to draw up extensive lists of parallels for the various types. Generally, parallels are drawn only where there is specific reason to do so. Otherwise reference is made to synthetic work that others have carried out. It will be noted that we are confining ourselves chiefly to the northern part of the country, where there is a greater likelihood of interaction (cf. Panitz-Cohen *et al*. 2009: 198). I have matched the Tel Dan typology to those of *Tel Beth-Shean III, Yoqne'am II* and *Megiddo 3* (Harrison 2004), *Megiddo IV,* and *Megiddo V* (Arie 2006; 2013), in a series of tables, inserted in the discussion by type.

The following descriptions of vessel types are accompanied by the type series presented in Figs. 3.109-126.

Remarks on Retrieval and Quantification

As in most excavations in the Levant, pottery retrieved at Tel Dan has been selectively retained. Every locus that exhibited the possibility of restoration was subjected to near-complete curation of pottery (though no sieving was done for very small sherds). Since most of the Stratum V and Stratum VI contexts were restorable, retrieval was closer to maximum than not. Stratum IVB was curated less comprehensively, because its contexts were sometimes mixed with surface material. Further gaps in the retrieval were created by unexcavated balks and surfaces left exposed over several years. Thus, the totals of both complete vessels and sherds represent minimum numbers.

A simple quantitative analysis of the ceramic types has been attempted—something on the order of those done by Mazar (1985) at Tel Qasile, Finkelstein at ‘Izbet Sartah (1986), Hunt (1987) at Tel Qiri and Bunimovitz and Finkelstein (1993) at Shiloh. In places, the Tel Dan typology is more nuanced, in the cooking pot category in particular, and in others less so, regarding the collared-rim pithos rim varieties for example. The quantitative discussion is mainly confined to complete vessels (Table 3.1), a large number of which were recovered from living surfaces and pits in many locations across the tel. Any vessel of which at least one third is preserved is considered complete. It is recognized that some degree of bias will result because some vessels preserved better than others. Pyxides, flasks and juglets, for example, break into fewer fragments than do cooking pots, jars, jugs and pithoi. In the future, it may be useful to derive mathematical formulae based on experimentation with various vessel types' breakage behavior to remove such bias. In the meantime the results presented here should be seen as provisional and more heuristic in value.

Table 3.1. Frequencies of complete ceramic vessels by area and stratum (MNI)

Stratum	Areas A and H	B-west	B-east*	M	T	Y	Total
VIIA1	0	5	8	0	8	4	**25**
VI	0	27	10	7	12	55	**111**
V	9	72	22	11	14	17	**143**
IVB	0	86	20	2	3	4	**117**
Total	**9**	**190**	**60**	**20**	**37**	**80**	**396**

* These totals are certainly much lower than what was originally found. This area was excavated mostly in the 1960s and early 1970s and more of the artifacts have gone missing.

Typology

Platter Bowls (Bp, Type Series Fig. 3.109:14-16)

Stratum VIIA1: Fig. 3.25:4; 3.107:2

Stratum VI: Figs. 3.33:5, 8-9; 3.101:2

Stratum V: Figs. 3.49:2; 3.50:5; 3.77:2

Stratum IVB: Fig. 3.66.1; 3.73:5; 3.93:9; 3.106:7

The simple Middle and Late Bronze Age type platter bowl, open and splayed outward, is surprisingly rare in the ceramic repertoire of the Iron I at Tel Dan. Only two complete profiles were recovered (Figs. 3.33:5 and 3.101:2) from Stratum VI contexts with many residual LB elements. Not one complete profile was found in Strata V-IVB. A number of the registered rims and bases of platter bowls are probably Late Bronze Age intrusions. Some chalice forms are essentially pedestaled platter bowls (see below); Figs. 3.33:8 and 3.107:2, for example, may belong to chalices of Type CH2a. Of course, the opposite may also be true in places—items identified as chalice bowls may be platter bowls.

Platter bowls with simple rims are Bp1a, those with simple everted rims are Bp1b, and those with thickened tapered rims are Bp2 (only Fig. 3.49:2).

The bowls in Figs. 3.73:5 and 106:7 are probably "bird-shaped cult bowls" similar to that published from Tel Qasile Stratum X (Mazar 1980: Fig. 29), or the associated but more schematized decorated bowls from Stratum XI (Mazar 1985: Pls.

18, 22). Mazar (2009b: 550) posits that bird-bowls of this type are an Egyptian-style artifact, which, at Beth Shean is quite common, but also adopted on the coastal plain by the Philistines.[1]

The repertoires of some contemporaneous sites do include certain platter bowl types, especially Tell Keisan Stratum 9 (more sporadically at other sites), but at most sites the carinated and hemispherical varieties were dominant. Hypothetically, wood, basket or metal vessels may have replaced the communal, serving function of the platter bowl.

Fig. 3.1. Hemispherical bowl (Bh1) = Fig. 3.94:1.

Hemispherical Bowls
(Bh, Fig. 3.1; Type Series Fig. 3.109:1-6)

Stratum VIIA1: Figs. 3.25:2,5,7

Stratum VI: Figs. 3.33:1; 3.36:1; 3.74:1; 3:102:1

Stratum V: Figs. 3.40:2; 3.49:1; 3.54:8; 3.87:1; 3.106:1; 3.108:2,5

Stratum IVB: Figs. 3.62:1-2; 3.66:2; 3.73:9; 3.78:1; 3.94:1; 3.95:7; 3.106:6

One candidate for the replacement of the platter bowls' function is the hemispherical bowl.[2] There are not so many of these, however—nothing like the percentage of platter bowls in the Late Bronze Age. While platter bowls are likely to have been serving plates—the larger ones for communal use—most hemispherical bowls are rather small, thus being vessels for individual consumption. Sherds of larger examples that lack bases are possibly chalice bowls (Type CH3, Fig. 3.110:7). Unlike the hemispherical bowls from contemporaneous assemblages (e.g. Tels Qasile, Keisan, Yoqne'am and Hazor) where both ring and flat bases exist, only flat base fragments are found on complete examples from Tel Dan. Ring bases appear confined to kraters in this period.

The hemispherical bowls have been divided into small (Bh1, 8-13 cm in diameter), medium (Bh2, 14-18 cm in diameter) and large (Bh3, 28-35 cm in diameter) categories. The larger category also looks very similar to the 'Manassite bowl' characteristic of the hill country of Manasseh, though the ware is not as coarse (Zertal 1994: 51-52). The larger variety is also not frequent. Rims are mostly simple, though slight thickening, beveling, tapering and profiling do occur.

Fig. 3.49:1 is the single example of a large hemispherical bowl with an everted rim (Type Bh4 - not in Type Series Fig. 3.109). Hemispherical bowls with rims that are thickened, everted and flattened, with some carination, are a feature of Stratum IVA and later. These features seem to be an amalgamation of the hemispherical and carinated bowl forms and herald a typical shape of Iron Age II (cf. Amiran 1969: Pl. 62).

Hemispherical bowls with bar or wing handles are also found, but not common (Fig. 3.33:1). Fig. 3.52:5 is a special form with interior flanges that connected in the center to form a cup—what is termed a "bowl-and-saucer" (see below).

Carinated Bowls (Bc, Fig. 3:2; Type Series Fig. 3.109:7-13)

Stratum VIIA1: Figs. 3.25:1, 3, 6; 3.28:6; 3.107:1, 3-4, 6-8

Stratum VI: Figs. 3.30:1; 3.32:4-5; 3.33:6-7; 3.35:3; 3.36:4; 3.39:6; 3.73:4; 3.98:1; 3.102:5

Stratum V: Figs. 3.41:5; 3.44:9; 3.46:2,4; 3.50:11; 3.53:1; 3.55:1-2; 3.91:1; 3.92:13; 3.93:3; 3.104:1-2; 3.106:5; 3.108:1

Stratum IVB: Figs. 3.58:5; 3.59:2; 3.61:1; 3.71:2; 3.95:5

Cyma- or S-profiled, these seem to be the successors of the flaring rim carinated bowls of

1 And see the sculpted bird's head discussed below, in Chapter 15.

2 Hemispherical bowls were also part of the LB assemblage (e.g. Amiran 1969: Pl. 38:24-25). Another candidate is perhaps the chalice, or pedestal bowl (see below).

Fig. 3.2. Carinated bowl (Bc3) = Fig. 3.46:4

the Middle and Late Bronze Ages (Amiran 1969: Pl. 39). They have been subdivided here into small (Bc1, diameter 12-17 cm), large (Bc2, diameter 30-50 cm) and hybrid hemispherical/carinated (Bc3) types which have the small diameter of the Bc1 variety. The Bc4 type also shares features with both the carinated and hemispherical bowl categories though it only appears from Stratum IVB on and even in that level it is very rare. At Tel Qasile the Bc4 type (a variant of Mazar's Bowl 1) appears from Stratum XI onward. It later evolves into the common "angular bowl" (Zarzeki-Peleg 1997: Fig. 9, Type 8), often attributed to the Samaria Ware class (Amiran 1969: Pl. 66:1-6).

The large Bc2 bowl can have a more vertical or a more everted rim throughout the period under discussion (compare for example Figs. 3.25:1 and 3.35:3). It is rarely found with its base but parallel assemblages show that this is usually a ring base (e.g. Mazar 1985: Fig. 29). Certainly, by Stratum IVB the ring base is normal and the rim attains the classic Iron Age II hammer-shaped profile (Fig. 3.61:1; cf. Amiran 1969: Pl. 62). But this rim was already typical of several chalice forms earlier on (below).

Of the carinated bowls lacking a base, the larger ones may belong to chalices, though only certain profiles can be assigned as such categorically (below). Smaller ones may be the elaborated rims of flasks (cf. Fig. 3.125:4 = FL4).

Table 3.2. Selected Tel Dan bowl and chalice typology correspondences with some key contemporaneous typologies (and cf. Panitz-Cohen 2009: Fig. 5.1).

Dan IV	TBS III	Yoqne'am II	Megiddo IV
Bh1	BL75	B IA	BL1-2
Bh2	BL75	B IA	BL1-2
Bh3	BL75	B IC	BL1-2
Bc1	BL77	—-	BL3
Bc2	BL77	B IIID	BL3
Bc3	BL81	B1D2	BL4
Bc4	BL76	B1B	BL6
Bp1	BL72	B IVA	—

Chalices (CH, Fig. 3.3, Type Series Fig. 3.110:1-8)

Stratum VIIA1: Figs. 3.79:1-2; 3.80:4; 3.107:2

Stratum VI: Figs. 3.33:8; 3.82:1-3; 3.102:12-13

Stratum V: Figs. 3.43:5,9; 3.46:6; 3.48:7; 3.49:2,10; 3.51:6-7; 3.55:4-5; 3.67:1; 3.87:4; 3.93:1, 9

Stratum IVB: Figs. 3.58:3; 3.66:7-8; 3.69:2; 3.71:3, 5, 8-10; 3.72:3-6, 8-9

A chalice is defined as a bowl on a pedestal. Tel Dan displays one of the largest corpuses of chalices of any Iron Age I site. Instead of the complete pedestal, the bowl can also have a stem that was meant to be inserted into a stand (Fig. 3.72:8-9 and see below). The complete chalices have been subdivided into the following categories, depending on the shape of the bowl:

CH1—carinated bowl with everted, flaring rim.

CH2—rounded bowl and everted rim, being either more open (CH2a) or more closed (CH2b).

CH3—rounded bowl, being slightly carinated (CH3a), having a thickened rim (CH3b) or a simple rim (CH3c).

CH4—straight-sided bowl with a flattened (CH4a) or profiled (CH4b) rim.

The later type seems confined to the earlier, Strata VIIA1 horizon (Figs. 3.79:1-2; 3.80:4). Parallels seem to show that it usually comes from earlier

Fig. 3.3. Chalices: a = Fig. 3.79:1 (CH4b), b = Fig. 3.48:7 (CH1), c = Fig. 3.69:2 (CH3b), d = Fig. 3.51:6 (CH3a)

contexts (cf. Guy 1938: Pl. 30:4 from Megiddo Tomb 911A1).

CH5—having a low carination and a high, almost vertical wall (cf. Amiran 1969: Pl. 68: 13,19). This type is not relevant to this discussion as it is a feature of Stratum IVA and after.

If only the upper, bowl portion of a chalice is recovered it is often indistinguishable from a bowl of either the carinated or hemispherical variety. However, those with an everted, ledge rim (CH1 and CH2) are almost always chalices rather than carinated or platter bowls. The base of the pedestal can be either a simple flaring one (e.g. Fig. 3.110:1), or carinated (e.g. Fig. 3.110:4). Some examples, apparently confined to Stratum IVB, show a massive conical stump at the join between the bowl and the pedestal (e.g. Figs. 3.71:9, 3.72:4).

Many have signs of burning in the bowl interior. There are several possible explanations for this, for example: the burning of incense (e.g. Amiran 1969: 302-303), use as a brazier, or as part of the metallurgy process (here Fig. 3.129 and see Ben-Dov 2011: 84-86). Another possibility is the burning of medicinal or psychoactive substances (entheogens): opium, *Ephedra, Peganum harmala* (harmal), *Cannabis* or *Artemisia arborescens* (wormwood) for example (e.g. Merlin 2003) Nevertheless, the fact that so many don't have signs of burning may indicate either an insulating layer or other uses as well.

The distribution of this vessel at Tel Dan in time and place is instructive. In Strata VIIA1 and VI they are found mainly in Area T (Figs. 3.79:1-2; 3.80:4). Even in later phases they are more frequent in Areas T and B-west. Since Areas T and B-west maintained ritual and metallurgical loci it stands to reason that chalices are connected to one or both of these practices.

Table 3.3. Tel Dan chalice typology correspondence with some contemporaneous typologies (and cf. Panitz-Cohen 2009: Fig. 5.2)

Dan IV	TBS III	Yoqne'am II	Megiddo IV
CH1	CH70	C II	CH1
CH2	CH70	C II	CH1
CH3	CH72	C I	—
CH4	CH71	C I	—

Stands (ST, Type Series Fig. 3.110:9)

Stratum IVB: Figs. 3.71:4,6; 3.72:7

At least some stands were meant to accommodate a bowl with a prominent base—e.g. those with long stems in Fig. 3.72:8-9. One of the types conspicuous in its absence at Tel Dan is the fenestrated stand (Amiran 1969: 304-305).

Kraters (K, Type Series Figs. 111-112)

Kraters of Strata VI-IVB follow closely upon the Late Bronze Age forms, often being indistinguishable from the latter (cf. Ben-Dov 2011: 226-231). Kraters are always carinated and almost always have ring bases. Following standard practice, they have been divided into several categories based on rim form and the number of handles. With incomplete examples however, it is not always possible to know whether a krater had two, four or more handles, or none whatsoever.

K1—These have a thickened 'ledged' rim, most often 'hammer-shaped' in profile but sometimes either squared or everted. They comprise the most common class of krater by far. Many, roughly half, have painted decoration. They have been subdivided according to whether they have two or four handles. Of course, when dealing with rim sherds it is often not possible to tell whether a fragment belongs to a two- or four-handled krater. These undifferentiated K1 fragments are represented by the following:
Stratum VI: Figs. 3.36:7; 3.39:5;
Stratum V: Figs. 3. 41:6; 3.44:2, 6;
3.51:1; 3.52:1; 3.57:5; 3.88:4; 3.92:6
Stratum IVB: Figs. 3.66:4; 3.69:1;
3.90:2; 3.94:2; 3.95:2

K1a—Kraters with four handles (Fig. 3.4a-b, Type Series Fig. 3.111).
Stratum VI: Figs. 3.31:1; 3.35:5;
3.36:10; 3.38:4; 3.99:2;
Stratum V: Figs. 3.43:3; 3.51:10, 13; 3.56:7
Stratum IVB: Figs. 3.60:4; 3.61:4

The dominance of the four handled type is noteworthy in contrast to the preponderance of the similar two-handled krater everywhere else. At Dan it appears to be an Iron I development, not being present even in Stratum VIIA1. Fig. 3.99:2 from Pit 3127b is an unusually large and deep one—similar in dimension to its multi-handled counterpart (K2a) from the same pit (Fig. 3.99:1). Fig. 3.44:10 is a more heavy-duty vessel with a large volume (K2b); perhaps it served a more industrial purpose. The more squat kraters with a vertical wall above a pronounced but rounded carination (e.g. Fig. 3.61:4) are more characteristic of Stratum IVB.

K1b—Kraters with two handles Type Series Fig. 3.112
Stratum VIIA1: Fig. 3.80:4
Stratum VI: Figs. 3.31:2; 3.33:11; 3.102:8; 3.103:1
Stratum V: Figs. 3.43:4; 3.45:2; 3.48:3;
3.55:3; 3.82:4; 3.85:9; 3.89:3
Stratum IVB: Figs. 3.63:5; 3.70:1; 3.71:7;

These have profiles like the four-handled kraters, but by Stratum IVB appear to be either squatter and tend toward flat bases (e.g. Fig. 3.71:7) or to have rounded carinations and vertical walls above (e.g. 3.70:1). Some fragments have been drawn as two-handled kraters, but may be four-handled.

K2a—Kraters with multiple (more than four) handles (Fig. 3.4c).
Stratum VI: Fig. 3.99:1
Stratum V: Fig. 3.56:8
Stratum IVB: Fig. 3.71:1

The few complete examples found show a wall that flares outward above the carination, in contrast to the usual inverted wall of the K1type. In this way they seem more reminiscent of the MBII-LBII flaring-rim carinated bowl and krater tradition (Ben-Dov 2011: 226-229). In fact, some K2a kraters have almost identical LBII counterparts, differing only in having multiple handles.

The K2a rim forms also tend to be ledged, flat-topped or slightly rounded, like the K1type. These rims can be much like the Galilean and Phoenician pithos rims and it is often hard to tell the rim sherds of the two vessel types apart. Thus, the totals tabulated for K2a krater sherds may be underrepresented—prejudiced in favor of the Galilean pithoi. K2 kraters, however, are more often made of yellowish red or pink clay, while the Galilean pithoi are most often reddish brown. Though not frequent at any particular site, multi-handled kraters are found at many Iron Age I sites throughout the country, both highland and lowland (Finkelstein 1988: 288), and the type continues into the Iron Age IIA.

K2b—Multiple handled krater that has an inverted wall and a more rounded, if any, carination.
Stratum V: Fig. 3.44:10; 3.95:3

It is also a larger, more massive vessel. It is uncommon in the Tel Dan assemblage (only four

Fig. 3.4. Kraters: a = Fig. 3.38:4 (K1a), b = Fig. 3.36:10 (K1a), c = Fig. 3.99:1 (K2a), d = Fig. 3.59:3 (K5), e = Fig. 3.66:9 (K4b).

or five have been identified). Iron Age I comparisons come from Shiloh Stratum V (Bunimovitz and Finkelstein 1993: Fig. 6.52.8) and Beth-Shean Stratum VI, (Rowe 1940: Pl. 46:13) for example (and see Amiran 1969: Pls. 69-70). This very same type remained a standard component of the Iron Age II repertoire in both north and south Canaan (Amiran 1969: Pls. 71-73).

K3—Kraters with a gently inverted wall and a simple or slightly thickened rim.

Stratum VI: Fig. 3.112:5

Stratum V: Figs. 3.44:5; 3.85:4; 3.104:4

Generally similar to the K1 category, these kraters are not common at Tel Dan and are only found as sherds. They are also found at Tel Qasile—also in small quantities (Mazar 1985: 47, Type KR3), and at Tel Qiri (Hunt 1987: Fig. 39:12-14) for example. The CP3e cooking pot is quite similar—the ware differentiates them.

K4—Kraters with a pronounced carination and a rim that is folded out and down (Fig. 3.4e).

Stratum VIIA1: Figs. 3.28:7; 3.74:3; 3.81:5

Stratum VI: Figs. 3.35:6; 3.84:6; 3.100:4

Stratum V: Figs. 3.44:11; 3.46:5; 3.48:6; 3.55:9; 3.56:4; 3.76:4, 10-11; 3.90:4; 3.108:11

Stratum IVB: Figs. 3.66:3,8; 3.67:9; 3.94:3-4

The ware of these tends to be pinkish yellow, as opposed to the yellow red and reddish brown of other krater varieties. It is also characterized by having many small to medium sized white carbonate grits. This very specific type already existed in the Late Bronze Age at Tel Dan (Ben-Dov 2011: Fig. 124, Kr3a) and other sites. Mazar (1985: 47, his Type KR3a) has pointed out that it is especially common in the Jezreel Valley assemblage, at Ta'anach in particular (Rast 1978: 12), in the Iron Age I. In its essentials, it enjoyed a long floruit at Tel Dan, down to Stratum II (Iron Age IIB, 8th century BCE). Over time, there appears to be a tendency for the carination to move lower down and to become more rounded.

The K4a type has high carination and either an ovoid or slightly trapezoid section. It is more typical of Strata VII-V. The K4b type has a lower carination and a more triangular profiled rim. It is more characteristic of the Stratum IVB assemblage and later, and resembles the CP2b5 cooking pot. The IAIIB version has a lower, more rounded carination and less ovoid, more horizontal rim (Pakman 1992: Fig. 2:2).

K5—Kraters with cooking pot profiles (Fig. 3.4d).
Stratum V: Fig. 3.54:9; 3.85:5
Stratum IVB: Fig. 3.59:3; 3.67:3

While the K4 type with the rounded rim has a profile that is similar to the typical cooking pot, the K5 type mimics the cooking pot profile exactly, particularly the CP3b1/2 or CP3c1/2 varieties. Though many of us have puzzled over it at various sites, Hunt (1987: 194) was apparently the first to stake it out as a krater by definition. In most publications the form is called a cooking pot.

Bell-shaped kraters of the Philistine type (Dothan's [1982] Type 2 and Mazar's [1985] Type K2) are conspicuously absent. Nor were any horizontal handles found. This is surprising given the occurrence of other seaboard type pottery and material culture (below Chapter 4).

Kraters are frequently decorated. This usually takes the form of painted ornamentation on an untreated surface. A light red wash is found on the exterior of a few (e.g. Fig. 3.60:4) but nothing of the lustrous slip one sees on some later Iron II bowls, kraters, jugs and juglets. There is almost no burnishing of kraters whatsoever in this period.

The painted decoration can be either monochrome or bichrome. Generally it is only the portion of the vessel above the carination that is painted. Varieties of triglyph and metope motif placed between horizontal bands are omnipresent. The horizontal bands can contain the entire upper vessel, resulting in a larger metope (e.g. Fig. 3.102:8; 3.82:4), or only the shoulder zone, leaving a more narrow band to fill (Fig. 3.56:7). Triglyphs often show wavy vertical lines between them (Fig. 3.33:11; 3.82:4). Metopes can contain simple geometric designs—triangles, net-patterns, and the like (e.g. Figs. 3.36:7; 3.52:1; 3.56:7; 3.69:1)—or figurative representations, the backward-looking bird being the most conspicuous (Figs. 4.15:1-2 and 4.16:9-10 and see Zuckerman's discussion in Chapter 4 concerning the Philistine motifs). Handles are often painted, with either simple vertical lines (e.g. Fig. 3.56:7), a union jack (not illustrated), or horizontal lines (Figs. 3.63:5; 3.45:2). Most of these motifs are clearly in the Late Bronze Age tradition (cf. Ben-Dov 2002: 2.54:16 and Amiran 1969: Pl. 41).

Table 3.4. Tel Dan krater typology correspondence with other typologies (cf. Panitz-Cohen 2009: Fig. 5:3).

Dan IV	TBS III	Yoqne'am II	Megiddo IV
K1	KR70-71	K IIA–B	K2, K4, K6
K2	KR72a	K IIC1	K5
K3	KR71a	K IA2	—
K4	KR74	K 1A3	K1
K5	—	—	—

Composite Vessels: Cup-and-Saucer (C&S) and Lamp-and-Bowl (L&B)—Type Series Fig. 3.113:1-2

Stratum VI: 3.75:1(C&S)
Stratum V: Figs. 3.52:5 (C&S); 3.56:6 (L&B); 3.75:2 (C&S); 3.106:2-3(C&S or L&B)
Stratum IVB: Fig. 3.63:7(C&S); 3.95:8(C&S?)

Curiously, the cup-and-saucer and lamp-and-bowl composite vessels are not found in the Late Bronze Age levels at Tel Dan, while they do occur in other parts of Canaan, even as nearby as Tel Hazor (Uziel and Gadot 2009).[3] These vessels continue to appear in Iron Age I assemblages; at

3 The lack of composite vessels in the Late Bronze Age levels at Tel Dan may be a matter of serendipity, since the assemblage is much smaller and more disturbed than those of the Iron I. Some bowl or lamp fragments may belong to such composite vessels, though, admittedly, none of the telltale composite portions have been recovered.

Tel Dan they appear for the first time in Stratum VI. These items are not frequent, but the counts are probably too low because rim fragments can be difficult or impossible to distinguish from the rims of some bowl, lamp, jug, flask or pyxis types. When fragmentary, the composite vessels are mainly identified by the join between the cup (or the lamp) and the saucer.

The cup-and-saucer suggests an amalgam of the lamp-and-bowl deposits discussed by Bunimovitz and Zimhoni (1993 and see Yannai 1996: 245-246 and Uziel and Gadot 2009: 49). Bunimovitz and Zimhoni concluded that these deposits were cultic offerings—foundation deposits—usually interred under floors and alongside walls. This practice was thought by them to have Egyptian antecedents but to have been adopted and transformed by local peoples. A similar conclusion has been drawn by Uziel and Gadot (2009) for the cup-and-saucer: it was introduced as a ritual vessel by the Egyptians and perhaps adopted by locals—of the lowlands in particular. Its absence in the Central Highlands may correspond to early Israelite cultural and religious sensibilities. Their resurgence in the Iron Age IIA in Samaria "may signify the more open nature of Israelite culture, as opposed to that of Judah" (Uziel and Gadot 2009: 52). In this context it is notable that lamp-and-bowl deposits are confined, for the most part, to the region south of the Jezreel Valley, and to the later part of the Late Bronze Age until the 11th century BCE. The cup-and-saucer, however, is quite frequent at Hazor (Uziel and Gadot 2009: Table 2).

Regarding the function of these vessels, Uziel and Gadot (2009) have summarized the various proposals, one being that water was added to raise the oil level for efficient consumption of oil in lamp illumination (Kaplan 1954). The other explanation suggests that two liquids, both probably lipids, somehow operated together to create both illumination and scent (Amiran 1953; Dothan 1953). These hypotheses should probably be tested.

Perforated Vessels: Tripod Mug (TM – Type Series Fig. 3.113:3), Perforated Goblets (Gperf—Type Series Fig. 3.113:4) and Strainer (Str—Type Series Fig. 3.113:5)

Stratum VI: Fig. 3.75:3 (Str)

Stratum V: Figs. 3.48:1 (TM); 3.90:3 (TM)

Stratum IVB: Fig. 3.63:8 (TM), 3.69:7 (Gperf), 3.73:3 (Gperf)

Tripod mugs seem to make their first appearance in Stratum V but these seem to be precocious loners. The more complete, and more standardized examples come from Stratum IVB. They all have either one or two rows of evenly spaced perforations. The form itself is documented in the Submycenaean corpus of the Helladic world and may have its origins in the Late Helladic tripod cooking pots (Mountjoy 1993: 82, 117-118, No. 346).

Goblets of the type common at Tel Qasile and Megiddo (e.g. Mazar 1980: 49-51) have not been identified in contemporaneous contexts at Tel Dan at all. Goblet rims and bases would be difficult to isolate as sherds; goblet rim sherds may be labeled as jug rims, and goblet bases as those of chalices or pedestaled jugs. Several such high bases are suspicious candidates. The type may exist but remains undetected. The only complete vessel that resembles the type in profile is the perforated goblet of Fig. 3.73:3. This vessel has five rows of evenly spaced perforations aligned around the upper half of the vessel.

The function of vessels with perforations in their upper portions is still something of a mystery. The obvious hypothesis is that they are incense burners, perhaps based on their resemblance to Byzantine and medieval censers. But it is also possible that they are strainers, where their solid contents sank to the bottom and liquid flowed out of the perforations, with the intention that the contents at the base maintained some residual moisture.

More obviously a strainer is Fig. 3.75:3, a small bottle-shaped vessel that has multiple perforations at the base. Such a vessel could also have been used for the preparation of infusions with botanical substances.

Lamps (L, Fig. 3.5—Type Series Fig. 3.113:6-8)

Stratum VI: Figs. 3.30:2; 3.38:6; 3.100:3

Fig. 3.5. Lamp (= 3.51:12).

Stratum V: Figs. 3.51:12; 3.85:13; 3.92:11; 3.104:6
Stratum IVB: Figs. 3.62:10; 3.68:4; 3.70:5

Lamps changed little throughout the second millennium BCE. In the Iron Age I levels at Tel Dan, as at other sites, there is an increased tendency to a pinched nozzle whose facing rims are roughly parallel and then splay outward as the bowl opens up away from the nozzle (e.g. Fig. 3.51:12). Further, the bowl of the lamp is often flatter and somewhat more shallow (Fig. 3.104:6) than are the LB lamps (cf. Ben-Dov 2011: Fig. 185). Fig. 3:62:10 is handmade.

The Tel Dan lamps are almost all of Beth-Shean Type LP71 (Panitz-Cohen 2009: Fig. 5:11) and Yoqne'am Lamp L I (Zarzecki-Peleg *et al.* 2005: Fig. II.12:1).

Cooking Pots (CP, Figs. 3.6-3.7, Type Series Figs. 3.114-3.117)

This is by far the most common component in the ceramic assemblage.[4] Cooking pots are identified by soot remains on the lower portion of the vessel, below the carination and by virtue of the fabric, which is generally coarse and usually contains a crushed, crystalline, calcite component. Almost all rims are folded out and down, forming an exterior collar. A detailed cooking pot typology has been constructed based on rim form, in a hierarchical arrangement, using the following criteria:

Rim-neck direction

1. Everted
2. Vertical
3. Inverted
4. Profiled (appears only in Stratum IVA)

Rim length (when folded)

a. Short (12-20 mm)
b. Medium (20-30 mm)
c. Long (30-40 mm)
d. Very long (>40 mm)
e. Simple—no fold

Rim form (when folded)

1. Concave
2. Flat
3. Convex
4. Grooved
5. Horizontally tapered

Thus for example, a cooking pot rim labeled CP3b1 is inverted, folded out and down with a medium-length collar that is concave in profile. No complete pots with everted rims of the LBII type (CP1a) were found in clean Iron Age I contexts, though quite a few sherds of this type do occur

4 I have refrained from making comprehensive references to the drawings as this would be superfluous.

Fig. 3.6. Cooking pots: a = Fig. 3.105:1 (CP2a2), b = Fig. 3.105:3 (CP2b2), c = Fig. 3.98:2 (CP2a3), d = Reg. no. 13787/3, L3175, Phase Y4, Stratum VA (CP2a3)—not drawn.

in Strata VIIA1-VI contexts, in particular. Strata VIIA1-VI levels show a higher percentage of vertical and short collared-rims than do the Stratum V levels. Stratum IVB rims show a greater preponderance of elongated and ridged rims. This pattern is similar to that demonstrated at Yoqne'am Stratum XVII and Megiddo Stratum VIA (Zarzecki-Peleg 1997: Figs. 2:6, 3:6), Tel Qiri Stratum VIII (Hunt 1987) and just about every other contemporaneous assemblage with a stratified sequence of Iron Age I ceramics. At the same time it must be stressed that even with complete vessels, there is a significant overlap in types. It is impossible to distinguish between Stratum VI and Stratum V contexts solely on the basis of presence/absence. It is only the relative frequencies of certain features that change over time. This is less true for Stratum IVB, where very long collared rims appear for the first time. But even here, the majority of the cooking pots still show the CP3b1-3 type rims, as do the Stratum V pots, though more of these lack the overhang (see below).

There are certain aspects of the cooking pot assemblage that are not adequately represented by the rim typology. Fig. 3.114 shows that there are small cooking pots and large cooking pots, in a variety of circumferences and volumes. One assumes that this reflects the different quantities needed for cooking in any kitchen. Some foods are prepared in larger quantities—for feasting, for wider distribution or trade—and others are prepared in smaller quantities—sauces, precious items available in small quantities, or portions for an individual nuclear family or for a family's high status members, for example. There is a significant statistical bimodality of pots 20-25 cm in diameter and those that are 41-45 cm in diameter. These must be the most frequently used sizes in the cooking tradition of the Tel Dan inhabitants. At the same time, Stratum IVB shows a distinct drop off in the proportion of very large cooking pots, relative to earlier strata. Perhaps this is an indication that communal food preparation and consumption was somewhat less common and that more of this was done in the framework of nuclear families.

Pots with overhanging rims are much more common in Strata VIIA1–V than in Stratum IVB. In the later phases of Stratum V (what I have

Fig. 3.7. Cooking pots: a = Fig. 3.34:2 (CP3b1), b = Fig. 3.67:8 (CP3b4).

termed VA) there appears a rim in which the bottom edge of the fold is flush with the fold—what Hunt (1987: Fig. 33) has termed the 'horizontal' rim. By Stratum IVB the 'horizontal' rim comprises approximately 60% of the cooking pot rims.

Cooking pots are always carinated to a greater or lesser degree and they always have rounded bottoms (when preserved). Most do not have handles, but some do, in all the Iron I phases (Figs. 3. 7b; 3.55:12; 3.76:4; 3.97:1; 3.105:3).

Table 3.5. Tel Dan cooking pots typology correspondence with other typologies.

Dan IV	TBS III*	Yoqne'am II	Megiddo IV
CP1	CP74	Type CI-II in Yoqne'am III	—
CP2-3, a–c, 1-4	CP70a, CP70b	CP I = Dan CP2a3 CP II = Dan CP3a3 CP IIIA = Dan CP2a2 CP IIIB = Dan CP2b2 CPIVA = Dan CP2a1	CP1a = Dan CP2a–e1 CP1b = Dan CP3a–e1 CP2a = Dan CP2a–e2 CP2b = Dan CP3a–e2 CP2b1 = Dan CP3a–e2 CP3 = Dan CP3a–e3
—	CP71	—	—
CJ (without handles)**	CP72-73 (with handles)	CP IX (with handles)	CJ1 (with handles)

* cf. Panitz-Cohen 2009: Fig. 5:4

** This type is discussed below, in the section on Egyptian-style pottery.

Chronologically, we can discern patterns in cooking pot development through the Iron Age I levels. The CP1 cooking pot—that with the everted rim—is present primarily in the form of Late Bronze Age residual sherds; no complete vessels were recovered from the Iron I levels under discussion here. Cooking pots with the more vertical rim—CP2—are more indicative of the early Iron Age IA levels—Strata VIIA1 and VI. But they continue to occur in Stratum V as well. The CP3 pots—those with an inverted rim—tend to be more characteristic of Strata V and IVB, but there are a number of CP3 types in the earlier strata as well. The long, folded-out-and-down rim (CP3c) becomes significant—though not exclusive by any means—in Stratum IVB, as has been recognized in parallel assemblages at other sites (e.g. Hunt 1987; Mazar 2015: 12). Statistically the patterns are clear, but, for the most part, individual items cannot be depended upon as typo-chronological anchors.

Baking Trays (BT, Fig. 3.8, Type Series Fig. 3.113:9-12)

Stratum VIIA1: Figs. 3.25:9; 3.29:12; 3.81:9

Stratum VI: Fig. 3.84:3, 7

Stratum V: Figs. 3.51:9; 3.76:5, 13; 3.84:3,7; 3.92:8; 3.106:4

Stratum IVB: Figs. 3.64:7; 3.94:12

Baking trays are characterized by a ware similar to that of the cooking pots (containing crushed crystalline calcite) and have a convex, platter-bowl shape. I have adopted the typology used by Hunt (1987: Fig. 41): BTa has a simple rounded rim; BTb has a thickened rim; BTc an outturned rim; BTe has a beveled or squared-off rim. The BTa type is the most common by far. No inturned (Hunt's Btd) or indented (Hunt's Btf) rims were found.

Usually, traces of soot are present on the concave side. When the soot is found on the convex side, the same vessels have been termed skillets (cf. Hunt 1987: 199), though they could be for baking bread too. Differentiation of the two is sometimes difficult, particularly when the item is found in a destruction layer.

The central portion of the exterior of the baking tray is always covered with punctures or notches that are not perforations—probably to hold the flat dough in place. Unlike many baking trays further south, none were marked by circular incised bands that served the same purpose.[5] Like Tel Qiri, they are not found in ovens and may thus have been intended for open fireplaces or ranges (Hunt 1987: 199).

Table 3.6. Tel Dan baking tray typology correspondence with other typologies.

Dan IV	TBS III	Yoqne'am II	Megiddo IV
BTa	—	CP XIA1	BT1
BTb	—	CP XIA1	—
BTc	—	—	—
—	—	CP XIB	—
BTe	—	CP XIA2	—

Pithoi (P – Type Series Figs. 3.118-3.120)

Pithoi are divided into the three main types described below, with additional subtypes suggested to be hybrids.

Collared-rim pithoi (PCR, Figs. 3.9-3.10; 3.118)

Stratum VIIA1: Figs. 3.25:15; 3.80:3,5

Stratum VI: Figs. 3.30:3-5; 3.34:4,8; 3.35:2; 3.36:2, 6; 3.37:6-7; 3.38:1-2; 3.39:2; 3.75:8-10; 3.101A:1

Stratum V: Figs. 3.44:8; 3.45:3,11; 3.46:1,8-9,11; 3.47:1-2; 3.49:12; 3.50:2; 3.52:3,10; 3.54:4; 3.57:4,7; 3.76:6; 3.85:2; 3.86:6; 3.89:2; 3.91:12-13

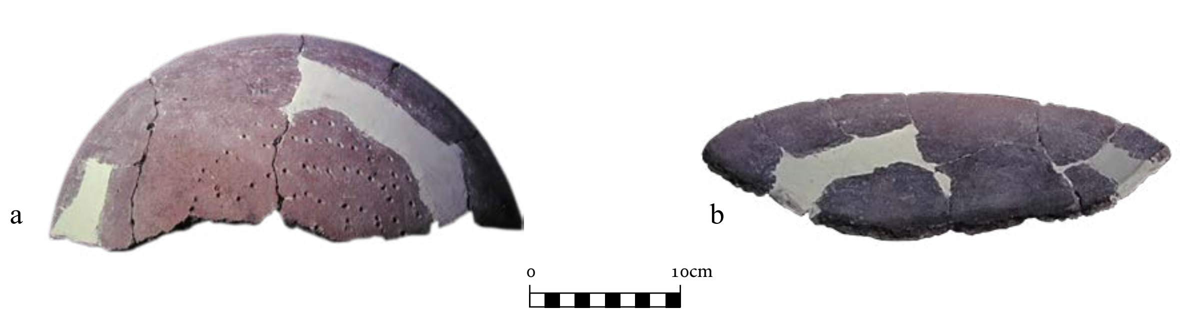

Fig. 3.8. Baking Tray = Fig. 3.64:7 (Type BTe)

5 At Tel Qiri all the baking trays appear to have incised bands and none are illustrated with notches (Hunt 1987: Fig. 41). At Tell Keisan, it appears to be about half and half (Briend and Humbert 1980 Pls. 52, 55, 63, 77). At Tel Dan all were notched.

Fig. 3.9. Collared-rim pithoi: a = 3.47:2; b = 3.38:1; c = 3.37:6; d = 3.38:2

Stratum IVB: Fig. 3.63:2

The collared-rim pithos at Tel Dan ranges in height from 95-120 cm and has an inner mouth diameter from 15 to 22 cm. The vessels weigh 27-38 kg and their capacity is c. 145-200 liters (cf. Hopkins 1985: 150; Zertal 1988: 351; and especially Raban 2001: 513-518).

The rim is folded out and down to form the eponymous collar.[6] This can take a number of forms (Fig. 3.118). Several analysts have attempted to classify collared-rims by form, but with limited success, since for the most part the different varieties seem to coexist (Finkelstein 1988: 276-278; Killebrew 2001: 382-383). It has been suggested that the thinner rim at Shiloh represents a later phase (Bunimovitz and Finkelstein 1993: 159). Killebrew (2001) posits that only the neck height is of significance, higher necks being earlier and lower necks being later, though she acknowledges much overlap. At Tel Dan, the neck is usually fairly short (4-9 cm, cf. Killebrew's Type B). Almost always, there is a band, or ridge, applied at the join between the neck and the body or around the shoulder (Fig. 3.11). The handles, apparently always two, are located on the sides, below the shoulders. The horizontal zone beneath the handles always shows rope impressions where the pithos was bound in its leather hard state before firing. Apparently this was the zone where the problem of sagging was most acute. While most of the complete collared-rim pithoi are piriform, a few have more of a barrel-shape (e.g. Figs. 3.34:8;

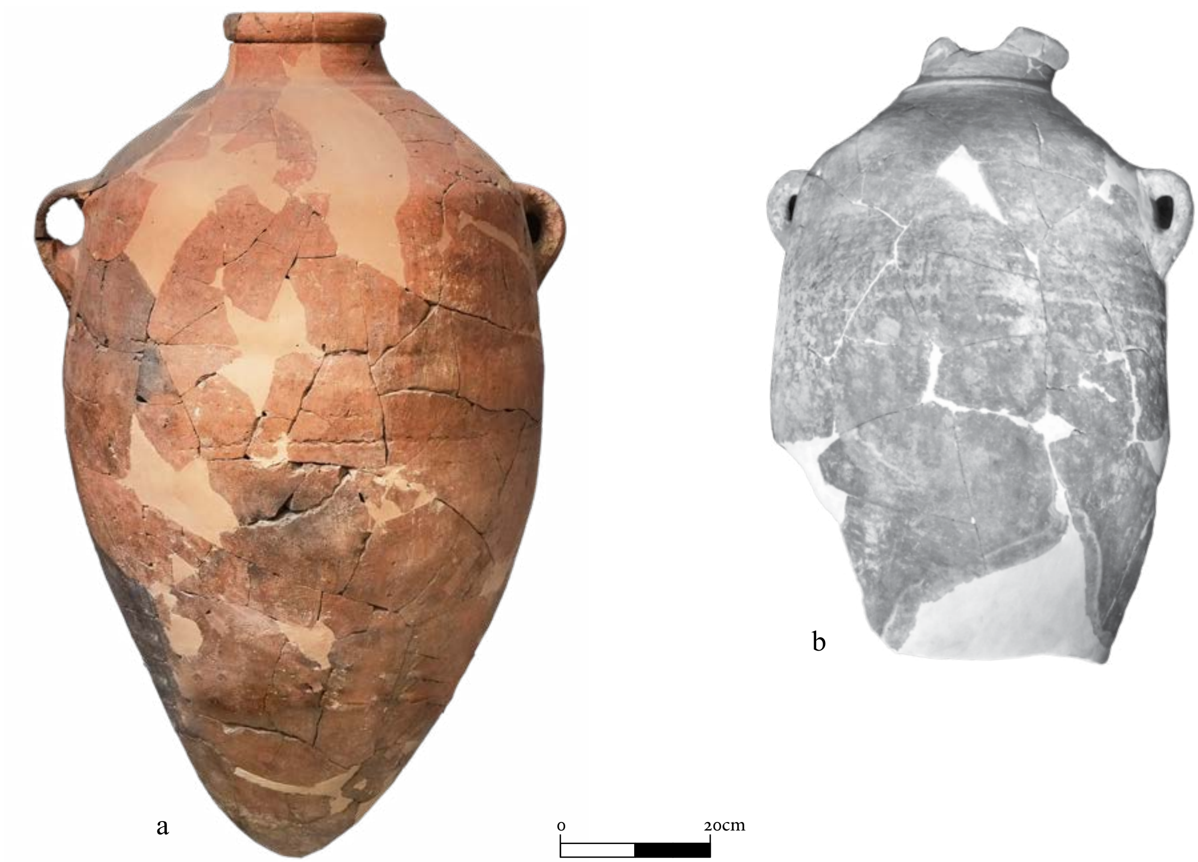

Fig. 3.10. Collared-rim pithoi: a = Reg. no. 19519/1, L2749, Phase T17, Stratum VIIA1 (see Fig. 3.80:1-6 for other ceramic items from this locus, including additional large PCR fragments), b = Fig. 3.45:11.

6 Killebrew (2001: 377) has claimed that the "collar" refers to the ridge on the shoulder of these vessels, and not to the rim itself, citing the first coinage of the term "collared jar" by Albright 1934: 12. But she is mistaken; Albright (1934: 13) specifically noted that the *rim* is collared. Those who refer to the ridge as the explanation for this term are mistaken. Albright was apparently using the collar of a shirt as the metaphor and not the collar of an animal.

3.101A:1). The latter is Golani and Yogev's (1996) pithos Type 3 at Sasa.

The base of the collared-rim pithos is always conical, being either pointed or slightly rounded. The ware varies considerably. It can be a reddish brown or reddish yellow, like the Galilean pithoi, with few grits, or pinkish yellow ("orange") like the collared-rim pithoi of the central hill country and the Upper Galilee highlands (see below). The latter have many grits, in some vessels all being calcerous, in others being a mixture of calcerous and basaltic minerals. The implications of ware composition await further petrographic study.

One pithos variety resembles the collared-rim type in all but the placement of the handles (Fig. 3.49:11). Since recent studies of the type have termed it a 'Galilean' pithos (Cohen-Weinberger and Goren 1996; Golani and Yogev 1996; Stepansky, Segal and Carmi 1996), I have elected to make it one of the Galilean pithos subtypes (PG3), though in fact, in most ways it is a collared-rim subtype.

The manufacturing technique appears to conform to Raban's (2001:494) description (and see Ibrahim 1978:117). We can add some detail and a hypothetical reconstruction of the forming technique based on close examination of the Tel Dan pithoi.

Pithoi are made in five parts: (a) the base, (b) the central section up to the ridge, (c) the shoulder portion, (d) the neck, and (e) the rim. The base was formed inversely by coils thrown over a conical drum. The central section was built up of coils on a tournette. The shoulder was formed by coils turned over a shallow conical drum fastened to a tournette. The neck was thrown on a wheel by the usual drawing-up method. The rim formation varied; it could be drawn up from the neck clay, and folded out and down (more common in the earlier, higher necked type (cf. Killebrew 2001: 380-381) or it could be formed by one individual coil to which the neck was later added (in the case of the shallow necked pithoi (cf. Killebrew 2001: 381-382).

Fig. 3.11. The shoulder, neck and rim of a collared-rim pithos (PCR, = 3.101A:1). Note the applied ridge at the join between the neck and the shoulder.

Once leather hard the sections were combined; the neck was placed inversely on the rim coil (if there was a separate rim), the base was placed on the central section, and the neck was placed on the now upright shoulder. This joining required two workers and support by rope lassoes. The joins were moistened and supplemented by adhesive clay. It is at this point where the classic ridge is usually applied to the shoulder. Once complete, the pithos was placed on its side on a cushion (plant material?) to dry over period of several days. Winter was probably the preferred season, so that drying would not take place too quickly. Finally, the vessel was placed in a firing pit, covered with combustible material, and fired for a number of hours.

It is my contention that the collared rim pithos was introduced by the Egyptians as a standard-measure stationary storage vessel for bulk commodities (cf. Raban 2001 and Wengrow 1996). But this is a topic to be developed elsewhere. In the context of a typological analysis it is worth remarking that its form resembles Killebrew's Egyptian-style form EG16, minus the tall neck (Killebrew 2005: 75, Fig. 2.16 and notes there).

By Stratum IVB only sherds of the collared-rim pithos are found, and no complete vessels, or even large fragments.

The general PCR category is type PT70 at Beth-Shean (Panitz-Cohen 2009: 240-242), type PI-II at Yoqne'am (Zarzecki-Peleg *et al.* 2005: 314-316), and type P1 at Megiddo (Arie 2006: 215-217; 2013: 520-522).

Galilean pithoi (PG, Figs. 3.12; 3.119)

Stratum VIIA1: Fig. 3.29.10; 3.75:7(?)

Stratum VI: Figs. 3.32:2; 3.33:19; 3.34:7; 3.39:1; 3.99:4-6

Stratum V: Figs. 3.40:6; 3.42:5; 3.44:4; 3.45:1; 3.49:11; 3.50:3-4; 3.108:10, 13

Stratum IVB: Fig. 3.62:6, 8, 11; 3.64:1; 3.68:5; 3.70:3; 3.71:11; 3.96:1

The Galilean pithos ranges from 80 to 150 cm in height, and varying more widely in size than does the collared-rim pithos. It also has a much wider mouth relative to the height of the vessel, ranging from 28-42 cms in diameter. Its rim is also thickened and tends to be either squared off or rounded and slightly tapered, but it is not folded out and down like the collared-rim pithos. The two handles are always located on the shoulders, i.e. above the carination. In the great majority, the neck is high and broad. Where the neck joins the lower body, there are always finger impressed grooves running around the circumference, probably a means of amalgamating the joins. This is one way of distinguishing it from the Wavy Band pithos, which has double, parallel, raised ridges that tend to be rather sharp (see below). The base is the same as that of the collared-rim jar base—conical but somewhat rounded—and it is usually difficult to distinguish the two. The ware is usually red to reddish brown, helping to differentiate the rims from those of the equally massive and very similar rims of the multi-handled K2 krater.

At this juncture we must clarify a nomenclatural confusion that has developed with regard to the 'Galilean' pithos. It was first identified by Aharoni as part of his synthesis of the Upper Galilee survey (1957: 21-23). In fact, Aharoni did not differentiate between two separate types: a wide mouthed one (our PG1) of which two complete or near complete examples were illustrated (Aharoni 1957: Fig. 4), and a more narrow mouthed one (our PG3) of which only sherds were illustrated (Aharoni 1957: Fig. 5: 10-20). On the one hand Aharoni (1989: 30) and others (e.g. Mazar 1981: 28; Biran 1989a: 82; Golani and Yogev 1996: 51) noted the similarity of the Galilean pithos to the Hazor LBII type, yet on the other hand it was said to be the Galilean version of the collared-rim pithos (e.g. Aharoni 1957: 21-23; Braun 1993: 123). Gilboa (2001: 167) has recognized this confusion and designated two types: Galilean 1, pithoi with large apertures that resemble the Hazor LB pithoi and, Galilean 2, pithoi that resemble collared rim jars. I have distinguished three subtypes of the Galilean pithos, based on the Tel Dan assemblage:[7]

PG1 (Fig. 3.119:1, 4-5, 7-8)—This is the most frequent type, having a wide mouth and a high neck that is either vertical or slightly out-flaring. Rims are generally flattened on top and can be rounded out (though not collared), tapered out, or profiled with grooves. An inner gutter is also common. Though it is the most frequent PG form at Tel Dan, it is almost completely absent from other sites in the region. I have noted a total of eight rim fragments, all in the Hula Valley—five in the northern part and only three in the southern part (two at Hazor and one at Tel Mashav).[8] At the same time however, this type especially appears to have antecedents in the Late Bronze Age levels of Tel Dan and Hazor and in LCII-III Cyprus (cf. Ben-Dov 2011: 256-259).

PG2 (Fig. 3.119:2)—This differs from the PG1 in having a short neck; it is only discernible when the neck is also present. From such examples it appears that most rims flare out and are thickened with some squaring off or flattening.

PG3 (Fig. 3.119:3)—This subtype takes the form of a collared-rim pithos, but the handles are located on the shoulders, rather than below them, and the neck is longer. The longer neck may be intended to facilitate pouring. It is Golani and Yogev's (1996) pithos Type 1 at Sasa.

It is of interest to compare the Galilean pithoi of Tel Dan with those of the heights of Naphtali—from Sasa, Horvat 'Avot and Tel Harashim, for

7 This scheme was suggested already in Ilan 1999: 83.

8 These counts are derived from my examination of pottery collected in surveys carried out by Idan Shaked and Yoseph Stepansky. These surveys are not yet published, but have been cited in several publications, such as Greenberg 2002; Ilan 1999 and Zwickel 2007. I thank both surveyors for giving me access to their collections and for sharing their insights with me.

Fig. 3.12. Galilean pithoi (PG): a = 3.34:7 (PG1); b = 3.50:4 (PG1); c = 3.99:5 (PG1); d = Fig. 3.32:2 (PG2).

example. The PG1 and PG2 types, most common at Tel Dan, seem to be virtually absent from the hill country sites, where the most frequent variety is our PG3—what seems to be a hybrid of the collared-rim and PG1–PG2 forms (Golani and Yogev's [1996] pithos Types 1 and 2).

As noted above, the Galilean pithos has been compared to the LBII Hazor-type pithos, but the PG1 and PG2 types are most similar to the Wavy Band pithos (discussed below), which was already present at Akko and on the Syrian coast in the Late Bronze Age, having been imported from Cyprus or inspired by Late Cypriot examples (citations in Golani and Yogev 1996: 51-54 and see Gilboa 2001 and Pilides 2000). The PG1 subtype, especially, shows strong affinities with the Wavy Band form.

The Galilean pithos is best understood as the Tel Dan adaptation of the Late Cypriot pithos Groups II and III (Keswani 1989: 14; Pilides 2000: Figs. 1-2). In addition to the general form, the rims of the Tel Dan examples are very much the same as those of the Cypriot pithoi (cf. Pilides 2000: Figs. 11-24). The placement of the handle on the shoulder, close to the join with the neck, also seems to be a diagnostic feature.[9] The ware and the base (conical rather than flat) may have been influenced by the techniques used in forming collared rim pithoi (see above).

Wavy-band pithoi (PWB, Figs. 3.13, 3.120)

Stratum VI: 3.75:7(?)

Stratum V: Fig. 3.51:8; 3.77:5-6; 3.85:3; 3.90:7; 3.92:5; 3.93:6

Stratum IVB: Figs. 3.65:6; 3.66:6; 3.70:4, 6; 3.94:8

The Wavy Band pithos was called the 'Phoenician' pithos in previous publications (Biran 1989a; Biran 1994; Ilan 1999: 85-86). It is similar in form to the Galilean pithos and probably derived from the same prototype (the Late Cypriot or Late Bronze Age Ugarit/Minat el Beidha type pithos). It can be identified by several distinct features (cf. Bikai 1978: Pl. 40; Frankel 1994: 27; Golani and Yogev 1996: 51; Schaeffer 1949: Fig. 28):

- It is handmade.
- It has a yellowish pink to pink ware.
- The circumference is decorated with two bands of double, parallel ridges; the upper, at the join between the neck and the body is horizontal, and the lower, on the shoulder, is a pair of wavy ridges.
- It has a heavily thickened, sometimes protruding, flattened base.

The variety observed at Ras Shamra and Minet el-Beidha is instructive (Schaeffer 1949: Fig. 86 and Monchambert 1983: 32). These are dated to the terminal Late Bronze Age—most with flattened bases. But the Wavy Band pithos features outlined above are all there. One example (Schaeffer 1949: Fig. 86:28) has handles placed at the join between neck and body, much like the PG3 hybrid pithos.

The Wavy Band pithos is attested in small numbers in Stratum VI, increasing in Stratum V and becoming the dominant type in Strata IVB and IVA (Biran 1989a; Ilan 1999: 85-86). However, at least one fragment was found in Locus 4609—a Stratum VIIA2 (13th century BC) context.[10] By Stratum IVB, the Wavy Band pithos became the exclusive type still manufactured, though perhaps not manufactured at Tel Dan. No other types of complete pithoi were found in Stratum IVB.[11] The single analyzed example from Tel Dan indicates a probable source on the northern coast of Canaan (Yellin and Gunneweg 1989) as do the earlier examples from Sasa (Cohen-Weinberger and Goren 1996). At the same time, as a component of the ceramic assemblage, the Wavy Band pithos is proportionately much less frequent than were the other types in their heyday—only three complete examples were recovered and rims and body parts of 36 others.

9 This was illustrated famously in the drawing reconstructing the palace storeroom at Kalavassos-Agios Dimitrios, e.g. in Keswani 1992: 142, Fig. 5. Compare also with the fragment from Ashdod Stratum XII (Dothan and Porat 1993: Fig. 34: 3) and the recent find of the upper portion of a Cypriot pithos from the Ashdod Southern Shore site dated to 13th century BCE (Nahshoni 2009).

10 Reg. no. 23053/5. For the location of this context (a pavement cut by Phase B11 pits) and for associated material culture see Ben-Dov 2011: Fig. 21a and Fig. 40.

11 For a parallel late, and even later 10th or 9th century BCE appearance of the type, see Mt. Adir (Ilan 1999: 182-184; Fig. 6:4).

Fig. 3.13. Wavy band pithoi: a = Fig. 3.70:6; b = Fig. 3.66:6.

The morphological similarity of the Wavy Band Pithos to the Galilean Pithos and their clear differences (ware, decoration, handles) elicit questions as to their respective origins and their implications for the cultural makeup of society at Tel Dan. On the whole, these kinds of vessels testify (together with other aspects of material culture) to potters of a Cypriot, or at least eastern Mediterranean littoral, origin (Gilboa 2001: 169-170). Gilboa has suggested that the handle-less Wavy Band pithos of the Syro-Palestinian littoral (and Tel Dan) derives from the Cypriot archetype and I would agree. But the Galilean pithos does too and the developmental trajectory and locational focus of the two ateliers was somewhat different, though perhaps contemporaneous. This rather complex issue will be addressed from a macro-economic and geopolitical perspective in Chapters 19 and 21.

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A number of pithoi—mostly collared rim pithoi—were subjected to Instrumental Neutron Activation Analysis (INAA) in the 1980s (Yellin and Gunneweg 1989). This analysis showed both local and exogenous origins for the pithoi tested, for those from both Stratum VI and Stratum V. This resulted in the rather puzzling conclusion that these massive vessels were being both manufactured locally and being transported to Tel Dan over substantial distances.[12] The question is: if you can make such unwieldly vessels on site, why bother importing them? However, with the reworking of the Iron I stratigraphy at Tel Dan a different pattern emerges: pithoi from Stratum VI are all imported to the site and local manufacture begins in Stratum V. The significance of this pattern will be discussed elsewhere.

12 A similar pattern has been noted in the provenience of pithoi from a number of sites on or near the Mediterranean coast (Cohen-Weinberger and Wolff 2001).

Storage Jars

(SJ, Figs. 3.14-3.15, Type Series Figs. 3.121-3.122)

Storage jars continue the Middle and Late Bronze Age morphological traditions. Most common is the ovoid shape, sometimes with a little carination at the shoulder, foreshadowing a frequent Iron Age II form (e.g. Figs. 3.43:1; 3.121:1; Amiran 1969: Pl. 79:1). The base can be rounded or it can retain the hint of a stump, a feature more prominent in the Late Bronze Age and certain other Iron Age I assemblages. There are no piriform storage jars with the sharply carinated shoulder in the Late Bronze Age Canaanite jar tradition such as those found at Dor (Gilboa 1998: Fig. 6), Yoqne'am XVII, Megiddo VIA (Zarzecki-Peleg 1997: Figs. 2:8, 3:8) and Tell Keisan Stratum 9a–b (Briend and Humbert 1980: Pl. 59-60). The latter appears to be more of coastal type that does not reach Tel Dan. Five rim forms occur:

SJ1 (Type Series Fig. 3.121:1-2)—a simple upright rim, often slightly thickened (not present in the LB repertoire).
Stratum VIIA1: Fig. 3.97:6
Stratum VI: Figs. 3.99:3; 3.100:6; 3.101:4, 9
Stratum V: Figs. 3.49:7-8; 3.52:2; 3.77:1; 3.85:1; 3.89:1; 3.91:4; 3.93:2, 11
Stratum IVB: Figs. 3.68:1; 3.72:15; 3.78:6

SJ2 (Type Series Fig. 3.121:3; 3.122:2-3)—an upright or slightly everted rim with an exterior carinated ridge a few centimeters below it (Ben-Dov's [2011] Types SJ3 and SJ5).
Stratum VIIA1: Figs. 3.27:3; 3.79:3
Stratum VI: Figs. 3.36:3; 3.102:10
Stratum V: Figs. 3.45:6; 3.52:4; 3.91:14; 3.93:11
Stratum IVB: Figs. 3.58:4; 3.60:3; 3.61:3; 3.69:3

SJ3 (Type Series Fig. 3.122:4)—an upright, thickened rim, on a short neck with a prominent ridge. It is characteristic of Strata IVA-I (i.e. the Iron Age II levels) and is not present in the Iron I (though see, possibly, Fig. 3.76:3).

SJ4a (Type Series Fig. 3.121:4; 3.122:5)—a rim folded out to form a short, usually rounded collar (Ben-Dov's [2001]Type 2c).
Stratum VIIA1: Figs. 3.27:4; 3.29:7, 9; 3.75:6; 3.107:13
Stratum VI: Figs. 3.31:3; 3.39:3; 3.83:1-2; 3.91:8
Stratum V: Figs. 3.40:3; 3.41:3

SJ4b (Type Series Fig. 3.122:6-7)—a rim folded out to form a short collar, with an internal concavity (Ben-Dov's [2011] Type SJ2b).
Stratum VI: Figs. 3.32:7
Stratum V: Figs. 3.49:9

SJ5 (Type Series Fig. 3.122:8)—an everted simple rim (Ben-Dov's [2011] Type SJ1).
Stratum VIIA1: Fig. 3.26:2

The SJ1 rim is the most frequent type at Iron Age I Tel Dan (see Table 3.8). It is rare at sites to the south (Table 3.7), but it is the dominant type in the earliest Iron Age I level (Stratum XIV) at Tyre (Bikai 1978: Pl. 39:6-12). It is notably absent in the LB levels of Tel Dan, though the simple rim with the concave interior of the jar in Fig. 3.97:6 first occurs in Stratum VIIA1, which Ben-Dov (2011: 252, Type SJ4) views as a very late LB context.

The SJ2 rim first occurs in Stratum VIIA1 and remains frequent thereafter, even into Stratum IVA (Iron IIA).

The SJ4 type is most common in LB contexts (= Ben-Dov Types SJ2b-d) at Tel Dan (and other sites), continuing to be popular through the early Iron I Strata VIIA1 and VI. Subsequently it becomes much less frequent in Strata V and pretty much disappears in Stratum IVB.

The SJ5 type is a carry-over from the terminal Late Bronze Age and is only present as a complete vessel in Stratum VIIA1 (Fig. 3.26:2).

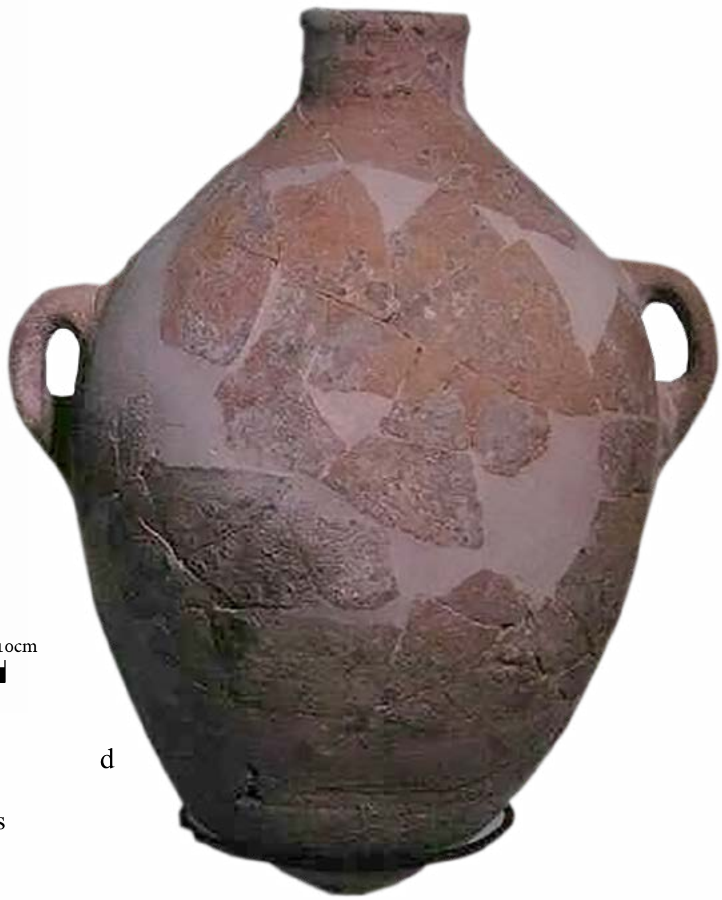


Fig. 3.14. Storage jars. a = Reg. no. 17080/1, L3213, Phase Y7, Stratum VIIA1 (see Fig. 3.97 for other material from this locus); b = Fig. 3.101:9; c = Fig. 3.26:2; d = Fig. 3.99:3

Fig. 3.15. Storage jars. a = Figs. 3.60:3; b = Figs. 3.36:3, 3.122:2; c = Figs. 3.49:9, 3.122:7

Table 3.7. Tel Dan storage jars typology correspondence with other typologies.

Dan IV	TBS III*	Yoqne'am II	Megiddo IV
SJ1	—	SJIIB (rim not shape)	—
SJ2	SJ70	SJ IA	SJ1a
SJ4a	SJ71	SJ IB	SJ1b
SJ4b	SJ71a	SJIIC	—
—	SJ72	SJ IIIA	SJ3
—	SJ73	—	SJ1c?
—	SJ74	—	—

* cf. Panitz-Cohen 2009: Figs. 5.5-5.6

Table 3.8. Storage jar rims types by Stratum and as a percentage (%) of the total identified in Area B.

Stratum	SJ1	SJ2	SJ4	SJ5	Other	Total
VIIA1	12	33	48	2	5	100
VI	29	34	34	—	3	100
V	52	38	8	—	2	100
IVB	40	51	—	—	9	100

It seems self-evident that two Iron Age I types evolved into the two characteristic rim forms of the Iron Age II: the SJ1 jar into the type with the thickened, rounded rim of Stratum IVA (cf. Amiran 1969: Pls. 79: 2, 5-7; Biran 1994: Figs. 124, 131) and the SJ2 type into that with the short, squat neck and thickened rim with a prominent neck ridge immediately below (the SJ3 type here, and see Amiran 1969: Pls. 79:1; Biran 1994: Figs. 131, 165-168).

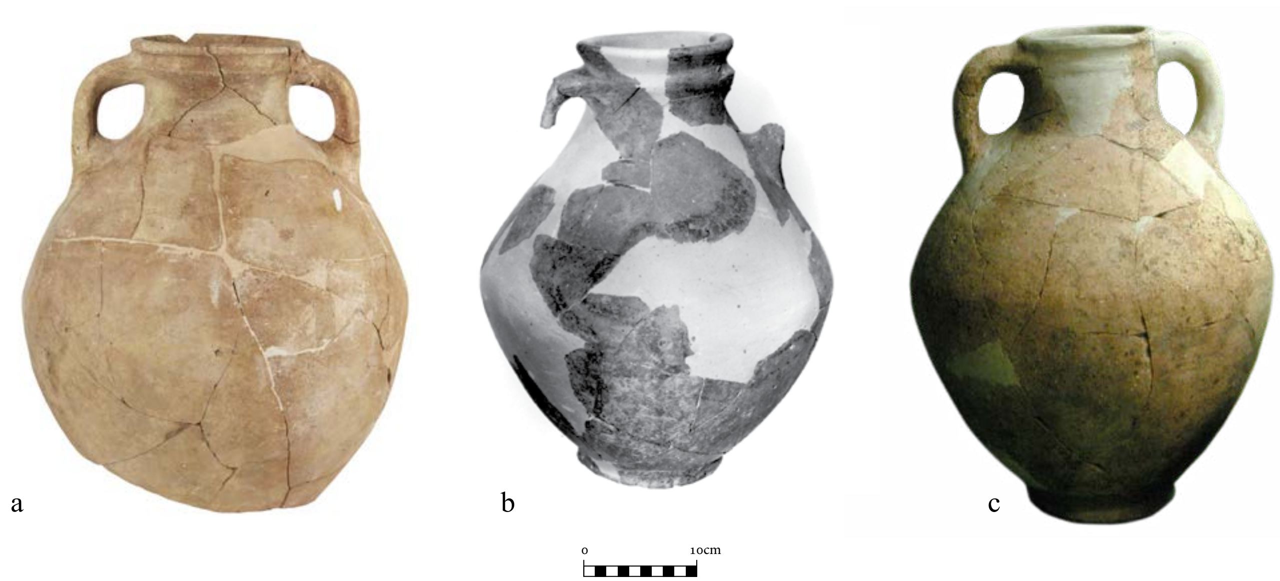


Fig. 3.16. Amphorae: a = 3.86:7; b = 3.59:6; c = 3.37:5.

Storage jars are not usually decorated and when they are, they stand out. Figs. 3.28:4; 3.49:9 (=3.15c); 3.72:15; 3.78:6; 3.107:13 are exceptions with good parallels from Tel Beth-Shean (Type SJ71a, Panitz-Cohen 2009: 237-238), Tell Keisan Strata 9a–c (Briend and Humbert 1980: Pls. 57, 69), the Tel Dor destruction level (Gilboa 1998; Fig. 6:4) and Tel Qiri Stratum VIII (Hunt 1987: Fig. 28:10). The ware is generally different than that of most of the other storage jars, being pinkish yellow. I thought initially that it has the feel of a coastal or Jordan Valley clay but petrography carried out on one of the painted vessels (Fig. 6A.4=Fig. 3.49:9) shows it to be of local manufacture.

A total of 12 thumb impressions were registered on the handles of storage jars (e.g. Fig. 3.40:3). Thumb impressions are widely cited in sites of the Iron Age I and Iron Age IIA, the largest corpus coming from Kh. Qeiyafa (76 items in Kang and Garfinkel 2009: 137-144; Figs. 6.36-6.39). A comprehensive list of parallels can be found in Kang and Garfinkel (2009: 144).

Amphorae (AM, Fig. 3.16, Type Series Fig. 3.123:1)

Stratum VIIA1: Fig. 3.80:6

Stratum VI: Fig. 3.37:5

Stratum V: Figs. 3.86:3(?), 7; 3.91:5; 3.93:8

Stratum IVB: Figs. 3.59:6; 3.61:6; 3.62:7 (an Aegean-style hydria, in fact); 3.94:9

This is a type with apparently no predecessor in the LBII levels at Tel Dan. It is a jug in shape but has two handles; it could be called a deep krater. There is also a telltale finger-wide groove running horizontally around the rim's exterior, forming a ridge at the base of the groove. In this way, the amphora rim and neck resembles the SJ2 rim and neck—the aperture is even pretty much identical.

Clearly though, this form is Aegean, even Mycenaean, in inspiration (cf. Mountjoy 1993: Figs. 107, 214, 235, 254, 281, 307, 329) becoming a feature of the coastal repertoire in the Iron Age I and thereafter. Iron Age I parallels for the form are not infrequent: one at Tel Qasile Stratum XI (Mazar 1985: Pl. 30:12, = Mazar's AM3) and another from Megiddo Stratum VIB (Loud 1948: Pl. 74:15). Other parallels have been found at Tel Hadar Stratum II (Kochavi 1993: 552). In the Iron Age II a version of this type becomes characteristic of the Phoenician and Ammonite assemblage (e.g. Amiran 1969: Pl. 101:24; Briend and Humbert 1980: Pl. 44:2).

At Tel Beth-Shean this shape is reported as a rare cooking vessel variety (Panitz-Cohen 2009: 230) of the Aegean type discussed most recently by Yasur-Landau 2010: 228-233. A Tel Dan parallel is cited by Panitz-Cohen from Biran 1994 (Fig. 99:4). While the form is indeed similar, the Tel Dan amphora is a container for liquids and not a cooking vessel. The Tel Dan amphorae also differ in that they have ring bases. Beth-Shean jug type JG74—that with a ridged neck, or with a ridge below the rim—may well belong to what I am calling amphorae at Dan. No complete profiles were recovered at Beth Shean (Panitz-Cohen 2009: 250). The two-handled Aegean-style cooking vessel does not occur at Tel Dan.

Jugs (J, Figs. 3.17-3.18—Type Series Figs. 3.123:2-8; 3.124:1-5)

Jugs seem to be more plentiful in the Iron Age I levels than they were in the Late Bronze Age. They are found in almost every room and sometimes appear in groups, e.g. in L7063 (Fig. 3.53), L129 (Fig. 3.59), and L571 (Fig. 3.64:9-11). Seven subtypes have been determined:

J1 (Fig. 3.17; Type Series Fig. 3.123:2-5, 7)
Stratum VIIA1: Figs. 3.26:1; 3.29:11; 3.75:4; 3.80:8; 3.97:9
Stratum VI: Figs. 3.30:6; 3.35:1; 3.37:3; 3.98:8
Stratum V: Figs. 3.41:7; 3.42:7; 3.43:6; 3.46:10; 3.53:3-5; 3.55:11; 3.76:12; 3.88:3; 3.90:9; 3.92:14; 3.105:4
Stratum IVB: Figs. 3.59:4-5; 3.62:5; 3.64:10-11; 3.69:6; 3.72:12-13, 16; 3.94:10; 3.95:6

This is by far the most frequent type, generally having an ovoid or globular form, sometimes slightly carinated, with a rounded or slightly flattened base and a handle stretching from shoulder to rim. The mouth is always pinched (trefoiled) to form a spout. The rims are usually thickened and often have an interior gutter.

Most common is the J1a subtype which is more globular. There is a smaller version that is truly globular (Fig. 3.17f; Fig. 3.123:4). Rare is the narrower, lentoid, J1b subtype (Fig. 3.17e and Fig. 3.123:5) and the small, squat, J1c subtype (Fig. 3.105:4 = Fig. 3.123:7). Both can be said to be related to the dipper juglet form. Indeed, the entire J1 category would appear to be related to the dipper jugs and juglets of the Late Bronze Age; in fact the J1 type appears in Late Bronze II contexts (Ben-Dov 2002: Fig. 157 and Ben-Dov 2011: 242-243, Figs. 179:7-10) and as early as the Middle Bronze Age (Ilan 1996: 223-224) at Tel Dan.

J2 (Fig. 3.18a-b; Type Series Fig. 3.123:6,8)
Stratum VIIA1: Fig. 3.81:8
Stratum VI: Figs. 3.32:1; 3.98:10; 3.103:5
Stratum V: Fig. 3.48:5; 3.89:6; 3.92:10
Stratum IVB: Figs. 3.64:9; 3.68:2; 3.72:14

This globular type is similar to the J1 variety but shows a handle that runs from shoulder to neck, rather than to rim. Also, the mouth opening is round, rather than pinched and spouted. The base is more pronounced and can be a disc. The J2a variety is plain while the J2b subtype is a type of strainer jug with painted bands (the Stratum IVB examples in the so-called “Phoenician bichrome” painted style). In the latter, the join between the neck and the shoulder is marked by a prominent ridge. The J2b jug came into its own in Stratum IVB, though the J2a type clearly begins in Stratum VI. Neither is frequent.

J3 (Type Series Fig. 3.124:1)
Stratum VIIA1: Fig. 3.28:1

This is essentially the Late Bronze II biconical jug with the everted rim (cf. Amiran 1969: Pl. 47 and, at Tel Dan, Ben-Dov 2011: Fig. 180:16-19). It is rare in the Iron Age I, appearing only in Stratum VIIA1, which can be viewed as the latest Late Bronze Age level. In fact, the few existing examples might be heirlooms or intrusive LBII material. Moreover, both the J1a jug and the cooking jug may be related to the form.

J4 (Type Series Fig. 3.124:2)
Stratum VI: Figs. 3.102:11
Stratum IVB: Figs. 3.62:9; 3.63:1; 3.95:1(?).

Also rare, the J4 jug has a globular form and neck/rim that flares out. The existing fragments

Fig. 3.17. Jugs, Type J1

Item	Type	Reg. no.	Locus	Remarks
a	J1a	1990/3	132	Phase B9-10, Stratum V
b	J1a	13537/19	3127b	Phase Y7, Stratum VI
c	J1c	15537/10	3127b	= Fig. 3.98:8
d	J1a	894/6	174	= Fig. 3.26:1
e	J1b	9592/1	571	= Fig. 3.64:10
f	J1a	1319/1	326	= Figs. 3.43:6, 3.123.4

Fig. 3.18. Jug Types J2 (a-b), J5 (c), and J6 (d)

Item	Type	Reg. no.	Locus	Remarks
a	J2a	9593/1	571	= Fig. 3.64:9
b	J2a	13537/9, IAA 11-285	3127b	= Fig. 3.98:10
c	J5	13549/1	3127b	= Fig. 3.98:5
d	J6	13535/6	3127b	= Fig. 3.98:6

(none are complete) are painted with horizontal reddish brown lines. The type seems most at home in Stratum IVB. The ware is sandy yellow and appears to contain quartz (cf. Briend and Humbert 1980: Pl. 70-71; Panitz-Cohen 2009: Pl. 51:3).

J5 (Fig. 3.18c; Type Series Fig. 3.124:3)
Stratum VIIA1: 3.25:13
Stratum VI: Fig. 3.75:5; 3.98:5; 3.101:7
Stratum V: Figs. 3.40:7; 3.44:7; 3.86:2; 3.91:11; 3.104:8
Stratum IVB: Figs. 3.64:4; 3.68:6; 3.96.4 (or J6); 3.106:11

The jug with the strainer spout (J5) is, together with the jug with the narrow spout and basket handle (J6), the second most frequent jug class after the J1 type. Stager (1994: 345, following Eisenstein 1905) has determined that it is a wine carafe (rather than a 'beer jug' as it is often called), designed to decant impurities. The J5 jug is Dothan's Type 17 (1982:191-194), one of the types appearing in the last phase of Philistine pottery, when traits of different vessel types, both Philistine and Canaanite, are said to fuse. Our J5 vessels had either a basket handle (e.g. Fig. 3.68:6), or none at all. The body is slightly biconical and resembles a puffed-up pyxis. Very few examples are preserved with their bases intact; the few that are seem to have a low ring base or a flattened base. J5 jugs are usually painted—directly on the plain surface, without an underlying slip, most often with monochrome, sometimes with bichrome, horizontal bands above, below, and around the spout, but never below the carination. This is very much the Beth Shean Type JG72b jug (Panitz-Cohen 2009: 248-249). But the Beth Shean examples are slipped red and the Tel Dan examples are mainly adorned with painted decoration, more in line with the Beth Shean JG72a biconical, high-necked form. Indeed this type seems to be a fusion of the LBII-type biconical jug, the pyxis and the Philistine strainer-jug with a more globular body and single strap handle (Dothan's [1982] Type 6 jug).

J6 (Fig. 3.18d; Type Series Fig. 3.124:4)
Stratum VI: Figs. 3.33:2-3; 3.98:6
Stratum V: Figs.3.106:3(?); 3.108:3
Stratum IVB: Figs. 3.66:5; 3.96:3 (or J6); 3.106:11

The globular jug with the narrow spout and basket handle (J6) is also not infrequent. It is Dothan's Type 7 jug (1982: 155-157) in the Philistine repertoire, sometimes referred to as a "feeding jug". The complete example used in the type series (Fig. 3.124:4) is plain but others mostly show evidence of painting (e.g. Fig. 3.108:3). Dothan (1982: 157) notes that her Type 7 jug was restricted to major Philistine centers and has clear Mycenaean antecedents, which shared their simple decoration.

J7 (Type Series Fig. 3.124:5)
Stratum VI: Fig. 3.100:1

Only one example of this type has been recovered—from L3082 in Area Y. The rim is missing, but the lower part bears resemblance to the carinated pyxis body, a form that existed in both the LBII and Iron Age I (below), but jugs with carinated bodies and broad high necks are characteristic of the LBII, not Iron Age I (e.g. Yadin *et al.* 1960: Pl. 124:18).

Jug fabric
The earlier (Stratum VIIA1—Stratum V) ware has few grits and a light red to pink color. In Stratum IVB a new fabric is gradually introduced in the jug repertoire, particularly in the pinched rim jug (J1a) category. It has many carbonate grits and a more reddish-yellow hue. The latter does not immediately replace the earlier fabric; it does so gradually.

Globular Jugs and Flask Jugs (GJ and FJ, Fig. 3.19, Type Series Fig. 3.124:6-7)[13]

Stratum IVB: Figs. 3.64:3,5; 3.68:3; 3.72:17

All the globular jugs and flask jugs appear to belong to the Phoenician Bichrome Ware class of pottery (Gilboa 1999 and see Chapter 5 below). Being of similar appearance, the two types must be distinguished from each other (Anderson 1990: 41-46; Zarzecki-Peleg 1997: 277-280). The flask jug is formed, like the flask, by making two hemispherical bowls on the wheel and joining them together.

13 The globular jug presented in Fig. 3.124:6 is from Area T Phase 13 (Stratum IVA, Iron Age IIA); No complete example existed from the Iron I levels but the existing large fragments suggest that this form is the same.

Fig. 3.19. Globular jug (= Fig. 3.72:17)

The neck unit is added at the juncture of the two in the next step (Anderson 1990: Fig. 8). The vertical direction of the potter's wheel striations reveals the technique. The globular jug, on the other hand, shows horizontal wheel striations indicating that the unit was thrown as a whole on the wheel like most other vessel types. Flask jugs have only rounded bases while the globular jugs can have a ring base. In the latter case their date is considered somewhat later (Anderson 1990: 41-46). No ring bases were found in the Tel Dan assemblage as of yet, but a flattened base was found from Stratum IVA (L3093, see Ilan 1999: Fig. 81:2). The globular jug tends to have a wider neck and mouth (Zarzecki-Peleg 1997: 280). Both usually have a prominent neck ridge from which a single, often double-stranded handle projects down to the shoulder.

Vessels of this type have been described at Sarepta (Anderson 1990: 41-46), Tyre (Bikai 1978: 37-38), the Tel Dor post-destruction layer (Gilboa 1998: 418), Tel Qasile Strata IX-X (Mazar 1985: 67-69, Type JG6), Yoqne'am Stratum XVII, Megiddo Stratum VIA and Hazor Stratum IX (Zarzecki-Peleg 1997: 277; Ben-Tor and Ben-Ami 1998: 28, Fig. 15) and others (see Mazar 1985: 67-69 and Gilboa 1999 for additional parallels and references). They are endemic to northern Israel, the northern Mediterranean littoral and Cyprus.

Fig. 3.64:3 is a flask jug and Figs. 3.64:5 and 3.72:17 (= Fig. 3.19) are globular jugs. Of the twelve fragmentary examples from Stratum IVB, eight are flask jugs and four globular jugs. Both types are decorated with the typical Phoenician bichrome motifs: concentric circles, crosses and networks below the handles (see below Chapter 5). The Tel Dan flask-jug (FJ) is paralleled by FL72 at Tel Beth-Shean (Panitz-Cohen 2009: 259; Fig. 5:10 and Photo 5.49).

Table 3.9. Tel Dan jug typology correspondence with other typologies (cf. Panitz-Cohen 2009: Fig. 5.7).

Dan IV	TBS III	Yoqne'am II	Megiddo IV
J1a	JG70	J IA–JIB	J1
J1b	—	J IV	J1
J2a–b	JG71	J IIIA–B	J3
J3	JG75	A IA (shape only)	J10
J4	JG71	—	—
J5	JG72b	J VB	J7a
J6	—	Combination of J VA and J AIB	—
J7	—	—	—
FJ	JG74a	J VIA1	J4–J5
AM	CP72 (Pl. 68:4 shape)	—	—[14]

Juglets (Jt, Fig. 3.20, Type Series Fig. 3.124:8-11)
Stratum VIIA1: 3.107:11
Stratum VI: Figs. 3.34:5; 3.98:7
Stratum V: Figs. 3.76:8; 3.85:12; 3.108:8
Stratum IVB: Figs. 3.60:1; 3.65:2

14 Arie (2006: 211) parallels the Tel Dan amphora type to his AM2 type found in Stratum VIA and VIB at Megiddo, but this doesn't seem to be a good parallel.

Fig. 3.20. Dipper juglet (Jtd): = Fig. 3.98:7

Juglets are surprisingly infrequent (cf. Beth Shean: Panitz-Cohen 2009: 254-255). Almost the only juglet present is a squat form of the typical MBII-LBI-II dipper juglet (Jtd). The base can be conical or flattened, though the former is much more common. The J1b and J1c jug forms are also juglets by size and belong to the dipper juglet class, but their proportions are more like those of the J1a class and that is where they have been grouped. This type is not diagnostic and we will forego further discussion.

Fig. 3.34:5 has inverse piriform dimensions, of a class known from late MB and LB contexts. Only Fig. 3.60:1 is decorated, and of a globular form (Jtg), without a pinched rim. These belong to a class more common on the coast and at Megiddo VIA (see a very close parallel from Megiddo: Loud 1948: 75:7).

Flasks (FL, Fig. 3.21, Type Series Fig. 3.125:1-4)

Stratum VIIA1: Figs. 3.29:1; 3.107:12

Stratum VI: Figs. 3.33:16-17; 3.36:8-9; 3.37:4; 3.98:9

Stratum V: Figs. 3.42:6; 3.51:3; 3.55:6; 3.86:4-5; 3.87:7; 3.88:2; 3.89:8-9; 3.105:8

Stratum IVB: Figs. 3.64:6, 8; 3.68:7-8

As described by Amiran (1969) and others, a flask is usually composed of two attached wheel-thrown bowls forming a seam along the vertical circumference of the vessel. The neck-and-rim unit is then appended and the body perforated by a smooth cylindrical object to form the connection between the neck and the body.[15] Two loop handles connect either the base of the neck or the shoulders, to either the rim or the neck itself. Rim form varies; the rim can be simple (FL1), have a mouth that is splayed (FL2), a hemispherical bowl shape (FL3) or a small carinated bowl shape (FL4). The simple FL1 rims are by far the most frequent. Some rims thought to be of small carinated bowls (Bc1) may be flask rims. Flasks are usually decorated with a concentric painted decoration, either in one (usually red) or two colors (red and black). Many or all of those represented as not being decorated may have been so originally, the paint having worn off.

The flasks from Tel Dan show much greater variety than those from Tel Beth-Shean or Yoqne'am where the flask typology is based on size and surface treatment rather than rim form (Panitz-Cohen 2009: 255-260; Zarzecki-Peleg *et al.* 2005: 337-339; Fig. II.47). Megiddo has more variety (Arie 2006: 208-210). On the other hand, the flask with the ladle-mouth found in contemporaneous contexts at Yoqne'am and Megiddo (e.g. Zarzecki-Peleg *et al.* 2005: Fig. II.47:5; Arie 2006: 209; Fig. 13.32) is lacking completely at Tel Dan (cf. Beth-Shean, Panitz-Cohen 2009: 255).

Fig. 3.33:4 is Cypriot Bichrome III barrel flask of the Late Geometric III period (900-750 BC), making it an intrusion into Pit 1209.

Pyxides/Alabastra (PYX, Fig. 3.22, Type Series Fig. 3.125:5-7)

Stratum VIIA1: Figs. 3.25:11; 3.29:2, 13; 3.80:9

Stratum VI: Figs. 3.35:8; 3.100:2, 5

15 For a different manufacture technique at Tel Beth-Shean—the clay of a single piece being pulled up and then pressed down—see Panitz-Cohen 2009: 256.

Fig. 3.21. Flasks

Item	Type	Reg. no.	Locus	Remarks
a	FL1	10790/1	1229	= Fig. 3.33:16
b	FL2	12836/1	2464	= Fig. 3.87:10, Fig. 3.125:2
c	FL4	13760/6	3172	= Fig. 3.105:8, Fig. 3.125:4
d	FL3-4	13548/1	3127b	Phase Y6, Stratum VI (see Figs. 3.98-3.99)
e	FL3-4	13535/10	3127b	Phase Y6, Stratum VI (see Figs. 3.98-3.99)

Stratum V: Figs. 3.43:2; 3.48:9; 3.50:6-7; 3.51:11; 3.54:5; 3.56:1-2; 3.76:7; 3.86:1; 3.91:7; 3.92:9, 15; 3.104:9; 3.105:6-7; 3.108:4, 7, 9

Stratum IVB: Figs. 3.63:4; 3.65:3; 3.70:7; 3.73:7; 3.78:7

Numerous pyxides were found at Tel Dan-36 complete vessels—one of the largest assemblages documented. At least part of the explanation for this is that they are small, compact and dense—their walls and bases are thick relative to the vessels' size. Hence they preserved better in collapse and destruction. They reach their greatest popularity in Stratum V. In Stratum IVB they are still a significant presence but, relatively, they are less frequent.

Pyxides always have horizontal lug handles and short flaring rims. In the Iron Age I levels they always have the squat biconical form in contrast to the original box-shaped Mycenaean alabastron (cf. Ben-Dov 2002: 102, Fig. 283) and the taller, juglet-like shape of the Late Bronze Age (Amiran 1969: Pl. 57:1, 7; and here Fig. 3.25:11). They would appear to be a hybrid of the Late Bronze Age amphoriskos and alastratron. Base form and decoration vary; bases can be flat, ring or rounded. The majority in all periods are flat. In Stratum VI there are no rounded bases while in Stratum IVB there are no ring bases.

Most pyxides show painted decoration. The paint may have worn off those that appear unpainted. Decoration is usually bichrome red and black, brown or purple, and tends to horizontal bands, zig-zags and vertical lines in metopes between horizontal bands. Fig. 3.70:7 is unusual in having triangles filled with vertical lines painted (lackadaisically) within a register.

The decorated pyxides are discussed by Beyl in Chapter 5 (Phoenician Painted Ware) where the illustrations are presented as a group (Figs. 5.4:5-16; 5.5:1; 5.7:5-6; 5.8:7-8; 5.9:11).

Miniature Vessels

Stratum VI: Figs. 3.33:18 (goblet)

Stratum V: Figs. 3.50:11 (bowl—carinated); 3.85:11 (bowl—hemispherical); 3:92:12 (bowl—hemispherical)

A miniature vessel is one that represents, symbolically, its larger prototype. This implies that their function was simulation or symbolic and not prosaic (Naeh 2012:188-190). All of them are open vessels (one goblet or cup and three bowls) and could have contained something. Miniature vessels occur at Tel Dan in most periods and occur at most other sites.[16] They are not numerous in the Iron I context, but are perhaps underrepresented due to their small size, particularly in the material collected in the earlier excavation seasons. They occur as individual items in various loci, not in groups.

Some miniature vessels may have been appended to kernoi (e.g. the carinated bowl in Fig. 3.50:11, which is only a borderline miniature). One wonders if some of the other smaller vessels, such as pyxides (e.g. Fig. 3.100:2) and flasks (e.g. Fig. 3.42:6), shouldn't be considered functional miniatures.

Miscellany

The cylindrical vessel fragment in Fig. 3.70:2 shows a ring of perforations around the central hollow neck and the beginnings of two small loop handles. One assumes that this configuration was intended to allow the passage of either liquid or smoke. This would appear to be an Aegean torch, the only other southern Levantine example of which comes from Beth Shean (James 1966: 13; Yasur-Landau 2010: 212, and see Aegean and Cypriot references there).

Fig. 3.55:13 is a complete, solid, ceramic cylinder, highly polished with a ceramic ring that enclosed it. The interior of this ring was also highly polished, indicating motion and friction between the two pieces. This motion seems to have been both rotary and vertical; it looks like a sort of model spindle and whorl. It was found in the corner cella (L7082b) of what I believe to be a ritual structure (Building 7052).

Fig. 3.91:6 has the wall thickness of a crucible or a pot bellows drum, but the form is wrong for

16 For Tel Dan in the Middle Bronze Age see Ilan 1992: Fig. 10:1-2; and for the Late Bronze Age: Ben-Dov 2011: Fig. 187. For a survey of miniatures in Middle Bronze Age contexts in the Levant see Naeh 2012 and for the Late Bronze Age see Ben-Dov 2011: 264. For the miniature phenomenon in Egypt see Allen 2006 and for Minoan Crete see Tournavitou 2009.

Fig. 3.22. Pyxides

Item	Reg. no.	Locus	Remarks
a	13756/1	3172	= Fig. 3.105:6
b	13776	3174	Phase Y5, Stratum V
c	13796/1	3176	= Fig. 3.104:9
d	10423	690	= Fig. 3.48:9, Fig. 3.125:6
e	13452/6	3119 (=3123)	= Fig. 3.100:5
f	10736, IAA 11-1402	574	= Fig. 3.65:3
g	12716/13, IAA 11-1400	2425	= Fig. 3.86:1, 3.125:7
h	18526/1	4323 (=679)	= Fig. 3.70:7

both of these and there are no signs of pyroclastic activity. Perhaps it was a sort of stand.

Another unique object recovered is a ceramic lid (Fig. 3.108:6) with two perforated appendages for attaching the lid to the lidded vessel—perhaps a jug.

One of the types conspicuous in its absence is the goblet, a type found with some frequency on the coast and the Jezreel Valley (e.g. Mazar 1985: 49-51; Arie 2006: 199-200, Fig. 13:15) and as far north as Tel Kinrot (Kinneret) in the Galilee (Fritz and Münger 2002: Fig. 7:6), though not at Beth-Shean. It is possible that the vessel type exists in the assemblage only as sherds—rims assigned to jugs (the J2a neck and rim in particular) and base fragments assigned to chalices—though if so, it must be rare. One probable goblet base is Fig. 105:5.

On Pottery Decoration

The most frequent sort of decoration is painted. Painted decoration characterizes specific vessel types (see Table 3.10). The motifs are highly standardized and have been outlined for each type in Chapter 5. One does not get the impression of much naturalism or creative impulse. Rounded vessels (flasks, flask-jugs) have concentric circles and other types (kraters, jars, jugs, pyxides) have bands, registers and geometric motifs between registers. Philistine-Aegean decoration and Phoenician Bichrome decoration are discussed below in Chapters 4 and 5.

Table 3.10. Percentage of decorated vessels by types.

Type	% decorated
K1	45
SJ1	<1
J5	89
FL	82
PYX	87

Red wash or slip is very unusual, detected, thus far, on a total of 31 vessels and sherds (e.g. Figs. 3.30:6, 3.33:5; 3,59:2, 6; 3.60:3-4; 3.61:6; 3.63:3). These percentages are even lower than the low figures observed in contemporaneous assemblages further south (cf. Arie 2006: 224-225). Moreover, the larger vessels, reddish "wash" may be a product of the drying and firing process, rather than an applied wash. The open bowl in Fig. 3.33:5 is a residual Egyptian-style bowl from the terminal Late Bronze Age phases (Ben-Dov and Martin 2011 and see below).

There is very little plastic decoration. We have already noted the wavy line of the Wavy Band pithoi. The bird heads in Figs. 3.52:6 and 3.97:8 probably belonged to hemispherical bowls (see above). These have been attributed to an Egyptian inspiration (see below). Bar or bird-wing handles adorn some items of the same type (Fig. 3.33:1). Fig. 3.63:5 is another example of a krater rim and handle with an applied vine or snake or some such, but it is only a sherd and may originate in an earlier context. Fig. 3.39:7 is interesting in that it depicts imitation rivets on a jug handle. Obviously an entire class of metal vessels is absent from most excavated Iron Age I assemblages.[17]

The impressed dots or reed impressions that are fairly common in the central hill country further south (e.g. Finkelstein 1988: 278-280) are rare at Tel Dan (Figs. 3.41:6; 3.44:8; 3.45:1). The few examples decorate pithoi handles and kraters. Thumb impressions are also not so frequent, but do occur on a number of storejar handles (Figs. 3.40:3; 3.83:5; 3.96:3 and see above p. 118 and references there).

17 The most glaring exception is the cache of bronze objects from Megiddo Stratum VIA reported in Megiddo 3 (Harrison 2004: Figs. 97-99).

Fig. 3.23. Egyptian-style cooking jugs: a = Fig. 3.98:4; b = reg. no. 13763/4, L3172, Phase Y4, Stratum VA (for accompanying material see Fig. 3.105).

Egyptian-Style Pottery (Fig. 3.126)

In recent years Egyptian and Egyptianizing pottery has been identified in increasing quantities in both Late Bronze and early Iron Age contexts. This is especially reflected in the work of M. Martin (e.g. Martin 2009; 2011; Martin and Barako 2007). Ben-Dov and Martin (2011) published 62 Egyptian ceramic vessels and sherds from the Late Bronze and early Iron I (Strata VIIA1-VI) levels at Tel Dan (ten of these from the Iron I levels). I have tabulated 93 vessels and Egyptian-style sherds in the Iron I levels—the overwhelming majority of which are cooking jugs—but many more items have certainly gone unidentified. A number of sherds, for example, could belong to slender ovoid jars or drop-shaped jars (Martin 2011: 57-60), but have gone unidentified as such due to the lack of complete examples or large profiles.

Bowls (N=15, Type Series Fig. 3.126:1)

Stratum VI: Fig. 3.33:5 (simple bowl with a plain rim)

A number of other red-slipped Egyptianized bowls occur in Iron I contexts, primarily in Stratum VI pits. Many of these were published as Late Bronze Age ceramics in residual contexts (Ben-Dov and Martin 2011: Table 6, nos. 5, 7b, 15-16, 20, 24-25, 31, 33-35, 38-39, 42, 44). Morphologically these include Martin's Types BL1-3 and Killebrew's (2005: Fig. 2.11) Types EG1-3.

Almost all examples appear to belong to Martin's Fabric Group 1, which appears to originate in the Lebanese coastal area, using Egyptian ceramic techniques. Two examples (Ben-Dov and Martin 2011: Table 6, nos. 5, 38) belong to Martin's Fabric Group 2, which Goren (2011: No. 5) has suggested to be Egyptian clay. However, Aston, Kopetzky and Martin all reject an Egyptian source and Martin prefers a local one (Ben-Dov and Martin 2011: 312).

Jars (N=6, Type Series Fig. 3.126:2-4, 10-12)

Stratum VIIA1: Fig. 3.28:1 (J3 hybridized neckless jar); 3.33:20 (K/Jar neckless storage jar)

Stratum VI: Fig. 3.38:3 (BB beer jar); Fig. 3.100:1 (J7 hybridized small ovoid to drop-shaped jar)

Stratum V: Figs. 3.52:2 (SJ1 two-handled storage jar); 3.104:7 (Neckless storage jar with rolled rim)

Morphologically these include Martin's (2011) Types BB, JR1, JR5, JR6, and AM1. Jar Fig. 3.104:7 has been analyzed petrographically and found to be of local manufacture (Weiman-Barak and Gilboa, Chapter 6A this volume, Cat. no. 1). Naked-eye and magnifying glass examination of other Egyptianizing vessel wares seems to show a similar fabric. Therefore one might expect most, if not all of them to being of local manufacture, much like the much larger assemblage at Beth Shean, for example (Martin 2009).

Cooking Jugs (CJ, N= 73, Fig. 3.23—
Type Series Fig. 3.126:5-9)

Stratum VIIA1: Figs. 3.25:12; 3.81:7; 3.97:3, 5

Stratum VI: Figs. 3.84:9; 3.98:4; 3.101:6

Stratum V: Figs. 3.43:7-8; 3.56:5;
3.57:1, 6; 3.82:9; 3.87:3; 3.89:7

Stratum IVB: Figs. 3.69:4

The cooking jug has a spherical to biconical form and a closed mouth, probably for the brewing of liquids more efficiently. Its ware is similar to that of the local cooking pot, containing crystalline calcite grits. The form first occurs in Late Bronze Age Stratum VIIA at Tel Dan (Ben-Dov 2011: 234, Figs. 138:7, 157:8, 178:24, though not identified there as Egyptian).

Rare in Canaan, outside of Tel Dan, this is Killebrew's (2005: 71-72) type EG11-12 and Martin's type JR5.[18] As cooking vessels, Martin (2011: 251-252) has noted their rarity in Canaan, but he was not aware of their large numbers at Iron I Tel Dan.

Isolated examples were published from Tel Mor Stratum V (Martin and Barako 2007: 145, Fig. 4.9:10 = 20th Dynasty), Kamid el-Loz (Metzger 1993: Pl. 117), Beth Shean (Yadin and Geva 1986: 68-69, Photo 67, "bottles") and Deir el-Balah (Gould 2010: 23-25, Figs. 2.3:9-10). At Deir el-Balah they are called "globular jars" (Type B) but "the lower part of the vessel…displays signs of secondary exposure to fire". It is curiously missing from the more recent excavations of Beth Shean (Martin 2009: 462). So far, Tel Dan has more of these than all the other sites put together. It would seem that by Stratum IVB the type was much less popular.

This jug form occurs often in New Kingdom Egypt (see Martin and Barako 2007: Table 4.9), but are especially characteristic of the 20th Dynasty (Martin and Barako 2007: 145, citing Aston 1998: Nos. 2252, 2483).

Sculpted bird's heads (attached to bowls/ritual vessels)

Stratum VIIA1: Fig. 3.97:8

Stratum V: Fig. 3.52:6

Terra cotta birds' heads found in Late Bronze Age and early Iron Age contexts were most often attached to hemispherical or platter bowls. While initially thought to be a hallmark of the Philistine material culture (Mazar 1980: 100), their ubiquity at Beth Shean has lead him to consider them an Egyptian-style feature (Mazar 2009: 546-550 and see the discussion in Chapter 15).

It will be noted that several vessels have been termed "hybrids". This term suggests that Egyptian prototypes were introduced into the Canaanite milieu and underwent morphological transformation under the influence of Canaanite, and perhaps even Aegean and Cypriot, forms. Specialists will have to decide how convincing my interpretations are in this regard.

Martin has shown that most of the Egyptian and Egyptian-type pottery in Canaan is locally produced household ware (2011: 20-21, 91, 249). This is held by him (and others) to indicate the actual presence of Egyptian potters and consumers. I have not attempted a close analysis of fabric for the Egyptianized ceramics described above (but see Ben-Dov and Martin 2011: 312). No imported Egyptian fabrics have been recognized as yet in the Iron I assemblage. Six Egyptian and Egyptian-style sherds from Late Bronze Age and Early Iron Age contexts were sampled by Goren (2011). Two of these were locally manufactured, three were imported from the Lebanese coast and one (from Late Bronze Age Stratum VIIB) was an import from Egypt proper. Two of the three vessels imported from the Lebanese coast were red-slipped bowls. The Egyptian-style jar sherd sampled by Waiman (Fig. 3.104:7; and this volume, Chapter 6A, Fig. 6A:1) is of local manufacture. Thus the

18 And see: Rose 1987: Fig. 10.3:63573 and Aston 1998: Nos. 2252, 2483.

small petrographically sampled group from Tel Dan presents a somewhat complex picture: local manufacture of Egyptian-style vessels, import of Egyptian-style vessels manufactured on the Lebanese coast and, possibly, some importation from Egypt, though not in the Iron Age I.

This ceramic material is complemented by other Egyptian or Egyptianizing items discussed in Chapters 11-13.

Metallurgical Ceramics (Type Series Figs. 3.127-3.129)

A large corpus of metallurgical ceramics has been recovered over the years, mainly in Area B-west (Fig. 3.24), but also in Area Y (Fig. 3.97:7). The metallurgy industry at Tel Dan, like that at many other sites of this period, was a recycling industry, and not one that smelted mined ores. This industry is the subject of a separate investigation carried out by R. Ben-Dov; the related ceramic objects will be treated only on a superficial level here.[19] Tables 3.11-3.13 are a summary of the Iron I metallurgical ceramics. A number of metallurgy ceramics were recovered from later Iron Age II contexts as well (e.g. in L7142). These probably originated in the earlier Iron I contexts but have not been included here.

Crucibles (CR Type Series Fig. 3.127:1-8; N=198)

Stratum V: Figs. 3.47:3; 3.50:9; 3.54:10

Stratum IVB: Figs. 3.73:1-2

Crucibles are bowl-shaped vessels with thick walls of coarse clay and many coarse inclusions. The base is always flat and very thick, the walls

Fig. 3.24. An assemblage of artifacts associated with the recycling metallurgy industry of Iron Age I Tel Dan.

19 See Ben-Dov 2018; Biran 1994: 147-158; and Ilan 1999: 125-131.

generally are inclined at an angle of ca. 60 degrees, and the rim is always simple and rounded. The rim is most often pinched to form a pouring spout, but there are a few examples of notched depressions without a spout (Fig. 127:8). Crucible measurements vary somewhat but rim diameters tend to be ca. 14 cm and height ca. 10 cm. Depth varies more, depending on the thickness of the base-3-8 cm. Average volume measures ca. 30 cm^3 (Ben-Dov 2018: 462-463).

Scrap metal was placed in crucibles to be melted at high temperatures over a span of several hours and then cast (in a liquid or viscous state) into molds to make new objects.

Bellow Pipes (BN Type Series Fig. 3.127:9-15; N=39)

Stratum VIIA1: Figs. 3.97:7

Stratum V: Figs. 3.50:10; 3.52:9; 3.54:11

Bellow pipes (often called *tuyères*) conveyed forced air from pot bellows to the melting furnace, via hollow reeds or wooden pipes. Hence they were integrated into the furnace construction horizontally, at surface level (see Figs. 2.32-2.35). The reed-end is straight and has a wider diameter (Fig. 127:14-15) while the furnace end is bent down (towards the crucible at the base of the furnace). The pipe at this end is also very narrow, so as to create a jet of forced air (Tylecote 1981:115). The bent-down pipe ends often show sintering due to high temperatures and a couple even bore copper residue (Ben-Dov 2018: 463-466).

Pot Bellows (PB Type Series Fig. 3.128; N=15)

Stratum VI: Fig. 3.37:2

Stratum V: Fig. 3.48:4

Stratum IVB: Fig. 3.65:1

Given the plethora of crucible and bellow pipe fragments, the small number of pot bellows fragments is surprising. Ben-Dov (2018: 466-468 has suggested that this may be due to a more frequent use of bellows made of wood and skins that have not been preserved.

Ceramic pot bellows are made of coarse clay with coarse inclusions and straw impressions. The rim diameter is generally ca. 30 cm and they average about 20 cm in height. The rims are rolled out to facilitate the fastening of an animal skin over the pot opening with twine. The base is flat. Pot bellows have a round, lipped opening near, or at, the base for the attachment of the wood or reed air pipe (Fig. 128:8).

It has also been suggested that chalices may have been used in metallurgy (see above p. 99; Ben-Dov 2018: 470-472; Biran 1989b: n.11 and Fig. 3.129).

* * *

Sea-People and Phoenician ceramics are discussed in Chapters 4 and 5 respectively.

Table 3.11. Crucibles from IA I contexts at Tel Dan

Locus	Reg. No.	Area/ year	Square	Phase/stratum	Description
574	9483	B74	A19	B8/IVB	Rim, medium, joins with 9476
574	9521	B74	A19	B8/IVB	Rim, medium
574	9564	B74	A19	B8/IVB	Fragment, small
587	9552/11	B74	C17	B8/IVB	Rim
587	9669	B74	C17	B8/IVB	Rim
591	9508/1	B74	B19	B9-VA	Complete profile; Figs. 3.47:3, 3.127:4
591	9508/2	B74	B19	B9-VA	Rim and fragment, large
601	9658/1	B74	B19	B8/IVB	Rim, medium
601	9658/1	B74	A19	B8/IVB	Rim
607	9644/1	B74	A19	B9-10/V	Rim, small

Locus	Reg. No.	Area/ year	Square	Phase/stratum	Description
607	9644/2	B74	A19	B9-10/V	Base, small
607	9672/1	B74	A19	B9-10/V	Base, large
607	9676/1	B74	A19	B9-10/V	Rim, medium
607	9676/2	B74	A19	B9-10/V	Rim, small
607	9676/3	B74	A19	B9-10/V	Rim, small
607	9687	B74	A19	B9-10/V	Base, medium
607	9695	B74	A19	B9-10/V	Fragment
607	9710	B74	A19	B9-10/V	2 rims, small
622	9748	B74	A19	B9-10/V	Rim, small
622	9790	B74	A19	B9-10/V	Fragment, small
622	9791	B74	A19	B9-10/V	Rim and 3 fragments, small
622	9812	B74	A19	B9-10/V	Fragment, small
622	9825	B74	A19	B9-10/V	Rim, small
650	10453/1	B75	A18	B9-10/V	Rim, small
650	10453/2	B75	A18	B9-10/V	Rim, small
659	10195/7	B75	U19	B8/IVB	
659	10236/5	B75	U19	B8/IVB	Fragment
659	10278.4	B75	U19	B8/IVB	Base
671	10242/1	B75	B20	B8/IVB	Rim, small
687	10439/1	B75	A20	B9-10/V	Rim, large
1204	10487/1	B75	B20	B10/VB	Rim, small
1204	10529/1	B75	B20	B10/VB	Rim, large, joins with 12037
1204	10529/2	B75	B20	B10/VB	Profile, large, joins with Base 692: 16415; Figs. 3.50:9, 3.127:7
1204	10536	B75	B20	B10/VB	Rim and fragment, small
1204	10623	B75	B20	B10/VB	Fragment, small
1210	10473/1	B75	A19	B11/VI	Rim, medium
1210	10499/1	B75	A19	B11/VI	Fragment, small
1211	10542/2	B75	A20	B11-12/VI-VIIA1	Rim, small
1212	10205/1	B75	U19	B9-10/V	Rim
1212	10205/	B75	U19	B9-10/V	Rim, small
1219	10582/1	B75	A19	B9-10/V	Fragment, small
1224	10623	B75	C18	B11-12/VI-VIIA1	Fragment, small
1225	10663/1	B/75	B19	B11/VI	Fragment, small
1225	10677	B75	B19	B11/VI	Rim, small
1229	10667	B75	A18	B11/VI	Rim, small
1231	10709	B75	C18	B11-12/VI-VIIA1	Rim, small
1241	10766	B75	A20	B11/VI	Fragment, small
3111	13439/	Y77	--	Y6/V	Rim, small
3216	17205	Y79	--	Y8/7-VIIA1/VI	Fragment, small
4202	18059/18	B79	A14	B8/IVB	Base, small
4202	18072/6	B79	A14	B8/IVB	Base, small

Locus	Reg. No.	Area/ year	Square	Phase/stratum	Description
4202	18123/4	B79	A14	B8/IVB	Base, medium
4202	18123	B79	A14	B8/IVB	Rim, small
4322	10520	B75	A19	B8/IVB	Base and fragment
4322	18508	B84	B18	B8/IVB	4 rims, small
4322	18513	B84	B18	B8/IVB	Fragment, small
4322	18515	B84	B18	B8/IVB	Rim, small
4322	18517/1	B84	B18	B8/IVB	Rim, small
4322	18517/2	B84	B18	B8/IVB	Rim and fragment, small
4322	18520	B84	B18	B8/IVB	Base, medium
4322	18522	B84	B18	B8/IVB	Rim and fragment, small
4323	18536	B84	B19	B8/IVB	Base, full
4325	18540	B84	B18	B11-12/VI-VIIA1	Rim, small
4349	12628	B84	B18	B11/VI	Rim, small
4736	25234/1	B88	U18	B12/VIIA1	Base
7015	24076	B85	AU14	B8/IVB	Base, half
7015	24082/1	B85	AU14	B8/IVB	Rims and fragment, small
7015	24083/19	B85	AU14	B8/IVB	Rim, small
7015	24084	B85	AU14	B8/IVB	2 Rims
7015	24090/15	B85	AU14	B8/IVB	Base, large; Fig. 3.127:2
7015	24090/16	B85	AU14	B8/IVB	Rim, large; Fig. 3.127:1
7015	24090/17	B85	AU14	B8/IVB	Base, large
7015	24092/10	B85	AU14	B8/IVB	Base, Profile, half a vessel
7015	24092/14	B85	AU14	B8/IVB	7 rims, small, many small fragments
7015	24099/11	B85	AU14	B8/IVB	Base, large
7015	24099/12	B85	AU14	B8/IVB	Rim and base, ¼ profile
7015	24099/13	B85	AU14	B8/IVB	9 rims and fragments, small-medium
7015	24099/13	B85	AU14	B8/IVB	Base, large
7015	24099/15	B85	AU14	B8/IVB	Rim, medium
7015	24102/6	B85	A14-15	B8/IVB	Rim and base, half profile; Fig. 3.127:3
7015	24102/a	B85	AU14	B8/IVB	Rim, small with slag
7015	24106/9	B85	AU14	B8/IVB	Base, small
7015	24106/9	B85	AU14	B8/IVB	5 rims, small
7015	24106/a	B85	AU14	B8/IVB	Rim, small
7015	24111/14	B85	AU14	B8/IVB	2 rims, small
7019	24108/7	B85	A14	B9-10/VA	Rim and fragments, small
7026	24140/1	B85	U15	B10/11-V/VI	Rim and fragments, small
7027	24134/2	B85	U14	B8/IVB	Rim, small
7027	24135/1	B85	U14	B8/IVB	Fragment, small
7050	23340/3	B86	A15	B8/IVB	Rim and fragment, small
7052	23421	B86	U16	B9-10	Rim and base
7053	23332/23	B86	A14	B8/IVB	Fragment, small

Locus	Reg. No.	Area/ year	Square	Phase/stratum	Description
7053	23389/28	B86	A14	B8/IVB	Rim, small
7060	23364	B86	U14/ 15	B8/IVB	Base
7060	23377	B86	U14/ 15	B8/IVB	Fragment, small
7060	23383	B86	U14/ 15	B8/IVB	Rim and base
7060	23392/7	B86	U14/ 15	B8/IVB	Rim, small
7060	23444/1	B86	U14/ 15	B8/IVB	Rim, large
7060	23444/2	B86	U14/ 15	B8/IVB	Rim and base, ½ profile, another large rim
7061	23361/18	B86	A15	B9-10/V	Rim, medium
7061	23371/8	A/86	A15	B9-10/V	Fragment, small
7061	23384/10	B86	A15	B9-10/V	3 rims, small
7061	23393/6	B86	A15	B9-10/V	Base, Full, Full
7061	23403	B86	A15	B9-10/V	Base, 1/2
7061	23412/4	B86	A15	B9-10/V	Rim and fragments
7061	23425/8	B86	A15	B9-10/V	Base, small
7061	23425/10	A/86	A15	B9-10/V	Rim, small
7061	23425/7b	B86	A15	B9-10/V	Base, half
7061	23425/7r	B86	A15	B9-10/V	Rim, medium
7061	23428/6	B86	A15	B9-10/V	3 rims, small, many small fragments
7061	23442/2	B86	A15	B9-10/V	Rim and fragment, small
7062	23372/2	B86	A15	B8/IVB	Complete; Figs. 3.73:2, 3.127:6
7062	23404/8	B86	A15	B8/IVB	Rim, base and fragment, profile, IAA94-1286; Figs. 3.73:11, 3.127:5
7062	23424/6	B86	A15	B8/IVB	Fragment, small
7062	23424/10	B86	A15	B8/IVB	Rim, base and fragment, ¼ vessel; 5 fragments
7065	23406/6	B86	A15	B9-10/V	Fragment, medium
7066	23427/1	B86	U14	B11-12/VI-VIIA1	Base, medium
7066	23438/1	B86	U14	B11-12/VI-VIIA1	2 fragments, small
7066	23439/3	B86	U14	B11-12/VI-VIIA1	Rim, small
7067	23443/1	B86	A15	B9-10/V	Complete; Figs. 3.54:10, Fig. 3.127:8
7067	23452/2	B86	A15	B9-10/V	Rim, large
7068	23453/6	B86	A15	B9-10/V	Base, medium
7068	23453/7	B86	A15	B9-10/V	2 rims, small
7075	23481/	B86	U16	B8/IVB	Rim, medium
7079	23477/	B86	A15	B11-12/VI-VIIA1	4 rims and base, small
7079	23484/	B86	A15	B11-12/VI-VIIA1	4 rims, base and fragments, small
7079	23484/	B86	A15	B11-12/VI-VIIA1	Fragment, small
7079	23498/	B86	A15	B11-12/VI-VIIA1	3 rims, small
7081	23914	B86		B11/VI	Rim, small
7083	2350512/	B87	A15	B11-12/VI-VIIA1	Rim and fragment, small
7084	23512/4	B87	A15	B11-12/VI-VIIA1	Rim and fragment, small
7099	23561/17	B87	U15	B9-10/V	Rim, medium
7099	23575/4	B87	U15	B9-10/V	Rim, medium

Locus	Reg. No.	Area/ year	Square	Phase/stratum	Description
7102	23587/2	B87	U14	B8/IVB	Rim, medium
7102	23589/3	B87	U14	B8/IVB	2 Rims, small
7102	23589/3	B87	U14	B8/IVB	½ Base
7102	23589/7	B87	U14	B8/IVB	Fragment, small
7104	23586/6	B87	U15	B9-10/V	Rim, small
7104	23591/7	B87	U15	B9-10/V	Rim, small
7104	23591	B87	U15	B9-10/V	3 fragments
7105	23599/1	B87	A15	B9-10/V	Base, small
7105	23599/2	B87	A15	B9-10/V	2 rims, small
7115	23622	B88	U15	B9-10/V	Rim, small
7115	23661	B88	U15	B9-10/V	4 rims and fragments, small
7115	23673/1	B88	U14	B9-10/V	Rim, medium
7115	23673/2	B88	U14	B9-10/V	3 rims and fragments, small
7117	23696	B88	U15/ 16	B8/IVB	Rim and fragment, medium, joins with 23695
7117	23707	B88	U15/ 16	B8/IVB	Rim
7119	23668	B88	U15	B8/IVB	Rim, medium
7119	23695	B88	U15	B8/IVB	Rim, large
7119	23704/1	B88	U15	B8/IVB	Rim, medium
7120	23694	B88	B15	B9-10/V	Rim, small
7120	23824	B88	U14	B9-10/V	Rim, small
7121	23701	B88	B15	B8/IVB	Fragment, large
7122	23777	B88	B15/ 16	B8/IVB	Rim and base
7122	23796	B88	B15/ 16	B8/IVB	Rim
7122	23796	B88	B15/ 16	B8/IVB	Fragment
7125	23785/2	B88	U14	B11/VI	Base, large
7125	23801	B88	U14	B11/VI	2 rims, large and small
7125	23807	B88	U14	B11/VI	Base, full
7125	23823	B88	U14	B11/VI	rim, base and fragment
7126	23712	B88	A15	B9-10/V	Rim, small
7126	23723	B88	A15	B9-10/V	4 rims, small
7130	23718/7	B88	U15	B11/VI	Rim, small
7131	23734	B88	U15	B9-10/V	2 fragments, small
7131	23742	B88	U15	B9-10/V	Base, medium
7131	23754	B88	U15	B9-10/V	3 rims and fragment
7132	23780	B88	AU14	B8/IVB	2 rims, medium and small
7135	23776	B88	U15	B9-10/V	Base, medium
7140	23781	B88	U15	B11/VI	Fragment, small
7141	23840	B88	U16	B8/IVB	Rim, medium
7142	23798	B88	B15	B9-10/V	Rim
7142	23798	B88	B15	B9-10/V	Fragment, small
7145	23826	B88	A15	B11-12/VI-VIIA1	2 Rims, small
7145	23832	B88	A15	B11-12/VI-VIIA1	Fragment, small

Locus	Reg. No.	Area/ year	Square	Phase/stratum	Description
7151	23887	B88	U16	B9-10/V	Rim and fragment, small
7152	23864	B88	U15	B8/IVB	Rim, small
7155	23873	B88	U15	B11/VI	Rim, small
7155	23899/5	B88	U15	B11/VI	Fragment, medium
7155	23899	B88	U15	B11/VI	Base, medium
7156	23894	B88	B15	B11-12/VI-VIIA1	Base and rim, = ½ vessel
7156	23910	B88	A15	B11-12/VI-VIIA1	Rim, small
7159	23898	B88	B15	B9-10/V	Fragment, small
7159	23919	B88	B15	B9-10/V	Rim, small
7160	23902	B88	A15	B11-12/VI-VIIA1	Rims and bases, medium
7167	23930	B88	U15	B9-10/V	Base, small
7167	23933	B88	U15	B9-10/V	Rim and fragment, small
7168	23948	B88	U15	B11-12/VI-VIIA1	Rim, small
7168	23967	B88	U15	B11-12/VI-VIIA1	Base, medium
7169	23956	B88	U15	B11-12/VI-VIIA1	Base and fragments, medium and small
7169	23960	B88	U15	B11-12/VI-VIIA1	Rim, small
7174	23975	B88	U15	B11-12/VI-VIIA1	Rim, small
7176	23992/1	B88	U14	B9-12/V-VIIA1	Base, large
7176	24612	B88	U14	B9-12/VI-VIIA1	Rim, small
7225	24674/1	B91	A20	B11/VI	Rim, medium; = Pit 1241
7225	24700	B91	A20	B11/VI	Fragment
7273	24961	B97	B19	B11/VI	Rim, small

Table 3.12. Bellow pipes (tuyeres) from IA I contexts at Tel Dan

Locus	Reg. No.	Area/ year	Square	Phase/ stratum	Description
571	9463	B74	B18	B8/IVB	Small fragments
574	10420/1	B75	A19	B8/IVB	Medium fragment
607	9644	B74	A19	B9-10/V	Small fragment
607	9672	B74	A19	B9-10/V	Medium fragment, nozzle end
607	9676	B74	A19	B9-10/V	Small fragment
607	9682	B74	A19	B9-10/V	Small fragment
607	9711	B74	A19	B9-10/V	Small fragment
612	9705	B74	A18	B8/IVB	Medium fragment, nozzle end
622	9826	B74	A19	B9-10/V	Small fragment, nozzle end
645	10205/7	B75	U19	B8/IVB	Large fragment, nozzle end broken, nozzle end
645	10252	B74	B19/20	B8/IVB	Medium fragment
659	10304	B75	U19	B8/IVB	Small fragment
678	10274/2	B75	A20	B8/IVB	Large fragment
685	10373	B75	U19	B9-10/V	Half of small, nozzle end
1204	10480	B75	B20	B10/VB	Fragment, nozzle end; Figs. 3.50:10, 3.127:14

Locus	Reg. No.	Area/ year	Square	Phase/ stratum	Description
1204	10529	B75	B20	B10/VB	Fragment
1212	10481a	B75	B19	B9-10/V	Medium fragment
1240	10745	B75	B20	B11/VI	Small fragment, nozzle end
4202	18059/17	B79	A14	B8/IVB	Medium fragment, nozzle end, Fig. 3.127:10
4322	18508	B84	A19	B8/IVB	Small fragment, nozzle end
4608	23017a	B84	A19	mixed	Small fragment, nozzle end
7030	24141/1	B85	A14	B10-11/V-VI	Small fragment
7060	23444/4	B86	U15/16	B8/IVB	Small fragment
7061	23384/11	B86	A15	B9-10/V	Small fragment
7061	23403/7	B86	A15	B9-10/V	Small fragment
7061	23451/2	B86	A15	B9-10/V	5 Fragments
7061	23451/3	B86	A15	B9-10/V	Half of pipe, nozzle tip, IAA 94-1293; Fig. 3.127:9
7061	23451/4	B86	A15	B9-10/V	Large fragment, with broken nozzle tip; Figs. 3.52:9, 3.127:11
7068	23453/4	B68	A15	B9-10/V	Large fragment, nozzle end; Figs. 3.54:11, 3.127:12
7115	23661	B88	U15	B9-10/V	Small fragments
7119	23695	B88	U15	B8/IVB	Small fragment
7126	23744/1	B88	A15	B9-10/V	Medium fragment
7135	23776/1	B88	U15	B9-10/V	Large fragment, nozzle end; Fig. 3.127:15
7135	23776/2	B88	U15	B9-10/V	2 small fragments
7160	23962	B88	A15	B11-12/VI-VII	Medium fragment, nozzle end
7174	23981	B88	U15	B11-12/VI-VII	Large fragment, nozzle end; Fig. 3.127:13
7176	24612/2	B88	U14	B9-12/V-VII	Small fragment
7273	24961/8	B97	B19	B11/VI	Small fragment

Table 3.13. Pot bellows from IA I contexts at Tel Dan (N=14)

Locus	Reg. No.	Area/ year	Square	Phase/ stratum	Description
7179	24610/1	B86	A15	B11-12/VI-VIIA1	Rim and shoulder, Fig. 3.128:1
7240	24416/2	B94	B12	B11-12/VI-VIIA1	Base, Fig. 3.128:6
7240	24935/1	B94	B12	B11-12/VI-VIIA1	Rim and shoulder, Fig. 3.128:5
4349	18628	B84	A-B19	B11/VI	80% profile without rim or base
7140	23820/1	B88	U15-16	B11/VI	Aperture for pipe insertion, Fig. 3.128:8
607	9644	B74	A19	B9-10/V	Rim
1216	10920	B75	A19	B9-10/V	Base
1227	10615	B75	A20	B9-10/V	Base and body
7060	23448/1	B86	U14-15	B9-10/V	Rim and shoulder, Fig. 3.128:7
7068	23453/5	B86	A15	B9-10/V	Body fragment
7099	23568/5	B87	U15	B9-10/V	Base, Fig. 3.128:2
7129	23713/3	B88	U15-16	B9-10/V	Rim and shoulder, Fig. 3.128:3
574	10398	B74	A19	B8/IVB	Base and body
7142	23810/1	B88	B15	B7/IVA	Base, Fig. 3.128:4
4608	23020	B85	A19	mixed	Rim

Conclusions

Much more could be done with the Iron I ceramic assemblage—more detailed statistical analysis and measurement, ware analysis, and more petrography. These tasks will remain for the future.

Table 3.14 summarizes the appearance and relative frequency of ceramic types in the Iron I strata of Tel Dan. This assemblage shows much that follows directly on the heels of previous Late Bronze Age ceramic traditions. There are more than a few types that, out of context, can be difficult to assign to either the Late Bronze II or the Iron Age I: kraters, storage jars, cooking jugs, jugs, pyxides, flasks and metallurgical items, to cite only the most frequent. We can summarize features of continuity and features of innovation in the Iron Age I repertoire of Tel Dan as follows:

Elements of continuity from the LBII assemblage:

- Hemispherical bowls
- "S-shaped" or "cyma" bowls which continue the tradition of the flaring rim carinated bowls[20]
- Chalices
- Cooking pot rims and cooking jugs
- Krater forms and painted decorations
- Storejar forms and rims
- Globular and biconical jug forms
- Dipper juglets
- Flasks (body forms)
- Pyxides
- Lamps
- Cup-and-saucer/lamp-and-bowl forms
- Crucibles and bellow pipe nozzles associated with metallurgy
- Egyptian-style ceramics (Fig. 3.126)

New elements:

- Lack of imported wares
- Low frequency of platter bowls
- Two-handled amphorae, mostly with a ring base
- Three pithos types: Collared-rim, Galilean and Wavy Band.
- Strainer jugs and narrow-spouted jugs
- Philistine or "Sea-People" pottery

Elements found in contemporary assemblages, but lacking or rare at Tel Dan:

- Bell-shaped bowls and kraters with horizontal handles (except for Fig. 3.107:6)
- Bowls and kraters with red slip and irregular hand burnishing (one exception: Fig. 3.59).
- Goblets
- Fenestrated stands

For the most part the Tel Dan Iron Age I assemblage is similar to characteristic assemblages further south. Lowland assemblages such as Beth-Shean, Kinrot (Kinneret), Yoqne'am, Ta'anach and Megiddo share most of the forms and their decoration (See Table 20.2 for a comparative chronology based on material culture). On the other hand, virtually all the elements found in the roughly contemporary sites of the Central Highlands are present as well.

Close connections with the coastal zone have also been demonstrated. The "Philistine" or "Sea People" elements in the Iron Age I assemblage are of great importance for relative chronology and from the perspective of cultural ties (see Zukerman, this volume, Chapter 4). They are fairly numerous:

- True Philistine ware with bichrome painted decoration on a white slip background (e.g. Fig. 4.15:1-3)
- Wavy-Band pithoi and Cypriot-style two-handled pithoi (Figs. 3.119-3.120)
- "Feeding bottles" (Fig. 3.124:4 = Dothan Type 7)
- Strainer jugs with basket handle (Fig. 3.124:3 = Dothan Type 17)
- Late Helladic IIIC type amphorae (Fig. 3.123:1)

20 Though given the plethora of Aegean and Cypriot forms in the Tel Dan Iron Age I assemblage they could also represent a late variant of the Mycenean "bell-shaped" bowl (cf. Dothan 1982: 98-106) or the Late Helladic kylix or shallow angular bowl (Mountjoy 1993: nos 222, 223, 225).

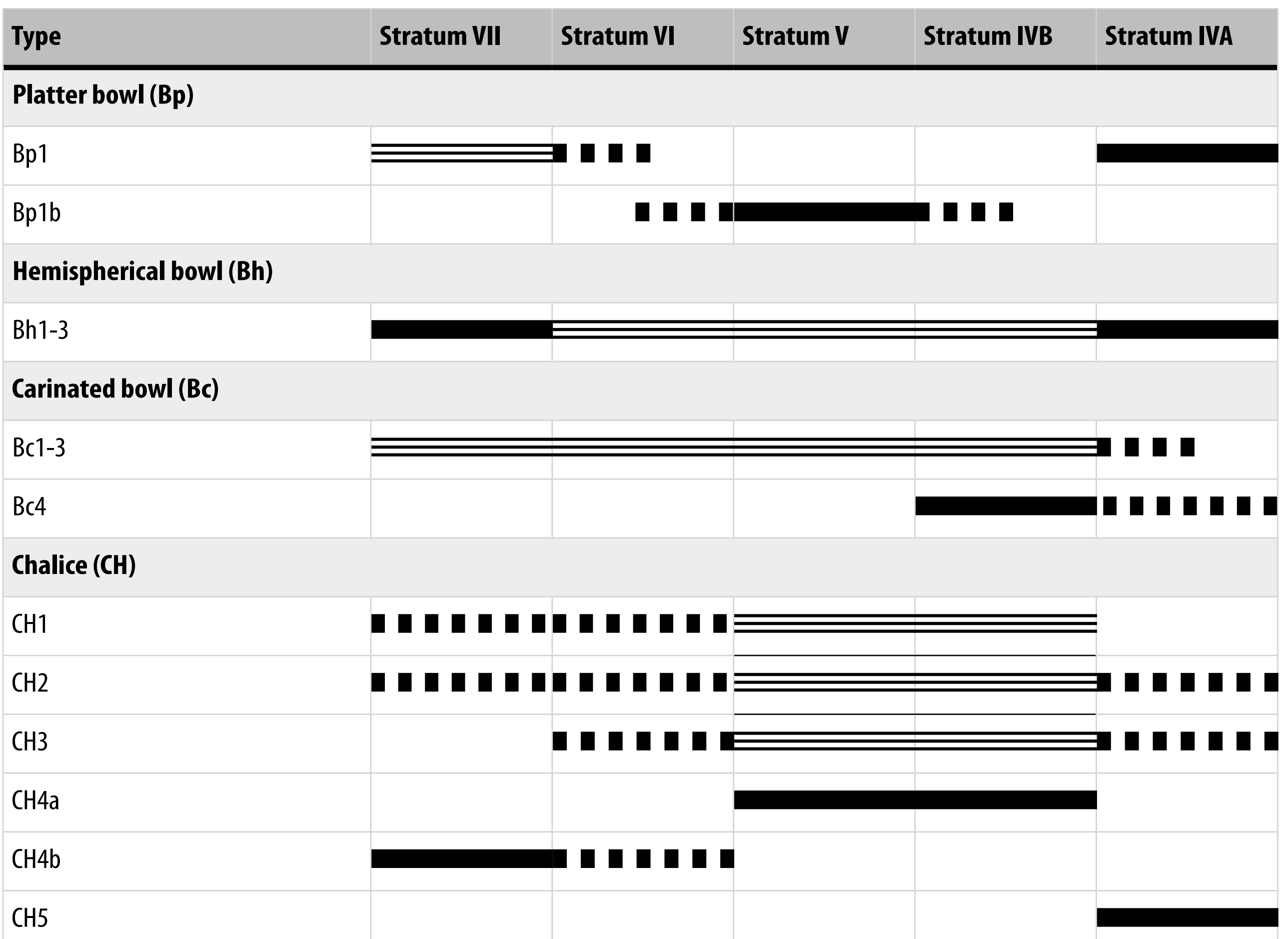
- The Late Helladic IIIC type stirrup jar (Fig. 4.17)
- The bird motif (Figs. 4.15-4.16)
- Kernoi (Figs. 15.3-15.5)
- The Mycenaean “mourning” figurines (Figs. 15.8-15.12)
- The Aegean torch (Fig. 3.70:2)

These testify to more than a chance connection with the coastal culture, with Cyprus and perhaps the Aegean region beyond. It is probably no accident that many are closed vessels; a number of these may have been intended for the consumption of alcoholic beverages—especially wine (Stager 1994: 345; Joffe 1998). However, many elements of the classic southern coastal Philistine repertoire are lacking: bell-shaped bowls and kraters, three-handled jars, pinched-bodied juglets, horn-shaped vessels and decorated bowls. Many of these have counterparts—most obviously the K1 kraters and the Bc and Bh type bowls in place of the bell-shaped kraters and bowls.

What then does the existing “Sea People” corpus, and its missing elements, tell us about the people who lived at Tel Dan? This question is raised in Chapter 21, where matters of ethnicity, economy and polity are discussed.

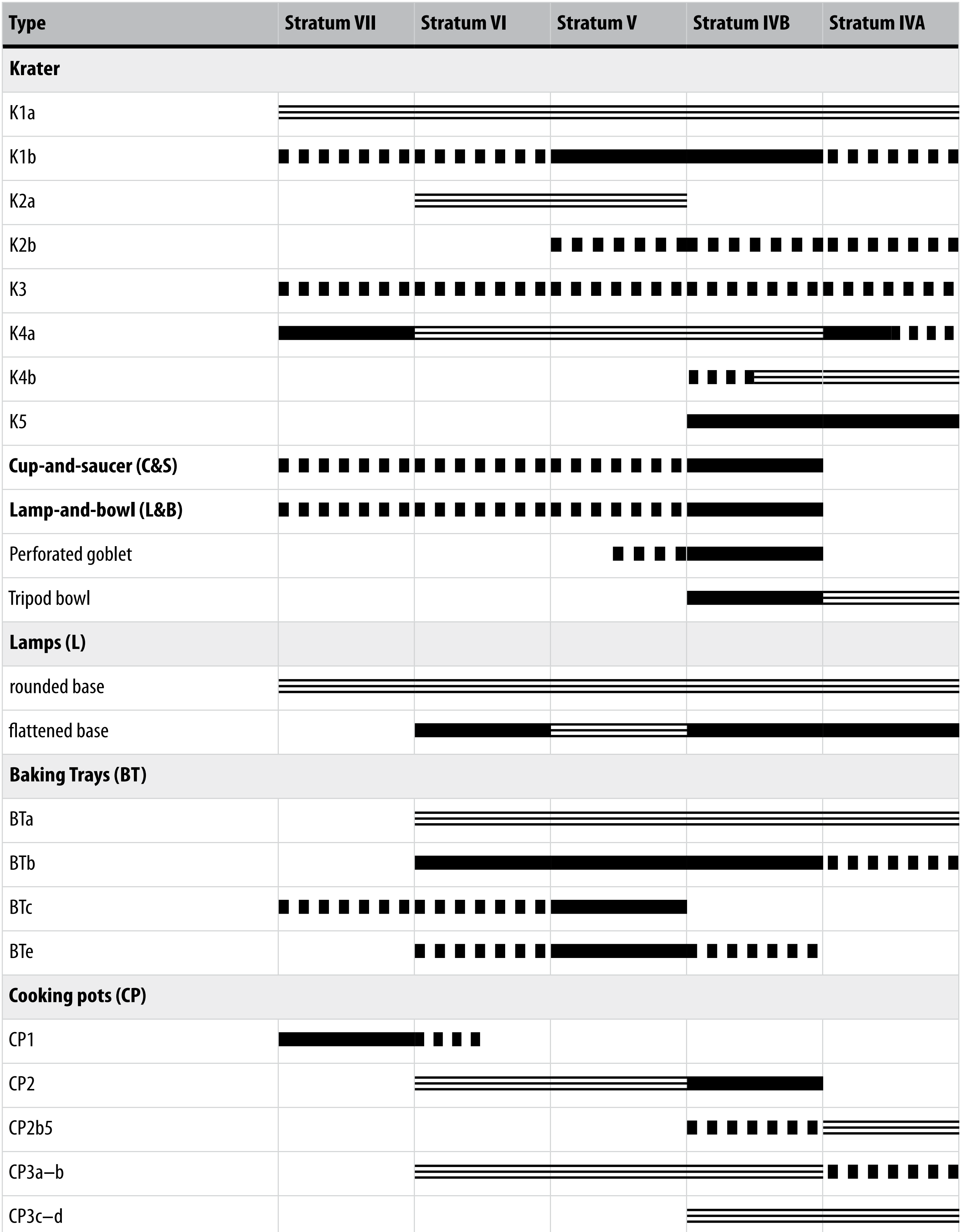
The pottery analysis tells us, in sum, that any notion of cultural or social insularity for Iron Age I Tel Dan should be ruled out. Whatever the mechanisms of communication and exchange, this was a multiethnic, cosmopolitan society.

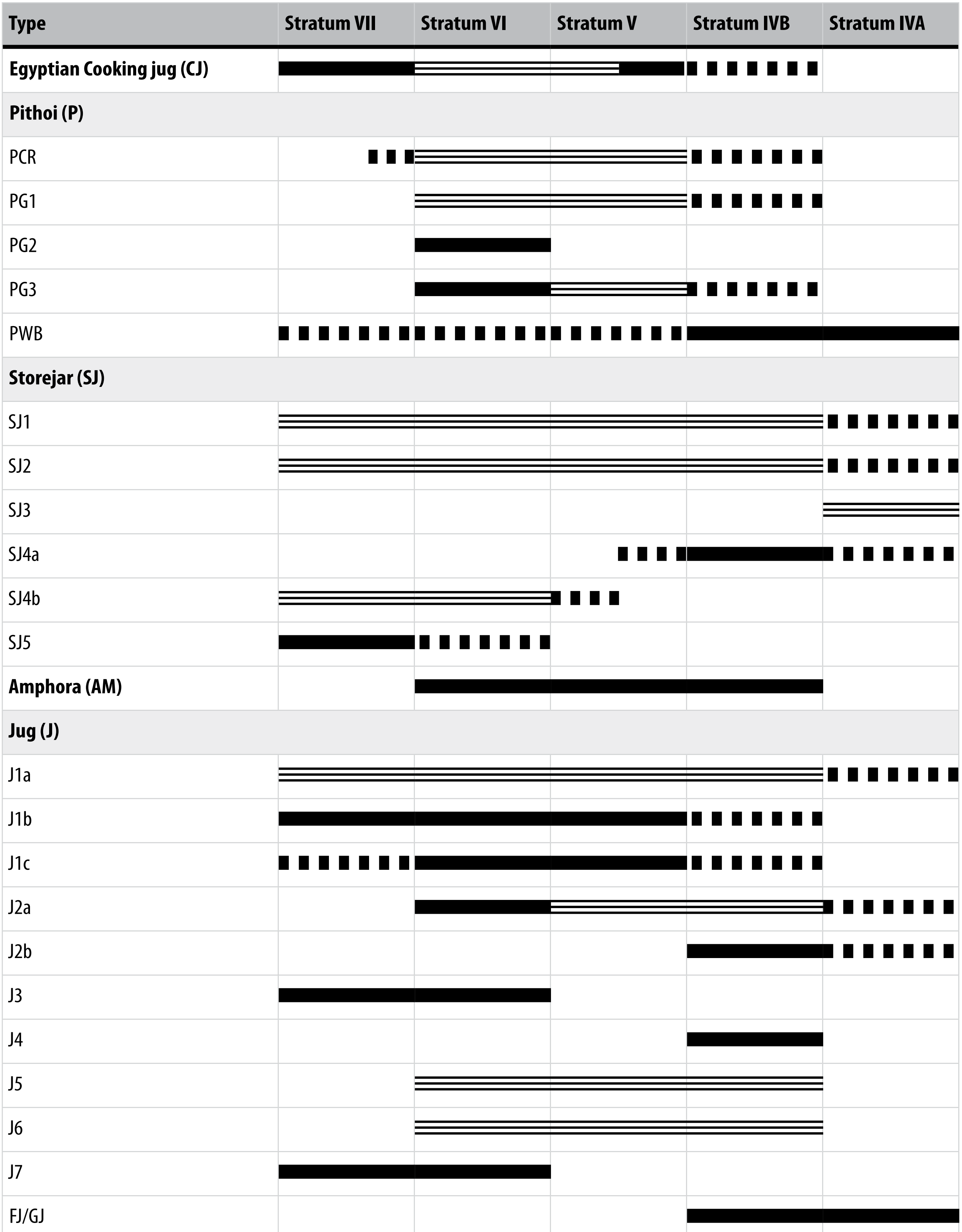
Table 3.14. Ceramic continuity and innovation at Iron Age I Tel Dan.*



* For abbreviations see type series Figs. 109-128.

<5 complete vessels; >5 complete vessels; sherds only;


Type
Stratum VII
Stratum VI
Stratum V
Stratum IVB
Stratum IVA
Krater
K1a
K1b
K2a
K2b
K3
K4a
K4b
K5
Cup-and-saucer (C&S)
Lamp-and-bowl (L&B)
Perforated goblet
Tripod bowl
Lamps (L)
rounded base
flattened base
Baking Trays (BT)
BTa
BTb
BTc
BTe
Cooking pots (CP)
CP1
CP2
CP2b5
CP3a–b
CP3c–d


Type
Stratum VII
Stratum VI
Stratum V
Stratum IVB
Stratum IVA
Egyptian Cooking jug (CJ)
Pithoi (P)
PCR
PG1
PG2
PG3
PWB
Storejar (SJ)
SJ1
SJ2
SJ3
SJ4a
SJ4b
SJ5
Amphora (AM)
Jug (J)
J1a
J1b
J1c
J2a
J2b
J3
J4
J5
J6
J7
FJ/GJ

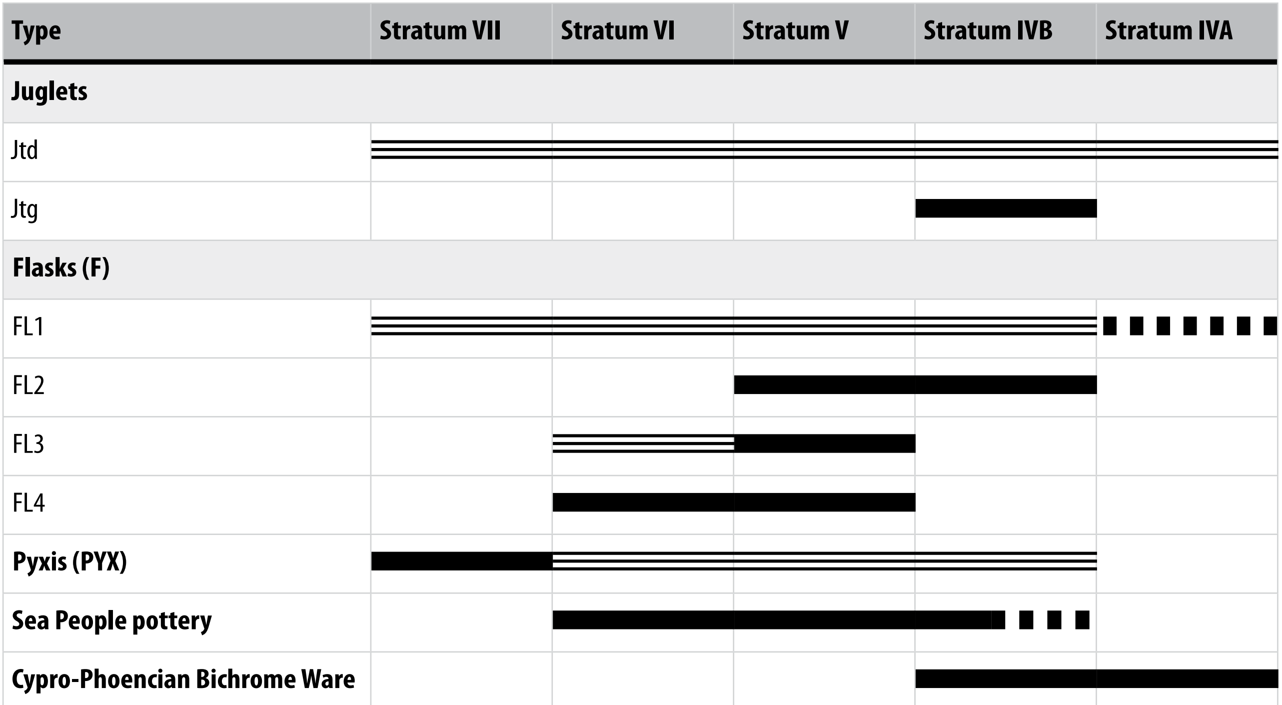


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Fig. 3.25. Pottery from Phase B12 (Stratum VIIA1), L174

No.	Type	Reg. no.	Locus	Remarks
1	Bc2	840/1	171	
2	Bh1	840/10	133 (170)	
3	Bc3	854/4	174	
4	Bp1a	854/7	174	
5	Bh1	898/6	174	
6	Bc1	854/6	174	
7	Bh2	854/5	174	
8	CP2a1	854/1	174	
9	BTc	855/1	174	
10	CP2a2	881/1	174	
11	PYX (Alabas-tron)	895/4	174	Myc IIIB (Ben-Dov 2011:291-297, Cat. No. 16)
12	CJ	853/1	174	Egyptian-style
13	J5	893/1	174	
14	Stirrup jar	898	174	Myc IIIA-B (Ben-Dov 2011:291-297, Cat. No. 32)
15	PCR	854/9	174	Grooved rim

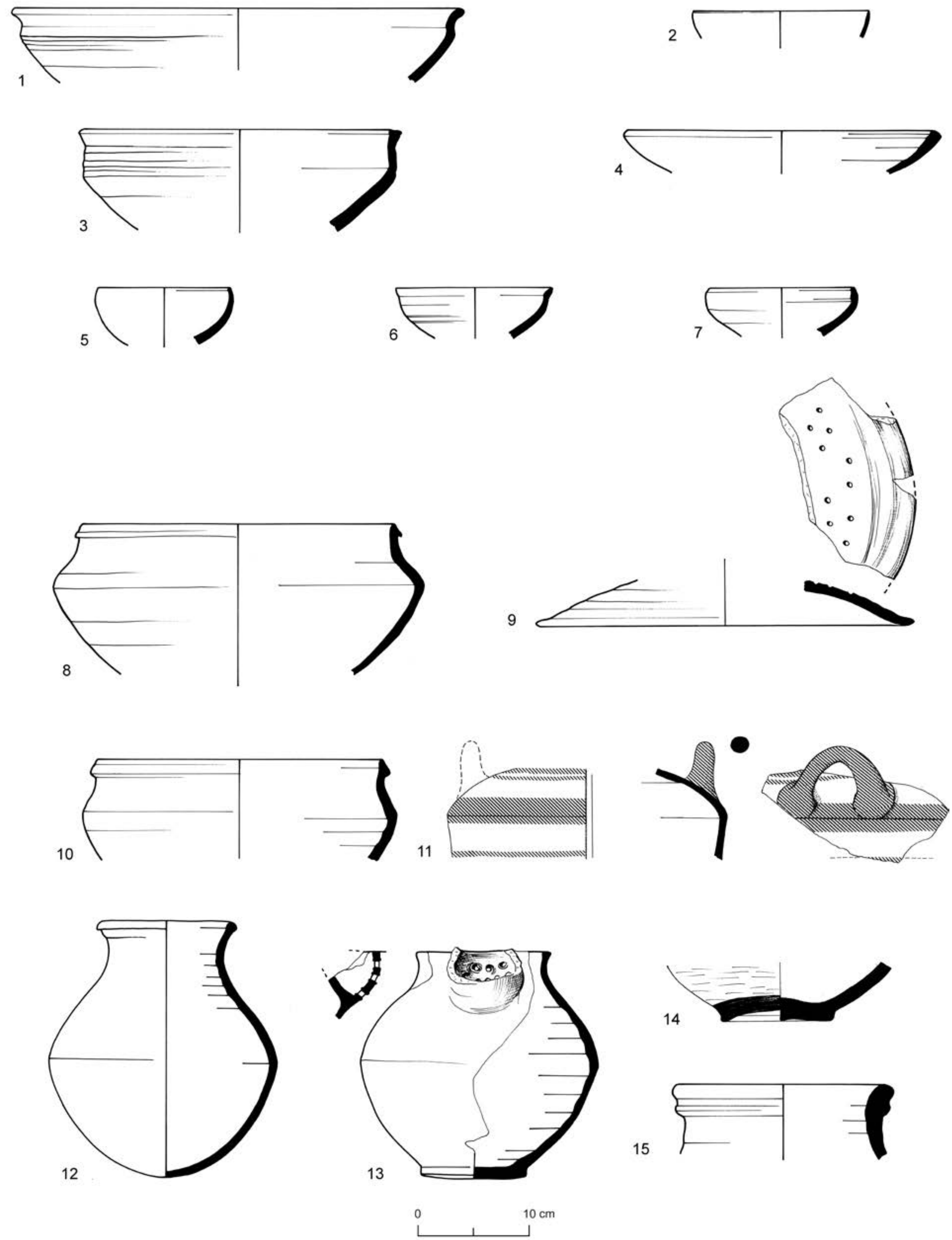

Fig. 3.25. Pottery from Area B, Phase B12

Fig. 3.26. Pottery from Phase B12 (Stratum VIIA1), L174 (cont.)

No.	Type	Reg. no.	Locus	Remarks
1	J1a	894/6	174	
2	SJ5	871/1	174	Photo: 3.14d

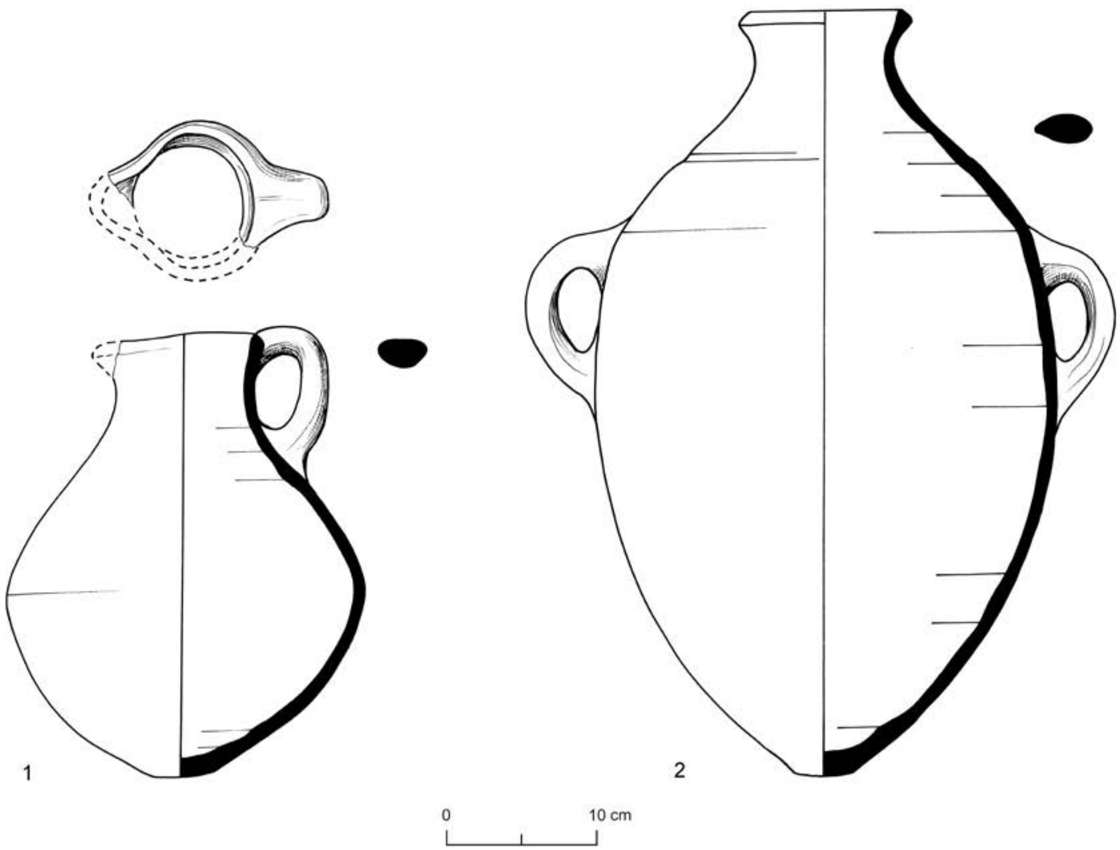

Fig. 3.26. Pottery from Area B, Phase B12

Fig. 3.27. Pottery from Phase B12 (Stratum VIIA1), L182

No.	Type	Reg. no.	Locus	Remarks
1	CP1a3	879/1	182	Ben-Dov 2011: Fig. 74:8
2	CP1a1	896/9	182	Ben-Dov 2011: Fig. 74:9
3	SJ2	913/2,	182	Ben-Dov 2011: Fig. 75:1
4	SJ4a	906/1,	182	Ben-Dov 2011: Fig. 75:2

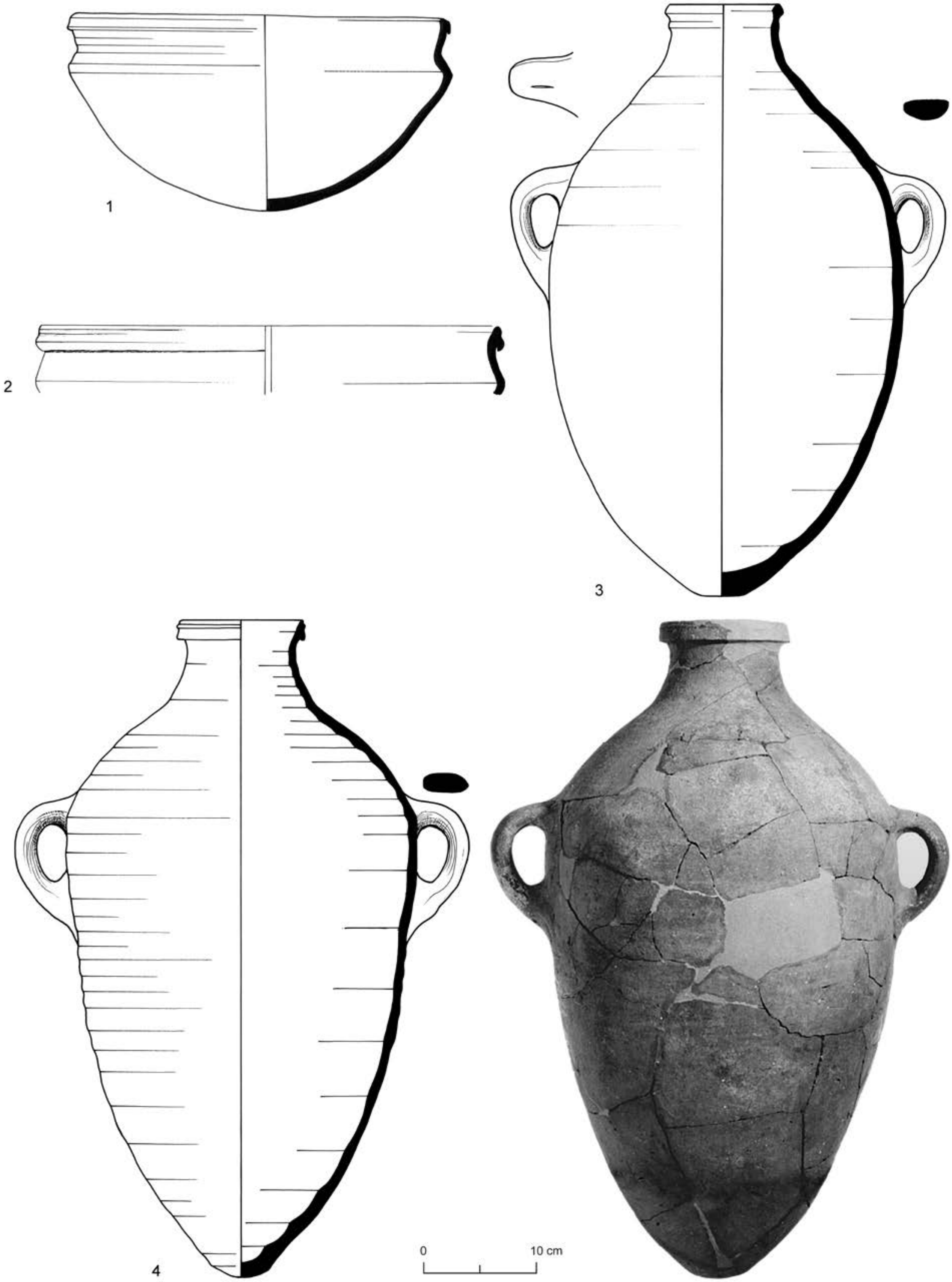

Fig. 3.27. Pottery from Area B, Phase B12

Fig. 3.28. Pottery from Phase B12 (Stratum VIIA1), Loci 435, 436, 7212 (cf. Ben-Dov 2011: Fig. 74)

No.	Type	Reg. no.	Locus	Remarks
1	J3	6287/3	435	Egyptian-style
2	CP1a	6268/5	435	
3	SJ/J	6265/1	435	Handle with painted "union jack" design
4	SJ	6274/24	436	Band-painted shoulder/neck
5	Kylix	6272/1	436	Myc III, Ben-Dov 2011: 293-301, cat. no. 40
6	Bc1	24769/1	7212	
7	K4a	24769/2	7212	
8	CP2a4	24774/6	7212	
9	CP2b4	24774/5	7212	
10	CP2b1	24774/3	7212	

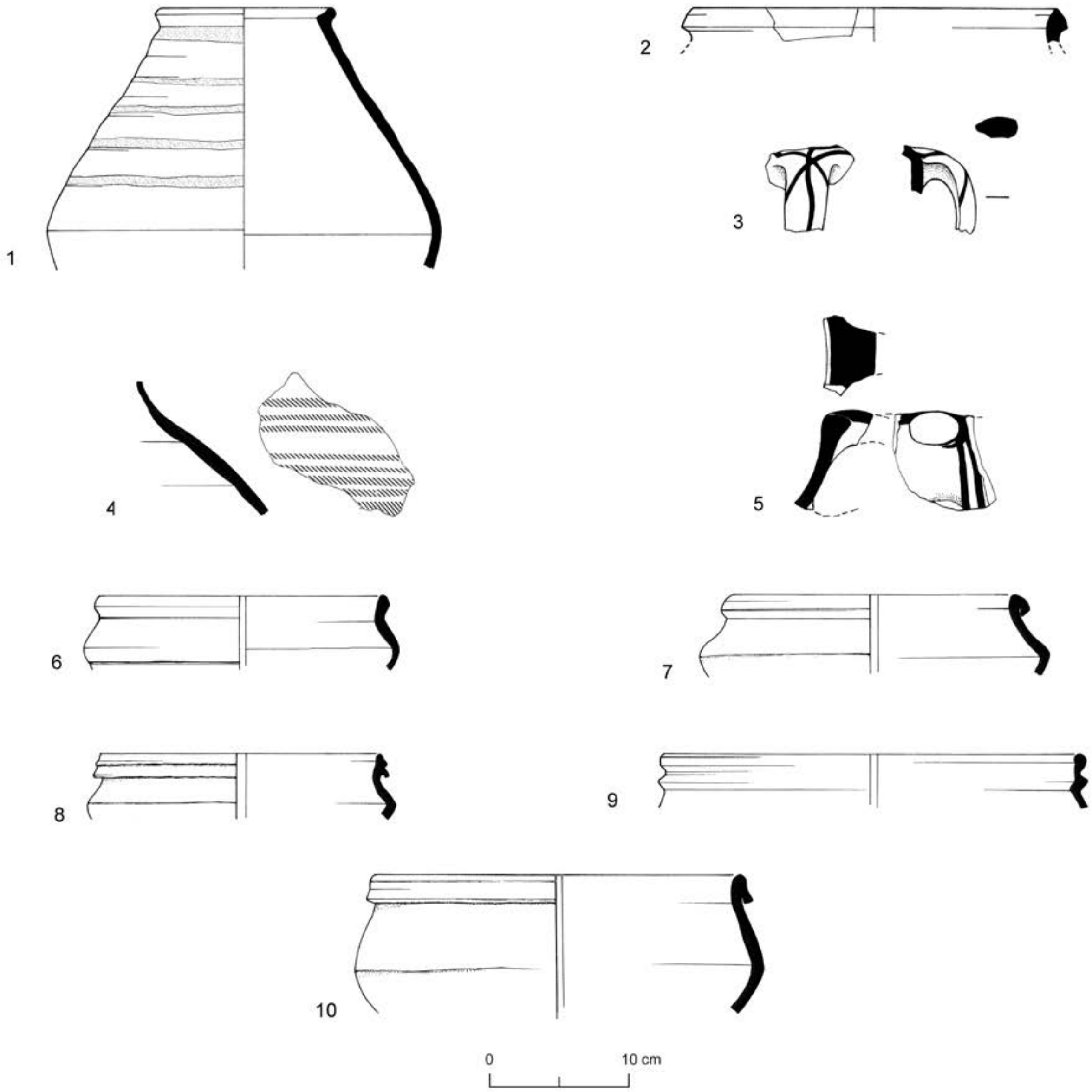

Fig. 3.28. Pottery from Area B, Phase B12

Fig. 3.29. Pottery from Phase B12 (Stratum VIIA1), various loci*

No.	Type	Reg. no.	Locus	Remarks
1	FL	18342	4264	Petrography: Table 6A.15
2	PYX	18350/1	4264	Petrography: Table 6C.1:25
3	CP2a4	23450/1	7083 (7065?)	
4	CP3a1	23445/2	7083 (7065?)	
5	CP3a1	23455/2, 23445/3	7083 (7065?)	
6	CP3a1	23450/1	7083 (7065?)	
7	SJ4a	23516/1	7083 (7079?)	
8	CP3a1	23423/4	7083 (7065?)	
9	SJ4a	23423/2	7083 (7065?)	
10	PG	23789	7140	Petrography: Table 6A.12
11	J1a	23820/4	7140	
12	BTa	23874/1	7156	
13	PYX	23893	7156	

* A body sherd from L4734 (Phase B12, Stratum VIIA1), bearing the painted decoration of a bird, is discussed by Zukerman in Chapter 4 (no. 8).

