

Salvage Excavation Reports

No. 5

Sonia and Marco Nadler Institute of Archaeology  Tel Aviv University



Front cover

Counterclockwise from top left:


MBA scarab stamped impression on a jar handle

A coin of Alexander Jannaeus (104-76 BCE)

Early Islamic lamps and juglet

Cover design: Yura Smertenko

Salvage Excavation Reports

Sonia and Marco Nadler Institute of Archaeology  Tel Aviv University

No. 5

RAMLA (SOUTH)

AN EARLY ISLAMIC INDUSTRIAL SITE AND REMAINS OF PREVIOUS PERIODS

Oren Tal and Itamar Taxel

Contributions by:

N. Amitai-Preiss, I. C. Freestone, R. E. Jackson-Tal,
I. Samet, R. Shimelmitz, D. Sweeney, A. Yasur-Landau

TEL AVIV - 2008

Published by the Emery and Claire Yass Publications in Archaeology
(Bequeathed by the Yass Estate, Sydney, Australia)
of the Institute of Archaeology, Tel Aviv University

Editors

Moshe Fischer
Ze'ev Herzog

Assistant Editor

Na'ama Scheftelowitz

Manuscript & Production Editor

Shirley Gassner

ISSN 1565-5407

©

Copyright 2008

All rights reserved

Printed in Israel by Top Print

CONTENTS

Foreword		5
Chapter 1	THE SITE AND ITS EXCAVATION HISTORY Oren Tal and Itamar Taxel	7
Chapter 2	THE MIDDLE BRONZE AGE	16
	STRATIGRAPHY AND POTTERY	16
	Assaf Yasur-Landau and Inbal Samet	
	A SCARAB STAMPED IMPRESSION	27
	Deborah Sweeney	
	FLINT TOOLS	29
	Ron Shimelmitz	
	APPENDIX I: A NOTE ON THREE IRON AGE I(?) VESSELS	32
	Assaf Yasur-Landau	
Chapter 3	THE PERSIAN, LATE HELLENISTIC AND EARLY ROMAN PERIODS Oren Tal and Itamar Taxel	33
Chapter 4	THE LATE ROMAN AND EARLY BYZANTINE PERIODS Oren Tal and Itamar Taxel	40
Chapter 5	THE LATE BYZANTINE AND EARLY Umayyad PERIODS	47
	Oren Tal and Itamar Taxel	
	ARCHITECTURAL FEATURES	47
	DOMESTIC COMPLEX	47
	OIL PRESS COMPLEX	53
	WINE PRESSES	59
	POTTERY KILNS	63
	A SECONDARY GLASS WORKSHOP	66
	Oren Tal, Ruth E. Jackson-Tal and Ian C. Freestone	
	ADDITIONAL BYZANTINE POTTERY	76
	Oren Tal and Itamar Taxel	
	SUMMARY AND CONCLUSIONS	78
	Oren Tal and Itamar Taxel	

Chapter 6	THE LATE Umayyad, ʿAbbasid and Fatimid Periods	81
	Oren Tal and Itamar Taxel	
	ARCHITECTURAL FEATURES	84
	CISTERNS	84
	PIPES AND CHANNELS	90
	POOLS	100
	SUBTERRANEAN VAULTED CHAMBERS	111
	PAVED WORKING SURFACES	115
	REFUSE PIT	122
	INDUSTRY	123
	FINDS	125
	Oren Tal and Itamar Taxel	
	POTTERY: TYPOLOGICAL DISCUSSION	125
	SELECTED LOCI	160
	GLASS VESSELS	166
	Ruth E. Jackson-Tal	
	STONE OBJECTS	185
	METAL OBJECTS	197
	BONE ARTEFACTS AND SHELLS	203
	EARLY ISLAMIC WEIGHTS	205
	Oren Tal	
	SUMMARY AND CONCLUSIONS	210
	Oren Tal and Itamar Taxel	
Chapter 7	NUMISMATIC FINDS	214
	PRE-ISLAMIC COINS	214
	Oren Tal	
	ISLAMIC COINS	219
	Nitzan Amitai-Preiss	
	Historical Sources	223
	References	223
	List of Loci	239
	List of Walls	254
	List of Pottery and Glass Finds	257
	General Site Plan of the 2005-2006 Seasons	Back Pocket

FOREWORD

The first season of excavations at the site of Ramla (South) (License No. B-298/2005) was carried out in July-August 2005 under the auspices of the Sonia and Marco Nadler Institute of Archaeology of Tel Aviv University, financed by the Israel National Road Company Ltd. and operated through the Israeli Institute of Archaeology.

Participants included: O. Tal and I. Taxel (field directors), T. Harpak and A. Yasur-Landau (assistant field directors), I. Gordin, N. Messika, I. Nashef (area supervisors), A. Keinan and I. Samet (registrars), and R. Eran (administrator). Technical assistance was provided by D. Porotsky and V. Pirsky (site draftsmen) and P. Shrago (site photographer). The expedition team also included some 80 hired excavators.

The second season of excavations (License No. B-306/2006) was carried out in June-July 2006 under the same auspices and financial backing.

Participants included: O. Tal and I. Taxel (field directors), T. Harpak (assistant field director), M. Iserlis and A. Nativ (area supervisors), A. Keinan (registrar), and E. Inbar (administrator). Technical assistance was provided by D. Porotsky and V. Pirsky (site draftsmen) and P. Shrago (site photographer). The expedition team also included some 50 hired excavators.

The third season of excavations (License No. A5168/07) was carried out in July 2007 under the auspices of the Israel Antiquities Authority and the Sonia and Marco Nadler Institute of Archaeology of Tel Aviv University, with the same financial backing.

Participants included: O. Tal and I. Taxel (field directors), T. Harpak (assistant field director), M. Edrey and G. Lerner (area supervisors), and N. Wachidi (administrator). Technical assistance was provided by D. Porotsky and V. Pirsky (site draftsmen) and P. Shrago (site photographer). The expedition team also included some 40 hired excavators.

Processing of the material and preparation for publication of the final report was done in the laboratories of the Institute of Archaeology of Tel Aviv University. Restoration of the ceramic and glass material was done by R. Pelta and Y. Wiener, and the conservation of the metal finds by N. Halperin. Finds were photographed by P. Shrago and drawn by Y. Gotlieb, N. Messika, R. Penchas and A. Perry. Maps and plans were produced for publication by A. Brauner, and plates of finds by Y. Gotlieb and N. Messika.

The authors of this report would like to thank the Director of the Institute of Archaeology of Tel Aviv University, Z. Herzog, for providing access to all its technical facilities, and the series production editor, S. Gassner, for her patience and editorial skills. Our gratitude goes also to the scholars who contributed their expertise to this report, namely N. Amitai-Preiss (Islamic coins), I. C. Freestone (glass production/glass chemical testing), R. E. Jackson-Tal (glass production and vessels), R. Shimelmitz (Middle Bronze Age flint tools), D. Sweeney (Middle Bronze Age scarab stamped impression), A. Yasur-Landau and I. Samet (Middle Bronze Age stratigraphy and pottery), T. Harpak our assistant field director and the above-mentioned staff of the Institute for their ongoing efforts in assisting us to produce a cohesive volume. Thanks is also due to A. Shavit of the Israeli Institute of Archaeology and the Israel Antiquities Authority employees: A. Gorzalczy, A. Onn, E. Yannai and especially G. Avni and Y. Levy, for providing technical assistance during the excavations and while processing the finds. We are indebted to I. M. Baidoun and A. Berman (Arabic numismatics and epigraphy), S. Gat and M. Gil (Early Islamic history), N. Lipschitz (archaeobotany) and H. Mienis (shells) for providing valuable comments in their respective domains, and last but certainly not least M. Fischer and Z. Herzog (co-editors of the *Salvage Excavation Report* periodical), and N. Scheftelowitz (assistant editor) who read the manuscript and provided constructive observations.

Oren Tal and Itamar Taxel
Tel Aviv March 2008

THE SITE AND ITS EXCAVATION HISTORY

Oren Tal and Itamar Taxel

The site of Ramla (South) (Map Ref. 1376/1146 [Old Israel Grid]) is located at a distance of 17 km off the Mediterranean coast on the margin of the valley of Ayalon (Ajalon), about 500 m south of the modern city of Ramla (Fig. 1.1). The site is situated some 80 m above sea level on brown alluvial terrain which at places has intrusions of brown-red and yellow sandy soil and *hamra* (red loam) soil. It appears that these dunes have accumulated over a long period.

The earliest occupation of the site is dated to the Middle Bronze Age IIA and confined to a very limited area. Later occupations in the Persian, Hellenistic and Roman periods were sparse and likewise limited. Given the fact that a site is created by the relics of ancient societies, it is only the Late Byzantine and especially the Early Islamic period architectural remains that can be considered to be major influential factors in its formation. In those times the site extended far beyond its earlier areas of occupation and in the Early Islamic period it was densely occupied as witnessed by the fact that almost every square dug revealed architectural remnants of that period. However, most remains were modest architectural features (industrial complexes sunken or built upon the ground) so that the natural topography, slightly elevated towards the east, was not substantially changed. The site's retrievable building materials were limestone worked stones and fieldstones, worked beach-rock, *hamra* mud-bricks, mortar and plaster. As will be shown below, the site was abandoned in the 11th century CE, and its industrial character changed in the 10th century CE. Most of the finds retrieved from its latest industrial occupation can be securely defined as secondary refuse, from a behavioural perspective, following Schiffer's terminology (1995:206-211).

The site's post-abandonment record was largely influenced by several factors: the removal of

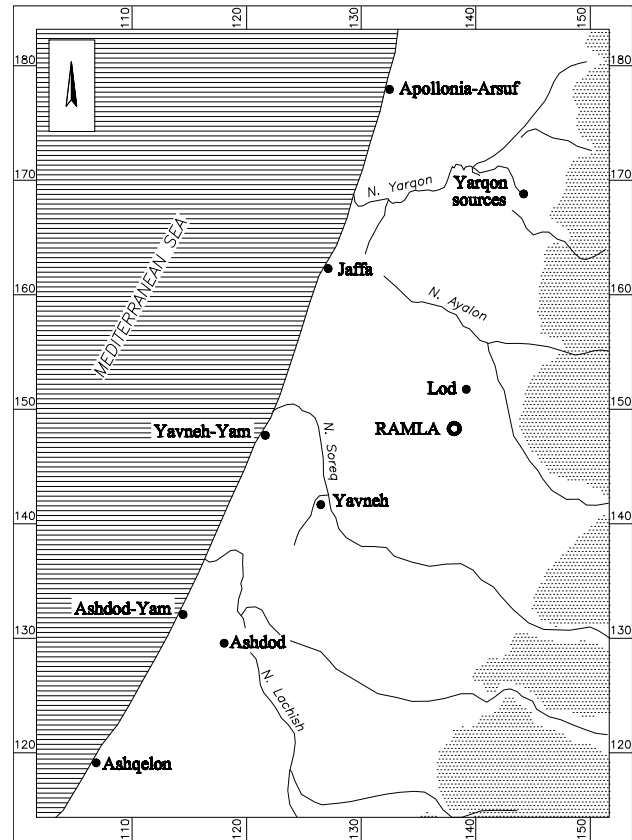


Fig. 1.1: General map showing the location of Ramla.

worked building stones from existing structures and installations for new constructions in the Mediaeval city of Ramla and the establishment of the Oded military base under the State of Israel. The former left numerous robber trenches all over the site, as is the case in many different excavations in Ramla and its vicinity, and the foundations of the latter, operated until the last decade, destroyed earlier architectural remains and caused considerable damage to others (Fig. 1.2a).

The post-abandonment pottery and numismatic finds, though scant, may show some evidence



Fig. 1.2: a) An Israel Defense Force button of a military uniform jacket from the 1960s; b) A complete bi-conical spouted jug of the Mamluk period found in the upper fill level of I534 (cf. Avissar and Stern 2005:111, Fig. 45:9); c) Porcelain cup of the Late Ottoman/Mandatory period.

of occupation during the Mamluk and Ottoman periods, but these had no visible bearing on the site's post-depositional processes (Fig. 1.2b, c and Chapter 7: Nos. 31-33). Another factor is the fact that parts of the site were agriculturally cultivated in recent decades (and probably in earlier times), so that ploughing may have damaged antiquities although we have no direct evidence for this.

The city of Ramla was founded in the days of the Umayyad caliph al-Walīd Ibn 'Abd al-Malik (705-715 CE), as the provincial capital of the military district of Palestine by his brother and heir Sulaymān, the then governor of *jund Filasṭīn*, which was one of the five provinces of *al-Shām*. The Early Islamic industrial complex discovered in the excavations reported here formed a suburb of the city in the process of its rapid urban development. This was balanced against the gradual abandonment of nearby Lod, which was even partially dismantled in order to provide building materials for Ramla.

Ramla's name is derived from the Arabic word *rml* (= sand) after the terrain on which the city was built. It is almost consensually agreed that the city was founded on an area empty of earlier occupations, despite the argument for the mention of Ramla in some pre-8th century CE sources which use the toponym Ramla anachronistically. Indeed,

archaeological excavations carried out throughout the area of Early Islamic Ramla did not yield pre-8th century CE remains, with the exception of some sporadic finds dated to the Middle Bronze Age II and Iron Age (Gat 2004:10-15, 25-26; Petersen 2005:95; Khalilieh and Artzy 2007:5).

Ramla's economic prosperity in the Early Islamic period, which derived from its status as the major commercial centre in Palestine, is reflected both in the contemporary historical sources and in the archaeological record. Ramla is described in the sources as a planned city with various public buildings, some of which were built already in the early 8th century CE. Among these were the governor's palace, the White Mosque, the House of Dyers, streets, markets, inns, baths, churches, synagogues, water reservoirs, gates and probably fortification walls (Luz 1996; Gat 2004:77-101; Petersen 2005:95-98; Khalilieh and Artzy 2007:5-9).

Ramla's prosperity was disrupted several times during the 11th century CE, mainly due to the earthquakes of 1033 and 1068 CE which destroyed extensive parts of the city, but also by warfare between the Fatimids and various local and foreign enemies. After the latter earthquake Ramla suffered severe damage and consequently was deserted. However, it seems that as early as 1072 CE it was founded anew by the Turkmen-

Seljuk, though on a much smaller scale than during its glorious days in the Ummayyad and 'Abbasid periods. It seems that this city was built in a new location, to the east of the ruined city, in the place known today as the Old City (the nucleus of Mediaeval and Ottoman Ramla). It was this city which was conquered by the Crusaders in 1099, thereby ending the history of Early Islamic Ramla and marking the beginning of a new era in the city's history (Petersen 2005:95; Gat 2008:66-67).

Archaeological investigations in areas located in both the old and modern city, covering parts of the Early Islamic settlement, have been carried out at Ramla over the past seven decades. The first was a small-scale excavation by the Department of Antiquities of the British Mandatory government of Palestine in 1940 (Petersen 2005: Table 33:1; see also Avni, in press) (Fig. 1.3). The first large-scale excavation was carried out by J. Kaplan at the White Mosque in 1949 (Kaplan 1958).

Although most of the excavations carried out in Ramla have been limited, their extensive dispersion provided important information about the nature, stratigraphy and chronology of different parts of the city. It must be said, however, that very few, if any, of the many public buildings and complexes mentioned in the historical sources have been identified so far in these excavations. The most common remains discovered are domestic and industrial in nature, and identified as belonging to private dwellings, industrial installations and water installations (cisterns, wells, pipes and channels). An overview of the dozens of excavations carried out at Ramla until 1998/1999 was published by Petersen, who prepared also thematic maps with the location of various features unearthed within the area of Ramla (2005: Table 33, Figs. 53-59; see also Gat 2004; Avni 2008:4-9). Final reports of some excavations carried out between 1996 and 2000 were published recently (Sion 2004; Kletter 2005a; Barbé 2006; Toueg 2007).

Despite the extensive archaeological activity within the city limits of modern Ramla resulting from urban development, very few excavations provided information about the immediate surroundings of the Early Islamic city. Until

recently, the most important of these were those carried out in three different locations southeast of Ramla, where remains of the major aqueduct which provided water to Early Islamic Ramla from wells/springs located at the foot of Tel Gezer were unearthed (Zelinger and Shmueli 2002; Gat 2004:106-116; Gorzalczany 2008a).

The excavations of Ramla (South) can now be added to this short list of excavations located outside the urban limits of present-day Ramla. Due to its position within the area of the Oded military base and the cultivated fields of nearby Moshav Mazliah, the site was unknown until 2002 in spite of a number of surveys carried out in the region over the last decades. Only after the evacuation of the military base and expropriation of agricultural lands slated for the construction of Highway 431 which will cut through the area, was a comprehensive archaeological survey carried out in November 2002. In the survey, conducted by O. Shmueli and T. Kanias (2007) on behalf of the Israel Antiquities Authority, a very large Early Islamic site (ca. 15 hectares) was recorded for the first time (Fig. 1.4: Site 1). The surveyors identified some industrial remains *in situ*, in addition to graves, pottery and stone artefacts. They suggested that the site, which is situated close to Ramla, was part of the city during the Early Islamic period. Three smaller sites, two with finds dating to the Byzantine and Ottoman periods and the third undated, were also discovered east of the large Early Islamic site.

The results of the survey justified trial archaeological excavations at the site of Ramla (South). These excavations were carried out in 2004 by A. Gorzalczany on behalf of the Israel Antiquities Authority in order to determine the extent of the ancient remains in the large Early Islamic site. Sixty two squares, spread across three areas (A, B and C) were excavated. Area A was located on the hill in the eastern part of the site; Area B was located at the western foot of the hill; and Area C was located on the plain west of Area B (Fig. 1.5). The excavation yielded remains belonging to residential(?) and industrial areas, which were dated to the Early Islamic period (Umayyad and 'Abbasid). They

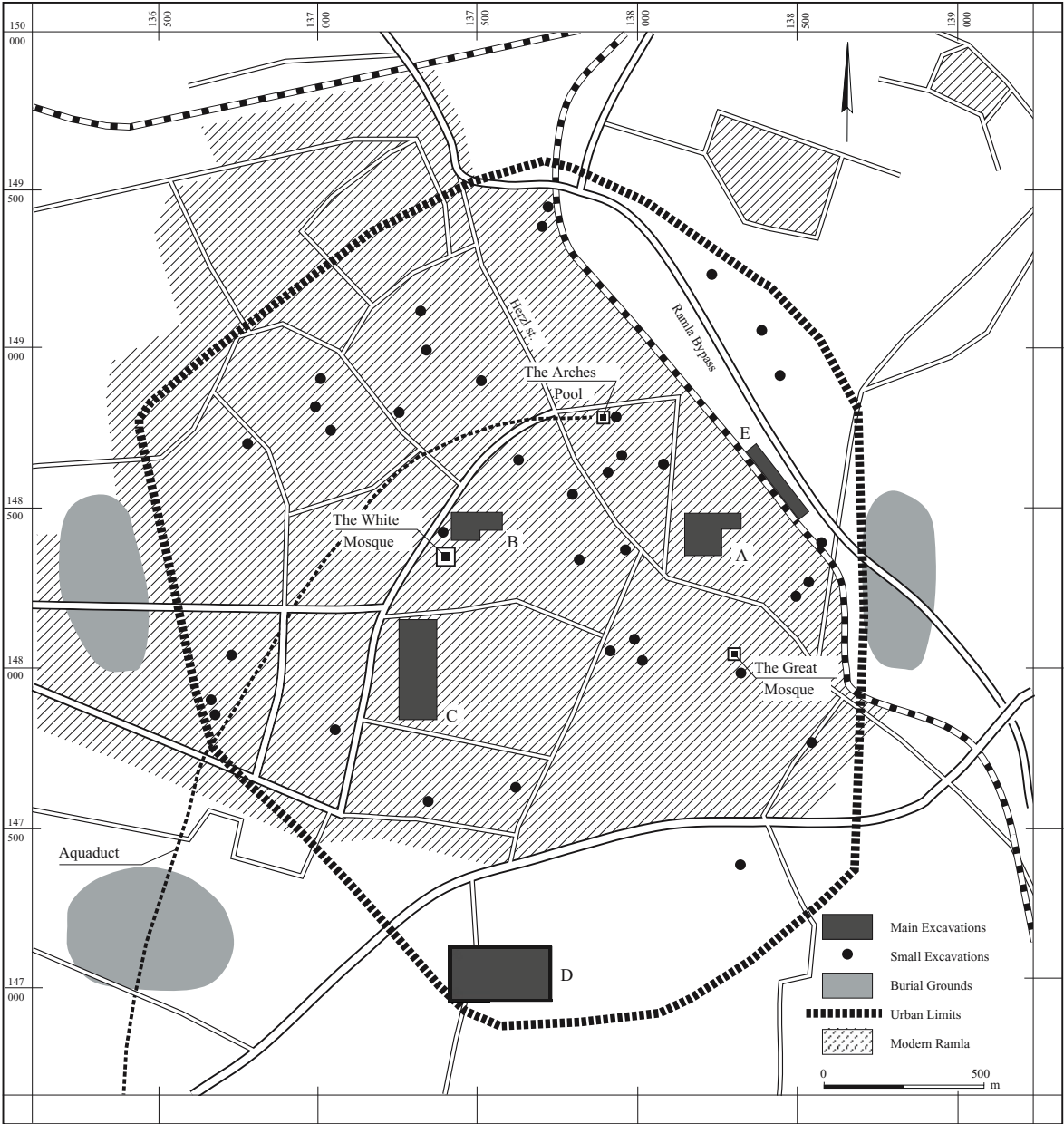


Fig. 1.3: Ramla city limits and excavations. (Courtesy of G. Avni, Israel Antiquities Authority).

were identified by the excavator as “numerous installations for storing water, pottery workshops and agricultural installations (wine presses, irrigation pools, pipes for conveying water and drainage pits) were discovered. Evidence for metal and glass industries (slag) was found, as well as architectural elements incorporated in secondary use in walls. These elements probably belonged to public buildings (churches?) from the Byzantine period”. In the uppermost part of Area A, remains dated to the Late Bronze Age II were found. These remains include mud-brick walls and floors overlaid with fragments of pottery vessels. In the same area some potsherds dating to Middle Bronze Age II, Iron Age II, and the Hellenistic, Early Roman, Mamluk and Ottoman periods were also found. In his conclusions, the excavator points to the significance of the finds in “understanding the early stages of Ramla’s construction and the Islamic rule in the Land of Israel” (Gorzalczany 2006; see also 2008b).

Following A. Gorzalczany’s investigation, a large-scale salvage excavation of the site commenced in July-August 2005. Three different archaeological institutions excavated simultaneously: The Institute of Archaeology of Tel Aviv University, directed by the present authors, excavated in the former Area A of the 2004 excavation; the Israel Antiquities Authority, directed by A. Onn, excavated in the former Area B; and Bar-Ilan University, directed by S. Riklin, excavated in the former Area C. In June-July 2006, the Tel Aviv University team returned to the site for another season of excavations in Area A.

The July 2007 season concentrated on a narrow area located between the former Areas B and C. In fact these salvage excavations were carried out underneath the road that led to Moshav Mazliah after it was dismantled. This season was conducted in collaboration with the Israel Antiquities Authority (Fig. 1.5) (for a preliminary summary of all three seasons, see Tal and Taxel 2008).

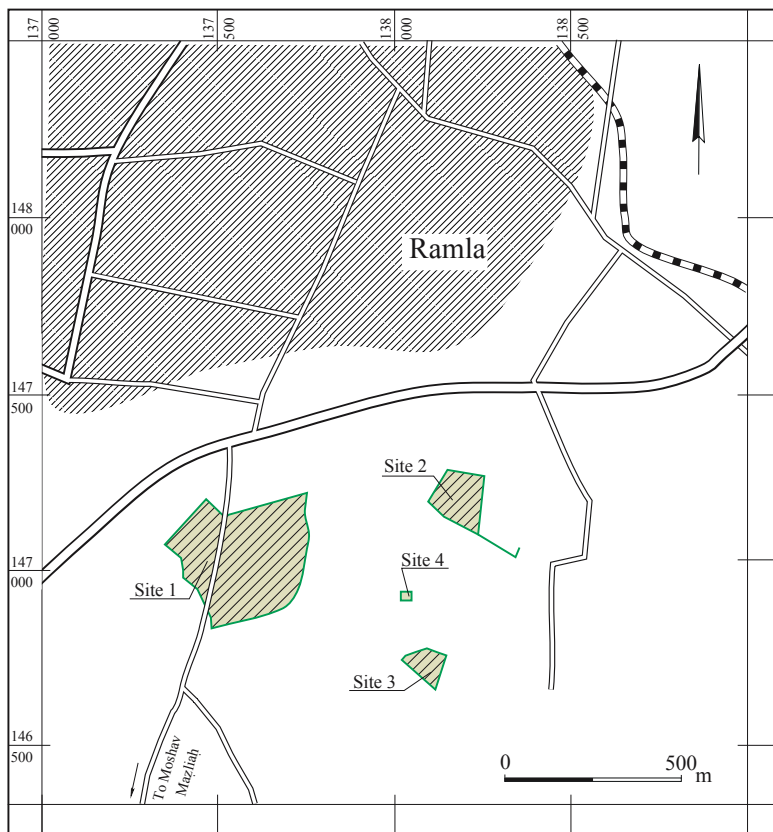


Fig. 1.4: Ramla (South) limits after Shmueli and Kanias 2007. (Courtesy of the Israel Antiquities Authority).

The grid of the excavations was oriented in accordance with the Israeli Mapping Center grid between the following reference points: 137700-146900 137600-146800 (Old Israel Grid) / 187700-647900 187600-646800 (New Israel Grid) in the seasons of 2005 and 2006, and 137484-147051 137450-156923 (Old Israel Grid) / 187484-647051 187450-646923 (New Israel Grid) in the season of 2007. Digging was normally carried out in 5×5 m squares, leaving 1 m baulks on either side. All in all, 151 squares were dug down to virgin soil, and many baulks were removed down to virgin soil in order to clarify stratigraphic and architectural matters. At the end of the excavations all architectural remains were dismantled by means of mechanical tools in order to track subterranean complexes and other features. However, none were found.

The current publication provides two general site plans for the 2005-2006 and 2007 seasons of excavations respectively. The general site plan of the 2005-2006 seasons of excavations is inserted in a pocket on the inner back cover. It enumerates numbers of loci, installations (prefixed I), floors (prefixed F) and walls (prefixed W) between 2-969. That of the 2007 season (Fig. 1.6) is similarly set out, and covers loci, installations, floors and walls between 1500-1749.

The excavation grid for all three seasons of excavations was prepared by draftsmen of the

Israel Antiquities Authority. This resulted in the grid of the 2005-2006 seasons of excavations differing from that of the 2007 season.

Occupation layers without architectural remains are marked on the general site plans, whereas disturbed fills and top soil loci are not indicated. They do however appear in the list of loci at the end of this volume, which includes fills, installations, working surfaces, floors and other features (some of which have been combined and thus loci numbers are sometimes non-sequential). The list of walls includes all the walls excavated at the site (with the exception of walls of cisterns, channels and pipes, pools, subterranean vaulted chambers and other installations). Defined architectural complexes appear selectively in 1:100 scale plans in their respective chapters.

With the completion of the current report (January 2008), another season was launched on both the northern and southern margins of the site in response to a new request for an engineering solution for the construction of Highway 431. The former strip was excavated under the auspices of the Sonia and Marco Nadler Institute of Archaeology of Tel Aviv University and the strip on the southern margin by the Israel Antiquities Authority.

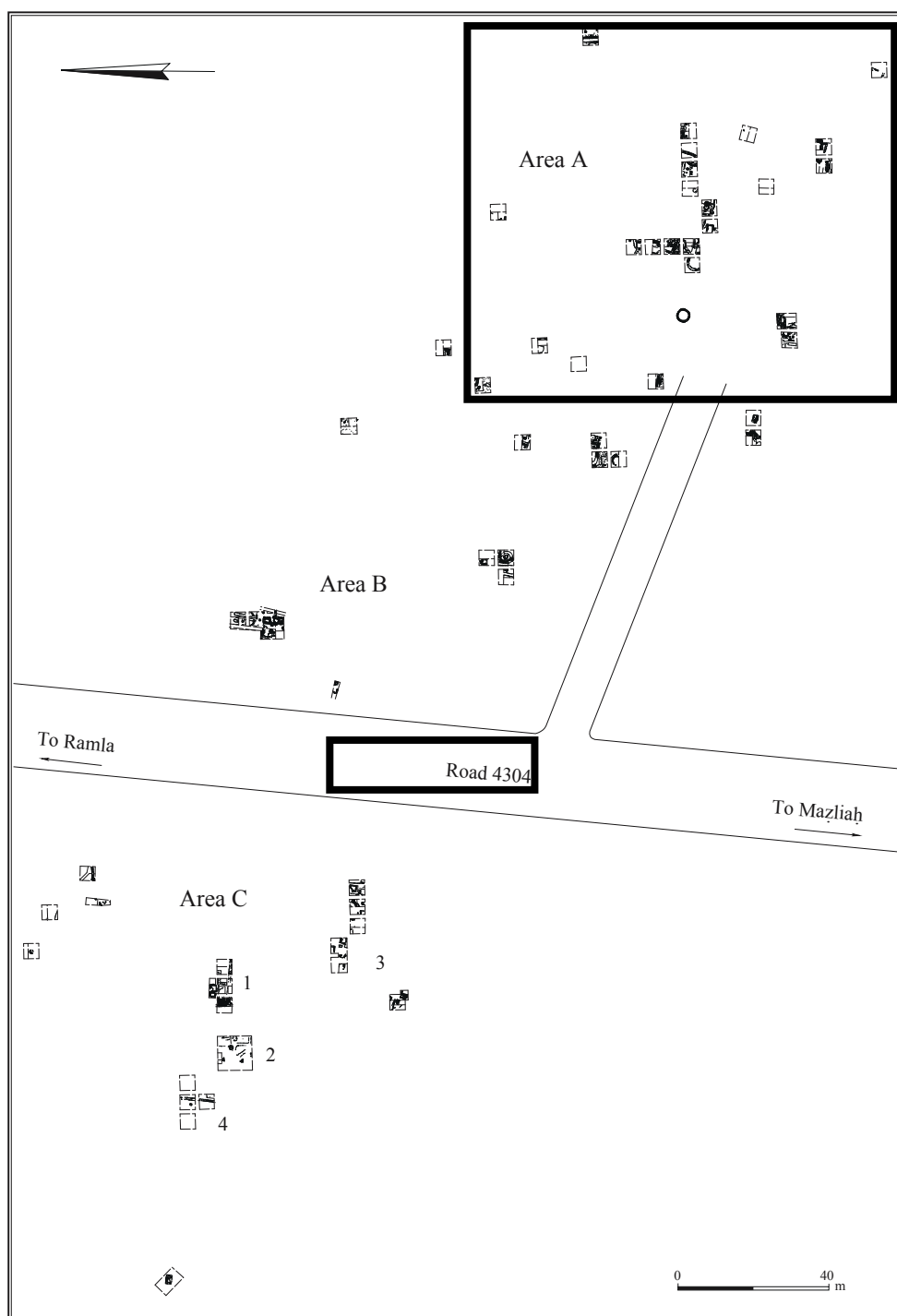


Fig. 1.5: Site map with indication of the trial excavation areas (A, B and C) of the Israel Antiquities Authority, on which the salvage excavation areas of the Institute of Archaeology of Tel Aviv University have been outlined (modified after Gorzalczany 2006).

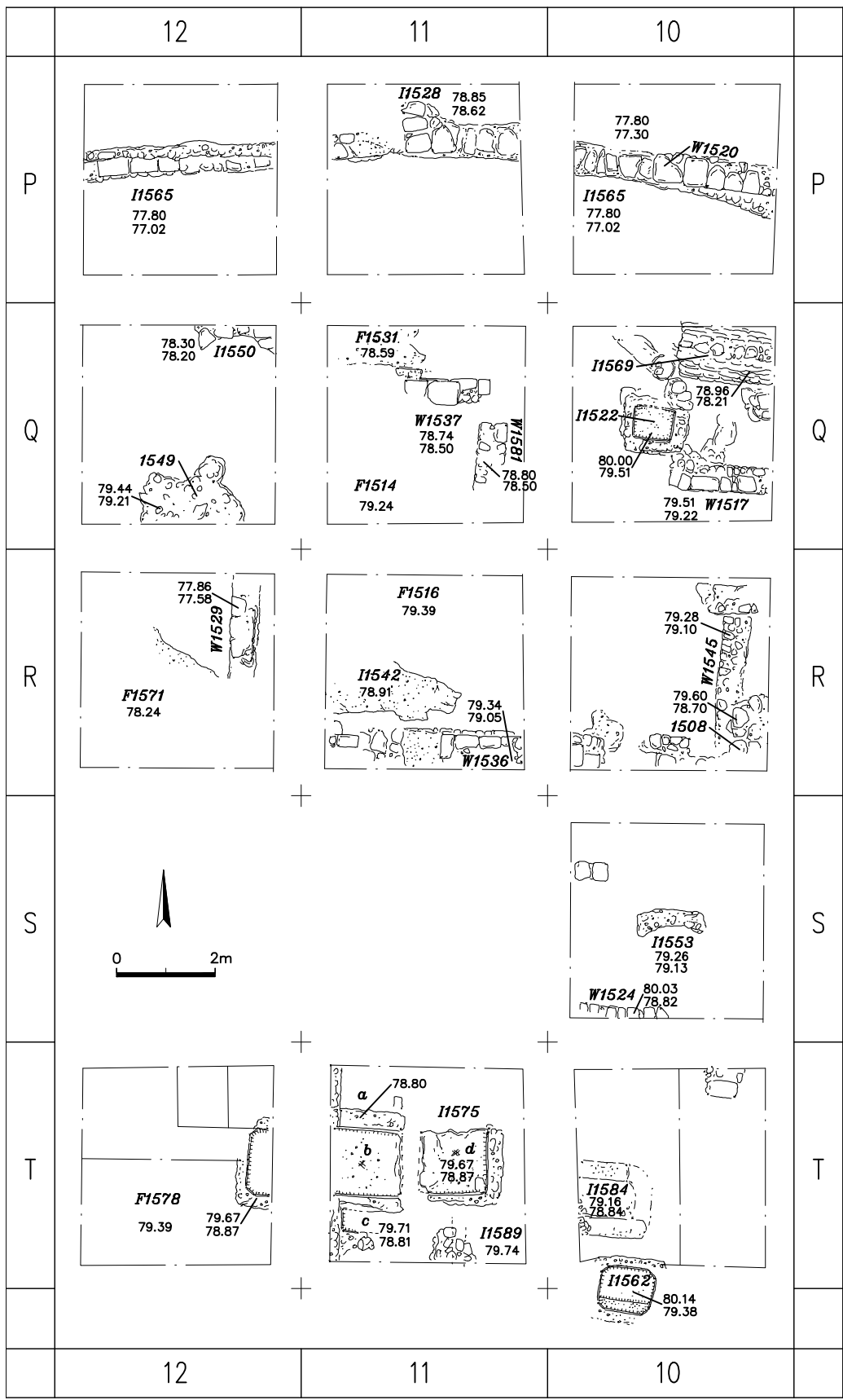


Fig. 1.6a: General site plan of the 2007 season (Squares P-T/10-12).

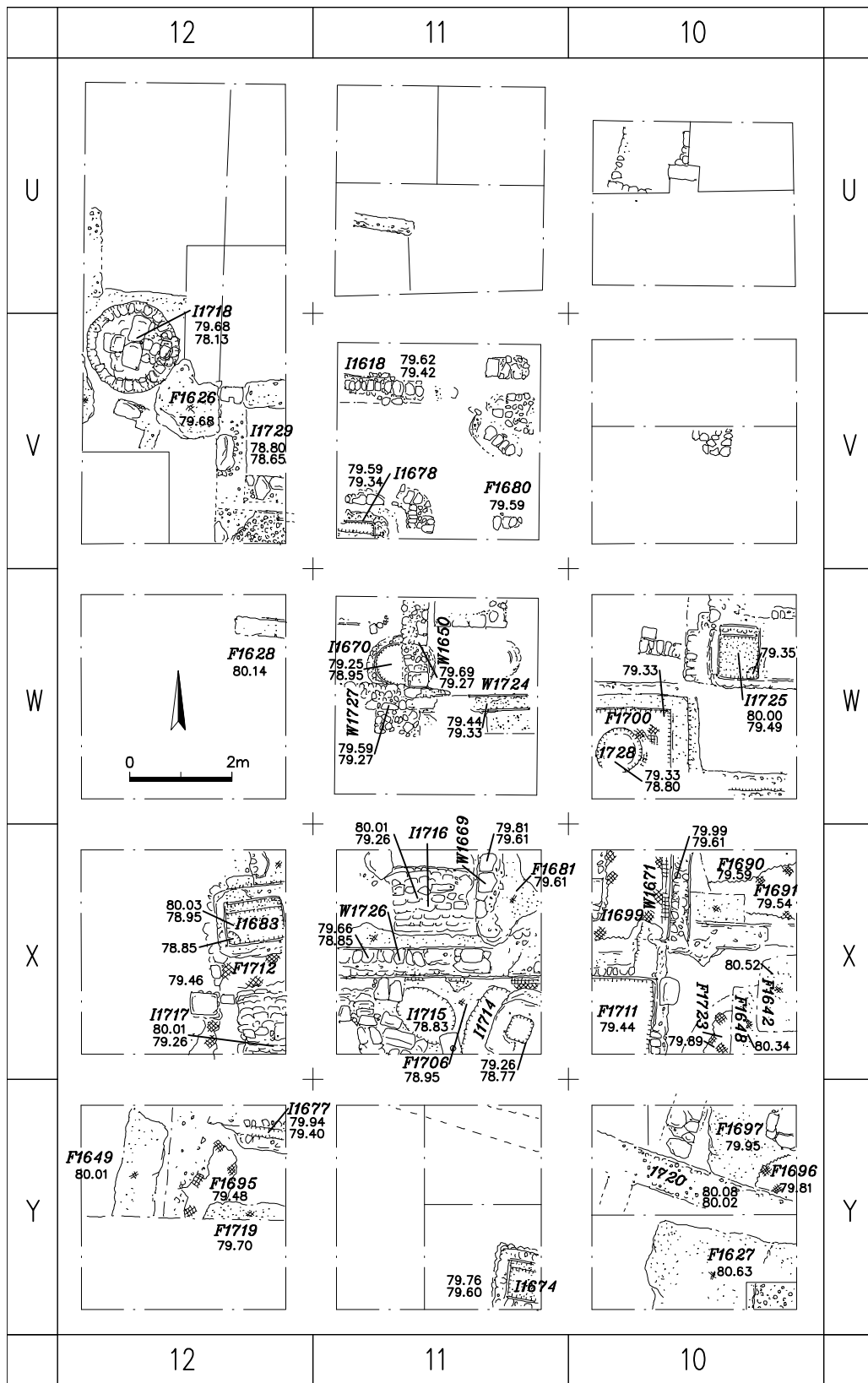


Fig. 1.6b: General site plan of the 2007 season (Squares U-Y/10-12).

THE MIDDLE BRONZE AGE STRATIGRAPHY AND POTTERY

Assaf Yasur-Landau and Inbal Samet

STRATIGRAPHY

The Middle Bronze Age (henceforth MBA) remains were excavated in a limited area below the Early Islamic settlement, although MBA sherds were also found in secondary contexts in the southern part of the site. The excavated area (Fig. 2.1) is defined from the north by the boundaries of Squares S213 and S214; from the south by the Early Islamic installations I67 and I38; from the east by the eastern boundaries of squares S213 and T213; and from the west by Locus 112 (not shown on plan). Foundation trench Locus 103 = Locus 419 running east-west cuts the area.

The southern excavated area included a series of eight different layers of surfaces and occupational deposits upon them, without any accompanying architecture. These deposits, rich in pottery embedded in a dark brown matrix of clay and silt, were separated from one another by thin layers of yellow and grey sand (Fig. 2.2). This area was excavated using a 1 × 1 m grid, in order to better understand the minute detail of the spatial aspects of deposition.

The uppermost: Locus 71 = Locus 401 included much flat lying pottery inside a matrix of dark brown clay and silt. No surfaces were clearly detected, yet since this deposit included ca. 20 cm of flat lying pottery, it is likely to represent a lengthy process of accumulation.

The second layer was composed of Loci 409, 411 and 432, which included several layers of flat lying pottery, the lowest one, at Locus 432, rested on an earth surface.

The third and fourth layers (Loci 436 and 437) were of a similar nature to the uppermost levels. A thin layer of ash found in Locus 437 indicates a localized burning. It supports our notion that the excavated area served as an outdoor activity area, and that the pottery was deposited by human agency.

Locus 438, a layer of yellow and grey sand, separated the fourth and the fifth layers. It was 7 cm thick, thicker than the 1-2 cm layers of sand separating the other occupational layers and surfaces.

Locus 439 included flat lying pottery on a surface below which was a thin layer of reddish sand separating it from the sixth layer (Loci 440 and 441). Some ash was found within the matrix of the latter locus.

The two lowest surfaces with occupational deposits (Loci 444 and 445) were similar to those above them. Below them the matrix changes, being composed of very loose sand and silt. Pottery exists, yet in considerably lesser amounts (Loci 447 and 449). Yellow sand appears in Locus 450, and *hamra* soil in increasing quantities appears in Locus 451 with almost no pottery. The clean natural *hamra* soil of the hill was reached in Locus 452 and excavation continued for another 20 cm.

The northern excavated area was severely disturbed by a large pit (Locus 418), with an estimated diameter of at least 5.10 m. The pit is most likely Early Islamic in date as indicated by the pottery found within it. However, most of its finds originated

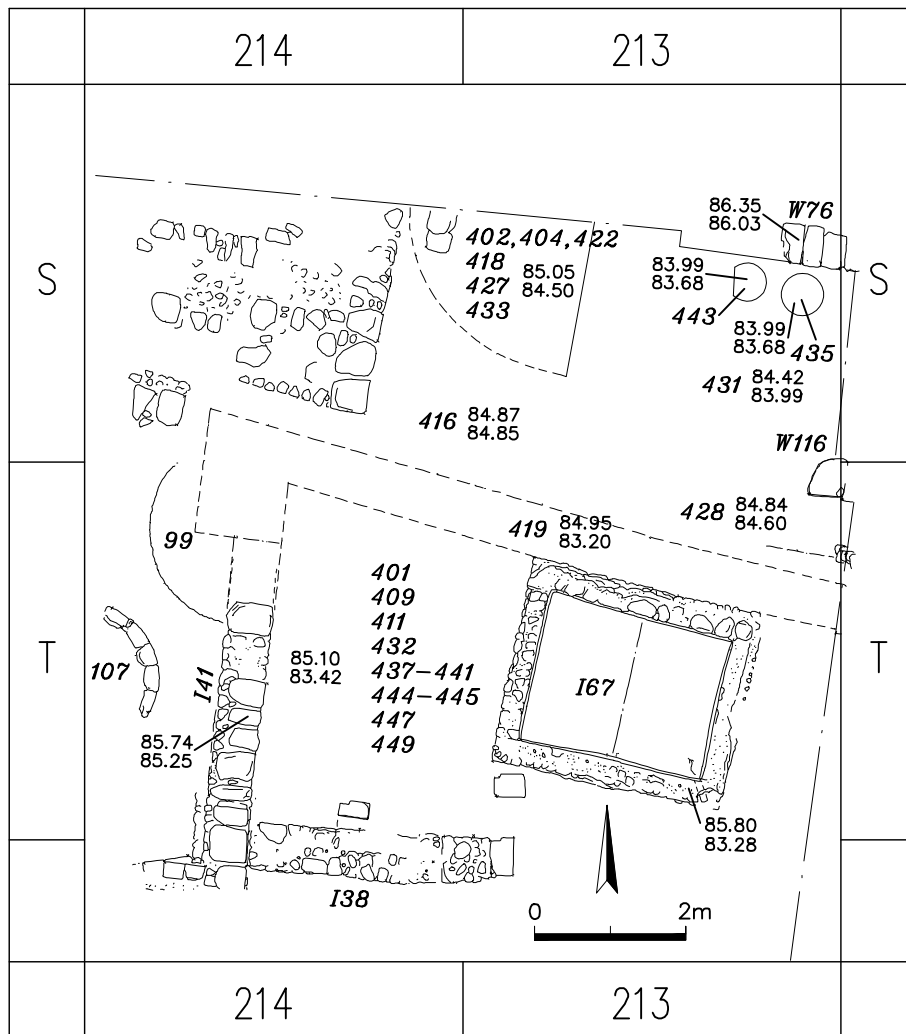


Fig. 2.1: Plan of the Middle Bronze Age loci.



Fig. 2.2: Occupation layers of MBIIA-B, with Early Islamic Installation I67 cutting them. Looking south (*left*), and east (*right*).

from the MBII level and included a considerable amount of pottery. Worth noting is a storage jar handle stamped with a scarab seal (Locus 418; see below). Loci manifesting different fills within this pit included Loci 402, 404, 422 and 427.

The pit had cut several occupational deposits belonging to the MBA. To its south remains of occupation deposits very similar to those in the southern area of excavations were found. Loci 413 and 414 probably belong to the same layers characterized by dark brown clay and silt with many sherds lying on the surface. Locus 414 included more sand, dark clay and silt as well as *tabun* fragments. Both the loci are most likely to be equated to Locus 401, which extends at the same level in the southern area of excavations.

Below Locus 414, a surface with flat lying pottery (Locus 416) was uncovered. The pottery was embedded in dark brown clay and silt with many phytoliths and it is to be equated with Locus 411 of the southern area.

An MBA feature, possibly a robber trench (Locus 424) also runs south of the pit on an east-west axis. It was filled with clean yellow sand. Its maximum preserved width is 75 cm. It is sealed on the west by occupational deposits (Loci 415 and 417) and on the east by Loci 420 and 428.

Below the western part of the above-mentioned pit (Locus 418) is Locus 433, which may be the remains of an occupation deposit. This was possibly a continuation of Locus 437. A probe dug into the eastern part of Locus 418 revealed an uneven deposit of dark clay and silt (Locus 406) possibly an MBIIA surface disturbed by the later pit. No other surfaces of occupational deposits were found below it, only stratified layers of grey, yellow and white sand (Loci 407 and 431) which had been cut by Pit 410. The amount of pottery decreased considerably in comparison to the occupational debris.

Two small pits (Loci 435 and 443) with a diameter of ca. 50 cm were dug into Locus 431, and may indicate human activity preceding the habitation levels.

Removal of the *hamra* fill from trench Locus 103 = Locus 419 revealed its eastern end. The lower part of the trench, from 84.50 downward, was dug into striated layers of yellow, white and grey sand, very similar to those of Loci 407 and 431.

POTTERY

As the pottery bears much resemblance to the well-excavated and published MBIIA assemblages from Tel Aphek, most parallels will be drawn to that site. Similarly, the naming of the types and the description of the rims will be according to the nomenclature defined in Beck (2000a; 2000b) and Kochavi and Yadin (2002). The following study with plates presents the material according to types which will enable the reader to follow the chronological development of the site.

GLOBULAR AND CARINATED BOWLS

Given the fact that none of the vessels displays a complete profile, it was impossible in most cases to distinguish between globular and carinated bowls. Both types appear as plain and red burnished.

Both carinated and globular bowls (Fig. 2.3: 1, 3) appear in Aphek Phases 2 and 3 (Kochavi and Yadin 2002: Figs. 13:17-20, 22:1-13),¹ although strong carination appears only in Phase 3. Thus, it may not be coincidental that the first clear carinated bowl does not appear before Locus 436 (Fig. 2.3: 2). During Phase 4, the transitional MBIIA-MBIIB (*ibid.*: Fig. 27:6-12), the globular bowls have a flaring neck but this feature is not found in Ramla (South). Globular bowls without necks continue in northern Israel into the later MBIIA phases, as in Tomb 1025 at Dan attributed to Stratum XII (Ilan 1996: Fig. 4.104:17, 217), and continue until the transition between MBIIA and MBIIB in Hazor Tomb 1181 (Maier 1997: Fig. IV.2:11, 16) and Qalil (Epstein 1974: Fig. 3:5). Similar imported as well as locally made globular bowls without distinctive necks are found at Tell el-Dab'a, Aston's Group 95 (Aston 2004:114), belonging to Strata G/4 = d/1 (*ibid.*:265).

1. Globular bowls are referred to in Aphek as S-profile or bowls with rounded carination (e.g. Kochavi and Yadin 2002: Figs. 13 and 27). It is a separate category from the carinated bowls and is seen as such by Ilan (1996).

HEMISPHERICAL BOWLS

There are very few examples of hemispherical bowls. The most indicative are Fig. 2.3:5-6, which have a simple straight rim that is red slipped on the outside. It is a well-known type limited to Aphek Phase 2 (Kochavi and Yadin 2002: Fig. 13:9-10). Similarly, red-slipped hemispherical bowls appear in Yoqne'am Strata XXV and XXIVb-a but not later (Livneh 2005: Fig. II.2:15-16, 26).

OPEN BOWLS

Medium-sized open bowls with out-turned or in-turned rims begin to appear in Phase 2 at Aphek and continue into Phase 3 (Kochavi and Yadin 2002: Fig. 22:20-22). These bowls are either plain or red slipped (Fig. 2.4:1-2). However, large open bowls with out-turned or folded rims begin to appear in Ramla (South) only in Loci 411 and 401 (Fig. 2.4:3-4). In Yoqne'am open bowls appear from Stratum XXV, of the mid-MBIIA (Livneh 2004: Fig. II:4-5) to the end of the MBIIA and after. Similar bowls appear in the moat deposit at Ashkelon (Stager 2002: Fig. 11) and at Tell el-Dab'a in Stratum G/4 = d/1 (Aston 2004: Fig. 33: a), belonging to Aston's Group 72, as well as in Stratum d/1-c (*ibid.*: Pl. 81:238, 82:242, Group 73) and later.

WHEEL-MADE COOKING-POTS

Most wheel-made cooking-pots have a gutter rim (Fig. 2.5). This feature is common in Aphek Phases 2-4 (e.g. Beck 2000a: Fig. 8.10.8 Stratum B Vd; 2000b: Fig. 10.2:11 Stratum A XVII-XVI; Fig. 10.25:2 Stratum A XIII), while gutter rims are not as pronounced in Phase 1 (Kochavi and Yadin 2002: 198). At Ramla (South) the later rims (e.g. Loci 411 and 401) seem to have a less pronounced gutter and a more rectangular profile than the earlier ones.

Gutter rims are also present in Yoqne'am Strata XXIVb (Livneh 2005: Fig. II.2:25) and XXIVa (*ibid.*: Fig. II.11:4-5).

The incised or reed decoration on Fig. 2.5:4 appears on cooking-pots from Aphek Phase 2 but no later (Kochavi and Yadin 2002: Fig. 16:1, 4).

Gutter rims are not the only ones represented at the site, and Fig. 2.5:8 is a cooking-pot with a thickened rim.

Gutter rim cooking-pots appear at Ashkelon in Phases 14 (= Aphek 2)-12 (= MBIIA/MBIIB; Stager 2002:355). However, the moat deposit, belonging to Phase 14 (*ibid.*: Fig. 6) yielded examples of cooking-pots with a row of reed imprints, similar to those of Aphek Phase 2 and to Ramla (South). Fig. 2.5:5 is a jug made of cooking ware and thus included here among the wheel-made cooking-pots.

HANDMADE COOKING-POTS

Handmade cooking-pots are considerably fewer than the wheel-made ones (Fig. 2.6:1-3). They show much variability. In some the holes pierce the side of the vessel and in others they do not. The plastic bands are either plain or decorated with thumb impressions or incisions. It appears that the type of decoration has little chronological significance within the MBIIA. Such variability exists at Aphek since the Pre-Palace Phase, e.g. Stratum A XVII-XVI (Beck 2000b: Fig. 10.2:12; Kochavi and Yadin 2002: Fig. 12:11) up to Phases 2-4 (Kochavi and Yadin 2002: Figs. 16:9-11, 23:13-14).

HOLEMOUTH KRATERS

Only a few examples of this type were found. Fig. 2.6:4 is a holemouth krater with a decoration of reed impressions on its shoulder. The triangular rim of the holemouth kraters appears in Aphek from Phase 1 to 3 (Kochavi and Yadin 2002: Figs. 12:9, 15:6-7, 23:4, 7-8), although they are usually undecorated, in contrast to the gutter-rim kraters which sometimes display an incised decoration or reed impressions.

JUGS

Jugs are not numerous at the site. Fig. 2.7:1 is red slipped, and most likely belonged to a globular jug of the type found in Aphek Phase 2 (Kochavi and Yadin 2002: Fig. 21:3-5).

A red burnished double handle (Fig. 2.7:2) probably also belonged to a similar vessel.

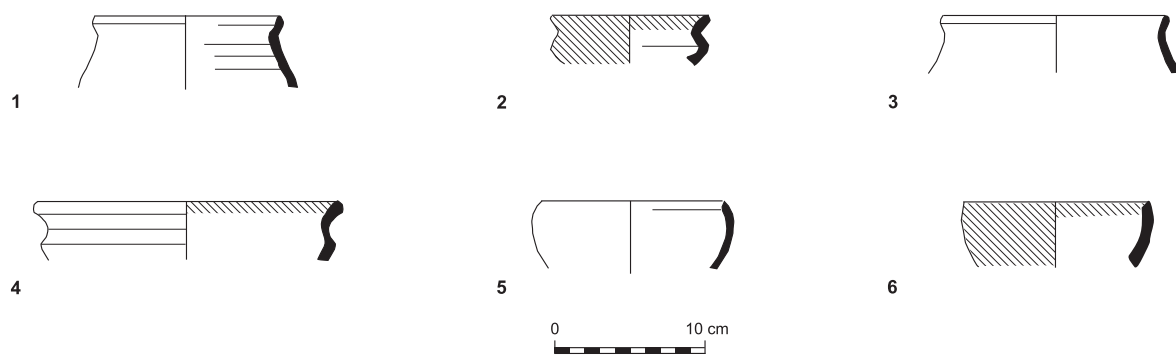


Fig. 2.3: Globular, carinated and hemispherical bowls.

<i>No.</i>	<i>Locus</i>	<i>Basket/Reg. No.</i>	<i>Elevation</i>
1	L449	4172/1	83.5
2	L436	4126/2	84.7
3	L401	4002/20	85.05
4	L401	4004/11	85
5	L445	4162/7	83.9
6	L444	4161/2	84.05

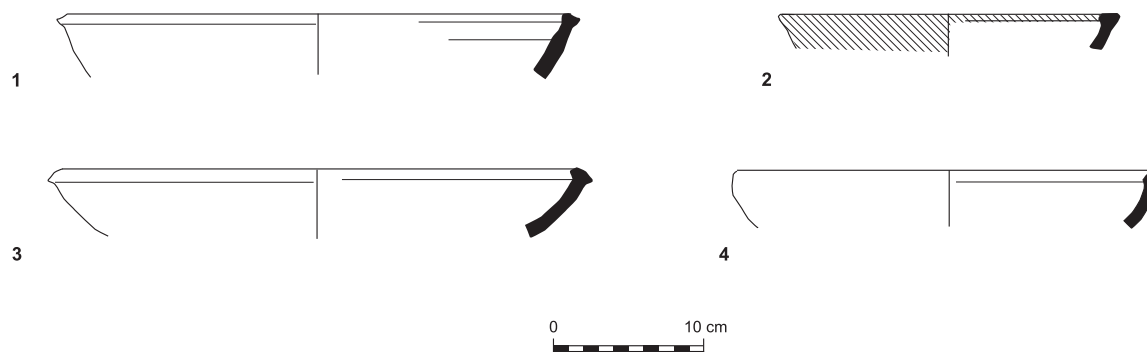


Fig. 2.4: Open bowls.

<i>No.</i>	<i>Locus</i>	<i>Basket/Reg. No./</i>	<i>Elevation</i>
1	L440	4150/5	84.35
2	L436	4126/3	84.7
3	L411	4084/3	84.75
4	L401	4010/1	84.95

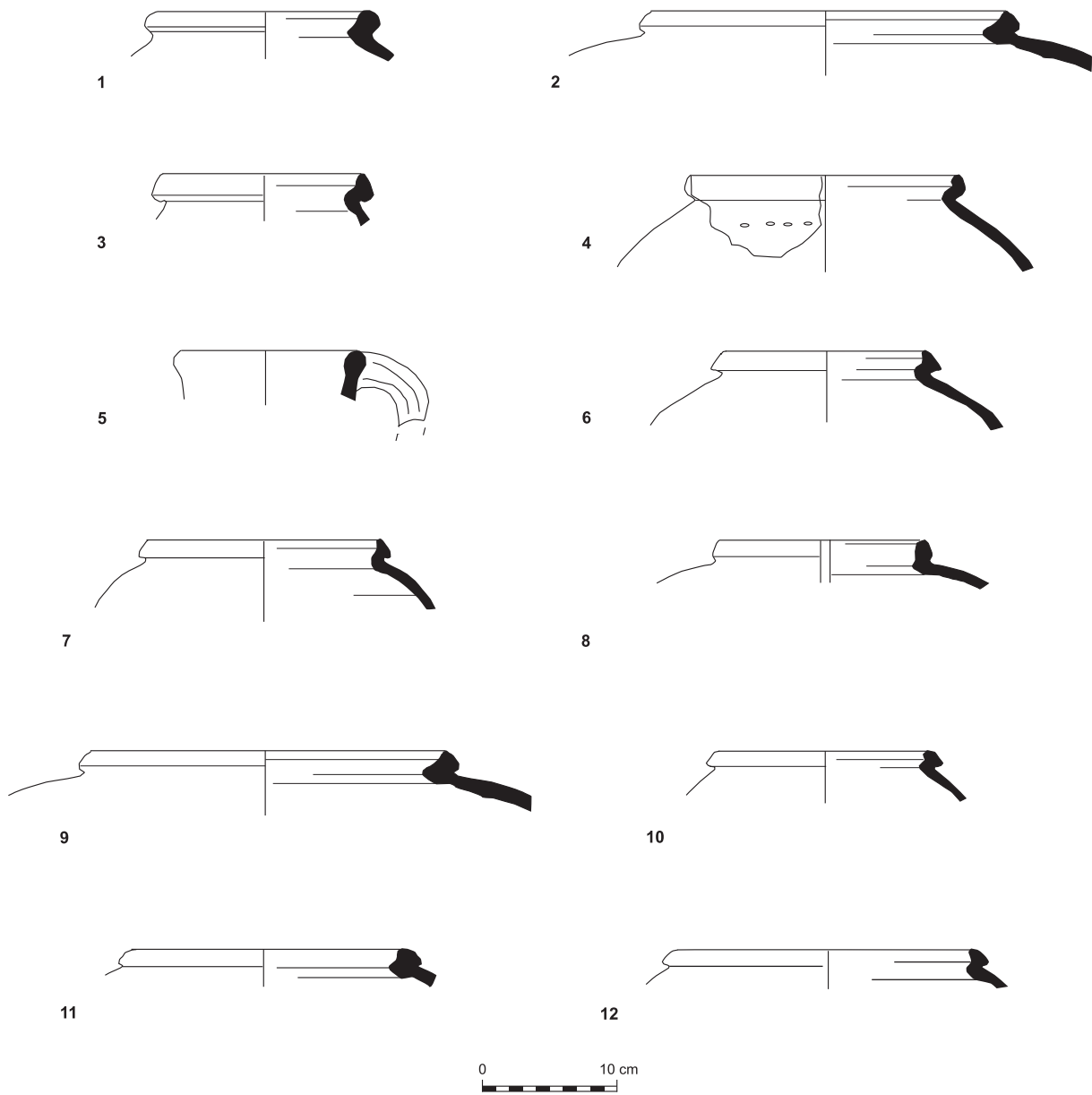


Fig. 2.5: Wheel-made cooking-pots.

<i>No.</i>	<i>Locus</i>	<i>Basket/Reg. No.</i>	<i>Elevation</i>
1	L450	4174/1	83.35
2	L409	4039/2	84.85
3	L444	4161/5	84.05
4	L440/441	4151/2	84.3
5	L440	4151/1, 15	84.3
6	L440	4150/7	84.35
7	L437	4137/1	84.6
8	L437	4142/6	84.55
9	L409/411	4039/2	84.8
10	L411	4059/14	84.8
11	L401	4029/1	84.9
12	L401	4018/2	84.95

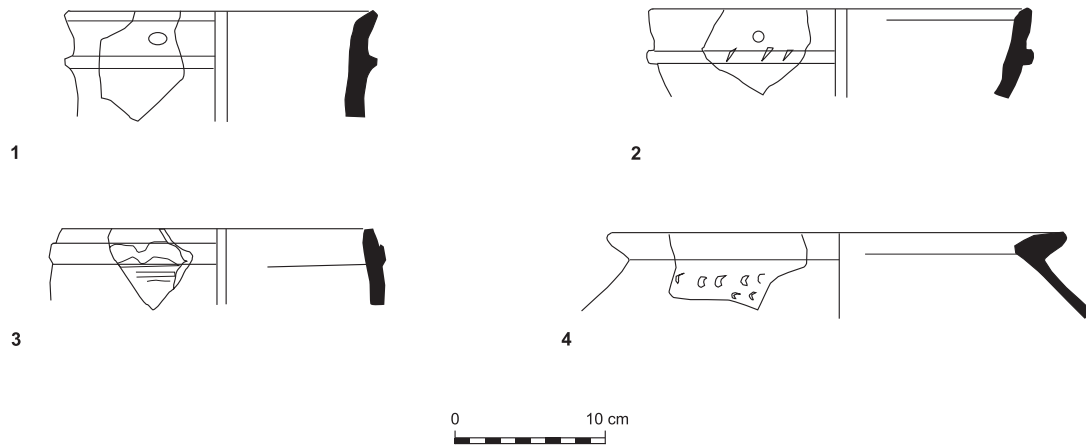


Fig. 2.6: Handmade cooking-pots and holemouth krater.

No.	Locus	Basket/Reg. No.	Elevation
1	L447	4170/1	83.7
2	L436	4127/1	84.7
3	L437	4137/3	84.6
4	L444	4161/4	84.05

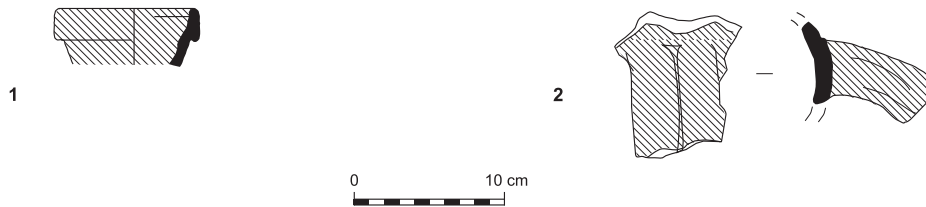


Fig. 2.7: Jugs.

No.	Locus	Basket/Reg. No.	Elevation
1	L437	4137/2	84.6
2	L447	4170/4	83.7

STORAGE JARS

Storage jars with an elongated folded rim, often with a ridge on the end of the fold are common in Ramla (South) from the earliest floors and deposits to the latest (Fig. 2.8). This rim form appears at Aphek starting from Phase 2 (Kochavi and Yadin 2002:200, Fig. 17:15-23) and continues to Phase 3 (*ibid.*: Fig. 24:2-11), and possibly even Phase 4 (*ibid.*: Fig. 28:1-4). Similar rim forms were found as imports in Tell el-Dab'a Stratum G/4 = d/1 Aston's Group 151b (Aston 2004: Fig. 33e) and in Stratum E2 of the MBIIB (*ibid.*: Pl. 171). Similar

rims are found in Yoqne'am Strata XXV (Livneh 2005: Fig. II.2:28-30) and XXIVb (*ibid.*: Fig. II.6: 11-13) and in Ashkelon Phases 12-14, including the moat deposit (Stager 2002:355, Fig. 2:2).

Fig. 2.8:11 is a variant with an elongated grooved rim. This type may have a Syrian ancestry, found in handleless jars with a rim that is either deeply grooved or profiled (e.g. Tell Hadidi, Dornemann 1979: Fig. 22:7; Dan, tomb 902c, Ilan 1996: Fig. 4.103:1; Tell Atchana/Alalakh, Stratum X, Tarsus, Hadidi, Ebla and Mumbaqt, Heinz 1992: Tl. 76 a-d).

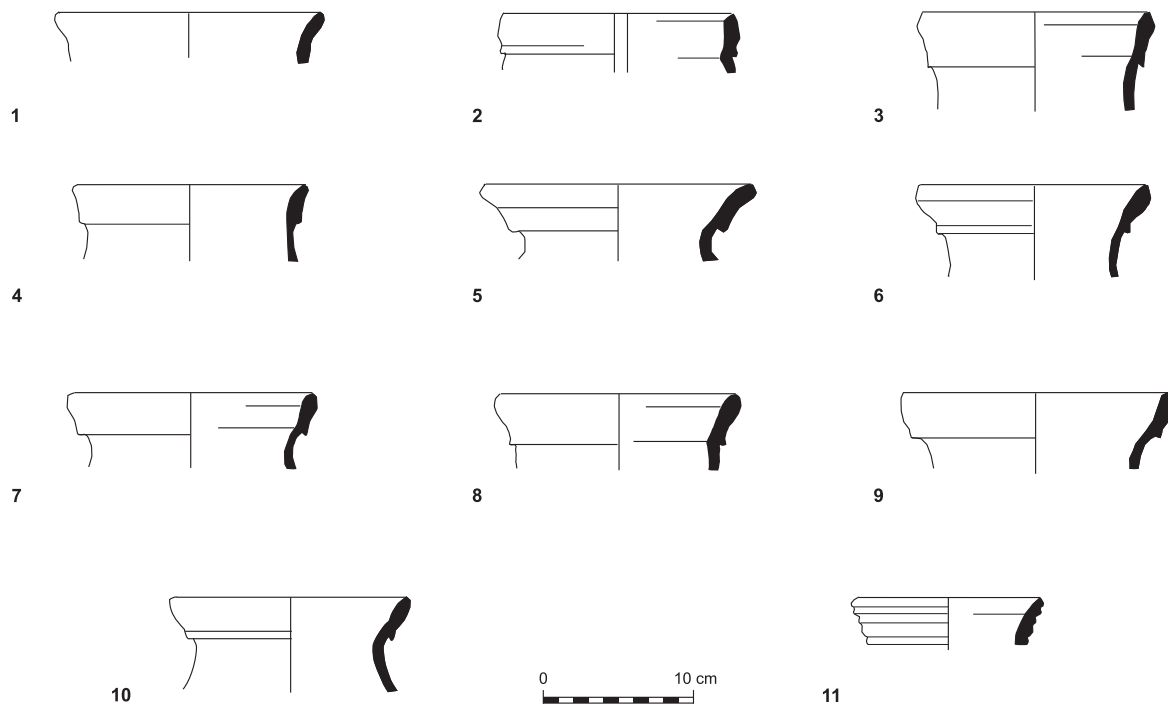


Fig. 2.8: Storage jars with elongated, folded rim.

<i>No.</i>	<i>Locus</i>	<i>Basket/Reg. No.</i>	<i>Elevation</i>
1	L450	4174/3	83.35
2	L445	4164/2	83.87
3	L440	4152/3	84.3
4	L440	4151/7	84.3
5	L439	4148/1	84.43
6	L439	4147/2	84.45
7	L437	4141/4	84.85
8	L437	4140/3	84.6
9	L411	4096/4	84.75
10	L401	4059/6	84.9
11	L445	4164/5	83.87

Medium-sized storage jars with thickened rims appear from the level of Locus 445 and above (Fig. 2.9). The thickened rim of Fig. 2.9:1-2 is triangular similar to examples from Aphek Phases 1 and 2 (Kochavi and Yadin 2002: Figs. 12:15, 18:3, 6-7). However, later examples from Loci 440 and 441 are more elaborate. Their rim is both thickened and folded, like those of Phase 2 at Aphek (Kochavi and Yadin 2002: Fig. 18:1).

The examples of rims illustrated in Fig. 2.9 do not continue to Aphek Phase 3, and thus their appearance in Ramla (South) may be a chronological indicator that some of the site's floors antedate this phase. One example of this type from Locus 438 is red burnished (Fig. 2.9: 5), yet its appearance, as well as another example of a thickened rim jar from Locus 433 (not illustrated), may be residual.

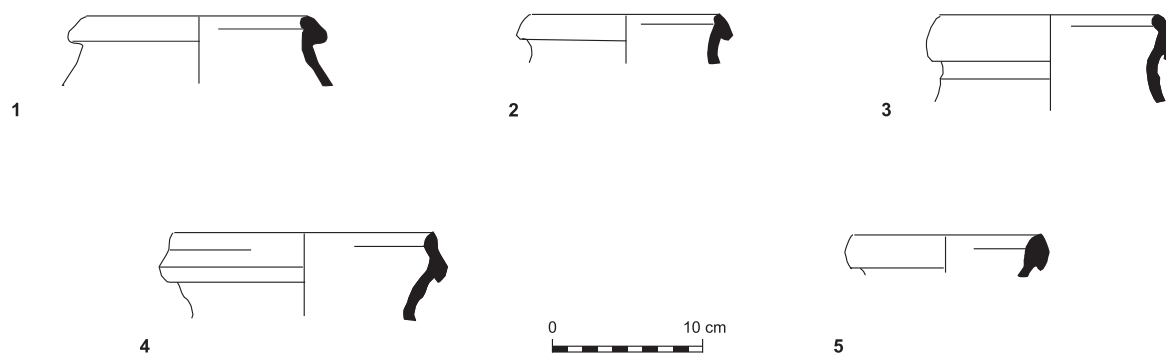


Fig. 2.9: Medium-sized storage jars with thickened rim.

No.	Locus	Basket/Reg. No.	Elevation
1	L445	4164/4	83.87
2	L445	4162/9	83.9
3	L440/441	4150/1	84.35
4	L441	4153/5	84.3
5	L438	4145/2	84.5

PITHOI

Large storage jars/pithoi with moulded rims appear in Ramla (South) from Loci 437/6 and later, until Locus 401 (Fig. 2.10). Their late appearance corresponds to the situation in Aphek, when they begin to appear in Phase 3 (Kochavi and Yadin 2002: Fig. 24:12-13) and they continue to occur in Phase 4 (*ibid.*: Fig. 28:5-6).

Similar rims begin to appear in Yoqne‘am Stratum XXIVa (Livneh 2005: Fig. II.9:24) and into the transition to MBIIB in Stratum XXIIIb (*ibid.*: Fig. II.15:15-17), as well as in Tel Mevorakh Strata XV and XIV (Kempinski 1984: Figs. 15: 22-25, 16:10).

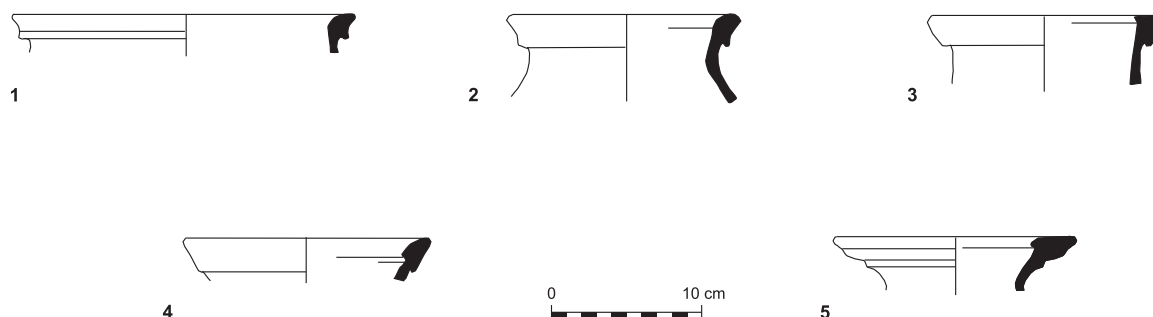


Fig. 2.10: Large storage jars and pithoi with moulded rims.

No.	Locus	Basket/Reg. No.	Elevation
1	L436	4126/4	84.7
2	L409/411	4039/6	84.85
3	L450	4055/9	83.35
4	L411	4096/2	84.75
5	L401	4022/5	84.95

SUMMARY AND CONCLUSIONS

The limited area of excavation curtails understanding of the size and exact nature of the MBA settlement at Ramla (South). Due to the lack of clear evidence for architecture, the area excavated may be best described as a courtyard or, alternatively, an activity area that lacks permanent architecture as in a camp site. However, the existence of thin deposits of clay and silt surfaces rich in material culture remains, with layers of cleaner sand separating them, suggests that the excavated area was not continuously inhabited, but rather experienced several cycles of habitation and abandonment. The dark clay and silt, not part of the natural soil of the reddish *hamra* hill, are likely to represent decayed mud-bricks. The sand separating them was most likely carried by wind after the area was abandoned.

The lack of any restorable vessel or indeed any usable artefact indicates the existence of a “curate behaviour”, the salvaging of any usable artefact, a behaviour indicative of post-abandonment assemblages (Cameron 1993:3; Graham 1993: 37). Indeed, even usable items like large pieces of grinding stones, recorded in the ethnographic record as being left behind in seasonal settlement (Graham 1993:33-35), are missing from the assemblage. The same is true for the flint tools, which include only one example of a usable sickle blade (Fig. 2.12:4).

The pottery assemblage indicates that the site was settled during Apeh Phases 2 and 3, i.e., the middle part of the MBIIA period. Loci 450-438 exhibit clear parallels to the assemblage typical of Apeh Phase 2, yet probably not earlier. It also bears the same types of pottery found in the moat deposit from Ashkelon (Phase 14), a contemporary of Apeh Phase 2.² The transition between Phases 2 and 3 occurs in the surfaces of Locus 436, and is marked with the appearance of moulded rims and bowls with sharper carination. Later, large open bowls also appear. Although some of the forms,

in the uppermost loci (as the jars with folded rims and those with moulded rims and the gutter-rim cooking-pots) continue to Apeh Phase 4, there is no positive evidence that the settlement continues to this phase. The scarab impression (below), found in an Early Islamic pit, is thus likely to belong to the later MBIIA Phase 3 habitation of the site.

After Phase 3 of MBIIA, the settlement at the site seems to have gone into a long hiatus, as excavations have not revealed any sign of activity in the MBIIB period, and only scant remains of Late Bronze Age occupation.

The site of Ramla (South) belongs to a series of MBA settlements along the basin of Naḥal Gezer and Naḥal Ayalon, an area dominated by the central site of Gezer. A survey of sites in the Ayalon valley carried out by Shavit (1992:120-124; 2000:209-211) has established the existence of a well-developed settlement hierarchy in the area during MBII. It seems that Gezer was the largest site with 5 medium-sized villages or towns and 17 smaller villages.

However, it is uncertain how much of this settlement hierarchy can be dated back to MBIIA, indicating the existence of a well-organized polity, headed by Gezer. Most of the survey material cannot be secured to MBIIA or MBIIB (Shavit, personal communication). Very few sites can be securely dated to MBIIA in the territory of Gezer. These include a site east of Mazkeret Batya, which is possibly another MBIIA rural site of the same territory of Gezer (Gophna and Beck 1981:74 no. 43). A second site, east of Ramla prison (Gophna and Beck 1981:52-53) is likely to be contemporary with the site of Ramla (South), as it shares several similar pottery types, among them cooking-pots with gutter rims (one incised), a hemispherical bowl and a holemouth krater with a triangular rim.

Furthermore, excavations at Gezer have added little to establish its central role during MBIIA, besides a massive granary found in Stratum XII, Field VI (Dever 1986:19-20), the sole example of public architecture at the site. Cohen (2002:79) sees

2. The moat deposit was dated using the scarab seal impressions it included to “a couple of decades before and after 1800 B.C.” (Stager 2002:353).

the building of this granary as well as the organized nature of the private dwellings in Stratum XXI as evidence that Gezer was already urbanized before the end of MBIIA, and assigns the pottery from Stratum XXI to late Phase 2 or 3 in the MBIIA sequence. However, Gezer was far from being a mature urbanized polity in the MBIIA. The impressive fortification and open air cult place with its grand *massebot* are to be dated to MBIIB-C (e.g. Dever 1973a:22; 1973b; 1993:500-502). Thus, it is very likely that the Gezer polity reached maturity and became a significant political and religious centre only later in the MBA.