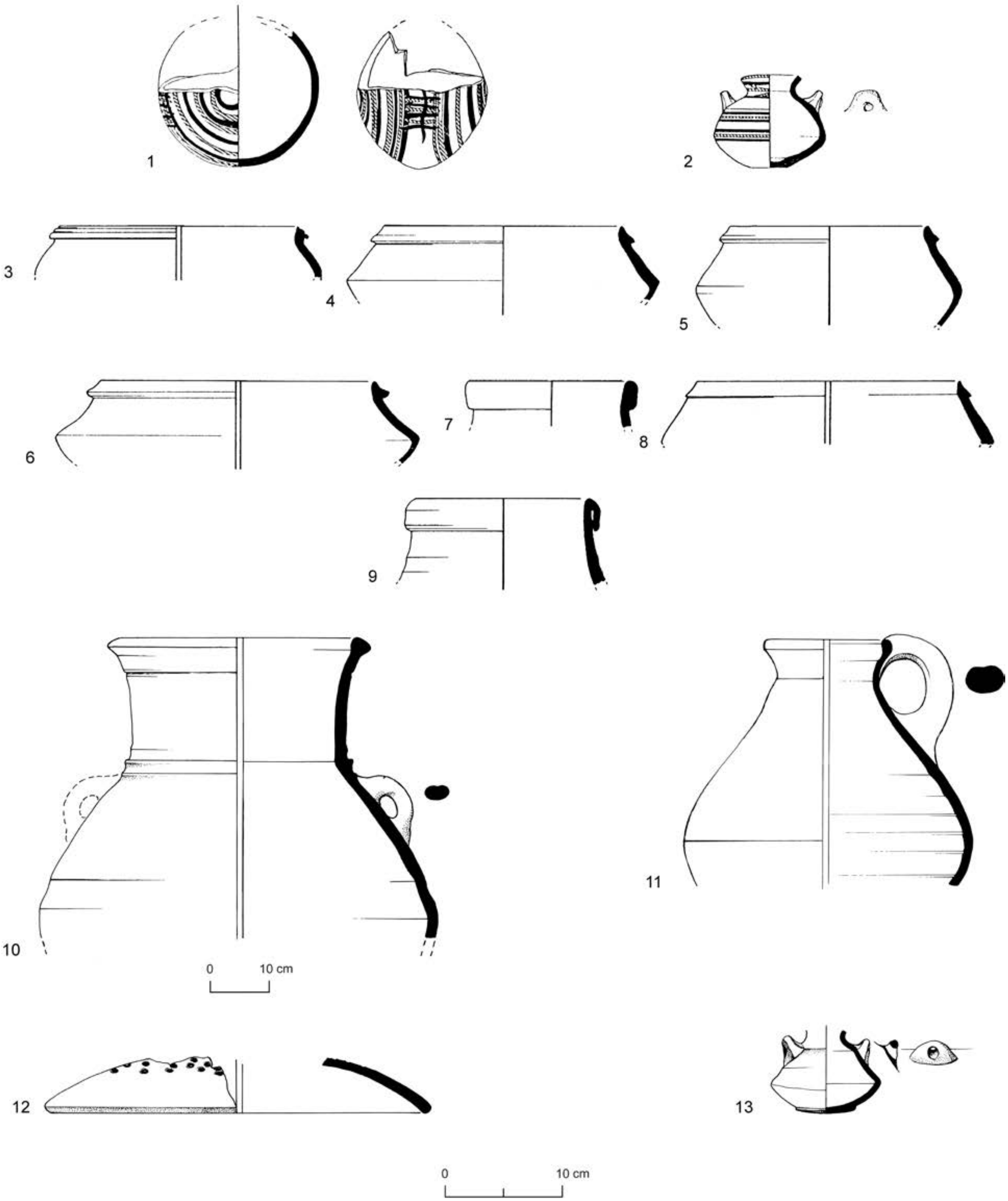

Fig. 3.29. Pottery from Area B, Phase B12

Fig. 3.30. Pottery from Phase B11 (Stratum VI), L336

No.	Type	Reg. no.	Locus	Remarks
1	Bc1	1340/1	336 (333?)	
2	L	1338/1	332	
3	PCR	1400/11	336	
4	PCR	1416/1	336	
5	PCR	1414	336	
6	J1c	1338/3	332	

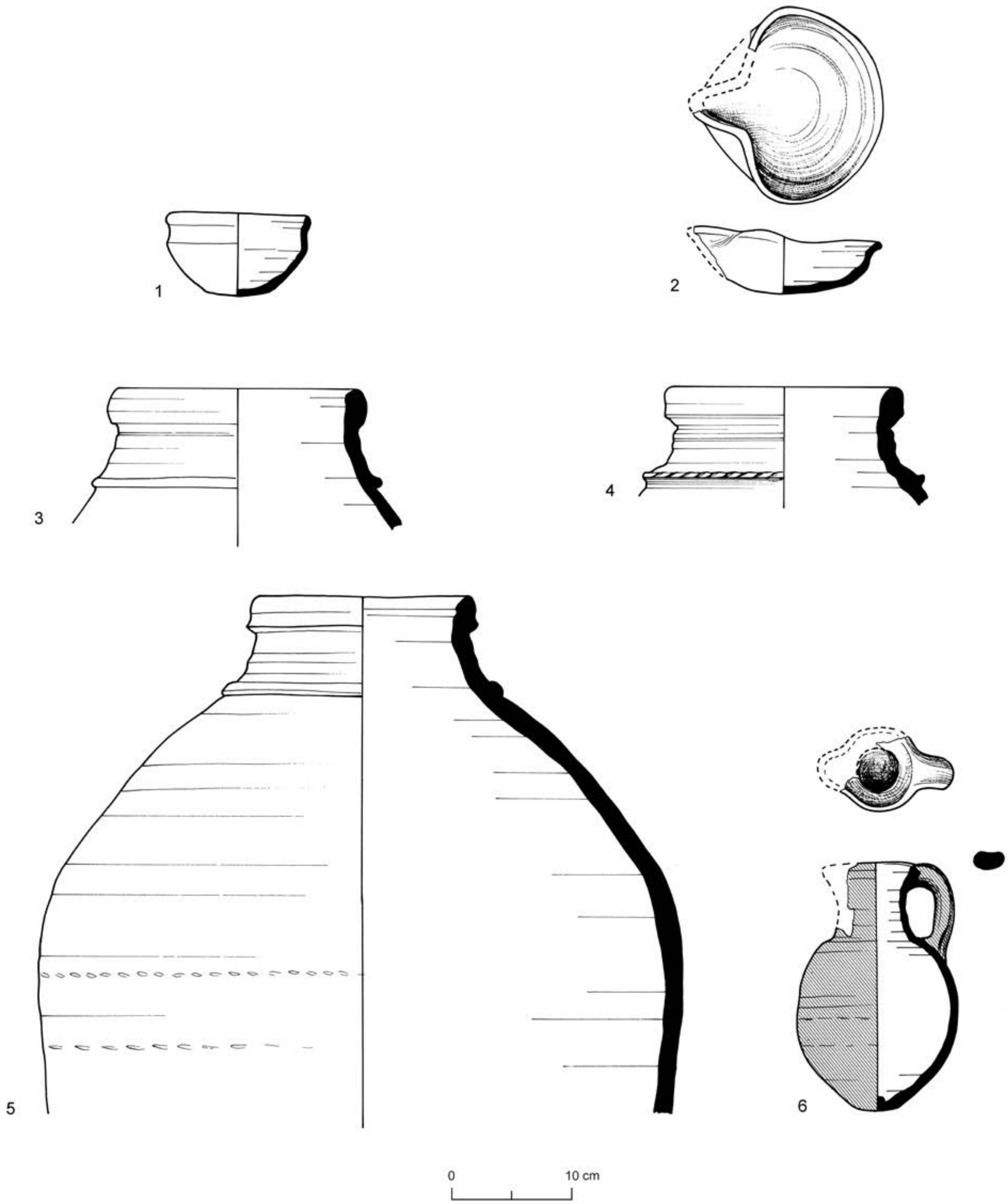

Fig. 3.30. Pottery from Area B, Phase B11

Fig. 3.31. Pottery from Phase B11 (Stratum VI), Loci 336, 338

No.	Type	Reg. no.	Locus	Remarks
1	K1a	1502/1	336 (346?)	
2	K1b	1345	336 (333?)	
3	SJ4a	1581	338	

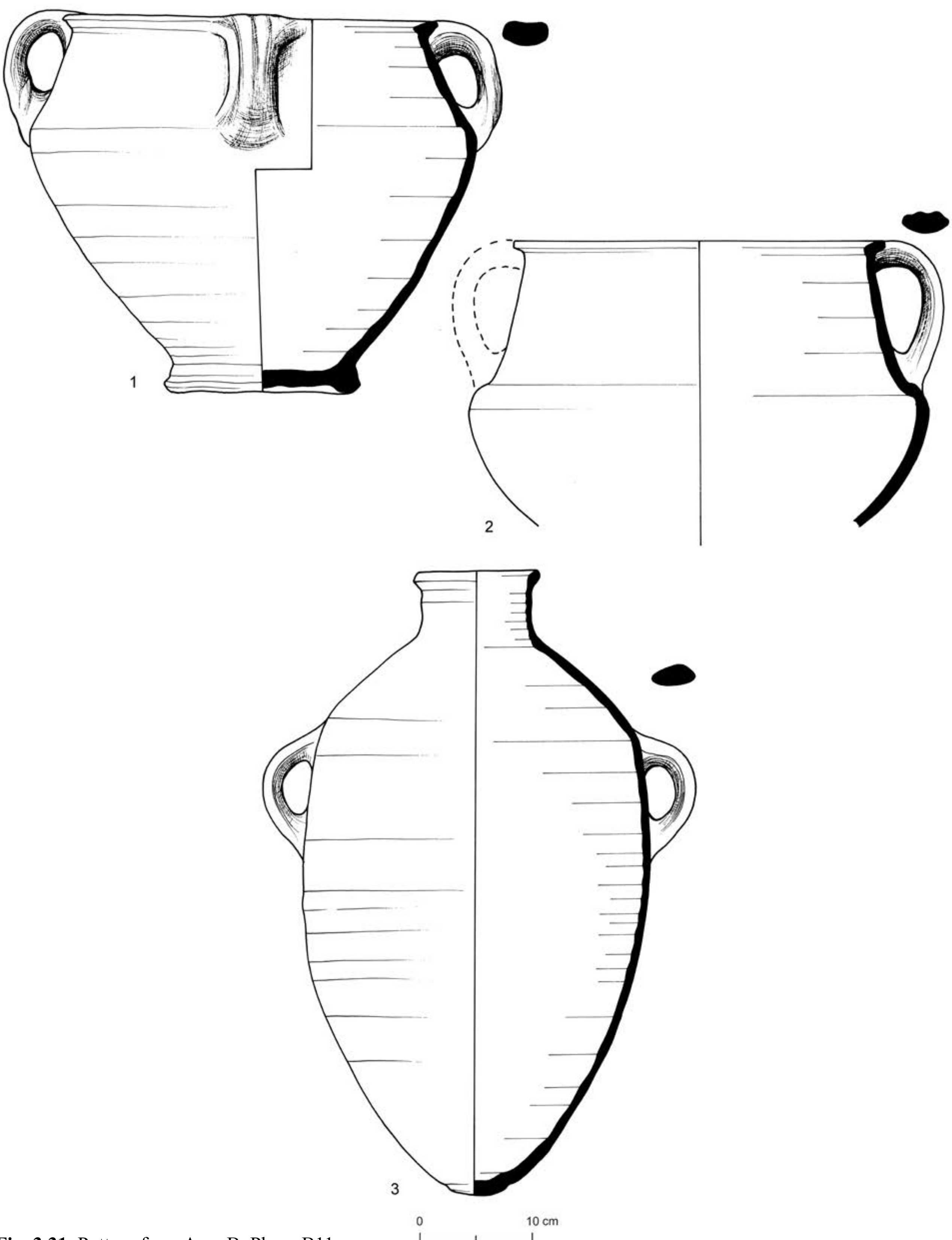

Fig. 3.31. Pottery from Area B, Phase B11

Fig. 3.32. Pottery from Phase B11 (Stratum VI), Pits 444, 1208

No.	Type	Reg. no.	Locus	Remarks
1	J2	6333	444	Possible intrusion from Pit 430 (Phase B9 or B8)
2	PG2	6352	444	Photo: Fig. 3.12d
3	K	10450/5	1208	Painted bird (bichrome painted decoration); see Chapter 4, no. 7
4	Bc3	10446/2	1208	
5	Bc1	10486/3	1208	
6	CP2a1	10465/4	1208	
7	SJ4b	10450/7	1208	
8	CP2a2	10486/2	1208	
9	CP2a1	10486/4	1208	
10	CP3a2	10465/11	1208	
11	CP2b2	10450/9	1208	
12	CP3a3	10465/2	1208	
13	CP3a1	10486/3	1208	
14	CP3a4	10450/6	1208	

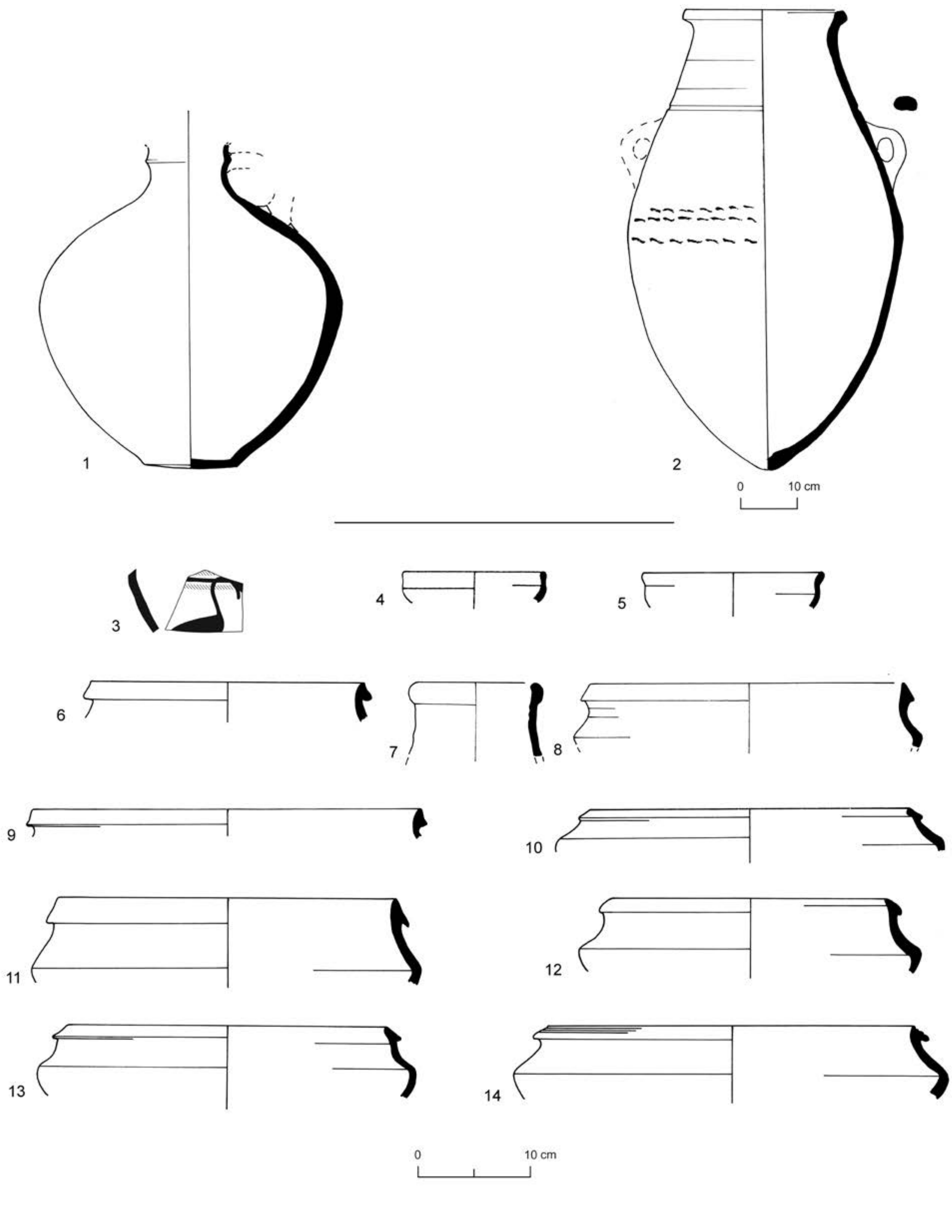

Fig. 3.32. Pottery from Area B, Phase B11

Fig. 3.33. Pottery from Phase B11 (Stratum VI), Pits 1209, 1229

No.	Type	Reg. no.	Locus	Remarks
1	Bh3	10579/1	1209	= Ben-Dov's LB Type BCC4a
2	J2b or J6	10451	1209	
3	J6	10331/3	1209 (=682)	
4	FL	10612/1	1209	Cypriot Bichrome III barrel flask, Late Geometric III period (900-750 BC),probably intrusive
5	Bp1a	10650/8,10	1229	Egyptian-style; Fig. 3.126:1
6	Bc3	10718/2	1229	
7	Bc3	10718/1	1229	
8	Bp2 or CH2a	10667/9	1229	
9	Bp1a	10650/12	1229	= Ben-Dov's LB Type BO1
10	CP3a5	10658/10	1229	
11	K1b	10650/1	1229	
12	CP2a1	10650/18	1229	
13	CP3e	10650/6	1229	
14	CP2b1	10650/23	1229	
15	CP2e	10667/11	1229	
16	FL1	10790/1	1229	Photo: Fig. 3.21a
17	FL	10658/8	1229	
18	Miniature goblet	10667/1	1229	
19	PG	10667/7	1229	
20	K/Jar	10650/4	1229	Egyptian-style

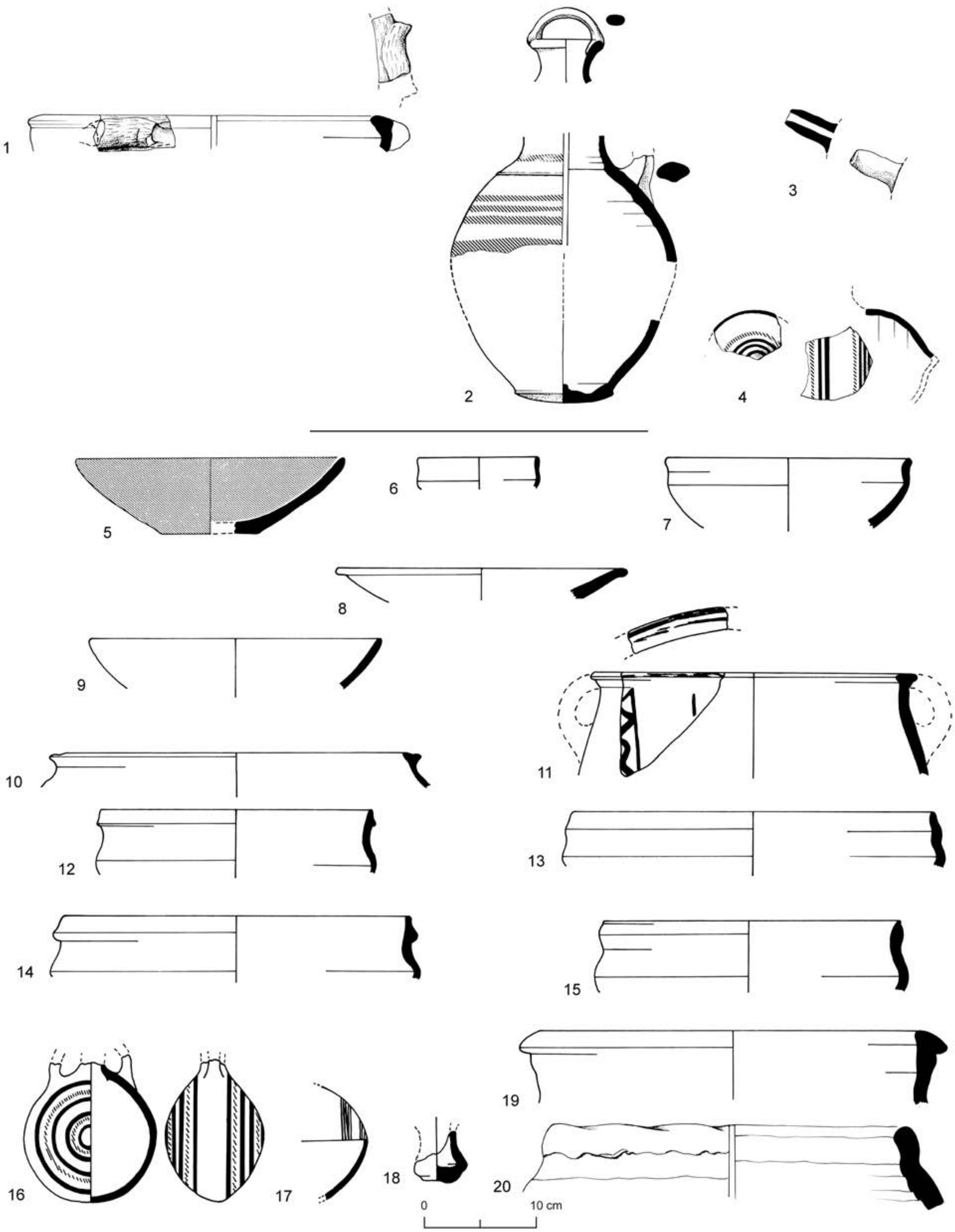

Fig. 3.33. Pottery from Area B, Phase B11

Fig. 3.34. Pottery from Phase B11 (Stratum VI), Pit 1225

No.	Type	Reg. no.	Locus	Remarks
1	CP2b2	10705/2	1225	
2	CP3b1	10663/1	1225	Photo: Fig. 3.7a
3	K5	10677/7	1225	
4	PCR	10694/1	1225	
5	Jtg	10724/1	1225	
6	J	10723/1	1225	
7	PG1	10764	1225	Photo: Figs. 3.12a and see Fig. 3.119:1
8	PCR	10725	1225	Barrel-shaped, grooved rim

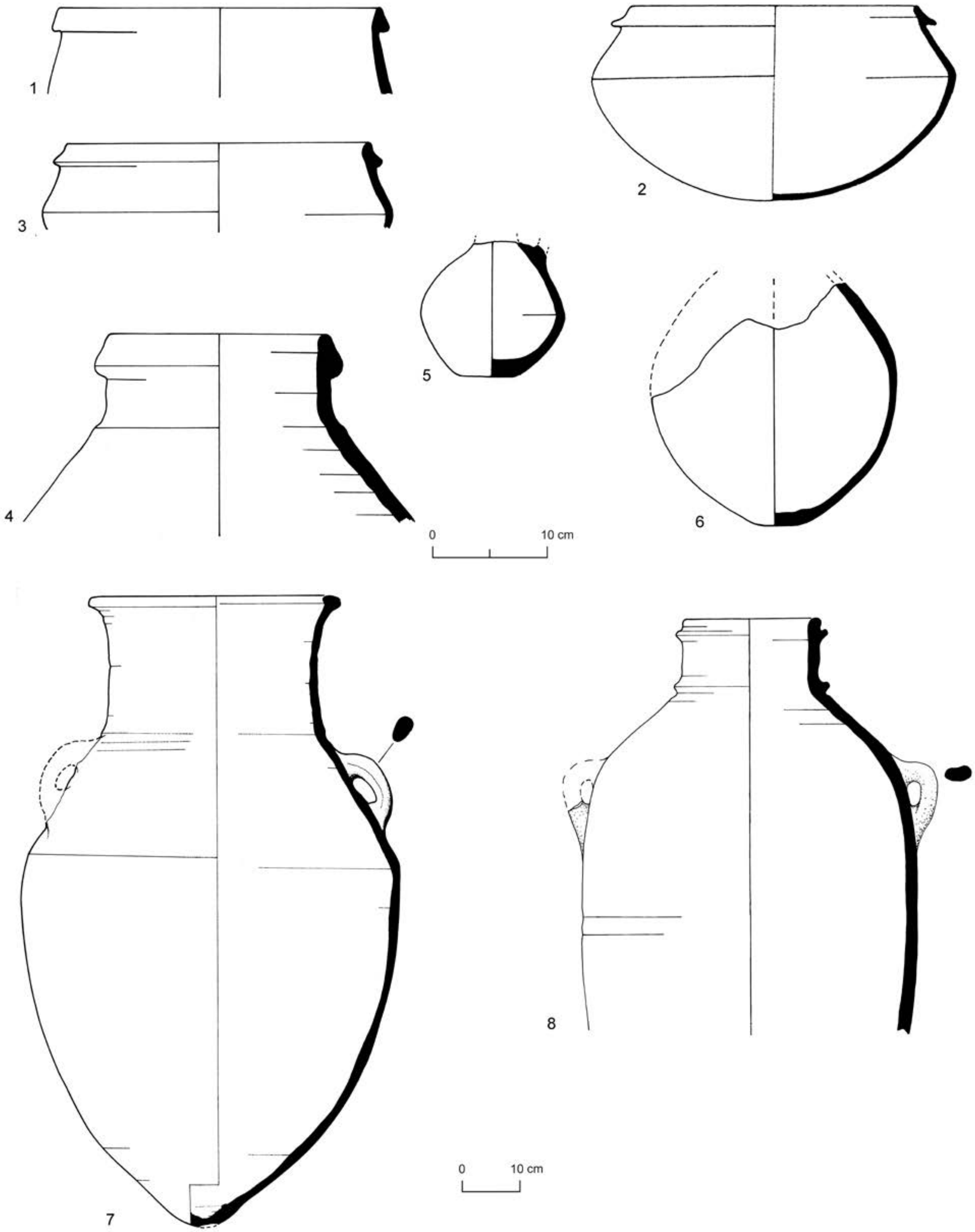

Fig. 3.34. Pottery from Area B, Phase B11

Fig. 3.35. Pottery from Phase B11 (Stratum VI), Pits 1233, 1240

No.	Type	Reg. no.	Locus	Remarks
1	J1	10739/1	1233	
2	PCR	10707/2	1233	
3	Bc3	10727/1	1240	
4	?	10745	1240	Not clear what this is
5	K1a	18620/2	1240 (=4343)	
6	K4a	18556/5	1240 (=4343)	
7	CP3b1	19617/3	1240 (=4343)	
8	PYX	18556/2	1240 (=4343)	

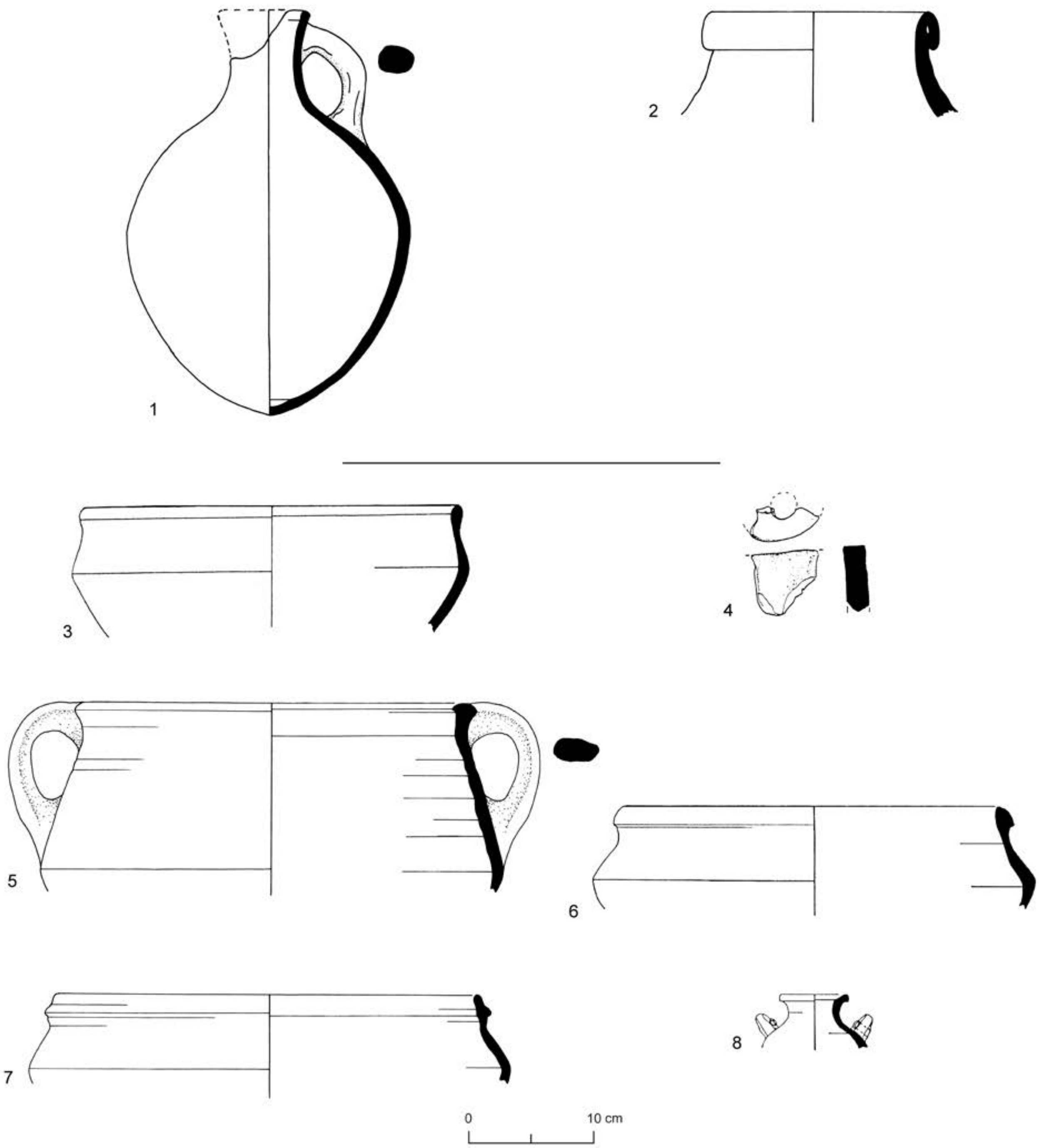

Fig. 3.35. Pottery from Area B, Phase B11

Fig. 3.36. Pottery from Phase B11 (Stratum VI), Pit 1241

No.	Type	Reg. no.	Remarks
1	Bh1	10793/1	
2	PCR	10649/6	
3	SJ2	10746/1	= Figs. 3.15b, 3.122:2
4	Bc2	10781/2	
5	CP3a1	10699/8	
6	PCR	10781/6	
7	K1	10699/11	
8	FL	10792/7	
9	FL	10699/7, 9, 10	Concentric black circles
10	K1a	10766/1	

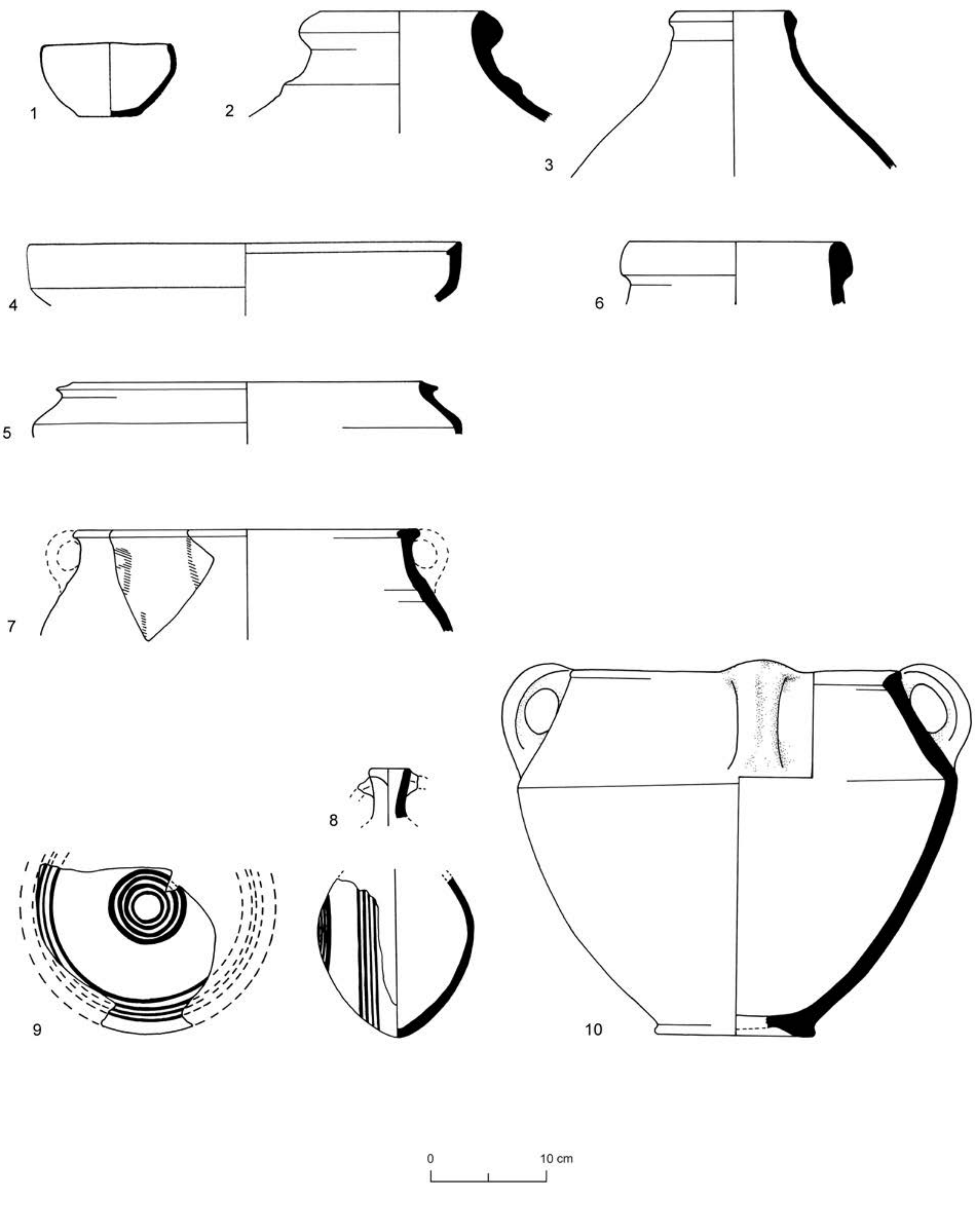

Fig. 3.36. Pottery from Area B, Phase B11

Fig. 3.37. Pottery from Phase B11 (Stratum VI), Pit 4349

No.	Type	Reg. no.	Locus	Remarks
1	CP3a1	18617/1	4349	
2	PB	12628/8	4349	
3	J1a	12628/1	4349	
4	FL	18628/7	4349	
5	AM	18628/2	4349	Fig. 3.16c
6	PCR	18628/6	4349	Fig. 3.9c
7	PCR	18623/1	4349	

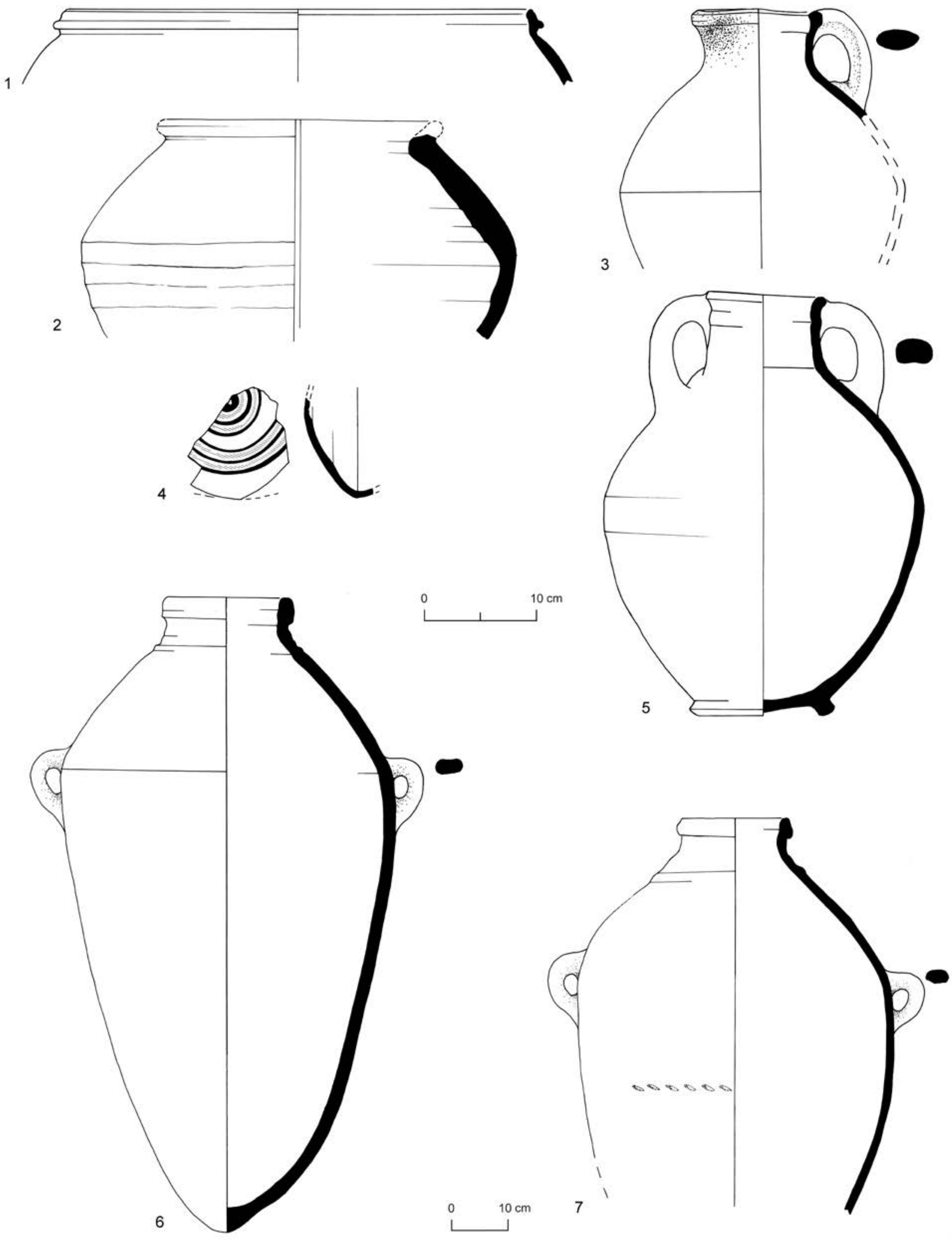

Fig. 3.37. Pottery from Area B, Phase B11

Fig. 3.38. Pottery from Phase B11 (Stratum VI), Pits 4349 (continued), 4628, L4670, L7060

No.	Type	Reg. no.	Locus	Remarks
1	PCR	12628/5	4349	Photo: Fig.3.9b
2	PCR	12628/4	4349	Photo: Fig. 3.9d
3	BB	23058	4620	Egyptian-style beer jar
4	K1a	23252/1	4670	Probably Phase B12 (Stratum VIIA1); photo: Fig. 3.4a
5	K	23402/1	7060	Ring base
6	L	23392/1	7060	

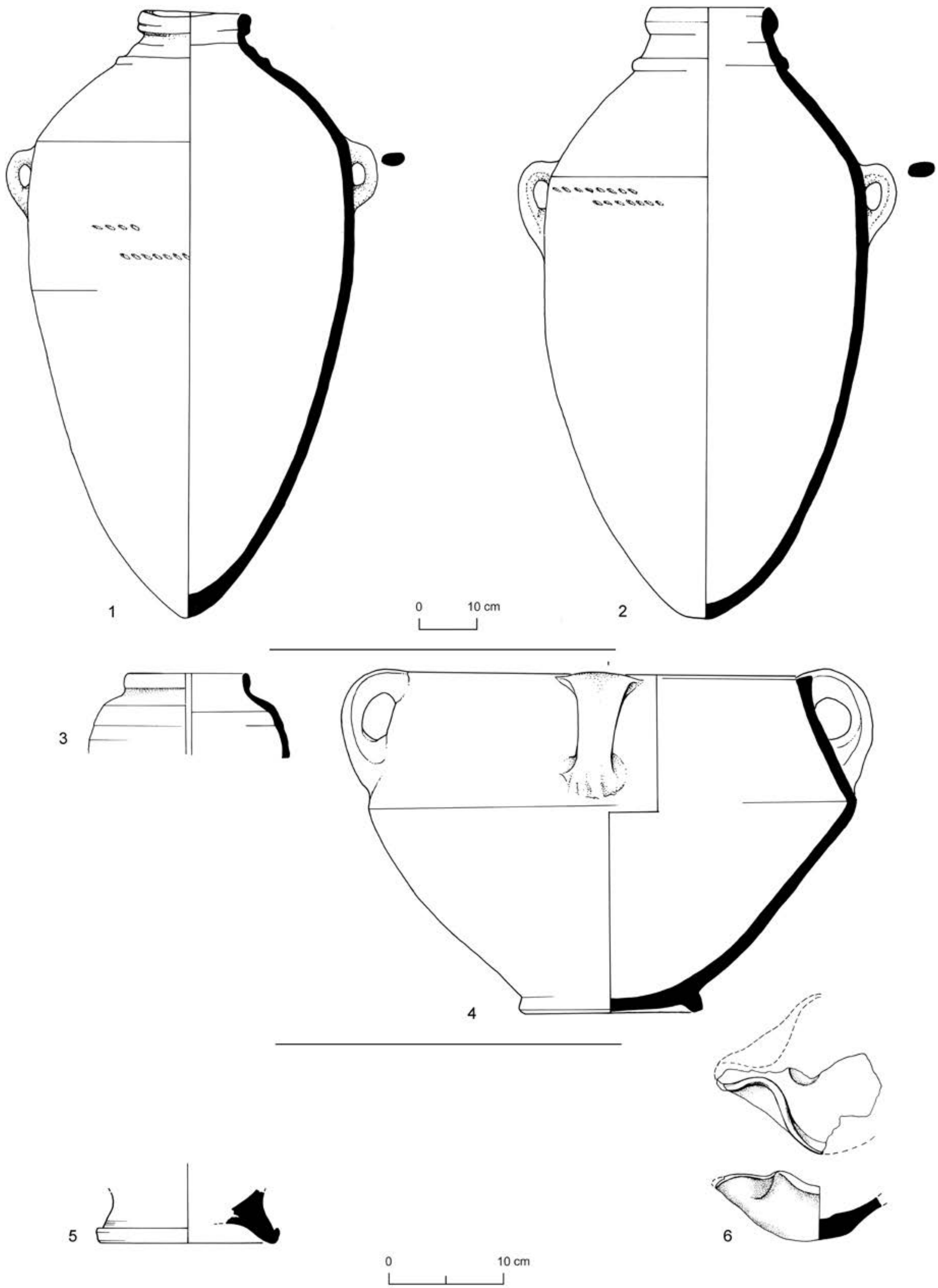

Fig. 3.38. Pottery from Area B, Phase B11

Fig. 3.39. Pottery from Phase B11 (Stratum VI), Loci 7078, 7079, 7175, 7155, Pit 7273

No.	Type	Reg. no.	Locus	Remarks
1	PG	23581/1	7078	
2	PCR	23476/1	7078	
3	SJ4a	23516/1	7079	
4	CP3a1	23577/1	7079	
5	K1	23823/2	7125	
6	Bc3	24952/1	7273	
7	J	23718/9	7155 (=7130)	Handle imitating metal vessel with simulated rivets and grooves

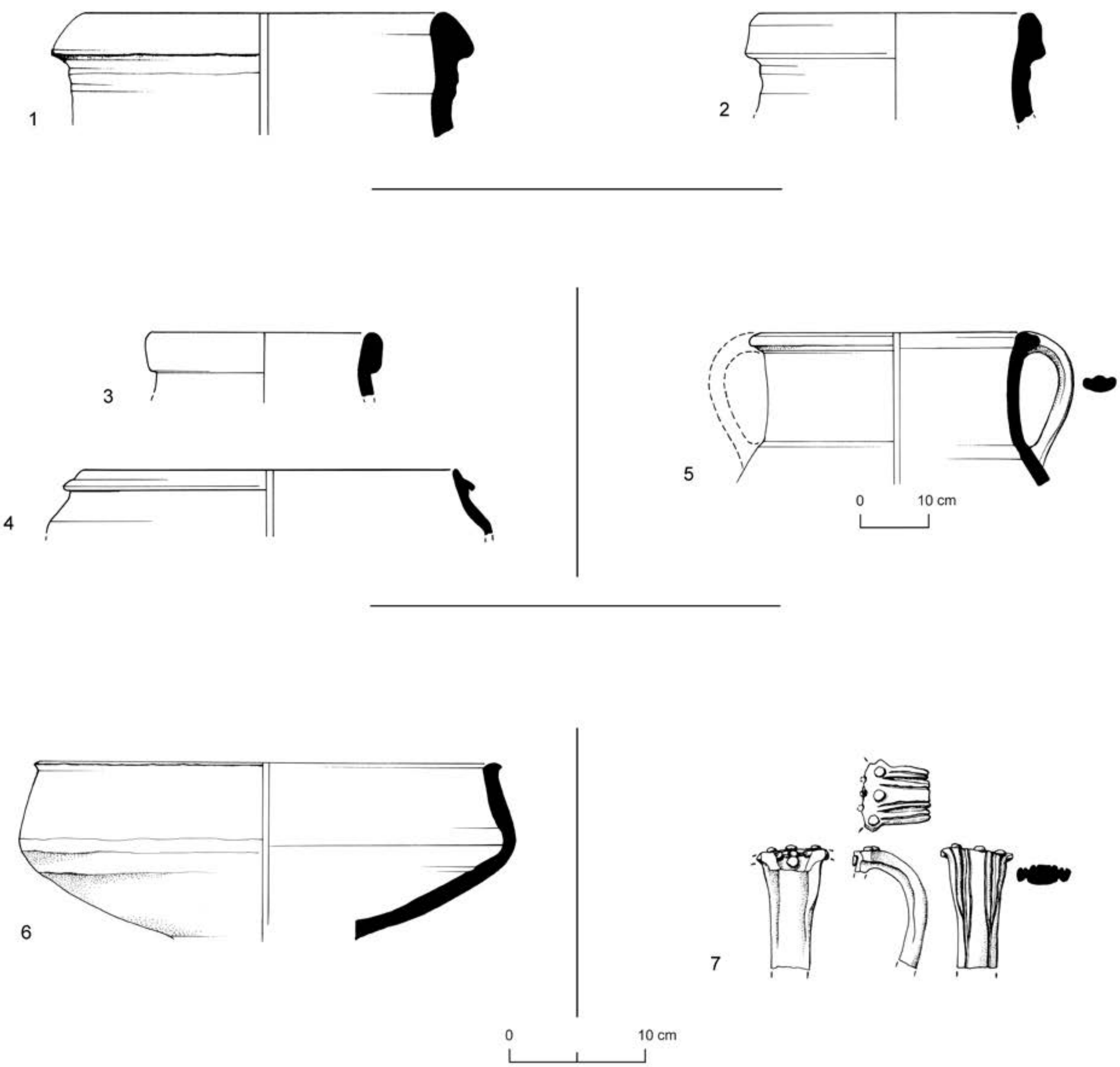

Fig. 3.39. Pottery from Area B, Phase B11

Fig. 3.40. Pottery from Phase B9-10 (Stratum V), Loci 132, 171 (=164)

No.	Type	Reg. no.	Locus	Remarks
1	SJ	820/3	132	
2	Bh1	820	132	
3	SJ4a	813/1	132	Thumb impression
4	CP2b1	807/1	171 (=164)	
5	CP3b4	790/1	171 (=164)	
6	PG	794/4	171 (=164)	
7	J5	794/6	171 (=164)	

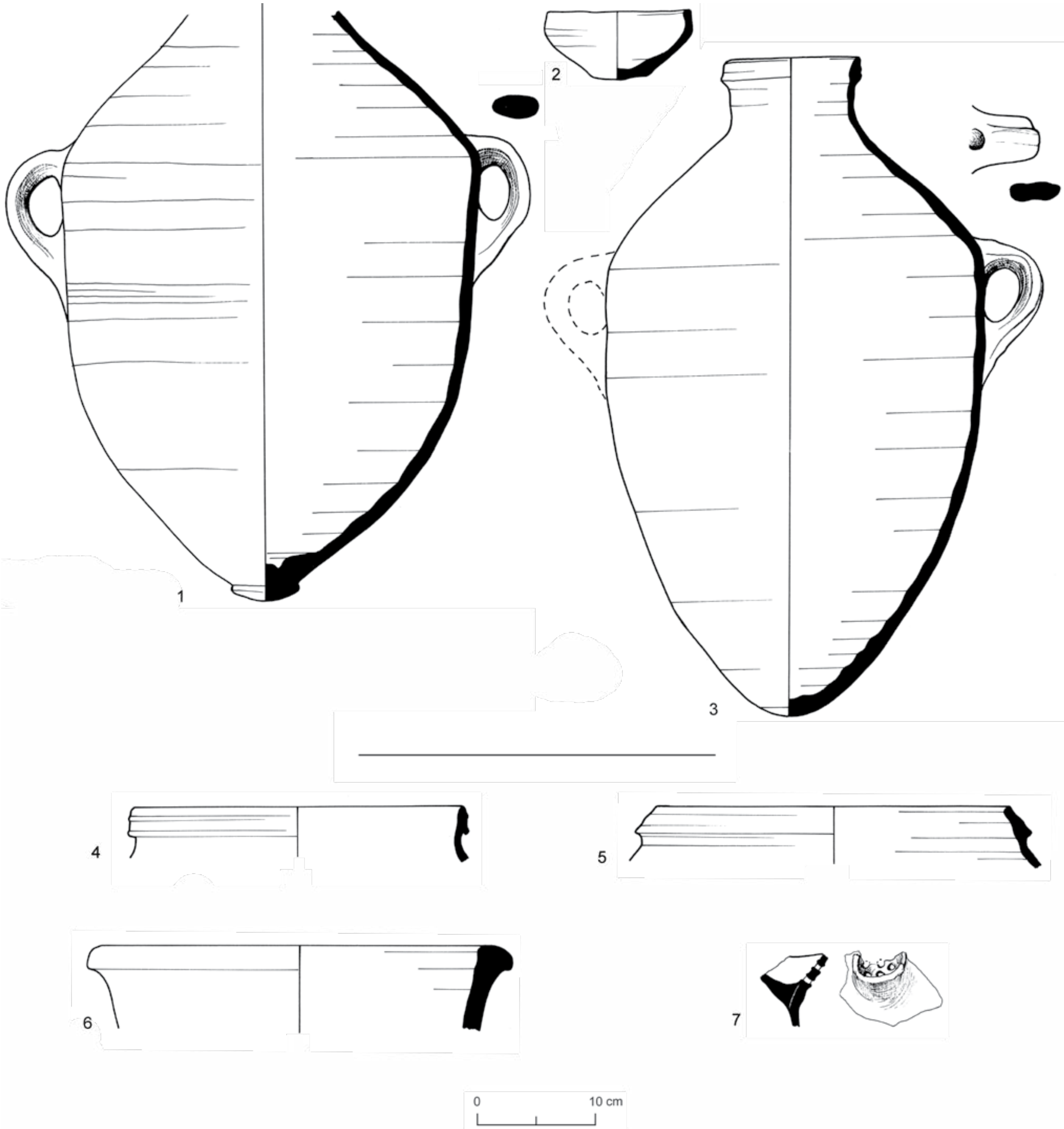

Fig. 3.40. Pottery from Area B, Phase B9-10

Fig. 3.41. Pottery from Phase B9-10 (Stratum V), Loci 171 (+164), 128

No.	Type	Reg. no.	Locus	Remarks
1	CP1a5	859/1	171 (+164)	
2	CP3b4	858/8	171 (+164)	
3	SJ4a	859/2	171 (+164)	Rim
4	SJ	859/8, 858/6	171 (+164)	Body and handles
5	Bc3	636/1	128	
6	K1	636/2	128	Handle with eight small round impressions
7	J1	636/3	128	

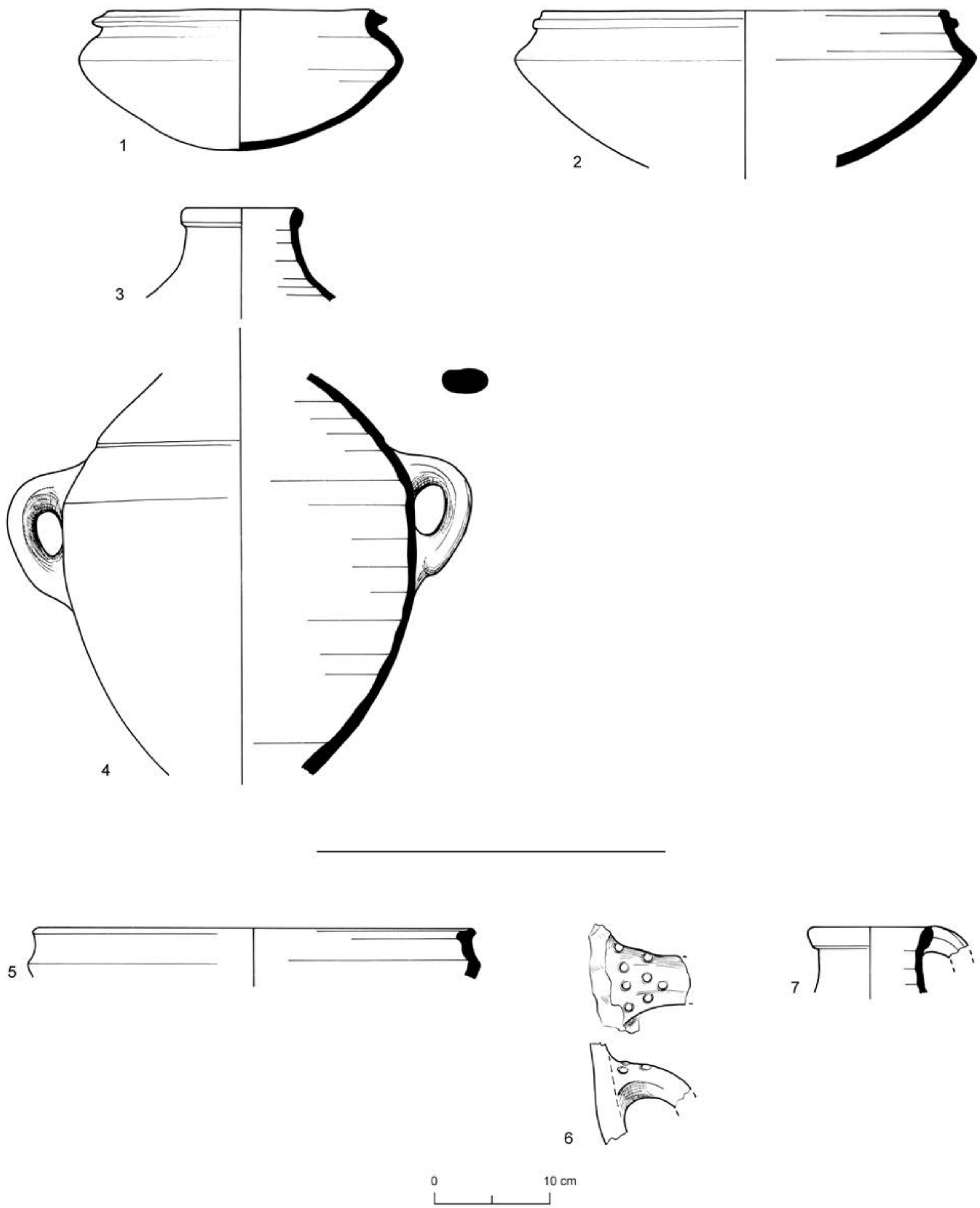

Fig. 3.41. Pottery from Area B, Phase B9-10

Fig. 3.42. Pottery from Phase B9-10 (Stratum V), L181

No.	Type	Reg. no.	Locus	Remarks
1	CP2e	902/1	181	
2	CP2a3	890/3	181	
3	CP3b1	889/1	181	
4	SJ	899/1	181	Missing shoulder, neck and rim
5	PG	891/1	181	
6	FL1	868/1	181	
7	J1a	907/1	181	

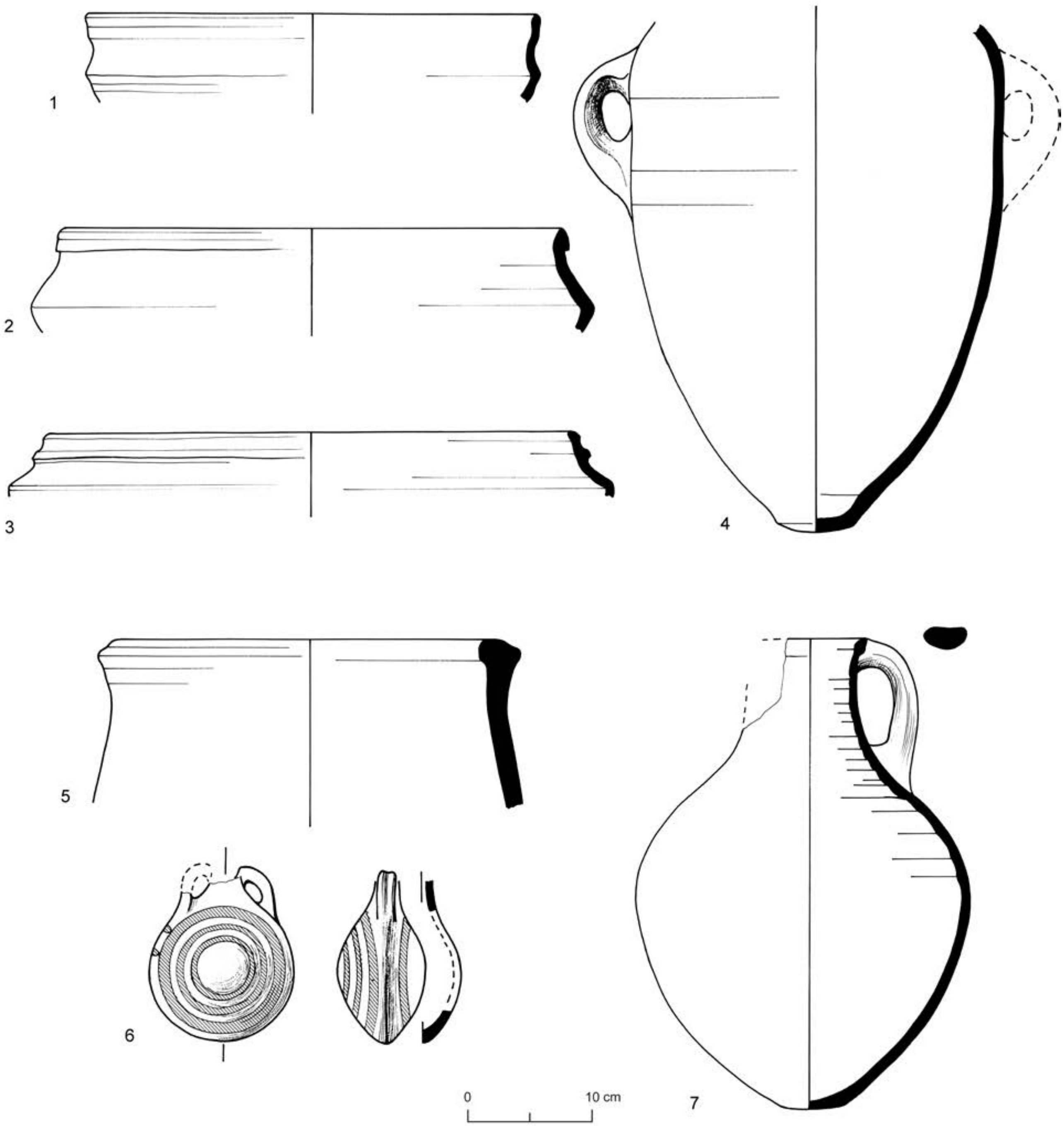

Fig. 3.42. Pottery from Area B, Phase B9-10

Fig. 3.43. Pottery from Phase B9-10 (Stratum V), Loci 218, 326

No.	Type	Reg. no.	Locus	Remarks
1	SJ	1115/1	218	
2	PYX	1121	218	
3	K1a	1323/1	326	
4	K1b	1322/1	326	
5	CH2b	1324	326	
6	J1a	1319/1	326	Photo: Fig. 3.17f
7	CJ	1318/2	326	Egyptian-style
8	CJ	1351/1	326 (=180)	Egyptian-style
9	CH4a	787/3	326 (=W159)	

Fig. 3.43. Pottery from Area B, Phase B9-10

Fig. 3.44. Pottery from Phase B9-10 (Stratum V), Loci 426, 431

No.	Type	Reg. no.	Locus	Remarks
1	CP3a2	6194/7	426	
2	K1	6198/1	426	Painted bird; see Chapter 4, no. 5
3	CP3b1a	6194/5	426	
4	PG	6193/3	426	
5	K3	6198/2	426	
6	K1	6188/2	426	
7	J5	6198/12	426	Painted bands
8	PCR	6260/8	431	
9	Bc3	6260/11	431	
10	K2b	6249/5	431	
11	K4a	6236/1	431	
12	CP3a1	6261/3	431	
13	CP2b4	6251/5	431	
14	CP2b2	6194/7	426	

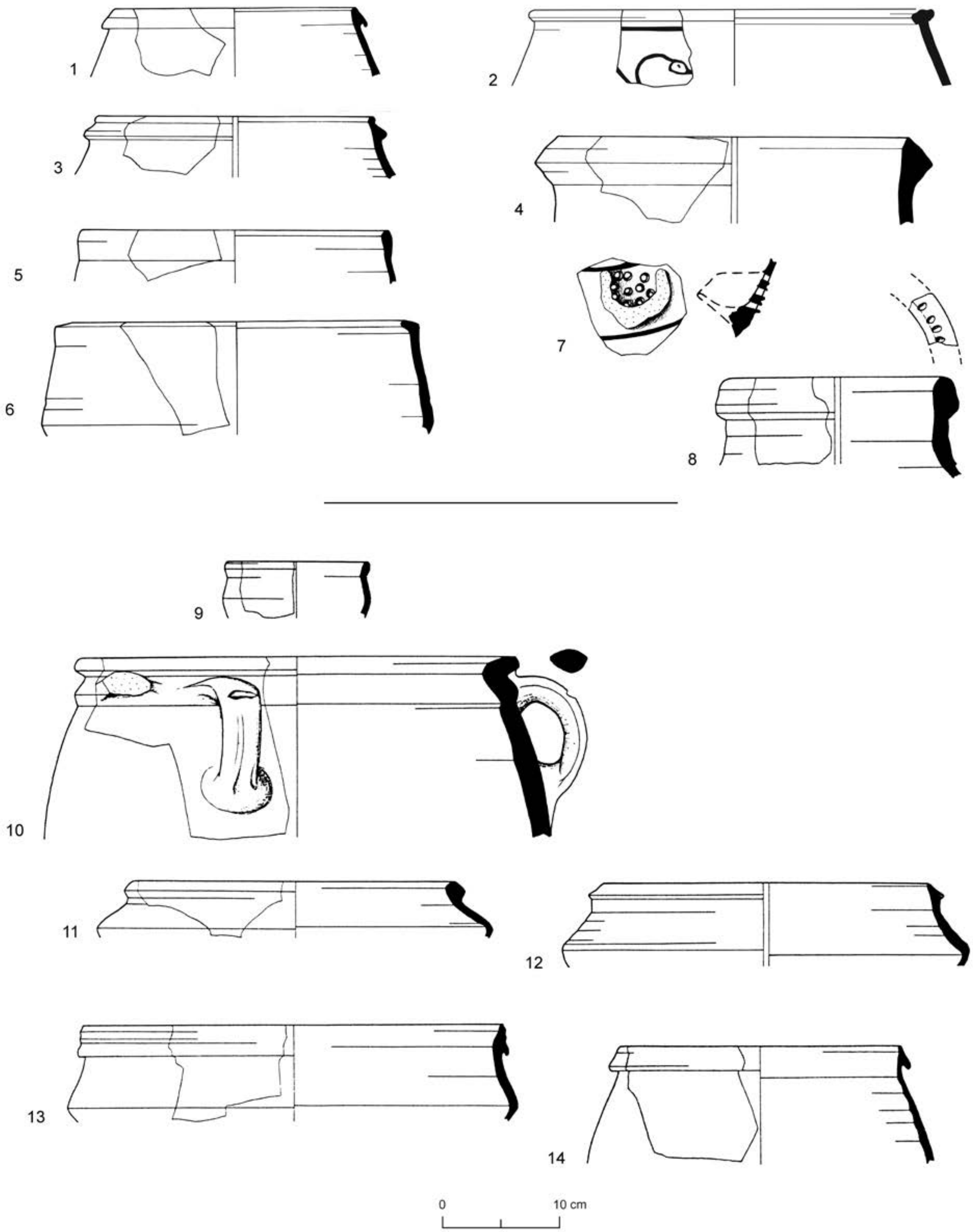

Fig. 3.44. Pottery from Area B, Phase B9-10

Fig. 3.45. Pottery from Phase B9-10 (Stratum V), Loci 431, 432

No.	Type	Reg. no.	Locus	Remarks
1	PG	6248/6	431	Handle with two round impressions
2	K1b	6251/1	431	Red painted lines on rim and handle
3	PCR	6243/2	431	
4	CP3b2	6236/11	431	
5	CP2b1	6236/5	431	
6	SJ2	6253	431	
7	CP2a1	6234	432	
8	CP3a1	6231/3	432	
9	CP3b1	6142/4	432	
10	CP1b2	6231/2	432	
11	PCR	6250	432	Photo: Fig. 3.10b

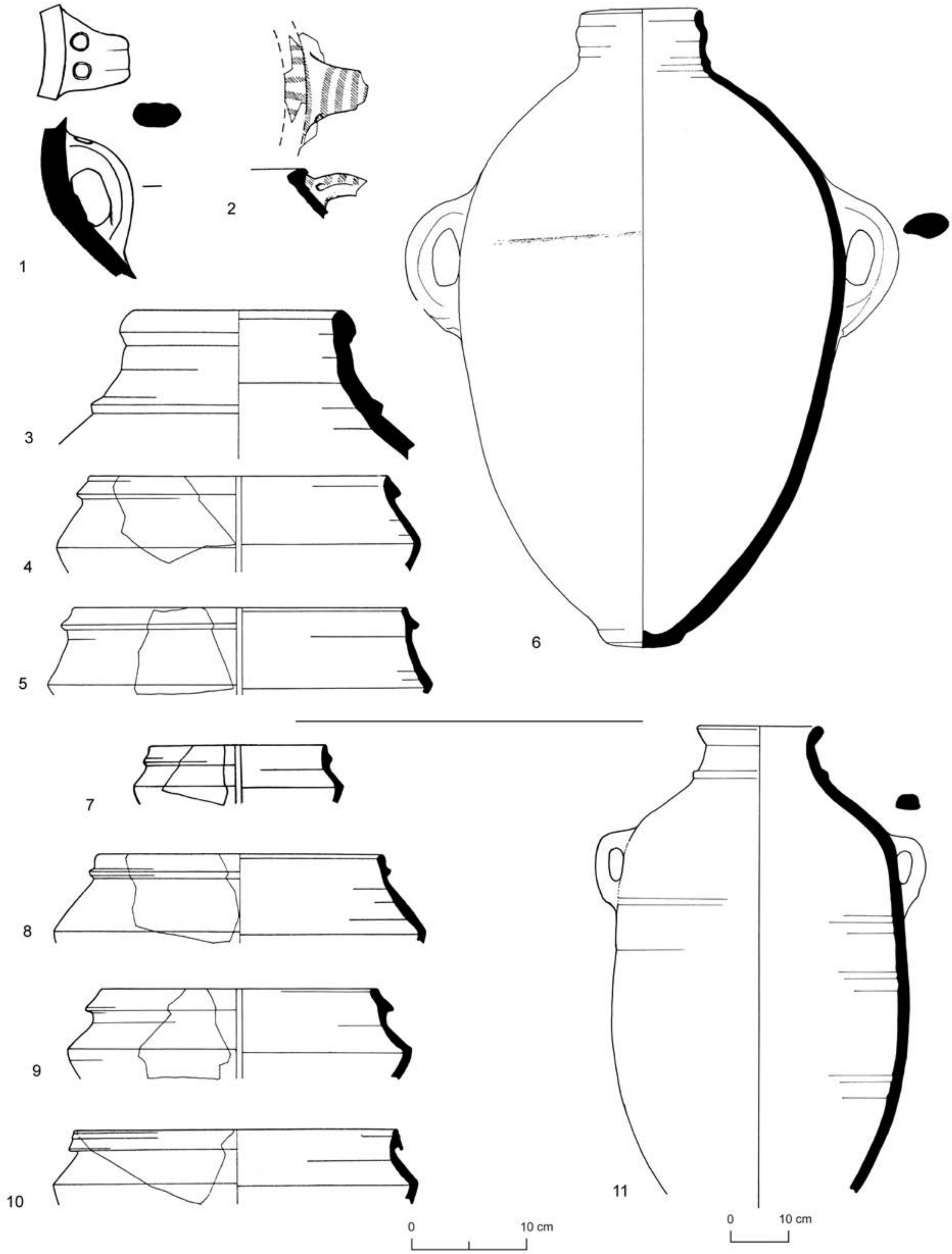

Fig. 3.45. Pottery from Area B, Phase B9-10

Fig. 3.46. Pottery from Phase B9-10 (Stratum V), L586

No.	Type	Reg. no.	Locus	Remarks
1	PCR	10397/1	588 (=586)	
2	Bc1	10371/1	586	
3	CP3b1	9699/1	586	
4	Bc3	9860/1	586	Photo: Fig. 3.2b
5	K4	9859/7	586	
6	CH3b	9532/1	586	
7	CP2b1	9656/3	586	
8	PCR	9848/1	586	
9	PCR	9699/2	586	
10	J1a	9848/2	586	
11	PCR	9821/1	586	

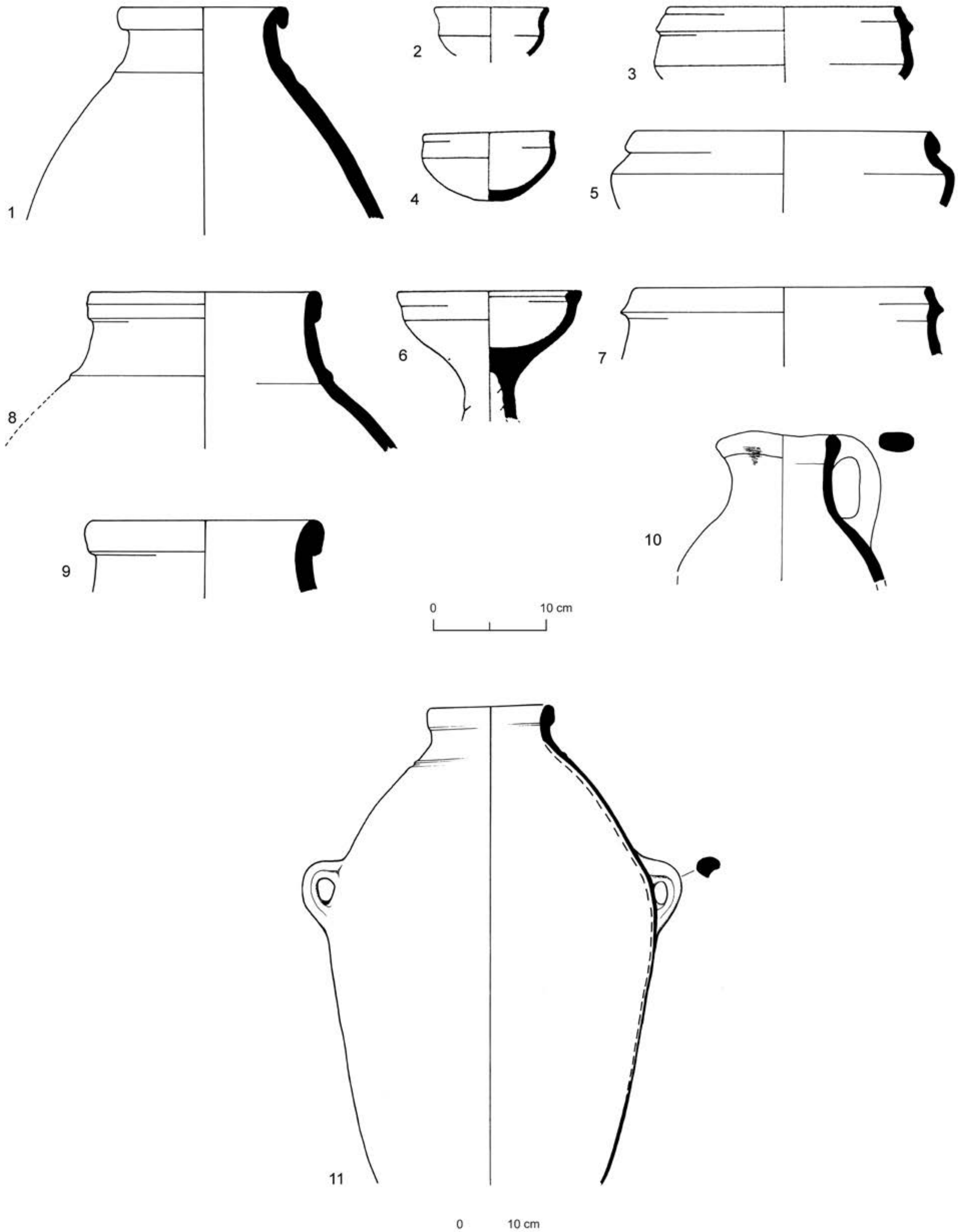

Fig. 3.46. Pottery from Area B, Phase B9-10

Fig. 3.47. Pottery from Phase B9-10 (Stratum V), Loci 586 (cont.), 591

No.	Type	Reg. no.	Locus	Remarks
1	PCR	9856	586	
2	PCR	9817	586	Photo: Fig. 3.9a
3	CR	9508	591	

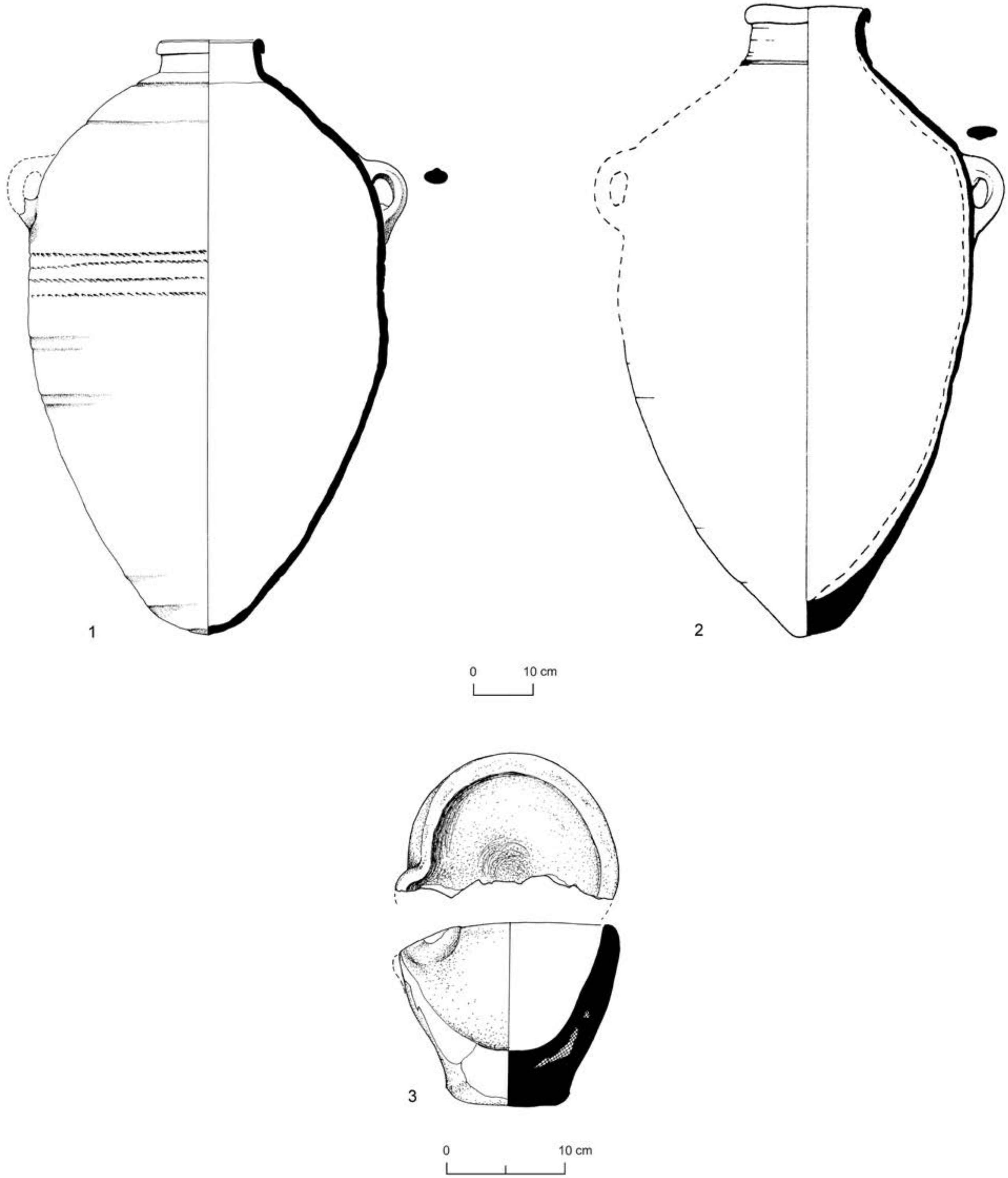

Fig. 3.47. Pottery from Area B, Phase B9-10

Fig. 3.48. Pottery from Phase B9-10 (Stratum V), various loci

No.	Type	Reg. no.	Locus	Remarks
1	TM	9694/5	614	
2	CP3b2	7599/3	607	
3	K1b	9706/5	613	
4	PB	10520	628 (=1216)	
5	J2b	9732/9	660 (=618)	
6	K4a	10540/1	660 (=1214)	
7	CH1	10148/5	660	
8	CP2b1	10106/1	660 (=650)	
9	PYX	10423	690	Photo: Fig. 3.22d
10	CP2b3	18547/2	692 (=4328)	
11	CP3b1	18563/1	692 (=4328)	

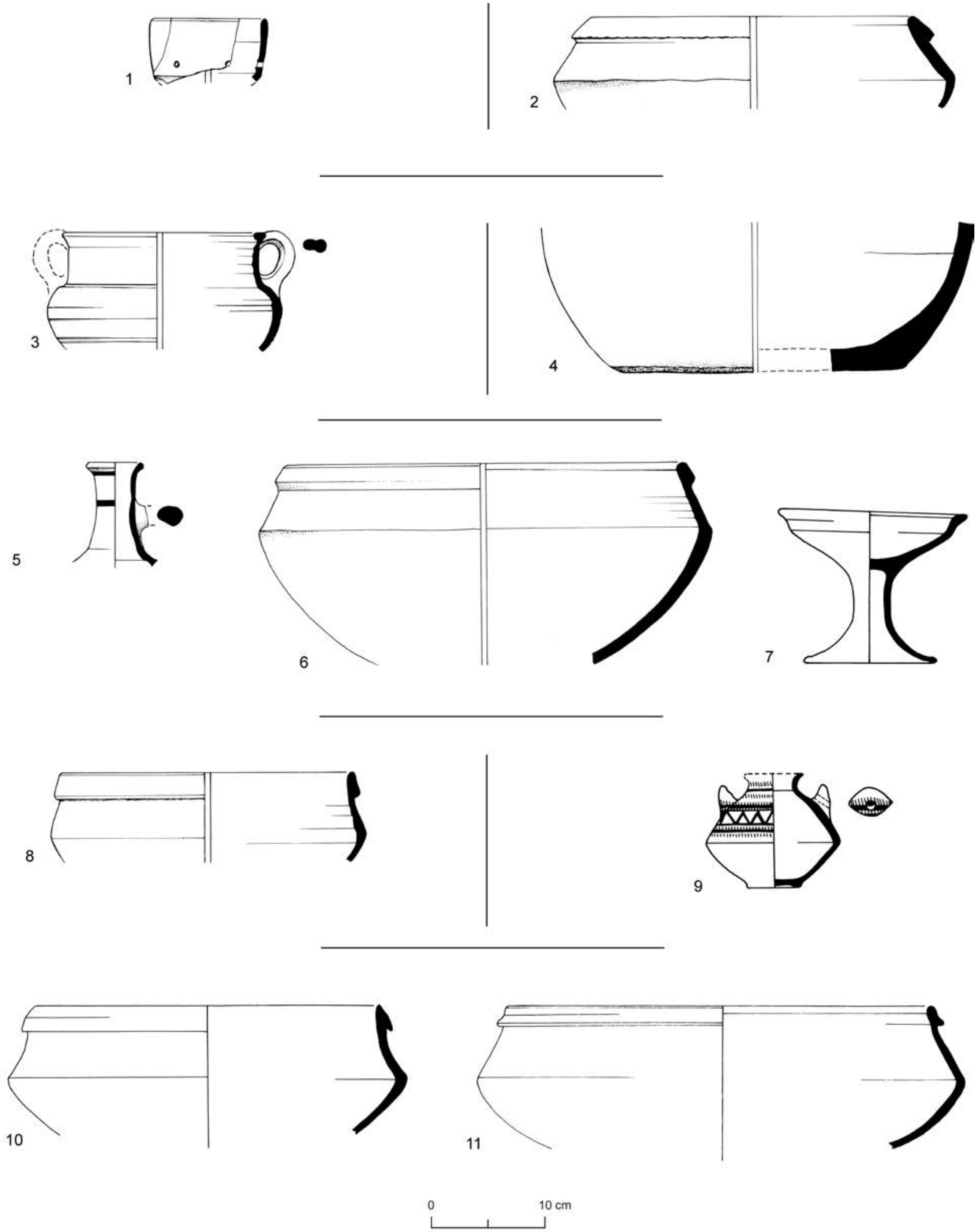

Fig. 3.48. Pottery from Area B, Phase B9-10

Fig. 3.49. Pottery from Phase B9-10 (Stratum V), L692

No.	Type	Reg. no.	Locus	Remarks
1	Bh4	18566/3	692 (+4328)	
2	Bp2/CH4a	18533/2	692 (+4323)	
3	CP3b2b	18568/1	692 (+4328)	
4	CP3b1	18547/3	692 (+4328)	
5	CP3b1	10367/17	692	
6	CP2e	10517/1	692	
7	SJ1	18547/1	692 (+4328)	
8	SJ1	18566/4	692 (+4328)	
9	SJ4b	10391/3	692 (+ 4323)	Painted bands on light-faced ware; Photo: Fig. 3.15c ; petrography: Table 6A.1:4
10	CH2a	18547/1	692 (+4328)	
11	PG3	18566/2	692 (+4328)	
12	PCR	18566/1	692 (+4328)	

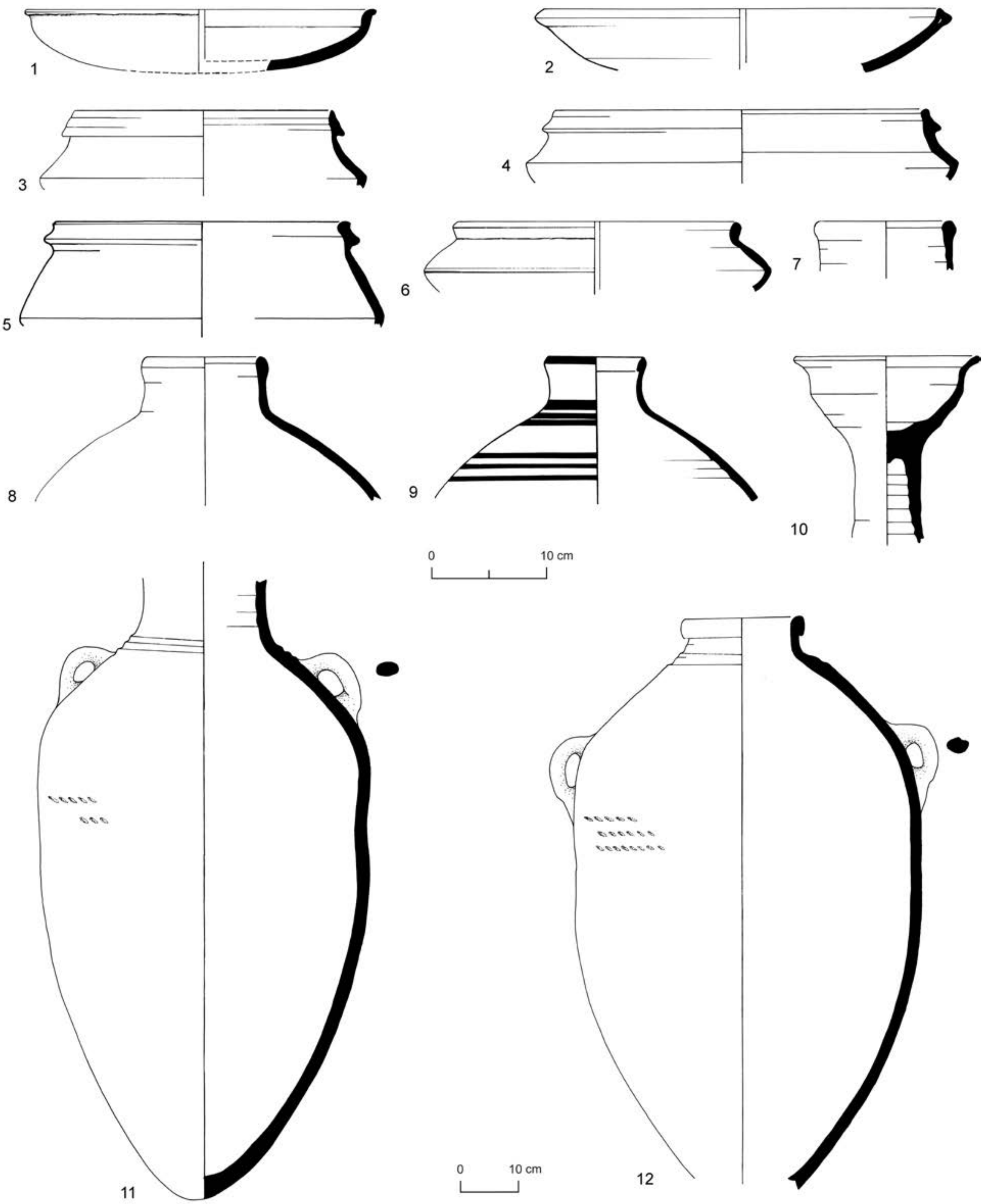

Fig. 3.49. Pottery from Area B, Phase B9-10

Fig. 3.50. Pottery from Phase B9-10 (Stratum V), Loci 698, 1203, 1204

No.	Type	Reg. no.	Locus	Remarks
1	CP2a1	10502/3	698 (=1213)	
2	PCR	10482/1	698 (=1213)	
3	PG1	10537/1	698 (=1212)	
4	PG1	10604/1	698 (=1212)	Photo Fig. 3.12b
5	Bp1a/CH?	10576/1	1203	Soot in interior
6	PYX	10527	1204	
7	PYX	10528	1204	
8	Kernos	10662/1	1204	Pomegranate or poppy; Fig. 5.5:2, Table 5.1:21
9	CR	10529/2, 10415	1204 (= 695)	
10	BN	10480	1204 (=695)	Pipe end
11	Bc1	10690/1	1204 (=695)	Miniature vessel

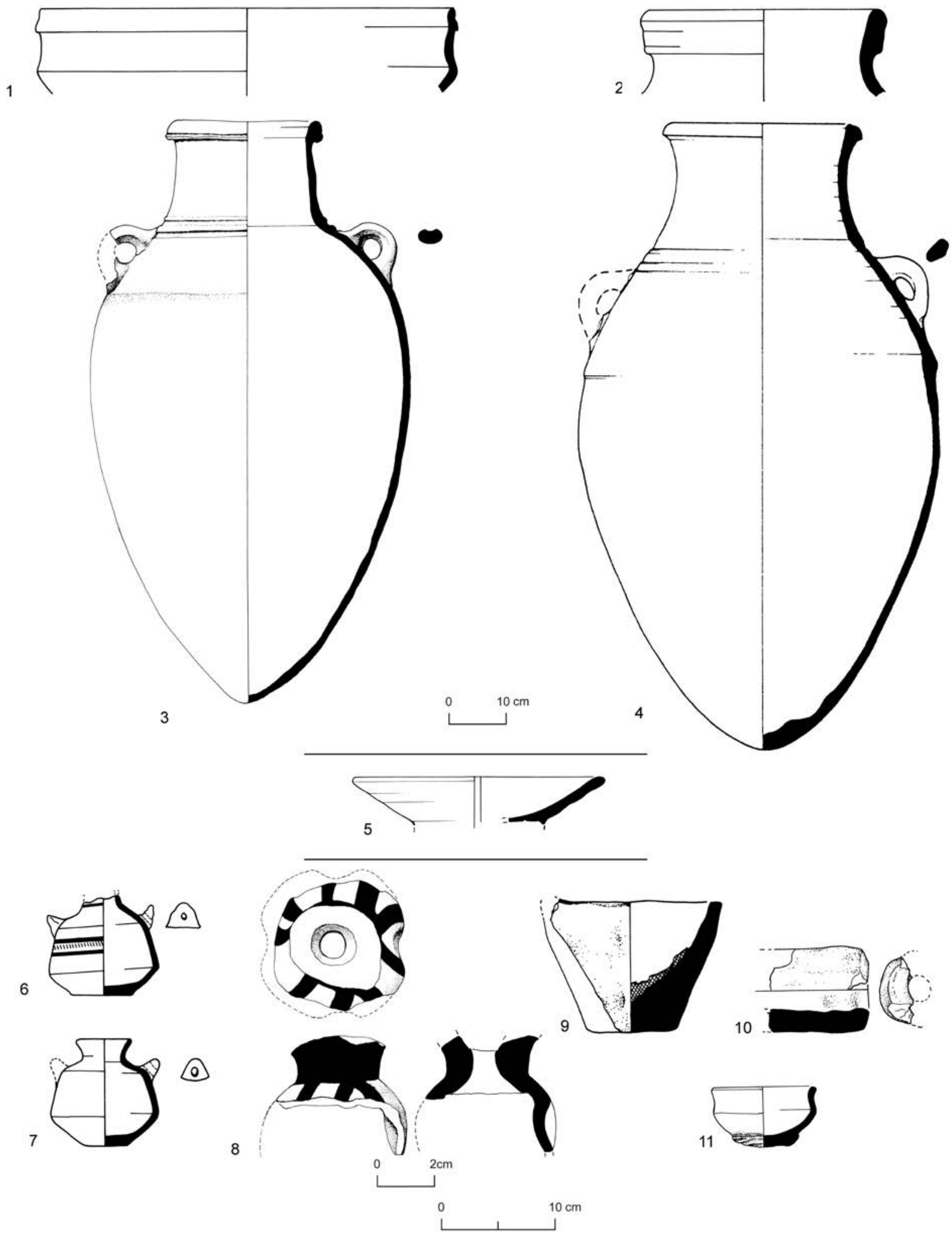

Fig. 3.50. Pottery from Area B, Phase B9-10

Fig. 3.51. Pottery from Phase B9-10 (Stratum V), Loci 1204 (cont.), 1207, 1218

No.	Type	Reg. no.	Locus	Remarks
1	K1	10435/1	1205 (=1204)	
2	CP3b1	18588/1	4339 (=1207)	
3	FL1	23027/1	4610 (=1218)	
4	CP2a2	10755/1	1218	
5	CP1b1	10665/1	1218	
6	CH3a	10733/1	1218	
7	CH	10607/1	1218	
8	PWB	10732/2	1218	
9	BTb	10708/1	1218	
10	K1a	10759/1	1218	
11	PYX	10532/1	1218	Black and red painted decoration
12	L	10701/1	1218	Photo: Fig. 3.5
13	K1a	10735/2	1218	

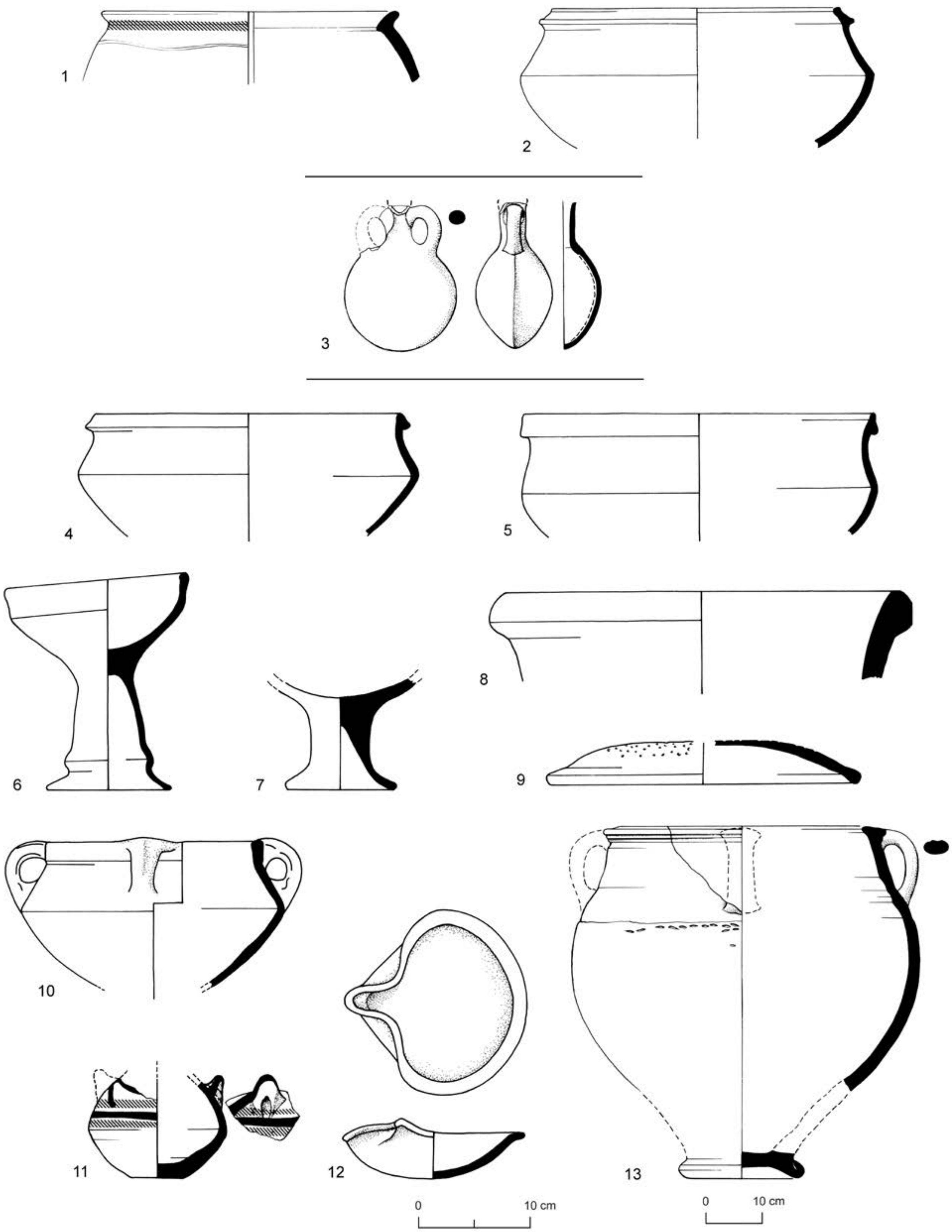

Fig. 3.51. Pottery from Area B, Phase B9-10

Fig. 3.52. Pottery from Phase B9-10 (Stratum V), Pit 1219, Loci 4710, 7061

No.	Type	Reg. no.	Locus	Remarks
1	K1	10750/1	1219	Red painted decoration
2	SJ1	10648/1	1219	Possible Egyptian-style
3	PCR	10622/1	1219	
4	SJ2	25045/1	4710	Petrography: Table 6A.1:3
5	C&S	23622/1	7061 (=7115)	Missing cup at center
6	Bird's head	23361/1	7061	Probably attached to a ritual bowl; Fig. 15.6
7	CP2b1	23403/1	7061	
8	CP2b1	23403/2	7061	
9	BN	23451/4	7061	Bent nozzle end
10	PCR	23425/2	7061	

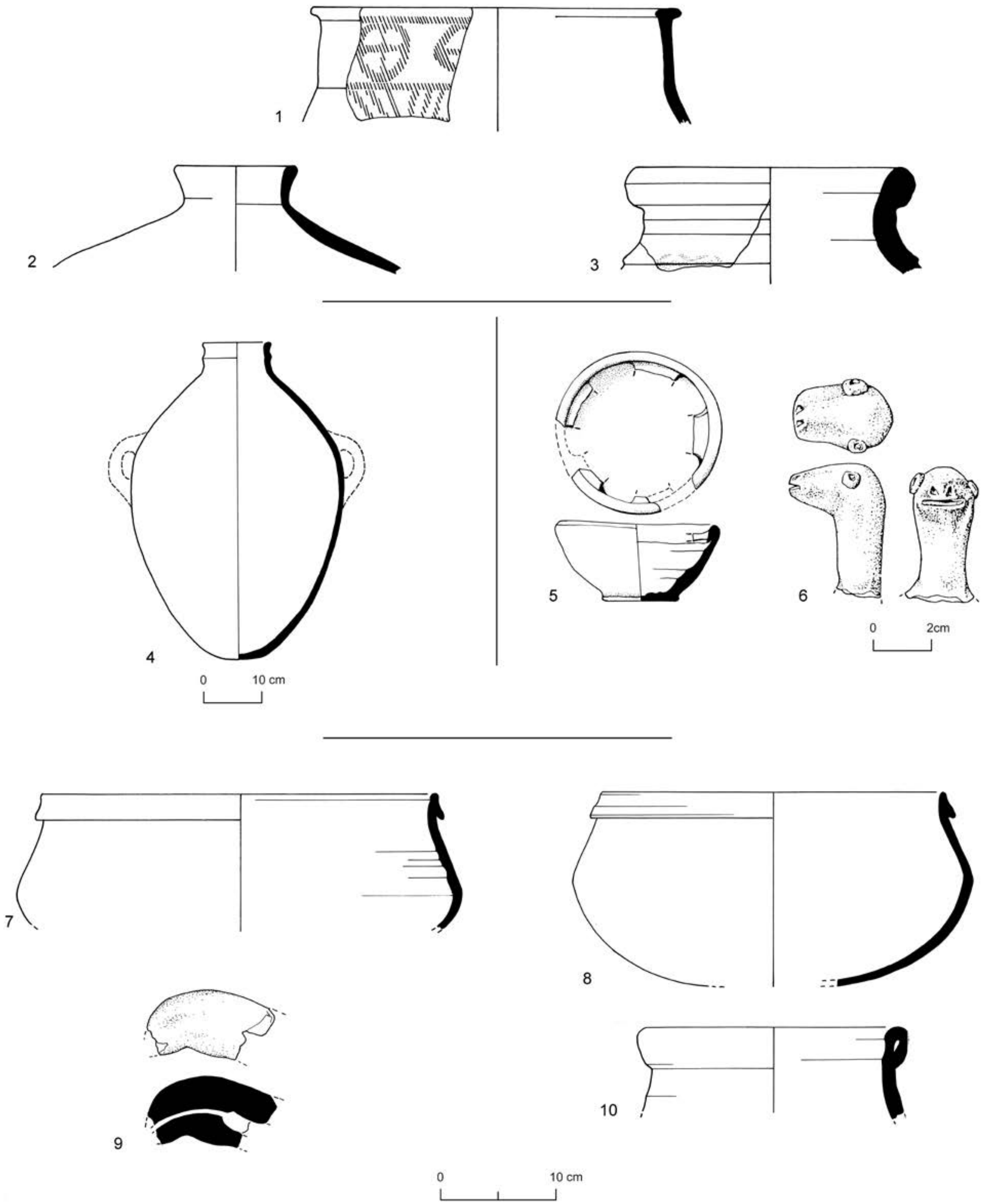

Fig. 3.52. Pottery from Area B, Phase B9-10

Fig. 3.53. Pottery from Phase B9-10 (Stratum V), L7063

No.	Type	Reg. no.	Locus	Remarks
1	Bc3	23422/1	7063	
2	CP2a1	23422/7	7063	
3	J1a	2429/2	7063	
4	J1a	23405/5	7063	
5	J1a	23429/1	7063	
6	SJ	23405/1	7063	

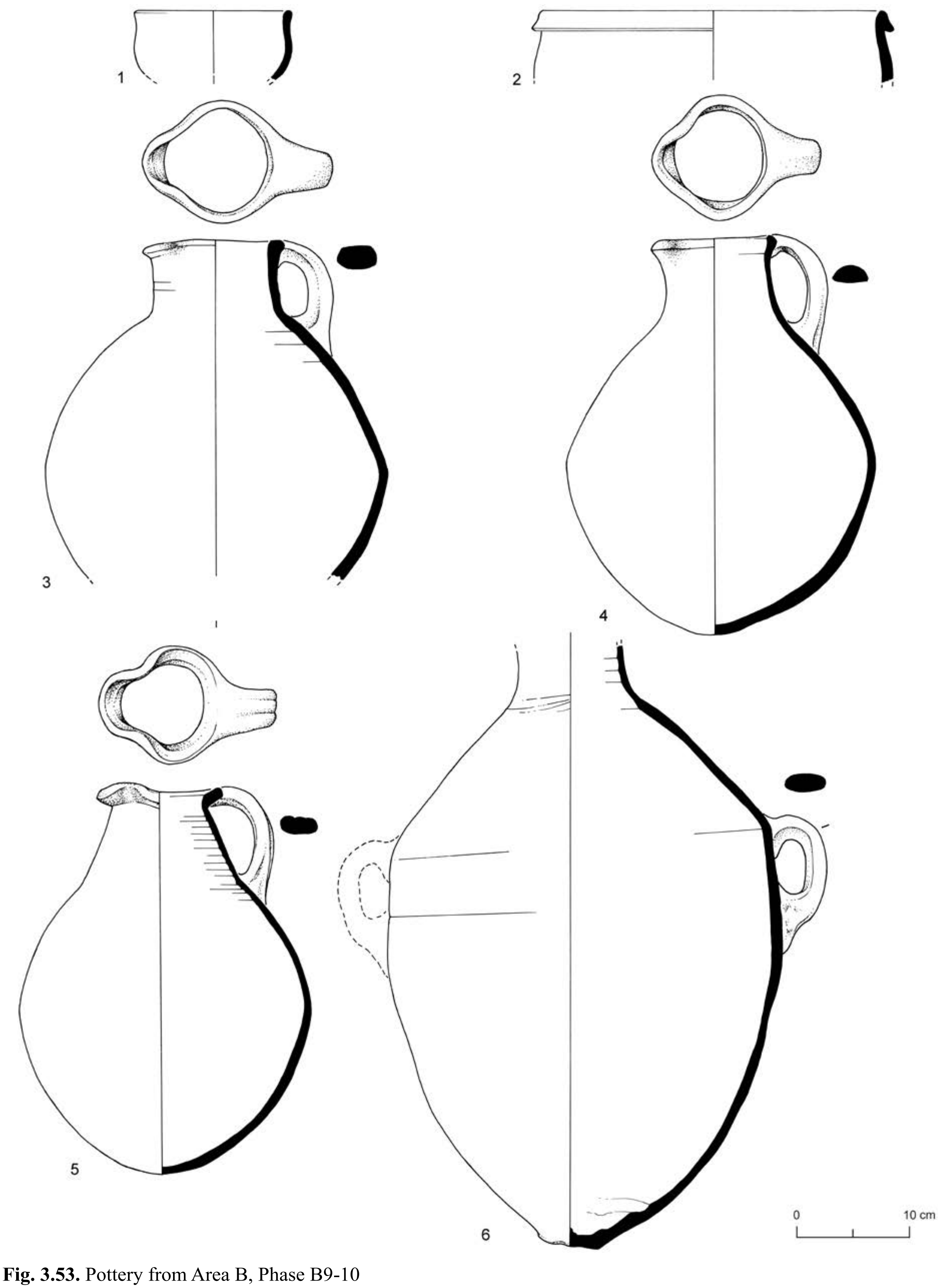

Fig. 3.53. Pottery from Area B, Phase B9-10

Fig. 3.54. Pottery from Phase B9-10 (Stratum V), Loci 7065*, 7067, 7068

No.	Type	Reg. no.	Locus	Remarks
1	CP2a4	23450/2	7065	
2	CP3a1	23450/1	7065	
3	CP3a1	23455/1	7065	
4	PCR	23423/2	7065	
5	PYX	23418/1	7065	
6	J	23430/1	7065	
7	CP3b1	23441/6	7067	
8	Bh1	23443/2	7067	
9	K5	23443/5	7067	
10	CR	23443/1	7067	
11	BN	23453/4	7068	Nozzle end

* For discussion of a body sherd bearing the painted image of a bird from L7064 (=7065) see Chapter 4, no. 13

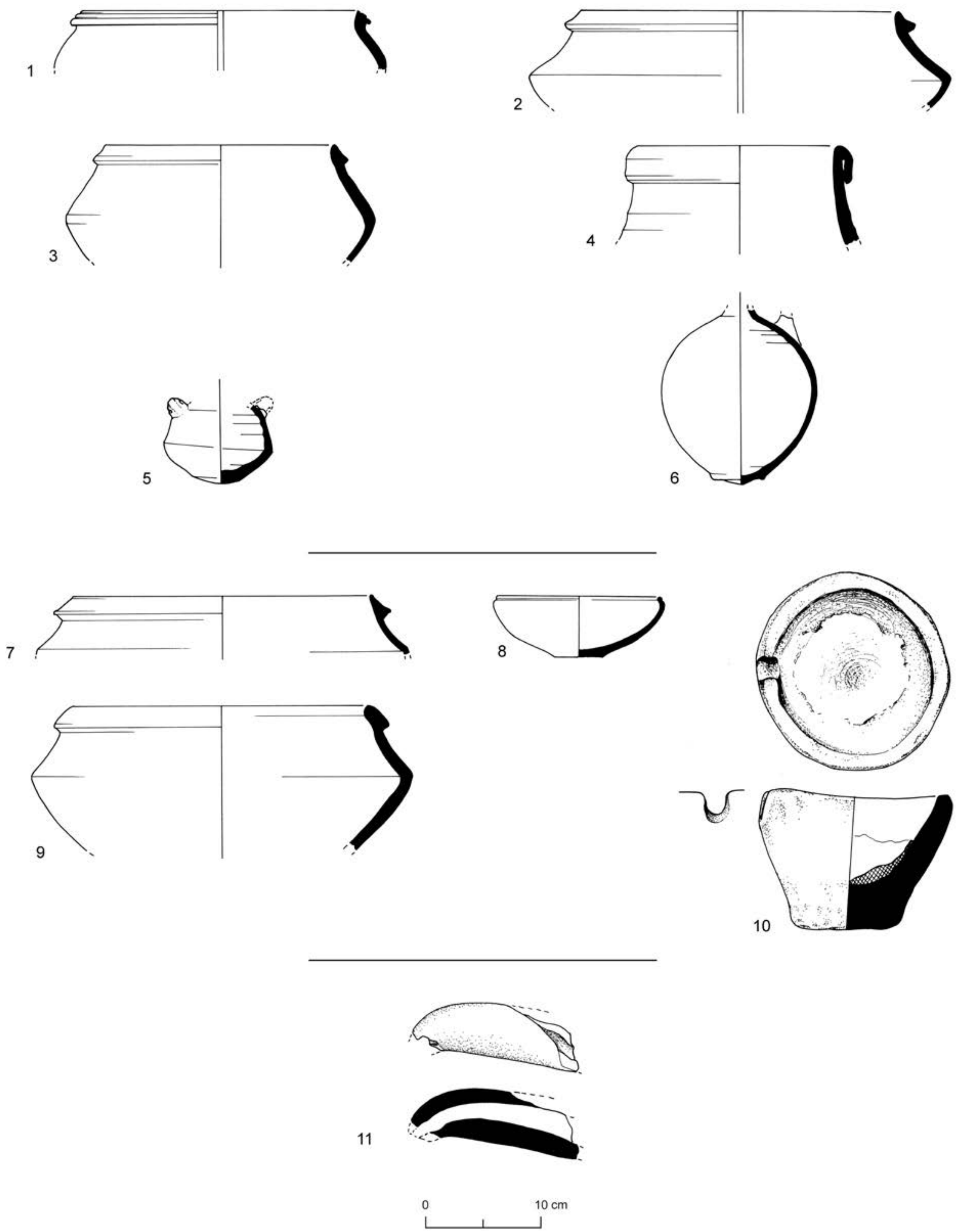

Fig. 3.54. Pottery from Area B, Phase B9-10

Fig. 3.55. Pottery from Phase B9-10 (Stratum V), L7082b*

No.	Type	Reg. no.	Locus	Remarks
1	Bc3	23507/14	7082b	
2	Bc1	23507/1	7082b	
3	K1b	23507/2	7082b	
4	CH2a	23507/2	7082b	
5	CH4a	23507/3	7082b	
6	FL2	23507/6	7082b	
7	CP2b1	23521/3	7082b	
8	CP2b2	23556/1	7082b (=7096)	
9	K4a	23565	7082b (=7096)	
10	Model silo	23507/4	7082b	Figs. 15.1-2
11	J1a	23526/8	7082b	
12	CP2a3	23565/1	7082b (=7096)	
13	Model rod and spindle?	23526/4	7082b	

* For a large FL fragment from this locus and its petrography see Table 6A.21

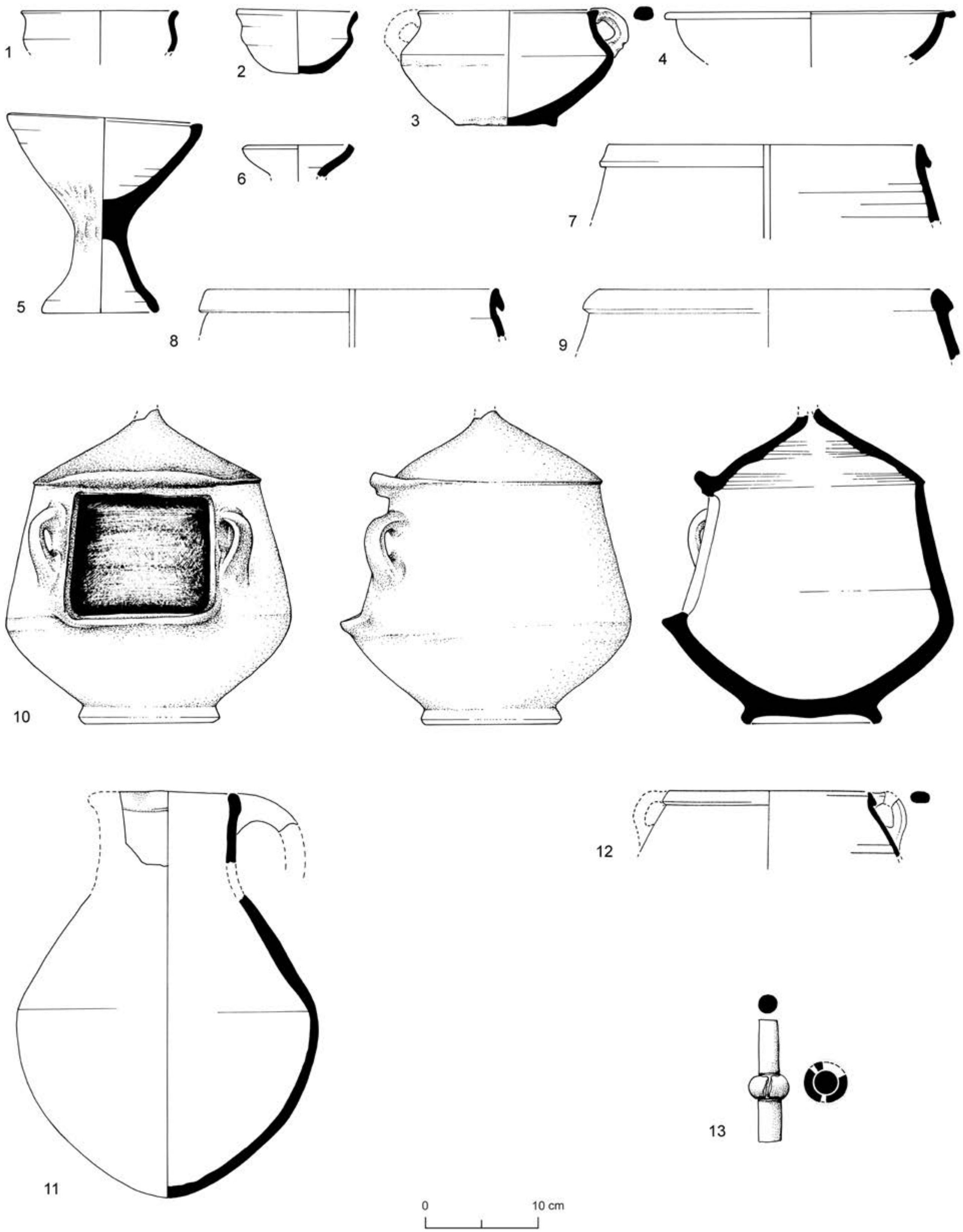

Fig. 3.55. Pottery from Area B, Phase B9-10

Fig. 3.56. Pottery from Phase B9-10 (Stratum V), Loci 7097, 7117, 7131

No.	Type	Reg. no.	Locus	Remarks
1	PYX	23562/2	7097	Painted with red and black bands
2	PYX	23562/1	7097	
3	CP3b3a	23563/4	7097 (=7103)	
4	K4a	23576/1	7097 (=7103)	
5	CJ	23563/1	7097 (=7103)	Egyptian-style
6	L&B	23706	7117	
7	K1a	23568/1	7131 (=7099)	Painted with red and black lines and bands
8	K2a	23561/1	7131 (=7099)	

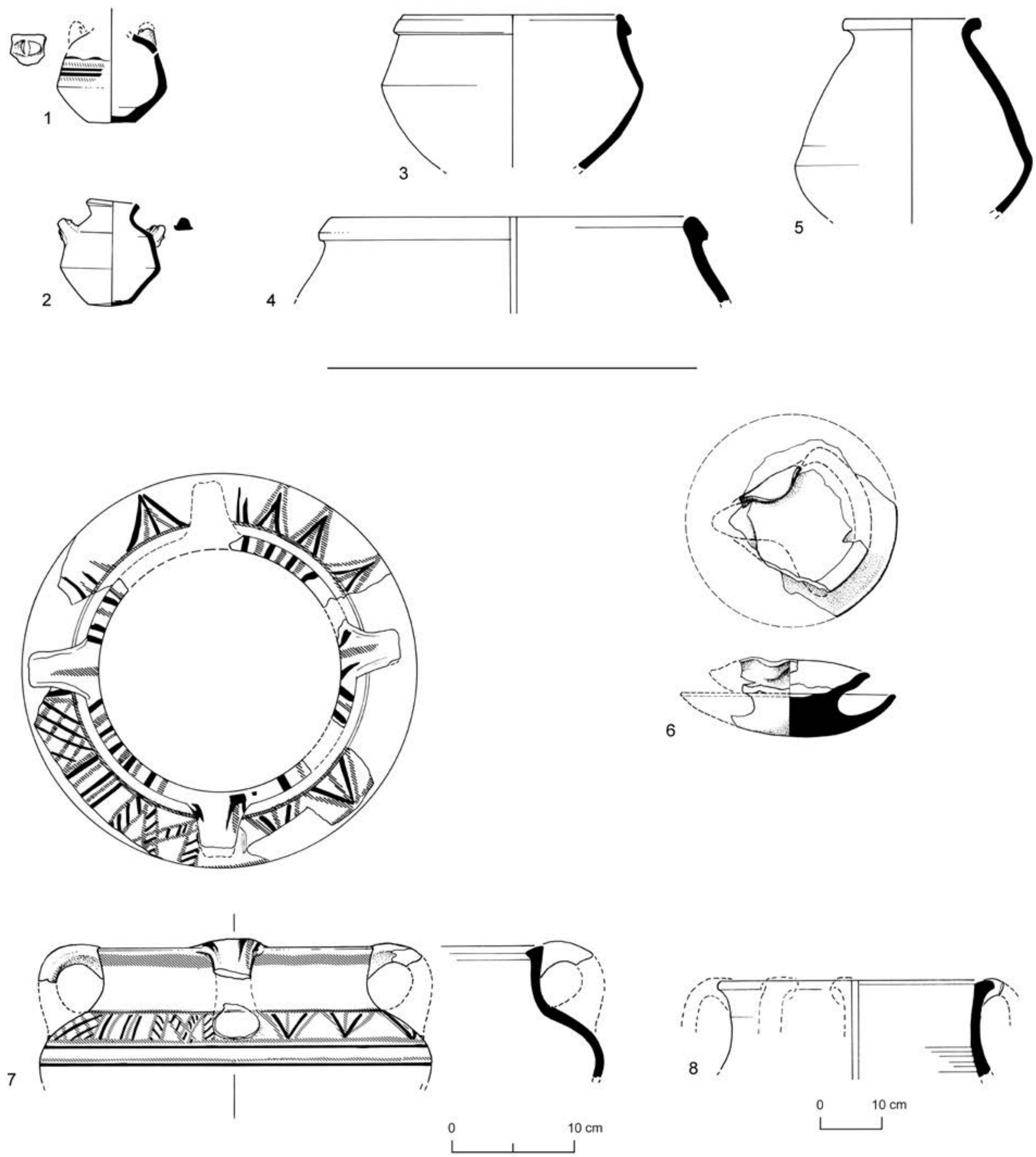

Fig. 3.56. Pottery from Area B, Phase B9-10

Fig. 3.57. Pottery from Phase B9-10 (Stratum V), L7139

No.	Type	Reg. no.	Locus	Remarks
1	CJ	23797/1	7132 (=7139)	Egyptian style
2	CP3b4	23734/2	7131 (=7139)	
3	CP3b1	23784/1	7131 (=7139)	
4	PCR	23605/1	7104 (=7139)	
5	K1	23810/1	7142	
6	CJ	23782/3	7139	Egyptian style
7	PCR	23762/7	7135 (=7139)	

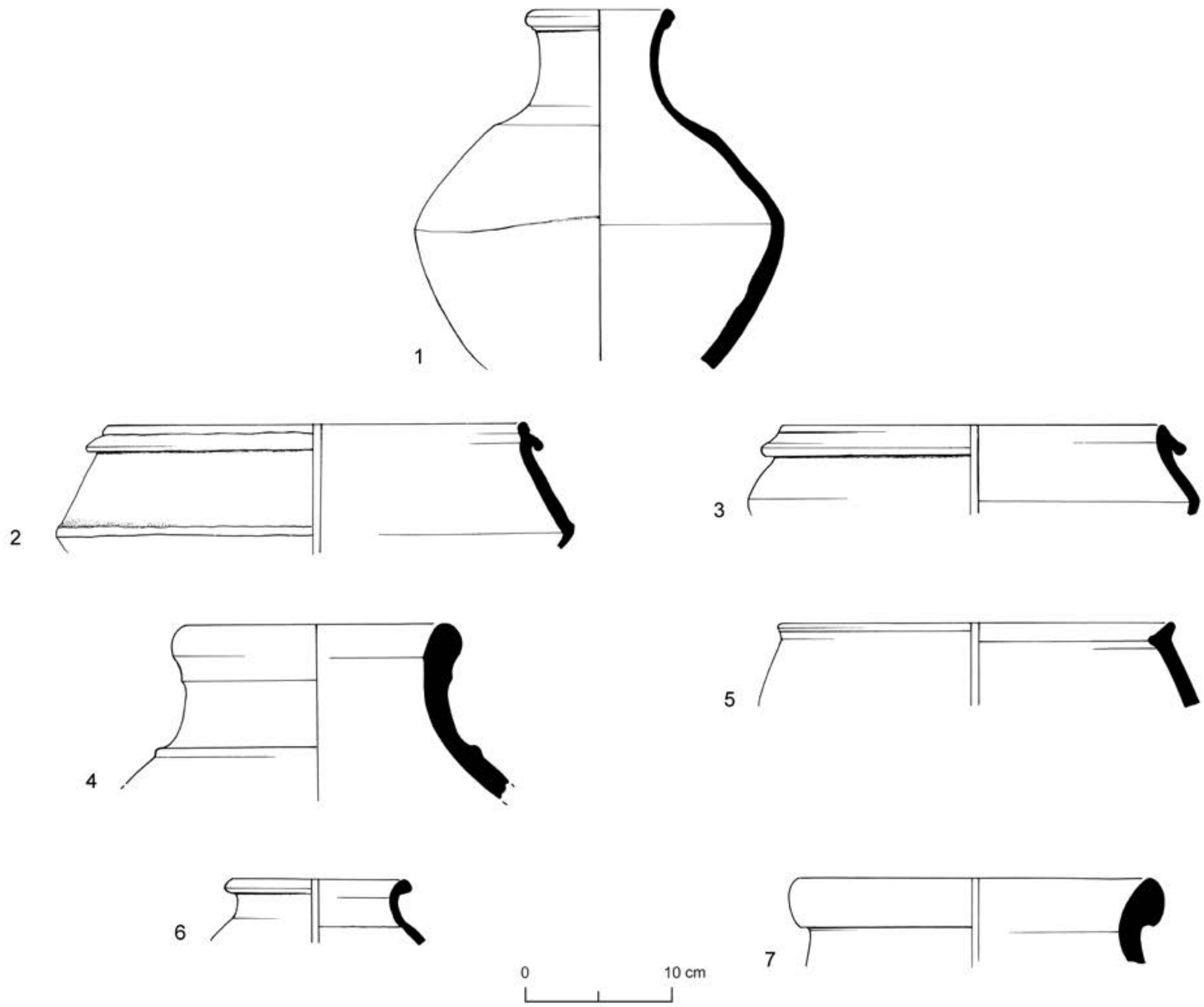

Fig. 3.57. Pottery from Area B, Phase B9-10

Fig. 3.58. Pottery from Phase B8 (Stratum IVB), Loci 116, 120

No.	Type	Reg. no.	Locus	Remarks
1	CP3b2	767/1	116	
2	CP3a2	747/3	116	
3	CH	629/1	116	
4	SJ2	741/17	116	
5	Bc3	635/1	120	

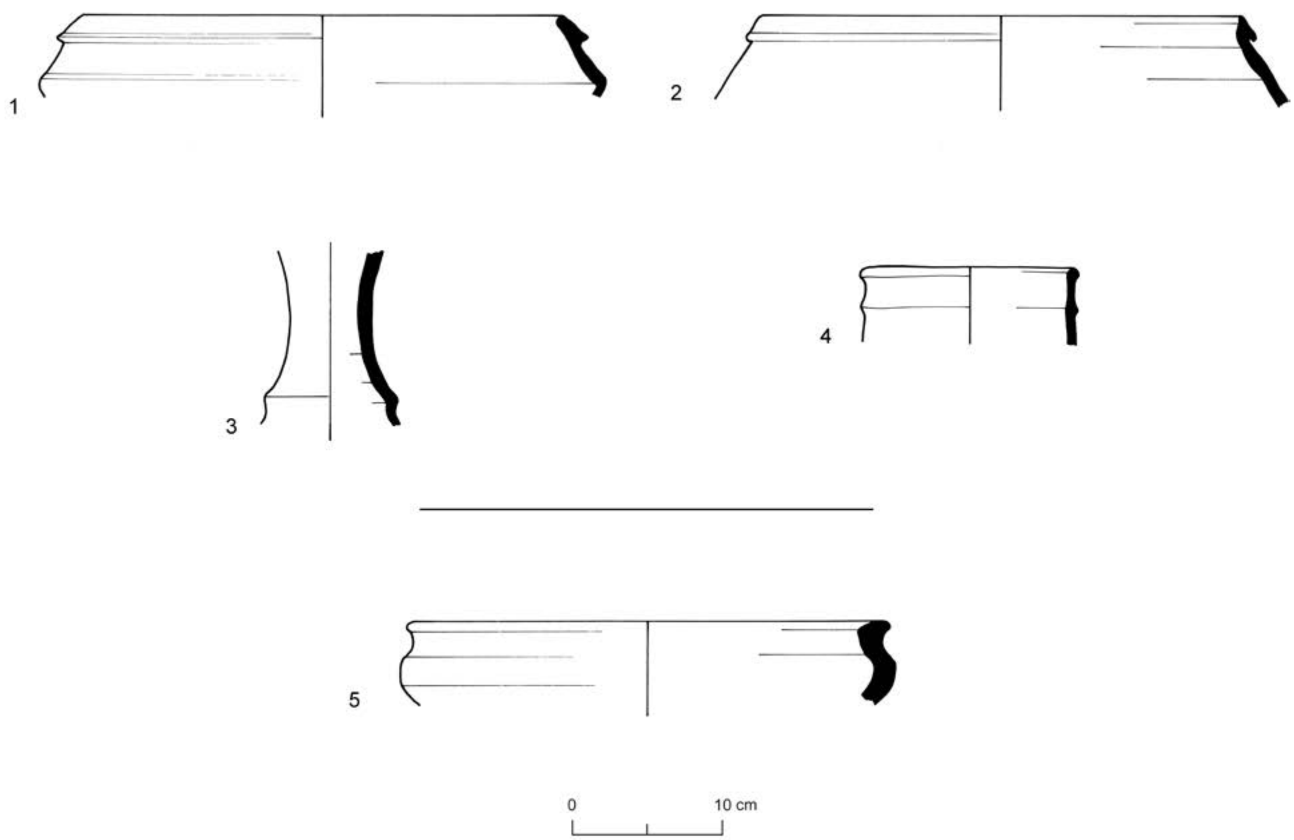

Fig. 3.58. Pottery from Area B, Phase B8

Fig. 3.59. Pottery from Phase B8 (Stratum IVB), L129

No.	Type	Reg. no.	Locus	Remarks
1	CP2b1	655/1	129	
2	Bc4	680/1	129	Red slip and burnish
3	K5	638/12	129	
4	J1a	657/1	129	
5	J1a	663/1	129	
6	AM	634/1	129	Red wash? Photo: Fig. 3.16b

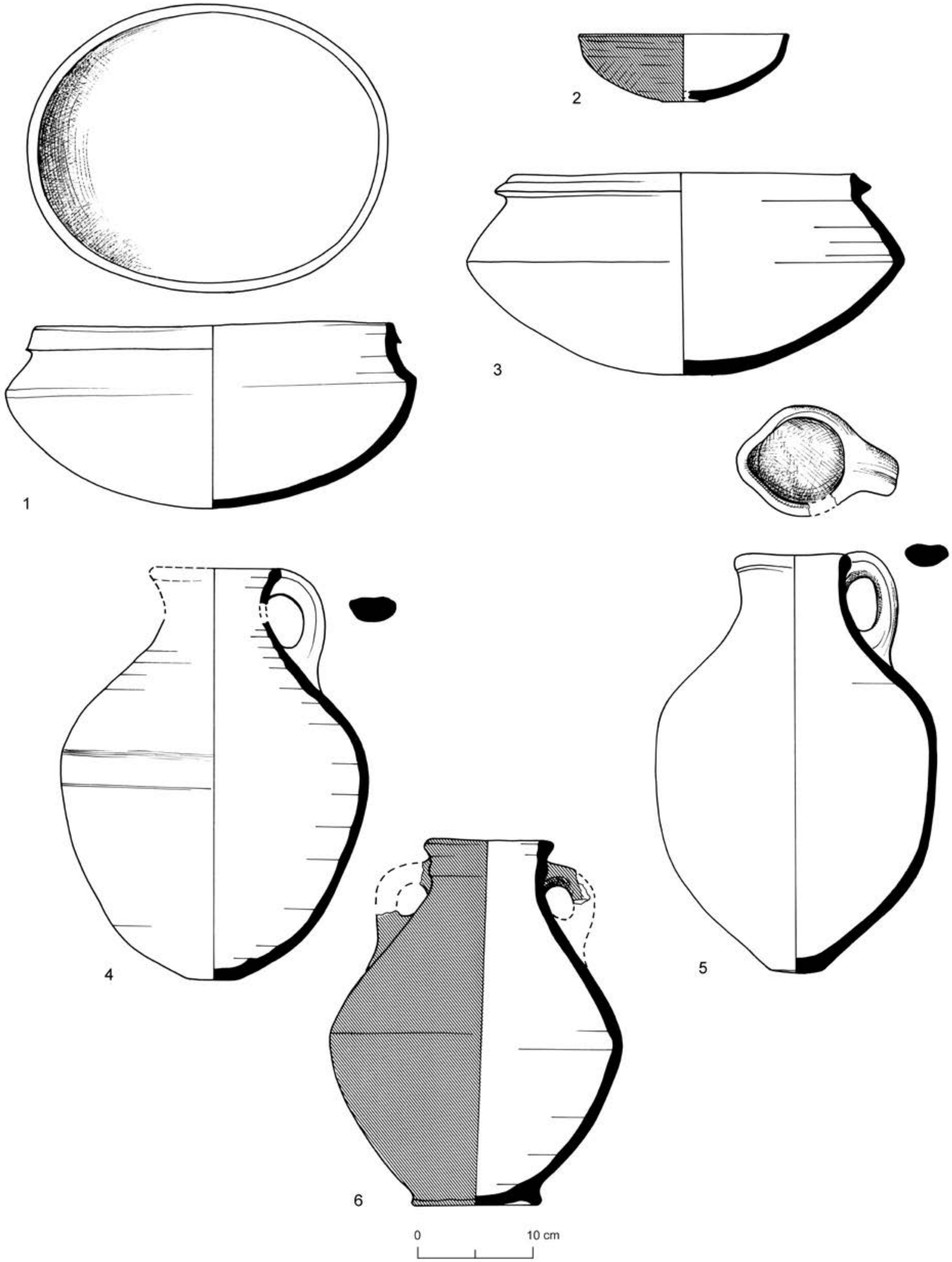

Fig. 3.59. Pottery from Area B, Phase B8

Fig. 3.60. Pottery from Phase B8 (Stratum IVB), L129 (cont.)

No.	Type	Reg. no.	Remarks
1	Jtg	669/1	Red and black painted bands
2	SJ	654/10	
3	SJ2	654/11	Red wash? Photo: Fig. 3.15a
4	K1a	656/4	Red wash?

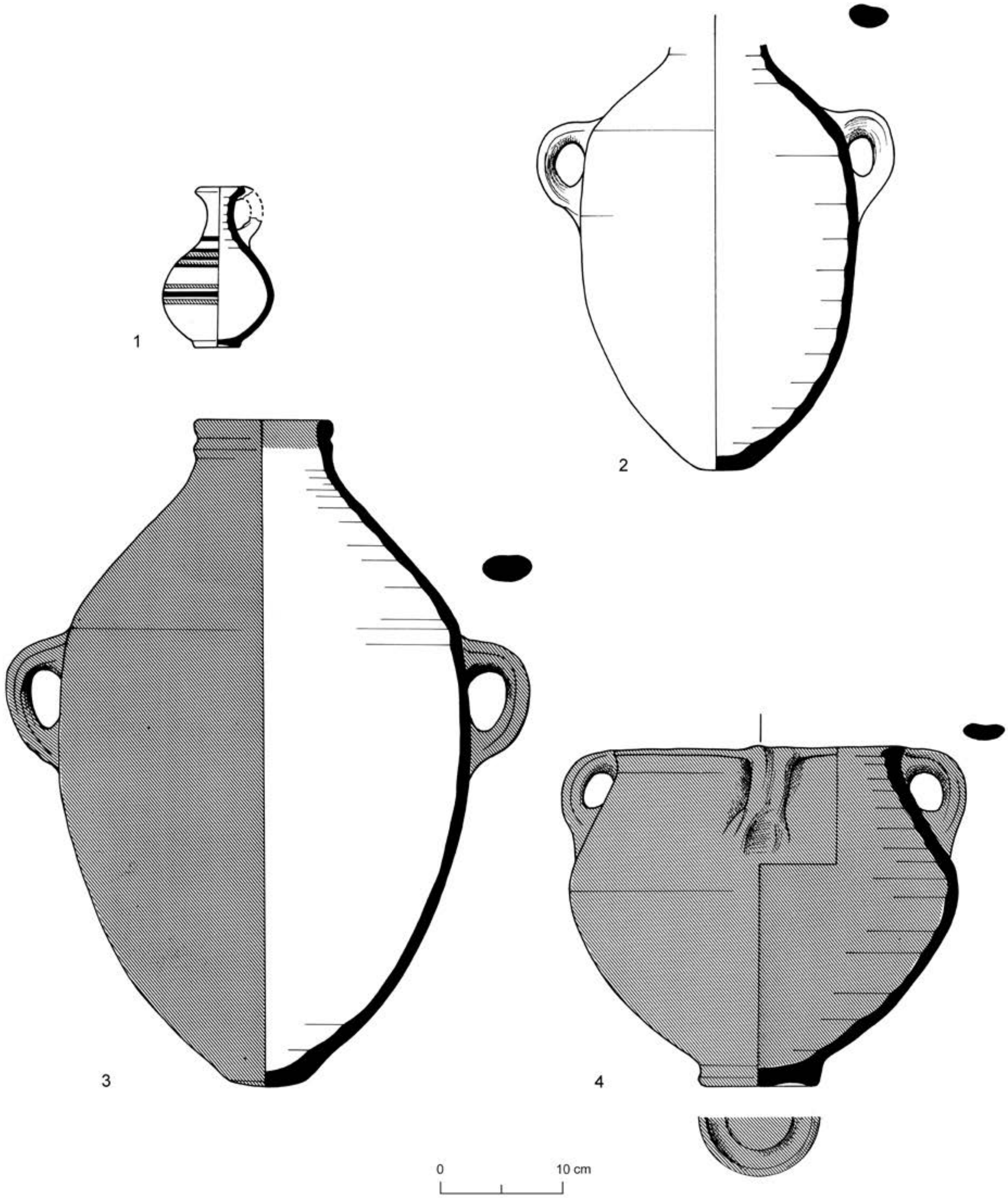

Fig. 3.60. Pottery from Area B, Phase B8

Fig. 3.61. Pottery from Phase B8 (Stratum IVB), L161

No.	Type	Reg. no.	Locus	Remarks
1	Bc2	795	161	
2	CP2b4	748/1	161	
3	SJ2	793/2	161	
4	K1a	796	161	
5	SJ	793/1	161	
6	AM	793/3	161	Red wash?

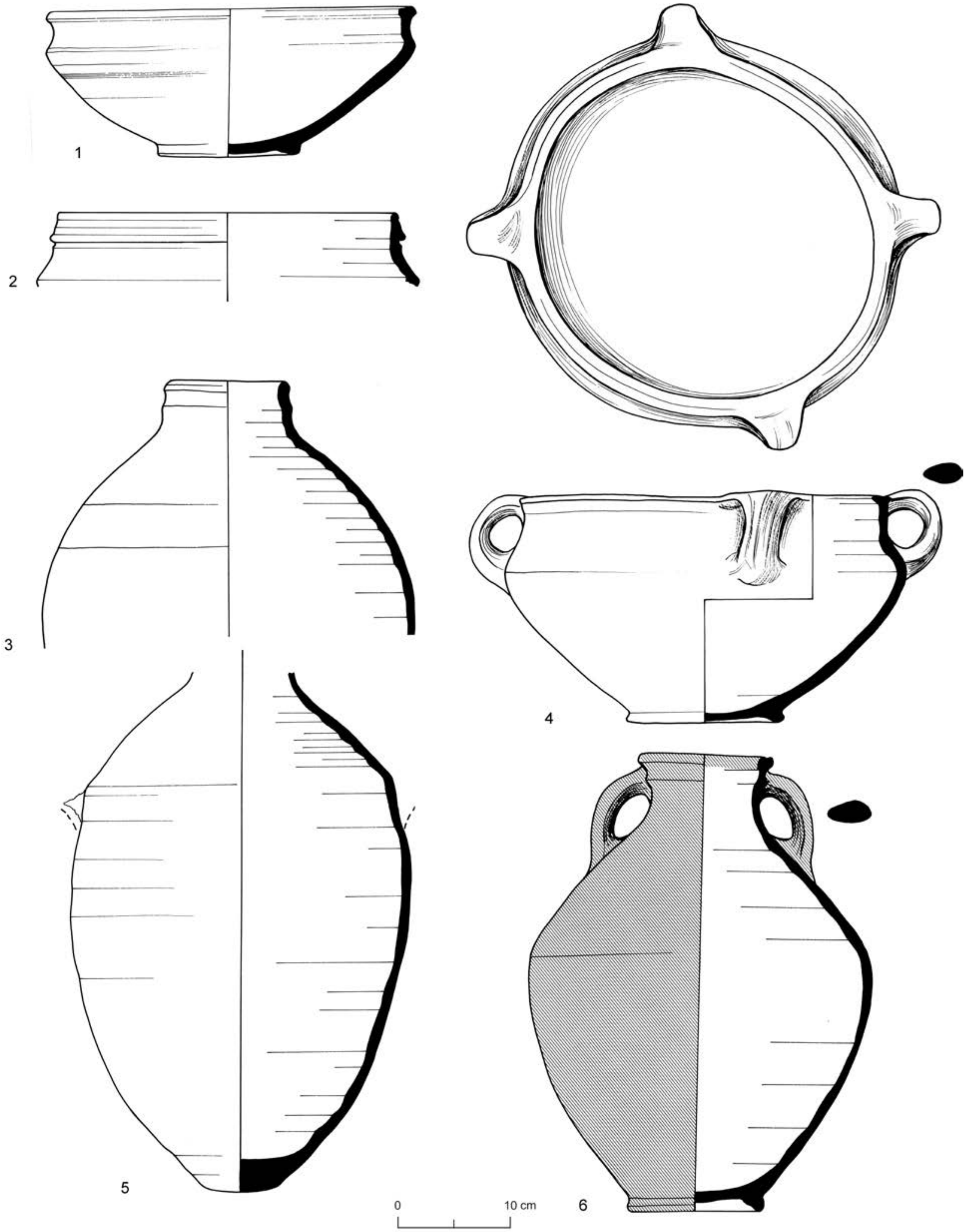

Fig. 3.61. Pottery from Area B, Phase B8

Fig. 3.62. Pottery from Phase B8 (Stratum IVB), Loci 179, 210*, 211

No.	Type	Reg. no.	Locus	Remarks
1	Bh1	770/9	179	
2	Bh1	788/1	179	
3	CP3c1	802/1	179	
4	CP3c1	770/3	179	
5	J1a	866/1	179	
6	PG	1064/1	210	
7	Hydria	1074/1	210	Horizontal loop handles; Aegean type; see discussion on p. 361
8	PG	1031/4	210	
9	J4	1080/1	210	
10	L	1107/10	211	Handmade
11	PG	1107/1	211	

* For a large FL fragment from L210 and its petrography see Table 6A.17

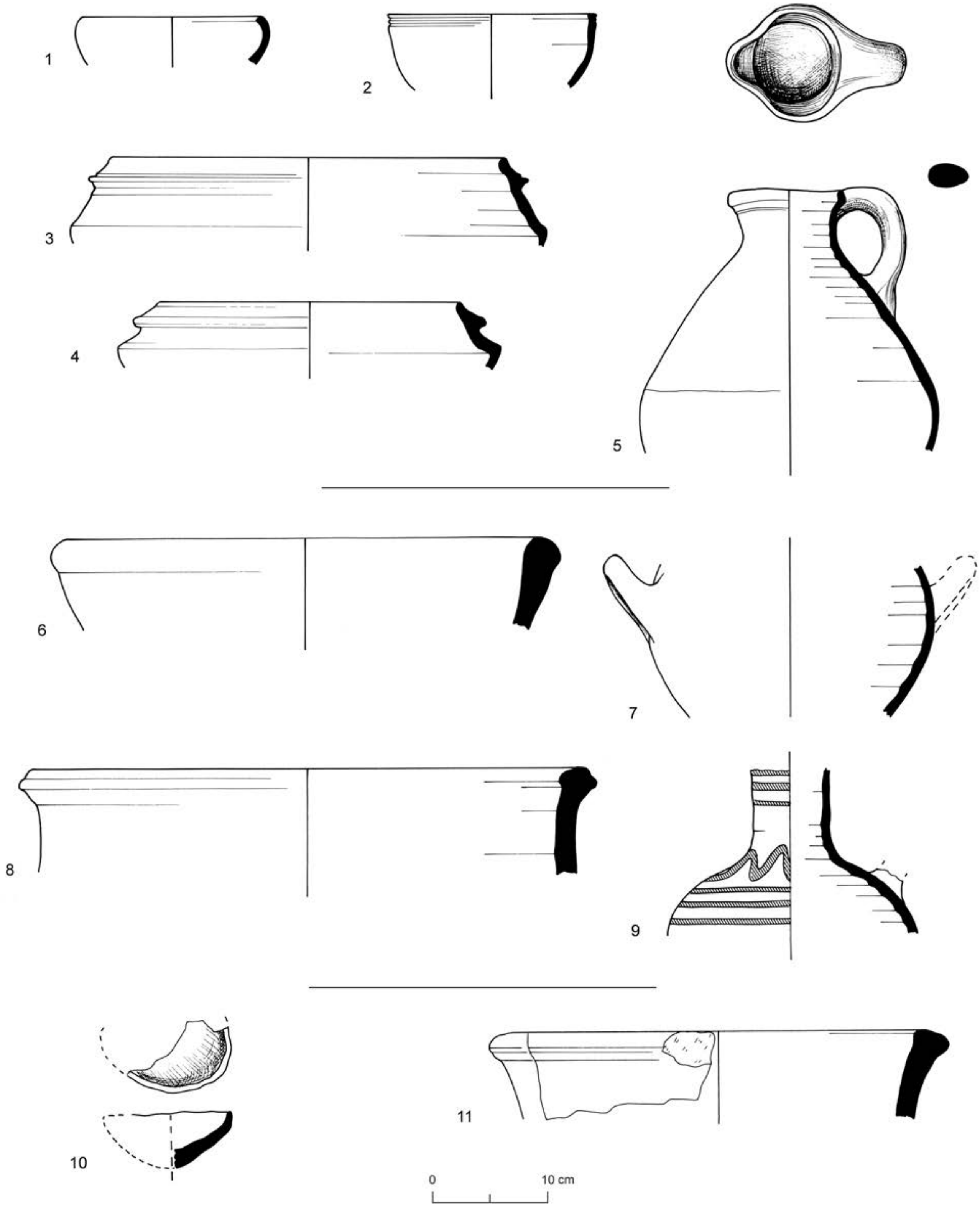

Fig. 3.62. Pottery from Area B, Phase B8

Fig. 3.63. Pottery from Phase B8 (Stratum IVB), Loci 213, 316, 318, 319, 416

No.	Type	Reg. no.	Locus	Remarks
1	J4	1126/9	213	
2	PCR	2080/4	316	
3	K?	2085	318	Body sherd painted with a bird
4	PYX	1308/4	319	
5	K1	2089/1	319	Handle with painted and plastic decoration
6	CP3c1	6108/2	416	
7	C&S	6024/2	416	
8	TM	6134/4	416	

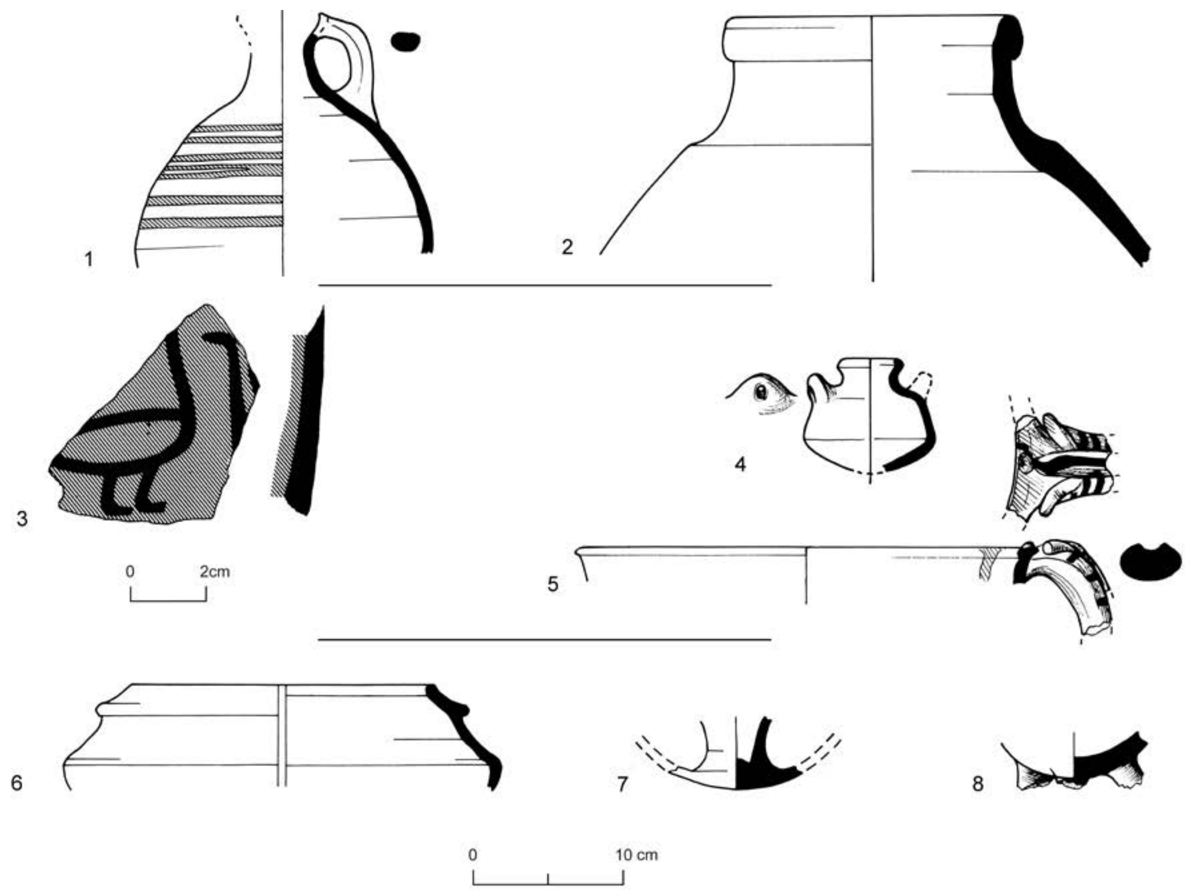

Fig. 3.63. Pottery from Area B, Phase B8

Fig. 3.64. Pottery from Phase B8 (Stratum IVB), Loci 419, 423, 563, 570, 571*

No.	Type	Reg. no.	Locus	Remarks
1	PG1	6155/7	419	
2	CP3c1	6199	423	
3	FJ	9329/1	542c	Bichrome "Phoenician" Ware
4	J5	9507	542c (=571)	
5	GJ	9733/2,3	563	Red painted net lozenge
6	FL1	25017/2	563 (=4704)	
7	BTe	25047/1	563 (=4704)	
8	FL1	9534	570	
9	J2a	9593/1	571	= Fig. 3.18a
10	J1a/b	9592/1	571	= Fig. 3.17e
11	J1a	9452/1	571	

* For a Phoenician Bichrome jug fragment and its petrography from L547 see Table 6A.13

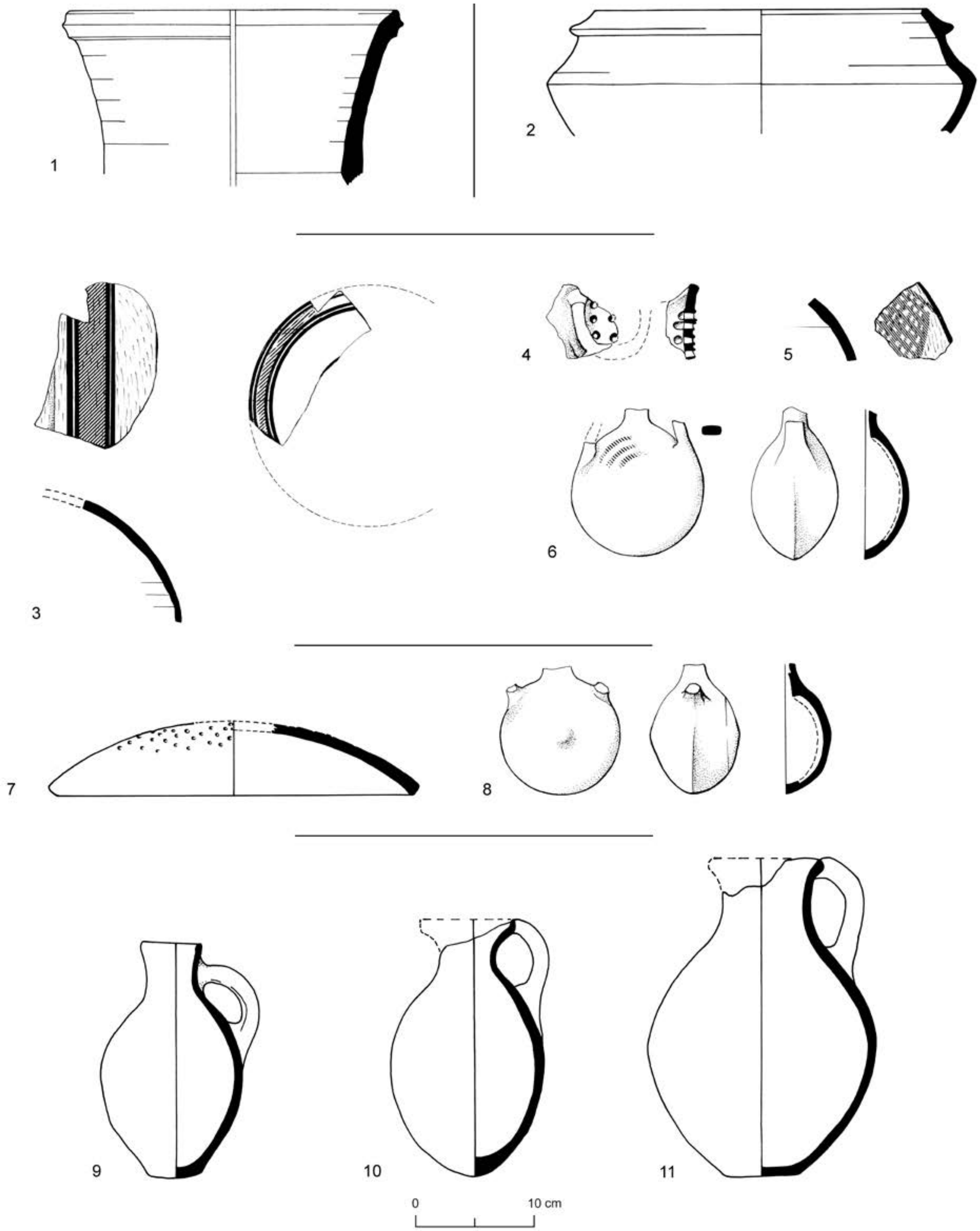

Fig. 3.64. Pottery from Area B, Phase B8

Fig. 3.65. Pottery from Phase B8 (Stratum IVB), Loci 574, 581, 582

No.	Type	Reg. no.	Locus	Remarks
1	PB	10398/4	574	
2	Jtd	10700	574	
3	PYX	10736	574	Red and black painted bands, dots and tassles; photo: Fig. 3.22f
4	CP2c3	9409/2	574	
5	CP3a1	9466/7	581	
6	PWB	9635/1	582	
7	CP2b1	23398/2	582(7064)	

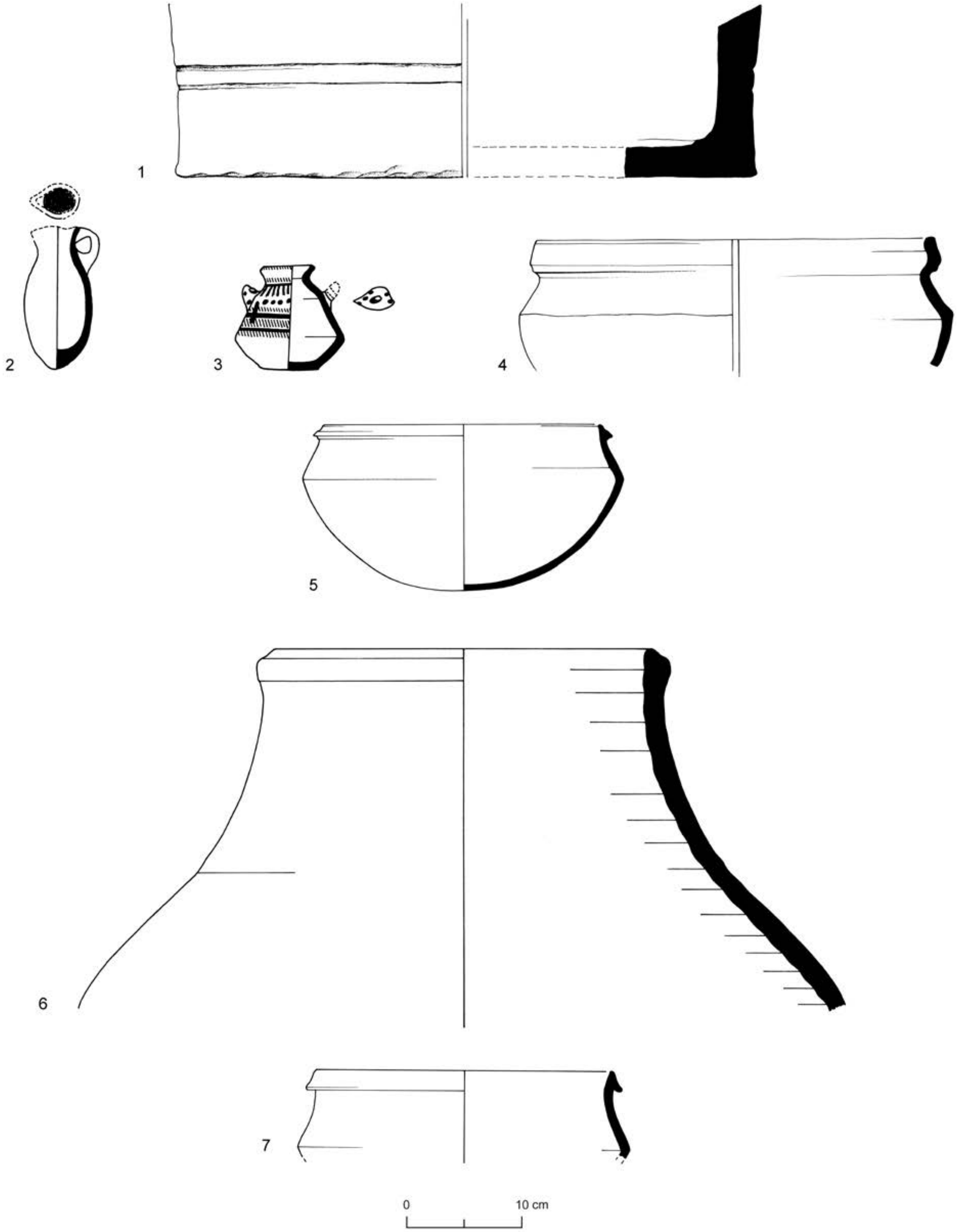

Fig. 3.65. Pottery from Area B, Phase B8

Fig. 3.66. Pottery from Phase B8 (Stratum IVB), Loci 584, 587, 601*

No.	Type	Reg. no.	Locus	Remarks
1	Bp	9522/3	584	
2	Bh3	10081/7	584	
3	K4a	10087/1	584	
4	K1b	10211/2	584	
5	J6	10211/1	584	"Phoenician Bichrome"
6	PWB	9497/1	587 (=589)	Wavy band application; photo: Fig. 3.13b
7	CH3b	1029/4	601	
8	CH2b	9587/1	601	
9	K4b	9787/1	601	

* For discussion of a body sherd from L601 bearing the image of a painted bird see Chapter 4, no. 12.

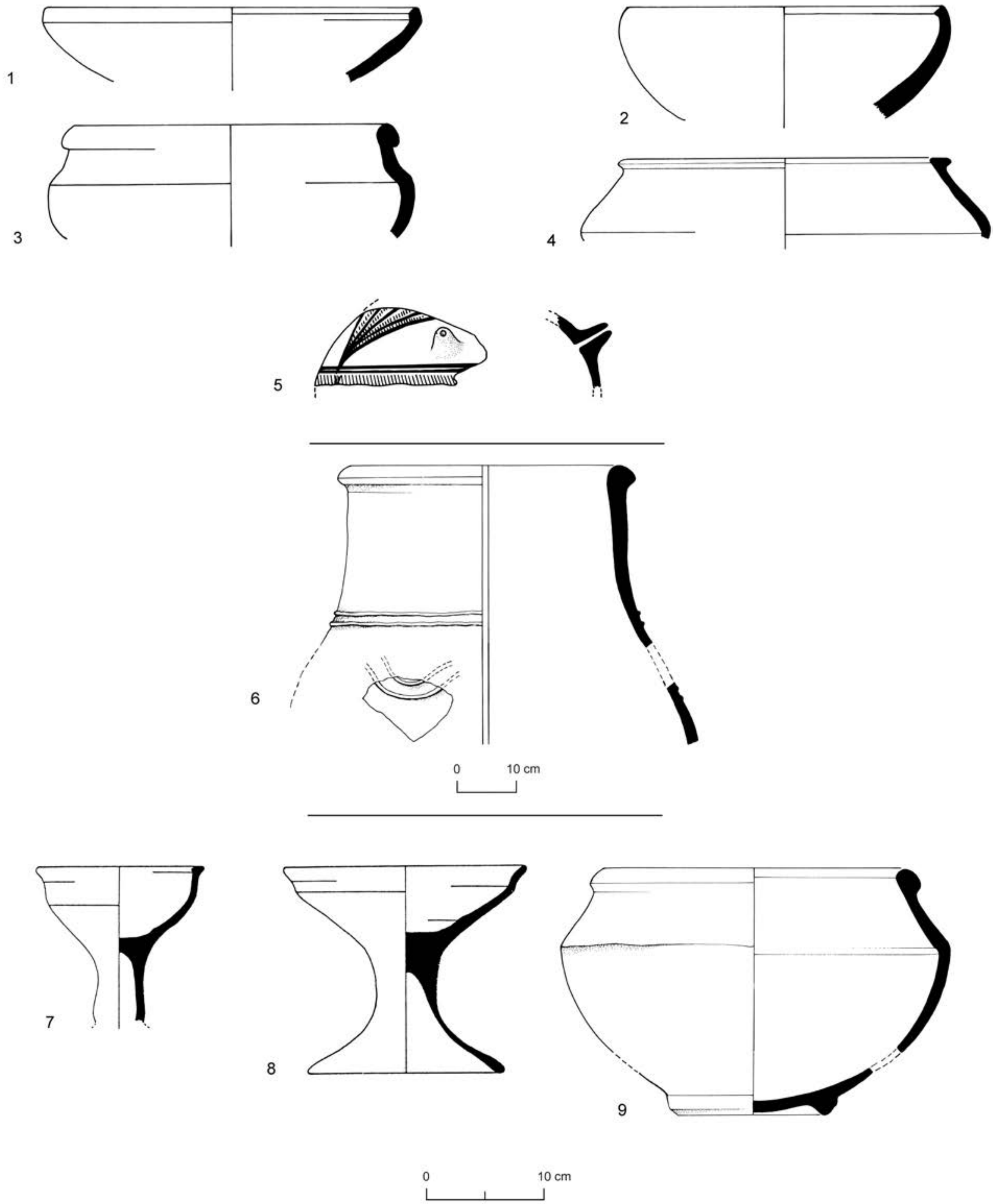

Fig. 3.66. Pottery from Area B, Phase B8

Fig. 3.67. Pottery from Phase B8 (Stratum IVB), L605

No.	Type	Reg. no.	Remarks
1	CH1	10567/1	
2	CP3c1	10555/2	
3	K5	15501/1	
4	CP3c1	10550/1	
5	CP3b1	9657/1	
6	CP3a1	9657/2	
7	CP3c2	9329/2	
8	CP3b4	9657/3	Photo: Fig. 3.7b
9	K4b	10554/1	
10	CP3c1	9657/5	
11	CP3b1	10464/1	
12	CP3b1	10367	
13	CP3e	10497/1	
14	CP3c1	9657/4	

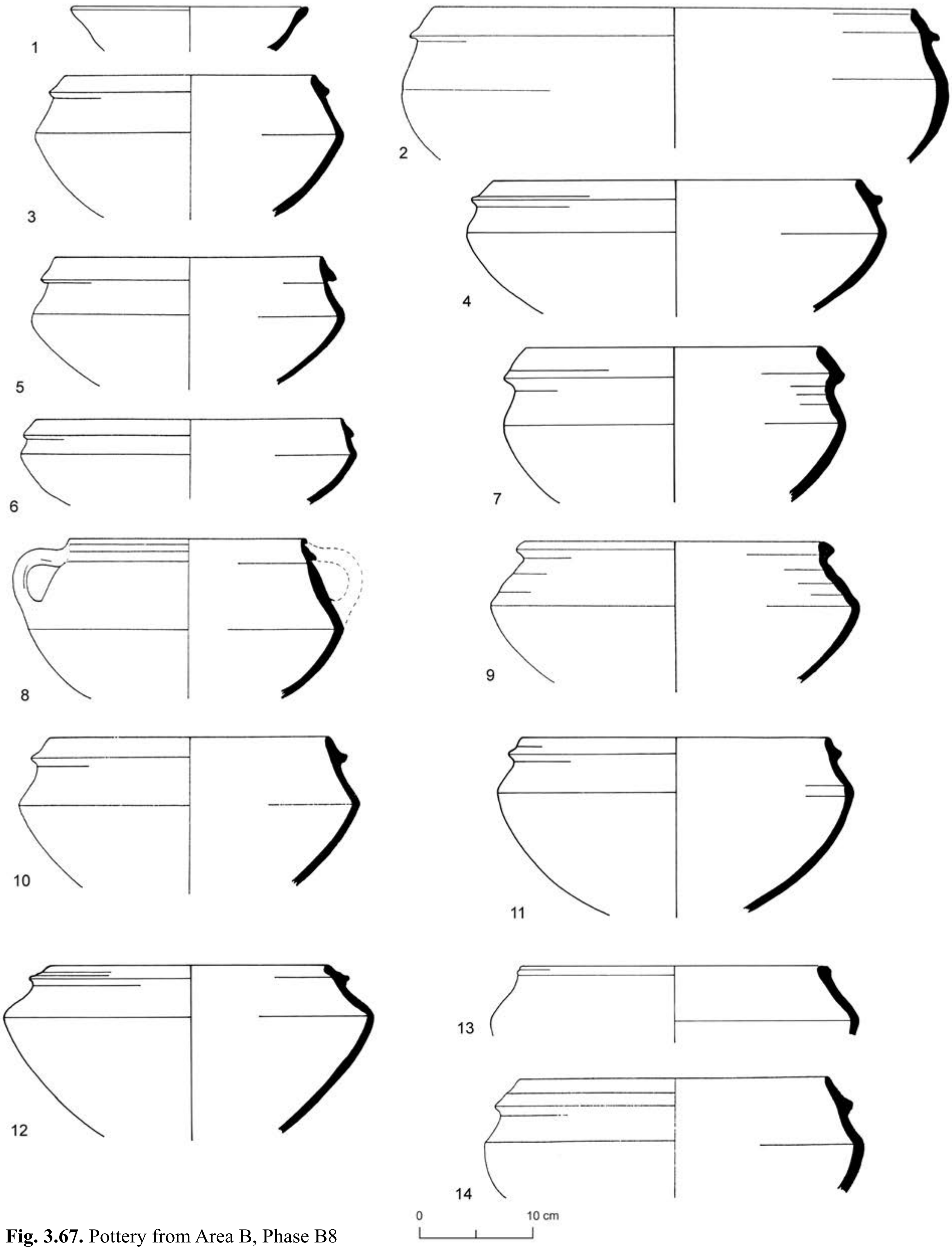

Fig. 3.67. Pottery from Area B, Phase B8

Fig. 3.68. Pottery from Phase B8 (Stratum IVB), Loci 605 (cont.), 612 (=572b, 597)

No.	Type	Reg. no.	Locus	Remarks
1	SJ1	10464/2	605	
2	J2b	10553/1	605	"Phoenician Bichrome"; Fig. 3.123:8
3	FJ	10547	605	Fig. 3.124:7
4	L	10552/1	605	
5	PG2	10549/1	605	
6	J5	9663/2	612	Red and black bands; petrography: Table 6C.1:24
7	FL	9431/16	612 (=572b)	Black concentric circle; petrography: Table 6A.16
8	FL	9855/1	612 (=597)	Red and black concentric circles; petrography: Table 6A:18

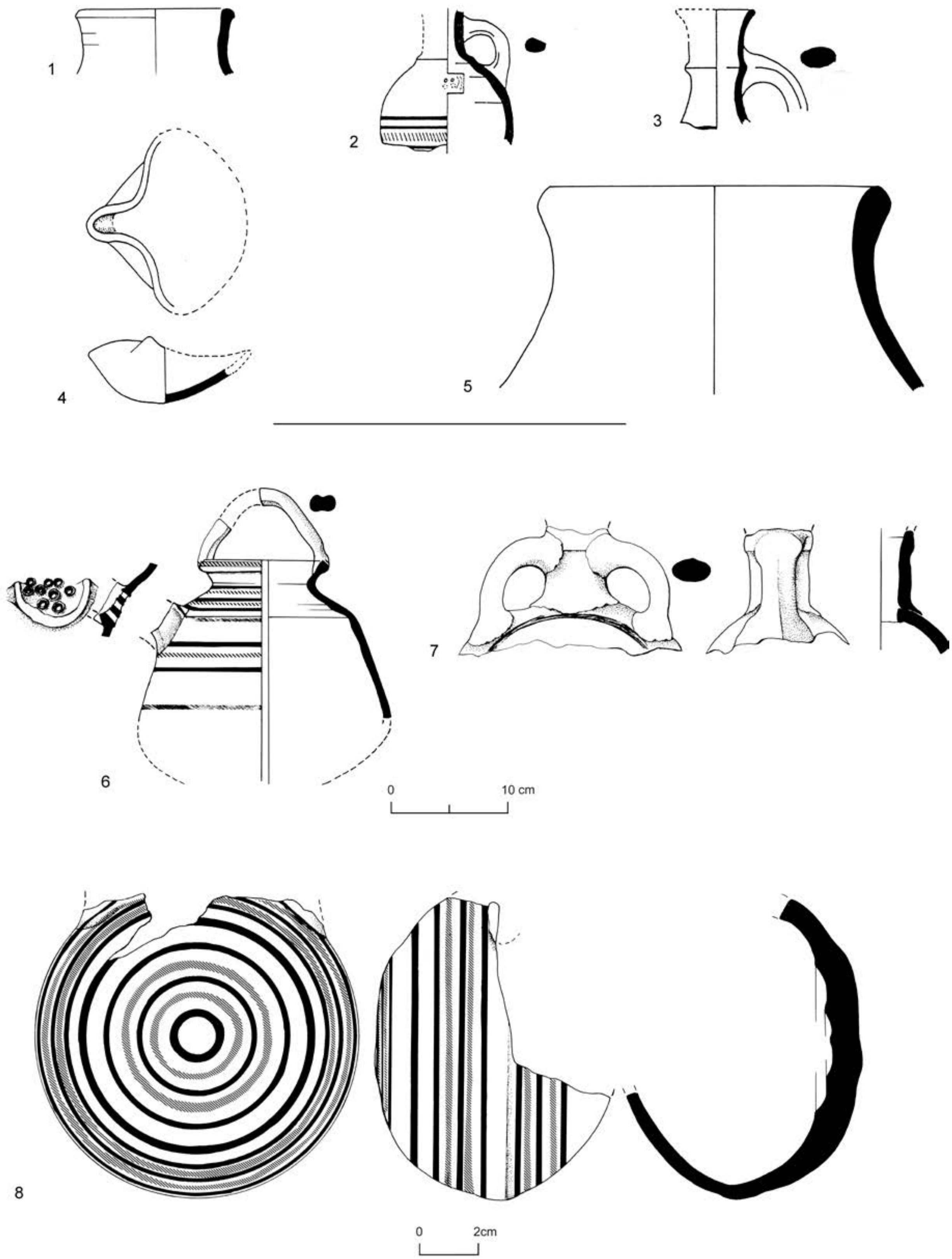

Fig. 3.68. Pottery from Area B, Phase B8

Fig. 3.69. Pottery from Phase B8 (Stratum IVB), Loci 645, 659

No.	Type	Reg. no.	Locus	Remarks
1	K1b	10164/3	645	
2	CH3b	10295/1	645	
3	SJ2	10247/1	645	
4	CJ	10197/1	645	Egyptian-style
5	J	10233/1	645	
6	J1a	10164/1	645	
7	Gperf	10192/1	659	
8	CP1b2	10205	659	

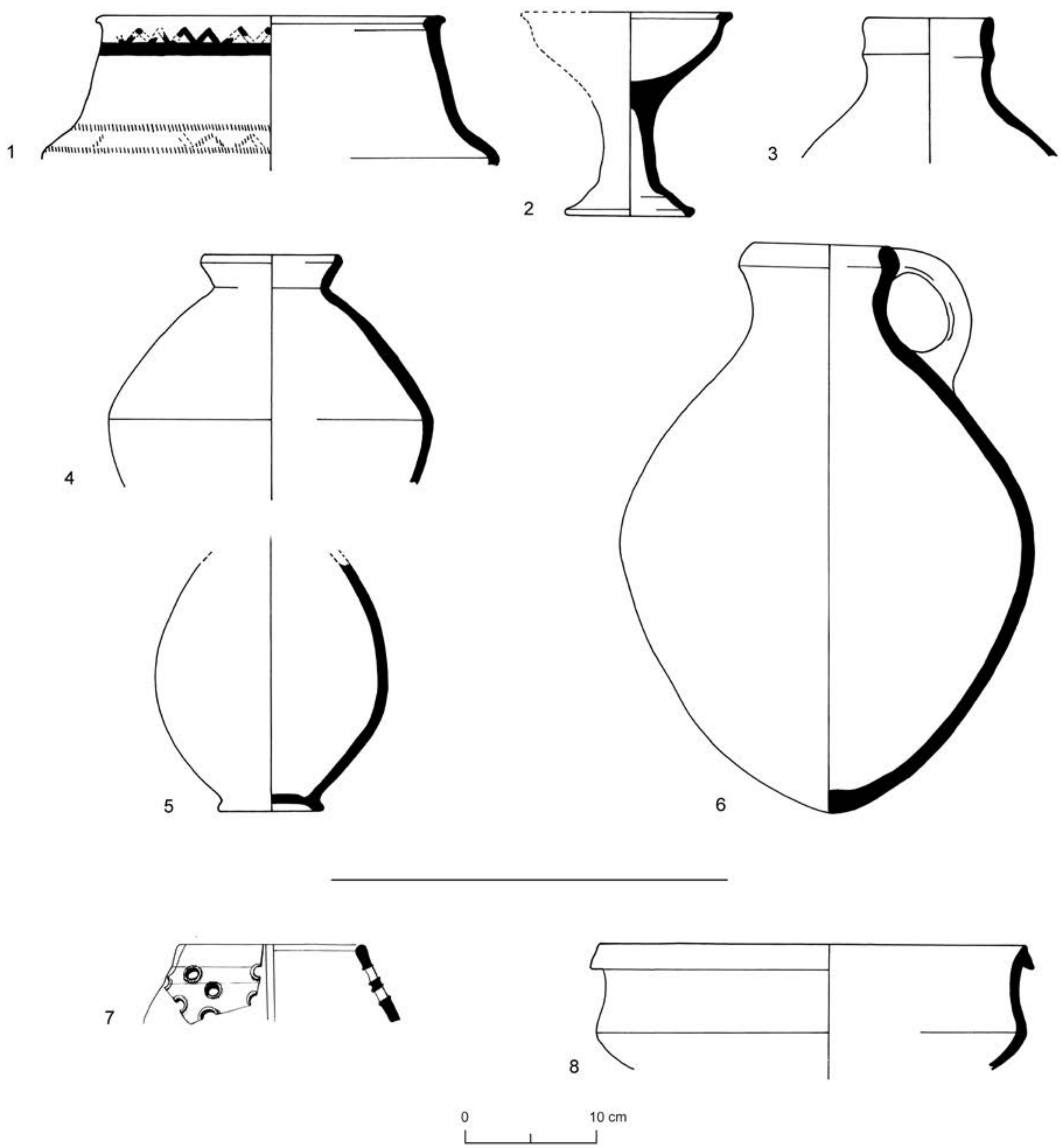

Fig. 3.69. Pottery from Area B, Phase B8

Fig. 3.70. Pottery from Phase B8 (Stratum IVB), Loci 663*, 678, 671

No.	Type	Reg. no.	Locus	Remarks
1	K1b	10260/1	663	
2	Torch	10201/16	663	Aegean-style, see p. 140.
3	PG2	10258/1	663	
4	PWB	10289/1	663	
5	L	102741	678	
6	PWB	10105	678	= Fig. 13a; petrography: Table 6A.11
7	PYX	18526/1	4323 (=671)	Black painted decoration; photo: Fig. 3.22h

* For a Phoenician Bichrome flask or jug fragment from L663 and its petrography see Table 6A.1:14

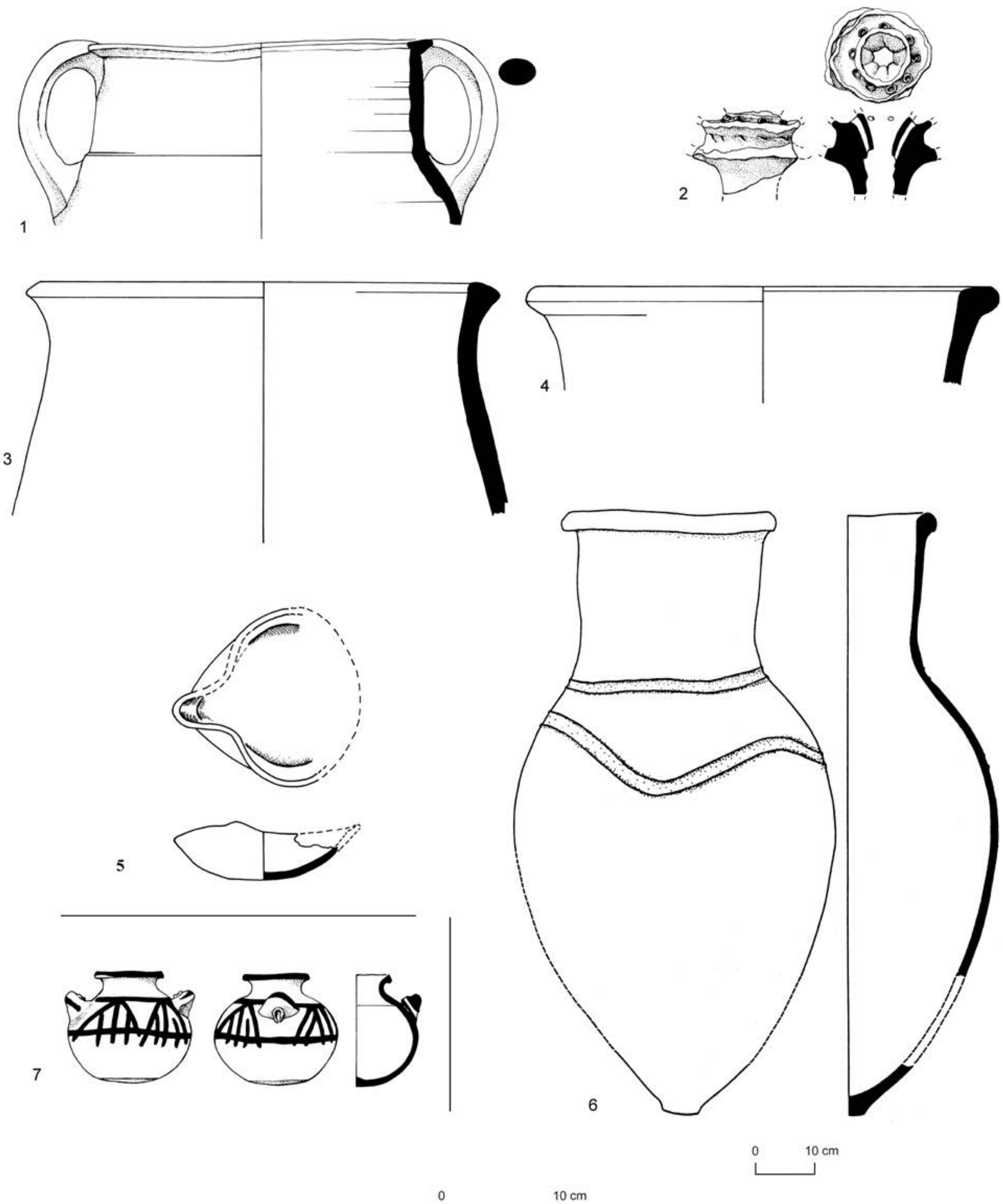

Fig. 3.70. Pottery from Area B, Phase B8

Fig. 3.71. Pottery from Phase B8 (Stratum IVB), Loci 4202, 7015

No.	Type	Reg. no.	Locus	Remarks
1	K2a	18065/1	4202/7099	
2	Bc1	18123/2	4202/7099	
3	CH3b	18084/12	4202/7099	
4	ST	18059//2	4202/7099	
5	CH	18051/9	4202/7099	
6	ST	18059/2	4202/7099	
7	K1b	23506/1	7015 (+7076)	
8	CH2a	24083/1	7015	
9	CH3a	24090/1	7015	
10	CH2b	24090/2	7015	
11	PG1	24083/4	7015	

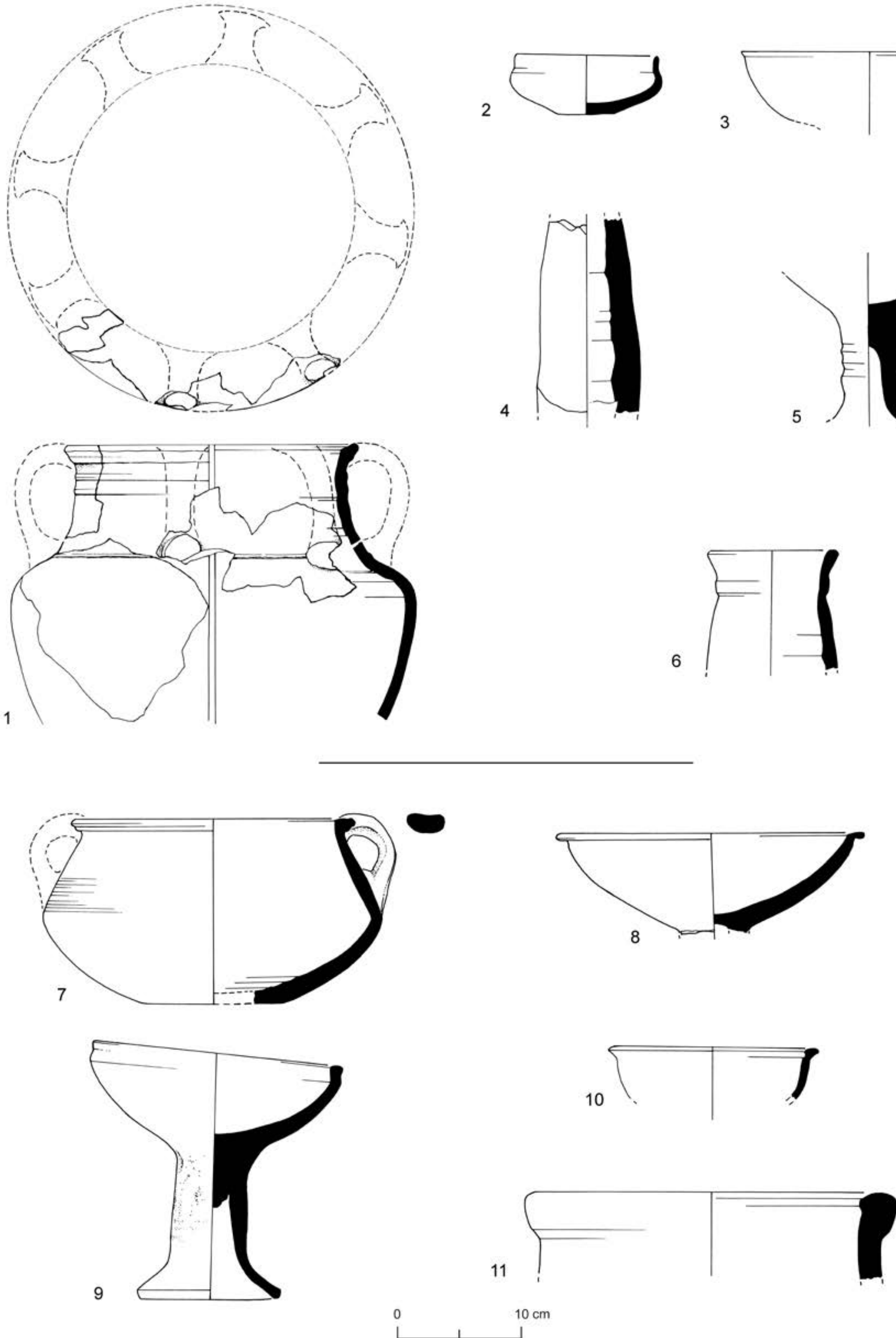

Fig. 3.71. Pottery from Area B, Phase B8

Fig. 3.72. Pottery from Phase B8 (Stratum IVB), L7062

No.	Type	Reg. no.	Locus	Remarks
1	CP3c1	23372/3	7062	
2	CP3c1	23404/5	7062	
3	CH1	23424/1	7062	
4	CH	23411/1	7062	
5	CH2a	23400/2	7062	
6	CH	23411/4	7062	
7	ST	23404/2	7062	
8	CH3c	23404/1	7062	
9	CH3c	23404/7	7062	
10	CP3c1	23404/10	7062	
11	CP3c1	23404/9	7062	
12	J1a	23368/2	7062	
13	J1a	23464/6	7062	
14	J2a	23368/1	7062	
15	SJ1	23404/4	7062	Red painted bands
16	J1a	23421/2	7062	
17	GJ	23400/1	7062	Red and black painted concentric circles; Photo Fig. 3.19

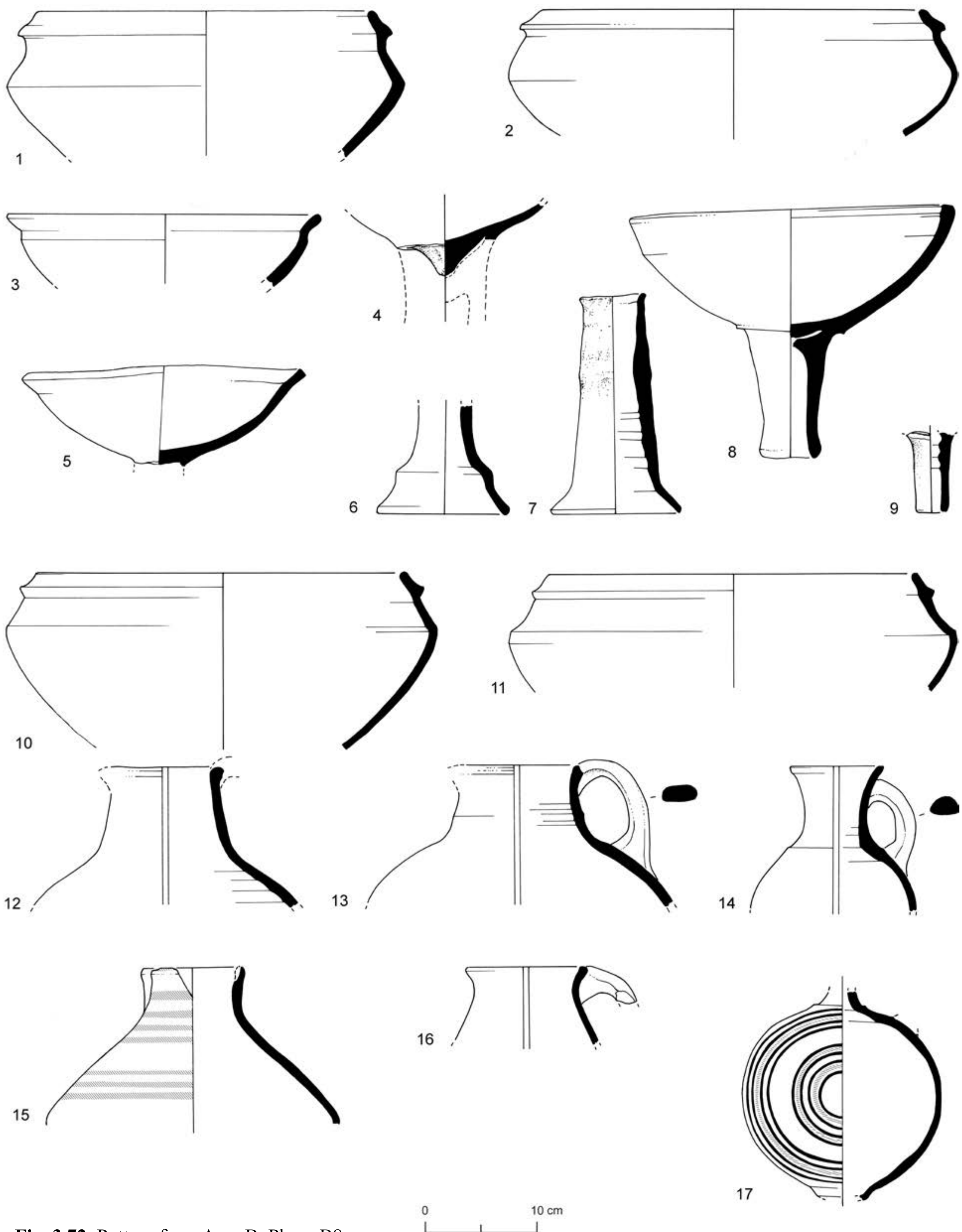

Fig. 3.72. Pottery from Area B, Phase B8

Fig. 3.73. Pottery from Phase B8 (Stratum IVB), Loci 7062 (cont.), 7075, 7114a

No.	Type	Reg. no.	Locus	Remarks
1	CR	23404/8	7062	
2	CR	23372/2	7062	
3	Gperf	23404/3	7062	
4	Bc2	23905/3	7075 (+7151)	
5	Bp	23905/2	7075 (+7151)	Probably with sculpted bird attached; black hatching on rim and red bands on lower exterior
6	CP3c1	23763/1	7075 (+7133)	
7	PYX	23481/1	7075	Red and black painted bands, vertical burnish
8	CP3b1	23663/1	7114a	
9	Bh1	23663/3	7114a	

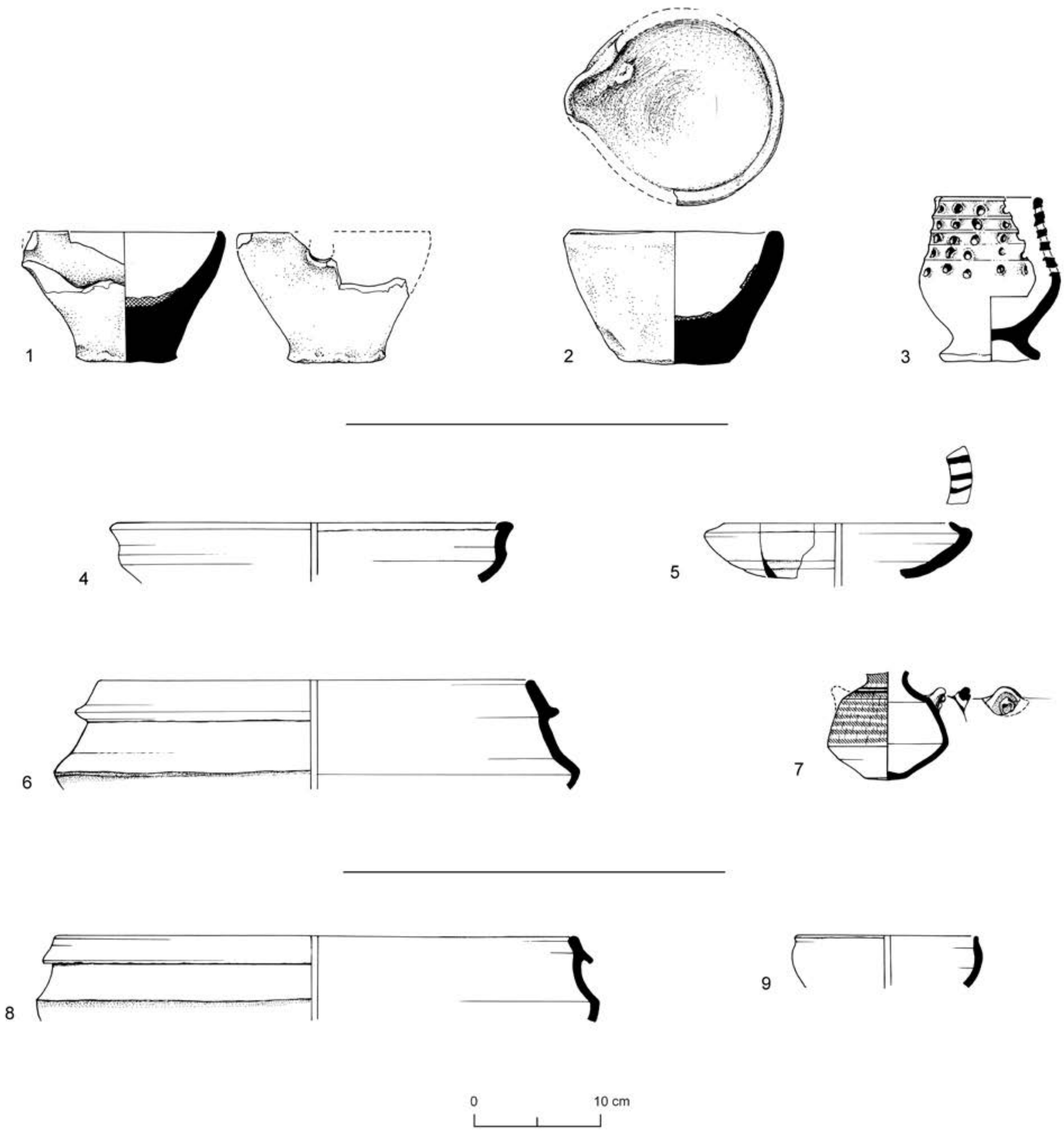

Fig. 3.73. Pottery from Area B, Phase B8

Fig. 3.74. Pottery from Phases M10-11 (Strata VIIA1-VI)

No.	Type	Reg. no.	Locus	Phase	Remarks
1	Bh1	6793/4	488	M10	
2	Cp2b1	20681/3	8186a	M11	
3	K4a	20681/2	8186a	M11	
4	CP2a4	20218/2	8095	M10-11	
5	CP3b1	6752/2	480	M10-11	
6	CP3e	6752/3	480	M10-11	
7	CP3b1	20201/2	8087	M10	
8	CP1b3	6743/1	488	M10	
9	CP1b3	6784/1	488	M10	
10	CP3b1	6758/4	480	M10-11	
11	CP2b2	20218/1	8095	M10-11	
12	CP3b1	6762/2	480	M10-11	
13	CP2a5	6776/4	488	M10	
14	CP3b1	6776/3	488	M10	
15	CP3b5	6797/1	8178a	M10-11	

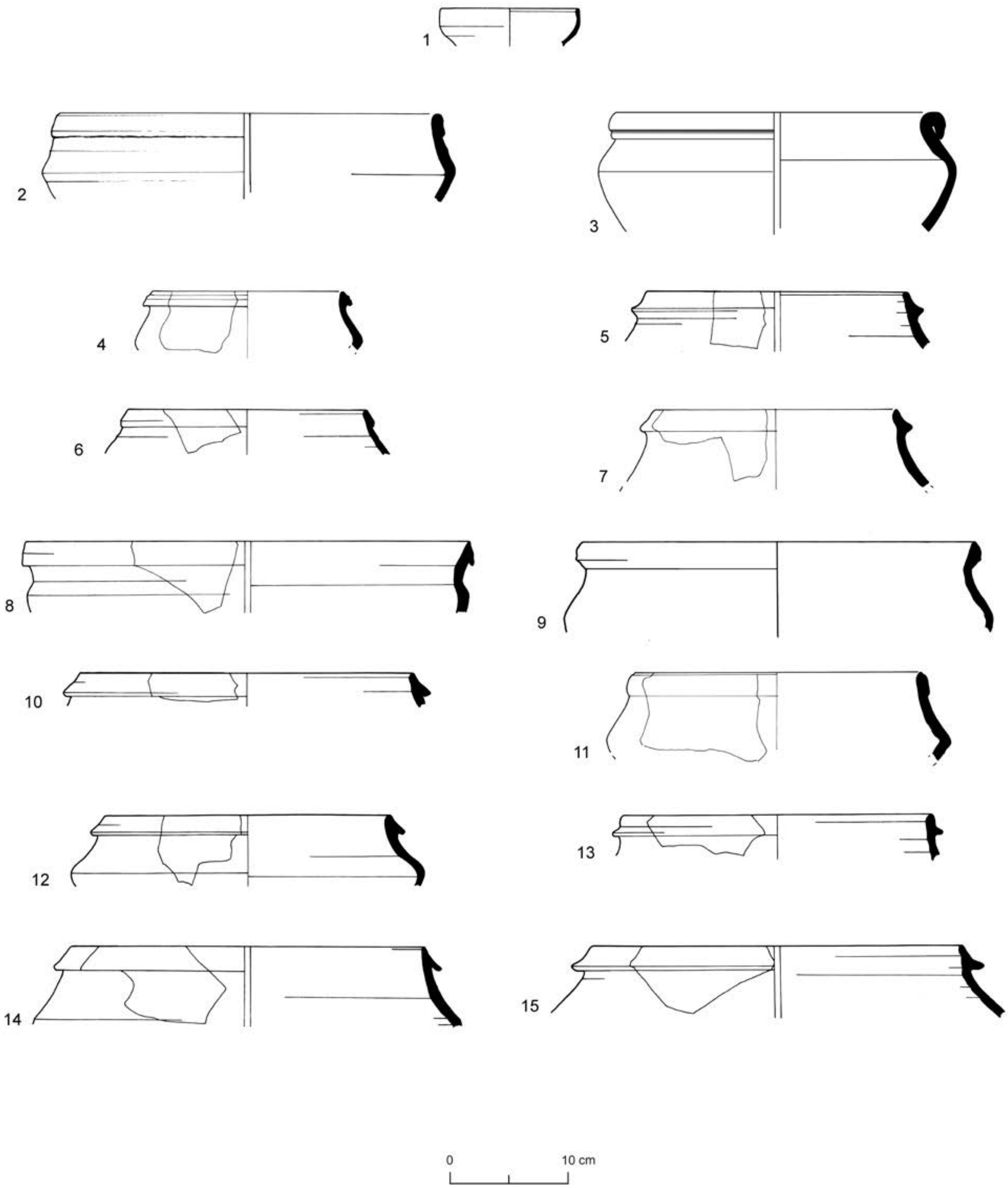
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
0
10 cm

Fig. 3.75. Pottery from Phases M10-11 (Strata VIIA-VI)

No.	Type	Reg. no.	Locus	Phase	Remarks
1	C&S	20786/4	8095	M10	
2	C&S	?	486	M9b-c	
3	STR	20680/1	8185	M10	
4	J1	20669/6	8186a	M11	
5	J5	20696/15	8190 (=8225)	M10	
6	SJ4a	20218/3	8095	M10-11	
7	PG1 or PWB	20543/5	8156	M10	
8	PCR	6776/5	488	M10	
9	PCR	6753/1	479	M10-11	
10	PCR	6780/6	487 (=488)	M10	
11	Whorl	20268/3	8095	M10-11	

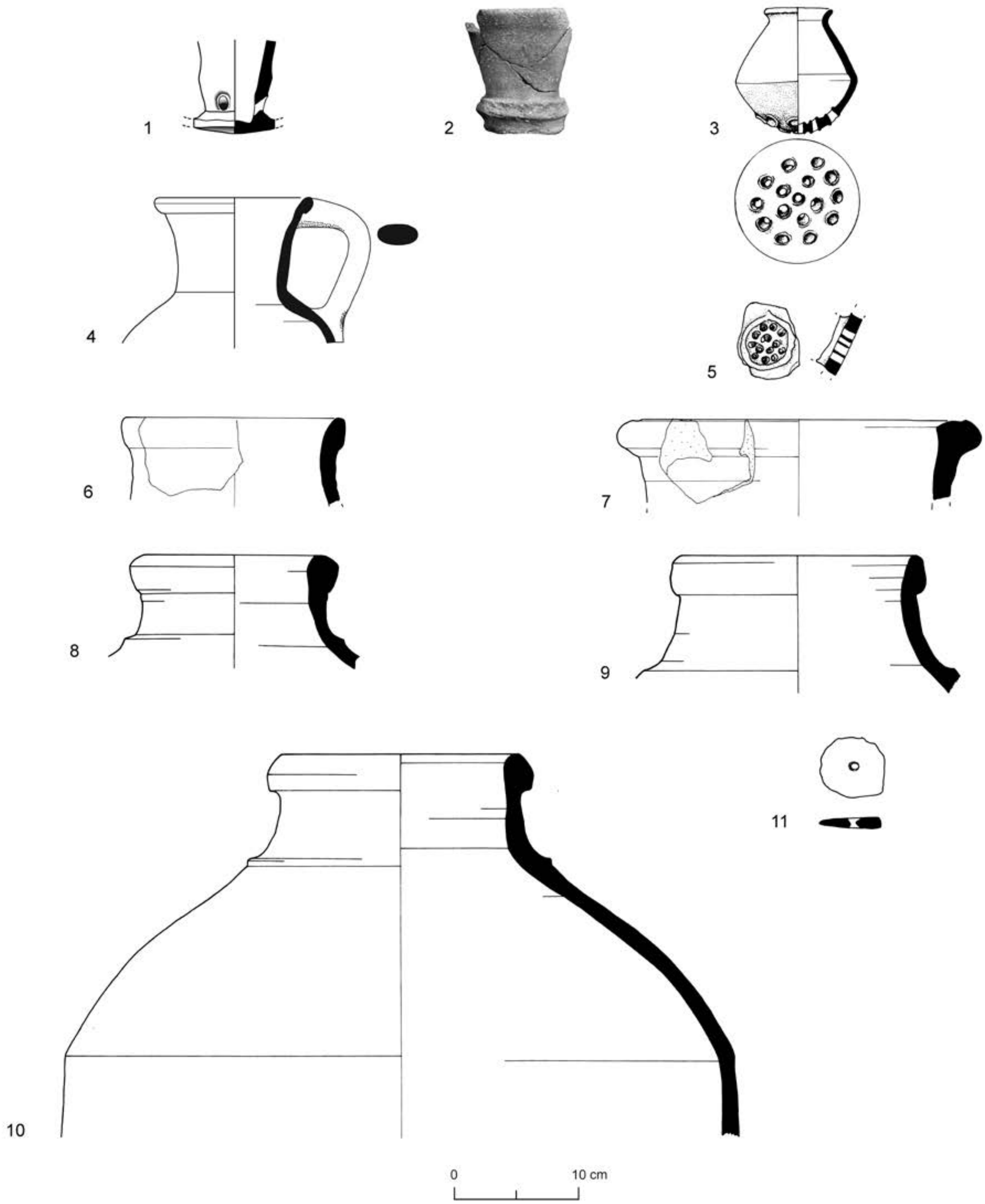

Fig. 3.75. Pottery from Area M, Phase M10-11

Fig. 3.76. Pottery from Phases M9b-c (Stratum V)

No.	Type	Reg. no.	Locus	Remarks
1	CP3b1	20139/1	8060	
2	CP2b2	20130/1	8060	
3	SJ3?	20141/15	8060	
4	K4a	20130/14	8060	
5	BTc	20141/1	8060	
6	PCR	20194/?	8060	
7	PYX	20141/6	8060	Red and black painted decoration
8	Jtd	20139/16	8060	
9	CP1a5	20608/1	8059 (=8177)	
10	K4b	20608/7	8059 (=8177)	
11	K4b	20593/3	8059 (=8177)	
12	J1	20608/9	8059 (=8177)	
13	BTc	20593/1	8059 (=8177)	

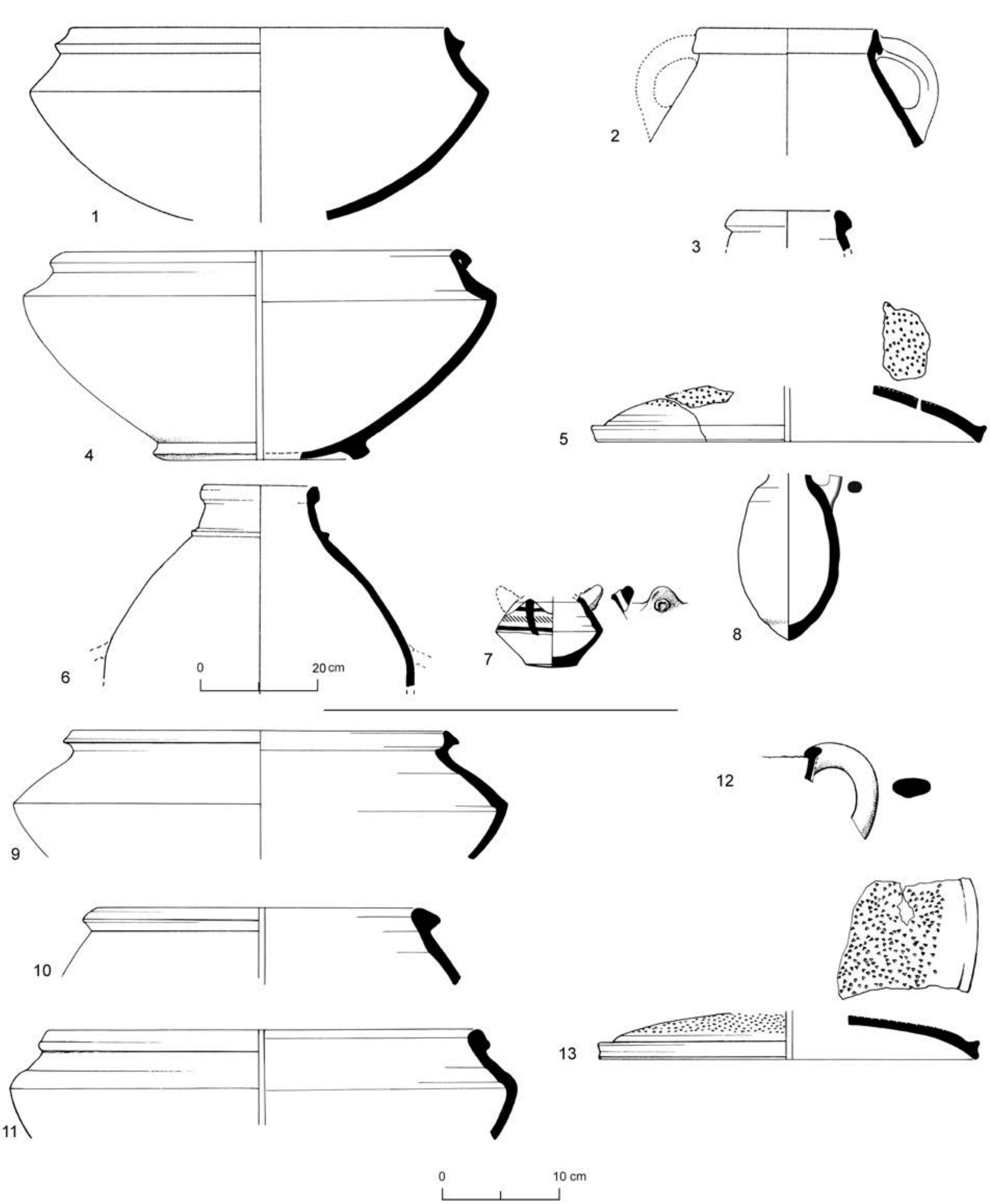

Fig. 3.76. Pottery from Area M, Phase M9b-c

Fig. 3.77. Pottery from Phases M9-b-c (Stratum V)

No.	Type	Reg. no.	Locus	Remarks
1	SJ1	20693/1	8191	
2	Bp1a	6735/4	476	
3	CP2a1	6727/6	474	
4	CP3b4	6771/9	486	
5	PWB	20056	8016	
6	PWB	20055	8016	

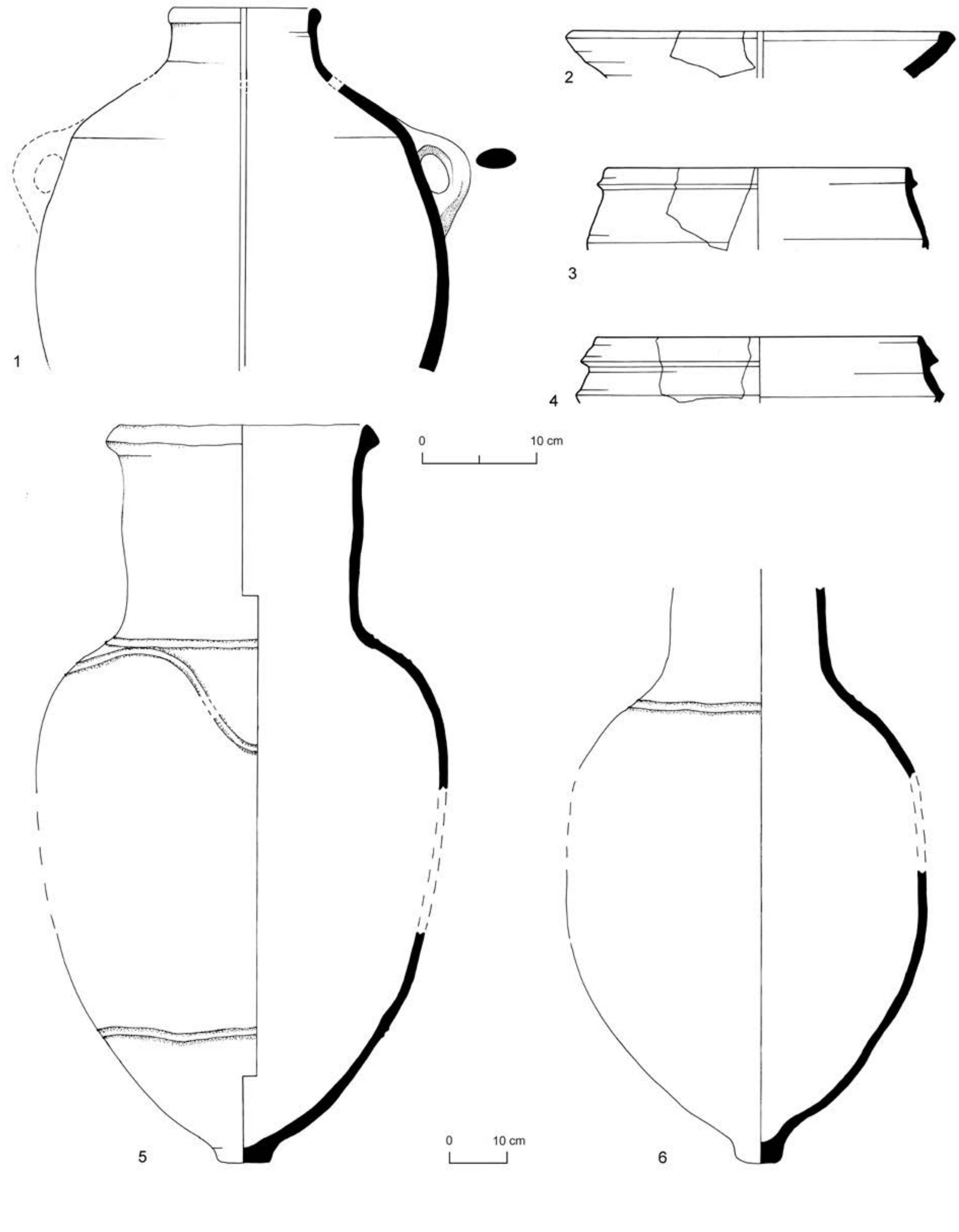

Fig. 3.77. Pottery from Area M, Phase M9b-c

Fig. 3.78. Pottery from Phase M9a (Stratum IVB)

No.	Type	Reg. no.	Locus	Remarks
1	Bh1	6749/4	478b (=486)	knob
2	CP3b1	6749/7	478b (=486)	
3	CP3b5	6756/5	478b (=486)	
4	CP3b1	6748	478b (=486)	
5	CP3b1	6749/6	478b (=486)	
6	SJ1	20089/1	8024	Reddish-brown painted bands on light face ware; petrography: Table 6C.1:13
7	PYX	20044	478	

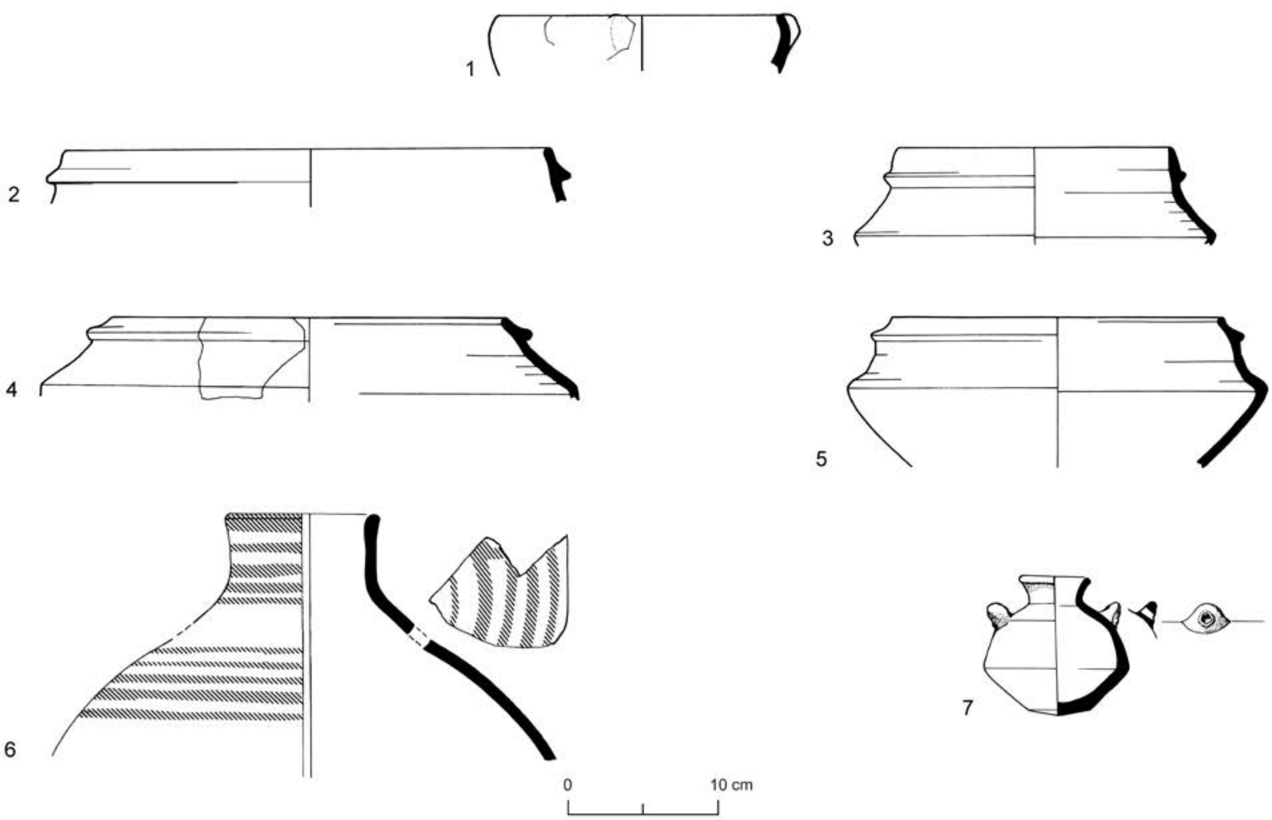

Fig. 3.78. Pottery from Area M, Phase M9a

Fig. 3.79. Pottery from Phase T17, (Stratum VIIA1)*

No.	Type	Reg. no.	Locus	Phase	Remarks
1	CH4b	12871/1	2468 (=2478)	T17	
2	CH4a	12871/2	2478 (=2468)	T17	
3	SJ2	12868/2	2478	T17	
4	CP2b2	12871/3	2478 (=2478)	T17	
5	CP2a2	12871/5	2478 (=2478)	T17	
6	CP1a	12871/4	2478 (=2468)	T17	
7	CP2a1	12871/7	2478 (=2478)	T17	

* This figure is the same as Ben-Dov 2011 (*Dan III*) Fig. 137.

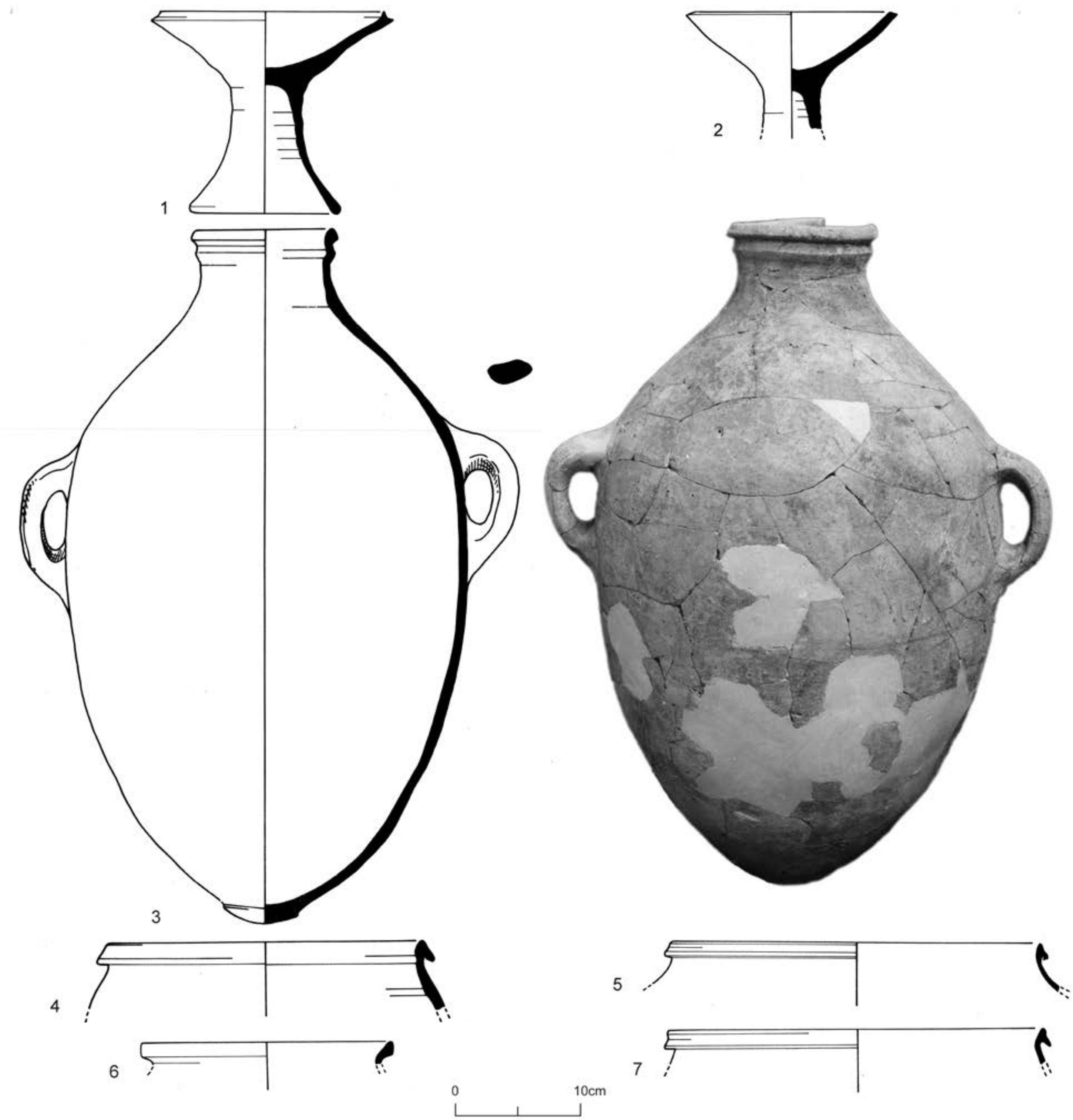

Fig. 3.79. Pottery from Area T, Phase T17

Fig. 3.80. Pottery from Phase T17 (Stratum VIIA1), Loci 2749, 2763

No.	Type	Reg. no.	Locus	Remarks
1	CP3b1	19519/2	2749	
2	CP3b2	19542/5	2749	
3	PCR	19519/2-6	2749	
4	CH4a	19519/7	2749	
5	PCR	19504/1	2749	
6	AM	19542/6	2749	
7	CP3b1	19524/6	2763	
8	J1a	19524/23	2763	
9	PYX	19524/2	2763	

* A complete PCR from L2749 (Reg. no. 19519/1, IAA 11-278) is illustrated in Fig. 3.10a

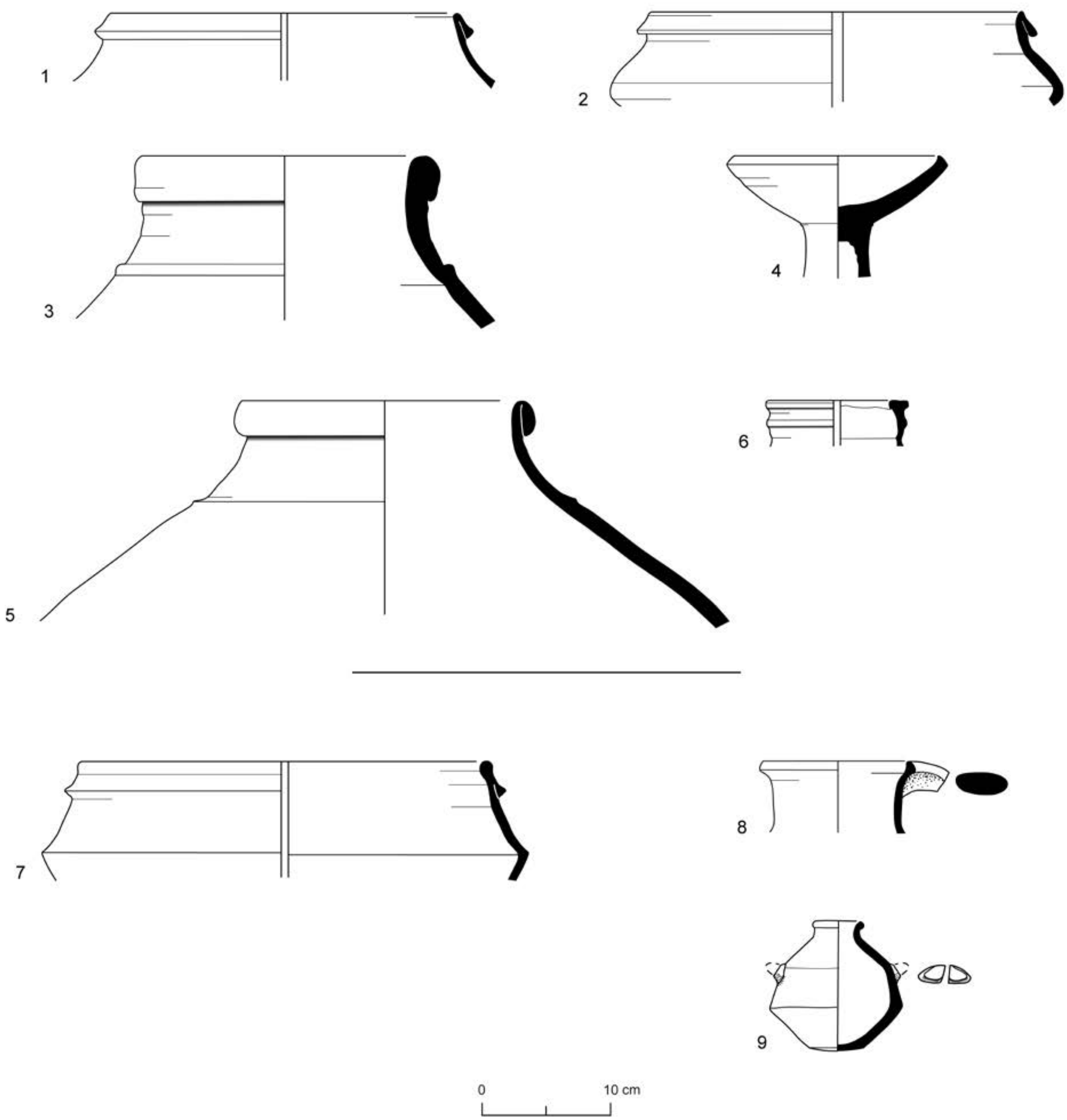

Fig. 3.80. Pottery from Area T, Phase T17

Fig. 3.81. Pottery from Phases T16-17 (Strata VI-VIIA1), Loci 2891, 2898, 2426

No.	Type	Reg. no.	Locus	Phase	Stratum	Remarks
1	CP2a2	19965/2	2891	T17	VIIA1	
2	J	19965/3	2891	T17	VIIA1	Disc base
3	Stopper	19968/10	2891	T17	VIIA1	
4	SJ	19977/1	2898	T17	VIIA1	
5	K4a	19973/5	2898	T17	VIIA1	
6	CP3b3	19973/2	2898	T17	VIIA1	
7	CJ	19973/4	2898	T17	VIIA1	Egyptian-style
8	J2a	19973/3	2898	T17	VIIA1	
9	BTe	19973/1	2898	T17	VIIA1	
10	CP2a3	12754/1	2429 (=Pit 7901)	T16	VI	
11	CP1b2	12750/8	2426 (=Pit 7901)	T16	VI	
12	CP2a4	12844/1	2468	T16	VI	

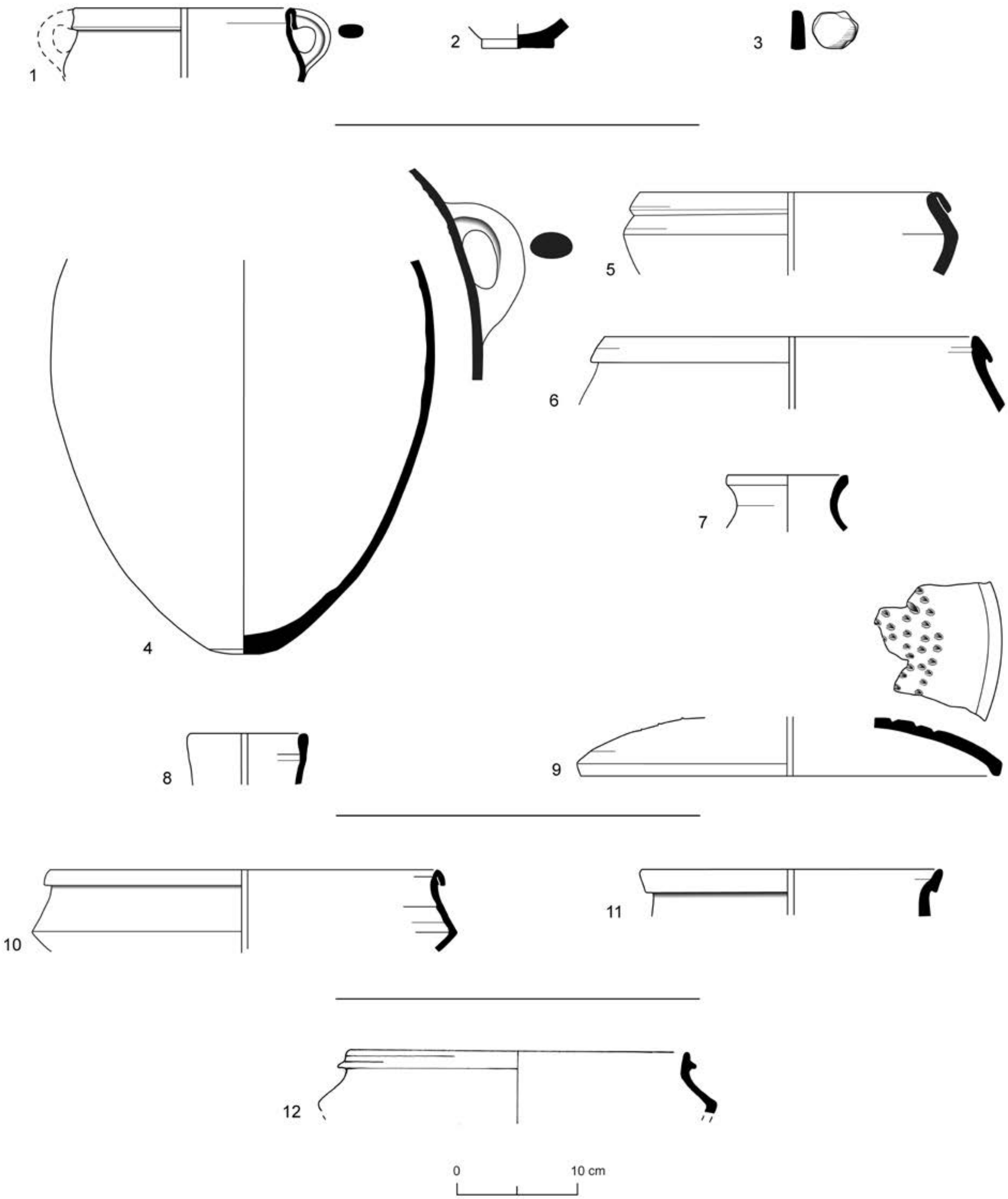

Fig. 3.81. Pottery from Area T, Phase T16-17

Fig. 3.82. Pottery from Phase T16 (Stratum VI), Pit 7904*

No.	Type	Reg. no.	Locus	Remarks
1	CH4b	12758/1	2428	
2	CH3b	12758/7	2428	
3	CH3b	12760/1	2431	
4	K1b	12758/1	2428	Red and black painted decoration; backward looking bird in metope, red and black hatching on rim; see discussion in Chapter 4, no. 9
5	CP1b3	12878/1	2484	
6	CP1a3	12760/2	2431	
7	CP2b2	12759/10	2430	
8	CP2b1	12760/1	2431	
9	CJ	12760/3	2431	Egyptian-style
10	CP2a1	12761/2	2432	

* Parts of this figure are the same as Ben-Dov 2011 (*Dan III*), Fig. 138.

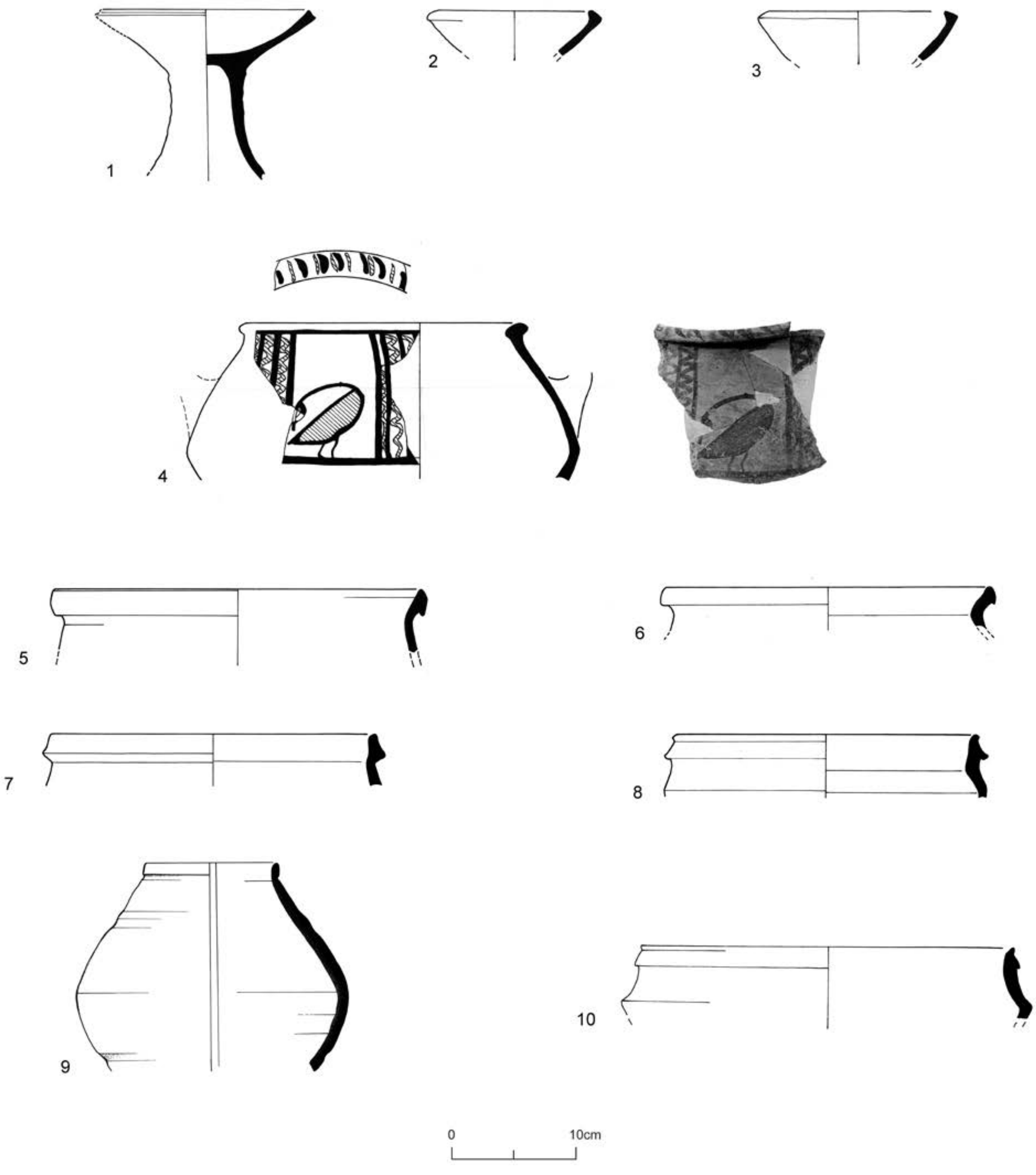

Fig. 3.82. Pottery from Area T, Phase T16

Fig. 3.83. Pottery from Phase T16 (Stratum VI), Pit 7904 (cont.)

No.	Type	Reg. no.	Locus	Remarks
1	SJ4a	12759/35	2430	
2	SJ4a	12759/36	2430	
3	SJ	12758/6	2428	
4	SJ	12758/2	2428	
5	SJ	12759/16	2430	Impression on handle

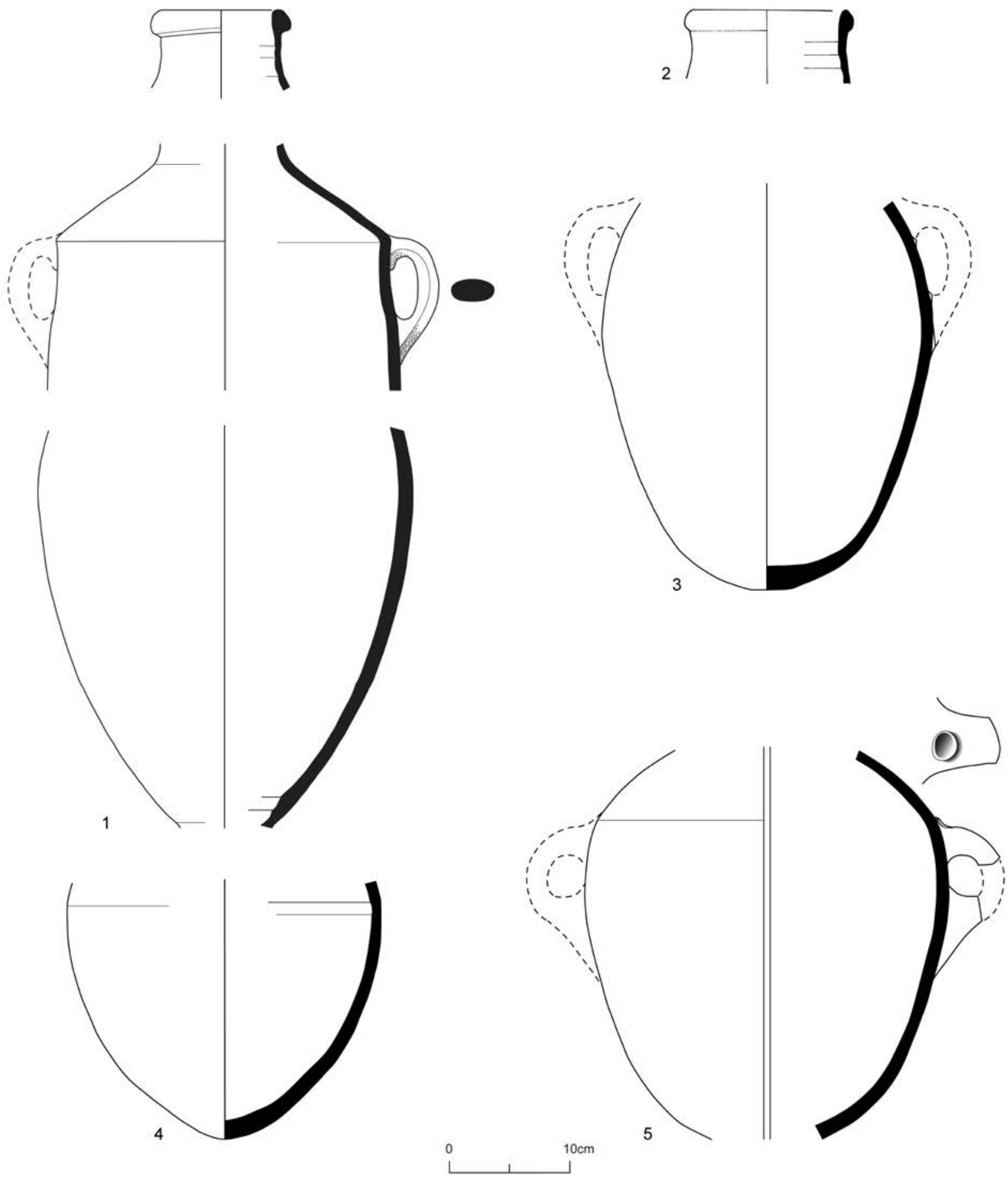

Fig. 3.83. Pottery from Area T, Phase T16

Fig. 3.84. Pottery from Phase T16, (Stratum VI)*

No.	Type	Reg. no.	Locus	Remarks
1	Stopper	12843/2	2467 (=2468)	
2	Stopper	12843/3	2467 (=2468)	
3	BT	12883/1	2474 (=2468)	
4	CP3b2	12997/1	2487 (=2788)	
5	CP3b2	12847/2	2487	
6	K4a	12897/1	2487	
7	BTc	33085/1	9343	
8	CP2b2	33085/2	9343	
9	CJ	18505	2749	Egyptian-style

* For a PWB body fragment from L2467 (=2468) see Table/Fig. 6A.9

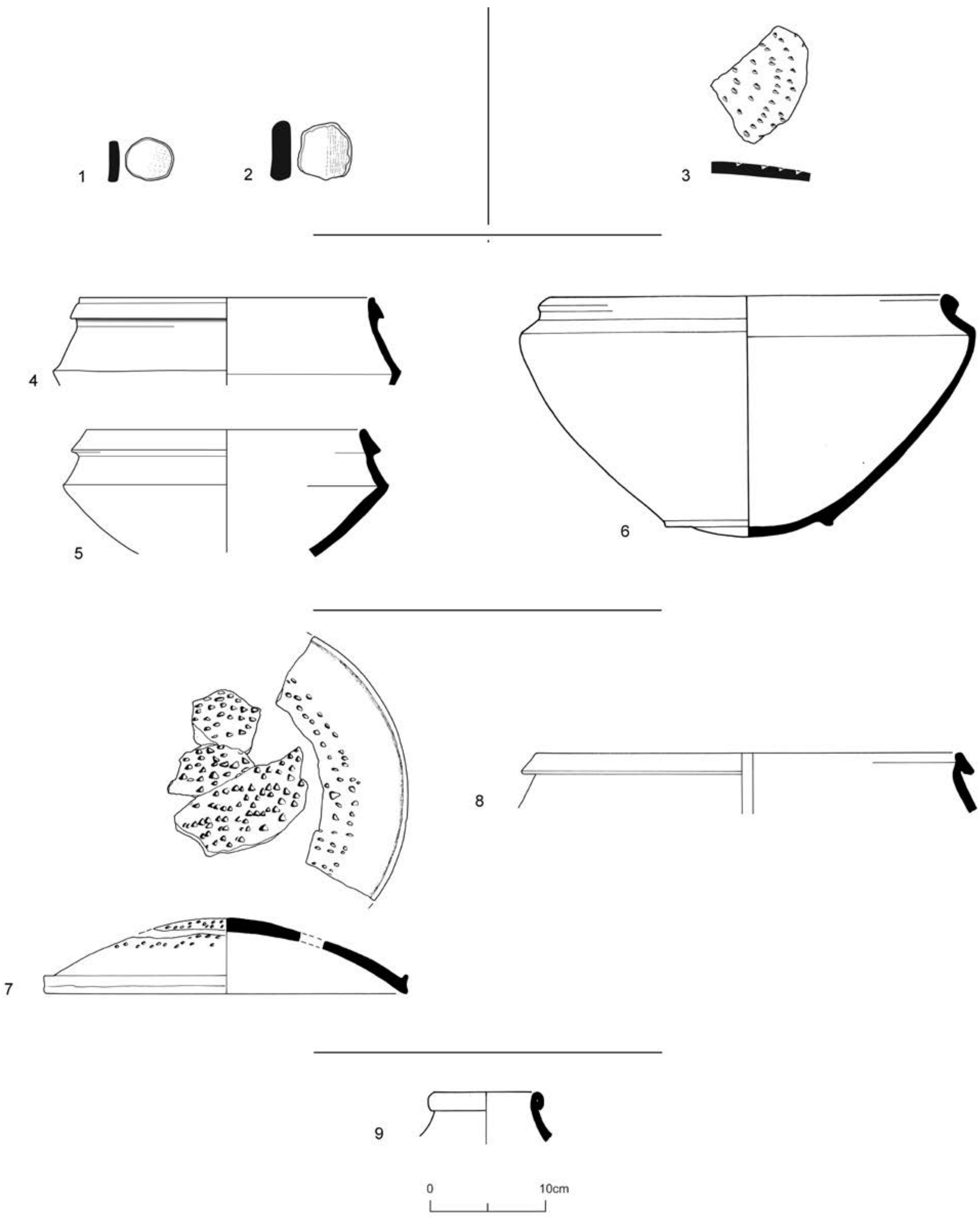

Fig. 3.84. Pottery from Area T, Phase T16

Fig. 3.85. Pottery from Phases T15-T16 (Strata V-VI), L2304a-c

No.	Type	Reg. no.	Locus	Remarks
1	SJ1	12069/5	2304a	
2	PCR	12107/8	2304c	
3	PWB	12094/6	2304b	
4	K3	12069/3	2304a	
5	K5	12098/1	2304b	
6	CP3a1	12098	2304a	
7	CP3b1	12084/1	2304b	
8	CP3b3	12094/2	2304b	
9	K1b	12107/5	2304c	
10	J	12115/19	2304c	Disc base
11	Miniature bowl	12069/9	2304a	
12	Jtd	12098/4	2304b	
13	L	12123/13	2304c	

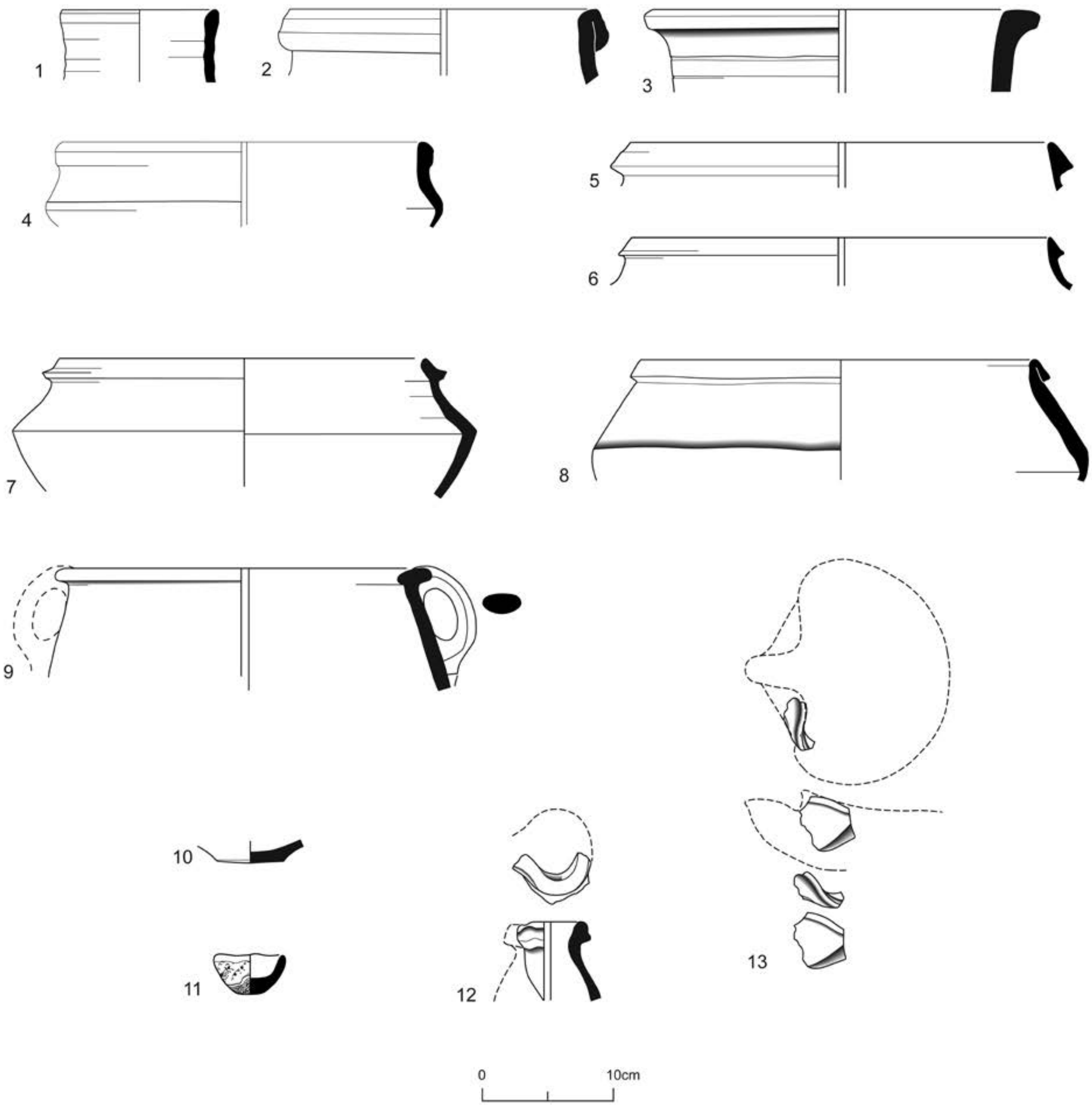

Fig. 3.85. Pottery from Area T, Phase T15-16

Fig. 3.86. Pottery from Phase T15 (Stratum V), L2425

No.	Type	Reg. no.	Remarks
1	PYX	12716/13	Red and black painted decoration; photo: Fig. 3.22g, Fig. 3.125:7
2	J5/J6	12757/3	
3	AM?	12757/6	
4	FL	12752/1	
5	FL	12746/1	Red painted concentric circles
6	PCR	12751/2	
7	AM	12757/17	Photo: Fig. 3.16a
8	SJ	12751/10	
9	SJ	12746/2	

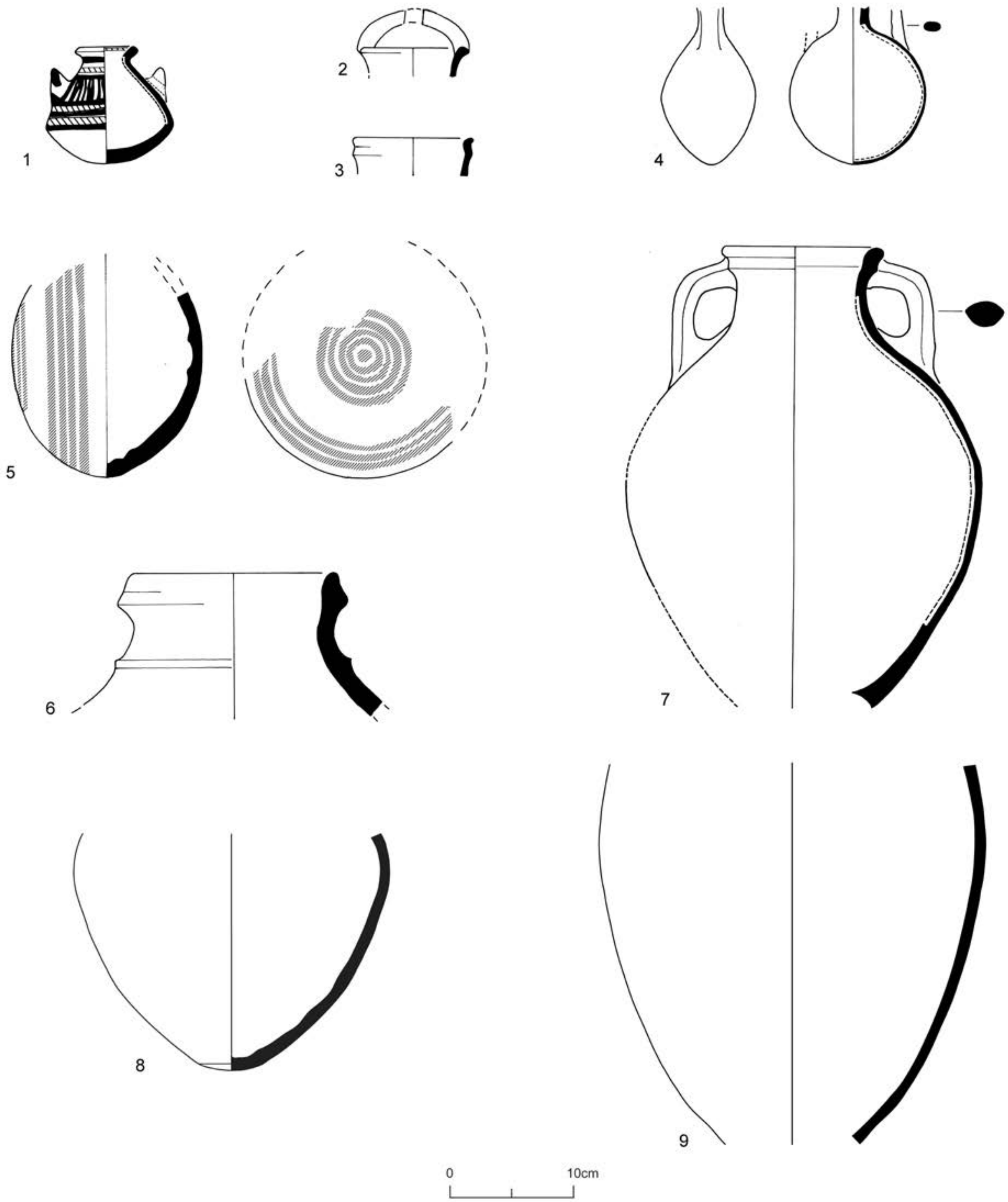

Fig. 3.86. Pottery from Area T, Phase T15

Fig. 3.87. Pottery from Phase T15 (Stratum V)

No.	Type	Reg. no.	Locus	Remarks
1	Bh2	12742/12	2422	
2	CP2b5	12742/4	2422	
3	CJ	12742/7	2422	Egyptian-style
4	CH3b	12742/1	2422	
5	Whorl	12742/18	2422	
6	Whorl	12742/17	2422	
7	FL2	12836/1	2464	Petrography: Table 6A.19; photo: Fig. 3.21b, Fig. 3.125:2

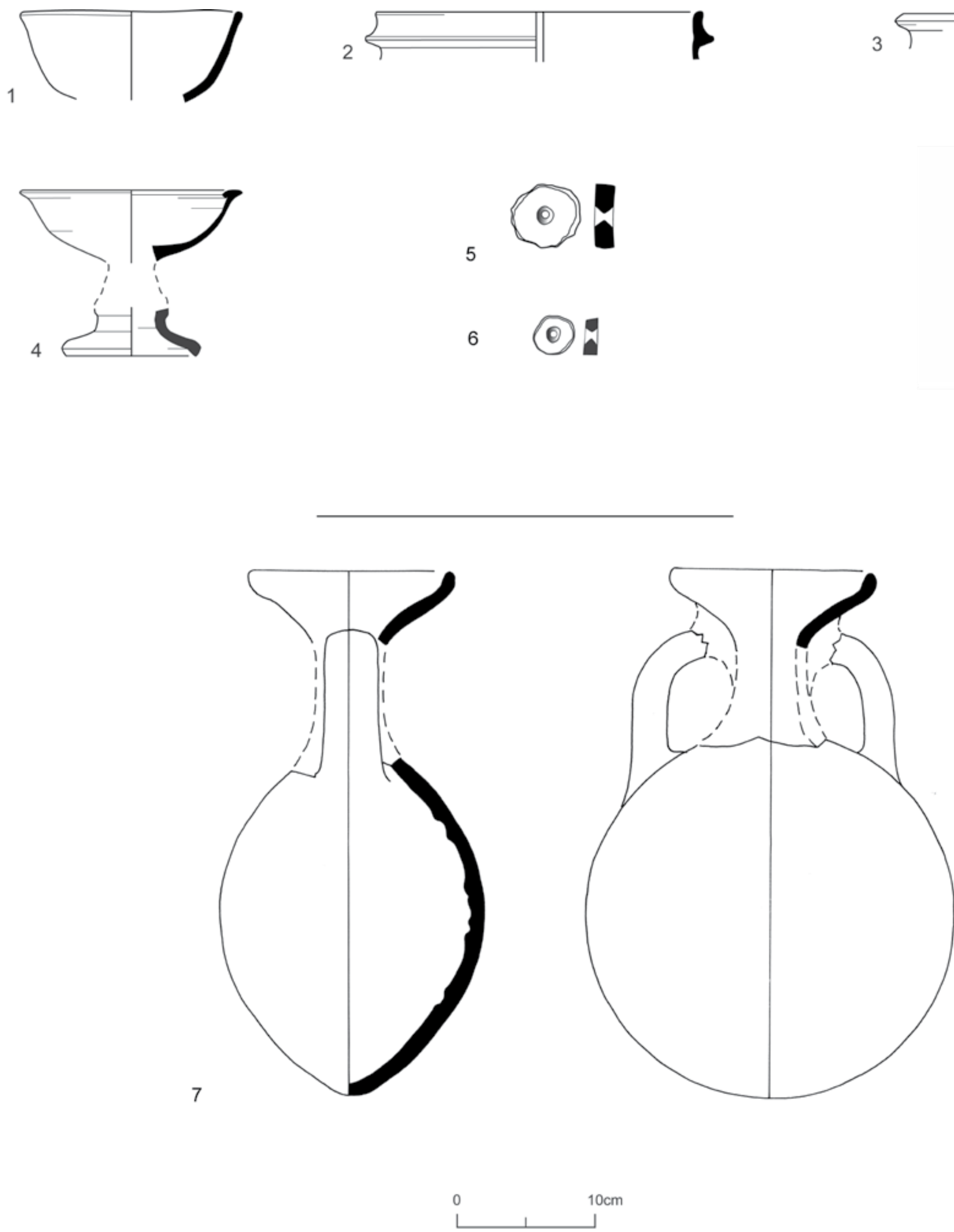

Fig. 3.87. Pottery from Area T, Phase T15

Fig. 3.88. Pottery from Phase T15 (Stratum V), Loci 2596, 2598

No.	Type	Reg. no.	Locus	Remarks
1	CP2b1	19181/1	2596	
2	FL2	19181/3	2596	
3	J1a	19181/2	2596	
4	K1-2	19182/1	2598	

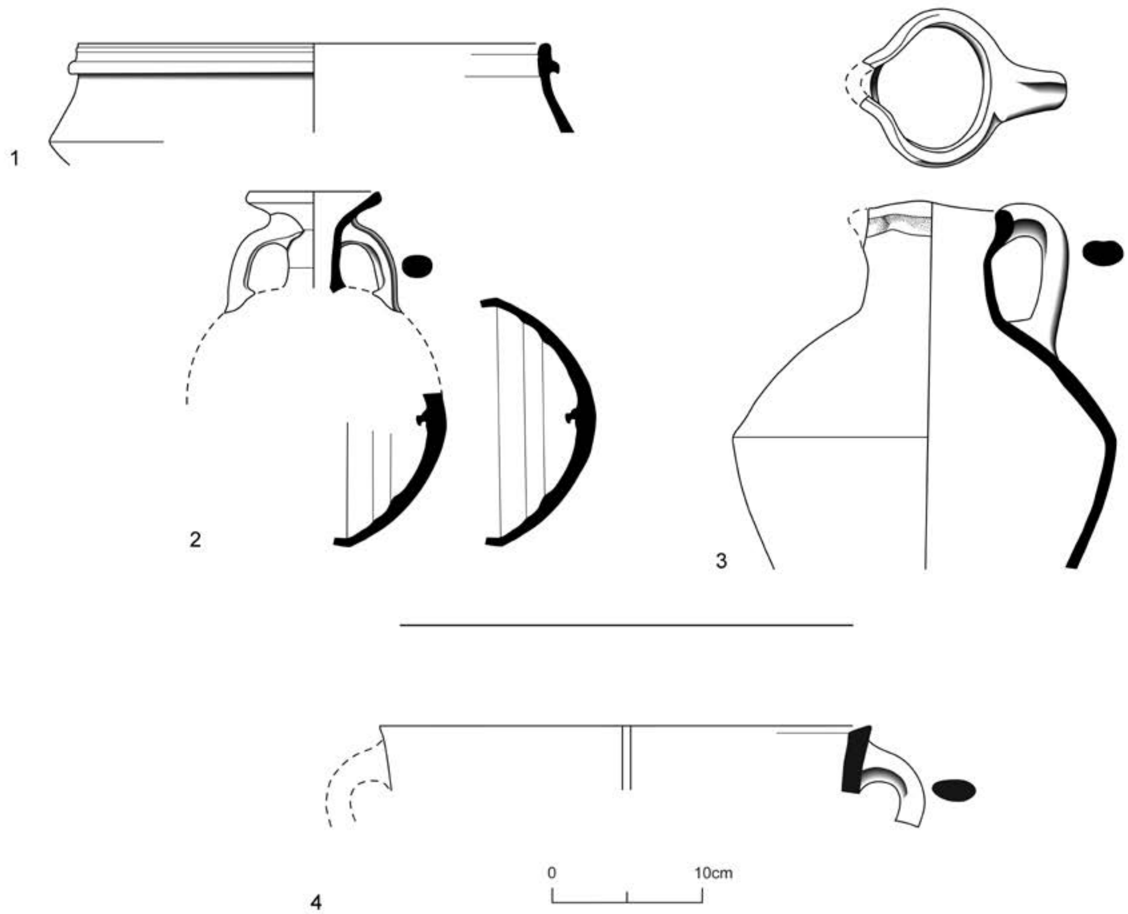

Fig. 3.88. Pottery from Area T, Phase T15

Fig. 3.89. Pottery from Phase T15 (Stratum V), L2592, L2599

No.	Type	Reg. no.	Locus	Remarks
1	SJ1	19170	2592	
2	PCR	19177/1	2592	
3	K1b	19177/2	2592	
4	CP3b1	19193/1	2599	
5	CP3b1	19190/1	2599	
6	J2a	19193/2	2599	
7	CJ	19193/3	2599	Egyptian-style
8	FL	19193/9	2599	Red and black painted concentric circles
9	FL	19190/3	2599	Red and black painted concentric circles

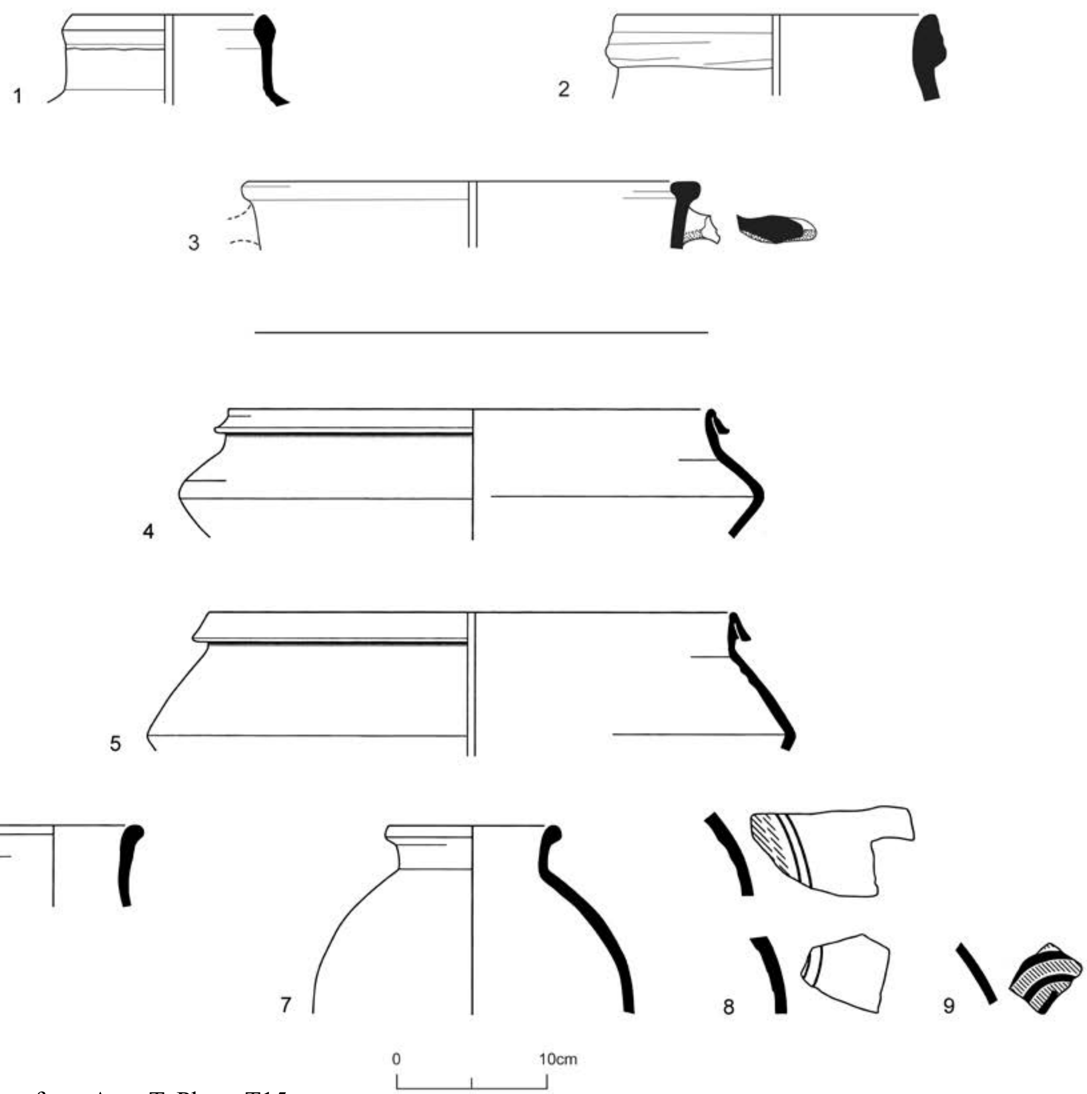

Fig. 3.89. Pottery from Area T, Phase T15

Fig. 3.90. Pottery from Phase T15 (Stratum V), Loci 2743, 2748, 2753

No.	Type	Reg. no.	Locus	Remarks
1	CP3b2	19494/4	2743	
2	K1	19494/3	2743	
3	TM	19494/16	2743	One of three legs
4	K4a	19498/1	2748	Possibly Phase T14 (Stratum IVB)
5	CP2a5	19523/1	2753	
6	CP2a1	19510/10	2753	
7	PWB	19510/8	2753	
8	K	19523/2	2753	Ring base
9	J1a	19510/9	2753	

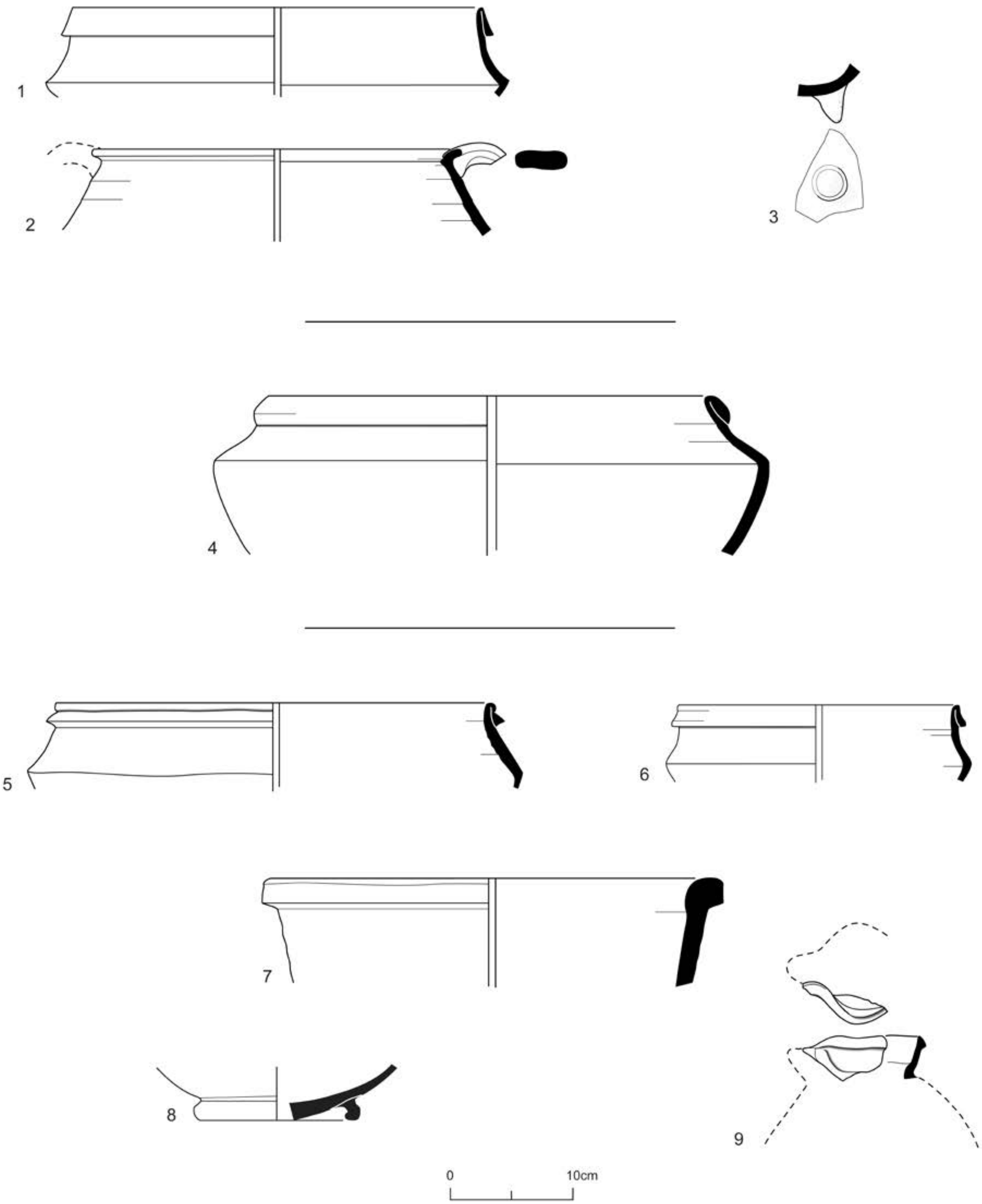

Fig. 3.90. Pottery from Area T, Phase T15

Fig. 3.91. Pottery from Phase T15 (Stratum V), Loci 2831, 2842

No.	Type	Reg. no.	Locus	Remarks
1	Bc1	?	2831	
2	CP2a1	19743/2	2831	
3	CP3b1	19729/3	2831	
4	SJ1	19708/1	2831	
5	AM	19734/8	2831	
6	ST?	19743/1	2831	
7	PYX	19743/7	2831	
8	SJ4a	19753/6	2842	
9	CP3a1	19753/10	2842	
10	CP3a1	19753/13	2842	
11	J5	19748/8	2842	Red painted band under spout
12	PCR	19748/12	2842	Half of this vessel's body was recovered but could not be meaningfully restored
13	PCR	19759/1	2842	
14	SJ2	19753/1	2842	Petrography: Table 6A.1:2

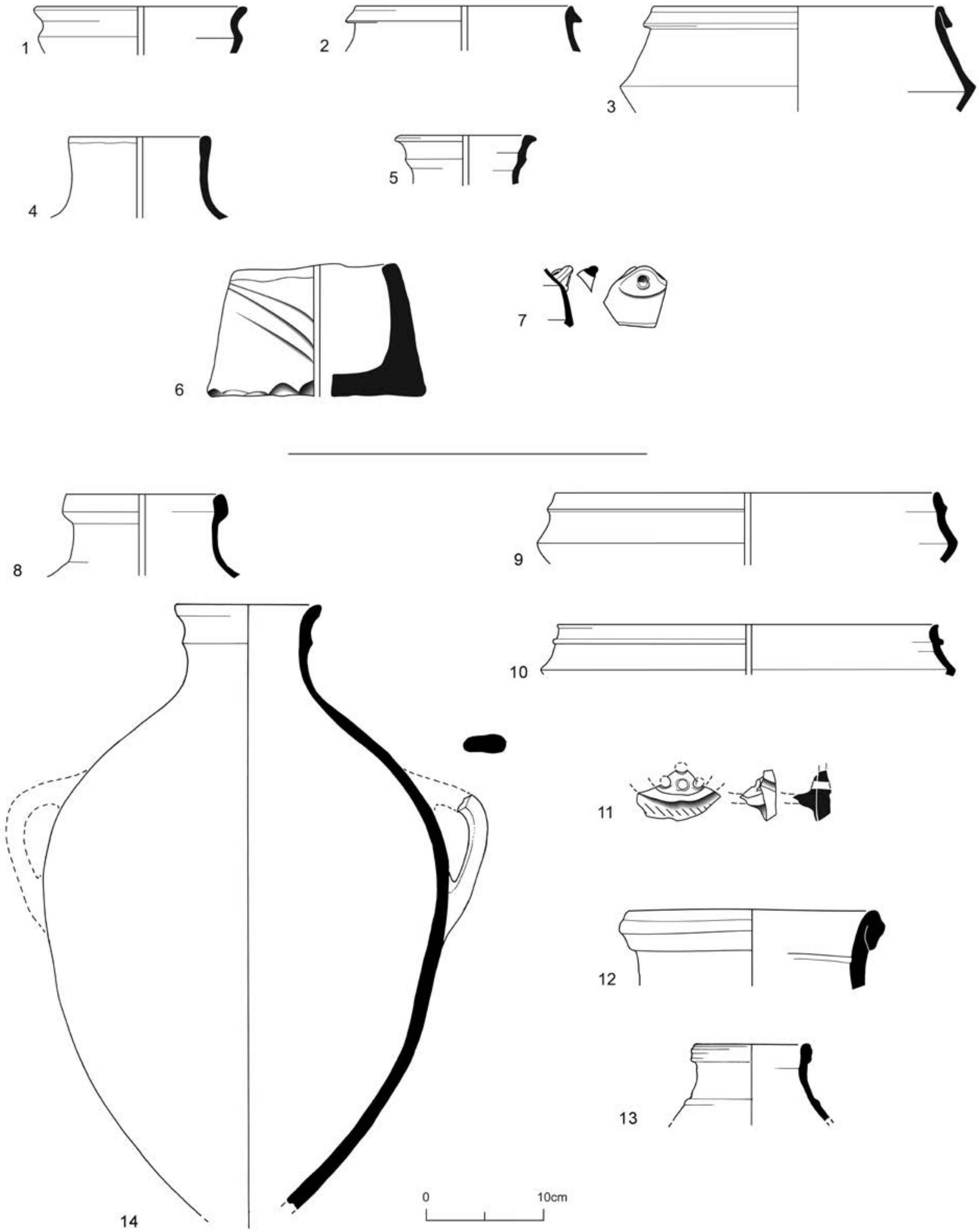

Fig. 3.91. Pottery from Area T, Phase T15

Fig. 3.92. Pottery from Phase T15 (Stratum V), Loci 2855, 2856

No.	Type	Reg. no.	Locus	Remarks
1	CP2b2	19772/1	2855	
2	CP2b1	19772/2	2855	
3	CP2b3	19785/3	2855	
4	CP3b3	19779/1	2855	
5	PWB	19785/7	2855	
6	K1	19772/5	2855	
7	K	19772/8	2855	
8	BTc	19779/10	2855	
9	PYX	19772/6	2855	Red and black painted bands
10	J2b	19779/11	2855	Red and black painted bands
11	L	19785/10	2855	
12	Miniature bowl	19793/4	2856	
13	Bc2	19793/2	2856	
14	J1a	19793/8	2856	
15	PYX	19793/1	2856	Red and black painted bands

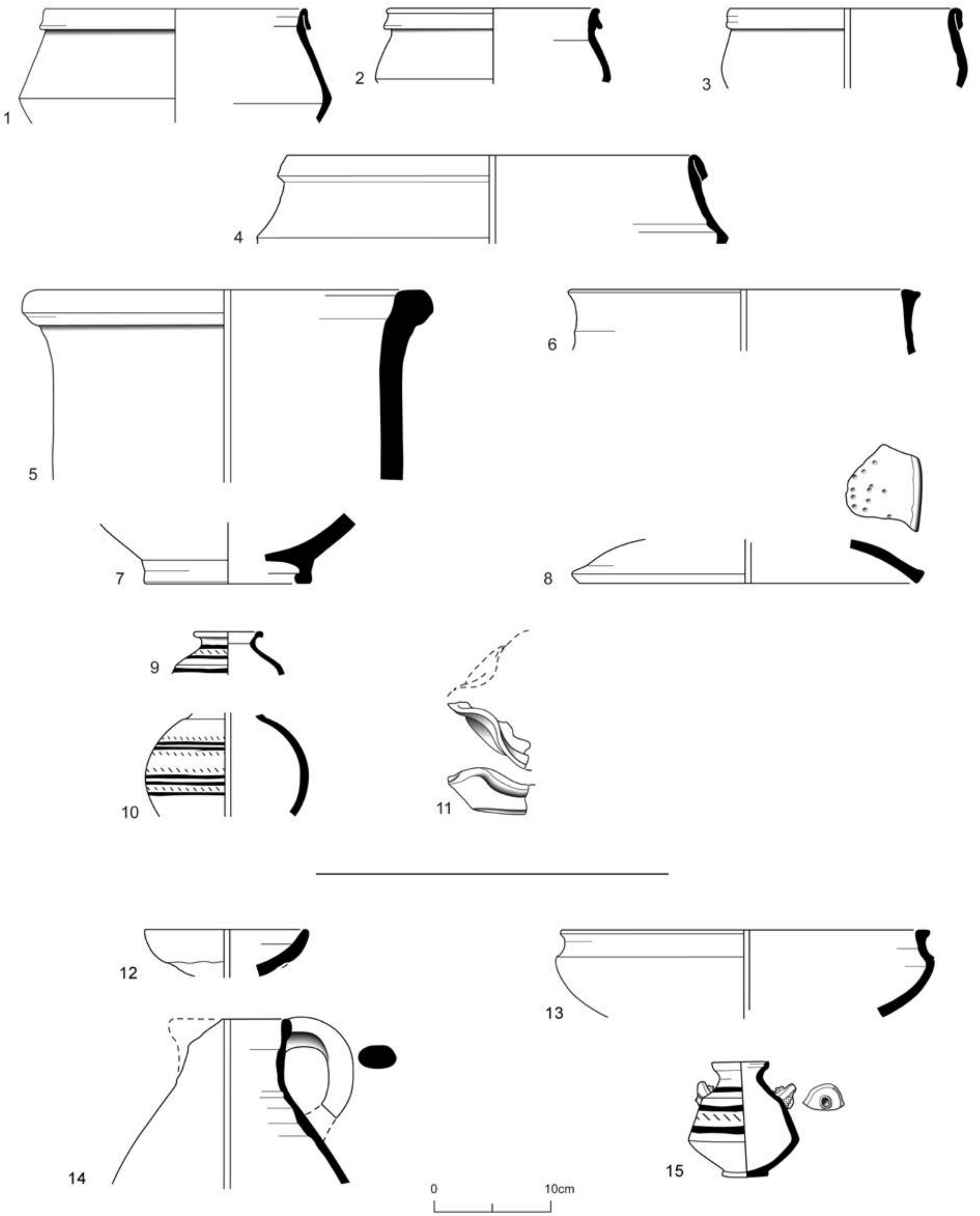

Fig. 3.92. Pottery from Area T, Phase T15

Fig. 3.93. Pottery from Phase T15 (Stratum V), L2826, and Phase T14 (Statum IVB) L2846

No.	Type	Reg. no.	Locus	Phase	Stratum	Remarks
1	CH4b	19698/2	2826	T15	V	
2	SJ1	19710/5	2826	T15	V	
3	Bc1	19710/1	2826	T15	V	
4	CP3b2	19693/3	2826	T15	V	
5	CP3b4	19710/2	2826	T15	V	
6	PWB	19703/1	2826	T15	V	
7	J	19715/2	2826	T15	V	Ring base
8	AM	19693/1	2826	T15	V	
9	Bp/CH3	19760/2	2846	T14	IVB	
10	CP3c1	19766/1	2846	T14	IVB	
11	SJ2	19760/3	2846	T14	IVB	

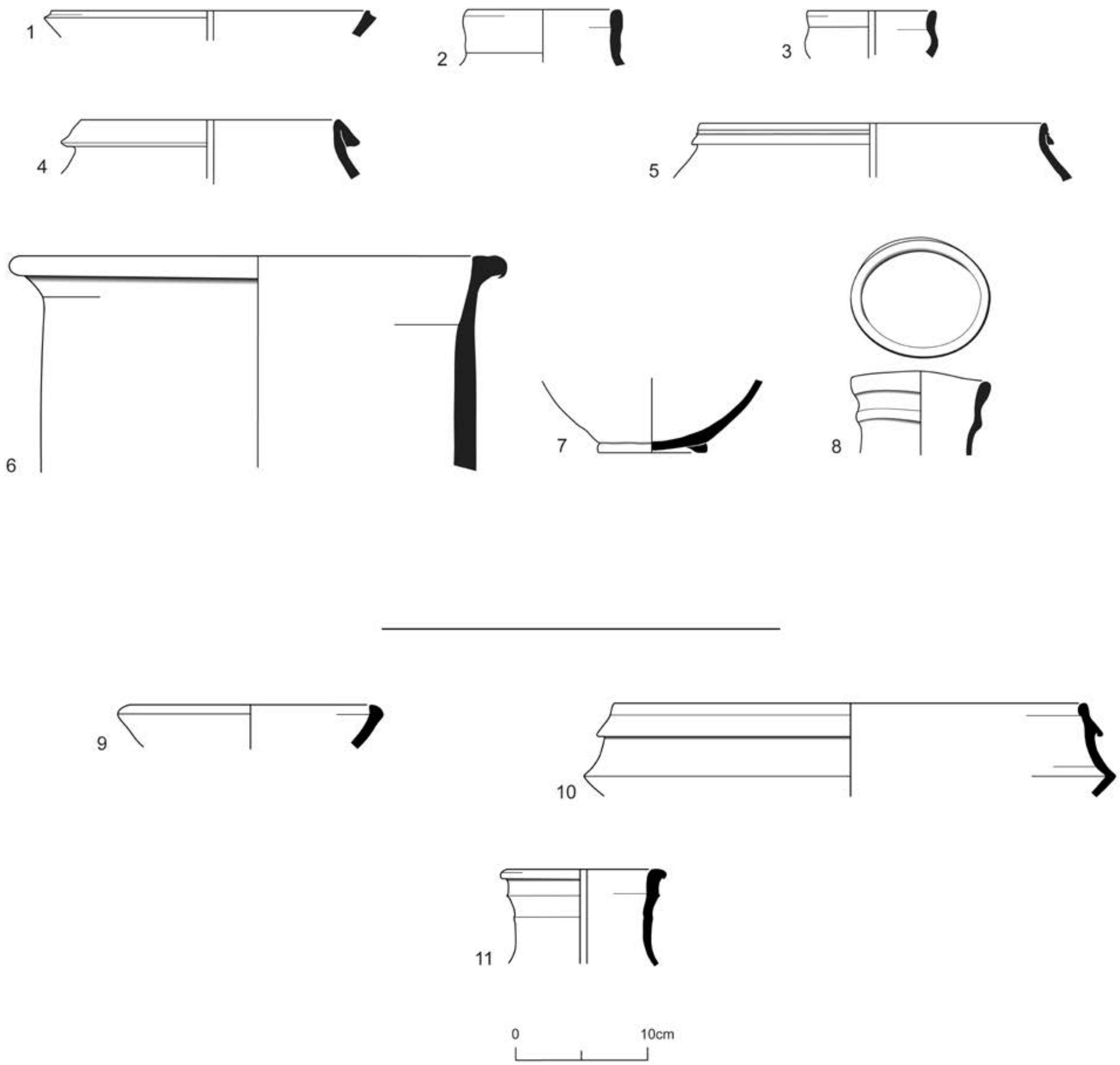

Fig. 3.93. Pottery from Area T, Phase T15

Fig. 3.94. Pottery from Phase T14 (Stratum IVB), L2595

No.	Type	Reg. no.	Remarks
1	Bh1	19176/2	Photo: Fig. 3.1
2	K1	19176/3	
3	K4b	19186/1	
4	K4b	19176/13	
5	CP3b1	19176/3	
6	CP2a4	19176/7	
7	CP3b1	19176/4	
8	PWB	19180/4	
9	AM	19186/11	
10	J1a	19180/2	
11	Whorl	19186/14	
12	BTa	19180/1	

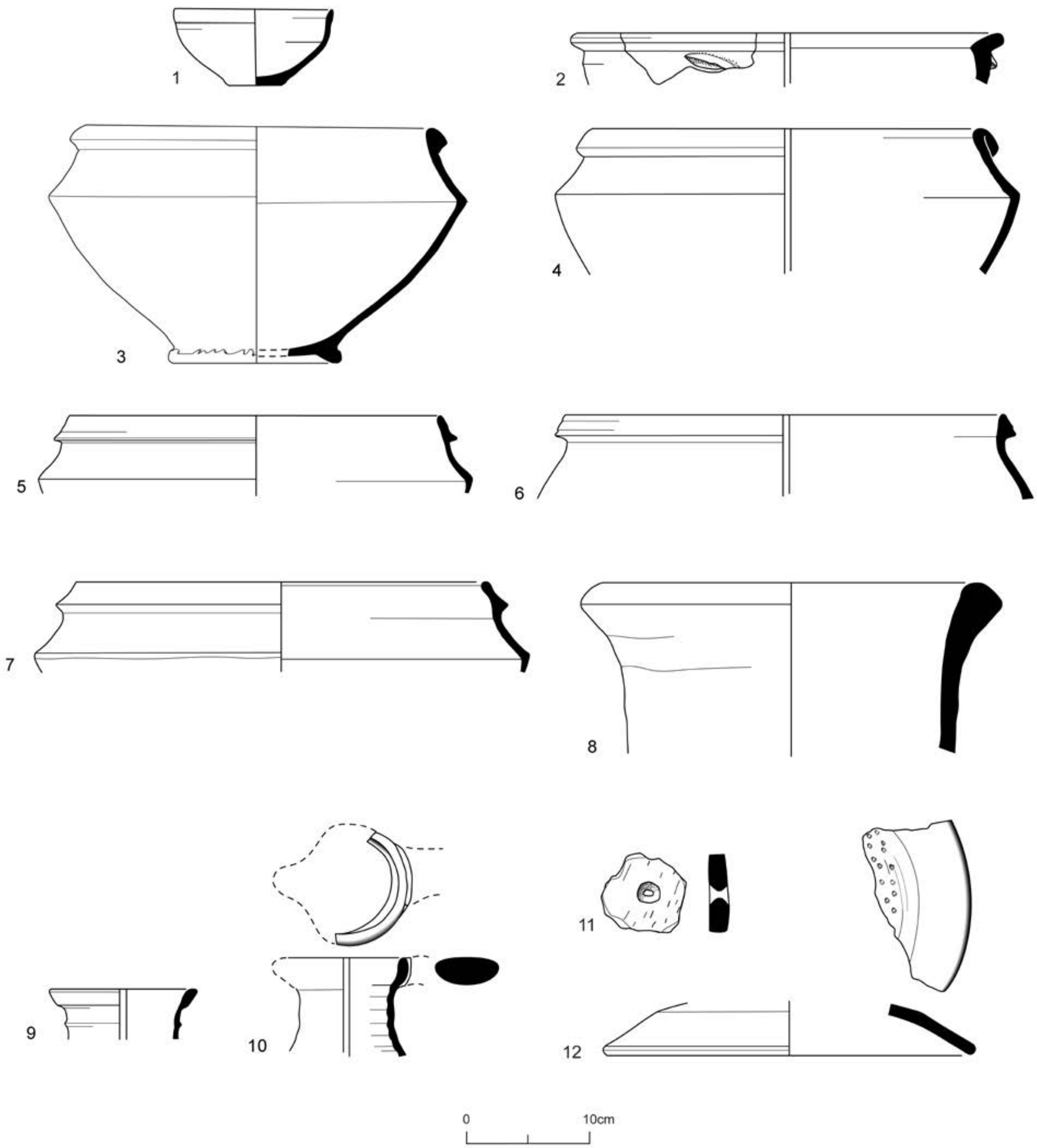

Fig. 3.94. Pottery from Area T, Phase T14

Fig. 3.95. Pottery from Phase T14 (Stratum IVB), Loci 2421, 2810, 2819

No.	Type	Reg. no.	Locus	Remarks
1	J4?	12762/5	2421	Red and black painted bands
2	K1	12741/3	2421	
3	K2b?	12741/2	2421	
4	CP2c2	12762/4	2421	
5	Bc3	19657/1	2810	
6	J1a	19657/2	2810	
7	Bh1	19668/1	2819	
8	C&S?	19668/3	2819	Cup rim
9	CP3c5	19668/2	2819	

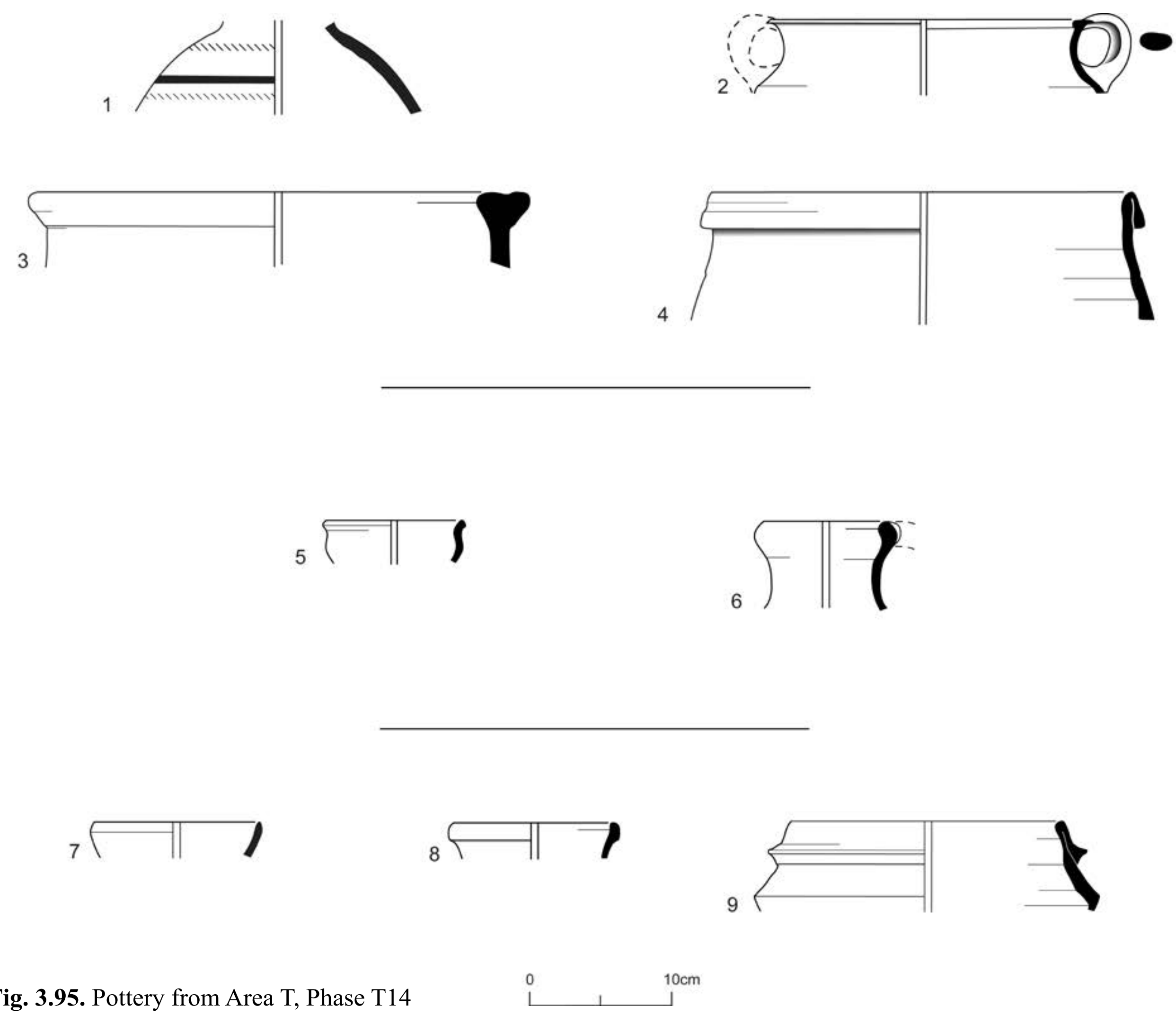

Fig. 3.95. Pottery from Area T, Phase T14

Fig. 3.96. Pottery from Phase T14 (Stratum IVB), L2589

No.	Type	Reg. no.	Remarks
1	PG2	19169/4	
2	CP3c2	19069/2	Excess clay at carination
3	J5/J6	19169/3	Basket handle, finger impressions

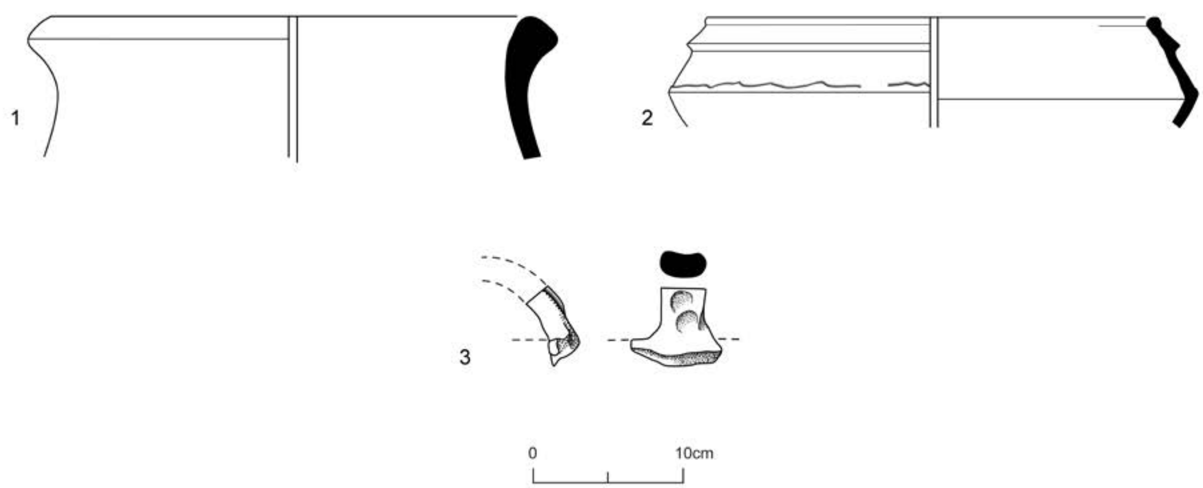

Fig. 3.96. Pottery from Area T, Phase T14

Fig. 3.97. Pottery from Phase Y7, (Strata VIIA1)

No.	Type	Reg. no.	Locus	Remarks
1	CP2b3	13493/1	3112	
2	CP2a1	17074	3012 (=3024)	
3	CJ	13763/4	3213	Egyptian-style
4	CP2a1	17119/1	3213	
5	CJ	13468/1	3114	Egyptian-style
6	SJ1	17080/2	3213	
7	BN	13005	3001 (=3024)	Bent nozzle end
8	Bird's head	13057	3012 (=3024)	A modelled bird (?). Part of a kernos or anthropomorphic vessel.
9	J1a	17084/1	3214	

* Additional material from this phase includes Fig. 3.14a depicting an ovoid storage jar (lacking rim) from L3213; Figs. 4.1:6 and 4.6 depicting a krater body fragment with a "Sea People"-style painted bird from L3012.

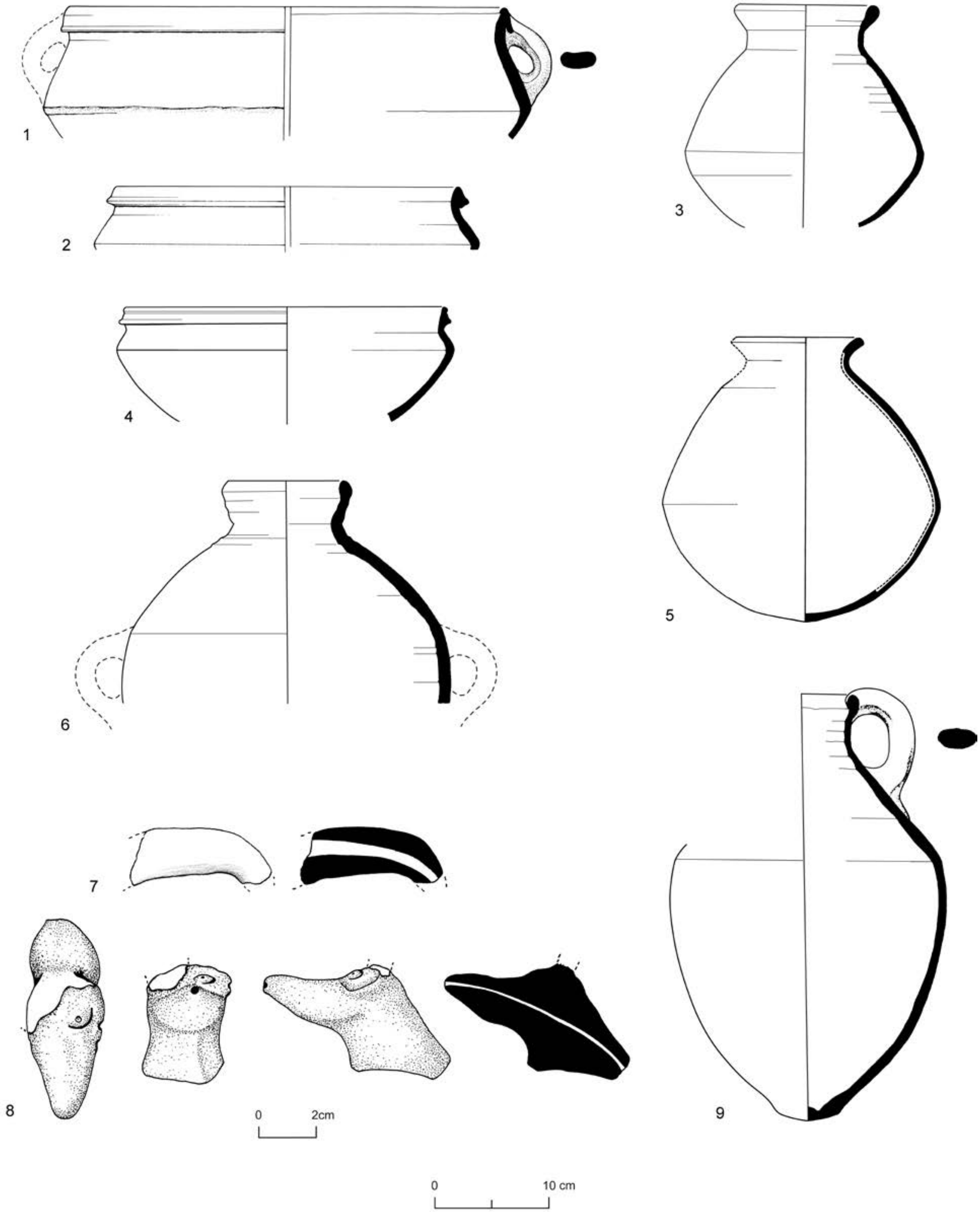

Fig. 3.97. Pottery from Area Y, Phase Y7

Fig. 3.98. Pottery from Phase Y7, (Stratum VI), Pit 3127b*

No.	Type	Reg. no.	Remarks
1	Bc1	13535/5	
2	CP2a3	13535/9	
3	CP3b1	13535/7	
4	CJ	13550/2	Photo Figs. 3.23a
5	J5	13549/1	Photo Figs. 3.18c
6	J6	13535/6	Photo Figs. 3.18d
7	Jtd	13535/3	
8	J1c	15537/20	Photo Fig. 3.17c
9	FL3	13550/3	Red and black concentric circles
10	J2a	13537/9	Photo Fig. 3.18b

* For vessels from this locus that were photographed but not included in these figures see Figs. 3.17b, 3.21b,e. The K3 rim in Fig. 3.112:5 is also from this locus but was left out of this figure.

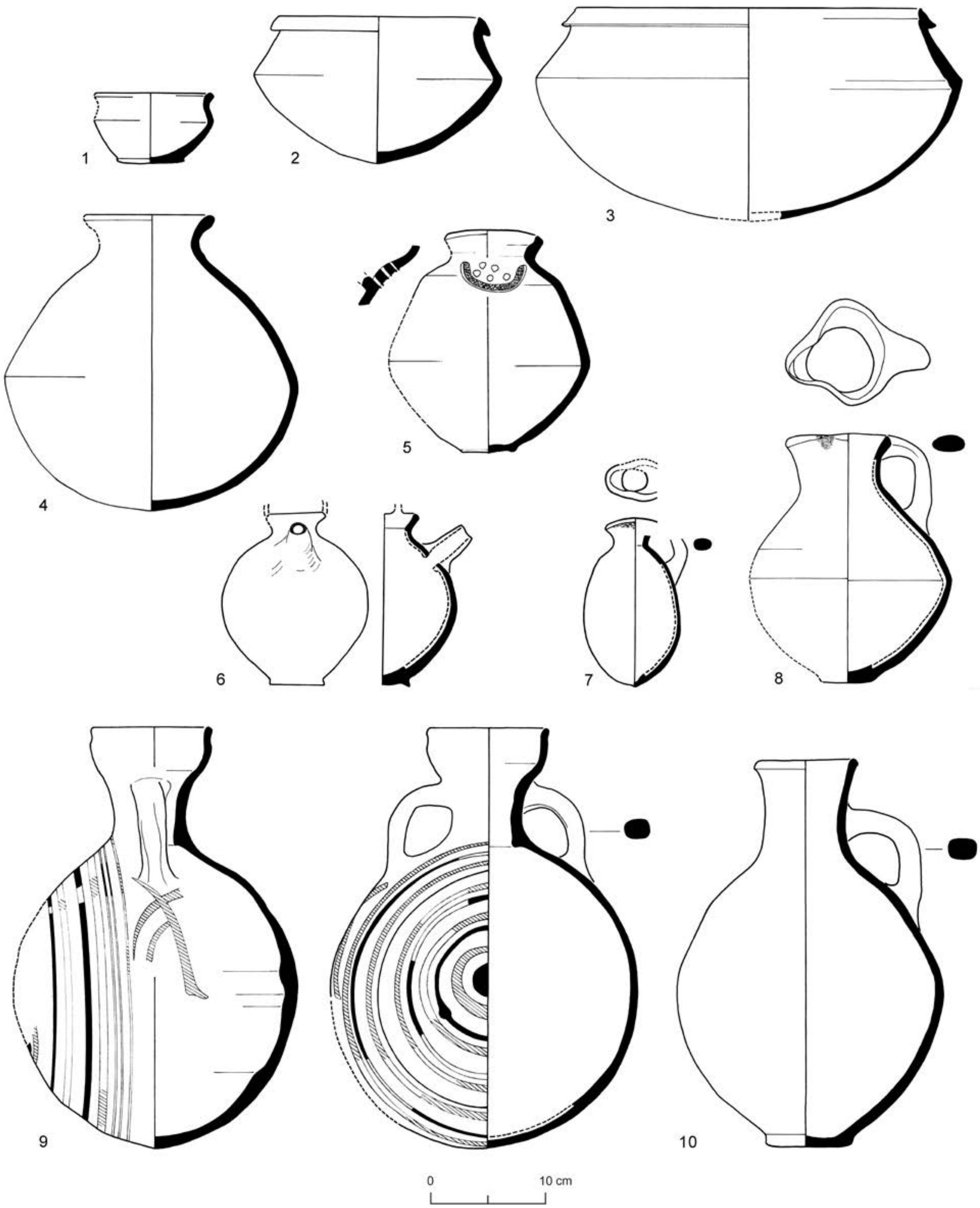

Fig. 3.98. Pottery from Area Y, Phase Y7

Fig. 3.99. Pottery from Phase Y7, (Stratum VI), Pit 3127b (cont.)

No.	Type	Reg. no.	Remarks
1	K2a	15530/8	
2	K1a	15537/16	
3	SJ1	13537/12	
4	PG1	13530/9	Photo Fig. 3.14d
5	PG1	13550/1	Photo Fig. 3.12c
6	PG1	13548/2	

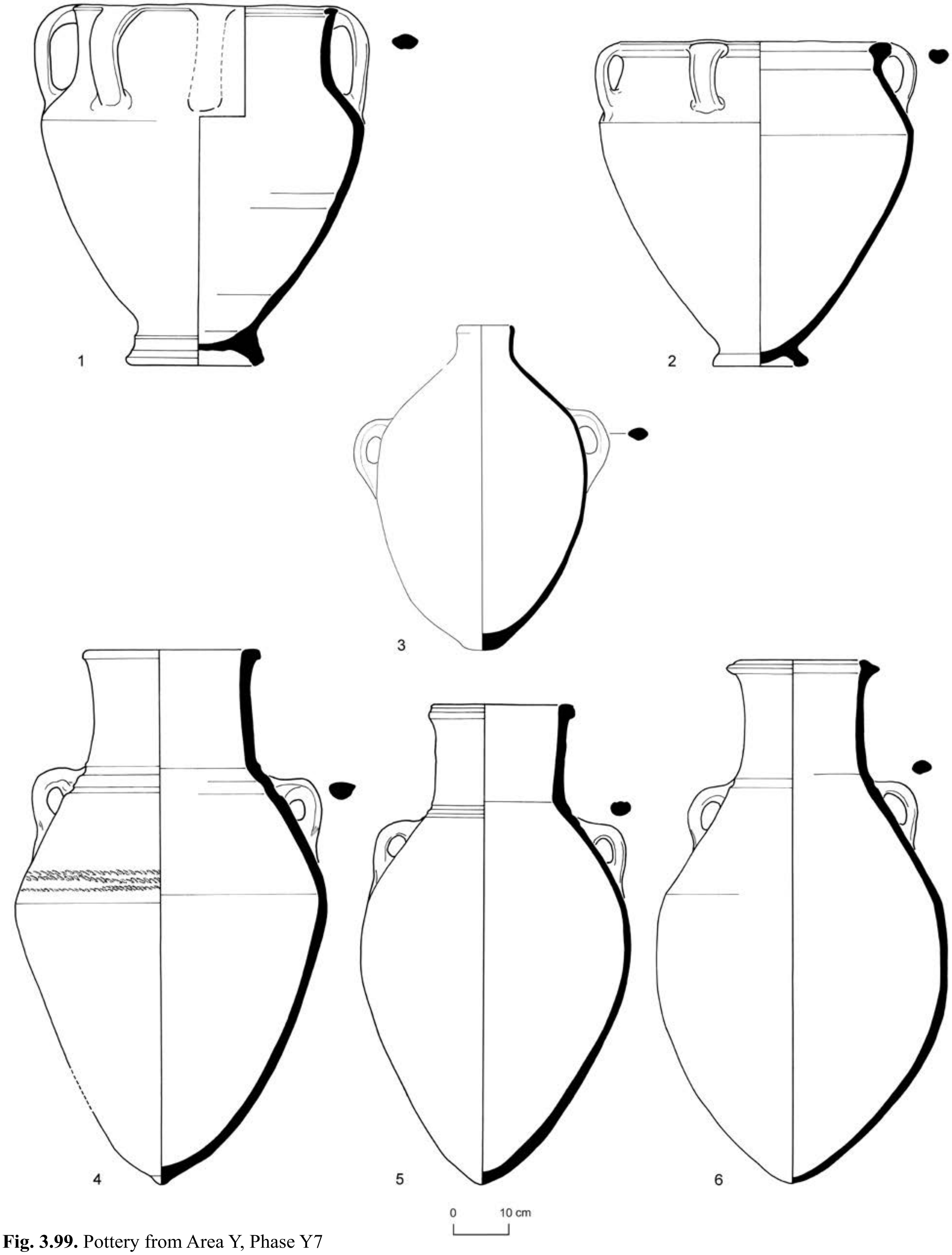

Fig. 3.99. Pottery from Area Y, Phase Y7

Fig. 3.100. Pottery from Phase Y6, (Stratum VI), L3082, 3123

No.	Type	Reg. no.	Locus	Remarks
1	J7	13318/1	3082	Egyptian-style
2	PYX	13315/2	3082	Red painted bands
3	L	13314/1	3123	
4	K4b	13452/5	3123	
5	PYX	13452/6	3119 (=3123)	Photo: Fig. 3.22e
6	SJ1	13476/3	3123	Petrography: Table 6A.1:5

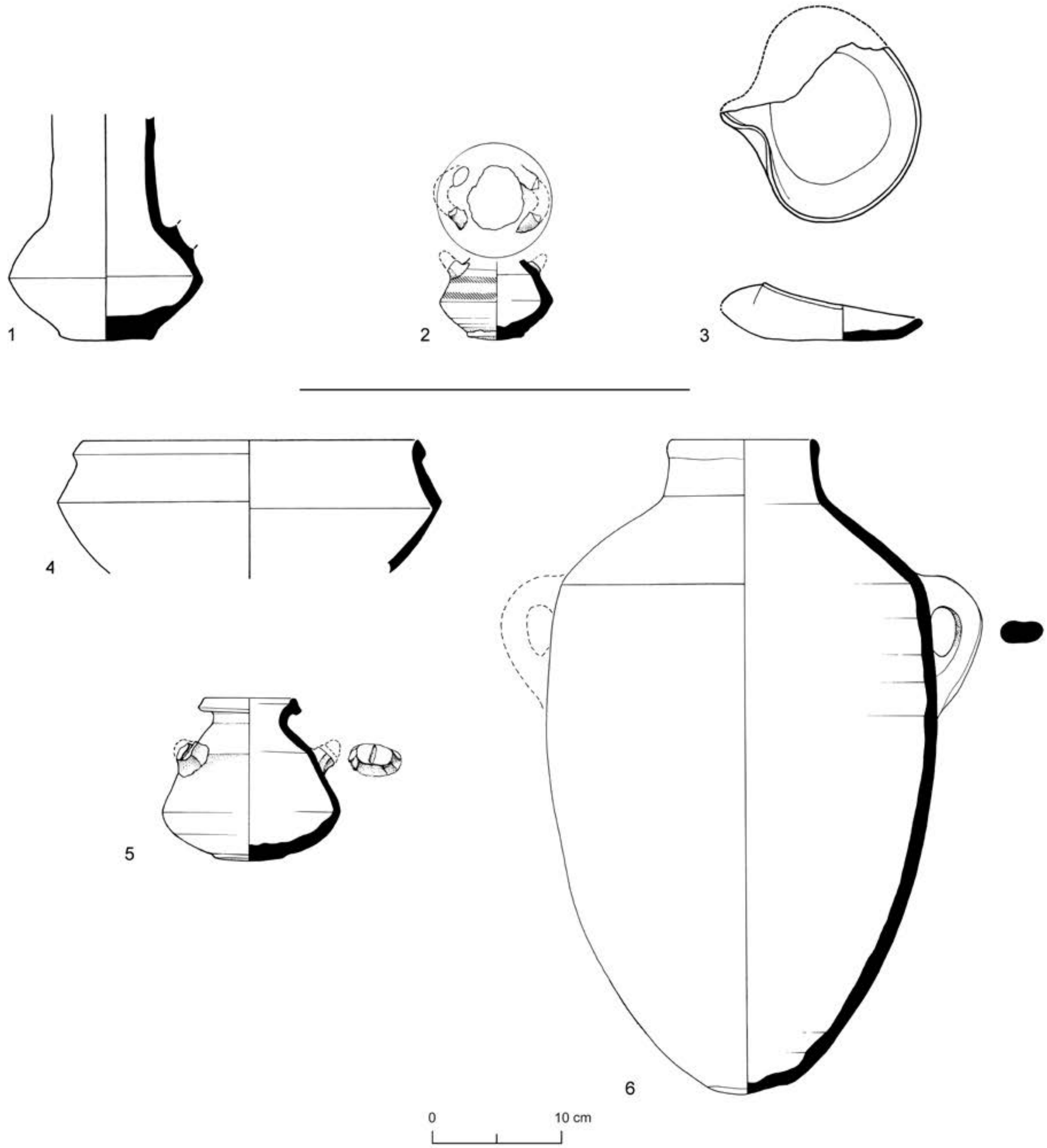

Fig. 3.100. Pottery from Area Y, Phase Y6

Fig. 3.101. Pottery from Phase Y6, (Stratum VI), L3212

No.	Type	Reg. no.	Remarks
1	CP2b3	17158	
2	Bp1b	17162/1	
3	CP3b1	17157	
4	SJ1	17082/3	
5	CP2a1	17082/2	
6	CJ	13763/4	Egyptian-style
7	J5	17082	
8	Stirrup jar	17090/2	Late Helladic IIIC; for discussion see Chapter 4, no. 14
9	SJ1	17090/1 13476/3	Photo: Fig. 3.14b; petrography: Table 6A:6

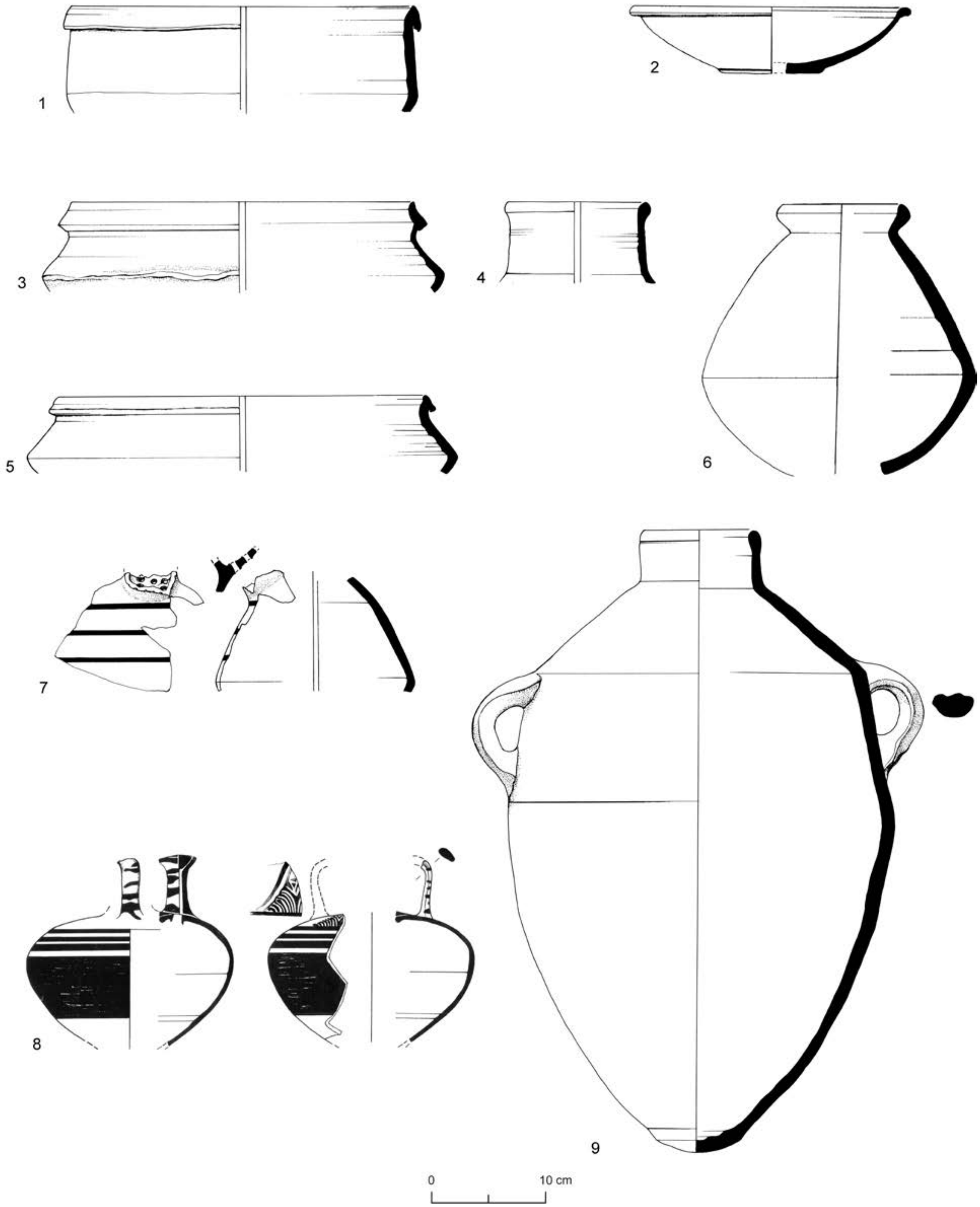

Fig. 3.101. Pottery from Area Y, Phase Y6

Fig. 3.101A. Pottery from Phase Y6, (Stratum VI), L3212 (cont.)

No.	Type	Reg. no.	Remarks
1	PCR	17146/1	Anomalous barrel shape; Photo Fig. 3.11 (lower portion with handle is missing in photo

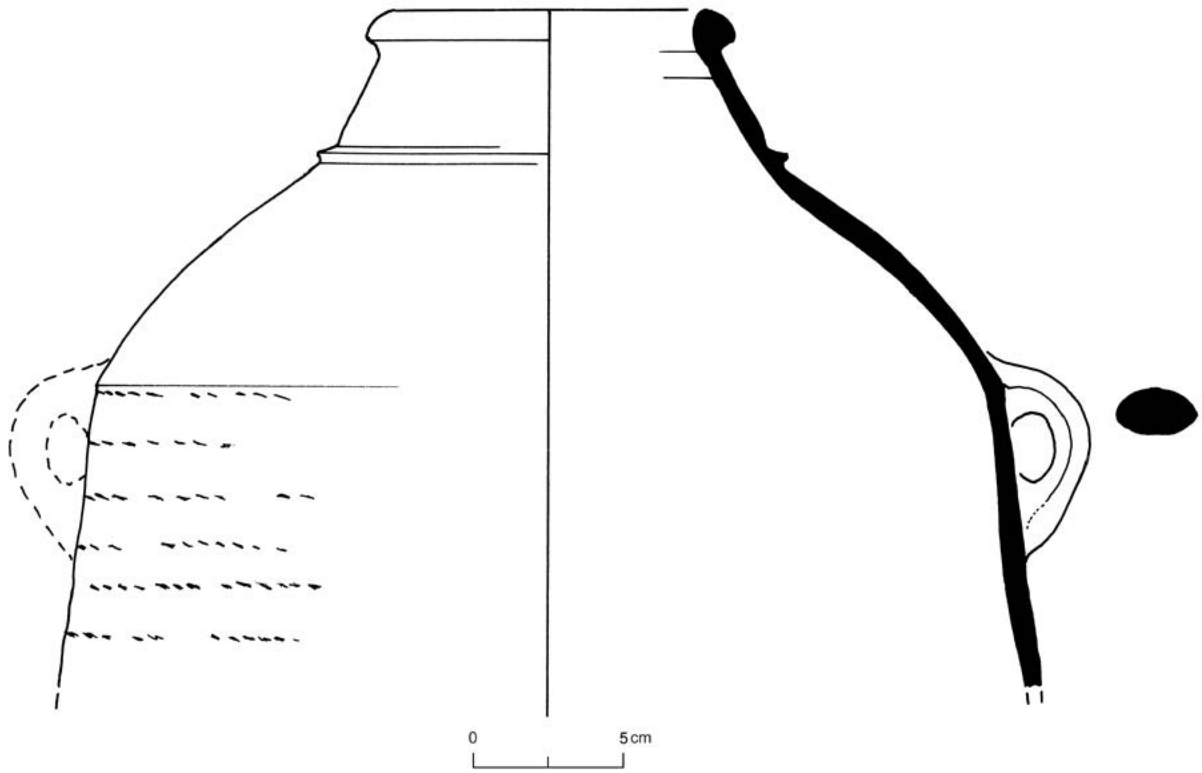

Fig. 3.101.A Pottery from Area Y, Phase Y6, L3212 (cont.)

Fig. 3.102. Pottery from Pit 905, (Stratum VI?)

No.	Type	Reg. no.	Remarks
1	Bh1	7015/2	
2	CP2a1	7021/3	
3	CP3a2	7028/5	
4	CP2a4	7015/4	
5	Bc2	7015/6	
6	CP3a1	7028/3	
7	CP1	7028/7	
8	K1b	7022	Red and black painted decoration: bird and net pattern in metopes; see discussion in Chapter 4, no. 10.
9	P	7028/8	Probably an MB type
10	SJ2	7015/7	
11	J4	7021/2	Red painted bands
12	CH	7019	
13	CH	7020	
14	Stirrup jar	7071/1	Philistine, black and red painted decoration; see Chapter 4, no. 1
15	Stirrup jar	7028/1	Philistine, black and red painted decoration; see Chapter 4, no. 2

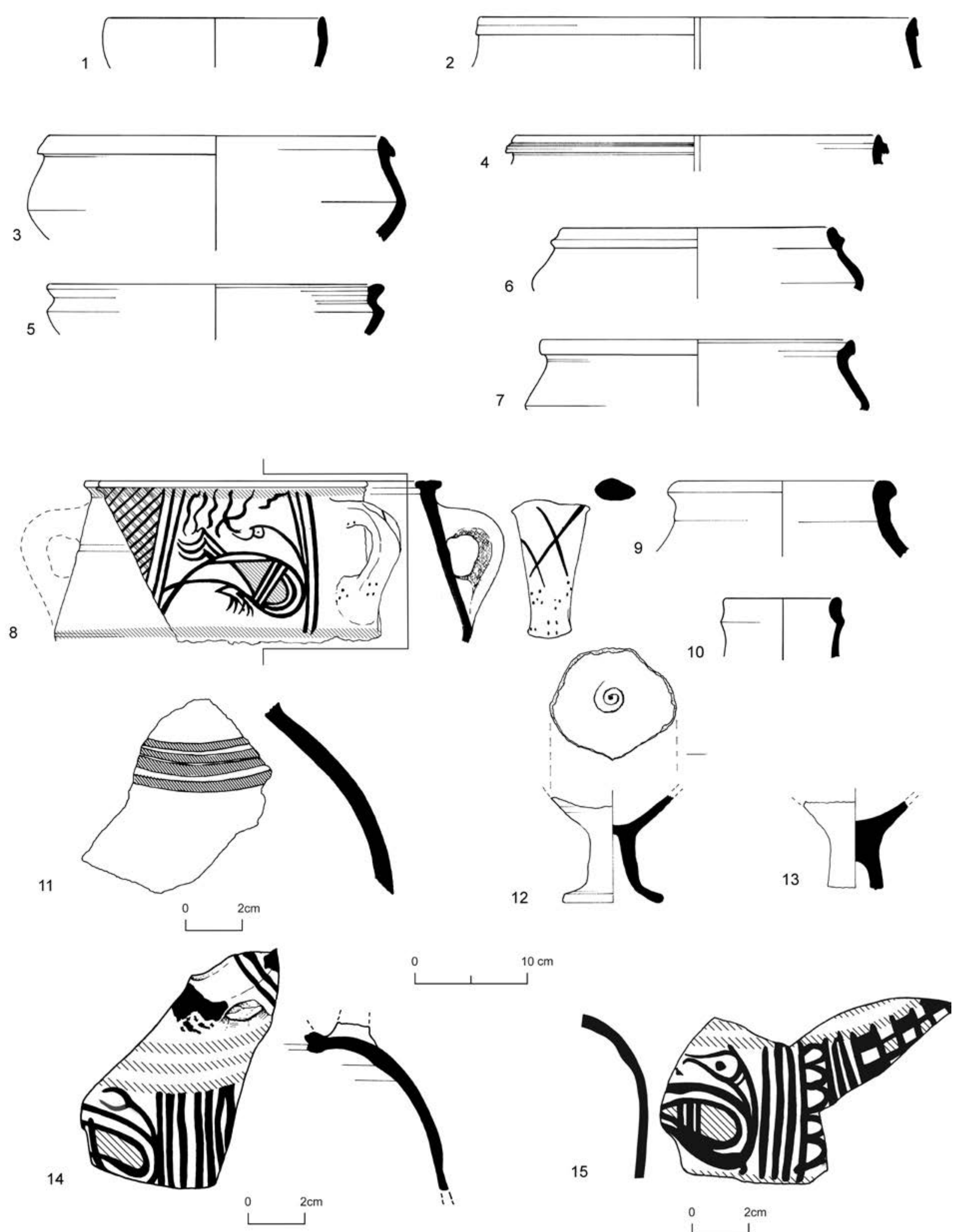

Fig. 3.102. Pottery from Area Y, Pit 905 (Stratum VI?)

Fig. 3.103. Pottery from Pit 3163, (Stratum VI?)

No.	Type	Reg. no.	Remarks
1	K1b	13685/1	
2	CP2b1	13701/2	
3	CP2e	13701/1	
4	CP1a	13722/1	
5	J2b/J6	13071/1	Red and black painted decoration—pendants, bands, metopes; see Chapter 4, no. 3

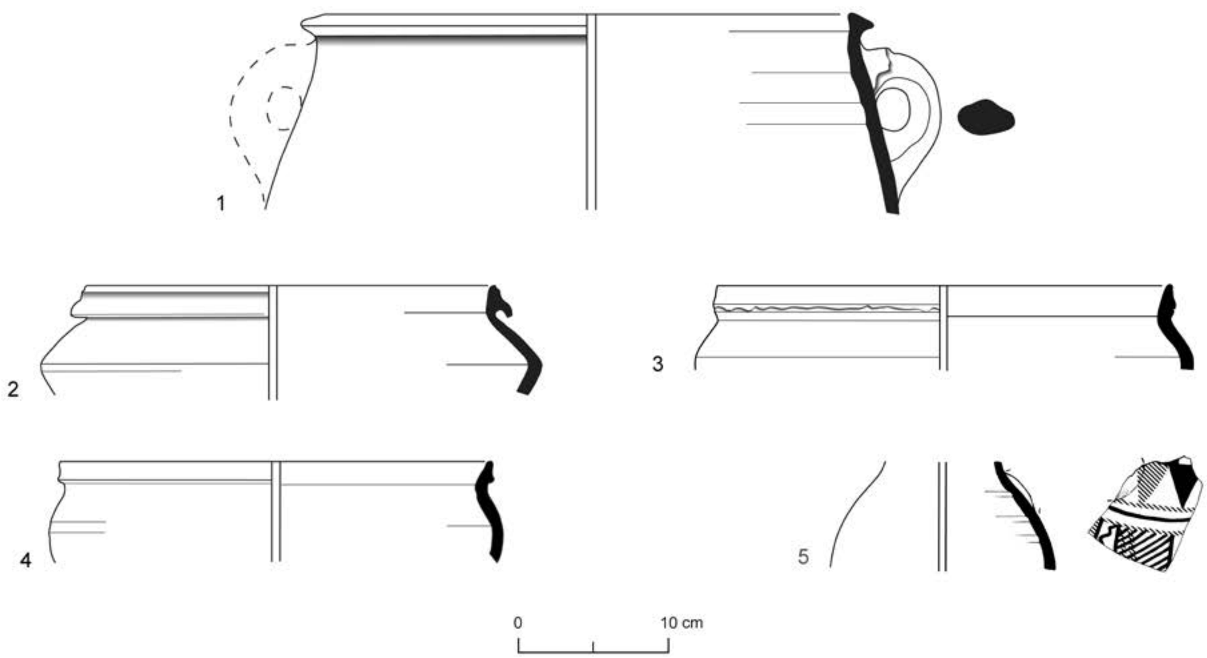

Fig. 3.103. Pottery from Area Y, Pit 3163 (Stratum VI?)

Fig. 3.104. Pottery from Phase Y4, (Stratum V)

No.	Type	Reg. no.	Locus	Remarks
1	Bc3	13360/2	3097	
2	Bc2	13319/5	3086a	
3	CP2b4	13360/4	3097	
4	K3	13820/1	3177	
5	CP3c2	13509/10	3177a	
6	L	13314/1	3086a	
7	Neckless jar	13417/1	3107	Egyptian-style; petrography: Table 6A.1:1; Fig. 3.126:3
8	J5	13816/3	3177	Red painted bands
9	PYX	13796/1	3176	Photo: Fig. 3.22c

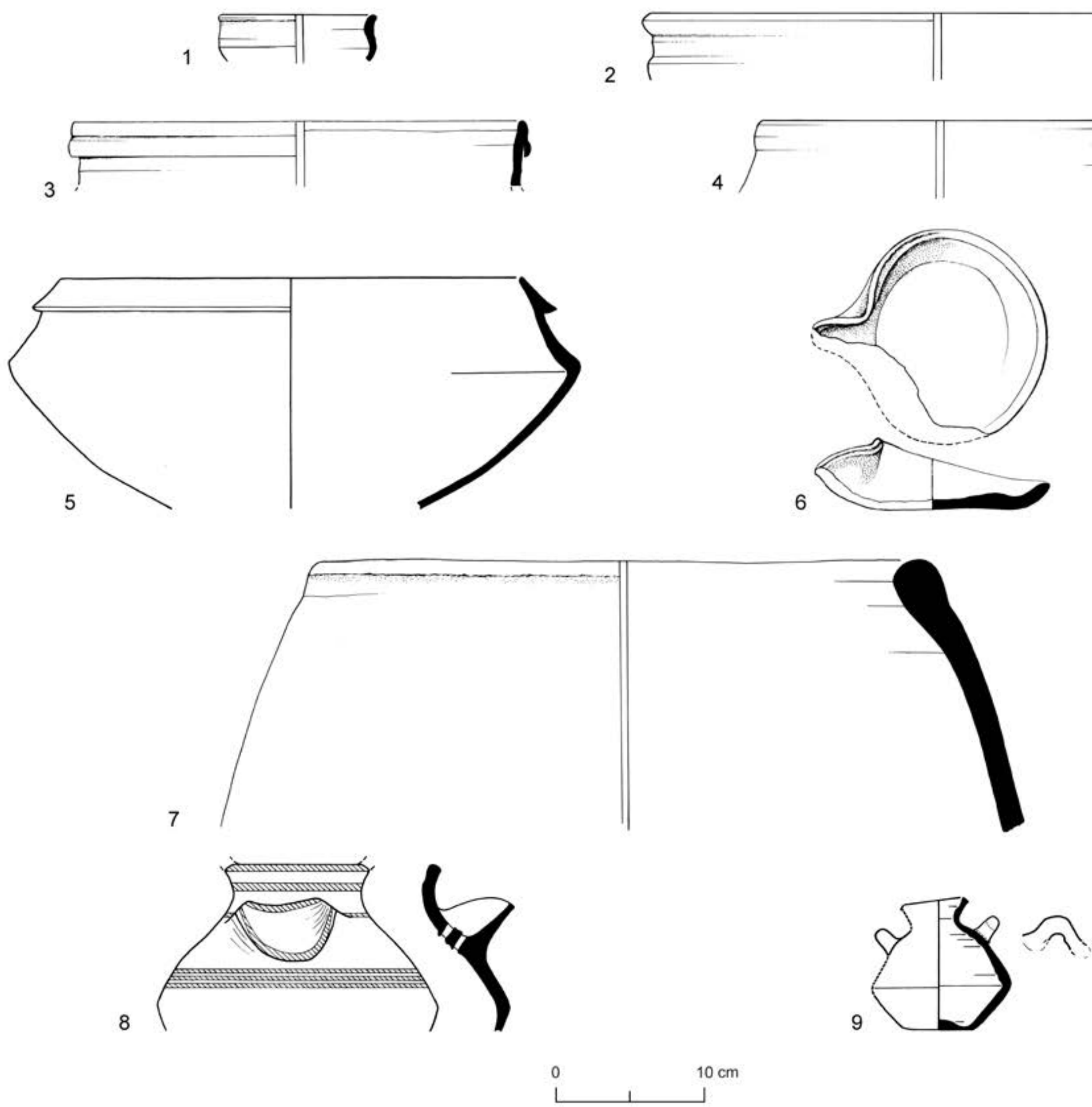

Fig. 3.104. Pottery from Area Y, Phase Y4

Fig. 3.105. Pottery from Phase Y4, (Stratum VA), L3172*

No.	Type	Reg. no.	Remarks
1	CP2a2	13782/3	Photo: Fig. 3.6a
2	CP2a2	13768/2	
3	CP2b2	13757/1	
4	J1c	13548/3	
5	J? Goblet?	13760/1	Trumpet base
6	PYX	13756/1	Red and black painted bands; photo: Fig. 3.22a
7	PYX	13776	
8	FL4	13760/6	Photo: Fig. 3.21c

* and see Fig. 3.23b for a photo of a complete Egyptian-style cooking jug from this locus.

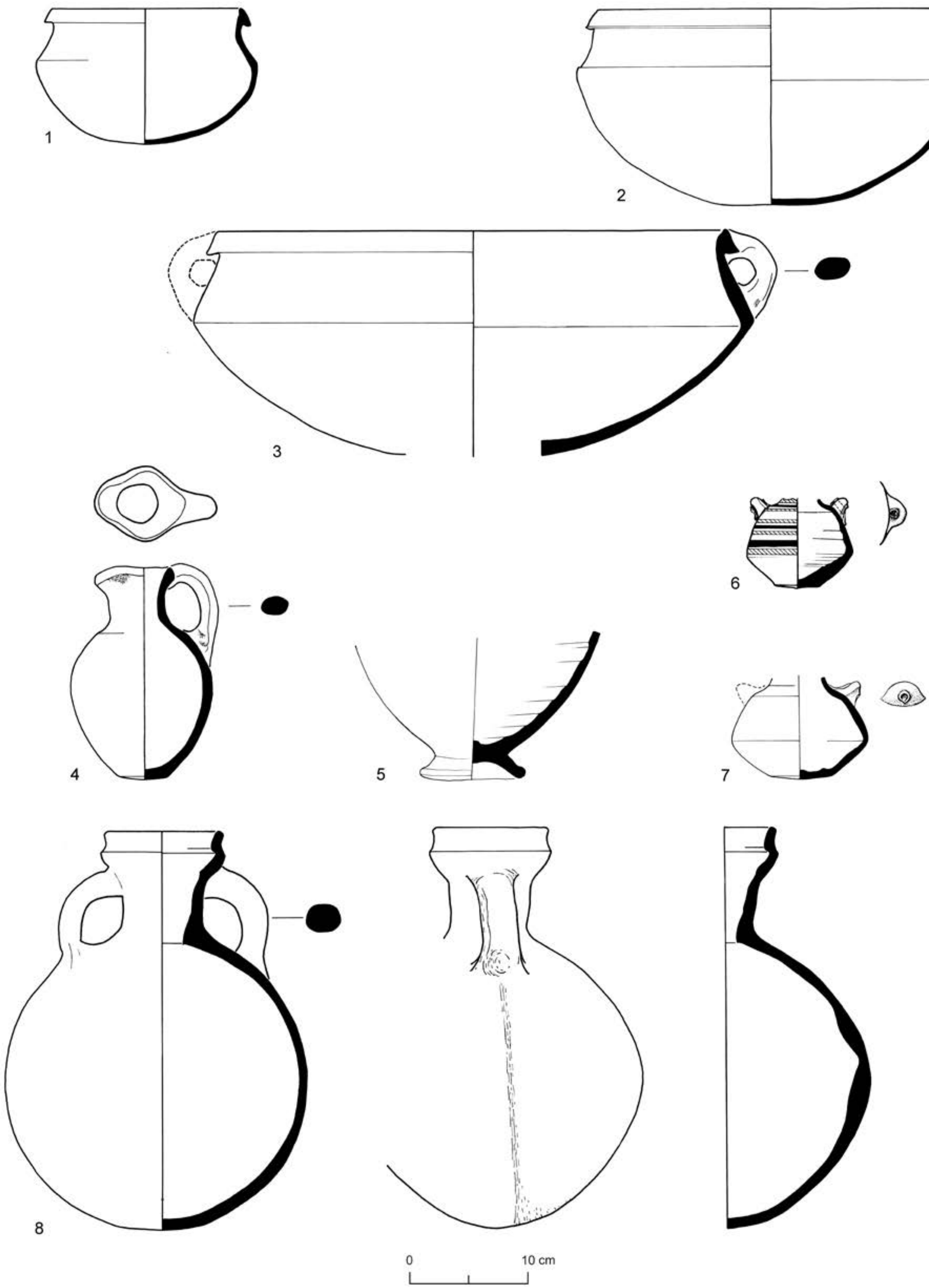

Fig. 3.105. Pottery from Area Y, Phase Y4

Fig. 3.106. Pottery from Phase Y4 (Stratum VA) and Phase Y3b (Stratum IVB), L3171

No.	Type	Reg. no.	Locus	Phase	Remarks
1	Bh3	13258/2	3075	Y4	
2	C&S	13427/4	3110	Y4	
3	C&S or J6	13305/2	3075	Y4	
4	BTb	13258/1	3075	Y4	
5	Bc2	13056/1	3020	Y4	
6	Bh3	13738/1	3171	Y3b	
7	Bp1b	13719/6	3171	Y3b	Red painted bands
8	CP3c1	13713/6	3171	Y3b	
9	CP3a1	13718/1	3171	Y3b	
10	CP3c1	13718/3	3171	Y3b	
11	J5 or J6	13718/13	3171	Y3b	Basket handle, red painted decoration

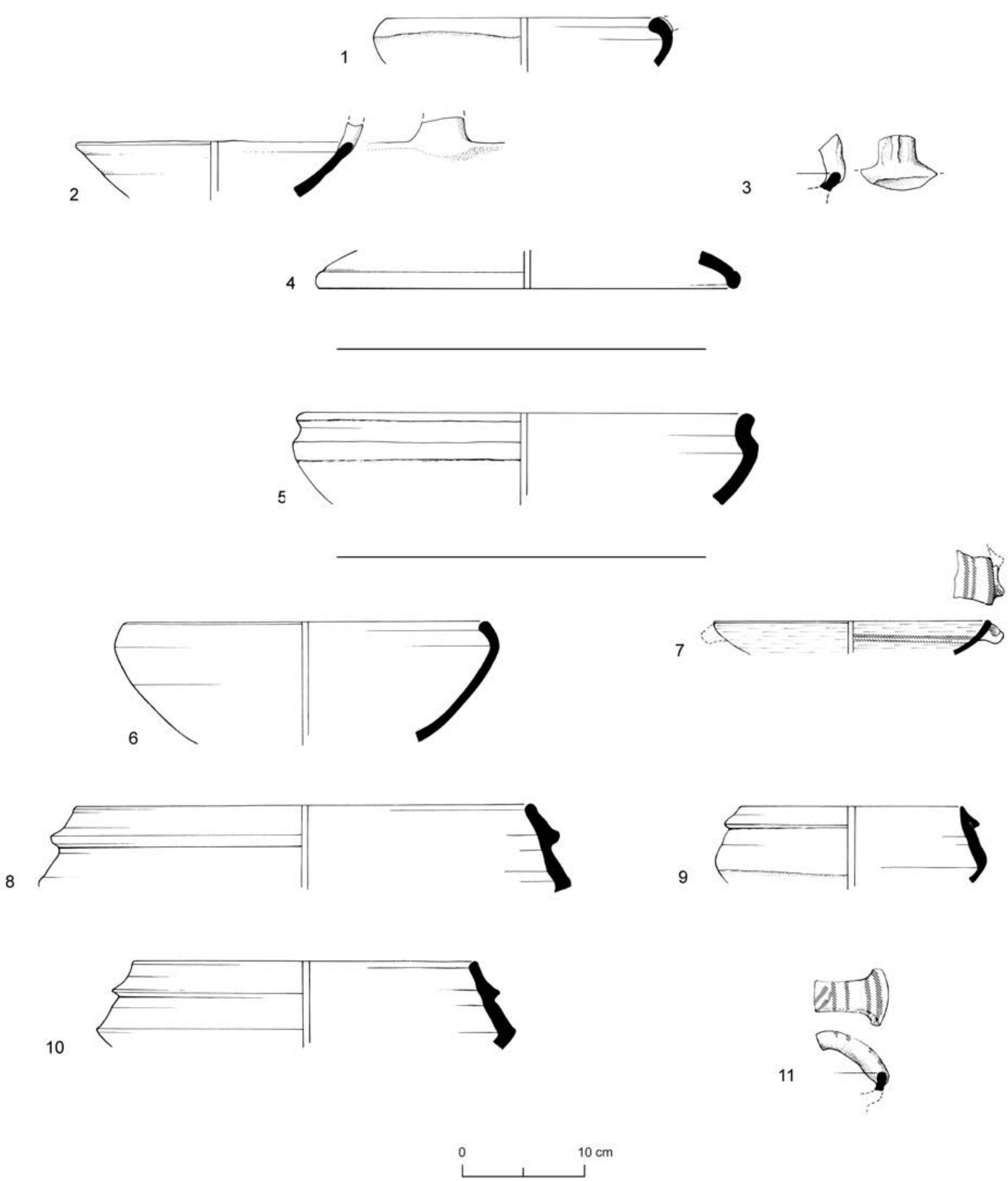

Fig. 3.106. Pottery from Area Y, Phases Y4 and Y3

Fig. 3.107. Pottery from Area K, (Stratum VIIA1)*

No.	Type	Reg. no.	Locus	Remarks
1	Bc1	22312/2	6373	
2	Bp1b/CH2a	22312/1	6373	
3	Bc1	22280/1	6369	
4	Bc2	22598/2	6434	
5	CH?	22594/1	6334	
6	Bc1	22338/1	6382	Philistine-style bell-shaped bowl, with horizontal handles
7	Bc2	22292/1	6369	
8	Bc2	22625/1	6437	
9	CP1a	22280/4	6369	
10	CP2b1	22598/1	6434	
11	Jtd	22338/2	6382	
12	FL	22280/3	6369	Black painted concentric circles
13	SJ4a	22597/1	6434	Red and black painted bands

* Originally published in Ben-Dov 2011 as Fig. 120.

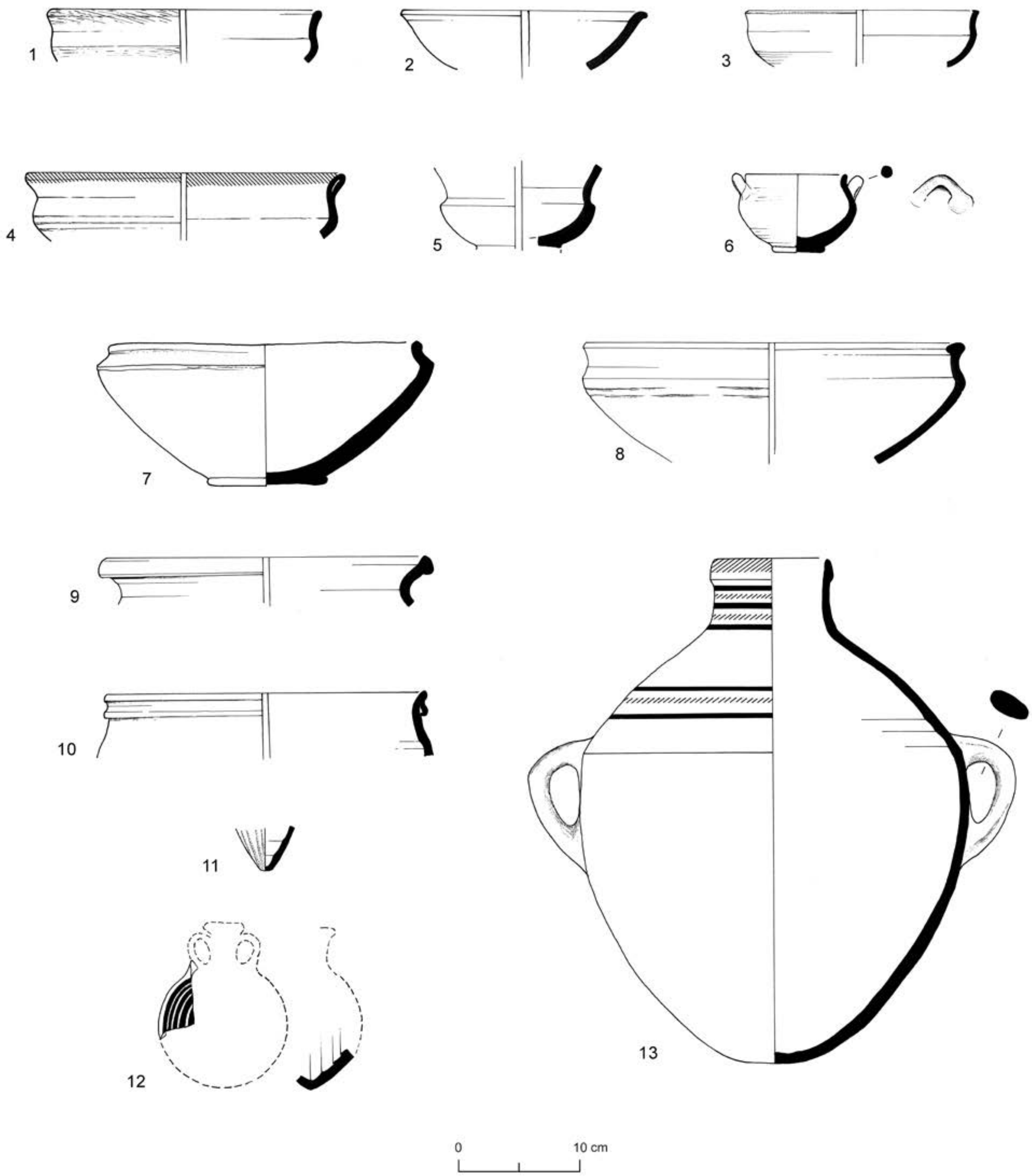

Fig. 3.107. Pottery from Area K, Stratum VIIA1

Fig. 3.108. Iron Age I Pottery from Area A, Loci 5009 and L7527, and Area H, L609a (Stratum V)

No.	Type	Reg. no.	Locus	Area	Stratum	Remarks
1	Bc3	15064	5009	A	V ?	
2	Bh1	15032/1	5009	A	V ?	Red and black painted bands
3	J6	15032	5009	A	V ?	Red and black painted bands
4	PYX	15029	5009	A	V ?	
5	Bh1	24575	7527	A	V ?	
6	Lid	24571	7527	A	V ?	
7	PYX	4126/4	609a	H	V ?	
8	Jtd	4091	609a	H	V ?	
9	PYX	4100	609a	H	V ?	Red and black painted bands
10	PG	4117/1	609a	H	V ?	
11	K4a	4117	609a	H	V ?	
12	CP2a4	4126/3	609a	H	V ?	
13	PG	4116/2	609a	H	V ?	
14	CP3b3a	4126/1	609a	H	V ?	