The location of the site is significant, as it is situated near the major international north-south route, going from Egypt through northern Sinai, going inland as far as Aphek, and then to the north, where it bypasses the Carmel ridge, before continuing to the Lebanese coast or towards Syria and Mesopotamia (Dorsey 1991:59). The list of Thutmose III describes an important alternate route to the international road which passes by Ramla and includes Gath, Ono, Lod and Aphek (Aharoni 1979:45, 49; Dorsey 1991:61, 64). A similar route connected Roman Diospolis (Lod) to Antipatris (Aphek) as evident by the find of several Roman milestones (Roll 2000: 43-44). During the MBIIA a similar route most likely linked the important polities of Ashkelon and Aphek (cf. Kochavi 2000: Fig. 1.2). These were likely to be the most powerful players in the southern coastal plain and the Shephelah during

this period, exhibiting well-planned fortifications (Ashkelon and Aphek), a palace (Aphek) and strong connections to Egypt (Ashkelon). Other potent polities in the MBIIB were Tel Miqne/Ekron, Ashdod and Gezer, which were unfortified centres in the MBIIA (Dothan 1993:93; Burke 2004:492-493, 537-538). It is possible, therefore, that the existence of the temporary settlement at Ramla (South) may be interpreted as a way-station along the coastal highway, in a context of an absence of strong political control in the immediate vicinity. The beginning of the use of the site occurs at the time when the two polities, connected by the road passing Ramla, attain a high level of political organization for the first time. During Phase 2 at Aphek, the first palace at Aphek, Palace I is built (Kochavi and Yadin 2002:194). During the same phase, Ashkelon is being fortified for the first time by impressive earthen works, a moat and a gate, Gate 1, to which the moat deposit belongs (Cohen 2002:73; Stager 2002:352; Voss 2002:379-380). In our opinion, the end of use of the site at the end of MBIIA after Phase 3 is far from coincidental, and is perhaps related to two events. The first is a hiatus in palatial activity at Aphek during Phase 4, following the end of Palace II, and before the building of Palace III in the MBIIB (Kochavi and Yadin 2002:194). The second event is the development of the Gezer polity, and its ability to exercise better control over land movement in its territory, perhaps exploiting the temporary weakness of Aphek.³

3. We are indebted to E. Yadin for her helpful comments on the pottery. We also thank the students who assisted in the excavations: H. Ashkenzi, S. Gordin and G. Jaffe.

A SCARAB STAMPED IMPRESSION⁴

Deborah Sweeney

Salvage excavations on the southern outskirts of Ramla have uncovered one of the city's Early Islamic industrial zones. In the western section of the excavated strip, occupation layers of middle-late MBIIA were unearthed. Within the abundant amount of pottery finds in Locus 418 (Basket/Reg. No. 4068/1, Elevation 84.9 m), a scarab stamped impression on a locally-made storage jar handle came to light (Fig. 2.11).

As D. Ben-Tor has shown in recent studies (1997; 2003; 2007:117-118), scarabs began to be produced in Canaan at the very end of the MBIIA and beginning of MBIIB. These Canaanite scarabs bear a number of characteristic features that are not attested on contemporary scarabs from Egypt.

This scarab impression on a jar handle from a middle - late MBII context from Ramla (South) includes a number of typical elements from this group of early Canaanite scarabs. The design is dominated by a shrine in the centre of the oval (see Ben-Tor 2007:135, Pl. 58.1-16). From this shrine descend two cobras (see Ben-Tor 2007: Pl. 53.2, 6), one on each side facing outwards and wearing the red crown (see Ben-Tor 1997: Fig. 3.9; 2007:128, Pls. 52.43, 44, 47, 48, 49, 54, 58, 59, 53.1, 4, 7, 8, 13, 56.42; Tufnell 1984:118, Class 3B1). Usually the protrusion of the red crown is much more slender, but a good parallel to this curvaceous representation of the coil of the red crown appears on a scarab from Ashkelon, dated to the XIIIth

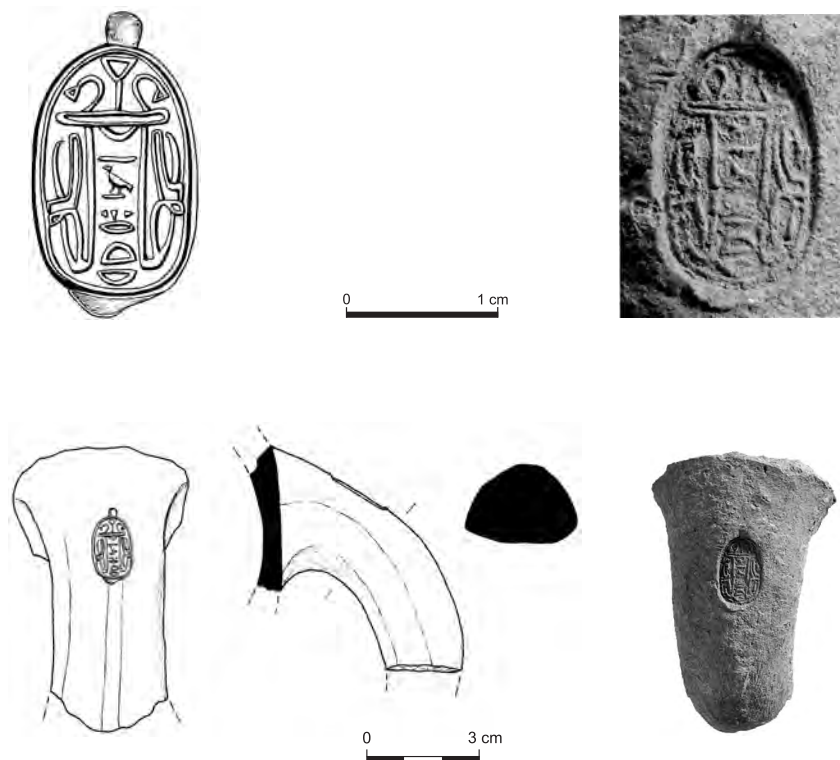


Fig. 2.11: Scarab stamped impression.

4. Many thanks are due to D. Ben-Tor for her help and advice in preparing this study.

Dynasty by Keel (1997:427, No. 951 = Ben-Tor 2007: Pl. 103.7).

On the other hand, the motif of the papyrus stem flanked by two blossoms is found both in Canaan (cf. Tufnell 1958: Pl. 36:205; Ben-Tor 1997: Fig. 6.4; Ben-Tor 2007: Pls. 50.1-7, 74.1-47) and at Kahun and Uronarti (Tufnell 1975:91; Ben-Tor 2007:10-11), and is thus shared by both the Egyptian and Canaanite traditions of scarab manufacture (Tufnell 1984:116, Class IE3). This is not surprising as many motifs occurring on early Canaanite scarabs were inspired by Egyptian late Middle Kingdom prototypes (Ben-Tor 2003: 244). However, we should also consider how this motif is used in the composition of more complex designs on scarabs. The arrangement where the papyrus motif is placed above or below a central design appears first in the early Canaanite series and is not found in Late Middle Kingdom scarabs in Egypt (Ben-Tor 2007:123).

MBII scarabs often include decorative arrangements of hieroglyphs which cannot be read as connected text (Neferzeichen). Egyptian scarabs tend to write the signs clearly and often include signs with connotations of blessing and good fortune (*nfr*, *wd3.t*, etc.). Ben-Tor notes (2007: 126) that the Canaanite scarabs, by contrast, often include misrendered signs or pseudo-hieroglyphs. By and large, however, the hieroglyphs on this scarab are clear and identifiable.

Within the shrine is a vertical column of hieroglyphs, reading from top to bottom:

1. *nb* (attached to the underside of the papyrus plant-sign, and may be part of it).
2. Line and bird, probably representing the characteristic early Canaanite Horus hawk and *ntr*-sign design (Ben-Tor 2007:126-127, Pl. 52.1-40). (Despite the absence of the vertical stroke of the *ntr*-sign, this seems the most likely interpretation since the combination *s/n* + bird is very rare in this period; Ben-Tor 2007: Pl. 52.19, 21; possibly Tufnell 1973: Fig. 3:115).
3. š^{S}
4. *t*
5. *nb* (not *r*?)

Like the shrine design, the Horus and *ntr* design is also absent from the known corpus of Middle Kingdom scarabs, while it is typical of early Canaanite scarabs (Ben-Tor 2007:126) supporting the Canaanite origin of the scarab used for the Ramla impression.

Since this impression was found on an MBIIA sherd, it belongs near the very beginning of the manufacture of Canaanite scarabs (cf. Ben-Tor 2007:117-118). The early date of the scarab used for the Ramla impression is also clearly indicated by both the “shrine design” and the “Horus and *ntr*” design,⁶ which are almost completely absent on later Canaanite scarabs. It is also interesting to find a scarab impression stamped into a daily-used clay vessel, given Ben-Tor’s argument that scarabs in Canaan were initially mostly used as funerary amulets (2003:246; 2007:119).⁷

5. Since the protrusions are triangular, this sign seems to be š^{S} rather than h^{C} . A semi circular or oval sign with radiating protrusions is common at this period (Rowe 1936: No. 28; Ben-Tor 1997: Figs. 6.6, 9.6, 2007: Pls. 50.7, 51.3, 34, 52.59, 53.1, 4, 7, 12, 55.27, 56.2, 14, 15, 25, 42, 44, 47, 57.2, 19, 28, 30, 61.10, 12, 14, 20, 62.4, 63.10, 66.9, 67.16). The rounder examples are more likely to be h^{C} but the flatter ones, such as Ben-Tor 1997: Fig. 2.11, might be š^{S} .

6. Keel (1995:202) suggested the association of the Horus and *ntr* with Hathor, but there is no conclusive evidence to support it.

7. Fifty sealings were discovered in a secure mid-MBIIA context at Ashkelon but were made using late Middle Kingdom type Egyptian scarabs (Ben-Tor 2007:117-118).

FLINT TOOLS

Ron Shimelmitz

During the excavation of the MBII area at the site of Ramla (South) a sum of 82 flint items were found in designated loci (Table 2.1). The material from these loci was sieved and the small number of items correlates to the rather thin MBII occupation in this area.

The flint raw material types vary, yet most are of low quality. The primary element flakes and the simple flakes lack any repeated pattern as do the rest of the debitage. Five of the six cores found are flake cores, in which three have one striking platform and two have two striking platforms. One of the latter is discoidal in shape, bears some patina and might be intrusive. The sixth core is a bladelet core, a phenomenon which is not known from MBII lithic assemblages and therefore might be intrusive. The core trimming elements (CTE) include two rough crested blades and four items that are cataloged as CTE-varia. The dominance of the latter corresponds to the unsystematic flake production at the site. The single blade found is represented by a medial fragment of a rather large blade (25 mm wide and 10 mm thick).

The tools include 16 items (Table 2.2), in which sickle blades and retouched flakes are the most common. Several denticulates and one scraper were found as well. All of the tools, except the sickle blades, fall well within Rosen's (1997) category of *ad hoc* tools.

The sickle blades include four items which are clearly from the MBII occupation, one intrusive item from the Pottery Neolithic period and one item which, although it typologically implies a Pottery Neolithic affiliation, is too robust and can be of a later date.

Only one of the four MBII sickle blades is whole (size: 74 × 30 × 10 mm) (Fig. 2.12:1). It is shaped on a proximal segment of a thick blade and

it is truncated in one end, while the other end is slightly arched. This sickle blade as a modified back partly shaped by abrupt retouch and partly by steep ventral retouch. The glossy cutting edge is serrated. Two of the other MBII sickle blades (Fig. 2.12:2-3) were also shaped on thick rough blanks (one on a rough primary element), in which both have an abruptly retouched back and an abruptly retouched truncated end (other end broken). One is 26 mm wide and 9 mm thick and the second is 22 mm wide and 6 mm thick. The fourth sickle blade that is attributed to the MBII is represented by a medial fragment of a rather thin blade (16 mm wide and 4 mm thick) (Fig. 2.12:4). The glossy edge of this sickle blade is heavily retouched and the opposite edge has a modified back.

The intrusive Pottery Neolithic sickle blade (Fig. 2.12:5) was shaped on a blade that was clearly produced within a systematic thin blade production. It has a denticulate cutting edge modified by pressure retouch, an abruptly retouched back and one truncated end. The heavy denticulation by pressure retouch is the main attribute that ascribes this item to the Pottery Neolithic industry which flourished in this region (e.g. Gopher and Blockman 2004). The last sickle blade (Fig. 2.12:6) is shaped on a medial blade segment; it has a steep retouched back and one truncated end. The cutting edge is heavily denticulate by simple retouch (size: 61 × 17 × 7 mm). Such items are known from the late Pottery Neolithic and Chalcolithic industries, yet their average width and thickness are usually smaller (Gopher 1989:77-125; Barkai and Gopher 1999; Hermon 2003). This situation does not enable us to ascribe this specific item to any clear entity and the possibility that it is from the MBII occupation could also not be ruled out.

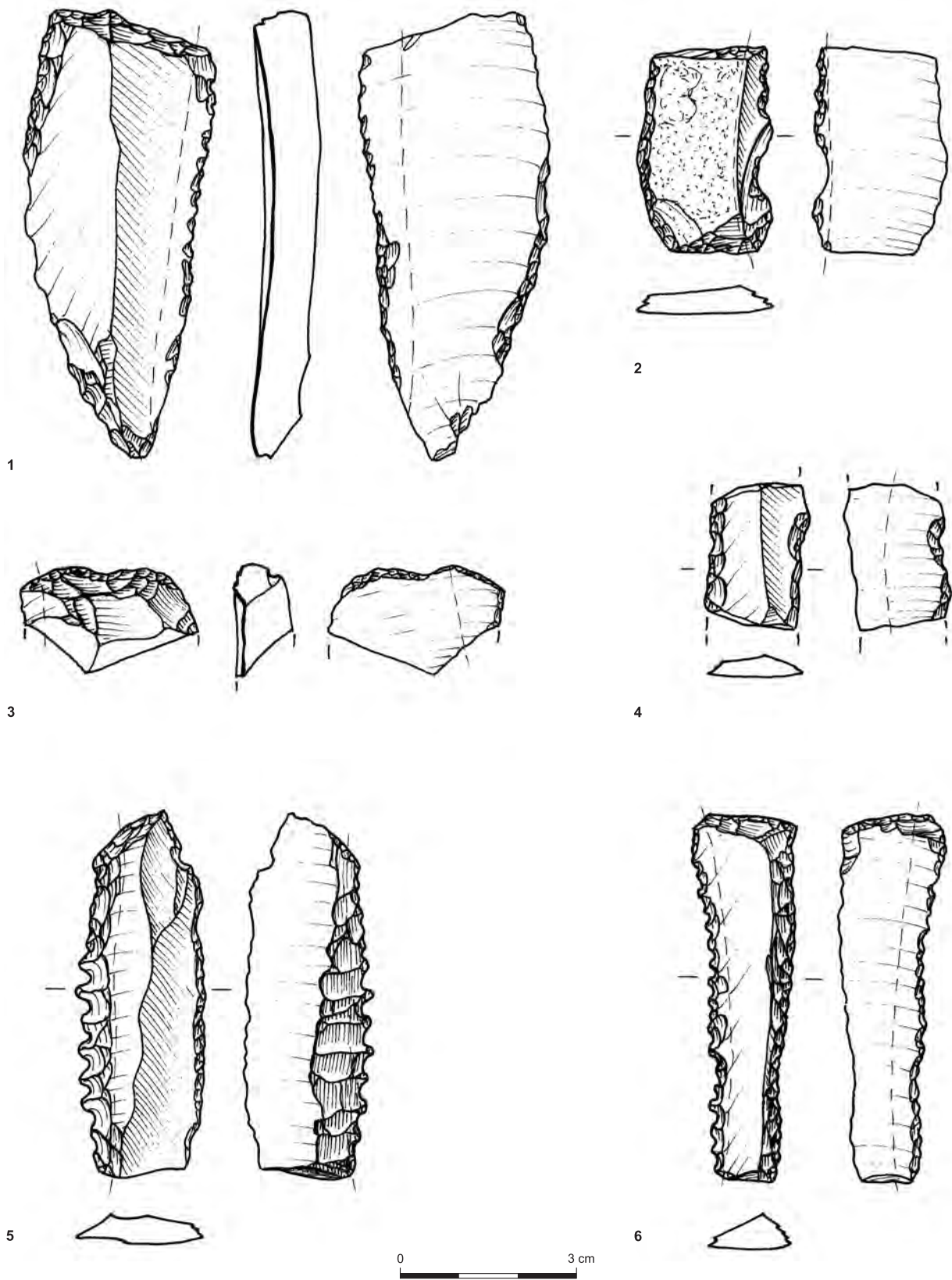


Fig. 2.12: Middle Bronze Age flint tools.

FIG. 2.12: MIDDLE BRONZE AGE FLINT TOOLS

<i>No.</i>	<i>Locus</i>	<i>Basket/Reg. No.</i>	<i>Elevation</i>
1	L401	4027/1	84.3
2	L411	4089/1	84.75
3	L440	4151/5	84.3
4	L411	4055/1	84.8
5	L433	4110/1	84.55
6	L433	4110/2	84.55

Similar sickle blades to the ones described here as MBII sickle blades were found in several MBII sites (e.g. Gilead 1973; Crowfoot Payne 1983; Mozel 2000; Rosen 2004). The main features of the MBII sickle blades is the use of wide and thick blade segments and the shaping of a back and truncations by abrupt retouch (Shimelmitz, forthcoming). The single blade

found in Ramla (South), although represented by a small fragment only, is of the same type of blade used for these sickle blades. The rest of the assemblage also does not differ from most MBII and other Bronze and Iron Ages sites where an opportunistic knapping trajectory (referred to by Rosen as *ad hoc* [1997]) flourished.

TABLE 2.1

	<i>No.</i>	<i>% of tools and % of whole debitage</i>	<i>% of whole assemblage</i>
Primary element flake	9	18.8	11.0
Flake	10	20.8	12.2
Blade	1	2.1	1.2
Core trimming element	6	12.5	7.3
Core	6	12.5	7.3
Tool	16	33.3	19.5
<i>Sub total</i>	48	100	58.5
Chunk	31		37.8
Chip	3		3.7
<i>Total</i>	82		100

TABLE 2.2

<i>Type</i>	<i>No.</i>	<i>%</i>
Retouched flake	6	37.5
Sickle blade	6	37.5
Scraper	1	6.3
Denticulate	3	18.8
<i>Total</i>	16	100

APPENDIX I

A NOTE ON THREE IRON AGE I(?) VESSELS

Assaf Yasur-Landau

Three restorable vessels, a bowl, dipper juglet and storage jar were found at the beginning of the 2005 season of excavations at surface level. These vessels originated from two nearby squares, P140 and M209 and were found lying on top of virgin *hamra* soil. It is possible that these vessels once belonged to a tomb assemblage which was disturbed during modern activity at the site, although no bones or indeed any tomb architecture were associated with the find. The lack of rims for the dipper juglet and storage jar hinders direct chrono-typological identification, yet it is likely that these belong to either the later part of the Late Bronze Age or to the very early Iron Age I period.

The bowl has a simple rim and slightly depressed disc base (Fig. 2.13:1). Parallels come from the early Iron I Ashdod Stratum XIIIb (Dothan and Porath 1995: Fig. 16:1) but also from the Late Bronze Age Strata XV-XIV (*ibid.*: Fig. 11:1-3). The dipper juglet has an ovoid body, with rim and handle missing (Fig. 2.13:2). Good parallels can be found in the Late Bronze Age Stratum VII at Tel Batash (Panitz-Cohen 2006: Pl. 44:9-11). The storage jar has an ovoid body, pointed base and two handles, with rim missing (Fig. 2.13:3). It finds good parallels in Ashdod Area G Stratum XIIIb (Dothan and Porath 1995: Fig. 15:7) and Area H Stratum XIII at the same site (Ben Shlomo 2005: Fig. 3.6:6).

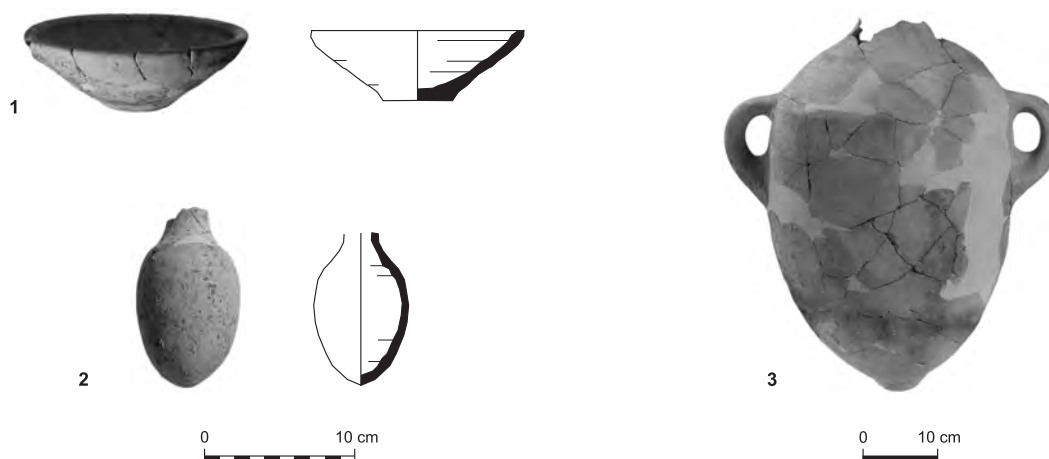


Fig. 2.13: Iron Age I(?) vessels.

No.	Locus	Basket/Reg. No.	Elevation
1	L521	5102/1	83.75
2	L525	5120/1	85.1
3	L525	5120/2	85.1

THE PERSIAN, LATE HELLENISTIC AND EARLY ROMAN PERIODS

Oren Tal and Itamar Taxel

There is a difficulty in establishing a Persian, Late Hellenistic or Early Roman architectural phase at Ramla (South). Walls and foundations of Early Islamic date penetrated deep into the site's earlier strata, sometimes reaching virgin soil and causing considerable damage. Moreover, there were no architectural remains that could be related to any of these periods. Pottery from these periods was found only in the western and north-western parts of the excavated site. The ceramic material attributable to the Persian and Early Roman periods originates in fills of disturbed nature, whereas the pottery of the Late Hellenistic period can be attributed to two secured assemblages.

Persian period pottery came from a few surface level disturbed loci (2-4, 8) and consists of fragments of an Attic bowl, locally-made bowls, heavy bowls (mortaria), cooking-pots, and storage jars.

The two assemblages of the Late Hellenistic (Hasmonean) period are similar in nature. The first originates from an earth-pocket (about 0.50 m²) very close to Early Islamic water cisterns that may have cut away segments of a Late Hellenistic stratum (if one indeed existed) (Locus 510; Square Q210). With the recovery of complete Late Hellenistic cooking-pots, fragmented bowls and storage jars, as well as a coin of Alexander Jannaeus (104-76 BCE) (Chapter 7: No. 2). The possibility that this assemblage represents a burial offering was raised. However, no skeletal remains were discovered (except a few *ovis/capra* metapodia). The second assemblage also originates from an earth-pocket (about 0.30 m²) uncovered on virgin soil (Locus 701; Square S210), and mainly consists of fragments of bowls, cooking-pots, kraters and storage jars. These two assemblages

can be supplemented by additional fragments of Hellenistic pottery, a monochrome cast/sagged glass fragment found in Locus 4 (Square T217), as well as two coins of Alexander Jannaeus that were retrieved from disturbed fills in Wall 24 (Squares T217, T218) and Locus 511 (Square R209) (see Chapter 7: Nos. 3-4). All finds can be attributed to a late 2nd and early 1st century BCE occupational phase. Thus, it should be emphasized again that the two assemblages do not originate in a definable stratum but rather reflect a phase of occupation of the site sometime during the Late Hellenistic period.

The Early Roman pottery came from disturbed loci of mixed fills (Loci 8, 11, 14 and 16) and consists of casseroles, cooking-pots, jugs, juglets, storage jars and a fragmented lamp. The assemblage can be supplemented by a coin of Herod Agrippa I's sixth year (41/42 CE) or Agrippa II that was retrieved from a disturbed fill in Locus 374 (Square L138) (see Chapter 7: No. 5).

POTTERY AND GLASS

The most representative fragments of the Persian period pottery are an Attic bowl and two cooking-pots. The Attic bowl (Fig. 3.1:1) is of a type termed in the Athenian Agora out-turned rim bowl and known from 4th century BCE contexts (Sparkes and Talcott 1970:128-130, 293-294, Nos. 801-808, Fig. 8, Pl. 32). It may be regarded as one of the most common types of Attic bowls found in 4th century BCE. Palestine (see Tal 1999:130, Figs. 4.27:4-7 and 4.42:6-11 for Palestinian comparanda). The cooking-pots (Fig. 3.1:2-3) are characterized by thickened rims and relatively high cylindrical necks (Stern 1982:100-102, Types A and G), with additional equivalents at Tel Michal (Singer-Avitz 1989:130, Fig. 9.8:3-4) and

nearby Gezer (Gitin 1990:79, Type 154A, Pl. 31:11-12), and may also indicate a 4th century BCE date.

The Late Hellenistic (Hasmonean) period is represented by glass and coins in addition to the pottery. The single glass fragment retrieved is a rim and wall fragment of a grooved bowl cast by sagging. The fragment is colourless with black and silver weathering and iridescence (Fig. 3.2:1). The rim (18 cm in diameter) is straight and the walls curve inward with two shallow horizontal grooves below the rim on the interior. This example is too fragmentary to be attributed to a specific shape, but it is a drinking bowl typical of the Late Hellenistic period. During this period similar simple monochrome conical and hemispherical drinking bowls with horizontal polished and cut grooves were produced, probably by sagging on a former mould (Grose 1979:55-59, 'Group A'; 1989:194).

Similar bowls are well known from excavations throughout Israel. They are found mostly in urban sites, in contexts dated to the mid-2nd-1st century BCE (Jackson-Tal 2004:17-20, 22-24, Figs. 8-10).

The pottery of the Late Hellenistic period is considerably varied as opposed to our Persian period specimens. The "fish-plate" (Fig. 3.3:1) is of a typical Hellenistic type (Guz-Zilberstein 1995:291, Fig. 6.3:6-16, with many Palestinian comparanda), whereas the in-turned rim bowl (Fig. 3.2:2) is among the commonest Late Persian and Hellenistic types (Stern 1982:94, Type A1; Guz-Zilberstein 1995:289-290, Fig. 6.1:1-24, with many Palestinian comparanda), and so is the typical slipped in-turned rim bowls ring base (Fig. 3.3:2). The cooking-pots of Locus 510 (Fig. 3.2:3-7) are typical Hasmonean (Judaean) types with good equivalents at Jericho (Bar-Nathan 2002:68-71, Pl. 11) and at nearby Gezer (Gitin 1990:98-99, Types 242, 246, Pls. 37:18, 40:22-23). The lid-device cooking-pot of Locus 701 (Fig. 3.3:3)

is a typical Hellenistic type with equivalents at Gezer (Gitin 1990:98, Type 239, Pl. 42:21) and Dor (Guz-Zilberstein 1995:299, Fig. 6.19:12-14). The overhanging rim krater (Fig. 3.3:4) is also of a typical Hellenistic type (cf. Guz-Zilberstein 1995:296, Fig. 6.11:4, with Palestinian comparanda), and so is the flaring rim jug (Fig. 3.4:5) (cf. Gitin 1990:85, Type 182C, Pl. 37:3; Guz-Zilberstein 1995:308-309, Fig. 6.30:6, with Palestinian comparanda). The storage jar rims (Fig. 3.3:6-8) belong to well-known Hellenistic bag-shaped jar types (cf. Guz-Zilberstein 1995:311-312, Fig. 6.35-6.37, with many Palestinian comparanda).

The pottery of the Early Roman period is mostly represented by typical Judaean types with many equivalents in sites in Jerusalem and the Judaean Desert. The two juglet rims (Fig. 3.4:1-2) belong to a well-known type of Judaean perfume juglet (Fischer and Tal 2000:40, Type JL1, Fig. 2.11; Bar-Nathan 2002:162-164, Pl. 25:443-450). The shallow casserole with the cut rim (Fig. 3.4:3) is of a more coastal orientation (cf. Elgavish 1977: Pl. 4:20), but the cooking-pots (Fig. 3.4:4-6) have good Judaean equivalents (Bar-Nathan 2002:71-73, Pl. 12). The storage jars belong to Herodian types and can be divided between rounded and vertical (triangular in section) rim types (Fig. 3.4:7-9), both with upturned necks with ridges at the base (Fischer and Tal 2000:36, Types SJ3 and SJ4b; Fig. 2.6:5-23, 28-29; Bar-Nathan 2002:150-155, Pl. 24). The fragmented lamp (Fig. 3.4:10) belongs to a Judaean radial lamp type that is dated to the 1st century BCE (cf. Barag and Hershkovitz 1994:14-16, 21-22, Nos. 3-14; Bar-Nathan 2002:107-110, Pls. 17:293-294, 18:295-296, both with many Palestinian comparanda). The pottery finds of the Early Roman period can be supplemented by fragments of Jewish stone vessels (cups and bowls) that were found on the site surface prior to the excavations.

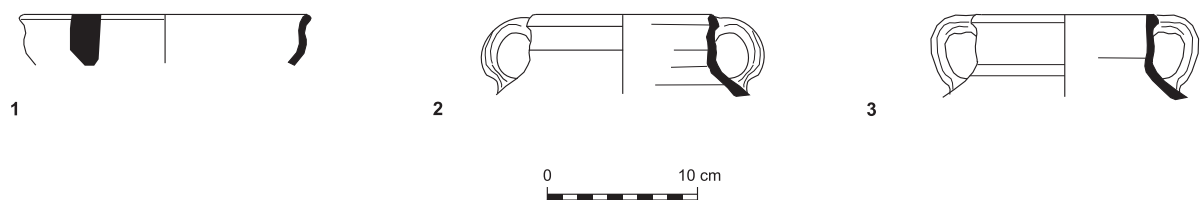


Fig. 3.1: Persian period pottery: 1) L4; 2-3) L8.

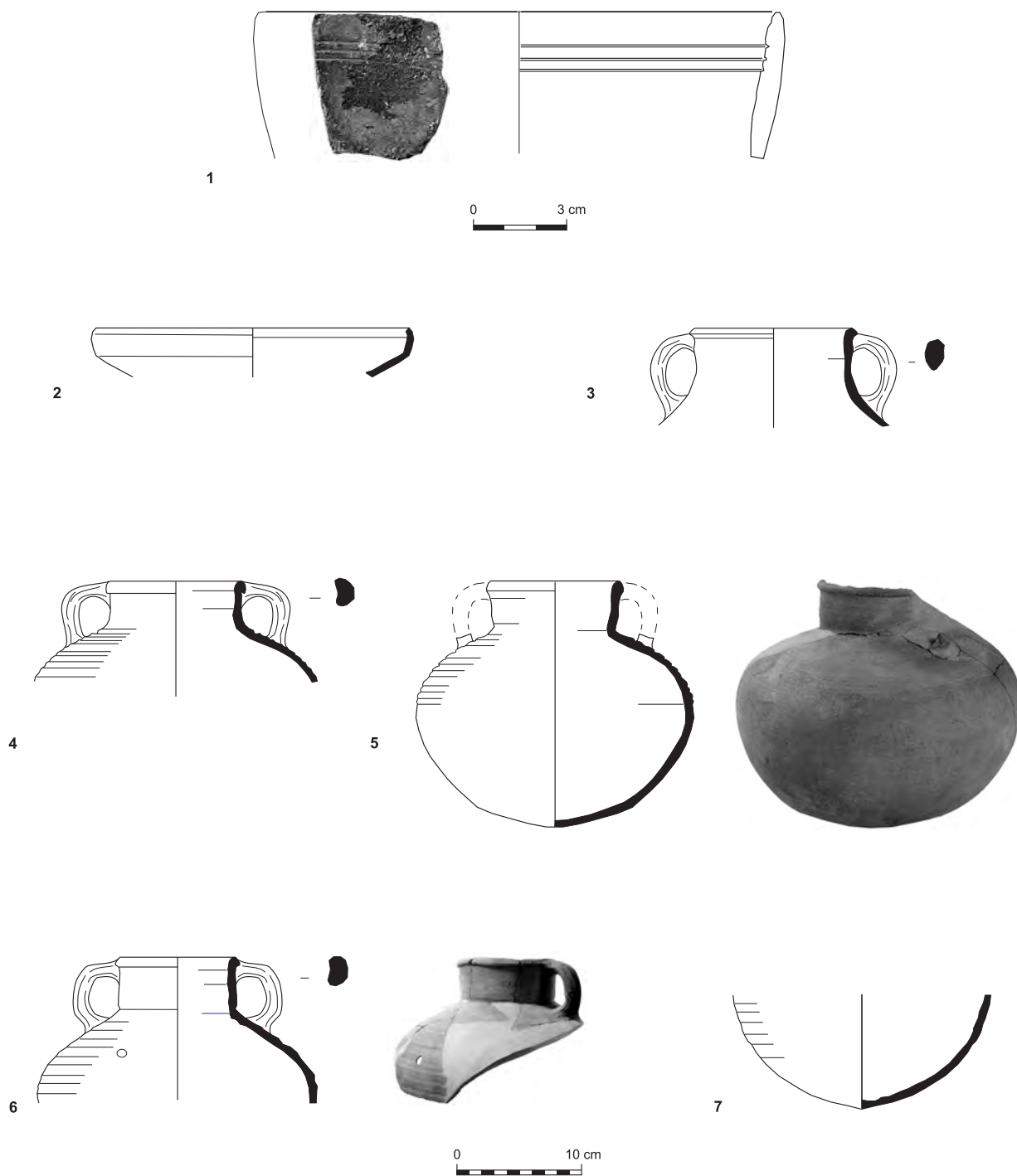


Fig. 3.2: Late Hellenistic glass (L4) and pottery (L510).

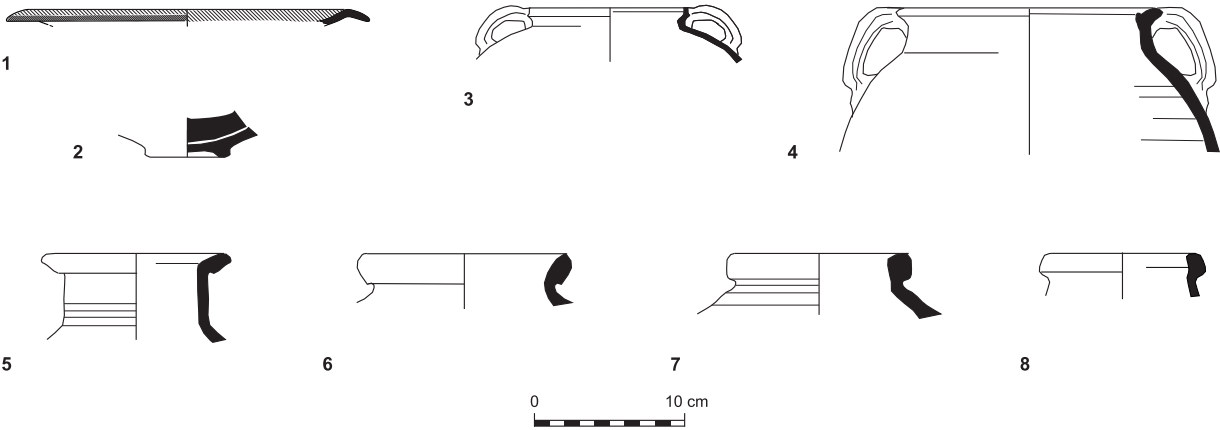


Fig. 3.3: Late Hellenistic pottery: 1) L701; 2) L14; 3-5) L701; 6) L4; 7-8) L701.

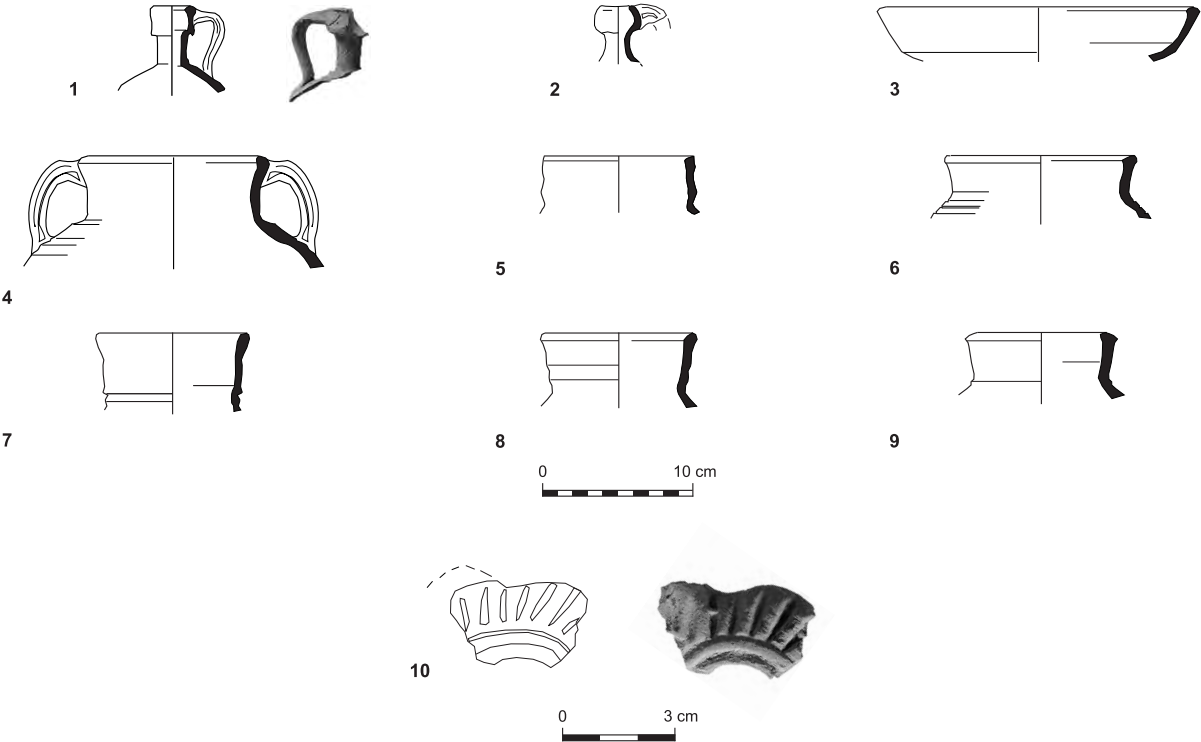


Fig. 3.4: Early Roman pottery: 1) L3; 2) L8; 3-6) L14; 7-8) L8; 9) L14; 10) L8.