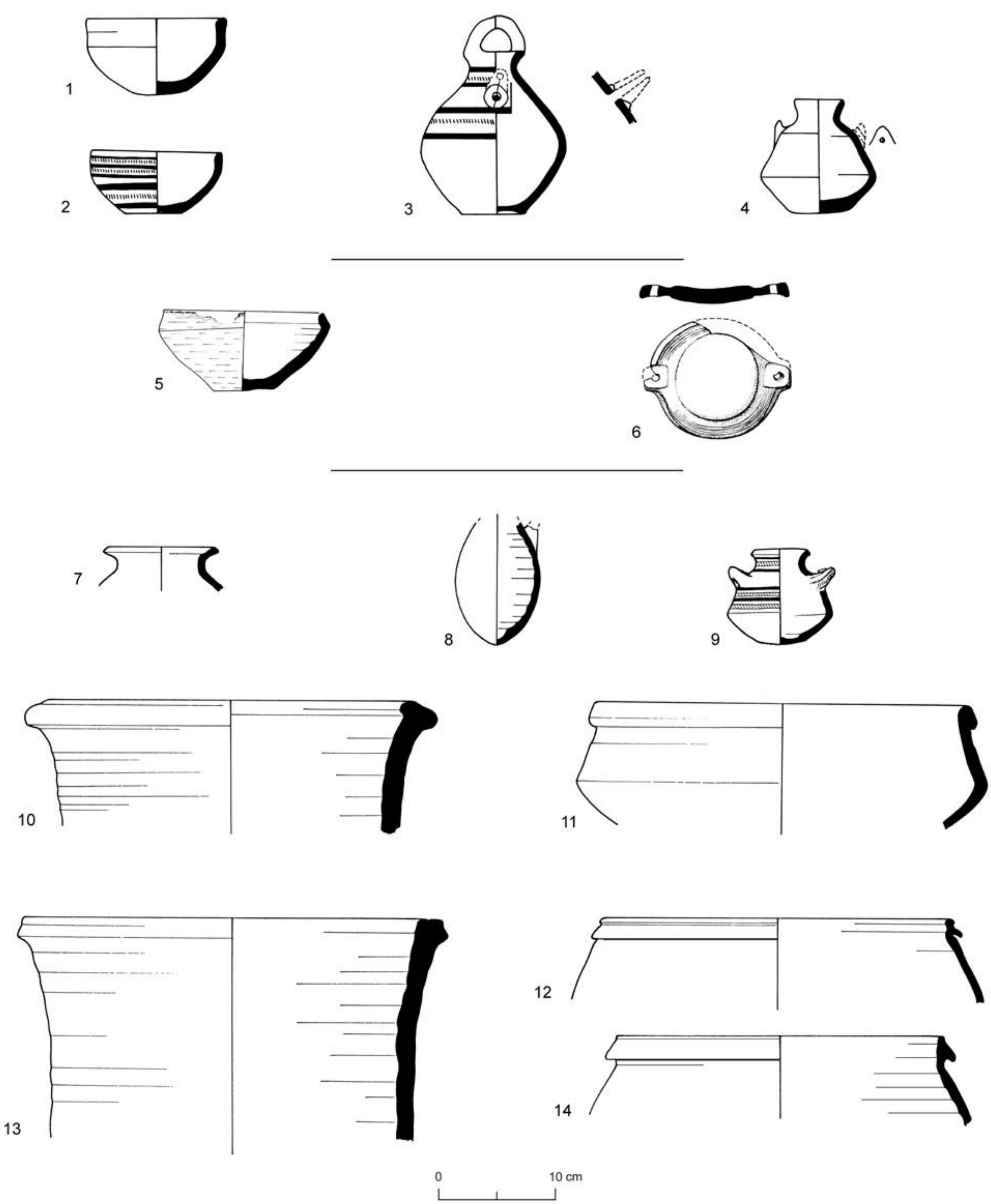

Fig. 3.108. Pottery from Areas A and H

Fig. 3.109. Type Series: Bowls (B)

No.	Type	Remarks
1	Bh1	= Fig. 3.36:1
2	Bh1	= Fig. 3.25:5
3	Bh2	= Fig. 3.54:8
4	Bh2	= Fig. 3.40:2
5	Bh3	= Fig. 3.66:2
6	Bh3	= Fig. 3.106:6
7	Bc1	= Fig. 3.98:1
8	Bc1	= Fig. 3.55:2
9	Bc1	= Fig. 3.71:2
10	Bc2	= Fig. 3.106:5
11	Bc3	= Fig. 3.35:3
12	Bc3	= Fig. 3.46:4
13	Bc4	= Fig. 3.59:2
14	Bp1a	= Fig. 3.33:5
15	Bp1b	= Fig. 3.101:2
16	Bp2	= Fig. 3.49:2; (can be a chalice as well: CH4b)

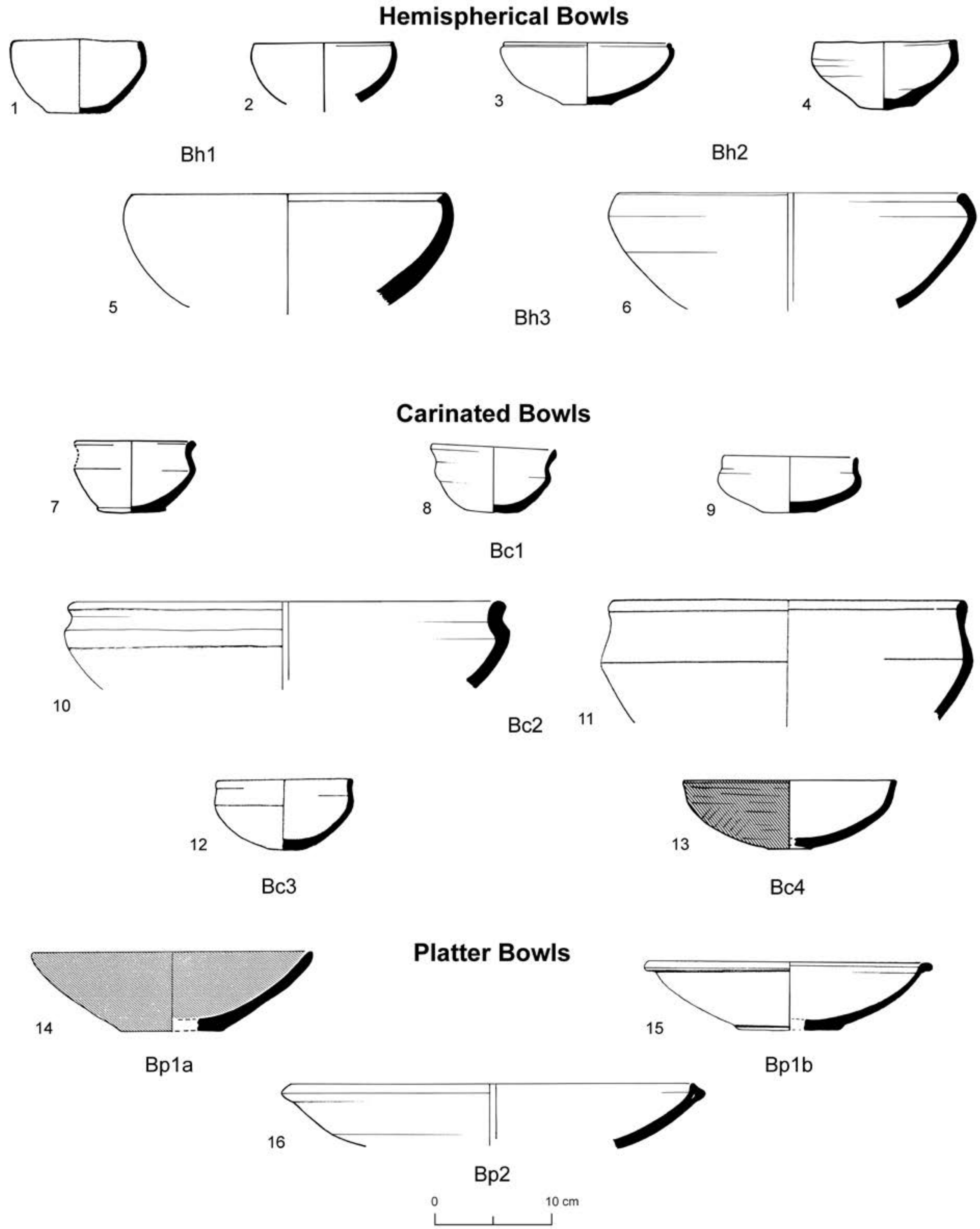

Fig. 3.109. Ceramic Type Series: bowls

Fig. 3.110. Type Series: Chalices (CH)

No.	Type	Remarks
1	CH1	= Fig. 3.48:7
2	CH2a	= Fig. 3.71:8
3	CH2b	= Fig. 3.43:5
4	CH3a	= Fig. 3.51:6
5	CH3b	= Fig. 3.46:6
6	CH4a	= Fig. 3.55:5
7	CH3c	= Fig. 3.72:8
8	CH4b	= Fig. 3.79:1
9	ST	= Fig. 3.72:7

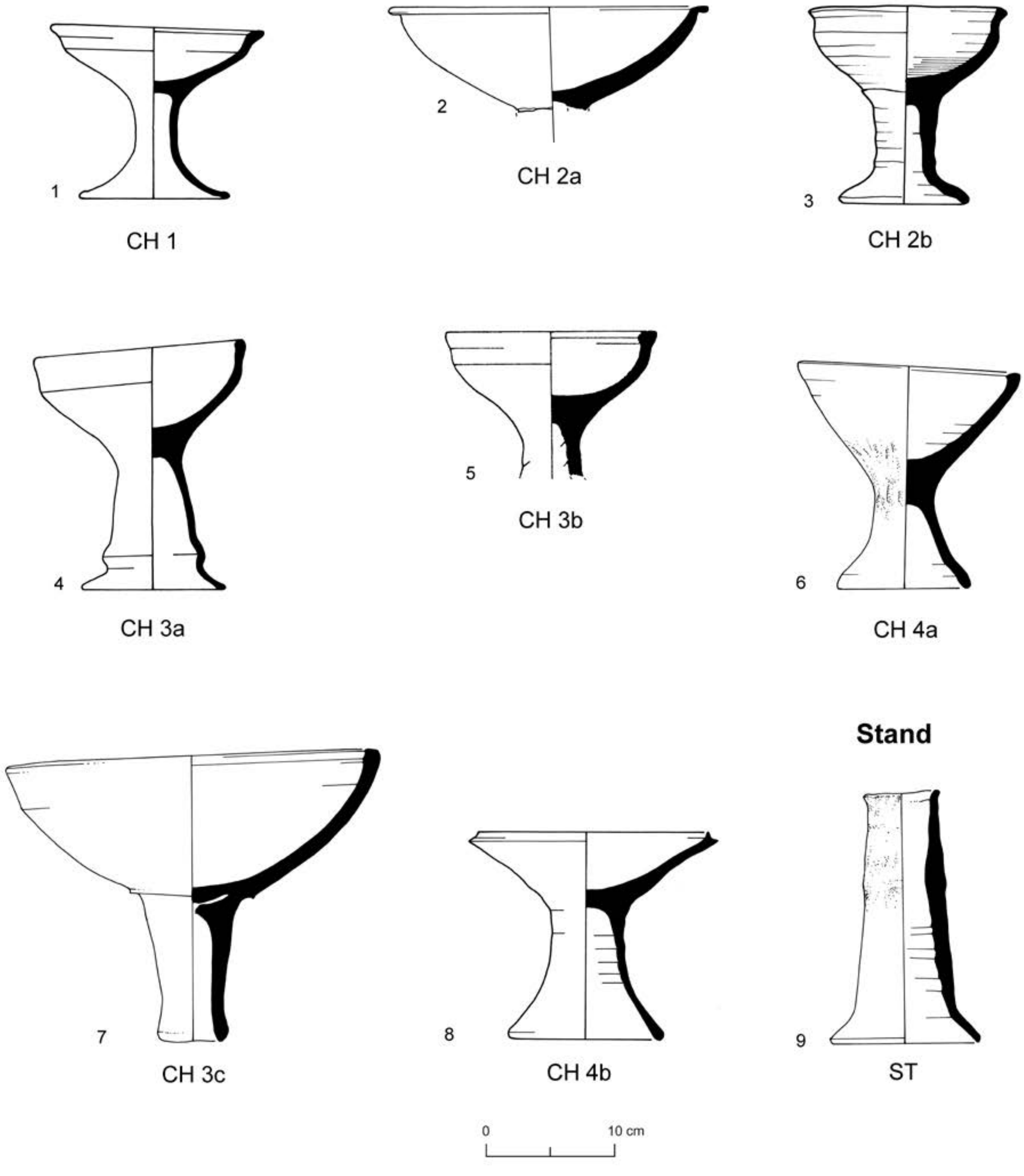

Fig. 3.110. Ceramic Type Series: chalices

Fig. 3.111. Type Series: Kraters (K)

No.	Type	Remarks
1	K1a	= Fig. 3.99:2
2	K1a	= Fig. 3.36:10
3	K1a	= Fig. 3.61:4
4	K1a	= Fig. 3.60:4
5	K1a	= Fig. 3.56:7
6	K1b	= Fig. 3.82:4

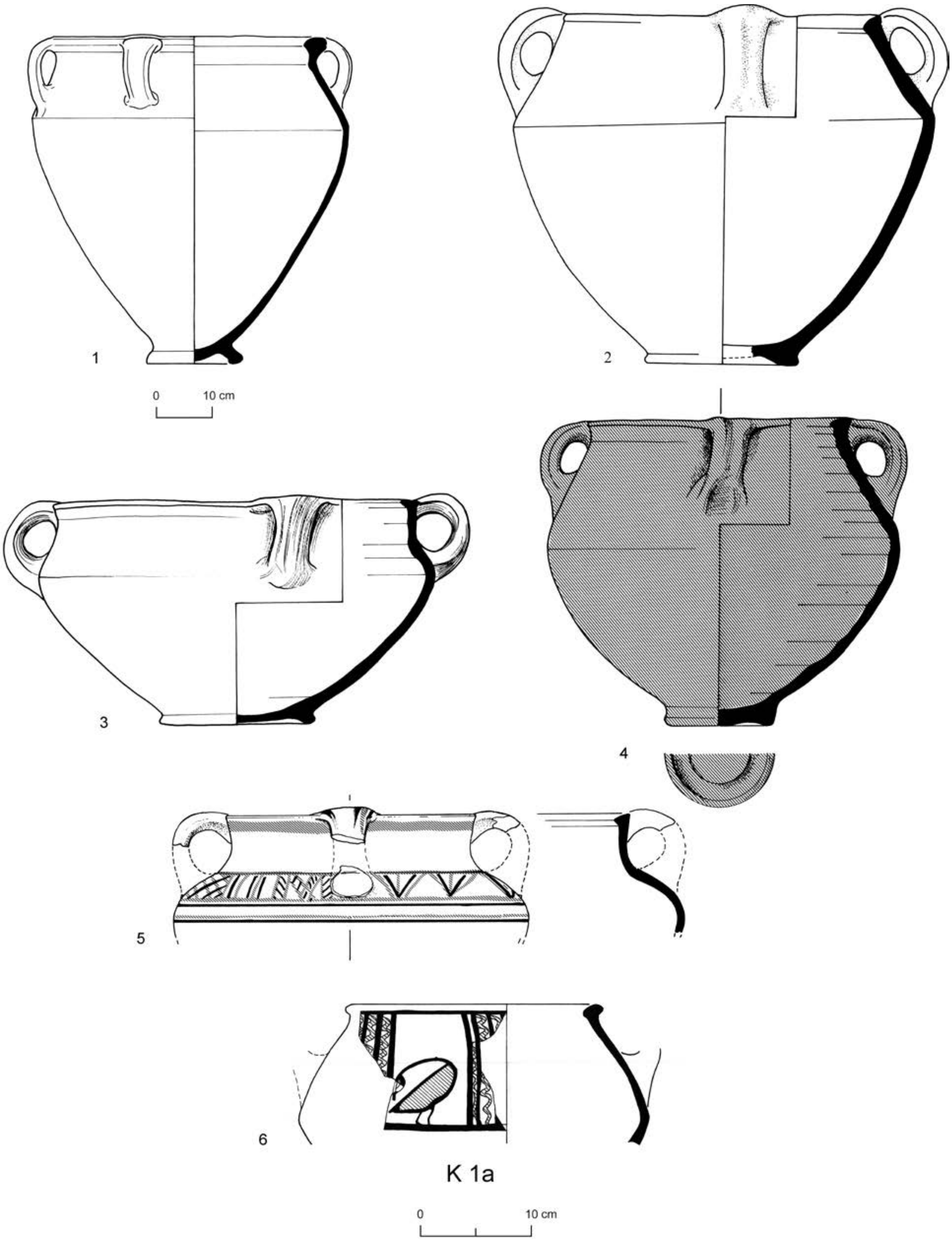

Fig. 3.111. Ceramic Type Series: kraters

Fig. 3.112. Type Series: Kraters (K, continued)

No.	Type	Remarks
1	K1b	= Fig. 3.55:3
2	K1b	= Fig. 3.102:8 (without painted decoration)
3	K2a	= Fig. 3.99:1
4	K2b	= Fig. 3.44:10
5	K3	Reg. no. 13514/5, L3127, Phase Y7, Stratum VI (see Fig. 3.98 for other ceramics from this context)
6	K3	= Fig. 3.104:4
7	K4a	= Fig. 3.84:6
8	K4b	= Fig. 3.67:9
9	K5	= Fig. 3.34:3

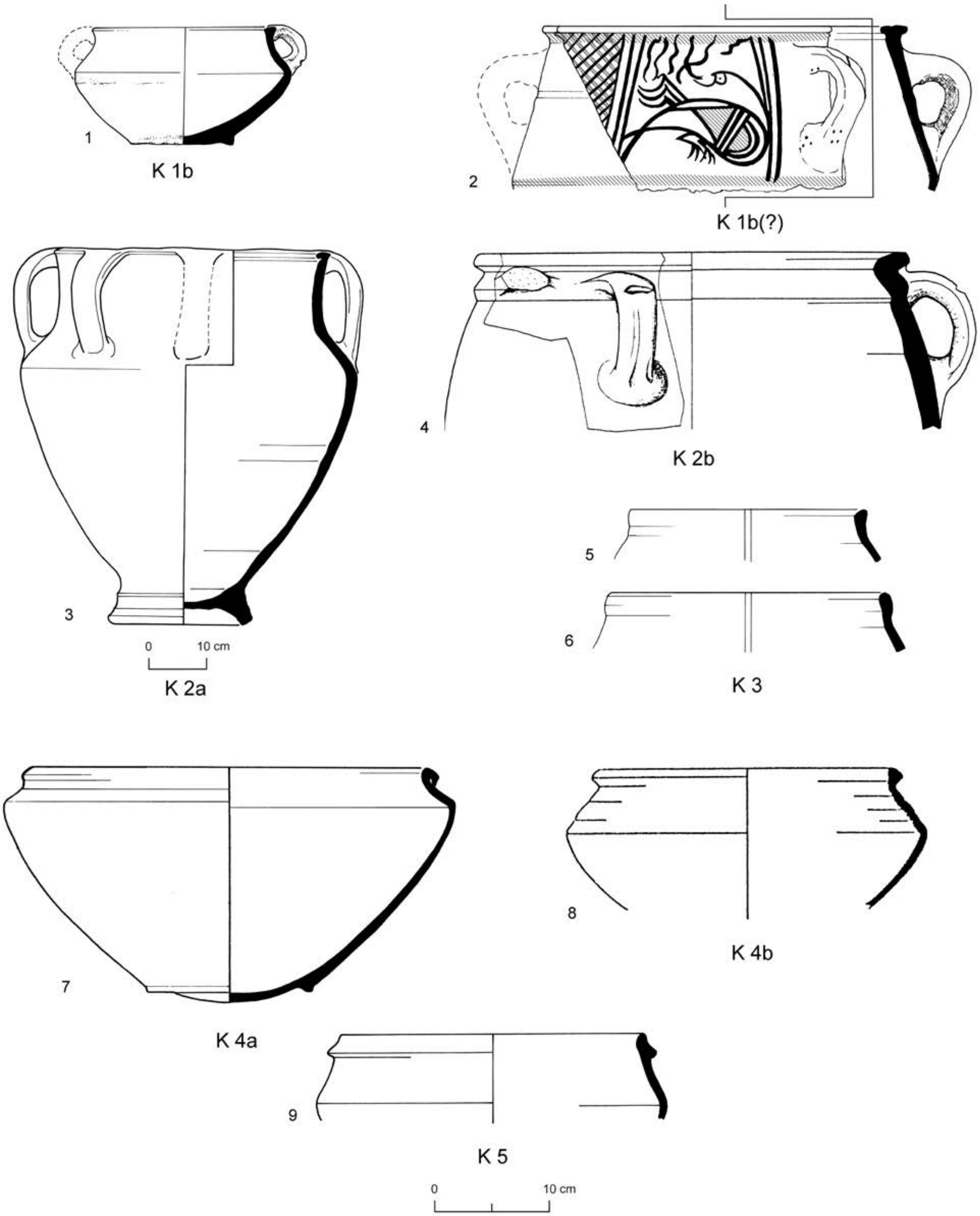

Fig. 3.112. Ceramic Type Series: kraters

Fig. 3.113. Type Series: Cup & Saucer (C&S), Lamp & Bowl (L&B), Tripod Mug (TM), Perforated Goblet (Gperf), Strainer (STR), Lamps (L) and Baking Trays (BT)

No.	Type	Remarks
1	C&S	= Fig. 3.63:7
2	L&B	= Fig. 3.56:6
3	TM	Reg. no. 12655, Locus 2367, Stratum IVA
4	Gperf	= Fig. 3.73:3
5	STR	= Fig. 3.75:3
6	L	= Fig. 3.30:2
7	L	= Fig. 3.51:12
8	L	= Fig. 3.100:3
9	BTa	= Fig. 3.29:12
10	BTb	= Fig. 3.51:9
11	BTc	= Fig. 3.76:5
12	BTe	= Fig. 3.64:7

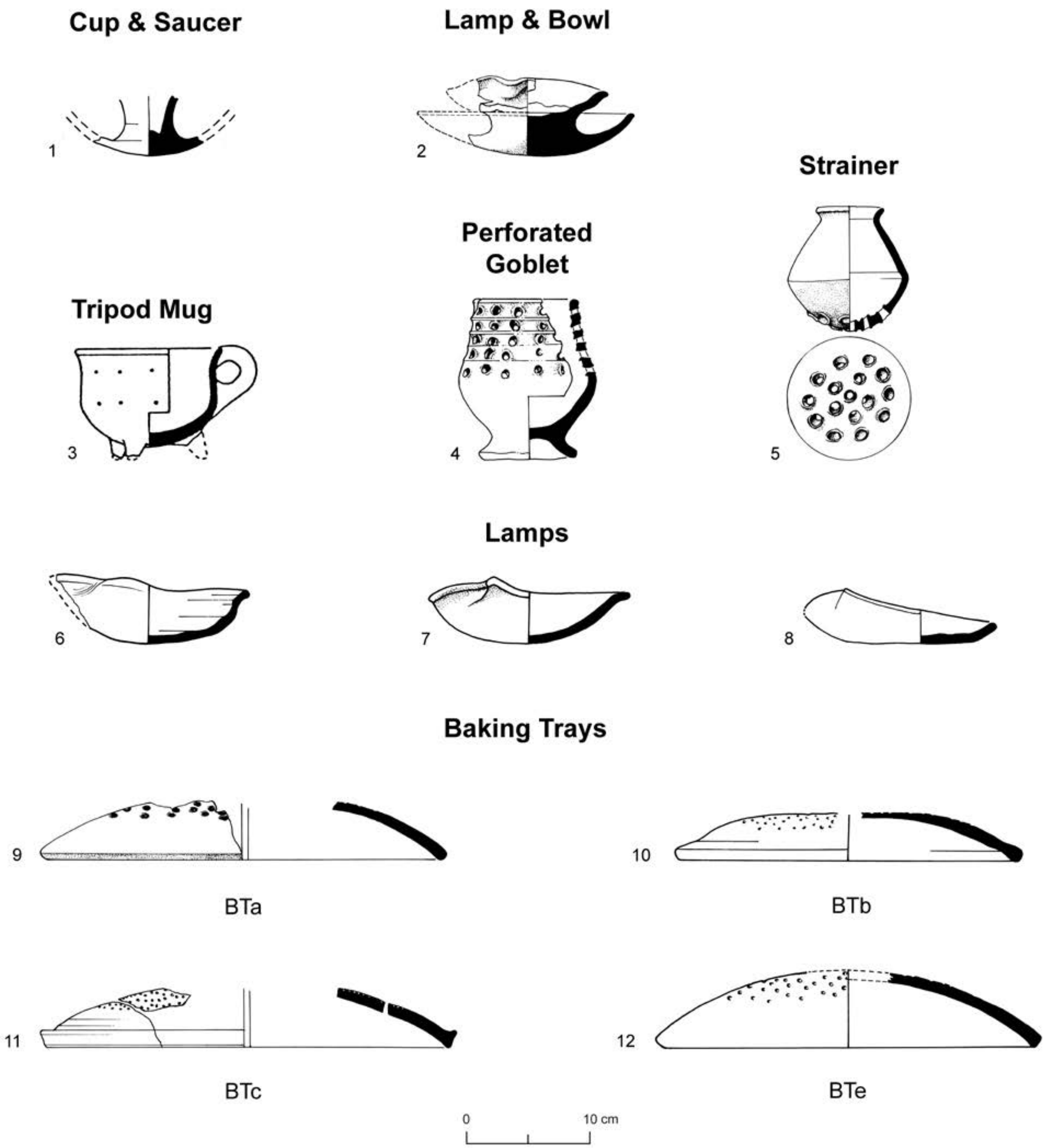

Fig. 3.113. Ceramic Type Series: cup & saucer, lamp & bowl, tripod mug, perforated goblet, strainer, lamps and baking trays

Fig. 3.114. Type Series: Cooking Pots (CP), Large and Small Forms

No.	Type	Remarks
1	CP2a2	= Fig. 3.105:1; photo: Fig. 3.6a
2	CP2b1	= Fig. 3.52:8
3	CP3b4	= Fig. 3.67:8; photo: Fig. 3.7b
4	CP3a1	Reg. no. 1052/1, Locus 204, Phase B7, Stratum IVA
5	CP2a2	= Fig. 3.105:2
6	CP2b2	Reg. no. 6211/1, Locus 429, Phase B9, Stratum VA (=L431)
7	CP2b1	= Fig. 3.59:1
8	CP2b2	= Fig. 3.105:3

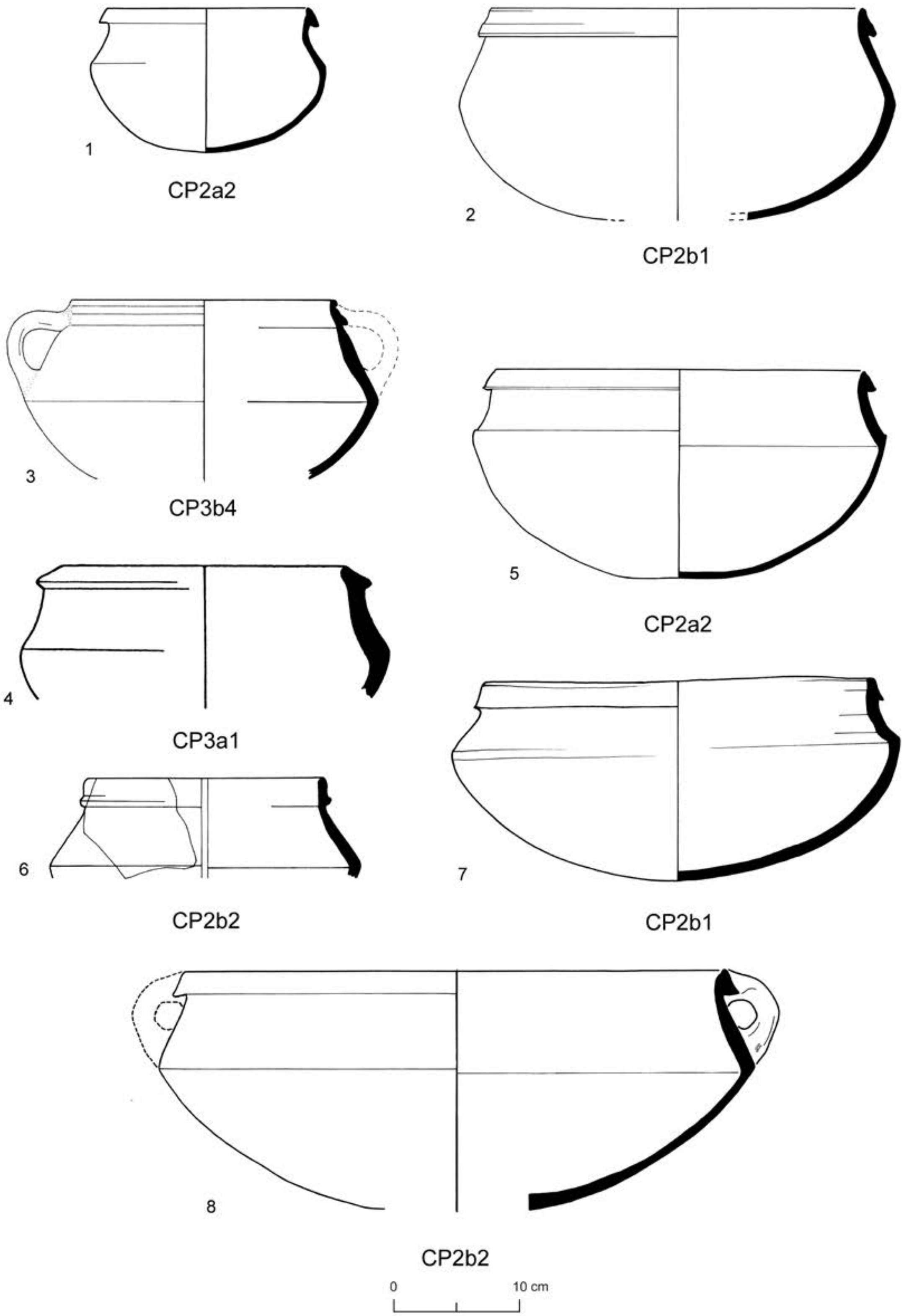

Fig. 3.114. Ceramic Type Series: cooking pots

Fig. 3.115. Type Series, Cooking Pots (CP, continued)

No.	Type	Remarks
1	CP1a2	= Ben-Dov 2011:Fig. 28:4
2	CP1b3	= Ben-Dov 2011:Fig. 152:3
3	CP1a3	= Fig. 3.82:6
4	CP2a1	= Fig. 3.45:7
5	CP2a1	Reg. no. 7028/6, Locus 1018; Phase Y3b. Stratum IVB
6	CP2a2	Biran 1994: Fig. 98:7, Stratum V
7	CP2a2	= Fig. 3.32:8
8	CP2a3	Compare with Figs. 3.98:2; 3.105:1
9	CP2a4	= Fig. 3.81:12
10	CP2b1	= Fig. 3.44:13
11	CP2b2	Reg. no. 23398/2, L7064 (=L7065), Phase B9-10, Stratum V
12	CP2b3	= Fig. 3.101:1

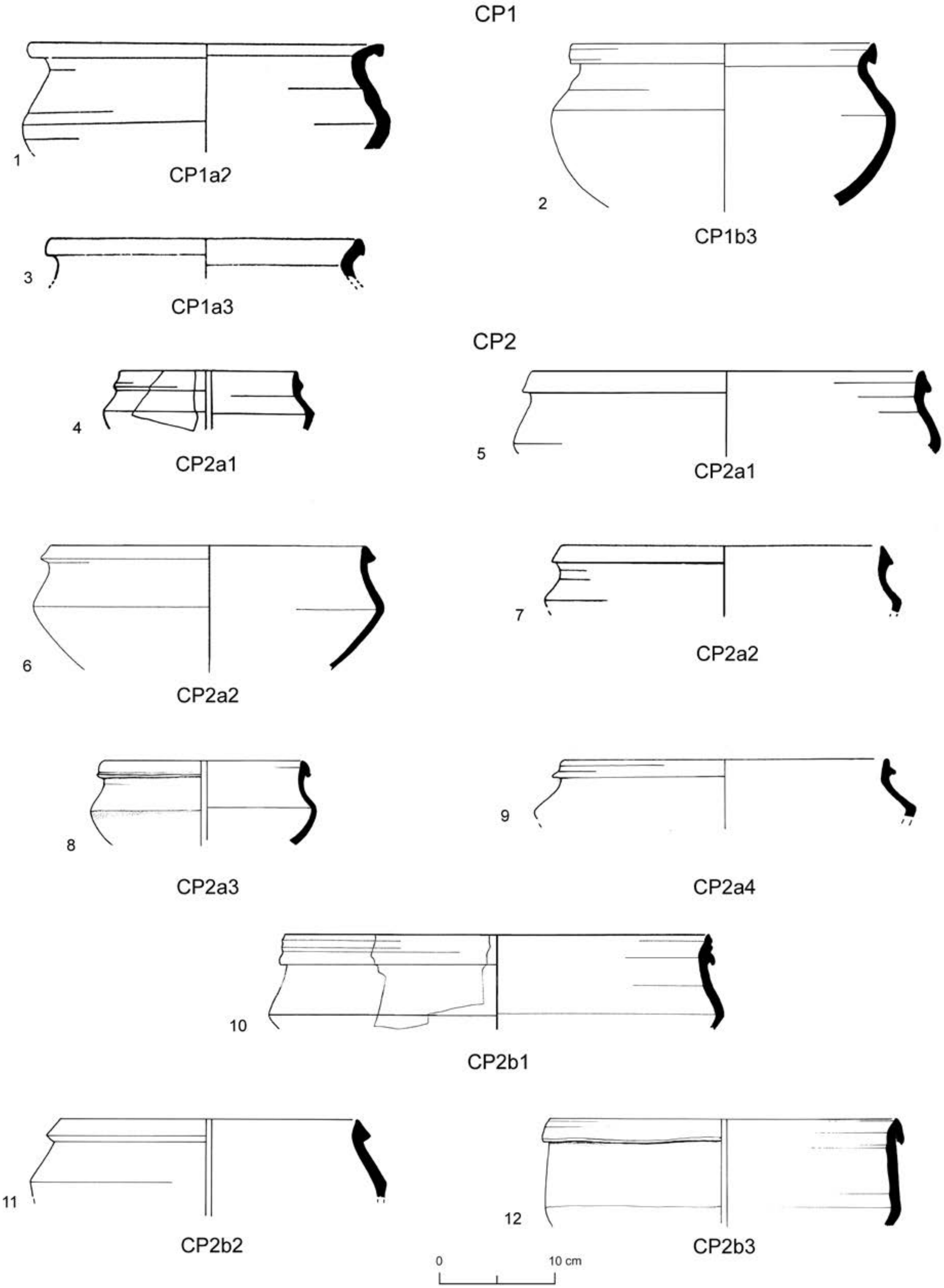

Fig. 3.115. Ceramic Type Series: cooking pots

Fig. 3.116. Type Series: Cooking Pots (CP, continued)

No.	Type	Remarks
1	CP2b5	= Fig. 3.87:2
2	CP3a1	= Fig. 3.106:9
3	CP3a3	= Fig. 3.32:12
4	CP3b1	Reg. no. 1193/1, Locus 254, Phase B7, Stratum IVA
5	CP3b1a	= Fig. 3.44:3
6	CP3b2	Reg. no. 6766/3, Locus 464, Phase M8, Stratum IVA
7	CP3b4	= Fig. 3.56:3
8	CP3b2b	= Fig. 3.49:3
9	CP3b4	= Fig. 3.67:8
10	CP3b5	= Fig. 3.74:15

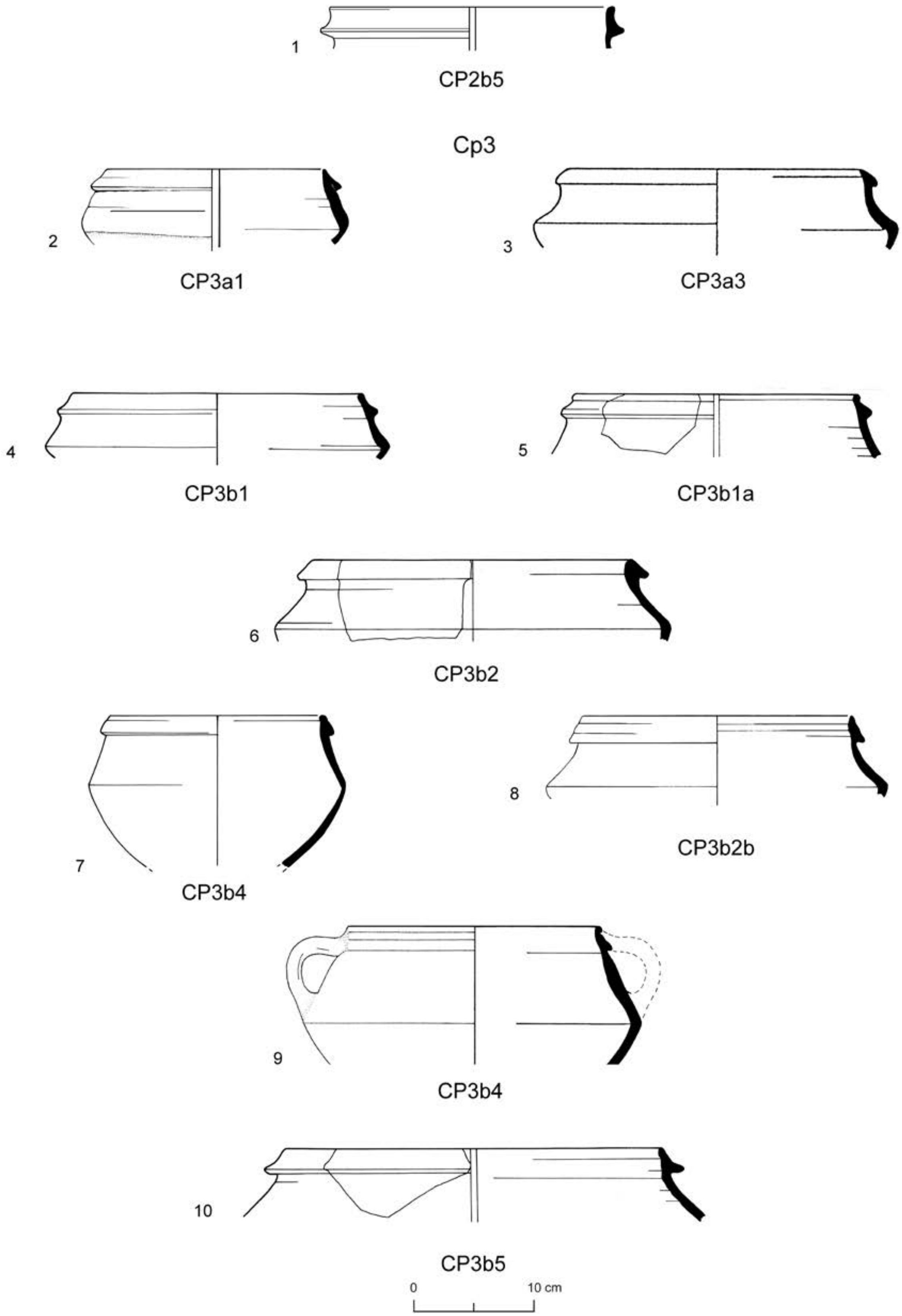

Fig. 3.116. Ceramic Type Series: cooking pots

Fig. 3.117. Type Series: Cooking Pots (CP, continued)

No.	Type	Remarks
1	CP3c	Reg. no. 6689/6, L465, Phase M8, Stratum IVA
2	CP3c	Reg. no. 9329/2, L512, Phase B6-7, Stratum IVA (cf. Fig. 3.67:7). Lower section of drawing removed.
3	CP3d	Reg. no. 6732/1, Locus 478a, Phase M8, Stratum IVA
4	CP3d	Reg. no. 4144/2, Locus 612 (Area H), Stratum IVA
5	CP3e	Reg. no. 23033/1, Locus 4609, Stratum VIIA2. For ceramic context see Ben-Dov 2011: Fig. 40.

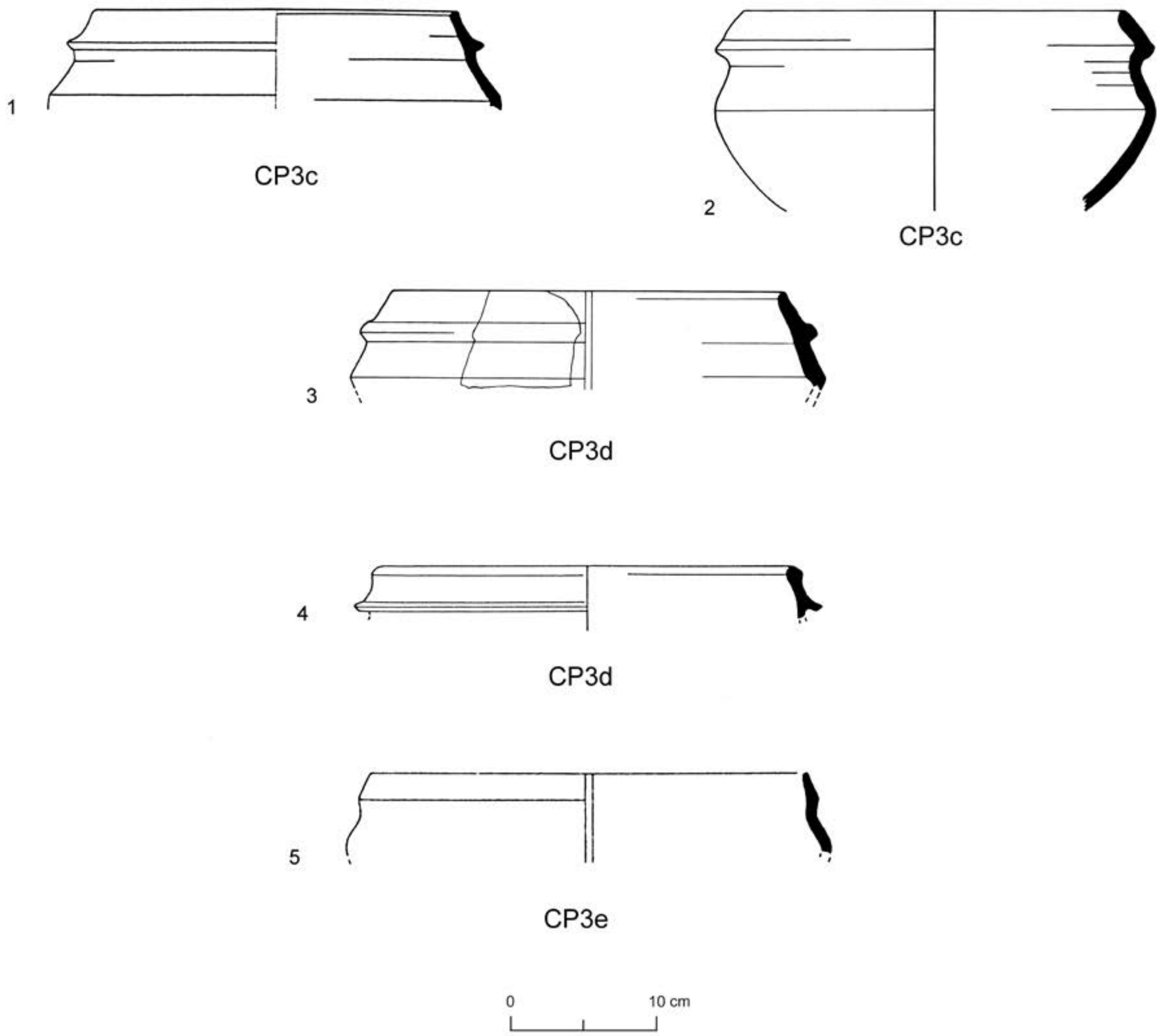

Fig. 3.117. Ceramic Type Series: cooking pots

Fig. 3.118. Type Series: Collared Rim Pithoi (PCR)

No.	Type	Remarks
1	PCR	= Fig. 3.45:11; photo: Fig. 3.10b
2	PCR	= Fig. 3.38:1; photo Fig. 3.9b
3	PCR	= Fig. 3.49:12
4	PCR	Reg. no. 23581/1, Locus 7100 (=7065); for ceramic context see Fig. 3.54:1-6
5	PCR	= Fig. 3.25:15
6	PCR	= Fig. 3.52:10
7	PCR	Reg. no. 1027/10, Locus 201, Square G19
8	PCR	Reg. no. 23505, Locus 7083; for ceramic context se Fig. 3.29:3-9
9	PCR	= Fig. 3.30:4
10	PCR	= Fig. 3.44:8

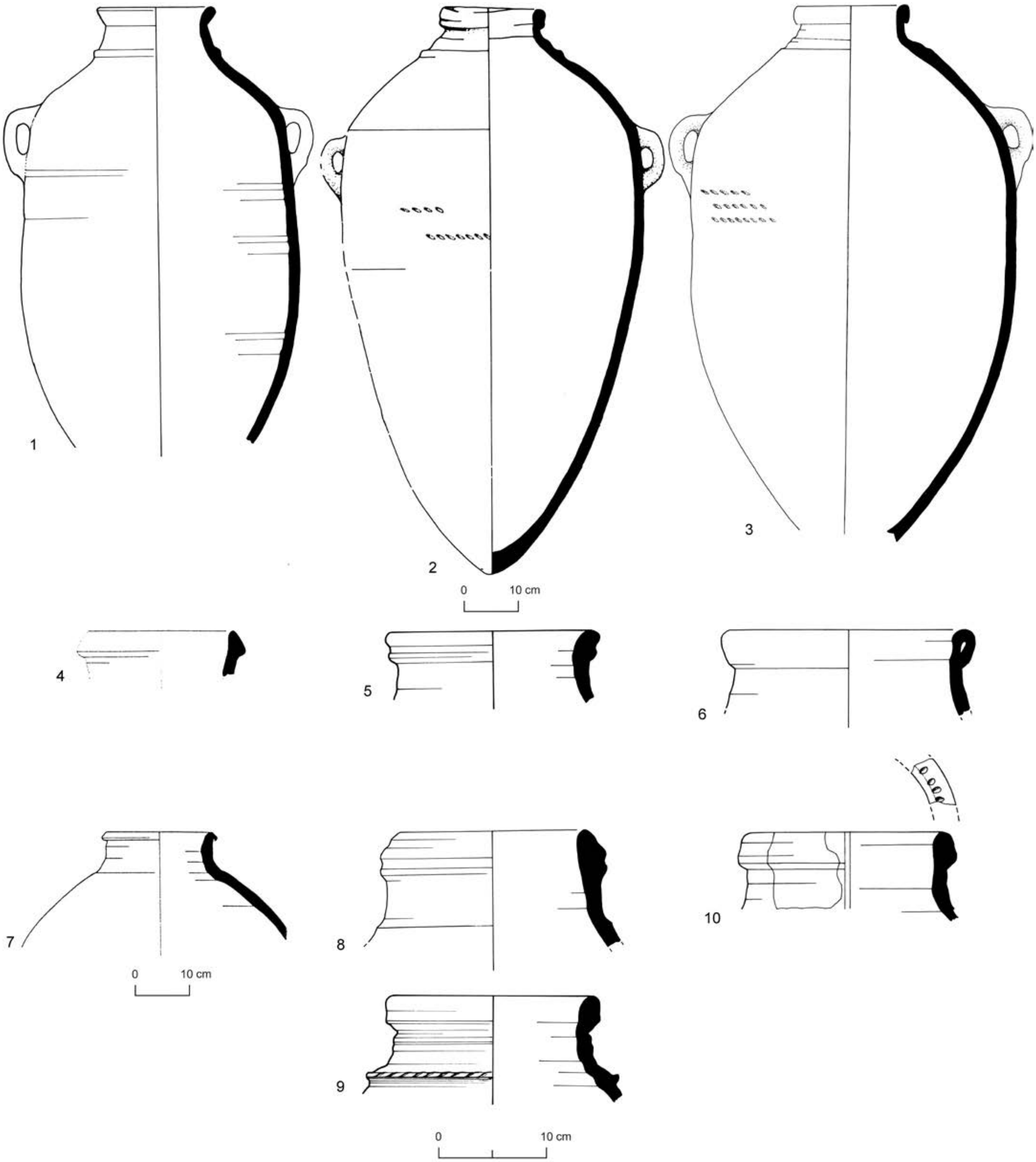

Fig. 3.118. Ceramic Type Series: collared rim pithoi

Fig. 3.119. Type Series: Galilean Pithoi (PG)

No.	Type	Remarks
1	PG1	= Fig. 3.34:7; photo: Fig. 3.12a
2	PG2	= Fig. 3.32:2; photo: Fig. 3.12d
3	PG3	= Fig. 3.49:11
4	PG1	= Fig. 3.64:1
5	PG1	= Fig. 3.44:4
6	PG	= Fig. 3.75:7; could also be PWB
7	PG1	= Fig. 3.71:11
8	PG1	= Fig. 3.99:5; photo: Fig. 3.12c

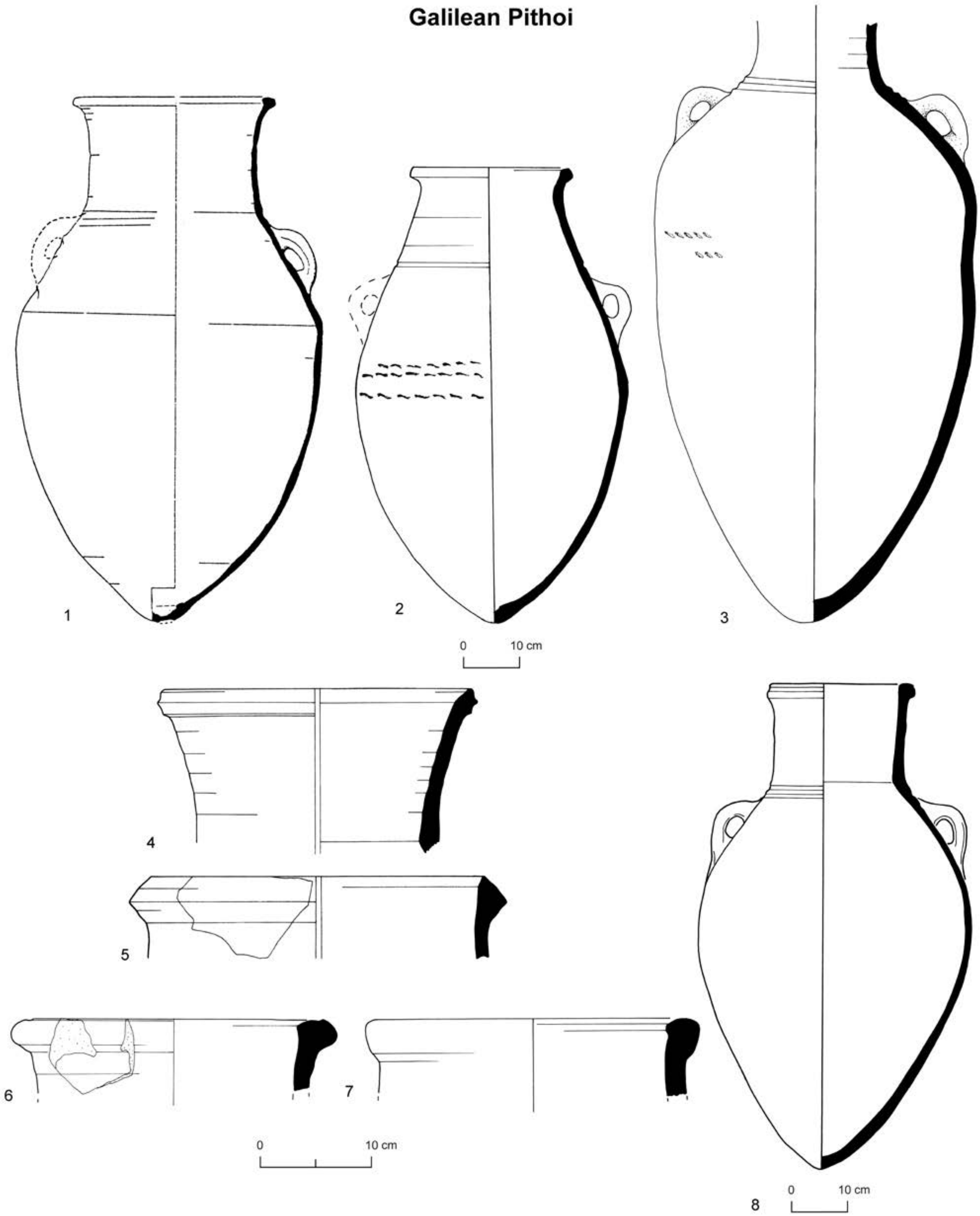

Fig. 3.119. Ceramic Type Series: Galilean pithoi

Fig. 3.120. Type Series: Wavy Band Pithoi (PWB)

No.	Type	Remarks
1	PWB	= Fig. 3.70:6; photo: Fig. 3.13a
2	PWB	Reg. no. 6178, Locus 417, Phase B7, Stratum IVA

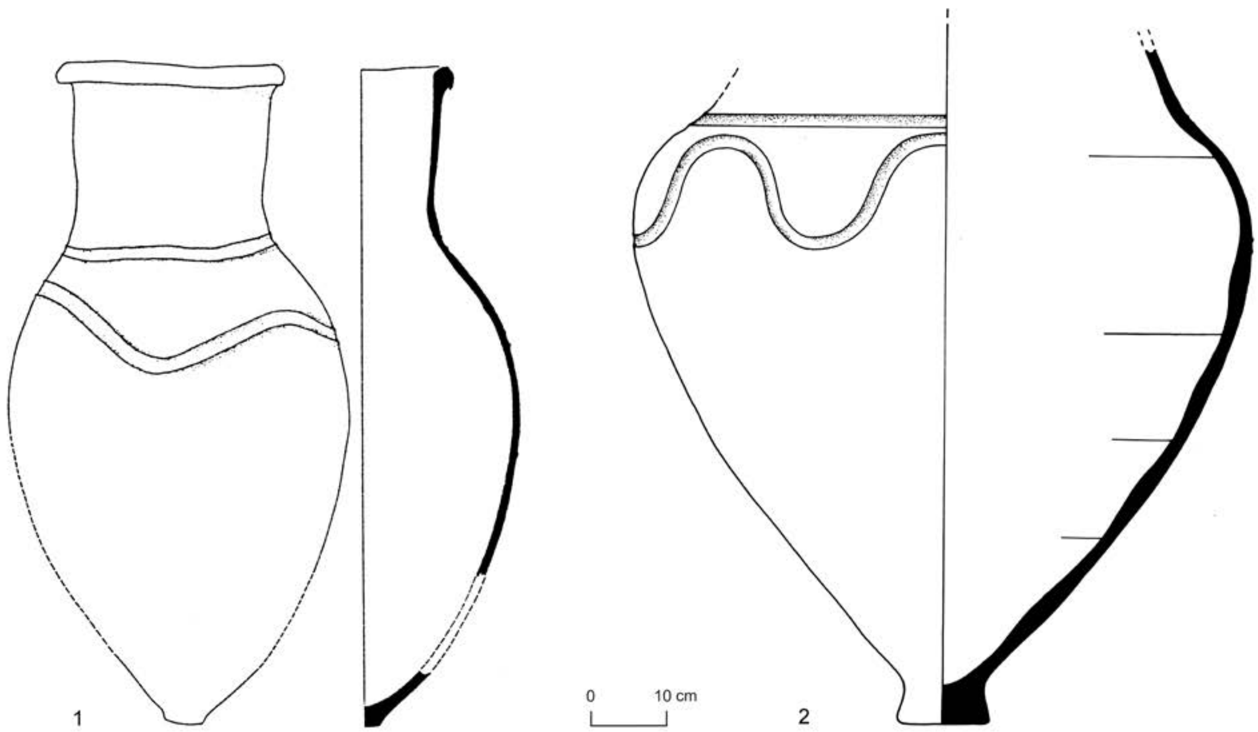

Fig. 3.120. Ceramic Type Series: wavy band pithoi

Fig. 3.121. Type Series: Store Jars (SJ)

No.	Type	Remarks
1	SJ1	= Fig. 3.101:9; photo: Fig. 3.14b
2	SJ1	= Fig. 3.99:3; photo: Fig. 3.14d
3	SJ2	= Fig. 3.45:6
4	SJ4a	= Fig. 3.31:3

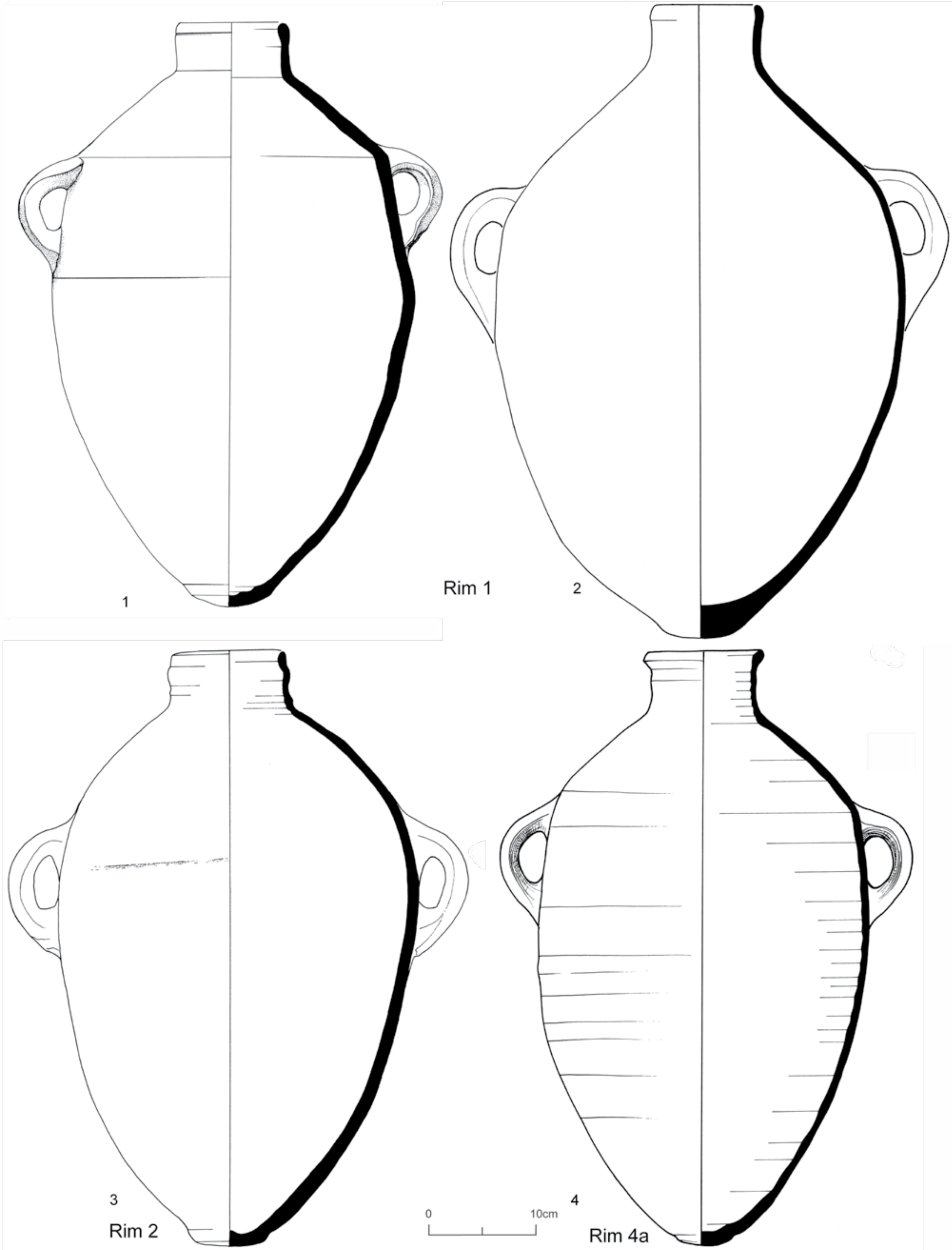

Fig. 3.121. Ceramic Type Series: storage jars

Fig. 3.122. Type Series: Storage Jars (SJ, continued)

No.	Type	Remarks
1	SJ1	Reg. no. 544/1, Locus E18, Stratum III-IVA
2	SJ2	= Fig. 3.36:3; photo: Fig. 3.15b
3	SJ2	Reg. no. 18653, Locus 4385 (= 690), Phase B9, Stratum VA
4	SJ3	Reg. no. 7059/5, Locus 1011, Phase Y2, Stratum IVA
5	SJ4a	
6	SJ4b	= Fig. 3.32:7
7	SJ4b	= Fig. 3.49:9; photo: Fig. 3.15c
8	SJ5	= Fig. 3.26:2

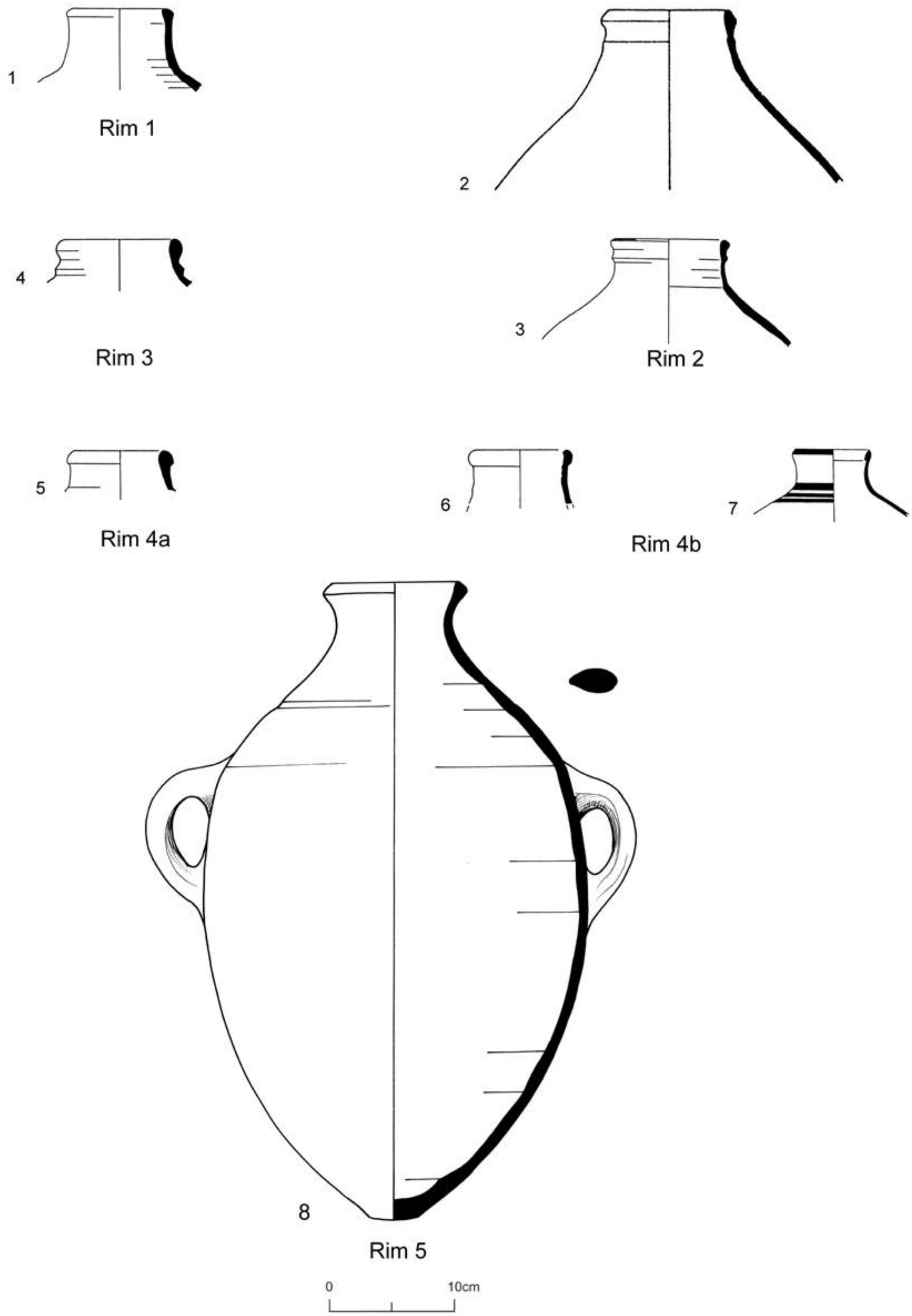

Fig. 3.122. Ceramic Type Series: storage jars

Fig. 3.123. Type Series: Amphora (AM), Jugs (J)

No.	Type	Remarks
1	AM	= Fig. 3.61:6 (different version); photo: Fig. 3.16c
2	J1a	= Fig. 3.59:5
3	J1a	= Fig. 3.69:6
4	J1a	= Fig. 3.43:6; photo: Fig. 3.17f
5	J1b	Context now unknown
6	J2a	= Fig. 3.98:10; Photo: 3.18b
7	J1c	= Fig. 3.105:4
8	J2b	= Fig. 3.68:2

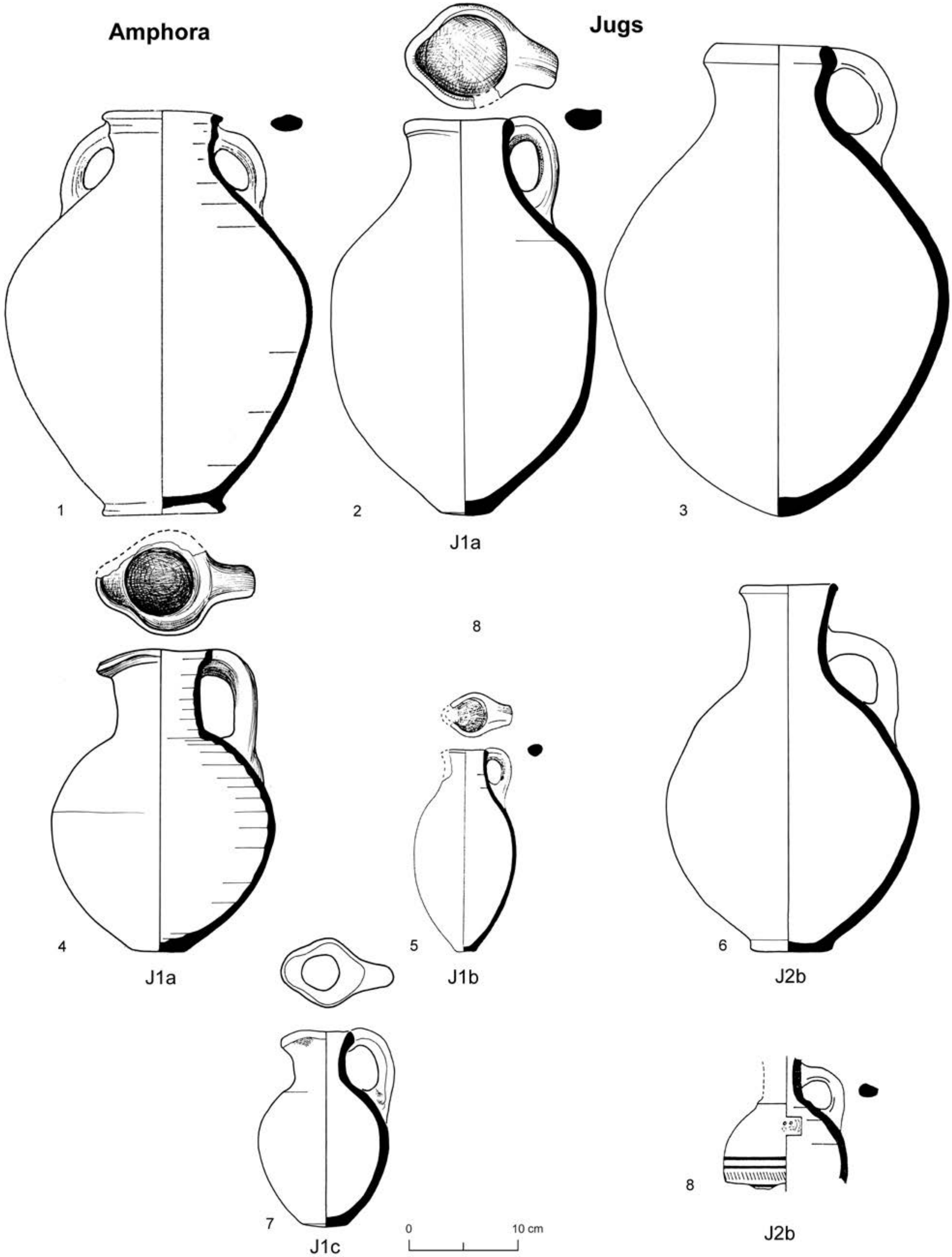

Fig. 3.123. Ceramic Type Series: amphora and jugs

Fig. 3.124. Type Series: Jugs (J, continued)

No.	Type	Remarks
1	J3	= Fig. 3.28:1
2	J4	= Fig. 3.63:1
3	J5	= Fig. 3.98:5; Photo Fig. 3.18c
4	J6	= Fig. 3.98:6; Fig. 3.18d
5	J7	= Fig. 3.100:1; Fig. 3.126:4
6	FJ/GJ	Reg. no. 18988, Locus 2506, Phase T13, Stratum IVA
7	FJ/GJ	= Fig. 3.68:3
8	Jtd	= Fig. 3.65:2
9	Jtd	Reg. no.1191, L254, Phase B7, Stratum IVA; IAA 66-1393
10	Jtd	= Fig. 3.98:7
11	Jtg	= Fig. 3.60:1

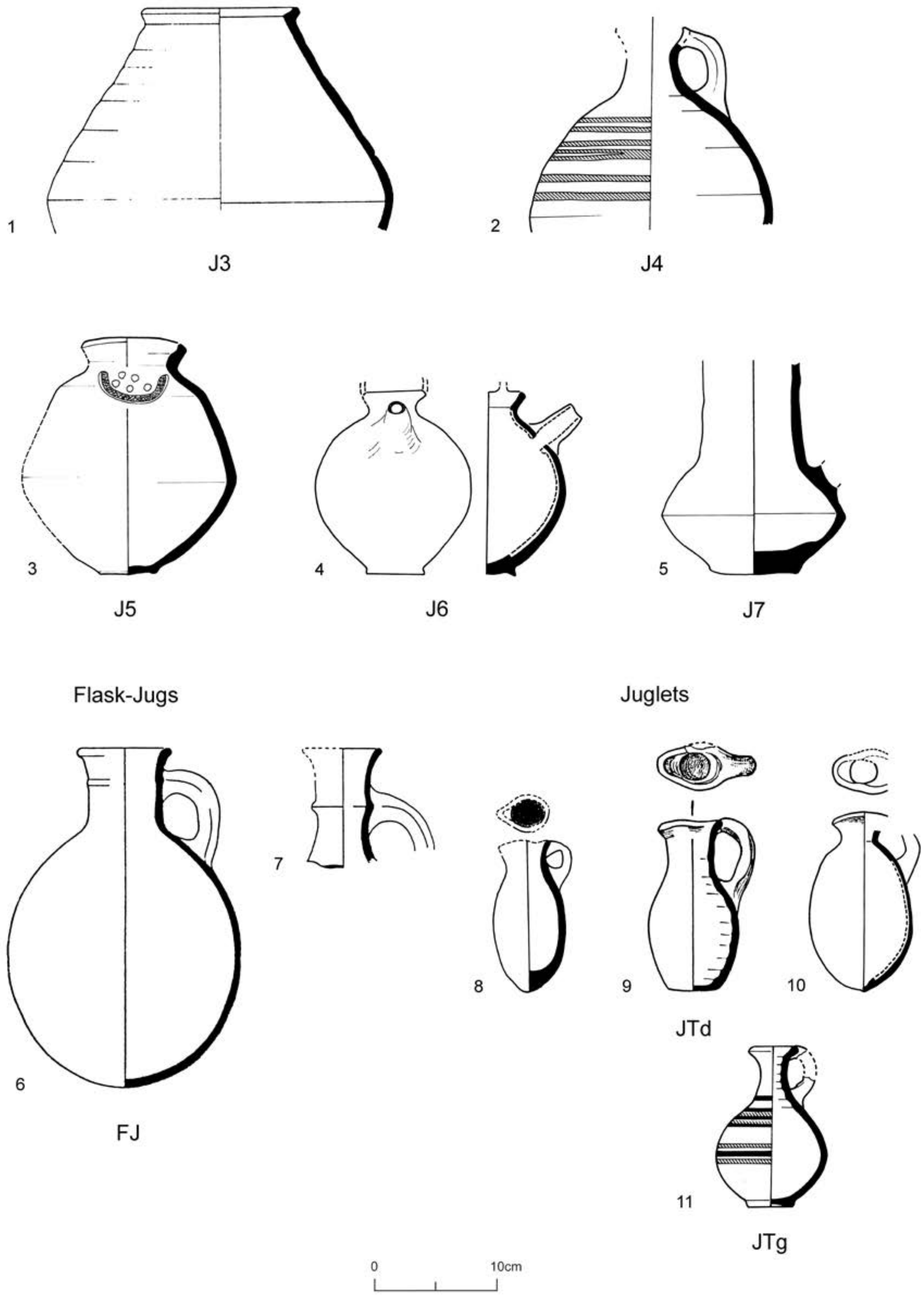

Fig. 3.124. Ceramic Type Series: jugs and juglets

Fig. 3.125. Type Series: Flasks (FL) and Pyxides (PYX)

No.	Type	Remarks
1	FL1	= Fig. 3.36:8
2	FL2	= Fig. 3.87:7; photo: Fig. 3.21b
3	FL3	= Fig. 3.98:9
4	FL4	= Fig. 3.105:8; photo: Fig. 3.21c
5	PYX	= Fig. 3.29:2
6	PYX	= Fig. 3.48:9; photo: Fig. 3.22d
7	PYX	= Fig. 3.86:1; photo: Fig. 3.22g

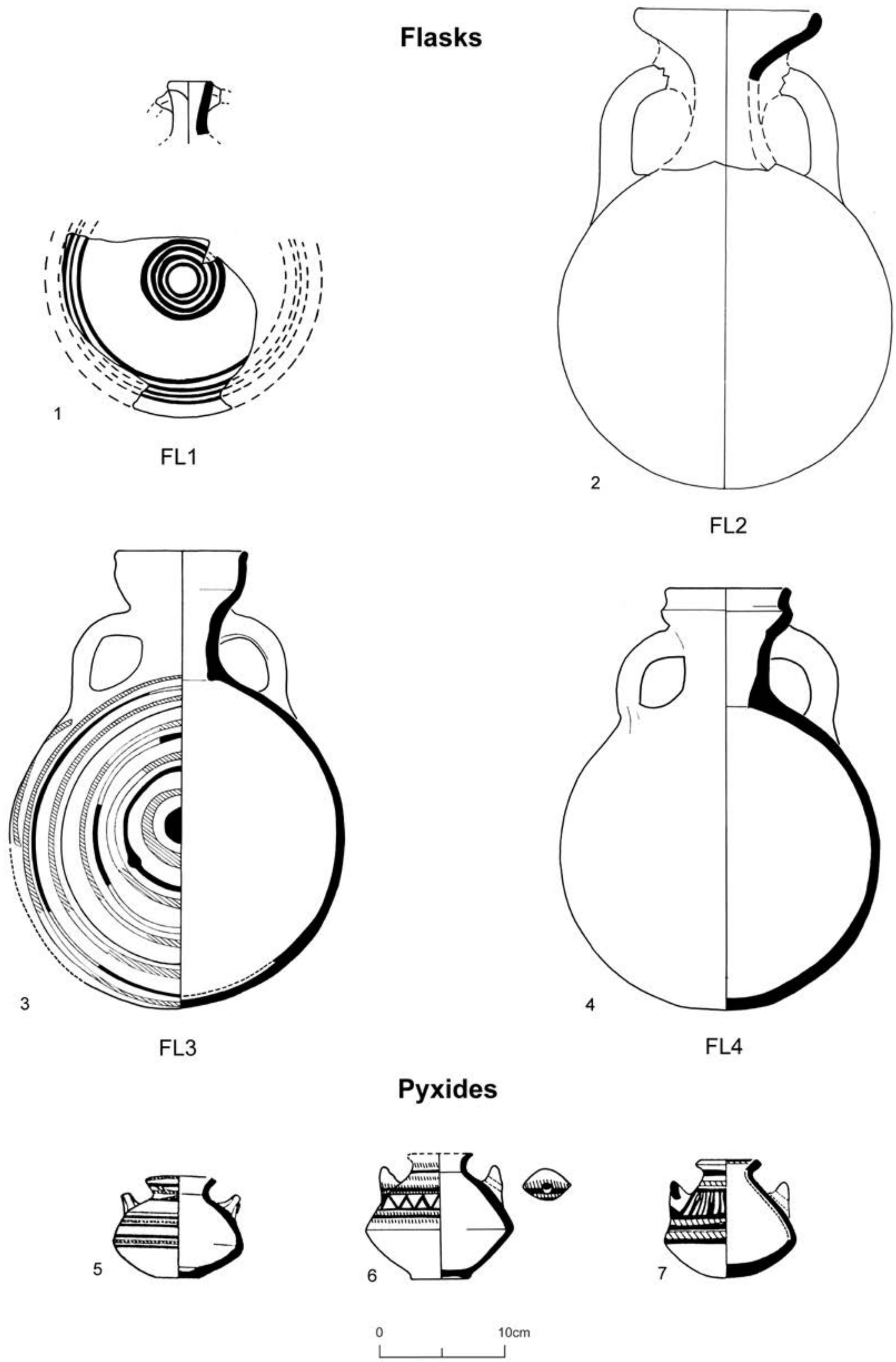

Fig. 3.125. Ceramic Type Series: flasks and pyxides

Fig. 3.126. Type Series: Egyptian-style vessels

No.	Type	Stratum	Remarks
1	Bp1a	VI	= Fig. 3.33:5
2	Neckless storage jar (K/Jar)	VI	= Fig. 3.33:20
3	Neckless storage jar with rolled rim	V	= Fig. 3.104:7
4	Hybridized small ovoid to drop-shaped jar (J7)	VI	= Fig. 3.100:1; Fig. 3.124:5
5	CJ	VIIA1	= Fig. 3.97:3
6	CJ	VIIA1	= Fig. 3.25:12
7	CJ	VI	= Fig. 3.101:6
8	CJ	VI	= Fig. 3.98:4
9	CJ	VI	= Fig. 3.89:7
10	Hybridized neckless jar (J3)	V	= Fig. 3.28:1; Fig. 3.124:1
11	SJ/1	VIIA1	= Fig. 3.52:2
12	BB (Beer jar)	VI	=Fig. 3.38:3

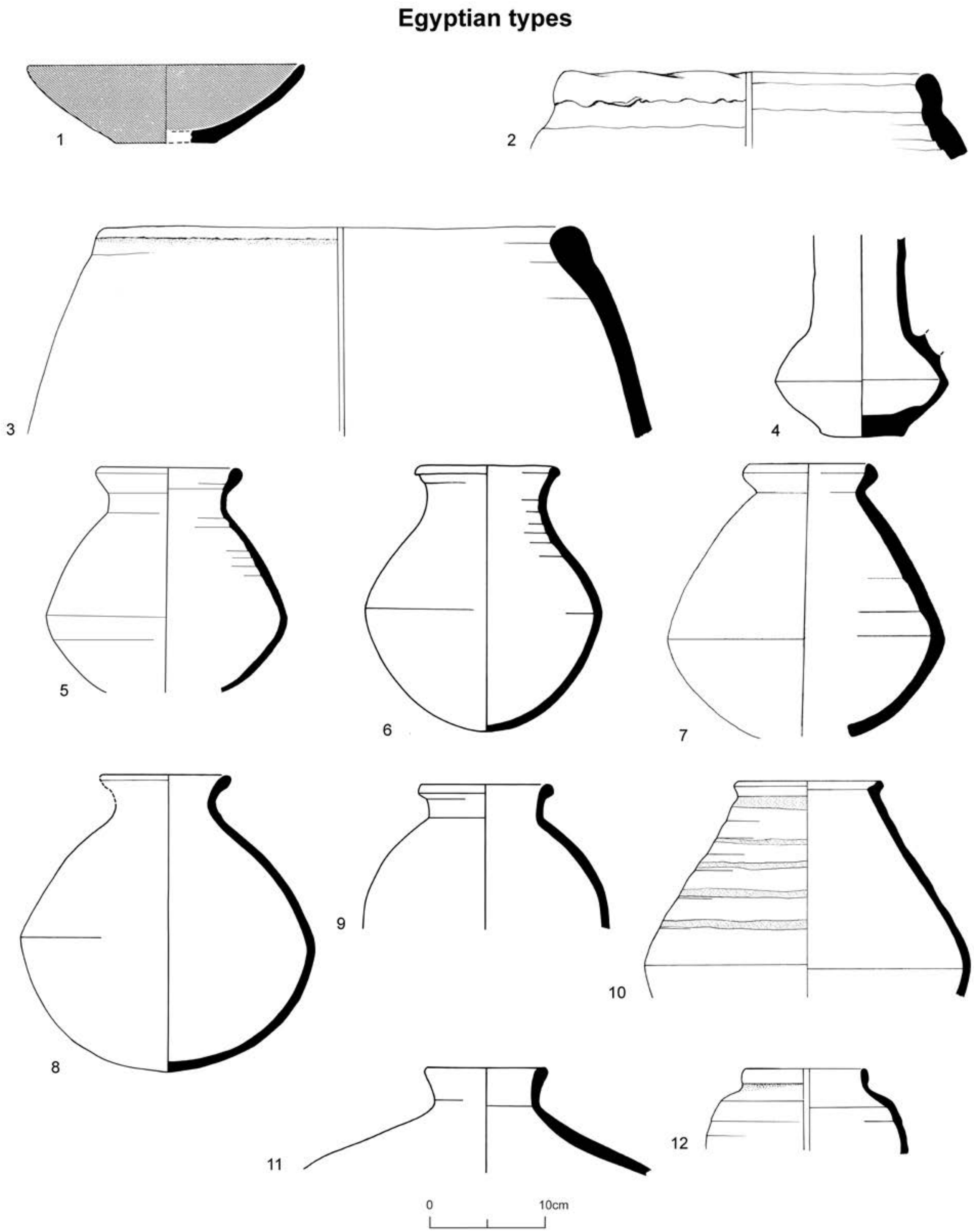

Fig. 3.126. Ceramic Type Series: Egyptian-style types

Fig. 3.127. Metallurgy ceramics: crucibles (CR) and bellows pipes (BN; after Ben-Dov 2018: Fig. 31.9)

No.	Type	Reg. no.	Locus	Phase	Stratum	Context
1	Crucible, pinched spout	24090/16	7015	B8	IVB	Installations in courtyard
2	Crucible, pinched spout	24090/15	7015	B8	IVB	Installations in courtyard
3	Crucible, pinched spout	24102/6	7015	B8	IVB	Installations in courtyard
4	Crucible, pinched spout	9508	591	B9	VA	Inside installation in room or courtyard; = Fig. 3.47:3
5	Crucible, pinched spout	23404/8	7062	B8	IVB	Chamber on courtyard; = Fig. 3.73:1
6	Crucible, pinched spout	23372/2	7062	B8	IVB	Chamber on courtyard; = Fig. 3.73:2
7	Crucible, pinched spout	10529/2	1204	B10	VB	Installation in room or court-yard; = Fig. 3.50:9
8	Crucible, notched spout	23443/1	7067	B9-10	V	Courtyard; = Fig. 3.54:10
9	Bellow pipe, nozzle tip	23451/3	7061	B9-10	V	Courtyard
10	Bellow pipe, nozzle tip	18059/17	4202	B8, B12	IVB, VIIA1	Courtyard
11	Bellow pipe, nozzle tip	23451/4	7061	B9-10	V	Courtyard; = Fig. 3.52:9
12	Bellow pipe, nozzle tip	23453/4	7068	B9-10	V	Furnace; = Fig. 3.54:11
13	Bellow pipe, nozzle tip	23981	7174	B11-12	VI-VIIA1	Furnace in courtyard
14	Bellow pipe, pipe end	10480	1204	B10	VB	Installation in room or court-yard; = Fig. 3.50:10
15	Bellow pipe, pipe end	23776/1	7135 (=7131)	B9-10	V	Installations in courtyard

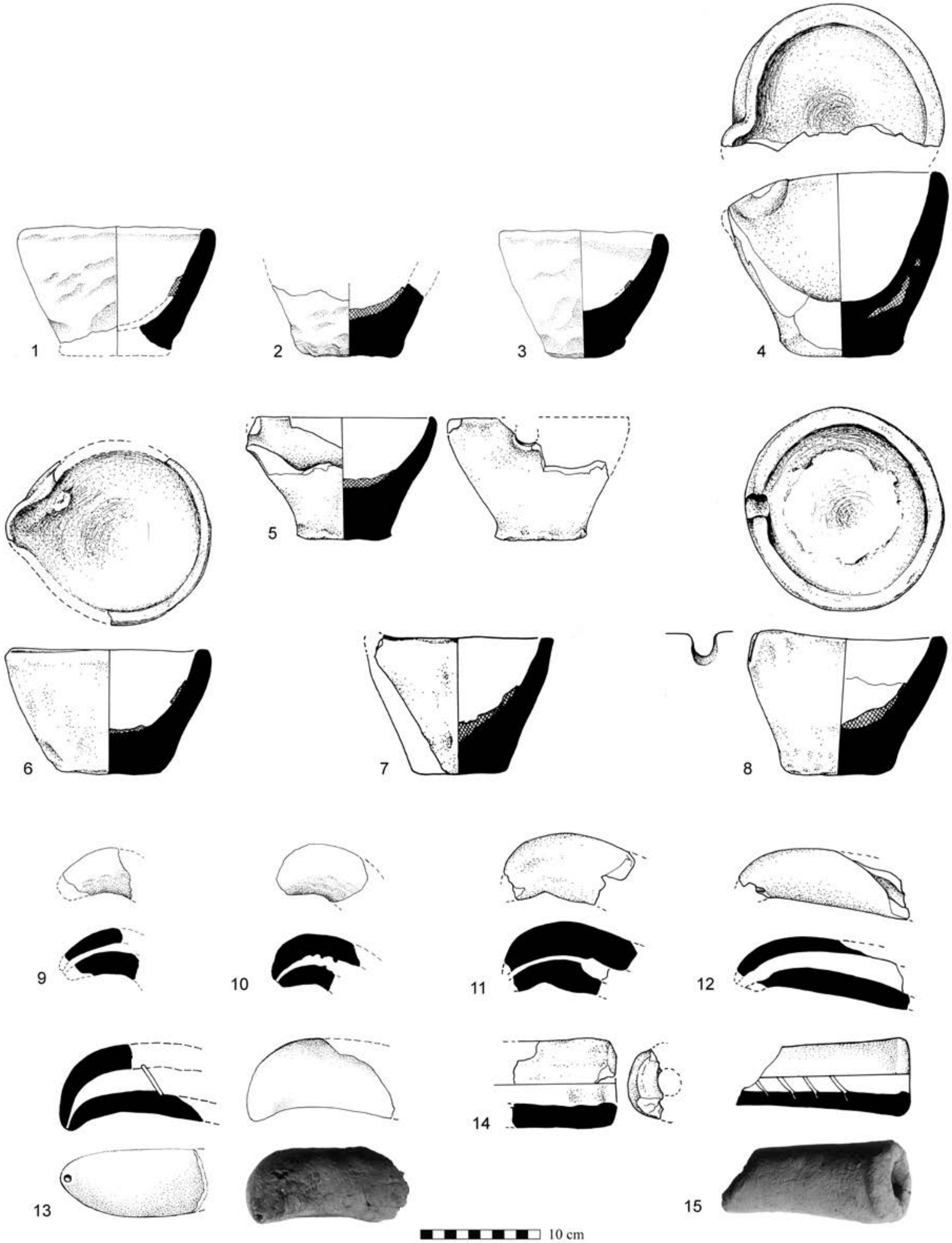

Fig. 3.127. Ceramic Type Series: crucibles and bellow pipes

Fig. 3.128. Type Series: pot bellows (PB; after Ben-Dov 2018: Fig. 31.10, with some changes)*

No.	Reg. no.	Locus	Phase	Stratum	Remarks
1	23403+24610/1	7061+7179	B10-11	V-VI	Pit in courtyard; see Fig. 3.52 for other items in context
2	23568/5	7099	B9-10	V	Installations in courtyard; see Fig. 3.56 for other items in context
3	23713/3	7129	B9-10	V	Installations in courtyard
4	23810/1	7142	B7	IVA	In matrix of W5616
5	24935/1	7240	B11-12	VI-VIIA1	Shallow pit in Courtyard 4732
6	24416/2	7240	B11-12	VI-VIIA1	Shallow pit in Courtyard 4732
7	23448/1	7060	B9-10	V	Installation in courtyard; see Fig. 3.38 for other items in context
8	23820/1	7140	B11	VI	Open courtyard, next to sunk pithos and installation niches; ; see Fig. 3.29 for other items in context

* Due to an oversight, none of these illustrations appear together with the rest of the ceramic vessels arranged by locus in Figs. 3.25-3.108.

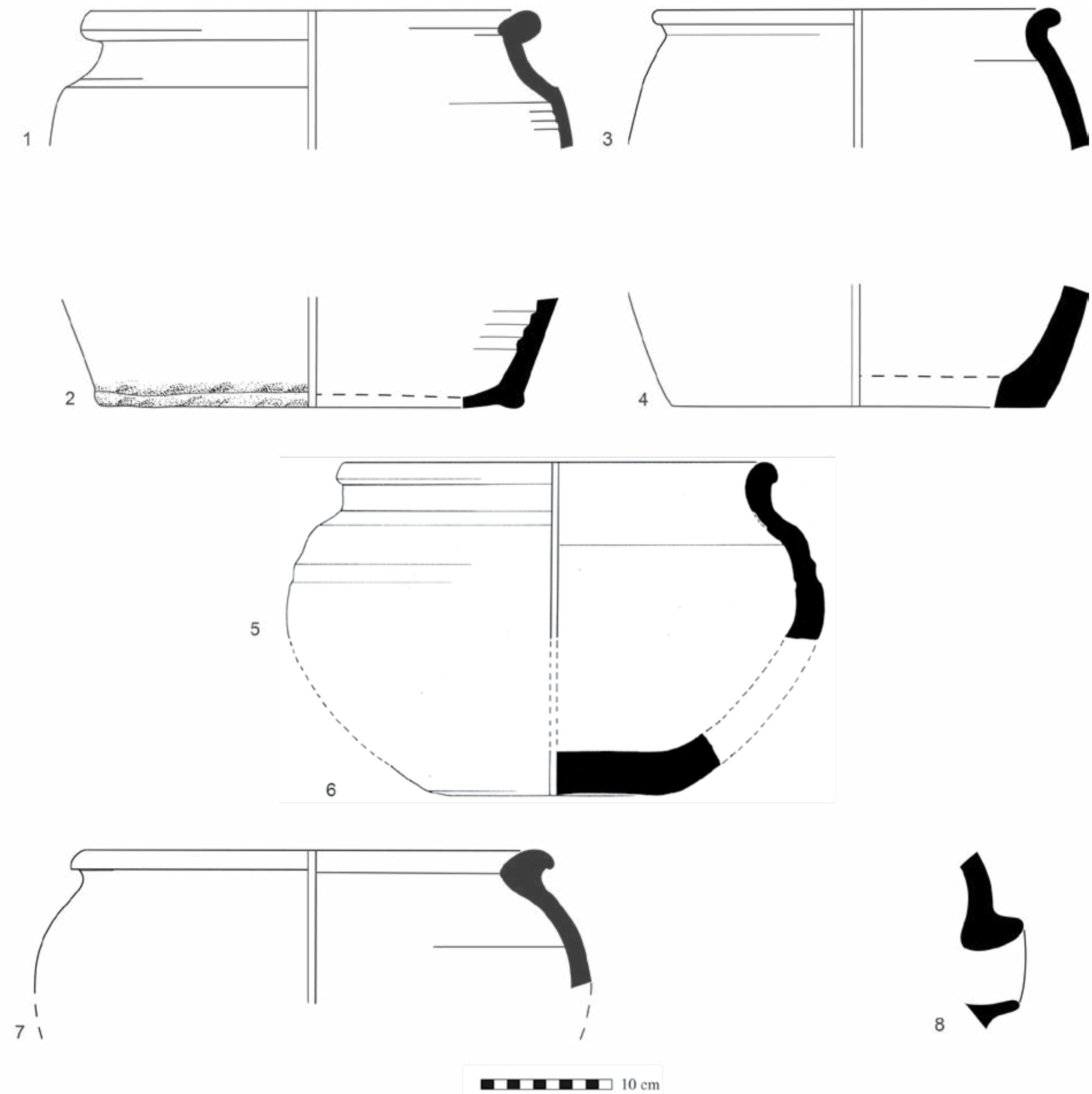

Fig. 3.128. Ceramic Type Series: pot bellows

Fig. 3.129. A scene in Theban Tomb 181 (Tomb of Nebamon and Ipuky, "The Tomb of the Two Sculptors") showing a chalice included as part of the metallurgy process. (Davies 1925: Plates XI and XIII).

CHAPTER 4

NOTES ON THE PHILISTINE, AEGEAN AND CYPRIOT-STYLE DECORATED POTTERY

Alexander Zukerman

This chapter presents and discusses pottery from Iron Age I contexts at Tel Dan that has stylistic connections with contemporary Philistine, Aegean and Cypriot ceramics.[1] The closeness of these connections varies from vessel to vessel; some can be defined as imports from Philistia or Cyprus, while others are essentially local-style products with certain "western" features. Ceramic types that represent an Iron Age I continuation of Late Bronze Age imitations of Aegean imports, such as pyxides, are excluded from this study, since during the Iron Age I these vessels, for all intents and purposes, became an integral part of the local-tradition assemblage, and in this volume they are categorized accordingly (see Ilan, this volume, Chapter 3). Cypriot-style pithoi, with or without wavy band decoration, are also presented by Ilan in this volume (Chapter 3, pp. 113-114), as are Aegean-style figurines (Chapter 15) and a torch (p. 126). Most of the ceramic material in this chapter was first presented and discussed by Ilan (1999), and the current study provides an additional description and analysis.

Catalog

1. Stirrup jar (Figs. 4.1; 4.15:1 = Fig. 3.102:14)

Area Y, Locus P905, Reg. no. 7017/1; Stratum VI?

Fragment of mid-body and shoulder of a globular stirrup jar, with a lower joint of one of the handles still preserved. In the upper part of the sherd, traces of a rounded hole prepared for insertion of the false neck can be seen. This formation technique is typical of stirrup jars produced in Philistia (Dothan and Zukerman 2004: 31-32). The walls are relatively thin (3-4 mm), with a very smooth exterior and interior; the fabric is well-fired and well-levigated, with few inclusions and without a core. The exterior, interior and section all have the same grayish-yellow color.

The decoration of this vessel also resembles that of high-quality Bichrome pottery from Philistia (compare, for example, with stirrup jars from Gezer and Tell el-Far'ah South; Dothan 1982: Figs. 14, 15:2 respectively). The red and black paint is quite eroded, and no traces of white slip can be detected. Decoration consists of a paneled register on the mid-body and a poorly preserved design on the shoulder. Two metopes are preserved on the paneled register, one filled with a checkerboard pattern, and another containing a Philistine-style bird (for discussions and examples see Dothan 1982: 198-203; Yasur-Landau 2009; Meiberg 2011). The front part of the bird's body is oval; it has a double outline in black and is filled with solid red paint. There are traces of a vertical black line, which is part of the triglyph that divided the body. The bird's head is retorted, the head itself too eroded to determine its shape, the neck is possibly

1 I would like to thank David Ilan for inviting me to write this chapter and for his assistance during its preparation, and David Ben-Shlomo for providing me with a draft version of his report for this volume (Chapter 6B).

Fig. 4.1. Philistine stirrup jar fragment 7017/1, Pit 905.

Fig. 4.2. Philistine stirrup jar fragment 7028/1, Pit 905.

rendered by a single black line, although it is also too eroded to determine with certainty. The triglyph separating the two metopes is composed of five vertical black lines. The paneled register is separated from the shoulder area by three horizontal red bands. The shoulder area contains possible remains of concentric arcs or triangles with a center filled with solid black color.

2. Stirrup jar (Figs. 4.2; 4.15:2 = Fig. 3.102:15)
Area Y, Locus P905, Reg. no. 7028/1,
IAA no. 71-845; Stratum VI?

Fragment of mid-body of a globular stirrup jar. This is a thin-walled (3-4 mm) vessel with a very smooth exterior. It is made of well-fired and well-levigated fabric with relatively few inclusions and without a core, very similar to that of No. 1. The exterior, interior and section all have the same light brown color. Its fabric, shape and decoration resemble that of high-quality Bichrome pottery made in Philistia. This sherd was analyzed both chemically and petrographically (Ben-Shlomo this volume pp. 415-417, sample DN6). It is a chemical outlier, while petrographically its fabric can be defined as a possible import from Philistia (calcareous marl, possibly from the area of Tel Miqne-Ekron). On the interior wall an air bubble and a crack that does not go all the way through the wall can be seen.

This vessel is decorated in red and black paint, which is better preserved than on the previous item; no clear traces of slip can be observed. A paneled register on mid-body contains two metopes separated by a triglyph. One metope contains a checkerboard, while another contains a bird. The bird is of the same type as on No. 1, but is better preserved. It has a drop-shaped body with a double outline, the central part (chest and rear part) filled with solid red color. The body is divided by a triglyph composed of three short vertical lines. The head is retorted and is disproportionally large, with a large eye rendered by a single circle. The neck is rendered with a single line, and the beak is open. As noted by Meiberg (2011: 67), the open beak is also a feature of the bird on the so-called "Monster Krater" from Ashkelon (Stager and Mountjoy 2007: Fig. 2). A trace of a wing is preserved. The triglyph between the two metopes is composed of a vertical row of semi-circles flanked by three to four vertical lines. The register itself is delimited by horizontal red bands. Although the black lines of the decoration are thicker than those of No. 1, the shape, fabric and decoration of both vessels are very similar, and they seem to be the product of the same workshop/artisan.

Fig. 4.3. Strainer jug shoulder fragment 13071/1, Pit 3163.

3. Strainer jug (Figs. 4.3; 4.15:3 = Fig. 3.103:4)

Area Y, Locus 3163, Reg. no. 13071/1, Stratum VI?

Shoulder fragment of a strainer jug, including the beginning of a neck and of a spout or handle. The shoulder is rounded, and the transition to the neck is gradual. The vessel is rather thick-walled (6 mm), the fabric is relatively coarse, with a thick dark core and dark inclusions; the interior is reddish-yellow. The exterior is smoothed.

The sherd is decorated in dark red and black paint on a background of continuous light-gray slip. Parts of two decorative registers are preserved on the body. The main element in the lower one is a triglyph-like rectangular field filled with a diagonal net pattern, flanked by what seems to be a vertical wavy line. The upper register is a row of connected inverted red and black triangles. Three thin horizontal lines, rendered in red and black, separate between the two registers. The small preserved portion of the neck is decorated with an unidentified motif. The overall visual impression is that this vessel is not a product of Philistia; it was probably produced in the northern part of the country.

Stylistically, the decoration of this item seems to derive from the local ceramic tradition of northern Israel, while the influence of Philistine ceramics, although possible, is harder to demonstrate. The horizontal net pattern is attested on Philistine 2 (that is, Bichrome) pottery (e.g., Mazar 1985: Fig. 51:2, 5-6, from Tel Qasile Stratum X), but as a filling motif of rectangular panels it appears on Phoenician Bichrome pottery (e.g., Bikai 1978: Pl. 29:3, on a strainer jug from Tyre Stratum XI) and on a locally-produced krater from Tel Dan itself (see No. 10 below). Similarly, the horizontal row of connected triangles rendered in alternating red and black colors is a known Philistine decoration (e.g., a bottle from Ashdod Stratum XIIIA—Dothan and Porath 1993: Fig. 20:9), but its inverted version, as on the sherd from Tel Dan, is attested both in Philistia (on the mid-body of a stirrup jar from Tel Qasile Stratum X—Mazar 1985: Fig. 51:4) and in the northern part of the country (the "Orpheus Jug" from Megiddo Stratum VIA—Loud 1948: Pl. 76:1). Since the example from Megiddo appears on the neck of a strainer jug, it seems to represent a closer parallel to the example from Tel Dan. Alternating black and red horizontal bands, present on the sherd under discussion as well as on other items analyzed in this chapter (Nos. 4, 7, 12), are atypical of Philistine pottery (see also below).[2]

4. Jug (Figs. 4.4; 4.15:4)

Area K, Locus 6060; Reg. no. 16313/1, residual find in Stratum III

Shoulder fragment of a large closed vessel, most probably a jug. It has brown fabric with a thick core and numerous small inclusions. Its decoration is executed in black and dark red color; there are no traces of slip. The main decorative motif is a bird, which is executed in a standard Philistine style and belongs to the same general type as those on Nos. 1-2. Only the lower part of the bird is preserved, including the lower body, elongated tail and an angled foot. Part of the red fill of the rear part of the body is preserved. The bird is located in

2 Note that Ben-Shlomo (this volume, Chapter 6b, pp. 415-417, sample DN8) reached a different conclusion on the basis of provenance studies: according to petrography, the fabric of this piece is of calcareous marl, possibly reflecting the Taqiye formation (that is, eastern Philistia), and the ICP analysis pointed to the same origin. However, as indicated in the present study, the visual examination of fabric, surface treatment and decoration of this sherd strongly suggest a northern provenance for this vessel.

Fig. 4.4. Jug shoulder fragment 16313/1, L6060, bird.

Fig. 4.5. Krater rim and upper body 6198/1, L426, bird.

a metope, flanked by a partially-preserved Canaanite-style triglyph composed of at least two alternating straight and wavy vertical lines. The register is delimited by three horizontal bands in alternating red and black. Although the rendering of the bird design is very faithful to the classic Philistine bird, other details of decoration are atypical of Philistine products, such as alternating black and red horizontal lines that delimit a register from below, the triglyph with wavy lines, and the location of a bird design on a shoulder register rather than on mid-body. Petrographic examination of this sherd (Ben-Shlomo this volume, pp. 415-417, sample DN12) indicates that this vessel was possibly manufactured in northern Israel. Visual examination of the sherd supports this conclusion.

5. Krater (Figs. 4.5; 4.15:5 = Fig. 3.44:2)

Area B, Locus 426, Reg. no. 6198/1,
Phase B9, Stratum VA

Rim and fragment of upper body of a krater. The rim is hammerhead-shaped, with rounded ends and thickened inner part. The straight upper wall with an inverted stance is similar to that of Philistine bell-shaped kraters (e.g., Dothan and Porath 1993: Figs. 27:4; 28:1; 29:3), but the option that this sherd belongs to a local-style krater cannot be excluded. The sherd has brown fabric with a dark-gray core and numerous inclusions. The rim bears clear traces of horizontal burnishing. The decoration is in faded black paint (due to the faded condition of the paint, it is possible that the horizontal band under the rim is in fact executed using dark red pigment). No traces of slip can be observed. Preserved decoration consists of a neck and head of a bird, turned right (and thus, most probably, forward), and a single horizontal band under the rim. The bird's neck is curved, while its head, painted with unsteady hand, is somewhat irregularly shaped and has a thickened beak. As already noted by Ilan (1999), the rendering of a bird's neck by a single line (in contrast to a double line of Philistine bird's necks) might be a local artistic feature (see Nos. 6-11, 13 for additional examples of this rendition). The eye is rendered by a large dot. The decoration is clearly Philistine in style, but the absence of slip and the dark fabric suggest that this vessel was produced outside Philistia. Indeed, petrographic examination of this sherd (Ben-Shlomo this volume pp. 415-417, sample DN11) indicated that this vessel was manufactured in northern Israel.

Fig. 4.6. Krater body fragment 13057, L3012, bird.

Fig. 4.7. Krater or jug upper body fragment 10450/5, L1208, bird.

6. Krater/jug (Figs. 4.6; 4.15:6)

Area Y, Locus 3012, Reg. no. 13057; Stratum VIIA1

Body sherd of a krater or a large jug. Its fabric is dark reddish-brown, without a clear core. The interior is slightly burnt. The decoration is executed in black paint; no traces of slip are visible. The decoration includes a partially preserved bird and part of a metope. Only a small fragment of the bird's body is preserved, and two vertical lines of the central triglyph within the body are visible. The neck is curved and the head is turned forward. The bird's body, neck and head are rendered in the classic Philistine style, while the triglyph, composed of two straight lines flanking a wavy line, is rendered in a local style. Although petrographic examination of the fabric of this vessel was inconclusive (Ben-Shlomo this volume pp. 415-417, sample DN10), visual examination of this item suggests that it was most probably produced in the northern part of the country.

7. Krater/jug (Figs. 4.7; 4.15:7 = Fig. 3.32:3)

Area B-west, Locus 1208, Reg. no. 10450/5; Stratum VI

Upper body fragment of a krater or a large jug. The exterior is brown, the core is dark gray, and the fabric is well-fired, with few inclusions. The decoration is executed in faded red and black paint. It includes a bird, painted in black, and two horizontal bands above it, painted in black and red. The bird's body is filled with solid black, without outlining. The back is almost straight, the chest is rounded. Birds with such a body are known from Tel Dan (see No. 9 below), as well as from Tel Beth-Shean (Zukerman 2009: Fig. 7.2:4). Another example of a bird from Tel Dan (Ilan 1999: Pl. 7:3, from Stratum IVB) exhibits the same body shape but is rendered in outline. The neck is curved, the head turns forward but is not preserved. According to petrographic analysis (Ben-Shlomo, this volume pp. 415-417, sample DN5), this vessel originated from northern Israel.

Fig. 4.8. Body sherd 25210/1, L4734, bird.

Fig. 4.9. Krater fragments 12758/1, L2428, bird.

8. Body sherd (Figs. 4.8; 4.15:8)

Area B-west, Locus 4734, Reg. no. 25210/1, Stratum VIIA1

Small body sherd, from vessel of unclear type. It has coarse crumbly fabric, light reddish-brown exterior, gray core, and many white inclusions. The decoration is in black paint; the identification of motifs is somewhat conjectural due to the fragmentary preservation. The motifs include a bird's curved neck, turned forward, a small portion of the bird's back, and, next to the bird, a vertical line that probably belongs to a triglyph. The vessel seems to be a local product of the region of Tel Dan. According to petrography (Ben-Shlomo, this volume, pp. 415-417, sample DN4), it possibly comes from the northern part of the country.

9. Krater (Figs. 4.9; 4.16:9 = Fig. 3.82:4)

Area T, Locus 2428, Reg. no. 12758/1; Stratum VI; Ben-Dov 2011: 227, Fig. 138:4, where it is associated with Stratum VIIA1

Two non-joining fragments of a krater, including rim, upper body and a lower joint of one of the loop handles. This is a closed krater with rounded carination, slightly rounded upper wall, hammerhead rim, and vertical loop handles. This shape is clearly in the local Canaanite-style. Fabric and exterior are reddish-brown, with many inclusions. Its rim and exterior are hand burnished—not a common feature of local Iron Age I pottery from the site.

Decoration is executed in black and dark red, without slip. It includes an almost completely preserved metope with a bird in it. The bird has a leaf-shaped body, with a rounded belly and an almost straight back. The body is outlined in black and is filled with solid red paint. The neck is retorted and springs from the front end of the body. The small drop-shaped head, filled with solid red paint, is rendered by a curved line that joins the neck from below, while the beak is a continuation of the neck. The feet are rendered by wavy lines. The bird is perhaps inspired by a Philistine prototype, but the rendering is idiosyncratic, with many elements related to local Canaanite tradition. The rendition of animal bodies with black outline filled with red paint is typical of local Late Bronze Age iconography (see also Ben-Dov 2011: 270). It is known from Tel Dan itself (Ben-Dov 2011: Fig. 161:21, ibex), as well as from other sites (e.g., Megiddo, Stratum VIII—Loud 1948: Pl. 58:1). A similarly rendered bird appears on a fragment of a closed vessel from Beth-Shean (Zukerman 2009: Fig. 7.2:4). Painted in monochrome dark red paint, the Beth Shean bird stands next to a tree, which is a typical Canaanite-style combination of motifs.

The register is delimited from top and bottom by black horizontal bands. The metope is flanked by wide Canaanite-style triglyphs composed of three or more units of red wavy lines flanked by straight black lines. The triglyph preserved next to the handle is composed of at least four such units. The rim is decorated by short alternating black and red lines that run perpendicularly to it.

This vessel was examined both chemically (ICP) and petrographically (Ben-Shlomo, this volume, pp. 415-417, sample DN1). It is a chemical outlier, and petrographically its fabric is typical of northern Israel.

Fig. 4.10. Krater upper portion 7022, Pit 905, bird.

10. Krater (Figs. 4.10; 4.16:10 = Fig. 3.102:8)
Area Y, Locus P905, Reg. no. 7022, IAA no. 71-842, Stratum VI?

Large fragment of an upper part of a krater with rounded carination, straight inverted wall and hammerhead-shaped rim. One vertical loop handle is preserved; the vessel had at least two such handles. The shape is well-known in the local-style Iron Age I assemblage from Tel Dan (Ilan, this volume pp. 100-102). The interior is heavily pitted or abraded; the exterior surface is quite rough, with some prominent grooves left unsmoothed; the handle is slightly misshaped and is attached slightly off the vertical axis. The clay of this vessel is reddish-brown, clearly local to northern Israel.

The decoration is rendered in red and black paint, in paneled arrangement. One complete metope is preserved, most of it is filled with a bird, executed in a typical Philistine style. The rounded head is retorted, the beak is curved. The breast is filled with concentric half-circles, the innermost one is filled with red paint. The rear part of the body is curved and tapering, and it is filled with a solid red triangle. The feet are angled, with three fingers [talons?] each, the tail is chevron-shaped, with a spur stemming from the apex (for this element on Philistine birds see, for example, Dothan 1982: Fig. 61: 2, 6, 8). Six short vertical wavy lines appear above the bird.

The metope is delimited from the sides by three vertical lines that are slightly off the vertical axis. The triglyph is filled with a diagonal net pattern (for a discussion of this local-style motif see No. 3 above). An elongated diagonal cross appears on the handle.

Fig. 4.11. Krater body sherd 10686, Pit 1227, bird.

Fig. 4.12. Krater body sherd 18508/1, L4322, bird.

11. Krater (Figs. 4.11; 4.16:11)

Area B Locus 1227, Reg. no. 10686, Stratum V

Small body sherd of a krater, including the beginning of a handle. The exterior is rough, the fabric and the surface are brown. The decoration includes a partially preserved bird and a triglyph, all rendered in black paint. As in most of the sherds examined above, the designs are a mixture of local and Philistine stylistic features. The bird has a retorted head and a chest composed of concentric half-circles, separated from the rest of the body by at least 3 vertical lines. Such rendering of the chest is typical of Philistine-style birds (see above for references). The rendering of a neck in a single line seems to be a local decorative feature (see also above). The triglyph, composed of three unevenly painted vertical lines, is clearly stylistically non-Philistine as well. Chemically, this sherd is an outlier, while petrographically it originates in northern Israel (Ben-Shlomo, this volume, pp. 415-417, sample DN2).

12. Krater (Figs. 4.12; 4.16:12)

Area B Locus 4322 (=L601),
Reg. no. 18508/1 Stratum IVB

Small body sherd of a carinated krater. The fabric and surface are gray. The decoration is in red and black paint, applied directly on the unsmoothed surface. Preserved are remains of the rear part of bird, including the end of long, tapering tail and a small portion of feet, delimited on the side by a triglyph of three black vertical lines and, below, by four horizontal lines (two thin black ones framed by two thick red ones). This combination of horizontal lines is atypical of Philistine pottery, while the bird is executed in a Philistine style, as far as can be ascertained from what is preserved. According to petrographic examination, this vessel was manufactured in northern Israel (Ben-Shlomo this volume pp. 415-417, sample DN9).

13. Krater or jug (Figs. 4.13; 4.16:13)

Area B Locus 7064 (=7065),
Reg. no. 23415, Stratum V

Small body fragment, with densely burnished exterior. The preserved decoration is rendered in black paint, and includes a rounded bird's head with a straight beak, a small portion of a neck and perhaps

Fig. 4.13. Jug body sherd 23415, L7064, bird.

of a chest, as well as a small fragment of a triglyph, of which one straight vertical line is preserved. Due to the fragmentary state of preservation, it is difficult to establish the stylistic derivation of these motifs, but at least the bird's head is not incompatible with the standard rendering of a Philistine bird design. According to petrographic examination, this vessel was manufactured in northern Israel (Ben-Shlomo this volume pp. 415-417, sample DN3).

14. Stirrup jar (Figs. 4.14; 4.17:14 = Fig. 3.101:8)
Area Y, Locus 3212/3216,
Reg. no. 17090, Stratum VIIA1 or VI;
Ben-Dov 2011: Fig. 193:12, Cat. no. 35

This fragmentarily preserved stirrup jar was described in detail by Ben-Dov (2011: 293), and here we supply some additional observations and analysis. The vessel has a slightly squat body and a vertically-oriented spout. In Furumark's typology, this shape seems to best fit FS180, of the LH IIIB, and FS181, of the LH IIIC period (see Furumark 1992: Pl. 104). It should be noted that nowadays Furumark's typology cannot be used as a straightforward basis for morphological attributions. Ben-Dov (2011: 293), for example, identified this vessel as belonging to FS175, and, according to Mountjoy (1999: 179), FS175 is a heterogeneous category that includes forms similar to the stirrup jar from Tel Dan (see, especially, Mountjoy 1999: Fig. 54: 407-410, from the LH IIIC Late Argolid). The fabric is dark-gray, metallic, and is very fine, although some inclusions can be discerned with the naked eye. The exterior of the vessel was carefully smoothed. The vessel was heavily burnt, clearly after being broken.

The vessel was decorated in semi-lustrous paint, which, although discolored as a result of post-depositional fire, was probably dark-brown. The paint was applied unevenly, and has streaky appearance. The painted lines, particularly those on the spout and handles, were carelessly executed. Three thin horizontal bands appear on the lower shoulder of the vessel, while most of the lower part of the vessel was covered with solid paint, leaving a narrow reserved area near the base. A preserved portion of a decorative zone on the upper shoulder, between the handles, exhibits curved parallel lines—most probably part of the elaborate triangle motif (FM 71) that is frequently filled with hatchings (see Furumark 1941: 407-408, Fig. 71:5-11).

In the Aegean, stirrup jars decorated with elaborately hatched triangles above a group of horizontal bands on the shoulder zone, a broad monochrome area at mid-body and a reserved area near the base

Fig. 4.14. Stirrup jar 17090, L3212/3216. Late Helladic IIIC Late.

are known from the LH IIIC Late Period Argolid (Mountjoy 1999: 79, 179). In particular, a stirrup jar from Argos (Mountjoy 1999: Fig. 54:407) has all these decorative elements (with the exception of elaborate triangles on the shoulder), as well as carelessly executed short, horizontal lines on the handles. Another LH IIIC Late stirrup jar from Argolid (Mountjoy 1999: Fig. 54:406) provides a parallel to the hatched triangles on the stirrup jar shoulder from Tel Dan.

These observations, however, are in contrast with the results of provenance studies, which indicate a non-Argolid origin for this stirrup jar. According to petrographic examination (Goren 2011: Cat. No. 40), the possible provenance of this vessel includes "Cyprus, Turkey and the Aegean zone". Moreover, the INAA of this vessel precluded a Argolid provenance (Ben-Dov 2011: 293, n. 7). Its relatively gritty fabric and the careless execution of its decoration suggest that this is not a product of mainland Greece. Since south Levantine, Cypriote, Cretan and Aegean fabrics are well-known chemically and geologically, the possible origin of this stirrup jar can be limited, by exclusion, to the only other area where such a vessel could have been possibly produced: the southern Anatolian Coast. Unless the typological similarities discussed here are accidental (which seems to be unlikely), it can be suggested that this vessel was manufactured in this region, and its shape and decoration exhibit the influence of the ceramic style common in the Argolid during the LH IIIC Late period.

The stratigraphic attribution of the vessel's context is somewhat unclear due to the narrow exposure of Area Y and the dynamic nature of associated metallurgical activities. Ben-Dov (2011: 293) assigned this vessel to Stratum VIIA1, while Ilan (this volume, pp. 82, 96-97) prefers a Stratum VI assignation. Since the beginning of the LH IIIC Late period is dated to ca. 1100 BCE (e.g., Warren and Hankey 1989: 169; Dickinson 2006: 23, Fig. 1.1), the attribution of this stirrup jar to Stratum VIIA1, dated to the 20th Egyptian Dynasty (Ben-Dov 2011: 377), would seem doubtful. It is seemingly too late for Stratum VI as well. However, the ca. 1100 BCE date, for both the end of Stratum VI at Tel Dan and for the beginning of the LH IIIC Late, is merely a convenient approximation; these termini can certainly be moved in either direction by a decade or two, and this chronological problem may very well be ephemeral.

Discussion

The ceramic material presented in this chapter can be divided into three groups: imports from Philistia (Nos. 1-2), local products with Philistine features (Nos. 3-13), and an Aegean-style vessel possibly imported from southern Anatolia (No. 14).

The two Philistine stirrup jars with elaborate Bichrome decoration (Nos. 1-2) possibly represent the northernmost instance of imported Philistine vessels (perhaps, with the exception of a sherd from Tyre, see Bikai 1978: Pl. 41:19). The fact that these two vessels are small containers suggests that they were imported for their contents, since during the Late Bronze Age vessels of this type were receptacles for precious liquids, such as aromatic oils (Leonard 1981: 91-100; Tournavitou 1992: 186). Several decorated Philistine sherds were reported from another Iron Age I site in the Upper Jordan Valley—Hazor (Dothan 1982: 90, n. 358). However, since this material is unpublished, its identification must be considered with caution. It can be concluded that imports of Iron Age I Philistine pottery to this region were sporadic at best. It seems that during the Iron Age I imports of Philistine pottery followed region-specific patterns. Thus, for example, very few such vessels were imported to the northern coast and the Akko Plain (Gilboa, Cohen-Weinberger and Goren 2006) and to the Beth-Shean Valley (Zukerman 2009), while many more possible, or certain, examples of Philistine imports are known from the Jezreel Valley (Dothan 1955; Raban 1991; Arie 2006: Tables 13.4-13.5).

The fact that both Philistine sherds from Tel Dan, as well as the locally-produced krater (No. 10), were found in the same installation, capped by the upper portion of a Galilean pithos (Ilan this volume pp. 81-82) is puzzling. It is clear that they were put in a jar in an already-broken state; otherwise these stirrup jars would be much better preserved. As both sherds feature Philistine birds, it can be hypothesized that they were kept as exotic or otherwise special items after breakage. Curation of symbolically-charged fragments is known from neighboring regions. For example, the lion-shaped bottom part of a cup from Tell es-Safi/Gath was carefully retouched and curated after the cup was broken (Maeir 2006). A similar practice is known in the Aegean and Cyprus (Hitchcock 2011: 274-76).

The eleven sherds of the second group were produced in northern Israel, perhaps at Tel Dan itself, and mostly exhibit a mixture of local Canaanite and Philistine morphological and decorative elements. In many cases their vessel types cannot be identified with certainty due to the small size of the sherds. Two examples (Nos. 9-10) belong to local-tradition kraters, while one (No. 3) belongs to a strainer jug, either to a wide-necked variant, known since the Late Bronze Age (cf. this volume Fig. 3:124:3) or the narrow-necked one, which evolved during the Iron Age I, most probably as a result of Cypriote influence (for example, at Tel Dor the earliest examples of the latter type have decorations of Cypriote derivation, see Gilboa and Sharon 2003: 28, Table 8). Thus, No. 3 is the only vessel in the second group that has no clear Philistine features.

In terms of decorations, the sherds from the second group exhibit the following local-style features: birds with rounded belly and straight back (Nos. 7, 9), birds' necks rendered in a single line (Nos. 5-11, 13), triglyphs composed of vertical straight and wavy lines (Nos. 4, 6, 9), horizontal bands in alternating red and black paint (Nos. 3-4, 7, 12), a metope filled with a diagonal net pattern (Nos. 3, 10), horizontal row of connected inverted triangles (No. 3), and burnishing (Nos. 9, 13). The only Philistine feature present in this group is a bird (Nos. 4-6, 10-11, and possibly also 12-13). Nos. 7-9 also have birds, see above: i.e., all except No. 3] This fact indicates that local potters selected one feature of Philistine pottery that they considered important, and incorporated it into their repertoire. This suggests that the Philistine bird had a symbolic significance in the eyes of the producers and consumers of locally-produced, decorated, serving vessels (all the vessels in question are kraters or jugs). It is remarkable that, while actual Philistine imports to Tel Dan are rare, the symbolic value of the Philistine bird in this faraway region was clearly significant. The possible curation of fragments of imported Philistine vessels featuring birds points to the same conclusion.

A slightly different phenomenon was revealed in a petrographic study of Iron Age I Philistine-style pottery from Tel Dor (Gilboa, Cohen-Weinberger and Goren 2006). This study identified several production centers of these vessels outside Philistia on the Carmel Coast and on the Lebanese Coast. Although these production centers were apparently not very prolific, they manufactured vessels of typical Philistine shapes and with a wide array of Philistine-style decorations. In contrast, the vessels from Tel Dan discussed here have local shapes and their only Philistine-style feature is the bird. The production centers identified in the Tel Dor study supplied luxury vessels that had a "Philistine" appearance, which perhaps substituted the unavailable Philistine imports. In contrast, the decorated vessels from Tel Dan are emphatically "hybrid", and had a correspondingly different symbolic message.

In this respect, some other, mostly undecorated vessels with non-local features from Iron Age I Tel Dan should be noted. Among these vessels are what seems to be the handle of a hydria (this volume, Fig. 3:62:7) and feeding bottles (Ilan, this volume, Type J6, p. 122). The hydria is a relatively uncommon Aegean type, and its significance in the Levantine context is unclear, particularly since it is unknown if the vessel was locally-produced at the site or imported from elsewhere. Even in Philistia the only known example of a hydria was recently published from Ashkelon (Master and Aja 2011: Fig. 5:1).

The feeding bottle is a well-known Philistine shape that appeared in the southern Coastal Plain as a part of the early Philistine assemblage (Dothan and Zukerman 2004: 24-28). It is suggested here that feeding bottles from northern Israel represent a different phenomenon: they are most likely local imitations of the Cypriote type. These imitations might reflect cultural interaction between Tel Dan and its neighbors on the Akko Plain, who maintained close connections with Cyprus (e.g., Gilboa 2001). Phoenician pithoi and Phoenician Bichrome vessels represent evidence of these westward connections (see Beyl, this volume, Chapter 5).

Another "western-style" vessel from Tel Dan was published by Ben-Dov (2011: Figs. 120:6; 165 from Area K, Stratum VIIA1). This is a small undecorated bell-shaped bowl, which is slightly misshapen. Again, rather than being a vessel of Philistine provenance or inspiration, it is best interpreted as a low-quality, local imitation of an Aegean deep (bell-shaped) bowl (for a list of possible and certain examples of such imports to the Levant see Leonard 1994: 118-21).

Finally, it is important to mention the absence of imported Cypriote decorated vessels, which are known, in limited quantities, in several sites in northern Israel, such as Tell Keisan and Beth-Shean (D'Agata *et al*. 2005; Sherratt 2009). As in the above-mentioned case of Philistine imports into various regions of northern Israel, it seems that the pattern of distribution of Cypriote decorated imports was influenced by various socio-economic and historical factors that are still insufficiently known. The negative data from Tel Dan will one day be part of the reconstruction of these factors.

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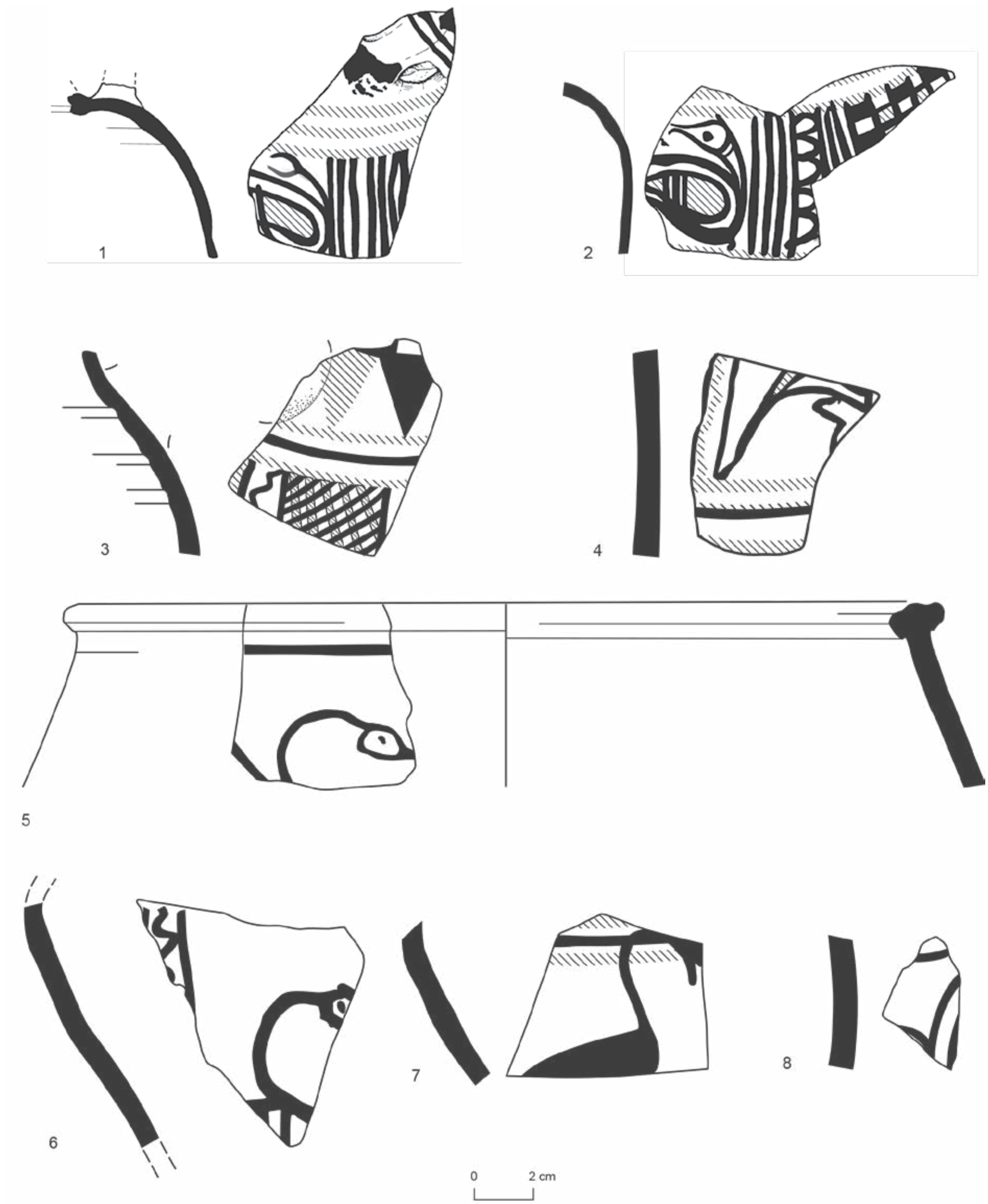

Fig. 4.15. Decorated Philistine, Aegean and Cypriot-Style pottery.

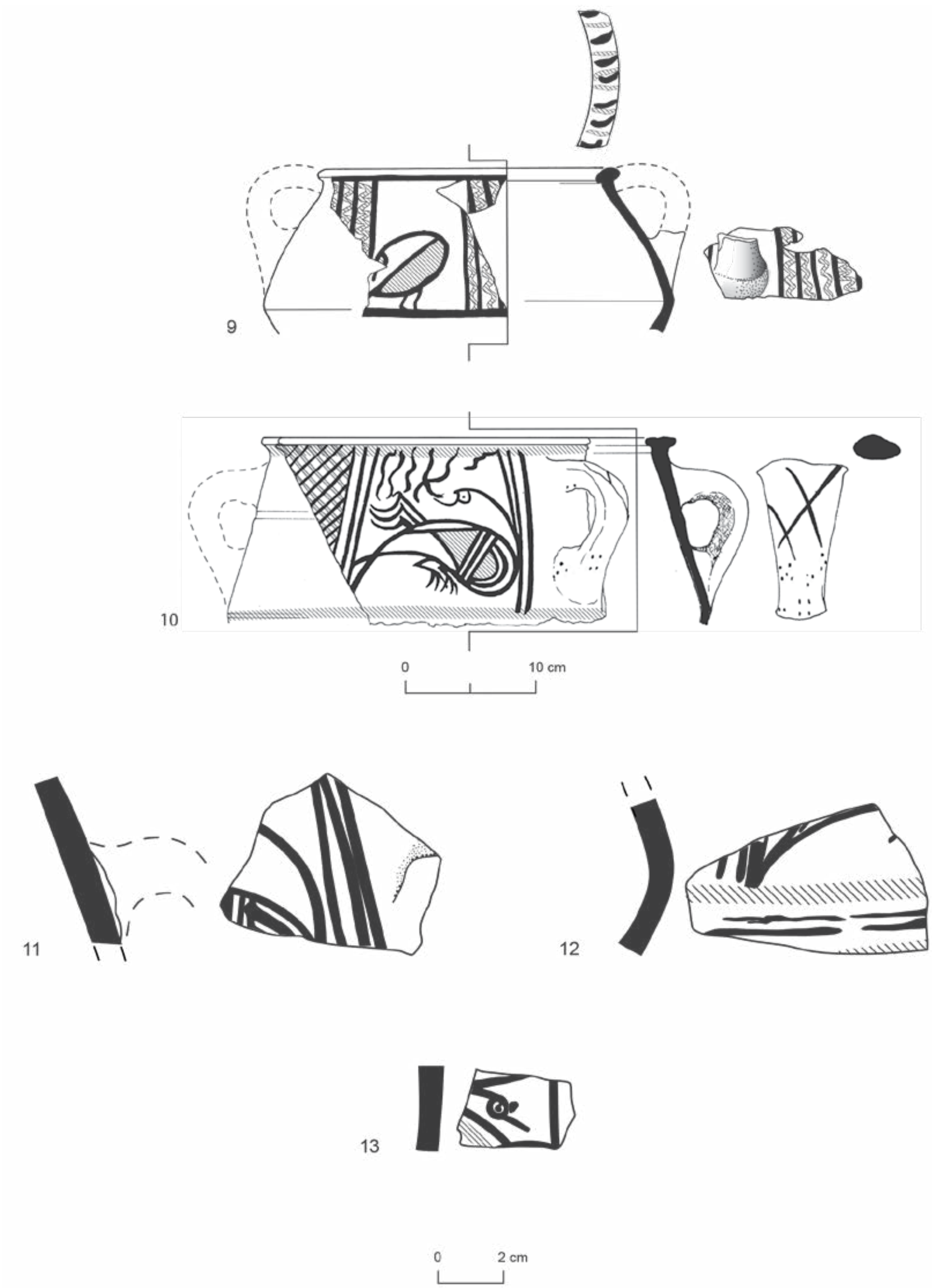

Fig. 4.16. Decorated Philistine, Aegean and Cypriot-Style pottery.

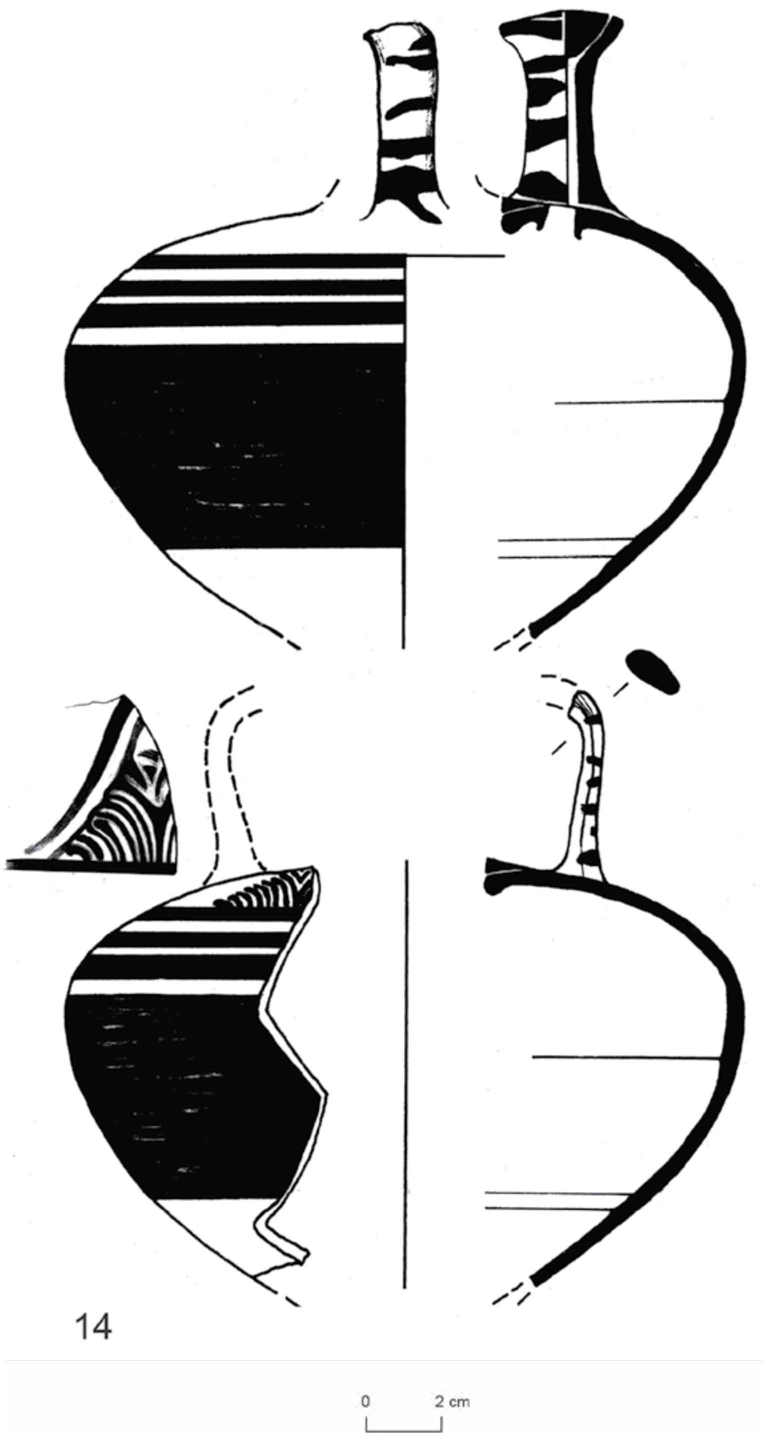

Fig. 4.17. Stirrup jar 17090, L3212/3216. Late Helladic IIIC Late.

CHAPTER 5

"PHOENICIAN" PAINTED WARE

Thomas Beyl

The painted vessels and types of decoration found in the early Iron Age strata at Tel Dan offer a valuable corpus that can tell us something about the nature of ceramic production and commerce as well as cultural origins and affinities. In particular, the similarities in decorative patterns point to influences from the Carmel and Phoenician coasts, from Cyprus and from western Syria. The catalogues below (Tables 5.1 and 5.2) include the painted ware from secure contexts lacking obviously intrusive material.[1] As such they represent a minimum count.

At no time was decorated pottery a large statistical component in the ceramic assemblage. While the decorated assemblage seems to be larger than that of most contemporaneous sites in northern Israel (in both absolute numbers and as a proportion), less than 1% of the ceramic assemblage is decorated in Strata V-VIIA. In Stratum IVB the figure is closer to 2%. Certainly a great deal of painted decoration has faded and flaked off over the centuries and the frequencies presented here can, once again, only represent minimum numbers.

While not frequent, painted pottery is fairly well distributed throughout the living spaces in both the Iron IA and Iron IB. However, there does seem to be a tendency for painted ware to congregate in particular loci, in L1229 in Stratum VI, in L692, L8060, L8181 and L8229 in Stratum V, and in L210, L319, L419, L563, L584, L651 and L4202B in Stratum IVB. This may have something to do with *who* utilized the rooms of these particular houses (as an indication of group identity). But it seems more likely that these contexts hosted more of the serving and consumption of condiments, unguents and liquids—in drinking ceremonies for example.

In the Iron IA strata jugs and pyxides are by far the most frequently decorated component, followed by flasks, storage jars, and kraters (Table 5.3). The large majority of pyxides and flasks were painted, as were the majority of certain types of jugs (strainer jugs and spouted jugs in particular). Simple globular jugs with trefoil mouths (J1) were not decorated.

A combination of red and black painted lines, bands and strokes is most common in all the Iron I strata. In the Iron IA levels alternating thin red and black lines, bands, and concentric circles are predominant. But there is a significant component of monochrome painting as well and the monochrome decoration shows diachronic patterning (Table 5.5); in the early Iron IA levels red is dominant, in the later Iron IA (Stratum V) black takes over, and in the Iron IB (Stratum IVB) red is again more popular.

In Table 5:1, item nos. 17, 22, 28 and 47 appear to belong to what Gilboa (2008: 223-225) has termed the "Overlapping Multiple Diagonal Strokes" (OMDS) style, which occurs at Tel Dor on the Carmel coast and at Megiddo but only rarely, if at all, at other sites of the southern Levant. The OMDS style is mainly executed in monochrome black or red (including two of the examples from Tel Dan), but nos. 22 and 47 from Tel

1 In some cases the decorated pottery itself might suggest a possible intrusion that was not otherwise identified. Item No. 13 in Table 5.1 from L675 is the conspicuous example. On the other hand, it might be an early example of a pattern that became common in later levels (see below).

Dan combine the use of alternating red and black lines. Petrographic analysis suggests that No. 22 was produced in the region between Tyre and Sidon (Golding-Meir, this volume, Chapter 6C, Item No. 23). Gilboa (2008: 232-234) argues that the OMDS pattern is of Syrian origin, citing parallels at sites such as Tell Tweini (Mazzoni 1998: Fig. 16:8), Tell Kazel (Capet and Gubel 2000: 439), Amuq (Swift 1958: Fig. 38), and 'Ain Dara (Stone and Zimansky 1999: Fig 25:3). The motif's presence at Tel Dor has led Gilboa to infer immigration of Syrians (in unknown numbers) down the coast to the southern Levant (and see Liverani 1987: 69-70 and Bell 2006: 211). As Ilan shows in Chapter 21, immigration from Syria appears to have headed for Tel Dan as well. The OMDS appears once in Stratum IVB—perhaps a matter of serendipity.[2]

In Stratum IVB jugs are more likely to be painted than they are in the Iron IA strata, particularly in the form of the newly-introduced flask jug (FJ). As in the Iron IA, the great majority of flasks are decorated. A certain portion of the storage jars and kraters continue to be decorated, now in slightly higher frequencies. Aside from the introduction of the flask jug, two other developments make their mark in this stratum: decorated pyxides are far fewer and other types are now sporadically decorated with paint as well: bowls, chalices and a juglet.

The "enclosed band style" is the most conspicuous characteristic of Stratum IVB (Table 5.4; Figs. 5.6: 7, 9-10, 13; 5.7:5; 5.9:4, 6, 8).[3] This generally entails thin black lines enclosing wide red bands (Gilboa 1999). The enclosed band style is the standard manifestation of what is called "Phoenician Bichrome" decoration. Other features of the Phoenician Bichrome class are the use of stars (Fig. 5.9:9) or ribbons (Fig. 5.9:8), usually, though not solely, on vessel handles, and cross hatched lozenges or bands on vessel bodies (Figs. 5.6:10, 12-13; 5.9:6). The development of the Phoenician Bichrome style has been attributed to commercial interactions between the Phoenician Levantine coast and Cyprus during the Iron Age IB period (Gilboa 1999: 2-12).

The three examples of enclosed band style decorated ceramics subjected to petrographic analysis (Nos. 22, 27 and 65 in Table 5.2) were all manufactured at Tel Dan or in its vicinity.[4] Other painted wares analyzed from Stratum IVB were also locally manufactured (Nos. 4 and 41 in Table 5.2) but two (Nos. 38 and 60 in Table 5.2) have coastal origins, one from the Carmel coast.

Vessel forms exhibiting Phoenician Bichrome decoration include globular or flask-jugs (Fig. 5.6: 12-13; 5.7:2) and spouted jugs (Fig. 5.6:7, 9-10). Globular jugs are well known from Tel Dor (Gilboa 1999: Fig. 11:2,4), Hazor (Yadin *et al*. 1961: Pl. CLXXII:3), Tell Keisan (Briend and Humbert 1980: Pl. 62:8), Megiddo (Finkelstein and Zimhoni 2000: Fig. 11.2:7), Sarepta (Anderson 1988: Pl.36:9), Tyre (Bikai 1978: Pl. XXV:9), and Yoqne'am (Zarzeki-Peleg 1997: Fig I.41:9), for example. The spouted jug with basket handle is more at home in the Philistine world (Dothan 1982: 155-157) and in Cyprus (Gjerstad 1948: Fig. XIII: 7, 8).

The simple pattern of alternating thin red and black lines characteristic of Stratum V continues into Stratum IVB (Figs. 5.6:6, 8, 11; 5.7:1, 3). One vessel decorated in this style is the basket-handled strainer jug (Table 5.2:41, Fig. 5.6:11). Similar vessels appear at Megiddo (Finkelstein and Zimhoni 2000: Fig. 13.4:2), Yoqne'am (Ben-Tor 2005: Pl. 61:18, 71:8), Tel Qasile (Dothan 1982: 194), Beth-Shemesh (Dothan 1982: 194), Tell Jemmeh (Dothan 1982: 194), Tell el-Far'ah (Dothan

2 A pyxis originally dated to a Stratum IVA context has been reassigned to the Stratum IVB (No. 17 in Table 5.1). Also a storage jar fragment (Reg. No. 20193 from L8080) with this motif was excavated in a Stratum IVA (Iron Age IIA) context. Its petrography suggests local manufacture.

3 One example was identified in a Stratum V context: L675 (Item No. 13 in Table 5.1). The question is whether this represents an early introduction of this technique or an unidentified intrusion from a later context. One suspects that this problem is encountered at most excavations of similar cultural horizons. The enclosed band style continues to be significant in Stratum IVA, beyond the purview of the current study.

4 Each of the three was analyzed by a different petrographer: No. 22 by Golding-Meir (Chapter 6C), No. 27 by Waiman-Barak (Chapter 6A) and No. 65 by Ben-Shlomo (Chapter 6B).

1982: 194), Tell Keisan (Briend and Humbert 1980: Pl.61:18, 71:8), and Tell Kazel (Capet and Gubel 2000: 439). This vessel can be traced back to Mycenaean forms as early as the LHIIIA period (Furumark 1941: 609-610). Similar strainer jugs decorated in the white painted style are known from Lapithos Cyprus during this period (Gjerstad *et al*. 1934: Pl. LIV:6, Pl. LIX:1, CXXXII:2, CXXXXIII:7, CXXXV:1). Petrographic analysis (Golding-Meir, this volume, Chapter 6C, Item No. 24) demonstrates that this vessel was produced locally at Tel Dan.

The horizontal wavy line motif (e.g. no. 42 in Table 5.1 [not illustrated] and No. 45 [not illustrated] in Table 5.2) seems to be a Cypriot inspiration at this stage (e.g. Gilboa 1999: Figs. 9 and 13; 2008: 226). Several other sherds may be of Cypriot origin (Table 5.1.24 and Table 5.2.37, 63, 64) and should be the subject of provenience analysis.

Interaction between Tel Dan and the Phoenician coast is evident in the types of painted ware present in Strata VIIA1–IVB. Three of the 11 painted vessels subjected to petrographic analysis do originate on the Phoenician coast, one in the Iron IA and two in the Iron IB. Eight of the painted vessels examined were manufactured locally, three in the Iron IA and five in the Iron IB. In other words, decorated vessels—mainly closed vessels—were transported from the coast, but vessels with similar functions were also manufactured locally, very much in the littoral tradition. In any case a larger petrographic project is clearly in order.

Table 5.1. Catalogue of Selected Painted Ware from Strata V-VIIA1 (Iron IA).

No.	Object	Field No.	Locus	Area/Phase/ Stratum	Petrography	Description	Fig.
1	FL, complete except rim	868/1	181	B11-12, VI-VIIA1,	—	Red concentric circles	5.4:3 (=3.42:6)
2	Pyx, upper part	1121	218	B9-10, V	—	Spaced black bands (red bands may have faded)	5.4:6 (=3.43:2)
3	SJ/J, b.f.	1665/8	326	B9-10, V	—	Thin, even black and red bands	5.8:3
4	SJ?	1667/5	326	B9-10, V	—	1 black band	
5	J5, spout	6195/2	426	B9, V	—	Thick black bands	
6	K, rim & handle	6251/1	431	B10, V	—	Red hatches on rim and handle	5.1:4 (=3.45:2)
7	J5, spout	6229/2	432	B10, V	—	Thin, even black and red bands	
8	SJ/J, b.f.	10426	586	B9, V	—	Thin, even black and red bands	
9	J, b.f.	9599/2	607	B9-10, V	—	Thin, even black and red bands	
10	SJ, b.f.	9732/2	618	B9-10, V	—	Horizontal and vertical black and red lines plus black vertical wavy lines	
11	J2b or FJ, neck with handle	9732/9	618	B9-10, V	—	Faded black and red bands	
12	J2b or J4, neck, rim and handle	9732/9	660	B9-10, V	—	Black bands	5.2:6 (=3.48:5)
13	J, b.f.	10075/3	675	B9-10, V	—	Thinner black bands enclosing thicker red bands	
14	Pyx, complete	10423	690	B9-10, V	—	Thin red and black bands and zig-zag	5.4:8 (=3.48:9)

No.	Object	Field No.	Locus	Area/Phase/ Stratum	Petrography	Description	Fig.
15	SJ, upper section	10391/3	692	B9, VA	—	Black bands	5.2:1 (3.49:9)
16	J, b.f.	18523/3	692 (4323b)	B9, VA	—	White slip, black parallel bands (LB)	5.8:4
17	Pyx, complete	18526/1	671 (4323b)	B8 *	—	Black bands forming register with vertical and diagonal lines between them = Overlapping Multiple Diagonal Strokes (OMDS)?	5.5:1; 5.8:8 (3.70:7)
18	Pyx, b.f.	18526/2	692 (4323b)	B9, VA	—	Thinner black bands enclosing thicker red bands	
19	Pyx, b.f.	18528/1	692 (4323b)	B9, VA	—	Thin black and red bands	
20	Pyx, rim missing	10527	1204	B9-10, V	—	Thin, alternate red and black bands	5.4:7 (3.50:6)
21	Kernos, "pomegranate"	10662/1	1204	B9-10, V	—	Black horizontal band at neck and vertical lines on fruit	5.5:2 (3.50:8)
22	J, b.f.	10574/6	1207	B10, VB	Table 6C.1.23 Group D Tyre/ Sidon	Thin black and red lines bordering a band of black hatched triangles (OMDS)	5.2:10; 5.8:5
23	Pyx, carin. frag.	10504/6	1207	B10, VB	—	Thin black and red lines	
24	FL, b.f.	10612/1	1209	B11, VI	—	Thin red and black concentric circles (Cypriot?)	5.5:3 (3.33:4)
25	J2, J4 or J6, 2/3 vessel.	10451/7	1209	B11. VI	—	Red bands	5.2:8 (3.33:2)
26	Pyxis, b.f.	10639/10	1218	B9-10, V	Table 6C.1.40 Group A Local	Thick black and red bands	
27	Pyxis, rim missing	10532/1	1218	B9-10, V	—	Alternate red and black bands and black vertical stroke	5.4:9 (3.51:11)
28	K, large rim	10750/1	1219	B9-10, V	—	Red spoked wheels and possible Overlapping Multiple Diagonal Strokes, (OMDS)	5.1:5 (3.52:1)
29	K1a, large rim	10650/1	1229	B11, VI	—	Black vertical straight and wavy lines	3.33:11
30	FJ, b.f.	10658/8	1229	B11, VI	—	Red concentric circles	3.33:17
31	FL, missing rim	10790/1	1229	B11, VI	—	Thin red and black concentric circles	5.4:2 (=3.33:16)
32	FL, b.f.	10699/7	1241	B11, VI	—	Black concentric circles	5.4:4 (3.36:9)
33	K1a, rim & neck	10699/11	1241	B11, VI	—	Red patterns	5.1:6 (3.36:7)
34	FL, 1/2 vessel	18342	4264	B12, VIIA1	—	Thin red and black concentric circles, red and black strokes under handle	5.4:1 (3.29:1)

No.	Object	Field No.	Locus	Area/Phase/ Stratum	Petrography	Description	Fig.
35	Pyxis, complete	18350/1	4264	B12, VIIA1	Table 6C.1.25 Group A Local	Thin black and red bands	5.4:11 (3.29:2)
36	SJ/J base	18574/1	4328	B9-10	—	White slip, thin black lines enclosing thick red band	
37	J, b.f.	18547/6	4328	B9-10	—	Thin black and red bands	5.8:6
38	FL, b.f.	18628/7	4349	B11, VI	—	Thin alternating red and black concentric circles	3.37:4
39	SJ/J, b.f.	25031/1	4706b (=665)	B8*	—	Black band	
40	K, b.f.	25052/1	4706b (=665)	B8*	—	Thin black bands with diagonal hatched lozenges	5.8:2
41	J5, b.f.	25076/2	4713b	B9-10, V	—	Red and black bands under spout	
42	J5, b.f.	25087/3	4713b	B9-10, V	—	Red and black bands under spout and wavy horizontal red band	
43	SJ/J shoulder frag.	23416/4	7052b	B9-10, V	—	2 black bands	
44	J, b.f.	23507/17	7082b	B9-10, V	—	Red and black bands	
45	Pyxis, rim missing	23562/2	7097	B9-10, V	—	Thin, alternating red and black bands	5.4:10 (3.56:1)
46	J, handle	23718/9	7155	B11, VI	—	Vertical black lines on handle, plastic decoration of imitation rivets	5.2:9 (3.39:7)
47	K1a, upper section	23568/1	7131	B9-10, V	—	Thin red and black bands and one register with Overlapping Multiple Diagonal Strokes, (OMDS)	5.1:3 (3.56:7)
48	Bp1, rim	23905/2	7151	B9-10, V	—	Black hatching on rim	5.1:2 (3.73:5)
49	J, b.f.	6771/3	486	M9b-c, V	—	Thin black bands enclosing fairly thin red band	
50	Pyx, shoulder frag.	20125/7	8059	M9b, VA	—	Black and red bands	
51	J6 with spout	20124/8	8060	M9b, VA	—	Spout fragment with thin black and red lines	
52	SJ, b.f.	20124/9	8060	M9b, VA	—	Thin black and red bands	
53	J, b.f.	20124/10	8060	M9b, VA	—	Red bands	
54	SJ, b.f.	20124/11	8060	M9b, VA	—	Thin black bands	
55	Pyxis, rim missing	20141/6	8060	M9b, VA	—	Alternating red and black bands, vertical black stroke	5.4:12 (3.76:7)
56	P?, b.f.	20652/9	8180	V-VIII	—	Red bands (LB?)	

No.	Object	Field No.	Locus	Area/Phase/ Stratum	Petrography	Description	Fig.
57	Pyx, handle	20623/5	8181	M9b-c, V	—	Thin black and red hori-zontal bands	5.8:7
58	Pyx, b.f.	20623/7	8181	M9b-c, V	Table 6C.1.16 Group B, prob-ably Tel Dan	Thin black and red hori-zontal bands	
59	Pyx, b.f.	20623/10	8181	M9b-c, V	—	Thin black and red bands	
60	Pyx, b.f.	20685/1-2	8185	M10, VI	—	Thin black and red bands	
61	Pyx.b.f.	20668/2	8185	M10, VI	—	Thin black and red bands	
62	J5-6, basket handle	20875/4	8229	M9b-c, V	—	Red bands with small touch of black	
63	SJ, b.f.	20891/1	8229	M9b-c, V	—	Black and red bands (LB?)	
64	SJ, b.f.	20877/4	8229	M9b-c, V	—	Black and red bands (LB?)	
65	J, shoul-der frag.	7021/2	905	Y6, VI?	—	4 red bands	5.2:2 (3.102:11)
66	Pyxis, rim missing	13315/2	3082	Y5, V	—	2 red bands	5.4:14 (3.100:2)
67	FL, complete	13550/3	3127b	Y6, VI	—	Thin alternating red and black concentric circles, black center, 3 overlapping red strokes below handle	5.3:2 (3.98:9)
68	FL, complete	13548/1	3127b	Y6, VI	—	Red concentric circles	3.21d
69	J, b.f. & handle	13071/1	3163	Y6?, VI?	—	Red and black decora-tion, (Philistine style)	4.1:3, 3.103:4; 4.15:3
70	Pyxis, rim missing	13756/1	3172	Y6, VI	—	Thin alternating red and black bands	5.4:15 (3.105:6)
71	J5, upper half	13816/3	3176	Y6, VI	—	Red bands	5.2:3 (3.104:8)
72	J5, strainer frag.	17082/4	3212	Y6, VI	—	Thin red and black bands	5.2.4
73	FL, 1/3 vessel	17133/1	3216	Y7, VI-VIIA1	—	Red concentric circles	5.3:1
74	Bh1 (complete)	15032/1	5009	V?	—	Thin red and black bands	5.1:1 (3.108:2)
75	J6 (complete)	15032/2	5009	V?	—	Thin red and black bands	5.2:5 (3.108:3)
76	Pyxis (complete)	4100	H609	V	—	Thin red and black bands	5.4:5 (3.108:9)
77	FL, b.f.	19193/9	2599	T11, VI	—	Thin red and black concentric circles	3.89:8
78	FL, b.f.	19193/12	2599	T11, VI	—	Thin black concentric circles	
79	FL, b.f.	19190/3	2599	T11, VI	—	Red and black concentric circles	3.89:9
80	Pyx, rim	19772/6	2855	T15, V	—	Thin red and black bands	5.4:13 (3.92:9)

No.	Object	Field No.	Locus	Area/Phase/ Stratum	Petrography	Description	Fig.
81	J, b.f.	19779/11	2855	T15, V	—	Thin red and black bands	5.2:7 (3.92:10)
82	Pyxis, complete	19793/1	2856	T15, V	—	Thin red and black bands	5.4:16 (3.92:15)
83	K1, upper part	12758/1	2428	T17, VIIA1	—	Red and black bands and lines forming registers and metopes, wavy lines, a bird	5.8:1 is same vessel as 3.82:4 (=4.9)

* Catalogue nos. 17, 39, and 40 were placed initially in Phase B9 (Stratum VA), but stratigraphic reevaluation now indicates that they belong to Phase B8 (Stratum IVB).

Table 5.2. Catalogue of Painted Ware from Stratum IVB (Iron IB).

No.	Object	Field No.	Locus	Area/ Phase	Petrography	Description	Fig.
1	Jt2 (complete)	669	129	B8	—	Thin red and black bands	5.6:8 (3.60:1)
2	FL, handle	1063/10	206	B8	—	Red star painted on handle	5.9.9
3	J4, shoulder and neck	1080/1, 1080/4	210	B8	—	Red bands and wavy line	5.6:5 (3.62:9)
4	FJ, b.f.	1079/7	210	B8	Table 6A.1.17 Group 2 Tel Dan	Thin black bands	5.9:7
5	J2b-4, neck	1091/2	210	B8	—	Thin red bands	
6	J, b.f.	1075/7	210	B8	—	Black bands	
7	J5, b.f.	1011/1, 1075/8, 10 1080/1	210	B8	—	Red bands and hanging pendants	
8	J4, body and handle	1126/9	213	B8	—	Red bands	5.6:4 (3.63:1)
9	FJ, shoul-der and handle frag.	1097/4	213	B8	—	Black and red concentric circles	
10	K1, rim and handle	2089/1	319	B8	—	Red band on rim, horizontal black hatches and vertical lines on handle; plastic decoration	5.6:2 (3.63:5)
11	CH, base/ bowl join	1310/8	319	B8	—	Thin black and red concen-tric circles (LB)	
12	J, b.f.	1317/5	319	B8	—	Thin black and red concentric circles	5.9:3
13	FL b.f.	2046/3	319	B8	—	White slip, thin black lines enclosing wide red band	
14	J, rim & neck	1347/1	327	B8	—	Even black and red bands around neck	5.9:11

No.	Object	Field No.	Locus	Area/ Phase	Petrography	Description	Fig.
15	J, b.f.	1339/2	332	B8	—	Black and red lines and metopes	
16	FL, b.f.	6127/2	415	B8	—	Alternating red and black concentric circles	5.9:10
17	J, b.f.	6156/3	417	B8	—	Thin black lines enclosing wide red band	5.9:2
18	FJ, b.f.	6144/4	417	B8	—	Red concentric circles	
19	J, b.f.	6746/5	418	B8	—	Very thin black lines enclosing wide red band	
20	SJ b.f.	6149/6	419	B8	—	Thin red bands border a thick black band (LB?)	
21	SJ, shoulder frag.	6164/2	419	B8	—	Red bands	5.9:1
22	FL, b.f.	6164/6	419	B8	Table 6C.1.18 Group A Tel Dan	Black and red concentric circles	
23	K1a, rim	6155/1	419	B8	—	Flat cut bowl rim with black hatch lines	
24	FJ, b.f.	9359/3	547	B8	—	White slip, thin black lines enclosing wide red band	
25	J, b.f.	9359/7	547	B8	—	White slip, thin black lines enclosing wide red band	
26	FJ, b.f.	9386/1	547	B8	—	White slip, thin black bands enclosing wide red band, black lines enclosing crosses and "fan"	5.9:8
27	J, b.f.	9386/9	547	B8	Table 6A.1.13 Group 6a, uncertain, probably Tel Dan	Buff slip, thin black lines enclosing a red band	5.9:4
28	GJ, b.f.	9329/1	563	B8	—	Thin black bands enclosing a thick red band, all burnished	5.7:2 (3.64:3)
29	FJ, b.f.	9747/5	563	B8	—	Alternate red and black lines in concentric circles	5.7:4
30	FL1, b.f. 9733/2	9733/2,3 08/26	563 (4704)	B8	—	Cross-hatched lozenge	5.6:12 (3.64:5)
31	FL, upper part	9431/16	572b (=612)	B8	—	Concentric black circle	3.68:7
32	Pyxis, complete	10736	574	B8	—	Alternating red and black bands, pendant collar lines, dots	5.7:5 (3.65:3)
33	SJ, b.f.	9434/4	584	B8	—	2 red bands on shoulder	
34	J, b.f.	9435/2	584	B8	—	Red and black bands	
35	J6 (spouted jug)	10211/1	584	B8	—	Buff ware, thin black lines enclosing wide red band with a black and red thin lined fan design	5.6:9 (3.66:5)

No.	Object	Field No.	Locus	Area/ Phase	Petrography	Description	Fig.
36	SJ, b.f.	9595/1	584	B8	—	Thin black and red bands	
37	J, handle	9481/3	587	B8	—	Horizontal hatched lines down handle (Cypriot?)	
38	FL, most of vessel	9855/1	597	B8	Table 6A.1.18 Group 7, uncertain, probably coastal	Thin black and red bands	5.7:1
39	FJ, b.f.	9643/1	605	B8	—	Thin black bands enclosing wide red band, black star under handle	
40	J2b, upper half	10553/1	605	B8	—	Two thin black lines enclosing thicker red band	5.6:7 (3.68:2)
41	J5 (Basket handled strainer jug & handle)	9663/2	612	B8	Table 6C.1.24 Group A Tel Dan	Alternating thin black and red lines	5.6:11 (3.68:6)
42	K1, large rim	10164/3	645	B8	—	Thin red and black bands and zig-zags	5.6:1 (3.69:1)
43	SJ?, b.f.	10113/5	651	B8	—	Black bands, possibly enclosing red band	
44	FJ, b.f.	10113/15	651	B8	—	Thin black bands enclosing wide red band	
45	SJ, shoulder and handle	10113/16	651	B8	—	2 red bands with wavy line between (Cypriot?)	
46	K, handle	10304/3	659	B8	—	Red vertical line; LCIIIB?	
47	J, b.f.	10501/15	663	B8	—	Black and red bands with vertical black line	5.9:5
48	SJ, handle	10193/2	665	B8	—	White wash, two brown stripes down length of handle	
49	SJ, handle	10208/1	665	B8	—	White wash, brown star on handle	
50	FL, b.f.	10242/8	671	B8	—	Very thin black lines enclosing wide red band	
51	FJ, b.f.	10476/4	686	B8	—	Thin black bands enclosing thick red band in concentric circles	
52	J, b.f.	25045/1	686	B8	—	Red lines with large black triangle (LB?)	
53	J, b.f.	16065/5	4202B	B8	—	Black and red bands	
54	K, rim	18072/3	4202B	B8	—	Black band	
55	Bp, rim	18107/1	4202B	B8	—	Interior alternating black and red bands (LB?)	
56	SJ, b.f.	18072/4	4202B	B8	—	Yellow surface, red bands on shoulder (LB?)	
57	SJ, upper section	23404/4	7062	B8	—	Thin red bands on shoulder and neck	5.6:3 (3.72:15)

No.	Object	Field No.	Locus	Area/ Phase	Petrography	Description	Fig.
58	GJ, 2/3 vessel	23400/1	7062	B8	—	Thin black bands enclosing [alternating] wide red band	5.7:3 (3.72:17)
59	Pyx, complete	23481/1	7075	B8	—	Thin alternating black and red bands	5.7:6 (3.73:7)
60	SJ, neck	20089/1	8024	M9a	Table 6C.1.13 Group C Carmel Coast	Red horizontal bands around a tall neck	3.78:6
61	SJ, b.f.	20592/10	8175	M9a	—	Red and black bands	
62	J, shoulder frag.	12762/5	2421	T14	—	Thin red and black bands	5.6:6 (3.95:1)
63	FJ, center frag.	19176/19	2595	T14	—	Red center enclosed by black bands; vertical burnish on white slip	
64	SJ, shoul-der frag.	19180/3	2595	T14	—	Black bands on shoulder (Cypriot?)	
65	J5, b.f. with spout and handle frag.	12762/5	1018	Y3b	Tables 6B.1-3 DN7 local [northern]	Black band enclosing thick red band, vertical black hatched strip enclosed by thin red lines, all on burnished face	5.6:10; 5.9:6
66	J5-6 rim & basket handle	13718/13	3171	Y3b	—	Horizontal red hatches on handle	3.106:11
67	J5, b.f.	17167/6	3171	Y3b	—	Thin black bands enclosing thicker red band; vertical lines enclosing black hatching	5.6:13

Table 5.3. Painted vessels by stratum and vessel type

Type	Strata VIIA1-V	Stratum IVB
Platter bowls	1	1
Hemispheri-cal bowls	1	—
Kraters	7	5
Chalices	—	1
Pithoi	1	—
Storage jar	7	13
Storage jar/Jug	5	—
Jug	24	24
Flask	12	7
Flask-jug	1	13
Pyxis	23	2
Juglet	—	1
Kernos	1	—
Undefined	10	4
Total	**93**	**71**

Table 5.4. Painted vessels by stratum and motif type

Motif type	Strata VIIA1-V	Stratum IVB
Dark circles, hatches, bands and lines	15	5
Red circles, hatches, bands and lines	13	14
Thin red and black lines	51	12
Enclosed band	—	19
OMDS	4	—
Horizontal wavy line	1	1
Vertical wavy line	3	—
Stars, ribbons, lozenges	1	3
Various Cypriot (?)	1	3
Miscellaneous or undefined	4	14
Total	**93**	**71**

Table 5.5. The stratigraphic distribution of monochrome painting

Motif type	Strata VIIA1-VI	Stratum V	Stratum IVB
Dark painted monochrome	4	13	5
Red painted monochrome	10	3	14
Total	**14**	**16**	**19**

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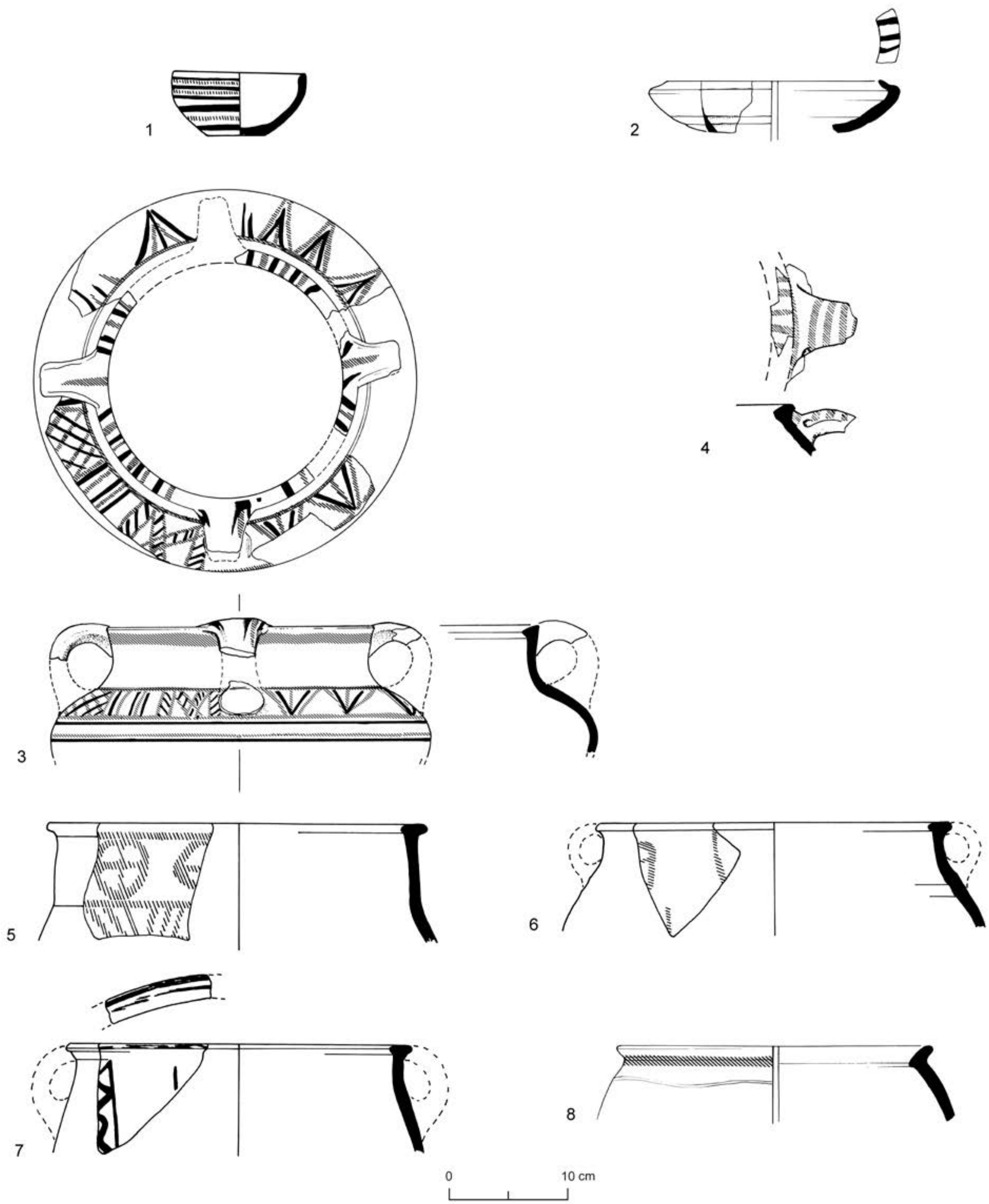

Fig. 5.1. Selected Iron IA painted pottery from Strata VIIA1-V: bowls and kraters.

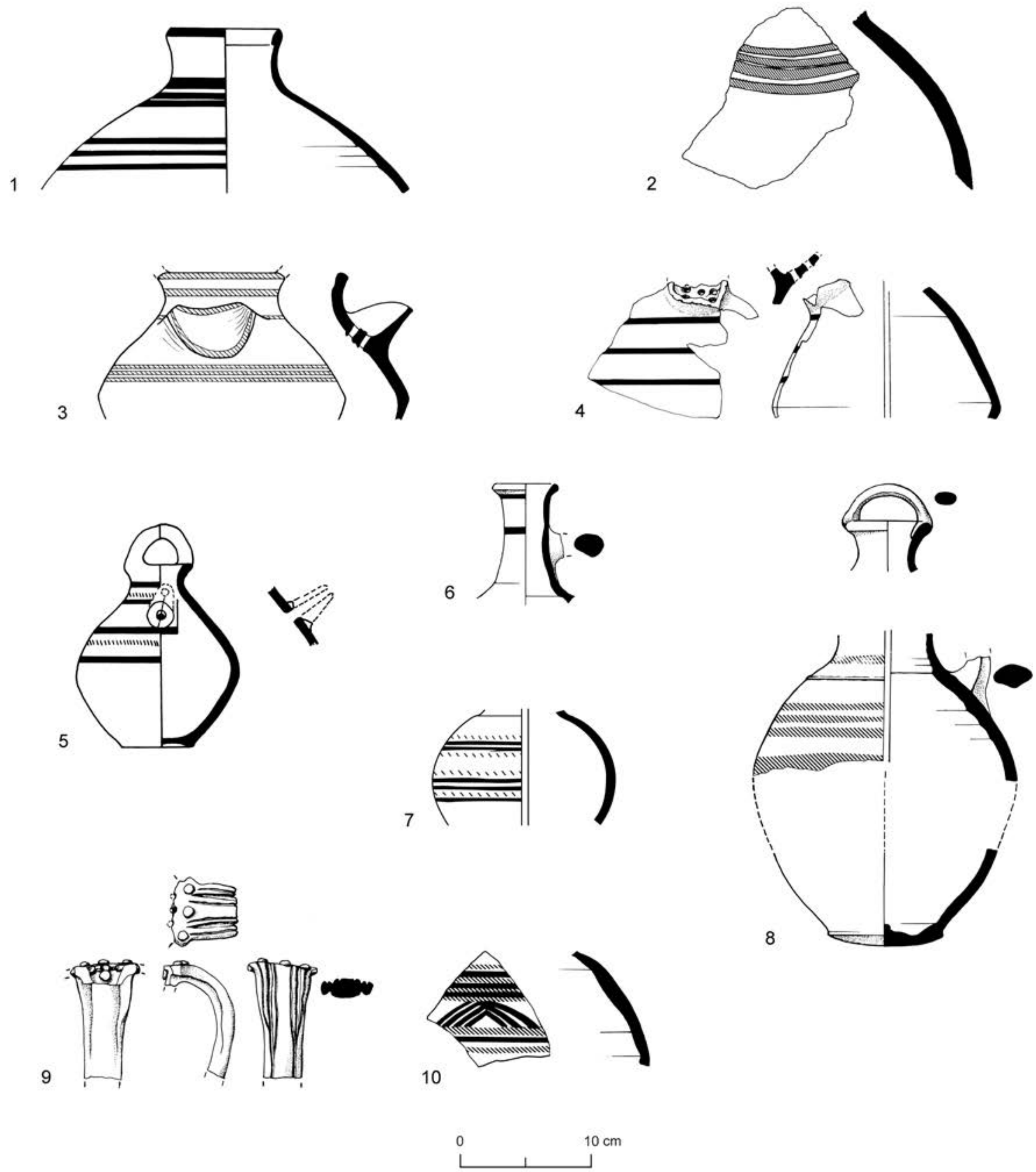

Fig. 5.2. Selected Iron IA painted pottery from Strata VIIA1-V: jars and jugs.

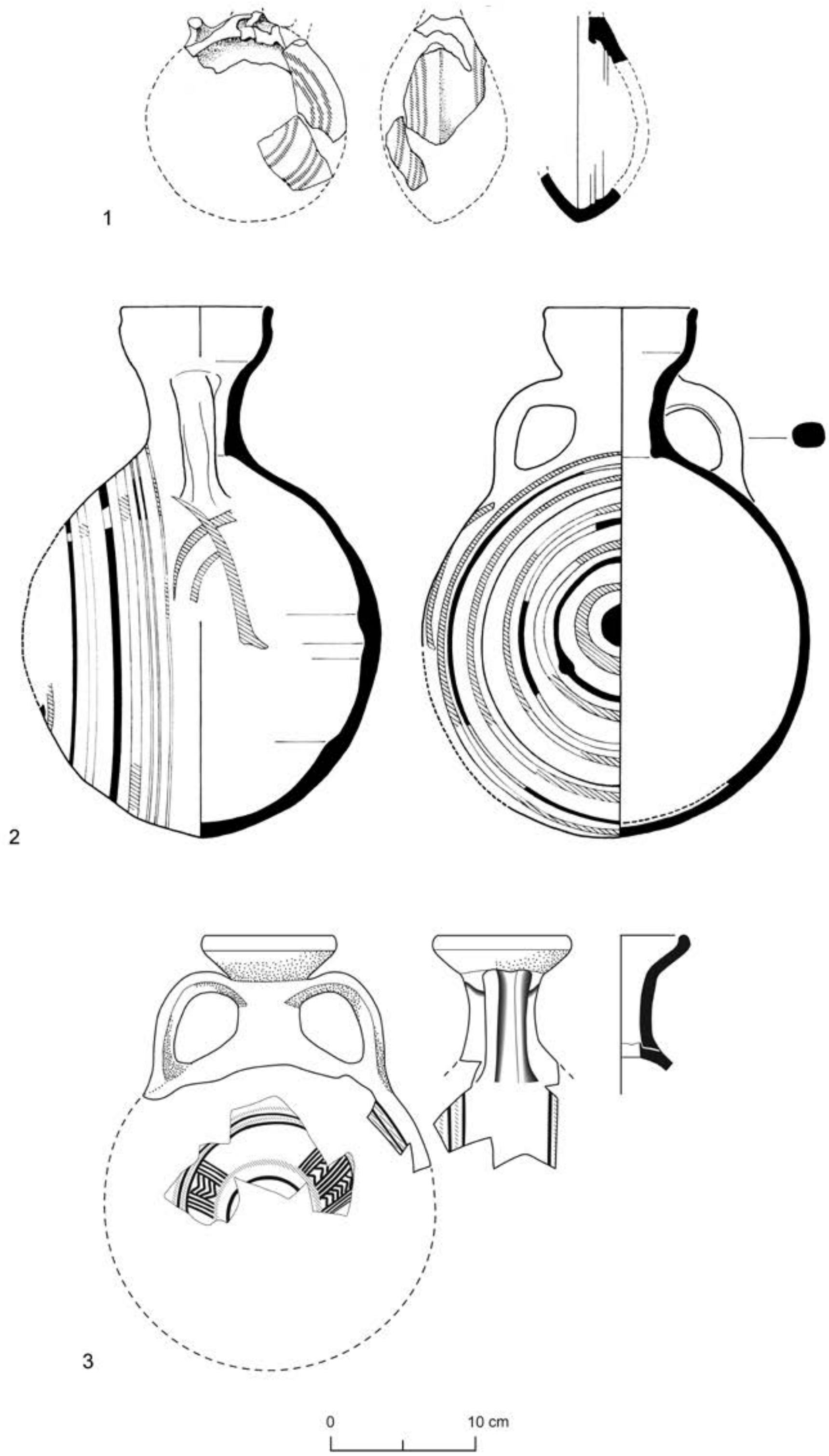

Fig. 5.3. Selected Iron IA painted pottery from Strata VIIA1-V: flasks.