SUMMARY AND CONCLUSIONS

The identification of the site's political affinity in each period is of scholarly interest, especially because of the political upheavals of the second half of the first millennium BCE. When dealing with the Persian and Late Hellenistic periods, the main questions are whether the site of Ramla (South) formed part of the western border of the Achaemenid Province of Judah, and did it form part of the Hasmonean kingdom in its early formative stage until the death of Simeon in 135 BCE.

Regarding the 5th and 4th centuries BCE, it may be concluded that the region of Lod (and Ramla) formed part of the Province of Ashdod, based on Philistian coins found in the area (Gitler and Tal 2006:49-62). A less likely alternative is that it was part of the Province of Judah (Ezra 2:33, Nehemiah 7:37) based on several Judaeon seal impressions found in Gezer (Stern 1982:203; 2001:431, although those are mostly of Hasmonean date), at least in the 4th century BCE, when the provinces of the country and major administrative units became functional, as Stern suggested based on the administrative-oriented archaeological finds (Stern 2001:580-582).

As for the Late Hellenistic (Hasmonean) period, the historical sources are more descriptive. Simeon conquered Gazara in 142 BCE (I Maccabees 13:43-48; 14:7, 34).¹ An indication of the western border of the Hasmonean kingdom in the days of Simeon may also be inferred from the Roman Senate recognition (of 139 BCE) on Hasmonean rights over Ioppa (Joppa) and Gazara (Tel Ya'oz) (Josephus, *Antiquities* XIII, 9, 2 [261]). The accounts about the surrender of the Province of Ekron to Jonathan in 147 BCE helps to define the western boundary of Judah in his days (I Maccabees 10:89; Josephus, *Antiquities* XIII, 4, 4 [102]). It can thus be assumed that during the

late 140s BCE a Judaeon presence in the region existed, and that the formal annexation of this region to the Hasmonean kingdom (after 141 BCE; I Maccabees 13:41-42) was made according to ethnic considerations (Kasher 1990:106-107, 110). It seems that Lydda (Lod) and its immediate hinterland (including Ramla) was likewise outside the official limits of Judah in the days of Jonathan, as were the Provinces of Ramathaim and Ephraim, north-east and east of Lydda. In any case, the accounts on the Lydda district are scant and later than the beginning of the Hasmonean revolt (Schwartz 1991:49). The Judaeon presence in these districts must have caused their inhabitants to join the Hasmoneans (Avi-Yonah 1979:54-59), and the official annexation of these districts to the Hasmonean kingdom came only *post factum* (I Maccabees 10:30; 11:28; 34:57; Josephus, *Antiquities* XIII, 5, 4 [145]; Schwartz 1991:50-51). The conclusion from this data is that there was a large Judaeon population in the northern Shephelah during the mid-2nd century BCE. It was only in the days of Simeon, and as a result of Hasmonean oppression, that the kingdom's official western and northern borders included the districts of Ekron, Lod, Ramathaim and Ephraim.

With this historical overview in mind the Late Hellenistic assemblages discovered in our excavations at Ramla (South) most probably belonged to Jews who settled in the region of Lod in the second half of the 2nd century BCE. This settling activity may be regarded as national in nature for the sake of ethnic territorial expansions for the Hasmonean kingdom. The Jewish character of this occupational phase can be supported by the fact that among our complete and almost complete cooking-pots of Locus 510, there is an example with an intentionally made hole (after firing) on its upper wall (Fig. 3.5:1). Cooking-pots

1. Here one must emphasize that I Maccabees refers to two toponyms of close affinity, the one spelled Gazara which is documented in a series of events (e.g. 9:52; 13:54; 14:7, 34), and the other Gazera (e.g. 4:15; 7:45). The one which included within the limits of the province of Ashdod (I Maccabees 14:34) and that was conquered by Simeon (e.g. 13:43-48) is spelled Gazara. It was recently identified with Tell Ghazza (Tell Ya'oz) on the north bank of Naḥal Šoreq, where impressive remains from the Hellenistic period were found (see Fischer, Roll and Tal 2008:152-155).

with intentionally made holes are mostly known from Late Second Temple period Jerusalem (Temple Mount, Jewish Quarter and City of David [see below]). To these we may add at least one unpublished example that was retrieved from a tomb in Ketef Hinnom (Fig. 3.5:2). Cooking-pots with holes were given several explanations in modern literature that are connected to Jewish purity rituals, that is the cooking and eating of the meat of sacrificed animals (see Grossberg 2002: 59-61). Other intentionally holed cooking-pots (and storage jars) are known from different Late Hellenistic and Early Roman sites in Judah, but were hardly given any explanation (e.g. Fischer, Gichon and Tal 2000:10, Note 6, for a foundation deposit of an intentionally holed storage jar). Late Hellenistic holed cooking-pots were documented at Qula, a site located to the south of Rosh Ha-ʿAyin (Avissar and Shabu 2000:51*, Fig. 104) and at Khirbet ʿAqed (Emmaus) (Fig. 3.5:3). In addition, we know of surveyed cooking ware from a few sites in Judah with intentionally made holes. It should be emphasized that all examples that are known to us are made of the characteristic Judaeans ware. It is thus quite certain that this evidence (i.e., holed cooking-pots) is ethnic in character and supports their use by Jews. The purpose of the holes is disputed. Ben-Dov (1982: 156-157) suggested that the production of *Temple* ware was a monopoly of the Jerusalemite priestly class for the sake of economic benefits. In order

to secure their continuing purchase, once used for the consumption of sacrificed meat they were intentionally holed as if to mark them from being used again for the same purpose. Grossberg (2002), too, sees the holes in the Jerusalemite cooking-pots as prohibition marks – aiming to avoid the repeated use of the cooking-pots, not for an economic reason but rather a religious one, that is the Halachic prohibition on the eating of the *notar* (= remaining), i.e., the sacrificial meat after sanctification, by re-using cooking-pots that absorbed residues of the offering. Both explanations for the holed cooking-pots may well fit the examples found outside Jerusalem and contribute to the identification of a Jewish presence in a given site/area, albeit other explanations (e.g. foundation deposits, cognitive perception, etc.) are possible as well.

In Early Roman, Herodian times the site apparently remained rural in nature, as it had been in Persian and Late Hellenistic times. Politically, the site was included in the district of Judaea throughout the Early Roman period. It is more than probable that its inhabitants were Jews (Avi-Yonah 1979:102-107) who may have abandoned the site in the context of the First Jewish War. The presence of fragmented Jewish stone vessels (not illustrated) in our excavations lend support to this surmise.

With the absence of urban centres in its vicinity during the Persian, Late Hellenistic and Early Roman periods, it seems likely that during



Fig. 3.5: Holed cooking-pots from 1) Ramla (South); 2) Jerusalem (Ketef Hinnom); 3) Khirbet ʿAqed. (Courtesy of G. Barkay [No. 2], M. Fischer and M. Gichon [No. 3]).

the first two periods the site of Ramla (South) was subject to Gezer, whereas in the latter period it was subject to Yavneh. The sites of Gezer and Yavneh are located south-west and south-east of Ramla respectively within a radius of less than 12 km. This rural site may well have formed part of a larger system falling into a Central Place Theory model with administrative urban centres and interacting hamlets. The more so, the location of the site on the western part of the vale of Ayalon contributes to its supposed productive nature. The survey map of Lod, which covers quite a similar geographic region, supports such a reconstruction for the number of rurally-oriented Persian, Late Hellenistic and Early Roman sites is considerable (Gophna and Beit-Arieh 1997). In this survey 28 sites were attributed to the Persian period and 19 to the Hellenistic period. Thirteen Persian period sites were not occupied during the Hellenistic period and four Hellenistic sites were not occupied during the Persian period. This evidence suggests that occupation of most Persian period sites discontinued in the Early Hellenistic period. As to the Early Roman period, 45 sites were attributed

to the Roman period in the survey map of Lod, although the surveyors did not distinguish between sites of Early and Late Roman occupation, or Late Roman-Byzantine occupation. Only 11 sites among the latter were already occupied during the Hellenistic period, while eight of the Hellenistic period sites did not continue to exist in Roman times. Among the few sites in the immediate vicinity of Ramla (South) with excavated remains of the Early Roman period, one can mention the site of Nesher Quarries (Hirschfeld and Shapira 1999:52*; Kol-Ya'akov 2000; Zelinger and Di Segni 2006).

The site of Ramla (South) during the periods dealt with above most probably benefited from its proximity to the important local (southwest-northeast) road which led from Ashdod to Lod (Dorsey 1991:64, Map 1:19). At Lod, this road joined a major junction, from which one could continue to the southeast, in the direction of the Judaeian Hills and Jerusalem or to the northwest in the direction of the coastal plain and Jaffa (Dorsey 1991:181-184, Map 13:J1; Fischer, Isaac and Roll 1996:67-107, Fig. 3).

THE LATE ROMAN AND EARLY BYZANTINE PERIODS

Oren Tal and Itamar Taxel

Two architectural elements of the 3rd/4th to 5th centuries CE were discovered during excavations.

In Squares M140, M209 the southeastern corner of an ashlar-encased podium (W557) that was filled with field stones and earth was discovered. Five courses were preserved, to a height of 1.4 m (Fig. 4.1). It seems that the podium (and its superstructure) was oriented according to the four cardinal points but with a slight deviation. The podium probably served a building of a public, cultic or military nature that did not leave any remains on site, as

excavations were carried out down to virgin soil around it. Pottery retrieved from stratigraphically related fills (Locus 547) was confined to shattered cooking-pots (from which only one rim fragment was retrieved) and storage jars that are dated to the 3rd/4th century CE. The cooking-pot is of a typical Roman type with a thickened lip, slightly concave short neck and densely ribbed body (Fig. 4.2), with equivalents at Shiqmona (Elgavish 1977: Pl. 15) and Jalame (Johnson 1988:198, Form 19, Fig. 7-41, Nos. 610-611).

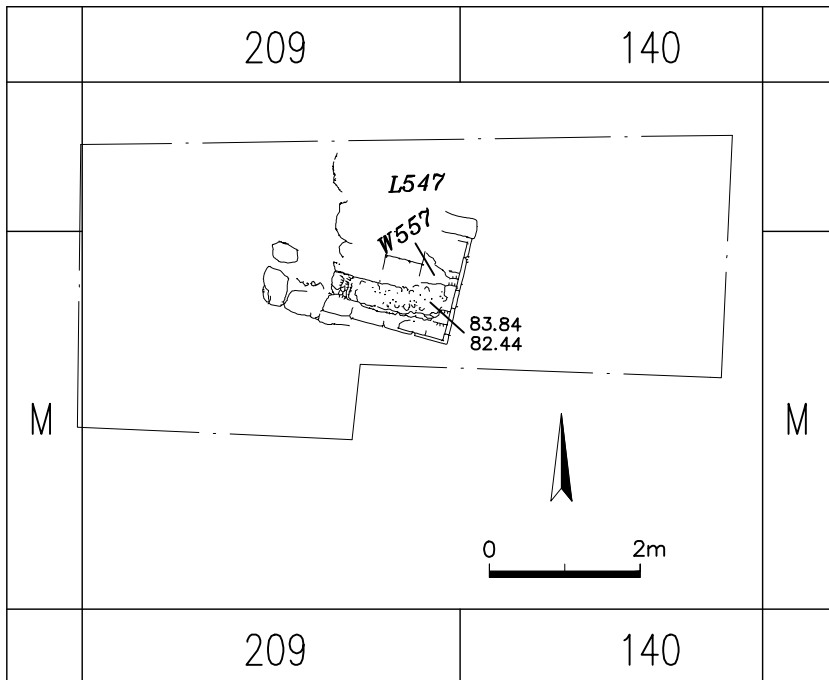


Fig. 4.1a: Plan of the podium.



Fig. 4.1b: The podium, looking west (*above*) and northwest (*below*).

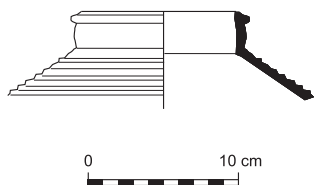


Fig. 4.2: Late Roman/Early Byzantine cooking-pot (L547).

In the southwestern corner of Square X209, the northwestern part of a plastered pool was found (I745; ca. 1.2 × 3 m). The pool was built of fieldstones bound with mortar, and was coated on the inside by buff-greyish plaster (Fig. 4.3). This plaster's gritty texture and colour differ from the smoother and paler plaster used in the installations of the later phase (see below). Access into the pool was by way of two steps. The pool ceased to be used when a large amount of domestic rubbish was thrown into it. This rubbish (Locus 796) contained mainly pottery (bowls and cooking-pots, storage jars and a fragment of lamp), including some restorable vessels, but also fragments of glass and stone vessels. A wall built at a later stage (W721) damaged the western side and northeastern corner of the pool. This wall was founded over a layer of reddish *hamra* soil, which cut through the fill inside the pool down to its floor. No dateable finds were found in the foundations of the pool, but we tend to attribute its construction to the Late Roman/Early Byzantine period. The pottery and glass from the fill date the last use of the pool to the 4th/5th centuries CE. Two Late Roman coins, one identifiable as an early 5th century CE type, discovered together with the pottery and glass find (Chapter 7: Nos. 8 and 17) lend support to this dating.

FINDS

POTTERY

Two types of cooking vessels were found in the pool. The first type is a casserole with horizontal loop handles (Fig. 4.4:1-2). It belongs to a type of casserole dated by Magness to the period between the late 3rd/early 4th to 8th/9th centuries CE (1993: 211-213, Form 1), yet thin-walled ribbed specimens like those found here are normally attributed to the Roman and Early Byzantine periods.

The second type of cooking vessel is a cooking-pot with a short, vertical neck and hooked rim (Fig. 4.4:3), dated to the period between the 5th/6th centuries to late 7th/early 8th centuries CE (Magness 1993:219-220, Form 4B); although they are known also in earlier contexts (Johnson 1988:190, Form 4, Fig. 7-35; Ayalon and Harpazi-Ofer 2007:33, Fig. 3:7-8).

The jar type represented in the assemblage is a ridged-neck bag-shaped jar, characterized by a ribbed body that has a painted red band in mid-body (Fig. 4.4:4). It is dated from the 2nd until the 5th centuries CE (Riley 1975:26, Type 1A, Nos. 8-9; Johnson 1988:214, Fig. 7-51, No. 772; Ayalon and Harpazi-Ofer 2007:30-33, Fig. 2:3-6).

The lamp fragment represents a small lamp with a relief decoration of guilloche pattern around the filling hole (Fig. 4.4:5). It is dated to the late 3rd to the mid-4th centuries CE (Sussman 1969:71), being common and most probably produced in the region between Yavneh and Lod. Most of the published lamps of this type were found in Rehovot and Qatra, and some have a similar or even identical decoration as that of this lamp (*ibid.*: Pls. 14:4-5, 10, 15:13, 14).

Two other lamps with a very similar pattern were found at Yavneh-Yam (M. Fischer and I. Taxel, unpublished). The relatively early date of this lamp is remarkable compared to the other Late Byzantine pottery found in the same assemblage. It represents, therefore, an accidental find which was washed or thrown into the pool and which has no chronological relation to the rest of the pottery.

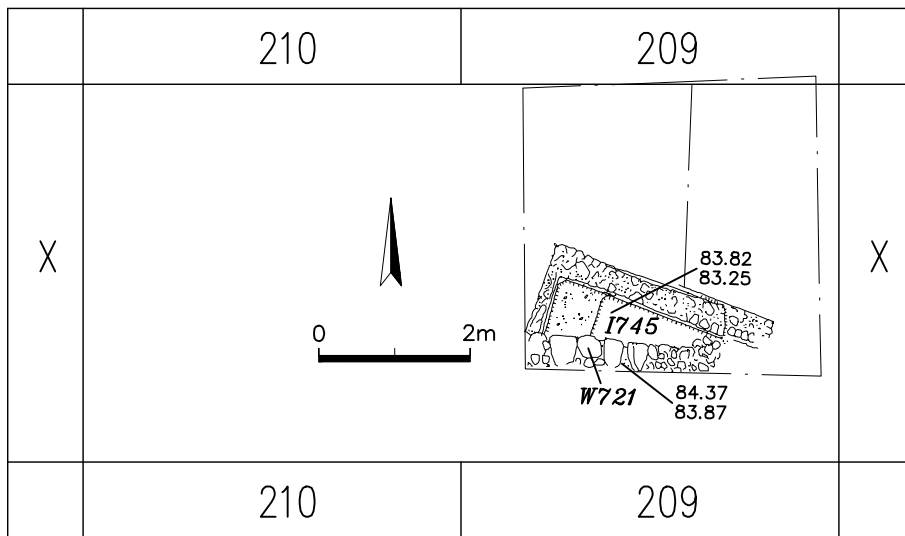


Fig. 4.3a: Plan of the plastered pool.



Fig. 4.3b: The plastered pool, looking north.



Fig. 4.3c: The plastered pool, looking east.

GLASS

Ruth E. Jackson-Tal

Three vessels were found in the same locus and basket, in a context dated to the Byzantine period. The first is a bowl with double tubular fold (Fig. 4.5:1). Such bowls are known from both Early Roman (Jackson-Tal 2007:475, Pl. 1:5, 7) and Late Roman contexts. Similar bowls were found in a Late Roman context at Meşad Tamar (Erdmann 1977:141, Fig. 7:872), in the factory dump at Jalame (Weinberg and Goldstein 1988:53-54, Fig. 4-15:109) and at Khirbat el-Niʿana (Gorin-Rosen and Katsnelson 2007:81-83, 129, Figs. 3 and 28). The second is a bowl with out-folded rim (Fig. 4.5:2). Bowls with out-folded rims are the most common find in Roman and Byzantine sites. Similar bowls were found in Late Roman/Byzantine contexts, for example Meşad Tamar (Erdmann 1977:105, Pl. 4:227-232), in Tomb XV at Ḥanita (Barag 1978:11, 13, Figs. 5 and 7), the factory dump at Jalame (Weinberg and Goldstein 1988:41, 43, Fig. 4-3), in a tomb at Ashkelon (Katsnelson 1999:67*-68*, Fig. 1:2-4), ʿAin ez-Zara (Dussart 1997:99, Pl. 25:1-4, 7-9), ʿEn Gedi (Jackson-Tal 2007:483, Pl. 6:2-5) and Khirbat el-Niʿana (Gorin-Rosen and Katsnelson 2007:79-80, 129, Figs. 2:1, 27:6). The third vessel is a double cosmetic tube (Fig. 4.5:3). Cosmetic tubes are known to have been used in the region from the Late Roman period to the Byzantine period (Barag 1970:175). They are sometimes plain or decorated with applied trails. This tube is decorated with wavy trails on its vertical sides. Other decorated tubes with various styles of applied trails were found in a burial cave at Beth Shean, dated to the 4th-5th century CE (Gorin-Rosen 2000a:200, 65*, Fig. 2:24), in Catacombs 15 and 17 at Beth Sheʿarim, dated to the 4th century CE (Barag 1976:201, Fig. 97:22-23), in the North Cemetery at Samaria, from the 4th-5th century CE (Crowfoot 1957:413, Fig. 95:24) and in Tomb 287 at Dominus Flevit, Jerusalem (Bagatti and Milik 1958: Fig. 34:9) dated by Barag (1970:177) to the Late Roman period.

OTHER GLASS VESSELS

These vessels are attributed to the Late Roman/Early Byzantine period based on typological rather than stratigraphic considerations. They are confined to three discernable types; the first is a bowl with horizontal ridge (Fig. 4.6:1). This type of bowl is known in Late Roman contexts in Palestine. Similar bowls were found in Tomb XV at Ḥanita dated to the 3rd and early 4th centuries CE (Barag 1978:15, 17, Fig. 8:26), at Jalame (in many variations) in a glass factory dump dated to the second half of the 4th century CE (Weinberg and Goldstein 1988:48, Fig. 4-6), in burial Cave 2 near Ḥorvat Sugar, dated to the 4th century CE (Gorin-Rosen 1997:96-97, Fig. 5:2), in burial Cave 3 at Kisra dated to the 4th century CE (Stern 1997:109, Fig. 2:12) and at Khirbat el-Niʿana dated to the 4th-early 5th centuries CE (Gorin-Rosen and Katsnelson 2007:78-79, Fig. 1:6).

The second is a bowl with curving-in rim (Fig. 4.6:2). This type of deep bowl is known in Late Roman contexts in Palestine, usually in tombs. It appears also with flaring or straight rims. Similar bowls were found in burials E and Z at Loḥamei HaGetaʿot, dated to the first half of the 3rd century CE (Peleg 1991:135, Fig. 8:1-2), and in two burial caves at Ḥurfeish, in Cave 2, that is dated to the 3rd and early 4th centuries CE (Aviam and Gorin-Rosen 1997:29, Figs. 4:5, 5:9), and in Cave D dated to the 3rd century CE (Gorin-Rosen 2002:144*, Fig. 4:9-10).

The third vessel is a cup with a solid base (Fig. 4.6:3). Cups with cylindrical or bag-shaped bodies and solid bases are well known in Palestine during the Late Roman period. Similar bases were found in Late Roman contexts such as the the factory dump at Jalame (Weinberg and Goldstein 1988:60-61, Fig. 4-23), a wine press at Akhziv (Syon 1998:95, Fig. 15:3-5), a painted tomb at Ashkelon (Katsnelson 1999:69*, Fig. 2:1-2, with a detailed bibliography), ʿEn Gedi (Jackson-Tal 2005:77*, Fig. 2:9, 11-12) and Khirbat el-Niʿana (Gorin-Rosen and Katsnelson 2007:93, 135, Figs. 8:4-9, 32:1-2).

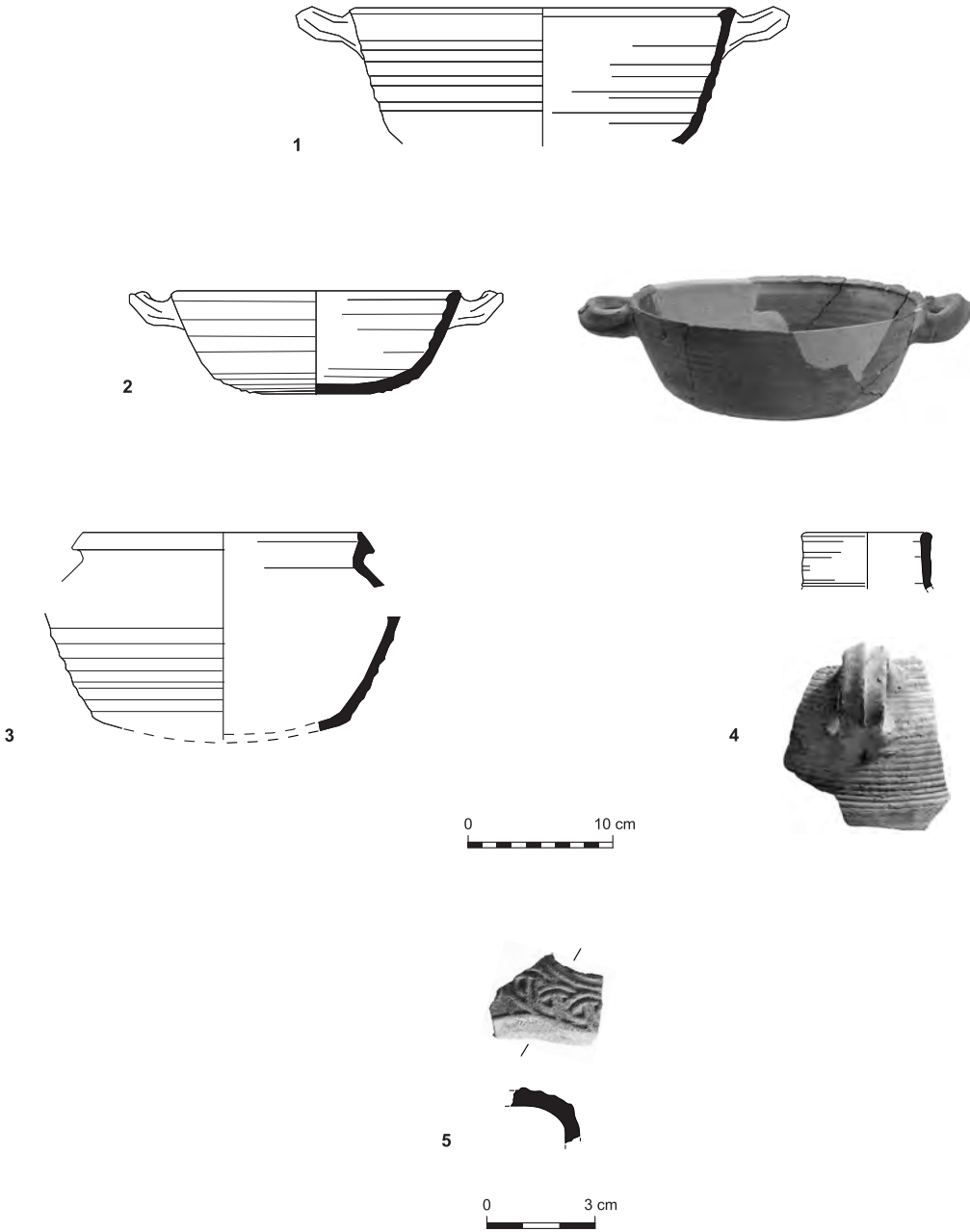


Fig. 4.4: Late Roman-Early Byzantine pottery (L796).

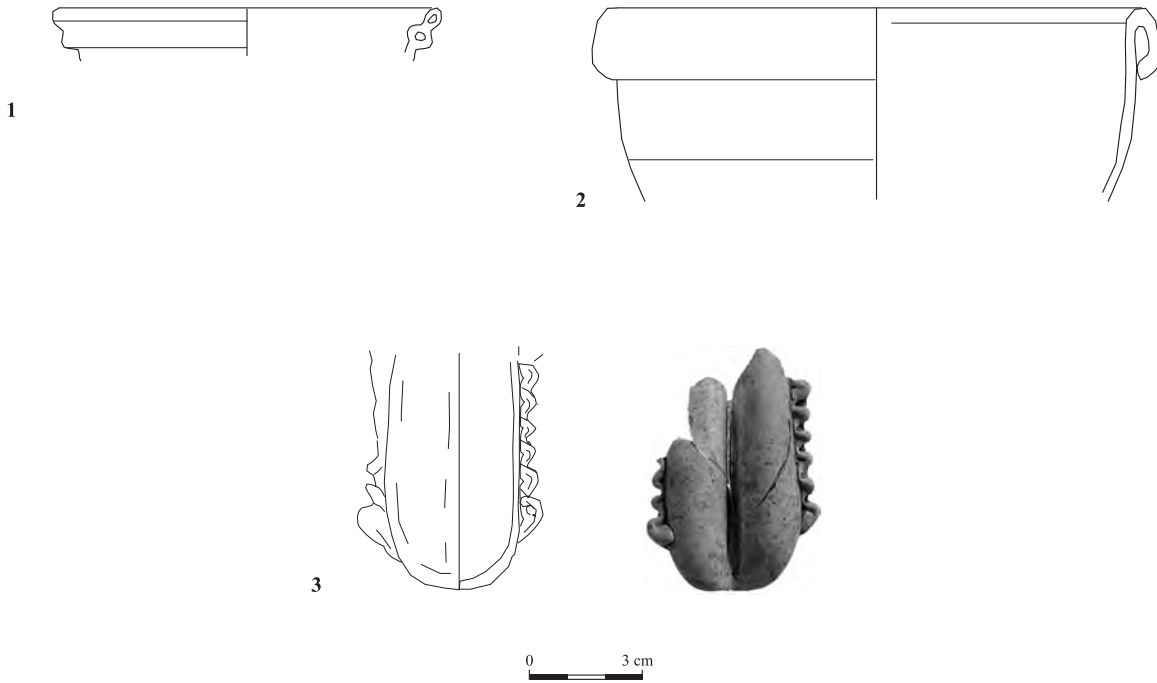


Fig. 4.5: Late Roman-Early Byzantine glass.

1. Locus 796. Rim and wall fragment. Colourless with white and silver weathering. Flaring and infolded rim with a double tubular fold below. Beginning of thin wall. Rim D.: 10
2. Locus 796. Rim and wall fragment. Colourless with thick black and silver weathering. Folded-out rim and curving in wall. Rim D.: 14
3. Locus 796. Lower part of a double tube, complete base and wall fragment. Colourless with light blue tinge. Silver weathering. Two hollow tubes pinched in the middle, flat base and backside. Remains of applied wavy trails along the vertical sides of the tubes. Base D. 2 cm.

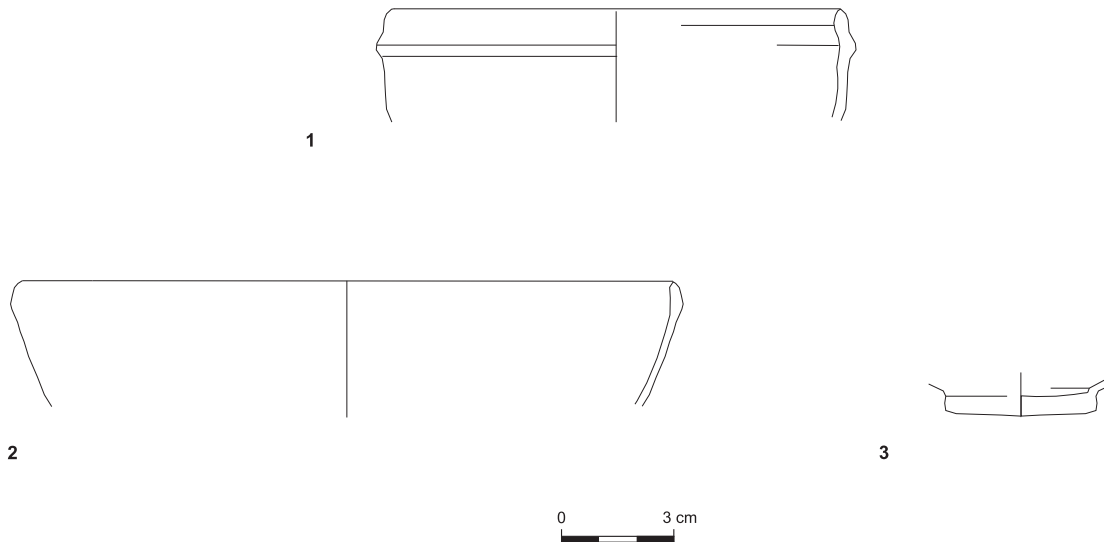


Fig. 4.6: Late Roman-Early Byzantine glass.

1. Locus 110. Rim and wall fragment. Light greenish. Silver weathering and iridescence. Straight rounded rim, straight wall with exterior horizontal ridge. Rim D. 12 cm.
2. Locus 36. Rim and wall fragment. colourless with yellowish tinge. black and silver weathering and iridescence. Curving in rounded rim, curving in wall. Rim D. 17 cm.
3. Locus 124. Complete base and beginning of wall. Light green, white and silver weathering. Pitted. Flat solid base with pontil mark (1 cm) and glass remains. Beginning of curving out and up thin wall. Base D. 4 cm.

SUMMARY AND CONCLUSIONS

As stressed above, 45 sites were attributed to the Roman period in the survey map of Lod (Gophna and Beit-Arieh 1997), although the surveyors did not distinguish either between sites of Early and Late Roman occupation, or Late Roman-Byzantine occupation. Excluding the city of Lod, within whose environs excavations yielded some contemporary remains, the most important of which is an impressive mosaic floor of a Late Roman villa (Avissar 1998). Other excavated sites with evidence of Late Roman/Early Byzantine occupation are hardly known in the immediate vicinity of Ramla (South). In fact, the closest sites are Tel Ḥamid, where Late Roman/Early Byzantine pottery kilns were excavated (Tal and Blockman 1998:150, 167; Wolff and Shavit 1999:70*) and Khirbet Deiran, where a Late Roman/Early Byzantine burial cave was excavated (Sussman 1969).

The site of Ramla (South) during the discussed periods was probably very small, as indicated by the paucity of architectural remains and small finds attributed to the 3rd to 5th centuries CE.¹ The possible public, cultic or military nature

of the podium excavated in the north of the site, taken together with its proximity to the nearby Ashdod-Lod road may indicate that this structure was part of a road station/look-out post which stood on the site at that time. The erection of such a structure may point to the increasing importance of the road in the Late Roman period, maybe as consequence of the upgrading of the municipal status of Lod (Lydda) after it became a formal *polis* (Diospolis) around 199/200 CE (Schwartz 1991:103).

A further boost to the importance of Lod and the roads that led to it most probably occurred in the 4th century CE, when Christianity was established in the city and Lodian bishops were involved both in international church councils and in local ecclesiastical conflicts (*ibid.*:125-126; Zelinger and Di Segni 2006:464-465, with references).

The pottery and glass finds can be supplemented by seven coins of the Late Roman and Early Byzantine periods (Chapter 7: Nos. 6-9, 15-17). Except for two coins that were retrieved from Locus 796 (Chapter 7: Nos. 8 and 17) the remainder came from disturbed fills.

1. Additional scant remains of this period, mostly of an industrial and agricultural nature, have been unearthed at the site during the excavations conducted by the Israel Antiquities Authority (Gorzalczy 2008b:31-32).

THE LATE BYZANTINE AND EARLY Umayyad PERIODS

Oren Tal and Itamar Taxel

ARCHITECTURAL FEATURES

Remains attributed to this phase were found in several different locations within the excavated area. They belong to domestic and industrial structures.

DOMESTIC COMPLEX

Numerous and relatively well-preserved remains of this phase were unearthed in Squares K-L/137-139. The most impressive belong to a structure

built of ashlar, some of which are well dressed while others are refined building stones (Fig. 5.1). The high-quality ashlar seem to be in secondary use, and were most probably taken from the ashlar-built structure of the earlier phase (Chapter 4) due to similar stone dressing and dimensions. The walls of the structure, and other contemporary walls nearby were founded on virgin soil.

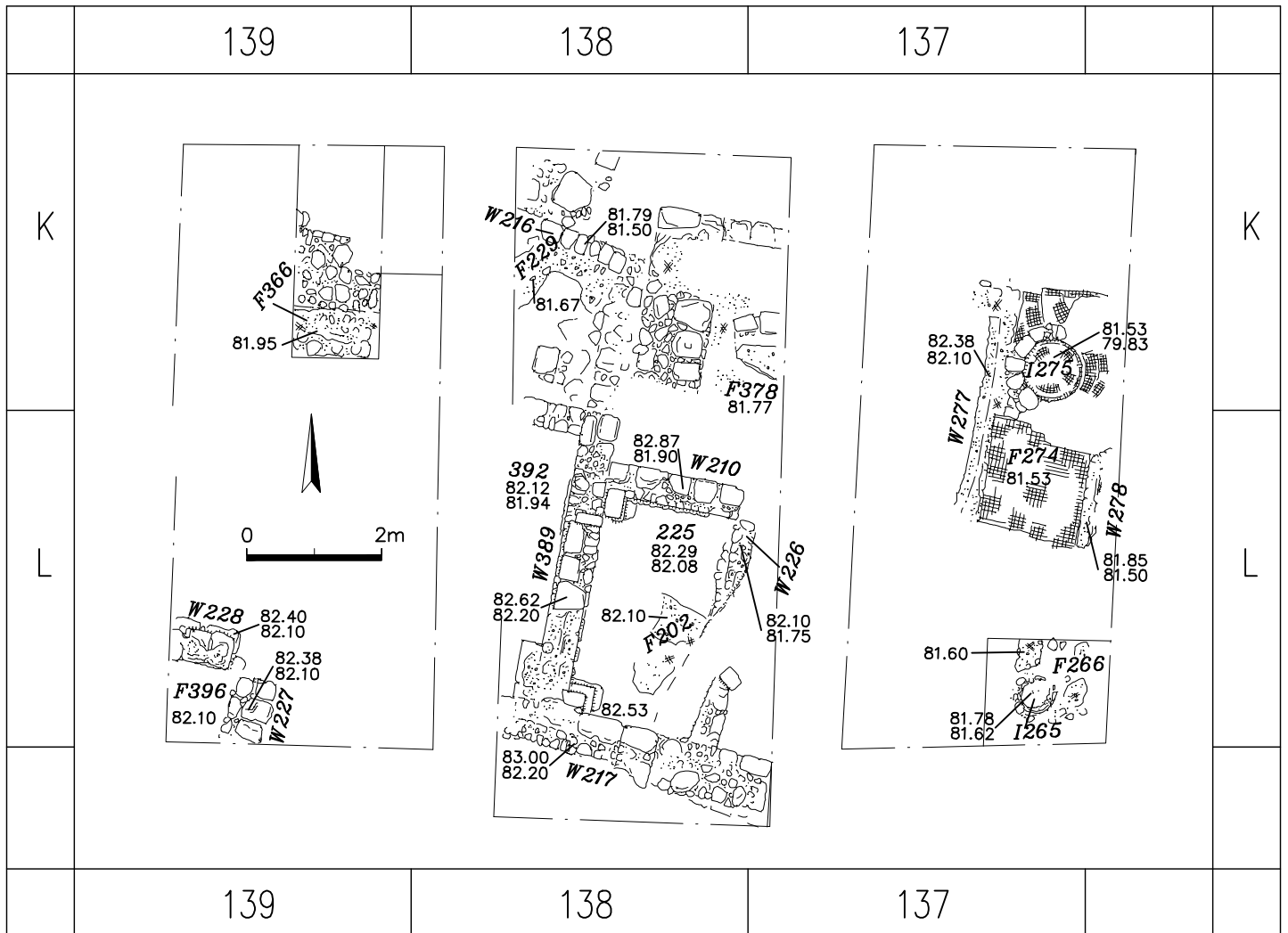


Fig. 5.1: Plan of the domestic complex.