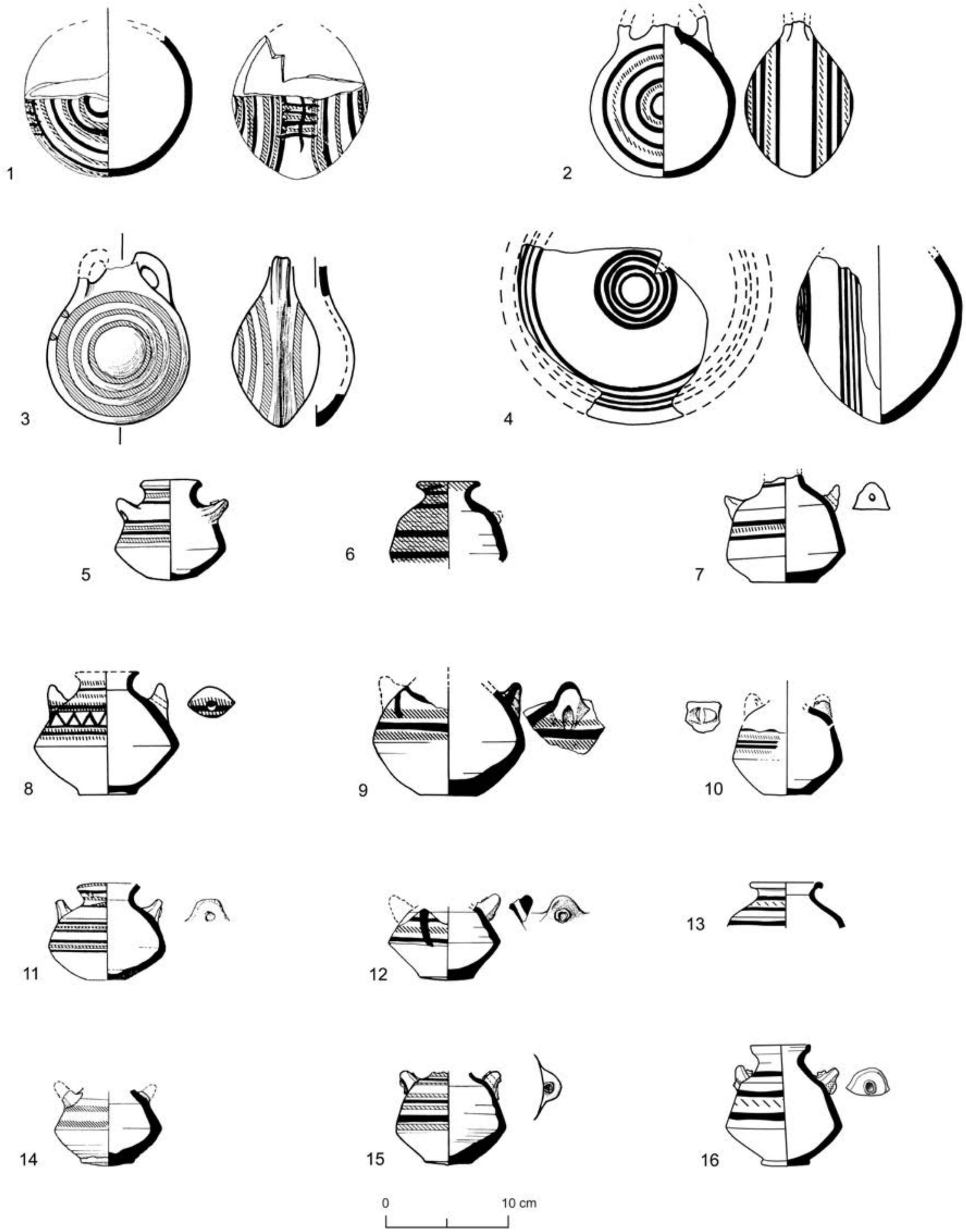

Fig. 5.4. Selected Iron IA painted pottery from Strata VIIA1-V: flasks and pyxides (alabastra).

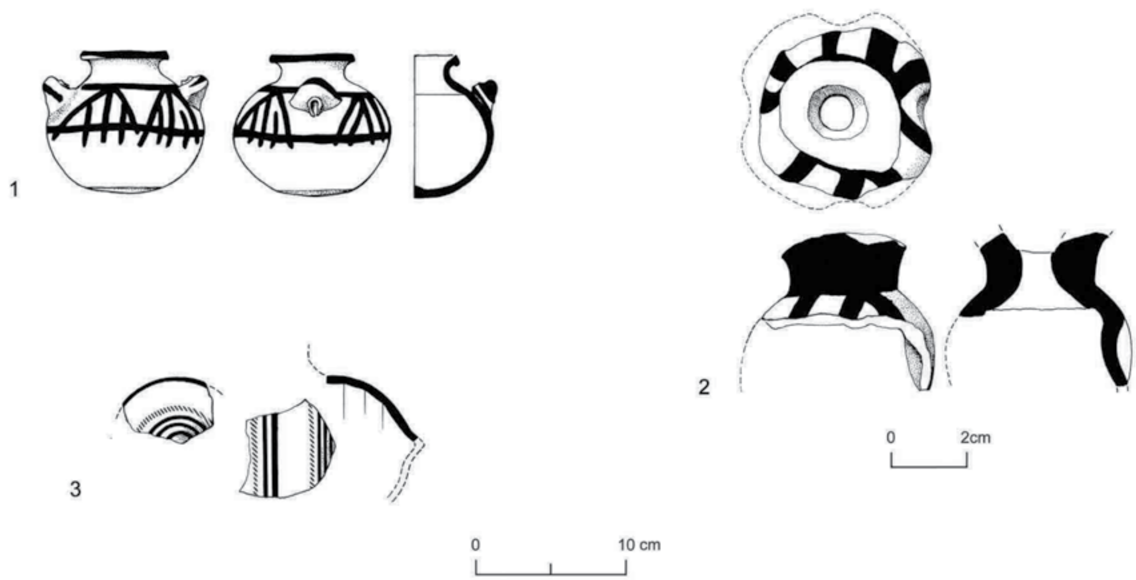

Fig. 5.5. Selected Iron IA painted pottery from Strata VIIA1-V: special miscellanea.

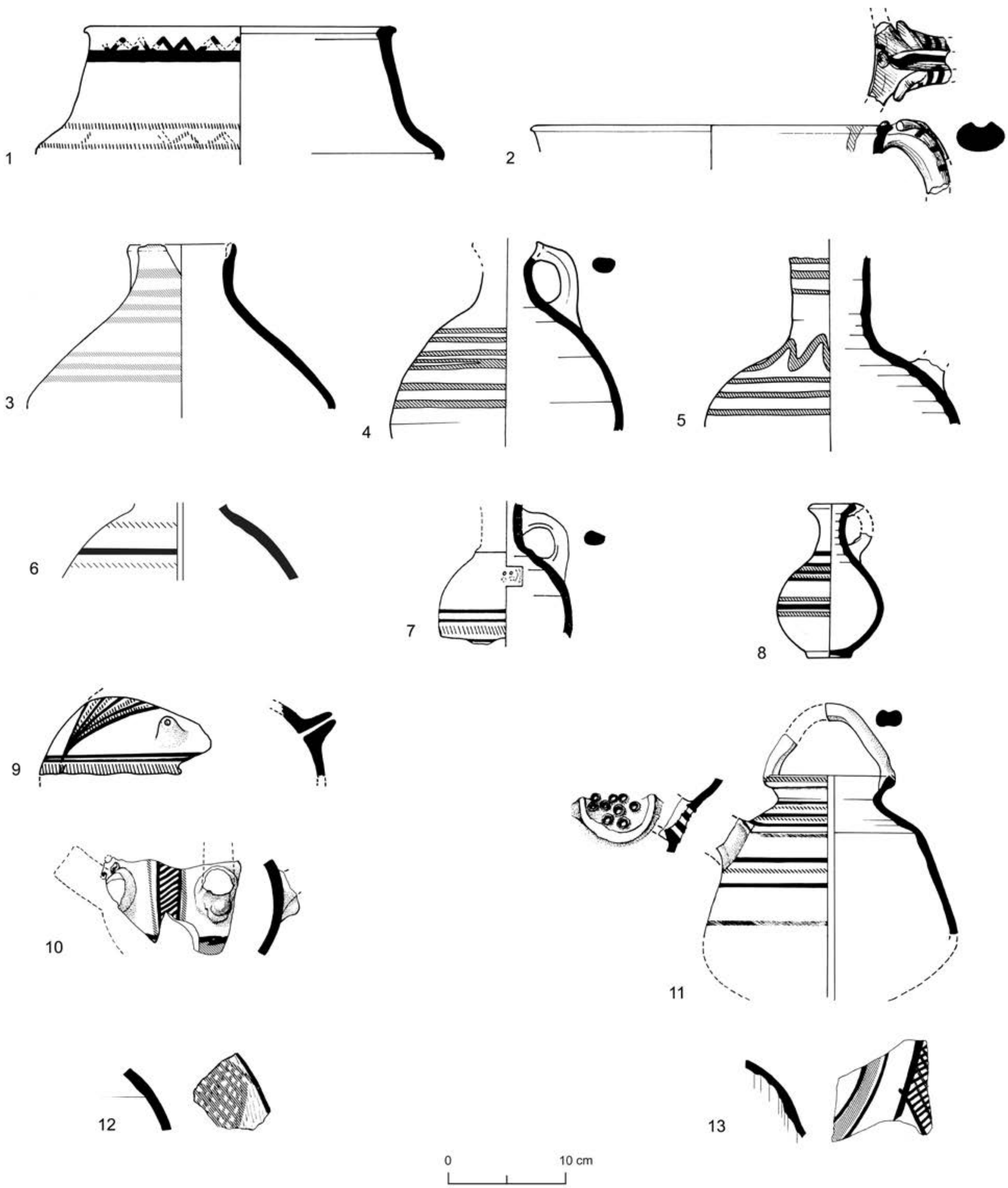

Fig. 5.6. Selected Iron IB painted pottery from Stratum IVB: kraters, jars and jugs.

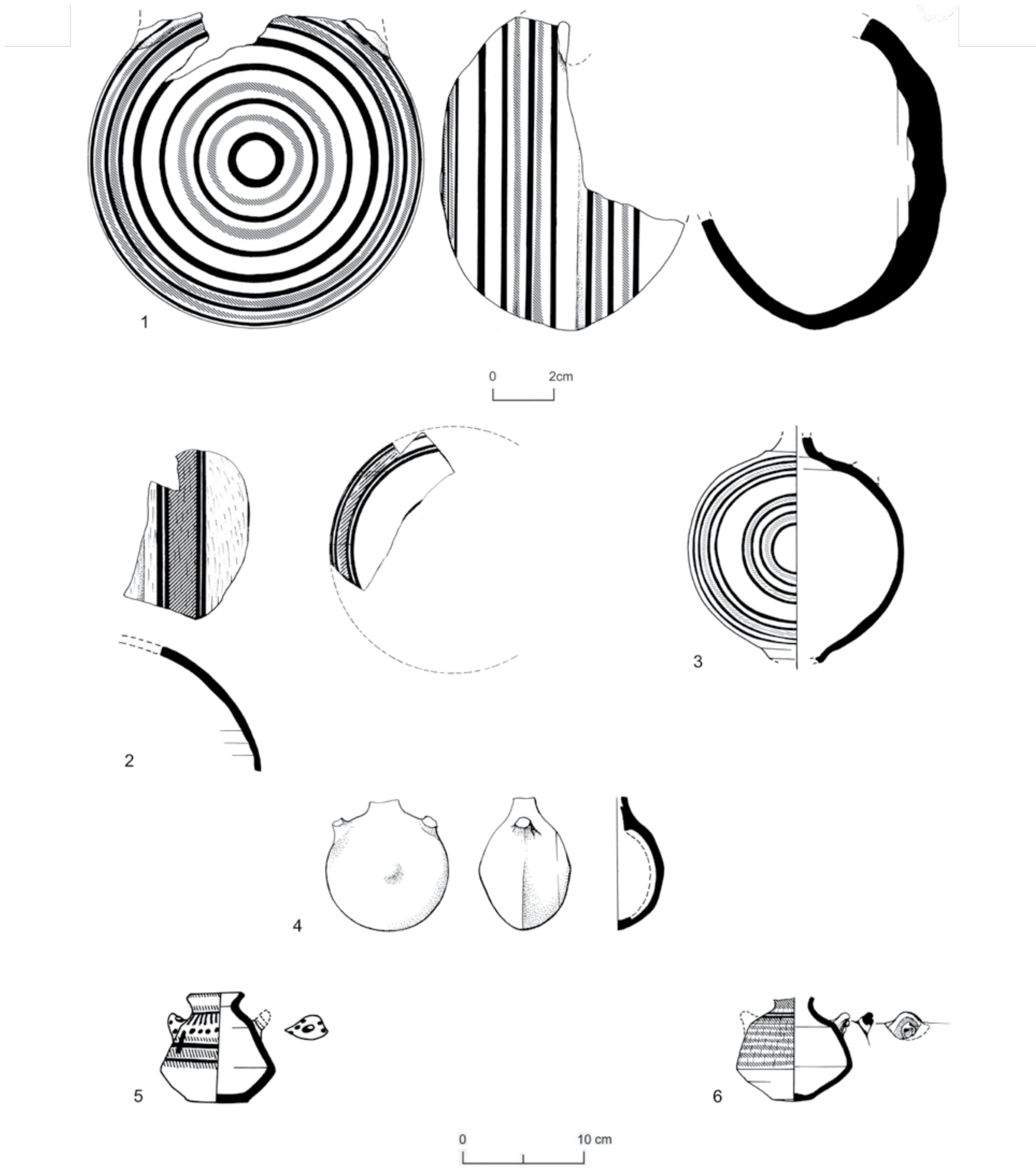

Fig. 5.7. Selected Iron IB painted pottery from Stratum IVB: flasks and pyxides (alabastra).

Fig. 5.8. Selected Iron IA painted pottery from Strata VIIA1-V, color photos.

Fig. 5.9. Selected Iron IB painted pottery from Stratum IVB, color photos.

CHAPTER 6A

A PETROGRAPHIC STUDY OF EARLY IRON AGE CONTAINERS AT TEL DAN

Paula Waiman-Barak and Ayelet Gilboa

Introduction

Twenty-one containers from Tel Dan dating to the early Iron Age have been sampled and analyzed for provenance.[1] This analysis is part of a wider research project, which focuses on a long over-looked phenomenon: early Iron Age trade relations in the Southern Levant, and especially between the Phoenician coast and other regions. Tel Dan was chosen for analysis due to its well-documented stratigraphic and ceramic sequence (this volume Chapters 2 and 3) and the proximity of the site to the Phoenician coast.

The transport vessel classes chosen for analyses are: jars, pithoi, Phoenician Bichrome jugs, and small decorated flasks. Regarding jars, it was quite clear, *a priori*, by morphological considerations, that no jars that typify the Phoenician coast in the early Iron Age are present at Dan (for the main types, see Gilboa, Sharon and Boaretto 2008: Figs. 6:1-3; 9;13:1-6; 16). The jars chosen for analysis (see below) represent the prevalent jar type at Dan (Ilan, this volume, Chapter 3). Among the pithoi we concentrated on the "Wavy-Band" category, since collared-rim pithoi from Dan and elsewhere have been studied in the past (e.g., Yellin and Gunneweg 1989; Cohen-Weinberger and Wolff 2001; Yannai 2006; London and Shuster 2001). Regarding "Phoenician Bichrome" containers at Dan, our sample includes only two such vessels since they are being studied separately (this volume, Chapters 4-5 and 6C). Other than closed containers, our sample also includes one krater fragment (No. 1), which according to its morphology was considered a possible Egyptian import, but this has not been borne out by the analysis.

Method and Method of Presentation

The components of the fabrics have been recorded and identified according to their optical features, which is the essence of fabric classification using petrography for provenience purposes (e.g., Porat 1989; Goren 1991; Orton *et al*. 1993; Goren *et al*. 2004; Vernon 2004). The mineralogical composition was then compared with relevant geological and soil maps of the Dan area, Northern Israel in general, the Jezreel valley, the Carmel coast and Lebanon. Geological studies of the northern Hula

1 This chapter, submitted in 2012, is part of a PhD dissertation written by Waiman-Barak, advised by Yuval Goren and A. Gilboa and supported by the Graduate Studies Authority at the University of Haifa and the Tel Dor Excavation, co-directed by Ilan Sharon and Gilboa. The analyses were carried out in the Laboratory of Materials in Archaeology at the University of Haifa, directed by Sariel Shalev. Golan Shalvi of the Zinman Institute of Archaeology at the University of Haifa produced the thin sections and the photomicrographs.

valley and the slopes of Mt. Hermon, as well as studies dealing with the geological formation of travertine helped with the fabric classifications (e.g., Kronfeld *et al*. 1988; Pedley 1990; Glover and Robertson 2003; Shulman *et al*. 2003; Rozenbaum *et al*. 2005).

Several provenience analysis studies of ceramics from Tel Dan and Upper Galilee were also consulted (most of them employ petrography). The latest are Goren 2011, dealing with Late Bronze pottery from Dan and Nativ 2012, a study of Middle Bronze Age ceramics from nearby Qiryat Shemona. Collared-rim pithoi from Dan were analyzed by Instrumental Neutron Activation Analysis (Yellin and Gunneweg 1989). This study found that many (though not all) of the pithoi were locally produced, but no distinction between different 'local' clays was made. The petrographic analysis of Iron Age I Galilean, "Tyrian" (termed here "Wavy-Band") and collared-rim pithoi from Sasa (Cohen-Weinberger and Goren 1996) demonstrated that all three types were produced locally. In addition, a few "Wavy-Band" pithoi were determined to have been brought from the Lebanese coast (see further below, discussion). Other petrographic research on ceramics and plaster from the region deals with the Neolithic period (Goren and Goldberg 1991), Early Bronze Age 'metallic' ware (Greenberg and Porat 1996) and Roman ceramics (Wieder and Adan-Bayewitz 1999). Further parallels to the fabrics we encountered at Dan are also to be found in Bettles 2003 (dealing with Phoenician jars of the Persian period) and Cohen-Weinberger 2007a (Middle Bronze Age II Pottery). In addition, we made extensive use of comparative data in the Laboratory for Comparative Microarchaeology and Metal Conservation in the Institute of Archaeology, Tel Aviv University.

For unusual components in the fabrics, such as silicified vegetation and other plant remains, sweet-water shell and bone fragments, the following publications were consulted: Madella *et al*. 2002; Canti 2003; Karkanas and Goldberg 2010; Mallol *et al*. 2010 and Matysová *et al*. 2010.

The possibility that some vessels may have been manufactured using clays from different sources has been taken into consideration, but because of the restricted nature of our assemblage, this is currently an unresolved issue. Sampling other shapes, such as bowls, cooking pots etc. may offer insights in this respect (Golding-Meir, Chapter 6c this volume, is an important first step).

When trying to trace interconnections between sites/regions, one must first define which ceramics might be termed 'local', i.e., probably produced at the site or in its immediate vicinity. Tel Dan is located by a number of good clay sources for ceramic manufacture (see below) and therefore for the purpose of this chapter the term 'local' is ascribed to several sources of raw material situated within several kilometers of the site. Ethno-archaeological data (e.g. Arnold 1985; Rice 1987; Rice 1996; Arnold 2000; Sillar and Tite 2000) indicate a clear preference among potters for clay sources in the immediate vicinity. The fabric groups defined with certainty as 'local' are Fabric Groups 1-4 (see below). It should, however, be borne in mind that regions immediately north and northeast of Tel Dan, within the borders of present-day Syria and Lebanon, share similar geological characteristics. Comparable provenience studies of ceramics from these regions, to the best of our knowledge, are non-existent. This creates a clear bias in favor of sites in Israel.

Figs. 6A.1-21 are arranged in typological order (and not according to the fabric groups). The illustrations include, in addition to the drawing or photograph of the vessel/fragment itself, photographs of fresh sections as viewed through a simple USB microscopic camera, and photomicrographs of the thin sections under cross-polarized light. This graphic presentation is meant to facilitate an assessment of the results and the interpretations offered herein and to contribute to future comparative research.

The Geological Setting of Tel Dan from a Petrographic Perspective

The geological setting of Tel Dan has been described by Ilan in Chapter 1 of this volume. This section seeks to highlight features important to our petrographic analysis.

Tel Dan is located at the southwestern foot of Mount Hermon, between the so-called Upper Galilee Panhandle and the Hula Valley wetlands, on the bank of the Dan river, which drains the Hermon limestones as well as the Golan Heights basaltic plateau. This is a lush environment that benefits from its three main perennial rivers: Hermon (Banyas), Dan and Snir (Hasbani). The once extensive Hula Valley wetlands lie immediately to the south. The site is surrounded by alluvium of the Hula Group, and also by Quaternary sediments of the northern Hula Valley (Sneh and Weinberger 2003). Fluvial terrace conglomerates are exposed along the riverbanks. These sediments include conglomerates, gravel, and re-deposited tufa-travertine. Tufa-travertine deposits are widespread in the northern margins of the Hula Valley (e.g., Heimann and Sass 1989). These are freshwater carbonate deposits that form in rivers and springs; they are usually fragile, fine-grained, white, yellow or brown. One of their common features is the preservation of abundant microfossils.

Results

The Fabric Groups

Eight fabric groups were defined. Groups 1-4 are the ones we consider 'local', Groups 5-7 are of uncertain location, and Group 8 is clearly imported.

Fabric Group 1: Clayey alluvium with limestone and silicified vegetation

This is the largest group in our sample and includes eight vessels—oval jars, wavy-band pithoi, and flasks (Nos. 2-4; 8-10; 15-16). The fabric is clayey, silty (~30% silt), porous, dark brown to red in Plain Polarized Light (PPL) with some iron accumulations and iron ooids (50-100µm). The silt contains mostly well-sorted angular quartz, poorly-sorted angular limestone and eroded flakes of feldspars. The a-plastic components consist of spherical terra rossa bowls (up to 200µm), which include silty quartz inclusions and in addition poorly-sorted angular limestone (~5% 100-400µm), sub-angular well-sorted quartz and quartzite (~50µm), and large fragments of silicified plants, bones and eroded shells (e.g., No. 10). Some of the samples of this group contain eroded basalt fragments (100-400µm).

Estimated firing temperature: There are several indications that suggest a firing temperature of about 800°C (for a recent study of firing temperatures of ceramic fabrics see Tschegg *et al*. 2009). There are anomalies in the color of the calcite: a breakdown and dissociation of carbonate minerals, some of the quartz grains are cracked as a result of thermal shock, and the bone fragments appear as dark red to black (for estimating firing temperature according to bone color see recently Odriozola and Martínez-Blanes 2007; Rasmussen *et al*. 2012 with references).

Interpretation and suggested provenance: Calcareous clays with a combination of volcanic basalt and limestone fragments are very common in northern Israel (e.g., Sneh and Weinberger 2003) and in southern Lebanon (Salib and Sayegh 1969; for documented ceramic parallels see Goren 2011; Goren *et al*. 2004: Ch. 8). The different components of the fabric suggest that the clay source is a lush water deposit. This, and the ethno-archaeological studies cited above makes the Tel Dan vicinity a good candidate for the provenance of this fabric group and we conclude that Group 1 is local to Dan (but see further the Discussion).

Fabric Group 2: Tufa-travertine

This group includes two oval/carinated jars (Nos. 5, 7) and a flask (No. 17). The fabric is carbonatic, compact dark brown in PPL. The inclusions consist of poorly-sorted rounded to angular tufa travertine fragments (~30% 50-400μm), including interclasts tufa and structureless micrite tufa and various microfossils. Also seen are some angular quartz sand (~5% up to 150μm), eroded basalt fragments (up to 200μm), and different forms and sizes of calcite (less than 5%).

Estimated firing temperature: Probably about 800˚C, as in Group 1.

Interpretation and suggested provenance: Tufa is a freshwater limestone deposit that occurs in spring, waterfalls and in fast-flowing streams (Pedley 1990; 2009; Rozenbaum *et al*. 2005; Perri *et al*. 2012). As noted above, the northern part of the Hula Valley is mainly covered with travertine, which has been extensively studied (e.g., Heimann and Sass 1989 for description and references). In Israel, travertine outcrops are also known (only) from the Beth She'an Valley (Kronfeld *et al*. 1988). The use of travertine for ancient pottery is also well documented in that region (e.g., Cohen-Weinberger 2007a; 2009), but it appears differently in the thin sections. This fabric group is most likely local to Dan.

Fabric Group 3: Terra rossa soils with terra rossa balls, nari, basalt and quartz

This group includes an Egyptian-style neckless jar (No. 1), an oval/carinated jar (No. 6), and a "Phoenician Bichrome" flask or jug (No. 14). The fabric is non-carbonatic, rich in iron and silty (~30%), porous, dark brown to red in PPL with some iron accumulations and iron ooids (50-100μm). The silt contains mostly well-sorted angular quartz, poorly sorted angular nari, chert and feldspars. The a-plastic components consist of spherical terra rossa bowls (up to 200μm) with silty quartz inclusions, poorly-sorted angular nari (~5%, 100-400μm), some siltstone, and sub-angular well-sorted quartz (~50μm). It is also possible to see eroded basalt and occasionally scattered alkaline feldspars (up to 50μm).

Estimated firing temperature: The breakdown of the nari suggests a firing temperature of about 800˚C.

Interpretation and suggested provenance: Terra rossa is a red-brown soil that has developed on limestone or dolomite. In antiquity, red-brown terra rossa was extensively used for pottery manufactured in the central highlands of Cis-Jordan (Goren *et al*. 2004), and in Galilee (Wieder and Adan-Bayewitz 1999; Tsatskin and Gendler 2001). Geologically, terra rossa is also widely known in the Lebanese mountains (Abdallah *et al.* 2005). Since terra-rossa is found 2-3 kilometers east of Tel Dan, this fabric group could also be local to Dan.

Fabric Group 4: Lower Cretaceous shales with chalk and quartz

This group includes only one, complete and rather small and deformed Wavy-Band pithos (No. 11). The fabric is ferruginous, foraminiferous with good optical orientation, tan to brown in PPL, with some silt (less than 10%). The silt contains mostly quartz and some feldspars and silt-size opaque bodies. The a-plastic components include very poorly sorted, sub-rounded to sub-angular limestone and nari chunks (up to 2mm), poorly-sorted quartz ranging from silt to sand size (up to 250μm), and occasional spherical shales (up to 800μm).

Estimated firing temperature: The pale diffused core, the relatively pale color and the relatively good condition of the carbonate components and the foraminifera in the matrix suggest a firing temperature lower than 750˚C.

Interpretation and suggested provenance: The use of Lower Cretaceous shales in pottery is well attested in the archeological record of northern Israel (Greenberg and Porat 1996; Goren *et al*. 2004:168; Goren 2011; Nativ 2012). Lower Cretaceous clays are of good quality because they are better sintered in lower temperatures during the firing process (Porat 1989: 71-72; Goren *et al*. 2004: 103-105 with references). This formation is exposed on the slopes of Mount Hermon (but also in mountainous Lebanon and, for example, in the Akkar plain in northern Lebanon (Porat 1989; Goren *et al*. 2004: 161-134). Due to the close proximity of such a clay source to Tel Dan, and the fact that this fabric group is common among the Late Bronze Age pottery of Dan (Goren 2011) this fabric group should probably also be considered 'local.'

Fabric Group 5: Unknown marl with shale fragments, iron oolites and chalk rich in microfossils

This group includes only one so-called Galilean pithos (No. 12). The fabric is silty (~20%), tan in PPL with some silt (10-15%). The silt contains mostly quartz and some limestone and silt-size opaque bodies. The a-plastic components include shale fragments (50µm to 1mm), dissolved chert with microfossils (up to 500 µm), well-sorted sub-rounded limestone (~100µm) and moderately-sorted sub-angular to angular quartz (50-100 µm).

Estimated firing temperature: The poor state of the carbonate particles suggest a firing temperature of 800˚C and over.

Interpretation and suggested provenance: As mentioned, similar pithoi from Sasa (in Upper Galilee) were determined by Cohen-Weinberger and Goren (1996) to be local to that site. The characteristics of the Dan pithos are different. At this point there is not enough information to determine the provenience of this fabric group.

Fabric Group 6a: Rendzina soil with volcanic tuffs and microfossils

This group includes only one vessel—a "Phoenician Bichrome" jug (No. 13). The fabric is carbonatic, foraminiferous, rich in iron oolites and silty (~10%). The silt contains mainly quartz and some volcanic-derived minerals and their alterations. The a-plastic components include moderately-sorted tuffs (~10%, 50-200 µm), moderately sorted lime stone (~5%, 100-200 µm) and angular quartz (~5% up to 200 µm).

Estimated firing temperature: uncertain

Interpretation and suggested provenance: Rendzina is a soil that develops on chalk. This fabric group is well known in the archaeological record of the southern Levant (e.g., Wieder and Adan-Bayewitz 1999; Cohen-Weinberger and Goren 2004; Goren *et al.* 2004; Cohen-Weinberger 2007a). The combination of this foraminiferous brown rendzina and volcanic tuffs is known in and near Israel's Carmel ridge and on the slopes of Mount Hermon. As we discuss below, both possibilities are acceptable as an origin for "Phoenician Bichrome", and currently it is impossible to be more exact than that.

Fabric Group 6b: Brown rendzina with basalt and chalk

This group includes one undecorated flask (No. 21). The fabric is carbonatic, foraminiferous, and silty (~10%). The silt contains mainly quartz and some volcanic-derived minerals and their alterations. The a-plastic components include poorly-sorted basalt fragments (~10%, 50-600 µm), moderately-sorted limestone (~5%, 100-200 µm) and some microfossils.

Estimated firing temperature: Uncertain

Interpretation and suggested provenance: Rendzina soils with basalt differ from Group 6a mainly in the lack of tuffs and also in the difference in genera and quantity of foraminifers (for its use in pottery see e.g., Buzaglo 2004, Goren *et al.* 2004, Nativ 2012). Rendzina with basalts may originate in various regions, such as the Jezreel valley, and Upper Galilee, and the eastern slopes of Mount Hermon (e.g., Dan 1983). Therefore, in all probability, this group is also local to Dan.

Fabric Group 7: Clay with shell and coastal quartz

This group includes one decorated flask (No. 18). The fabric is clayey, dense, dark brown in PPL, with some iron accumulations (50-100µm). The a-plastic components consist mostly of fresh shell fragments in various sizes (up to 300µm) and sub-angular quartz (~50-70µm).

Estimated firing temperature: Due to the good preservation state of the shell and quartz, probably below 800˚C

Interpretation and suggested provenance: There are not enough data or equivalents to determine the provenance.

Fabric Group 8: Neogene marl with iron ooids and microfossils

This group includes a large undecorated flask and a small undecorated one (Nos. 19, 20). The clay is carbonatic, yellowish to tan in PPL, rich with poorly-sorted carbonate micrite, with many very poorly-sorted spherical and rounded iron rich minerals (up to 50µm). The matrix is very rich in microfossils, including planktonic foraminifera such as Globigerinella. In some cases the foraminifera are filled or surrounded with iron rich minerals (e.g., Nolet and Corliss 1990; Noujaim Clark and Boudagher-Fadel 2001). The fabric also includes benthonic foraminifera, such as Brizalina (e.g., Reuter *et al*. 2011) and coralline algae such as Amphiroa (Buchbinder 1975) and Bryozoa (e.g., D'hondt 1988]). The inclusions consist of sub-angular to angular quartz (5-15% 50-150µm), limestone (~5% up to 200µm) and chert in different levels of erosion.

Firing temperature: The light color of the matrix, the well-preserved carbonates components that include the different microfossils, as well as the nicely-preserved quartz grains suggest a firing temperature below 750˚C.

Interpretation and suggested provenance: This type of Neogene marl is well-documented in ceramic petrographic groups from the Lebanese coast (e.g., Bettles 2003; Yannai *et al*. 2003; Goren *et al*. 2004; Badreshany and Genz 2009). These well-known marls, the presence of *Amphiroa* algae among other microfossils, and the chert inclusions, point to a provenience in coastal Lebanon.

Summary and Commentary

Eight fabric groups were identified in this study, of which four (Groups 1-4; altogether 15 vessels) were defined as local and one is from the Lebanese coast (Group 8, two vessels). For four groups (5-7; four vessels) no origin could be suggested.

Local Production at Dan

In addition to the Egyptian-style neckless jar (No. 1) the following classes of vessels were produced at Dan or in its immediate vicinity:

Jars: All six oval and oval/carinated jars (Nos. 2-7) are apparently 'local' to Dan. Indeed, both shapes are very common at the site. Though very similar in shape, the jars belong to three fabric groups: Group 1 (Nos. 2-4), Group 2 (Nos. 5, 7), and Group 3 (No. 6, which could also be from some other nearby region, see above). The decorated No. 4 points to the lingering of Bronze Age ceramic traditions in this respect.

Wavy-Band pithoi: The four samples belong to two fabric groups: Group 1 (Nos. 8-10) and Group 4 (No. 11). The production of these Cypriot-style pithoi in the early Iron Age Levant has been discussed in the past chiefly in Gilboa 2001 and Pedrazzi 2007: 157-158. They occur in this period almost solely on the Phoenician coast (from Tyre to Dor) and in Phoenicia's hinterland, mostly in upper Galilee—at sites such as Sasa, Horbat 'Avot, Har Adir and more (see list in Gilboa 2001: 163; for Qiryat Shemona see Covello-Paran 2012; for the prototypes in Cyprus, e.g., Pilides 1996; 2000; Keswani 2009). Most of them were produced in the immediate environs of the sites where they were found. Provenience studies have pinpointed production on the Carmel coast for pithoi found at Dor (Cohen-Weinberger and Wolff 2001: 639-658 and yet unpublished INAA and petrographic analyses), and production in Upper Galilee for pithoi found at Dan and Sasa (Yellin and Gunneweg 1989; Cohen-Weinberger and Goren 1996). The locally produced wavy-band pithoi of Dan in the current study conform to this picture. It is also worth mentioning that three of them (Nos. 8-10, Group 1) were manufactured from the same clays as other vessels.

In addition, however, to this mostly 'local' production, some "Wavy-Band" pithoi in the early Iron Age, at least at Dor, are actual imports from Cyprus (Cohen-Weinberger and Wolff 2001: 647 and unpublished data). Moreover, Cohen-Weinberger and Goren (1996) have demonstrated that some of these very large pithoi were transported from coastal Phoenicia to its hinterland—in that particular case from the coast of Lebanon to Sasa.

In Gilboa 2001 this quite sudden influx of Cypriot-style pithoi in Phoenicia during the early Iron Age was attributed to Cypriot potters operating there (see there the detailed argumentation). In the southern Levant, however, similar pithoi are also attested earlier, in Late Bronze Age contexts, though in considerably smaller numbers. In contrast, in Syria, notably at Ugarit, they are much more numerous. Preliminary petrographic analysis conducted by Goren indicates that some of the Cypriot-style pithoi at Late Bronze Age Hazor may also be locally-produced. Zuckerman (2003:164) suggested that at Hazor, a local production of such pithoi may be attributed to an indirect Cypriot influence—via Syria. Indeed, the connection (if any) between the production of these pithoi in the Levant in the Late Bronze and Iron Ages requires further study.

Of the four pithoi in our sample, one (No. 8) originates in a terminal Late Bronze/early Iron Age locus, two (Nos. 9, 11; respectively Strata V and IVB) originate in early Iron Age contexts, while one (No. 10) was found in Stratum IVA, attributed to Iron Age IIA. Thus, the question whether at Dan this sort of local pithos production started already in the Late Bronze Age remains unanswered at present.

"Phoenician" Bichrome jug: One such vessel (No. 14, Group 3) was apparently produced at Dan (for some reservations, see above). The "Phoenician Bichrome" group of the Iron Age is commonly associated with the major Phoenician centers on the Lebanese coast (e.g., Bikai 1994: 31, 33-34; Aubet 2000: 80, 85; 2008: 250; Markoe, 2005: 24, 29, 224). Recently, however, it has been demonstrated that extensive production of this ware group was conducted both on the Carmel coast, which in the early Iron Age was part of Phoenicia (yet unpublished analyses by Goren and Waiman-Barak; provisionally Gilboa and Goren 2009), and, to a lesser extent in other regions such as the western Jezreel Valley (Harrison and Hancock 2005: Table 2: Nos. 5, 8, 10, 80; Arie, Buzaglo and Goren 2006:562-563; Arie 2011:463). This one jug from Dan therefore provides another indication that the production centers of "Phoenician" Bichrome, and hence the meaning of this term, require reconsideration. The other "Phoenician Bichrome" jug in our sample (No. 13, Group 6a) was either manufactured in Dan's vicinity or imported from the Carmel region and, again, currently we have no information regarding the provenience of other early Iron Age Bichrome vessels at Dan.

Large and small flasks: The three flasks that were produced at Dan comprise two decorated small ones (Nos. 15, 16, (Group 1); and one decorated large flask (no. 17; Group 2). For comments on the flasks, see below regarding the imports.

Imports to Dan

Only a couple of flasks, one large and one small (Nos. 19, 20; Group 8), constitute undisputedly long-distance 'imports', from the Lebanese coast. They originate, respectively, in Strata IVB and V. One additional small flask (No. 18) is probably another 'import'. The small early Iron Age flasks, by their shape, thickness of walls and restricted volume, must have contained some 'precious' liquid, and our current project indeed indicates that such flasks (and their contents) circulated quite extensively within the Levant and beyond (for their widespread occurrence in Cyprus, for example: Karageorghis and Iacovou 1990; Gilboa, Sharon and Boaretto 2008 and references therein; and unpublished data from Dor). It thus comes as no surprise that some flasks at Dan arrived from elsewhere. This apparently quite lucrative import should also be taken into consideration when the socio-economic composition of the village at Dan is considered.

Thus, on present evidence, the import to Dan of commodities packed in clay containers seems to have been quite limited, though it is definitely attested (and see also Golding-Meir this volume, Chapter 6c, and Yellin and Gunneweg 1989 for collared-rim pithoi imported to Dan). Such exchanges across shorter distances cannot be gauged at the moment. Future studies at other sites may be able to determine whether any such commodities were 'exported' from Dan elsewhere.

Table 6A.1. Petrographic provenance of selected ceramic vessel samples from the Iron Age I levels at Tel Dan

Sample no.	Vessel type	= Figure	Field info	Phase/ Stratum	Petro-graphic group	Suggested prov-enance
1	Egyptian-style neckless jar	6A.1	Area Y, L3107, 13417/1	Y4-5/ V	3	Dan
2	Oval jar	6A.2	Area T, L2842, 19753/1	T16/ VI	1	Dan
3	Oval jar	6A.3	Area B west, L4710, 25045/1	B9-10/ V	1	Dan
4	Decorated oval/ carinated jar	6A.4	Area B west, L692, 10391/3	B9/ VA	1	Dan
5	Oval/carinated jar	6A.5	Area Y, L3123,13476/3	Y6/ VI	2	Dan
6	Oval/carinated jar	6A.6	Area Y, L3212, 17090/1	Y5 /VI	3	Dan
7	Oval/carinated jar	6A.7	Area T, L2464, 12840/2	T15/ V	2	Dan
8	Wavy-Band pithos	6A.8	Area B-west, L4609, 23053	B13/ VIIA2	1	Dan
9	Wavy-Band pithos	6A.9	Area T, L2467, 12743/12	T15/ VA	1	Dan
10	Wavy-Band pithos	6A.10	Area T, L2606, 19213	T13/ IVA	1	Dan
11	Wavy-Band pithos	6A.11	Area B, L678, 10105	B8/ IVB	4	Dan, Mt. Hermon or southern Lebanon
12	Galilean pithos	6A.12	Area B-west, L7140, 23789	B11-12/ VI-VIIA1	5	Uncertain
13	Phoenician Bichrome jug	6A.13	Area B-west, L547d, 9386/2	B8/ IVB	6a	Uncertain
14	Phoenician Bichrome flask/jug?	6A.14	Area B-west, L663, 10201/15	B8/ IVB	3	Dan
15	Small two-colored decorated flask	6A.15	Area B west, L4264,18342	B9-11/ V-VI	1	Dan
16	Medium-sized decorated flask	6A.16	Area B west, L572b, 9431/16	B9-10/ V	1	Dan
17	Large flask with red/ brown decoration	6A.17	Area B-east, L210,1079/7	B8/ IVB	2	Dan
18	Small two-colored flask	6A.18	Area B-west, L597 (=L612), 9855/1	B8/ IVB	7	Uncertain
19	Large undecorated flask	6A.19	Area T, L2464, 12836/1	T15/ V	8	Lebanese coast
20	Small undecorated flask	6A.20	Area B west, L608 (=L570a), 9670/1	B8/ IVB	8	Lebanese coast
21	Flask	6A.21	Area B west, L7082, 23525/11	B9-10/ V	6b	Uncertain, Hermon region or Jezreel valley

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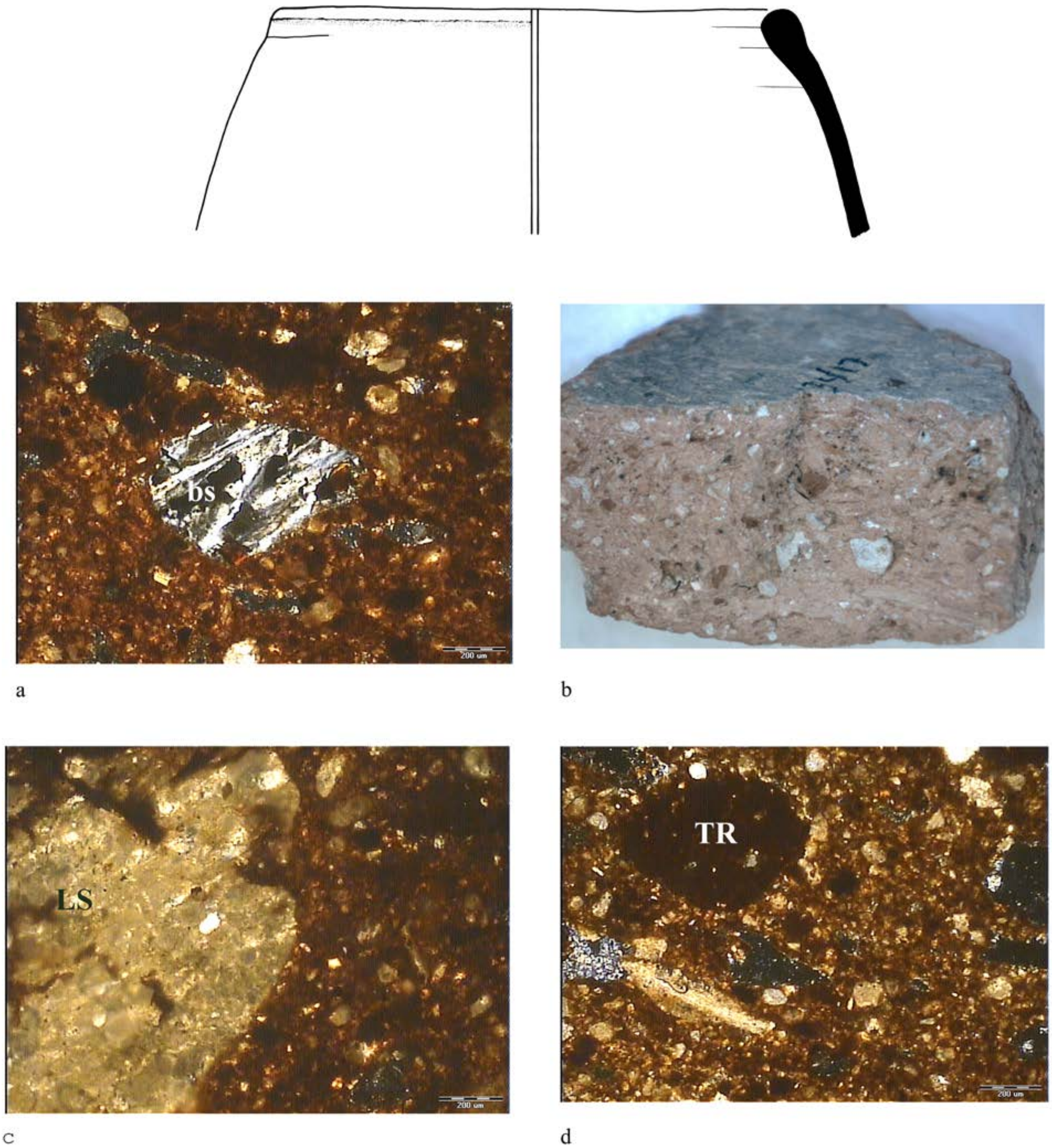
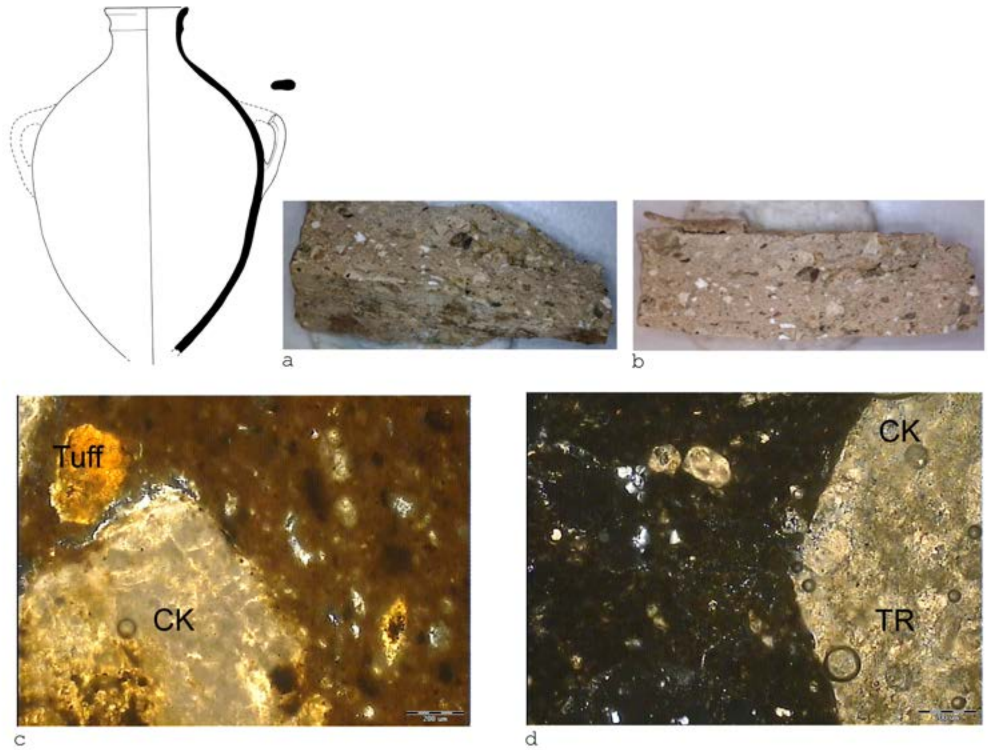
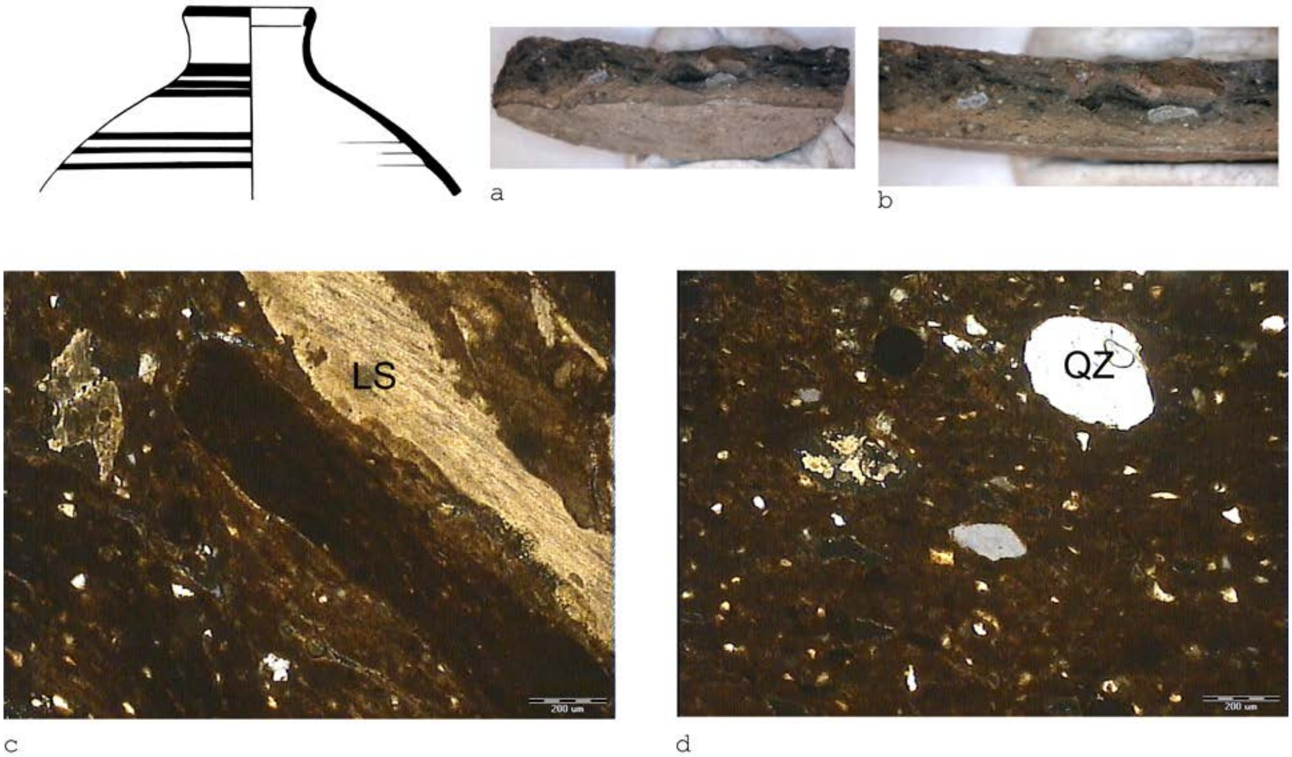


6A.1 Jar (Egyptian-style), 13417/1, L3107, Phase Y4-5, Stratum V.

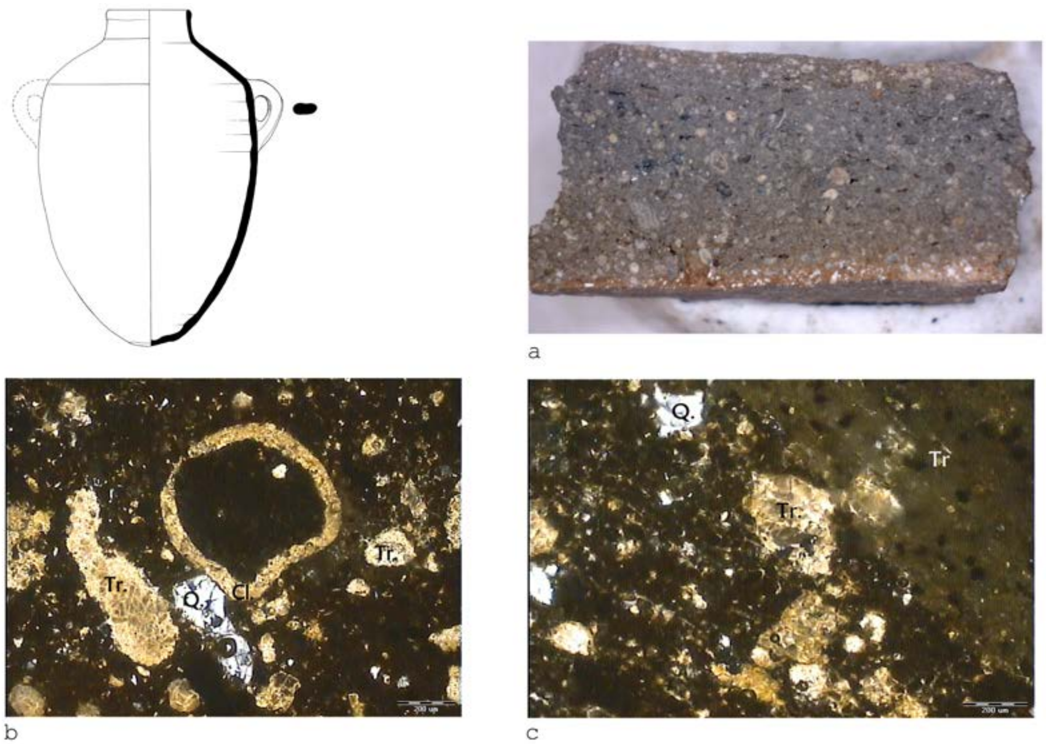


6A.2 Storage jar, 19753/1, L2842, Phase T16, Stratum VI.

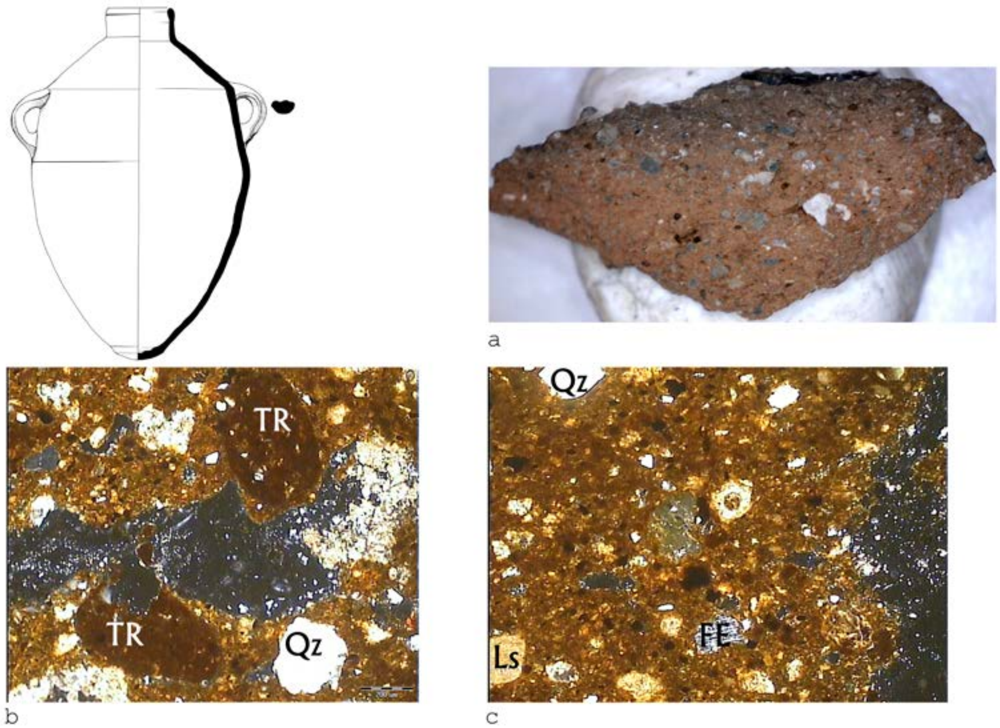
6A.3 Storage jar, 25045/1, L4710, Phase B9-10, Stratum V.



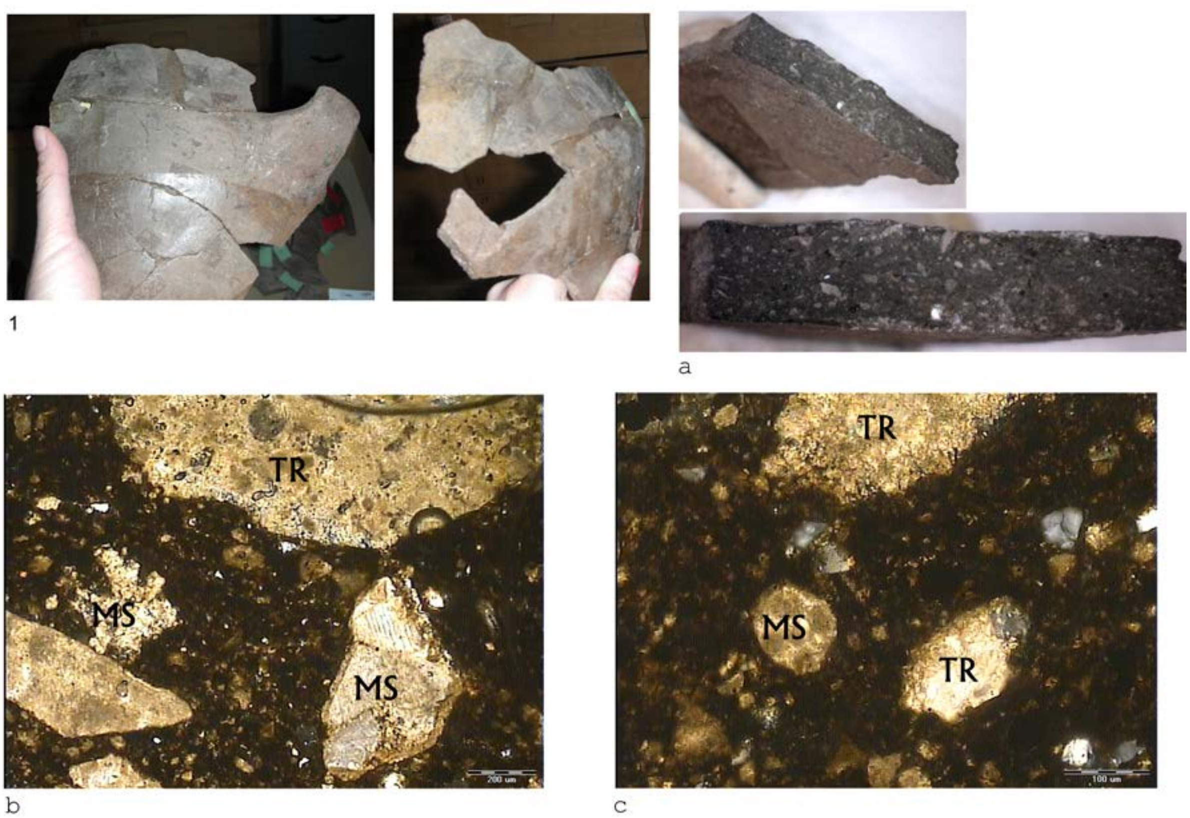
6A.4 Storage jar, 10391/3, L692, Phase B9, Stratum VA.



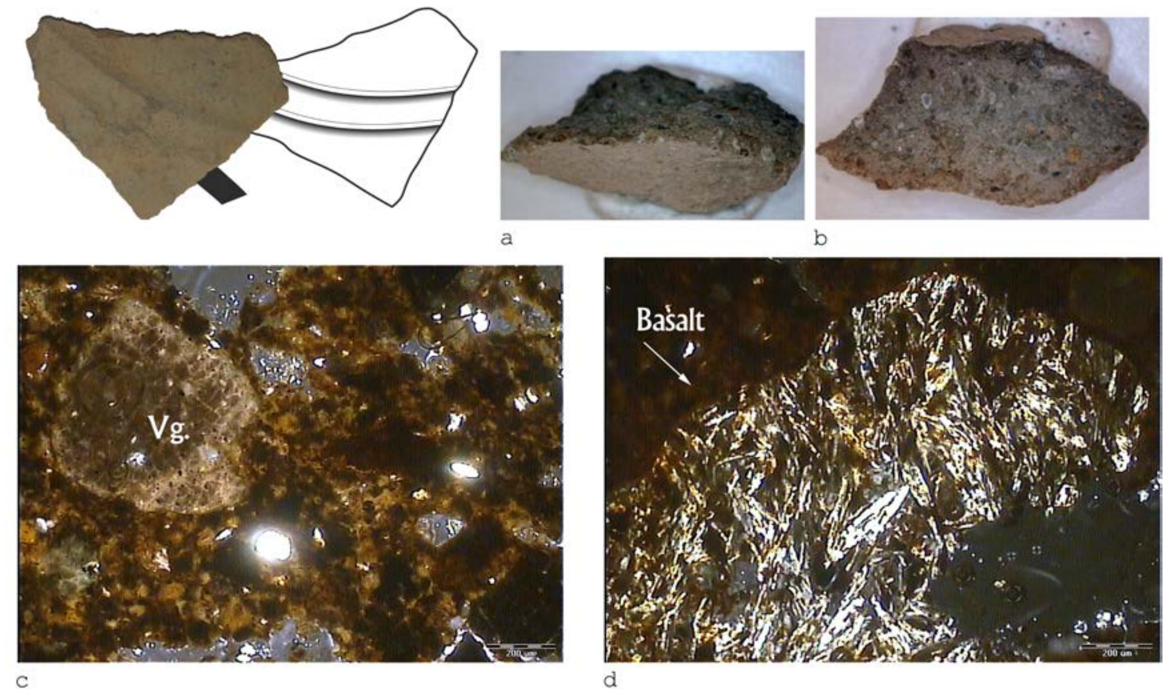
6A.5 Storage jar, 13476/3, L3123, Phase Y6, Stratum VI.



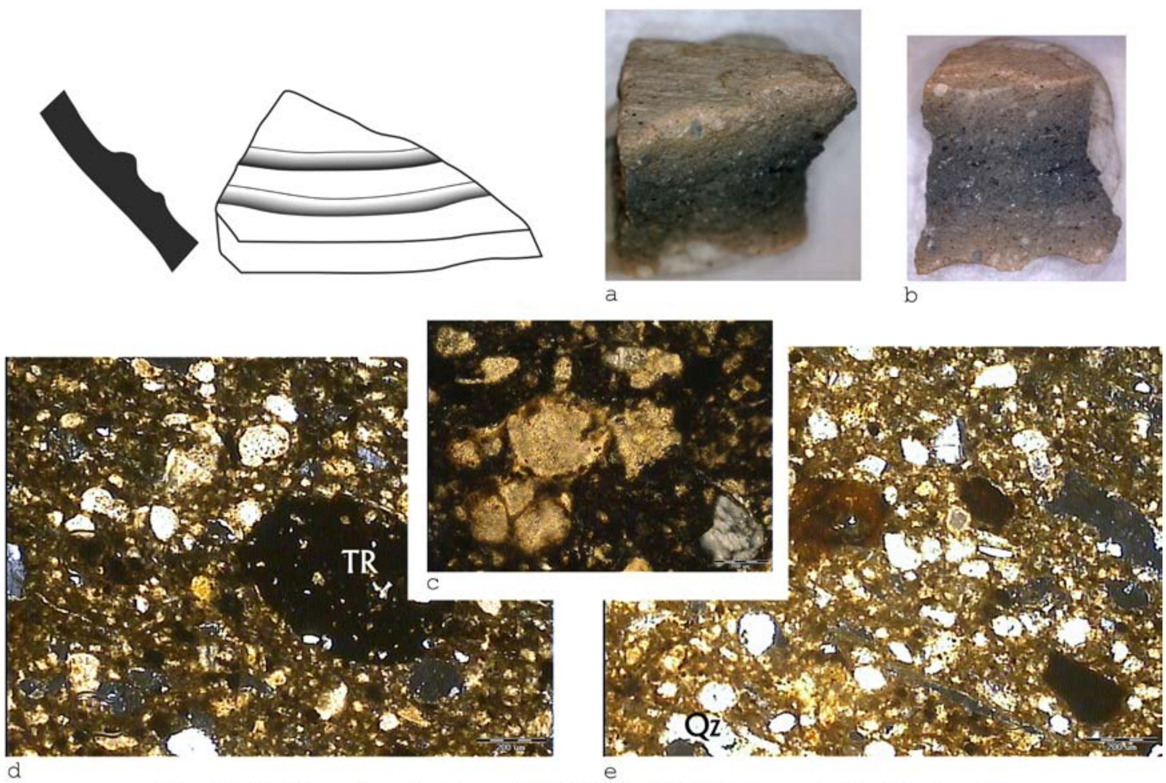
6A.6 Storage jar, 17090/1, L3212, Phase Y5, Stratum VI.



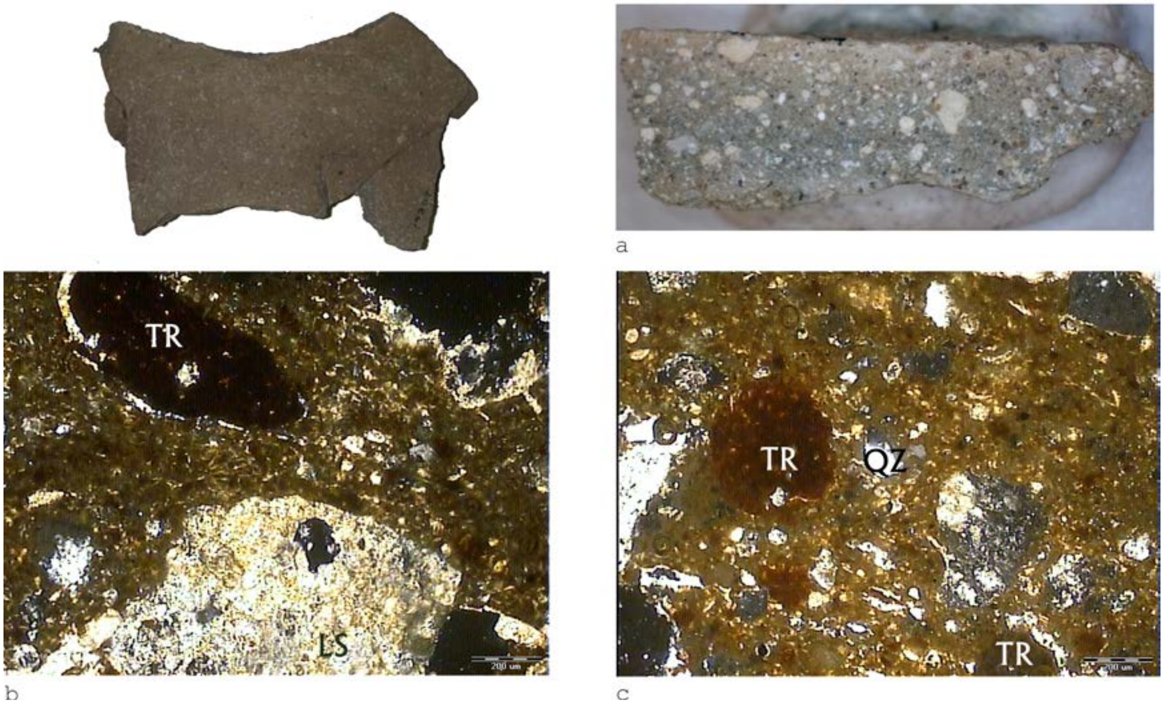
6A.7 Storage jar, 12840/2, L2464, Phase T15, Stratum V.



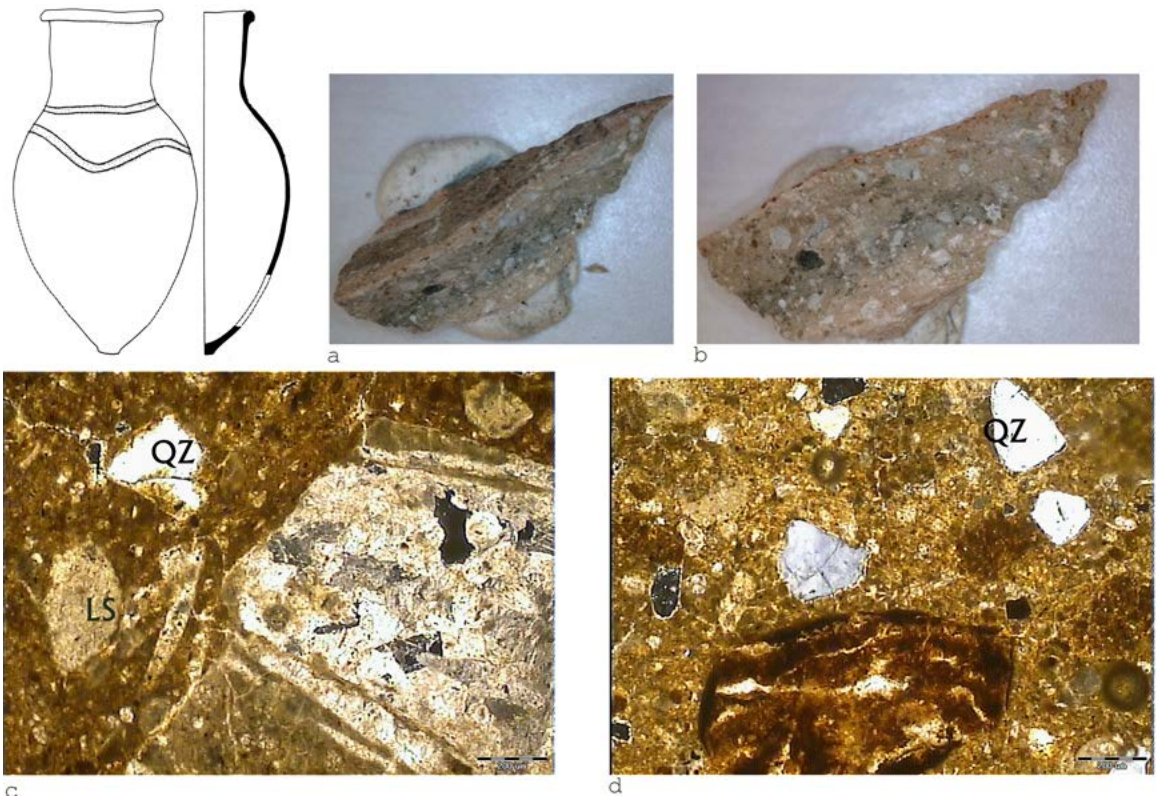
6A.8 Wavy-band pithos, 23053, L4609, Phase B13, Stratum VIIA2 (LBIIB).



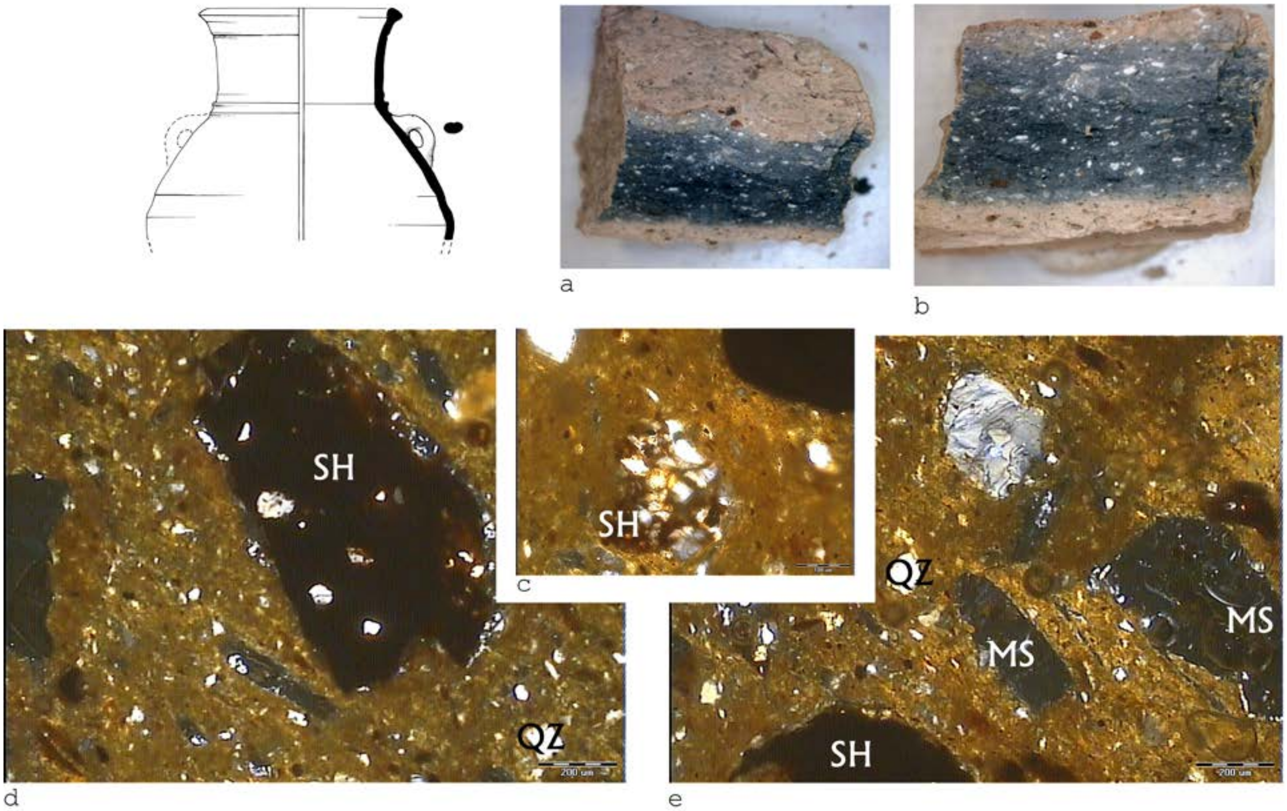
6A.9 Wavy-band pithos, 12743/12, L2467, Phase T15, Stratum V.



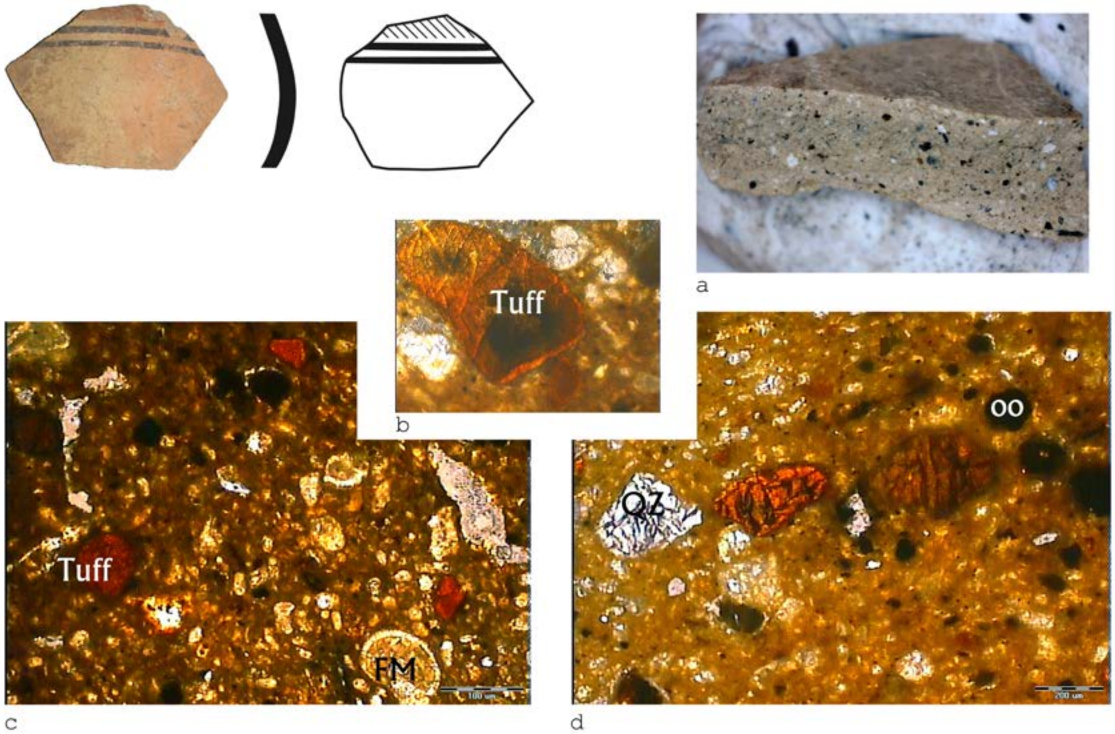
6A.10 Wavy-band pithos, 19213, L2606, Phase T13, Stratum IVA.



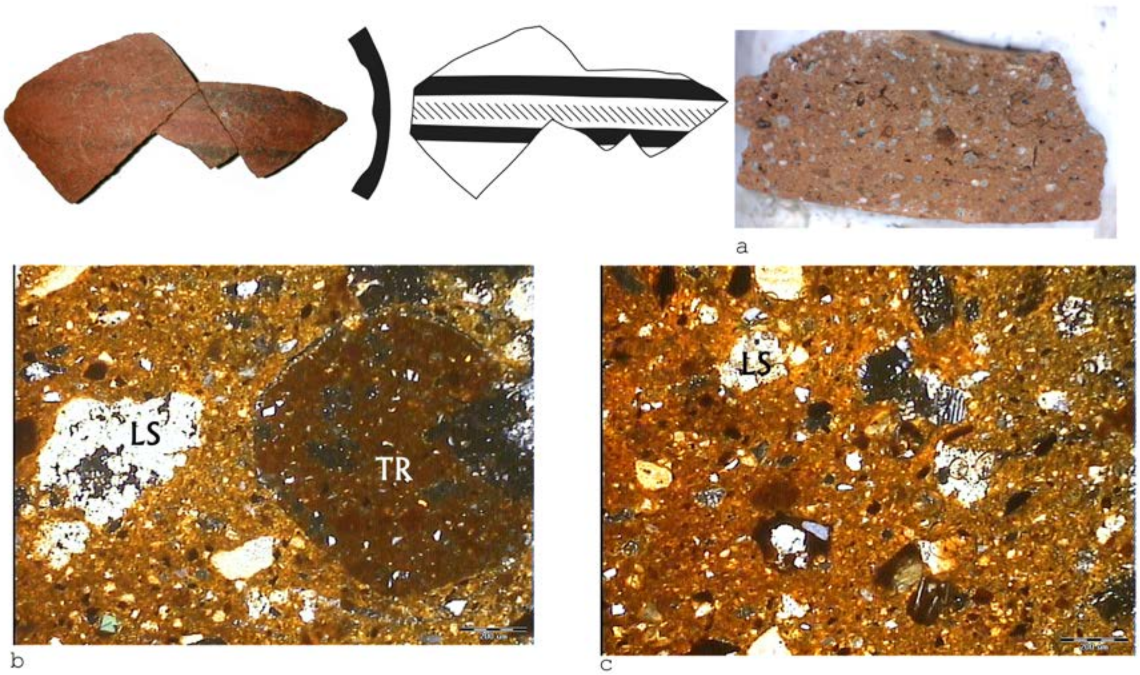
6A.11 Wavy-band pithos, 10105, L678, Phase B8, Stratum IVB.



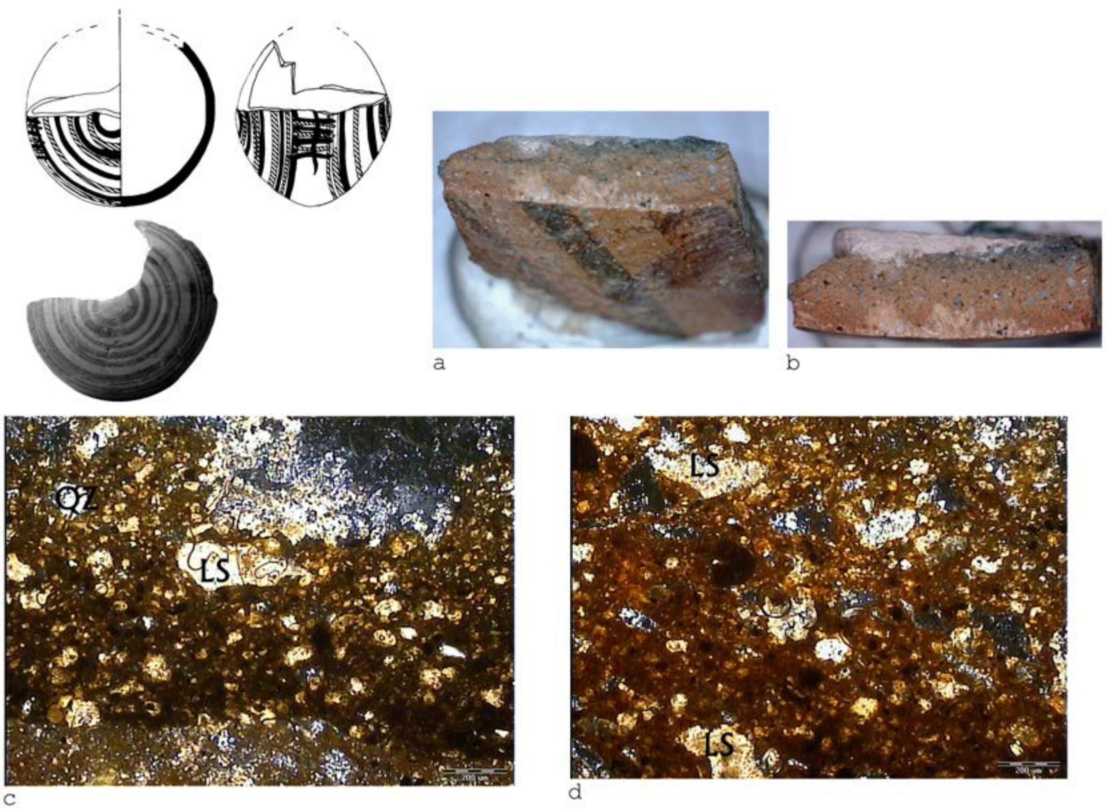
6A.12 Galilean pithos, 23789, L7140, Phase B11-12, Stratum VI-VIIA1



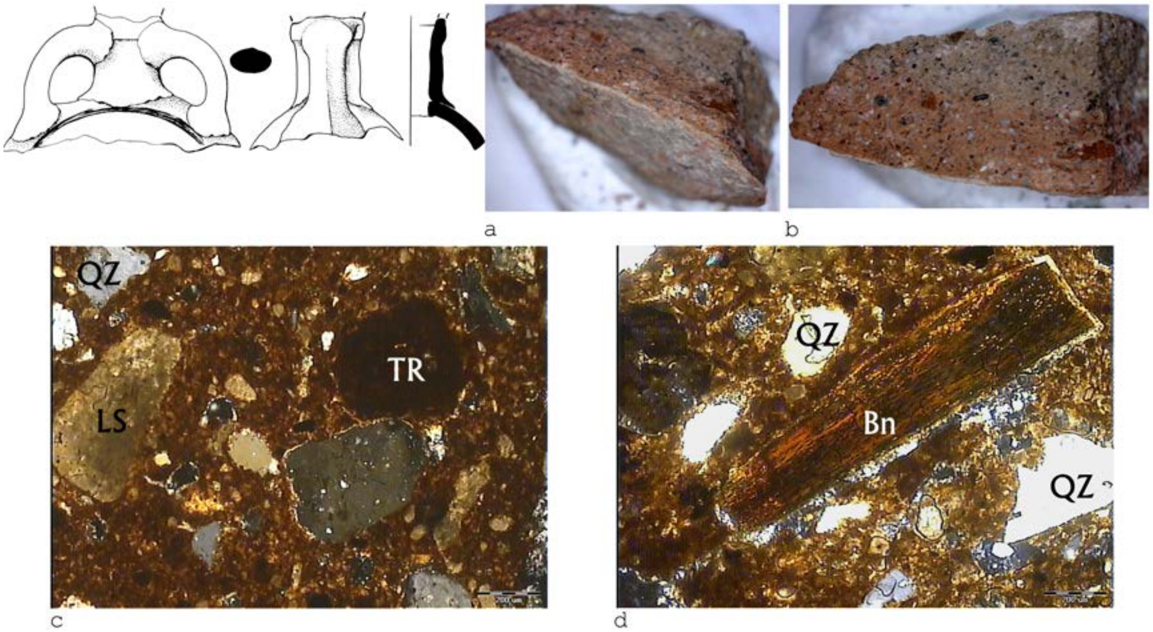
6A.13 Phoenician Bichrome jug, 9386/2, L547d, Phase B8, Stratum IVB



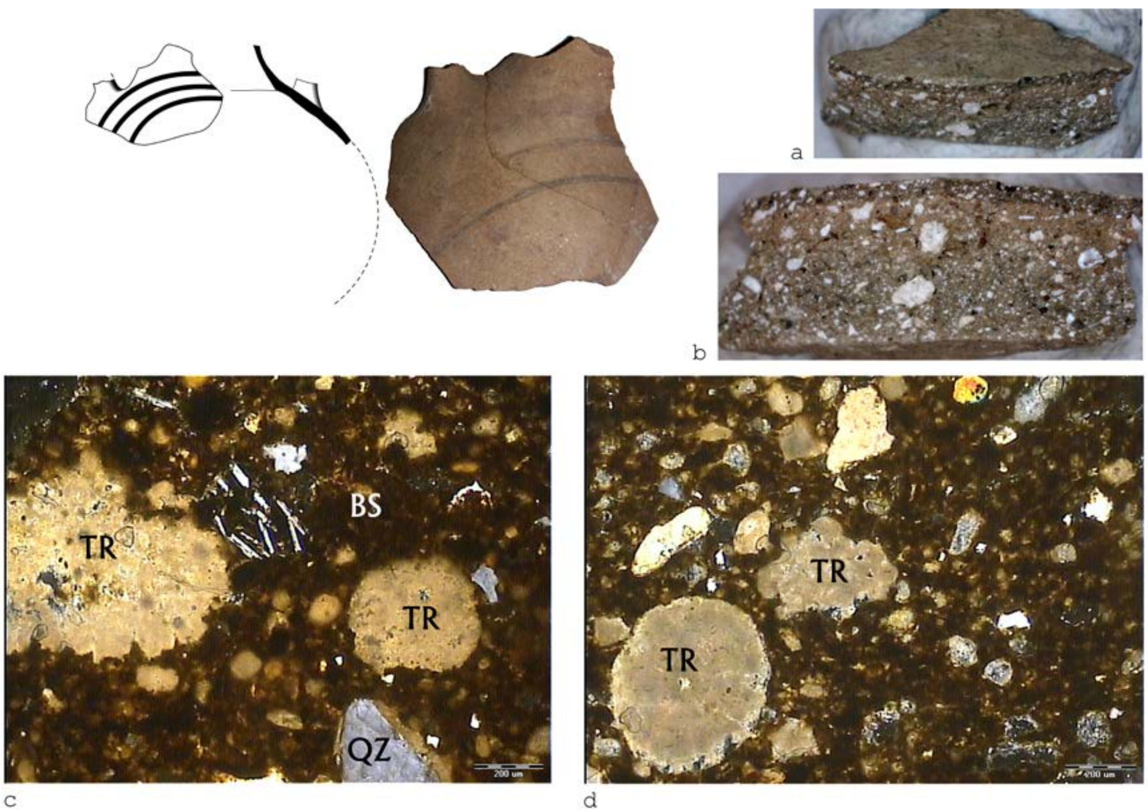
6A.14 Flask, 10201/15, L663, Phase B8, Stratum IVB.



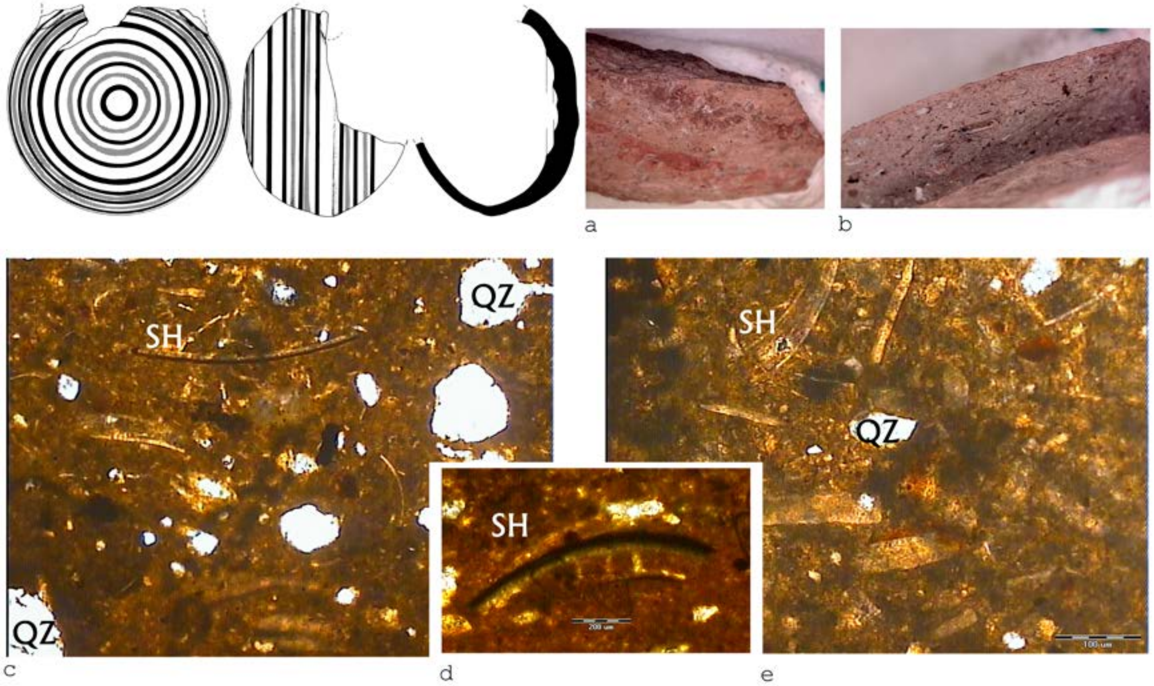
6A.15 Flask, 1834/2, L4264, Phase B9-11, Stratum V-VI.



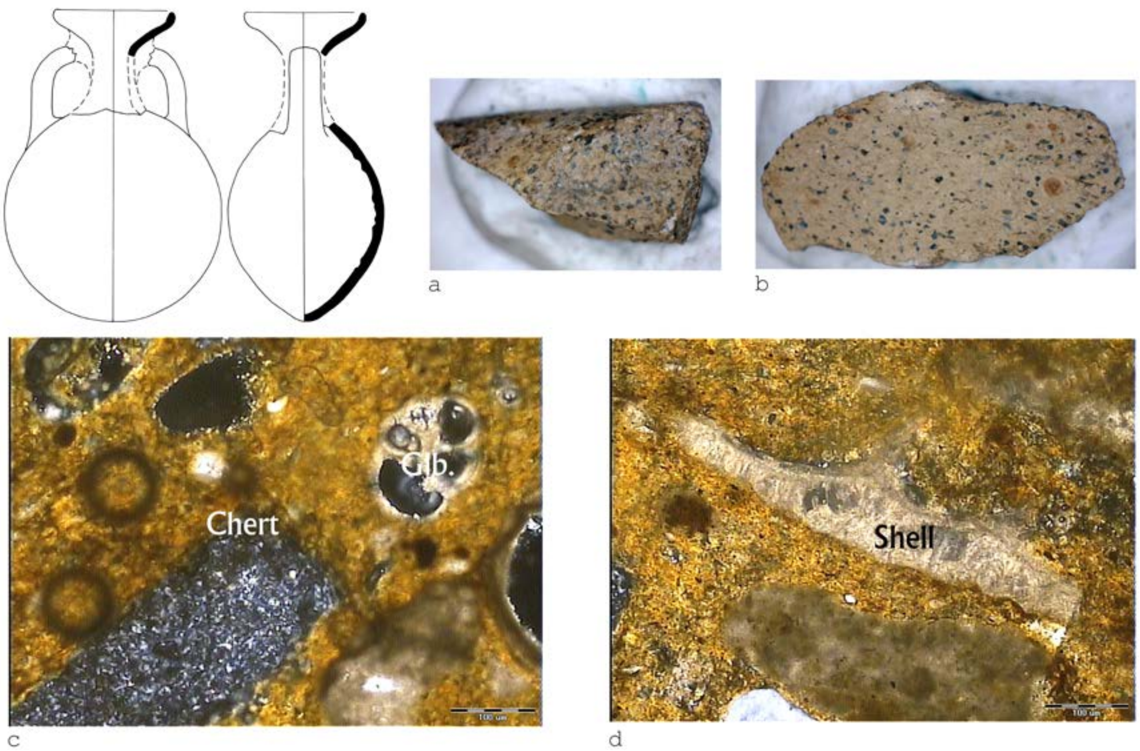
6A.16 Flask, 9431/16, L572b, Phase B9-10, Stratum V.



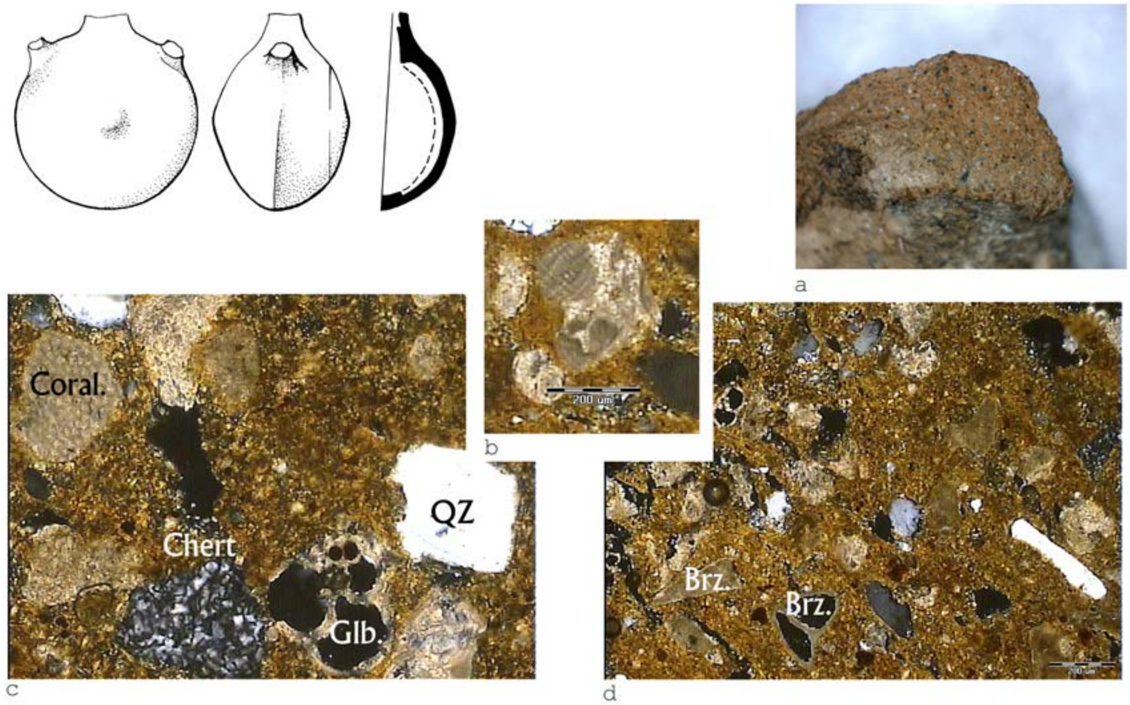
6A.17 Flask, 1079/7, L210, Phase B8, Stratum IVB.



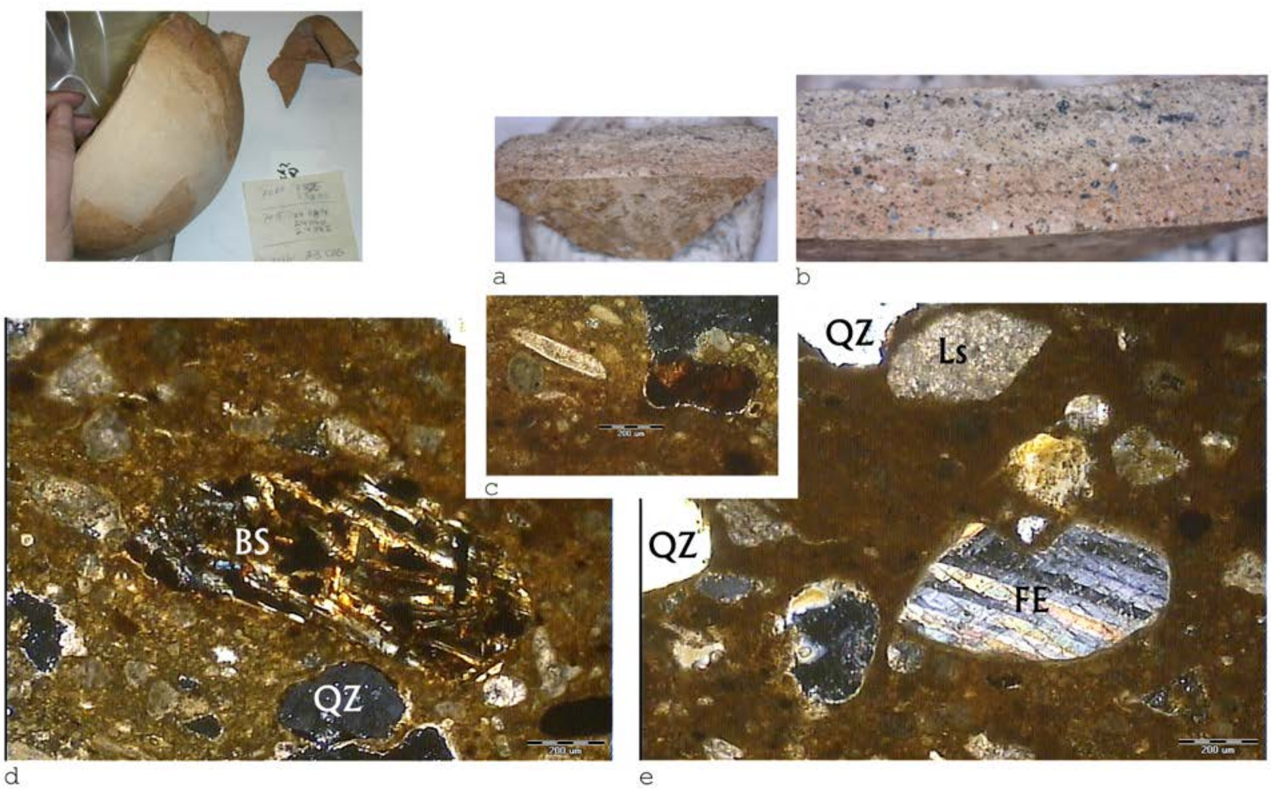
6A.18 Flask, 9855/1, L597(=L612), Phase B8, Stratum IVB.



6A.19 Flask, 12836/1, L2464, Phase T15, Stratum V.



6A.20 Flask, 9670/1, L608 (=L570a), Phase B8, Stratum IVB.



6A.21 Flask, 23525/11, L7082, Phase B9-10, Stratum V.

CHAPTER 6B

CHEMICAL AND PETROGRAPHIC ANALYSIS OF AEGEAN/PHILISTINE POTTERY FROM TEL DAN

David Ben-Shlomo

As of 1999, twelve vessels from Tel Dan had been identified as Philistine, or Philistine-related (Ilan 1999: 93-95 and see here Table 6B.1). These vessels come from an Iron I contexts and illustrate various similarities to Philistine Bichrome vessels. They were subjected to petrographic analysis (five chemically analyzed) within the framework of a larger study of Philistine pottery (Ben-Shlomo 2006: 200, Table 4.23). This report is a reiteration of the analysis published in 2006 and will be, therefore, brief. It informs the updated analysis of this material by Zukerman in Chapter 4 of this volume. While eight vessels have Philistine decorative motifs, they are not of distinct or 'classic' Philistine forms (these were krater fragments and body sherds). Four vessels are more typically Philistine with white slip and bichrome decoration (DN5, DN6, DN11 and DN12), including a bell-shaped krater and a stirrup jar.

Four of the vessels were chemical outliers while one clustered with Group 4B (DN8).[1] Samples DN2, DN6 and DN7 are closer to each other, with high 14-19% Ca values. Of these, DN6 has a low 195 ppm Mn value, while DN2 has high La, Ce, Nb and Ta values (37, 77, 28.6 and 1.9 ppm respectively). The fourth outlier, DN1, was closer to Group 7 with a low 3.51 Ca value.). The three samples (DN2, DN6, DN7) have relatively high values of Fe, La, Co, Cr, Sm, Ce, Ta and Eu (7.5%, 40, 34, 164, 7.5, 88, 2.1 and 1.7 ppm respectively). These elements also have high values in a chemical profile of a reference group from Dan (Yellin and Gunneweg 1989:137, Table 3), if compared to equivalent values of pottery from Philistia (as Group I here). Thus, these two vessels (DN1 and DN2) at least have a high probability of being manufactured at Tel Dan.

Eight or nine of the samples were classified as belonging to petrographic groups relating to soils in northern Israel (Table 6B.3). Two samples were classified as Lower Cretaceous (Group L1), a ferrous clay with basalt fragments. Three samples (DN2, DN3 and DN5) were classified as travertine soil (Group L2) common in the vicinity of Tel Dan. These two petrographic groups are related. Three or four samples were defined as an intermediate group, Group L3. Sample DN8 was of calcareous marl, possibly reflecting Taqiye formation (Group F), while Sample DN6 was similar to the calcareous marl defined as Group C2, a fabric, possibly of a rendzina soil, originating from the Tel Miqne area.

Thus, only two of the samples (DN6 and DN8) indicate a possibility of being imported from Philistia, while the other vessels were most probably made in the vicinity of the site. It should be noted that the two vessels noted above are also typologically more similar to Philistine Bichrome vessels from Philistia.

1 For a detailed account of the petrographic groups see Ben Shlomo 2006: 151-159; for the petrographic groups see Ben-Shlomo 2006: 178, 200.

Table 6B.1. Sea People pottery sampled for petrography from Dan

Sample	Chapter 4 Cat. No.	VP	Type	Ware	Reg. no.	Locus	Stratum	Analysis
DN1	9	Rim	K	BC? ns	12758/1	2428	VI	ICP+TS
DN2	11	Rim	K	BC? ns	10686	1227	V	ICP+TS
DN3	13	Sherd	K/J	BC? ns	23415	7064	V	TS
DN4	8	Sherd	Sherd	BC? ns	25210/1	4734	VIIA1	TS
DN5	7	Sherd	J	BC	10450/5	1208	VI	TS
DN6	2	Sherd	SUJ	BC	7028/1	905	VI?	ICP+TS
DN7*	*	Rim	J5	BC?	7114/5	1018	IVB	ICP+TS
DN8	3	Sherd	J5	BC	13071/1	3163	VI?	ICP+TS
DN9	12	Sherd	K	BC? ns	18508/1	4322	IVB	TS
DN10	6	Sherd	K/J	BC? ns	13057	3012	VI	TS
DN11	5	Sherd	BS K?	BC? ns	6198/1	426	VA	TS
DN12	4	Sherd	JG?	BC	16313/1	6060	III (residual)	TS

* DN7 is a Phoenician Bichrome sherd and therefore does not appear in the Chapter 4 catalogue. It is No. 65 in Table 5.2 in Chapter 5, which discusses this pottery class.

Table 6B.2. Analytical profile of samples from Tel Dan

Sample	Ware	ICP group	ICP prov.	TSPA group	TSPA prov.	Final prov.
DN1	BC?	Outlier	?	L1	Northern	Northern
DN2	BC?	Outlier	?	L2	Northern	Northern
DN3	BC?	-	-	L2	Northern	Northern
DN4	BC?	-	-	L1?	Northern?	Northern?
DN5	BC	-	-	L2	Northern	Northern
DN6	BC	Outlier	?	C2?	Inner plains?	Inner plains?
DN7	BC?	Outlier	?	L3	Northern	Northern
DN8	BC	4B	Inner plains	F	?	Inner plains?
DN9	BC?	-	-	L3	Northern	Northern
DN10	BC?	-	-	A?*	?	?
DN11	BC?	-	-	L3	Northern	Northern
DN12	BC	-	-	L3?*	Northern?	Northern?

* Low quality slide.

Table 6B.3. Petrographic descriptions of samples

Sample	Group	Soil type	Matrix	Inclusions	Remarks
DN1	L1	Lower Creta-ceous?	Inactive, ferru-ginous, ds, 10% voids, poorly silty.	QZ: 7%, moderately sorted, 10-60 a, several 100-200 sr; LS: 5%, moderately sorted, 80-150 sr; OP: dark 1%, 20-60 sr; several: clay pellets 40-200 r; rare: OP red 20-50 sa, mica 10-30 sa, bioclasts 40-60 r.	
DN2	L2	Travertine	Carbonate (50% biomicrite?), slightly active, cs, 15% voids, highly silty.	LS/CC: 30%, moderately sorted, 30-150 sr, few 250-300 sa; QZ: 5%, moderately sorted, 10-50 sa, few 120-180 r; CC: 5%, 40-80 r; several: OP dark 40-120 sr, clay pellets(?)/shales 50-120 r, bioclasts 30-70 r, (one 800 r); rare: basalt 350 a, calcite 50 sa, mica 10-30 sr.	
DN3	L2	Travertine	Carbonate, slightly active, ds, 10% voids, highly silty.	LS/CC: 25%, poorly sorted, 30-300 sr; QZ: 2%, poorly sorted, 20-150 a-sa; OP: dark, 1%, 20-150 sr; several: reddish ferrous/clay pellets 40-80 r; rare feldspar: 20-40 sa.	DC
DN4	L1?	Lower Creta-ceous?	Inactive, dark, ss, 20% voids, poorly silty.	LS: 20%, moderately sorted, 40-120 sr; QZ: 5%, poorly sorted, 30-200 a; several: OP black 20-60 sr.	
DN5	L2	Travertine	Carbonate, active, ss-ds, 7% voids, highly silty.	LS/CC: 15%, poorly sorted, 40-400 sr; QZ: 7%, moderately sorted, 20-60 a; OP: black 1%, 20-40 sr; rare: clay pellets 50-100 r, shell 120-200 heavy minerals 10-20 sr, eolithic basalts(?).	DC
DN6	C2?	Cal/Rendzina?	Carbonate, slightly active, ss, 5% voids, highly silty.	FR/CC: 20%, poorly sorted, 30-300 sa; QZ: 2%, poorly sorted, 20-100 a; several: clay pellets, 60-250 r (pear shaped), OP reddish 20-60 sr, OP black 30-80 sa; rare: mica 20-50 sa, FR400 a.	DC
DN7	L3	Travertine	Carbonate, slightly active, ds, 10% voids, moderately silty.	LS: 30%, poorly sorted, 30-250 sr, one 1000 r (nari?); QZ: 2%, moderately sorted, 20-50 a; OP: black, 1%, 20-50 sr; several: calcite(?) 30-60 sa, bioclasts 40-80 sr.	
DN8	F?	Taqiye?	Carbonate, slightly active, os, 20% voids, highly silty.	LS: 10%?, 30-100 sr; QZ: 5%, poorly sorted, 20-200 sa; several: shell 500 r.	LQ DC
DN9	L3	Travertine?	Carbonate, active, ss-ds, 20% voids, moderately silty.	LS: 15%, moderately sorted, 30-120 sa; QZ: 5%, poorly sorted, 10-100 a; several: OP black 20-40 sa; rare: biocalst 40-60 r, chalk 50-70 r.	DC
DN10	A?	?	Slightly active, ds, 15% voids, moder-ately silty.	LS/CC: 10%, poorly sorted, 40-150 sa; QZ: 10%, moderately sorted, 30-80 a; several: basalt(?) 150-250 sa, OP 20-50 sr; rare: hornblende 100 a.	
DN11	L3	Travertine?	Carbonate, slightly active, ds, 20% voids, moderately silty.	LS: 15%, poorly sorted, 30-300 sa-sr; QZ: 2%, poorly sorted, 20-120 a; several: OP black 20-60 sa; rare: basalt(?) 60 sa, mica(?) 120 sa.	DC
DN12	L3?	Travertine?	Carbonate, slightly active, ss, 20% voids, moderately silty.	LS: 10%?, 30-100 sr; QZ: 3%, poorly sorted, 20-150 a; several: OP black 20-50 sr, clay pellets 40-60 r.	LQ DC

Abbreviations

a	angular
Ns	not sampled
BC	bichrome
OP	opaque minerals
BS K	bell shaped krater
os	open-spaced
CC=	calcareous concentrations
QZ	quartz
DC	disintegrated calcite
r	rounded
ds	double-spaced
sa	sub-angular
FR	microfossils
sr	sub-rounded
ICP	Induced Coupled Plasma Analysis
ss	single-spaced
J	jug
SSJ	strainer spouted jug
K	krater
SUJ	stirrup jar
LQ	low quality slide
TS	thin section
LS	limestone
TSPA	thin section provenience analysis
OP	opaque minerals

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CHAPTER 6C

PETROGRAPHIC ANALYSIS OF IRON AGE I PAINTED POTTERY FROM TEL DAN

Nissim Golding-Meir[1]

Forty one Iron Age ceramic vessels were sampled from Tel Dan and analyzed using thin-section petrography. Of these, seven items date to the Iron Age I (Table 6C.1). Thin-section petrography is used by geologists to identify minerals and to describe and categorize rocks, soils and sands. Here it was used to identify and describe the minerals and rock fragments found in the sampled vessels, both as part of the temper (sand size) and in the clay (silt size). The mineralogical contents of the thin-sections were then compared to various possible mineral compositions referencing geological maps and comparative data from data bases derived from vessels originating in potential source areas.

The vessels analyzed here were divided into petrographic groups. These groups are classified by the chemical and physical properties of their fabric without reference to period, typology or juxtaposition (Goren *et al*. 2004: 4-22; Cohen-Weinberger and Goren 2004: 3). In order to better understand the nature of the local ware, 21 samples of vessels with a high probability of being local were used as a comparative data base (Table 6C.2). These vessels include pot bellows, bowls, cooking-pots, kraters, a lamp and a tabun.

The petrographic groups

Group A—Local to Tel Dan (Fig. 6C.1)

This group is the largest of the groups analyzed and includes twenty five samples. This group's fabric is clayey and includes silt sized grains of basaltic tuff and small amounts of opaque minerals. The temper comprises mainly grains of basaltic tuff and limestone; also present are small amounts of quartz grains. In only one sample (sample 12669) were grains of basalt found. This group's mineral composition fits well with the geology of Tel Dan's surroundings. The geological features in a ten kilometer radius of Tel Dan include alluvium from the Holocene including clay and gravel; conglomerates, gravel, volcanic tuff and basalt of the Hula Group; and limestone from the Hermon formation belonging to the Arad Group (Sneh and Weinberger 2003). This group's fabric and temper very much resemble the samples that were taken from vessels with a high probability of being local. It also resembles comparative data from the Laboratory for Comparative Microarchaeology of the Institute of Archaeology, Tel-Aviv University of similar local vessels sampled from this site. Therefore this group is assigned to the region of Tel Dan or its surrounding.

Group B—local to Tel Dan (Fig. 6C.2)

This group is represented by 10 of the analyzed samples. The clay of this group is characterized by

1 I would like to express my thanks to Prof. Yuval Goren formerly of the Laboratory for Comparative Microarchaeology of the Institute of Archaeology, Tel-Aviv University, for the use of the extensive data base of ceramic thin-sections.

argillaceous, ferruginous, shale-rich clay, with relatively high content of opaque grains and ferruginous oolites, (these are round grains, usually made of iron oxides; some of them develop around quartz grains while others have no specific internal structure). The temper includes a large percentage of limestone fragments, spheroids of iron oxide and volcanic tuff, some of the samples had a few small (<0.3mm) quartz grains and two of the samples had a small grain of basalt in them. With reference to comparative data (Cohen-Weinberger and Goren 2004: 7, Goren *et al*. 2004: 104, Greenberg and Porat 1996: 17), it appears that this group is derived from the Levantine Lower Cretaceous shales for both clay and inclusions. These formations crop out in the Negev, Samaria, the eastern side of the Dead Sea, the eastern slopes of the Galilee hills, the Hermon Mountains (Sneh *et al*. 1998, Sneh and Weinberger 2003), the Lebanon Mountains and the Anti-Lebanon (Dubertret 1962). This group is most likely local to Tel Dan, based on the proximity of these geological formations to Tel Dan. In addition, this group's fabric and temper very much resemble the samples that were taken in this study from vessels with a high probability of being local and the samples in the database of the Laboratory for Comparative Microarchaeology of the Institute of Archaeology, Tel-Aviv University, derived from similar vessels sampled from this site,.

Group C—The Carmel Coast (Fig. 6C.3)

This group is represented by three of the samples analyzed. This group's fabric is characterized by ferruginous fine clay comprised of *hamra* soils. It is unclear how these soils were formed but their proximity to the *kurkar* rocks (a local term for aeolianite, namely calcite cemented sandstone incorporating quartzitic coastal sand) probably indicates a connection between them (Singer 2007: 210). *Hamra* soil is spread along the Coastal Plain of Israel from the Ashdod area northwards (Dan *et al*. 1975). This group's temper includes quartz sand together with calcareous inclusions; also present in the temper are volcanic tuff inclusions. The quartz grains found in the samples come from coastal sands originating from the Nile River. The proportion of quartz to other sediments diminishes as one goes north and from Akko northwards quartz virtually disappears and the sediment becomes increasingly calcareous. The percentage of quartz inclusions in the samples is high but calcareous inclusions are very frequent, sometimes even in higher percentage than the quartz, therefore it is clear that their origin is from the northern coast of Israel but south of Akko. The presence of volcanic tuffs in the samples helps us in narrowing the area of provenance to the Carmel Coast. Volcanoclastic rocks are found on Mount Carmel (Sass 1980: 9) and rock fragments are transported down to the Carmel Coast via the rivers cutting through them.

Group D—Region between Tyre and Sidon
(Fig. 6C.4)

This group is represented by three of the samples analyzed. This group's clay consists of fine-textured, dense, foraminiferous and ferruginous marl; it also has numerous granules or streaks of ferric oxide which give a reddish hue. The inclusions comprise mainly limestone fragments; some large fragments of fossil shell or coralline algae and also a very small amount of quartz grains. This group resembles the pottery recovered from the Phoenician pottery workshop found in Sarepta (Bettles 2003: 71). The marl that comprises this group can be identified as belonging to the Paleogene age. Paleogene marls are confined to patches on the lower slopes of the coastal side of the northern Alauite range in the region north of Latakya and to the river Kabir and northern Ghab valleys (Beydoun 1977: 332). Outcrops of marl from the Paleogene are exposed nearest to the coast in the region between Tyre and Sidon (Dubertret 1962). The lithology in southern Lebanon is described as "chalky-marly-globigerinal", with chalky Palaeocene formations overlain by "cherty, marly, chalky limestone of the Lower Eocene, in turn overlain by chalky Middle Eocene marls" (Beydoun 1977: 332). Therefore this group is assigned to the region between Tyre and Sidon.

Summary

Group A and Group B are local to Tel-Dan; Group C originates in the Carmel Coast and Group D probably originates in the area between Tyre and Sidon.

Table 6C.1. The analyzed Iron I samples.

Sample number	Object	Basket	Locus	Phase/ Stratum	Petro group	Provenance	Notes	Fig.
18	Flask	6164/6	419	B8/IVB	A	Local	high burning	—
24	Strainer	9663/2	612	B8/IVB	A	Local		5.6:11 (=3.68:6)
40	Pyxis	10639/10	1218	B9-10/V	A	Local		—
25	Pyxis	18350/1	4264	B12/VIIA1	A	Local		5.4:11 (=3.29:2)
16	Pyxis	20623/7	8181	M9b-c/V	B	Local	Crushed calcite	—
13	Storage jar	20089/1	8024	M9a/IVB	C	Coastal north		3.78:6
23	Jug	10574/6	1207	B10/VB	D	Region between Tyre and Sidon		5.2:10; 5.8:5

Table 6C.2. Presumed local material taken for comparative data

Basket	Object	Locus*	Petro group	Provenance	Notes
12897	Krater	2488	A	Local	
19498/2	Krater	2748	A	Local	
23678/1	Lamp	7112	A	Local	
12116/4	Bowl	2311	A	Local	
19916/3	Bowl	2883	A	Local	
12181/5	Bowl	2321a	A	Local	
12108/3	Bowl	2311	A	Local	
23804	Cooking Pot	7139	A	Local	
10615/3	Pot bellows	1227	A	Local	
24916/2	Pot bellows	7240	A	Local	high burning
24930	Tabun	7248	A?	Local	
23445/2	Cooking Pot	7065	A1	Local	Crushed Calcite
23218/3	Cooking Pot	4672	A1	Local	Crushed Calcite
12839/13	Cooking Pot	2460	A1	Local	Crushed Calcite
19676	Cooking Pot	2824	A1	Local	Crushed Calcite
19524/7	Cooking Pot	2763	A1	Local	Crushed Calcite
12201	Cooking Pot	2321c	A1	Local	Crushed Calcite
12628/8	Pot bellows	2331	B	Local	
24935/1	Pot bellows	7249	B	Local	large basalt grain
23020/1	Pot bellows	4608	B	Local	
10520/4	Pot bellows	1216	B	Local	

* A number of these loci are not Iron I loci.

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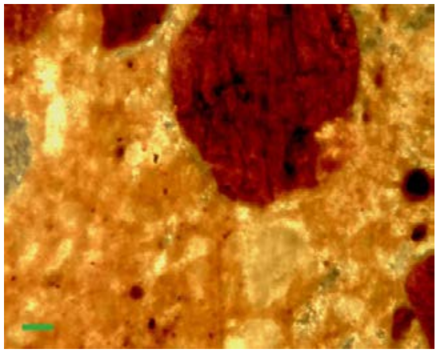

Fig. 6C.1. Group A (Sample: 12514).

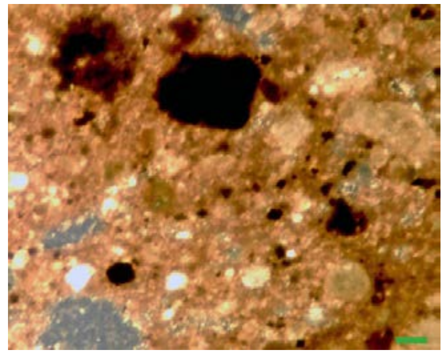

Fig. 6C.2. Group B (Sample: 12558).

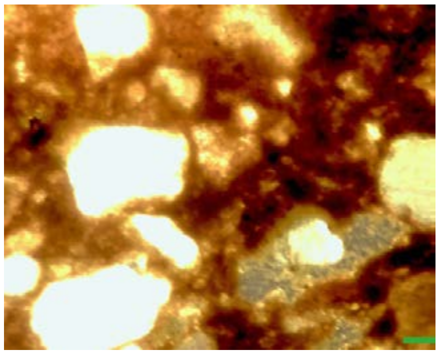

Fig. 6C.3. Group C (Sample: 1086).

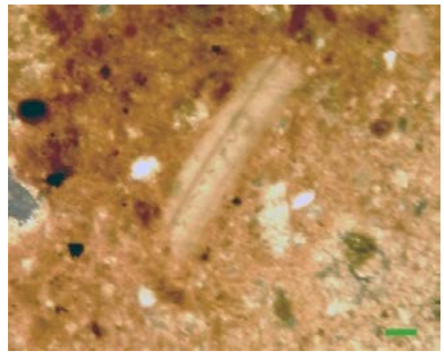

Fig. 6C.4. Group D (Sample: 12699).

All figures were taken under XPL with a magnification of X40; the scale on the photographs is 0.15 mm.

CHAPTER 7

GROUND STONE AND NATURAL STONE OBJECTS

Introduction

The ground stone items were selectively collected and curated over the years. The stone objects excavated in the 1960s and early 1970s were stored in the storerooms of the Israel Antiquities Authority. Over time, many of the basket and locus numbers faded or rubbed off these objects. The same thing happened to a number of the large stone objects stored at the Hebrew Union College from the 1970s. The result is that the areas excavated in these earlier seasons show a significant underrepresentation of stone artifacts. Area B-east certainly had many more of these than the catalogues below would suggest. In fact, given the patterns observed in the fields excavated in later years I am sure that, of the 200 or so unprovenanced stone artifacts in the Tel Dan collection, more than half come from Iron I levels.

Later seasons, from the 1980s and after, are much better represented. Grinding slabs, mortars and pestles have been marked in some cases on the plans, so as to give an idea of distribution. This is mainly true of Area B-west, but this should not be considered a complete plotting.

Caveats aside, the ground stone assemblage of Tel Dan is so far the largest of any Iron I site in the Levant, and probably one of the largest of any period. Many of the worked objects appear to lack the worn or scarred surfaces produced by grinding, pounding or rubbing. In some cases these objects have been identified tentatively as weights. But some may have been meant for active use and never used, preserved in their "pristine" form at their place of manufacture.

This account of the ground stone assemblage[1] (N=200 objects) follows the typology of Wright (1992), a work which deals primarily with prehistoric assemblages but whose system of classification is all-inclusive and useful. For some reason it has not been widely adopted by others in the archaeology of historical periods. Aside from Wright's typology, the foundational work for ground stone analysis of historical period assemblages in the southern Levant is that of Hovers (1996) who reported on the assemblage from the City of David. The great majority of studies written since Hover's work adopt similar terminologies and methodologies (e.g. Milevski 1998; Cohen-Weinberger 2001; Yahalom-Mack and Panitz-Cohen 2009).

Ground stone utensils can be divided into the following categories by utility, taking into account some overlap between categories:

- Stone vessels: bowls and a goblet
- Grinding stones: millstones, slab querns, handstones, whetstones and grinding bowls.
- Pounding stones: mortars, anvils, pounders and pestles.
- Non-friction artifacts: scale weights, suspension weights, flaked slabs, lids and whorls.[2]
- Natural stones of special color or form (though not modified and therefore technically not ground stone) which may have been weights, gaming pieces or objects with efficacious or magical properties.

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1 I would like to thank my colleagues Yorke Rowan and Jennie Ebeling for their insights regarding the ground stone assemblage. Levana Zias made the measurements and discussed with me questions of methodology and identification. Ted Schvimer also helped with measurements.

2 The whorls are discussed in Chapter 14.

Raw Material

The overwhelming majority of the ground stone objects excavated at Tel Dan are fashioned of basalt, readily available around the site. Most of the objects are made of fine-grained basalt. Querns and upper grinding stones are the only objects to be made consistently of vesicular basalt. Of the few objects not made of basalt, some pounders, cobbles, spheroid pebbles and scale weights are made of either flint or limestone nodules. Six handstone mullers (see below) were made of either pumice or scoria (pumice has a lower specific gravity and floats in water). While stone, and basalt in particular, would have been the preferred, perhaps exclusive, material used for grinding, wood is likely to have been preferred for pounding. Therefore, stone mortars, pestles and mallets will represent only a fraction of the original number of these tools in the assemblage; several studies have indicated that the grain milling process and other food-processing activities are likely to have included deep wooden mortars and long wooden pestles (e.g. Hovers 1996: 184 citing Dalman 1933: 213, 273; Hillman 1984: 6, Fig. 4 and Samuel 1989: 259, Fig. 12.9).

Manufacture

Basalt utensils were manufactured using a combination of techniques in stages (adapted from Wright 1992: 57).

- Stage 1: Acquisition of a stone of appropriate size and shape, having the finished product in mind.
- Stage 2: Primary reduction by splitting or flaking (this stage was unnecessary if an appropriate blank was available).
- Stage 3: Secondary reduction by finer flaking and/or coarse pecking.
- Stage 4: Final shaping/retouch by more gracile pecking.
- Stage 5: Finishing by grinding, polishing and sometimes by incision or perforation.

Materials other than basalt were modified by the same techniques but with different emphases. Pumice, for example, would require less pecking and more grinding. While one might expect flint to be flaked more often, this is not the case; the massive flint objects under discussion here were, from their inception, clearly pecked and ground more than flaked.

Typology[3]

Item numbers noted in the text below refer to the item numbers in the tables. All measurements are in millimeters. Linear measurements were taken with a caliper and weights were taken with a high-resolution electronic scale.[4] For the precise parameters of measurement the reader is directed to Wright 1992. Incomplete items are listed as either *broken* (when more than 50% of the object is preserved) or *fragment* (when less than 50% is preserved).[5]

3 The cataloguing of the stone objects began with a typology and catalogue constructed by Danny Rosenberg in 2005. Rosenberg gave each object a serial number resulting in a sequential list which we then continued. At the time, contextual information was not available to him. Rosenberg's typology was also much different than what is published here; he used a different nomenclature and different criteria for classification (cf. Rosenberg 2011).

4 I thank Marina Rassovsky of the Israel Museum conservation laboratories for giving me access to the museum's electronic scale, and Conn Herriot and Ted Schvimer for their help in weighing the objects.

5 Abbreviations are as follows: Cir = circumference; D. = depth; Dia. = diameter; ext. = exterior; Fig. = figure number in text; Ht. = height; int. = interior; L = length; n/a = not applicable; No. = Item number; Perf. = Perforation; Preserv. = Preservation; R = radius; Reg. No. = registration number; Ser. No. = serial number; Str. = stratum; Th. = thickness; W = width.

Bowls

I have discerned three basic types of stone bowl.

1. Massive bowls with walls 3-5 cm thick and rounded or tapered rims. These are made of medium-grained, somewhat vesicular basalt. Most of these bowls would have weighed in excess of 12 kg, making them stationary objects for the most part. While the interior is always smooth and symmetrical, and the exterior is usually rounded and regular, the exterior can be rugged (Item no. 7). They are shallow, generally being no more than 10 cm high. The largest stone bowl, Item no. 5, has a ring base, for stability, but the bases of the rest are not preserved.
2. Tripod bowls with tapered rims. The walls are generally *ca.* 2 cm thick and they are made of fine-grained basalt. One has legs whose bases are flush with the base of the bowl (Item no. 1) and one has legs that are higher than the bowl (Item no. 9). These were light enough to have been mobile objects—*ca.* 3-4 kg.
3. Fine shallow bowls with walls 1-2 cm thick made with fine-grained basalt. The rims are flattened or rounded. These appear to be so symmetrical as to have been made on a lathe, though current thinking is that symmetry was achieved by a series of drillings (Spalinger 1982: 126). They were also light enough to be mobile objects—no more than 2 kg. Of those whose bases were preserved, Item no. 10 has a flat base.

The stone vessels with ring bases have parallels in the Late Bronze Age assemblage at Tel Dan (Ben-Dov 2002: 138-139). The tripod bowls also have Bronze Age antecedents (cf. Gal 1994).

Their symmetry and fine design suggest that such bowls were probably used for finer kinds of crushing and grinding in conjunction with food preparation, craft applications (the making of glues or colorants for example) or the preparation of ointments, salves or other medicaments. All these types are paralleled in the Tel Beth Shean assemblage from the 13th-11th centuries BCE strata (Yahalom-Mack and Panitz-Cohen 2009: 719-724). At the same time, the fact that *none* of them are complete (unlike the more fragile ceramics) suggests that at least some of these stone bowl fragments originated in the preceding Late Bronze Age levels. In the Iron Age I contexts they were detritus or in secondary use.

Table 7.1. Stone bowls (all basalt).

No.	Phase/Str.	Reg. No.	Locus	Ser. No.	Subtype	Ht.	Dia.	D.	Th. (av)	Preserv.	Fig.
1	B8, IVB	18018/31	4202	43	Tripod	60	?	?	26	Fragment	
2	B8, IVB	6099	415	29	Fine Shallow	?	320	?	22	Fragment	
3	B9-10, V	9758	622	391	Massive	?	?	?	29	Fragment	
4	B9-10, V	10540	1214	47	Fine Shallow	25	320	?	17	Fragment	
5	B9-10, V	23684	7115	26	Massive, ring base	?	?	?	46	Fragment	7.17:5
6	B9-10, V	23887	7151	28	Massive	60	360-480	25	40	Fragment	
7	B9-10, V	23502/16	7082	427	Massive	78	180-200	25	46	Fragment	7.17:2
8	M9b-c, V	20623/1	8181	—	Massive	131	400	88	34	Fragment	7.17:3
9	B11, VI	870/10	170	IAA	Tripod	129	164	81	35	Broken	7.17:4
10	T16, VI	20059	8012	75	Fine Shallow	?	?	?	20	Fragment	
11	T16, VI	20047	8012	581	Fine Shallow	50	230	37	19	Fragment	
12	Y7-8, VI-VIIA1	13662	3128	18	Massive	50	384	17	33	Fragment	7.17:1
13	B11-12, VI-VIIA1	23976	7168	787	Massive	35	380	15	32	Fragment	

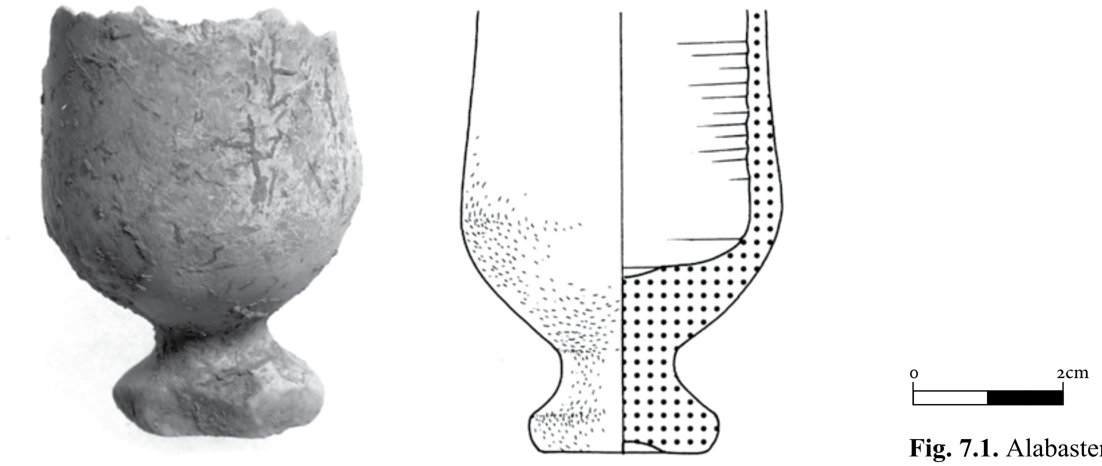

Fig. 7.1. Alabaster goblet.

Alabaster goblet

Field no. 10454, Locus 1204,
Phase B11, Stratum VB.

This is a small stemmed goblet of calcite alabaster. The flat base (chipped) has a small depression at center. While the upper section is broken, the highest preserved section is very close to the rim. The alabaster is not translucent. Such objects are characteristic of New Kingdom Egypt (Aston 1994; Bourriau 1982: 129, Cat. No. 119). This particular type is not at all common in Canaan; I have found similar (not identical) objects in the Beth Shean Northern Cemetery, Coffin Tomb 90 (= 13th-12th cent. BCE; Oren 1973: 130, Fig. 45:26), the Lachish Fosse Temple Stratum III (Tufnell *et al* 1940: 25:3) and the Amman Airport Temple (Hankey 1974: Type S35). But none were detected in the Late Bronze Age levels at Tel Dan, Hazor, the Megiddo Tombs, Tel Beth-Shean, or Gezer, for example. Nor is this particular type in Ben-Dor's (1945) admittedly dated corpus of alabaster vessels from Palestine. It is most probably an Egyptian import.

Grinding Slabs, Lower Millstones or Querns

Several complete examples were left in the field and are identified mainly by field notes. These are marked on the area plans with the symbol GS (grinding stone). In a few cases photos were available, but millstones did not receive careful

Table 7.2. Lower millstones and a grinding slab (Wright's Type 6, all basalt).

No.	Phase/Str.	Reg. No.	Locus	Ser. No.	L	W	Th.	Preserv.	Fig.
1	B8, IVB	23421/11	7052	531	350	255	105	Fragment	
2	T14-15, IVB–V	19498	2748	599	170	160	50	Fragment	
3	B9, VA	18538	4323	659	93	78	48	Fragment	
4	B9-10, V	25160	4723	722	310	300	57	Broken	
5	B9?-10, V	23451/6	7061	785	280	280	52	Fragment	
6	B10-11, V-VI	23582/6	7096	786	625	320	81	Complete	7.2; 7.18:1
7	B11, VI	24763/1	7212	549	125	127	52	Fragment	
8	B11-12, VI-VIIA1	25160	4727	712	310	305	37	Fragment	

Fig. 7.2. Lower millstone.

attention.[6] Only one complete lower millstone was retrieved and brought back to the NGSBA (Nelson Glueck School of Biblical Archaeology) lab in Jerusalem: Item no. 6 from L7096 (Figs. 7.2; 7.18:1). Numerous fragments were cited in the field notes, but many were not collected or catalogued. These fragments appear to be in secondary use as building material. Almost all the lower millstones appear to be saddle-shaped slabs (Wright 1992: Type 6) implying lateral grinding in a linear path. None have raised rims; part of the flour would have spilled off to the sides. The complete example [Item no. 6 in Table 7.2 and discussion above] shows a bulbous ledge at the distal end, indicating the position of the worker opposite (cf. Leibowitz 2008: Figs. 12.1 and 12.3—an identical Late Bronze Age grinding slab, *in situ*). All the lower millstones are fashioned of vesicular basalt.

Millstones and querns are most frequently associated with the grinding of grain. Large examples can weigh up to 17-18 kg. Many are quite thin due to extensive use—less than 5 cm at the thinnest point, close to "the point of exhaustion". The thinner slabs are those with a longer history; many fragments originated in those slabs that broke as a result of this thinness. The fragments could be used as building material, or the thicker ends could be recycled as pestles, handstones or weights.

A question not often addressed in the local archaeological literature concerns the means by which flour would have been collected from the lower millstone. A rimless lower millstone would have required a sheet of cloth or skin to be placed either underneath the stone or around its edges. Alternately, lower stones could have been incorporated into bordered installations that would facilitate flour collection (e.g. Hovers 1996: 186: Photo 23; Ebeling and Rowan 2004: 114), though the extant examples all appear to date no earlier that the Iron Age II. Leibowitz (2008: 185) is adamant that lower millstones were normally used horizontally, on the floor.

Upper Millstones

As complete objects, one would expect to find approximately the same number of upper millstones as lower millstones, since they are mainly used in pairs. This is not the case in the assemblage discussed here. The explanation probably lies in the fact that upper grinding stone fragments were more likely to be transported back to the lab.

All the examples studied were of the loaf-shaped, unifacial kind similar to Wright's Type 43, though many are longer (20-30 cms) and show more tapering at either end—a type more common in the Bronze and Iron Ages than in the prehistoric periods Wright deals with. They were clearly used in tandem with lower grinding slabs, being moved laterally with two hands.

The faces tend to be quite flat, with none of the concavity noted sometimes at other sites (e.g. Liebowitz 2008: 190-192). This suggests that upper millstones were manufactured from new blanks rather than from exhausted, recycled lower millstones.

Upper millstones show different size modalities. Some are flatter, thinner and lighter (Item nos. 3, 8, 13, 15, 16). These would have been less efficient for grinding but easier to manipulate. Perhaps they are intended for weaker individuals, such as young girls or elderly women,[7] or for substances that require

6 For my dissertation (Ilan 1999: 102) I counted grinding stone fragments based on both finds stored in the lab and on the field notes. Subsequent closer examination of the field notes and the ground stone inventory has revealed that several contexts were problematic and their stratigraphic attributions incorrect. On the other hand, many new items were rediscovered in our storerooms. Table 7.2 includes only the objects actually present in our collections or visible in photos of verified contexts.

7 It seems clear that women were more active in the grinding of grain to make flour (e.g. Ebeling and Rowan 2004: 109, 113; Harding 2004: 80; Meyers 2003: 430-432; 2007), though not exclusively so.

Fig. 7.3. Upper millstones (photo).

less force—the smoothing of hides, for example. The heavy-duty upper stones, (e.g. Item nos. 17, 19 and 20) would have required more strength but would have produced larger quantities of flour more quickly. The largest (Item no. 20) would have been more than 36 cm long and weighed more than 10 kg. Some are longer, to the point where they may have protruded beyond the edges of the lower millstones (e.g. Item no. 15). Some are shorter and would appear to have facilitated a more controlled grinding toward the center of the lower stone (e.g. Item nos. 10 and 12). Most of the upper stones are fragments and their full length cannot be reconstructed accurately.

Table 7.3. Upper millstones (Wright's Type 43, all basalt).

No.	Str.	Phase	Reg.No.	Locus	Ser. No.	L	W	Th.	Preserv.	Fig.
1	IVB	B8	2020/8	316	85	125	100	48	Fragment	
2	IVB	B8	23751/2	7132	103	56	94	38	Fragment	
3	IVB–V	T14-15	19766	2846	452	110	95	45	Fragment	
4	V	B9-10	18547	4328	639	80	115	62	Fragment	
5	V	B9-10	25076/1	4713	108	56	155	43	Fragment	
6	V	B9-10	25076/2	4713	92	65	99	62	Fragment	
7	V	B9-10	25041	4713	448	130	124	66	Fragment	
8	V	B9-10	25087/2	4713	93	102	90	40	Fragment	
9	V	B9-10	23388/26	7063	90	90	124	53	Fragment	
10	V	B9-10	24016	7125	450	260	135	81	Complete	
11	V	B9-10	25138	W5851	101	137	92	55	Fragment	
12	V	M9b	20672/2	8189	561	210	110	58	Complete	7.3 upper; 7.18:2
13	V	T15	19513	2749	643	205	125	52	Broken	
14	VI	B11	18623	4349	644	135	93	62	Broken	
15	VI	B11	23721	7130	82	320	110	43	Complete	7.3 lower; 7.18:3
16	VI-VIIA1	B11-12	23087	4622	83	124	109	47	Fragment	
17	VI-VIIA1	B11-12	23437	7060	454	200	105	103	Broken	
18	VI-VIIA1	B11-12	23495/7	7081	94	107	103	50	Fragment	
19	VI-VIIA1	B11-12	23547/5	7093	517	242	139	92	Broken	7.18:4
20	VI-VIIA1	B11-12	23868	7150	797	262+	155	133	Broken	
21	VIIA1-VI	B11-12	1675	182	1000	n/w			Broken	
22	VIIA1-VI	B11-12	25212	4733	—	282	102	51	Complete	7.18:5

Handstones

Handstones are the upper, mobile stones in a pair of grinding utensils (Wright 1992: 67, Types 24-62). They do not show the scars of pounding, only the smoothness of grinding. The upper millstones described above are included in this category, but here I am using the term to refer to stones that were meant to be grasped *in one hand*, facilitating more of a rotary motion. By this criterion cuboids and spheroids also belong to the class, though I have made them separate categories based on their other characteristics (see below). Some handstones are clearly unifacial and some are clearly bifacial or multifacial. With handstones of loaf-shaped or rounded profiles it is unclear to what degree the rounded surfaces were active; the rounded sides never show the polishing of extensive use. Handstones can be separated into the following morphological subcategories:

Discoidal/lens (Wright Types 24-31; N=5, Fig. 7.4a). These tools are sometimes called *manos* in archaeological publications (*mano* means "hand" in Spanish; cf. Hovers 1996: 178-179).

Ovate (Wright Types 32-36; N=5, Fig. 7.4.b); The thicker ovate handstones are essentially loaf-shaped handstones, but smaller. Unlike the loaf-shaped examples, however, they are almost uniformly made with finer-grained basalt.

Loaf-shaped (Wright Types 40-47; N=7, Fig. 7.4c). These resemble upper millstones but are clearly designed to be moved with one hand. The bases are most often flat (Item no. 16) but several

Table 7.4. Handstones (all basalt).

No.	Phase/Str.	Reg. No.	Locus	Ser. No.	Material	Shape	Wright shape	L	W	Th.	Wt.	Preserv.	Fig.
1	B8, IVB	9777	571	127	Basalt	Ovate	33	95	75	57	450	Complete	7.4b left
2	B8, IVB	9537/1	594	102	Basalt	Rectilinear	52	99	68	41	590	Complete	7.4d center
3	B8, IVB	?	671	393	Pumice	Lunate?	n/a	48	45	35	51	Broken	
4	B8, IVB	10243	678	789	Basalt	Ovate	32	104	73	56	525	Complete	
5	T14, IVB	19562	2793	782	Basalt	Rectilinear	52	103	64	40	360	Complete	7.4d right
6	B9, VA	18546	4323	645	Basalt	Rectilinear	52	94	80	38	475	Complete	7.4d left
7	B9-10, V	9659/2	607	118	Basalt	Ovate	36	130	110	38	805	Complete	7.4b right
8	B9-10, V	9706	613	198	Scoria	Rectilinear	53	83	51	27	300	Broken	7.19:1
9	B9-10, V	10615	1227	58	Scoria	Rectilinear	52	66	62	28	40	Broken	
10	B9-10, V	25147/1	4723	96	Basalt	Loaf-shaped	41	134	92	47	50	Complete	7.4c center
11	B9-10, V	25147/2	4723	100	Basalt	Loaf-shaped	33	132	94	58	900	Complete	
12	B9-10, V	25156	4723	117	Basalt	Ovate	35	100	92	52	700	Complete	

No.	Phase/Str.	Reg. No.	Locus	Ser. No.	Material	Shape	Wright shape	L	W	Th.	Wt.	Preserv.	Fig.
13	B9-10, V	23413/5	7063	467	Basalt	Rectilinear	41	148	100	51	1112	Complete	7.4c right 7.19:6
14	B9-10, V	23422/11	7063	122	Basalt	Loaf-shaped	33	79	66	58	425	Complete	7.19:5
15	B9-10, V	23443/5	7067	462	Basalt	Loaf-shaped	62	130	80	57	980	Complete	
16	B9-10, V	23526/8	7082	97	Basalt	Loaf-shaped	43	138	83	60	1000	Complete	7.4c left
17	B9-10, V	23734	7131	205	Pumice	Rectilinear	52	68	81	32	75	Broken	
18	M9b-c, V	20910	8229	132	Basalt	Rectilinear	33	91	74	41	400	Complete	7.19:2
19	T15, V	19785	2856	601	Basalt	Discoidal	24	68	76	44	319	Complete	
20	H, V–VI	4086/4	609	156	Basalt	Discoidal	28	71	73	41	700	Complete	7.4a left
21	B11, VI	23736/1	7130	422	Scoria	Rectilinear	61	124	68	43	212	Complete	7.19:3
22	B11, VI	23736/2	7130	158	Basalt	Discoidal	24	92	86	56	701	Complete	7.4a right
23	B11-12, VI-VIIA1	6276/6	435	137	Basalt	Discoidal	25	80	77	43	400	Complete	7.4a center
24	B11-12, VI-VIIA1	25174	4729	177	Basalt	Discoidal	24	80	87	48	860	Complete	7.19:4
25	VI-VIIA1	23549/8	7093	114	Basalt	Ovate	34	98	79	53	630	Complete	7.19:7
26	B11-12, VI-VIIA1	23547/4	7093	115	Basalt	Loaf-shaped	47	154	85	47	1209	Complete	
27	VI-VIIA1	23549/7	7093	463	Basalt	Loaf-shaped	62	127	78	58	700	Broken	
28	T15, V	19772/21	2885	606	Scoria	Bifacial rectilin-ear-triangular	54	?	41	33	38	Broken	

show convexity (e.g. Item no. 11) suggesting use on a concave saddle quern, grinding slab or mortar. At least one (Item no. 21, of scoria) has a concave working surface. This stone utensil may have been used for rounding and smoothing wooden poles, for example.

Rectilinear (Wright Types 48-55; N=10, Fig. 7.4d). These objects are sometimes called mullers, or rubbing stones (cf. Hovers 1996: 179 and references there). All six faces are ground and smoothed, suggesting that they were more all-around tools. Most of the items made of lightweight scoria or pumice belong to the rectilinear class (Item nos. 8, 9, 17, 28). These were tools for shaping and cleaning softer, generally organic materials.

The variety of form described above suggests that handstones were designed for various purposes

Fig. 7.4a. Discoidal Handstones
(left to right: Table 7.4:20, 23, 22).

Fig. 7.4b. Ovate Handstones
(left to right: Table 7.4:1,-, 7).

Fig. 7.4c. Loaf-shaped Handstones (left to right: Table 7.4:16, 10, 13 [13 is rectilinear, not loaf-shaped]).

Fig. 7.4d. Rectilinear Handstones
(left to right: Table 7.4:6, 2, 5).

and that the shape of any given object often underwent evolution through use, sometimes even becoming a different type over time. It is conceivable, for example, that some, or many, of the discoidal, rectilinear and ovate handstones are weights (Item no. 24, for example).

Whetstones

Item no. 3 is of smooth dolomite and the other four items are of very fine-grained basalt and very smooth. Item no. 4 is a large irregular cobble with several flat, smooth, almost polished surfaces. The other pieces are more or less flat and could be grasped in one hand. I suggest that all these objects are whetstones for the sharpening of metal blades. It is also possible that they are palettes upon which finer, softer substances were ground and mixed.

Table 7.5. Whetstones.

No.	Str.	Phase	Reg. No.	Locus	Ser. No.	Material	L	W	Th.	Wt.	Preserv.	Fig.
1	V	B9-10	24763/2	7208	116	Basalt	110	92	35	650	Complete	7.19:8
2	V	B9-10	10714	1227	216	Basalt	67	56	36	200	Broken	
3	V	T15	19519	2749	554	Dolomite	135	69	20	308	Broken	7.19:9
4	V	T15	19519	2749	713	Basalt	195	122	75	3289	Complete	
5	VI	B11	25170	4722	128	Basalt	110	46	27	275	Complete	7.19:10

Fig. 7.5. Bow drill sockets (top to bottom: Table 7.6:2, 1).

Fig. 7.6. The bow-drill and capstone in use, as depicted in the 18th Dynasty tomb of Rekhmire (TT100) in Thebes.

Drill Sockets

These basalt objects are interpreted as bow drill sockets (also termed capstones, handholds or pivots. The bow drill would have been used for drilling holes in wood, pottery, shell, stone and bone and for the making of fire (cf. Amiran and Ilan 1992: 74-75; Ilan 2016). Item no. 1 is the smaller, simpler item with the shape of a rounded cone. No. 2 is broken and its identification as a bow drill handhold is more tenuous. It has a roughly cylindrical transverse section and two axial depressions. Four longitudinal grooves of similar size were made equidistant around the circumference at the midsection, perhaps to improve the grip. Lubrication (oil) would have been applied at the contact between the butt of the spindle and the handhold.

Drill sockets are probably underreported in the Bronze and Iron Age assemblages of the Levant. Recently, one has been identified at Megiddo (from an unstratified context in Area K where a substantial Iron I occupation was excavated, Sass and Cinamon 2006: Fig. 18.30:653) and two have been identified recently at the Intermediate Bronze Age site at Sha'ar Hagolan, (Eisenberg 2012: Fig. 51:1-2). A more extensive treatment of this tool type can be found in Ilan, 2016.

Pounders

Sometimes called "hammerstones", pounders, must, by definition, show the scars of pounding. They take on various shapes and sizes, most being less regular versions of the cuboid and spheroid forms discussed below (Wright Types 76-78). The largest pounders are of basalt and the smaller items are of silicified limestone or flint. As with spheroids and cuboids these sometimes have a facet that has been ground flat and have only a few scars, suggesting that the items were scale weights at some point (Item no. 9, for example).

Table 7.6. Drill sockets (all basalt).

No.	Str.	Area/Phase	Reg. No.	Locus	Ser. No.	Upper Dia.	Lower Dia.	Ht.	Wt.	Preserv.	Fig.
1	V	B9-10	23890	7151	257	34	50	65	198	Complete	7.5 bottom; 7.19:11
2	V	B9-10	23450/10	7065	423	66-80	80-85	96	970	Broken	7.5 top; 7.19:12

Table 7.7. Pounders.

No.	Str.	Reg. No.	Locus	Ser. No.	Material	Wright shape	L	W	Th.	Wt.	Preserv.	Fig.
1	B8, IVB	2044/4	319	375	Silicified limestone	77 pounder	65	62	52	325	Complete	
2	B8, IVB	9359	547	221	Silicified limestone	32 handstone	79	66	59	450	Complete	
3	B8, IVB	9761/4	592	369	Flint	76 pounder	56	54	53	175	Complete	
4	B11, VI	23736	7130	362	Limestone	25 handstone	76	77	56	459	Complete	
5	T16, VI	19682	2824	605	Silicified limestone	76 pounder	78	73	73	661	Complete	7.20:1
6	B10-11, V-VI	23576/8	7096	359	Basalt	78 pounder	84	82	80	843	Complete	7.20:2
7	B11-12, VI-VIIA1	25217/1	4729	381	Basalt	41 handstone	120	81	53	745	Complete	
8	B11-12, VI-VIIA1	23444/1	7060	637	Basalt	77 pounder	83	65	62	400	Flake missing	
9	B11-12, VI-VIIA1	1235/1	183	1090	Basalt	76 pounder	76	71	64	657	3 flakes missing	

Cuboids

In Wright's typology these would be in the "pounder" category (Type No. 78). But they do not show the scars of pounding. Some would term them "hammerstones" (e.g. Yahalom-Mack 2006: 267), others would call them "pestles" (e.g. Hovers 1996: Fig. 24:5; Yahalom-Mack and Panitz-Cohen 2009: 725-727), while still others would class them as "weights", due to their flat sides (Eran 1996: Figs. 31-39).[8]

The cuboid type has six flattened, smoothed facets, but the angles are rounded (e.g. Item nos. 6, 8, 11). The use of cuboids can be identified somewhat by their form. They could have been used in shallow mortars or grinding bowls, but the grinding motion would have been more lateral and less rotary. The fact that their corners and edges are usually somewhat rounded indicates such a combination of motions. They could have been used with grinding slabs.

On the other hand, cuboids could have been designated *a priori* as weights; there is some consistency in weight values; almost all fall within the 200-400 gr range (see graph Fig. 7.7). Hypothetically, this range may represent mid-size weights from several different systems (differentiated by either space or time) in which the cuboid shape was normative for that range. The edges may have been rounded to prevent unintentional cutting or abrasion.

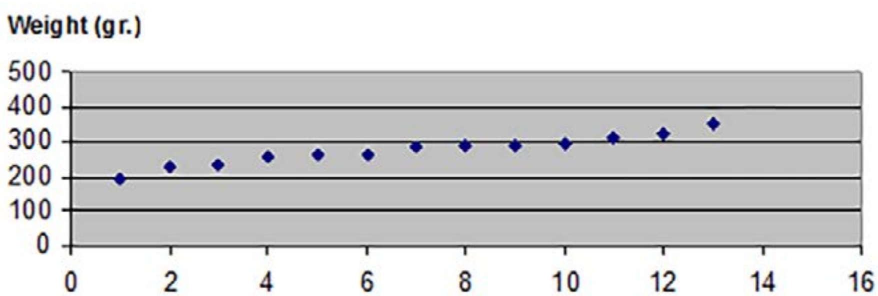

Fig. 7.7. Graph showing cuboids in ascending order of weight.

8 The ground stone catalogues published by Sass (2000, 2004a, 2004b), Sass and Cinamon (2006) generally leave the definition of ground stone cuboid objects open.

Table 7.8. Cuboid groundstone tools (Wright's Type 78, all complete and all basalt).

No.	Phase/ Str.	Reg. No.	Locus	Ser. No.	L	W	Th.	Wt.	Fig.
1	B8, IVB	23520/3	7075	596	49	52	49	232.41	
2	B8, IVB	10255	663	298	57	57	53	294.27	7.20:6
3	Y4, VA	13780/10	3174	324	53	51	50	264.09	7.20:5
4	B9-10, V	23406/7	7065	374	57	63	54	287.16	
5	B9-10, V	23418/9	7065	280	59	42	52	310.15	
6	B9-10, V	23521/9	7082	597	47	46	47	194.9	
7	B10, V	23576	7096	598	57	59	57	324.22	
8	B9-10, V	25087/1	4713	319	51	54	55	289.72	7.20:3
9	B9-10, V	10202	650	292	54	52	53	256.44	
10	B10, VB	10637	1204	218	58	54	50	283.84	
11	Y6, VI	13018	3007	302	58	56	58	352.74	7.20:4
12	B11, VI	23756	7130	321	50	48	49	226.05	
13	B11, VI	23736	7130	323	52	51	50	262.39	

Table 7.9. Spheroid ground stones.

No.	Str.	Reg. No.	Locus	Ser. No.	Material	L	W	Th.	Wt.	Preserv.	Fig.
1	B8, IVB	664/7	129	331	Basalt	52	50	50	234.67	Complete	
2	B9-10, V	23388/5	7063	272	Basalt	57	60	57	328.34	Complete	7.20:7
3	B9-10, V	23526/5	7082b	181	Silicified limestone	75	73	74	507.47	Complete	
4	B9-10, V	23565	7096	282	Basalt	50	51	51	192.63	Complete	
5	B9-10, V	1197	120	144	Basalt	60	66	61	416.27	Complete	
6	B9-10, V	9612	607	297	Basalt	52	54	53	274.57	Complete	
7	B9-10, V	25094	4713	309	Basalt	51	51	51	202.49	Complete	7. 20:8
8	Y5, V	13338/7	3065	170	Basalt	72	66	60	394.63	Complete	
9	B11, VI	23776	7130	153	Basalt	66	64	52	346.54	Broken	
10	T11, VI	20010	8002	574	Basalt	62	62	64	395	Complete	7. 20:9
11	Y7-8, VI-VIIA	13742	3128	353	Silicified limestone	59	57	54	282.9	Complete	
12	Y3b, IVB	7111/4	1018	1040	Basalt	74	73	71	504	Complete	

Spheroids

In Wright's typology these would come under the "pounder" category (Type No. 77), but once again, there are no scars of impact. Here, too, the spheroid form is indicative of motion and use. The rounded form, sometimes an almost perfect sphere (Item no. 10), suggests use in grinding bowls in a rotary motion, with little or no lateral motion involved.

Like the cuboids, however, it is hard to know whether their form is purely a result of their makers' intention or a result of their use. Signs of use cannot be differentiated from the marks of manufacture; they were certainly fashioned by grinding, but they need not have been grinding utensils. They may have been designed as projectile weapons or *bolas*, for example (cf. Sass and Ussishkin 2004: 1974-1982). Or perhaps they were game balls. Certainly their lack of stability seems to preclude their being scale weights; all spheroids with a flat surface have been termed weights, following Eran (e.g. 1996 and see below).

Mortars/Grinding Bowls

Mortars can be made of either vesicular or non-vesicular basalt. They tend to be heavy (the heaviest weighed in the lab was 23 kg but heavier ones were left in the field, (e.g. Figs. 2.110 [L3177] and 2.86 [L2826] Area T; Reg. no. 13761 [L4715] Area B, Phase B11, Stratum VI. None of the mortars here are of the deeper variety reserved exclusively for pounding. As noted in the introduction to this chapter, there is reason to believe that these would have been made of wood. Their bases are rarely completely flat and stable (Item no. 1 is the exception) and therefore they need to be embedded in the floor or other work surface for stability; Item no. 1 is encrusted with white plaster around its exterior, indicating that it was so embedded.

Our mortars show a shallower, more rounded cavity that suggests both pounding and grinding in rotary motion. Materials other than grain were also processed, though precisely what is still an open question in need of further research. Pestles, convex-based handstones, spheroids or rounded cuboids, either of wood or stone, would have been the active pounding or grinding tools.

Item no. 7 is unique—a small mortar of vesicular basalt that is a combination of Wright's (1992) pebble mortar (Type 15) and pillar mortar (Type 20). Since it is not stable on its own, it would have been embedded in the floor or on a platform. Item no. 3 is a miniature mortar, also a combination of Wright's Types 15 and 20. The angle of its flat base suggests that it was formed from a lower millstone fragment.

Fig. 7.8. Mortar (Table 7.10:1).

Table 7.10. Mortars and grinding bowls (all basalt).

No.	Phase/Str.	Reg. No.	Locus	Ser. No.	Wright Shape	L	W	Ht.	D.	Th.	Preserv.	Fig.
1	B8, IVB	9777	571	717	18	240	265	130	87	39-44	Complete	7.8; 7.17:8
2	B8, IVB	10399	574	715	18	?	?	154	?	87-90	Broken	
3	B8, IVB	14747	4187	595	?	59	59	52	2	n/a	Complete	7.17:7
4	B9-10, V	10654	1216	720	18	?	?	210	90	64-91	broken	
5	B10, VB	10565	1204	719	18	?	?	154	63	61-70	broken	
6	T16, VI	19715	2826	716	18	30	31	157	95	21-29	complete	
7	B11-12, VI-VIIA1	23860	7150	505	16	150	142	117	20	n/a	complete	7.17:6

Fig. 7.9. Boulder quern (photo and drawing).

Table 7.11. Boulder quern (Wright's Shape 3).

No.	Phase/ Str.	Reg. No.	Locus	Ser. No.	Material	L	W	Dia.	Ht.	Preserv.	Fig.
1	B9-10, V	25158	4723	714	Basalt	445	255	44	135	Broken	7.9

Boulder Quern

One type of grinding slab (Item no. 1) is defined as a "boulder quern" in Wright's terminology (Shape No. 3). It has an ovate depression ground into a boulder, which has an uneven base and would have had to be inserted into a floor or bench for stability. Rotary grinding is indicated, rather than lateral grinding, such that this type is closer to the mortar in function.

Door socket

Reg. no. 6140/1, L.419, Phase B9-10, Stratum V, Serial no. 1079. This object could be a mortar, but the depression has a small diameter (97 mm) and it is very regular and 34 mm deep. It resembles *in situ* domestic door sockets from other places and periods. Its worked sides form an angle that suggests engagement into the corner of a doorway next to the threshold (cf. Amiran and Ilan 1992: Fig. 49).

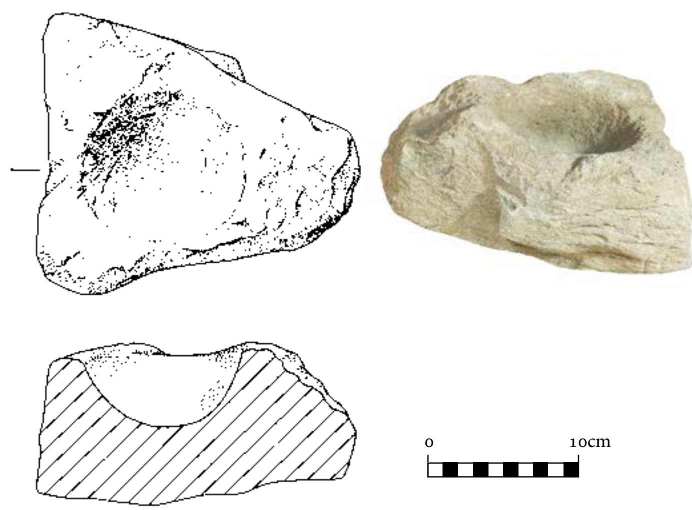

Fig. 7.10. Door socket.

Anvils

Anvils are massive, heavy blocks of dense basalt that show scars of percussion. There were certainly many more of them at the site that were either part of the architectural configuration or not identified. All those listed here were gleaned from the industrial zone in the southern sector of Area B-west.

Table 7.12. Stone anvils (all basalt).

No.	Phase/ Str.	Reg. No.	Locus	Ser. No.	L	W	Th.	Preserv.	Fig.
1	B9-10, V	23451/9	7061	735	45	100	90	Broken	
2	B9-10, V	23405/3	7063	783	110	163	104	Broken	
3	B9-10, V	23453/1	7068	784	380	245	110	Broken	7.21:8

Pestles

Pestles can be elongated tools for heavier pounding (Item nos. 7-8), or shorter and lighter for lighter rotary crushing and grinding (most of the remainder). The larger, oblong-shaped tools (Wright 1992 Types 62-68; N=3) were grasped in one hand with the thumb bracing the butt. Only one end seems to have been used—usually the broader end—and the proximal, handle end tapers back. The smaller pestles would have been grasped with the fingers and the wrist would have been more active in the lighter grinding.[9] One type of smaller pestle shares the oblong characteristics (Item no. 9). The most common small pestles (Item nos. 1, 11, 14) have a somewhat conical shape which results in a smaller grasping end and broader working face (cf. Hovers

Fig. 7.11. Long pestles
(left to right: Table 7.13:2, 7, 8).

Fig. 7.12. Short pestles
(left to right: Table 7.13:1, 11, 4).

9 Smaller pestles are not included in Wright's 1992 typology; apparently they were not part of the prehistoric tool kit.

1996: Fig. 24:2-5; Cohen-Weinberger 2001; Yahalom-Mack and Panitz-Cohen 2009: 725-727). This working face is often quite smooth from use.

Item no. 15 is shaped like a rectilinear handstone but it has a small distal working surface. It would have been grasped in the full hand with the thumb bracing the proximal butt.

It is likely that a number of items classified here as cuboids, spheroids and weights functioned as pestles (cf. Yahalom-Mack and Panitz-Cohen 2009: 725-727).[10]

Table 7.13. Stone pestles.

No.	Phase/Str.	Reg.No.	Locus	Ser.No.	Material	Wright shape	L.	L. dia	U. dia	Wt.	Preserv.	Fig.
1	B8, IVB	6088/2	415	256	Basalt	n/a	44	42	dome	108	Complete	7.12 left; 7.21:1
2	B8, IVB	9532	571	—	Basalt	68	75	63	dome	622	Complete	7.11 left; 7.21:4
3	B8, IVB	9569	601	790	Basalt	n/a	64	55	dome	304	Chipped	
4	B8, IVB	9691/4	608	249	Basalt	68 pestle	68	63	45	492	Complete	7.12 right 7.21:2
5	T14-15, IVB–V	19169	2589	778	Silicified limestone	40 handstone	132	76	47	848	Complete	
6	B9, VA	9495/3	591	382	Basalt	n/a	76	57	49	312	Complete	
7	B9-10, V	23405/10	7063	473	Basalt	66 pestle	183	74	55	1277	Complete	7.11 center; 7.21:6
8	B9-10, V	23413/6	7063	244	Basalt	n/a	192	66	62	1234	Complete	7.11 right; 7.21:5
9	B9-10, V	23577/8	7097	180	Basalt	33 handstone	63	50	47	90	Complete	
10	Y5, VB	13795/5	3176	207	Basalt	n/a	106	67	54	575	Complete	7.21:7
11	B11, VI	18602	4343	254	Basalt	n/a	58	47	49	175	Complete	7.12 center; 7.21.3
12	T16, VI	19524	2763	266	Basalt	n/a	83	21	?	?	Broken	
13	B11-12, VI-VIIA1	922/15	184	142	Basalt	n/a	65	61	47	308	Complete	
14	B11-12, VI-VIIA1	916/8	184	315	Basalt	57 handstone	61	59	66	275	Complete	
15	B8, IVB	2053/23	318	1064	Basalt	49 handstone	100	68.5	62.5	417	Complete	

Rings

Each of the rings is different and may have had a different purpose. Item no. 3 is the smallest and fits the profile of a digging stick weight stone (cf. Amiran and Ilan 1992: 40, Fig. 25). Weighing *ca.* 1.63 kg, it may also have been a suspension weight (for tent ballast for example) or a flywheel for a bow-drill. Two fragmentary rings (Item nos. 1 and 4) are much heavier artifacts with larger perforations. They are apparently too heavy and not of the proper form to be scale weights (cf. Eran 1974). Item no. 2 is large enough to have been a door socket (cf. James and McGovern 1993: 195 and parallels there). As with the stone bowls, the fact that the two larger rings are fragmentary suggests that they originate in earlier levels, from the Middle or Late Bronze Ages.

10 Yahalom-Mack and Panitz-Cohen (2009: 725-727) include a large variety of smaller ground stone objects in the pestle category. While this is possibly justified in many cases, it is likely that some are scale weights.

Fig. 7.13. Stone ring (Table 7.14.3).

Table 7.14. Stone rings (Wright's Type 106, all basalt).

No.	Phase/Str.	Reg. No.	Locus	Ser. No.	L	W	Ht.	Th.	Perf. Dia.	Preserv.	Fig.
1	B9-10, V	23763	7133	344	Dia. ±200		100	78	±80	Fragment	
2	B12, VIIA1	24765/10	7212	345	Dia. 220		69	44	80	Fragment	
3	M9b, V	20672/1	8189	567	183	152		41	29-41	Complete	7.13; 7.20:10
4	B8, IVB	9811	601	1075	Dia. 142		81	45	50	Fragment	

Suspension Weight

This object, interpreted as a suspension weight, has a pecked "waist" and is the only one of its kind recorded. Its ends are ground down to a rounded form and show no signs of battering or pecking. As a suspension weight it may be related to the ceramic "spool" weights of the Aegean type (e.g. Stager 1991: 14-15; Yasur-Landau 2010: 132-135, 267-268). Other stones (e.g. the cobbles below) may have been used as suspension weights if attached by multiple strands of twine.

Table 7.15. A suspension weight.

No.	Phase/ Str.	Reg. No.	Locus	Ser. No.	Material	L	W	Th.	Wt.	Preserv.	Fig.
1	B9-10, V	9758	622	416	Basalt	98	71	50	696	Complete	7.20:11

Cobbles and Pebbles

Smooth cobbles (Fig. 7.14 right) of a certain range of weight (ca. 190-1000 gr) and size (diameter 3-11 cm) were systematically collected in antiquity for purposes that are unclear. They may have been either cooking stones, projectiles, suspension weights or scale weights (cf. Michailidou 2010: 74: Fig. 7.5). They are inevitably smooth (probably made so in a fluvial environment) and apparently unworked (unless an artificial smoothing is so fine as to mimic the fluvial result). The larger cobbles are generally ovate, with smaller examples being spheroid. Four of the 15 cobbles are silicified limestone. One of the smaller cobbles (Item no. 20) is a probably a volcanic bomb (Fig. 7.14 upper left). Such cracked natural projectiles can be found near the volcanoes of the Golan Heights.[11]

The smaller pebbles (diam. 30-50 mm; Fig. 7.14 left) are all spheroids, except one. Most are limestone. I would suggest that these may have been gaming pieces, for some variant of the *senet* or *tab* game for example (cf. Sebbane 2001) or *mankala*. No such gameboards are documented in the Iron Age I levels discussed here but it is likely that the gameboards were made either of wood, marked out on animal skins, or traced in the dirt. The pebbles may also have been weights or sling stones.

Fig. 7.14. Selected cobbles (right), pebbles and one cracked cobble (left) and handstones (center).

Table 7.16. Cobbles.

No.	Phase/Str.	Reg. No.	Locus	Ser. No.	Raw Material	L	W	Th.	Wt.	Preserv.
1	B8, IVB	2020/9	316	134	Basalt	120	74	48	728	Complete
2	B8, IVB	2020/13	316	140	Basalt	76	72	60	557	Complete
3	B8, IVB	9409/8	574	623	Silicified lime-stone	57	51	50	200	Complete
4	B8, IVB	9537/2	594	380	Basalt	84	68	54	333	Complete
5	B8, IVB	9691/6	608	367	Basalt	65	63	62	325	Complete
6	B8, IVB	9663/4	612	236	Silicified lime-stone	89	85	53	596	Complete
7	B8, IVB	9663/3	612	702	Basalt	96	71	61	630	Complete
8	B8, IVB	23416/16	7052	630	Basalt	56	50	54	210	Complete
9	B8, IVB	23421/10	7052	638	Basalt	130	78	56	740	Chipped
10	B8, IVB	23751/1	7132	603	Basalt	61	53	43	203	Complete
11	B9, VA	18537	4323	341	Calcite geode	84	62	56	341	Complete
12	M9b, VA	20139	8060	665	Basalt	80	67	44	380	Complete
13	Y4, VA	13760/7	3172	239	Basalt	86	67	56	525	Complete
14	B9, V	23905	7151	190	Basalt	112	52	50	416	Complete
15	B9-10, V	23384/9	7061	219	Basalt	92	77	50	520	Complete

11 I thank Dov Levitte for identifying the volcanic bomb and for several other mineral identifications.

No.	Phase/Str.	Reg. No.	Locus	Ser. No.	Raw Material	L	W	Th.	Wt.	Preserv.
16	B9-10, V	23429/7	7063	193	Silicified limestone	75	63	56	397	Complete
17	B9-10, V	23429/8	7063	200	Basalt	77	68	51	420	Complete
18	B9-10, V	23526/7	7082	203	Basalt	103	89	75	1038	Complete
19	B9-10, V	23763	7133	161	Basalt	96	76	67	690	Complete
20	B10-11, V-VI	23582	7096	214	Basalt	67	64	50	317	Complete, cracked
21	B10-11, V-VI	23576/9	7096	186	Basalt	57	53	48	193	Complete
22	B11, VI	23736	7130	213	Silicified limestone	74	62	58	377	Complete
23	B11, VI	23756	7130	226	Basalt	101	57	39	355	Complete
24	B11-12, VI-VIIA1	25171	4728	693	Basalt	77	63	48	334	Chipped
25	B8, IVB	1081/4	210	1054	Basalt	118	106	66	1428	Complete

Table 7.17. Pebbles.