Fig. 5.2: Domestic complex. Rectangular room with later pool and channel, looking north (*above*) and west (*below*).

The better-preserved part of the structure is a rectangular room (ca. 2 × 3.20 m) (Fig. 5.2). Its southern and eastern walls (W217, W226) were preserved to the height of the foundation course only (ca. 0.40 m), while the northern wall (W210) was preserved to a height of three courses (ca. 1 m). W217 and W389 may have been the delimiting walls of one of the structures in this complex as they continued to the east and north. Since no remains of a doorway were found in W210, W389, it seems that the access into the room was through a doorway in the southern and/or eastern wall.

In the northwestern and southwestern corners of the room built pilasters were unearthed which most probably were designed to support an arch.

The room's walls (at least the better-preserved) were built from an outer face made of ashlars and an inner face made of small fieldstones bound with mortar without plaster. This construction method is characteristic of the Byzantine period and later, and is known from many other sites, mainly in the central and southern parts of the country (e.g. Hirschfeld 1999:11; 2002:165).

The room had a plastered floor which abutted on the second course of the walls, and was founded on a fill of soil. Only a small section of the floor (F202) was preserved in the southern part of the room. Numerous pottery fragments, mainly of Gaza amphorae of the type dated to the 6th and 7th centuries CE (Fig. 5.7), were discovered in a trial trench together with tiles (Fig. 5.8) (Loci 225 and 392; Square L138), excavated in the northwestern corner of the room, where the floor was not preserved. Similar pottery was found right outside the western wall of the room (W389; Locus 390; Squares K138, L138). F378 is a foundation of ashlars and fieldstone, designated most probably to support a floor as is F229.

East of the above-mentioned room additional remains were found, which may have also belonged to the same structure. Most of these belong to a room(?) of which the western and eastern walls (W277, W278) were preserved to foundation height only (ca. 0.30 m). These too were built of

ashlars (Fig. 5.3). The floor of the room (F274) was a mosaic made of large white tesserae (4-5 cm²), although in some sections smaller tesserae were embedded. Against the western wall was a square pilaster which may have supported an arch. Next to the pilaster and W277 a round plaster-coated pool was unearthed (I275; 0.80 m in diameter; 1.70 m depth). Body fragments of ribbed Byzantine storage jars were embedded in the plaster. The pool's floor was of white mosaic made of medium-sized tesserae, and in its centre was a plastered settling pit. The pool ceased to be used sometime during the 'Abbasid period and became a refuse pit.

The northern and southern walls of the room, as well as the continuation of the floor in these directions, were completely destroyed by later robber trenches and pits attributed to the 'Abbasid period. A short distance south of the mosaic floor a *ṭabun* was found (Fig. 5.4; I265; 0.50 m in diameter), with a small patch of plastered floor next to it (F266). The pottery fragments found within the *ṭabun* and its foundations date it to the 6th and 7th centuries CE. The rest of the area around the *ṭabun* and the plastered floor was damaged by later activity, thus the relation between these remains and the mosaic-paved room are indistinguishable.

Other walls (W227, W228), a segment of plastered floor (F396) (Fig. 5.5) and remains of another floor (F366), founded on a layer of limestone, flint pebbles and yellowish sand, were found north-west of the remains mentioned above (Fig. 5.6). Based on the pottery found on them, these remains were dated to the 6th and 7th centuries CE as well. It is difficult to establish whether these remains are part of the same domestic complex.

The nature of the remains indicates that at least some of them belonged to domestic rather than industrially-oriented structures, although it is possible that we are dealing here with a more elaborate structure which had living quarters in its western part and industrial areas in its eastern part.



Fig. 5.3: Domestic complex. Mosaic floor with pool, looking south (*above*) and west (*below*).





Fig. 5.4: *Ṭabun* I265, looking west.



Fig. 5.5: Walls 227 and 228, looking south.



Fig. 5.6: Floor 366, looking south.

POTTERY

Most of the indicative pottery from the domestic complex originated in Locus 392 in the ashlar-built room. This pottery is represented almost exclusively by fragments of elongated Gaza amphorae with a plain rim that continues the line of the shoulder and a conical ribbed base (Fig. 5.7). This variant is dated to the 6th and 7th centuries CE (Majcherek 1995:169, Form 4, Pls. 7-8).

Other ceramic objects found in the same locus are fragments of flat lower roof tiles (*tegulae*) with square-sectioned fringes (Fig. 5.8). Such tiles, used mainly for roofing public but also private and even industrial buildings, were common throughout Palestine between the Late Roman and the Umayyad periods (e.g. Lombardi 1956-57: Figs. 8-9; Pele 2003: Pl. I.20; Tsafir and Hirschfeld 1979: Fig. 27).

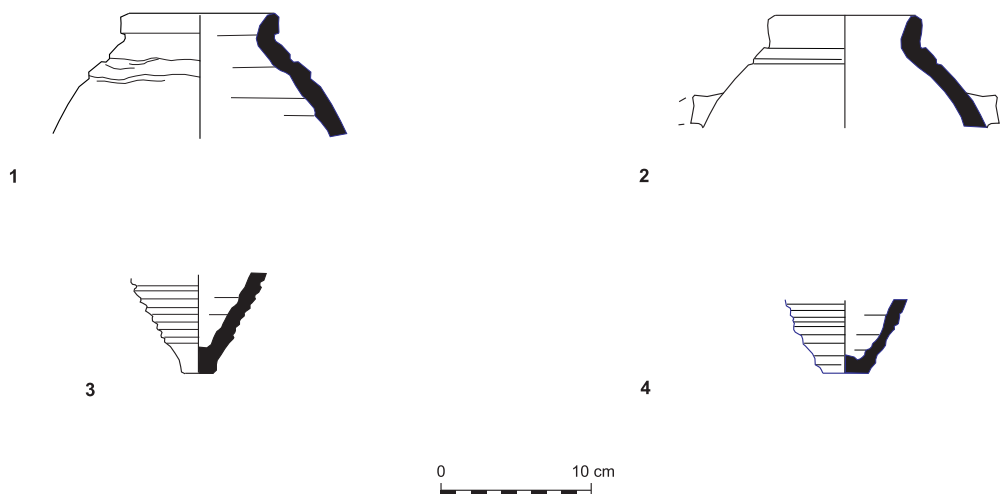


Fig. 5.7: Gaza amphorae: 1) L225; 2) L392; 3) L225; 4) L392.

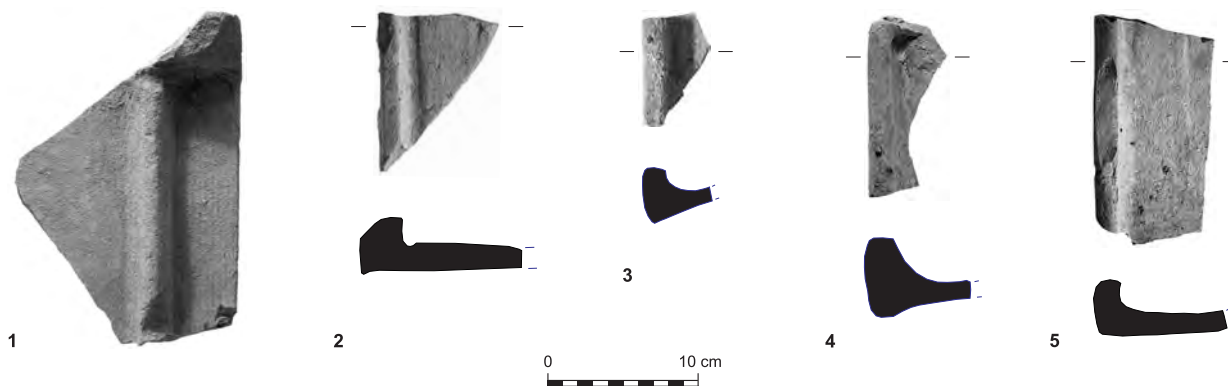


Fig. 5.8: Byzantine roof tiles (L392).

OIL PRESS COMPLEX

The remains of an oil press were found in Squares R139, Q139 and Q140 (Fig. 5.9). The complex includes two pressing systems of the lever and screw type, built side by side in an east-west orientation.

The crushing basin and crushing stone were not found, probably having been uprooted from their original position at a later stage. The enclosed walls and the floors/paved surfaces of the complex were also not preserved due to later construction activities and stone robbing. One of the screw weights and the two collecting vats of the pressing systems were preserved *in situ*. The second screw weight was found lying on its side at a higher level and a short distance to the east of the rest of the oil press elements. All these elements are monolithic and carved of limestone (*nari*). Other elements not found in the excavations (probably due to robbing)

are the stone pressing bases, originally put on top of the collecting vats.

The screw weight found *in situ* most probably belonged to the northern pressing system (Fig. 5.10). It is relatively high (1.70 m) and has an oval cross-section (ca. 0.85 × 1 m in diameter). It has a central round socket (0.33 m in diameter; 0.22 m depth) and two external dovetail mortises (0.75 m length; 0.11 m upper width; 0.17 m lower width; 0.12 m depth). The weight was set into the virgin *hamra* soil to a depth of 0.40 m. At a higher level, adjacent to its western and northern sides, thin fieldstone walls with *hamra* fills between its stones were noted (Fig. 5.11). The walls and the partial burying of the massive weight in the ground was designed to stabilize it during pressing and allow rotation of the wooden screw which was fastened to the weight.

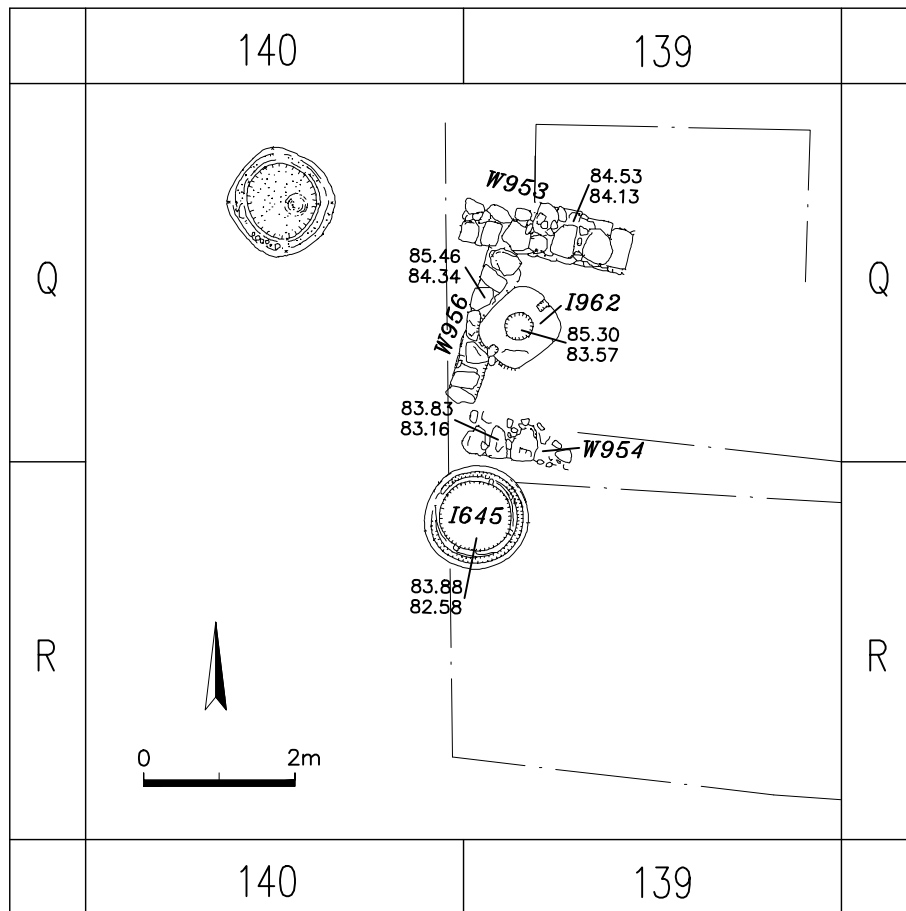


Fig. 5.9: Plan of the oil press.

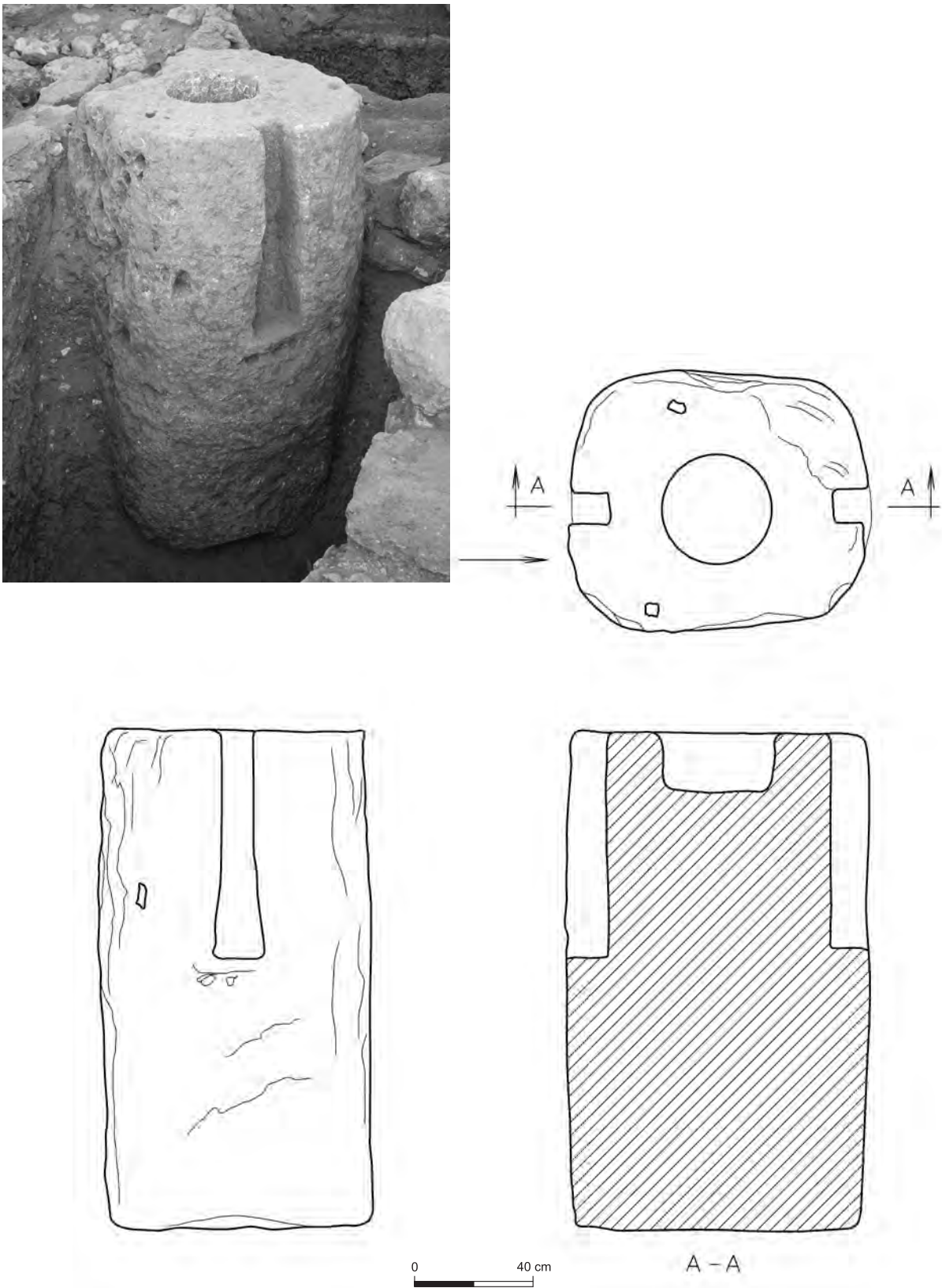


Fig. 5.10: Screw weight *in situ*.



Fig. 5.11: Screw weight *in situ*, looking west.

The collecting vat of the northern pressing system was placed 2.40 m west of the screw weight (Fig. 5.12). It is rounded and has a barrel-shaped section (1.38 m external diameter; ca. 0.90 × 0.96 m internal diameter; 0.80 m depth). A rounded settling pit (0.25 m in diameter; 10 cm depth) was hewn around the bottom. A deep channel (9-15 cm width; 10-20 cm depth) was carved almost all along the vat's rim in order to collect the oil from the upper pressing base and funnel it into the vat by means of three lateral grooves. The vat was buried in virgin soil almost up to its rim, and was most probably surrounded by a floor or other solid surface which was not preserved. The estimated length of the wooden beam which connected the screw weight

and the pressing base is ca. 5 m, since one end of the beam was put inside a niche in the western wall of the oil press (which was not preserved) and the other end reached at least the centre of the screw weight.

The screw weight of the southern pressing system is much smaller and somewhat different from the weight of the northern pressing system (Fig. 5.13). It is shorter (1.45 m) and has a round cross-section (0.60 m in diameter) (Fig. 5.14). Like the northern weight, it has a central round socket (0.20 m in diameter; 0.12 m depth), but its two external dovetail mortises (0.60 m length; 7 cm width and depth) have a square-shaped depression (ca. 0.13 × 0.14 m; 10 cm depth) at their ends.

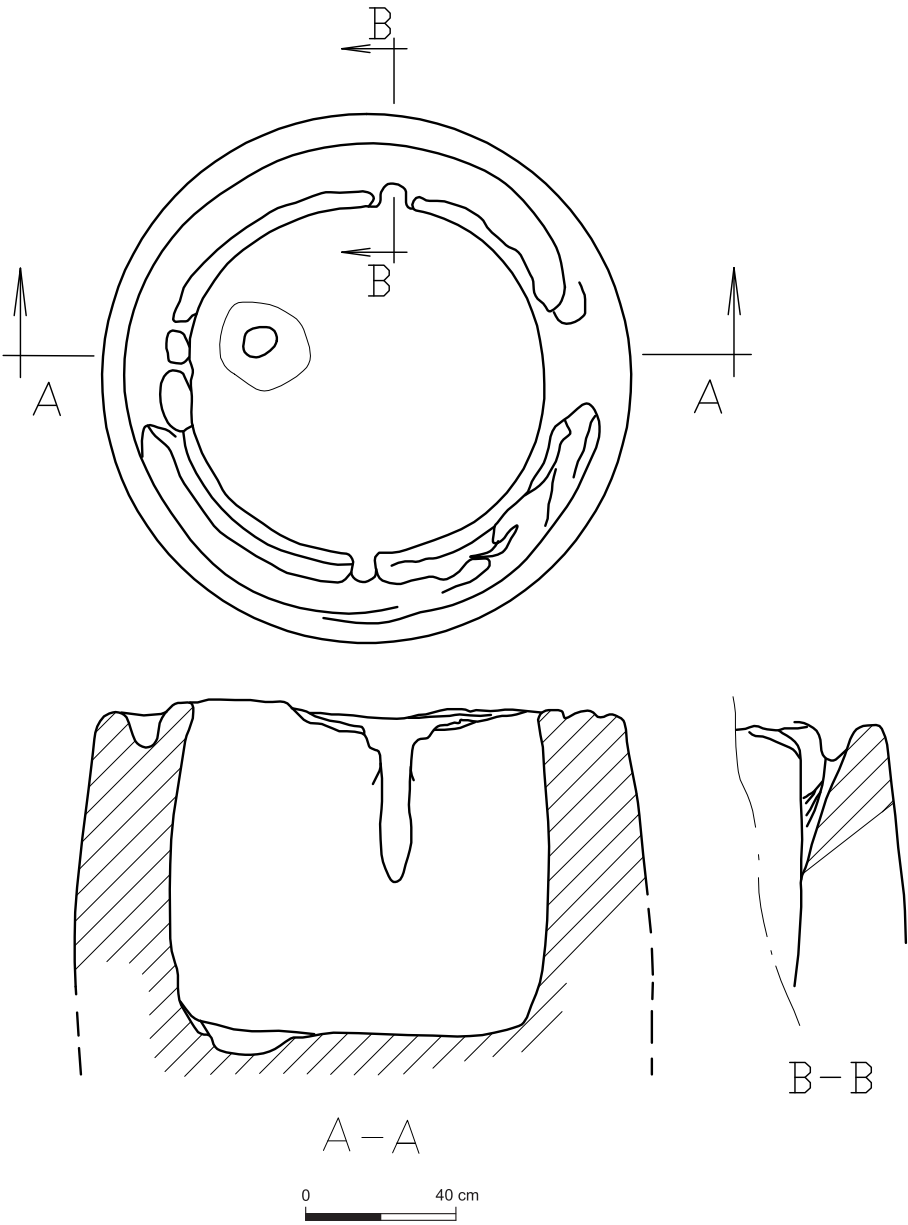


Fig. 5.12: Northern collecting vat *in situ*.

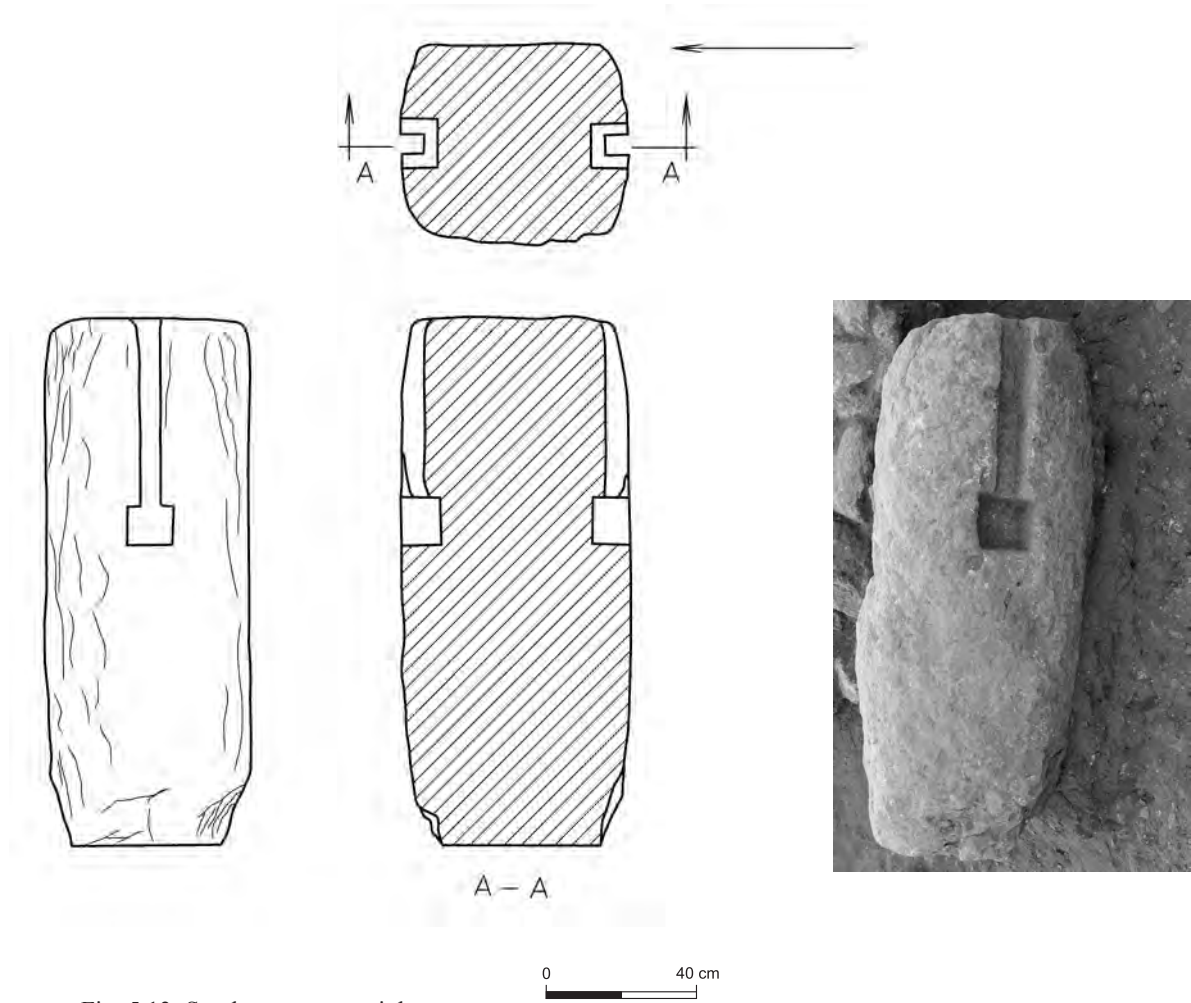


Fig. 5.13: Southern screw weight.



Fig. 5.14: Southern screw weight, looking east.

The collecting vat of the southern pressing system is almost identical to the northern collecting vat, both in shape and dimensions (1.35 m external diameter; 0.90 m internal diameter; 0.80 m depth) (Fig. 5.15). It too has a settling pit (0.25 m in diameter; 10 cm depth) at the bottom and a radial channel (0.12 m width; 10-15 cm depth) with grooves. This vat was buried in the ground at the same level as the northern vat.

The distance between the two vats (3.90 m) actually marks the distance between the two parallel pressing systems. Both screw weights used in this oil press are subtypes of Frankel's Samaria screw weight which and was the commonest type

used in Palestine and abroad (mainly in Italy), mainly in the central hill country and coastal plain (Frankel 1994:61; 1999:111-113, Map 19). The lever and screw pressing technique flourished in the region during the Byzantine period, and continued in use well into the Umayyad period. A fragment of a lamp of a type dated to the Umayyad period, found in the foundations of the northern wall built near the findspot of the northern screw weight, apparently date the construction of the oil press no earlier than the late 7th century CE. The lamp fragment, however, may represent a later addition or renovation to the oil press, though that would indicate its use during the Umayyad period.



Fig. 5.15: Southern collecting vat *in situ*.

POTTERY

The only indicative pottery sherd associated with certainty to the period of use of the oil press complex belongs to a lamp decorated with a geometric pattern of short lines and dots (Fig. 5.16; Locus 778). This type of lamp, which originally had a small conical handle and a ring base, is dated to the second half of the 7th century CE to the late 8th century CE (Hadad 2002:82-95, Type 36; Magness 1993:255-258, Forms 4B and 4C [Early Channel-Nozzle Oil Lamps]).



Fig. 5.16: Umayyad lamp fragment (L778).

WINE PRESSES

Remains of at least two wine presses were found, one in the northern part of the site and another one in its western part.

The first wine press was found in Square O138 (I555) (Fig. 5.17). It consisted of a white mosaic treading floor and a settling pit (I574; 0.7 m diameter, 0.7 m depth) in the south-western corner. The mosaic floor (ca. 1.5 × 1.5 m) which abutted to the edge of the settling pit was built of large, white limestone *tesserae* (4-5 cm²), as was the settling pit. Curiously, no indicative rim fragments were found in the foundations of this wine press but a Late Byzantine date is plausible based on the many ribbed pottery fragments of southern Palestinian bag-shaped jars documented. In the Early Islamic period the settling pit was modified for use as a silo or other storage facility, as is evident from a later circular stone construction that was partly preserved on its western half.

The second wine press (I1699) was found in Squares W10, W11, X10, X11, directly on virgin soil (Fig. 5.18). A rectangular mosaic treading floor (F1700) (4.7 m width; 8.5 m known length) made of large white limestone *tesserae* (3-4 cm²) was preserved (Fig. 5.19). This treading floor was surrounded on the north, east and south (and apparently also from the west) by thin plastered

walls (0.4-0.5 m thick) built of fieldstones bonded with mortar. In the northeastern corner of the treading floor, a round plastered setting pit was found (Locus 1728; 0.9 m diameter, 0.53 m depth) (Fig. 5.20), which could also have served as a collecting vat. Another possible collecting vat built of small fieldstones and plastered on the interior (I1670; 1 m diameter; 0.6 m depth), was found beyond the northern wall of the treading floor (Fig. 5.21).

Beyond the southern wall of the treading floor a large basin-like limestone installation was found out of context (I1714; Fig. 5.22). This coarsely-carved installation is rectangular (1.1 × 1 m; 0.8 m high) and has a central depression (0.5 × 0.5 m; 0.5 m depth) (Fig. 5.23). Based on numerous parallels, it may be suggested that this is the stone press-bed of a wooden screw used for secondary grape pressing that was originally placed in the centre of the treading floor. It was uprooted from its original place (for reasons unknown) sometime after the wine press ceased to exist (most probably during the Umayyad period, and see below; e.g. Ayalon 1997a).

Remains of some other mosaic-paved surfaces were found beyond the southern, western and eastern borders of the treading floor in Squares X10, X12, Y10 and Y12. These surfaces could have belonged to other parts of the same wine press complex (see for example Fig. 6.74).

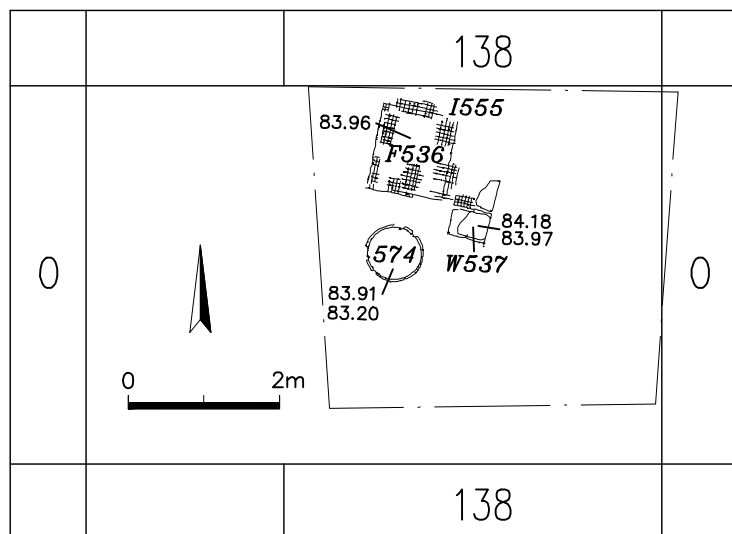


Fig. 5.17: Northern wine press. Plan (left) and view looking east (right).

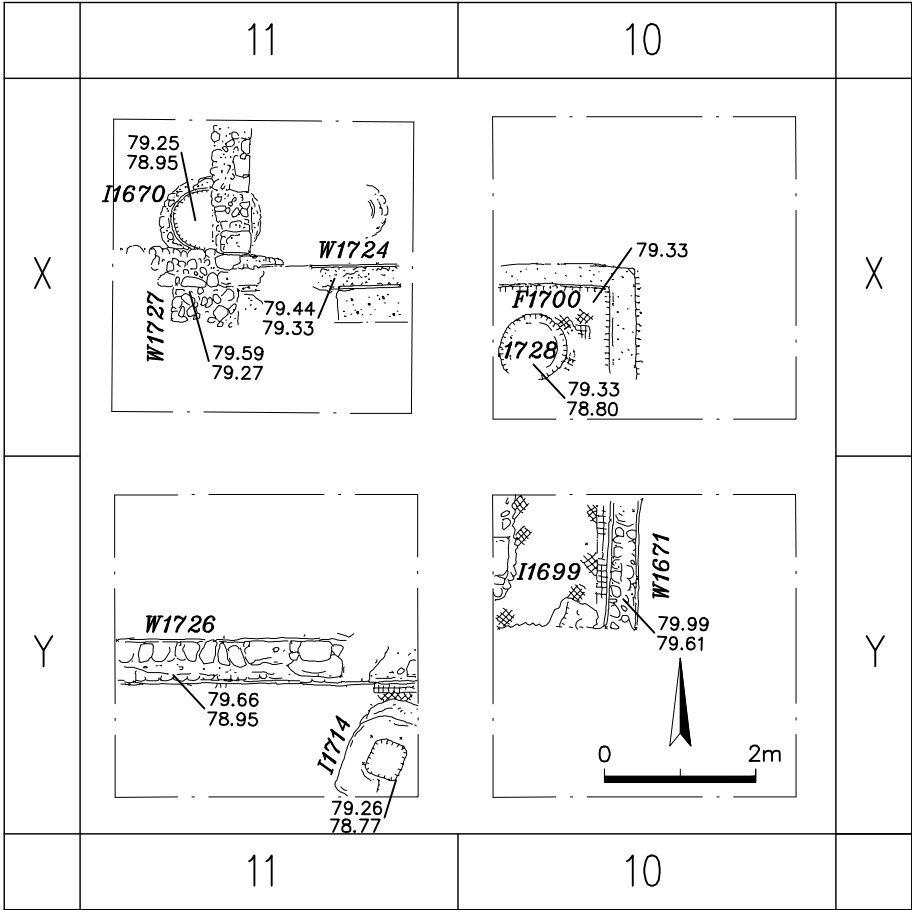


Fig. 5.18: Western wine press. Plan of the rectangular treading floor.



Fig. 5.19: Western wine press. The rectangular treading floor, looking west.



Fig. 5.20: Western wine press. The settling pit.



Fig. 5.21: Western wine press. The collecting vat.



Fig. 5.22: Stone press-bed of the western wine-press wooden screw upon discovery, looking south-east.

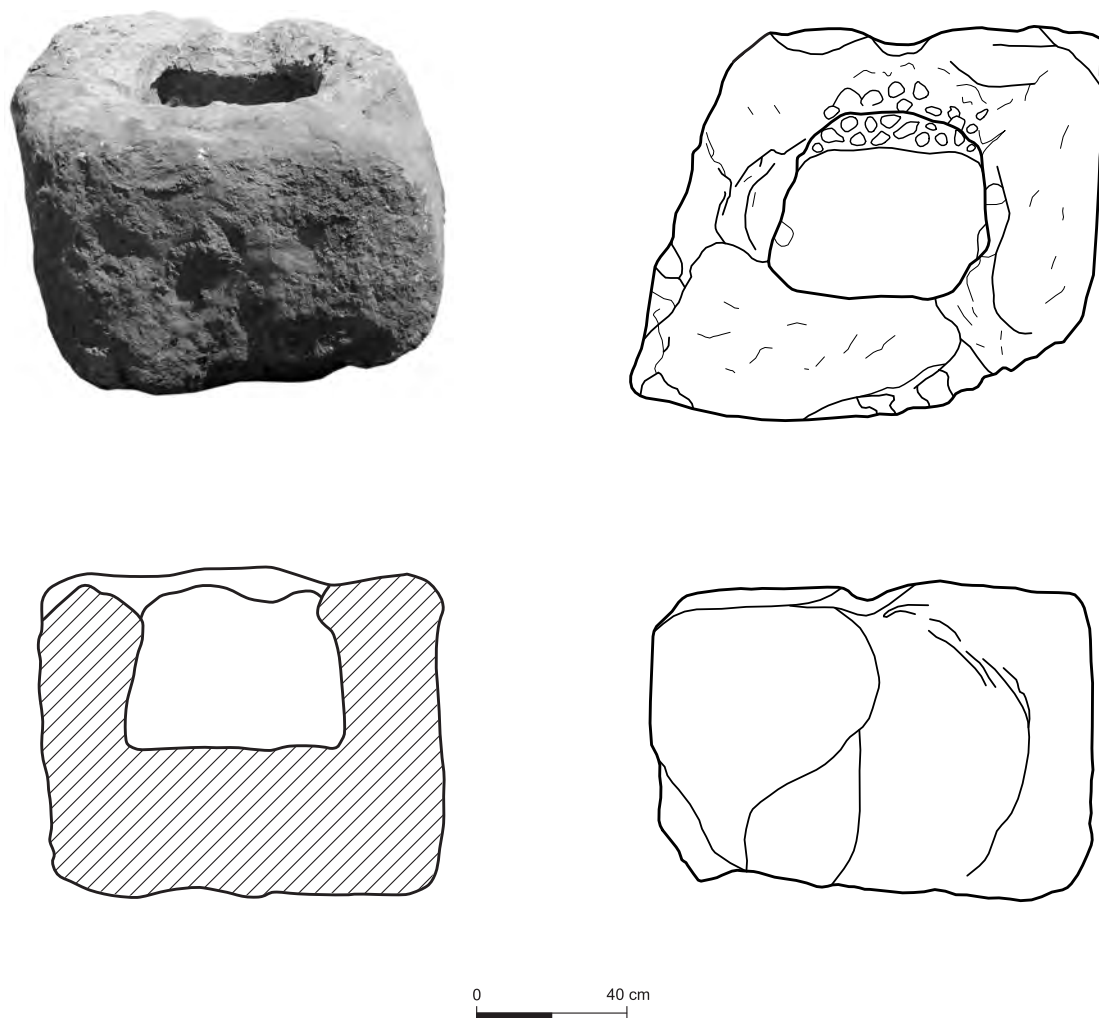


Fig. 5.23: Western wine press. The stone press-bed of a wooden screw (I1714).

Although only small body sherds of southern Palestinian bag-shaped jars were found below the foundations of wine press I1698 (of the type discovered in our pottery kiln dumps), these finds can easily date the construction of the wine press to the Late Byzantine period.

Very little can be said about the typology of the poorly-preserved wine press found in the northern part of the excavation area. However, based on the remains of the better-preserved wine press on the western fringes of the site, it can be determined that this wine press belongs to the

improved type composed of several connected units and a secondary pressing facility.

Still, the preserved parts of this wine press are too meagre to determine whether it was a four-rectangle plan wine press or a composite plan wine press, both are common variants during the Byzantine period (Frankel 1999: 149-152). The screw base of this wine press, however, can be identified as the commonest variant of Frankel's Ayalon [valley] press, i.e., a square/rectangular press-bed with a central square mortice (1999:141-142, Map 35).

POTTERY KILNS

Remains of two pottery kilns were found in the western part of the site (Fig. 5.24). The more southerly of these was found in Square T10, embedded in virgin soil. This mud-brick installation was built in the shape of a horseshoe (I1584; external measurements: 1.5 × 1.5 m; internal measurements 0.7 × 1.1 m) (Fig. 5.25). Next to the kiln, in the eastern section of this square, a domed collapse of mud-bricks was observed. In Square S11, a pit (Locus 1592) which contained large amount of pottery sherds, all belonging to a variant of a Late Byzantine southern bag-shaped storage jar was found. It seems likely that the pottery found in this pit represents the production refuse of a kiln.