No.	Str.	Reg. No.	Locus	Ser. No.	Material	L	W	Wt.	Preserv.
1	B8, IVB	9409/7	574	386	Limestone	Diam. 43.4		103	Complete
2	B8, IVB	9666/15	608	617	Silicified limestone	Diam. 50.2		162	Complete
3	B8, IVB	25038	4704	608	Limestone	50	45	140	Complete
4	Y4, VA	13763/3	3172	168	Limestone	40	36	67.62	Complete
5	B10-11, V	23565/7	7096	616	Limestone	Diam. 37.1		64.84	Complete
6	B9-10, V	25094	4713	704	Limestone	45	40	96	Complete
7	B9-10, V	23507/15	7082	620	Silicified limestone	44	41	99	Complete
8	B9-10, V	23507/18	7082	631	Calcite	37	32	54.07	Complete
9	B9-10, V	23821	7139	625	Flint	Diam. 34.4		54.39	Complete
10	B11, VI	23736	7130	611	Limestone	49	42	125	Complete
11	B11-12, VI-VIIA1	18531	4325	225	Limestone	Diam. 48.8		137	Complete
12	B9-10, V	889	181	1065	Basalt	53	49	112	Complete

Slabs

These are flat, even, rectilinear basalt slab fragments. Many more of these were left at the site, of course. They are not ground down or smoothed, just naturally flat. None were found in obvious in situ contexts, but I would suggest that they originate in constructed installations requiring a stable, level surface. All were recovered from the industrial area of Area B-west, where numerous installations are in evidence, though it is often not possible to reconstruct their form.

Table 7.18. Basalt Slabs.

No.	Phase/ Str.	Reg. No.	Locus	Ser. No.	L	W	Th.	Preserv.
1	B8, IVB	23589/2	7102	388	116	84	34	Broken
2	B8, IVB	23589/1	7102	387	115	82	25	Broken
3	B9-10, V	23393/5	7061	395	136	61	37	Broken
4	B11-12, VI-VIIA1	24603/1	7177	392	99	98	33	Broken

Natural stone curiosities

Five of these are limestone and one is crystalline gypsum. Of the limestone objects, two are flat ovate stones that could have been *ad hoc* palettes. One is a cobble with two natural cavities and a reddish iron-oxide patch at top which, together, give the appearance of an off-kilter face. Despite its unusual look, it could have been a pestle.

Items nos. 2 and 3 are two calcareous geodes found in the corner cult room of Sanctuary 7082. Their form is reminiscent of the contoured brain. Their meaning is, of course, hidden to us, but the context appears to be a ritual one. Item no. 6 is an unworked fragment of crystalline gypsum found in the Stratum IVB destruction debris of a house in Area Y. Evocative natural stones are a topic requiring further study.

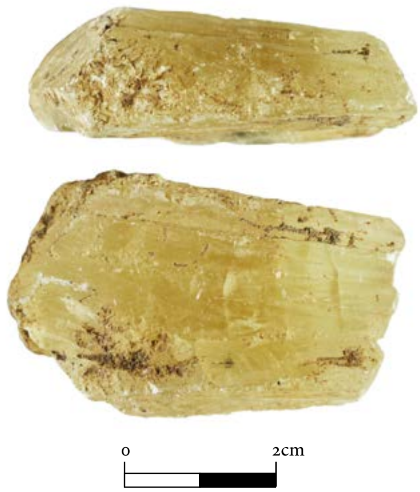

Fig. 7.15. A crystalline gypsum stone (Table 7.19:6).

Fig. 7.16. Two limestone geodes from the *cella* of L7082 (left to right: Table 7.19: 3,2).

Table 7.19. Natural stone curiosities

No.	Phase/ Str.	Reg. No.	Locus	Ser. No.	Material	L	W	Th.	Wt.	Preserv.	Fig.
1	T14-15, IVB-V	19169	2589	777	Limestone	80	66	52	395	Complete	
2	B9-10, V	23507/16	7082	621	Limestone geode	43	40	34	75	Complete	7.16 right
3	B9-10, V	23507/17	7082	626	Limestone geode	64	60	55	235	Complete	7.16 left
4	B11, VI	23039	4609	600	Limestone	101	74	23	245	Complete	
5	B11-12, VI-VIIA1	23444/2	7060	707	Limestone	75	57	25	145	Complete	
6	Y4, IVB	13750/18	3171	798	Gypsum	5.5	3.1	1.7/1.9	38	Fragment	7.15

Unidentified Stone Objects

I cannot find an explanation for these objects. The red sandstone items however, are clearly imports to the site. Item no. 3 is a Tripoli (Libya)-type sandstone; the question of whether it occurs in the southern Levant requires more research. Item nos. 2 and 5 are of arkozic sandstone which is found in the southern Rift Valley-Eilat region and *not* in the sandstone formations of Mt. Hermon.[12]

Table 7.20. Unidentified stone objects.

No.	Phase/ Str.	Reg.No.	Locus	Ser. No.	Material	L	W	Th.	Preserv.	Shape
1	B9-10, V	18547	4328	641	Basalt	210	90	40	Broken	Elongated and amorphous, with one long, smooth, flat face
2	B9-10, V	23606/1	7061	792	Red arkozic sandstone	75	63	21	Broken	Chip of polyhedron; one smooth face
3	M9b-c, V	20623/2	8181	488	Red sandstone	80	65	45	Broken	Polyhedron with six smooth facets
4	B9-10, V	23692	7115	99	Basalt	100	62	47	Broken	Elongated with one flat facet and a rounded dorsal side; weathered, not ground.
5	B11-12, VI-VIIA1	10450/10	1208	791	Red arkozic sandstone	59	67	21	Broken	Rectilinear with flat, but not smooth, facets

Discussion

Distribution and Context

The southern part of Area B-west (especially Squares U–A/14-16) abounds with evidence for craft activity in the form of metallurgy (Chapter 2) and flint-tool production (Chapter 9). To this we can add the plethora of ground stone artifacts. I would suggest that these are not just the tools implemented in the other crafts; rather, they were also manufactured here as well. While basalt chips and flakes are always part of the debris matrix, none of these were recognized as industrial debitage and debris and were not collected. In any case, it is reasonable to assume that the earlier stages of manufacture were conducted in the countryside where the basalt boulders were initially located.

Choice of Material

Like other sites of northern Israel near basalt flows, Tel Dan enjoyed easy access to a very useful mineral. This proximity accounts for the preponderance of basalt relative to other sites and ability to select for vesicular characteristics according to purpose. Large vesicles were better suited for coarse grinding and a denser matrix for rubbing and polishing. Limestone and flint seem to have been more selected for cobbles, spheroid pebbles and for some scale weights.

Use

The large number of basalt objects in a variety of forms is evidence for a range of activities. Some examples that the present assemblage would account for include:

1. Stone tool manufacture. While blanks were initially shaped at the source it is likely that the final stages of manufacture took place on site. Modification, rehabilitation and recycling

12 Once again, the mineralogical identifications were made by Dov Levitte, whom I thank for sharing his expertise.

would also have been part of ground stone tool maintenance.

2. Food preparation. This is the most widely acknowledged function of ground stone utensils: the preparation of grains in different forms for various dishes (e.g. Hovers 1996; Leibowitz 2008); crushing onions, lentils, chickpeas; crushing or softening meat; cracking and crushing nuts, and so on.
3. Preparation of cosmetics, pigments, glues and other craft materials.
4. Metallurgy. Crushing of slag and flux material, annealing, sharpening metal implements.
5. Woodworking. The rough vesicular nature of basalt is conducive to smoothing wood—finishing that a carpenter would use a file, a rasp and sandpaper for today. The drill handholds are further evidence for carpentry and fire-making.
6. Tanning. The scraping and smoothing of hides.

Signs of use vary. Smoothed surfaces—even polished ones—may be the result of either manufacture or use. A number of objects display a high polish on what seem to be the main active surfaces.[13] This may be best understood as the result of intense working, so much so that the active surface may no longer have been effective.[14] Such polished items may be simple discards, in their last incarnation, or they may have become something else—weights, for example. Alternately, the polished effect on some items may have been intentionally aesthetic. Multiple scars appear to be the hallmarks of pounders and anvils alone.

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13 Items showing polish: scale weights nos. 138, 237, 238 (Table 8.1: 6,7,17); handstones nos. 114, 177 (Table 7.4: 25, 12); cuboid no. 302 (Table 7.8: 11); spheroid no. 144 (Table 7.9: 5); and pestle no. 254 (Table 7.13: 11).

14 My thanks to Yorke Rowan for pointing this out.

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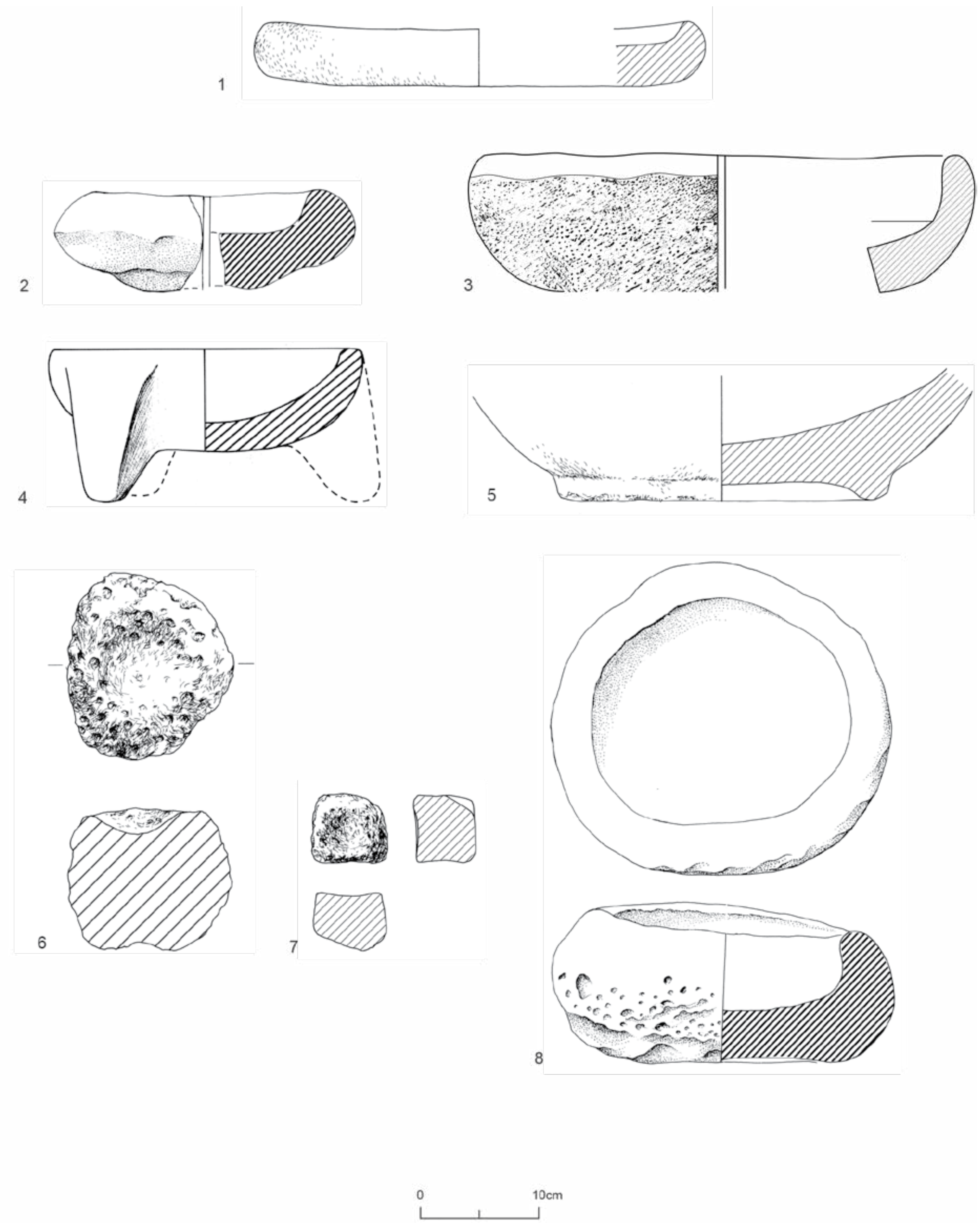

Fig. 7.17. Line drawings of stone bowls and mortars.

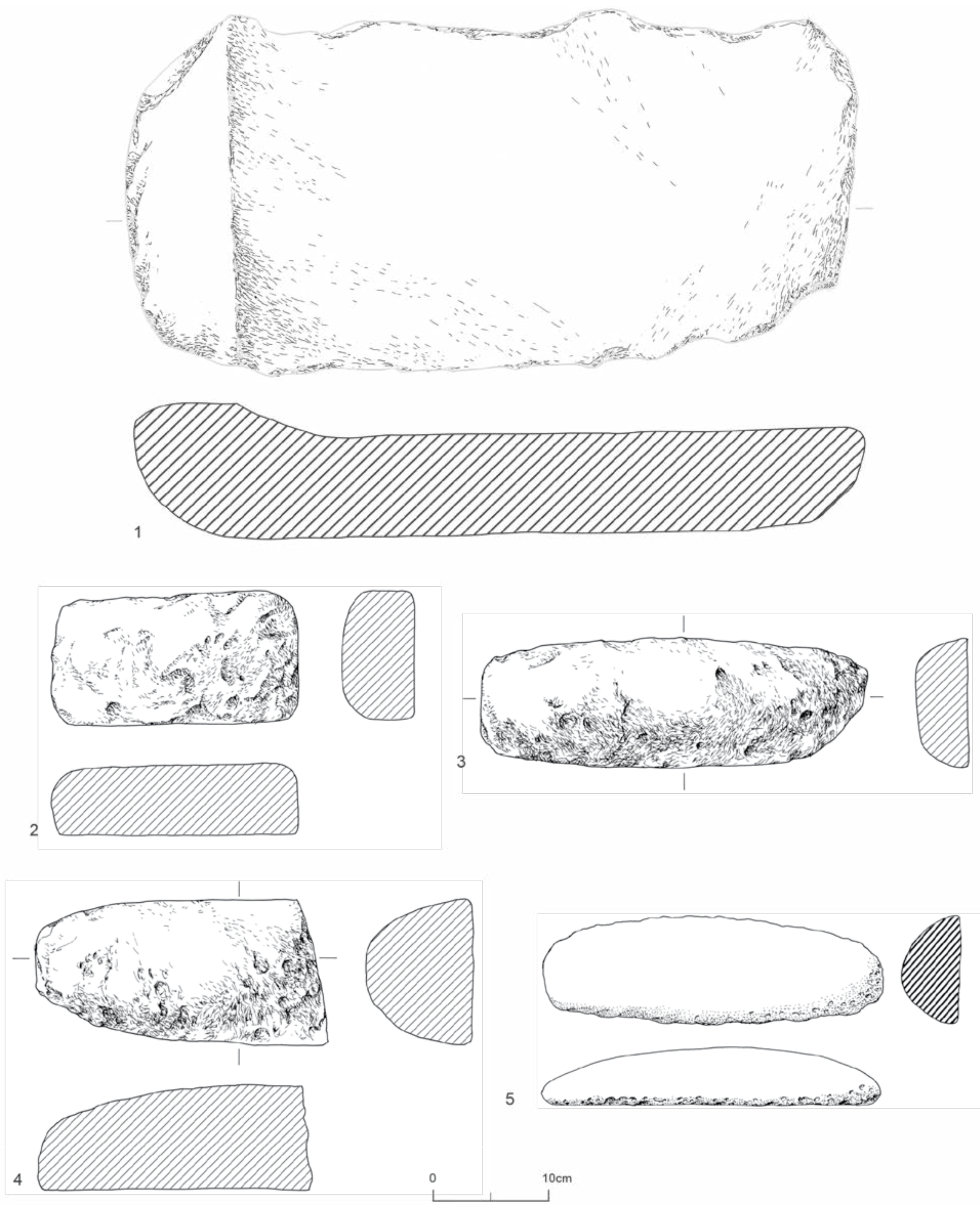

Fig. 7.18. Line drawings of upper and lower millstones.

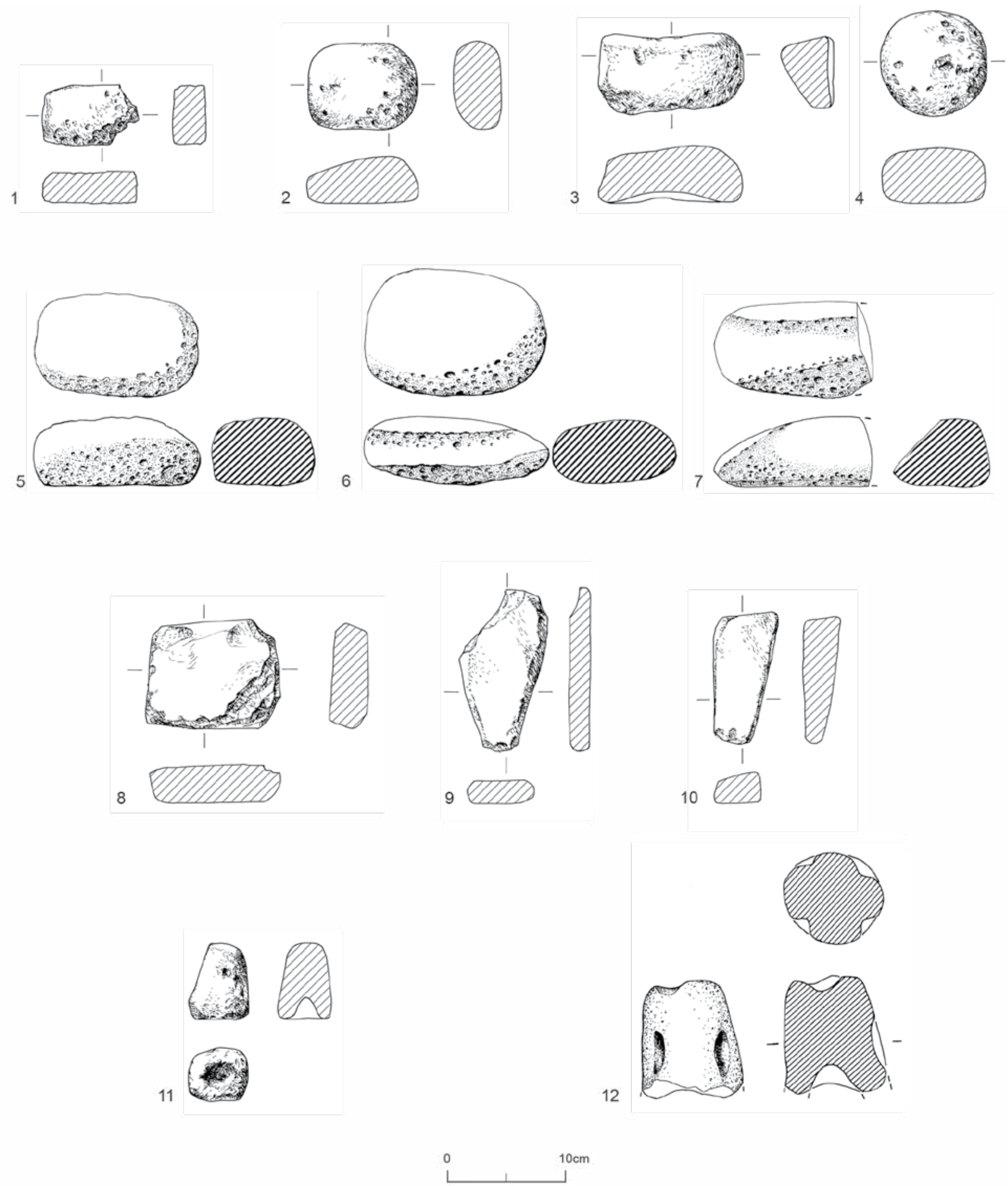

Fig. 7.19. Line drawings of handstones, whetstones, and drill sockets.

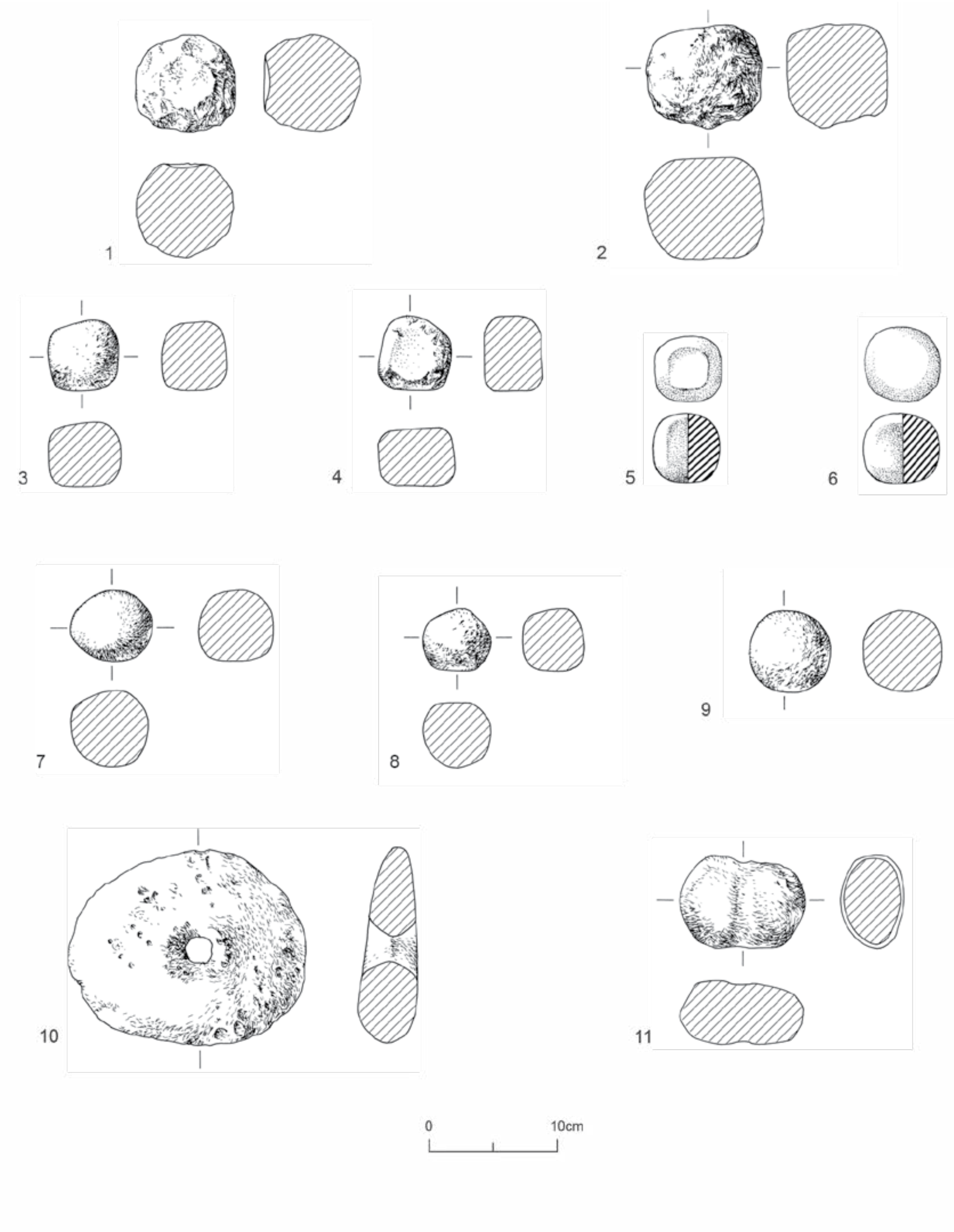

Fig. 7.20. Line drawings of pounders, cuboids, spheroids, a ring and a suspension weight.

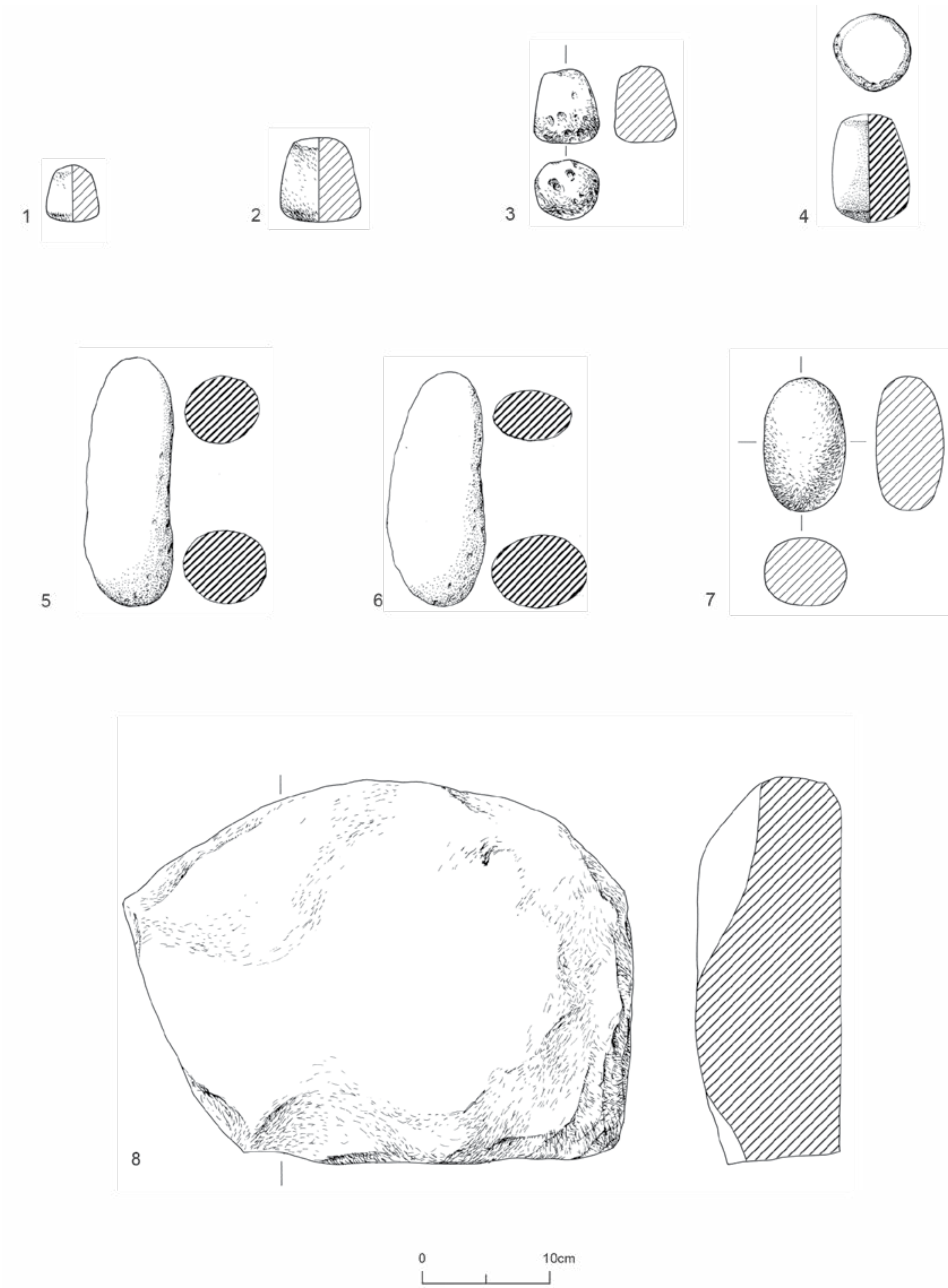

Fig. 7.21. Line drawings of pestles and an anvil.

CHAPTER 8
SCALE WEIGHTS

Uninscribed (sometimes called "mute") stone scale weights from the southern Levantine Bronze and Early Iron Ages have not been studied systematically.[1] Part of the explanation for this is that, lacking a uniform scale of shape and mass, identifying weights is problematic. Even in regions where weights are known and recognized, the standardization of weight values was neither universal nor completely consistent (e.g. Heltzer 1996; Eph'al and Naveh 1993: 62-63; King and Stager 2001: 197; Stieglitz 1979). A weight must fit a particular system but it can also fit more than one system (e.g. Kletter 2006: 275) and it may belong to a local, as yet unrecognized system. It is, of course, crucial that some sort of weight-value hierarchy is observable (Rahmstorf 2010: 99-100).

A starting point is the hypothesis that scale weights would have been part of domestic assemblages, even in agrarian societies of limited complexity. This will be discussed further below. A total of 33 stone artifacts were identified as scale weights in the Iron Age I assemblage (Table 8.1). But this figure is surely too low. I believe that many of the cuboids, spheroids, cobbles and pebbles discussed in the previous chapter are weights as well.

Raw Material and Manufacture

Kletter (2006: 275) observes that weights are made of materials that are "not too light or porous [and] not too hard or fragile." A few weights are of silicified limestone (Nos. 15, 16, 19, 26, 30). One small, dome-shaped weight (No. 23) is fashioned of polished flint, and one disc weight (No. 31) is of scoria. Three smaller weights are of hematite (Nos. 24, 27, 28) and one spheroid example appears to be of reddish sandstone (No. 22). All the others (N=22) are made of fine-grained basalt. Some are polished on one or more faces (Nos. 6, 7, 17, 23), but most are coarse. It may be significant that highly polished, fine-grained basalt can take on the look of hematite (hematite being a mineral of choice for weights). Aside from the polished items, none of the remainder shows evidence for extensive friction work. In other words, stones seem to have been collected and prepared to achieve their current form as weights and not to serve as active grinding or pounding tools (cf. Eran 1996: 208-209). The advantage of basalt in this context is obvious: fine-grained basalt is highly durable, yet its grinding can be controlled and precise weights achieved easily. The flat surfaces are generally achieved by grinding but in several cases the surface is gained by other means:

- Pecked, flaked or battered flat surface: Nos. 10, 11, 15.
- Natural flat surface: Nos. 6, 16.

1 For an attempt on unprovenanced weights see Segal 1971. The lack of context makes this an almost pointless exercise.

Morphology

In the prosaic contexts of the Bronze Age and early Iron Age I Levant, the main criterion for interpreting a larger stone object as a weight (as opposed to a handstone, small pestle or polisher) is the presence of a flat surface that will ensure stability on the weight pan (Eran 1996: 208-209), though even this criterion should not be taken for granted. A flat surface can be achieved by either flaking or by grinding. A smooth spheroid with one uneven flaked surface is unlikely to have been anything other than a weight (dome-shaped). A ground face, however, could be interpreted as a handstone, for grinding. Stones with multiple flat faces are even more problematic, since each could be a working face (but see below). It must be recognized therefore, that some of the items identified as scale weights may be pestles, polishers, lids, sling-stones, gaming pieces or natural pebbles (cf. Sass 2000: 368). The possibility also exists of an object starting as a motor tool and then being converted into a weight, or if broken, vice-versa. Whatever the possible scenarios, flint cuboids and spheroids are a frequent weight type in both the Levant and in Egypt (Eran 1996: 208-209).

With a flat surface (i.e. base) as a starting point, the objects identified as weights can be divided into the following formal categories with some overlap between them:

- Square cuboid
- Rectangular cuboid
- Squat
- Barrel-shaped
- Dome-shaped
- Loaf-shaped
- Spheroid
- Grain-shaped
- Disc-shaped

To some degree these shapes are *ad hoc*, depending on the shape of the blank to begin with. Loaf-shaped weights are heavier. Squat weights are those that are polished and show concavity; they would seem to be recycled fragments of lower grinding stones. The cuboid and dome-shaped weights are the most frequent.

Only six small objects of less than 150 g were identified as weights.[2] The pebbles discussed in the previous chapter may have been weights too—there is a good deal of weight value consistency (see Chapter 7, Table 7.17). Such pebbles may often have gone either undetected or uncollected by excavators. Finer bag and counter weights of hematite, polished stone and metal may have been among the valuables taken with people fleeing the successive destructions of the Iron Age I levels. Two of the smaller weights (Nos. 22 and 23) have a reddish color: might the reddish color be related to weight value?

Five weights are elliptical or grain-shaped (Nos. 24-28). Three are of hematite, one is of fine basalt and one is silicified limestone. The smallest weight (No. 28) is of the grain-shaped type (if it is indeed a weight) though its shape is not symmetrical.

There are no carinated dome weights of the Egyptian *dbn* (*deben*) measure in the Iron Age I assemblage at Tel Dan (cf. Cour-Marty 1985; 1990; Kletter 2006: 275-276). Nor were zoomorphic weights found of the type known in Bronze and Iron Ages contexts throughout the Ancient Near East (e.g. Chavane 1987; Fales 1995; Kohlmeyer 1982; Petrie 1926; Weigall 1908; Yadin 1970: 47 and Color Plates A and B). Small metal cube weights are also lacking. These rare finds are generally thought to have belonged to elite individuals or commercial institutions in the later Iron Age (cf. Kletter 1994: 37-39 on the IIIA cubical metal weight from Horvat Rosh Zayit; Kletter 1998: 130-131 for an important example from Gezer and Stager *et al*. 2008: 310-311 for examples from Ashkelon). The cuboid shape may, however, have an earlier resonance in larger stone weights (see below).

One form is worth singling out as a potentially unrecognized scale weight form. These are round, flat disks that range from 75 mm to 105 mm in diameter (Fig. 8.1). They do not show signs of

2 These are termed "bag and counter" weights. Larger weights have been called "store weights" (Eran 1996: 207).

Fig. 8.1. Flat disc weights (?), from left to right: 487, 526, 418, 202 (Table 8.1:29-32).

intense grinding or polishing and being fairly thin, would have been difficult to grasp efficiently. This, and their diameters, suggest, at first, that they may be lids. Such lids could have sealed jugs or small jars. However, with the exception of No. 31, they are perhaps too heavy to safely seal a fragile ceramic vessel. I prefer the possibility that these, too, are weights. Weights take the disk form in the Late Bronze Age Aegean—of lead and of stone (e.g. Michailidou 2010: 72, Fig. 7.3).

Selected Comparanda

The phenomenon of stone weights has been underreported and somewhat neglected for the Iron Age I. Below is a review of some of the more recent literature that touches on Middle and Late Bronze Ages (second millennium BCE), and early Iron Age weights from elsewhere in the southern Levant.

Eran's report of the Bronze and Early Iron Ages weights from the City of David presents a rather broad interpretation of what a weight might look like (Eran 1996: Weights 1-28 in Figs. 31-32). This, in fact, is closer to the approach I have adopted. Eran's weights include a number of irregular forms and the weight values vary quite a bit. By ranging widely across the weight systems of the Bronze and Iron Ages, and even later, Eran was able to associate most of the weights with one system or another, concluding that Jerusalem, and Iron Age Jerusalem in particular, was an international city with wide-ranging economic ties.[3]

A fine series of weights was found in 10th-9th centuries BCE fortress at Horbat Rosh Zayit (Kletter 1994; 2000). Four of these are of the domed limestone variety, similar to typical Egyptian *deben* weights, and five others have other forms. Two are of bronze. While the dome-shaped weights resemble *deben* weights their common unit appears to be a value of 7.6 grams, a unit found at Iron Age Hama and perhaps in earlier contexts at Alalakh and Ebla. Kletter suggests that the 7.6 grams unit may comprise the Phoenician *sheqel*, a poorly known quantity up till now. There is little resemblance between the standardized "muffin" ("domed") shape of the Horbat Rosh Zayit weights and any of the Tel Dan Iron Age I weights.

Kletter's (2006) study of the Late Bronze Age weights of Tel Batash (a completion of work that Eran began before he passed away) notes very few stone weights—only one definite example (an Egyptian *deben* weight) and six possible weights. Might not some of the hammerstones and pestles in Yahalom-Mack's (2006) treatment of the ground stone assemblage be some variant of *mina* weights or compound shekel weights (see her Table 64)?

The account of the scale weights at Bronze Age Lachish (Sass 2004a: 1469, Fig. 23.11) is extremely

3 Kletter (1998: 40) has dismissed Eran's study of the City of David weights as "not worth discussing."

cautious, allowing for the possibility that almost every item identified as a weight might be something else. Moreover, none of the cuboid, spheroid or loaf-shaped weights that I have included in the Tel Dan assemblage are even suggested to be weights by Sass.[4] Many of the objects interpreted here as weights would be classed as "slingstones" by Sass and Ussishkin (2004: 1974-1982) at Iron Age Lachish. Significantly, the authors recognize the likelihood that slingstones often served other purposes in peacetime (scale weights among them) and only became slingstones in an emergency (Sass and Ussishkin 2004: 1974). It is also interesting to note that the weights of the slingstones are close to, though somewhat lighter on average, than the middle-range cluster of the Tel Dan Iron Age I weights (Sass and Ussishkin 2004: Table 27.20 and here Fig. 8.2). Perhaps the Tel Dan weights also doubled as slingstones or *bolas* when needed. By attributing larger items to the slingstone category, the Iron Age weights from Lachish are thus confined to smaller units, with no discussion and no weight values given (Sass 2004b: 2001-2003).

The weights published in the recent Megiddo volumes (Sass 2000 and Sass and Cinamon 2006) adopt a similar cautious approach, though here the weight values are given. This assemblage seems to be the one most similar to the Tel Dan Iron Age I group. The Iron Age I weights of Megiddo include what I have called loaf-shaped, dome-shaped, barrel-shaped, grained-shaped and squat weights (Sass 2000: Figs. 12.13-12.14; Sass and Cinamon 2006: 378-380). Several natural or modified pebbles and cobbles are included—of limestone, flint and some basalt and hematite. The authors abstain from commentary but their criteria for weight identification appear to be the same as those adopted here.

As to the cuboid stone objects identified as weights, the smaller metal examples from later Iron Age contexts at Horvat Rosh Zayit, Gezer and Ashkelon were noted above as being absent from the Iron Age I assemblage of Tel Dan. It may be, however, that the dark basalt cuboids are a sort of earlier, poor-man's version of the metal weights. We must also consider the distinct possibility that some of the ground stone objects discussed in the previous chapter are, in fact, weights.

Which Weight Standard(s)?

All the objects identified as weights in the Iron Age I contexts of Tel Dan could fit one or another of the known existing standards of the time, within a 5% deviation (Table 8.3). But no one standard can account for all the weights. The Babylonian and Canaanite systems appear to be best represented, but it is perfectly possible that all the contemporaneous standards are here. Furthermore, a local system may be in play that I have missed (someone more mathematically inclined may discover which). Other factors must also be considered: for one thing, standards probably changed slightly over time. Secondly, some weights may have facilitated cheating. Certainly, one could say more here, but this will wait for another publication.

Summary

This account of the weights at Iron Age I Tel Dan is more in the maximalist mode of Eran (e.g. 1996), rather than in the minimalist mode of Kletter (e.g. 2006) or Yahalom-Mack and Panitz-Cohen (2009). Objects identified as weights must fit a hierarchical system of weight values, but that system may be local rather than regionally pervasive. And multiple systems almost certainly coexisted at Tel Dan.

4 These are termed either "hammerstones" or "'polishers" by him (Sass 2004a: 1468-1469).

Thus, rather than requiring all objects' weights to fit known systems (Babylonian, Canaanite, Ugaritic, Egyptian, Judahite, Phoenician), I have adopted a process-of-elimination approach, with added emphasis on form and surface treatment.

Weights were a crucial part of administration and commerce, even at the most basic level of household production and local commerce, and it is likely that in such a bustling town as Iron Age I Tel Dan many people owned sets of simple stone weights. Local rulers or magistrates maintained "official" weights that served as standards for comparison (cf. II Samuel 14:26, "shekels by the king's stone" and see Eph'al and Naveh 1993). Symmetrical and polished stone weights were used at Tel Dan and it seems likely that metal weights were as well.[5] Local people would then check their own weights against the local standard, as the need arose. Commercial transactions would also have been enacted using different sets of weights owned by the respective parties involved.[6] I would suggest that the scale weights published here were the property of common folk. One group of local weights may have corresponded to a local system, not widely recognized, but other weight sets may have corresponded to other contemporaneous systems (e.g. Stieglitz 1979: 15).

The values of the large weights seem to group into three modes or clusters, with variability within each cluster (Fig. 8.2). I would suggest that these modes support the identification of these objects as weights in different coexisting standards. If the scattergram is indeed identifying the standard units of weight, these units will conform to certain multiples of certain known common denominators (Rahmstorf 2010: Tables 8.3-8.5). What has been identified as the Syrian *mina*, with a weight of ca. 470 gms, is absent. However, if we adopt one of the standard shekel weights of the time, in both the Near East and the Aegean (either 7.8 or 9.4 gms.), most of the larger weights could comprise units of 20 or 40 shekels.[7] Other options are available as well.

In his study of Judean inscribed limestone weights of the Iron Age II, Kletter (1998: 30-41) has rejected what he calls the "many standards" approach. While I suspect there may be justice in this conclusion for the Iron Age II, a period of territorial states, I also suspect that the Iron Age I—a time of more political fragmentation—*was* a period of many standards and *did* require multiple sets of

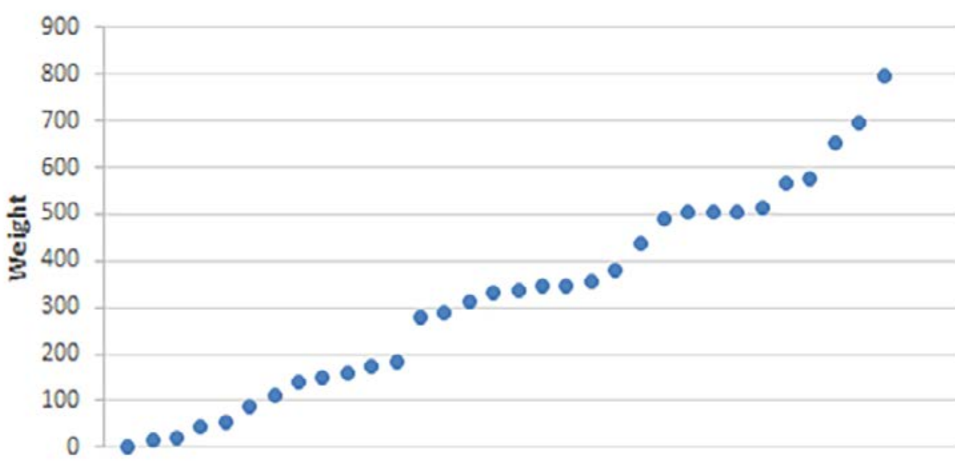

Fig. 8.2. Scattergram of weight values of balance weights from Iron Age I Tel Dan (in ascending order).

5 These would have been owned by the elite and been among the valuable items taken by departing inhabitants, especially at the end of each stratum.

6 Cf. Talmon 1964 with regard to the letter from late Iron Age Mezad Heshvayahu, in which a dispute over measured quantities of grain is involved and Kemp 1989: 253 for a similar scenario in New Kingdom Egypt.

7 7.8 x 20 = 156 gm.; 7.83 x 25 = 195 gm.; 7.8 x 40 = 312 gm.; 7.8 x 50 = 390 gm.

weights for purposes of conversion. Kletter himself, in his discussion of the uninscribed weights of Iron Age II Judah, has noted the existence of anomalous weight units not present in the inscribed weight set: 3, 5, 10, and perhaps 15, 30, 32 and 400 sheqels (Kletter 1998: 134). A similar situation maintains for the earlier Phoenician weights of Horvat Rosh Zayit (Kletter 1994: 36-37). This observation could also apply to the objects identified as weights at Tel Dan and, by implication, to heavier units as well.

At the crux of the argument as to whether the objects described here are indeed weights is an underlying assumption. In Kletter's view (1998: 140), weights were only used for expensive commodities (chiefly gold, silver, precious stones, and perhaps spices and incense) measured in small quantities. Other commodities were traded by barter, with volume measurement being the effective dimension. This leads to the illogical conclusion that large weights were non-existent. Kletter (1998: 141) notes the lack of *maneh* and *kikar* units amongst his inscribed Judean weights and infers that these units are an expression of the Hebrew Bible's ideological orientation and not part of everyday life. The more logical conclusion is that the *maneh* and *kikar* weights were not inscribed, more amorphous in shape and thus more difficult for scholars to identify.

Certainly, volume measurement played an important role in the commerce of bulk commodities (*homer, kor, bat, hin*, *log* for liquids and *homer, kor, lethek, ephah, seah, omer, kab and issaron* for dry goods). However, I would suggest that certain important commodities were traded in larger quantities but not amenable to volume measurement: copper, raw stone, pigments, pomegranates, cuts of meat, flour (as opposed to processed grain) and salt are some of the things that come to mind (and see the list of weighed commodities in Stieglitz 1979). These are the things that were weighed with larger scale weights. In this the ancients were not so different from us.

Table 8.1. Weights from the Iron Age I levels (organized by form).

No.	Stra.	Area/ Phase	Reg. No.	Locus	Ser. No.	Raw Material	L mm	W mm	H mm	W gr	Form	Preserv.	Figs.
1	V	T15	12750/16	2426	174	Basalt	76	74	64	504.73	Square cuboid	Complete?	8.3:1
2	VI-VIIA	Y7–Y8	13742	3128	318	Basalt	59	58	54	344.29	Square cuboid	Complete	8.3:2; 8.5:2
3	IVB	B8	9733/2	563	322	Basalt	55	57	60	356.54	Square cuboid	Complete	8.3:3; 8.5:3
4	IVB	B8	9645/11	570	327	Basalt	44	48	45	160.07	Square cuboid	Complete	8.3:4; 8.5:4
5	V	B9–B10	25064	4713	414	Basalt	48	31	32	113.62	Rectangular cuboid	Complete	8.3:5; 8.5:5
6	IVB	B8	6118/3	417	138	Basalt	67	43	65	338.91	Squat	Complete	8.3:6; 8.5:6
7	V	B9–B10	25086/2	4713	237	Basalt	79	80	43	516.01	Squat	Broken	8.3:7; 8.5:7
8	VI-VIIA	B11-12	23549/6	7093	281	Basalt	72	69	65	502.1	Barrel-shaped	Complete	8.3:8; 8.5:8
9	V	Y4	13427	3110	325	Basalt	55	57	52	288.25	Dome-shaped	Complete	8.3:9; 8.5:9
10	IVB	B8	9669/7	587	614	Basalt	74	52	46	332.85	Dome-shaped	Complete	8.3:10

No.	Stra.	Area/ Phase	Reg. No.	Locus	Ser. No.	Raw Material	L mm	W mm	H mm	W gr	Form	Preserv.	Figs.
11	V	B9–B10	25086/1	4713	157	Basalt	95	60	66	566.93	Dome-shaped	Complete?	8.3:11
12	V	B9–B10	18550	4328	615	Basalt	59	59	54	312.43	Dome-shaped	Broken	8.3:12; 8.5:12
13	IVB	AB8	23389/25	7053	337	Basalt	50	47	46	173.42	Dome-shaped	Complete	8.3:13; 8.5:13
14	IVB	B8	6127/8	415	332	Basalt	46	50	46	181.22	Dome-shaped	Complete	8.3:14; 8.5:14
15	IVB	B8	9701/5	601	373	Silicified limestone	47	48	41	141.38	Dome-shaped	Broken	8.3:15
16	V	B9-10	9724/8	614	627	Silicified limestone	62	68	61	380.88	Dome-shaped	Complete	8.3:16; 8.5:16
17	VI	B11	23427/7	7066	238	Basalt	87	79	52	654.77	Loaf-shaped	Complete	8.3:17; 8.5:17
18	VI	B11	23018	4609	146	Basalt	78	84	61	695.57	Loaf-shaped	Complete	8.3:18; 8.5:18
19	V	M9b–c	20560/6	8178	498	Silicified limestone	88	70	63	573.59	Loaf-shaped	Complete	8.3:19
20	VI-VIIA	Y7–Y8	13662	3128	232	Basalt	70	68	61	506.3	spheroid	Complete	8.4:20
21	V	AB9–B10	23403/10	7061	361	Basalt	69	62	58	346.46	Spheroid	Complete	8.4:21
22	IVB	Y3b	13750/10	3171	796	Sand-stone?	36	32	30	55.23	Spheroid	Complete	8.4:22
23	V	B9–B10	10249	650	794	Flint	39.5 max diam	35 base diam	36.5	88.85	Dome-shaped	Slightly chipped	8.4:23
24	V	B9–B10	1508	356	IAA	Hematite	54	26	26	n/a	Grain-shaped	Complete	8.4:24
25	VI	M10	20695/2	8185	799	Basalt	40	28	26	43.49	Grain-shaped	Complete	8.4:25
26	VA	M9b	20123/12	8060	800	Silicified limestone	57	17	16	22.16	Grain-shaped, elongated	Complete	8.4:26
27	VI	T16	19971	2898	793	Hematite	27	16	16	14.2	Grain-shaped	Complete	8.4:27
28	V	B9–B10	25087/1	4713	795	Hematite	22	12	5	2.05	Grain-shaped, elongated	Complete?	8.4:28
29	IVB	B8	9611/5	589	487	Basalt	112	104	40	798	Disc	Complete	8.1:1
30	V	B9-10	23441/10	7063	526	Lime-stone	109	87	30	492	Disc	Complete	8.1:2
31	V	B9-10	24727/13	7208	418	Scoria	83	79	24	152	Disc	Complete	8.1:3
32	IVB	B8	9602/4	582	202	Basalt	80	76	27	281	Disc	Complete	8.1:4
33	IVB	B8	1114/9	211	1087	Basalt	117	94	30	438	Disc	Complete	—

Table 8.2. A comparison of some common weight standards in the Ancient Near East (after Stieglitz 1979: 15 and Kletter 1994).[8]

Unit	Ugaritic	Babylonian	Canaanite	Egyptian	Phoenician
Shekel	9.40 gr	8.37 gr	11.55 gr	9.33 gr (*qdt*)	7.6 gr
Mina (50)	470.00 gr	—	577.50 gr	93.33 gr (*dbn*)	380 gr
Mina (60)	564.00 gr	502.20 g	693.00 gr	—	456 gr
Talent (*kikar*)	28.200 kg	30.132 kg.	34.650 kg	933 gr (*sp*)	?

Table 8.3. Possible weight values (±5%) in different weight systems.

No.	Wt. grams	Ugaritic	Babylonian	Canaanite	Egyptian	Phoenician	Judahite (11.3 gr.)
1	504.73	—	1 mina	—	—	—	—
2	344.29	—	—	30 sheqel	—	—	30 sheqel
3	356.54	—	—	30 sheqel	—	—	30 sheqel
4	160.07	—	—	—	—	20 sheqel	—
5	113.62	—	—	10 sheqel	—	—	—
6	338.91	—	40 sheqel	30 sheqel	—	—	30 sheqel
7	516.01	—	1 mina	—	—	—	—
8	502.1	—	1 mina	—	—	—	—
9	288.25	30 sheqel	—	25 sheqel	30 *qdt*	—	25 sheqel
10	332.85	—	40 sheqel	30 sheqel	—	—	30 sheqel
11	566.93	—	—	50 sheqel (1 mina)	60 *qdt*	—	—
12	312.43	—	—	—	—	40 sheqel	—
13	173.42	—	20 sheqel	15 sheqel	—	—	15 sheqel
14	181.22	—	20 sheqel	15 sheqel	—	—	15 sheqel
15	141.38	15 sheqel	—	—	15 *qdt*	—	—
16	380.88	40 sheqel	—	—	40 *qdt*	50 sheqel (1 mina)	—
17	654.77	70 sheqel	80 sheqel	—	70 *qdt*	—	—

8 This table is by necessity schematic. There are many small variations in the standard denominations and different scholars prefer different averages or ranges. This is beyond the scope of the present chapter, but the variability is well expressed in the sources cited and their bibliographies.

No.	Wt. grams	Ugaritic	Babylonian	Canaanite	Egyptian	Phoenician	Judahite (11.3 gr.)
18	695.57	—	—	60 sheqel (1 mina)	—	90 sheqel	—
19	573.59	60 sheqel (1 mina)	—	50 sheqel (1 mina)	60 *qdt*	75 sheqel	Maneh (50 sheqel)
20	506.3	—	1 mina	—	—	—	—
21	346.46	—	40 sheqel	30 sheqel	—	45 sheqel	30 sheqel
22	55.23	—	—	5 sheqel	—	—	5 sheqel
23	88.85	—	10	—	—	—	—
24	n/a	—	—	—	—	—	—
25	43.49	—	5 sheqel	4 sheqel	—	6 sheqel	4 sheqel
26	22.16	—	—	2 sheqel	—	3 sheqel	2 sheqel
27	14.2	—	—	—	—	2 sheqel	—
28	2.05	—	1/4 sheqel	—	—	—	—
29	798	—	100 sheqel	70 sheqel	—	100 sheqel	
30	492	—	1 mina	—	—	—	—
31	152	—	—	50	—	20	—
32	281	30 sheqel	—	25 sheqel	30 *qdt*	—	25 sheqel
33	438	—	50 sheqel	—	—	—	40 sheqel

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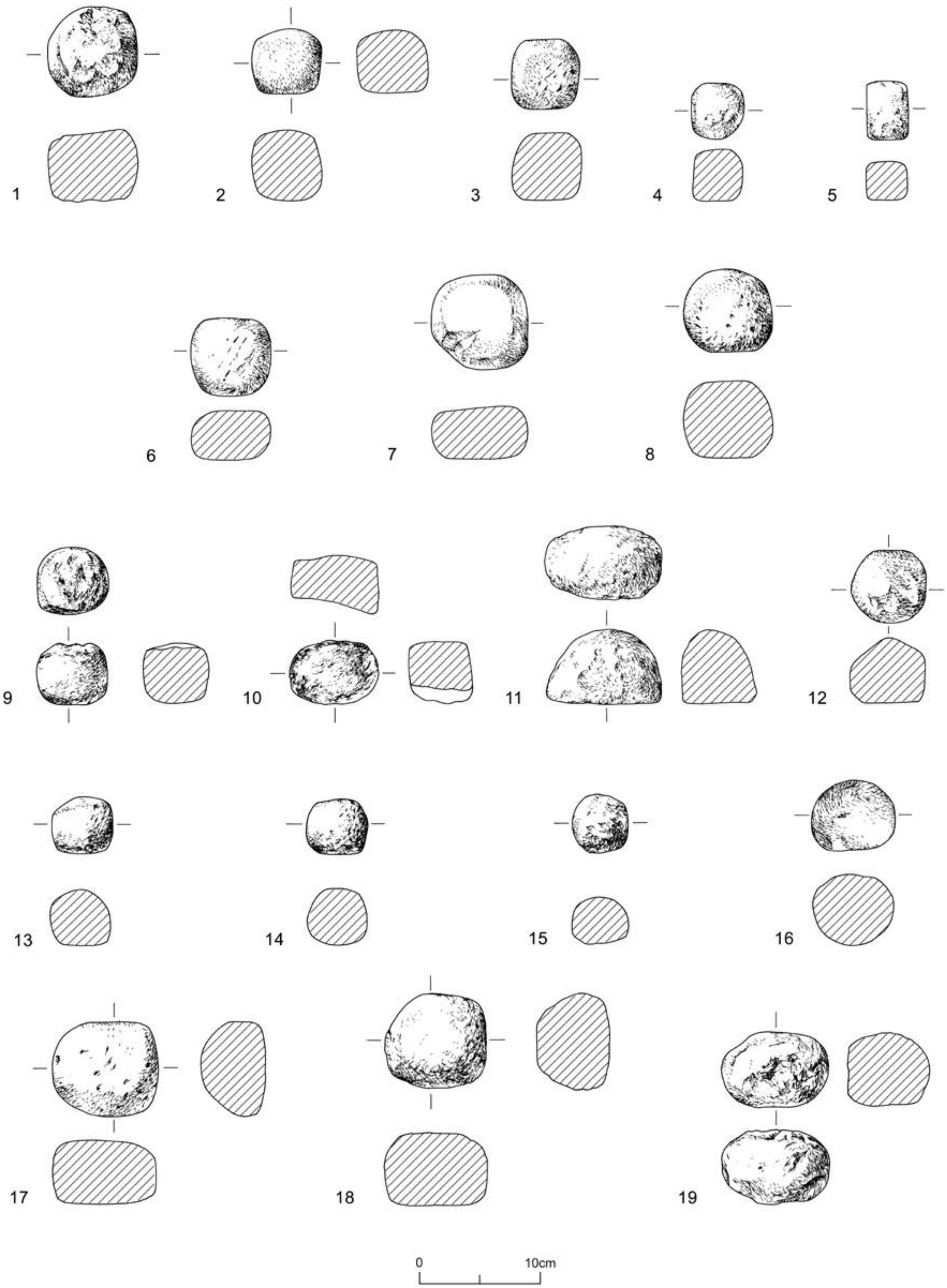

Fig. 8.3. A selection of the scale weights from the Iron I levels at Tel Dan.

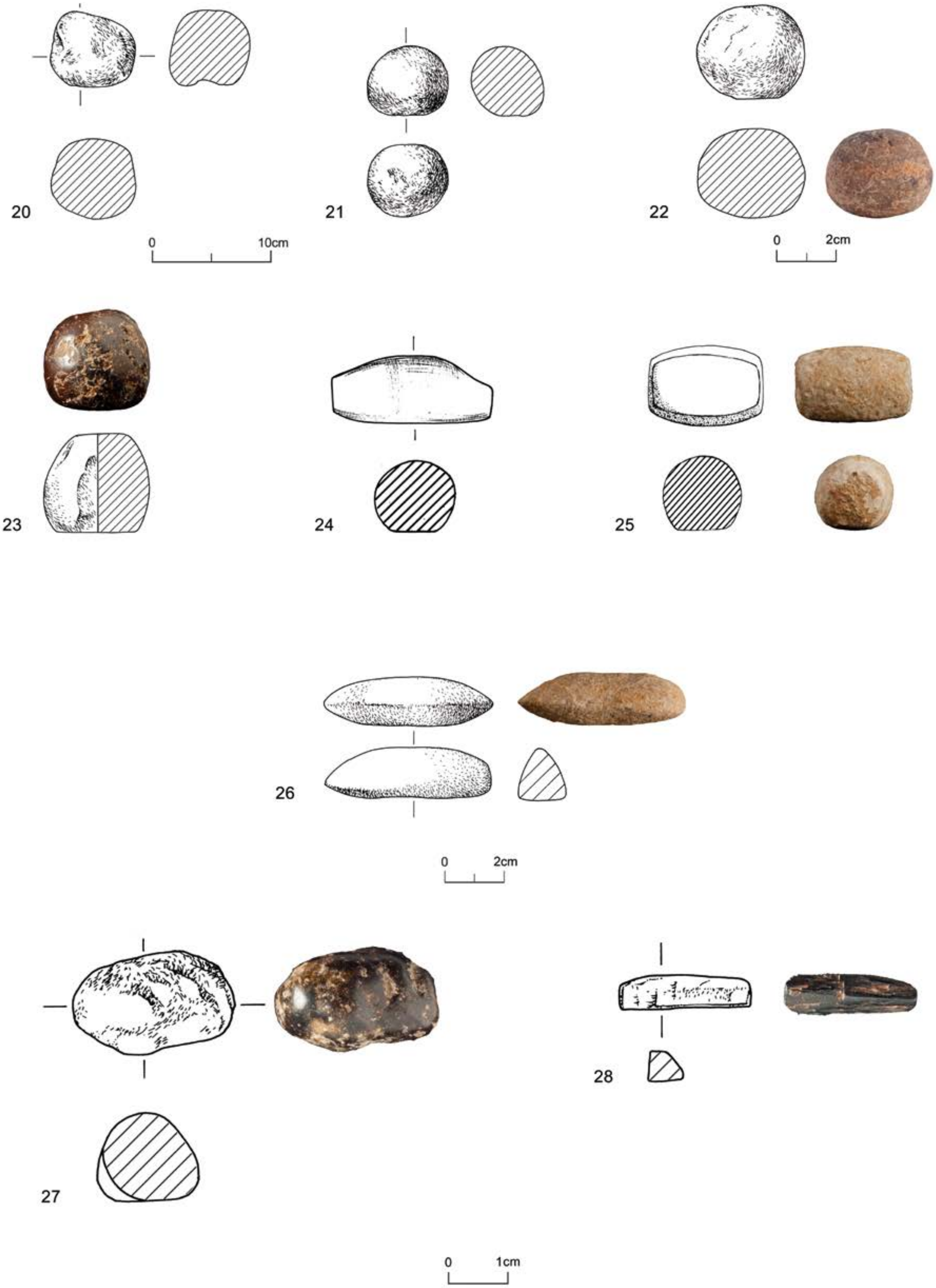

Fig. 8.4. A selection of the scale weights from the Iron I levels at Tel Dan (continued).

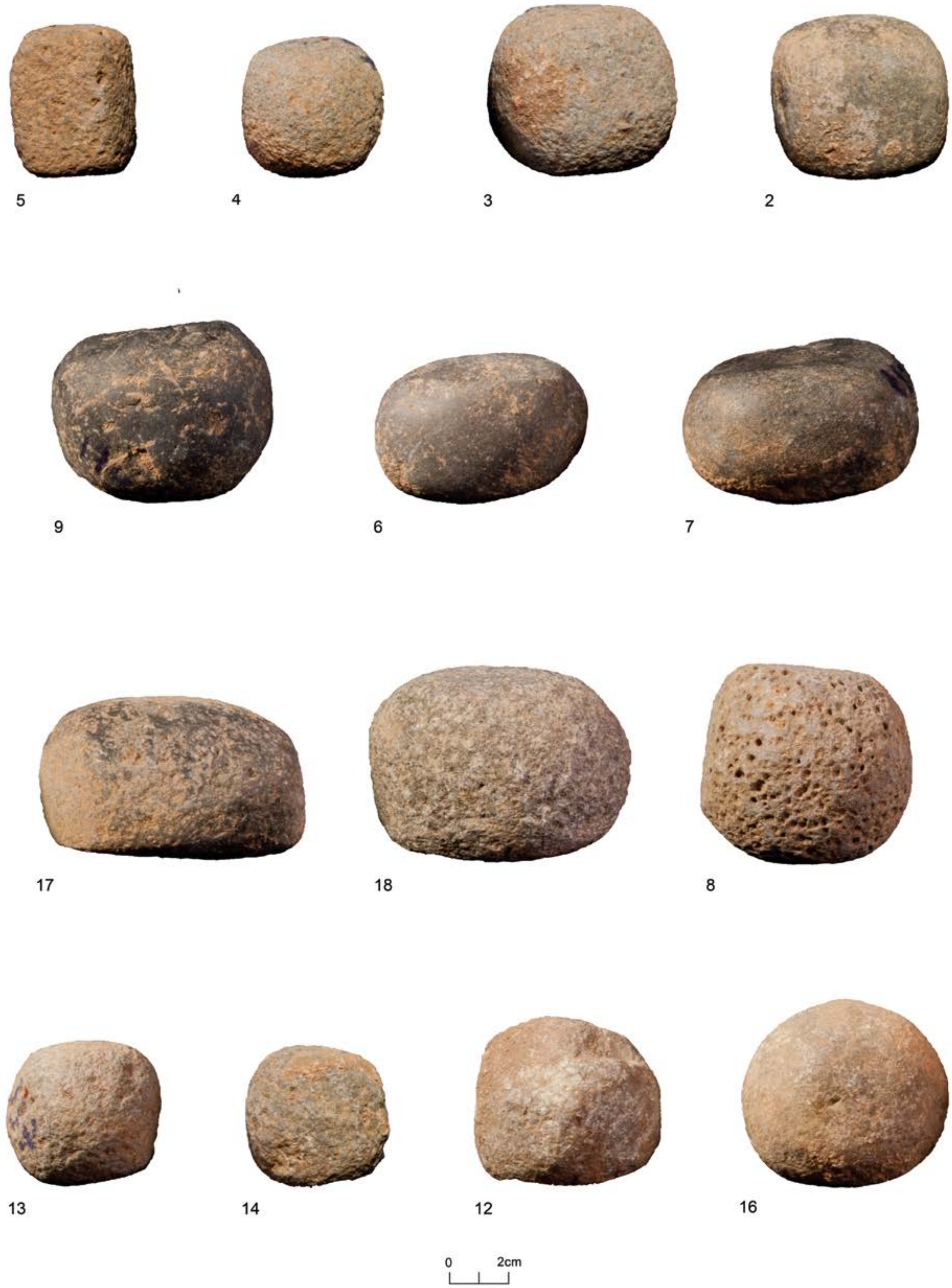

Fig. 8.5. A selection of the scale weights from the Iron I levels at Tel Dan.

CHAPTER 9

THE CHIPPED STONE ASSEMBLAGE

Conn Herriott[1]

Introduction

The lithic artifacts from second and early first millennium BCE sites in Canaan do not generally enjoy the same research attention as their prehistoric antecedents. This is partly due to a decline in the quantity of flint tools after the Early Bronze Age (Rosen 1997: 151-166), and partly to it being harder to know the true horizon of their origin on the busy occupation mounds of the Bronze and Iron Ages (Rosen 2006: 281). And finally, it must be said that lithic analysis is not traditionally a priority of Bronze and Iron Ages and biblical-period archaeologists working in the Levant, because flint artifacts are not generally considered to say a great deal about the topics of interest to those researchers: the great historical and pseudo-historical events mentioned in the Bible and other ancient literary sources.

But despite the barriers to their research, chipped stone artifacts can be a useful source of evidence for the investigation of more prosaic questions. They can help us understand a little more about craft specialization, motor habits, resource procurement, and trade links—to mention just some societal facets. In short, flint tools can tell us something about life in the town we call early Iron Age Tel Dan.

For example, as we shall see, the Dan flint sickle assemblage testifies to the importance (or lack thereof) of cereal production in the town's economy. It also tells us something about how the settlement was organized in terms of activity areas, the kinds of things for which people were using flint tools (and not using them), and of course the crucial issue of how many left-handers there were.

In this chapter, I will describe and discuss this chipped stone assemblage by first looking at its main components and the raw materials used. This will be followed by a consideration of each artifact group (tools and then waste), a spatial analysis and discussion of other relevant themes.

Raw Materials

Most of the chipped stone artifacts were made from light grey and light brown medium-grained Eocene/Cretaceous flint. This is difficult to source but is widely available in the Tel Dan hinterland (Rosen 1997: 33). The assemblage evinces few associations in terms of flint type and tool type. Many of the blades, flakes and sickles might just as well have shared the same cores. However, alongside this dominant impression of mixture it is evident that the finer-grained (often darker) flint without cortex is more frequent in sickles—a pattern noted at other contemporaneous sites and usually understood as resulting from a need for large quantities of standardized-quality tools (see Hammond 1977; Rosen 1997: 32-34; 2006: 282).

1 I am grateful to David Ilan for the opportunity to study this material. Thanks to him also as well as to Levana Zias and Yorke Rowan, for their bibliographic help. Thanks to Shoh Yamada and David Ilan for reading over my text and offering their comments.

Fig. 9.1. A selection of some of the Iron I flint tools from Tel Dan.

By contrast, blades, retouched flakes and *ad hoc* tools reflect less concern with material quality: here we see more mottled, marbled and rough flints.

Finally, the Tel Dan scrapers, blades and sickles from earlier periods found in early Iron Age contexts were often fashioned on a wider variety of rough, translucent, lustrous and possibly even burnt Eocene, Cretaceous and Cenozoic flints (Fig. 9.1; cf. Rosen 1997: 33).

Assemblage Description

The inhabitants of early Iron Age Tel Dan made use of a limited flint tool repertoire (Table 9.1): mostly sickles for harvesting grain, but also the odd blade and scraper. The rest of the recovered chipped stone artifacts were tool-making waste—flakes, chips, chunks and one core, as well as some possible *ad hoc* tools.

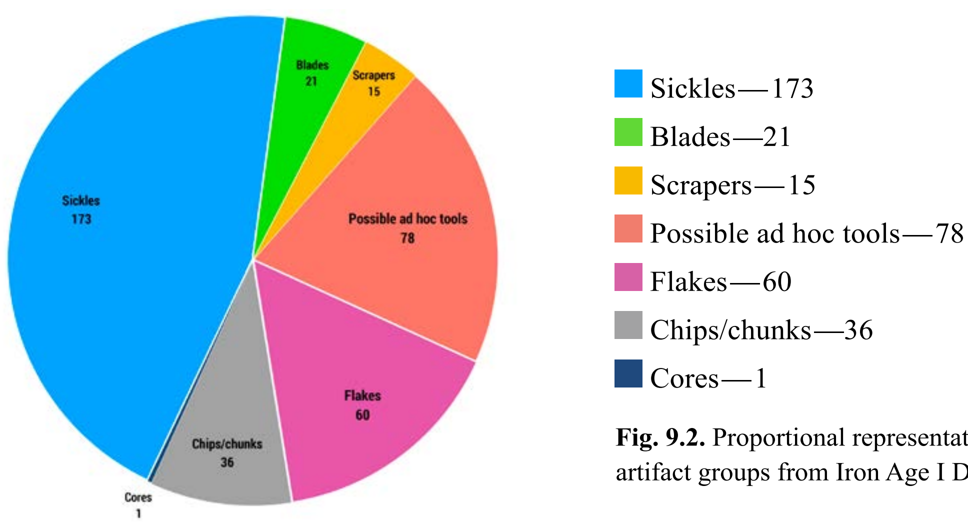

Fig. 9.2. Proportional representation of chipped stone artifact groups from Iron Age I Dan.

Sickles

At 173 items, sickles represent by far the largest tool group (Fig. 9.2). One hundred fifty-two are geometric types, characteristic of the post-Early Bronze Age. The rest (21) are Neolithic and Canaanean strays, possibly reused in the Iron Age or kept for non-functional purposes.[2] All of the sickles found were composite tools, whereby blade segments would have been hafted to a wooden handle (Fig. 9.3). We identify these artifacts as sickles because hafting requires a particular and easily-recognizable morphology. We can also identify sickles by the reaping gloss that can still be seen on a used tool's cutting edge. Such gloss can also result from cutting reeds, cane, wood, or from hoeing, so we cannot automatically assume that the tool in question was used for harvesting cereal (Curwen 1935; Unger-Hamilton 1984). This point is hotly debated by workers researching the periods that saw the development of agriculture. But for the Iron Age, scholarly consensus generally favors association of gloss with reaping activities (Rosen 2006: 284) and use-wear analyses have confirmed this to be the case for certain assemblages—including that of Tel Dan (see Yamada, Chapter 10 this volume; Gersht 2006: 351).[3]

A number of recovered tools which lack gloss are considered unused or unfinished sickle blade segments (i.e., blanks), based on a morphology identical to the glossed sickles. Hundreds of such blanks were also found in storage contexts at Iron Age Gezer, and in fact these were observed to be very similar in form and degree of working to their counterparts from Tel Dan (Rosen 1986).

Large Geometric sickles: One hundred-fifty-two sickle blade segments of this type were recovered (Fig. 9.5; Table 9.1). As said, this type forms by far the largest lithic group from this period at Tel Dan, and was dominant in the southern Levant from the Intermediate Bronze to the Iron Ages. Large Geometric sickles differ from older types—the below-mentioned Neolithic and Canaanean sickles—in being produced on blade flakes as opposed to blades, and also in their size and length-to-width ratio.

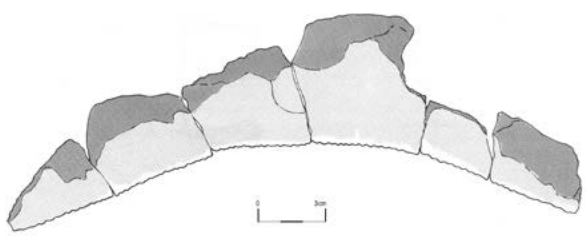

Fig. 9.3. Reconstruction of a composite blade sickle from Lachish (Mozel 1983: Fig. 2).

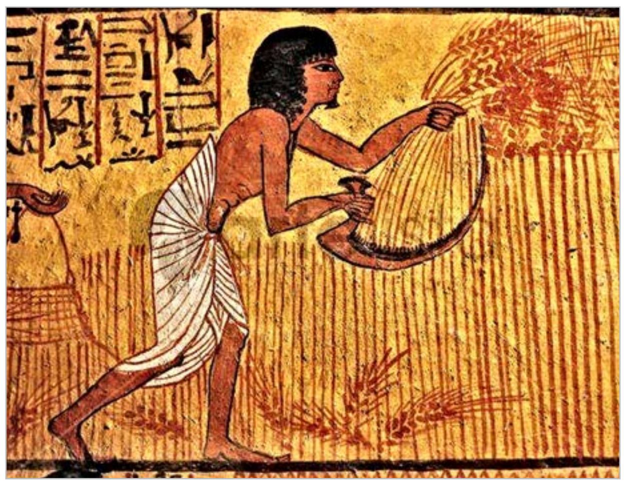

Fig. 9.4. This 13th century Egyptian fresco (tomb of Sennedjem) gives some idea of how sickles and reaping at early Iron Age Dan might have looked (www.lessing-photo.com).

2 Who is to say that there were no antiquarians in the Iron Age, especially when we remember the Chalcolithic figurine brought to Dan in the Iron Age? (Greenberg 1996: Fig. 3.1).

3 Presumably the other activities which produced gloss were no longer carried out or, with the increased availability of metal, more efficient tools were developed for those activities. Flint sickles were exceptional in that they were not replaced with copper or bronze versions, partly because flint is superior to copper as a sickle material and is at least the equal of bronze (Coles 1973: 34-39, Steensberg 1943: 11-26). Iron is unquestionably more efficient than flint for use in sickles, but it was 300-400 years into the Iron Age before this replacement occurred—presumably because iron was too expensive until this time (Rosen 1997: 163).

The majority of the pieces are backed and truncated, mostly on their dorsal sides. Working-edge retouch varies from none in the blanks to intensive re-sharpening of the sickle blade, which suggests that these tools were 'relatively valuable and not lightly discarded' (Rosen 2006: 286[4]).

Beyond these analysis-worthy details, size and shape variations within each sub-type probably reflect individual knappers' own preferences and skills (Rosen 2006: 286).

One hundred twenty-three Large Geometric quadrilateral blade body segments were recovered from Iron Age I contexts at Tel Dan (Fig. 9.5:8, 11). Sixty-eight had gloss on them and 55 did not. These quadrilaterals varied in shape, from parallelograms to rectangles to trapezoids of various types, which together formed the curving sickle blade. The shapes in majority were the more even parallelograms and rectangles, these being needed for the straighter section of the blade as opposed to the curve (which required trapezoidal forms).

Twenty-six blade-end segments were also found, these of course being triangular in shape (Fig. 9.5:9-10). Twenty-one were glossed and five were not. These end pieces made up an unusually large proportion (almost 15%) of the recovered Large Geometric sickle segments. This contrasts with Tel Batash (1%) and Tel Megiddo (not specified but a clear minority –Gersht 2006: 345), and—along with the large quantities of sickle blanks found—may be taken as evidence supporting the Tel Dan excavators' conclusion that they had discovered sickle production workshops (see below p. 43; Ilan 1999: 106).

Three 'Early Large Geometric' pieces were also recovered (Fig. 9.5:7). These pieces are problematic. They are formed on blades, are abruptly backed and almost all bitruncated. Their technology could fit broadly within the Large Geometric tradition. However, they are typologically similar to Chalcolithic backed blade sickles, in being particularly heavily backed, elongated rather than trapezoidal and showing less regular denticulation than is generally the case with Large Geometric sickles. For this reason Rosen (2006: 284) has left open the possibility that similar ambiguous sickle blades found at Iron Age Tel Batash were either *ad hoc* variants of the Large Geometric type or Chalcolithic intrusions. Given that they have also been recovered at Iron Age Tel Dan, though, I am suggesting that we may be seeing the beginnings of a pattern. We should reconsider Rosen's suggested possibility that these backed sickle blades were neither intrusive nor *ad hoc*, but rather may require classification within the Large Geometric spectrum (*ibid.*).

Canaanean sickles: Two Canaanean sickle segments were recovered (Fig. 9.5:5-6), both glossed. These tools were made by snapping typical Canaanean prismatic blades into segments to accommodate a sickle's necessarily curving form. These Chalcolithic-Intermediate Bronze Age (Rosen 1997: 60) items are artifacts of the extensive Early Bronze and Intermediate Bronze Age occupations at Tel Dan (Greenberg 1996: 139-140).

Neolithic sickles: Nineteen Neolithic sickle segments were recovered from early Iron Age contexts (Fig. 9.5:1-4). Ten have gloss on them and nine do not. The group evinces varying degrees of the denticulation for which such early Pottery Neolithic tools are known. Most are bitruncated. Some may have been straight and unhafted reaping knives. Sickles of the same type were also found in Neolithic loci at the site and are discussed elsewhere (Gopher and Greenberg 1996: 73-74, Fig. 2.6.1, 2). These Neolithic sickles were either scavenged and reused by the early Iron Age inhabitants or are intrusions.

Blades

Retouched blades: Twenty-one blades were recovered, mostly of Neolithic types (see Gopher and Greenberg 1996: 75) but also Canaanean types (Fig. 9.6:1-8). Given the shared technology and forms between blades and sickles, some of these may have been unglossed sickle blades.

Retouched flakes: Six *ad hoc* blade tools were made from retouched flakes (Fig. 9.6:9-12), and either adhered to no standard form or were too fragmented

4 Referring to similar trends in the Tel Batash sickle assemblage.

to identify as recognizable blade types. Undoubtedly, though, they were used as cutting, whittling, and piercing tools of one sort or another.

Scrapers

Fifteen tools of this type were found (Fig. 9.7): three end scrapers, four side, two thumbnail and six tabular. No use-wear analysis was carried out on these tools, but we can suppose that they served to cut skin or hide or to scrape pelts (McConaughy 1979: 339-341). The Tel Dan scrapers form a very heterogeneous group, with no standardization in degree or angle of retouch and undoubtedly included are a number of intrusions from earlier periods. Tabular scrapers, for instance, disappeared at the end of the Early Bronze Age (Rosen 1997: 162) so we know that those found in Iron Age loci were reused or were post-depositional intrusions. Judging from their forms, it also seems likely that a few of the scrapers were Neolithic in date (Fig. 9.7:2, 5; compare with Gopher and Greenberg 1996: Fig. 2.7).

One hundred seventy-five waste artifacts were collected from early Iron Age contexts. These are dominated by flakes and include: one thoroughly-exploited single-platform core (Fig. 9.8:15); 36 chips and chunks; 60 flakes; and 78 possible *ad hoc* tools which lack retouch but exhibit impact scars and blade/scraper/point forms (Fig. 9.8:1-15). Use-wear analysis would again help establish whether or not these were in fact tools and what they may have been used for.

Few of the flakes bear hinge breaks, which may be an indication that the knappers were fairly able craftsmen. This is also suggested by the fact that the flakes are quite standardized in shape, bespeaking regularity in tool-making methods as opposed to *ad hoc* production. These flaking methods correspond to Neolithic and Iron Age industries (Gopher and Greenberg 1996: 73). This is not only indicated by the flake shapes, but also the circumstantial evidence of their find spots, degree of patination and the flint types from which they are made.

Table 9.1. Dimensions of flint tools (in centimeters).

Type	N=	L max.	L min.	W max.	W min.	Th. Max.	Th. Min.	Ave. L x W x Th
Large Geometric Sickles (quadrilateral)	123	6.2	2.9	3.3	1.9	1.1	0.6	4.3 × 2.4 × 0.8
Large Geometric Sickles (triangular)	26	2.4	1.6	0.9	0.4	0.4	0.2	2.1 × 0.7 × 0.3
'Early Large Geometric' Sickles	3	6.4	3.5	3.0	2.8	0.9	0.8	4.8 × 3.0 × 0.9
Canaanean Sickles	2	7.4	6.5	2.4	2.6	0.4	0.6	6.8 × 2.6 × 0.6
Neolithic Sickles	19	4.6	2.2	1.7	1.5	0.8	0.7	3.3 × 1.5 × 0.7
Retouched Blades[5]	20	—	—	2.8	1.2	—	—	—
Retouched Flakes	6	3.3	1.8	1.8	1	0.4	0.2	2.9 × 1.3 × 0.3
Scrapers (end)	3	2.8	2.6	2.4	2.2	0.6	0.5	2.6 × 2.4 × 0.5
Scrapers (side)	4	4.9	2.6	2.9	2.2	1.4	1.0	3.0 × 2.5 × 1.1
Scrapers (thumbnail)[6]	2	—	—	—	—	—	—	2.4 × 2.0 × 0.5
Scrapers (tabular)	6	9.5	3.8	6.5	3.1	2.5	1.0	4.1 × 3.6 × 1.3

5 These blades are broken, so only their widths provide useful measurements.

6 Both are very much the same size.

Spatial Analysis

Recovery methods favored tools over waste pieces (see Ilan 1999: 105), with the result that more than half of the recovered chipped stone artifacts were tools (Fig. 9.2). That this is a statistic not to be trusted as reflecting the real artifact group ratios is indicated by the fact that waste makes up 60%–90% of thoroughly-collected assemblages (Rosen 1997: 29). Even among the Tel Dan waste artifacts, 45% were possible *ad hoc* tools, which again suggests that the 'pretty piece syndrome' was influencing collectors (Rosen 1997: 29).

Thus it is not possible to be certain about where in the town flint tools were made or maintained, nor where they were used and stored. However, some spatial patterns can be suggested.

First of all, despite the interpretative problems caused by the 'pretty piece syndrome' of the early Tel Dan dig seasons, Ilan (1999: 105) testifies that almost no waste was to be seen in early Iron Age loci. So it may well be that he is correct in putting most production outside the excavated areas or outside the town altogether. This fits with evidence from other Iron Age sites, where very few cores have been found (Rosen 1986; 1997: 111; 2004: 2223), suggesting primary tool production stages taking place elsewhere.

Rosen (1997: 112, and references therein) has noted how their morphology and contextual patterns indicate that Large Geometric sickles were made in three stages: initial reduction, then further fine-tuning at another workshop, followed by final preparation at or near the place of tool use (possibly also at the workshop of the second production stage).[7] Yamada's observation (Chapter 10 this volume) that in some instances lateral edge retouch actually cuts the sickle gloss is interesting in this regard, as it is proof positive of expert maintenance which saw segment size adjustment during the use period.

It is very likely that Rachel Ben-Dov (pers. comm.) identified a location where the second stage of this Large Geometric sickle-making process was carried out (Fig. 9.9). Located in Area B-west, this workshop yielded relatively large sickle caches—including blanks and considerable numbers of triangular blade-end segments—which marked the place where craftsmen took initially-reduced flakes and shaped them into sickle blades. This workshop may or may not have been in use over the course of the early Iron Age—the artifacts' find contexts seem to point to this— but more likely some post-depositional process diffused those finds between Strata IVB and VIIA1, and in fact the workshop was only in use during the one or two generations of Stratum V.

Beyond this—and despite the above-mentioned spatial analysis difficulties—we found several small and randomly-placed concentrations of flint artifacts, which suggests that the making and fixing of flint tools took place throughout the settlement.[8] Imagining the clatter of knapping, please append the annoyance of napping neighbors to your idyllic image of this ancient town.

Conclusions and Discussion

The Prominence of Sickles

It is not surprising that the assemblage is largely comprised of sickles. This tool type usually dominates early Iron Age lithic collections (e.g. Gersht 2006: Table 17.2; Rosen 2006: Table 67). Metal by this time was generally the preferred material for most implements but flint was still proving itself against copper and bronze when it came to the kind of wear and tear demanded for sickles. Only with the wider availability of iron some centuries later would flint finally be phased out (see above, Footnote

7 This differs from Canaanean sickle production, whereby tools were shaped at one "workshop" and then given their final preparation on site (*ibid.*).

8 This is also the impression Rosen (1997: 112) has from the Middle–Late Bronze Ages Jerusalem data.

Fig. 9.9. The remains of a possible sickle workshop in L7114/7117 (Area B-west).

3)—and even then, flint was used for sickles and for threshing, right into the twentieth century.[9]

Cereal Harvesters

We know that cereals played some role in the diet and economy of Tel Dan during this period. This is predictable, but hard evidence is also available in the form of the sickles, as well as actual wheat remains, basalt millstones and a great number of what have been identified as grain storage pits (Ilan, Chapter 19 this volume).

But can we measure the importance of cereals in the diet and economy of early Iron Age Tel Dan? How much of the cereals were actually being grown in the Tel Dan hinterland? One point of departure for addressing these questions would be to figure out how many sickles are represented in the assemblage. To calculate this we would need to know about how many segments went into each blade. Complete *in situ* blades (according to the excavators) of three Large Geometric sickles have been found in the southern Levant from Gezer (Rosen 1986: 259), Tell Nagila (Gilead 1973) and Lachish (Fig. 9.3; Mozel 1983). The blades of these sickles were made from seven, four and six segments respectively. These numbers give us a ball-park figure. Let us say that about 20 Large Geometric sickles are represented in the Tel Dan assemblage. Assuming they were not all in circulation at the same time, I am sure the reader will agree that this provisional number paints the picture of a very modest Reaper's Union (if not to say a grim one) relative to a population the size of early Iron Age Tel Dan (estimated at 2000-2500, D. Ilan, pers. comm.). And yet we know from the above-mentioned wheat evidence and grain pits that cereals were a significant dietary element. So pending further sickle discoveries—remember: only some 1.5% of the site has been excavated!—the evidence for reaping suggests that the Dan inhabitants were storing their sickles in an as-yet uninvestigated part of the town (or indeed outside the town). Cereal imports may also have contributed to meeting the town's demands.

Handedness

I tempted you into reading this chapter with the assurance that I would delve into the matter of handedness. This is given a thorough going-over by Yamada (Chapter 10 this volume) and has been

9 Modern evidence for flint threshing teeth comes from in Turkey and Cyprus (Bordaz 1965).

considered also by Coqueugniot (1991, studying the Late Bronze Age Ras Shamra lithics). Their analyses and my own are in agreement on this point: there is very little evidence for left-handed use of sickles in the Middle Bronze– Iron Ages.

Yamada and Coqueugniot's analyses indicate that the Large Geometric end segments were hafted near the handle end of the blade rather than near the point of the sickle. This makes sense because—as the use-wear analyses show and is illustrated in Fig. 9.4—sickles were pulled toward the user to cut the plants. As the plants met the blade there first, it was the near end that needed to be snag-free. This is borne out by direct evidence. Egyptian and Italian Bronze Age hafted sickles indicate that triangular segments were indeed in some cases used at the handle end (Gilead 1973: Fig. 5). It would be very interesting to carry out a use-wear analysis on the only convincingly accurate reconstruction of a Levantine sickle blade, from Late Bronze Age Lachish (Mozel 1983: Fig. 2; the segments of this blade fit together very neatly and adhesive used to bind the segments into the handle is still visible in a continuous line along the length of the blade).

There is a slight problem with Yamada and Coqueugniot's shared conclusion that the ventral side faced up, because there is no clear reason why this should be so and it paints the picture of almost no left-hander sickle body segments being found. But I see no reason why the dorsal side could not face up, in which case the use-wear would also be compatible with left-handers. Until evidence that the ventral side did in fact always face up can be put forward, in my opinion the Large Geometric body segments are non-indicative when it comes to handedness.

It is the triangular Large Geometric segments—the blade-end points—that tell us most about handedness, through their use-wear patterns and morphology. In the Tel Dan assemblage, 23 of these (88.5%) were parts of sickles designed for right-handers, leaving only three pieces (11.5%) for left-handers. These proportions just about accord with modern statistics—8%–15% of the current world population is left-handed—but its position in the statistical spectrum could reasonably be taken as a sign of societal pressure in favor of right-handedness at early Iron Age Tel Dan—at least among sickle users (see also Yamada, Chapter 10 this volume).

On this point, it is worth mentioning—with a generous pinch of caution—a certain adventurous psychologist's theory that there are more left-handers in egalitarian, decentralized cultures (Previc 1991). And certainly, the less hierarchical—as currently understood—societies of the Neolithic Levant have left for posterity more left-handed sickles than have their Iron Age counterparts (Stekelis 1972; Yamada, Chapter 10 this volume).

But I will not venture further along this speculative trajectory. It is a dubious link that connects a few recovered sickle blade segments with real numbers of left-handers and then strains its shaky clutches to the overarching nature of the reapers' society! For one, Coqueugniot (1991) observed more left-handers' sickle end segments at Late Bronze Age Ras Shamra than were recovered at Tel Dan. Should we then conclude that Ras Shamra society at the height of the Late Bronze Age was more egalitarian and less centralized than Tel Dan? Surely not. In short, then, any conclusions drawn from these statistics on handedness must remain provisional. I hope further data and research will help us address this topic in the near future—and on less speculative grounds. But in the meantime, as a left-hander myself, I couldn't resist throwing in my tuppence's worth.

Value

The possible reuse of flint tools from earlier periods is a curious phenomenon which rarely is the subject of serious examination from an anthropological perspective. At Tel Dan the likelihood is that the lithics of earlier times were scavenged. Perhaps in some cases they were kept for uses other than their original makers' intent.[10]

10 This favouring of the scavenger explanation over bioturbation in the case of Tel Dan is based on the fact that very little Neolithic and Early Bronze Age pottery was found in early Iron Age loci, whereas lithics from those periods are better represented, which suggests intentional collection of the latter (D. Ilan, pers.comm.). For many other sites, I suspect that bioturbation is a more reasonable explanation. Stratigraphy has a very mixed-up sense of humor, which it loves to put on show—and in which archaeologists are perennially and happily engrossed.

The sickles evince an unquestionable attachment of value. In contrast to the little-retouched Neolithic, Canaanean and Chalcolithic backed pieces, the intensive re-sharpening of many of the Large Geometric sickle blades of the Middle Bronze–Iron Ages suggests that these tools were 'relatively valuable and not lightly discarded' (Rosen 2006: 286[11]). Given that flint is so widely available in the stream beds and hills of the Tel Dan environs, this value cannot have been due to any raw material supply-and-demand issues. And it seems unlikely that the town's rulers would attempt to control access to such a widely available material. Therefore we may reasonably speculate that the value of these tools was in their workmanship. The farmers who used these tools maximized their sickle blades' lives because replacing them was expensive.

Craft Specialization

This leads us to an interesting and useful insight offered by lithics. Despite relatively few waste pieces being collected—and notwithstanding that irritating clamor of flint being knocked into shape that must have occasionally been heard around the town—it seems safe to conclude that sickle blades were being produced in at least one specific area (interestingly, also a metallurgical workshop).

During this period, therefore, craft specialization was a feature of life at Tel Dan. Tool-making was carried out by experts. Some of these were making sickles in a multiple-stage process, and they focused their work in specific locations. As has been widely discussed (see Rosen 1997: 112 and references therein), specialization is a development that comes hand in hand with urban life and more specifically with a limited variation of ranking and power structures, restricted access to raw materials, and certain trade and exchange systems (see also Yamada, Chapter 10 this volume).

One effect of this specialization was on farmers' attitudes to flint. As just discussed, they took care of their sickle blades by this period because they had to rely on the services of the toolmaker. Also, this expert did not tailor-make his blade segments so that left-handers could also set their blades with the non-steep ventral side up (see above). Rather, he produced the segments according to a set template. It seems that left-handers simply had to make due and harvest with the steeper dorsal side facing up—potentially a drag on the sickle's reaping action (although this is yet to be tested by experiments)—or to work with their right hand. This stands in contrast to the greater morphological variety in the sickles of earlier periods. As Yamada (Chapter 10 this volume) notes, with the rise of specialization farmers had become dependent consumers rather than independent makers of these tools. And of course, if flint tool-making had developed in the direction of specialization, it seems safe to also assume that other crafts did so also.

With regard to the associated themes of identity, ethnicity, culture and politics, it is important to reiterate Yamada's point that specialized Large Geometric sickle production was carried out by many populations over a broad span of time and a wide geographical region (*ibid.*). As such, we should avoid associating this craft with group identity and ethnicity issues.

11 He is referring to similar trends in the Tel Batash sickle assemblage.

Fig. 9.5. Sickles.

No.	Reg. no.	Description
1	23043	Neolithic
2	23663/1	Neolithic
3	23441/4	Neolithic; no gloss
4	23761/7	Neolithic; no gloss
5	9265/1	Canaanean
6	23879	Canaanean
7	20625/10	'Early Large Geometric'
8	23507/16	Large Geometric; no gloss
9	23734/1	Large Geometric; no gloss; left-hander's?
10	23663/10	Large Geometric
11	23738/1	Large Geometric

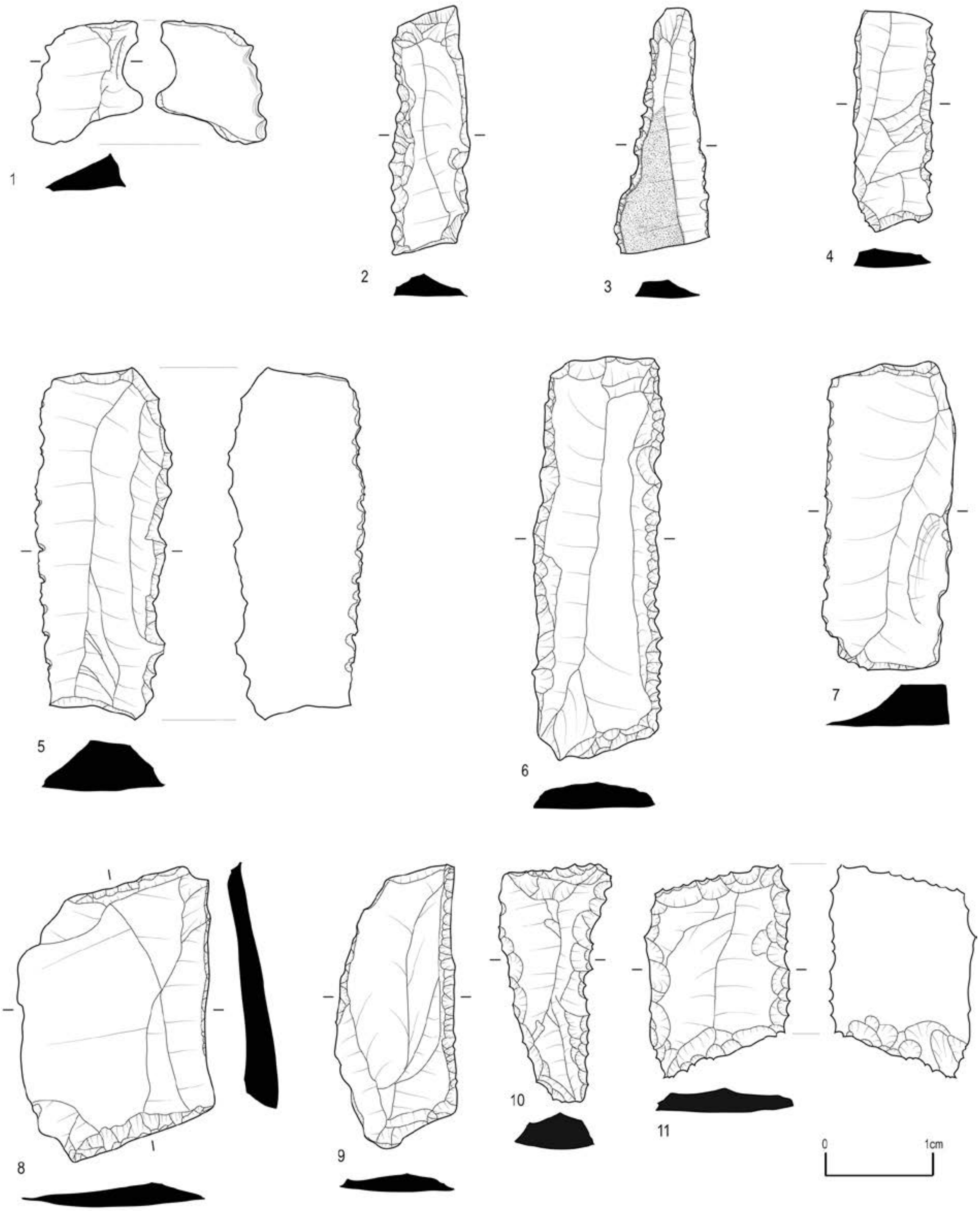

Fig. 9.5. Sickles from Iron Age I Tel Dan.

Fig. 9.6. Blades.

No.	Reg. no.	Description
1	23394/6	Blade (Neolithic)
2	20649/7	Blade (Canaanean)
3	20757	Blade (Canaanean)
4	23392/12	Blade
5	23526/10	Blade
6	23661/2	Blade
7	24972/2	Blade
8	24972/3	Blade
9	10637	Retouched flake
10	23738/4	Retouched flake
11	23892/5	Retouched flake
12	23923	Retouched flake

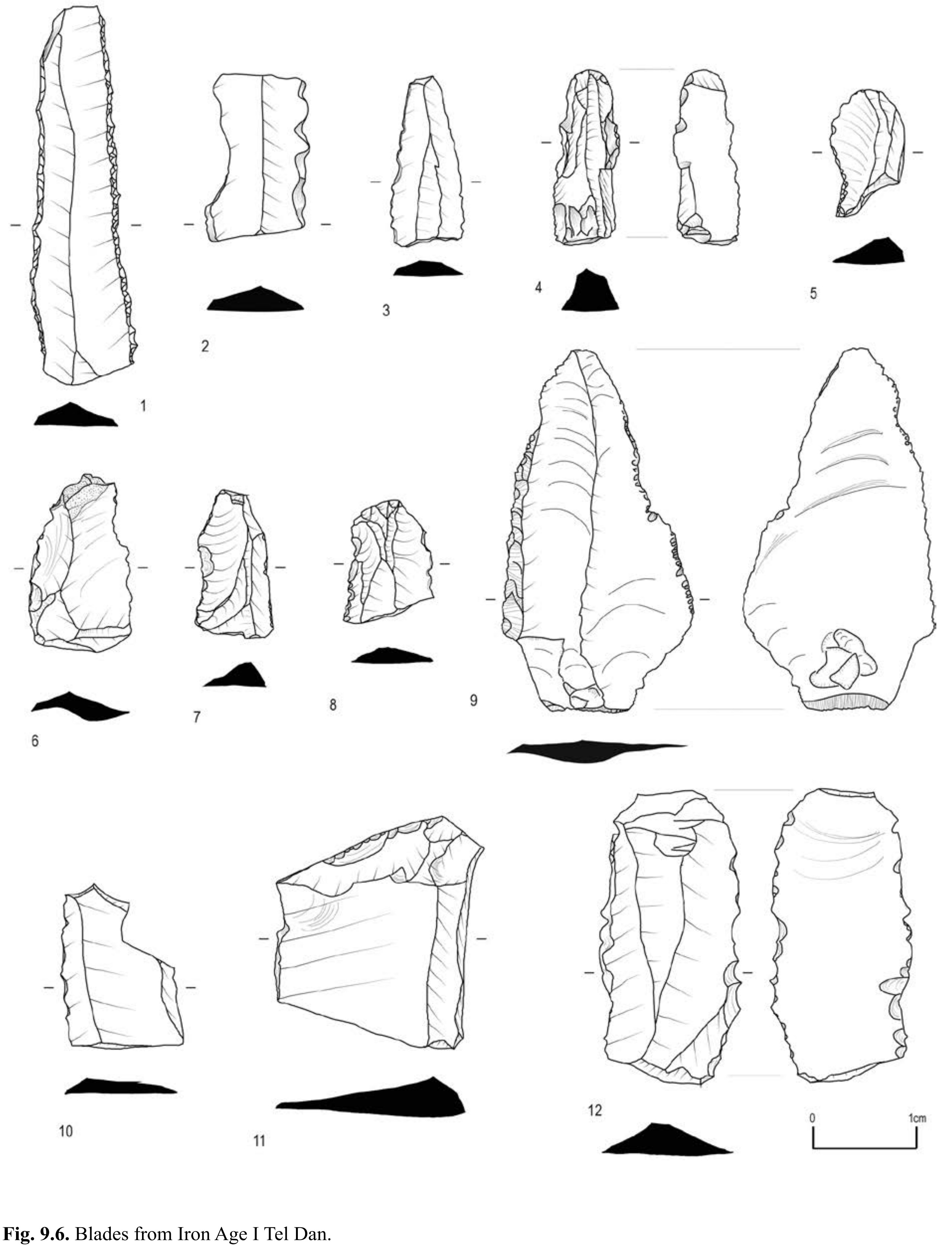

Fig. 9.6. Blades from Iron Age I Tel Dan.

Fig. 9.7. Scrapers.

No.	Reg. no.	Description
1	23745/2	Thumbnail scraper
2	20649/8	Side scraper
3	23509/5	End scraper
4	23663/18	End scraper
5	25185/1	End scraper
6	20653/5	Tabular scraper
7	23663/19	Tabular scraper
8	23663/20	Tabular scraper
9	23897	Tabular scraper

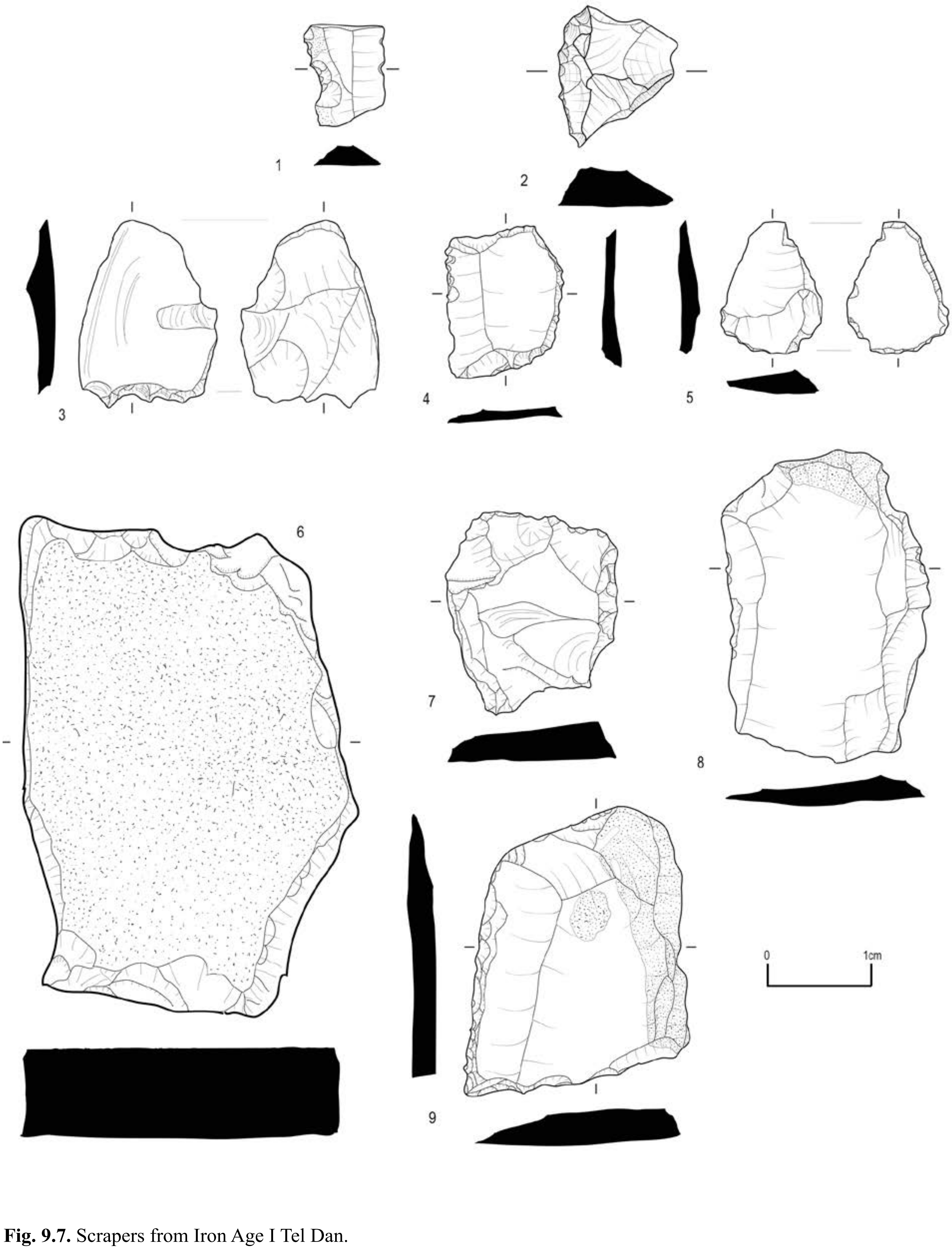

Fig. 9.7. Scrapers from Iron Age I Tel Dan.

Fig. 9.8. Possible *ad hoc* tools.

No.	Reg. no.	Description
1	7117/23	Point?
2	7119/9	Point?
3	23892/1	Point?
4	9335/8	
5	18052	
6	23423/8	
7	23506/8	
8	23749	
9	23820	
10	27258/2	

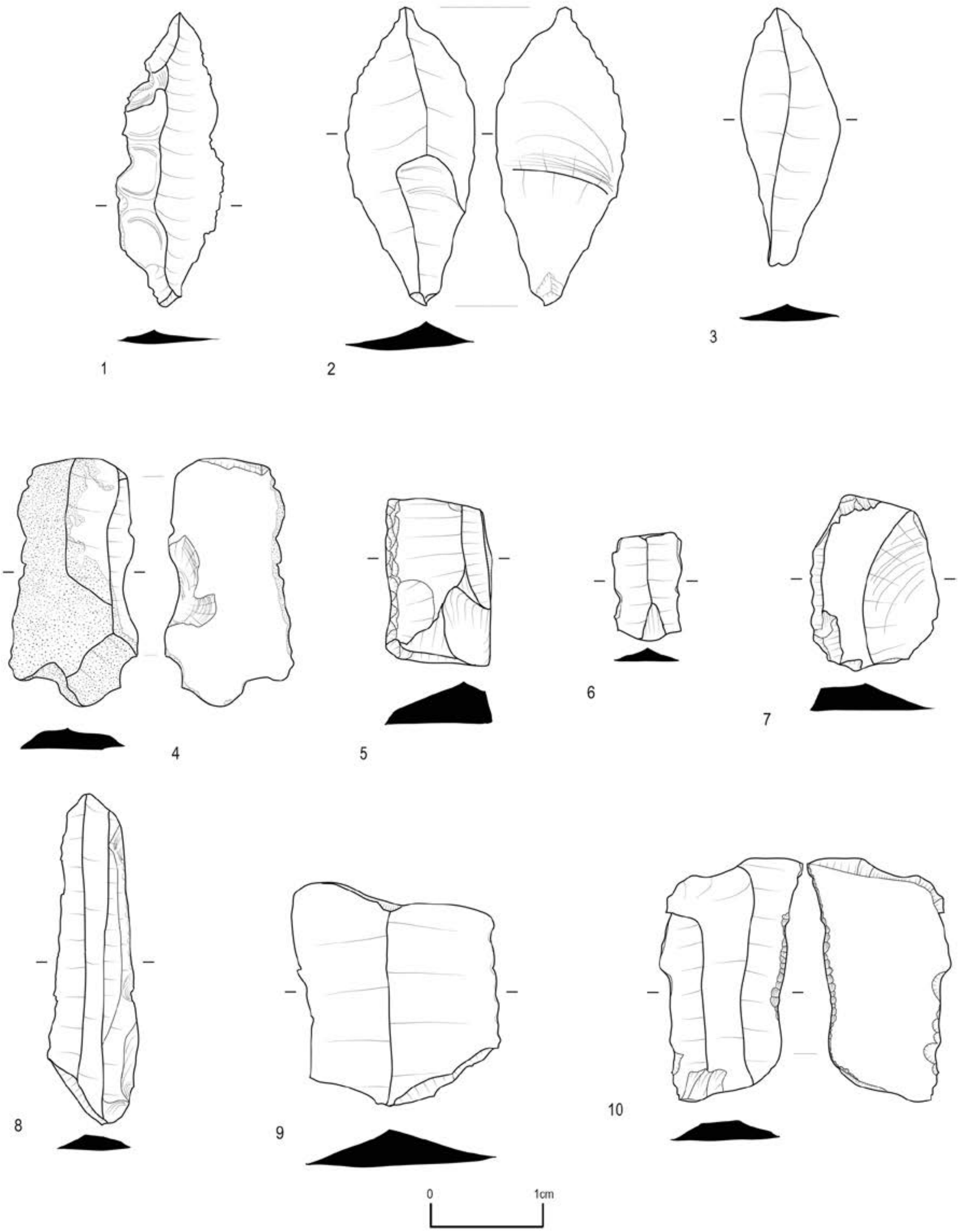

Fig. 9.8. Chipped-stone waste from Iron Age I Tel Dan.

Fig. 9.8. Possible *ad hoc* tools, plus core (cont).

No.	Reg. no.	Description
11	24702/1	
12	20073/18	
13	10572	
14	7169	
15	23779	Single-platform core

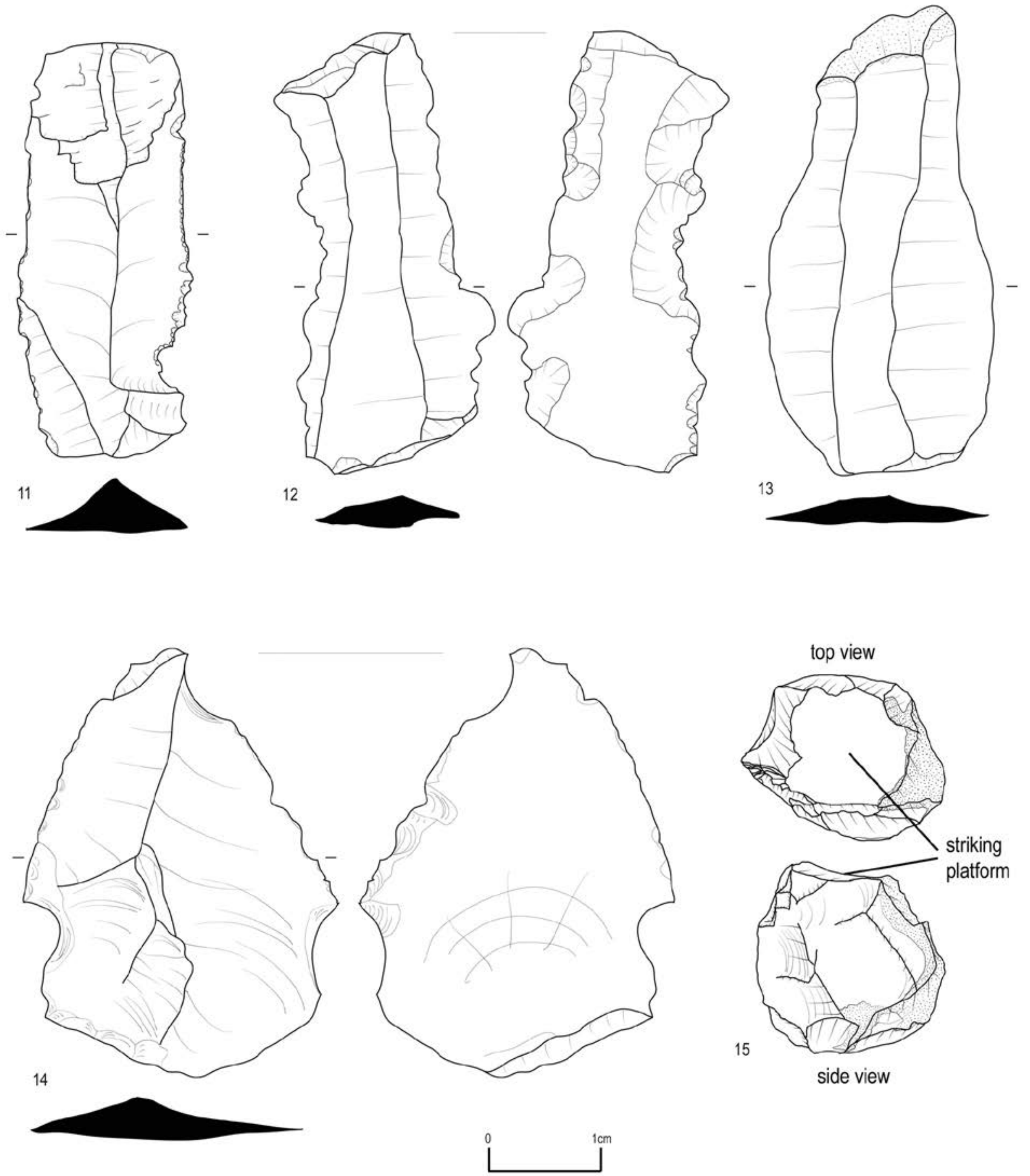

Fig. 9.8. Chipped-stone waste from Iron Age I Tel Dan (Cont.).

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CHAPTER 10

USE-WEAR ANALYSIS OF SICKLE BLADES

Shoh Yamada

Flint tools, representative artifacts of the prehistoric period, are not well-conceived subjects in biblical archaeology, as they are overshadowed by more refined and aesthetic artifacts made of various other materials. However, flint tools can provide valuable information about those who carried them, the "working" people who historically are also overshadowed by the ruling class of society who tend to occupy the primary place in written history. The present study sheds light on the culture of those who produced and used sickles, based on the pattern of use-wear on the tools found by microscopic analysis.

Samples and Methods

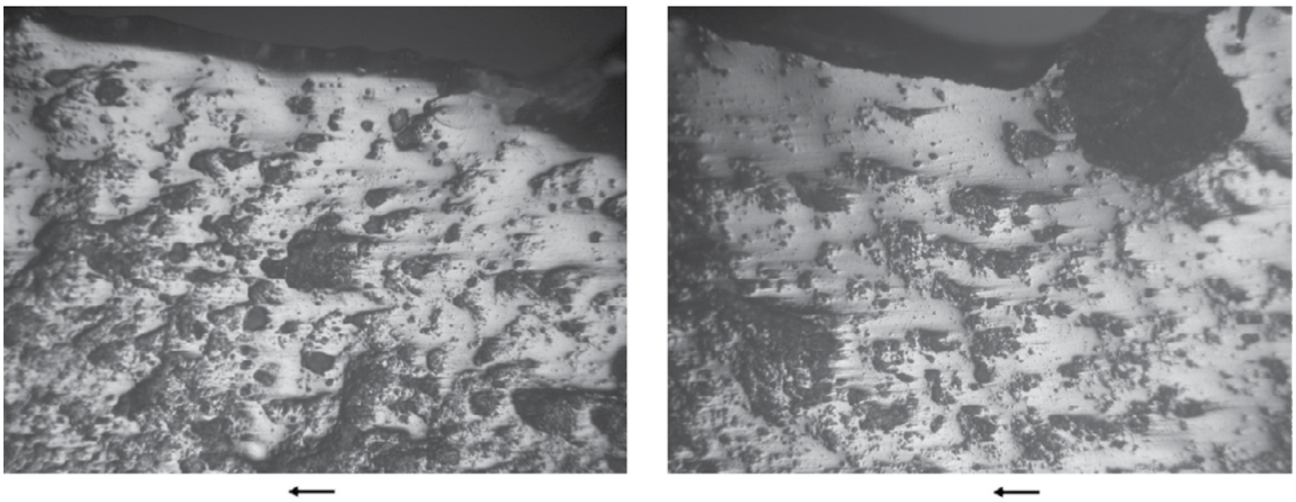
A total of 38 sickle blade pieces from Area B-west (Table 10.1) were assessed through microscopic *use-wear analysis*, wherein the microscopic striations (scratches) and polish on the worn edges of the tools exhibit identifiable patterns associated with known types of application in daily life. The method allows researchers to determine the type of material the stone tool worked, such as non-woody plants, wood, bone/antler, hide and meat. The term "sickle blade" is used here to refer to each single blade element of a stone tool sickle that featured a segmented series of small sharp blades, inlaid in a curved wood or bone sickle-shaped frame. The "sickle blades" of this period are not necessarily blades by definition; in lithic analysis, a blade is a flake whose length is over twice as large as its width, with parallel side edges. Nevertheless the term "sickle blade" is used in this report with the above definition, as it allows readers who are not lithic specialists to understand the discussion.

The basic method of microscopic analysis is the *high power approach* (Keeley 1980), in which microscopic *polish* (a polished surface, or worn surface, produced as a result of a stone tool use), is examined under the relatively high magnification (X100-500) of an incident light microscope. With this method, the types of materials worked can be determined by the pattern of the surface topography and distribution of the polished surfaces, and the direction of the tool movement can be determined by the direction of striations (scratches) found on the polished surface. Polish patterns have been established through contemporary experiments using replica tools in typical settings, i.e. harvest, chopping wood, butchering, etc. (*ibid*).

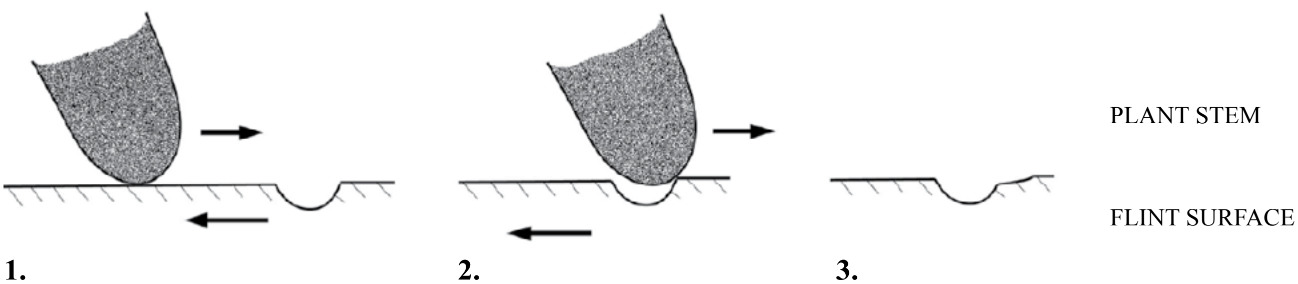
As with many other sickle blades of various periods, the sickle blades from Tel Dan were identified by their distinctive glosses covering their edges, visible to the naked eye. The gloss is the most developed type of *use-wear polish* typically produced by silica-rich non-woody plants such as members of *Graminae*, and generally referred to as *sickle gloss* or *sickle sheen*. Thus, these flint tools were believed to be sickle blades even before a microscopic inspection. Nevertheless, microscopic analysis was conducted to study detailed features of the glosses that are relevant to specific aspects of sickle usage. In particular, "comet-shaped pits"

(Figs. 10.1) serve as an indication of sickle movement in a single direction. These pits and their presentation may lead to revelations about which surface of the sickle blade (either ventral or dorsal surface: Fig. 10.2) was facing up or down during use, a tendency which may show chronological or regional patterns. As "comet-shaped pits" are normally formed on a well-developed gloss, specimens with relatively developed glosses were selected by naked eye, based on my previous experience.

Typologically, the sickle blades belong to "Large Geometric sickles", which were used in Middle Bronze II through Iron Ages (1800 BCE-850 BCE) in the Levant, replacing sickles made of "Canaanean blades" in the Early Bronze Age.



A) Comet-shaped pits on sickle edges from Tel Dan.
An arrow indicates the direction of the comet's head (= direction of the sickle movement).



B) Formation of a comet-shaped pit.

1. When the tool moves to the left, the material worked moves to the right in a relative movement.
2. When the material passes over a pit/depression on the flint surface, it drops into the pit/depression, and hits the opposing edge of the pit/depression.
3. Repeated friction results in the development of wear on the tail edge of the pit.

Fig. 10.1. Comet-shaped pit and its formation.

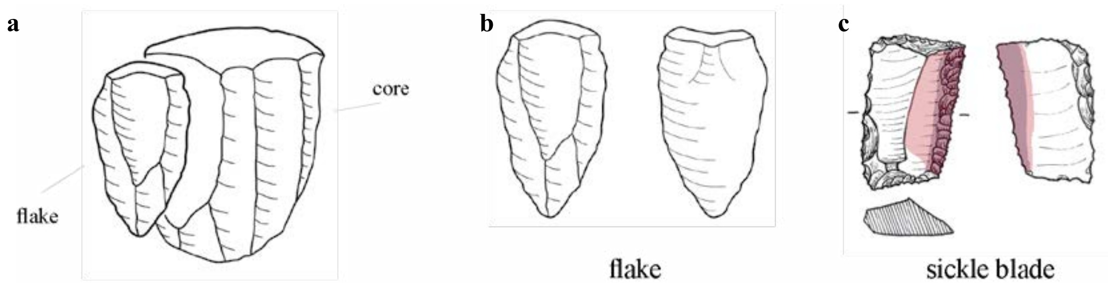


Fig. 10.2. Dorsal vs. ventral surfaces
a. core and flake; **b.** dorsal surface (left) and ventral surface (right); c. sickle blade, modified dorsal and ventral surfaces.

Attribute Analysis

Major attributes analyzed are: polish type, polish distribution, "comet-shaped pits", sequential order of polish and breakage/truncation and degree of polish development in retouch scars. The first four of these were routinely practiced in my analyses of late Epi-Paleolithic and Neolithic sickles (Yamada 2000; 2003; 2011; n.d.). The purpose and technical problems of each point are explained below.

Polish type. Microscopic examination of sickle gloss can confirm if this gloss was actually produced by harvesting plants.

Polish distribution. Observation of gloss distribution can provide information about sickle use, including hafting. Distribution of use-wear polish on a tool surface was mapped with two degrees of shading, corresponding to different degrees of polish development (Figs. 10.6 and 10.7): extensive polish visible to the unaided eye, and weak polish visible with a microscope. In some cases, weakly polished areas can also be detected with the unaided eye. Even in such cases, two-tone shading was still applied to differentiate the distribution of strongly polished and weakly polished areas. The map shows which part of the tool had the most intensive contact with the worked materials, and also indicates which part of the tool was possibly imbedded in a haft. The true contact area can be larger than the mapped area. Additionally, the boundary line between strong and weak polish is more or less subjective; polish distribution maps drawn by different researchers for the same specimen might not be exactly the same, although they should not be significantly different.

Direction of tool movement. Striations (scratches) shown on sickle polish indicate the direction of tool movement. In addition, "comet-shaped pits" have been shown to be an indication of unidirectional movement of a stone tool (Semenov 1964: 119; Witthoft 1967: 384); the "head" of a comet points in the direction of tool movement (Fig. 10.1), although the lack of "comet-shaped pits" does not necessarily signify two-way, back and forth motion. The direction of tool movement identified from "comet-shaped pits" is indicated by arrows in the illustrations (Figs. 10.6-10.10).

Ventral surface vs. dorsal surface. There are two major surfaces on a tool made of a flake: a ventral surface at which the flake was detached from a core and a dorsal surface that bears scars of previous flaking (Fig. 10.2; in conventional illustrations, the former is placed on the right side and the latter on the left side). For large geometric sickle blades, retouches are not too intensive to alter the original features of ventral or dorsal surfaces, and thus, these two surfaces are always distinguishable.

Closely related to the question of tool movement is the question of whether the dorsal or ventral surface was facing up (or facing down) during use. Since harvesting is made possible primarily by pulling rather than pushing motions, the "comet-shaped pits" can indicate which end of the sickle was placed on a particular side of the harvester. Then, if we assume the dominant hand of the sickle user is the right hand, a working edge of sickle must be located on the left side of the sickle, when viewed from the top. Then, the "comet-shaped pits" indicating which end of the sickle was placed on the side of the harvester, also determine whether the dorsal or ventral side was facing up (or toward the ground) during harvesting. For example, the edge of sickle blade Fig. 10.6:2 was used with the dorsal surface facing up, assuming the edge was used with right hand. If different tendencies in tool use habits are found regionally or temporally, this may provide information on possible inter-group relationships.

In the present analysis, in order to make identifications secure, only completely delineated "comet-shaped pits" on a flat surface with developed polish were counted as a sign of unidirectional movement; when use-wear polish is not very developed, the irregular topography of the original flint surface is preserved and can imitate the feature of "comet-shaped pits". Sometimes "comet-shaped pits" are identified on one surface of the edge but not on the other surface of the same edge. In such a case, too, the direction of the tool movement was determined by the "comet-shaped pits" found on one of the surfaces. This approach is reasonable, because this author has never seen "comet-shaped pits" heading in the opposite direction between the two surfaces of the same edge on any sickle, in any period.

Sequential order of polish and truncation/breakage. Truncation retouch scars on both ends of a sickle blade were made to adjust the length of a piece, and are expected to be covered with use-wear polish after it was used. By contrast, with breakage that occurred during use, the breakage scar is expected to cut the use-wear on the working edge, unless it was reused after the breakage. These hypotheses can be tested by careful microscopic examination. The observed sequential order of use-wear and truncation is denoted by a symbol in the illustration (Figs. 10.6 and 10.7).

Degree of polish development inside retouch scars. This attribute reveals the history of edge resharpening. The degree of polish development inside retouch scars are classified in four categoriesin Table 10.1: 0 = no polish; 1 = weak polish; 2 = relatively developed polish visible to unaided eye but not as much as an unretouched part of the edge, particularly on the ventral surface; 3 = well-developed polish comparable to that on an unretouched part of the edge, particularly on the ventral surface. Co-incidence of Categories 0, 1, and 2 with the presence of developed polish outside the scars indicates that the edge was resharpened. Co-existence of more than two of these categories indicates more than two cycles of resharpening. With the present scheme of analysis, up to three resharpenings can be detected on the same working edge. More cycles of resharpening may have occurred, but the evidence is not likely to be preserved.

Results

Polish Morphology

Under the microscope, all the sickle gloss found on Tel Dan sickle blades are confirmed to be regular polished surfaces produced by silica-rich plants (Figs. 10.8-10.10). They present well-developed, very smooth polished surfaces, which are rounded or domed in profile. The presence of sickle gloss, however, does not necessarily mean that the tool was actually used for harvesting cereals; it simply means that it was used on silica-rich plants. Experimental research on the southern Levantine flora conducted by Unger-Hamilton (1991), suggests that sickle gloss found in this region is most likely to have been produced by cereals. Also, the distinctive morphological features of the Large Geometric sickles as well as the contexts of their occurrence suggest that they are most likely to be sickle blades.

Distribution Pattern

Most of the specimens show an almost equal degree of polish invasion on both surfaces, suggesting an equal degree of haft coverage on dorsal and ventral surfaces. There are some sickle blades on which polish is more invasive on the ventral surface (Fig. 10.6:2, 17). There are possible residues of hafting or adhesive for hafting found on some of the specimens. The distribution of haft/adhesive residue shows a good correspondence with the area that is not covered with sickle polish.

Direction of Tool Movement

Striations and "comet-shaped pits" found on the specimens in this study indicate that all the edges showing sickle gloss were used in a cutting motion parallel to the edge line.

Ventral vs. Dorsal Surface

The observation of this feature has brought about a very interesting result. Except for two pieces on which "comet-shaped pits" were not observed, all the specimens (N=36) present the same direction of tool movement relative to the "anatomical parts" of a sickle blade. That is, if a sickle blade is placed, as shown in Figs. 10.6 and 10.7, with the working edge right when the dorsal surface faces up, and the working edge left when the ventral surface faces up, all the "comet-shaped pits" "fly" downward (meaning the sickle blade was pulled downward). This means that if the user was right handed, the entire sickle blade was hafted with the ventral surface facing up, with the dorsal surface facing toward the ground. In the case of a faux (a long-handed sickle), a different reconstruction could obtain, but Egyptian tomb paintings (and a papyrus) of the New Kingdom Period show short-handled sickles (see Coqueugniot 1991; Herriott, Chapter 9 this volume, Fig. 9.4).

A mixed occurrence of the two cases (ventral surface up and dorsal surface up) has been found in Neolithic assemblages (Yamada 2000, 2003, 2011, n.d.), although, among them, the case of dorsal surface facing up constitutes the majority at Nahal Zehora I (Wadi Raba phase; Yamada 2011). Compared with the Neolithic cases, the uniformity in the surface placing at Tel Dan is striking; the reason for this will be discussed below.

Sequential Order of Polish and Truncation/Breakage

Examination of this feature also has brought about an interesting result. Following the results of my previous analyses of Neolithic sickles (Yamada 2000; 2011), truncated ends of Large Geometric sickles are expected to show use-wear polish covering truncation retouch scars (typically seen in Fig. 10.9: #25*1 and #28*1). However, this, it turns out, is not always the case at Tel Dan; there are significant numbers of instances where truncation retouch cuts use-wear polish (Table 10.1); a sharp truncated edge shows a clear contrast with a heavily worn surface in some cases in Figs. 10.8:#2*2; 10:9: #8*2 and #9*2; 10:10:#29*2 and #36*3). Also, even when the truncation edge is covered with some polish, the degree of polish development was distinctly less in comparison to the adjacent area of the ventral surface (Fig. 10.8: #2*3, #2*4, and #7*4). These observations suggest that the ends of sickle blades were retouched after a certain period of use.

In addition, observations independently made on the ventral and dorsal sides of the same end are often contradictory: most typically, polish is cut by truncation retouches on the ventral side but polish covers truncation retouches on the dorsal side (Fig. 10.6: #7; Fig. 10.7: #29). In some cases, on the ventral side, there are retouch scars covered by polish and other scars cutting polish that occur on the same edge (Fig. 10.6: #2, #5; Fig. 10.7: #25, #27). Therefore, it appears that the scale of adjustment of the truncated edges was so small that it did not necessarily remove the entire polish on the end, or did not completely remove the previous truncation retouch scars, leaving some of them with polish, particularly the terminal part of the larger retouch scars on the dorsal surface.

In summation, either the trimming of the truncated edges or the adjustment of the length of a sickle blade appears to have been practiced quite commonly for some reason. Such a practice requires a sickle blade to be removed from a haft.

Degree of Polish Development Inside Retouch Scars

The most frequent categories found are (a) weak polish and (b) relatively developed polish visible to unaided eye but not to the degree of an un-retouched area.

In some cases, retouch scars showing different levels of polish development co-exist side-by-side on the same edge line (Fig. 10.8: #7*5). This means that only a part of the edge was resharpened (unless those specimens were in the middle of the resharpening process when they were left at the site). One can distinguish the series of more recent resharpening scars from the previous retouch scars by a careful observation of their morphology: they may be more invasive or show a steeper angle with a greater depth in their concavity. However, the difference is subtle and the overall edge line presents a regular, consistent pattern of serration. This may represent the expertise of those who did the resharpening, suggesting a possibility that these sickle blades were not only made by specialists but also resharpened by specialists. Also, the overall morphological homogeneity of the sickle blades in Area B-west may suggest that these blades were produced and resharpened by a small number of individuals.

Discussion

Uniformity in Morphology and Directionality

The uniformity in the positioning of ventral/dorsal surfaces identified by “comet-shaped pits” is an interesting phenomenon. First of all, the Large Geometric sickles themselves are highly uniform in their morphological directionality. Among the 38 specimens examined out of the total 123 Iron Age I sickle blades at Tel Dan (for statistics of the sickle assemblage see Herriott, Chapter 9 this volume), 28 pieces are parallelograms in a broad sense, all of which are tilted in the same direction. That is, if looked at on the ventral surface with the working edge placed horizontally, it is always tilted to the right, as shown in Fig. 10.3A. There are no parallelograms in the Tel Dan assemblage that tilt to left. Parallelograms from other sites have the same tendency. In published and unpublished reports on other flint assemblages in the southern Levant from the Middle Bronze Age II through Iron Ages, I have found so far only five parallelograms and three semi-parallelograms that are left-tilted when seen on the ventral surface at Lachish (Rosen 2004: symbols // and |/, respectively, in his Table 37.1, though he described the pieces conventionally from the dorsal surface), as well as one left-tilted parallelogram each at Tell et-Safi/Gath (Rosen *et al.* 2012) and Tell Jemmeh (Rosen and Vardi 2014).

The uniformity in the directionality of the parallelograms makes sense, because they need to be tilted in the same direction to be aligned in a haft without gaps between them, if all the sickle blades present the same surface (dorsal or ventral) to the same side (Figs. 10.4 and 10.5). This point was noted by Coqueugniot (1991). Therefore, it is no surprise that the direction of sickle movement indicated by “comet-shaped pits” has a consistency relative to the “anatomical” features of the sickle blades.

Triangular pieces are normally believed to have been placed at the ends of a sickle blade row in a haft, as demonstrated by examples from Sha’ar Ha-Golan (Stekelis 1972) and Gaza (Petrie 1932). However, triangular pieces also show a biased directionality at Tel Dan. When looked at on the ventral surface with the working edge placed up horizontally, one always finds a pointed end on the left (<), not on the right (>) (Fig. 10.3b). “Comet-shaped pits”, when found, indicate that these pieces were moved toward their pointed end (with the ventral surface facing up). Assuming a user is right-handed, this means that triangular pieces examined in this study are only placed at the proximal end of a sickle haft (that is, a harvester’s side); no triangular pieces were placed at the distal end of a haft. Although use-wear analysis has not been conducted, this appears to be also the case for many other Middle Bronze II-Iron Ages sites in the southern Levant; the majority of triangular pieces are left-pointed.

At Lachish (Mozel 1983) and Gezer (Rosen 1986), contexts are reported in which several sickle blades were found together, which the respective authors believe represent sets of sickle blades placed in the same hafts. These cases remain hypothetical as no hafts or original alignments were preserved, unlike the case at Sha'ar HaGolan in Pottery Neolithic (Stekelis 1972). However, for each case, there is no right-pointed triangle when viewed on the ventral surface, which supports the above hypothesis. The sickle blades from Gaza reported by Petrie (1932) are exceptional, including one right-pointed triangle.

At Ras Shamra (Late Bronze Age), the majority of the triangles are left-pointed but there are significant numbers of right-pointed ones as well (Coqueugniot 1991). Based on the direction of "comet-shaped pits", Coqueugniot believes that the latter were not pieces placed at the distal end of a sickle, but at the proximal end of a sickle for left-hand users ("Mode 2 use" in his terminology). This means that left-hand users used sickles with the ventral surfaces of the blades facing up. It also means, in theory, that there should be some trapezoids/parallelograms showing "comet-shaped pits" with different directions from the majority, but whether this actually exists is not stated in his article.

After the completion of this author's use-wear analysis, Herriott (Chapter 9 this volume) identified the presence of two right-pointed triangles out of the total of 26 triangular pieces at Tel Dan. Because the direction of "comet-shaped pits" has not been checked, it is not known whether they were placed at the distal end of a right-hander's haft or at the proximal end of a left-hander's haft (in both cases, with the ventral surface facing up). There are no "comet-shaped pits" heading to the right found on the parallelograms examined in this study, to support the latter theory, although such evidence might be found in future analysis.

The discovery on the directionality of sickle blade movement noted at Tel Dan is in accordance with that recognized by Coqueugnoit at Ras Shamra, who reached the same conclusion through an approach somewhat different from mine. While Coqueugnoit first analyzed the uniformity in sickle morphology and then checked the direction of "comet-shaped pits", the present author first found the uniformity in "comet-shaped pits" direction and then noted the uniformity in the directionality of sickle blade morphology.

One should note that Coqueugnoit's terminology is different from mine. In this report, a trapezoid that has two pairs of *roughly* parallel side edges is called a parallelogram. However, Coqueungoit limits sickle blade "parallelograms" to a stricter definition of trapezoids with two truncated side edges having *exact* parallel lines. This point is important in his study, as he believes the imperfect parallel lines between the adjacent sickle blades would create a curvature of the blade line in the haft. Many of the parallelograms at Tel Dan in the present study would be classified as "trapezoids" by Coqueugnoit's criteria. Some are actually pentagons (e.g., Figs. 10.6: #7, 10.7:#27), but termed parallelograms here.

Uniformity in Large Geometric Sickle Blades in MBII-Iron Ages

Many Large Geometric sickle blade assemblages are from tell sites where intensive occupation over time has resulted in mixed occurrences of sickles dating from the Middle Bronze to the Iron Ages, thus making it difficult to define the sickle characteristics of each period and sub-period (Rosen 1997:34-38). According to the series of analyses conducted by Rosen there appear to be no distinctive differences in the basic morphology of Large Geometric sickles and in the ratios of their subtypes in different assemblages throughout the period (Rosen 2003; 2004; 2006; Rosen and Vardi 2014; Rosen *et al*. 2012; Vardi and Rosen 2007). Although use-wear analysis has not been undertaken on most of the assemblages, the strong correlation between morphological features and the method of hafting revealed in the analysis of the Tel Dan assemblage suggests that the principles found here are very likely to apply to other assemblages as well because of the consistency in the morphological features. Therefore, not only the basic shapes of sickle blades but also the precise method of hafting (and thus, the way they were used) did not change for two thousand years, despite the changes in political regimes and in ethnic territories known from other evidence, including biblical texts.

The observed high level of standardization of these sickle blades is intriguing when we consider that they are not mass-produced. Their production took place locally; as Rosen's analyses show, sickle blades were made out of sickle blanks by flint workers who resided in each town.

While at Tel Dan, parallelograms constitute the majority of Large Geometric type sickles, other assemblages include many trapezoids and rectangles. The presence of these rectangles and trapezoids of various shapes appears to represent an opportunistic strategy used by local flint workers to adjust to the irregular shapes of sickle blades in a haft so as to avoid gaps between them. Nonetheless, parallelograms and triangles show a striking uniformity from the Middle Bronze II through the Iron Age.

As long as local flint workers kept the same standard for the shape of the sickle blade, hafting and harvesting would have progressed smoothly. For example, in certain regions, parallelograms can be all left-tilted. Or flint workers could have provided trapezoidal pieces to fill a space between left-tilted and right-tilted parallelograms, so both could exist at the same site. The fact that left-tilted parallelograms existed even in very small quantities at Lachish and Tel es-Safi/Gath (Rosen 2004; Rosen *et al*. 2012) means that such adjustments were actually made. Then, what was the reason for the overwhelming ratio of right-tilted pieces?

Might the reason be mechanical? When a sickle is used in a pulling motion, plant stems slide toward the opposite direction. With a left-tilted alignment of sickle blades, plant stems may be easily trapped in the gap of blades, and cause an accidental removal of the sickle blade (Fig. 10.5c). The right-tilted blades may reduce the risk (Fig. 10.5b). This needs to be tested in controlled experimentation.

Another question is: why is the ventral surface facing up? Might this also have a functional explanation? The edge of the Large Geometric sickle blade that was produced by unifacial retouches on the dorsal side has an asymmetrical cross section, which may have influenced the efficiency in cutting plant stems, depending on which surface was facing up. This is not at first obvious, because many Neolithic sickles were dorsal-surface-up, in contrast to the Large Geometric sickles of the Middle Bronze II-Iron Age. However, the positioning of the ventral/dorsal surface may have a different effect on different types of sickle and haft, and placing a ventral surface up in a curved haft in the Middle Bronze–Iron Ages may have increased the efficiency of harvesting. This point could also be tested experimentally.

Incidentally, if the ventral surface is positioned facing up for a functional reason, how did left-handed users manage the situation? The possibilities are: (1) they used sickles in their left hands with the dorsal surface up despite its possible functional disadvantage; (2) they used sickles with the ventral surface up in their right hands; (3) there were small numbers of ventral-up sickles for left handed users as suggested by Coqueugniot at Ras Shamra (see above). Because (3) is not confirmed in many assemblages, either (1) or (2) appears to have been the case in many places.

At Tel Dan, there is an indication that sickle blades were not only made by specialists but also brought back to the workshop after a certain period of use, for resharpening and readjustment by specialists, as evidenced by traces of skilled resharpening retouches and truncations cutting use-wear polish. This suggests that the maintenance of sickles was also under the control of sickle makers, and farmers were only users (consumers) of sickles, which was probably not the case in the previous periods. This may be seen as a development of specialization, but may also be seen as a sort of "alienation" caused by the development of an urban system. In the Neolithic period, farming tools were perhaps produced and used more domestically, and each individual user carried out the adjustments and maintenance of their own tools for themselves, which resulted in less uniform positioning of ventral/dorsal surfaces. But in the period of Large Geometric sickles, farmers became passive consumers of commercial sickle products, being removed from their own tool maintenance.

While it is possible that uniformity in Middle Bronze II-Iron Age sickle morphology has some functional explanation, it suggests, overall, the action of exchange and the continuity of tradition in sickle use across the Levant in this period. This principle has also been noted by Rosen (2004: 2223), including the other lithic types of the second millennium BCE. This uniformity went beyond political and ethnic boundaries. This fact should not be interpreted as a sign that the flint sickle is a poor reflection of its social context. On the contrary, uniformity reflects a shared cultural tradition going beyond political and ethnic boundaries during the Middle Bronze II-Iron Age continuum.

A Possibility of a Threshing Sledge

Anderson and her colleagues (Anderson and Inizan 1994; Anderson *et al*. 2004) have claimed that Early Bronze Age Canaanean sickle blades were not sickles but the teeth of threshing sledges. Is this also the case for the Large Geometric sickles examined in the present study? The answer is no. First, morphological features of large geometric sickles in general clearly indicate these were primarily sickle blades. Their finely denticulated edge is not required for threshing sledge teeth, and the occurrence of a certain ratio of triangular pieces also suggests that these were sickle blades inserted in a curved haft. But could they have been recycled as threshing sledge teeth? The possibility is denied by the consistency in their positioning and in the direction of tool movement known from the "comet-shaped pits"; it is highly unlikely that such precise positioning of blades was required when they were used as threshing sledge teeth. In addition, the morphological features of use-wear polish shows those of regular plant polish, not of the coarse threshing sledge polish seen in photos presented by Anderson.

Conclusions

Microscopic analysis of use-wear on sickle blades, particularly of "comet-shaped pits", at Tel Dan has revealed a high degree of uniformity in the way the blades were arranged in a haft as well as in their morphology; (1) all the sickle blades were placed with the ventral surface facing up when used; (2) a triangular piece was placed primarily at the proximal end of the haft; (3) parallelograms were tilted right and most triangular pieces are pointed left when placed horizontally with the ventral surface facing up.

The refined edge resharpening technique and the trace of "re-truncation" undertaken at the workshop suggest that the sickles were brought back to the workshop for such maintenance activities by specialists, which renders farmers mere consumers of the commercial product. Along with the high standardization in sickle form and sickle use, this may represent an "alienation" of individual sickle users from the control of their own tool—one of the symptoms of urban craft specialization.

The high degree of uniformity in sickle use in the Middle Bronze II-Iron Age Levant (1900-850 BCE) suggests a shared culture, which went beyond the political and ethnic boundaries defined by the ruling classes, and beyond periodic changes in these boundaries.

In pre-modern state societies, each stratum or class appears to have had more autonomy than in modern state societies. Or, like in Balinese society, social structure may have been functionally specific, with each purpose and each set of rules being formally portioned out to a separate organization (Geertz and Geertz 1975). Therefore, information provided by different categories of archaeological material associated with a specific "*Sitz im Leben*" (situation of life) has a bias conditioned by the context to which these categories belonged.

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n.d. *Use-Wear Analysis of Selected Specimens from Kfar Ha-Horesh.*

Table 10.1. Inventory of the analyzed sickle blades.

#	Locus	Reg. no.	Polish inside retouch[1]	Sequential order: polish vs. truncation/breakage[2]				Sickle type[3]	Note
				ventral surface		dorsal surface			
				Left end	Right end	Left end	Right end		
1	7052	23407	1	P	T	P	P	PL	
2	7060	23392/13	2	T	PT	P	P	PL	
3	7105	23599	3	B	B	B	B	PL	no comet pit
4	7107	23592	2, 1	B	T	P	B	PL	
5	7114	23663	2, 1	? (on breakage)	PT	P	? (on breakage)	TRI	
6	7114	23663	1	P	TP	P	P	PL	
7	7114	23663	2, 3	T	T	P	P	PL	
8	7114	23663	1	?	T	?	N. A.	TRI	
9	7114	23663	1, (2)	?	T	?	P	TRI	
10	7117	23671	2	B	?	N. A.	B	PL	
11	7117	23696	3, 2	N. A.	?	P	?	PL	
12	7117	23662	3	N. A.	?	P	P	PL	
13	7117	23662	0, (2, 3)	?	T	P	P	PL	
14	7117	23662	2, 3	P	TP	P	P	PL	no comet pit
15	7117	23662	2, (1)	P	T	P	P	PL	
16	7117	23662	1	P	?	P	?	PL	
17	7117	23662	2	P	?	?	P	PL	
18	7117	23662	1	P (on breakage)	N. A.	?	? (on breakage)	PL	
19	7119	23695	2	P	T	P	P	PL	
20	7119	23695	1	T	P	N. A.	?	PL	
21	7119	23695	3, 2	PT	TP	P	P	PL	
22	7119	23695	2	T	T	P	P	PL	
23	7119	23695	0	P	T	?	?	PL	
24	7119	23695	2, 0	P	T	N. A.	P	TRI	
25	7131	23738	2	P	TP	P	P	PL	
26	7128	23732	2, 3	T	T	?	P	PL	
27	7129	23761	2, 3	P	TP	PT	N. A.	PL	
28	7129	23761	2	P	TP	P	P	PL	
29	7129	23761	2	T	T	P	P	PL	
30	7135	23319	2	PT	B	B	P	PL	
31	7151	23905	2	PT	T	P	N. A.	PL	
32	7152	23892	2	N. A.	?	N. A.	N. A.	TRI	
33	7151	23905	2	B	T	P	B	PL	
34	7152	23179	2	P	T	P	P	PL	
35	7152	18297/1	2	B	T	P	B	PL	
36	7152	23892	2	P	T	P	?	PL	
37	7159	23897	2	T	T	P	T	PL	
38	7096	23565	1, (2)	?	?	P	?	PL	

1 **Degree of polish development inside retouch scars**
0: No polish
1: Weak polish
2: Relatively developed polish visible to unaided eyes but not to the degree comparable to that on an unretouched part of the edge, particularly on the ventral surface.
3: Well-developed polishes comparable to that on an unretouched part of the edge, particularly on the ventral surface.
( ) indicates the presence in small ratio.

2 **Prevailing features**
P: polish covers truncation/breakage
T: truncation cuts polish
B: breakage cuts polish
?: sequential order is not identified
N. A.: polish is not found on the end
PT: mainly polish covers truncation/breakage, but with some opposite cases
TP: mainly truncation cuts polish, but with some opposite cases

3 **Type of geometric sickle**
PL: parallelogram
TRI: triangle

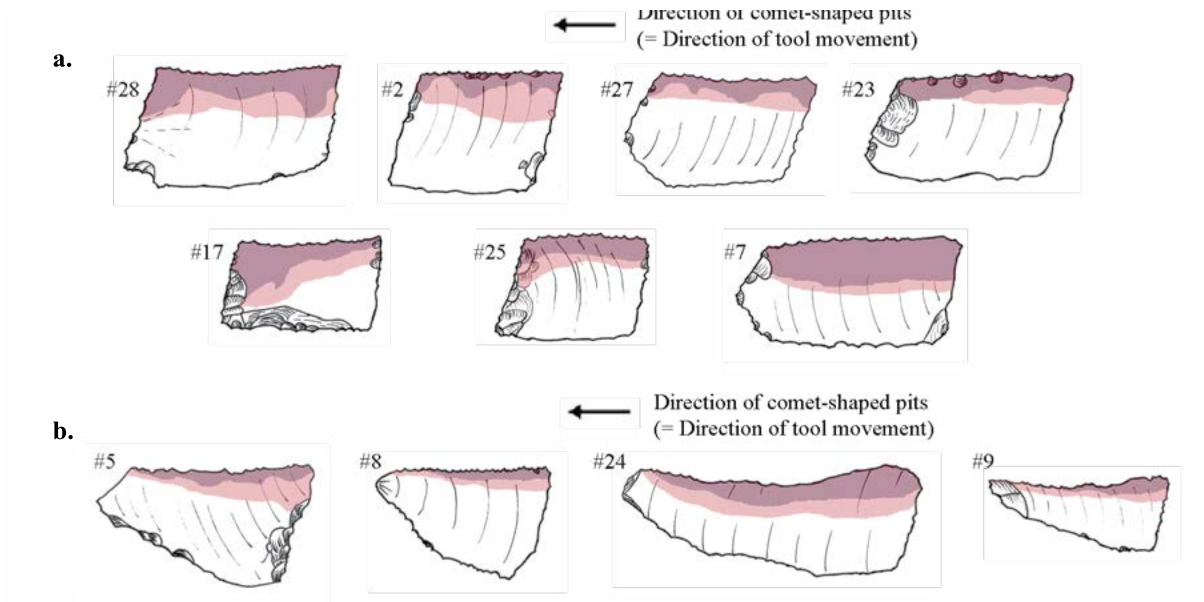


Fig. 10.3. Directionality of sickle blades seen on the ventral surface.
a. parallelograms; **b.** triangles.

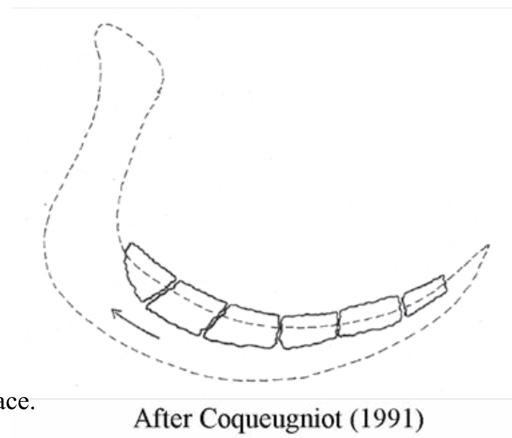


Fig. 10.4. Directionality of sickle blades seen on the ventral surface.

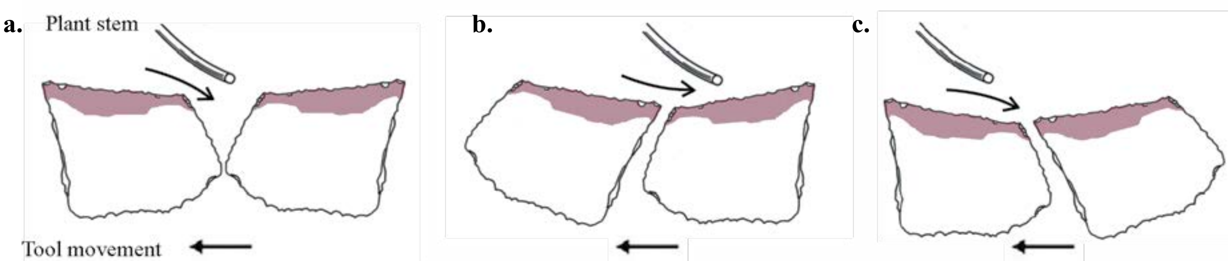


Fig. 10.5. Alignment of parallelograms and possible trapping of plant stems.
a. Assymetrical. A big gap between blades in which plant stems will be trapped.
b. Right-tilted. Plant stems are likely to skip over a gap between blades.
c. Left-tilted. Plant stems could be trapped in a gap between blades.

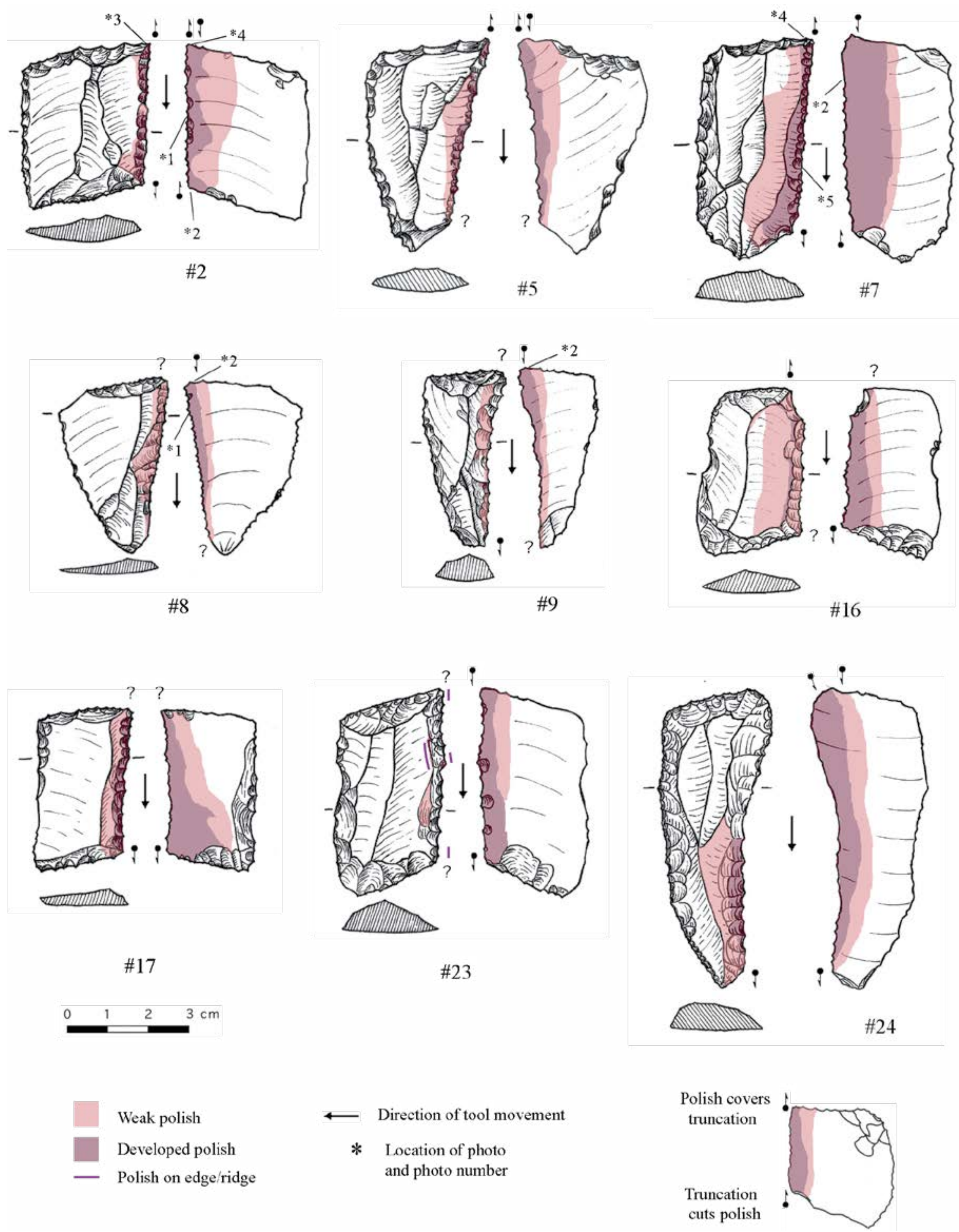


Fig. 10.6. Distribution of use-wear polish on sickles from Tel Dan.

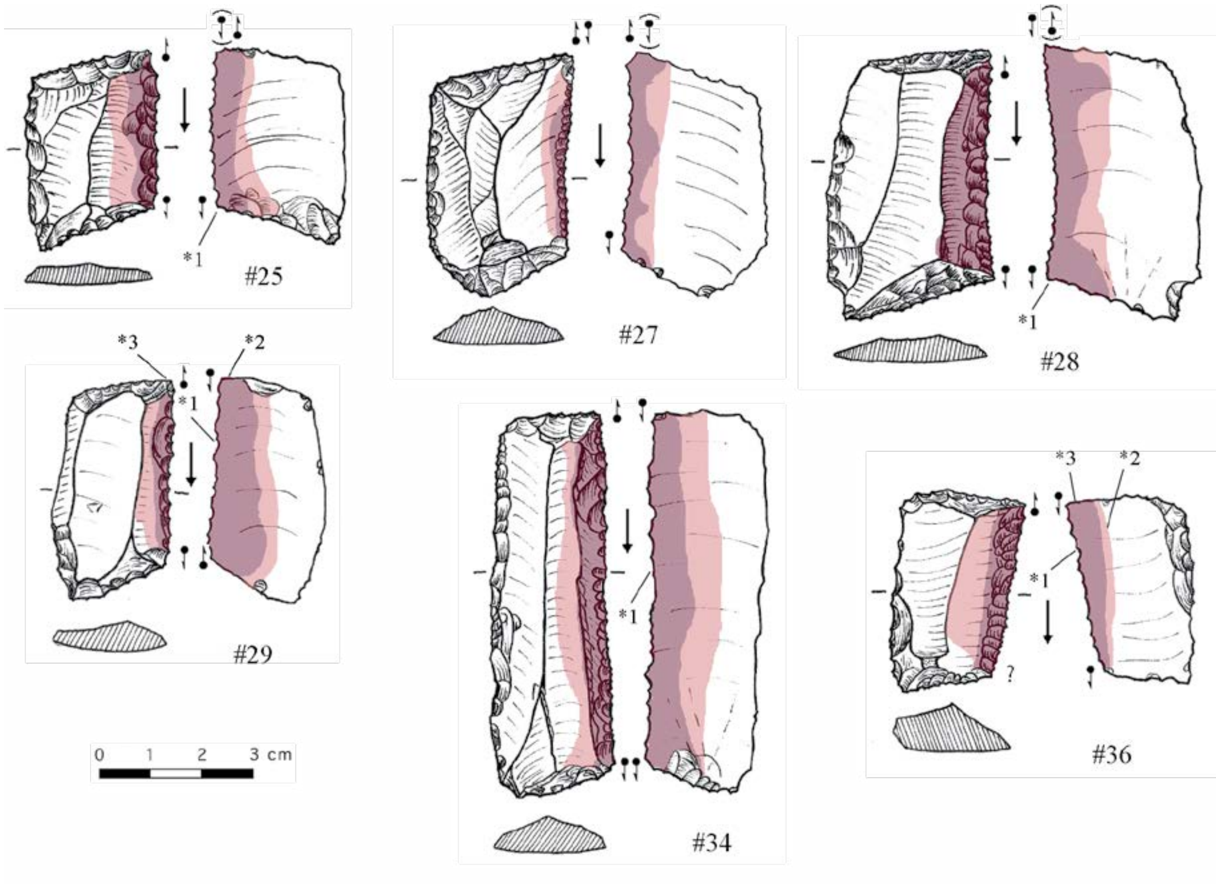


Fig. 10.7. Distribution of use-wear polish on sickles from Tel Dan (continued).

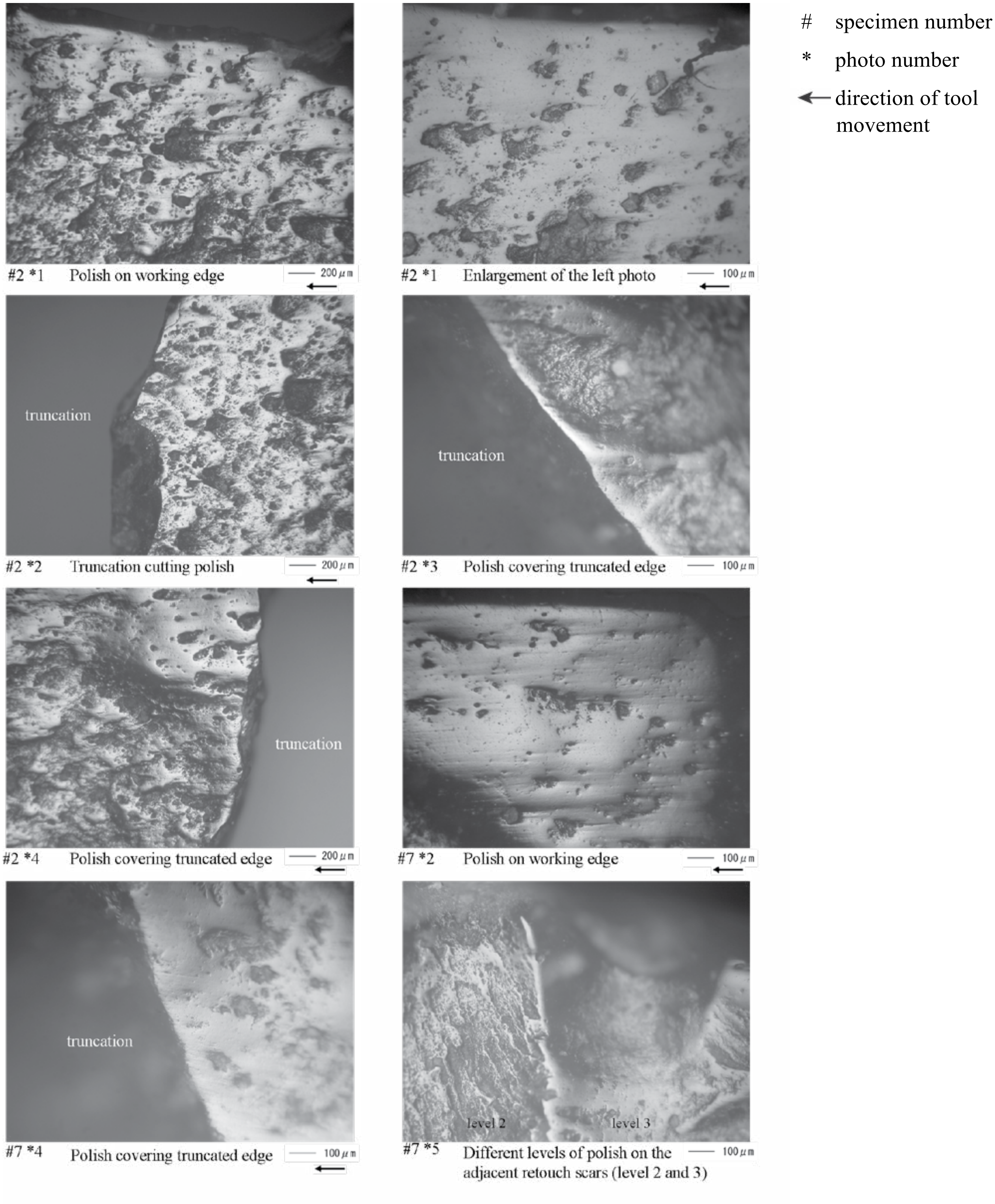
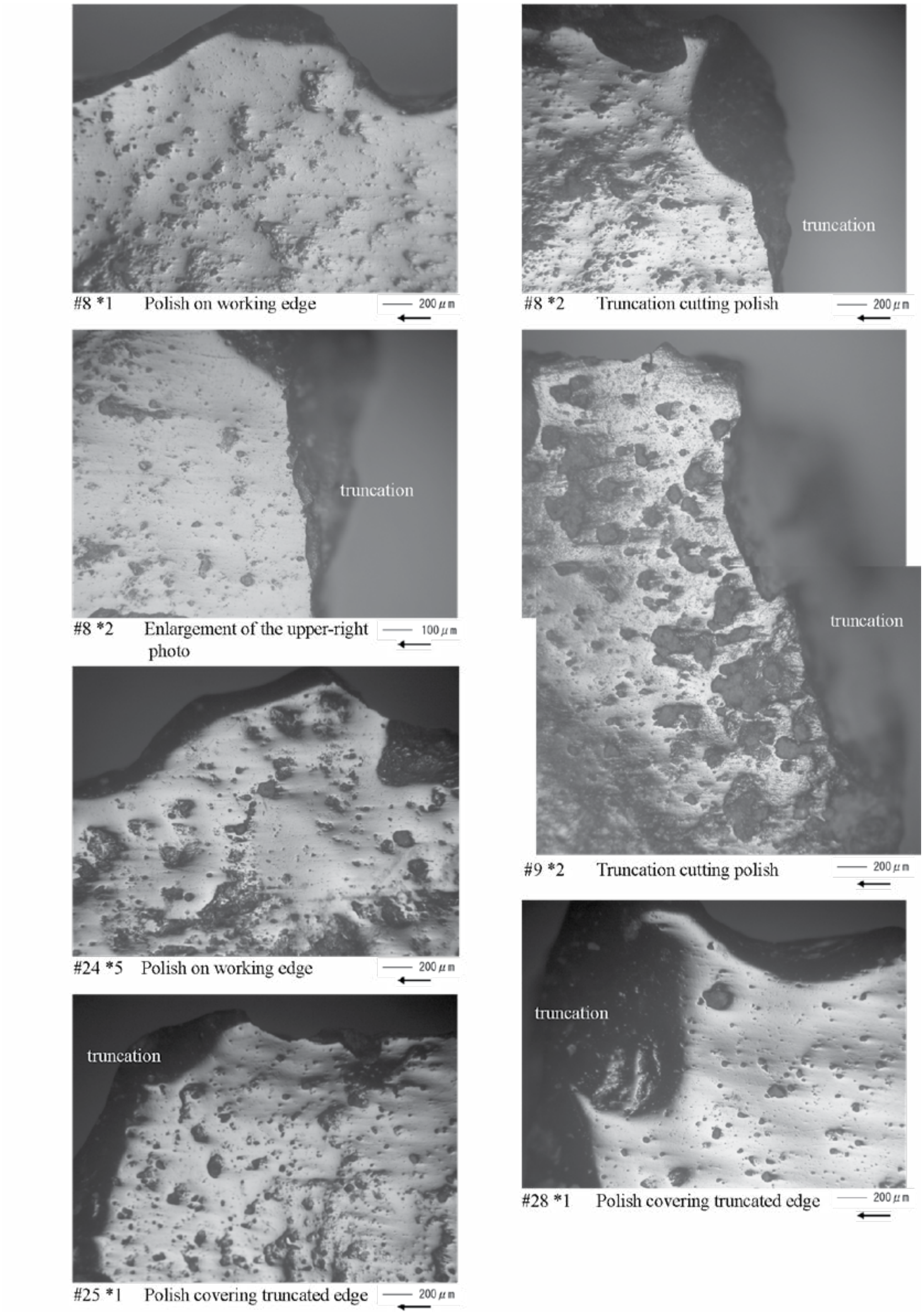


Fig. 10.8. Use-wear polish on sickles from Tel Dan.



\# specimen number

* photo number

← direction of tool movement

Fig. 10.9. Use-wear polish on sickles from Tel Dan (continued).

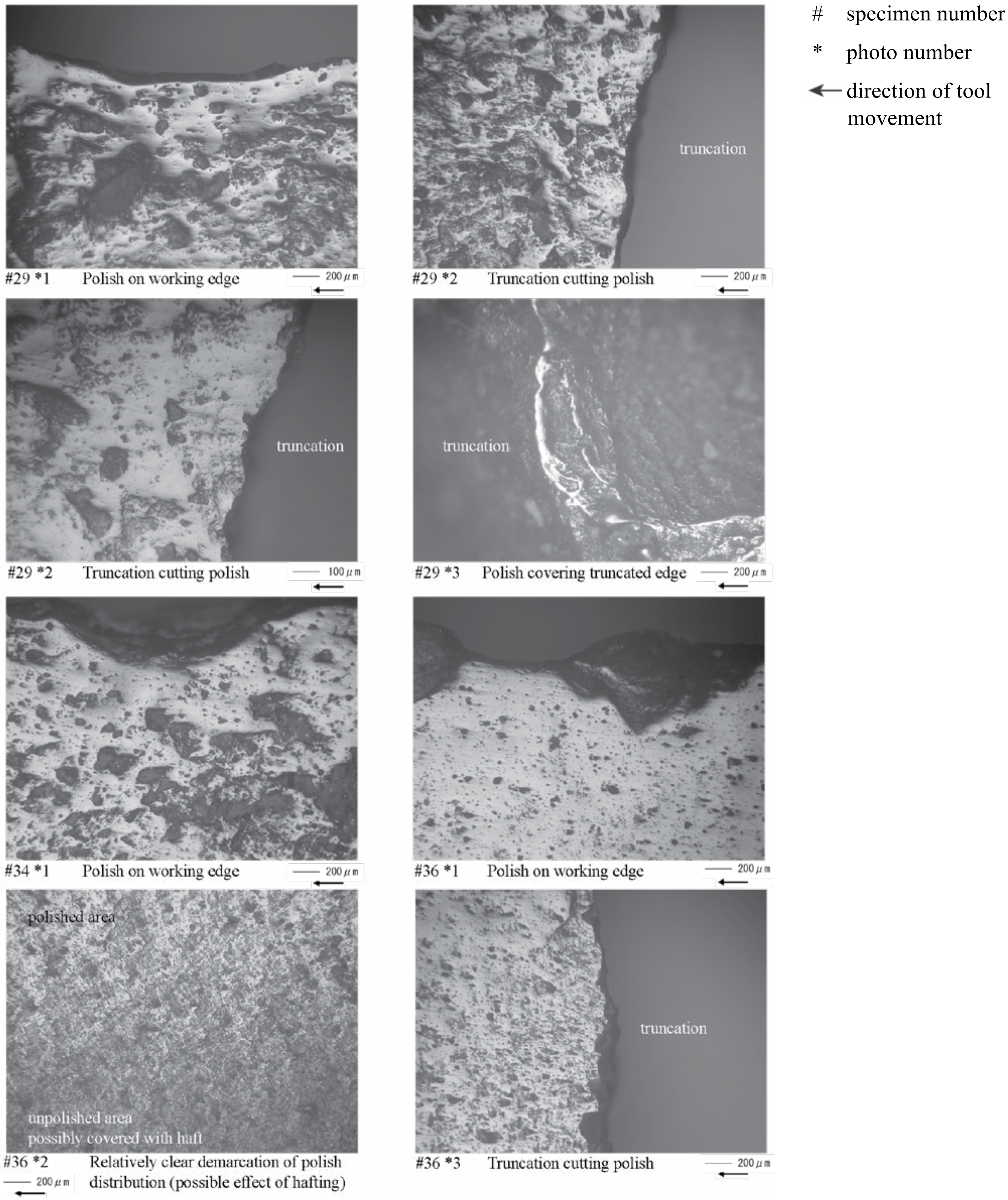


Fig. 10.10. Use-wear polish on sickles from Tel Dan (continued).

CHAPTER 11
THE METAL OBJECTS[1]

A total of 56 metal objects were recorded from the Iron Age I levels of Tel Dan. Of these, 45 are of bronze or copper alloy, eight of iron, one of silver and two of lead. The metal objects are organized by metal composition and then by functional category and type (where known). While the iron objects were almost certainly manufactured in the Iron Age I, many of the bronze, silver and lead objects may be the products of scavenging for the purpose of recycling. As regards bronze artifacts, there is no typological difference between the repertoire of the Late Bronze Age and that of the early Iron Age; the latter continues the traditions of the former.

Bronze/copper alloy (Table 11.1)

Chisel (N=1)

The single chisel identified (Fig. 11.3:1) is of the solid, nail-headed type, looking very much like a modern chisel. It shows signs of pounding on the head. This type was common throughout the Mediterranean basin in the second half of the second millennium BCE (Catling 1964: Fig. 10:1) and has parallels at a number of Iron Age I sites in the southern Levant (Yahalom-Mack 2009a: 572; 2009b: 121, Table III.4 and references in both). No socketed chisels have been reported at Tel Dan so far.

Awls (N=5)

Awls come in different sizes, ranging from 4.0 to 13.3 cm (Figs. 11.3:2-5). They are characterized by an upper shaft with a square or rhomboid section and a lower shaft with a round section. The working end is a point. The upper shaft tapers somewhat toward the butt. It is clear that the smaller awls had handles of wood, bone or antler (e.g. Fig. 11.3:2-4) which would facilitate the application of downward pressure. These would have been used primarily in leatherwork.

The beautifully preserved large awl (Fig. 11.3.5) may have been used without a handle. It resembles modern-day sculpting and engraving tools, rather than a simple piercing awl, and it fits well in the hand. Awls are not that common in Iron Age I assemblages, even in Cyprus (Catling 1964: Fig. 10:6-7); this corpus appears to be one of largest.

Drill bits (N=3)

These small rods with pointed ends range from 2.3 to 2.8 cm in length (Fig. 11.3:6-7). They have round to rhomboid sections. The working ends are dull points, the result of use wear, much like what can happen with a modern drill bit. In their inchoate state they may have been stepped or ribbed—Fig. 11.3:6 seems to preserve such ribs. They would have been set tightly into a bone or hard wood shaft, around which the twine of a bow drill would have been twisted to effect the rotary motion. Note that both drill sockets, or handholds, and bone cylinders have been identified in the Iron Age I assemblage at Tel Dan (Chapters 7 and 12 respectively, this volume). One assumes that the tip would have needed frequent hammering and annealing to maintain its effectiveness.

1 I thank Naama Yahalom-Mack for her useful comments regarding metallurgy and the metal objects.

Fig. 11.1. A selection of metal objects from the metallurgy workships in the Iron I levels in Area B-west.

It has been pointed out that these may be under-reported in excavation reports, due to their small size and lack of distinguishing characteristics (Yahalom-Mack 2009b: 123, Table III:6).

Needles (N=6)

Needles are defined as having either an eye or a hook at the butt end (Fig. 11.3:8-11). They vary widely in length and thickness; the largest is 21.3 cm. long and the shortest (near) complete example is circa 6.0 cm long. This suggests that a variety of materials were sewn. The larger needles would have been used for sewing leather, or stringing together other tough and bulky commodities, while the smaller needles would have been more adapted to textiles. Similar needles have been reported from Hazor Stratum XI; Beth Shean Strata VI, S-4; Megiddo Strata VI, VIIA and K-4; Aphek Stratum X9; Ashdod Stratum XI; Beth Shemesh Stratum III; Gezer Stratum 7; Tel Miqne-Ekron Stratum VIIA and Tel Masos Stratum II (Yahalom-Mack 2009b: Table III.7). The same types are found in Late Cypriot contexts (Catling 1964: Fig. 10:15-19).

Pins (N=2)

Pins have no eye and a simple or hooked butt, indicating that they were not used to pull a thread through perforations (Fig. 11.4:1). Rather, they would have been used to pierce soft commodities or to hold fabrics together. The single intact example measures 12.6 cm in length. (For the stick or "toggle" pin, see below). Being thin and more fragile they tend to not preserve well, usually being corroded. My guess is that pins (like drill bits) are underrepresented in the archaeological record. Pins similar to Fig. 11.4:1 have been reported from Aphek Stratum X9; Ashdod Stratum XIIIb; Beth-Shean Stratum VI; Beth Shemesh Stratum III; Bethel; Gezer Stratum 5C/A, Megiddo Strata VIIAa-VI and K-4; and Tel Miqne-Ekron Stratum VIA (Yahalom-Mack 2009b: Table III.21).

Spear-butt spikes or plowshare points (N=2)

These socketed items are most often interpreted as spear or javelin butts (Catling 1964: Fig. 16:15-18, Pl. l-n; Drews 1989: 188-189; Yadin 1963: 353-353; Yahalom-Mack 2009b: 138-139). Yadin's original interpretation may have been influenced by the points known from Greek hoplite spear (*doru*) butts of the Archaic and Classical periods (e.g. Hanson 1991: 72) and Catling (1964: 133) compared them to the later *sigynnae*. But I have found no hard evidence for the spear butt in the Levantine Bronze or early Iron Ages. The existing depictions of spears and javelins show no butt and not a single butted spear has been reported. Moreover, these bronze, socketed objects do not appear in tomb assemblages, while spearheads and javelin heads do, e.g. at the Persian Garden Tombs (Ben-Arieh and Edelstein 1977). For this reason, the plowshare point seems to be another option (cf. Ben-Dov 2018: 468-469), though other possibilities exist too.

Fig. 11.4:7 has a long prong but it doesn't seem massive enough to have been attached to a heavy plow; it may have been attached to a light plow pulled by a donkey or a person. It could also be a kind of pike, meant to incapacitate an armored opponent, without piercing the armor. Fig. 11.4:6 has a shallow point that would have encased the wooden ploughshare. It too, is fairly small. It could be a spear butt as well.

Lugged axe/adze (N=1)

This axe, or adze, (Fig. 11.4:2) seems to have been cast in a mold but not finished (Shalev 1993: 63-64). Shalev suggests that the casting was defective (a result of an insufficient tin component), resulting in an incomplete blade, that was set aside for recasting. It is, however, evidence for what local people were demanding from Iron Age I metallurgists. Miron (1992: 37) has pointed out that, for some shapes, it is difficult to differentiate between axes and adzes, but notes that the lugged axe often has one flatter side, suggesting that these were adzes. This is also the case with the present example from Tel Dan. Whether an axe or an adze, this is primarily a tool for working with timber. The lugs of the axe stopped the blade at the socket and enabled the head to be cross-lashed to the handle with sinew and/or twine. In Maxwell-Hyslop's (1949; 1953) typology this is Type II. This type may have Anatolian origins; it appeared on the coast and northern valleys of Canaan in the Late Bronze Age and became widespread in the early Iron Age (Miron 1992: 39-44; Yahalom-Mack 2009b: Table III.1 and numerous parallels in both).

Arrowheads and javelins (N=4)

The projectile points (Figs. 11.5:10-13) range from 6.0 to 9.6 cm. in total length. Two tangs are rhomboid, one is square and another is round in section (see Table 11.1). Referencing the typology of Cross and Milik (1956) we see that each of the arrowheads from Iron Age I contexts is a different type: lanceolate (I), oblanceolate (II), lonzenge-shaped (III), and oblong (VII). While all the arrowheads show some thickening along the central spine, only Fig. 11.5:12 shows a pronounced midrib and even this is not really substantial. Cross and Milik (1956: 18) proposed that the subdued midrib is a feature of the Late Bronze–Iron Age I transition. None of the points display a stem, contrary to what might be expected from an early Iron Age assemblage (Cross and Milik 1956: 18); perhaps some of these are Late Bronze Age arrowheads intended for remelting (cf. Ben-Dov 2002: 124-137; 2011: 357).

Arrowhead assemblages are usually heterogeneous in this way, even when found together in a single context. I have elected not to differentiate javelin heads from arrowheads; experimental research has shown that arrowheads can be quite large and heavy and overlap the range of javelin shapes and sizes (Miller *et al.* 1986: 189-191). Different weights and shapes are tailored to different purposes. A military archer will possess a range of arrowhead shapes and sizes for different tactical situations (close-range armor piercing vs. long-range showers for example), and warfare requires different kinds of arrowheads than does hunting. Boar requires a head different from what is needed to hunt either gazelle or quail. A recent compendium of parallels can be found in Yahalom-Mack 2009b: Table III.13.

Stick pin (N=1)

This intact stick pin (Fig. 11.5:8) is fairly small (6.5 cm. long) and of the type where the hole is closer to the butt than to the point. It has no head but the upper shaft is horizontally ribbed at regular intervals—Henschel-Simon's (1937) Type 6a. It is quite similar, though shorter, to the stick pins from Middle Bronze Age Tomb 8096 (Ilan 1996: Fig. 4.100: 14-–15). This a common type whose characteristics indicate a Middle or Late Bronze Age date (though no stick pins have been found in Late Bronze Age contexts at Tel Dan). Numerous Late Bronze Age and Iron Age I parallels for stick pins can be found in Yahalom-Mack 2009b: Table III.20.

Large rings (bangles/bracelets/anklets/handles, N=4)

Two of these (Fig. 11.5:1,3) could have fit a smallish adult arm and two could only have been worn by children. There is also the question of whether they were bracelets at all. They may be a means of keeping and transporting raw, weighted metal, or clasps for bundling hair or textiles, or handles attached to bronze vessels. As preserved, none of them are completely annular; they may all have been penannular. A number of Late Bronze Age and Iron Age I parallels can be found in Yahalom-Mack 2009b: Table III.18. Yahalom-Mack's table illustrates that this is a type where bronze was replaced by iron to a substantial degree in the Iron Age I (and see below Fig. 11.6:4).

The two pieces of Fig. 11.5:2 have been tentatively categorized as bracelet fragments, but they may be fragments of something else, such as dress fasteners, the tabs of which have broken off (cf. Maxwell-Hyslop 1971: 124-125; Harrison 2004: Pl. 27:10).

Finger rings (N=2)

One is annular (Fig. 11.5:4) the other penannular (Fig. 11.5:5). Both would fit an adult finger. The annular ring shows two overlapping tapering ends of the kind that can be adapted to finger thickness, though the ends are not open here. At least some penannular rings may have been intended to accommodate scarab seals, with wire being threaded through the scarab holes and then twisted around both ends of the ring (e.g. Eaton-Kraus 1982: 244). This penannular ring has an exact parallel from Late Bronze Stratum VII at Tel Dan (Ben-Dov 2011: 215:12). Similar, though not exactly parallel, rings come from Tel Beth Shean (Golani 2009: 616-618) and a number of other Late Bronze and Iron Ages I sites listed in Yahalom-Mack 2009b: Table III.19.

Crescent (N=1)

The crescent form is often used for earrings, but this object (Fig. 11.5:6) seems too large and heavy to be an earring. It could be part of a composite bracelet, but it may be interpreted better as a pendant (e.g. Maxwell-Hyslop 1971: 149-151; Ziffer 1990: 58*). Lacking for this interpretation, however, is the attached cylinder for the stringing of twine for suspension that is a feature of the crescents from sites such as Tell el-Ajjul, Beth-Shean, Hazor, Shechem and Ugarit (e.g. Maxwell-Hyslop

1971: 149-151; Pl. 115; Ziffer 1990: Fig. 29*). All these date to the Middle and early Late Bronze Age. As a plain form perhaps the best analogue is the much larger (23 cm. between the tips) copper crescent found with the Kfar Monash hoard (Hestrin and Tadmor 1963: 276-277, Fig. 8:3), now dated to the Early Bronze IB (Sebbane 2003).

From Tel Beth Shean Stratum S4 (=Iron Age I), a silver crescent weighing 17.17 grams has been called an earring by Thompson (2009: Fig. 11.1.4). It is quite large for an earring and its ends are quite thick. It may be better viewed as part of a pendant. Relevant too, is that it belonged to a silver hoard ("Hacksilber"), which had a monetary function, where the actual metal, and its weight, were the major considerations.

Perhaps the best identification of this object is that it is a fragment of a Middle Bronze Age belt buckle (Ziffer 1990: 75-77).[2]

Jug handle (N=1)

This broken handle (Fig. 11.5:9) has two grooves toward at the broader, upper end closer to the vessel rim. This looks like the handle of a krater (Catling 1964: Fig. 18:6) or a platter bowl (Gershuny 1985: No. 107, from Tel Zeror). But it also could be part of a lotus-handle from a jug (Gershuny 1985: No. 127 from Deir el-Balah; Spalinger 1982: 123). In any event, the motif appears to be either Cypriot or Egyptian.

Thin, fan-shaped blade (N=1)

This thin trapezoidal-shaped plate with a curved blade (Fig. 11.2) has been identified as a razor (Ben-Dov and Gorski 2009). Adhering to it were the remains of woven linen cloth, probably a wrapping to either protect the blade or the handler from the blade. An exact parallel, including cloth wrapping, comes from Beth-Shean Stratum VII (Bonn *et al*. 1993: 204-205, Fig. 149:6). Other parallels have been cited from Aphek Stratum X8; Megiddo Level K-4; Madeba and Tel Batash Strata IV and II (Ben-Dov and Gorski 2009: 81 and Yahalom-Mack 2009b: 126-127). At least three of the aforementioned sites maintained an Egyptian presence. Since it has been the subject of a special treatment by Ben-Dov and Gorski, I will not go into further descriptive detail here.

The identification of this blade as a razor stems from its resemblance to the blade portion of the *mechak*-type razor of New Kingdom Egypt (e.g. Vivian-Davies 1982). Yahalom-Mack (2009b: 126-127) has been more equivocal concerning their possible uses, and Philip (2006: 129, Item 314; Fig. 58:1), discussing a similar shaped object from the Middle Bronze Age horizon at Tell el-Dab'a, suggests that it may be a leather cutting tool. The curved blade would not be efficient for shaving. A back-and-forth cutting motion is more likely. This type of razor is probably more for cutting hair, rather than shaving.

Fig. 11.2. The razor. Note the remains of linen cloth adhering to the blade.

2 I thank Baruch Brandl for this identification.

Knife/razor (N=1)

Fig. 11.4:3 seems to be the tang end of a knife, including one possible rivet hole.[3] The tang is quite broad and the entire piece is quite thick, including both edges. There is no observable midrib. While it seems similar to the knives published from Tel Beth-Shean Stratum N-3b (Yahalom-Mack 2009a: 569-570) and Yoqne'am Stratum XVIII (Yahalom-Mack and Shalev 2005: 369-370, Fig. I.1:18, where it is identified as a Mycenaean type), and from Cyprus (Catling 1964: Fig. 10: 11-13; Pl. 11: d–g), it is probably better identified as an Egyptian razor of a New Kingdom type (cf. Yahalom-Mack 2009a: 570-571; Fig. 10.5:2).

Tweezer or tong fragments (N=3)

The items published here are straight, flat and thin (Fig. 11.4:4). Several possible uses can be hypothesized. They may be reinforcement or connecting bands for furniture or a container made of a less durable material. In this case one would expect rivets or rivet holes, which are not present on these fragments. It is more likely that they belonged to tweezers or tongs (Catling 1964: Figs. 5:8-10; 22:1-3; Freed 1982: 195; Yahalom-Mack 2009b: Table III.26 Item nos. 77 [= Tel Eitun, bronze], 78 [= Ai, iron]; Yahalom-Mack and Shalev 2009: Fig. 13:7).

Earring or hook (N=1)

The object in Fig. 11.5:7 is most likely a hooked tool of sorts, perhaps for the textile craft. One would expect it to be hafted in some way, but I am not sure how.

Lumps of metal (N=6)

These amorphous pieces (e.g. Fig. 11.4:5) are probably leftovers and spillage from the bronze/copper alloy recycling and casting process. Two other such lumps from Iron Age I metallurgy industry contexts (Loci 7122 and 7079) were analyzed by Shalev (1993: 64 and Table 1B: 5 and 17). One of these, his sample B17, was a bronze leftover from casting. The other (B5), however, was pure copper with iron and sulphur, without any tin whatsoever. This was interpreted as an ingot fragment, probably originating in the ʻArava Valley mines of Timna or Feinan.

Iron (Table 11.2)

Eight iron artifacts were recovered from the Iron Age I levels. Two are from Stratum VI contexts, one from a Stratum V context and five from Stratum IVB contexts. Iron corrodes more quickly and the corrosion tends to obscure the objects' salient features. I have weighed them but the items that are heavily corroded probably weigh more than the original object and those that have been cleaned of corrosion (all the items illustrated in Fig. 11.6) probably weigh in at less than their original weight.

Knife (N=2)

These iron artifacts appear to be knives because they seem to have one cutting edge, a flattened edge opposite the cutting edge, and they lack the curvature of what typically defines a sickle. The item not illustrated (Reg. no. 1723/1) is a handle fragment, the rivets of which are of copper alloy—what is termed a "bimetallic" knife (Yahalom-Mack 2009b: 130). It has parallels at Gezer Tomb 58; Tel Miqne-Ekron Strata V-VI; Beth Shemesh Stratum III, and Tel Qasile Stratum XII (Yahalom-Mack 2009b: Table III.12). Fig. 11.6:2 consists of part of the handle core and the butt end of the blade.

At the date of this writing, Yahalom-Mack (2009b: 129-131) presents the most comprehensive list of iron knives in the southern Levant. Quite similar to the Iron Age I knives from Tel Dan are examples from: Yoqne'am Stratum XVII (Yahalom-Mack and Shalev 2005: Table III.1.10-11, Fig. I.28:18); Megiddo Stratum VIA= F-5 (Sass 2000: Fig. 21.1:4; and Harrison 2004: Pl. 35:9-10); and

3 This item has also been called, tentatively, a handle (Shalev 1993: Table 1B:4).

Beth-Shean Stratum S-2, S-1b (Yahalom-Mack 2009a: 570, Table 10.1: 28, Fig. 10.4:4). It is possible that some or all of the bone and ivory plaques (Chapter 12 this volume, Figs. 12.3:6-7) originate in the handles of these knives.

Scalpel (N=1)

This is an unusual find (Fig. 11.6:3). It has one curved, or angled, cutting edge and one flat side. Its thick tang (broken?) would have been hafted into a hollow bone or wooden handle. I have not found parallels for this item.

Miniature pick-axe (N=1)

This artifact has two working edges, one vertical and the other horizontal (Fig. 11.6:1). A central socket would have housed the handle. The socket is round in shape. It is what Miron (1992: 80-88) would have called a double tool, his Group B, where each blade served a different function (for a brief, updated discussion see Yahalom-Mack 2009b: 116-120). Unlike those in Miron's typology however, this one is of iron and its form is not represented in Miron's corpus. While all of the other double tools are either double axes or axe-adzes, this looks like a pick-axe, though quite small. It is unique so far, and this particular version does not seem to occur in Cyprus either (Yahalom-Mack 2009b: 119, Table III.3).[4]

What would such a small tool with two working edges be used for? It looks like a small pick of the kind used in archaeological excavations, though it is even smaller than these. It may have been useful for light cultivation work. On the other hand, one cannot rule out a ritual role, as a miniature, symbolic artifact. One of the hoards from the "ashlar building"' of Late Cypriot period Enkomi was completely comprised of miniature objects (Catling 1964: 288-289).

As an iron tool from the Iron Age I this pick is unique. Shape-wise, the nearest form is that of the near-pristine steel pick-adze published from Mt. Adir, from what was reported to be an early Iron Age I deposit (Davis *et al.* 1985). The present writer has cast doubt on its context and date (Ilan 1999: 182-184), but the context of the Tel Dan pick—a sealed Iron Age IA (Stratum VI) pit context—leads me to accept that the Mt. Adir pick is indeed *in situ*, though it dates somewhat later, to the Iron Age IB.

It is also worth pointing out at least one parallel in bronze that has gone unnoticed in various metallurgical studies. This was found in the LB II Persian Garden cemetery (Ben Arieh and Edelstein 1977: Fig. 17:18. P. XVIII:7). It is even smaller than the Tel Dan example, at approximately 5.2 cm. in length, and both its blades are pointed, or pick-like.

Ploughshare? Handle? (N=1)

This object has corroded severely since its excavation and it is difficult to know its precise form beyond noting its massiveness and the fact that it has corroded in concentric layers, probably reflecting the way it was constructed (also in layers).

Nails (N=2)

These seem too large to be rivets; they are more likely to be nails (Fig. 11.6:5-6). Rivets and nails are quite common in the Iron Age I, more so in copper alloy/bronze, cf. Beth-Shean Strata VII-VIII and S-3a, S-4-5 (James and McGovern 1993: Pl. 153; Yahalom-Mack 2009a: Fig. 10:1), Deir el-Balah (Dothan and Nahmias-Lotan 2010: 190, Fig. 15.3) and Megiddo K-4 (Sass 2000: Fig. 12.25:3—bronze).[5] Iron nails are much rarer, being known at this point only from Ashdod Stratum XII (Dothan and Ben-Shlomo 2005: 165) and Ai (Marquet-Krause 1949: 73, Pl. 39). My guess is that being smaller, thinner artifacts, and being made of highly corrosive iron, they have not preserved well and have therefore gone unnoticed or unreported.

Large ring (N=1)

This annular ring (Fig. 11.6:4) is much too large to be a finger ring and too small to be a bracelet.

4 Somewhat similar double sided tools from Late Cypriot period Cyprus can be found in Catling 1964: Fig. 9:8-9 and Pl. 8.

5 For others from Megiddo, Jatt, Ashdod and Gezer see Yahalom-Mack 2009b: Table III.25.

It may be a clasp for hair or for some other soft material that needed to be gathered. Such rings are most often found in burial contexts, at least in the southern and coastal part of the Levant, which probably suggests that it was an item of personal attire. This is one of the earliest types for which iron becomes the preferred metal in the Iron Age I (Yahalom-Mack 2009b: 139-140, Table III.18 and references there).

Other metals (Table 11.3)

Three objects of silver, lead or tin were recovered from the Iron Age I contexts.

"Tassle" earring (silver, N=1)

This"tassel" earring (Fig. 11.6:7), in the terminology of Maxwell-Hyslop (1971: 225), originally consisted of a crescent that was longer and thinner at one end than the other: it was hung in the earlobe by this thinner end, which was then bent downward to close the loop. Such crescents or "lunates" are ubiquitous in Late Bronze Age and early Iron Age assemblage in the Levant (Sass 1997: 243). Both ends of the crescent are missing, as are several nodules from the lower cluster (grapes?). It is this cluster that makes the earring special.

Sass (2002: 22-24) has described in detail this unusual type in his discussion of the Iron Age I Wadi el-Makkuk hoard from the Judean Desert. The Tel Dan earring shows the same stem at the bottom of the loop and the same four platelets at the base of the stem. The first row of granules was soldered to these platelets.[6] The Tel Dan earring is missing a number of granules and the existing arrangement consists of two granules in the center, at the meeting point of the four platelets, and then eight or nine granules soldered in a circle around the two in the center. Minute scars on the exposed nodules can be seen under magnification, indicating where granules came off.

This earring type is unusual and apparently confined to the Iron Age I and early Iron Age IIA. Parallels have been cited from Iron Age I tombs at Tell el-Far'ah (S) and Madaba, an unstratified context at Tawilan, and the Hathor temple at Timna (Sass 2002: 22-24 and references there). Of the parallel earrings, those from Tell el-Far'ah (S), Madaba, and Tawilan are all gold or electrum. The earring from Timna is the only bronze example. The Tel Dan earring appears to be the only silver example.

Lead coil (tin?)

Coils or rods of this size and thickness (Fig. 11.6:8) are known from most of the larger Iron Age I sites of the southern Levant. It would appear to be a fragment of scrap intended for melting.

Lead snake (?)

Metal snakes (if that is what this is, Fig. 11:9) are a frequent occurrence in the metal object repertoire. This one may have been held in the hand of a figurine of another material. Examples of bronze or copper alloy are reported from Late Bronze Age Hazor Stratum 1 (Yadin *et al*. 1961: Pls. 278:20, 339:5-6), the Timna Hathor Temple (Rothenberg 1988: Fig. 53:3), Gezer Stratum 9 (Dever *et al.* 1986: Fig. 51:2) and Tel Mevorakh Stratum X (Stern 1984: Fig. 3.1), to name some prominent examples. Stern (1984: 22-23) has discussed some of the ritual contexts of metal snake images, and some of their cultural and religious implications.

6 Sass' description of the Wadi el-Makkuk earring cluster is only partially relevant to the Tel Dan earring. The Tel Dan earring does not seem to have the same arrangement of cords and strands.

Concluding Remarks

While it has been suggested that many of these objects may have been scavenged from earlier contexts, most prominently tombs, it should be pointed out that there is nothing in the metal artifact assemblage that requires an Early Bronze or Middle Bronze Age date. Everything either could, or must, date to either the Late Bronze Age or the Iron Age I. Moreover, at least one of the objects appears to be an unfinished blank, more indicative of local manufacture.

This assemblage of metal artifacts is very similar to those of the 14^{th}-11^{th} (even 10^{th}?) centuries BCE strata at Beth-Shean, Megiddo, Hazor, Deir el-Balah, Ashdod and Tel Miqne-Ekron. Many of these sites show the same combination of scavenged earlier metal types, contemporaneously manufactured artifacts (e.g. the iron objects) and a recycling metallurgy industry. At the same time, most of the metal artifacts also have good parallels in Late Cypriot period Cyprus, and some are almost certainly Egyptian.

The metallurgy industry of Tel Dan has been the subject of preliminary research (Ben-Dov 2018; Biran 1989; Ilan 1999: 125-131; Shalev 1993; Yahalom-Mack 2009b). It will be presented in fuller form by R. Ben-Dov in a future publication. For this reason, slags, prills and other material byproducts of the metallurgy process are not published in this volume.

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The following tables of inventory are organized in the same order as the sections describing the metal objects: three separate tables itemize objects of different composition (bronze, iron and other). Each table is ordered by functional category: tools, weapons, jewelry and varia.

Table 11.1. Inventory of copper alloy/bronze objects from Iron Age I contexts.[7]

Object	Reg. no.	Locus	Phase/ Stratum	Weight (gr.)	Description	Illust.	Analysis[8]
Chisel	20133	8060	M9b/ VA	12.91	Intact; nail-shaped head; two lengthwise grooves along the shaft, up from the two flat sides of the chisel edge; little corrosion	11.3:1	X
Awl	25120	4710	B9-10/ V	4.74	Intact; square section, thicker butt; no corrosion	11.3:2	—
Awl/spatula	23667/1	7114	B8/ IVB	15	Intact; square section; handle end flattened; no corrosion	11.3:5	X
Awl	23957	7169	B11-12/ VI-VIIA1	+10	Broken at both ends; square section; mild corrosion	11.3:3	X
Awl	23991/5	7052B	B9-10/ V	+5	Upper shaft; point broken	11.3:4	—
Awl or drill bit fragments	844/1	164	B8/ IVB	0.92	Small fragments of shaft	—	—

7 Since the objects are published to a convenient scale (usually 1:2), there is little point in including length and width measurements for each object. The ranges are noted in the discussion.

8 Metallurgical analysis of these items was carried out by Shalev (1993) and Yahalom-Mack 2009b: 211-255.

Object	Reg. no.	Locus	Phase/ Stratum	Weight (gr.)	Description	Illust.	Analysis
Drill bit	25141/1	4722	B11/ VI	2.52	One end pointed, the other flattened; folding and annealing visible; some corrosion.	11.3:6	—
Drill bit	18051	4202	B8/ IVB	0.94	Intact; short bit with two pointed ends	11.3:7	—
Drill bit	6235	432	B9-10/ V	3/12	Intact? Rhomboid section; corroded	—	—
Needle	25122/1	4717	B9-10/ V	2/32	Top of eye missing; dull tip	11.3:9	—
Needle	13547/1	3127	Y	11.74	Intact; round section; some corrosion	11.3:8	—
Needle	20132/6	8059	M9b/ V	23.83	Intact; round section	11.3:11	—
Needle	852	174	B9-10/ V	1.08	Five fragments of small needle; corroded	—	—
Needle or pin	23828/1	7141a	B8/ IVB	4.19	Two fragments of shaft; ovoid section; mild corrosion	—	X
Pin	13705	3165	Y3b/ IVB	+0.55	Fragment	—	—
Needle	24114/1	7020	B11/ VI	10	Intact; bent; mild corrosion	11.3:10	X
Pin, hook-top	23682	7117	B8/ IVB	4	Very end of hook is broken; tip is flattened	11.4:1	
Plowshare point	23768	7125	B9-10/ V	38	Intact; moderate corrosion; short type	11.4:6	X
Ploughshare point	23775	7133	B9-10/ V	121.55	Intact; no corrosion; long type	11.4:7	X
Lugged axe	23755	7131	B9-10/ V	324	Intact; worn (rounded edges); moderate corrosion	11.4:2	—
Arrowhead	18059/2	4202	B8/ IVB	10	Intact; rhomboid tang section; moderate corrosion; Cross and Milik 1956 Type III	11.5:13	X
Arrowhead	23450/9	7065	B9-10/ V	8	Intact; square tang section; no corrosion; Cross and Milik 1956 Type II	11.5:10	X
Arrowhead or javelin head	20134	8060	M9b/ VA	12.94	Missing tip; round tang section; shallow midrib; moderately corroded; Cross and Milik 1956 Type I	11.5:11	—
Arrowhead	10265	675	B9-10/ V	3.61	Intact; rhomboid tang section; linear midrib; no corrosion; Cross and Milik 1956 Type VII	11.5:12	—
Stick pin	25102/1	4712	B11-12/ VI-VIIA1	3.24	Complete; worn but in good condition; eye near center; handle has horizontal lines	11.5:8	—
Bracelet or buckle clasp	20075	8018	M9a/ IVB	14.22	Half a bracelet, bent toward the convex, resulting in a "bicycle handle" profile; lenticular cross section	11.5:1	—

Object	Reg. no.	Locus	Phase/ Stratum	Weight (gr.)	Description	Illust.	Analysis
Bracelet	10512	1209	B11/ VI	+6.37	Half a bracelet; lenticular cross section	—	—
Bracelet, penannular, or garment clasp	23384/6	7061	B9-10/ V	2.62	Two end fragments that do not join; round section; little corrosion	11.5:2	—
Bracelet, penannular, or garment clasp	25064/1	4713	B9-10/ V	3.02	Two joining fragments (not ends); round section; no corrosion	11.5:3	—
Finger ring	25170/1	4722	B11/ VI	2.29	Intact; round section; thicker and thinner portions; some corrosion	11.5:4	—
Finger ring, penannular	25086/2	4713	B9-10/ V	3.28	Almost intact—small piece of tip missing; some corrosion	11.5:5	—
Hook? Earring?	23712	7126	B9-10/ V	2.13	One end hooked, the other end with a rhomboid shape	11.5:7	—
Crescent	9530	584	B8/ IVB	10.43	Intact, no corrosion	11.5:6	—
Jug handle	18101	4202	B8/ IVB	+17.90	Fragment of upper part of handle; lengthwise grooves; mild corrosion	11.5:9	X
Razor	24898	7240	B11/ VI	21.93	Trapezoidal shape; no signs of breakage; no rivets or holes; remains of cloth; published by Ben-Dov and Gorski (2009)	11.2	—
Knife/razor	24083/20	7015	B8/ IVB	+44	Broken; tang and one rivet hole, much of blade missing; worn and corroded	11.4.3	X
Tweezers or tongs	23392	7060	B9-10/ V	+13	Broken strip; some corrosion; may be one with 23383 (illustrated together in figure 11.4:4)	11.4:4	X
Tweezers or tongs	23383	7060	B9-10/ V	+5.20	Broken strip; some corrosion; may be one with 23392 (illustrated together in figure 11.4:4)	11.4:4	X
Tweezers or tongs	24965/2	7273		+0.69	Broken strip, bent	—	—
Lumps	6268	436		4.04	Three small lumps; corroded	—	—
Lump	9649	590	B9/ VA	20.16	Broken fragment; flattened section; rounded edges; some corrosion	11.4:5	—
Lump	10473	1210	B11/ VI	6.08	Fragment; corroded	—	—
Lump	13057	3012	Y6/VI-VIIA1	14.38	Highly corroded; possibly cast	—	—
Lump	9418	561	B8/ IVB	2.21	Small fragment	—	—
Lump	23864	7152	B8/ IVB	12.36	Moderate corrosion	—	X

Table 11.2. Inventory of iron objects from Iron Age I contexts.

Object	Reg. no.	Locus	Phase/ Stratum	Weight	Description	Illust
Knife	1723/1	374	B11/VI	+11.21	Broken, handle section, two bronze rivets, moderately corroded	—
Knife handle core	9545	589	B8/ IVB	59.38	Handle core of a dagger or knife with a cast hilt (if a dagger = Shalev 2004 Type 7); two aligned rivets; broken near beginning of blade; corroded	11.6:2
Scalpel	10216	674	B8/ IVB	3.56	Small part of tang missing; corroded; curved blade (cf. Philip 2006: 78-79 Type 2)	11.6:3
Miniature pick-axe	13537	3127	VI	45.06	Complete; some corrosion	11.6:1
Plowshare? Handle?	9489	2742	T15/ V	104.43	Massive cylinder with highly corroded exterior and less corroded central core	—
Nail or rivet	23656	7114	B8/ IVB	+12.56	Head section and upper shaft; lower shaft/point missing	11.6:5
Nail	9422	576	B8/ IVB	7.66	Complete; some corrosion	11.6:6
Ring	10255	663	B8/ IVB	15.50	Intact, some corrosion	11.6:4

Table 11.3. Inventory of silver and lead objects from Iron Age I contexts.

Object	Reg. no.	Locus	Phase/ Stratum	Weight	Description	Illust.
'Tassle' earring	9538	587	B8/ IVB	+3.62	Silver; missing both ends of crescent and bottom nodules of cluster; round section	11.6:7
Snake figurine?	23029	4611	B9-10/ V	+25.90	Lead? Two fragments, almost complete; white; corroded; perhaps part of a composite figurine?	11.6:9
Bent rod	25207	4732	B11-12/ VI-VIIA1	9.16	Tin? Lead? Bent rod fragment; ovoid section	11.6:8

Fig. 11.3. Bronze objects: chisel, awls, drill bits and needles.

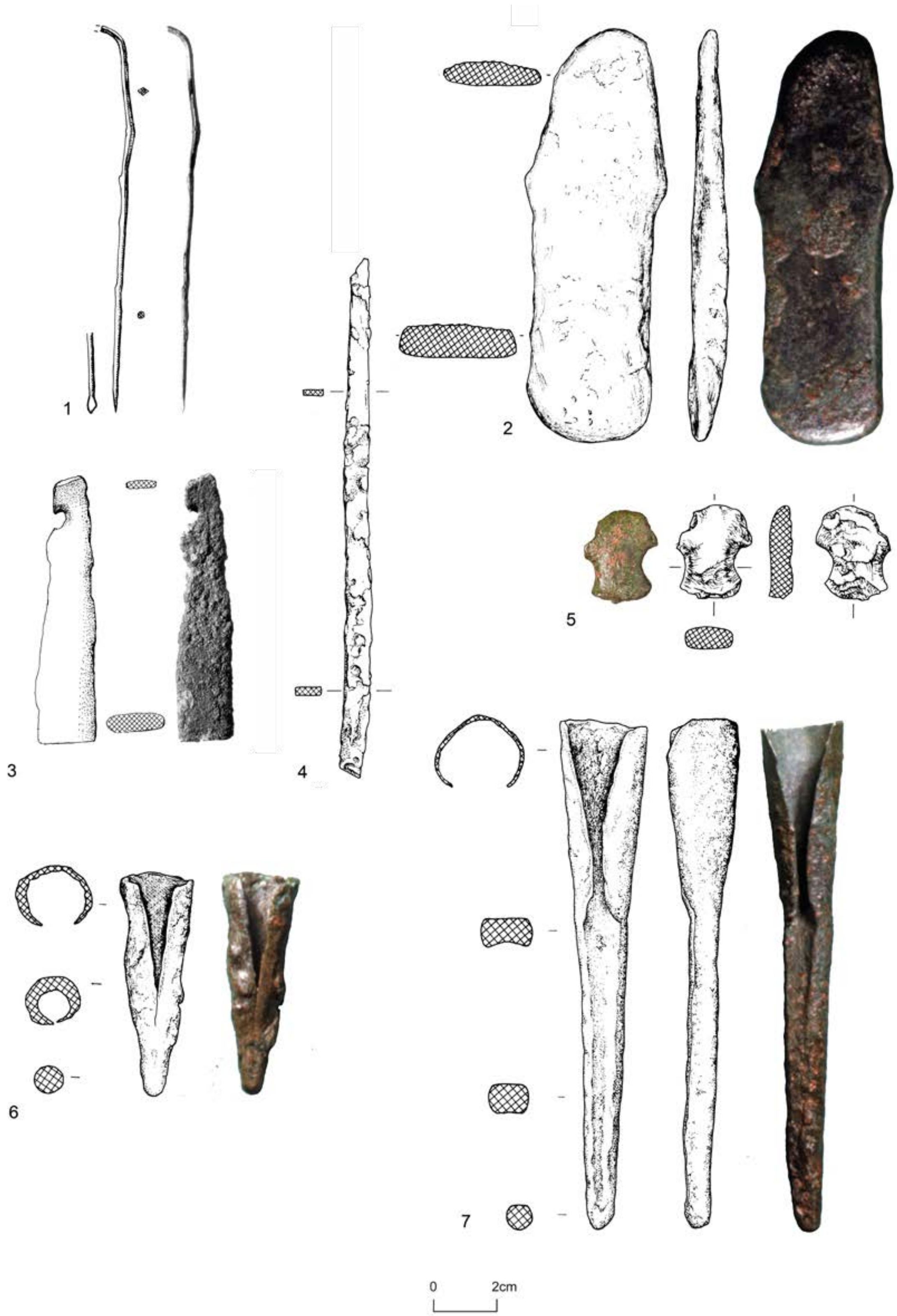

Fig. 11.4. Bronze objects: pin axe, knife, tweezer, metal lump, plowshare points (or spear butts)

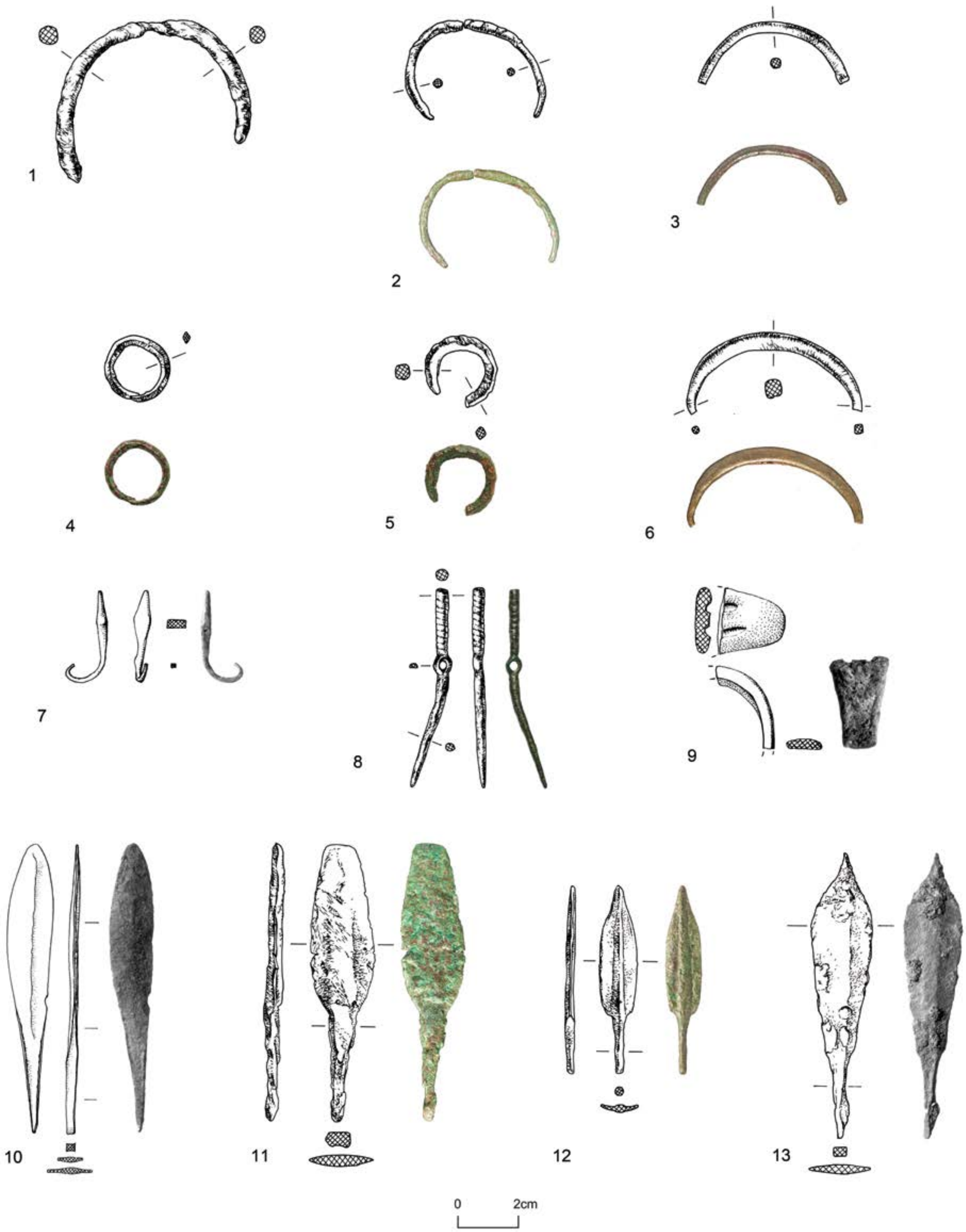

Fig. 11.5. Bronze objects: rings, crescent, hook, stick pin, jug handle, arrowheads.

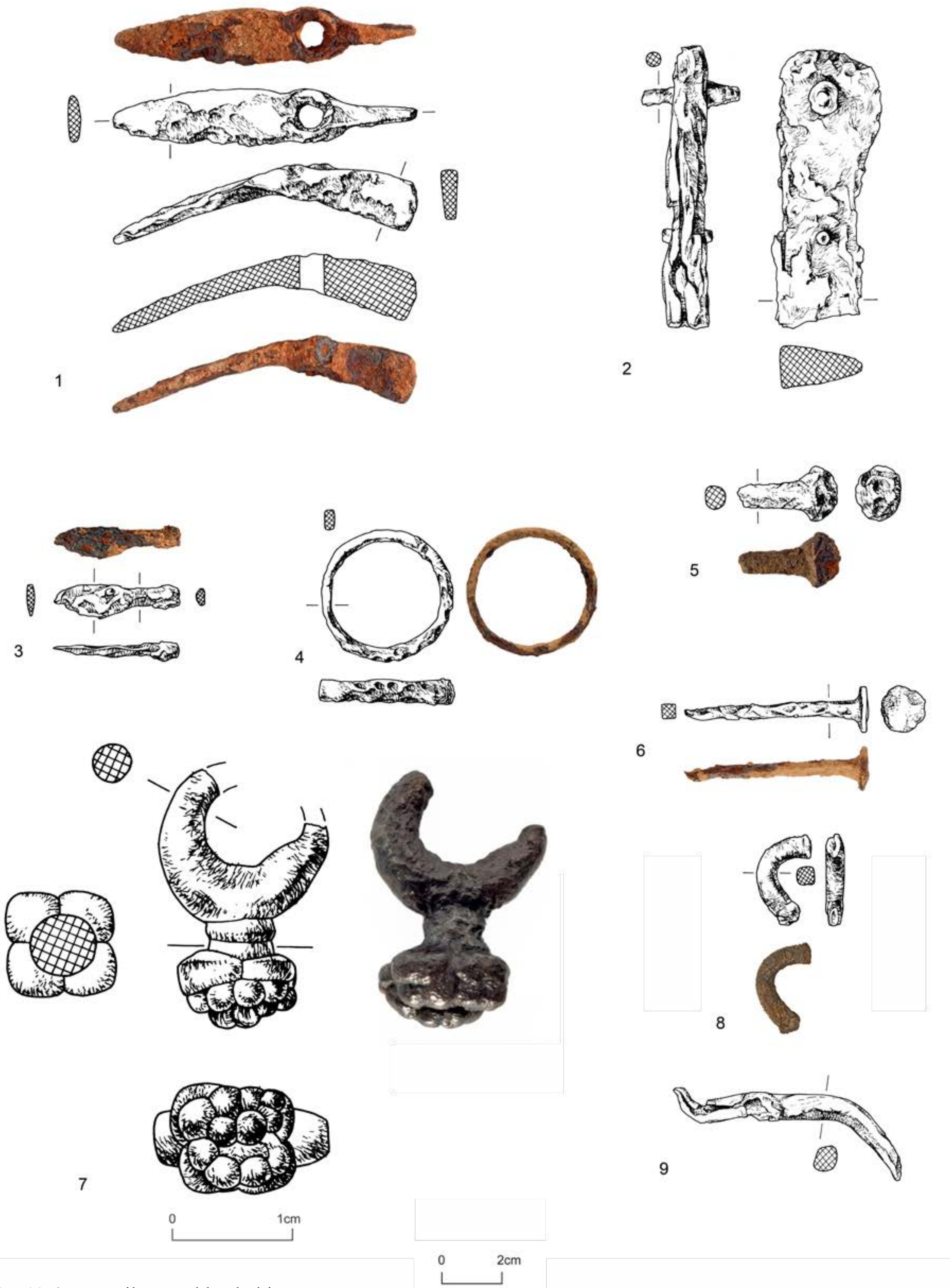

Fig. 11.6. Iron, silver and lead objects.

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CHAPTER 12

THE BONE AND IVORY OBJECTS[1]

An assemblage of 25 modified bone and ivory objects was recovered from clear Iron I contexts, (Table. 12.1) although it is likely that some of them were manufactured in the Late Bronze Age or even earlier, representing either heirlooms, intrusions (via pit collapse, for example), or scavenged objects.

The majority (N=16) of the pieces were manufactured on mammalian bone: two were made of antler, one from a wild boar tusk and five items were ivory. Using criteria outlined in Espinoza and Mann (1992) for distinguishing between hippopotamus and elephant ivory, all ivory was identified as deriving from hippopotamus (*Hippopotamus amphibius*). Bone, being cheaper and more readily available, was more commonly used, especially for more utilitarian items. Moreover, bone is more versatile since it is easier to carve and generally less resistant to cracking and splitting (MacGregor 1985). Ivory was reserved for more luxurious items such as knife handles.

Most of the non–ivory bone objects appear to have been made from the bones of large mammals — cattle in particular. Dense, straight bones were preferred, such as the metapodials and lower fore and hind limbs (radius, ulna and tibia). This fits the pattern observed at both Ashkelon and Tell es–Safi, and seems to be relevant for most sites and periods (Horwitz *et al.* 2006: 169-170; Wapnish 2008: 590).

Notched Rib (N=1, Fig. 12.5:2)

This notched segment of bone is made of a cattle (*Bos taurus*) rib with fresh breaks on either end. The surviving piece has a maximum length of 8.7 cm, a maximum width of 3.1 cm and a maximum thickness of 7.0mm. There are six short notches on the one edge of the rib, and *ca*. ten on the other edge. One end of the rib has been cut obliquely and two additional notches can be seen on this edge.

The notches are quite fine with the longest being *ca.* 3.0mm long. They occur along the parallel edges, usually at more or less equal intervals of 8-10 mm. In three cases, two adjacent (*ca.* 1 mm apart) notches are discernible. Most of the notches on either edge line up with those on the opposite side. In addition to the notches, a number of fine scratches are in evidence adjacent to the notches, perhaps signs of use or a result of polishing.

The notched rib brings to mind the notched scapula associated with Sea People assemblages in the Levant and Cyprus (Zukerman *et al.* 2007). Notched scapula are primarily an Iron I phenomenon in the southern Levant, with parallel occurrences in Cyprus beginning with Late Cypriot IIC. Until now the northernmost example cited comes from Tel Kinrot (Marom *et al.* 2006).

This notched cattle rib differs in several ways from the notched scapula. Notched scapulas are most often scored on the ventral aspect while our rib is notched along its edges.[2] The notches in the Tel Dan rib are not nearly so coarse and deep as is usually the case with notched scapula. Does

1 I thank Liora Kolska Horwitz for discussing with me her insights regarding this material, and particularly for identifying the ivory as hippo ivory and for providing the magnified photo in Fig. 12.2.

2 Edge scoring is more characteristic of the Cypro-Archaic period on Cyprus (Webb 1977).

the object under discussion fall into the same category, with the same purpose as the notched scapula? This question must remain open for the time being (and see the description of the notched boar's tusk below). If the notched rib from Tel Dan does belong to the same functional category it becomes the northernmost example in the southern Levant, though it would not be surprising for similar items to turn up at sites even further north.

As to the object's function, several possibilities have been suggested (for these see Zukerman *et al.* 2007 and references there). The most frequent hypothesis posits that it was a ritual object, perhaps associated with divination. The scapula has also been viewed a musical instrument (rasps or scrapers) or part of a musical instrument (Marom *et al.* 2006). And it has been proposed that they may be accounting or tallying devices, perhaps in the service of ritual practice (Zukerman *et al.* 2007: 70-71). Finally, it may be a weaving utensil, such as a heddle bar for a standing loom (Zukerman *et al.* 2007: 71-72), though its arch makes this less likely, or more likely a spool for the winding of yarn.

Notched Boar's Tusk (N=1, Fig. 12.5:1)

This item is a complete upper right tusk (canine) of a wild boar (*Sus scrofa* fer.), undoubtedly an adult and probably a male, given the size of the tusk; 18cm along the outer circumference and 10cm along the inner circumference; with a basal circumference of the tooth, at the root, of 8cm. The tusk is heavily abraded on the medial aspect of the apical portion of the tooth (the whetting surface), penetrating the dentine where it has rubbed against the lower tusk.

The tooth is unmodified except for deep notches along its medial and lateral edges, beginning a third of the way up from the tooth root. Five notches are visible on the medial edge and six or seven along the lateral edge. The notches are cut to varying depths (1-5 mm) and are not located at regular intervals or opposite each other. The tooth enamel has been damaged on the lateral aspect due to the notches but otherwise is intact.

The damage observed on the tooth does not relate to butchery activities. In terms of function, this tusk was clearly neither a musical instrument nor a weaving tool (see the above discussion pertaining to the previous notched artifact). The object's context is of little help since it appears to comprise a standard room assemblage. The ritual explanation must be entertained, as must some form of tallying in the context of commercial transaction, gaming or sporting activities. Alternately, the notches may represent preparation for the manufacture of an object, such as an ivory inlay, where sections of the enamel and thick dentine, were to be used. This tusk appears to be a unique example so far, but as is often the case, the identification of more examples is anticipated as researchers become aware of the practice.

Remains of wild boar are rare in Iron Age sites in the Levant (Vila and Dalix 2004), a factor which is undoubtedly associated with the rarity of ornaments and artifacts manufactured from this species. Tel Dan is no exception, with Greer *et al.* (Chapter 17 this volume) reporting only two pig bones in the Iron Age I levels, and few (1%) in the Iron Age II. However Vila and Dalix (2004) have documented quite extensive hunting and consumption of wild boar in Late Bronze Age Ugarit (Syria), which they attribute to ritual practices associated with the worship of Ba'al. However, remains of domestic pig are rare at Ugarit, suggesting that a marked distinction was made between the two species. Perhaps the best–known use of modified boars' tusks in the Mediterranean region are the Mycenaean boar's tusk helmets, dating to *ca.* 1450-1300 BC (Borchhardt 1972).

Dagger, Knife, or Mirror Handles
(tang insertion type, N=3, Figs. 12.3:1-2, 5)

Dagger, knife or mirror handles can be made of single long bones, ivory tusks or antlers that are modified to accommodate the tang. All three of the examples illustrated here are made of hippopotamus ivory and were carved and polished to create a comfortable grip, i. e. they are both narrower at the mid-section and broader at the butt and blade ends. Given their length and elongated shape, it is likely that they were manufactured on the straighter incisors rather than the curved canine teeth.

Fig. 12.1. Ivory dagger handle, note repairs.

Fig. 12.2. Closeup of ivory knife or dagger handle.

The handle illustrated as Fig. 12.3:1 (length: 99.4mm; width: 25.5 at butt and 18.3mm on shaft; depth: 14.5mm), has a rounded, slightly protruding butt end and a narrower shaft[3]. The piece is not large, and does not seem robust enough to have been attached to a heavy–duty weapon or tool. It looks very much like the handle of a modern tableware knife, though it could be a mirror handle, for example. It has a slot to accommodate a short, flat tang (some of which is still present) and it preserved one centered rivet hole. The rivet hole may have been the only one, but it may also have been one of three (in which case the handle was two centimeters or so longer). If it is a dagger handle it belongs, therefore, to either Shalev's (2004) Type 1 or Type 6F. In this case it is datable to the Middle Bronze Age or the beginning of the Late Bronze Age (Shalev 2004: 7, 40). If it is a knife handle the riveting might be compared to that of the iron knife handles from Tel Qasile Stratum XII (Mazar 1985: 6-8) and Ekron (Dothan 1989), though the handle here is not of the same standardized form and bone type. It is most likely to be a mirror handle. The best parallel that I have come across was found in a Mycenaean tomb at Pylos, recently excavated by J. L. Davis and S. R. Stocker of the University of Cincinnati (Wade 2015). The place that seems to coincide with the end of the tang is incised with a line around the circumference. Most intriguing is an ancient repair showing a finely etched inlay of bone set into a sort of "plastic wood". The bone inlay has a more yellowish color than the white ivory of the handle itself and the faux wood filler is of a darker color (Fig. 12.1). Clearly the handle was valuable enough to invest an effort in its repair.

Fig. 12.3:2 (length: 126.9mm; width: 23.0mm; depth: 17.2mm) shows remnants of enamel as parallel, slightly raised lines running along the length of the handle (Fig. 12.2). This suggests that the enamel of the hippopotamus tooth was not totally stripped but left, probably after smoothing, perhaps to enhance the grip.

The tang was accommodated by a cylindrical boring down the center, which means that the tang would have been round, square or rhomboid in section (cf. Ben-Dov 2002: Fig. 290: 119; 2011: Fig. 215:4). There were no rivet holes preserved (rivets being unnecessary in this form of hafting) and the breakage suggests that this was the handle of a hooked tang dagger—Shalev's Type 3 (cf. Ben-Dov 2002: Fig. 290: 119; Shalev 2004). This type is most frequent in the LBII and may have Cypriot origins (Shalev 2004: 20).

Fig. 12.3:5 (length: 29.3mm; width: 18.4mm; depth: 10.2mm) is the most fragmentary of the three handles; only a fragment of the butt–end is preserved. It is decorated with incised lines that delineate registers of sequential concentric circles.

3 This handle was the subject of a separate publication: see Ilan 2016.

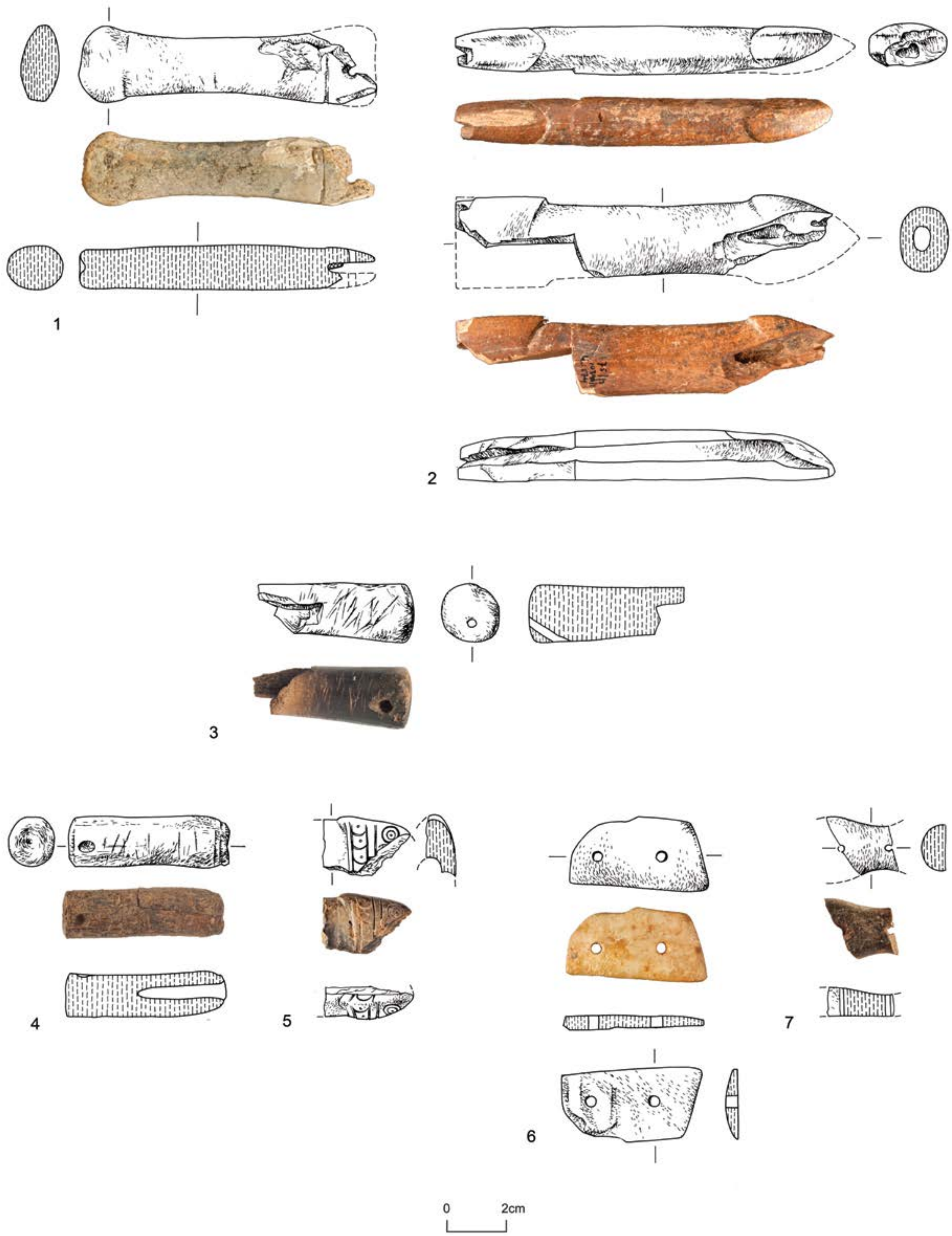

Fig. 12.3. Bone and ivory objects: handle fragments.

Slab of a composite handle (N=1, Fig. 12.3:6)

This piece has been manufactured on a long bone shaft of a mammal. One end preserves the original smooth end while the other is a fresh break. The inner surface of the piece has been smoothed and is flat while the other, outer aspect, is convex, suggesting a matching piece on the other side (length: 46.8mm; width: 23.4mm; depth: 4.8mm). It has two perforations to accommodate either rivets or dowels. It seems most likely to have been attached to a metal tang or hilt, perhaps of a full–tanged knife or dagger hilt. But attachment to a wooden base of some other object, with a dowel, cannot be discounted. The slab is a bit broken at one end but shows four finished edges that form something resembling a trapezoid. One of the long edges, however, was carved with a jogged inset, apparently to conform to the underlying base or core. This was only one piece of what was a composite object with multiple plaques. A dagger or knife is one option—the most likely—but it may also have belonged to a sword handle, a piece of furniture or been part of a musical instrument, for example. If it does belong to a dagger or sword it would be from a handle of Shalev's Type 6, 7 or 8—daggers with hilt stubs, cast hilts or swords, respectively. Contemporaneous parallels come from Megiddo Stratum VI and Stratum K-4 (Sass and Cinamon 2006: 398-399, Fig. 18.32: 682 and Cyprus (e.g. Catling 1964: Fig. 10:13—an example of a similar bone plaque still attached to a knife handle).

Cylinders (N=5, Fig. 12.4:4-8)

The 'cylinders' were made on the long bones of medium to large mammals. It is usually difficult to identify the species of the bone due to the extensive nature of modification but all five appear to have been made on long bones of medium mammals (i.e. sheep/goat size); at least two can be definitely identified as metapodial shafts. Generally, the bone shaft was first sawn part way through and then snapped (what is called the "groove–snap" technique) following which the central medullary cavity was hollowed out and in some cases, smoothed. The cylinders in this assemblage vary in diameter, thickness and length, a fact which may indicate a variety of uses. Three of the cylinders are complete: Fig. 12.4:4 (length: 62.9mm, width 12.1mm), Fig. 12.4:6 (length 21.8mm, width 25.3mm), and Fig. 12.4:5 (length 31.6, width 16.4mm).

Two additional cylinders are decorated with a typical incised cross–hatch design. Both are complete (Fig. 12.4:8, length: 18.5mm; width: 12.2mm; Fig. 12.4:7, length: 40.9mm; width: 12.3mm).

The longer cylinders may be metal tool handles (below) or kohl tubes (cf. Bovarski 1982: 222). The more massive, undecorated cylinders (Figs. 12.4:5-6) may be hinges or parts of handles, or blanks intended for further modification. Fig. 12.4:6 shows striations at the edges which suggest movement—hence the aforesaid functional interpretations.

Similar objects have been published from Megiddo Stratum VI (Loud 1948: Pls. 196: 4-5; 197:1-13; Harrison 2004: 80, Pl. 29:13, 15) and from Tel Keisan Stratum 9c (Briend and Humbert 1980: 82:15). A group of smaller decorated cylinders was found with a whorl, aligned together, supposedly lacking the original core rod, in Tomb 3018F at Megiddo, dated to the LBI (Loud 1948: Pl. 197:2). This configuration was interpreted as a spindle and whorl assemblage, with all the cylinders being part of one rod. If this is so, it would explain most of the hollowed–through bone cylinders. However, as I understand the spinning process, this does not seem likely. Short, decorated cylinders have been called beads (e.g. Guzowska 2009: 408, Item No. 7 and Fig. 12.10:7) and perhaps the bone assemblage in Megiddo Tomb 3018F represents a bead necklace, despite the straight alignment. Or perhaps they are associated with another aspect of the textile craft—parts of heddles, for example. In any case, they seem too delicate to have been subjected to much in the way of force or pressure.

Handles (N=2, Fig. 12.3:3-4)

Two cylindrical bone objects are closed at one end, have small openings at the other and are likely to have served as handles for small tools—awls and knives in particular (cf. Loud 1948: Pl. 196:6). They are both made of deer antler. The piece illustrated in

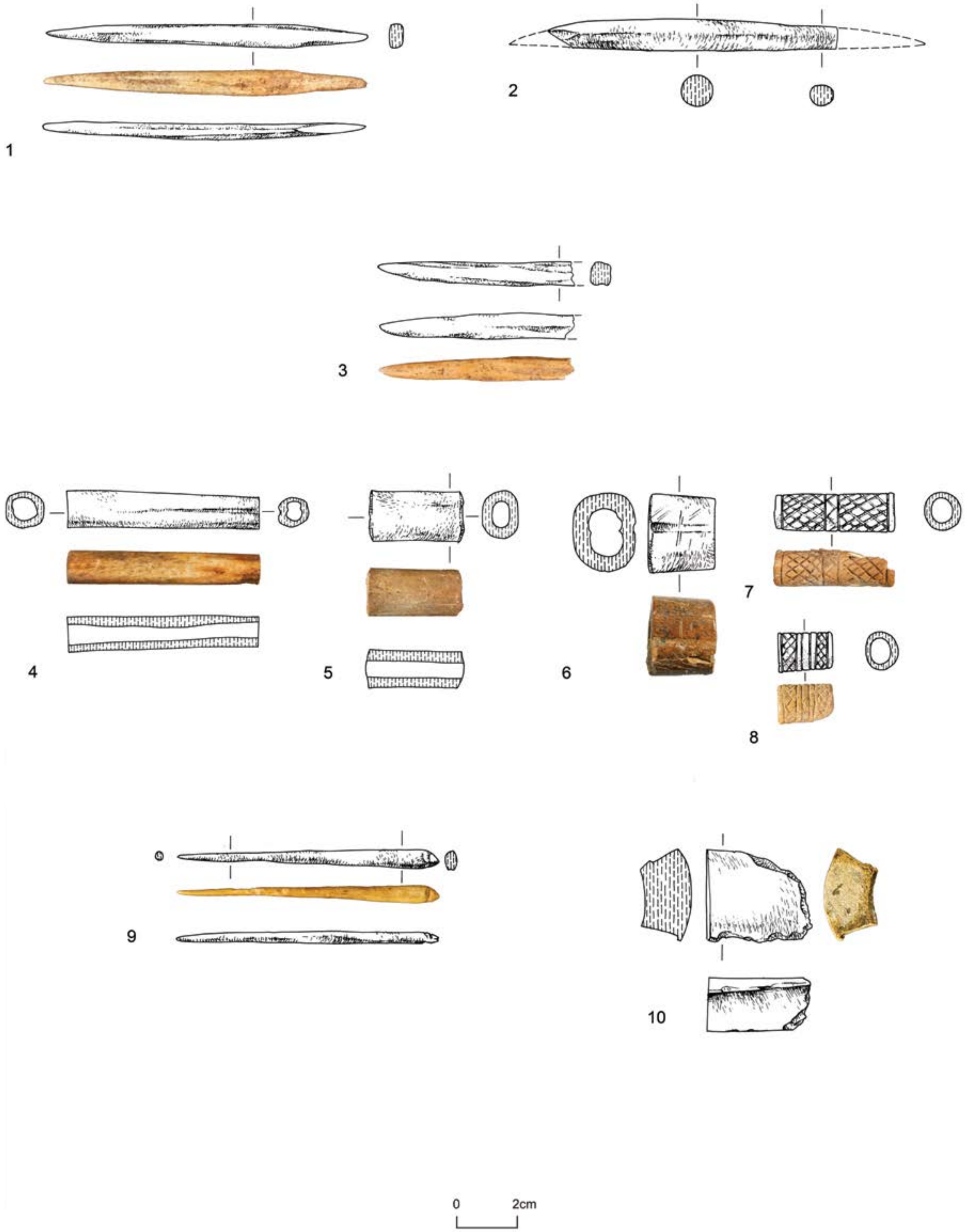

Fig. 12.4. Bone and ivory objects: projectile points (?), tubular handles and beads, pin, worked bone fragment.

Fig. 12.3:3 is incomplete, with a recent break where the implement would have been hafted (length 52.7mm; greatest width at butt: 19.5mm). The handle is broader at the butt end and tapers to the hafted end. The butt end was perforated obliquely at its base in order to tie a lanyard for suspended storage or to improve the grip. The piece is deeply scored with short incisons running at right angles to the abrasion of the handle's manufacture. It has a good parallel from Beth Shean Stratum S-3b, said to be a knife handle (Panitz-Cohen *et al.* 2009: 759 and Fig. 16.12:4, Photo 16.17).

The second antler handle (Fig. 12.3:4) is complete (length: 53.7mm; greatest width at butt: 16.2mm). It is less finely worked and polished on its outer surface than the other antler handle, so that the natural, outer texture of the antler is visible. The piece is more symmetrical in shape than Fig. 12.3:3. It appears that a perforation at the butt end was planned but not completed; an indentation is evident on the base. The opposite side, where the tools would have been hafted, has been whittled down to form a narrow neck.

Projectile (?) points (N=3, Fig. 12.4:1-3)

Dimensions:

Fig. 12.4:1: length: 105.7mm; greatest width: 7.6mm
Fig. 12.4:2: length: 92.2mm; greatest width: 9.4mm
Fig. 12.4:3: length: 64.3mm; greatest width: 8.1mm

These points are made from medium–to–large mammal long bones. They show clearly the marks of longitudinal whittling with a knife. They also bear horizontal striations suggesting light lateral movement or abrasion.

They are too thick to be textile needles and they have no eye. Figs. 12.4:2-3 have recent breaks the ends while Fig. 12.4:1 is complete.

They do not seem to be awls, because they are tapered at both ends, which would have made hafting into handles ineffective. Since Fig. 12.4:3 is broken an eye cannot be ruled out, which might make it a fishing net needle.

The interpretation preferred by the author is that they are all projectile points. All three show the hint of a shoulder, delineating the depth to which the tang would have been inserted into the arrow haft. The horizontal striations may be the result of swiveling movement connected with hafting, or with lashing.

These may be what are termed *target points* (bullet–shaped, designed to penetrate target butts easily without causing excessive damage to them) or *field points* (similar to target points but with a distinct shoulder), intended to prevent missed outdoor shots from becoming stuck in obstacles such as tree stumps. They are also used for shooting practice by hunters, by offering flight characteristics and weights similar to those of broadhead or flanged points, without getting lodged in target materials and causing excessive damage upon removal. Such tapered points are classed by Clark *et al.* (1974: Fig. 9) as Type IIIE1-2 or Type IIIF1 arrowheads: bone and ivory arrowheads that are either pointed (E) or foliate (F).[4]

Bone arrowheads have been documented from Iron Age Lachish, Megiddo, Gezer and Tell Jemmeh and have been suggested as the product of an Iron Age IIA workshop at Tell es–Safi (Horwitz *et al.* 2006: 172). An identical double point has been published in an Iron I context at Megiddo (Sass 2000: Fig. 12.25:8). They are also quite frequent in Egypt, going back to prehistoric times and continuing into the Late Dynastic period (Clark *et al.* 1974). A good example of the range of arrowhead types in use in the New Kingdom comes from the tomb of Tutankhamen (Carter 1933: Pl. 46; 1954: 213).

Pin (N=1, Fig. 12.4:9)

This object was made on a piece of mammalian bone, probably a long bone shaft (length: 86.1mm; maximum width at butt: 6.1mm). It has been identified as a pin because it lacks an eye. It, too, is

4 I thank Samantha Cook of Liverpool University for this reference and for her advice regarding the limited bibliography of ancient archery. I also thank Hugh Soar, secretary of the Society of Archer-Antiquaries (http://www.societyofarcher-antiquaries.org) for his direction.

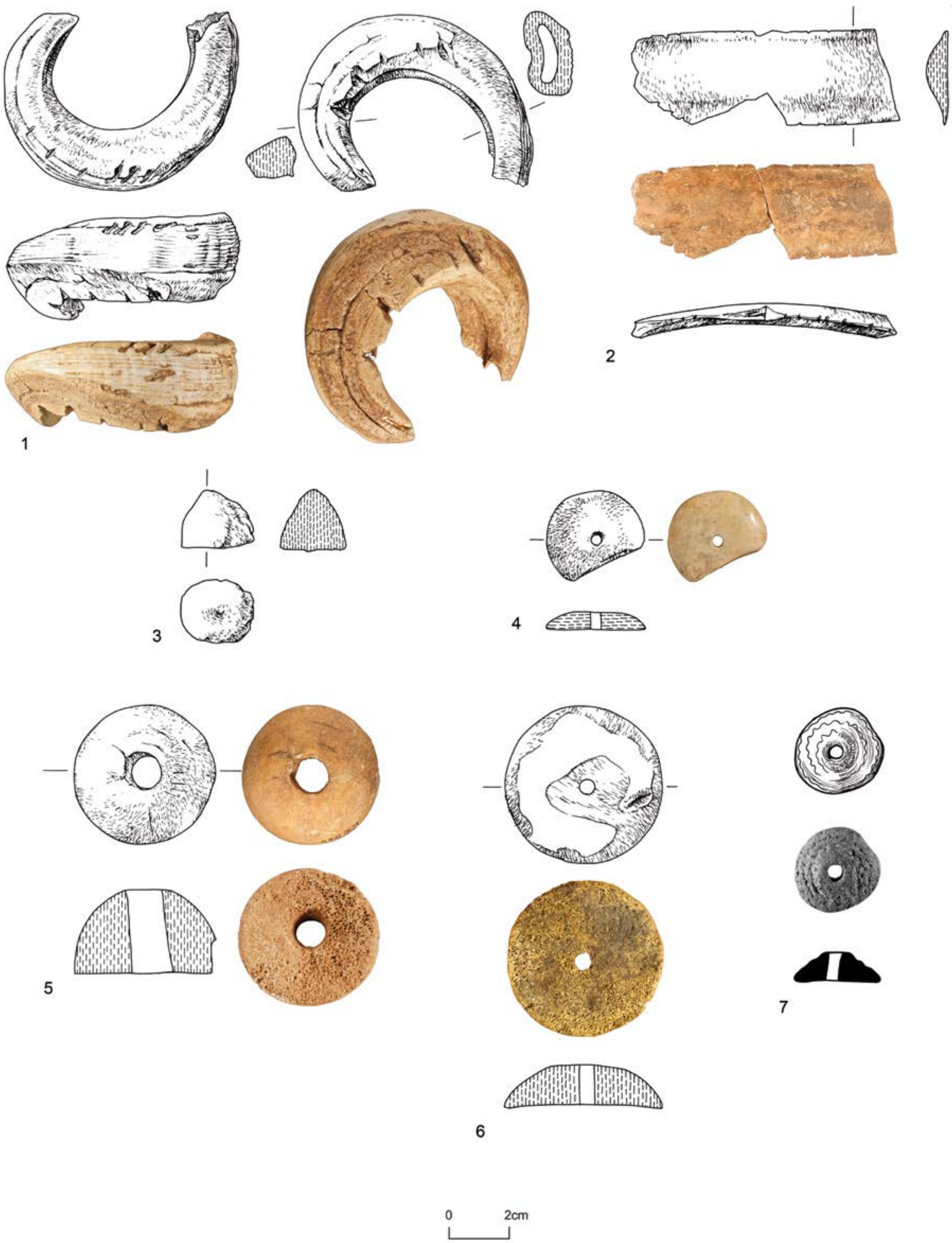

Fig. 12.5. Bone and ivory objects: boar tusk, notched rib, game piece, whorls and buttons.

whittled lengthwise and smoothed. The distal end, or butt, is scored horizontally (perhaps secondarily; it may not comprise the complete original pin). This may be the fragment of a longer pin with a decorated butt and shaft, such as the one from Aphek Stratum X12 (Guzowska 2009: 404-405, Item No. 6 and Fig. 12.8:6). Such decorated pins are well–known in New Kingdom Egypt and are most often thought to have been hairpins (Freed 1982).

Whorls (N=3, Fig. 12.5:5-7)

Whorls differ from buttons primarily in the greater diameter of the drilled perforation into which the spindle rod was inserted. In general they also tend to be larger and more dome–shaped, though this is not a hard and fast rule.[5] Two whorls are fashioned of the proximal ends of the femur or humerus of large mammals, probably cattle. The shaft had been severed and this end smoothed leaving a dome–shaped piece of bone that was then perforated (Fig. 12.5:6 maximum width: 51.7mm; maximum height: 14.8mm; Fig. 12.5:5 maximum width: 46.8mm; maximum height: 28.8mm). They are both undecorated. Fig. 12.5:5 shows a number of butcher marks made before its modification as a tool, together with smaller marks that relate to its subsequent manufacture and use. Fig. 12.5:6 had been smoothed on the top of the 'dome' to reveal the underlying trabecula bone as well as whittled on the sides. Both modifications probably represent use wear.

A smaller, decorated whorl made of faience is described in Chapter 14 of this volume.

Buttons (N=3, Fig. 12.5:4, 7)

These items are buttons, being smaller and flatter than whorls and, most importantly, having smaller perforations. They were probably made on pieces of bone cut from mammalian long bone shafts. Both items are highly polished and have one flat side and one convex side (Fig. 12.5:4 greatest width: 32.4mm; greatest thickness: 5.7mm; reg. no. 23829/2 (not illustrated) greatest width: 18.1mm; greatest thickness: 4.8mm). The perforations were drilled from the flat sides and they show chipping and striations, observable through the microscope, which are signs of use. The larger of the two, Fig. 12.5:4, was broken in antiquity and continued to be used, judging from the smoothing of the broken edge. Fig. 12.5:4 would have belonged to a larger, heavier garment and Field no. 23829/2 to a smaller, lighter one.

The buttons can be compared with buttons from the Late Bronze Age and early Iron Age assemblages of Tel Dan (Ben-Dov 2002: 157-160 and references there), Megiddo (Sass and Cinamon 2006: 384), and other sites.

Gamepiece (N=1, Fig. 12.5:3)

Made of ivory, this dome–shaped object (thickness: 21.4mm; diameter at base: 25.6mm), retains traces of enamel on one aspect, suggesting that it represents part of a hippopotamus tooth, probably canine. Like the cylinders, it was probably manufactured using the groove–snap technique, since a small protrusion of ivory is present at the center of the base indicating that it was not sawn all the way through.

The identification of this object as a gamepiece is based on somewhat analogous objects found with games in Egypt (e.g. Kendall 1982; Pusch 1979). In Canaan, such items have also been found in the Late Bronze Age Persian Garden tombs (Ben-Arieh and Edelstein 1977: Fig. 14:21-23) and Megiddo Stratum VI (Loud 1948: Pl. 191:9-15; Harrison 2004: 79, Pl. 24:9-10). A similar object, albeit of soft limestone, has been noted in an Iron Age II context at Megiddo and interpreted as a gaming piece (Sass 2000: Fig. 12.32:5). Tokens of this type would have been used with flat board games.

Decorative Ivory Fragment (N=1, Fig. 12.3:7)

This small object (length: 21.3mm; width: 19.6mm; depth: 9.6mm), is broken at two ends, has one flat side and one rounded side, and two rivet holes, where the breakage occurred at both ends. One

5 The main purpose of the whorl is to maintain the momentum of the spinning motion; it is a sort of flywheel and needs to have weight.

of the rivet holes still contains metal residue. It is made of hippopotamus ivory. Given its shape, this artifact does not appear to be associated with a weapon; it is more likely to have been applied to furniture or a mobile object of some kind.

Fragment of Worked Bone (N=1, Fig. 12.4:10)

This thick but short fragment (Length:34.1mm; Width: 31.5mm; Depth: 16.1mm), made from the long bone shaft of a large mammal, is sawn cleanly and carved down along the length to leave a fine overhang along two sides. It was then finely smoothed. The overhangs may suggest a series of interlocking or overlapping pieces that were part of composite object.

Conclusions

In the introductory paragraph it was pointed out that some of the items presented here may have derived from Late Bronze Age, or earlier, contexts. At the same time however, it is worth remembering that the metallurgy workshop would have produced a large number of tools and weapons that would have required handles of wood, bone or antler. Thus, at least part of the inventory must be associated with objects manufactured in the Iron Age I. A corollary to this statement is that bone carving was extensively practiced by experienced craftsmen and often resulted in objects of beauty and high value, as composite artifacts with both functional purpose and aesthetic appeal.

Two bone utensil types that are starkly absent are the flat, sharply–pointed tools made on ribs and the weaving shuttle. The place of the former may have been taken by metal tools and the later may have been made of wood at Tel Dan, though they do exist in later levels at the site.

Finally, the breakage of some of these bone objects, looking particularly at the dagger handles, and the fact that some must date to the Middle Bronze Age or early part of the Late Bronze Age, suggest that they belonged to objects scavenged for their metal, forcefully separated from the metal, in order to melt it for recasting. In such cases, the broken bone and ivory handles became unused detritus. This whole process, if reconstructed correctly, suggests a time of resource stress, and even emergency.

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Table 12.1. Utensils made of animal bone.[6]

Object	Species	Reg. No.	Locus	Phase/ Stratum	Description	Weight (grams)	Fig.
Slab handle fragment of knife	?	23436/2	7065	B9-10/V	Fragment of slab; polished; two rivet holes	5.76	12.3:6
Gaming piece?	Hippopotamus	23477	7079	B11-12/ VI-VIIA1	Dome–shaped/pyramidal	8.56	12.5:3
Knife/dagger handle	Hippopotamus	23488/6	7079	B11-12/ VI-VIIA1	Tang insertion type; remains of metal tang still present, rivet hole; ancient repair with adhesive	31.08	12.3:1; 12.1
Cylinder	Sheep/goat?	23579/9	7102	B8/IVB	Incised parallel lines and net pattern	+1.84	12.4:8
Cylinder (awl handle?)	Sheep/goat?	23667/2	7114	B8/IVB	Hollow, remains of adhesive in cavity	8.56	12.4:5
Notched rib	Cattle?	23629	7117	B9/VA	Notches and polishing	15.54	12.5:2
Knife/dagger handle	Hippopotamus	10390/1	574	B8/IVB	Bored housing for tang insertion, polished	+37.81	12.3:2; 12.2
Knife/dagger handle butt	Hippopotamus	23384/5	7061	B9-10/VA	Burned; geometric, floral motifs	4.96	12.3:5
Cylinder (handle/ bead?)	Sheep/goat?	25031/1	4706	B8/IVB	Hollow, circumferential engraving of two registers of net pattern with zigzag around middle	+4.62	12.4:7
Handle	Deer	19721	2833	T15/V	Antler; perforation at base, charred	12.46	12.3:3
Cylinder	?	19748	2842	T16/VI	Hollow at both ends but not all the way through	9.29	12.4:4
Cylinder (pivot, hinge?)	Sheep/goat	18506	4322 = 601	B8/IVB	Polished, burnt	11.23	12.4:6
Projectile (?) point	?	13535	3127	Y7/VI	Flattened mid section, more rounded at pointed ends	4.80	12.4:1
Projectile (?) point	?	10393	684	B9/VA	Ends broken off	+8.91	12.4:2
Projectile (?) point	?	13547	3127	Y7/VI	Broken, square profiled midsection	+3.73	12.4:3
Pin	?	10513	1209	B11/VI	Complete; butt has grooves on two sides	1.70	12.4:9
Awl handle	Deer	1403/13	336	B11-12/ VI-VIIA1	Antler; bored cylindrical perforation housing, possible beginning of base perforation	12.08	12.3:4
Tusk	Wild boar	10385	695	B9-10/V	Complete boar tusk; notches	55.79	12.5:1

6 Most of the ivory objects were initially identified by F. Poplin of the Louvre Museum.

Object	Species	Reg. No.	Locus	Phase/ Stratum	Description	Weight (grams)	Fig.
Carved piece	Cattle?	23885/1	7156	B11-12/ VI-VIIA1	Fragment	18.50	12.4:10
Carved decorative fragment	Hippopotamus	10313/1	687	B9-10/V	Broken at either end at the place of two rivet holes; burnt; one side flat, the other rounded	+3.27	12.3:7
Button	?	23477/7	7079	B11-12/ VI-VIIA1	Polished	+4.98	12.5:4
Button	?	23829/2	7120	B9-10/V	Complete; polished	1.53	—
Whorl	Cattle?	9474	547	B8/IVB	Femur head	31.47	12.5:5
Whorl	Cattle	10327	684	B9/VA	Signs of wear across top of dome	31.48	12.5:6
Whorl/button?	?	857/5	170	B11/VI	Truncated cone	?	12.5:7

CHAPTER 13

SEALS AND IMPRESSIONS

The seals from Tel Dan have been published comprehensively by Keel (2010 and earlier references there). The following account singles out the seals found in Iron Age I contexts. A modified version of Brandl's (2009) system of organization is adopted. Some further observations and corrections have been added as well.

Fig. 13.1. "Anchor" seal, 20124/13, Locus 8051 (Phase M9b, Stratum VA).

1. "Anchor" seal (Fig. 13.1)

Field no. 20124/13, Locus 8051, Area M, Phase 9b, Stratum VA.

Material: Limestone.

Dimensions: 32.7 ×15.0 × 44.9 mm.

Method of manufacture: Caring, abrading, drilling, incising.

Preservation: Complete.

Shape: A truncated pyramid with a rectangular base, perforated breadth-wise under the apex ("anchor"stamp seal).

Base design: The deeply cut geometric decoration consists of lines and drillings in a rectangular base; three vertical registers delineated by horizontal incised lines, one end with a smaller field with two horizontally aligned drilled holes, the center with two vertical incised lines with a drilled hole at center and the other end with three drilled holes and two vertical incised lines intercepting the two holes nearest the center. No frame.

Origin: Probably local.

Date: Iron Age I.

Archaeological context: debris above floor.

This seal was published and described by Keel (1994: 25, Seal No. 8; Keel 2010: 389, Seal No. 19). The 1994 publication dealt with a group of similarly shaped seals termed "Philistine anchor seals". These resemble typical Bronze Age stone anchors (Frost 1969; Galili 1985; Schaeffer 1979) and are engraved with various motifs on the base: possible Cypro-Minoan signs, schematic human figures and horned quadripeds, and a lyre player. The shape of the Tel Dan seal is closest to that of seals from the southern Levantine coast and somewhat inland, up to the Shephelah, occurring at Ashdod, Tell el-Far'ah (S), Tel Qasile, Tel Batash, Tell Keisan, Akko and Lachish (Keel 1994: Nos. 1-14; the closest in overall shape being Nos. 1 and 4).[1] Single examples have also been found at Tell en-Nasbeh

1 Two further "anchor"seals from Iron Age I contexts have been published recently from Ashdod (Ben-Shlomo 2005: 130-131, 166-167; Figs. 3.41:2; 3.67) and a "truncated pyramid" seal, without perforation, from Tel Beth Shean Stratum S-2 (dated to the late 12th and 11th centuries BCE; Brandl 2009: 655-656). The latter shows incised lines and drilling, similar in technique to those of the Tel Dan example.

Fig. 13.2. Scarab seal, 1322, Locus 326.

and Samaria, from contexts that are either later or unknown (Keel 1994: Nos. 15-16). The signs on the base are quite deliberate and organized, clearly with a coded meaning, though this meaning still escapes us. No object was found bearing the anchor seal's impression.

Keel (1994: 34) concluded that the group's decoration has Late Bronze Age Canaanite and/or Egyptian origins and that, except for the lyre-player motif from the Tel Batash seal (Keel 1994: No. 7), they cannot be considered specifically Philistine.[2] However, it may be significant that most of the anchor seals do come from the coastal region. At the same time, if we range somewhat further afield and focus on the engraving, rather than on the seal's form, much better parallels are found at Tell en-Nasbeh, Tell Beit Mirsim Stratum C, Sahab in Jordan and Mt. Ebal Stratum II (see Keel 1990: catalogue Nos. 86, 88, 89, 100 respectively)—all hill country sites with silos and collared-rim pithoi. While the engraving has no perfect parallels, the closest compositions are those of the trapezoidal seal from Mt. Ebal (Brandl 1986-1987: 170-171; Pl. 20:3a-d = Keel 2010: 512f seal No. 3) and one from Sahab (Ibrahim 1983: 53, No. 10 = Eggler and Keel 2006: 268f seal No. 10). The combination of incised lines and drilled depressions of Side C of the Mt. Ebal seal is very much like those of the Tel Dan "anchor" seal. The Mt. Ebal seal, however, lacks the perforation and truncated-pyramid form of the "anchor" seals. But the concept appears to be similar.

To summarize, the "anchor" shape seems to be more of a coastal feature but the engraving and drilling more characteristic of the inland zone. How to interpret this amalgamation culturally is a question that we leave for the concluding chapter.

The association of the shape with the anchor is perhaps another aspect that requires reexamination. This was borne of the idea that they emerged out of a seafaring culture with roots in the Bronze Age eastern Mediterranean (Keel 1994: 28). We would suggest, however, that rather than the anchor, the shape of these seals may reference pyramidal loom weights of the kind common in LCIIC-III Cyprus, at sites such as Athienou (Dothan and Ben-Tor 1983: Fig. 48:9-10), Kition Area II (Karageorghis and Demas 1985: Pl. 201), and Enkomi Strata 2A-3C (Dikaios 1971: 445-474, Pls. 127:19, 134:35, 37-38, 154:9, 155:2, 46). If this is so, the pyramidal stamp seals may be related to the manufacture of textiles.[3] We may add these seals to the other evidence for Cypriot-style material culture at Tel Dan.

2. Scarab (Fig. 13.2)

Field no. 1322, Locus 326, Area B, Phase 11, Stratum V (=Keel 2010: No. 3)

2 The assertion that the lyre player is a Philistine motif is founded on the premise that the Orpheus Jar from Megiddo is Philistine (Keel 1994: 32). But the Orpheus Jar is now thought by some to belong to another, perhaps local tradition (Yasur-Landau 2008).

3 For a survey of pyramidal loom weights in the southern Levant and Cyprus see Shamir 1996: 147-148.

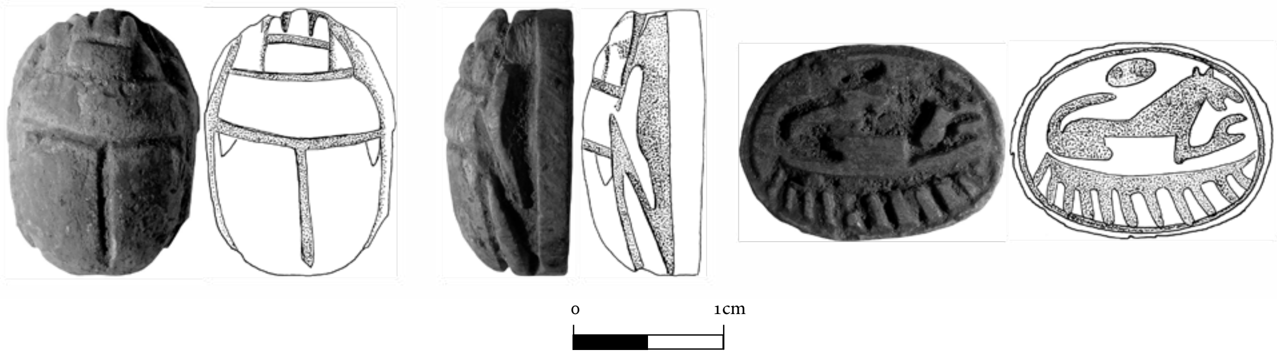

Fig. 13.3. Scarab seal, 20895, Locus 8236.

Material: Steatite, with remnants of glazing.
Dimensions: 15.9 × 11.2 × 7.2 mm.
Method of manufacture: Abrading, carving, drilling, engraving, hatching.
Preservation: Sides are a bit chipped.
Shape: Tufnell's (1984) classes D9/0/d5.
Base design: horizontal arrangement with Lion squatting on hind legs, tail is upraised over back. Behind lion is a uraeus over a hatched oval.
Origin: Local.
Date: MBIII (=MBIIC).
Archaeological context: Tamped earth floor bearing Iron Age I ceramics, including several complete vessels (two cooking jugs, two chalices, two kraters and a jug).

The find context of this scarab plainly postdates the scarab's original period of manufacture. While scarabs are not really numerous at Tel Dan in the Middle Bronze Age (Ilan 1996: 236-242), 13 of them are documented (Keel 2010: Nos. 2-3, 13-17, 22, 31-32, 38-40). In the upper part of Area B the Middle Bronze Age levels are not that far below the Iron Age I horizon, and pits, especially, would have dredged up MBII-III material. It does raise the question of how Iron Age I people related to old scarabs. Were they actively sought out and used? Or are they more in the way of chance detritus?[4]

3. Scarab (Fig. 13.3)

Field no. 20895, Locus 8236, Area M, Phase M9b, Stratum V (=Keel 2010: No. 35).
Material: Enstatite.
Dimensions: 13.9 × 10.4 × 6.6 mm.
Method of manufacture: Abrading, carving, drilling, engraving.
Preservation: Complete.
Shape: Tufnell's (1984) classes C1/vIv/d5.
Base design: Within an oval frame: horizontal arrangement of a crouching lion with tail uplifted. Above the tail is an oval (sun?). The lion's paw looks like a human hand. Under the crouching lion is a curved line, running parallel to the lower edge with 10 vertical/oblique lines projecting downward to the edge of the frame.
Origin: Uncertain.
Date: Probably 19th-21st Dynasties (Iron Age I-IIA).
Archaeological context: Tamped earth floor with Iron Age I sherds.

This scarab was initially mistakenly thought to come from an IAIIA context and is so cited by Keel (2010: 396).[5] But it comes from a clear Iron Age I context.

4. Scarab (Fig. 13.4)

Field no. 20862, Locus 8225, Area M, Phase M10, Stratum VI (=Keel 2010: No. 37).

4 Brandl (2009: 674) notes that 22 out of 35 glyptic items recovered at Tel Beth Shean came from secondary, i.e. later, contexts. The significance of earlier scarabs in later contexts is discussed in Keel 1995: 262-264,§ § 692-695.

5 It comes from a locus in a square in Area M that was left out of my 1999 dissertation because it was not contiguous with the rest of the excavated Iron Age I remains.

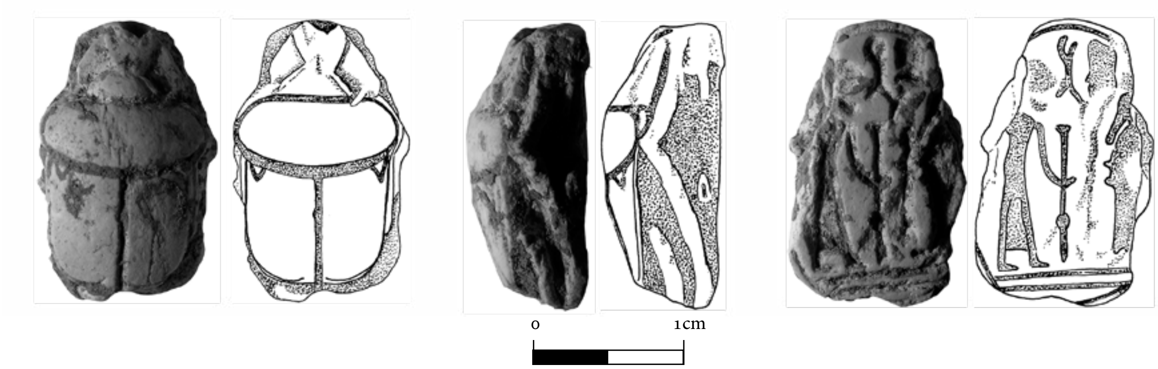

Fig. 13.4. Scarab seal, 20862, Locus 8225.

Material: Enstatite.

Dimensions: 18.5 × 11.6 ×7.4 mm.

Method of manufacture: Abraing, carving, drilling, engraving.

Preservation: Worn, edges are chipped.

Shape: Tufnell's (1984) classes: B2/vIv/d5.

Base design: Oval frame containing a vertical arrangement with the standing bearded Ptah on the right and the lion-headed, striding Sekhmet on the left, holding a flower-scepter (see Keel 2010: 396 for further details).

Origin: Import from Egypt, most probably from the Ptah temple in Memphis.

Date: 19th Dynasty (LBIIB–IAI).

Archaeological context: a pit, containing a number of large Iron Age I sherds and two Egyptian-style red-slipped bowl sherds common in the Late Bronze Age Stratum VII (cf. Martin and Ben-Dov 2007).

This scarab raises, once again, the question of the date of the Iron Age I. Though found in an Iron Age I pit, there was also some Late Bronze material in the pit. This worn scarab may well belong to the earlier occupation. At the same time, the occurrence of 19th-20th Dynasties scarabs in Iron Age I contexts is not uncommon; it seems unlikely that they are all heirlooms or scavenged objects.

5. Stamped impression on a clay horn or beak? (Fig. 13.5)

Field no. 23696, Locus 7117, Area B Phase 9, Stratum V.

Material: Ceramic

Dimensions (impression): >26 x 17.6 mm.

Method of manufacture: modeled, stamped, fired

Preservation: one edge is chipped (by excavator)

Shape: looks like a horn or a beak, but unattached

This ceramic item looks, at first glance, like a horn, or beak, but it was a stand-alone artifact, not

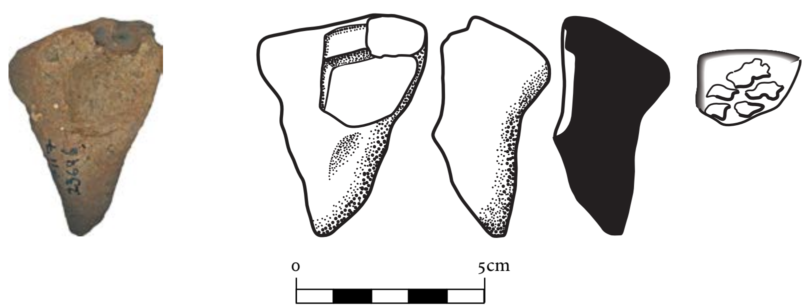

Fig. 13.5. Stamped seal impression on clay object, 23696, Locus 7117.

attached to anything else. It is solid and made of rather coarse clay, with many poorly sorted grits, fired at a low temperature. It was stamped with a rectangular-shaped impression, though no image is clearly discernible. It would seem to have been the impression made by either a truncated pyramid seal, as in No. 1, or a flat, domed seal. The stamping is not centered on the object—in fact one end of the seal ran over the edge and was not impressed. There is no twine or knot impression anywhere on the clay lump.

* * *

A rectangular plaque seal published by Keel (2010: 388-389, No. 18) and Münger (2005: 386, No. 12) was mistakenly attributed to Strata V-VI. Both Keel and Münger were misinformed by the preliminary data on the object card, prior to full analysis. The correct stratigraphic attribution of this seal (Field no. 12168, Locus 2328) is Area T, Phase 13, Stratum IVA (probably 10th century BCE). This fits better Keel's 21st Dynasty, post-Ramesside, or Münger's (2005: 395) mass-produced "Tanite", attribution. Conceivably it could have a Stratum IVB (late Iron Age I) origin, but this stratum is only sketchily represented in Area T and an early IAIIA date is more likely. Thus, this particular plaque seal cannot be used as evidence to lower the date of the Iron Age I horizon (contra Münger 2005: 397-400).[6]

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6 Another rectangular plaque seal of this class from Tel Dan was published by Keel (2010: 396-397, No. 34) and assigned the same time frame-21st Dynasty=IAIB–early IAIIA. But the context of this seal is indeed IAIIB. Hence, the seal is an heirloom in any case.

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CHAPTER 14

VARIOUS OBJECTS OF STONE, FAIENCE, AND CERAMIC

Beads (N =5, Table 14.1)

Only five beads were registered from the Iron Age I levels at Tel Dan; two of these, of glazed composition (Fig. 14.1:4), are probably Late Bronze Age intrusions. Long biconical beads (Fig. 14.1:2-3) are common throughout the Bronze Age Near East. The lenticular bead (Fig. 14.1:1) is much less so. The shapes are not temporally indicative; they could also originate in the LB levels (cf. Ben-Dov 2011: 331-334).

Given the plethora of other finds, a total of five beads seems very low, when compared, for example, with contemporary levels at Beth Shean (Golani 2009) and Tel Qasile (Mazar 1985:18). However, coeval contexts at other published sites, such as Yoqne'am (Ben-Ami 2005: 388-391), Megiddo (Sass and Cinamon 2006: 403-404) and Shiloh (Sass 1993), also yielded only a few beads. The lack of beads may be at least partly due to infrequent sieving during the 1960s and 1970s seasons. But, given the similar dearth in more recent excavations, it is also worth asking whether personal ornamentation was in decline, or even rejected, by some groups during this period.

Stone, Faience and Ceramic Whorls (N =6, Table 14.2)

The smaller whorl (Fig. 14.2:5) is made of faience whose original blue or green pigment is now barely visible. The convex side shows radial incisions of parallel lines, in sets of two, running perpendicular to two parallel horizontal lines incised around the circumference above the base. Variants of this composition are well known from the Late Bronze and Early Iron Age, e.g. at Tel Dan (Ben-Dov 2002: Fig. 2:123), Beth Shean (Panitz-Cohen *et al.* 2009: 760 and Fig. 16.12:10) and Megiddo Stratum VI (Loud 1948: Pl. 172: 29-45; Harrison 2004: 81, Pl. 30:3-14; Sass and Cinamon 2006: 384).

Fig. 14.2:1-3 are whorls manufactured on pottery sherds—body sherds of large vessels. Of the stone whorls, one is of basalt and the other of limestone. Fig. 14.2:4 is heavy enough to be a flywheel for a drill, but its perforation seems too narrow. Bone whorls are described in Chapter 12 of this volume.

Burnishing tool (N=1)

This ovoid body sherd (Fig. 14.2:7) is abraded on all its edges. It appears to be of the yellow-gray sandy ware characteristic of one class of Late Bronze Age store jars, imported from the northern coastal region (Ben Dov 2011: 250). Very little of the Iron Age I pottery at Tel Dan is burnished and we may assume that it was a Late Bronze Age object that was transported to an Iron Age I level or that it was used to burnish something other than pottery—leather or wood, for example. Sherds used as burnishing tools are known from most sites, e.g. Beth-Shean (Panitz-Cohen *et al.* 2009: 745, Fig. 16.1:12-14, and references there).

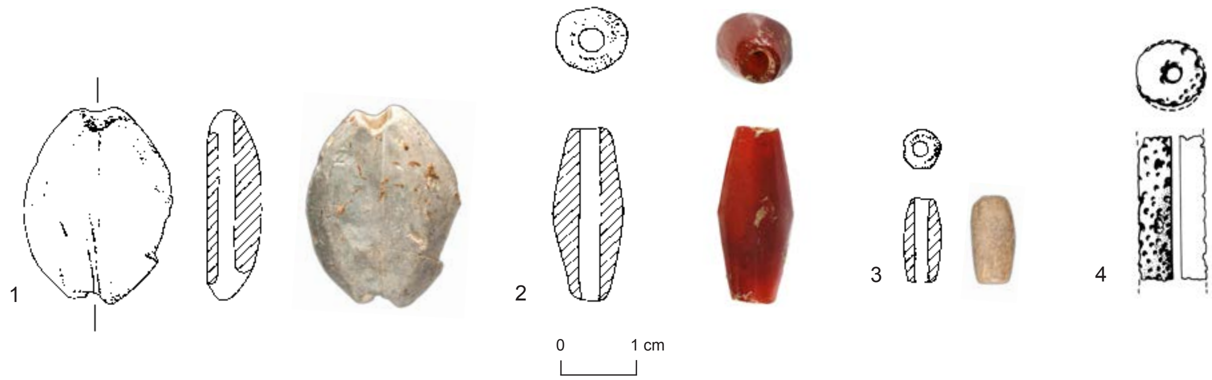

Fig. 14.1. Beads.

Table 14.1. Beads.

Fig.	Field no.	Locus	Phase/Stratum	Material	Preservation	Shape	Beck (1928) type
14.1:1	13751	3172	Y4/VA	Steatite	Chipped	Lenticular	IV
14.1:2	9424	542	IVB	Carnelian	Complete	Long, truncated convex biconical	I.d.1.f
14.1:3	23361	7061	B9-10/V	Steatite or off-white glass	Complete	Long, truncated convex biconical	I.d.1.f
14.1:4	24894	7240	B11/VI	Glazed composition	Weathered at either end	Long cylinder	I.d.2.b
—	24900	7240	B11/VI	Glazed composition	Chipped at ends	Long, truncated convex biconical	I.d.1.f

Table 14.2. Whorls or flywheels and burnishing tool[1].

Figure	Field no.	Locus	Phase/Stratum	Material	Description
14.2:1	23922	7165	B12/ VIIA1	Ceramic	Pithos sherd; drilled from two sides, each drilling with conical profiles
14.2:2	23823	7125	B9-10/ V	Ceramic	Jar sherd; drilled from two sides, each drilling with conical profiles
14.2:3	10210	645	B8/ IVB	Ceramic	Jar sherd; drilled from two sides, each drilling with conical profiles
14.2:4	10446	1204	B10/ VB	Siliceous limestone	Dome-shaped, drilled from two sides
14.2:5	9464	547	B8/ IVB	Faience	Scored horizontal lines at bottom of dome, vertical lines from top of dome to base
14.2:6	25195	4732	B12/ VIIA1	Basalt	Double convex shape, drilled from one side, polished
14.2:7	19759	2842	T16 VI	Ceramic	Burnishing tool, jar body sherd

1 Other ceramic whorls are listed in Figs. 3.75:1; 3.87:5-6; and 3.94:11

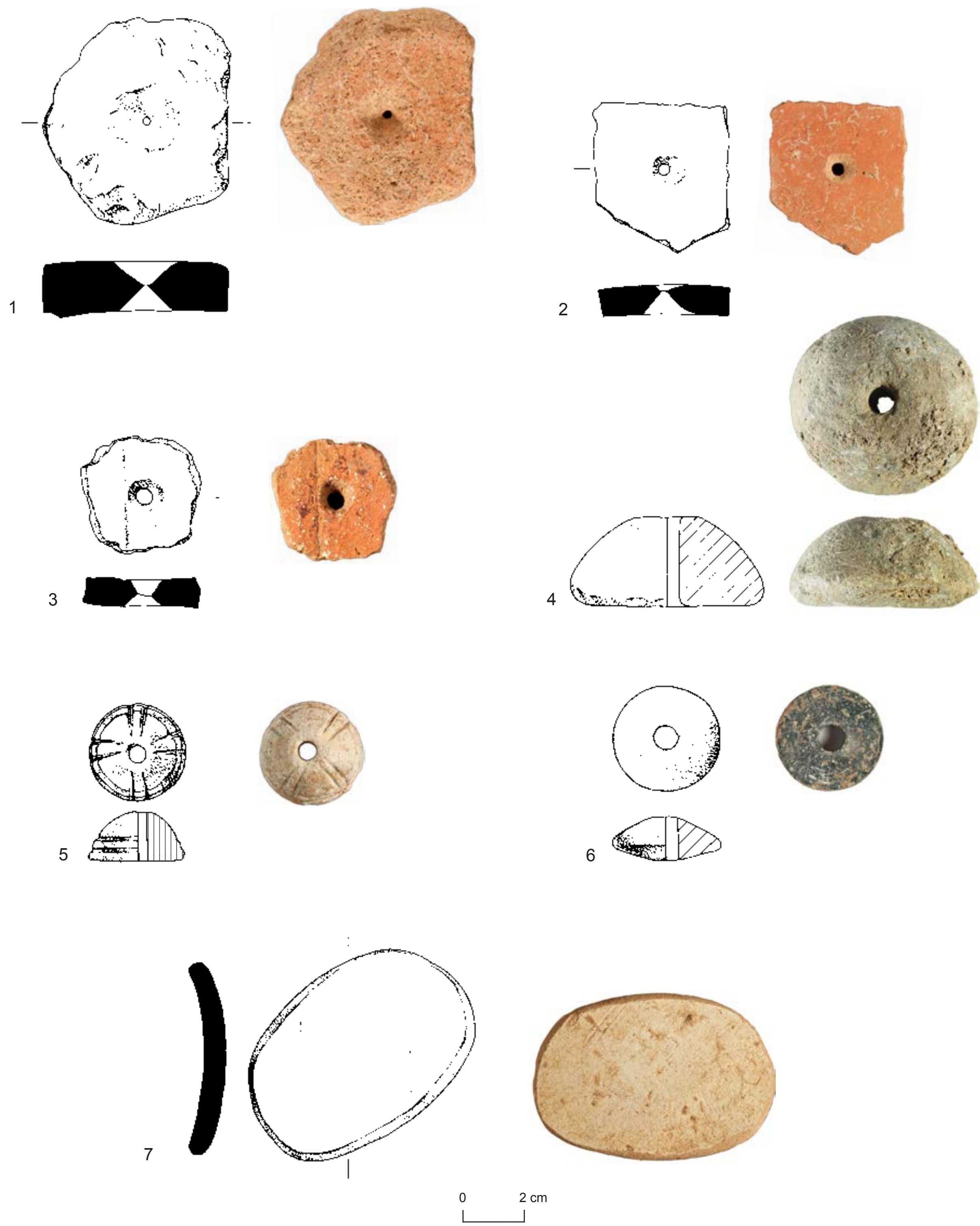

Fig. 14.2. Whorls, buttons, burnisher.

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CHAPTER 15

FIGURINES AND RITUAL OBJECTS

Fenestrated Vessel
("snake house", "sanctuary", "house" model)

Reg. no. 23507/4, Locus 7082b, Area B
Phase 9, Stratum V. Ceramic. Figs. 15.1-15.2

This ceramic vessel has the shape of a krater surmounted by a domed top. At the apex of the dome was a knob that is now broken off. The vessel rests on a ring base. The bottom of an almost-square opening starts at the lower carination. Protruding lips frame the lower and upper edges. To either side are loop handles through which a bar was probably inserted to secure a ceramic or wood cover over the opening. The frame of the opening is beveled inward, so as to prevent the cover from falling through.

The fenestrated vessel is a variant of the kind found at a number of sites that date from the Middle Bronze Age (Ashkelon, Tel Gerisa)[1] through the Late Bronze and early Iron Ages (Ugarit, Hazor, Deir ʻAlla, Enkomi, Atheniou, Kition; for references see Biran 1989: notes 7-10; Negbi 1991: 213-214 and Nissenen and Münger 2009 with the most complete list of parallel examples to date). It was initially referred to as a "snake house" in the literature (Biran 1989) because the first one reported, that from Ugarit, was adorned with the image of a snake over the opening (Schaeffer 1949: Figs 79A-79D). A number of objections have been raised to this interpretation, though it cannot be rejected outright (Nissenen and Münger 2009: 136). Negbi (1991: 214) has called them "house models", though this is certainly understating their significance. Negbi has also pointed out that they are first found in "Canaanite" centers in the Late Bronze Age. In the Late Bronze Age–Iron Age I connection, it is suggestive that so many come from the Rift Valley; it may be a localized aspect of Canaanite cult by this time. But we would do well to remember that the earliest examples, dating to the Middle Bronze Age, come from the coast: Ashkelon and Tel Gerisa (Stager 2006; 2008; Herzog 1991).[2]

More recently these rounded fenestrated vessels have been termed by a number of scholars "model sanctuaries" (for a list of references see Nissenen and Münger 2009: 136 note 25). At present, the model sanctuary interpretation seems to be the dominant one and previously this was my own interpretation as well (Ilan 1999: 96). Nissenen and Münger (2009: 137) feel that "the cylindrical shape of the models is originally a Cretan invention" (citing Mersereau 1993) which was insinuated into the Canaanite milieu as part of a "tendency to adapt the foreign forms to the local tradition", (citing Hesse 2008: 45). This interpretation would mesh with other indications of Cypriots settling at Tel Dan (see below pp. 628-629).

In Egypt, however, similar objects are thought to be model grain silos ("corn granary" in Bourriau 1981: 69, Cat. no. 27) and it seems to me that this may be a better explanation. For one thing, the Tel Dan example was recovered from the cella of a sanctuary that was built over an area that served as a grain storage field in Stratum VI. The reason

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1 We seem to have a Middle Bronze Age example from Locus 9357 as well. I will publish this in a future volume.

2 We should also differentiate between two separate types. The flatter, laterally elongated fenestrated vessels such as those from Atheniou, Enkomi and Kition in Cyprus, with air holes, are very likely animal traps or cages (e.g. Dothan and Ben-Tor 1983: 53; Fig. 16:1; Karagheorghis 1972).

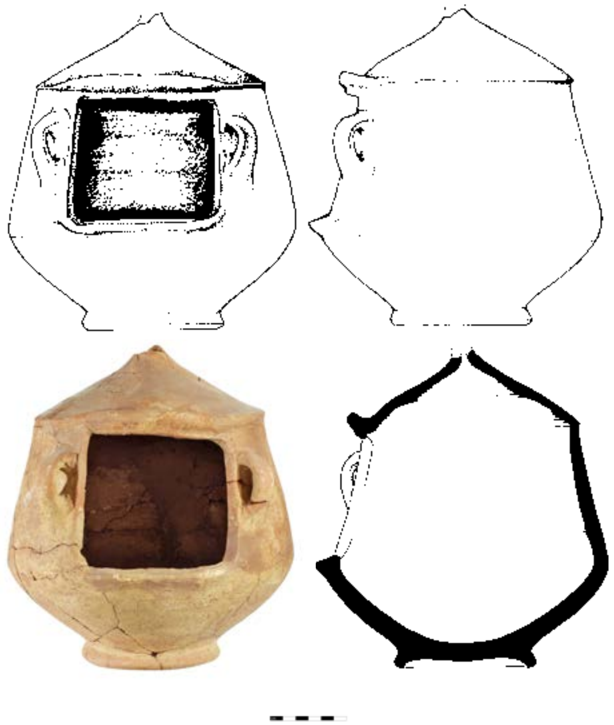

Fig. 15.1. Fenestrated vessel (model silo).

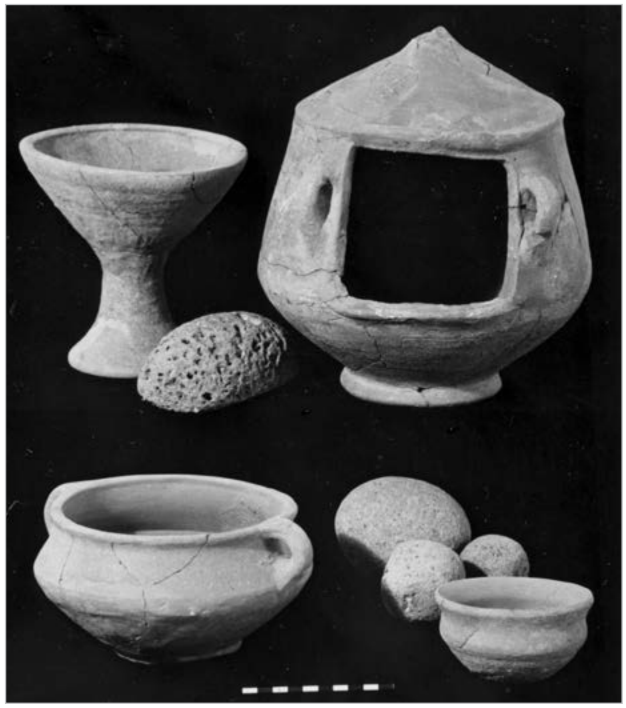

Fig. 15.2. Fig. 3.36. Area B-west: the assemblage from the adyton L7082b.

that some are adorned with snakes over their openings may be that snakes protect grain from vermin. Perhaps the snake is an attribute of the grain deity.

Similarly shaped ossuaries of the Chalcolithic period have been interpreted as grain silos, associated with attending regenerative properties (Bar-Yosef and Ayalon 2001). Stager (2008), in his explication of the calf figurine housed in the vessel from Middle Bronze Age Ashkelon, suggests identifying the calf as an emblem of the Canaanite deity Ba'al. In the Ugaritic texts Ba'al is most often the son of Dagon (e.g. KTU1.2.i:36-37; KTU1.10.iii:11-14). If, as his name suggests, Dagon is the god of grain (e.g. Singer 1992), it would make life-cycle sense for Ba'al to emerge from the model silo.[3] In this context too, the biblical text's attribution of Dagon as the chief Philistine deity may be evidenced by this object at Tel Dan, where so many other Sea People associations are manifested.

Kernos Fragments

Reg. no. 10662/1, Locus 1204, Area B, Phase 9, Stratum V. Ceramic. Floral (pomegranate, poppy). Fig. 15.3.

Reg. no. 13057, Locus 3012, Area Y, Phase 6, Stratum VI. Ceramic. Zoomorphic (bird?). Fig. 15.4.

Reg. no. 9008, Square B18, Area B, surface. Ceramic. Zoomorphic (bull). Fig. 15.5.

Three kernos fragments were identified. I can only assume that kernos ring fragments were discarded with body sherds, either in field processing or after restoration, since they can easily be mistaken for juglet or jug neck fragments. Figs. 15.4-5 have channels running through the

3 Many scholars of Ugaritic religion agree that El and Dagon were identified as one and the same god, each with earlier origins: Dagon in inner Syria/northern Mesopotamia and El in Canaan, nearer to the Mediterranean coast. This seems to have been a general pattern with the rest of the pantheon as well (Fontenrose 1957; del Omo Lete 1999: 51-52 and references there).

Fig. 15.3. Kernos fragment; poppy or pomegranate.

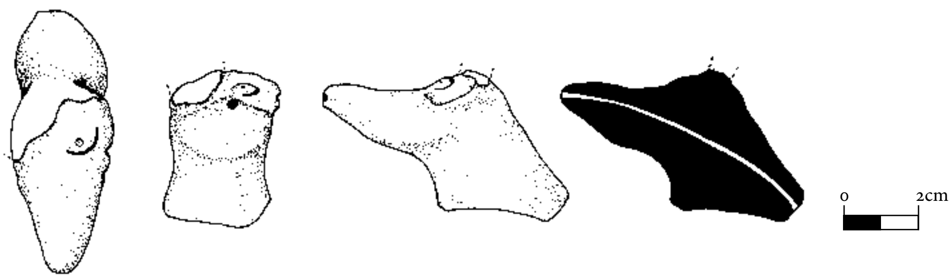

Fig. 15.4. Kernos fragment; bird?

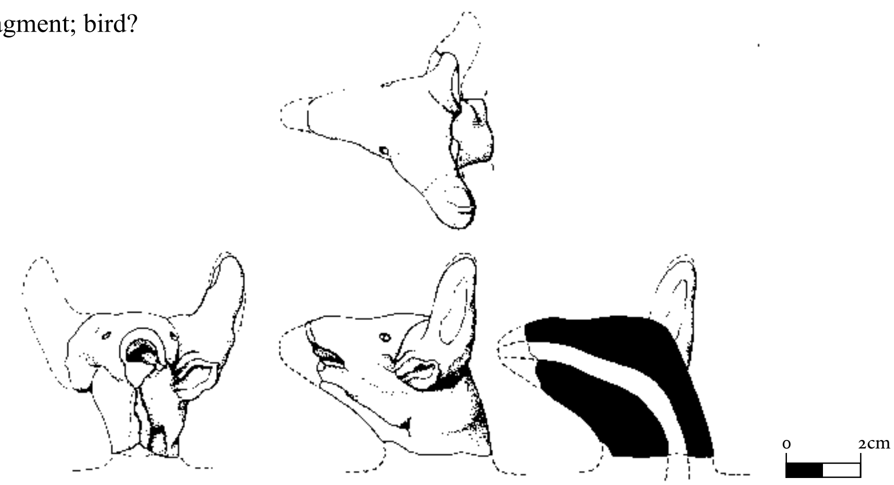

Fig. 15.5. Kernos fragment; bull?

beak, or snout, for pouring or inhaling (cf. Mazar 1980: Fig. 41). The pomegranate (or poppy), bull's head and bird's head are all common kernos attributes (e.g. Bignasca 2000; Dothan 1982: 222-224; Mazar 1980: 108-111). Fig. 15:4 resembles the modeling and profile of the bird drinking from a bowl found at Megiddo (May 1935: Pl. 16) and another example from Beth Shean Stratum S4 (Mazar 2009: 546-7, Fig. 9.17:3 = 9.15c). Mazar calls this type an Egyptian-style zoomorphic object—duck/goose figurines attached to bowls—but the channel in our example suggests that it is a kernos appendage.

No kernoi-attached miniature bowls were identified, though they must exist. It is quite likely that some sherds identified as fragments of storejar rims or cyma bowls are in fact the miniature bowls of kernoi (for the ubiquity of this component

Fig. 15.6. Ceramic bird's head, probably from a bowl.

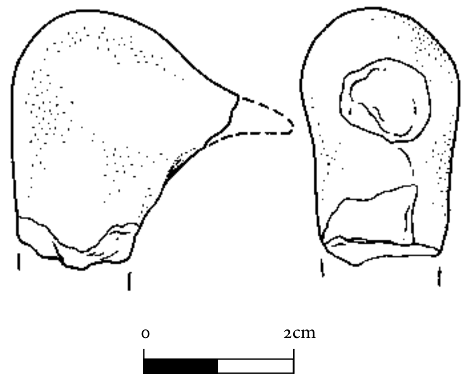

Fig. 15.7. Ceramic modeled bird head, probably from a bowl.

in northern Canaan see Mazar 1980: 110, Table 16 and Bignasca 2000: Pl. 7).

None of these fragments came from obviously ritual contexts. All the same, the context of kernos finds from other parts of the Mediterranean basin and the Near East, together with analyses of kernos forms, suggest both ritual action and symbolism. This symbolism is thought by Bignasca (2000: 254-257) to be chiefly cosmological, perhaps representing a microcosm of the natural universe.

Virtually all the scholars cited in this short discussion associate kernoi with liquid libation or manipulation. I would suggest that smoke is another option—opium or cannabis comes to mind, or one of the other psychotropic substances mentioned in the section on chalices (above p. 99). This, however, would require substantiation by residue analysis or textual or pictorial evidence.

Mazar (1980: 111) notes that the kernos became especially popular in both Palestine and Cyprus in the 12th-11th centuries BCE and is mainly found in the coastal and lowland areas. Those found inland, such as the fine Sasa example (Bahat 1986: 105), would, in Mazar's estimation, have been imported from the coast. Mazar is also of the opinion that the kernos is a cultural artifact of the Sea Peoples, a point reiterated by Dever (2001: 125-126), though Bignasca (2000: 150-157, 250) is more equivocal.

Bird Bowl Birds

Reg. No. 23361, Locus 7061, Area B Phase 9-10, Stratum V. Ceramic. Fig. 15.6.

Reg. No. 23708/2, Locus 7122, Area B Phase 7-8, Stratum IVA-IVB. Ceramic. Fig. 15.7.

These two ceramic bird heads probably belong to open bowls of the type known so well from Tel Qasile (Mazar 1980: 96-100, Fig. 29 and Pls. 33-34; the bowl type is discussed in Chapter 3, pp. 96-97). Unlike the Tel Qasile examples, no painting is discernable. Mazar (1980: 100) emphasized the Egyptian New Kingdom and local Late Bronze Age Canaanite precedents for this type.

Modeled Head

Reg. no. 19519, Locus 2749, Area T Phase 15, Stratum V. Ceramic. Reddish-brown painted features on a thick pinkish-yellow, burnished slip. Appears to have been part of a hollow vessel/object. Fig. 15.8. First published in Biran 1994: 142, Fig. 101.

This human head depiction was part of a closed vessel or figurine; the interior shows a convex curving and its dark grey color indicate lack of oxidation. The ears, nose and mouth are schematically sculpted and the head is flattened in the form of a cap or coronet. This may be the *polos* discussed recently by Ben-Shlomo and Press (2009: 41). Over

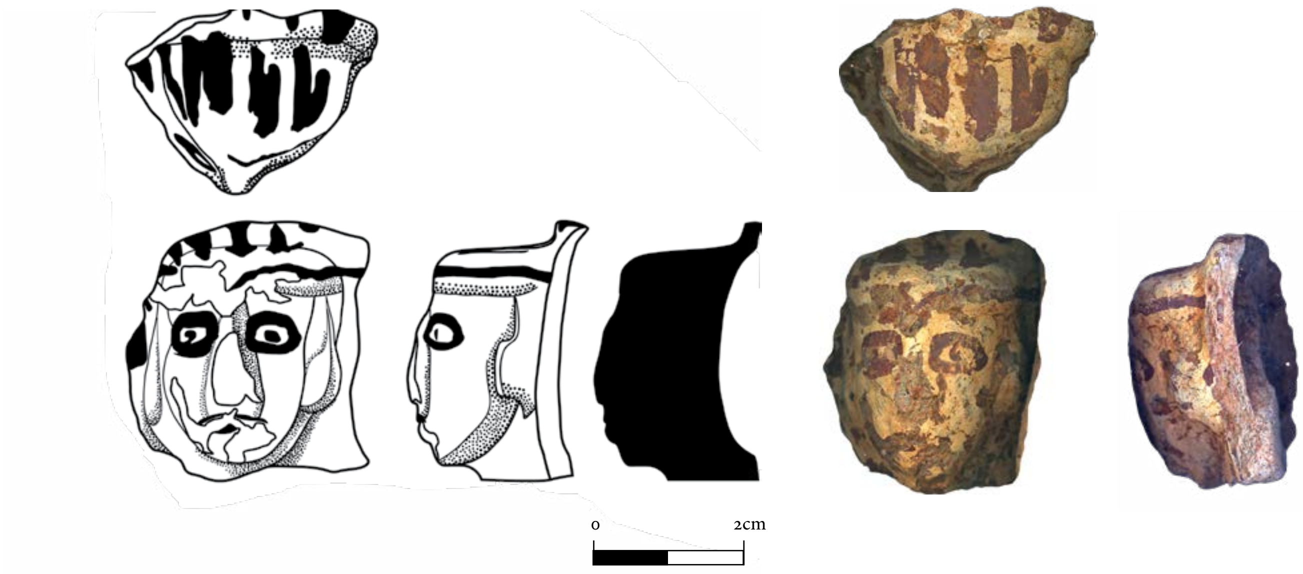

Fig. 15.8. Mycenaean-style mourning figurine head.

the burnished slip, the eyes are painted, pupils included. The cap or coronet is also painted with a band around the forehead, which apparently continues onto the body of the vessel. The forehead band chevrons down, in line with the nose; perhaps eyebrows or a sort of diadem is being indicated. Five parallel stripes are painted lengthwise across the top of the head.

This piece shows a general resemblance to some of the anomalous Aegean-style figurines derived from more recent excavations at Ashdod, Miqne and Ashkelon with similarly dated contexts (Ben-Shlomo and Press 2009: Fig. 10:1-3). An even better parallel is a figurine from Macalister's excavations at Gezer (Dever *et al.* 1974: Fig. 271, discussed in some detail by Dothan 1982: 227-228). The latter figurine is compared by Dothan to one from Tell es-Safi/Gath (Dothan 1982: Fig. 5 and Pl. 12). Another polos-capped figurine has been reported recently from Beth Shean, Stratum S-2 or S-3 (Mazar 2009: 536-538).

In general terms, this figurine fragment is related to the Mycenaean Phi, Psi and Tau figurine types as defined by Furumark (1941: 86-89). Most suggestive is a Mycenaean IIIC:1 "mourning" figurine from Naxos (cited and illustrated in Dothan 1982: Fig. 12: 5). The protrusions above and behind the head of the Tel Dan figurine may have been arms covering the head in the mourning pose.

I suggest that this is the head of a hollow-bodied, Mycenaean-style mourning figurine, in the Late Helladic IIIC tradition of local manufacture. It was most likely a free-standing figurine, but it may, in theory, have been appended to a vessel, such as a Mycenaean *lekane* (cf. Dothan 1982: 245, Pl. 28). While Ben-Shlomo and Press (2009: 39-40) are probably correct in cautioning us against attributing all such Aegean-style figurines to the "mourning figurine" class, this particular example does indeed justify the attribution. It must also be remembered that Ben-Shlomo and Press are referencing Philistine material culture, and Tel Dan is probably not a Philistine site, *per se*.

Psi, Tau or "Ashdoda" Figurine Heads

Reg. no. 31188, Locus 9273, Area T Phase 7,
Stratum II (Iron Age IIB). Ceramic. Fig. 15.9.

Reg. no. 61709/1, Locus 7754, Area B Phase 7-8,
Stratum IVA (Iron Age IIA). Ceramic. Fig. 15.10.

Reg. no. 19674, Locus 2822, Area T,
Hellenistic, Ceramic. Fig. 15.11.

The first figurine fragment (Fig. 15.9) comes from a fill locus above the destruction layer of Stratum II, dated to the 8th century BCE and under the

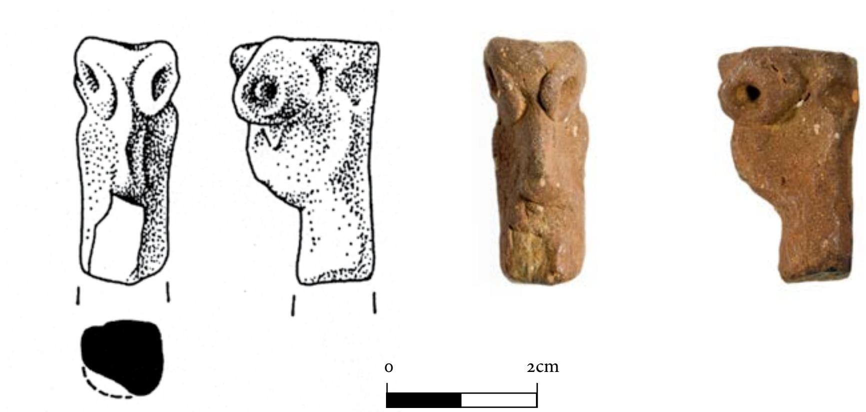

Fig. 15.9. Ceramic "Ashdoda" figurine head fragment.

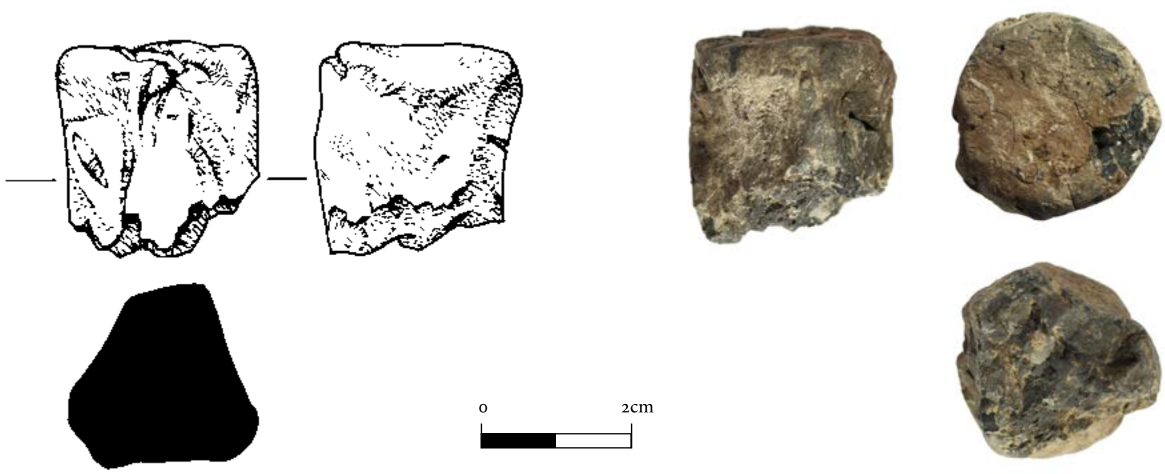

Fig. 15.10. Ceramic *tau* or *psi* figurine head fragment.

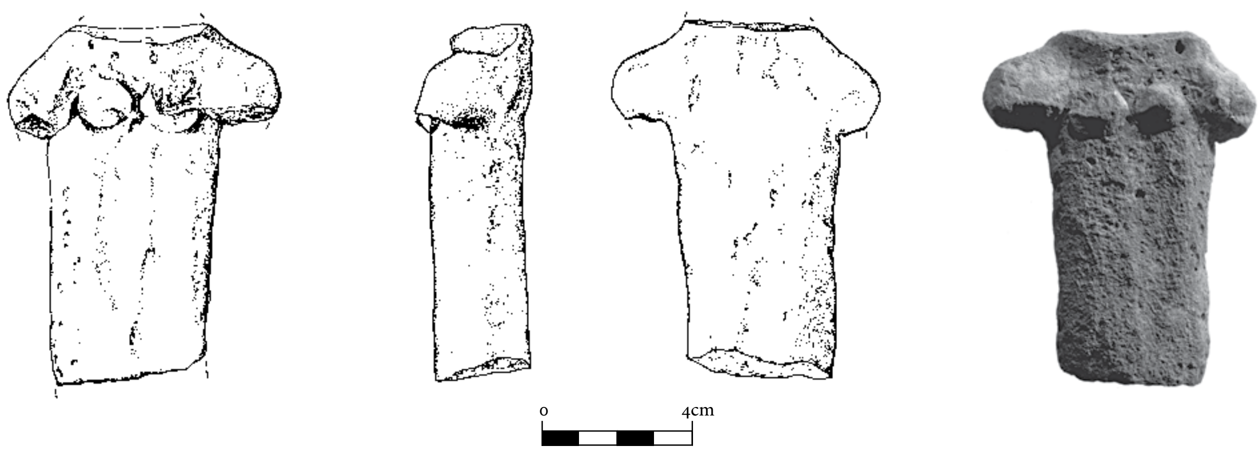

Fig. 15.11. Ceramic *tau* or *psi* figurine body.

pilastered Building 9214 of the 7th century BCE (Biran 1994: 214, Figs. 169 and 173). It is clearly out of its original context. The clay is dark reddish-brown, reminiscent of wares from the Lebanese and Syrian coast. Lighter colored grits are present. No painting is discernible. The head is narrow and the neck long, a feature that would seem to best fit the Ashdoda class (Ben-Shlomo and Press 2009: 54). The pinched nose and eyes are emphasized. The eyes were made of applied buttons of clay which were then punctured to form the pupils (it is conceivable that the resulting depression was originally filled with a colorant). The top of the head shows the usual concavity, but is narrower than is typical for the Ashdoda figurines known from Philistia. The mouth is not depicted.

The modeling of the second fragment (Fig. 15.10) is not as sharp and its preservation not as good. It looks more like a Psi or Tau figurine head (Ben-Shlomo and Press 2009: Figs. 1-2, 4). It comes from within a sequence of Iron Age II loci with a very dense stratigraphy and evidence for much recurrent leveling. A number of Iron I sherds occur in these levels, dredged up by construction in the Iron II. This fragment shows the flattened head and the pinched face, but these are somewhat less defined. No neck is preserved and it lacks the eye buttons.

The third example is what appears to be a headless female *tau* figurine of the local variety (Fig. 15.11). The ware is coarse and it lacks painted decoration, but it shows affinity to the examples collected by Ben-Shlomo and Press (2009: Figs. 1-4). Its arms seem to be folded under the breasts.

These figurine heads closely resemble the Ashdoda, Psi and Tau figurines and fragments published most comprehensively by Schmitt (1999) and Ben-Shlomo and Press (2009), characteristic of the Philistine coast and the Judean Shephelah. At the same time, they show anomalies—the narrow top and punctured eyes—that are not typical of the Ashdoda class. The fact that the fragments were found in post Iron Age I contexts prevents us from knowing whether they represents a later degenerate form, such as those known from the southern coastal plain (Ben-Shlomo and Press 2009: 53) or a contemporaneous northern variant. I know of no parallel finds in northern Israel, Lebanon or Syria.

Base of female mourning figurine (?)

Reg. no. 23662/16, Locus 7117, Area B
Phase 9, Stratum IVB. Fig. 15.12.

This solid, conical-shaped ceramic fragment appears to have been part of one of two possible objects: (1) it may be the base of a bowl meant to be inserted into a hollow stand (cf. Fig. 3.110:9); (2) it may have been the base of a standing female mourning figurine in the Aegean style (Ben-Shlomo and Press 2009: 48-49; Dothan 1982: 237-239).

Modeled hair, beard or talons

Reg. no. 10086, Locus 647, Area B Phase 11-12, Stratum VI-VIIA1, Ceramic. Fig. 15.13.

Leaving the modeled relief aside, the profile of this vessel fragment looks like the shoulder of a pithos or a large krater. Unlike Iron I pithoi and kraters, however, the ware is coarse and includes many large calcareous grits. The modeled relief occupies the shoulder between the neck and the lower carination. I have not found a parallel example. Several possible interpretations come to mind: the end of a stylized beard, a lock of styled hair, or talons. It has crossed my mind that it may be part of an anthropoid coffin, but, again, I have found nothing even vaguely similar.

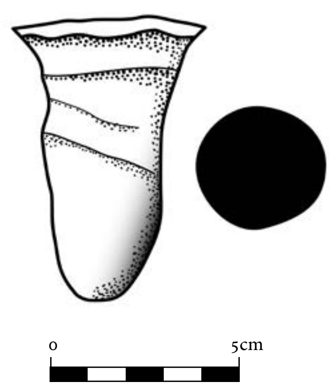

Fig. 15.12. Ceramic base of a Mycenaean-style female mourning figurine (?).

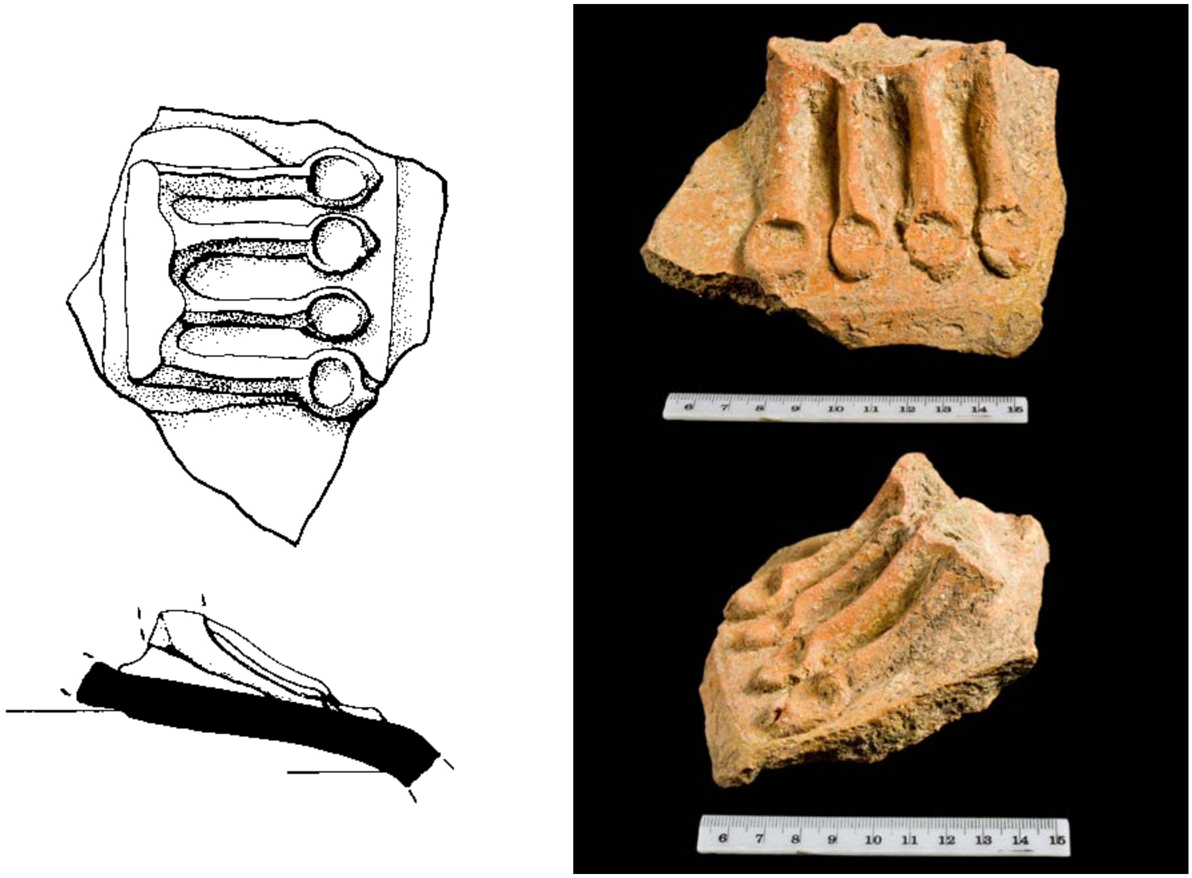

Fig. 15.13. Modeled relief of hair, beard or talons on large ceramic vessel fragment.

Some Concluding Remarks

In the context of specialized ritual vessels, it is curious that no fenestrated stands were identified in the Iron Age I assemblage. This vessel is almost always present, at least in fragmentary form, in Late Bronze and Iron Age I sites, e.g. at Beth Shean (Panitz-Cohen 2009: 263-264); Tel Qasile (Mazar 1980: Pls. 32-33); Megiddo (Harrison 2004: Pl. 9:6-7); Hazor (Yadin *et al.* 1961: Pls. 169:17; 204:2-5). Perhaps the large number of chalices was an alternate expression of fenestrated stand function. Whatever the case may be, given the large quantity of material recovered from the Iron Age I levels at Tel Dan we can safely say that the fenestrated stand was not ubiquitous at the site.

The coroplastic images and the kernoi fragments would appear to demonstrate the same Late Helladic Aegean roots as those inferred for their counterparts in the southern coastal region of Canaan. The model silo seems to represent a venerable Canaanite tradition that emerged out of Middle Kingdom Egypt. Assuming that both ritual artifacts and redundant iconography represent culture group identification, we are faced with a rather complex picture of cultural associations. This is not surprising, given the current trend towards understanding culture formation in Iron Age I Canaan as a process of "creolization", "cultural fusion" or "acculturation".[4] Scholars see such processes as being extended in nature, with

4 For the coastal regions of Canaan see for example: Ben-Shlomo and Press 2009: 67-68; Ben-Shlomo, Shai and Maeir 2004: 20; Uziel 2007; Stone 1995; Yasur-Landau 2010; for Canaan as a whole see Killebrew 2006 and her somewhat hyperbolic concept of "mixed multitudes".

cultural traits picked up along the routes of migration. The style of Aegean figurines may have undergone a metamorphosis during residence in Syria or Cyprus. The Egyptian model silo may have arrived via the Hyksos phenomenon in the late Middle Bronze Age or via a Late Bronze Age transmutation in Cyprus or Syria. We shall return to the implications of the various coexisting cultural traditions in the concluding chapter.

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CHAPTER 16
RITUAL CONTEXTS

In the previous chapter mobile expressions of ritual action were presented; but the *contexts* of these artifacts did not always appear to be of a ritual nature. This chapter discusses what can be interpreted as ritual contexts. One of these contexts highlights standing stones (*masseboth* or *stelae*), and the other is understood as a ritual structure comprised of Building 7052b, "Cult Corner" 7082, and Altar 561.

Standing Stones (Masseboth, Stelae)

So far, standing stones occur in only two rooms—L132 and L343—both in Area B-east, both belonging to Stratum V (Plan 3).[1] A single stone stands in L132 (Fig. 2.39), while a pair seems to have stood in L343, the smaller of the two perhaps tilted down intentionally (Figs. 16.1-2). These were not removed by the expedition and they are no longer preserved in the field. They were not described in any detail in the daily logs or locus cards. From the photographs and plans they appear to be made of unworked basalt slabs of even thickness, with rounded tops. The standing stones are set up flush against the rooms' south walls. The stele in L132 is located in the southwest corner of the room, while the pair in L343 was planted more or less at the midpoint. As noted in the contextual description, these stones have no apparent structural function. They would seem to be attention-focusing devices imbued with symbolic meaning.

Fig. 16.1. A pair of standing stones (*masseboth*) in L343, (looking east). Note that the one closer to the meter stick is tilted down.

Associated with the standing stones in L343 is a collared-rim pithos that was standing (originally) next to it, in the southwest corner of the room (Fig. 16.2). Since pithoi are thought to contain mainly liquids (see discussion in Chapter 3), and olive oil in particular, this brings to mind verses in

1 The standing stones may also belong to Stratum IVB; the stratigraphy is not completely certain. In the case of L132 (Stratum V), the locus immediately above, L129 (Stratum IVB), is also associated with the *massebah*, and its contents (Plan 4) must also be considered as part of the context.

Fig. 16.2. The standing stones (*masseboth*) in L343, (looking southeast and down) and a collapsed collared rim pithos that originally stood in the corner between the large *massebah* and W130.

Gen. 28:18; 35:14, where Jacob erected a *massebah* (his "pillow-stone") at Bethel and then poured olive oil over it.

Standing stones have a venerable tradition in Canaan and in the ancient Near East in general (e.g. Avner 1984; Graesser 1972; Mettinger 1995; Zevit 2001: 256-265), though they are also a feature of the Aegean, where they are termed *baetyls* (e.g. Warren 1990).[2] They are a feature of the Late Bronze Age Tel Dan as well (Ben-Dov 2002: 51, Figs. 2.20 and 2.32).[3]

The ritual compounds of Iron Age I Hazor, in both Areas A and B, each show standing stones, albeit in differing configurations (Ben-Ami 2006; Yadin 1972: 132-134; Yadin *et al*. 1961: Pls. 37-38 and Yadin 1989: 80-82). Both contexts include one large standing stone. The Area A installation is reported to be an open-air grouping that was somewhat raised above the surrounding space and delimited on the east by the fragment of a wall. Ten very small standing stones are arranged in a circle on the north side of the main stone and three slabs were present, interpreted as offering tables (Ben-Ami 2006: 123-126) though one or more could be fallen (or felled) stelae. Aside from the singularity of the standing stone, this grouping is not really similar to the Tel Dan stelae contexts.[4]

The Area B cult place at Hazor shows more affinity to the Tel Dan examples. In both cases the main stone was set up against a wall and propped up in the corner (the Hazor stele in L3746 was subsequently toppled, making it a sort of bench). As for the artifacts accompanying each assemblage, the associations seem less than clear-cut. For the most part, both show a preponderance of quotidian objects (storejars, cooking pots, jugs and bowls) and only Hazor gave up more in the way of fenestrated stands and chalices (Yadin *et al.* 1961: Pls. 103-104).[5]

It is beyond the scope of this study to delve into the history and significance of *masseboth*. In any case, this has been done by Graesser (1972) and more recently by Mettinger (1995) and Zevit (2001: 256-265). Mettinger (1995: 32, 37) is of the opinion

2 *Baetyl* (or *betyl*) is a Greek term which is "a transparent borrowing of Semitic *byt'l"* (Mettinger 1995: 35).

3 Ben-Dov (2002: 51) attributed the standing stone placed directly over Tomb 387 to the above Iron Age I levels, but subsequent stratigraphic analysis shows that it belongs to L363 which belongs to Stratum VIIA2. Apparently out of caution, Ben-Dov (2011:27-30) also elected to pass over what appears to be a *massebah* in L4609 in Stratum VIIB.

4 It seems to me that we must also distinguish groupings of standing stones from single stones—the different configurations imply different meanings.

5 The writer's dissertation includes a more detailed examination of the Hazor Iron Age I remains, including the ritual compound of Area B (Ilan 1999: 151-159). In the meantime Finkelstein (2000) has added some further observations and Ben-Ami (2001; 2006) has added more data derived from the more recent work carried out by the Hebrew University expedition.

that *masseboth* are almost entirely representations of the divine and that where more than one *massebah* is present there is more than one deity represented. Graesser (1972), on the other hand, has outlined other functions: commemoration of events, witnessing of treaties, or demarcation of tombs and borders (and see the summary in Avner 1984: 118). Lewis (1998), too, has reiterated convincingly the case for multiple meanings, contingent on textual and archaeological context.[6] Speaking of context, it may be significant that the standing stones in L343 are located almost directly above the Stratum VII (Late Bronze Age) Tomb 387 ("the Mycenaean Tomb"; Ben-Dov 2002). The slabs may even have come from the tomb's roof slabs. In any case, the upper portions of the original LBII tomb superstructure were visible to the Iron Age I inhabitants. Perhaps they also have something to do with the spirits of the dead.

Building 7052b, "Cult Corner" 7082b and Altar 561

Building 7052b had three defined spaces: the "Cult Corner" 7082b, the central hall (L7052b) and what might be called an entry hall (L7109), though the location of the doorway is not known (Figs. 2.27-2.28, 16.3). The exterior dimensions of Building 7052b are 4.0 × 9.2 m (if we consider W4362 its northern limit). Doorways were present in the south part of the east wall (W4327), the south part of the west wall (W5829) and possibly the east end of the north wall (W4362). The west and east entrances were both blocked up at some point; there is no way of knowing if this was simultaneous. A single entrance may have migrated over time. It is even possible that the "Cult Corner" 7082b was accessed at some point in time from the west and not directly associated with Building 7052b.

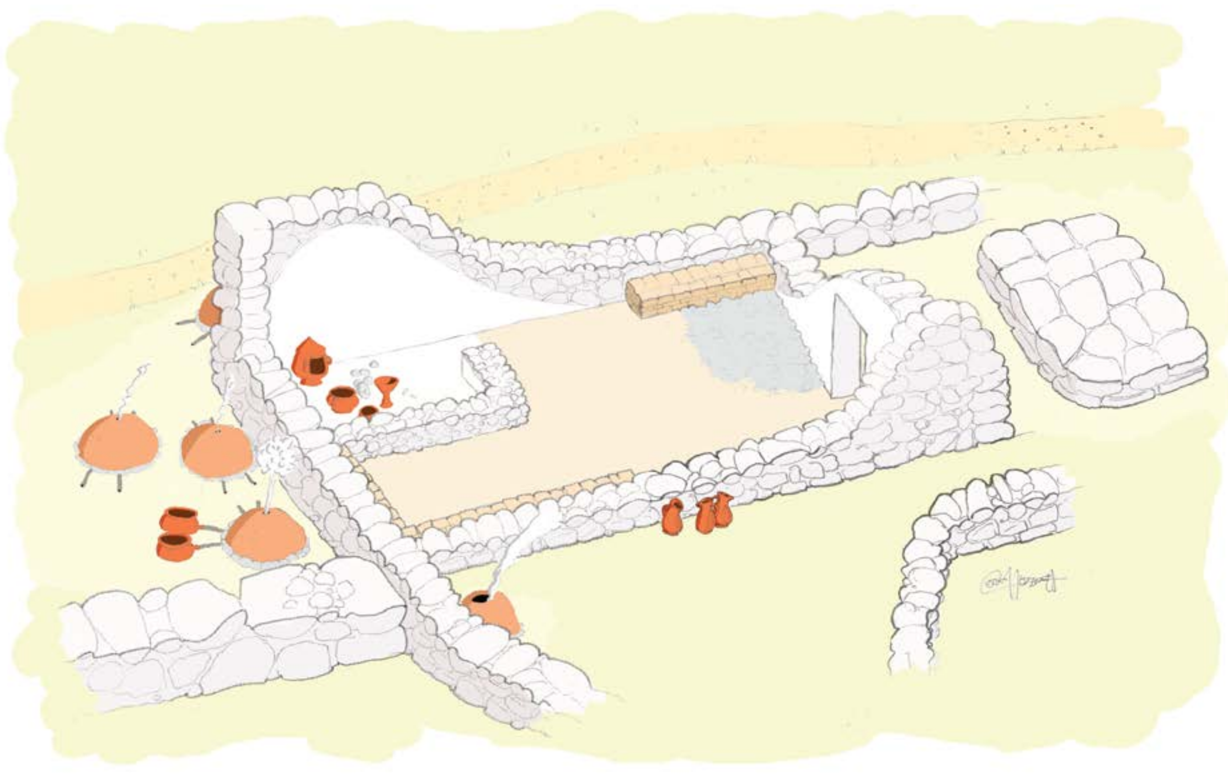

Fig. 16.3. Artist's reconstruction of Sanctuary 7052b (Conn Herriott).

6 Zevit (2001: 257) emphasizes that they were "representations of deity" but allows, too, for other functions (Zevit 2001: 259).

The northernmost chamber was paved. It may have been a later addition and W5610 may have become a bench. Aside from this, at least two clear benches were found, both in the central hall, one along the south wall (Bench 5608) and the other along the west wall (Bench 5612). In this northern part of the main hall, L7063, a storejar and three complete jugs were recovered (Fig. 3.53).

Being directly under the Iron Age II road leading down from the gate (Biran 1996: 26) it appears that the upper levels and the more northerly portions of the structure were truncated. Thus, most of the complete, *in situ* vessels were preserved at the southern end of the structure, in "Cult Corner" 7082b and L7063. The rest of the structure contained mainly fragmentary Iron Age I remains with Iron Age II intrusions, with a few exceptions on the margins. Table 16.1 is a summary of the finds from this structure.

Table 16.1. The artifact inventory from "Cult Corner" 7082b and Building 7052b.

Locus	Complete ceramic vessels	Iron Age I sherds	Stone[7]	Other
7082b	1 Galilean pithos 1 model silo 1 carinated bowl 1 chalice 1 krater 1 jug 1 rod-and-ring Fig. 3.55	bowl cooking pots chalice krater flask Fig. 3.55	1 handstone (97) Table 7.4:16 1 spheroid (181) Table 7.9:3 1 cobble (203) Table 7.16:18 1 cuboid (597) Table 7.8:6 2 pebbles (620, 631) Table 7.17:7-8 2 geodes (621, 626) Table 7.19:2-3 1 bowl fragment (427) Table 7.1:7	Bronze bowl fragment (not illustrated)
7052b	1 storejar (23416) 2 pyxides Fig. 3.56:1-2	53 large diagnostic sherds of: 2 cooking pots 1 krater 1 baking tray	2 cobbles (630, 638) Table 7.16:8-9	Bronze awl Fig. 11.2:4
7063	3 jugs 1 storejar Fig. 3.53	carinated bowl cooking pot Fig. 3.53	2 handstones (122, 467) Table 7.4:13-14 1 upper millstone (90) Table 7.3:9 1 spheroid (272) Table 7.9:2 2 pestles (244, 473) Table 7.13:7-8 1 anvil (7083) 2 cobbles (193, 200) Table 7.16:16-17 1 disc weight (526)	—
7109	1 cooking pot 1 cooking jug (not illustrated)	No diagnostic sherds	No stone items	—

"Cult Corner" 7082b is a small chamber (internal measurements 1.0 × 1.5 m) with a plaster floor located in the southwest corner of a rectangular structure. Only to the corner itself can a ritual function be attributed with confidence; the rest of the building is more equivocal, as we shall see below, though some features suggest a ritual function for the larger context. The stratigraphy of this building is not completely clear; it seems that the "Cult Corner" 7082b (as well as L7063 to its east) belongs to Phase B9–B10 of Stratum V, i.e. the mid Iron Age I.[8]

The finds in "Cult Corner" 7082b are listed in Table 16.1; priority should be given to the complete

7 Numbers in parentheses are catalogue numbers in Chapter 7.

8 There appears to be an upper phase belonging to Phase B8 (Plan 4), but this is comprised only of foundations (Walls 5614 and 5611), lacking an *in situ* assemblage due to disturbances wrought by later Iron Age II construction.

items. These include six complete vessels, a ceramic rod-and-ring of unknown use, and eight intact stone items of various kinds (Figs. 3.55; 15.1-2).[9] A Galilean pithos, subsequently truncated, was lodged between W5829 and perpendicular W5613 (though this may have been sunk from the next phase up). The assemblage contains single objects that are not represented redundantly, save for the four natural stones which occur in pairs: two basalt pebbles and two unique, brain-shaped, calcareous geodes of a form found nowhere else on the site from any period (Fig. 16.4). This conspicuously selected, non-random group of stone artifacts, in what appears to be a ritual context, should be the subject of further investigation in the future.

Whether the large pithos occupied the gap between Walls 5829 and 5813 or came from the phase above and truncated W5813, there seems to be no doorway or opening into 7082b from the main hall of Building 7052b. Perhaps there was a doorway in W5829 (see below) but given the distribution of the finds in this small space, it seems more likely that it was either a closed-off chamber—as a *geniza* or silo—or separated by low walls creating only a symbolically separate space.

Beyond the northern wall of Building 7052b, perhaps just out the doorway, lies what on the surface appears to be a rectangular patch of stone pavement, L561 (4.0 × 2.4 m, see Fig. 16.5). However, this pavement is not made of mere slabs, but rather of large boulders of the kind used to construct the monumental Late Bronze Age walls in this area (Ben-Dov 2011: 107-113). This feature must predate the construction of the Stratum V walls on either side and could date either to the end of the Late Bronze Age (Stratum VIIA) or Stratum VI (early Iron Age I). At the same time the pavement in L7109, the entry hall of Building 7052b, though made of smaller slabs, maintains the same elevation. In any event, this anomalous feature, (an altar?), is mentioned here because it may in some way be associated with the ritual structure, even though it gave up nothing in the way of ritual objects (being so close to the surface, these would have disappeared with subsequent scavenging or building activity).

Fig. 16.4. Calcareous geodes from "Cult Corner" 7082b.

Fig. 16.5. A possible constructed altar, L561.

One of the striking facts about the contents of Building 7052b is that, while surrounded by metallurgy installations and metallurgical objects (crucibles, slag, scrap metal, blowpipe nozzle fragments) the structure itself contains almost no metallurgical utensils. The components of Building 7052b—its plan, benches and "Cult Corner"—all collude

9 Some of the stone objects may belong to the underlying phase (L7096, Phase B10 or B11?) at which time this structure may have had a prosaic or industrial use, rather than a ritual function. Six other hand stones were found in this earlier locus, mostly north of "Cult Corner" W5613.

to suggest a ritual function. The idea of a corner *adyton* or altar may also be present at Iron Age I Ekron (e.g. Dothan 1998: 155-158; and note the three column bases and wall benches). While Building 7052b is smaller than most contemporaneous structures identified as temples, the features described above resemble particularly the Tel Qasile Stratum X Temple and Tell Abu Hawam Building 30 in Canaan and, as noted in Chapter 2, the Temples of Kition and Enkomi in Cyprus (e.g. Mazar 1980: 62-68, especially Fig. 15; 1992: 174-183). In the latter two cases, there is also a vivid similarity in the existence of a recycling metallurgy industry (e.g. Karageorghis 1973, 1976; Karageorghis and Demas 1985).

Mazar (1980: 68) has opined that the sanctuary "template" found at these sites was a Levantine one, adopted by the Philistines or Sea Peoples, even in Cyprus and the Greek islands (e.g. Phylakopi on Melos). More recently, Hitchcock (2011) has discussed "cult corners" as a generic phenomenon present throughout the Aegean and eastern Mediterranean from the Early Bronze through the Iron Ages, in a volume dealing with household archaeology. But it seems to me that Hitchcock has blurred the architectural definitions and missed the more specific occurrence of the corner *cella*, *adyton*, or "holy of holies". These are truly located in the corner. As far as this writer can tell, it has precedence in the Aegean and/or Cyprus and arrives in Canaan in the later part of the Iron Age I. As such, this phenomenon, too, represents the arrival of Cypriots or other "Sea People(s)" at Tel Dan.

The plan of Building 7052b changed in Phase B8 (Stratum IVB; Plan 4). The "Cult Corner" was cancelled and the column bases that replaced W4327 suggest a more open, more domestic floor plan. As noted above, the matrix was contaminated with later material; nothing was found in the way of ritual equipment in this higher phase and metallurgy appears to have continued all around it.

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CHAPTER 17

THE ANIMAL BONE REMAINS

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Introduction

The value of faunal analysis for explorations of ancient peoples is increasingly recognized as an important characteristic of Levantine archaeology, and for good reason. It provides fodder for discussions of foodways, inextricably linked to issues of social relationships, economy, ethnicity, and religious beliefs—in short, the very essence of being human for many ancients and not a few moderns. That this report appears in this volume as a chapter instead of relegated to an appendix reflects recognition of such value and emphasizes the aim of this project to integrate faunal analysis into the larger reconstructions of life at Iron Age I Dan.

Toward this goal of integration for reconstruction in light of the previous chapters, questions were formulated to which faunal evidence may be brought to bear. Namely:

- Is there a change in meat-eating practices over time within the various sub-phases of the Iron I in regard to taxa and age at slaughter? If so, is this reflective of socio-economic shifts?
- Which taxa were consumed by Iron I Danites? Is there any evidence for the avoidance of pig for consumption?
- Do faunal patterns emerge that flag Area B's "cultic corner" of Stratum V as different from the structures around it? If so, what can be surmised of associated cultic practices based on the faunal remains?

Methods

This report is based on a sample of faunal remains from the 1966-1999 Biran excavations analyzed primarily at The Pennsylvania State University from 2009-2011 in a combined effort by the authors. The sample was isolated from the larger collection in correspondence with the current director David Ilan (and with reference to Ilan 1999) based on a list of relatively secure loci—i.e., those with chronologically homogenous ceramic assemblages, clear site matrix relationships, and sharply defined architectural or stratigraphic features. Results of this analysis are considered in light of previous publications of other samples from Tel Dan (Wapnish and Hesse 1991; Wapnish, Hesse, and Ogilvy 1977; Wapnish 1993; Greer 2013).

1 This report comes in the tragic wake of the loss of Brian Hesse, dearly missed by us all. It is based primarily upon his identifications, and those made under his supervision, though we have been deprived of what insight he would have provided regarding the interpretation of the remains. We only hope he would have found some satisfaction in seeing that many of the findings here are consistent with the trends suggested in Wapnish and Hesse 1991 and, more significantly, that the faunal record plays a major role in the larger reconstruction proposed in this volume. We also wish to thank Kate Thompson and Nicole Lau, both former Anthropology undergraduate students taught by Brian and trained in the Penn State Zooarchaeology lab he established; both Kate and Nicole put in long hours in assisting with the analysis and data entry and we are most grateful. Note that this report represents our understanding as of 2014 based on the Biran excavations. Readers are referred to a forthcoming faunal supplement for a reevaluation of the Iron I remains based on the renewed excavations.

Contexts

The sample derives from Areas B, M, and Y, the contexts of which are described in detail above (see Chapter 2), though a brief overview with regard to the faunal remains from each is reiterated here.

The faunal remains from Area B represent the largest subsample and, in many ways, the most secure in terms of context. As discussed above (see Chapter 2), some complications arose due to the presence of terraced foundations and the merging of fields from previous seasons (A, AB, B1, and B), as well as difficulties in distinguishing phases in certain areas, but the relatively large size of the sample allowed focus on loci unaffected by these stratigraphic complications.

Most of the remains from Area M derive from deep probes, complicated by disjointed stratigraphy (possibly as the result of an earthquake or karstic sinkhole), and come from fills, as described above. These fills are associated with the large Stratum V building cut by the probes in this area and come from between walls, down to surfaces, and, thus must be associated with the later phases of V (i.e., M9-10).

Comparably few remains derive from the Area Y trench, though the clear stratigraphy allowed for the isolation of relatively secure loci with faunal remains. These, in turn, may be compared with previous analyses from earlier publications (i.e., Wapnish, Hesse, and Ogilvy 1977).

Areas H and T were not included in this analysis due to a lack of information about the contexts of the loci at the time the publication project began. Efforts will soon be underway to produce a supplemental report to fill this lacuna.

The Sample

This sample was collected by volunteers for the Biran excavations during excavation seasons 1974-79, 1981-82, 1984-88, 1991, and 1997 and sent to Brian Hesse for analysis. Due to the fact that excavations were carried out over several decades under various area supervisors and by numerous volunteers, we cannot be entirely confident that the same rigor in collection technique was applied equally across the sample. Further, there is little evidence that any type of extensive screening was applied. As such, this report is biased toward the inclusion of large taxa (e.g., cattle, sheep, and goats) and the exclusion of small taxa (e.g., birds, fish, and rodents). Still, in regard to large taxa, the overall distribution of bone element types is comparable to those reported from Levantine historical sites in general (cf. Wapnish and Hesse 1991) and, thus, may instill cautious assurance that we possess a representative sample from Tel Dan. As some measure of control in regard to the extent of problems associated with the sampling methods, identified and unidentified fragment counts were tallied as the first step in analysis (see below).

The affect of other taphonomic forces (cf. Shipman 1981; Lyman 1994) appears to be minimal. The fact that bone elements of various sizes were recovered suggests a relatively high state of preservation as observed in the previous study of Wapnish and Hesse 1991. There is little evidence of widespread gnawing (cf. Halstead and Isaakidou 2004). Most post-mortem modifications to the bone observed included those typically associated with the activities of slaughter, processing, and consumption (cf. Binford 1978; 1981).

Analysis

Information useful for addressing the questions posed above was obtained in recording the taxa encountered, the abundance, anatomical position and physical size of bone types and carcass parts, the osteological and dental maturity evidenced by the state of fusion and the degree of tooth wear, and the frequency of post-mortem modifications to the bone (Hesse and Wapnish 1985; Reitz and Wing 2008).

Taxonomic category representation was estimated on the basis of the proportion of the Number of Identified Specimens (NISP) and the Minimum Number of Individuals (MNI) in each category.[2] Broad categories employed in this study include Large Mammal (LM), Medium Mammal (MM), and Other. The Large Mammal category includes all elements identified as cattle (*Bos taurus*) and additional carcass elements (mostly vertebrae, long bone shaft fragments, and rib fragments) that most likely derive from cattle but cannot be identified as such for certain. Similarily, the Medium Mammal category includes all elements identified as sheep (*Ovis aries*) and goats (*Capra hircus*) and any additional carcass elements, as above, that most likely derived from sheep or goats. Sheep and goats were differentiated when possible based on the morphological characteristics identified by Boessneck 1969, recently reexamined and found to be highly reliable in Zeder and Lapham 2010. Each taxa identified in the "Other" category was recorded and listed separately.

Age at death for Small Cattle was determined on the basis of mandibular tooth wear patterns following Payne 1973, recently affirmed as a reliable tool in Greenfield and Arnold 2008.[3]

Particular attention was also focused on the frequency of bone element representation in certain analytic categories in order to assess butchering processes for Large and Medium Mammal categories (cf. Hesse and Wapnish 1985). In this study, portion categories included "head" (crania and teeth), "trunk" (vertabrae and ribs), "limbs" (scapulae, humerii, radii, ulnae, femorae, tibae, and long bone shafts), and "feet" (phalanges). Right and left sided limb elements were also tallied for Small Cattle in the presumed "cultic corner" and related areas in light of recent studies that have demonstrated a correlation between side preference and cultic practice (e.g., Greer 2013; Marom *f.c.*; Marom and Bar-Oz 2014; Davis 1987; 2008).

Results

Before a model capable of linking these variables to certain aspects of the culture-historical questions listed above will be offered and evaluated, the results are here laid out topically for inspection.

Identified Fragments

As seen in Table 17.1, proportions of identified to unidentified fragments in each subsample varied between 3-24% unidentified fragments. Samples from Area B Strata VI-IVB are viewed as the most reliable due to the relatively high total counts and higher percentages of unidentified fragments.

Table 17.1. Total number of identified and unidentified fragments in each stratum by area.

	Area B			Area M			Area Y		
	Total	Unidentified		Total	Unidentified		Total	Unidentified	
Stratum	N	N	%	N	N	%	N	N	%
VIIA1	121	12	10	—	—	—	1	0	0
VI	243	52	21	22	2	9	94	23	24
V Total	1771	432	24	22	3	5	29	1	3
V	1129	311	28	22	0	0	—	—	—
VB	510	94	18	—	—	—	6	0	0
VA	132	27	20	35	3	9	23	1	4
IVB	501	95	19	—	—	—	52	9	17

2 Counts are much higher for NISP, in that it assumes that the bones derive from a large number of animals thus minimizing the likelihood of interdependence (two or more bones coming from the same animal), and much lower for MNI, in that it assumes the opposite: that most bones are likely to have come from a small number of carcasses. On the strengths and weaknesses of each, see Hesse and Wapnish 1985: 112-16.

3 That said, Greenfield and Arnold (2008) found Grant's method (Grant 1975; 1982) and their absolute aging for Grant's Mandibular Wear Stages to provide more precise age estimations.

Taxa Representation

Summarizing the more detailed table of Appendix 17.1, which indicates relative taxa estimations based on NISP and MNI by Stratum and Area (see Appendix 17.2 for the sub-phases of Stratum V), Table 17.2, below, summarizes the broader trends by combining the Areas in each Stratum. These results show a slight increase in the percentage of LM-cattle from the earlier Stratum VIIA1 to the later Stratum IVB; comparably, we observe a slight decrease over time with respect to the MM-sheep/goat category in each stratum. That said, the difference is not statistically significant (p = .573).

Smaller samples from the relatively secure pits in Stratum VI-VIIA1 (L1236, 1242, 4619) and Stratum VI (L1201, 1220, 1229, 1233, 1234, 1240, 1241, 4349) were analyzed separately in order to provide comparative confirmation or refutation of relative abundance (see Appendix 17.4). In fact, the more secure contexts of the Stratum VI pits yielded almost identical proportions (36% LM and 59% MM) as was observed for the whole of Stratum VI; the Stratum VI-VIIA1 pits, however, yielded slightly higher proportions of LM (41%) and fewer MM (59%) than observed for the whole of Stratum VIIA1, but the importance of these results should be mitigated by the low percentages of unidentified fragments observed above (Table 17.1) and may be the result of collection bias. One Stratum VI pit (L1229) also contained a worked astragalus from a sheep or goat (Figure 17.1). Such finds are often associated with divination practices (Gilmour 1997) though this is by no means the only explanation for these ubiquitous finds.

Fig. 17.1. Worked sheep/goat astragalus from Stratum VI, Pit 1229.

Table 17.2. Taxa estimations by stratum based on NISP.

Stratum	Taxa	NISP	%
VIIA1	LM (Cattle)	39	35
	MM (Sheep/Goat)	68	62
	Other	3	3
	Total	**110**	
VI	LM (Cattle)	95	36
	MM (Sheep/Goat)	161	60
	Other	11	4
	Total	**267**	
V Total	LM (Cattle)	536	38
	MM (Sheep/Goat)	827	58
	Other	55	4
	Total	**1418**	
IVB	LM (Cattle)	183	41
	MM (Sheep/Goat)	255	57
	Other	10	2
	Total	**448**	

In cases where sheep and goats were able to be distinguished based on morphological characteristics (Table 17.3), a difference was also observed in the decreasing percentage of sheep moving from the earlier Stratum VI to the later Stratum IVB, yet again this trend failed to meet statistical criteria for determining confidence in these results (p=.165). Stratum VIIA1 was excluded due to the fact that the total distinguishable elements fell below five.

Table 17.3. Taxa estimations for sheep and goats by stratum based on NISP**.**

Stratum	Taxa	NISP	%
VIIA1	Sheep	1	—
	Goats	2	—
	Total Sheep or Goat	**3**	
VI	Sheep	13	62
	Goats	8	38
	Total Sheep or Goat	**21**	
V Total	Sheep	68	58
	Goats	50	42
	Total Sheep or Goat	**118**	
IVB	Sheep	10	38
	Goats	16	62
	Total Sheep or Goat	**26**	

Other taxa identified in this study are listed in Table 17.4 (see Appendix 17.3 for the sub-phases of Stratum V). Such include deer—mostly Mesopotamian fallow deer (*Dama mesopotamica*) and a few Red deer (*Cervus elaphus*)—mountain gazelle (*Gazella gazella*), various birds, donkey (*Equus assinus*), canids (*Canis*), various fish, pig (*Sus scrofa*), and turtle,[4] in addition to several unidentified small mammals.[5]

When comparing the taxa proportions from the possible cultic area of Area B Stratum V with the rest of Area B Stratum V, differences were observed. As shown below, there was a higher proportion of MM-sheep/goats in the possible cultic area (Table 17.5) compared to the proportions for the whole of Area B Stratum V (Table 17.6) and these differences are statistically significant (p=.004).