Poor remains of a slightly rounded mud-brick built wall, which may belong to another pottery kiln, were found to the north of the former, in Square S10 (I1533; 1.5 m preserved length; 0.30 m width) (Fig. 5.26), although there is not enough in the current data to reinforce this assumption.

POTTERY

The great majority of pottery found in relation to the pottery kiln/s (Loci 1586, 1588 and 1592) are southern bag-shaped jars that were also found in the debris of the secondary glass workshop dump (below) (Fig. 5.27:3-6), i.e., with a ribbed body and shoulders and a short plain neck (Kingsley 1994-95: Fig. 3: Group 2). Casseroles of Late Byzantine date (cf. Magness 1993:211-213, Form 1) were found in very small quantities (Fig. 5.27:1-2) but it is not clear if they are intrusive or formed part of the kiln dump.

The existence of a pottery production industry in rural settlements of the Byzantine period in Palestine is a well-known phenomenon. Archaeological investigations (both excavations and surveys), mainly in the central and southern coastal plain, brought to light dozens of sites, some urban but mostly rural, which took part in intensive pottery production during the Byzantine period, and mostly in its later part. Many examples are known, for instance, from the southern Sharon plain (Ayalon 1997b) and from the southern coastal plain (e.g. Israel 1993; Gadot and Tepper 2003).

Additional evidence for pottery production was found in sites closer to Ramla (South), such as Yehud (van den Brink and Shemueli 1997), Khirbat el-Ni‘ana (Sion 2007:39*, 46*-47*; Tsioni 2008:39-44), Ḥorbat Hermas (Elisha 2007) and Kafr ‘Ana.¹ While no information has been published on the types of vessels produced in Yehud, there is evidence that cooking vessels and oil lamps were produced at Khirbat el-Ni‘ana (located 4 km southeast of Ramla [South]; Sion 2007:39*, 46*; Sussman 2007:64-69, 71; Tsioni 2008:43) and that at least some of the kilns at Ḥorbat Hermas (located 7 km southwest of Ramla [South]) produced southern bag-shaped jars. However, the jars produced at Ḥorbat Hermas belong to another variant of southern bag-shaped jar, with a densely-combed shoulder (Y. Elisha, personal communication). It is important to note, thus, that both variants of the Late Byzantine southern bag-shaped jar were produced in the same region, though probably not in the same settlements and by the same artisan.

1. Remains of Late Byzantine pottery kilns were unearthed in 2007 in an excavation carried out at Kafr ‘Ana by O. Sion on behalf of the Israel Antiquities Authority. These kilns probably produced Gaza amphorae, as indicated by the enormous and almost homogeneous amount of fragments of these vessels found in relation to the kilns (O. Sion, personal communication; see also Taxel 2007:13).

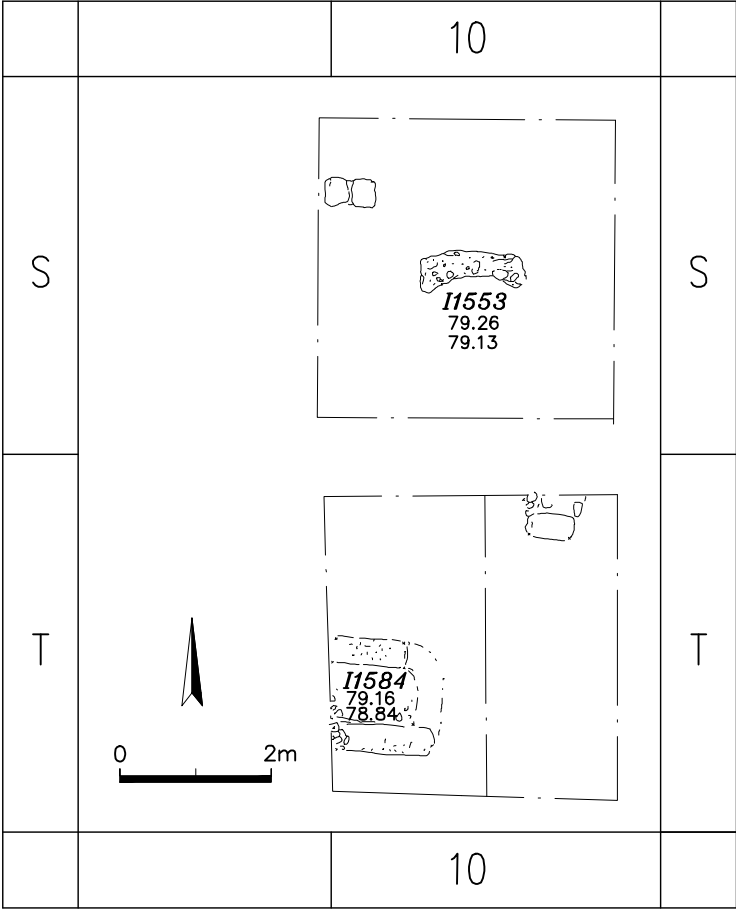


Fig. 5.24: Plan of the pottery kilns.



Fig. 5.25: Southern pottery kiln, looking west.



Fig. 5.26: Northern pottery kiln, looking south.

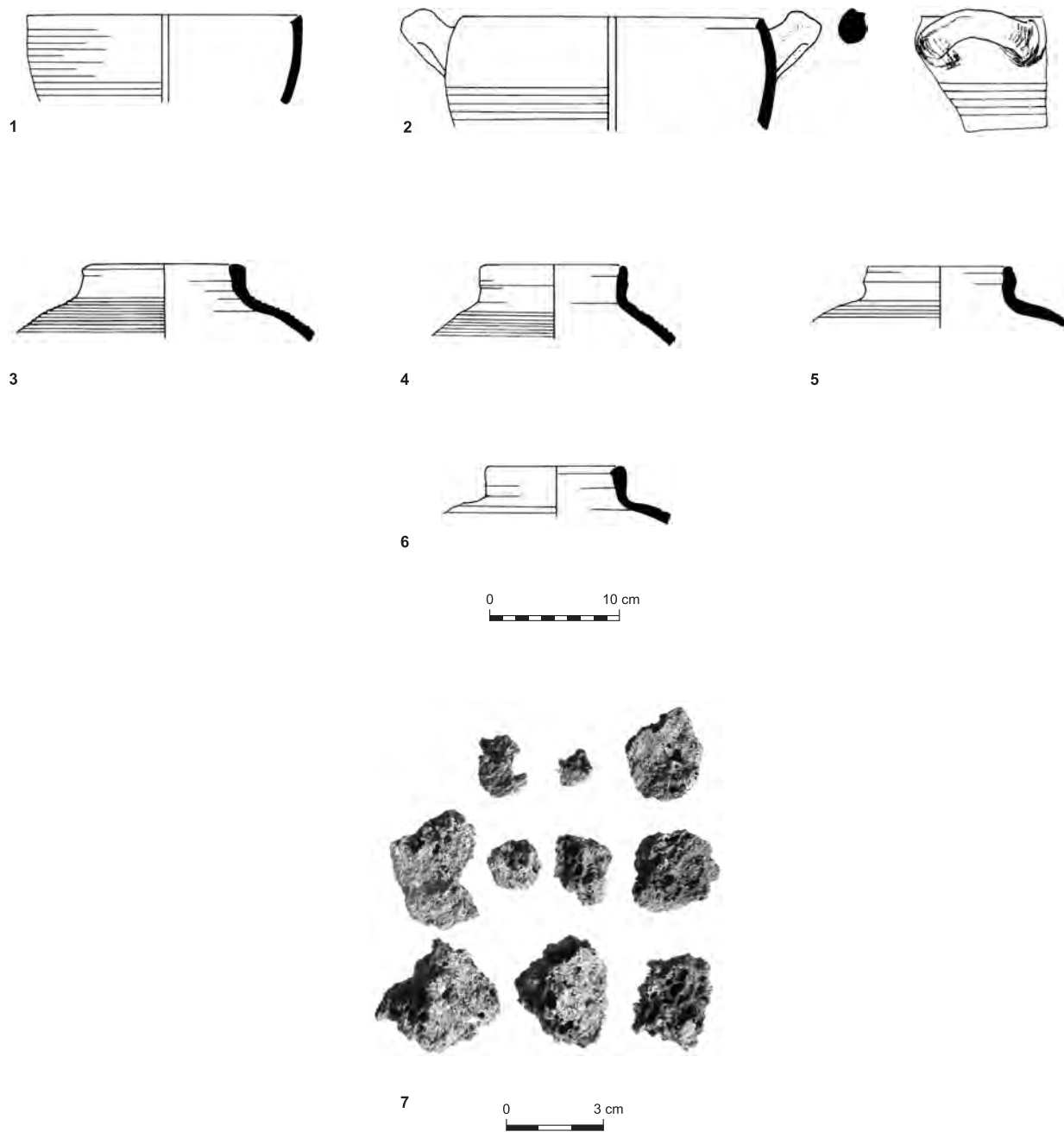


Fig. 5.27: Pottery (L1586, L1588) and slag (L1592) from a kiln dump.

A SECONDARY GLASS WORKSHOP

Oren Tal, Ruth E. Jackson-Tal and Ian C. Freestone

The glassworking debris (Locus 966), which was related to the production of vessels, was found in one of the excavated squares (Y134) on virgin red loam (*hamra*) following the dismantling of walls from an installation that was attributed to the Early Islamic period. Although the architectural remains could not be connected to the workshop debris with certainty, several fragmentary glazed and unglazed fired mudbricks, sometimes mixed with fieldstones, that probably formed part of the workshop's furnace were recovered. The bricks (2 cm thick) can be reconstructed as about 12 cm² (Fig. 5.28). Fired mudbricks were often used to build pottery kilns and glass furnaces. Evidence for the use of such bricks, occasionally mixed with fieldstones, has been found in furnaces at Late Roman Jalame (Weinberg 1988) and Mediaeval Giv'at Yasaf (Tell er-Ras/Somelaria) (Weinberg 1987) and in many glass furnaces in western Europe.

Comparison with the evidence from western Europe reveals that secondary glass furnaces vary in shape (rounded or rectangular) and are constructed of bricks, tiles, and stones. In most cases only the lower part of the furnace is preserved, and the reconstruction of glass furnaces is therefore usually based on iconographic sources which are few and difficult to interpret (Foy and Nenna 2001:47-66). In fact, the iconographic (archaeological) sources are virtually restricted to a lamp and a terra-cotta, both of which are dated to the Early Roman period and show two levels in a rounded glass furnace. The lower level probably included the firing chamber, divided into two parts, and the upper level probably consisted of melting chambers, also divided into two sections, where the raw glass and recycled cullet were melted (Price 1988:317-319; Stern 1995:22; Foy and Nenna 2001:61-62).

The glass refuse consists of raw chunks and lumps, moils, waste (including drops, threads, melted and deformed vessels) and fragmentary vessels (Fig. 5.29). Dating to the 6th and 7th centuries CE is based on the discovery of the glass vessels (Fig. 5.30) as well as pottery sherds (Fig. 5.31).

Among the many pottery finds were rim fragments of a Palestinian bag-shaped jar (Fig. 5.31:1). Based on several local discoveries of the remains of pottery kilns that produced jars of this type, this was locally made (Figs. 5.24-5.27) (cf. Kingsley 1994-95: Fig. 3, Group 2). Also found was a deep ribbed-wall casserole (Fig. 5.31:2) (Magnes 1993:211-213, Form 1, esp. No. 12). The debris was sealed by fills that yielded pottery of similar (Late Byzantine) date, including body fragments of the Palestinian bag-shaped jar type (e.g. Fig. 5.31:3).

The glass finds illustrated here on a scale of 1:2 can be described as follows:

PRIMARY PRODUCT REMAINS

1. Six raw chunks (the largest being about 3 × 1.5 cm) of yellowish green and bluish green glass, covered with a layer of silver weathering, probably broken from larger chunks and used to produce vessels (Fig. 5.32). Alternatively, these chunks may be the remains of primary glass chunks, small lumps and recycled vessel fragments (i.e., cullet) melted in the furnace. However, the fact that, with a single exception (Table 5.1:4 that is well outside but only in potash), all of the glasses analyzed display precisely the same correlation between the various chemical components. This strongly suggests that all of them came from the same furnace and represent a single source for the glass. It also argues against the use of cullet. In debris from furnaces that appear to have been used exclusively for the remelting

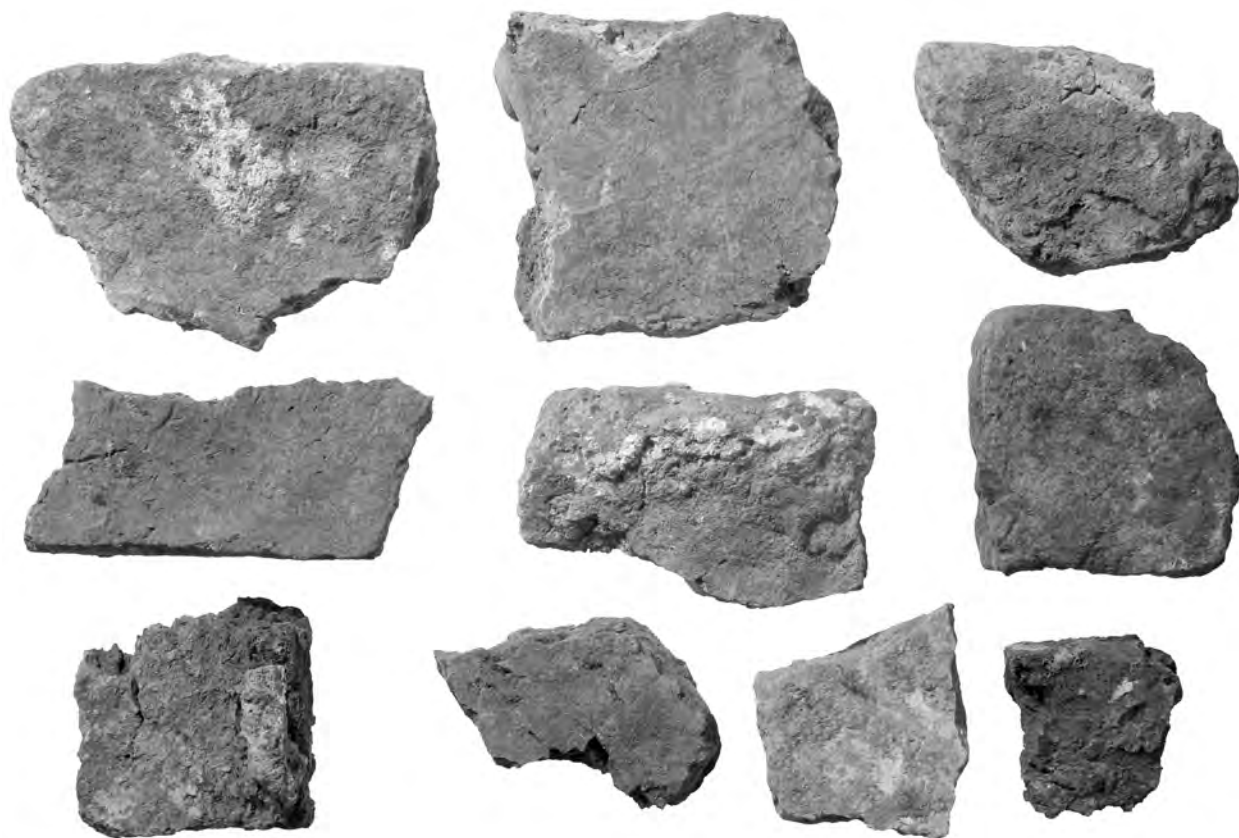


Fig. 5.28: Glazed and unglazed fired mudbricks from the workshop furnace (L966).



Fig. 5.29: Debris from the glass workshop (L966).



Fig. 5.30: Glass vessels from the workshop debris (L966).

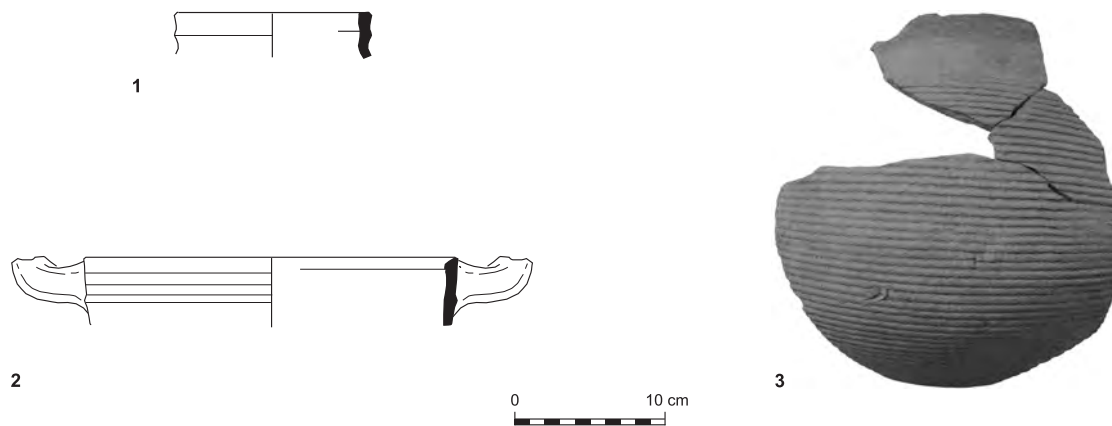


Fig. 5.31: Pottery from the glass workshop (L966).



Fig. 5.32: Raw glass chunks (L966).



Fig. 5.33: Glass lumps (L966).

of cullet (e.g. San Vincenzo, Italy, in which old vessels were melted in pots), there is no evidence of such chunks (personal observation of Ian C. Freestone).

2. About 30 small (1-4 cm) rounded and uneven lumps of blue and green glass covered with a thick layer of limy/ashy material. These lumps may be waste from the mixing of raw glass in the furnace. They may have been left on the floor and sides of the furnace, thus becoming contaminated with lime, or they may have been remelted with cullet (Fig. 5.33). The material covering these lumps may be ash or a fuel-ash slag. As is noted below, the primary glass used at Ramla (South) was contaminated by unusual quantities of fuel ash. These lumps may be direct evidence of that process.

VESSEL PRODUCTION REMAINS

1. Thirteen moils made of colourless glass with a bluish tinge and covered with silver weathering. Moils are waste glass that remains around the end of the blowing tube after the vessel has been removed, usually by cracking off (for definition see Price 1998:333, Note 4; Amrein 2001:22). They are typically cylindrical rods with one end cut off straight and the other end left rounded and uneven. The moils (1-2 cm in diameter) clearly indicate the use of blowing tubes for the production of glass at the site (Fig. 5.34). Glass moils appear in two basic shapes, depending on their distance from the blowing tube. Narrow cylindrical moils, like the finds at Ramla (South), indicate the upper part of the glass left around the end of the blowing tube. Broader moils, shaped like the upper part of a bowl, like those found together with cylindrical types in a Late Roman glass furnace at Jalame, indicate the lower part of the glass, cut from the

top of an open, wide-rimmed vessel (Weinberg 1988:35, Pls. 3-5E, Colour Pl. 3A; Amrein 2001: 22-33, Figs. 12.1, 15, 18, and 20-23, Pls. 10.5-8, 11.9-16, 12.17-19, and 17.56 and 57, with many western European parallels).²

2. About 15 fragments of working debris: deformed glass, melted pieces, drops and threads made of colourless, bluish and greenish glass and covered with a thick layer of black and silver weathering. These objects are typical by-products of the making of glass vessels. The drops would have fallen either from the gob of glass removed from the furnace or from the blowing tube while the vessels were being formed. Their shape would be the result of the sudden contact of the warm glass and a cold surface (Fig. 5.35) (Amrein 2001:35-37, Fig. 31, Pl. 13.24-27). Similar finds were discovered at Late Roman Jalame (Weinberg 1988:33-37, Pls. 3-6, Colour Pl. 3A).

FINAL PRODUCTS

The glass vessels found in the workshop refuse consist of about 50 fragments of colourless glass with a bluish tinge, covered with silver weathering. Most of these fragments cannot be assigned to a specific type, but they include a rim and wall fragment of a wineglass or lamp-bowl with applied horizontal blue trails (Fig. 5.36:1), a wick-tube from a suspended lamp-bowl (Fig. 5.36:2), and the base of a stemmed hollow lamp-bowl (Fig. 5.36:3). There are also straight or infolded bottle rims, concave bottle bases, a wineglass base and a mould-blown wall fragment. These fragments were probably the remains of glass products made in the furnace. However, they could have been used as cullet. In either case, the homogeneity of their chemical composition indicates that they represent types of vessels produced in the furnace.

2. For broad moils, see Weinberg and Goldstein 1988:87-89, 98-101, Figs. 4.45 and 52; Amrein 2001:23, Fig. 12.2.

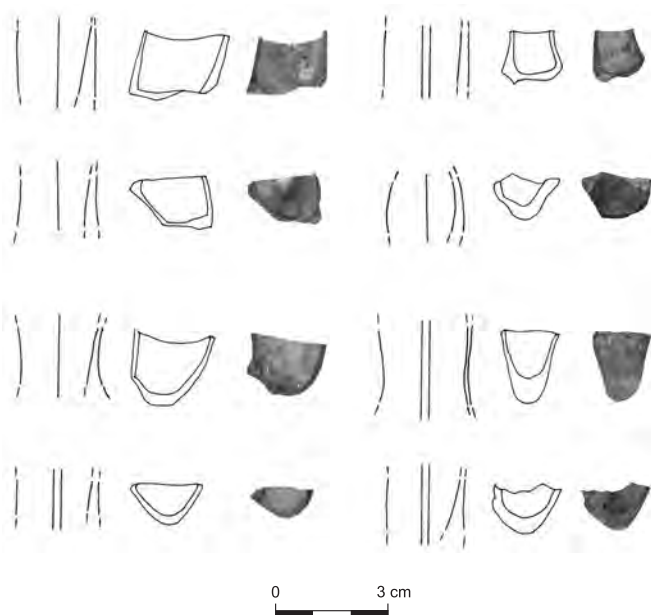


Fig. 5.34: Moils (L966).



Fig. 5.35: Working debris (L966).

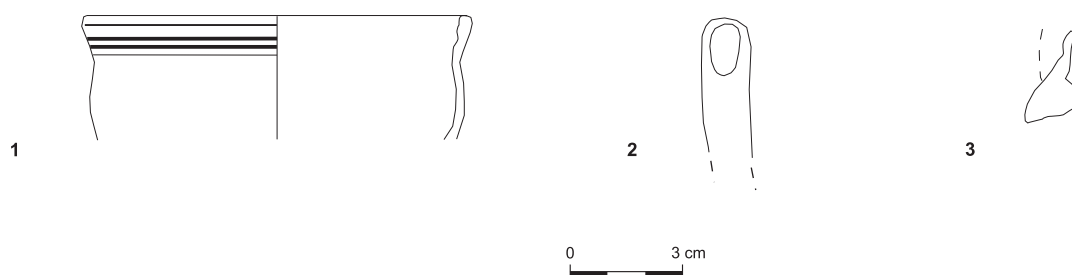


Fig. 5.36: Selected drawings of glass vessels from the workshop debris.

1. Locus 966. Rim and wall fragment. Colourless. Silver weathering and iridescence. Straight rounded rim, slightly curving-in wall with applied three horizontal blue trails on the upper side of the exterior rim. Rim D. 10 cm.
2. Locus 966. Fragment of wick tube. Colourless with greenish tinge. Silver weathering and iridescence. Cylindrical tube, tapering rim and cut base. Base D. 1 cm.
3. Locus 966. Fragment of stemmed Imp bowl. Light greenish-blue. Thick white weathering and iridescence. Small part of cylindrical hollow tube with beginning of knobbed base. Base D. 1.5 cm.

CHEMICAL ANALYSES

Samples of the glass were analyzed with a JEOL JXA-8600 Superprobe at the Institute of Archaeology, University College London by courtesy of Thilo Rehren. They were performed by Kevin Reeves who carried out our earlier study (Tal, Jackson-Tal and Freestone 2004) using the same technique and instrument.

Each analysis represents the mean of at least six spots on the glass fragment. Average relative

standard errors were 0.2% for SiO_2 , 0.5% for Na_2O , 0.5% for CaO , 0.8% for Al_2O_3 , 2% for K_2O , 2% for MgO , 3% for Fe_2O_3 , 2% for Cl , 13% for SO_3 , and 8% for P_2O_5 . The results were checked against Corning Museum ancient glass standards A and B, as well as a commercially available glass standard. Small corrections were made to the CaO , Al_2O_3 , and Fe_2O_3 values to bring them in line with the standards.

The results are presented in Table 5.1.

TABLE 5.1: ANALYSIS OF GLASS FROM RAMLA BY ELECTRON MICROPROBE*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	chunk	chunk	chunk	chunk	chunk	chunk	vessel	vessel	vessel	vessel	vessel	vessel	vessel	moil	moil	moil?
SiO ₂	71.00	70.04	70.91	69.53	70.57	69.88	70.36	70.57	70.55	70.45	70.27	70.67	70.27	70.68	70.46	70.94
TiO ₂	0.11	0.12	0.11	0.10	0.11	0.13	0.11	0.12	0.12	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Al ₂ O ₃	3.03	2.90	2.88	3.06	2.84	2.91	2.95	2.92	3.07	2.91	2.95	2.95	2.98	2.90	2.92	2.90
Fe ₂ O ₃	0.66	0.62	0.55	0.55	0.57	0.65	0.60	0.61	0.63	0.62	0.61	0.58	0.59	0.61	0.61	0.60
MnO	0.03	0.02	0.03	0.01	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.01
MgO	0.70	0.71	0.61	0.64	0.68	0.75	0.69	0.69	0.74	0.70	0.70	0.68	0.71	0.70	0.70	0.67
CaO	8.62	9.36	8.36	8.71	8.65	9.27	8.86	8.70	8.46	8.80	8.78	9.14	9.65	8.47	8.69	8.43
Na ₂ O	14.03	13.88	14.76	13.77	14.40	13.95	14.41	14.40	14.51	14.29	14.25	13.78	13.45	14.62	14.53	14.48
K ₂ O	0.94	1.41	0.88	2.67	1.19	1.48	1.06	1.03	0.96	1.11	1.36	1.11	1.30	0.97	0.99	0.92
P ₂ O ₅	0.13	0.23	0.12	0.20	0.18	0.28	0.17	0.16	0.14	0.19	0.19	0.17	0.20	0.15	0.16	0.13
SO ₃	0.07	0.04	0.05	0.05	0.06	0.05	0.07	0.08	0.09	0.07	0.07	0.06	0.05	0.08	0.08	0.08
Cl	0.69	0.68	0.73	0.71	0.72	0.61	0.70	0.69	0.70	0.70	0.69	0.71	0.66	0.72	0.73	0.74
Total	100.51	100.35	100.14	100.45	100.45	100.45	100.30	100.33	100.44	100.45	100.41	100.48	100.51	100.41	100.55	99.14

* The data are in weight percent, normalized to 100%. Original analytical totals, after correction to secondary standards, are given.

These are soda-lime-silica glasses with low potash (K_2O) and/or magnesia (MgO). This means that they are also natron glasses, as is typical for the first millennium CE until the 9th century CE (Table 5.1). The glasses are similar in composition, but they show some variation, notably in K_2O , which ranges from 0.88 to 2.67 wt. %. Most of the other oxides vary significantly, but over a limited range. The vessels and raw glasses show more or less similar compositional ranges.

The variations in composition are best understood through a series of variation diagrams. In particular, lime (CaO) and phosphate (P_2O_5) are strongly correlated (Fig. 5.37), as are potash and phosphate (Fig. 5.38). There is a weak correlation between magnesia and these components. On the other hand, soda (Na_2O) and silica (SiO_2) show a positive correlation, and they are negatively correlated with potash, lime, and phosphate (e.g. Fig. 5.39). The typical components of wood or plant ash—potash, lime, phosphate, and magnesia—increase together in these glasses, and they slightly depress the “glassy” components, silica and soda.

It appears, therefore, that the main source of variation in the glasses is the addition of a vegetal ash. This is unlikely to have been the type of plant ash used to make conventional soda-lime-silica plant-ash glass because such ashes were rich in soda, whereas the soda contents of the present glasses decrease as the other ash components increase. The ash here was rich in potash, lime, magnesia, and phosphate, but low in soda. This is likely to represent contamination by wood ash, probably from the fuel used to feed the glass furnace. It probably occurred because of a poor separation of glass and fuel in the furnace. This can be seen in the excavated glass lumps surrounded by limy/ashy material.

Levantine glass typically has K_2O values below 1 wt. %; higher values are found in a small number of samples, but until now they have been regarded as unusual (Freestone, Gorin-Rosen and Hughes 2000:65-84, esp. pp. 77-78, Table 2, Analyses 13 [Apollonia-Arsuf] and 93-100 [Dor], which is also quite high in K_2O ; and also

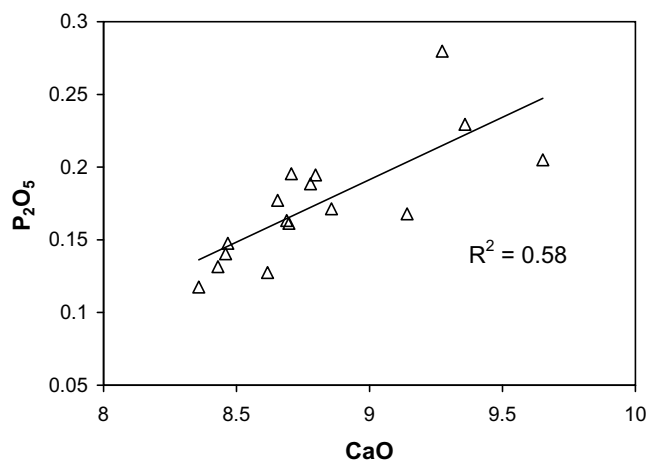


Fig. 5.37: Phosphate versus lime in chunk, vessel, and waste glass from Ramla (South), by weight percent.

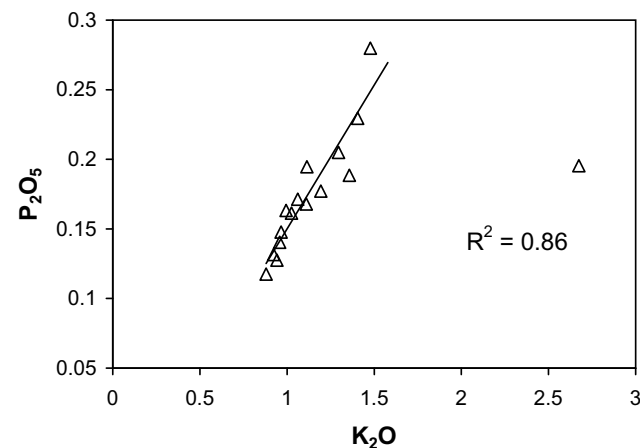


Fig. 5.38: Phosphate versus potash in glass from Ramla (South). The calculation of the correlation coefficient (R) did not include the outlier at the right of the diagram.

Schibille, Marii and Rehren in press). The present observations demonstrate that, in this case, such high potash values are based on contamination by fuel ash. The fact that all of the Ramla (South) glass is contaminated, combined with the close correlations between the various components in all but one of the glasses (Fig. 5.39), strongly supports the view that this assemblage was produced in a single workshop. Furthermore, it is significant that the chunk glass samples show evidence of the

same contamination as the vessels and the working debris. Assuming that the chunks represent primary glass rather than remelted material, the contamination occurred at the primary stage of manufacture. Because of some accident or peculiarity in the primary glassmaking process, the glass shows a level of contamination with fuel ash more pervasive than has been observed in other assemblages of Byzantine and Early Islamic natron glass from the Levant. Whether this was a one-time accident (in which case, all of the glass analyzed would have come from a single primary melt) or the result of a general practice at one workshop cannot be determined. However, the very close compositional relationship among all of the glasses appears to suggest that they were fired in a single tank, in which case we may suppose that the life of the workshop was relatively short.

The exceptional sample with much higher K_2O , which lies removed from the correlation line in Fig. 5.39 was probably contaminated by potash vapour derived from the fuel. It has been shown that, at temperatures above 800°-900°C, large amounts of potassium are released by wood fuel as vapour (Misra, Ragland and Baker 1993). It is likely that, in certain critical temperature ranges, potassium vapourized from wood ash in a hotter part of the furnace accumulates in glass in a cooler area. Therefore, this sample is not necessarily from a different batch than the others.

CHRONOLOGICAL COMPARISON WITH OTHER GLASS ASSEMBLAGES IN PALESTINE

The base composition of the Ramla (South) glass, aside from the ashy component, is typical of Byzantine-Islamic natron-type glass from the Levant, with alumina at about 3 wt. % (Table 5.1). Fig. 5.40 compares the Ramla glasses with those from selected sites: the Early Islamic tank furnaces at Beth Eli'ezer (Freestone, Gorin-Rosen and Hughes 2000: Table 2), the Late Byzantine secondary workshops at Beth Shean (Mazor and Bar-Nathan 1998:27-29; Gorin-Rosen 2000b:59-60) and Apollonia-Arsuf (Tal, Jackson-Tal and Freestone 2004: Table 1; Freestone, Jackson-Tal and Tal 2008: Table 1; see also Freestone, Gorin-Rosen

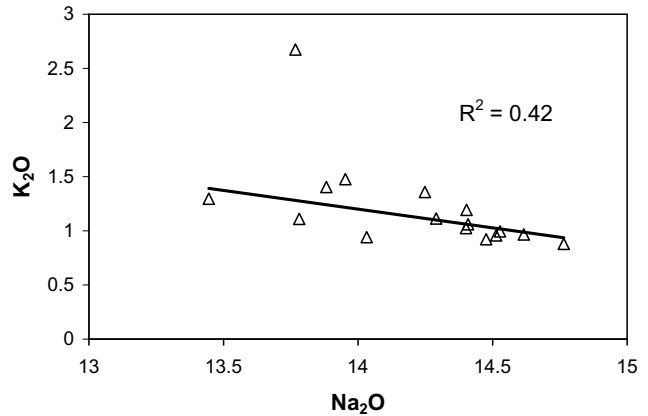


Fig. 5.39: Potash versus soda in glass from Ramla (South). Note the negative correlation, which indicates that the ash (high potash) that contaminated the glass was low in soda. The calculation of the correlation coefficient (R) did not include the outlier at the top of the diagram.

and Hughes 2000: Table 2). The glass from Beth Eli'ezer has elsewhere been termed Levantine II, while Apollonia-Arsuf and Beth Shean glasses fall into the Levantine I grouping (Freestone, Gorin-Rosen and Hughes 2000:72-74, Table 2; Freestone, Jackson-Tal and Tal 2008). Although there is some overlap, the Ramla glass plots in the upper left of the diagram, with the majority of data from Apollonia-Arsuf and Beth Shean, rather than in the bottom right, with the data from Beth Eli'ezer.

Figure 5.41 compares Ramla, Apollonia-Arsuf, and Beth Eli'ezer data for soda and lime, adding a group of nine vessels from Early Islamic contexts at Ramla (retrieved from excavations carried out by the Israel Antiquities Authority). Most of the Early Islamic vessels and the Beth Eli'ezer data plot in the lower left, while the present Ramla (South) and Apollonia-Arsuf data have higher CaO and Na₂O. This supports the view that the Ramla workshop glass discussed in this article dates from the Late Byzantine period. This result is not unambiguous, however, because some Early Islamic vessels are compositionally closer to the Apollonia-Arsuf glasses. Furthermore, we have noted elsewhere (Freestone, Jackson-Tal and Tal 2008) that there is considerable overlap between the Apollonia-Arsuf glass and glass from Raqqa, analyzed by Henderson and others, that is attributed to the Early Islamic period.

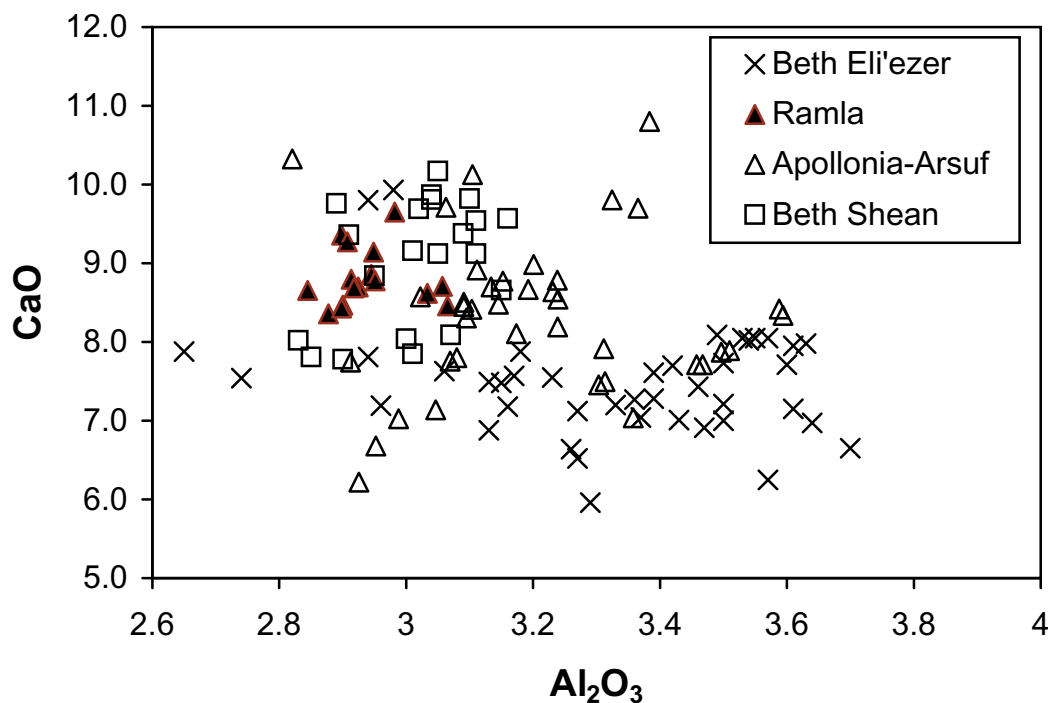


Fig. 5.40: Lime versus alumina for raw glass from Beth Eli'ezer, raw glass and vessels from Appollonia-Arsuf, raw glass and vessels from Beth Shean, and raw glass, vessels, and waste from Late Byzantine Ramla (South). The Ramla samples tend to group in the upper left of the diagram with the analyzed glass from Apollonia-Arsuf and Beth Shean.