Table 17.4. Other taxa identified based on NISP by stratum and area.

Stratum	Area	Deer	Gazelle	Bird	Donkey	Canine	Fish	Pig	Turtle	SM	Total
VIIA1	B	0	0	1	0	0	0	2	0	0	**3**
	M	—	—	—	—	—	—	—	—	—	**—**
	Y	0	0	0	0	0	0	0	0	0	**0**
VI	B	3	1	0	2	0	2	0	0	2	**10**
	M	0	0	0	0	0	0	0	0	0	**0**
	Y	0	0	1	0	0	0	0	0	0	**1**
V Total	B	20	4	7	3	3	8	1	2	5	**53**
	M	0	0	0	0	0	0	0	1	0	**1**
	Y	0	0	1	0	0	0	0	0	0	**0**
IVB	B	4	0	0	1	1	3	0	0	0	**9**
	M	—	—	—	—	—	—	—	—	—	**—**
	Y	1	0	0	0	0	0	0	0	0	**1**

Table 17.5. Taxa estimations for the possible cultic area of Stratum V Area B based on NISP and MNI.[6]

		Area B "Cultic Corner" 7082b			Area B "Cultic Court" 7063 & 7097			"Cultic Area" Total		
Stratum	**Taxa**	**NISP**	**%**	**MNI**	**NISP**	**%**	**MNI**	**NISP**	**%**[7]	**MNI**
V	LM	9	32	1	8	18	2	17	23	3
	Cattle	2	22	1	4	50	1	6	35	2
	MM	19	68	1	36	80	3	55	75	4
	Sheep/Goat	9	47	1	15	42	3	24	44	4
	Sheep	0	0	0	3	20	1	3	13	1
	Goat	6	67	0	1	7	1	1	4	1
	Other	0	0	1	1	2	1	1	1	2
	Total	**28**			**45**			**73**		

4 Since all of the turtle remains were shell, it is most likely that these remains are indicative of turtle shell being used for some decorative or utilitarian purpose rather than evidence for the consumption of turtle.

5 Rodents were excluded from these counts as it is not always entirely clear if they were intrusive.

6 Note that the percentages in the sub-categories indicate the percentage relative to the parent category. Thus, in the first case above, Cattle in 7082b represent 22% of the parent category of LM, rather than 22% of the entire assemblage.

7 The total percentages in this category only total 99% due to rounding.

Table 17.6. Taxa estimations for the possible cultic area of Stratum V Area B compared to all other remains from Stratum V Area B with the possible cultic area loci removed.

		Area B All Loci		Area B without "Cultic Area" Loci		Area B "Cultic Area" Loci	
Stratum	**Taxa**	**NISP**	**%**	**NISP**	**%**	**NISP**	**%**[8]
V	LM	536	38	494	39	17	23
	Cattle	251	47	230	47	6	35
	MM	827	58	719	57	55	75
	Sheep/Goat	464	56	412	57	24	44
	Sheep	68	15	59	14	3	13
	Goat	50	11	47	11	1	4
	Other	55	4	52	4	1	1
	Total	**1418**		**1265**		**73**	

Table 17.7. Mortality of sheep and goats based on mandibular tooth wear according to Payne 1973 scoring.

Age in Years (Payne Category)														
			0-1 (A-C)		**1-2 (D)**		**2-4 (E-F)**		**4-6 (G)**		**6-8 (H)**		**>8 (I)**	
Stratum	**Area**	**N**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**[9]
V	B	21	2	10	7	33	9	43	1.5	7	0.5	2	1	5
IVB[10]	B	6	0.5	8	2.8	47	2.2	37	0.3	5	0	0	0	0

Mortality Patterns

The small sample size of diagnostic teeth and mandibular tooth rows allowed only for age estimations for this method in Strata V and IVB for sheep and goats. As seen above (Table 17.7), a higher percentage of sheep and goats killed before the age of two was observed in Stratum IVB as opposed to Stratum V, though the difference is not statistically significant (p=.548).

Carcass Part Distribution

Overall, no strong spatial or chronological patterns of carcass part distribution of MM-sheep/goats and LM-cattle elements were observed, as seen below (Table 17.8). One exception may be the higher percentage of bones from the trunk in the possible "cultic corner" when it is separated from the larger cultic area (Table 17.9) in comparison to the Area as a whole (Table 17.10), though the sample sizes minimize the validity of this observation with a borderline statistical significance (p=.052). Sample sizes were too small to determine any preference for right sided or left sided limb portions.

8 See n. 6.

9 See n. 7.

10 Note that percentages in Stratum IVB do not add up to 100% due to rounding.

Table 17.8. Carcass part distribution by stratum and Area.[11]

		Area B		Area M		Area Y		Total	
Stratum	**Portion**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
VIIA1	Head	14	14	—	—	0	0	14	14
	Trunk	33	34	—	—	0	0	33	34
	Limbs	49	51	—	—	1	100	50	51
	Feet	1	1	—	—	0	0	1	1
	Total	**97**		**—**	**—**	**1**		**98**	
VI	Head	14	9	4	24	7	13	25	11
	Trunk	51	32	6	35	14	25	71	30
	Limbs	88	55	7	41	31	55	126	54
	Feet	7	4	0	0	4	7	11	5
	Total	**160**		**17**		**56**		**233**	
V	Head	186	17	6	15	2	10	194	17
	Trunk	336	30	9	23	5	24	350	30
	Limbs	521	47	24	60	14	67	559	48
	Feet	60	5	1	3	0	0	61	5
	Total	**1103**		**40**		**21**		**1164**	
IVB	Head	43	13	—	—	3	9	46	12
	Trunk	103	30	—	—	6	19	109	29
	Limbs	184	54	—	—	20	63	204	55
	Feet	10	3	—	—	3	9	13	3
	Total	**340**		**—**		**32**		**372**	

Table 17.9. Carcass part distribution for the possible cultic area of Area B Stratum V.[12]

		Area B "Cultic Court" 7063 & 7097		Area B "Cultic Corner" 7082b		Area B "Cultic Area" Combined	
Stratum	**Portion**	**N**	**%**	**N**	**%**	**N**	**%**
V	Head	6	16	0	0	6	11
	Trunk	13	35	10	50	23	40
	Limbs total	18	49	9	45	27	47
	Fore total	5	28	0	0	5	19
	Right	1	20	0	0	1	20
	Left	2	40	0	0	2	40
	Hind total	1	6	2	22	3	11
	Right	0	0	2	100	2	67
	Left	0	0	0	0	0	0
	Feet	0	0	1	5	1	2
	Total	**37**		**20**		**57**	

11 Note that some of the percentages do not add up to 100% due to rounding.

12 See n. 6.

Table 17.10. Carcass part distribution for Area B Stratum V without possible cultic loci.

Stratum	Portion	N	%
V	Head	180	**17**
	Trunk	313	**30**
	Limbs	496	**47**
	Feet	59	**6**
	Total	1048	

Discussion

On the whole, the faunal profile seems consistent with and contributes to the proposed reconstruction of "a process of increasing settlement density, socioeconomic complexity and political hierarchy" moving from Stratum VIIA1 to Stratum IVB (see this volume Chapter 21). Indeed, the faunal analysis appears to track this change over time and fill out trends already observed in previous studies that included Iron I samples (Wapnish and Hesse 1991; Wapnish, Hesse, and Ogilvy 1977), though the trends in this study could not be statistically confirmed. There does, too, seem to be a relative absence of pig remains (for the significance of this, see below). The proposed "cultic corner" does stand out in the faunal profile, as well, though not in all the expected ways.

Socio-Economic Context and Change

Previous studies noted high proportions of cattle in the LB that plummeted in the early Iron I and rose slowly through the later Iron IIB (cf. Wapnish and Hesse 1991). After ranging in the LB from the 50-60% noted in previous studies, it was observed in this study that cattle drop to 35% at the VIIA1 transition point. Conversely, sheep/goat concentrations increased to 62%. These factors are consistent with the proposed social situation and a shift to pastoral means of existence for the population (see below, and Chapter 21). Moving to the later phases, the proportions begin to climb slowly toward the percentages of the later Iron II: in Stratum VI cattle are estimated at 36% and sheep/goats at 60%; in Stratum V the proportions change to 38% cattle and 58% sheep/goat; in Stratum IVB proportions are estimated at 41% cattle and 57% sheep/goat (Table 17.2; Figure 17.2). While the results of this study were not confirmed statistically, they are consistent with the trajectory suggested in Wapnish and Hesse 1991.

Interestingly, the sheep to goat ratios seem to complicate the picture. For the elements that could

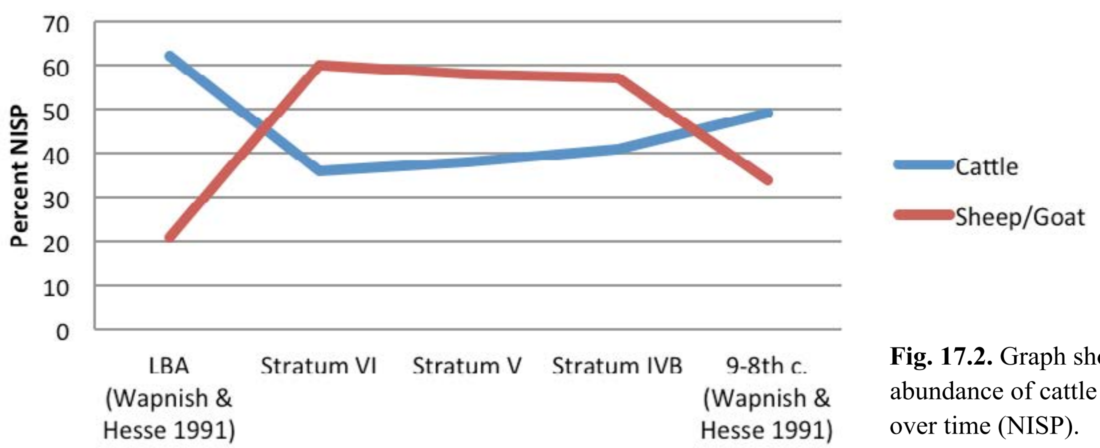

Fig. 17.2. Graph showing relative abundance of cattle and sheep/goats over time (NISP).

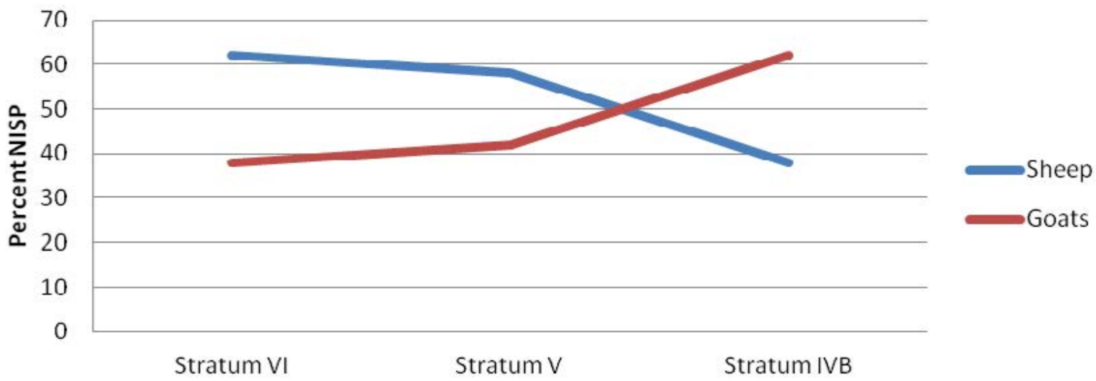

Fig. 17.3. Graph showing relative abundance of sheep and goats over time (NISP).

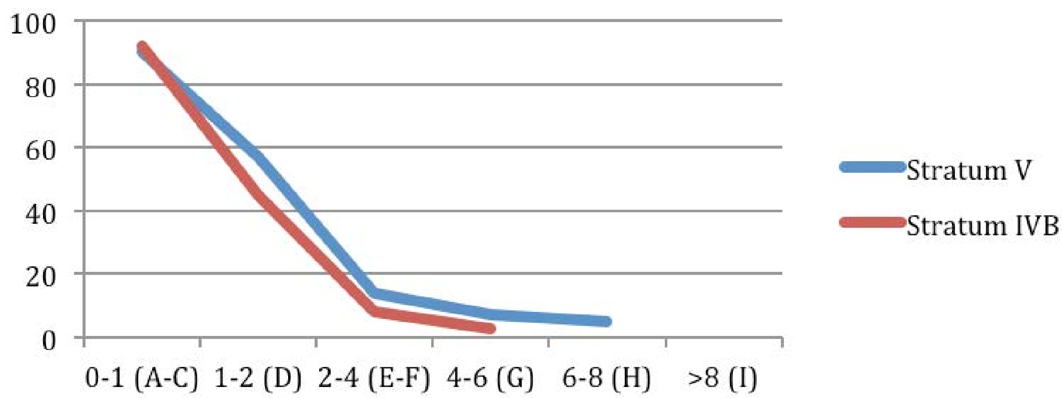

Fig. 17.4. Graph showing percent survival for Stratum V and Stratum IVB based on dental wear.

be identified as either sheep or goat, the percentage of sheep was initially greater than that of goats in Stratum VI with 62% sheep and 38% goats. This percentage drops in Stratum V with 58% sheep and 42% goats and by Stratum IVB goats outnumber sheep with 62% goats and 38% sheep (Table 17.3; Figure 17.3). Thus, the trend seems to suggest a move away from an emphasis on sheep toward an emphasis on goats; this trend, however, again failed to be confirmed statistically.

Some resonance with the move toward social complexity was also found in the analysis of the subsample of diagnostic teeth and mandibular tooth rows. Though limited by small sample sizes and unconfirmed statistically, it appears that a higher percentage of animals were killed before the age of two in Stratum IVB compared to the earlier Stratum V as depicted in the mortality curve above (Table 17.7; Figure 17.4).

Thus, taken together, the first and third factors point in the same direction and are consistent with a move toward "increasing settlement density, socioeconomic complexity and political hierarchy." If high percentages of cattle may be viewed as a rough measure of agricultural intensification and sedentism of the population (Rosen 1986; Wapnish and Hesse 1991), the sharp decrease may be associated with the more rural and pastoral setting suggested for Stratum VI. The slow rise in the percentage of cattle, then, is compatible with a move toward increasing complexity that continues into the later Iron II. Similarly, the mortality curve suggests a heightened emphasis on meat production in that animals are killed at younger ages rather than kept to older ages for their utilization in the production of secondary products such as wool and milk. Complicating the picture, however, may be the increased focused on goats, which could indicate a social context less focused on specialized meat production. In light of the fact that none of these trends were statistically confirmed, the most that can be said is that the first and third factors, i.e. the rise in cattle and the decreasing age of sheep/goat slaughter, are consistent with the trajectory observed in Wapnish and Hesse 1991 and the social history reconstructed by Ilan in this volume.

Pigs and Ethnicity?

While we can no longer affirm the complete absence of pig remains in Iron I samples suggested in previous studies due to the identification of a wild pig tooth and mandible fragment in Stratum V (Fig. 17.5),[13] a sharp contrast remains clear between the Iron I assemblage from Tel Dan and those of the Philistine sites of the coastal plain (cf., e.g., Faust and Lev-Tov 2011). That said, caution is suggested in equating "pig absence" with any particular ethnic group in this case (Hesse 1990; Hesse and Wapnish 1997). One important factor here is that pork was less frequently consumed in this region than it was in others (Hesse and Wapnish 2002). Still, when compared with samples from earlier periods at the site itself (Wapnish and Hesse 1991) and even with the two pig elements recovered from the transitional Stratum VIIA1 in this study, the relative dearth of pig is apparent. It is hoped that as excavations continue at this site and at others in the region more data—or lack of—will be available to address this question in its wider local and regional contexts.

Fig. 17.5. *Sus* molar and mandible fragment from Stratum V.

Cultic Practices in the Stratum V Cultic Corner of Area B

The special attention directed to the question of faunal markers of cultic activity in the proposed "cultic corner" of L7082b of Area B Phases B9-10 (Stratum V) yielded some statistically significant differences between this and its surrounding contexts. The strongest was the higher proportions of sheep and goats, with 75% in the "cultic area" compared to 57% in the rest of Area B Phases B9-10, without these loci. Some contrast was also observed in carcass part distribution with a higher percentage of bones from the trunk in the possible "cultic corner" (50%), when it is separated from the larger cultic area, compared to the rest of Area B Phases B9-10, without these loci (30%). Such may suggest eating activities in the cultic corner, typical of a shrine, though that such is not observed in the courtyard is surprising. The high percentage of sheep and goats may be more instructive in this regard, especially in this social context, as smaller animals are more suitable for family units engaged in sacred feasts (Greer 2013). Sample sizes were too small to identify any preference for right or left sided portions, as has been identified in other Iron Age cultic contexts (Marom *f.c.*; Greer 2013).

13 Identification of this specimen as wild, as opposed to domestic, is based on metric analysis and comparison. The dimensions of this tooth (GL 42.0 and GB19.3) are within the upper range of the measurements for modern wild boar and ancient examples from other Levantine Iron I sites (cf. Raban-Gerstel, *et al*. 2008).

Appendix 17.1. Relative abundance of taxa by area and stratum.[14]

		Area B			Area M			Area Y			Total NISP	%
Stratum	**Taxa**	**NISP**	**%**	**MNI**	**NISP**	**%**	**MNI**	**NISP**	**%**	**MNI**		
VIIA	LM	39	36	1	—	—	—	0	0	0	39	**35**
	Cattle	15		1	—	—	—	0		0	15	38
	MM	67	61	2	—	—	—	1	100	1	68	**62**
	Sheep/Goat	26		2	—	—	—	1		1	27	40
	Sheep	1		1	—	—	—	0		0	1	4
	Goat	2		1	—	—	—	0		0	2	7
	Other	3	3	2	—	—	—	0	0	0	3	**3**
	Total	**109**		**5**	**0**		**0**	**1**		**1**	**110**	
VI	LM	68	38	2	5	28	1	22	32	1	95	**36**
	Cattle	34		2	2		1	13		1	49	52
	MM	102	57	2	13	72	2	46	67	2	161	**60**
	Sheep/Goat	53		2	8		2	19		2	80	50
	Sheep	7		1	3		1	3		1	13	16
	Goat	4		1	1		1	3		1	8	10
	Other	10	6	6	0	0	0	1	1	1	11	**4**
	Total	**180**		**10**	**18**		**3**	**69**		**4**	**267**	
V Total	LM	511	38	7	19	37	2	6	21	1	536	**38**
	Cattle	236		7	13		2	2		1	251	47
	MM	774	58	15	32	62	2	21	75	3	827	**58**
	Sheep/Goat	436		15	17		2	11		3	464	56
	Sheep	62		9	3		2	3		2	68	15
	Goat	48		4	2		1	0		1	50	11
	Other	53	4	13	1	2	1	1	4	1	55	**4**
	Total	**1338**		**35**	**52**		**5**	**28**		**5**	**1418**	
IVB	LM	169	42	3	—		—	14	33	1	183	**41**
	Cattle	72		3	—		—	10		1	82	45
	MM	227	56	5	—		—	28	65	2	255	**57**
	Sheep/Goat	117		5	—		—	18		2	135	53
	Sheep	8		1	—		—	2		1	10	7
	Goat	14		4	—		—	2		1	16	12
	Other	9	2	4	—		—	1	2	1	10	**2**
	Total	**405**		**12**			**0**	**43**		**4**	**448**	

14 See n. 6.

Appendix 17.2. Relative abundance of taxa for the various sub-phases of Stratum V

		Area B		Area M		Area Y	
Stratum	**Taxa**	**NISP**	**MNI**	**NISP**	**MNI**	**NISP**	**MNI**
V	LM	288	3	5	1	—	—
	Cattle	124	3	2	1	—	—
	MM	497	8	15	1	—	—
	Sheep/Goat	264	8	11	1	—	—
	Sheep	41	6	2	1	—	—
	Goat	28	2	2	1	—	—
	Other	33	7	0	0	—	—
	Total	**818**	**18**	**20**	**2**	**0**	**0**
VB	LM	177	3	—	—	0	0
	Cattle	89	3	—	—	0	0
	MM	223	5	—	—	6	2
	Sheep/Goat	143	5	—	—	4	2
	Sheep	20	2	—	—	2	1
	Goat	17	1	—	—	2	1
	Other	16	4	—	—	0	0
	Total	**416**	**12**	**0**	**0**	**6**	**2**
VA	LM	46	1	14	1	6	1
	Cattle	23	1	11	1	2	1
	MM	54	2	17	1	15	1
	Sheep/Goat	29	2	6	1	7	1
	Sheep	1	1	1	1	1	1
	Goat	3	1	0	0	0	0
	Other	4	2	1	1	1	1
	Total	**104**	**5**	**32**	**3**	**22**	**3**

Appendix 17.3. Relative abundance of taxa for Iron Age I area and strata including the various sub-phases of Stratum V.

			Other Taxa (NISP)								
Stratum	**Area**	**Deer**	**Gazelle**	**Bird**	**Donkey**	**Canid**	**Fish**	**Pig**	**Turtle**	**SM**	**TOTAL**
VIIA	B	0	0	1	0	0	0	2	0	0	3
	M	—	—	—	—	—	—	—	—	—	—
	Y	0	0	0	0	0	0	0	0	0	0
VI	B	3	1	0	2	0	2	0	0	2	10
	M	0	0	0	0	0	0	0	0	0	0
	Y	0	0	1	0	0	0	0	0	0	0
V Total	B	20	4	7	3	3	8	1	2	5	53
	M	0	0	0	0	0	0	0	1	0	0
	Y	0	0	1	0	0	0	0	0	0	0
V	B	12	0	5	3	3	3	1	1	5	33
	M	0	0	0	0	0	0	0	0	0	0
	Y	—	—	—	—	—	—	—	—	—	—
VB	B	6	4	2	0	0	3	0	1	0	16
	M	—	—	—	—	—	—	—	—	—	—
	Y	0	0	0	0	0	0	0	0	0	0
VA	B	2	0	0	0	0	2	0	0	0	4
	M	0	0	0	0	0	0	0	1	0	1
	Y	0	0	1	0	0	0	0	0	0	1
IVB	B	4	0	0	1	1	3	0	0	0	9
	M	—	—	—	—	—	—	—	—	—	—
	Y	1	0	0	0	0	0	0	0	0	1

Appendix 17.4. Relative abundance of taxa for secure Stratum VI-VIIA1 and VI pits.[15]

	Stratum VI-VIIA1 Pits Combined			**Stratum VI Pits Combined**		
	1236, 1242,4 619			**1201, 1220, 1229, 1233, 1234, 1240, 1241, 4349**		
Taxa	NISP	%	MNI	NISP	%	MNI
LM	19	41	1	68	36	2
Cattle	11		1	34		2
MM	27	59	1	112	59	3
Sheep/Goat	16		1	53		3
Sheep	0		0	7		1
Goat	2		1	4		2
Other	0	0	0	10	5	6
Total	**46**			**190**		

15 See n. 6.

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CHAPTER 18

ARCHAEOBOTANY

The archaeobotanical remains recovered (or curated) from the Iron Age I levels are clearly underrepresented; in most seasons it was a matter of collecting only what was conspicuous. Where sieving was carried out, especially in Area B-west in the 1985-1988 seasons, more paleoflora was recovered—mainly charcoal and olive pits. Several attempts at flotation by various area supervisors (including the writer) during different excavation seasons have led to disappointing results; perhaps the climactic conditions are not as amenable to good preservation as they are for more arid or waterlogged environments. Table 18.1 summarizes the archaeobotanical remains.

In addition to the samples listed in the table, according to field records carbonized grain was identified in Pit 3009 and on the surface of L3024 in Area Y (Figs. 18.1 and 19.3, both Stratum VI). Another cache of carbonized grain was reported in what I believe is the base of Pit 336 in Area B-east (Stratum VI). I have not been able to locate these remains.

Fig. 18.1. Carbonized grain on the surface of L3024 in Area Y, Stratum VI-VIA

Olive pits are quite common in Iron Age I contexts, though they were not always collected. Field diaries indicate that they were present in most rooms and courtyards. A number of *olea europa* specimens have been identified from Iron Age I loci by E. Werker of the Hebrew University Department of Botany (Bruins *et al.* 2005, and see sample GrA-9624 in Table 20.3). Obviously, oil production was an important part of the Iron Age I economy, as it perhaps always was (an olive pit from MBII Tomb 4244 has recently been dated by radiocarbon to the Early Bronze Age; H. Bruins, personal communication). Stager and Wolff (1981) have also demonstrated its importance to the Iron Age cult of Tel Dan. Interestingly, olive pollen is absent, or nearly so, from the Birket Ram core sample discussed by Langgut, Finkelstein, and Litt (2013) and Langgut, *et al.* (2015). Conversely, the Sea of Galilee core shows a significant olive pollen component in the Iron Age I. Perhaps pollen from the Hula Valley is not being carried up to the Birket Ram catchment.

For the Iron Age I it is important to note that olive cultivation is a clear indicator of sedentary occupation; olive horticulture requires a great investment of time and effort (Singer 1996) and the time span of investment-to-reward for olive cultivation is always at least five years (Rosen 1996: 26). Olive cultivation also testifies to a degree of security, since the investment can easily be negated by chopping down trees or by several years running of neglect.

The quantities and wide distribution of the olive pits in the Iron Age I levels of Tel Dan require explanation. At least three are possible:

1. Olive oil was produced within the confines of the settlement in installations that have gone unrecognized.
2. Olives were being cured or pickled at this time and the pits are refuse.
3. Residual pulp, including pits, from the pressing process was being brought into the village as fuel for ovens and metal furnaces.

We cannot reject any of these scenarios at present, though the first one is hard to accept since none of the large pressing or collection installations known from the period were observed (Frankel 1999: 51-58, 61-67). It would appear that large-scale oil production was being carried out in areas other than those excavated.

In any event, it is worth remembering that the yield of oil per tree and per dunam is greater in areas of higher precipitation (Singer 1996: 30-31). This would have made the northern end of the Hula Valley an ideal region for large-scale olive oil production (Fig. 18.2). Moreover, since it seems that water is an important part of industrial-scale production (Frankel 1999: 47-48) the proximity of the Dan springs would have been a boon as well.

Field diaries sometimes also note the find of lentils or chickpeas in Iron Age I contexts, but since these were not sent for professional analysis and are no longer to be found, they must be relegated to the category of "possible occurrences".

Over the years, charcoal samples have been submitted to paleobotantists for identification (Table 18.1), much of this from material sent for radiocarbon dating (Chapter 20, this volume). Most charcoal that derives from Iron Age I contexts is oak, either Cyprus oak (*Quercus boissieri*) or Tabor oak (*Quercus ithaburensis*). However, some terebinth (*Pistacia atlantica*) and Euphrates poplar (Populus euphratica) is also present. Though the presence of these trees is not surprising it does give a good indication of the kinds of timber available for construction and fuel. The lack of *Quercus calliprinos* (evergreen oak), *Pinus* (pine), *Cedrus* (cedar) and *Plantanus orientalis* (oriental plane) is rather conspicuous. Pine and cedar forests may have been too distant at this time to have been utilized. *Quercus calliprinos* and plane trees may have been deforested or deemed inferior.

Fig. 18.2. An olive grove 500 m. west of Tel Dan. Photographed in November 2015, the branches are heavy with fruit.

Table 18.1. Carbonized wood and seed remains.

Basket	Locus	Phase, Stratum	Material	Species	Remarks
9420	542c	B8, IVB	Charcoal powder	?	
23670	7114	B8, IVB	Charcoal	Quercus ithaburensis	Bruins *et al*. 2005: Table 19.1*
9544	574	B8, IVB	Charcoal	Pistachia atlanta	Liphschitz and Waisel 1975, lab no. 10660
9429	574	B8, IVB	Lentil seeds	Lens culinaris	Liphschitz and Waisel 1975, lab no. 10661
1515	356	B9–B10, V	Charcoal	?	
10153/2	593 (624)	B9–B10, V	Charcoal	Quercus boissieri	Bruins *et al.* 2005: Table 19.1*
10359/1	593 (694)	B9–B10, V	Charcoal	Quercus ithaburensis	Bruins *et al.* 2005: Table 19.1*
10307/1	593 (624)	B9–B10, V	Charcoal	Quercus ithaburensis (?)	Bruins *et al.* 2005: Table 19.1*
10474	650	B9–B10, V	Charcoal	?	
10148/1	660	B9–B10, V	Charcoal	Quercus ithaburensis (?)	Bruins *et al.* 2005: Table 19.1*
10376/1	675	B9–B10, V	Charcoal	Quercus boissieri	Bruins *et al.* 2005: Table 19.1*
10302/1	675	B9–B10, V	Charcoal	?	Bruins *et al.* 2005: Table 19.1*
10640/5	1203	B9–B10, V	Charcoal	Platanus orientalis	Bruins *et al.* 2005: Table 19.1*
25090/1	4711	B9–B10, V	Charcoal	?	
25086/1	4713	B9–B10, V	Charcoal	?	
25144/1	4720	B9–B10, V	Charcoal	?	
23867	7147	B9–B10, V	Charcoal	Quercus ithaburensis	Bruins *et al.* 2005: Table 19.1*
24789	7208	B9–B10, V	Soil and charcoal mixture	?	Bruins *et al.* 2005: Table 19.1*
10593	1204	B10, VB	Soil and charcoal mixture	?	Bruins *et al.* 2005: Table 19.1.*
10463/1	1204	B10, VB	Charcoal	?	
13521	3127a	Y5–Y6, V	Charcoal	Pistacia atlantica	Bruins *et al.* 2005: Table 19.1*
23974	7168	B11, VI	Charcoal	*Quercus ithaburensis/ boissieri*	Bruins *et al.* 2005: Table 19.1*
10693	1236	B11–B12, VIIA– VI	Charcoal	?	
25167/1	4728	B11–B12, VIIA–VI	Charcoal	?	
10161/1	647	B-west, VII	Charcoal	?	
10087	647	B-west, VII	Charcoal	?	
10119	647	B-west, VII	Charcoal	?	
9386	547	B8, IVB	Olive pits	Olea europea	Liphschitz and Waisel 1975, lab no. 10659
9481	574	B8, IVB	Olive pit	Olea europea	Liphschitz and Waisel 1975, lab no. 10658
9854	574	B8, IVB	Olive pit	Olea europea	Liphschitz and Waisel 1975, lab no. 10662
9689	607	B9–B10, V	Olive pit	Olea europea	Liphschitz and Waisel 1975, lab no. 10663
1796	379	B9–B10, V	Olive pits	Olea europea	From Iron I pit in a Stratum VIII locus
10346/1	690	B9–B10, V	Olive pits	Olea europea	
10405	692	B9, VA	Olive pits	Olea europea	
10463/2	1204	B10, VB	Olive pits	Olea europea	
13103	3024	Y6, VI	Olive pits	Olea europea	Bruins *et al.* 2005: Table 19.1

* Identified by E. Werker of the Hebrew University, Department of Botany. Question marks represent samples that were not identifiable.

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CHAPTER 19

COMMODITY STORAGE: PITS, PITHOI AND INSTALLATIONS[1]

Treatments of Iron Age I archaeology consider the many pits that agglomerate in excavated sites a hallmark of the period's material culture, particularly in the highlands (e.g. Bloch-Smith and Alpert Nakhai 1999: 75-76; Finkelstein 1988: 264-269; Killebrew 2005: 157, 175-176; Mazar 1992: 289; Rosen 1994: 343-344). The large number of pits excavated in the successive Iron Age I strata at Tel Dan, with a relatively high degree of stratigraphic control, supply a good opportunity for diachronic analysis that is matched perhaps only by Hazor, 'Izbet Sartah and Tell Beit Mirsim.[2]

If we add to this the large numbers of complete pithoi and installations at Tel Dan (Plans 2-4), it is clear that we have the opportunity to discern and analyze the storage and distribution of agrarian commodities on a broader scale than is usually accessible in archaeological contexts of the period. An understanding of storage strategies allows us to better comprehend the economic and social organization of Iron Age I society how that organization may have changed over time.

The function and implications of pit construction

Pits serve a number of purposes in traditional societies (Currid and Navon 1989 and further literature there). Moreover, a given pit may have been used in different ways. Below are several possible pit functions and a consideration of what we might expect to find in each scenario.

Grain Storage

In Borowski's (1987: 72) typology of grain storage facilities, those most commonly found in Iron Age I contexts are termed "grain pits", while only the much larger (and by inference, public) storage facilities like the famous example at Megiddo Stratum III (Lamon and Shipton 1939: 66-68) are "silos". Borowski's definitions are adopted here. Grain pits are extensively used by traditional agrarian societies today (Figs. 19.1-2).[3] It is rare to find carbonized grain in such pits, but several instances in our time frame are recorded: Shiloh Stratum V, Silos 1400 and 1462 (Lederman and Finkelstein 1993: 47-48; Kislev 1993: 354) and Tell Keisan Stratum 9a (Kislev 1980, probably coeval with Tel Dan IVB).[4] The grain pit interpretation is accepted by the present author as likely for most of the pits, most of the time.

1 An earlier version of this chapter appeared in Ilan 2008.

2 The Iron Age I context with the greatest number of pits uncovered thus far (a total of 198) is Tell en-Nasbeh, Stratum IV. However, the diachronic aspect is less clear (Zorn 1993: 103-113); Greenhut and de Groot (2009: 220-224) believe that many, or most, of the pits date to the Iron Age II.

3 See, for example the Food and Agriculture Organization of the United Nations webpage on grain storage: http://www.fao.org/docrep/s1250e/S1250E0w.htm (accessed April 3, 2019).

4 Several examples of grain remains found in later Iron Age pits are noted by Greenhut and de Groot (2009: 219).

Fig. 19.1. A sorghum storage pit in the Sudan (http://www.wmo.int/wcc3/bulletin/57_2_en/stigter_en.html).

Fig. 19.2. A grain storage pit in Somalia (http://www.vicariousnomad.com/2011/04/somaliland.html)

Subfloor Storage of Other Commodities

Many commodities would not leave obvious traces. It is documented for example, that pits are often used to store fodder and make silage (Reynolds 1979: 77-79; Finkelstein 1988: 266 and references there to Shimeoni 1947: 133; Amiran and Ben-Arieh 1963: 168; Shmueli 1973: 33). Perhaps future phytolithic analysis will detect high proportions of fodder plants, but this writer knows of no published investigation with this goal in mind. In the making of silage, residues of lactic acid might also be detected, if looked for (Reynolds 1979: 78). Otherwise, one has no expectation of fodder plants being preserved in the archaeological record and one expects an empty pit. Other possibilities are salted meat (for which chemical analysis of side or base material could detect higher sodium chloride levels than is normal), short-term water storage (of which no signs will remain except for basal sedimentation that cannot be differentiated from post-use water-deposited silting). These are just some examples (for others see Reynolds 1979: 79; Currid and Navon 1989: 70-71).

Storage of Household or Mercantile Items

The emphasis here is on storage during a period of absence. In this case, one would expect to find intact or complete objects or assemblages that are restorable, if broken, into complete objects, with no missing parts. Moreover, one does not expect to find large numbers of pits for this purpose, beyond, say, two or three per extended household and perhaps only one, smaller deposit per merchant.

Composting and Solid Waste Collection

It is hard to know just how one would identify a composting pit since its contents would probably revert to something like the soil and debris fill that one would expect to accumulate over time or by purposeful action. Writing about house plans at Ugarit and following the descriptions provided by Calvet (1990) and Calvet and Geyer (1987), Schloen (2001: 340-342) has concluded that the non-plastered, stone-lined pits found amongst these houses are mainly compost pits.[5]

Ritual Use (*favissa, bothros* or *ob*)

In this case one might expect a standardized repertoire of objects and materials left as offerings. This may take the form of organic materials that leave little or no discernible traces (which would usually seem to be the case if the ancient texts are any indication; Hoffner 1967). A high degree of object

5 In Schloen's view the *plastered* stone-lined pits at Ugarit—fewer in number—are grain silos (Schloen 2001: 335-336). No paleobotanical or sediment analysis has been presented to either confirm or counter these interpretations (compost vs. grain storage). What does 3000-year-old compost look like?

redundancy might be expected.[6] One might also expect them to be concentrated in places imbued with cultic or spiritual meaning, rather than being widely distributed. Such places may show some surface manifestation of cultic activity as well. The archaeological and textual evidence for ritual pit deposits is prodigious and there is no point in citing it extensively here.[7]

Garbage Disposal/Landfill

Large quantities and varieties of pottery, animal bone, broken stone artifacts and other detritus can attest to this (cf. Finkelstein 1986: 127). But quantities and typological variety is not enough. The key is pottery from inside pits that can be joined to shards found in the floors, benches and fills above them. Intact pits that contain large shards which do not join into complete vessels are an even better indication.

This writer has concluded that most of the pits in the Iron Age I levels at Tel Dan are grain storage pits (cf. Finkelstein 1988: 102, 266-267). Though cases where grain was actually found in the pit are not common, the construction technique, the patterns of storage in the ethnographic record and the fact that they are often empty but sometimes contain a secondary deposit of rubbish, all indicate that the first use of the majority was to store grain. It is also highly likely that some pits were used as composters or for other kinds of controlled storage. The discussion below describes the reasoning behind these conclusions and then, with grain storage in mind, proceeds to matters of economic and social organization.

Pit construction

Most of the pits, by far, are cylinder-shaped (e.g. Figs. 2.3, 2.58-2.59) while a very few are beehive shaped (e.g. Pit 8185a, Figs. 2.70, 2.72, 2.76). Sometimes, when the top has been lopped off, it is hard to know which. Some pits are stone-lined and some are not. None showed unequivocal evidence of firing (a means of fumigation) though many contained a fine gray material which may have been ash (Currid and Navon 1989: 75). Those that are not stone-lined are usually inserted down into the hard-packed pebble fill of the Late Bronze Age, which must have served the same purpose as the stone lining. Where this matrix was missing a stone lining was provided—a sort of patch, as it were. The stone lining is generally considered a means of isolating the contents of the pit or silo from the soil beyond, particularly in defense of rodents and insects. If not of stone, the lining may originally have been of basketry or mud plaster, sometimes fired hard, but these may not be detected by the excavator (Currid and Navon 1989: 70; Reynolds 1979: 72-76).

Intact stone-lined pits are fairly easy to detect. At Tel Dan, the lower sections of most pits in Area B-west were easily discerned because they were inserted into the hard packed Late Bronze pebble layer (Ben-Dov 2011: Fig. 16; Biran 1994: Fig. 89). Often, however, the upper sections were not so easy to make out and it is now clear that in several cases material from a pit was excavated together with material from an earlier floor or debris level. Particularly when empty, or if their contents have burned away in conflagration, the upper sections tend to collapse inward, mixing pottery from different contexts.

It is not clear how the pits were sealed in the period of their initial use. Ethnographic and other archaeological data indicates that a variety of sealings could be used: animal dung, clay and stones, or a combination of these (Currid and Navon 1989: 70, 72). But since all of the pits seem to have been emptied of their original contents, either by natural or human agents, we would not expect to find the sealing intact—only the surface or a feature of the following occupation.

6 See for example the Late Bronze Age *favissa* in the Area A "Southern Temple" at Hazor (Ben-Tor 1999: 272-273).

7 For archaeological manifestations see for example: Ilan 1992 and references there. For textual references, including the Hebrew Bible, see Hoffner 1967 and references there.

Pit contents and their implications

At least one pit—Pit 3009 in Area Y (Fig. 19.3)—contained charred grain and another patch of charred grain was found nearby on the surface of L3024 (Fig. 18.1). These are exceptional cases, both at Tel Dan and in other Iron Age I contexts; many pits contain almost nothing aside from fill, and some of that comes from penetrated earlier layers. Stratum VI Pits 1231, 1235, 4622, 4618, 4628, 8104, 488, 3022, 3033 for example contain almost no Iron Age I pottery; only Late Bronze Age or earlier shards, from the walls and bases of the pits. The few pits of Strata V and IVB always contain at least some Iron Age I pottery, though Late Bronze Age ceramics can make up the majority since here, too, Late Bronze Age levels were penetrated (e.g. Pit 1201).

Many pits however, did contain complete, restorable pottery vessels and large quantities of animal bone and destruction debris (e.g. Fig. 2.5). Tel Dan is one of only a few Iron Age I sites where this is so. The others that I have located are Aphek (Stratum X8, Gadot 2009: 100-103), Shechem (Currid and Navon 1989: 69-70) and Sasa (L5, Golani and Yogev 1996). It has been suggested that such finds represent rubbish rather than the original intended use of the pits (Finkelstein 1988: 267; Currid and Navon 1989: 71). As it turns out, this hunch is correct, but we must prove it and then explain what happened. First to the proof:

In many cases pottery from pits could be restored with pottery from surfaces (e.g. Pit 3127=L3171&3172; Pit 7273=L1207&L1206; Pit 1209=L678&L682). While most of the debris was discarded into the pits, some fragments were missed and integrated into the floors, benches and other features of the subsequent occupation. This implies that the material in the pits is refuse from cleared floors. Why were the floors cleared rather than the debris being simply leveled down and built upon? The answer is probably twofold. On the one hand the inhabitants wished to reuse their old architecture as much as possible. So they cleared the destruction debris out. They also wished to build over areas that were densely pitted. So they cleared the debris from the destroyed houses and filled in the troublesome pits, which must have been mostly empty and at least partly visible, to provide a level surface for planned construction. This is a crucial point, for it means that the inhabitants no longer wished to make use of the pits—at least not here. The potentially problematic nature of old pits is vividly illustrated by Exodus 21:33-34: "When a man opens a pit, or when a man digs a pit and does not cover it, and an ox or a donkey falls into it, the owner of the pit shall make restoration. He shall give money to its owner, and the dead beast shall be his." How did the silos get empty enough (down to their bases) to fill them with what are clearly the fractured contents of living floors? Were their contents first emptied *en masse* and the erstwhile silos left open? One possible explanation is that the grain had already been consumed entirely, perhaps in time of famine. It does not seem likely that the grain contents burned in conflagration since no recognizable quantities of carbonized grain were discerned (when the contents of a full grain pit burn a certain portion at the core will be preserved in carbonized form (Zohary and Hopf 1994: 3-4). Would not at least a few have been forgotten or otherwise preserved with their contents intact? Perhaps so, but if not burned, the seeds would have decayed and left no recognizable trace.

Fig. 19.3. Charred grain being excavated in Pit 3009 in Area Y, Phase 6, Stratum VI.

It is only fair at this juncture to remark that the excavation techniques used in the 1960's-1980's were not as precise as one might desire, especially in the retrospective light of the questions raised here. In only a few cases was flotation carried out (during the season of 1988, by the author, producing no seeds). Moreover, sealing materials, wall linings and basal matter were not sampled for phytolithic or other microanalysis. This remains a project for the future.

Not all the pits need have been grain storage receptacles. In previous publications I gave short shrift to the idea the some pits were intended for the composting of organic materials (Ilan 1999; 2008) but I am now of the opinion that some of the pits must have been compost pits (and see Ilan 2010). Especially evocative of this possibility is the pit capped by the upper part of a recycled Galilean pithos at the top of the old rampart in Area Y which I have interpreted as a latrine (above Fig. 2.98). Following Schloen's (2001) understanding, this would have been intended for solid rather than liquid waste.[8]

Ben-Ami (2001) has proposed that the pits of Iron Age I Hazor were purpose-made as rubbish pits, with no prior use. But the evidence from Tel Dan does not support this reconstruction (nor does the evidence from Hazor, in my opinion). Neither the ethnographic nor the archaeological records provide data for such systematically constructed rubbish bins. The regular shape and stone lining of many of the pits and the lack of sufficient quantities of rubbish-like contents preclude the idea that they were intended as garbage receptacles. To reiterate: garbage disposal was a secondary use of some pits and in many cases they simply required filling to facilitate subsequent activity.

Spatial and temporal distribution of pits

The ratio of pits to excavated area (52:1020 m^2) in Stratum VI is similar to, but even greater than that encountered at 'Izbet Sartah Stratum II, the site and horizon with the densest array of pits reported until now: 43:1275 m^2 (Finkelstein 1986). At nearby Hazor, the "dozens" of Iron Age I pits discovered in the Yadin-led excavations together with the "more than 70" pits in the renewed Hebrew University excavations comprise what is, by now, probably the largest assemblage of such pits from this period (Ben-Ami 2001: 153; Ben-Ami and Ben-Tor 2012: 18-20). The Hazor XII-XI ratio of pits to excavated area seems to be similar. The ratios at Tel Dan break down by area as follows (Table 19.1):

Table 19.1. Numbers of pits relative to excavated area in Strata VI and V.

Area	Stratum VI	Excavated area m^2	Stratum V	Excavated area m^2
B-east	4	350	1	400
B-west	28	475	3	550
H	1	30	0?	30
K	3	21	0?	21
M	11	65	0	85
T	7	45	1?	60
Y	5	55	0	70
Totals	**59**	**1041**	**5**	**1216**

8 Solid waste/compost would be brought to the fields as fertilizer and liquid waste (urine) would have been used for textile processing (e.g. Mazow 2008: 298 and references there).

In Stratum VI, Areas B-west, M and T have many more pits relative to their excavated areas than do the other areas. Conversely, Areas Y and B-east display more architecture.[9] It therefore seems likely that Finkelstein (1988: 266) is correct in asserting that Area B-west was a sector devoted to grain storage in Stratum VI—a sort of subsurface granary—much like the grain-pit fields of ʻIzbet Sartah, Hazor and Tel Zeror. Plainly, these underground granaries are all outdoors.

Very few of the pits at Tel Dan overlap or disturb each other. In fact, a number are placed abutting each other, almost in rows (Plan 2). This is mainly true of Area B-west (cf. Shiloh Stratum V, Lederman and Finkelstein 1993: 47). The implication is that they were largely contemporaneous and were somehow marked.[10] Because there are so many pits which appear to be at least partly contemporaneous, logic also dictates that they may have been labeled with additional information—date of harvest, which commodity is contained (wheat, barely or other), which is reserved for seed, and perhaps, the family to which the silo belongs—all of which leads us to questions of ownership and distribution.

Against the background of our and previous analyses of Iron Age I social structure (see below Chapter 21) and the implications of the architectural layout at Tel Dan, it is to be expected that certain grain pits belonged to certain families (*batei av*, Stager 1985). A major question is whether by "families" we mean multiple-family, extended households or nuclear ones, and on what level, within the family, storage was organized. The dense agglomerations of pits in Area B-west (and those from ʻIzbet Sartah Stratum II and Hazor, for example), suggest that storage was organized by multiple-family households, and perhaps even by patrilineal clans that occupied a segment or neighborhood of the settlement (Gottwald 1979: 316). One would also expect that a given family's holdings would be well defined and recognized by the inhabitants of the settlement. The question is how these holdings were defined and whether it is possible to identify them in the archaeological record. When primordial Iron Age I levels are excavated and their layouts distinguished, the hypothetical holdings of compounds can be inferred. Such might be the case at Giloh (Mazar 1981), or ʻIzbet Sartah (Finkelstein 1986) for example. With regard to the Tel Dan pits however, these questions are insoluble because the Stratum VI dwelling units are so hard to identify—if they are preserved at all—within the Stratum V agglomeration.

I am doubtful that in a large, partially excavated site, a calculated estimate of grain pits per dunam (cf. Finkelstein 1986: 127-128) would be a true measure of the total number of grain pits on the site and the total tonnage of grain harvested by the inhabitants. Such calculations presuppose: (a) that pits are distributed, on average, throughout the site as they are in the excavated areas. As noted above, Finkelstein himself has suggested that many sites may have specific areas designated for grain storage; (b) that the pits were all contemporaneous, ignoring the probability that at a given point in time only a portion of them were in use; (c) that all the pits were used to store grain. While Rosen (1986: 172-173) did try to establish statistical limits to reduce the element of uncertainty, many unknown values remain. Such calculations may be useful as a heuristic device—they give maximum values at least—but their accuracy is questionable (cf. Hill, Lacey and Reynolds 1983).

Throughout the site Stratum VI has many more pits than the two later strata, both in absolute numbers and relative to the extent of excavation (Table 19.1). Surely this trend should be understood as reflecting social and economic change. Most Iron Age I sites lack both the diachronic resolution and aerial extent of the Tel Dan excavation and this bears directly on the question of economic processes reflected by grain pit distribution. Aside from Tel Dan, only ʻIzbet Sartah shows a clear process of changing priorities: Stratum III has a

9 The probes in Area T were too narrow and cluttered to determine how much surface architecture was actually present in Phases 16 and 15 (Strata VI and V). Area K shows almost no evidence for Iron I occupation, aside from the pits, which may belong to either Stratum VI or Stratum V.

10 Currid and Navon (1989: 68) note that the Bedouin of the southern Shephelah identified their grain pits with stone markers.

few pits (7), Stratum II many (43) and Stratum I, once again, few (10).[11] I feel these patterns can be explained by a combination of demographics and security concerns (elaborated below).

Why did Iron Age I inhabitants store grain in pits?

Composting in pits has a clear physical, even gravitational logic behind it. But subterranean grain storage is a less obvious strategy. The few detailed studies of Iron Age I pits have focused on determining their use and on their storage efficacy. The question of why pits, rather than other means, were chosen to store grain in *this* period is not sufficiently addressed.

There can be no doubt that stone-lined, plastered, sealed pits are an efficient means of storing grain (e.g. Reynolds 1979: 71-82; Currid and Navon 1989; Rosen 1994: 344; and references in these). In Finkelstein's view (1986: 126 and see references there) silo digging is a characteristic feature of populations in the process of sedentarization *or of rural communities* (my italics). His emphasis was on the first part of the statement—on settling nomads—though this was later revised to include population elements with other origins (Finkelstein and Na'aman 1994: 13). While there is logic in this, the second part of the hypothesis deserves equal attention. Pit construction has been equally prevalent amongst farmers with long traditions of permanent residence and land ownership, both in Palestine and without, in ancient times and until the not-too-distant past (Currid and Navon 1989: 67-69 and see references to Hyde *et al.* 1973 and Ilan 1974 in Finkelstein 1986: 127). It appears to have been less common both before the Iron Age I, in the Late Bronze Age, and after, in the Iron Age II.[12]

Rosen (1994: 344) has remarked that grain pits were constructed "to the very minimum", i.e. so as to expend the least effort for the most benefit. He calls this "'value engineering'—calculated and conscious saving in building activity". Larger, above-ground facilities, he reasons, are characteristic of periods of sophisticated, more complex administration. But would it not be easier and equally efficient to store grain in pithoi, (indeed, this is probably what happened in Stratum V), or in jars, such as have been found in 10th century BCE Horbat Rosh Zayit (Gal 1992: 47-53)? There is perhaps another correlate of complex, sophisticated administration that may better explain the use of the grain pit when such an administration does not exist or is perceived to be hostile.

One of the primary reasons grain is stored in subterranean facilities is to hide it—from bandits, other enemies or from the government tax collector (see for example the references in Currid and Navon 1989: notes 2 and 3). Indeed, the biblical references to grain storage do so mainly in metaphors of insecurity and refuge (Jer. 41:8; 2 Sam 17:15-20; Judg. 6:1-4; and see Currid and Navon 1989: 69). Though grain pits were probably marked, they can be quickly "unmarked" and therefore safeguarded. Even if some of the grain were detected and stolen by an adversary, much of it would not. Hence, subterranean grain storage was a matter of expediency rather than the ideal method. One imagines that some grain pits were sited purposely in even more obscure, more distant locations, just-in-case (the pits in Area K seem to be of this nature). The Iron Age I was a period of social and political turbulence; this, it can be asserted, is an important reason for subterranean storage.

Although it is true that pits are found in Iron Age I "settlement" sites from the northern Negev to the Upper Galilee, more are dug where there

11 These numbers assume that Finkelstein's stratigraphic attributions for the silos are correct. The great majority are sited in an open area between the large central structure and the outer band of buildings (Finkelstein 1986: Figs. 3-5). Finkelstein's criterion for assigning them to Stratum II is that they lack a light-colored brick debris that filled most of the Stratum III pits—not a criterion that inspires confidence. Many could belong to either Stratum III or to Stratum I or any other combination of strata.

12 The Iron Age II settlement at Moza, Stratum V, with 25 silos, is the exception that proves the rule. It was probably an administrative center (Greenhut and de Groot 2009: 12-22; 219-226).

is soil underfoot to dig them in. Where the site is founded at or near bedrock, there are usually few or none, particularly if the bedrock is hard limestone or dolomite rather than chalk.[13] This is clear from Finkelstein's survey of pits in Iron Age I sites (1986: 124-128). The depth may also be affected by the depth of soil above bedrock; Finkelstein (*ibid*: 127) suggests, for example, that the ʻIzbet Sartah Stratum II pits were shallow and more numerous than at other sites for this reason. Rock-hewn pits are found at Beer-Sheba (attributed to Stratum IX in Herzog 1984: 8-11, 70) and at Tell el-Ful (Lapp 1978: 56-62), but rock-cut features are usually difficult to date and to assign a function to.

Why did the inhabitants not make larger grain pits? Clearly, each family—whether a nuclear, extended or multi-family household—must have harvested much more than the contents of a single grain pit. The answer is probably that grain keeps best when undisturbed, and a household will consume only so much grain at a time. A larger silo would mean more grain exposed to moisture, blight and vermin for a longer time. Thus, the volume of a grain pit, which is surprisingly uniform across the country (generally averaging 1.8-2.5 m^3), was calculated by experience to match a given rate of consumption.[14] Once a grain pit was opened, its contents were removed in their entirety and stored short-term in bins or jars—also vermin proof—located inside the home (and from that point on, see Rosen 1994: 343). It is also likely that smaller but more numerous pits were a means of reducing the risk of spoilage. If a small pit is penetrated by moisture or vermin, or spoiled by bacterial or fungal activity, only a small quantity is lost.

Why did grain pits go out of vogue?

In some locations, pits may never have been hewn to begin with, particularly where a settlement was established directly on hard and karstic bedrock. The sites of the Upper Galilee highlands show relatively few pits. In these places we may hypothesize that pithoi were used to store grain (though I do not know of any examples of pithoi found with grain inside). Finkelstein (1988) has asserted that settlements with small numbers of pits could not have produced the quantities of grain sufficient for subsistence and must therefore have depended on exchange with better grain producing areas to make up the difference. But the presence or absence of pits ("silos") cannot be the criterion, by itself, for such a judgment.[15]

It is almost certain that grain pits (and pits with other functions) went out of use from time to time. By way of example, Reynolds (1979: 76) gives the following explanation for a farmer abandoning his pit:

> "Apart from ritual reasons which we shall never be able to establish by excavation, the only possible cause for abandoning a pit is the farmer's reaction to failure. When the stored grain is affected by water, the effects are remarkable. The fungal and bacterial infestation can cause strange and weird colourations, such as shiny reds, dull browns and violent greens. Faced with such a prospect, which is not enhanced by the accompanying ill odour, no farmer could be blamed for digging a new pit and abandoning the old to the evil spirits. Yet there is nothing

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13 Many pits hewn out of chalk bedrock have been reported at Shechem (Toombs 1972). Chalk would have been a positive byproduct for enhancing agricultural yields and for lime-plaster. At Tell en-Nasbeh, with the largest number of Iron Age grain pits excavated anywhere, they were hewn out of limestone bedrock (Zorn 1993: 104-105). This may be an indication of insecurity, but equally, many or even most of the pits may date to the Iron Age II. Greenhut and de Groot (2009: 223-224), agreeing with Zorn, suggest that this battery of grain pits, like the one at Moza, represents the regional granary of a central authority resident in Jerusalem.

14 cf. Zorn 1993: 104-105 concerning the averages and variation of capacity at Tell en-Nasbeh and Greenhut and de Groot 2009: 221-225 for the larger pits of Iron Age II Moza.

15 Carrying capacity analysis is a better tool and its results depend on how much of the slopes were terraced—almost impossible to gauge at this stage.

wrong at all with the pit itself, only with the stored grain. One experiment in operation at present is to monitor its disintegration. Ultimately, the grain should rot down to nothing more than a thin black layer. Such layers have been recorded but never analysed."

This one example illustrates how individual pits might remain unused while others were filled. One guesses that unused pits would have been backfilled, to remove a safety hazard and to hide the granary from those who would rob the grain. In fact, the whole process of grain pits going out of style was probably a gradual one. We have seen that pits did continue to be used, and even to be dug, in Strata V and IVB at Tel Dan. The same holds true for 'Izbet Sartah Stratum I.

The phasing-out process may be reconstructed in three stages:

1. Political stability increased and security conditions improved. These allowed the consideration of other storage methods that were less arduous (i.e. better "value engineered", to quote Rosen 1994: 344) and less prone to spoilage, spontaneous combustion and forgotten placement.
2. Under these new conditions, and given the disadvantages of underground storage, it was found preferable to store grain in pithoi and jars, of which there are prodigious numbers in Stratum V.[16] Why so? For one thing, perhaps grain was now more frequently transported as an exchanged commodity and better access was required. And perhaps, there developed a problem in keeping track of grain pits in a larger, more densely populated and built-up settlement. Perhaps too, the number of vermin expanded with increased population density and pithoi were deemed better protection against them. Too, as suggested above, perhaps problems with high groundwater, poor winter drainage and clay sealing caps being removed by rainfall and runoff made it much more sensible to store grain above ground, in sealed pithoi, under a roof. That is, as soon as one was not afraid of someone stealing one's stores.
3. At some point, probably well-advanced by the destruction of Stratum IVB, *bet av* economics (the domestic mode of production) were gradually supplanted by an increasing centralization of production and storage. Perhaps central storage facilities were established (real 'silos' in Borowski's [1987: 72] terminology) in lieu of erstwhile household facilities. There is only negative evidence for this at Tel Dan; in Stratum IVB the numbers of pithoi (and pits) are much lower than in Stratum V. It is hard to imagine that yields were significantly less, or that all was stored in jars, of which there are many, but not substantially more than in Stratum V. Part of the grain may have been stored in above-ground facilities that belonged to individual households—those chambers without doorways (cf. Tel Hadar Stratum IV, Kochavi 1998). Other portions may have been going to a central storage place or facility. Such facilities have been located in contemporaneous and slightly later contexts (e.g. Tel Hadar Stratum IV, Horvat Rosh Zayit—Kochavi 1998; Gal 1992: 47-53). But none has been found yet at Tel Dan.

We can summarize the change in grain storage techniques with the following diagram:

Stratum VI	>	many grain pits and some pithoi.
Stratum V	>	many pithoi, few pits and bins.
Stratum IVB	>	large above-ground household silos, few pits and bins, few pithoi.

A similar scenario for diachronic changes in methods of grain storage, albeit better documented in all its stages, has been reported by Amiran and Ilan for Early Bronze Age Arad (1996: 145-147).

16 And see p. 29, n. 8 above concerning the find of a wheat-filled pithos in a Phase B9-10 (Stratum V) context.

From Pit to Pithos: Concerning Pithos Distribution

In Stratum V pithoi were usually found propped up against walls (see Plan 3 and Figs. 2.21-2.26), though in several cases (e.g. Area B-west, L7140 and L7083), pithoi were sunk into the ground (when pithoi are sunk, they are definitely *in situ*, but the upper portion is usually missing). Lacking evidence to the contrary, we can only presume that the same would have been true for Stratum VI; i.e. pithoi found in the Stratum VI pits, must have leaned against walls—even in the unlikely event that the walls were made of reeds (cf. Geva 1984). They may also have been supported by stone props (Fig. 19.4).

As noted above, pithoi frequency increases from Stratum VI to Stratum V as pit frequency declines. Several Stratum V rooms, in Area B-west in particular, contain more than one pithos (Loci 1204, 1213, 698 and 586 that contained five). No rooms were found containing more than this, which suggests a household mode of production and distribution, at least for the neighborhoods excavated. This pattern exists in all the excavated areas where Iron Age I levels were encountered.

The pits of Stratum VI and the rooms of Stratum V contain both classic collared-rim and Galilean pithoi, fragmentary and complete, in approximately equal numbers. But they seem to occur in segregated groups and are not often mixed as whole vessels. Note, for example, that where more than one pithos occurs in a room or pit, the types almost always group together: Pit 3127b and L698 contain only Galilean pithoi, while Pits 336, 4349 and Loci 586, 692, 1204 and 1213 contain only collared-rim pithoi. Only in Pit 1225 is there a combination (one of each). This may be an indication of commodity separation and identification, or, perhaps, it is a question of cultural preference. We shall return to this point in our conclusions in Chapter 21.

Finally, pithoi occur in ritual contexts—next to the cult corner of L7082b and next to a standing stone in L356a (Fig. 2.41; Fig. 16.2). In such cases

Fig. 19.4. Pithos storage in the basement of a traditional household in Lefkara, Cyprus (http://cyprusreflections.files.wordpress.com/2011/11/img_5567.jpg).

we can infer bulk storage associated with ritual function.[17]

Installations Made of Pithoi

Inverted pithoi were found in L8060 (Stratum V, Fig. 2.71), L3107 (Stratum V, Fig. 2.102) and L605 (Stratum IVB, Fig. 2.47). Their function is not clear, but the find of one of these at Tel Harashim filled with ash and supporting a cooking pot (Aharoni 1957: 20), suggests that they primarily functioned as cooking ranges, and not as "ovens" as was asserted by Yadin (1972: 129) regarding similar installations found at Hazor Stratum XII (ovens are closed installations for all-around heating). Other installations made of the upended upper section of a pithos have been found, for example, at Sasa (Bahat 1986: 87) and Tell Keisan (Briend and Humbert 1980: 200, Fig. 52 in L503 in Stratum 9a). At Tel Dan, they were found in rooms filled with ash, partly from metallurgy and perhaps other pyrotechnic activity, but also in the form of destruction debris, so it is hard to isolate remains of burning that belong specifically to these inverted pithoi. It

17 In Chapter 21, we shall discuss the questions of where the various pithoi types were manufactured, how they moved across the region and why. This discussion is based on Neutron Activation Analysis carried out by Yellin and Gunneweg (1989) and petrographic work on the pithoi of Sasa (Cohen-Weinberger and Goren 1996).

appears that anchoring, at least the inverted mouth, and probably the shoulder as well, into the floor would create a stable container or stand.

They would not have been metal melting furnaces, since it would be too hard to remove the crucible while the metal it contained was still in a molten state. Another kind of installation is made of the upright upper section of a pithos set onto the stone lining of a pit (Pit 905, Fig. 2.98). I have suggested that this was a latrine or compost pit (above p. 82)

Bins and Troughs

In several places, semi-circular bins were found built up against walls, e.g. W8201 (=L2596) and L2304 in Area T, Phase T15 (Plan 5b and Fig. 2.85); L3175 in Area Y, Phase Y4 (Figs. 2.105 and 2.112); L8181 in Area M Phase M9c (Figs. 2.70, 2.73); L4710 in Area B-west Phase B11 (Plan 3). Obviously, these represent ground floor installations since they would not be intact had they collapsed from an upper floor. Perhaps the best explanation for them is that they are animal feed troughs (cf. Stager 1985: 13-15). But these may be stone foundations of another kind of grain bin. At least one also had a large stone mortar or basin next to it (L4710 in Area B-west). However, they can also contain a complete vessel or two: a cooking pot in Area Y L3175 and a storejar in Area B-west L4710. Hence they may also serve as temporary, *ad hoc* storage.

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CHAPTER 20

CHRONOLOGY

Relative Chronology

The wealth of ceramic, architectural and behavioral parallels described in the previous chapters provide the means for the construction of a relative chronology. My previous effort (Ilan 1999: 137-138) has mostly withstood the test of subsequent publication of other Iron Age I assemblages. But relative chronology is less the straightforward exercise it once was.

Gilboa and Sharon (2003: 8) have articulated a program for establishing a relative and absolute chronology for the early Iron Age of the eastern Mediterranean region which, "entails (1) a construction of a framework of relative chronology (including a new terminological framework for Phoenicia) based on a comparative study of ceramics, illustrated and explicitly discussed; (2) the establishment of absolute dates for this framework, based on ^{14}C determinations; and (3) determination of the network of intra-, inter- and super-regional contacts, to reconstruct cross-cultural synchronisms." The present writer concurs with this program—it could be adopted for any culture region.[1] How then, does the stratified material culture presented in the previous chapters measure up to the task that Gilboa and Sharon have set before us?

Tel Dan is similar to Dor, Megiddo and Beth Shean in that it shows continuous settlement from the Late Bronze Age though the Iron Age II. This should allow for the kind of seriation that these expeditions have aspired to (Gilboa and Sharon 2003: 8; Arie 2006: 227-231; Panitz-Cohen 2009: 270-273). These developing seriations are beginning to enable closer synchronization, something that is reflected in Table 20.1.

The Tel Dan Iron Age I assemblage is particularly close to the Tell Keisan Iron Age I assemblage from the viewpoint of morphology and the development of types (cf. Briend and Humbert 1980; Burdajewicz 1994). There are differences as well: Tell Keisan shows larger numbers of bowls in all strata, stump-based storejars in Stratum 13, footed goblets, and greater quantities of Cypriot material (e.g. the bird juglets, and goblets of Stratum 9c), while Tel Dan has larger numbers of chalices, alabastra ("pyxides"), and pithoi (of all kinds), and it lacks skyphoi bowls, having carinated bowls instead. These differences seem to suggest differences in resource procurement, cultural background and exchange partners. However, the morphological similarities indicate contemporaneousness, particularly since preliminary petrographic work suggests that at least some items in the Tel Dan Iron Age I assemblage originate in the Akko Plain area (Golding-Meir, Chapter 6c this volume). This link can then be associated with the cross-dating arrived at by Gilboa and Sharon (2003: Table 21).

While Tel Dan is outside the Phoenician coastal heartland, the Iron Age I levels demonstrate significant contact with Phoenicia (various expressions of this contact are summarized in by Beyl in Chapter 5 this volume). In some ways the Iron Age I material of Tel Dan is superior to the Tel Dor assemblages

1 For more recent treatments by these same authors (with others) operating under the same research agenda and supplementing further data or approaching the Dor assemblage from a different angle see: Gilboa, Sharon and Zorn 2004; Gilboa *et al.* 2008; Gilboa, Sharon and Boaretto 2009.

Table 20.1. Comparative Chronology with Selected Sites (schematic).

Site	late LB IIB	Iron IA	Iron IA	Iron IB	Iron IIA
	(c. 1300-1150)	(c. 1150-1100)	(c. 1100-980)	(c. 980-920)	(c. 920-800)
Dan	VIIA	VI	V	IVB	IVA
Hazor	XIII		XII-XI	—	X-IX
Keisan	13	12b-a	11-9c	9b-a	8
Tell Abu Hawam	Vc	IVa	—	IVb	III
Dor (Gilboa and Sharon 2003)	G12-11 = LB	G10, B1 13 = Ir1a(*e*)	G9, D2 13, B1 12; destruction, = Ir1a(*l*)	G7-8, D2 11-12, B1 10-11; post destruct. = Ir1b	G6a-b, D2 8b-c; B1 8-9a = Ir1/2-Ir2a
Kinrot	—	VI	V	IV	III
Beth Shean	VII, S-5, N-3b?-4, Q-2	Lower VI – lower, S-4 (S5?), Q-1, N-3b	Lower VI, S-3-2, Q-1, N-3a	Late Level VI and double temple of Lower V, N-2?, Bldg. 1700, S-2	Parts of Lower V, N-1?, S-1
Megiddo	VIIA	VIIA-VIB	VIB	VIA	VA-IVB
Yoqneam	XIX	(cont.)	XVIII	XVII	XVI-XIV
Qiri	—	IX	VIII	VII	
Taanach	IA	IB?	—	IIA	IIB
Mt. Ebal	II	IB	—	—	—
Shiloh	V	—	L.623	—	—
Izbet Sartah	III	—	II	I	—
Aphek	X12	X11	X10	X9	X8
Qasile	—	—	XII-XI	X	IX-VIII
Tyre (Bikai 1978)	XV	XIV	(cont.)	XIII-X	IX
Sarepta (Anderson 1988)	G	F	(cont.)	E, then gap	D2

that served as an anchor for Gilboa and Sharon's scheme. The terminal Late Bronze and early Iron Age IA assemblages appear to be better represented at Tel Dan (Strata VIIA1 and VI). Even the later Iron Age IA assemblage (Stratum V) seems to include more complete vessels.[2] The Iron Age IB is much better represented at Tel Dor and the synchronism with Tel Dan Stratum IVB is generally clear.

Many types developed at Tel Dan in ways that are similar to the patterns observed at Tel Dor (Table 20.2), while other types are mutually exclusive: Tel Dor has very few or no baking trays (BT), chalices (CH), K5 kraters, handless cooking jugs

2 Excavation since has certainly expanded the early Iron Age repertoire at Dor, though this material was not yet extensively published at the time of this writing (Gilboa and Sharon 2008: 153). After this volume went to layout the final report on the Late Bronze and Iron Age levels from Area G at Tel Dor was published (Gilboa 2018).

Table 20.2. Selected typological equivalencies between Tel Dan and Tel Dor (after Gilboa and Sharon 2003)[3]

Dan Type	Dor Type
Bh1-2	B25
Bh3	KR26
Bc2	BL23
Bc3	BL22
Bc4	BL33
Bp1	BL2-5, 8
CH	BL2?, BL22?, CH
K1/2	K2, K22
K3	K14, K21a
K4	K21
CP2b1	CP14
CP2b4	CP7
CP32a	CP11
PCR	PT1
PP	PT2
SJ1	SJ1
SJ4	JR3
J1	JG1-2
J2	PJ15
J4	PJ1
J5	PJ23-25
J6	PJ20
J7	JG10
FJ	PJ13
JTd	DJ1

(CJ), perforated goblets (PG), tripod mugs (TM), SJ3 storejar rims, two-handled amphorae (AM), and FL1 or FL3 flasks. Tel Dan has very few or no Dor-type BL1 bowls, KR1 kraters, and goblets. This suggests that such types are regional in nature, culturally specific ("pots = people"), or pertain to functions not represented to a similar degree at both sites.(cf. Gilboa 2018: 155-160) In summary though, a strong typological linkage with the Tel Dor sequence can be discerned, and through it with other Iron Age I Phoenician sites. This linkage will require further study in the future.

The relative chronology arrived at by Gilboa and Sharon (2003) for the coastal sites, together with the analogous material culture from sites further inland, provides the basis for the synopsis of stratigraphic equivalencies presented below in Table 20.2. The recent relative chronology schemes of Arie (2006: 227-231) and Panitz-Cohen (2009: 270-273) confirm these equivalencies, to a great degree.

Egyptian Linkages

Regarding the Egyptian and Egyptianizing material, we have only a little to go on. Our primary datum is perhaps the two scarab seals of the 19th Dynasty, one from Stratum VII2A bearing the throne name of Ramses II and another from Stratum VI (Iron Age I) Pit 8225 (Keel 2010: Nos. 2 and 4). The later may have fallen into the pit from penetrated Late Bronze contexts, but it may also originate with the pit contents. Given these contexts, the 19th dynasty could be either a *terminus post quem* or *terminus a quo* for the beginning of Stratum VI.

The Iron Age I cooking jug is found first in Late Bronze assemblages (L2431, Ben-Dov 2011: Fig. 178:24) and at Kamid el-Loz (Metzger 1993: Pl. 117). But it is also known from Beth Shean Stratum 4 (Yadin and Geva 1986: Fig. 27:10), considered an Iron Age IA stratum, equivalent to Level VI of the University Museum Excavations and Strata N3 and S3-5 of the Mazar excavations, dated to the 20th Egyptian dynasty (Mazar 2009: 13).

In summary, Egyptian and Egyptianizing items found in Iron Age I contexts appear first in the late 13th century BCE, in Stratum VIIA (LBII) and belong to both the 19th and 20th Dynasties. The Egyptian-style cooking jug continued to be manufactured and used in Strata VI and V, holding out for at least several generations after Egyptian hegemony ended in Canaan (and see below).

3 My typology and Gilboa's (2001) typology are not always strictly comparable. For the most part I use body and rim form as the primary criteria (with emphasis depending on the vessel type), subdividing hierarchically, in detail, only cooking pots (above p. 104). Gilboa subdivides forms much more than I do (except for cooking pots) and seems to use a more particularistic system, rather than a hierarchical one. Moreover, she utilizes decoration extensively for the typological subdivision of jugs and juglets while I discuss decoration only as an attribute of types. Therefore, certain types—jugs in particular—are hard to compare based on an attribute-analysis basis.

Aegean and Cypriot linkages

A number of Aegean or Cypriot features have been described in the previous chapters: "cult corners", ceramics, scale weights, a loom weight, a stamp seal and figurines. None of these offer a precise linkage for relative chronology, since most, if not all, appear in assemblages throughout the eastern Mediterranean from the late 13th through the 11th centuries BCE, and often in secondary contexts. The Mycenaean IIIC1b stirrup jar comes from what seems to be a Stratum VIIA1 context, dated by Ben-Dov (2011: 376-377) to the 12th century, based on analogous material in Beth Shean Stratum S5. Zukerman (Chapter 4 this volume p. 360) notes that in the Argolid this type would belong to the LH IIIC Late period which began *ca.* 1100 BCE, seemingly too late for the dating ascribed to the context by Ben-Dov and even the somewhat later dating that I have proposed. But the vessel does not come from the Argolid—it may originate on the southern coast of Anatolia. Stylistic development may have been somewhat different there, with this type occurring earlier. Another possibility is that the vessel is intrusive, from a higher phase. Finally, perhaps the entire Dan sequence should be down-dated by 100 years or so, but given the Beth-Shean comparanda, this seems unlikely. In any case, a single, unique vessel cannot be the basis of such a down-dating.

The three sherds of what appear to be true "Philistine" bichrome pottery all come from pits in Area Y that may be assigned to either Stratum V or Stratum VI (the lack of certainty stems from the fact that they are not associated with architecture). On the face of things, this "classic" Philistine pottery would appear to indicate that the Stratum VI and Stratum V assemblages should correspond to Philistine levels at Tel Qasile (XII-X) and to assemblages with smaller quantities of Philistine pottery at Megiddo, Tel Qiri, Tell Keisan, 'Afula, Aphek, 'Izbet Sartah, etc. The Mycenaean IIIC1b and non-Philistine painted pottery decorated with birds and other Aegean or Cypriot motifs (mostly monochrome, some bichrome, without a white slip background) first appears in either Stratum VIIA1 (according to Ben Dov 2011: 161) or Stratum VI. The simple monochrome "Sea People" painted pottery together with the early, non-Philistine bichrome pottery represents a different scheme of development than the monochrome > bichrome sequence of the Philistine southern coastal plain (cf. Dothan 1982: 94-96). Future excavation may reveal a larger sample from broader contexts to clarify this matter.

As for the wavy band and Cypriot-style pithoi (including what have been called Galilean pithoi) the matter of relative chronology is also equivocal. As laid out in Chapter 3 the locally manufactured Galilean pithos is clearly of Late Cypriot inspiration; but no similar vessels have been found yet in good contexts in the southern Levant. The Cypriot type can only be referenced as a *terminus a quo*. The true Wavy Band pithos occurs at Tel Dan as early as Stratum VIIB (Ben-Dov 2011: 256) and continues in a Levantine coastal variant as late as Stratum IVA (above pp. 113-114).

The "anchor" seal with the form of a Cypriot-style pyramidal loom weight is characteristic of Late Cypriot IIC and III contexts and after (above pp. 541-542). Here again, we have a *terminus a quo*, but no more. In terms of the Aegean- and Cypriot-style items Strata VI and V belong clearly to the 12th-11th centuries BCE horizon, as indicated in Table 20.2.

Phoenician pottery

The Phoenician Bichrome ware found beginning with Stratum IVB provides a more clear-cut criterion (cf. Gilboa 1999 and Beyl, Chapter 5 this volume), though no complete vessels were recovered. The fact that it occurs at Tel Dan after the appearance of Philistine pottery conforms to what we know from the sequences at other sites that have both. Moreover the "red-monochrome" and thin-banded, bichrome decorative techniques that occur in the pre-destruction level at Tel Dor (Iron Age IA) also occur with some frequency in Tel Dan Strata VI and V. Here then, we have another anchor for relative chronology.

Absolute Chronology

Absolute chronology is achieved ideally by a large series of radiocarbon dates derived from short-lived samples (seeds, grain) from discrete, undisturbed archaeological contexts, such as sealed pits or closed jars containing large quantities of a carbonized organic commodity, enabling repeated assays on the same material from the same context. Multiple contexts of this sort, found in the same archaeological horizon (e.g. a destruction layer) will give the best aggregate series of dates (e.g. Boaretto 2007; Finkelstein and Piasetzsky 2010: 1667; Gilboa and Sharon 2003: 57-60). This ideal situation rarely exists; usually one must be satisfied with small quantities of datable material from discrete, definable archaeological contexts. These would seem to comprise the majority of samples published. It is no longer considered worthwhile sampling just any kind of organic material from just any context. For historical periods, dates derived from wood charcoal are no longer considered of much utility (e.g. Finkelstein and Piasetzsky 2010: 1668-1670). Be that as it may, the patterns evident in the Tel Dan charcoal dates suggest that the complete dismissal of wood charcoal is akin to "throwing the baby out with the bathwater." I expand on this below.

Absolute chronology is also still achievable, to a degree, utilizing a combination of historically-pegged material (Egyptian in the case of Iron Age I Tel Dan) and relative chronology, where an assemblage with limited or no means of absolute dating is keyed into assemblages that are dated with absolute criteria. The combination of larger numbers of secure radiocarbon dates combined with more precise analyses of material culture change can lead to historical reconstructions that are much more nuanced and highly resolved than those of the past (e.g. Finkelstein and Piasetzsky 2006a; 2009; Gilboa and Sharon 2003; Mazar *et al.* 2005).[4]

A number of organic carbonized materials from Iron Age I contexts were sampled within the framework of a larger radiocarbon dating project carried out by Hendrik J. Bruins of Ben-Gurion University and Johannes Van der Plicht of the University of Groningen's Centre for Isotope Research (see Table 20.3). The results of this sampling were published by Bruins, van der Plicht, Ilan and Werker (2005). As a coauthor of this publication I supplied the archaeological-contextual data, but my co-authors and I were not in complete agreement about the interpretation of the dates. The background information concerning the sampling procedures can be found in Bruins *et al*. 2005. I use this opportunity to clarify my own viewpoint as to what can and cannot be gleaned from the radiocarbon assays from Tel Dan.

Unfortunately, none of the charred grain noted in the field diaries of the 1970s and 1980s was available for sampling; it had somehow gone missing by the time the present author conducted a systematic search for it in the mid-1990s. Table 20.3 is a summary of the 12 samples collected and submitted from Iron Age I contexts, i.e. from Strata IVB, V and VI. Only two samples came from Stratum VI (one of these may come from Stratum VIIA1) and none from Stratum IVB. All the rest are from the destruction layer of Stratum V. The only non-charcoal sample in the series is derived from olive pits (Lab no. GrA-9624 from L3024 in Stratum VI). It has been pointed out that scattered olive pits, (as opposed to clustered deposits) are contextually questionable and, on their own, of limited utility (Boaretto 2007: 210). However, the date from the olive pits is quite consistent with the charcoal dates, as we will see below. The rest of the dates are derived from charcoal, which means that we have no samples that can date the strata destructions (this would require seeds of short-lived annuals).

The charcoal originates in the wood (most likely trunks or branches) of trees, reflecting some part of the trees' life-spans prior to their felling. The charcoal dates represent a *terminus post quem* for the felling of trees or the cutting of branches. The problem of old wood is especially acute for the samples

4 The relative chronology of Strata VI, V and IVB is laid out in the preceding section.

of Tabor Oak (*Quercus ithaburensis*) which can live for hundreds of years.[5] The charcoal will give a date that is earlier than the felling of the tree or the cutting of a branch if it comes from the earlier, more interior rings of a trunk.

Having made the above caveats we must now point out some intriguing positive patterns in the radiometric results. The most remarkable aspect of these dates is their uniformity: at one sigma they line up within a time frame of 1373-1045 BCE (calibrated) all with low standard deviations (see Table 20.3). For most of the samples (nine of them) the latest possible calibrated dates are *ca.* 1130 BCE. Certainly, there is an element of old wood here. This is old wood that was burned to charcoal in the Stratum V destruction. And to repeat, the dates tell us nothing about when Stratum V was destroyed by fire. What they *do* tell us is that most, if not all the trees were cut prior to ca. 1130 BCE. And they seem to have been cut at close to the same time, the small variations in the BP dates reflecting the ages of particular rings at varying depths of the original branches or trunks. This logging activity of circa 1250-1150 BCE must have occurred at some time during the later 19th or the 20th Dynasty. We can further presume that Stratum VIIA1 or Stratum VI—from which the timber must have been scavenged for Stratum V—was *not* destroyed by an all-consuming conflagration event; otherwise there would be no timber to salvage. Here then, we come to the historical context for the spate of tree cutting, which will be discussed in the concluding chapter.

In recent articles by Finkelstein and Piasetzsky (2006b: 380-381) and by Fantalkin, Finkelstein and Piasetsky (2011) it is claimed that the contexts from which the radiocarbon samples were derived at Tel Dan are not reliable. Certainly they are correct concerning the lack of utility these assays have for supporting a high (=traditional) date for the various destructions of the three Iron Age I strata (and I do not reject the low chronology). However, in their interpretive enthusiasm they overstate the contextual difficulties, citing my own general caveats regarding the Iron Age I stratigraphy (Ilan 1999: 27-28). I wish to point out here that the archaeological contexts described in Table 20.3, while not "perfect" in the sense that Boaretto (2007) describes, were clearly part of the same destruction event that was described clearly, excavated carefully and curated with techniques that did not prejudice the results. I have made a point of leaving out the doubtful contexts published in Bruins *et al*. (2005) from Table 20.3 below. Fantalkin, Finkelstein and Piasetsky's wholesale rejection of the Tel Dan dates based on general remarks made at the beginning of my dissertation is too facile.

What then can be said about the absolute chronology of the Iron Age I levels of Tel Dan? The charcoal-derived dates suggest a *building* episode in the late 13th or first half of the 12th century BCE. Of the present radiocarbon samples only the olive pits (Sample GrA-9624) may hint at a destruction date for Stratum VIIA1 or Stratum VI; their BP date is somewhat later than almost all the charcoal dates, but the calibrated range is still quite broad. To reiterate: the rest of the samples have nothing to say about the destruction dates of successive Strata VI, V, and IVB.

Given the dearth of radiocarbon dates from short-lived samples, material culture analogous to the Beth-Shean sequence is key, due to that site's datable Egyptian finds (cf. Gilboa and Sharon 2003: 57; Mazar 2009: 24-28). On the basis of relative chronology—material culture analogy—Stratum VIIA1, the terminal Late Bronze Age or earliest Iron I stratum, has been dated by Ben Dov (2011: 377) to the 12th century BCE, comparing Stratum VIIA1 to Beth-Shean Stratum S-5.[6] However, she has also included Mycenaean IIIC ceramics in her Stratum VIIA1. This class of pottery appears at Beth Shean in Stratum Lower VI of the University Museum excavations and Stratum S-4 and S-3

5 Radiometric assays conducted on material from a late MBII level at Jericho, destroyed by fire, showed that, on average, charcoal dated 63 years earlier than short-lived samples (Bruins and van der Plicht 1995: 218). This difference was thought to represent the maximum time span between construction date and destruction date, i.e. a life span of approximately 63 years for the occupation. The charcoal date may, however, predate construction by a substantial margin.

6 Though for some reason Ben-Dov's ceramic analysis cites almost no parallels to this stratum at Beth-Shean.

of the Mazar excavations. Stratum VIIA1 may be more analogous to the latter, at least to Stratum S-4. While lacking the Egyptian elements of Beth-Shean Strata S-3–S-4, Tel Dan Strata V-VI would seem to parallel those strata, as Panitz Cohen (2009: 273, Table 5.24) has suggested. I would say, however, that Beth-Shean Strata S-2 parallels Tel Dan Stratum V more than Stratum IVB (and note the dearth of the classic "Phoenician Bichrome"' ware at Beth Shean S-2).

Coming back to the radiocarbon evidence, the consistent charcoal dates from Tel Dan seem to correspond, generally, to the short-lived samples from the 20th and 19th Dynasty strata (N-4 and S-3a) at Beth Shean (Mazar 2009: 25-27). The problem is that while the radiocarbon dates from Strata N-4 and S-3a overlap almost completely, these two levels are three stratigraphic phases apart. A possible explanation is that the N-4 "bins" are actually pits belonging to N-3a, contemporaneous with S-3a. But the correspondence between the Tel Dan dates and the Beth-Shean dates is something of a red herring. The Tel Dan charcoal dates represent the *terminus post quem* of a construction episode while the Beth Shean dates represent a destruction episode. There may be an historical connection between the two, and this will be discussed in the final chapter.

To summarize the matter of absolute dating for the Iron Age I strata at Tel Dan it would seem that the last Late Bronze Age stratum, Stratum VIIA1, dates to the reign of Ramses III, more likely at its middle or end, *ca*. 1160 BCE (again, cf. Gilboa and Sharon 2003: 57). The *end* of this stratum may represent the end of Egyptian rule at Tel Dan and perhaps in Canaan, perhaps the time of Ramses VI, ca. 1140 BCE. Stratum VI would then begin soon, perhaps immediately, thereafter. The hewing of trees for construction (which ended up as charcoal, mostly in Stratum V) may be attributed to either the building of Stratum VIIA1 or that of Stratum VI.

While there is some evidence for destruction in Stratum VI (ash, cinders and burnt brick debris in pits) it is impossible to date this destruction for the time being. It may be contemporary with the latest phase of Egyptian occupation at Beth-Shean (Strata S-3a, N-3a), i.e. ending in *ca.* 1140 BCE or it may postdate this phase. The material culture of Stratum V is quite similar and still contains some Egyptian elements (e.g. the collared rim pithos and the cooking jug). It, too, probably begins at a time not too distant from the end Egyptian rule, perhaps ca. 1100 BCE.

The careful analysis of Gilboa and Sharon (2003: 62), based on both detailed typological analysis and radiocarbon dates in series, pegs the first appearance of Phoenician Bichrome ware in the Iron Age IB at no earlier than 980/970 BCE. This we can accept as the *terminus ante quem* for the end of Stratum V and the *terminus post quem* for the beginning of Tel Dan Stratum IVB. While this seems like a long stretch of time for Stratum V, it should be remembered that this stratum shows a great deal of organic growth, the gradual filling in of open spaces, alterations of architecture and multiple plaster surfaces on walls.

Table 20.3. The Radiocarbon Dates from the Iron I levels at Tel Dan

Lab No	Basket	Locus	Stratum	Area & Phase	Palaeobotany*	Archaeological Context and Comments	14C Date BP	δ13C (‰)	1σ Calibrated Date cal BCE	2σ Calibrated Date cal BCE
GrA-9616	10593	1204	V	B 10	Mixture soil, charcoal	Destruction debris just above tamped earth floor in locus with metalworking furnace. Complete vessels. Horizon in between two pits	2930 ± 50	-23.90	1256-1242 (4.7%) 1212-1198 (5.7%) 1192-1138 (21.8%) 1132-1045 (35.9%)	1296-1274 (2.3%) 1265-996 (92.0%) 990-974 (1.2%)
GrN-22532	13521	3127a (3127)	V	Y 5 or 6	Charcoal W-3,-4 *Pistacia atlantica*	Sealed pit. The original pit 3127 was probably made in Phase Y7 (Stratum VI) but at least some of the contents are later - from Stratum V or IVB	2985 ± 25	-24.50	1287-1282 (2.8%) 1261-1209 (37.7%) 1201-1190 (7.8%) 1178-1160 (11.6%) 1141-1130 (8.4%)	1368-1361 (1.4%) 1314-1186 (65.3%) 1183-1127 (28.7%)
GrN-22523	10153/2	593 (624)	V	B 9-10	Charcoal (coarse fraction) W-18,-19 *Quercus boissieri*	In destruction layer above stone pavement. Square C-17	2960 ± 15	-24.94	1256-1240 (15.8%) 1213-1206 (6.4%) 1203-1198 (5.2%) 1193-1189 (4.0%) 1180-1151 (27.5%) 1143-1138 (5.3%) 1133-1129 (4.0%)	1261-1225 (22.7%) 1222-1124 (72.7%)
GrN-22967	10153/2	593 (624)	V	B 9-10	Charcoal (fine fraction) W-18,-19 *Quercus boissieri*	In destruction layer above stone pavement. Square C-17	2995 ± 20	-25.56	1291-1279 (8.4%) 1262-1252 (7.9%) 1250-1211 (33.0%) 1200-1191 (6.6%) 1176-1167 (5.2%) 1140-1131 (7.2%)	1369-1360 (2.2%) 1315-1207 (64.3%) 1203-1189 (8.5%) 1180-1152 (11.6%) 1142-1129 (8.9%)
GrN-22534	10640/5	1203	V	B 9-10	Charcoal W-9 *Platanus orientalis*	In debris on paved street	2960 ± 50	-24.76	1287-1283 (1.1%) 1261-1124 (56.6%) 1121-1111 (2.9%) 1099-1082 (5.0%) 1061-1052 (2.6%)	1370-1359 (1.6%) 1316-1012 (93.8%)

* Paleobotanical identification carried out by Ella Werker.

Table 20.3. The Radiocarbon Dates from the Iron I levels at Tel Dan

Lab No	Basket	Locus	Stratum	Area & Phase	Palaeobotany*	Archaeological Context and Comments	14C Date BP	δ13C (‰)	1σ Calibrated Date cal BCE	2σ Calibrated Date cal BCE
GrN-22530	10376/1	675	V	B 9-10	Charcoal W-7 *Quercus boissieri*	In destruction layer above stone pavement	2965 ± 15	-24.66	1257-1238 (19.0%) 1214-1208 (5.9%) 1202-1197 (5.0%) 1194-1189 (4.1%) 1179-1154 (24.5%) 1142-1137 (5.4%) 1134-1129 (4.2%)	1261-1226 (25.5%) 1222-1126 (69.9%)
GrN-22526	10302/1	675	V	B 9-10	Charcoal (layered)	In destruction layer on stone pavement. Few soil crumbs adhered to charcoal	2980 ± 15	-24.85	1259-1231 (27.5%) 1218-1210 (8.5%) 1200-1191 (9.3%) 1177-1163 (12.3%) 1140-1131 (10.5%)	1291-1278 (4.3%) 1263-1188 (58.1%) 1181-1149 (20.2%) 1144-1128 (12.8%)
GrN-22517	23867	7147	V	B 9-10	Charcoal W-11 *Quercus ithaburensis*	Amongst collapsed mudbrick and plaster from destruction	2985 ± 20	-25.09	1260-1210 (40.7%) 1200-1191 (8.1%) 1177-1163 (10.3%) 1140-1131 (9.1%)	1311-1273 (10.5%) 1265-1187 (56.0%) 1181-1149 (17.6%) 1144-1128 (11.3%)
GrN-22527	10359/1	593 (694)	V	B 9-10	Charcoal W-6 *Quercus ithaburensis*	One large charcoal piece. In destruction layer above stone pavement, next to W4330	2990 ± 15	-24.79	1287-1283 (2.9%) 1261-1253 (7.5%) 1248-1211 (35.9%) 1199-1191 (7.7%) 1175-1168 (5.4%) 1140-1131 (8.8%)	1310-1300 (1.6%) 1297-1273 (9.9%) 1265-1207 (49.4%) 1203-1188 (10.2%) 1180-1152 (13.6%) 1142-1129 (10.8%)
GrN-22524	10307/1	593 (624)	V	B 9-10	Charcoal (layered) W-17 *Quercus ithaburensis* (apparently)	In destruction layer above stone pavement	3000 ± 30	-24.97	1366-1363 (1.4%) 1304-1302 (0.9%) 1296-1273 (13.4%) 1265-1211 (35.6%) 1200-1191 (5.5%) 1176-1165 (5.7%) 1140-1131 (5.8%)	1372-1339 (8.6%) 1318-1188 (68.2%) 1181-1150 (11.2%) 1144-1128 (7.4%)

* Paleobotanical identification carried out by Ella Werker.

Table 20.3. The Radiocarbon Dates from the Iron I levels at Tel Dan

Lab No	Basket	Locus	Stratum	Area & Phase	Palaeobotany*	Archaeological Context and Comments	14C Date BP	δ13C (‰)	1σ Calibrated Date cal BCE	2σ Calibrated Date cal BCE
GrN-22525	10148/1	660	V	B 9-10	Charcoal W-13 *Quercus ithaburensis* (apparently)	In destruction layer above stone pavement	3000 ± 30	-24.97	1366-1363 (1.4%) 1304-1302 (0.9%) 1296-1273 (13.4%) 1265-1211 (35.6%) 1200-1191 (5.5%) 1176-1165 (5.7%) 1140-1131 (5.8%)	1372-1339 (8.6%) 1318-1188 (68.2%) 1181-1150 (11.2%) 1144-1128 (7.4%)
GrA-9618	24789	7208	V	B 9-10	Mixture soil, charcoal	Youngest Iron-I; in destruction layer on lime-plaster floor	3020 ± 50	-25.42	1373-1337 (15.1%) 1319-1254 (30.8%) 1246-1211 (15.1%) 1199-1192 (2.8%) 1174-1170 (1.5%) 1139-1132 (3.0%)	1409-1125 (95.4%)
GrA-9624	13103	3024	VI-VIIA1	Y 6-7	Charred olive pits	On floor. This is a tamped earth surface with burnt destruction debris above it. As there was quite a bit of LB material, it may be a terminal LB surface with intrusions from Iron I pits from above, or a Stratum VI surface	2930 ± 50	-21.71	1256-1242 (4.7%) 1212-1198 (5.7%) 1192-1138 (21.8%) 1132-1045 (35.9%)	1296-1274 (2.3%) 1265- 996 (92.0%) 990- 974 (1.2%)
GrA-9610	23974	7168	VI	A-B B 11	Charcoal W-10 *Quercus ithaburensis/ boissieri*	Destruction debris associated with ash pits and metallurgy installations; upright column or post surrounded by plaster floor	2990 ± 50	-24.40	1367-1362 (1.8%) 1313-1271 (14.9%) 1266-1188 (33.5%) 1180-1151 (11.6%) 1143-1129 (6.3%)	1385-1333 (10.5%) 1321-1049 (84.9%)

* Paleobotanical identification carried out by Ella Werker.

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CHAPTER 21

CONCLUSION: ECONOMY, SOCIETY AND POLITY AT TEL DAN IN THE IRON AGE I

The data presented in the above chapters will be fodder for much scholarly analysis in the future; no report is ever the last word. Some of the previous chapters are more exhaustive and some less so, as with all final excavation reports. Certainly, more quantitative analysis can and should be carried out by future researchers.

The following text is a compendium of analysis and conclusions. Some excavation reports present data with minimal interpretation, while others endeavor to interpret the data extensively, sometimes more than is justified. Most of us take a middle road. Like Mr. Palomar's tour guide friend in Italo Calvino's (1985) short story Serpents and Skulls, I have taken the path of more interpretation.

Architecture, Economic Organization and Changing Social Structure

The stratified sequence observed from Stratum VIIA through Stratum IVB manifests a process of increasing settlement density, socioeconomic complexity and political hierarchy.

Stratum VIIA is comprised of two phases: VIIA2 and VIIA1 (Ben-Dov 2011: 31-32, 76-81, 135, 159-161; 188-190; 376-377). The sketchy remains of Stratum VIIA2 lie over the destruction of the previous Stratum VIIB and include imported Mycenaean and Cypriot sherds; this is where the red-slipped Egyptian vessels and scarabs of Ramses II originate.

The next level up, Stratum VIIA1, shows possible signs of destruction: burnt brick debris and charcoal on plaster or tamped earth floors, but here, too, the architectural remains are not well preserved; the horizon is not always discernible. Since the charcoal samples from Strata V and VI yielded consistent calibrated dates in the 13th-12th centuries BCE, I have suggested that the wood originates in the structures of Stratum VIIA. If beams and posts were salvaged, it stands to reason that stones were salvaged too. This is probably the reason that Stratum VIIA1 is so poorly preserved (in addition to the damage done by the pits of Stratum VI). It is quite clear that the material culture of Strata VIIA1 and VIIA2 presages the Iron Age I assemblage; Table 3.14 is a schematic illustration of the ceramic progression. In other words, at Tel Dan too, we see types traditionally associated with the Iron Age I (collared rim pithoi and upright cooking pot rims for example) occurring *in situ* with types more often associated with the Late Bronze Age. This crucial point has major historical implications, which are discussed below.

Much of the site was occupied in Stratum VI, but in the largest area exposed, Area B, it seems to be characterized by a diffuse array of buildings with large, open spaces between them. The latter are riddled with grain pits. Areas T and Y give the impression of being more densely occupied, but the exposures are too small to know for sure. Areas K and M show only pits; they may have lacked surface architecture. It has been suggested that livestock corrals may have existed over the open areas, especially over the grain-pit fields between houses. Metallurgy was practiced in at least two areas: Areas B-west and Y. Thus, it does not appear to have been concentrated in the hands of a particular family or lineage.

Stratum V features a filling-in of the open spaces and the integration of older buildings into more complex groups of insulae. Tel Dan had now become an agglomerate settlement. Large open spaces have not been detected. Even courtyards—if that was the function of the larger walled spaces—were small: no more than 30m^2.This is an indication that no more than a few head of livestock (primarily sheep and goats) were kept in each household compound (cf. Herzog 1998: 211). At the same time, the faunal remains testify to a slightly reduced emphasis on sheep and goat herding and an increase in the quantities of beef consumed. That some livestock was kept may be attested by what have been understood here as feed troughs. However, there are signs that land holdings were now more important than livestock ownership. Sheep-goat products were probably being purchased and imported more than being processed within the household. Meat was now emphasized over secondary products.

In Stratum V, in contrast to Stratum VI, metallurgy was now practiced only in Area B-west, perhaps an indication of lineage specialization. Very few pits exist in this phase—perhaps one per household—but pithoi are numerous. From this I have inferred that the previous advantages of subsurface storage were now outweighed by the advantages of above-surface storage—much of it probably in pithoi, but still within the household (above Chapter 19 this volume and Ilan 2008).

Stratum IVB continues the architectural pattern of before, with somewhat more internal subdivision of structures. No troughs were found in this phase. Perhaps little or no livestock were now kept. Even more than in Stratum V, the finds correlate with the archaeozoological data which point to a decline in the importance and value of household caprovine livestock and a rise in specialized production and redistributive (market?) exchange.

Pits remain few in this phase: again, perhaps one per household. But pithoi also become fewer; never more than one in a room, and perhaps as few as one per nuclear household. This has been interpreted as indicating that storage was either delegated to small chambers with no lateral openings—found in most identifiable building agglomerations and accessed only from above—or that storage was now more centralized and concentrated in some other part of the town. Metallurgy continued to be practiced only in Area B-west.

It is clear that the site was not fortified in Stratum VI, since pits exist directly over the old MBII ramparts at the crest of the mound. But it is not known if the Strata V-IVB settlements were fortified; the apex zone around the tell's circumference was disturbed and many periods are missing or preserved only in fragments here. It is clear that by Stratum IVA (late 10th century BCE) the town was fortified and gate towers built (Biran 1994: 247-249).

The limited extent of the architecture excavated in Strata VIIA and VI, preclude definitive statements about family size and structure in these levels. If, however, we adopt Faust's (1999) observations and conclusions regarding rural versus urban household organization, we would posit that the larger, more dispersed houses of Stratum VI reflect a more rural settlement characterized by extended family residency—something along the lines of 'Izbet Sartah Stratum II (Finkelstein 1986).

In contrast, the dense architectural fabric of Strata V and IVB suggests compounds occupied by multiple families (cf. Kramer 1982; Stager 1985). The lack of strict standardization in architecture and room contents is a portrait of social fluidity. Family size fluctuated and the functions of spaces changed accordingly. As part of this fluidity, one generation's kitchen could become a storeroom in the next, without moving the old oven. At the same time, open spaces were gradually filled in by the need to accommodate expanding families. It also appears that rooms could be transferred—by the opening and closing up of doorways—from one compound to another.

The density of the architecture and the possible identification of *ca*. 10-12 compounds in Area B suggest the existence of social units larger than the nuclear, or extended family. These would have been lineage groups, made up of families with common ancestors, which congregated into neighborhoods (cf. Stager 1985: 20). These lineage groups may have also retained separate ethnic identities (see below). Sanctuary 7052 and its surrounding metal workshops might be construed as a lineage/neighborhood cult-place-and-workshop.

As an ultimate phase in the social evolution of the Iron Age I settlement, it is even possible that, with increased specialization, centralization, and the development of a multi-tiered hierarchy, Tel Dan became a "town" in which the nuclear family became the most common household unit (cf. Tannous 1944). But this could only be true, I think, of Stratum IVB, when troughs and bins seem to disappear and storage facilities become fewer in number.

The evolution outlined above illustrates very well, I think, the perspective advocated by Herzog (1998: 7), namely that urbanism is a process rather than a phenomenon. Urbanization in the southern Levant takes on a wide variety of forms and does not lend itself to convenient checklists of defining criteria (Herzog 1998: 7 commenting on Fox's 1977 formulations of pre-industrial cities).

Agriculture

Information regarding agricultural production in the northeastern Galilee in the Iron Age I is less available than we would like. Ethnographic evidence from the region is of limited potential since, in the Hula Valley at least, many of the crops raised in the pre-industrial (Ottoman) period were not native, e.g. rice and millet (Shalem 1935).

Several aspects of material culture suggest that grain was a central component in the subsistence economy:

- Grain found in Iron Age I contexts at Tel Dan (Pit 336 in Area B-east, Pit 3009 and L3024 cut by several pits in Area Y, and the grain-filled pithos observed in the balk in Area B-east in the 1990s, see above p. 29, n. 8).
- The large number of pits in the Iron Age IA levels at Tel Dan, Hazor (Ben-Ami and Ben-Tor 2012) and Tell Wawiyat (Onn *et al*. 1995).
- The plethora of flint sickle blades, many with silica sheen, at Tel Dan and the sickle manufacturing workshop in particular.

Most of the grain was probably wheat since rainfall is plentiful (450-1000 mm annually) and climatic conditions fairly mild.

The surrounding highlands show less evidence for grain production: sickle blades are not reported and pits are rare (mainly the few at Sasa). Grain however, has been found in a storejar at Sasa (Stepansky, Segal and Carmi 1996: 65, Figs. 3-4, 6:4). It stands to reason that extensive farming and larger yields were the case in the Hula Valley, but only small-scale subsistence farming of grain in the highlands. To quote Hopkins (1985: 74): "Diversity of agricultural environment permits Highlands' communities to pursue a variously proportioned mix of crops and livestock, lowering the risk of subsistence failure due to any single cause. In addition, it facilitates the spreading of limited agricultural energies across the annual calendar. Overall, the variegation of the environment promotes self-sufficiency on the part of Highland's communities…". This same diversity was the hallmark of the rural economy of the Lebanese highlands (Marfoe 1979).

Olive oil production is hinted at by the many olive pits at Tel Dan. Since there is no evidence for the pickling of olives before the Hellenistic period (Borowski 1987: 123-124), the olive pits must be the remains of oil production. No large presses have been found from this period at Tel Dan, nor elsewhere in the northeastern Galilee, but such an installation was found in a Stratum IVA cultic context in Area T, next to the altar compound (Stager and Wolff 1981). This appears to be the earliest press found in the northeastern Galilee at the time of this writing (Frankel 1996:

198; 1999).[1] Olive wood is found in many archaeological contexts from the Golan Heights and from the Galilee (Liphschitz 1996: 9 and references there). It is likely that some of the basalt bowls, together with stone pestles or pounders were used to extract smaller quantities of oil for household use (Borowski 1987: 119-120). Circumstantial evidence, therefore, suggests that the northeastern Galilee must have produced olive oil in quantity.

Detecting grape cultivation is even more difficult. No pips or wineries have been found yet in Iron Age I contexts in the area of Tel Dan. Certain pottery vessels were intended for wine consumption (Jug Type 5), and it seems most likely that viticulture would have been practiced in the region, particularly along the slopes of the valley's margins and in the surrounding highlands. But we still lack concrete evidence for such. The same is largely true for other signs of fruit or nut exploitation, though almonds, figs, dates, pomegranates and other fruits and nuts were known (Zohary and Hopf 1994: 134-180).

One precondition for horticulture of any kind is security—knowing that the massive investment in planting and maintaining vines, trees, presses and storage facilities will not be wasted. A corollary precondition is sedentary habitation—the horticulturist must be nearby to care for and protect his investment.

Storage Practices

Of the extensively excavated sites in the northeastern Galilee, grain pits are common in Stratum VI at Tel Dan and Strata XII/XI at Hazor (Ben-Ami and Ben-Tor 2012) and less common in later levels. From the narrow exposure at Tell Wawiyat and the finely constructed silo there (Onn *et al*. 1995), one can infer a similar reconstruction for this village in the Hula Valley. The excavated highland sites such as Sasa, Horvat ʻAvot, Mt. Adir and Tel Harashim appear to have very few subterranean pits. This may be due to more than one factor: difficulty in hewing, greater security and lower yields (grain in particular). In highland sites therefore, one should seek alternative storage facilities, and pithoi would seem to fit the bill.

Multitudes of pithoi are found at Tel Dan Strata VI-V, but they are much fewer in Stratum IVB—occurring only as individual vessels. Excavated highland sites (Sasa, Horvat ʻAvot, Tel Harashim, Mt. Adir) that are contemporaneous with Tel Dan Strata VI-V and Hazor Strata XII-XI also exhibit substantial numbers of pithoi (Bahat 1986; Cohen-Weinberger and Goren 1996; Golani and Yogev 1996; Braun 2015; Aharoni 1957; Vitto and Davis 1976; respectively). As noted above, these may have been more frequently used in lieu of pits from the very beginning. In any case, their distribution at Tel Dan shows that pithoi were used as a medium of stationary storage.

It has been suggested here that changes in storage techniques may be correlated to security conditions and to changes in scales of production and economic organization. In the earlier phases of settlement storage was arranged and directed by the household. Initially, pits were preferred, due to conditions of insecurity. When security improved, pithoi were preferred (though it was always a good idea to have an emergency supply socked away underground). Storage was still oriented to the domestic mode of production, if in a wider, lineage-group sense. In the final phase of our purview (Stratum IVB), pithos numbers go way down. This phase appears to be lacking or very minor at Hazor, though Stratum X (early Iron IIA) at that site shows much the same pattern. The paucity of large containers for household storage at Tel Dan has been attributed to a move toward greater centralization of storage facilities, located in places as yet unidentified. But it is also possible that household grain storage continued in small, door-less rooms. This is a question that requires further investigation and more evidence.

In contrast, Mt. Adir shows larger ratios of pithoi in a later (Iron Age IB–IIA) context (Vitto and Davis

1 Though an Iron Age I olive press carved in bedrock has been reported at Migdal Ha-emek (R. Frankel personal communication)

1976), but this may have something to do with the nature of the site, being a provisioned fortress or a locality of storage administered by a central authority rather than a town, village or farmstead (cf. Gal and Alexandre 2000 concerning Iron Age IIA Horvat Rosh Zayit). Indeed, it is precisely this dichotomy that points up social and political developments of the Iron Age IIA: the rise of administrative centers as separate from the locale of household production in the older, by now kin-based settlements.

Faunal Resources

At present only three Iron Age I faunal assemblages from this region have been subjected to specialist analysis—Tel Dan, Sasa (Horwitz 1996) and Hazor (Lev-Tov 2012). Only the first is substantial.

The largest component in all assemblages and all levels is caprovine. At Tel Dan it appears that sheep are more common than goats in Stratum V, suggesting that secondary products were emphasized and perhaps that a market organization of sorts existed. In Stratum IVB the situation seems to be reversed, though the sample is not large enough to be certain. Bovines were always present in significant quantities, especially at Tel Dan and Hazor—beef consumption was significant. More importantly, it is an indication of plow agriculture, extensive valley-bottom cultivation, and the attendant value placed on land (versus livestock; Wapnish 1993: 431). At Tel Dan, cattle made up roughly one half of the animals slaughtered in the Late Bronze, 35-38% in the Iron Age IA and 41% in the Iron Age IB. Slaughtering patterns also changed over time, with a somewhat greater emphasis on meat consumption in Iron Age IB than in the previous phase.

By way of comparison, Hazor shows a similar profile, but the small Sasa assemblage shows a total dominance of caprovines. Stockbreeding was a foundation of the local subsistence strategy. Only one cow bone was discerned at Sasa, though this in itself may indicate sedentary occupation and traction (plowing and dragging).

In this context, it is worth remembering that in recent times, in the Beq'a Valley of Lebanon, "rural communities rely on a wide continuum of pastoralism, from the small herds in the intensively cultivated 'pockets' to the widespread practice of vertical nomadism on the piedmont and…steppe zone" (Marfoe 1979: 7).

One significant mystery is the absence of loomweights—particularly at a large excavated and densely settled site such as Tel Dan, destroyed by conflagration. This would seem to contrast sharply with caprovine, and especially ovine, dominance in the faunal assemblage. Yasur-Landau (2007) has posited that the Egyptian New Kingdom-type vertical loom was used at sites such as Lachish, Megiddo, Hazor and Beth-Shean; apparently this type of loom did not require loom weights. Moreover, a couple of spool-shaped stone weights of the Aegean and Cyprus type have been presented in Chapter 7, resembling the clay weights found at various "Sea People" sites in the Levant (Yasur-Landau 2010: 267-268). One wonders if the lack of Canaanite-style loom weights and the small number of Cypriot-Aegean-style loom weights might have gender implications. Did Egyptian women introduce the Egyptian loom to local women, who came to prefer it?

The small numbers of wild animal bones found at Tel Dan—gazelle and fallow deer especially—point to dietary supplements acquired by hunting. Fish bones were found as well. The catfish bones from Sasa probably indicate fishing trips to the Hula Valley (Horwitz 1996: 60).

Only two pig bones were found in the Tel Dan Iron I assemblage, and these in a Stratum VIIA1 context, i.e. in what might be considered a terminal Late Bronze Age context. This dearth stands in contrast to the presence of *sus* in earlier levels and it most likely has an ideological, cultural explanation, even if based on economic considerations (such as pigs being more trouble than they are worth). Very few equid bones were unearthed at Tel Dan; obviously equids were not eaten and the corpses of those that died were disposed of in a way that prevented their bones from entering the faunal bone assemblage. No camel bones were found either.

Timber, Charcoal and Deforestation

One factor that is consistently passed over in analyses of economic behavior and environmental exploitation in the ancient southern Levant is the utilization of combustible materials for activities that require pyrotechnology: cooking, heating, ceramic manufacture and metallurgy. Ethnoarchaeological research suggests that for valley dwellers in the Near East especially, animal dung is the most important source of fuel (e.g. Kramer 1982: 45-47; Miller 1984). This is especially true in places that are deforested. Leaving aside the lack of forethought and planning, this has much to do with the immediate benefits of deforestation beyond the mere acquisition of firewood. Pasture expands and land is cleared that can be claimed for an expanding agricultural base (e.g. Rowton 1967; Stager 1985: 4-5; Miller 1986; Cordova 2005: 116-117).

More than other parts of the southern Levant, the Upper Galilee and a pocket of the northern Golan Heights are blessed naturally with expanses of dense maquis, park forest and riverbank trees (see Chapter 1). Given the relatively high rainfall this area is less prone to upheavals in time of climate change (Langgut *et al*. 2015: 230). In an earlier study (Ilan 1999: 192-194), I had proposed that the intensified settlement pattern and evidence for increased population in the Iron I would lead one to expect increased deforestation and the need to travel farther to acquire timber. Recent studies, however, are showing no evidence for such a scenario; rather the opposite seems to be the case (Langgut *et al*. 2013; Langgut *et al*. 2015: 228-229). A severe drought crisis at the end of the Late Bronze Age is registered in pollen records from four sediment cores extracted from lacustrine environments in the southern Levant. The one nearby Tel Dan, at Birket Ram, shows very little fluctuation in the vegetation profile; arboreal pollen remains a consistently significant proportion of the total (ca. 70-80%). From a local environmental perspective the region-wide drought seems to have had little effect on the floral and agricultural regime. Of course, this would have made a site like Tel Dan a valuable target for conquest. This has been the subject of a recent study based on cores made next to Tel Dan itself (Kaniewski *et al*. 2017).

Agricultural Production and Resource Exploitation: Summary

While the environmental conditions of the various parts of the northeastern Galilee vary, it is probably fair to say that the agricultural economy of the region was a mixed agrarian one. Marfoe (1979: 3) has characterized a similar landscape in the Beq'a Valley of Lebanon as "fragmentary"—"a vast mosaic of small, diverse, and localized microenvironments, where wide variations coexist." This "…lack of unifying ecological features resulted in a wide spectrum of complementary and supplementary subsistence niches and spatial patterns of exploitation" (Marfoe 1979: 5). In the same spirit, Hopkins (1985: 74-75) has borrowed a term from Andean anthropology—"verticality": the principle of exploiting different ecological niches, usually at differing altitudes, using various adaptive strategies.

Thus, horticulture may have been practiced mainly in the higher parts and along the hilly flanks of the Hula Valley. Pastoralism will also have played an important role throughout, with some populations putting greater emphasis on it (in the highlands and in the small hamlets along the hilly Hula valley margins) and others, less (in the larger centers). The sedentary dwellers of the pseudonymous village of Aliabad, located in the Zagros Mountains in Iran, always maintained viable, even large, flocks of sheep and goats (Kramer 1982).

Rosen (1994; 1996: 24-25) describes three main diet types in the pre-modern Middle East: the animal products diet (supplemented by dates) of the desert Bedouin; the cereal-based diet of valley-dwelling peasants and urban poor; and the more complex "Mediterranean diet" which includes substantial quantities of olive oil, wine, fruits and vegetables and very little meat. Adopting this generalized tripartite scheme as a foundation, and combining it with the results of the faunal analysis from Tel Dan, results in a somewhat more nuanced portrait. The Mediterranean diet is certainly a reasonable reconstruction as regards the highlands of the Galilee, particularly considering the lack of beef in the faunal assemblage of Sasa, though one ponders what kind of meat-consuming frequency is implied by the caprovine bones. But the picture from Tel Dan—a valley site—is more complex. The Mediterranean diet is there; but substantial quantities of meat are indicated and a plentiful supply of cereal grain. Though relative quantities consumed are not immediately knowable, it seems as if the denizens of Iron Age I Tel Dan—at least Strata V and IVB—had the best of all worlds.[2]

Metallurgy, Society and Polity in the Iron Age I Levant

Since Waldbaum's 1978 survey of the evidence for metallurgy in the Levant much data has been added, not least from Tel Dan. Summaries of the Tel Dan metallurgical finds have been published (Ben-Dov 2018; Biran 1989; Ilan 1999: 125-131), but a more in-depth, comparative study should enhance our understanding of the interrelationship between metallurgy, economy and polity.

Aside from Waldbaum's survey (Waldbaum 1978), metallurgy has been discussed in more particularistic terms: ore extraction technology at the source areas (e.g. Rothenberg 1988), site-specific evidence for production (see Ilan 1999: 220-230; Yahalom-Mack 2009) and metallography (e.g. Shalev 1993; Yahalom-Mack 2009), the role of the Philistines in metal production (e.g. Tubb 1988; Negbi 1991; Muhly 1982), and the origins of Iron tool production (e.g. Waldbaum 1978; Muhly 1980; Yahalom-Mack and Eliyahu-Behar 2015; Eliyahu-Behar and Yahalom-Mack 2018).

In the past, biblical accounts of metallurgy's role exerted a major influence on social and economic reconstructions. Perhaps the most important of these was the notion of Philistine control over iron production as the explanation for that people's initial dominance over the biblical Israelites (I Samuel 13: 19-22). But the archaeometallurgical evidence shows that this was not the case. Throughout the Iron Age I both lowland (Philistine, Canaanite) and highland sites show that bronze was still the dominant metal used and that, while more iron weapons have been found in the lowlands, the highland denizens used the metal as well, if more for tools (Stager 1985: 10-11). Moreover, bronze weapons were often superior to iron ones fashioned in the early technological stages (Eliyahu-Behar and Yahalom-Mack 2018).

It has been suggested that the adoption of iron—initially in the early Iron Age, in the form of knives and smaller objects—came about as a result of the shortages of copper and tin (McNutt 1990; Waldbaum 1978). Another twist to this scenario has it that iron developed because it requires less charcoal—a crucial advantage in a land that was being rapidly deforested (Stager 1985: 11 citing Horne 1982 and Wertime 1983).

The distribution of metallurgy seems to encompass all parts and peoples of the country: terminal Late Bronze sites (e.g. Tel Dan, Tel Zeror, Tel Mor, Tel Yin'am, Beit Shean), lowland sites of the Iron Age I (e.g. Tel Masos, Tel Beit Shemesh, Tel Qasile, Tell Abu Hawam, Megiddo, Tell Deir 'Alla, Tel Dan) and the mines and smelting factories at Timna and Feinan. A number of rural highland sites, such as 'Ai, Khirbet Raddana and Tel Harashim, show metallurgy industries no less advanced (Ilan 1999: 220-230; Yahalom-Mack 2009). All told, the picture is one of ongoing traditions and interregional contact and commerce.

The fact that so much in the way of metallurgical remains are found in terminal Late Bronze and Iron Age I contexts, in juxtaposition to earlier Late Bronze and later Iron Age II assemblages, also requires explanation. The phenomenon must be related to the period's political chaos and disintegration of international trade networks that

2 To be fair, it must be noted that Rosen (1996: 24) has made the point that pure forms of these models are rare.

prevailed at the end of the Late Bronze Age which correspond to the paucity of evidence for internationally exchanged luxury and prestige goods (e.g. Liverani 1987: 71). In the Late Bronze Age "trade in metals seems to have been characterized by a concentration of production in conveniently controlled areas and by intensive inter-regional trade" (Liverani 1987: 68). Expensive and prestigious copper and bronze items were acquired by means of gift exchange (of various commodities) between palatine centers or between kings and their subjects (Zaccagnini 1973, 1983). Trade and the attainment of raw materials from weaker peripheral entities were organized also by these same centers. Only toward the end of the Late Bronze Age, when the palatine centers fell did an alternate system develop. Local populations were forced to do more of the procurement, refining and casting themselves. This also may have contributed to the growth of specialization in the form of cottage industries and itinerant artisans who dealt in finished products as well as ingots. Whether or not southern Levantine peoples had direct access to the copper being extracted in the flourishing and contemporary mines of Timna, perhaps worked by an autonomous or semi-autonomous population, (Finkelstein 1984) is still an open question.[3] But certainly the Egyptians had the upper hand in distribution, until they withdrew from Canaan.

How then do we describe the sociopolitical organization of metallurgy in the early Iron Age at Tel Dan? Given the fact that metallurgy utilizing similar techniques is found throughout the country, to what degree was metallurgy a specialized knowledge? Were the practitioners specialists, or was metallurgy a part-time pursuit done by a wide range of people on an *ad hoc* basis? Was it a guild-like activity practiced only by the initiated? Did each settlement, region or tribe have its own metalworkers or were metal smiths wider ranging and itinerant?

Ethnographic literature suggests several models that could apply (e.g. Horne 1987), but for the present, I suggest, as a working hypothesis, that the metalworkers were part-time specialists who resided at Tel Dan most of the time and probably engaged in other forms of industrial production as well (see below). Production was small-scale, even domestic, and probably executed on an *ad-hoc* basis. Metal sources were irregular and dependent mainly on scavenging. It does seem that metal working was concentrated in one area, Area B-west, by the Iron Age IB. It is reasonable to expect that every corporate kin group would have striven to assure itself access to metal and metallurgists. In times of uncertainty, one didn't want to be stranded without the possibility of making or fixing tools and weapons. It is also possible that the metallurgists of Tel Dan moved about the northeastern Galilee practicing their craft for customers at other villages, such as Tel Harashim and Hazor where evidence for small-scale metallurgy has also been found (Aharoni 1957: 20-21; Ilan 1999: 228-230).[4]

From a technological point of view, the Tel Dan metal industry appears to have local origins. It lacks the manifestly Egyptian crucible canals and bent tuyeres, and the Cypriot-type bellow pot and tuyere is missing as well (Yahalom-Mack 2009: 270-272). At this point, then, the question of who among the resident identity groups was conducting the metal industry remains open.

While small scale and perhaps opportunistic, the long history of metallurgy at Tel Dan indicates a well-worn tradition that may be reflected by the Danite associations with metallurgy in the biblical accounts in Exodus 31: 5-6; 38: 23 and II Chronicles 2: 12-14.

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3 The recent study of Yahalom-Mack (2009: 260-262) suggests that ingot copper from Timna was in fact reaching Iron Age I metallurgists in Canaan.

4 I have interpreted the Hazor metal deposit found in the sanctuary in Area B (Yadin *et al*. 1961: Pl. 38:4 and Pl. 205) as a cache of scavenged metal intended for recycling (Ilan 1999: 155-156).

Other Forms of Industrial Production: Stone, Flint, Bone and Papyrus

As we have seen in Chapters 7-10 the quantity and variety of stone utensils recovered from the Iron Age I levels at Tel Dan is prodigious. Given this richness and the site's proximity to basalt sources one might expect to encounter evidence for a ground stone tool workshop. The matrix of the floors and fills at Tel Dan contains large numbers of basalt flakes and chips, which, on their own, probably suggest workshop activity to some extent. But these were never examined carefully with the intention of discerning industrial activity. In any event, it is most likely that the coarse flaking and core reduction would have taken place in the field, at the source. The final product may have been ground down in the settlement, but grinding would produce little in the way of observable debris.

A flint workshop, found amidst the metallurgy workshop, was described in Area B (Chapter 2, p. 43) and by Herriott and Yamada in Chapters 9 and 10. This workshop specialized in sickle blades. A great deal of bone, both worked and unworked was also found in this area. The concentration of industrial activities in one zone indicates specialization. This is further borne out by the fact that this zone is located just inside the entrance into the site, through what was left of the old Bronze Age gate.

Finally, I repeat a question that was posed in Chapter 1. It was pointed out that the pollen samples from boreholes in the Hula Valley indicate that papyrus became dominant in the Hula Valley in the 3rd millennium BCE (Bein and Horowitz 1986). Given the fact that Egyptian administrative centers and military stations were active in the region in the Late Bronze Age and Early Iron Age, I do not think we can avoid the conclusion that papyrus was being harvested and processed on an industrial scale in the Hula Valley. Gadot (2010) has recently proposed a similar scenario for the Yarkon River headwater marshes in the Late Bronze Age at Tel Aphek, the location of an Egyptian governor's residency. One suspects that the production of papyrus sheets and scrolls would have been a lucrative business.

Patterns of Exchange

In the present state of research, exchange patterns are documented by either historical sources or the physical analysis of provenience by such means as petrography and Neutron Activation Analysis (NAA). For the period and region under investigation here, historical sources are few and vague (e.g. the I Papyrus Harris, the Amenope Onomasticon and the Letter of Wenamon) and none mention Dan or Laish. As concerns provenience analysis, a few initial forays have now been made for Tel Dan and its environs (Yellin and Gunneweg 1989; Cohen-Weinberger and Goren 1996; Goren n.d.; Golding-Meir, Chapter 6C this volume; Waiman-Barak and Gilboa, Chapter 6A this volume), but none of these is comprehensive.

The analysis of pithoi provenience provides one particular set of insights, not related directly to the patterns observed for other ceramic types. Two studies, one dealing with Tel Dan (Yellin and Gunneweg 1989—Instrumental Neutron Activation Analysis [NAA]) and the other with Sasa (petrography—Cohen-Weinberger and Goren 1996) show that pithoi of different kinds were manufactured in several different localities and transported over significant distances (cf. Cohen-Weinberger and Wolff 2001).

It is clear from these studies that Wavy-Band ("Phoenician") pithoi were shipped inland from the coast, reaching several of the highland sites (Sasa, Mt. Adir, Horvat 'Avot) and Tel Dan, and only rarely other sites in the Hula Valley. The Tel Dan wide-mouthed type "Galilean" pithos (PG1-2) is a local version of the Cypriot Wavy-Band pithos. It was manufactured solely on-site and was designed for local storage. Unlike the collared-rim pithos, it was rarely transported; only a few examples were found at other sites of the Hula Valley (Ilan 1999: 157, 164). At the end of the Iron Age I sequence a variant of the Wavy-Band pithos was being manufactured in the Galilean highlands as well (Cohen-Weinberger and Goren 1996; Goren n.d.; Braun 2015).

The more widely distributed pithos type is the short-necked, collared-rim variety (CRP). Yellin and Gunneweg determined that the largest group (Group I), was locally manufactured.[5] These are all from Stratum V.[6] Six other groups were identified whose source areas are not known, though the field can be narrowed down by inference. Groups II and III probably come from the northern coastal region.[7] The two CRPs from Yellin and Gunneweg's Group IV and two outliers cannot be assigned a source region by NAA. The single PG3 "hybrid" pithos analyzed is of local manufacture (Yellin and Gunneweg 1989: 135).

The analysis of the Sasa CRPs by Cohen-Weinberger and Goren (1996) shows manufacture of the short-necked CRP in a basaltic area (Dalton plateau, Hula Valley or Golan Heights), while the "hybrid" version (our PG3 type) was made near, though not at, Sasa. We have seen that the latter type is found mainly in the Galilean highlands and at Hazor and its surrounding daughter sites. It is present, and even manufactured, at Tel Dan, but in smaller quantities than the short-necked version. In sum, it was manufactured and exchanged regionally, but not across the wide distances that the short-necked CRP was.

The overall picture derived from this survey is one of great variety in pithos provenience. To this we can now add the petrographic data from Tel Hadar which shows local CRP manufacture with clay from the alluvium of the Yarmuk River (E. Yadin, personal communication). In addition to there being many centers of manufacture, the large containers were being transported to a wide variety of locations (cf. Cohen-Weinberger and Wolff 2001).

Were just the vessels transported, or were the contents the central concern? Previously, this writer concluded that the pattern described above—CRPs being manufactured, exported and imported, all at the same time—could only mean that the contents of the pithoi were the focus of exchange. How else was one to explain a situation where local manufacture of pithoi existed together with the import of pithoi? But this is very hard to accept, given the great weight of a fully laden pithos (easily in excess of 100 kg.), as Cohen-Weinberger and Wolff (2001: 654) have pointed out, contrary to the conclusions of Artzy (1994) and Wengrow (1996).

The key to the quandary lies in stratigraphic/chronological assignation. In Stratum VI (and most likely in Stratum VIIA1) none of the pithoi were manufactured at Tel Dan. They came from many different locales. These were the jars manufactured under the tutelage of the Egyptian administration as standard units of storage (inferred by Raban 2001), the target consumers being Egyptian outposts, administrative centers and agrarian clients. Tel Dan was one of these. The Stratum VI pithoi were brought in from somewhere else, probably in Stratum VIIA and continued to be used for a long time thereafter. Only in Stratum V did potters who knew how to make the CRP reside at Tel Dan. They made many hundreds of them, if not thousands. Perhaps the same atelier knew how to make the local version of the Wavy-Band pithos as well, but it may well have been the product of another local atelier.

While the emphasis here is on the CRP, evidence is beginning to accumulate for other, even prosaic, ceramic types being traded; cooking pots from the Hazor area, for example, have been found at Tel Hadar (E. Yadin personal communication).

5 Y. Goren conducted a petrographic analysis of the Tel Dan pithoi at the same time that Yellin and Gunneweg carried out their INAA study. His results were very similar to those of Yellin and Gunneweg and he sees no point in publishing them (Y. Goren personal communication).

6 In Yellin and Gunneweg's Table 2, two were assigned mistakenly to Stratum VI.

7 In the same paper Yellin and Gunneweg (1989: 139) attributed CRPs from Tel Mevorakh and Tel Qasile to a common coastal origin, though the Tel Mevorakh example would now appear to have been manufactured in the Ramat Menashe region (Cohen-Weinberger and Wolff 2001: 653-654).

Clearly the exchange system was complex and wide-ranging.

The fact that so many different source areas are represented at Tel Dan emphasizes its role as a central place, an emporium, and even a gateway between the interior Galilee and the northern coast, on the one side, and the Golan Heights and the Syrian interior on the other. It was the locus of redistribution; a gathering place for local produce that was to be transported to the coast or the interior. This is a hypothesis that awaits further testing, but the existence of multiple weight standards (Chapter 8) would appear to support it.

The process of this system's evolution can be summarized in theoretical terms laid down by Polanyi (1957) and summarized by Renfrew (1984: 90-91):

	Early Iron Age IA	**Iron Age IA-B**
Economy	Reciprocal	Redistributive/Market
Configuration	Symmetry	Centricity
Geography	No central place	Central place (Tel Dan, Tel Abel?)
Affiliation	Independence	Central organization
"Solidarity" (Durkheim 1893)	Mechanical	Organic

It should be stated that this is a schematic configuration from both a chronological and terminological viewpoint. Many elements of reciprocity will exist in a redistributive economy, though less, vice versa. The existence of a central place does not imply complete subordination to that place.

As Renfrew (1984: 91) notes: "This, then, is a purely economic reason for the emergence of central places as the exchange of goods develops. In cases where there is also marked local diversity, with ecological variations within the region, a desire to obtain the products of a neighbouring niche will inevitably promote exchange, which in turn will favour the development of central places." There could be no better description of the northeastern Galilee, or of the Levant, for that matter. At Tel Dan this system is more embedded in Stratum IVB, but the size and density of the settlement in Stratum V and even in Strata VI and VIIA1, suggests that the foundations for a redistributional, or market system were already in place. It is notoriously difficult to differentiate redistributional and marketplace exchange archaeologically (Renfrew 1984: 93). Moreover, it would be a mistake to suggest that any economy functions on only one level, beyond the most isolated and small scale societies. Barter, reciprocation, elite-sponsored gift-giving and redistribution, can all co-exist within a marketplace economy. Market economies themselves show various forms of interaction, e.g. centralized vs. decentralized exchanges or nucleated vs. dispersed interactions (Hirth 1998: 455). Recent studies from other parts of the world are now suggesting that household artifact inventories and their variability may allow us to discern marketplace exchange (e.g. Hirth 1998), but this subject will not be pursued here.

Cultural Origins and Social Identities

The Iron Age I settlement at Tel Dan was neither isolated nor insulated. Though material imports from distant Egypt, Cyprus, Anatolia and the Aegean were no longer an important part of the repertoire, wide-ranging cultural interaction is demonstrated by a number of indications in the Iron Age I assemblage. For one thing, Instrumental Neutron Activation Analysis and petrography have demonstrated long-distance exchange with the coastal plain, and several other regions, as yet unidentified (above). Other aspects of social identity and cultural interaction are manifested by typological criteria. These can be summarized as follows.

Features of continuity with the local Late Bronze Age material culture found throughout the southern Levant in Iron Age I:

- Most of the pottery repertoire: carinated ("cyma") bowls, hemispherical bowls, chalices, kraters, lamp-and-bowls, cup-and-saucers, cooking pots, storejars, globular jugs, dipper juglets and flasks represents continuity with the forms known from Late Bronze Age Tel Dan and Hazor, for example.
- The technology and morphology of the chipped stone assemblage is solidly within Levantine 2nd millennium BCE traditions.
- The technology and tools of metallurgy from Strata VIIA–IVB were already in place early in the Late Bronze Age (Ben-Dov 2011: 349-366).
- Many of the metal tools and weapons and bone and ivory objects have Late Bronze Age antecedents. While it is true that some of this probably represents scavenged artifacts, some objects, prosaic ones in particular, were surely manufactured on site.
- Food consumption in the Iron Age levels differs little from that of the Bronze Age with the important exception of a lack of pork remains.
- The standing stones in Area B-east have a venerable ancestry in the ancient Near East, though they are found throughout the eastern Mediterranean as well (*baetyls*).

All of these facets suggest the existence of a local "Canaanite" identity (we don't know what they called themselves in the northern Hula Valley) sharing cultural affiliations with other local groups in the southern (and perhaps northern) Levant.

Egyptian elements:

- Cooking jugs. These have been shown to be a clearly Egyptian form. It has only recently been identified as such (Martin 2011: 252-253) because no site except Tel Dan has very many of them. Other Egyptian pottery forms have been identified but these are less indicative of Egyptian cultural identity.
- Collared-rim pithos. I am positing that this vessel type was introduced as part of the Egyptian administration of Canaan (following the lead provided by Raban [2001] and a different administrative model from that proposed by Wengrow [1996]). The morphological inspiration, however, may derive from a local form (either Finkelstein 1988: 283-284 or Wengrow 1996: Fig. 1).
- A few other ceramic items are Egyptian forms of local manufacture (e.g. Fig. 3.126).
- A number of the metal objects (Chapter 11) and possibly some of the bone items (Chapter 12) are most at home in the Egyptian world and some were artifacts of personal hygiene—razors for example.
- At least two of the stamp seals are Egyptian and date to the Iron Age I horizon.

Aegean, Cypriot and coastal connections:

- Wavy-Band pithoi (called "Phoenician" in earlier reports) and their derivations (called "Galilean" in previous reports) are clearly of a Cypriot and Mediterranean littoral heritage. Import of the former (as vessels and not for their content) implies a commercial and cultural connection, at least with the coast, if not with Cyprus and beyond. The large-scale local manufacture of the latter is even more indicative of specialist potters who learned and practiced their craft in the Cypriot-littoral tradition (Gilboa 2001).
- Mycenaean IIIC pottery is rare and imported (one example from an unknown source, perhaps in Cyprus or Turkey and one from the Lebanese coast; Ben-Dov 2011: Figs. 193:12, 194:10). There was no local manufacture.
- A few Philistine-type sherds were found which originate in the southern coastal zone. But a number of locally-made vessels display strong Aegean/Cypriot traditions (Chapter 4). These include several sherds bearing the bird motif. The iconography and "emblemic style" suggest people with Aegean or Cypriot origins.

- An Aegean-type torch has been identified (Fig. 3.70:2).
- The notched boar's tusk and a notched cow rib appear to be in the tradition of the notched scapulae characteristic of the "Sea People" sphere.
- A couple of stone, spool-shaped suspension weights and flat stone discs which I have interpreted as balance weights have Aegean antecedents.
- The anchor seal is best understood as a Cypriot item—perhaps associated with textile manufacture.
- Aegean ritual objects. Aegean style figurines (a molded mourning figurine head and "Ashdoda" heads) and the kernos fragments suggest Aegean deities and rituals (without negating the idea of syncretism, of course).
- The plan and internal features of Sanctuary 7052, and its surrounding installations, are highly reminiscent of sanctuaries in Cyprus and the Aegean. Its only real counterpart in Canaan is the ritual architecture of Tel Qasile, an Iron Age I Philistine site.
- While different in some ways (pot bellow typology perhaps), the spatial organization and technology of the recycling metal industry, resembles especially that of Late Cypriot period Kition.
- "Phoenician" Bichrome ware occurs only in the last Iron Age I level, Stratum IVB, and after. Some is imported from the Phoenician coast, but most seems to have been made locally. While this may be simple emulation on the part of local potters of a coastal decorative tradition, it would seem more likely to indicate potters schooled in the coastal/Cypriot tradition who practiced their craft locally (cf. Gilboa 1999: 9).

Given the above, I believe it is fair to say that Astour's (1965) and Yadin's (1968) thesis tracing the origins of the biblical tribe of Dan to the Danuna/Denyen, a "People of the Sea", has gained greater currency via the results of the Tel Dan excavations. At the same time, much of this material is also present in the Amuq/Cilicia area of northern Syria and southeastern Anatolia. This should also be considered a possible source (cf. Rainey 1996: 10-11; Yasur-Landau 2010: 334, 338).

At the same time, while Cypriot and Aegean features are many, certain features of the Philistine heartland to the south are missing:

- The most common ceramic forms—bell-shaped bowls and kraters—are largely missing. These types have functional counterparts at Dan that are of a similar shape, but they are not the typical Philistine forms.
- There are no Aegean style cooking pots of the type that is found in the southern coastal plain. If women were the primary cooks, we might hypothesize that the Aegeans or Cypriots at Tel Dan were solely men who married local (or Egyptian?) women.
- There are almost no pig bones. Whoever the Aegeans, Syrians or Cypriots were at Tel Dan, they did not eat pork.

If we are asking who the inhabitants at Tel Dan were in the Iron Age I, we must also be cognizant of certain features that are either indicative of who they might *not* be, or indicative of a newly coalescing social and ideological identity.

- While five anthropomorphic fragments with Aegean referents are published here, they are the exceptions to the rule. We have no other anthropomorphic imagery. It might even be hypothesized that the Aegean fragments are residuals from Strata VIIA and VI and that by Stratum V no human portraits were made.
- Iron Age I Tel Dan shows no evidence for mortuary remains. This is a pattern that is visible in the central hill country and even on the coastal plain. What little is documented in the way of mortuary remains appears to comprise the tail end of Late Bronze Age practices (Kletter 2002; Faust 2004; noted already by Ilan 1999: 206-207).
- The typical pillared ("four-room") house is missing completely from Tel Dan's Iron Age I architecture.

How, then, are we to interpret this very mixed bag of material culture attributes? More specifically, where did the people who lived and/or settled in Tel Dan come from? The most parsimonious explanation is that a number of culture groups are represented and coexisted. These identity groups preserved their respective heritages and maintained, initially at least, social boundaries ("Canaanites", Egyptians, "Danuna Land and Sea Peoples" and "Israelites"?). But some features indicate that by Stratum V a certain ideology congealed, and perhaps preempted others, in archaeologically recognizable ways: the lack of pig bones, the lack of shells from nearby Lake Hula, the lack of mortuary remains and the non-anthropomorphic nature of the cult, for example. Perhaps these are the beginnings of a self-identifying tribe of Dan, which was subsequently inducted into a larger nation (and territorial state) of Israel. The Iron Age I levels at this one site, Tel Dan, illustrate what Killebrew (2005: 184-185) has termed the "Mixed Multitude Theory", which describes the larger process of Israelite ethnogenesis.

This amalgamated archaeological context expresses the changing strategies adopted by immigrant groups. The social psychologist J.W. Berry (1997: 10) notes that four of these are possible: *assimilation, separation, integration* and *marginalization*. Elements of *separation* are observable in, for example, the Cypriot/Aegean-style sanctuary, in the midst of a metallurgy industry, located 20 meters away from contemporaneous rooms containing single standing stones (*masseboth*), a traditional Levantine feature. But the complete dearth of pig bones, for example, also suggests *integration*. In other words, socializing strategies are flexible and circumstance-dependant.

Yasur-Landau (2010: 12-13) has recounted Berry's variables (Yasur-Landau prefers to call them "parameters") relating to migrants' interaction with local natives. It is worth explicating these variables from the perspective of Iron Age I Tel Dan:

The number of people involved in the interaction between immigrants and locals was small and therefore manageable. The locals themselves were of various origins.

The duration of the interaction was drawn out over many generations, for at least 200 years. By definition, this requires some degree of separate identity, but processes of integration and assimilation are in evidence over time (above).

The cultural distance between the populations involved. Initially, under Egyptian suzerainty, cultural distances would have been greater, but under the auspices of a military regime with a strict hierarchy, such differences would have been sublimated to the personal sphere. Later on, if my analysis is correct, newly arrived immigrants encountered their own countrymen who were probably part of the power structure. Embedded veteran immigrants would have mediated the potential for misunderstandings, or at least provided a protecting balance of power (below).

The segment of the population involved. Initially, these would have been small numbers of individuals, primarily males. Later, a broader spectrum of individuals would have been included, including women and children (cf. Sweeny and Yasur-Landau 1999).

The balance of power between the cultures. We are examining here immigration to a particular place, Tel Dan, rather than immigration as a general phenomenon of the Iron Age I. At Tel Dan power was wielded initially by the Egyptian regime which apparently employed officers and functionaries from distant lands, as a strategy of control. When the Egyptian administration withdrew, power was apportioned by those who remained. We do not know who retained, or obtained, power, but the pluralistic nature of the finds suggest a multiethnic society which adopted, at first at least, an egalitarian system of governance. In such a hypothetical system, the different culture groups would have had an interest in maintaining equilibrium, a system of mutual support. This appears to have ended with the destruction of Stratum V. In Stratum IVB governance and production were more centralized, suggesting a more hierarchical power arrangement and perhaps the blurring or shifting of earlier identities.

The level of pluralism and tolerance within the interacting societies. Segueing from the above reconstruction of power relations, I further hypothesize that pluralism and tolerance were the order of the day in the earlier Iron Age I horizons. The question is, what happened once inequalities developed and once alliances shifted, both within the settlement and into the countryside? Perhaps by this time group identity with a homeland culture was no longer an issue, as a result of acculturation or assimilation. Or perhaps pluralism and tolerance gave way to chauvinism and internecine conflict. These are interesting questions, particularly as Tel Dan verges into the period of state formation in the Iron Age II. But this is a subject to be addressed elsewhere.

In a discussion of heterogeneous cultural origins it is worth noting that the archaeological remains reported in this volume appear to be mainly domestic in nature. Even the industrial zone in Area B-west seems to represent an almost domestic scale of production. No obviously public or elite buildings or spaces have been excavated yet. This may be fortunate, in a way, since it is in the household that immigrant culture expresses itself best. The public arena is more apt to reflect the dominant culture and to show unity and standard practice (Berry 1997: 12; Burmeister 2000: 542 and others cited in Yasur-Landau 2010: 15-17).

The model silo (Chapter 15, Fig. 15:1) may be emblematic of the agglomerative social fabric. It is hard to know where to place it culturally. I have suggested that it has Egyptian origins, but it already had a history in the religion(s) of the Middle and Late Bronze Age Levant. For reasons laid out in Chapter 16, I believe that it was an attribute of the god Dagon, whether it contained a figurine or not. But it was found in Sanctuary 7052—a Cypriot/Aegean style structure. Variants of the model silo occur in northern Syria (e.g. Ugarit) and in early Iron Age Cyprus as well. Perhaps it should be seen as the ultimate material example of religious syncretism and the apotheosis of Iron Age I acculturation.

Ritual and Religion

I have only just touched on the question of the religion, or religions, of the Iron Age I inhabitants of Tel Dan. Some more general remarks can now be made and several questions for further study can be posed.

This report documents standing stones (*masseboth*), a Cypriot-Aegean-style sanctuary and numerous small finds that are held to be of ritual and religious meaning: the model silo, large numbers of chalices and some stands, kernoi and bowls with birds' heads, and pomegranate (or poppy) appendages of other kernoi. It is worthwhile examining ritual practice in a regional context.

The small sanctuary uncovered at Hazor in Area B, Stratum XI included benches, at least one *massebah* and the well-known metal hoard that was cached away under the floor in the southeast corner (Ben-Ami 2006; Ben-Tor 1989: 80-82; Yadin 1972: 132-134). I have suggested that the sanctuary included more than just the small chamber itself; ceramic cult stands and a goodly number of imbedded mortars, and grinding slabs were part of the inventory (Ilan 1999: 154-156). The sanctuary-metal hoard connection resembles the metal-cult association at Tel Dan and several sites in Cyprus. However, the contents of the jug, and the bronze statuette in particular, appear to date to the Late Bronze Age. It can be asserted therefore, that the hoard is comprised of scavenged metal, and that the iconography of the bronze statuette is not part of the ritual inventory, unless the Area B sanctuary's *massebah* expresses dominance over the buried figurine.

The more recent find of a small ritual installation in Hazor Area A (Ben-Ami 2006) includes a single large *massebah*, a circular array of small standing stones next to it, and three flat slabs interpreted by Ben-Ami as offering tables. While this configuration does not correspond exactly to anything at Tel Dan, the prominent single *massebah* finds resonance in the Dan *masseboth*, in two separate rooms, and the slab offering tables bring to mind the massive stone platform on the north side of Sanctuary 7052. The present writer would hypothesize that the Hazor ritual features share much with Dan counterparts, possibly suggesting similar religious beliefs and ritual actions.

At Sasa, the famous kernos is a signifier of ritual behavior (Bahat 1986). It was found in a small chamber with other several features that suggest ritual use: low benches and red painted spots on the wall plaster. None of the other nearby sites have exhibited clear evidence for ritual, but this may be due to their small size, or the limited nature of their excavation.

It has been shown that certain ritual features point to connections with Cyprus, the Aegean, the Levantine coast and northwestern Syria: the form and attributes of Sanctuary 7052, kernoi (cf. Mazar 1980: 108-111) and bird representations (cf. *Tel Qasile*, Mazar 1980: 99-100). Perhaps these phenomena are only representative of part of Tel Dan's Iron Age I population, but ritual behavior, being a reflection of religious belief and worldview is patently an aspect of social identity. There was a "Sea People" element present in the population.

But this is not the whole story, and other observations can be made based on the negative evidence—what is missing. Lewis (1998) in his review of Mettinger (1995) has laid down an outline of what we know and don't know about early Israelite religion. Among other things he reiterates the complete lack of anthropomorphic figurines from clear Iron Age I contexts. We recall, once again, that the seated male figure from Hazor Stratum XI has been explained as the result of Iron Age I scavenging of metal from the ruins of the Late Bronze city.

Perhaps this is the key to understanding the small number of figurines at Tel Dan—the only five being Aegean. If metal scavenging had become an integral part of the Iron Age I economy, and if a significant and particularly evocative proportion of the metal scavenged took the form of metal figurines, might it not have been expedient to repudiate the power and efficacy of such figurines, whatever their precise function? And would it not be necessary to extend this repudiation to include any form of explicitly iconic or at least, anthropomorphic representation? It may be suggested that an early form of aniconic ideology was formed in this way—what Mettinger (1995: 18-20) would call "material aniconism" as opposed to "empty space iconism". This ideology may have also taken hold in mortuary practices.

Funerary Practices and Burial Remains: Where are They?

Mortuary remains are completely missing from all the Iron Age I assemblages of the northeastern Galilee. The same is largely true for the central hill country (Kletter 2002; Faust 2004), the deserts and much of the Philistine heartland. Only at some locations on the coast (e.g. Tell el Far'ah south, Tel Zeror, Azor) and in the lowlands further south (e.g. Beth Shean, Megiddo, Tell es-Sayidieh, Kefar Yehoshua) is there evidence for organized burial with mortuary offerings. These are often associated with intrusive populations—Egyptians at Beth Shean and Lachish, "Sea Peoples" at Tell el-Far'ah (S) and Tel Zeror, etc. But why are they absent from the rest of the country and from northeast Canaan in particular? Since numerous Bronze Age and later Roman-Byzantine cemeteries are attested, we must presume that the lack of the same in the Iron Age I (and later Iron Age for that matter) is not an accident of investigation.

The hypothesis adopted here (first proposed in Ilan 1999: 206-207) holds that, in conjunction with changes in ritual paraphernalia and practice, the concept of ideal burial changed as well. It was no longer desirable to inter objects of value with the deceased. Faust (2004) has called this an ideology of simplicity. Like the new anti-anthropomorphic trend, this may have stemmed from the proclivity, or necessity, to scavenge for much-needed metal to create weapons and tools. It may have been found necessary to prohibit burial offerings and figurative representations, not only to conserve precious commodities, but also to legitimize the scavenging of metals from Bronze Age tombs. At the same time, perhaps corporeal remains were interred, unaccompanied by burial goods, much further away from settlements than was the case in the Late Bronze Age. I can think of no other good explanation for the complete lack of Iron Age I mortuary remains in these regions.

Destructions and Defense

Stratum VI appears to have been destroyed by conflagration; though most of its remains were gleaned from pits. The pits themselves contained what appear to be quantities of ash and charcoal but no human bones or weapons.

Stratum V was destroyed in a massive conflagration that is easily identified in most parts of the tel. Here, too, there were very few weapons found and no human remains amongst the debris. Whatever happened, the inhabitants were not trapped in the fire and most valuables were removed, either by them or someone else, prior to the conflagration. Nor were any caches or hoards recovered. Unlike the transition from Stratum VI to Stratum V, this time, the debris was left in place and constructed upon by the builders of Stratum IVB.

The destruction of Stratum IVB is only discernible in some spots. In places the walls have collapsed *en masse*, preserving their courses on the ground. In other places (Area Y), a burnt layer is visible. This destruction may have been caused by earthquake; in any case the conflagration was not settlement-wide. Human remains were not encountered here either, and weapons were mainly found in association with the metal industry.

Thus, while there is no evidence in any of the above strata for destruction as a result of human conflict, it cannot be ruled out either. If the shift from subterranean grain storage to above-ground storage is indeed an indication of increased security, it reflects a long-term change in sociopolitical perceptions, but this does not necessarily preclude individual events of violence, either internecine or wrought by forces outside the regional system.

Indeed, the lack of fortification in Stratum VI, and probably in Stratum V too, is curious. Given the evidence for insecurity one would expect some kind of security mechanism to be in place. Perhaps by Stratum V at least, we need to posit the existence of linked houses at the apex of the tell, such as the configurations proposed by Herzog (e.g. 1998: 211) for Tel Masos, Beersheba and 'Izbet Sartah. Megiddo Stratum VIA might also be so defended. Or perhaps the mechanism of security was the threat of retribution.

Political Organization

Small kinship groups were the building blocks of social organization in the Levant (Joffe 1993: 2, 60-61). Extending this concept further, it seems clear that the long-term organizing framework of societies in the ancient Near East was the "patrimonial household" (Schloen 2001: 50-53). At their foundations these societies are kin-based and hierarchical with patriarchs ruling at successive tiers—the extended family, the clan or lineage group, the kingdom or the empire. The scale may change, but the essential structure remains the same. However, we must ask whether this foundation is present, or to what degree it is present, at any given site, in a society that is suborned to imperial hegemony. Does the patrimonial household model (PHM) apply, in any way, to those sites with Egyptian garrisons and administrations, employing mercenaries or functionaries from different parts of the eastern Mediterranean and the Levant, and beyond? Perhaps not.

If Tel Dan Stratum VIIA1 represents the final phase of Egyptian rule (and the dissolution of that rule) the settlement represents an outpost of an archaic state. One of the defining features of the archaic state is that elites were not related by kinship to those they ruled (Johnson and Earle 2000: 304). This certainly held true for the central administration but it may, or may not, have held true for imperial outposts. The El-Amarna period, for example, exhibited a local system of patrimonial household rule, but the rulers (vassals) were subordinate to the empire. This system apparently failed to meet Egyptian expectations and was supplanted by one that was more "hands-on" (e.g. Bietak 1993: 294-297; Bunimovitz 1995: 327-328; Na'aman 1981: 185; Weinstein 1981). Further, in archaic states, "local populations are bound economically to the state through a carefully managed dependency that is a consequence of long-term intensification in the subsistence economy" (Johnson and Earle 2000: 305). While the finds from Stratum VIIA1 are thin on the ground, the hints of Egyptian, Aegean and Cypriot people living at the site and the pattern of pithos manufacture and distribution, for example, suggest that Tel Dan was administered directly by the Egyptians, with the help of foreigners, and not by a local elite.

Stratum VI represents what filled the vacuum with the withdrawal of the Egyptian empire—a dispersed settlement, apparently of fairly large houses, (*not* of the quadripartite type), with silo fields between them and in other open areas. Since I am claiming that this settlement was populated by the remnants of the Egyptian outpost and its dependents, I do not believe that we can simply impose Schloen's Patrimonial Household Model. This appears to have been the start of something truly new. Initially, perhaps, it was a somewhat egalitarian local group or a Big Man collectivity (cf. Johnson and Earle 2000: 123-244), one of many in the politically fragmented, post-empire landscape of the Levant.

Subsequent Stratum V represents a phase of agricultural intensification, population growth, architectural density and improved security. This can no longer be considered an egalitarian local group and must be defined somewhere along the continuum between a Big Man society and a Simple Chiefdom. The latter, especially, implies the existence of subsidiary settlements such as those identified at nearby Tell el-Wawiyat, Tel Anafa and Khirbet Sanbariyeh, for example (Ilan 1999: 160-171). The question is: how much further did Tel Dan's authority reach and, did the extent of this territory expand over time? I shall not address these questions in the present volume.

Though Tel Dan was a densely occupied central place that engaged in long-range trade relations, I have called it a large village or a town rather that a city. This is because, as mentioned above, there is still no clear evidence for true elite structures (both physical and bureaucratic), full-time craft specialization and fortifications. Another key question with regard to political elites is whether Tel Dan maintained or achieved a central ritual function during this time. While the Iron Age II temple platform appears to rest upon what may be the foundations of a Middle Bronze Age *migdol* temple (Ilan 2018), we have no evidence that this structure served the Iron Age I levels. On the contrary, the rather ubiquitous evidence for ritual practice in and amongst the prosaic structures of the Iron Age I levels suggests that ritual behavior was small scale, heterogeneous (even pluralistic) and household-oriented. But we cannot discount the possibility of an established, more centralized cult that has not yet manifested itself in the archaeological record. In this light, it has been suggested that the larger public structures may be located closer to the springs, amongst the mass of basalt boulders through which the springs flow, and under the later terraces on the northwest slope down to the source of the Dan River.

I have made the case for Tel Dan's role as an Egyptian garrison/administrative center in the terminal Late Bronze Age and early Iron Age I, in the 13th and first half of the 12th centuries BCE (i.e. Stratum VIIA). The settlement's affiliation *after* the Egyptian withdrawal is another matter. An autonomous status is likely, at least in the initial stages following the withdrawal, represented by Stratum VI. By Stratum V Tel Dan had evolved into a local center that dominated a hinterland of undetermined size, though the distribution of pithos jar rims in the Hula Valley may be some indication (see below). How long did this autonomy last? This is hard to say. Our next datum point would seem to be the Tel Dan stele of the late 9th century BCE which testifies to Aramean-Damascene suzerainty (Biran 1995; Biran and Naveh 1993).

Given its distance from the events it portrays and its theological nature, the biblical text is a highly equivocal source for the Iron Age I. But I do not think that we can completely ignore it; the archaeological data show a certain processual correspondence with the biblical account. As a heuristic exercise it is worth rehearsing the sequence of events as laid out by the text.

The portrait painted by Judges 18:7 would suggest the kind of autonomy indicated by the archaeological remains of Stratum V, and perhaps by Stratum IVB. Even after the conquest of Laish by the Danites the town would have been autonomous, "for in those days there was no king in Israel". By II Samuel 8, David has defeated the northern kingdoms of Zobah and Damascus and made Hamath a vassal. Of course, the historicity of this account is questionable (Na'aman 2002), but it may imply that the area of Tel Dan was ruled by one of these Aramean kingdoms (or by another Aramaean kingdom such as Beth Rehov or Ma'achah) prior to conquest by Israel. In any event, Jeroboam's establishment of a cult center in Dan (I Kings 12:28-33) presupposes Israelite rule by the late 10th century BCE. To this writer it seems unlikely that this last story could have been a total fabrication (contra Arie 2008). But this argument goes beyond the scope of the present study. The bottom line is that Dan's autonomy was suborned at some point in the 10th century BCE, whether by Israel or by one of the Aramean kingdoms. The destruction of Stratum V and the construction of Stratum IVB may be the expression of this change in rule.

Historical Reconstruction

In the sections above I outlined the archaeological sequence and inferred economic, social and political processes, both within the settlement and in a regional geopolitical framework. As noted in Chapter 20, the radiocarbon dates acquired thus far, mainly from long-lived wood samples, provide only ancillary assistance in dating these processes. Nevertheless, the archaeological data are sufficiently robust to allow us an attempt at historical reconstruction.

Stratum VIIA (c. 1270-1140/1130 BCE): An Egyptian outpost between Beth-Shean and Kumidi (Kamid el-Loz)

The Egyptian finds at Tel Dan from the LBIIB were somewhat equivocally addressed by Martin and Ben-Dov, who suggest that the Egyptian material arrived via trade, mainly from the Lebanese coast (Martin and Ben-Dov 2007; Ben-Dov and Martin 2011).[8] They interpret the small quantities of Egyptian material as arguing against an actual Pharaonic presence at Tel Dan. However, the cooking jugs found in this stratum (e.g. Ben-Dov 2011: Figs. 138:7; 157:8) were not identified by them as an Egyptian type and they are significant in this regard. This is also the phase during which the collared-rim pithoi were introduced, which I have interpreted (above) as an Egyptian tool of administration.

To this writer, the evidence suggests that there *was* a Pharaonic presence during the 19th and 20th dynasties at Tel Dan. In addition to the pottery, the Ramesside scarabs comprise further support (Keel 2010: Figs. 205, 207). But the clinching artifact must be the statuette of an official from Area T (Ben-Dov 2011: Fig. 122), which may be dated to the New Kingdom (Brandl and Ophel n.d.). To this we might add the female smiting figurine (Ben-Dov 2011: Fig. 121), perhaps an Egyptianized Anat (Negbi 1976: 84-86) and another Egyptian inscribed block statue fragment, a surface find.[9] All

8 Ben-Dov's (2011) presentation of the Late Bronze Age material overlaps into the Iron Age I (Stratum VIIA1), at least according to conventional terminology (e.g. Killebrew 2005: 22). Her analysis was based on material culture continuity, which is a legitimate viewpoint (cf. Ussishkin 1985 for a similar conception of Late Bronze Age Lachish).

9 Schulman (1990) has dated this last item to the 2nd millennium BCE, but claims that it was re-inscribed later, in the 1st millennium BCE. It might be time to reexamine this conclusion. Both statuettes have recently been studied by Ashley Arico (2013) who feels they are both Middle Kingdom objects, perhaps transported in a later period.

these were found in Area T near the upper spring (En Leshem). This must be where the large public buildings were located, amongst and underlying the masses of basalt boulders and dense vegetation that are as yet unexcavated. Its proximity to a copious water source with potential for the irrigation of abundant fertile land makes Tel Dan ecologically similar to the Egyptian center at Beth Shean (James and McGovern 1993: 235). The timber that was eventually burned in the Stratum V conflagration was logged to construct the buildings of Stratum VIIA.

This Egyptian presence, situated between the Egyptian centers at Kamid el-Loz (Kumidi) and Beth Shean, was one of the garrisons and administrative centers placed at intervals along the Rift Valley. It also lay alongside the main route between the Lebanese coast and southern inland Syria (see above Chapter 1). It was part of the 19th Dynasty policy of "buildup" in Canaan, with the goal of staunching rebellion, maximizing agrarian production and consolidating resources needed for potential campaigns against the Hittite Empire (Oren 1984; Weinstein 1981; 1992; Morris 2018: 187-221).

The Egyptian imperial center at Tel Dan was populated by multiple ethnic groups—certainly soldiers and officials, but probably also homesteaders, merchants, craftsmen, wives and religious practitioners. This was a frequent feature of Egyptian administration (e.g. Kitchen 1992; Redford 1992: 243; Yasur-Landau 2010: 194-215; Morris 2018). Perhaps long service to the Egyptian crown was rewarded by a land grant and pension, like Roman imperial practice in relation to retired officers more than a millennium later. Foreigners with a stake in the success of the Egyptian enterprise were much more likely to be loyal to the crown.

A discussion of Egyptian rule and its manifestations in northern Canaan must consider the role of nearby Hazor. This has proven to be a point of much discussion with no real agreement. A number of Egyptian and Egyptianizing prestige objects have been recovered (e.g. Allen 2001; Ben-Tor 1998: 462, 465; 2006; Kitchen 2003), but no Egyptian architecture and very little prosaic Egyptian pottery. This suggests elite relations with Egypt, but no large-scale Egyptian contingent. It seems clear that Hazor was nominally under Egyptian rule, but maintained a large degree of *de facto* autonomy (Bienkowski 1987: 58-59) and cultural affiliations with a more Syrian orientation (e.g. Bonfil and Zarzecki-Peleg 2007; Zuckerman 2010).

The dates and agents responsible for the destruction of Hazor are also matters of debate. Yadin (1972: 108) claimed that Stratum Ib was destroyed by Seti I (1303-1290) and Stratum 1a (Upper City Stratum XIII) by Joshua c. 1230 BCE. Ceramic studies convinced Beck and Kochavi (1985: 38) and Finkelstein (2005) that this last Late Bronze Age stratum was destroyed earlier, in the first half of the 13th century. Both Bienkowski (1987: 59) and Ben-Tor feel that one cannot date the destruction of Stratum 1a/XIII any closer than to a general 13th century date (Ben-Tor and Zuckerman 2008: 2). Kitchen (2003: 27) is adamant that Hazor cannot have been destroyed before c. 1230 BCE, but the historical framework of events he constructs is something of a house of cards. Recently, Zuckerman (2010: 178) has revised her opinion, agreeing with Beck, Kochavi and Finkelstein, implicitly acknowledging the lack of a terminal Late Bronze Age horizon parallel to Tel Dan Stratum VIIA1 (Zuckerman 2007: 25 and see Ben-Dov 2011: 377).

Zuckerman (2007) views the final destruction of Late Bronze Age Hazor as the end result of gradual decline and internal revolt, citing the lack of evidence for actual warfare. While this is certainly possible, the evidence for rebellion and the Egyptian buildup in Canaan during the 19th Dynasty make it hard to believe that the Egyptians were not somehow involved in Hazor's downfall. Would we expect, for example, statues of local deities to be decapitated (Ben-Tor 1998: 465) by rebellious locals, who most likely shared the religion of their erstwhile elite? To my mind, a foreign instigator is more likely—the Egyptians and their foreign mercenaries—though Zuckerman makes a good case that the Egyptians were dealing with a weakened polity by this time.

Egyptian withdrawal (c. 1180/1140 BCE)

The Egyptian garrison at Tel Dan was abandoned, as an Egyptian outpost, at some point in the process of the withdrawal from Canaan which took place during the 20th Dynasty and ended no later than the reign of Ramses VI (1141-1133 BCE; Weinstein 1981; 1992; Morris 2018: 216-217). At present we do not have the data to allow us to determine whether this withdrawal from Tel Dan occurred earlier or later in the 20th dynasty. Looking wider afield, many of the Egyptian outposts were not maintained past the end of the 19th Dynasty (Weinstein 1992). The excavators of Kamid el-Loz place the end of the Pharaonic center (Kumidi) at c. 1150 BCE (Hachmann 1983: 19-20), in the beginning of the 20th Dynasty, though this is a fairly round date. The Egyptians withdrew from Beth Shean some time during the reign of either Ramses IV, Ramses V or Ramses VI (Mazar 2009: 17, 23) and from Megiddo and Deir el-Balah during, or just after, the reign of Ramses VI (Weinstein 1992). Given this geographical and chronological framework of the Egyptian imperial collapse one may propose that Tel Dan ceased being an official Egyptian outpost later in the 20th Dynasty, similar to Beth-Shean and Megiddo, perhaps *ca*. 1140-1130 BCE. In fact, I would propose that the final Egyptian withdrawal was simultaneous, and not a drawn-out process.

Stratum VI: a dangerous new world (c. 1140-1100 BCE)

The site was no longer an Egyptian control post, but it was not abandoned by all its residents. I propose that many of those who had served the Egyptian administration stayed on. The Egyptian-style cooking jugs are quite common, and continue to be so in Stratum V. The Levant was a land in turmoil even before the Egyptian exit, but once they were officially gone it probably became even more dangerous, there being no hegemonic deterrent. In the section dealing with political organization above, I have made the case that Tel Dan was an independent entity with a small population having limited, if any, alliances. This is not to say that Tel Dan lived in economic or political isolation. If such alliances did exist they may have been with the Lebanese coastal zone. Dangerous as things were, this settlement may not have had the wherewithal to build an effective fortification. These were also the circumstances that required storing grain in underground pits.

The people living in the village were the remnants of the Egyptian imperial center: Egyptian soldiers and administrators, homesteaders, Aegean and Cypriot mercenaries, local people and perhaps others. Astour's (1965) and Yadin's (1968) thesis tracing the origins of the biblical tribe of Dan to the Danuna/Denyen, a "people of the sea", has gained greater currency as a result of the Tel Dan excavations—the first Danuna/Denyen may well have been decommissioned soldiers.[10] There is certainly a Cypriot element in this population, though we still cannot say whether this coincides with the Danuna/Denyen.[11]

Destruction (c. 1100 BCE?)

The debris and ash deposited in some of the pits and on fragments of living surfaces indicate some destruction in Stratum VI, but the extent of this destruction cannot have been great because the wooden beams and poles that burned in the later Stratum V conflagration (below) originated in the earlier Egyptian Stratum VIIA construction. This timber would not have survived had the Stratum VI destruction been wrought by a widespread fire. We have no way of knowing who, or what was responsible. But the material culture of the following stratum is nearly identical; we may posit that the same people cleared away the debris and rebuilt.

10 Oren (1973: 149) made the case for Denyen/Danuna mercenaries at Beth-Shean. I believe the case for Danuna/Denyen at Tel Dan is much better.

11 Rainey (1996:11) opposed the Dan/Danuna/Denyen identification vociferously.

Stratum V: Political consolidation, improved security and economic prosperity (a. 1100-1000 BCE?)

Following the destruction of Stratum VI, the inhabitants of Tel Dan probably rebuilt existing structures. Over time, the population grew, the settlement expanded, filling in open spaces between houses; many larger spaces were subdivided. Floors were raised in places, and perhaps individual buildings, or parts of buildings, were damaged and rebuilt. The earlier silo fields were built over and pithoi took their place above-ground. The material expressions of heterogeneous ethnicity are still present in this stratum. Therefore I would propose the following reconstruction, based on Anthony's (1990) scheme describing the mechanisms of migration.[12]

The Iron Age I was a period of chaos and flux with desperate people looking for solutions to poverty, a lack of security, fear and homelessness. Migration was one solution in desperate times. These were the "push-factors". What were the "pull factors", in the case of Tel Dan? Continuing the process outlined in Anthony's model, we have already recognized the pioneer informants: soldiers, craftsmen, wives and possibly merchants of Aegean, Cypriot, Syrian, Canaanite and even Egyptian origins, who perhaps maintained communication with their homelands (even indirect, hearsay contact). This communication informed countrymen that in times of desperation there was a place to go; a well-watered place with plentiful arable land, a good climate, trade possibilities and a political vacuum; a place where fellow countrymen had taken their fate into their own hands. These are the kinds of people we see and hear about in the Medinat Habu reliefs and Papyrus Harris I, though the scenario that I am positing for Tel Dan would have occurred several decades later.

Given the amalgam of material culture attributes at Iron Age I Tel Dan, and it is a unique amalgam, it seems reasonable to suggest that a new social identity evolved at the site, which incorporated the elements of previous identities (cf. Burmeister 2000: 546; Rouse 1986: 178-179).

Wholesale destruction (c. 1000 BCE)

The agent responsible for the final destruction of Stratum V is unknown. As noted above, it seems unlikely that an earthquake was responsible since there is no clear pattern in the collapse of walls and no human remains were encountered anywhere. We can hypothesize that the inhabitants were removed rapidly (or removed themselves) and the entire town was put to the torch. It is tempting to suggest that memory of this destruction informed the account of Laish's destruction by the Danites in Judges 18. But this is only speculation.

Stratum IVB: Building on previous foundations (c. 1000-900 BCE)

Stratum IVB was built directly over the remains of Stratum V, without removing the destruction debris and, for the most part, using the existing walls as foundations. The material culture of Stratum IVB seems to be a direct continuation of that of Stratum V. This suggests that the inhabitants were the remnants of those who occupied the site previously, but one cannot rule out another population group with origins nearby.

Destruction of Stratum IVB—earthquake?

Despite the sketchy nature of the Stratum IVB remains, there is some evidence for earthquake destruction, probably sometime in the 10th century BCE (this general date will work with any of the proposed chronologies and we cannot be more precise at present). The following stratum (IVA) shows much continuity in material culture, but also clear differences that reflect the passage of time and perhaps a change in the site's function and geopolitical associations. This will be the subject of future volumes.

12 Yasur-Landau's (2010) extensive treatment of Aegean migration to the Levant has adopted successfully, in my view, this same model. His treatment has been a useful guideline for my own, more place-specific, reconstruction (see especially Yasur-Landau's Chapter 1 and the above section entitled Cultural Origins and Social Identities).

Questions for Future Research

Excavation reports laden with great quantities of data are endless quarries for archaeological insight. But at some point all of us must decide when and where to close the analysis and its presentation. Inevitably further questions remain to be pursued at a later opportunity or by other students and scholars. Below are some of the questions that remain to be investigated for Iron Age I Tel Dan:

- Does a complex of public buildings exist, perhaps those of the Egyptian administration, somewhere more proximate to the Ein Leshem spring on the tel? Excavation in this area would be difficult and would impinge upon the natural beauty of the nature reserve, but the potentials are tantalizing.
- What are the dates of destruction of the Iron Age I strata? Future recovery of short-lived radiocarbon samples may well provide an answer.
- To what extent did Iron Age I dominate its countryside? Further provenience analysis and excavation of nearby rural sites may give us a more complete picture.
- Can we supplement our recovery of organic remains to expand the corpus of foods consumed and materials manipulated? Further excavation using wet sieving might give results.
- Is there more pottery of a non-local character that has gone unrecognized? I myself learned to identify some of the Egyptian, Aegean and Cypriot forms long after my initial, ostensibly comprehensive, analysis of the ceramics.
- Are the architectural and social processes detected in Area B, the only area with a broad exposure, characteristic of other parts of the site, as the author has postulated for Areas Y and T? Or are there substantial differences from area to area, as seems to be indicated by the smaller exposures in Areas H, M, and K? The excavation of another area with a large exposure would go some way in answering this question.

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