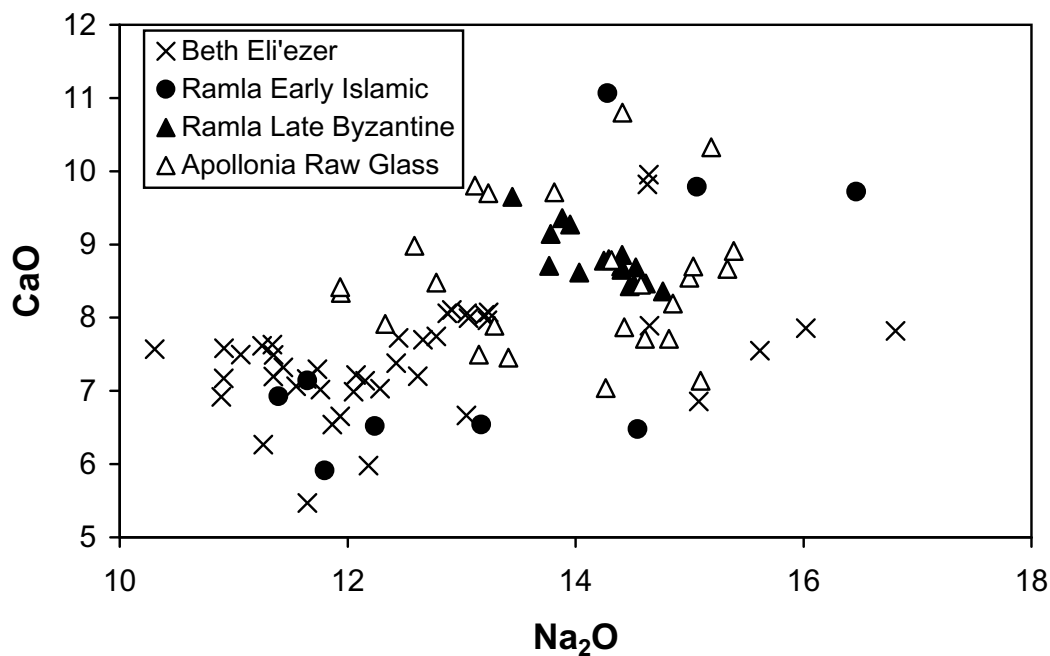


Fig. 5.41: Lime versus soda for raw glass from Late Byzantine Apollonia-Arsuf, raw glass from Early Islamic Beth Eli'ezer, natron glass vessels from Early Islamic Ramla, and the Late Byzantine Ramla (South) workshop debris.

CONCLUSIONS

The evidence discovered in the Ramla (South) workshop debris includes all of the components of secondary glass vessel production: glazed and unglazed bricks from the furnace structure, primary product remains (raw glass chunks and lumps), vessel production remains (working debris), and final products (glass vessels). The chunks and lumps were remelted in the furnace, and the by-products of vessel production are the drops, threads, melted and deformed fragments, and the remains of moils, which indicate the use of a blowing tube. The products of this workshop included everyday tableware, bowls, bottles, lamps, and wineglasses. Most of these were blown, but one fragment was mold-blown.

Secondary glass production is documented in Israel by finds dating from the Early Roman to Mediaeval periods (for a survey of finds, see Gorin-Rosen 2000b:56-62). An important find is the furnace remains from Jalame in northern Israel, dated to the second half of the 4th century CE. They include poor remains of a rectangular furnace with hundreds of glass fragments representing the production process and final products (Weinberg 1988:24-37). Clear remains of Byzantine secondary glass production in Israel were found at Kafr Yasif, Ḥorbat Qav, and Sepphoris (in Galilee), Raqit (in the Carmel), Khirbat el-Niʿana (in the Shephelah), and possibly at a few other sites (including Apollonia-Arsuf) (Gorin-Rosen 2000b:56-62; and also Fischer and Patrick McCray 1999 [for detailed analysis in Sepphoris]; Jacobson 2004:249-251 [for Raqit]; Gorin-Rosen and Katsnelson 2007:73-76, 124-129, 145-147 [for Khirbat el-Niʿana]; Freestone, Jackson-Tal and Tal 2008 [for detailed analysis in Apollonia-Arsuf], and Gorin-Rosen 2004a:17*; 2004b:26*; 2005a; 2006:34*-35*; Gorin-Rosen and Katsnelson 2007:147; Elisha 2007 [for preliminary notes on Khirbat Jarrar, Jatt, Ḥorbat Hermas, Lod and Khirbat el-Faṭuna]). The best-preserved workshop, dated to the Late Byzantine period, was found at Beth Shean, but only preliminary findings have been published. The published information

from this site presents evidence that is somewhat similar (although much better preserved) to the finds from Ramla (South).

It includes remains of the furnace, ash heaps with the remains of olive pits that may have been used for annealing as is evident from slightly deformed complete glass vessels discovered on top of them. There, too, raw glass, moils, pontil glass chunks, glass drops, and distorted annealed glass vessels were found (Mazor and Bar-Nathan 1998:27-29; Gorin-Rosen 2000b:59-60). An almost complete secondary glass furnace made of fired mudbricks was found at Givʿat Yasaf (Tell er-Ras/Somelaria) in northern Israel, dated to the 13th century CE. It included the remains of two firing chambers, a rectangular melting chamber, vents, and working areas, as well as such production debris as raw glass chunks, glass drops, deformed glass vessels, and pots with melted glass (Weinberg 1987).

Secondary glass production is well attested in western Europe (e.g. at Lyons and Avenches) (Amrein 2001:87-94; Foy and Nenna 2001:42-44). The evidence from Lyons included an artisanal quarter where glass was made alongside such other fire-based industries as the production of pottery. In this respect, it is similar to our evidence from Ramla (South). The documented evidence from western Europe also reveals that the shape of secondary glass furnaces varies; it is usually rounded and sometimes rectangular, made of bricks and tiles (Foy and Nenna 2001:47-66).

Chemical analysis shows that the glass from the workshop debris is typical of Byzantine-Islamic natron-type glass from the Levant. The vessels and the raw glasses have similar compositional ranges and present the same evidence of unusually extensive contamination by fuel ash. Assuming that the contamination of the chunks occurred during the primary glassmaking process, it seems possible that all of the analyzed glass, chunks, vessels, and moils, came from a single contaminated tank of glass. This also suggests that the debris was produced during a relatively short period. From a chemical perspective, the

Ramla (South) glass overlaps somewhat with the 6th and 7th century CE chunks from Apollonia-Arsuf and particularly with chunks and vessels from Beth Shean. This confirms the notion that stratigraphically secured Late Byzantine and Early Islamic glasses in Palestine display similar chemical compositions.

In the Late Byzantine period, Ramla (South) was a satellite of nearby Lydda (Diospolis/Georgiopolis) (see below). Recent excavations in and around Ramla have also produced the remains of pottery kilns and other industrial activities that have not yet been investigated. This indicates that the two fire-dependent industries coexisted in the area. The location of these industries was carefully chosen: a rather elevated, sparsely inhabited area that was somewhat removed from the major administrative centre it served. The pottery kilns were oriented along an east-west axis, with the firing area on the west side and the firing chamber on the east side. These conditions allowed the ceramic and glass artisans to utilise wood from the surrounding valleys and to make the best use of western sea winds.

The remains of the secondary glass production at Ramla (South) lack a furnace *in situ* and present

a relatively small quantity of debris. However, construction in the upper occupation layer, dated to the 8th century CE, leveled (and thus destroyed) the entire Late Byzantine occupation layer. Moreover, secondary glass production usually leaves poorer archeological traces than other fire-based industries because of the recycling of glass and the small and fragile nature of the furnaces (Foy and Nenna 2001:40). There is archeological evidence that the Late Byzantine occupation layer at Ramla (South) was abandoned sometime in the 7th century CE, and so it is possible that the furnace was dismantled by the artisans themselves.

Archeological and chemical analyses of the secondary glass workshop debris are an important addition to our understanding of the major role of glass production in Palestine. As in Apollonia-Arsuf and Beth Shean, the production of glass (both primary and secondary) was probably monitored by the central authority of that time, the church. It is no coincidence that glass production in Palestine is documented in major administrative centres and in nearby communities. The Late Byzantine glass industry in Ramla (South) was the prelude to the flourishing glass industry of Early Islamic Ramla, which has yielded numerous finds.

ADDITIONAL BYZANTINE POTTERY

Oren Tal and Itamar Taxel

In addition to the well-defined Late Byzantine-early Umayyad remains described above, a few other earth fills that originated in occupation layers which contained contemporary pottery were unearthed at the site.

In Locus 57 (Square S216) two types of cooking vessels were found – deep, ribbed casseroles (Fig. 5.42:1-2) (Magness 1993:211-213, Form 1) and cooking-pots with a short, vertical neck and hooked rim (Fig. 5.42:4-7) (Magness 1993:219-220, Form 4B). The cooking vessel lid (e.g. Magness 1993:215) can be added to this group (Fig. 5.42:3).

One example of a Byzantine water-wheel (*antilya/sāqiya*) jar was also found. It is made of

sandy and gritty orange-brown ware, and has thick walls, relatively wide bag-shaped body, and ridged cylindrical neck (Fig. 5.42:8). According to Ayalon (2000:223, Fig. 3:4), this variant should be dated to the 5th/6th through 7th centuries CE.

Southern Palestinian bag-shaped storage jars were found in various loci. Locus 16 (Square T215) yielded a storage jar of the variant described above, with a ribbed body and shoulder and short, plain neck (Fig. 5.42:9) (Kingsley 1994-95: Fig. 3: Group 1; dated to the 6th century CE). Another variant of this type was found in Locus 768 (Square Y134/Y135), with a densely combed shoulder and convex neck (Fig. 5.42:10)

(Kingsley 1994-95: Fig. 3: Group 3; dated late 6th/7th century CE).

The lamp fragment found in Locus 55 (Square V216) has a radial pattern on its body and low ring base (Fig. 5.42:11). It belongs to the small candlestick lamps type (En Yabrud), which is dated

by Magness to the mid-4th to the mid-6th centuries CE (1993:250-251, Form 2). Another fragmented lamp decorated with a geometric pattern of short lines and dots, similar to the one shown in Fig. 5.16, was retrieved from Locus 318 (Square L133) which represents top soil (not drawn).

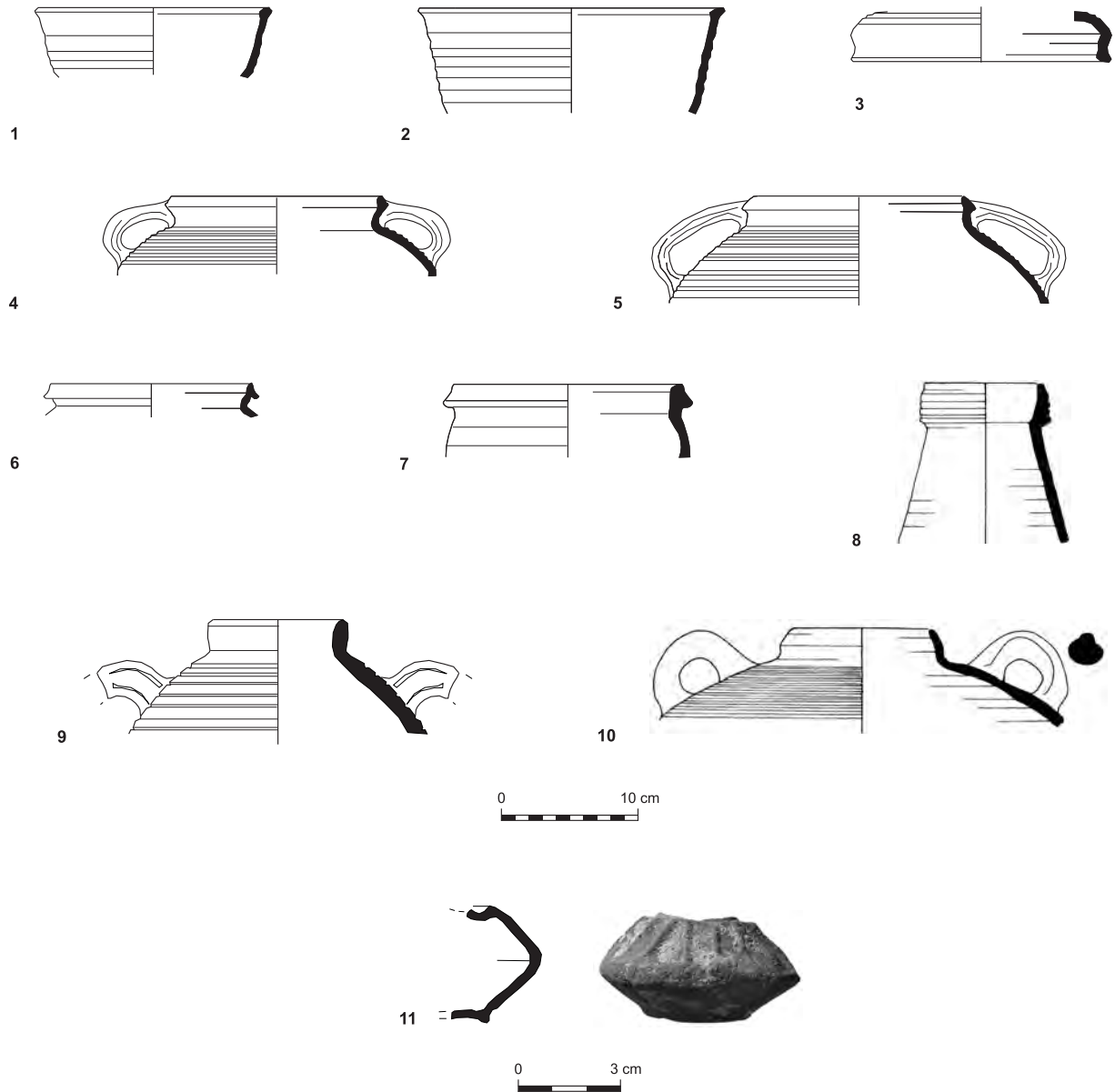


Fig. 5.42: Additional pottery of the Byzantine period: 1-7). L57; 8) L1670; 9) L16; 10) L768; 11) L55.

SUMMARY AND CONCLUSIONS

Oren Tal and Itamar Taxel

The relatively scanty remains unearthed at the site seem to belong to a small- to medium-sized rural settlement of the 6th and 7th centuries CE. The exact size of this settlement – presumably a village – is unknown, due to later construction activities which demolished most of the earlier remains and also due to the fact that not all of the site's area was excavated. The distance between the farthest remains belonging to this settlement – the domestic complex in the north and the wine press and pottery kilns in the west is about 140 m, while the distance between the domestic complex and the glass workshop debris in the south is about 65 m. Between these remains other remains of industrial nature were found – the oil press complex and one of the wine presses. This area alone measures some 8.5 dunams. Beside these built features and the finds associated with them, some Late Byzantine-Umayyad pottery and stone artifacts were also found in various locations in the site but without a clear connection to a certain architectural remain. Among the latter were also some architectural artifacts that may indicate on the existence of a public building in the settlement during the discussed periods (see Chapter 6). These finds can be supplemented by five folles of the 6th century CE (Chapter 7: Nos. 10-14) and three Arab-Byzantine coins of the 7th century CE (Chapter 7: Nos. 18-20) that were either found in surface level or came from disturbed fills.³

The location of the glass and pottery workshops in the southern and western parts of the site, most probably in the settlement fringes, has a clear ecological reason. The smoke, heat and bad smells, which are inseparable effects of pottery and glass production, were taken away by the common northwestern wind blow in this region. The location of polluted industries, such as pottery, glass and

metal workshops, in the fringes of rural settlement is known also from other contemporary sites (e.g. Ayalon 1997b). Wine presses are also known as installations usually located in the fringes of settlements, due to economic considerations, as is attested in II699. On the other hand, it is possible that the location of the oil press close to the domestic complex of the settlement was the wish to keep both the raw materials and the product – olives and olive oil – precious commodities – close to the local community who owned the oil press. The phenomenon of constructing oil presses within the built-up area of a settlement has also parallels in other sites (Taxel 2005:133-134).

The different industrial installations mentioned above points to the varied economy of the Late Byzantine-early Umayyad settlement at Ramla (South). The inhabitants of this rural settlement found their living not only in agriculture and in the production of olive oil and wine, but also in the production of pottery and glass. This economic picture has parallels in rural settlements throughout the country.

The scale of both wine and oil production in Ramla (South) is unknown. Nevertheless, it can be assumed that at least part of these commodities were sold in the local markets and maybe even exported abroad. This can be indicated by the production of bag-shaped jars at the site. These jars were not only used in local trade but also as containers for exported foodstuff (mainly wine) in the international sea trade (Kingsley 2002:77-84). Sites that are engaged in the production of wine and oil production, more often than not show evidence of pottery production (as indicated by kilns), that is the manufacture of storage jars which were used as wine and/or oil containers. Ample evidence for such a phenomenon can be seen in the excavations

3. Additional remains of domestic, public(?) and industrial nature, dated to the 7th-8th centuries CE, have been unearthed at the site during the excavations conducted by the Israel Antiquities Authority (Gorzalczany 2008b:32-34).

of the “3rd Mile Estate” near Ashkelon, where Late Byzantine wine and oil presses were found next to pottery kilns that were engaged in the production of the so-called Gaza amphorae (Israel 1995).

The industrial areas which surrounded the settlement from the south and west help to define its borders at least in these directions. It seems that most of the private and public (a church?) buildings of this settlement located at the plain to the north/northeast of our excavations area. This assumption can be also supported by the pottery evidence: The Late Byzantine-early Umayyad pottery found in our excavated parts of the site include not even one example of fine table ware or serving dishes (such as imported Late Roman Red Ware or Fine Byzantine Ware) and only very few fragments of lamps. Instead, the contemporary ceramic assemblage from the site composed, almost exclusively, of ceramic containers (southern bag-shaped jars and Gaza amphorae), with fewer jar lids and cooking vessels. These finds, in addition to the architectural remains described above, indicate that only small-scale domestic activity occurred in the southern and western parts of the settlement which we excavated.

The rural settlement existed at Ramla (South) in the Late Byzantine and early Umayyad periods is located within the territory (*toparchy*) of the city of Lod (Lydda/Diospolis), which was one of the major cities in the central coastal plain. The importance of Lod has increased from the 6th century CE onwards, due to the association of the city with the birth and acts of St. George. Lod/Georgiopolis then became a relatively important pilgrimage center, a fact which most probably strengthens also the Christian population in its rural vicinity (Avi-Yonah 1979:156-159; Schwartz 1991: 124-130). The site of Ramla (South) is situated ca. 4 km southwest of Lod, and it is one of a number of similar contemporary settlements existing in the immediate vicinity of the city (within a distance

of ca. 5 km), some of which were also excavated. Among the latter, one can mention Khirbat el-Ni‘ana (Kodesh 2002; Sion 2007; Tsioni 2008), Tel Malot (Weksler-Bdolah and Golani 2000:71*; N. Lalkin, personal communication),⁴ Tel Ḥamid (Tal and Blockman 1998:166-168; Wolff and Shavit 1999: 69*-70*), Neshar Quarries (Hirschfeld and Shapira 1999:52*; Zelinger and Di Segni 2006),⁵ Ṣarafand el-Kharab (Gorzalczany 2004), Ṣarafand el-‘Amar/Horvat Zerifin (Kohn-Tavor 2008), Khirbet ‘Asfura (Ben-Zvi 1954; Gudovitch 1999) and Khirbet Deiran (Sussman 1969; Roll and Ayalon 1981; Bouchenino 2007; Kogan-Zehavi 2007).

Numerous sites dated to the Byzantine period were found in the broader vicinity of Ramla (South). More than a hundred Byzantine sites were identified in the survey map of Lod, situated to the northeast of the city of Lod. Among these sites, more than 20 were identified as rural settlements of various sizes. The surveyors claimed that only 28 sites among those inhabited in the Byzantine period continued to exist in the Early Islamic period (Gophna and Beit-Arieh 1997:12*). These conclusions should be treated with caution, since many Late Byzantine pottery types continued to be used in the Umayyad period. Thus the actual number of sites which existed also in the Early Islamic period, or at least in its early part, can be larger than the one offered by the surveyors. Many Byzantine sites were found in the survey map of Yavneh (M. Fischer and I. Taxel, in preparation), situated to the southwest of Ramla (South) and in a supplementary survey (I. Taxel, in preparation) to the east of the map of Yavneh. So far, more than 20 sites yielded finds from the Byzantine period, among which are two major urban sites (Yavneh and Yavneh-Yam) and ten large rural settlements. Most of the latter yielded pottery and/or coins which points to their existence in the Umayyad period as well (Fischer and Taxel 2006; forthcoming).

4. We wish to thank N. Lalkin for permission to mention his yet unpublished excavations at Tel Malot, carried out in 1998 on behalf of the Institute of Archaeology of Tel Aviv University.

5. We wish to thank Y. Zelinger (Israel Antiquities Authority) for permission to mention his yet unpublished excavations at the Neshar Quarries in 2004 and 2005.

The end of the Late Byzantine-early Umayyad settlement at Ramla (South) could have been connected to one of two substantial events that occurred in the first half of the 8th century CE. The first event is the foundation of the city of Ramla in the early 8th century CE (ca. 715 CE). The rapid development of Ramla as the capital of *jund Filasṭīn*, and its economic flourishing, have been accompanied by the gradual decreasing in the status and importance of nearby Lod. The rural hinterland of Lod, which now became the hinterland of Ramla, must have been affected by the shift of urban power centers and by the strong Muslim presence in Ramla, which was first and foremost a capital city in the Muslim Umayyad caliphate (Gat 2004:9, 14, 15, 26). Some of the rural settlement in the vicinity most probably continued to exist without any substantial change also after the foundation of Ramla (see below). However, we should not rule out the possibility that other settlements, perhaps such as the one that existed at Ramla (South), had been negatively affected – either directly or indirectly – by the foundation of Ramla, and finally abandoned (see Schick 1995: 134-138 for the various reasons of abandonment or decline of Christian settlements in the Early Islamic period; Magness 2003 for a positivist view on the Byzantine/Early Islamic continuation). Evidences to such a process were found in other nearby sites, such as Tel Ḥamid (Tal and Blockman 1998:169; Wolff and Shavit 1999:70*).

The second event is the severe earthquake of January 749 CE (Russell 1985:47-49; Guidoboni 1994:366-370). Ramla and its vicinity are not explicitly mentioned in the contemporaneous sources as affected by this well-known catastrophe, though according to Gat, it is hard to believe that Ramla escaped from this earthquake, due to its location in a region known

to be highly sensitive to earthquakes (2004:30). Gat also tends to identify a section of a Jewish *piut* which apparently describe the earthquake of 749 CE, as relating to Ramla, though he admits that the extent of destruction caused to the city cannot be estimated (*ibid.*:30-31). Until recently, no clear archaeological evidence of the 749 CE earthquake has been claimed to be found in excavations at Ramla or its vicinity. The excavations conducted in 2008 at Ramla (South) on behalf of the Israel Antiquities Authority revealed clear evidence for destruction by a severe earthquake of some architectural remains. According to the excavator, these remains can be safely dated to the earthquake of 749 CE based on the chronology of the pottery found in relation to the earthquake destruction and post-destruction layers (Gorzalczany 2008b:34). It must be emphasized, however, that no such remains were found in our excavations at the same site, though this fact can be related to the different nature and preservation conditions of the archaeological remains attributed to the Late Byzantine-early Umayyad phase in the site. Therefore, we do not rule out the possibility that the end of this phase occurred because of the earthquake of 749 CE. This would date our late Umayyad-ʿAbbasid remains to post-749 CE.

As stressed in the previous chapters the site of Ramla (South), apparently benefited, in the Late Byzantine period too, from its proximity to the local (southwest-northeast) road which led from Ashdod to Lod (Dorsey 1991:64, Map 1:I9). At Lod, this road joined a major junction, from which one could continue to the southeast, in the direction of the Judaeian Hills and Jerusalem or to the northwest, in the direction of the coastal plain and Jaffa (Dorsey 1991:181-184, Map 13:J1; Fischer, Isaac and Roll 1996:67-107, Fig. 3).

THE LATE Umayyad, 'Abbasid AND FATIMID PERIODS

Oren Tal and Itamar Taxel

The rural settlement of the Late Byzantine and early(?) Umayyad periods ceased to exist either with the foundation of the city of Ramla in ca. 715 CE or else pursuant to the earthquake of 749 CE. It is difficult to establish whether the Umayyad occupation was continuous or had a break between the early and late phases of this period. The new phase, however, represents the most intensive and extensive human activity at the site. It lasted throughout the 8th and 9th centuries CE, and ended in the 11th century CE thus covering the later part of the Umayyad period but mainly the 'Abbasid and part of the Fatimid period.

During this time the nature and landscape of the site were radically changed. A vast area, which spread beyond the limits of the present excavations, was covered by industrial installations. Many of these were founded deep in the ground, causing damage to earlier remains. Furthermore, the builders of these new installations re-used many building materials that originally belonged to the remains of the earlier phases, mainly of the Late Byzantine and early Umayyad phase.

The industrial activity which took place at the site was reliant on the availability of large amounts of water. This was supplied by several cisterns of different sizes which were dug in various locations and then transferred to the industrial installations by way of a complex network of pipes and channels. Most of the installations were associated to the dozens of plastered pools of various sizes and shapes

which were built throughout the site. Many of the pools, if not all of them, formed parts of larger complexes which included other features, such as paved surfaces, threshing floors and subterranean vaulted chambers.

Only little evidence for true domestic activity was found in the excavations, and it seems that though a few small living rooms existed in our excavated remains, and a few others in the excavations carried out by the Israel Antiquities Authority (Gorzalczany 2008b:32; A. Onn, personal communication), the nature of the site was basically industrial. Evidence for sub-phasing within parts of several industrial complexes was also found which is not surprising when dealing with a phase that lasted over 300 years. As can be understood, although the great majority of small finds (pottery, glass and stone vessels and objects and metal artefacts) was also found in relation to the late Umayyad-Fatimid period remains, several coins can be attributed to this phase (Chapter 7: Nos. 21-30). These finds, especially the pottery, glass and metal weights, considerably augment the present knowledge of the material culture of the discussed periods in general and to that of Early Islamic Ramla in particular.

Various groups of architectural remains belonging to the industrial quarter are described in this chapter. Each group is discussed separately, and is represented by selected features which are described in detail. Other related features are described in a catalogue following the discussion of each group.¹

1. Squares K131, P136 and P139 were excavated by Y. Zelinger of the Israel Antiquities Authority but no information about them was given to us. Squares M-P/210, P211, P137, P138, Q140, Q209, S137, S219, T139, U214, U215, W137, W138, W212 and Z133 were excavated in 2004 by A. Gorzalczany and H. Torge of the Israel Antiquities Authority and all technical data mentioned below regarding these squares are based on written summaries that were put at our disposal.



Fig. 6.1: Aerial view of Ramla showing the location of the site of Ramla (South). (Courtesy of G. Avni, Israel Antiquities Authority).

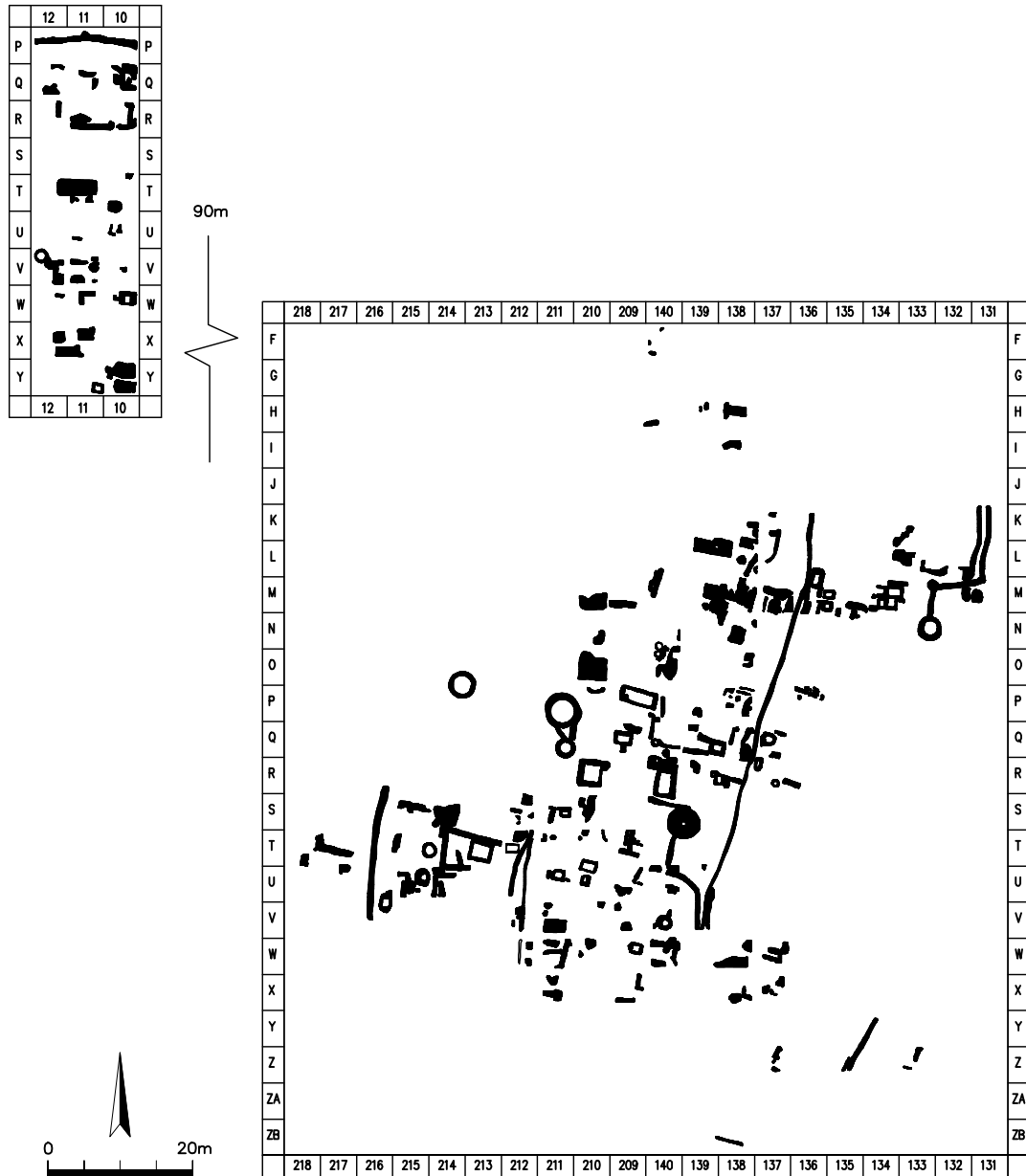


Fig. 6.2: Schematic site plan of the Early Islamic remains discovered during the excavations.

ARCHITECTURAL FEATURES

CISTERNS

Five cisterns (I332, I356, I572, I590, I931) were found in the present excavations, and an additional two were found in the sounding conducted by the Israel Antiquities Authority in the same area (I72, I964). All the cisterns have a cylindrical shape and domed ceiling. They vary in size – the internal diameter of the smallest ones is ca. 1 m, and that of the largest one is ca. 4 m. The cisterns were built of fieldstones in various sizes bound with whitish or greyish mortar, and were coated on the interior with one (or more) layer of greyish plaster. In cases where the examination of the interior of the cistern was possible, it was found that the uppermost layer of plaster was covering a layer of pottery sherds. The latter were usually body fragments of storage jars, but sherds of other vessels (including rim fragments) were found as well. These sherds supply a *terminus post quem* to their construction in the late Umayyad period. In four cisterns the ceiling was found collapsed. All the cisterns except one were found filled with silt and stones up to their surface level.

Cistern I590 (Squares S-T/139-140) is the largest found, and the only one that was found almost clean of silt (Fig. 6.2). Its 0.25 m thick walls are built from small fieldstones bound with mortar and covered with plaster on the inner side. The depth of the cistern exceeds 12 m, though it seems that it was originally deeper, since a silt and debris layer of unknown thickness covers its bottom. The internal diameter of the cistern is ca. 4 m. At the top of its domed ceiling there is a square opening (ca. 0.50 × 0.50 m) built of ashlar. A smaller, oval (ca. 0.20 × 0.30 m) opening whose purpose is unknown was placed about 0.60 m northwest of this. Its rough form and small dimensions may indicate that this is not a real opening nor is it an ancient feature at all, but rather unintentional damage caused to the cistern in modern times. A ceramic pipe (I968) and a stone-built channel (I782) lead to the cistern from the northwest and the southwest, respectively. Their junctions with the cistern were covered by ashlar bound with mortar, forming a

square protruding from the cistern's ceiling. The pipe joined the cistern at a lower level than that of the channel, indicating that the two features had different purposes. It seems that the latter allowed water (apparently rain water) to flow into the cistern, while the pipe acted as an overflow outlet for surplus water in rainy winters when the water level threatened to reach the level of the inlet channel. The pipe (which was preserved to a length of 6 m), as were the other pipes found at the site, was coated with a thick layer of small fieldstones bound with grey mortar. It leads to a rounded, domed and plastered installation (I901; S209; Fig. 6.3) which was only partially unearthed. The plaster of this installation was covered by a layer of body fragments of storage jars dated from the late Umayyad period onwards. No remains were found west of the installation but this may be due to modern activity so we cannot know whether another pipe/channel joined the installation from this direction, nor can we know what the exact purpose of the installation was. It may have been used as a collecting pool which gathered the water drained from the cistern, or as a sifting pool which prevented dirt flowing into the cistern. In the latter case the pipe could not have functioned as an overflow outlet. The junction of the stone channel with the cistern was not preserved. Only a small stretch (ca. 2 m length) south of the cistern was unearthed. The channel runs 2.50 m southwards and then makes a 90° turn to the east (this turning point also was not preserved) (Fig. 6.10). After 2 m it curves again to the south and continues to a known length of 7.50 m. The channel (0.50 m external width; 0.20 m internal width; 0.45 m height) was built of small fieldstones bound with mortar, and is covered by slabs made of large roughly-worked stones. Its walls were not plastered on the inside nor was its base which was made only from packed earth. A third protrusion, identical to that covering the junctions of the pipe and channel with the cistern, lies on the eastern side of the cistern. Its level is the same as that of the aforementioned feature and indicates that there was a

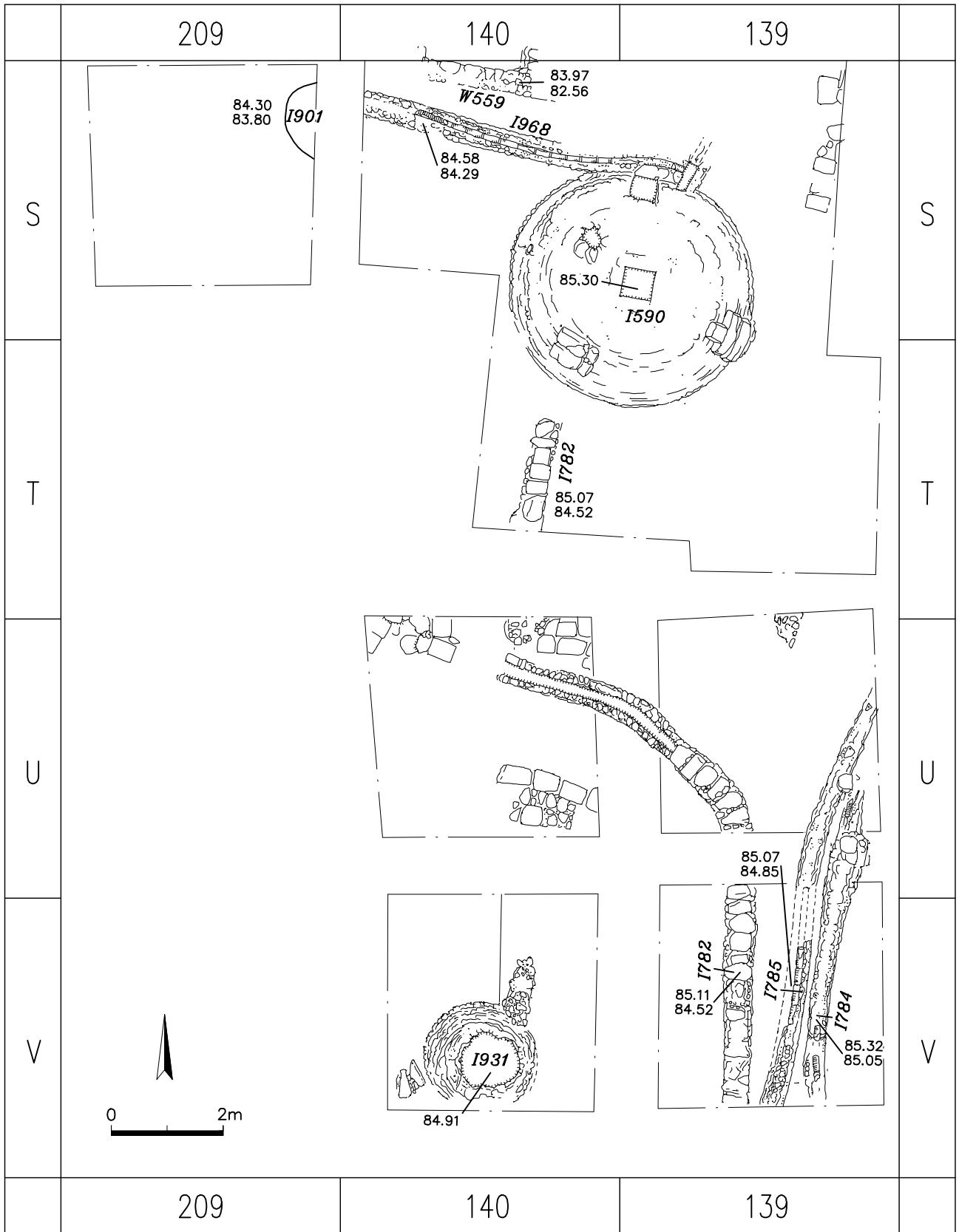


Fig. 6.3a: Plan of Cistern I590.



Fig. 6.3b: Cistern I590, looking west.



Fig. 6.4: Installation I901, looking east.



Fig. 6.5a: Plan of Cistern I356.

third pipe/channel which led to the cistern but was subsequently destroyed. The size of this cistern (I590) and its location at the highest elevation point of the site demonstrates that this was one of the main water sources of the site. Water from this cistern was certainly supplied, both directly (by means of pipes/channels) and indirectly (by jars), to many of the industrial installations all around, and mainly to the plastered pools.

The second intact cistern (I356; Squares M138, M139; Fig. 6.5) was found filled almost up to its opening with silt, which precluded accurate

measurement. Nevertheless, it seems to be relatively large, perhaps even as wide as Cistern I590. It was placed more or less in the centre of a large open space, probably a courtyard, which was partially paved with white mosaic (F355, see below). The cistern has a square opening (ca. 0.50 × 0.50 m) built of ashlars, identical to that of Cistern I590. Since the interior of the cistern was not excavated and only a small probe was made below the courtyard floor, we have no indication on how this cistern was supplied with water.

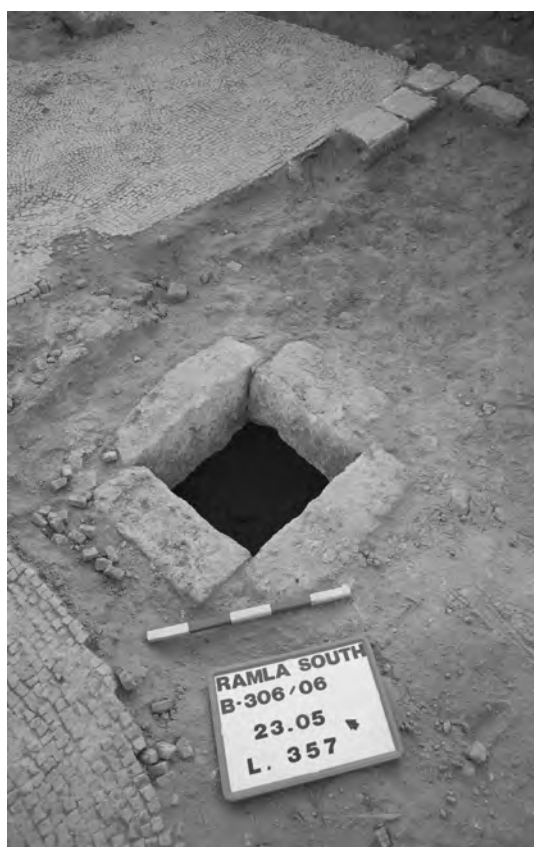


Fig. 6.5b: Cistern I356, looking northwest (*left*) and southwest (*right*).

The other cisterns found in the excavations are briefly described below:

Cistern I72 (Fig. 6.6): Square U215; partially excavated by the Israel Antiquities Authority; diameter: external 1.50 m, internal 1 m; known depth 1.03 m.

Cistern I332 (Fig. 6.7): Square M133; partially excavated; diameter: external 3 m, internal 1.80 m; known depth 0.60 m. Connection with other features: Channel I338.

Cistern I572 (Fig. 6.8): Square Q211; partially excavated; diameter: external 2.50 m, internal 1.50 m; known depth 0.60 m. Connection with other features: Channel I522 and Cistern I964.

Cistern I931 (Fig. 6.9): Square V140; partially excavated; diameter: external 2 m, internal 1.20 m; known depth 0.60 m.

Cistern I964 (Fig. 6.8): Square P210, P211, Q211; partially excavated by the Israel Antiquities Authority; diameter: external 4.70 m, internal 3.50 m; known depth 1.50 m. Connection with other features: Channel I522, W523 and Cistern I572.



Fig. 6.6: Cistern I72, looking north.



Fig. 6.7: Cistern I332, looking north.

It seems that contrary to earlier periods, and especially the Byzantine period, where cylindrical cisterns represent only one of a variety of types (cf. Tsuk 1994:145, Table 1), from the Early Islamic period onwards they became dominant. This is indicated not only by the results

of the present excavations, but also by numerous parallels of similar Early Islamic cisterns found in the city of Ramla (e.g. Glick and Gamil 1999: 52*; Gutfeld 1999: Fig. 154; Avissar 2000: Fig. 125; Vitto 2000: Figs. 103-104; Sa'ïd 2006: Fig. 5; Shmueli and Artzi 2006).

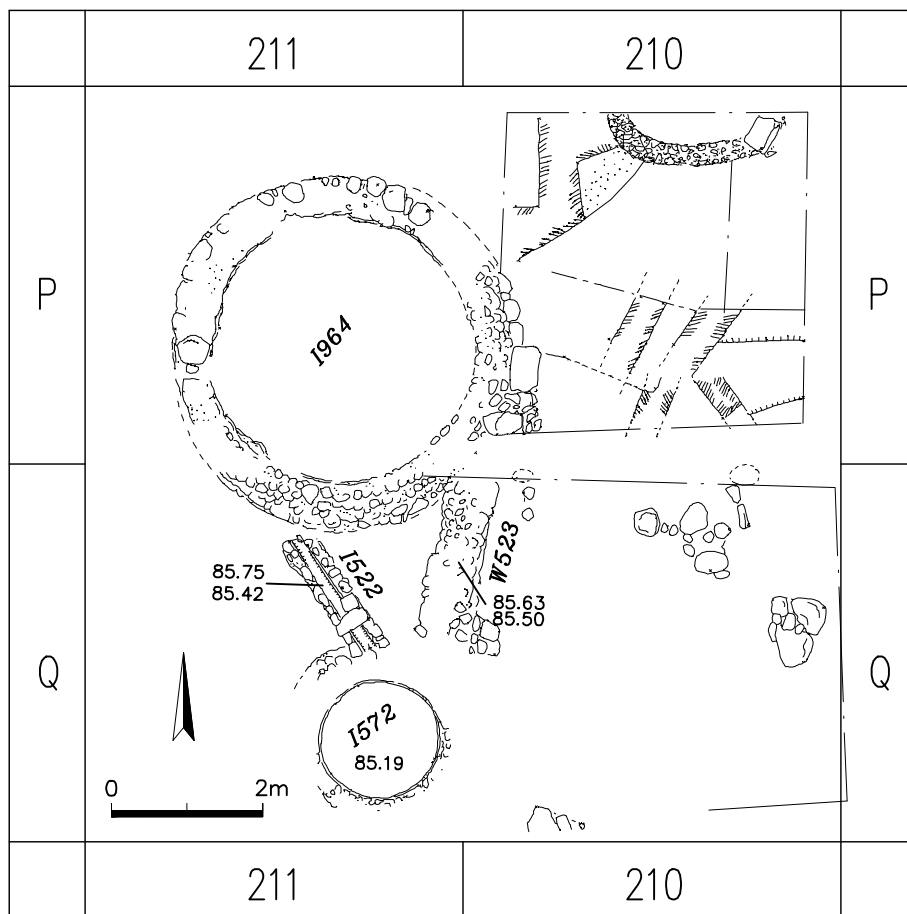


Fig. 6.8a: Plan of Cisterns I572 and I964.



Fig. 6.8b: Cisterns I572 and I964, looking south.



Fig. 6.9: Cistern I931, looking west

PIPES AND CHANNELS

Remains of many pipes and channels were found in the area excavated. In some instances a physical connection could be traced between pipes or channels and other installations, e.g. cisterns or pools, while in others only isolated lengths of pipes or channels were found. Most of these features were subterranean. Some channels were embedded in floors but must have been visible in antiquity. In some cases two or even three different pipes were found built one above the other at different elevations. There is also evidence of plastered pools cutting pipes and terminating their usefulness.

All the pipe units are ceramic and cylindrical in form with a narrow opening and carination underneath and wider (somewhat splayed) endings. The pipe units come in a limited variety of standards. The unit of the predominant type which forms the medium standard unearthed at the site is 0.3 m length, with an internal diameter of 0.07 m (at its opening) and 0.11 m (at its end), and about 0.09 m (in the centre) (Fig. 6.10: 1-2). Another standard pipe unit is 0.21 m in length, with an internal diameter of 0.09 m (at its opening) and 0.13 m (at its end), and about 0.11 m (in the centre) is the largest discovered at

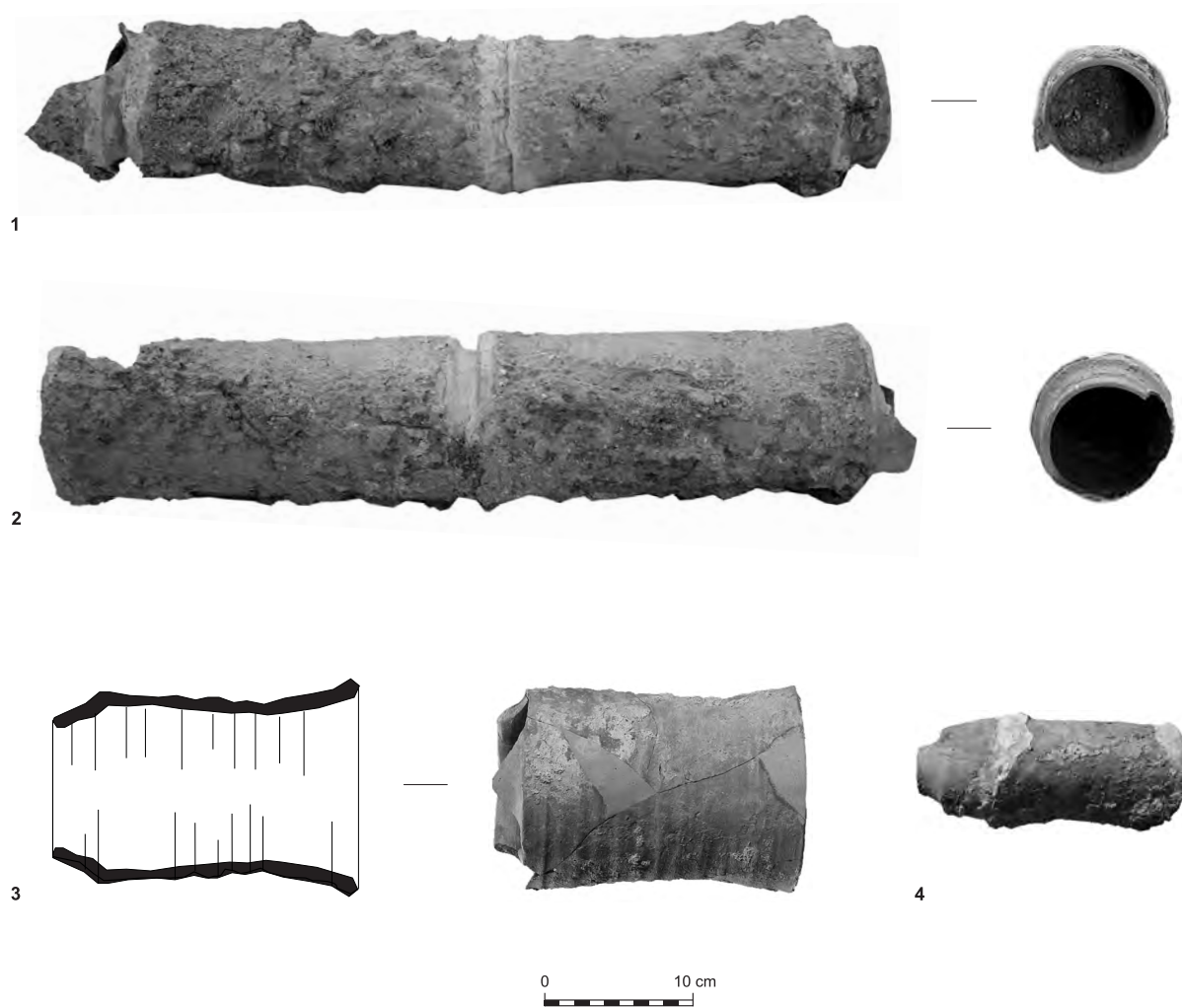


Fig. 6.10: Ceramic pipes of the Early Islamic period. 1-2) Taken from I784; 3) L243; 4) Surface.

the site (Fig. 6.10:3). There is also one example of a smaller standard unit which is 0.18 m length, with an internal diameter of 0.03 m (in its opening) and 0.06 m (in its ending), and about 0.05 m (in the centre) (Fig. 6.10:4). All pipelines at the site were constructed in two stages. First the ceramic sections were bound to each other in a straight line according to the required direction and slant. In the second stage the pipeline itself was coated with a relatively thick layer (about 10 cm) of a mixture of small fieldstones and grey mortar, which was designed to seal, protect and stabilize the fragile pipe units from leaking, minor earth movements, penetration of plant roots, etc. Sometimes, flat, roughly-worked stones were attached to the upper face of the mortar coating of the pipes in order to provide additional protection.

Two main pipeline systems were discerned at the site: an eastern and a western. The most impressive was unearthed along some 60 m in the eastern part of area (in Squares K136, L136, M136, N137, O137, P137, R138, U139, V139) associated with Installations I685, I784 composed of medium standard pipes (Figs. 6.11 and 6.12). The general orientation of the pipeline is southwest-northeast. It seems that its source was somewhere in the higher southern part of the site whence it slanted downwards towards the northern part of the site, beyond the excavated area. Due to the moderate natural slope of the site, the builders of the pipeline had to find artificial solutions which helped to increase the speed of the water flow. Evidence of one such solution was found in Square M136. Here, the level of the pipe was lowered abruptly by some 0.65 m and the higher and lower sections were bound together by a mortar-built angled casing (I385) (Fig. 6.13). The purpose of this pipeline is unknown. It might have delivered water from a large cistern located beyond the excavated area to agricultural plots outside the industrial site.

This pipeline was utilised by at least two secondary pipelines which were built at the same elevation using the same pipe standard. In Squares U139, V139 Pipeline I785 was built parallel to I784 (Fig. 6.12). In Squares K136, L136, M136, an additional pipeline was unearthed at a lower level than the main system (I268, I386) (Fig. 6.14).

It cannot be said whether these two pipelines functioned contemporaneously with I685 and I784, or represent different stages of use.

The second major pipeline was unearthed in Squares T213, U212, V212, W212 (Fig. 6.15). In all four squares stretches of the pipeline (I131; no less than 18 m in length) were found running north-south. It is made of medium-standard pipes. This pipe fell from use when a small plastered pool (I145; Square V212) was built above it and cut it off. In Squares T212, U212 another pipe (I130, I133) was found which, at least in its southern part, ran parallel to the long pipe and then made a turn to the northeast until it reached the line of the latter. However, their state of preservation precludes determining whether the two pipelines were joined to each other and functioned contemporaneously, or whether pipeline I130 replaced pipeline I131/I133. It seems that the latter option is more feasible since Pipe I130/I133 appears to have bypassed the pool on the west and continued in the same line as Pipe I131. A third pipe (I134; Square U212), from which only a small segment was unearthed, split off from Pipe I130 and continued westwards. This pipeline runs more or less parallel (ca. 25 m west) to the long pipeline mentioned above. It seems likely that this pipe system led water to the cisterns to its north (I572 or I964).

In contrast to the ceramic pipes, the stone-made channels were built in numerous locations and are usually shorter than the pipes. One of the better-preserved channels (I782) is mentioned above. Another similar long channel (I338; 0.70-1 m external width; 0.20 m internal width; 0.40 m height) with a packed earth bottom was unearthed in Squares L131, L132 and M133. This channel originates on the northern side of Cistern I332 and runs northward. After an estimated length of 4 m it makes a sharp turn of almost 90° to the east-northeast (Fig. 6.16). It continues in this direction for approximately 7 m and then turns again sharply to the north for at least 10.50 m where it was unearthed in Square K131 by the Israel Antiquities Authority, 4 m north of the present excavation. In this square another channel (I969) was unearthed parallel to it, its southern end being found in Square L131 joined to a plastered pool (I335).



Fig. 6.11: The eastern pipe system. Segment of Pipe I685 in Squares N-P/137 (*left*), looking north and detail of I685 in Square O137 (*right*), looking north.



Fig. 6.12: The eastern pipe system. Segments of Pipes I784 (*right*) and I785 (*centre*), and Channel I782 (*left*) in Square V139, looking north.



Fig. 6.13: The eastern pipe system. The angled casing (I385) (*left*) looking west and (*right*) south.

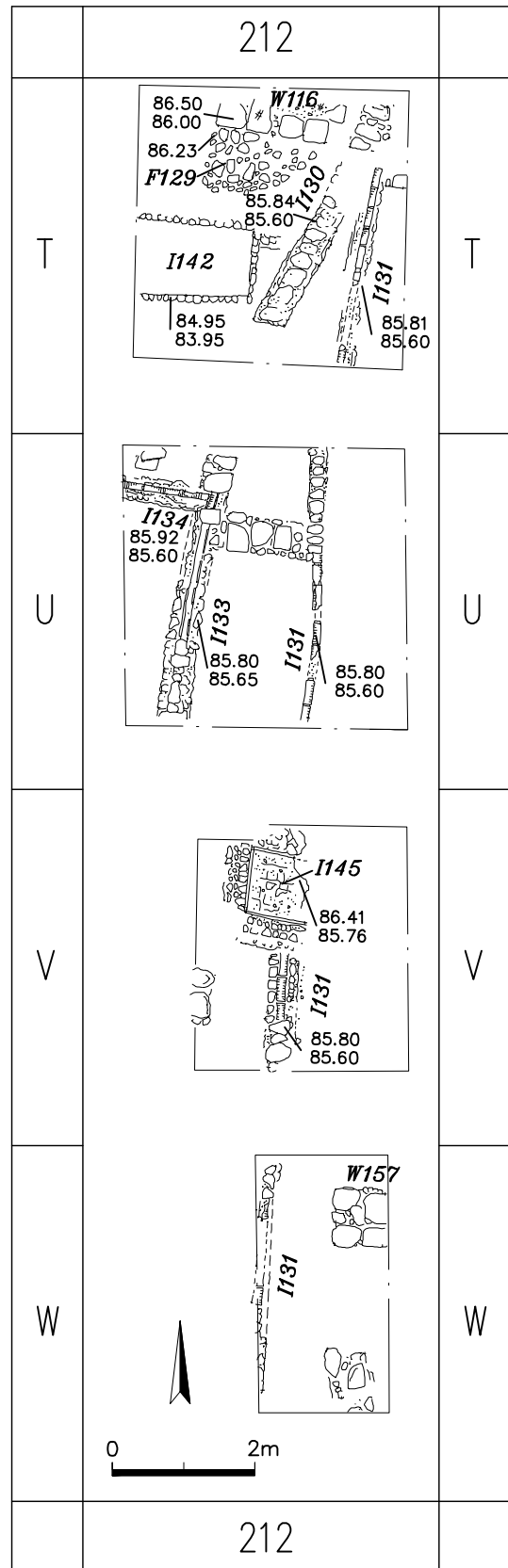


Fig. 6.14: The eastern pipe system. Pipes I268 and I386 in Square K136, looking west.



Fig. 6.15a: The western pipe system in Square U212, looking north.

Fig. 6.15b: Plan of the western pipe system.



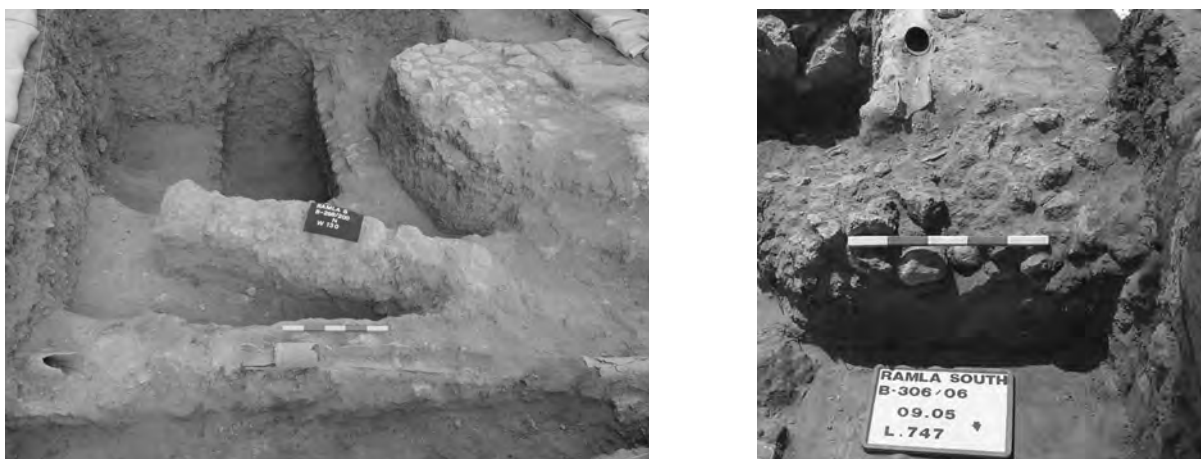


Fig. 6.15c: The western pipe system. Square T212, looking west (*left*); Square V212, looking south (*right*).

Segments of another long channel (I1565; 15 m known length; 0.60-0.70 m external width; 0.30 m internal width; 0.40 m height) were exposed in the western part of the site, in Squares P10-P12 of the 2007 season (Fig. 6.17). The channel is oriented roughly west-east, with a slight turn to the south at both of its excavated ends. The source and destination of the channel are unknown, since no additional installations were found in relation to it. Later, a wall (W1520) was built above parts of the channel in Squares P10 and P11. This was constructed of large coarsely-dressed stones (Fig. 6.18) and might have been the foundation wall of another channel which was not preserved.

There are also channels which were embedded in floors. One such channel (I261; Squares K137, L137; 0.60 m external width; 0.20 m internal width) was built together with the plastered floor F240 (Fig. 6.19). It is built of small fieldstones bound with mortar and has a plastered bottom. The channel was preserved along 5 m. It runs north-south and makes a 45° turn to the southwest. Its ends were not preserved, but it seems that its southern end was connected to the mosaic-paved courtyard floor (F355) to the southwest.

Another channel (I380; 0.60 m external width; 0.20 m internal width) which was connected to the paved courtyard was found in Square L138, beyond the courtyard's northern wall (not preserved). This channel, oriented northeast-southwest, was built over the remains of the Late Byzantine ashlar-

built structure (Chapter 5) (Fig. 6.20). The fact that its southern end touches the outer face of the Late Byzantine wall (W217) may indicate that the channel was originally a device which was attached to the wall from the outside in order to collect rainwater from the courtyard and direct it into a cistern or pool which was not found.

Square Q139 revealed a similar channel (I789; 0.50 m external width; 0.20 m internal width) which was probably embedded in a beaten earth floor (F733) sealing the Late Byzantine-Umayyad oil press (Chapter 5). The channel was cut in some later stage during the construction of a small plastered pool (I724) (Fig. 6.21). The two latter channels were found without covering stones, and were apparently open to the sky.

Other channels found in the excavations are:

I29: Squares S216, T216, U216, V216; orientation: north-south; known length: 20 m; external width: 0.60 m; internal width: 0.20 m; height: 0.45 m (Fig. 6.22).

I38: Square U214; orientation: east-west; known length: 3.50 m; external width: 0.70 m; internal width: unknown; height: 0.40 m.

I41: Square T214; orientation: north-south; known length: 4 m; external width: 0.60 m; internal width: unknown; height: 0.50 m (Fig. 6.23).

I249: Square K138; orientation: west-east; known length: 1.50 m; external width: 0.50 m; internal width: 0.20 m; height: 0.30 m. Connection with other features: Pool I222 (Fig. 6.24).



Fig. 6.16: Cistern I332 and a segment of Channel I338 (*left*), looking north. *Below*) The sharp bend in Channel I338, looking west.





Fig. 6.17: Channel I1565, looking west.



Fig. 6.18: Wall 1520 on top of Channel I1565, looking north.



Fig. 6.19: Channel I261 and Floor 240, looking west.



Fig. 6.20: Channel I380, looking west.

I377: Square K138; orientation: west-east; known length: 1.50 m; external width: 0.60 m; internal width: 0.30 m; height: 0.30 m (this installation may have been used as a trough or a very narrow pool rather than as a channel) (Fig. 6.25).

I522: Square Q211; orientation: northwest-southeast; known length: 2 m; external width: 0.60 m; internal width: 0.20 m; height: 0.35 m. Connection with other features: Cisterns I572 and I964 (Fig. 6.8).

I556: Square M209; orientation: west-east; known length: 3.50 m; external width: 0.80 m; internal width: 0.30 m; height: 0.30 m (Fig. 6.26).

I688: Square M140; orientation: north-south; known length: 4 m; external width: 0.60 m; internal width: unknown; height: 0.50 m.

I782: Squares T140, U139, U140, V139; orientation: north-south; known length: 13 m; external width: 0.50 m; internal width: 0.20 m; height: 0.60 m. Connection with other features: Cistern I590 (Figs. 6.3a and 6.12).

I788: Square Q138; orientation: southwest-northeast; known length: 2.50 m; external

width: 0.50 m; internal width: unknown; height: 0.35 m. Connection with other features: Vaulted Chamber I787(?) (Fig. 6.27).

W829 (probably foundation of a channel): Squares Y134, Z135; orientation: southwest-northeast; known length: 8 m; external width: 0.50 m; height: 1.09 m (Fig. 6.28).

I969: Squares L131, K131; partially excavated by the Israel Antiquities Authority; orientation: north-south; known length: 8 m; external width: 0.50 m; internal width: unknown; height: 0.14 m. Connection with other features: Pool I335.

Similar pipe units and pipelines were found in many Early Islamic assemblages in Palestine, in domestic and industrial contexts in both urban and rural settlements (e.g. Shor 1999: Fig. 100; Milevski and Rapuano 2001: Figs. 146, 147:15, 16; Stacey 2004: Fig. 4.7; Taxel 2005: Fig. 47:7). Parallels for stone-built channels are known from Ramla, some are incorporated with ceramic pipes (e.g. Gudovitch 2004: Figs. 1-2; Toueg 2007: Fig. 8).



Fig. 6.21: Channel I789, looking south.



Fig. 6.22: Channel I29, looking south.



Fig. 6.23: Channel I41, looking east.



Fig. 6.24: Channel I249 ending in Pool I222, looking east.



Fig. 6.25: Channel I377, looking south.



Fig. 6.26: Channel I556, looking east.



Fig. 6.27: Channel I788, looking south.



Fig. 6.28: Wall 829, looking east.

POOLS

Remains of 43 pools in varying states of preservation were discovered during the excavations at the site. Some were fully preserved while others reveal nothing but constructions and segmented floors. All the pools were built of small fieldstones bound with mortar and were coated on the inside and sometimes outside by whitish smoothly textured plaster. In some cases, a marble slab was inserted in the inner wall as a step to enter or exit the pool. The pools' floors were made of plaster, *tesserae* or limestone and/or marble slabs. As was the case with the cisterns, the uppermost layer of plaster usually covered a layer of pottery sherds – body fragments of storage jars in the main together with sherds of other vessels (including rim fragments). Here, too, these sherds supply a *terminus post quem* for the construction of the pools in the late Umayyad period. Typologically, the pools can be divided into three types:

TYPE 1: BARREL-VAULTED ROOFED SQUARE POOLS

Four different-sized pools of this type were discovered. In three of these the roof had collapsed prior to the excavations whereas the fourth was completely preserved.

The largest pool (I534) was excavated in Squares P140, P209. It is ca. 1.50 × 4.10 m (inner dimensions) with a depth that exceeds 2 m. It has a flat floor and in its southwestern corner a settling pit of about 0.50 m depth was fixed (Fig. 6.29). Once the pool ceased to be used, this pit formed the lower part of a refuse pit (Locus 535) which was found filled with 9th-10th century CE pottery-types.

A fully-preserved pool of Type 1 was discovered in Squares K-L/138-139 (I230; ca. 1.50 × 2 m inner dimensions). It was filled with earth and was not excavated but a square opening (0.50 m wide) on the western side of the roof could be discerned (Fig. 6.30). West of this was an unplastered vaulted chamber (I247; ca. 1 × 1.50 m inner dimensions) that may have served as a settling pit (at least at some stage) for residue in the water flowing into the pool to its east.

One of the other two pools of this type was found in Square T213 (I67; ca. 1.90 × 2.35 m inner dimensions), the western half of which was excavated to a depth of more than 2 m without producing any indicative finds (see Chapter 1: Fig. 1.1). The lower part of the second pool appeared in Square R210 (I518; ca. 2.20 × 2.30 m inner dimensions). It was fully excavated and revealed a stepped eastern wall (Fig. 6.31).

TYPE 2: OPEN SQUARE POOLS

Most pools of this type are small (ca. 1 × 0.50 m inner dimensions) and shallow (ca. 1 m maximum depth). Remains of 34 such pools were excavated, but in many cases they were only partially preserved or partially excavated and often architecturally or stratigraphically unconnected to remains in their immediate area. Exceptions were discerned in Squares L134 and M134 where a series of four pools at different elevations were found to be part of the same installation. They included a settling pit made of a storage jar with a detached neck that was placed right outside the southwestern corner



Fig. 6.29: Pool 1534, looking east.



Fig. 6.30a: Pool I230 and Vaulted Chamber I247, looking east.

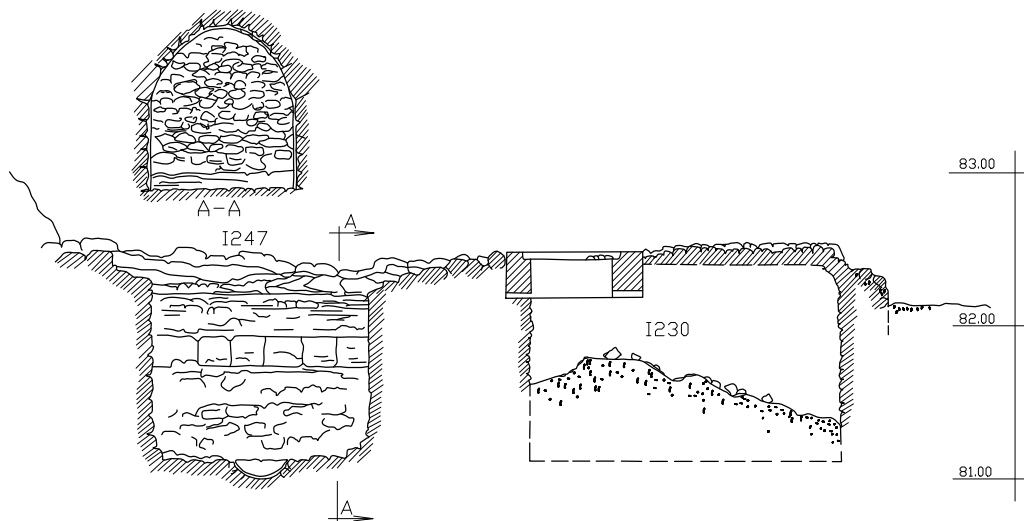


Fig. 6.30b: Section through Pool I230 and Vaulted Chamber I247, looking north.



Fig. 6.31: Pool I518, looking north.

of one of them (I655) (Fig. 6.32, for the storage jar see also Fig. 6.94:4). Another series of four open square pools was unearthed in Squares T11 and T12 (I1575) (Fig. 6.33). Three of the pools were partially preserved (I1575a, c-d), and the inner dimensions of the fourth (I1575b) are 3.5 × 1.6 m. With the exception of a ceramic pipe that connected the northwestern pool to that south of it the relation between the pools is unclear. In Squares K138, L138 on the other hand, a pool (I222) was discovered that was built against a wall of an earlier date, as well as a built channel (I249) that served it (Fig. 6.24). In Square V212 was another pool (I145) with a floor made of square-shaped ceramic tiles. The construction of this pool caused an earlier ceramic pipe (I131) which was oriented north-south (Figs. 6.34 and 6.35) to be detached (see also Fig. 6.15).

Among the square pools of Type 2 are stepped variants. One of these (I39) has three steps and a

large settling pit. Another group of five pools unearthed in the western part of the site (I631, I1562, I1674, I1683 and I1725) is characterized by a narrow step (ca. 0.20 m wide) built along the inner face of one of their walls (sometimes reaching a height of 0.40 m). Two of these pools also have settling pits (see below).

All the Type 2 pools found in the excavations are described below:

I39 (with steps and settling pit): Squares U216, V216; internal measurements: 0.90 × 1.15 m; known depth 1 m; two steps, ca. 0.30 × 0.30 × 0.30 m each; settling pit 0.35 × 0.45 m and 0.15 m deep in its southwestern corner (Fig. 6.36).

I123 (with settling pit): Square U211; internal measurements: 0.85 × 1.05 m; known depth 0.50 m; settling pit 0.30 m in diameter and 0.20 m deep in its northwest corner. Connection with other features: Floor F152 (Fig. 6.37).

I128: Square S211; partially preserved; internal measurements: 0.55 × 0.95 m; known depth 0.07 m.

I145: Square V212; partially preserved; internal measurements: 0.95 m long; known depth 0.65 m (Fig. 6.34).

I222: Squares K138, L138; internal measurements: 0.60 × 0.80 m; known depth 0.51 m. Connection with other features: Channel I249 and Floor F207 (Fig. 6.24).

I253: Square K137; partially excavated; internal measurements: 0.35 × 0.60 m; known depth 0.50 m.

I335: Squares L131, M131; internal measurements: 0.65 × 0.78 m; known depth 0.13 m.

I343: Square M136; partially excavated; internal measurements: 0.60 m wide; known depth 0.56 m (Fig. 6.38).

I345: Square M136; partially excavated; internal measurements: 0.65 m wide; known depth 0.63 m (Fig. 6.38).

I348: Square M137; internal measurements 0.65 × 0.95 m; known depth 0.15 m (Fig. 6.39).

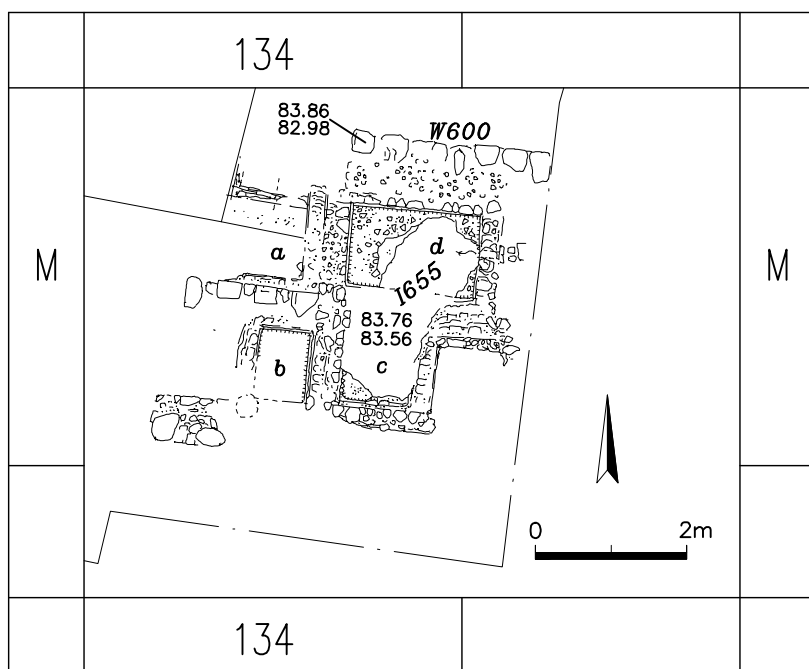


Fig. 6.32a: Plan of Pools I655a-d.



Fig. 6.32b: Pool I655b, looking south (*left*); Pool I655d, looking east (*right*).

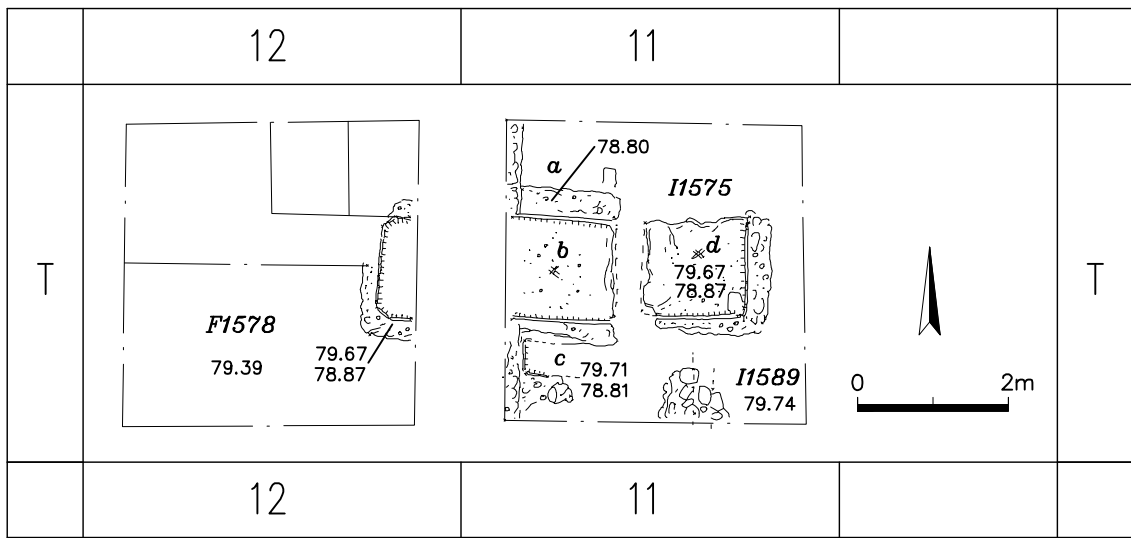


Fig. 6.33a: Plan of Pools I1575 a-d.



Fig. 6.33b: Pools I1575 a-d, looking south.



Fig. 6.34: Pool I145, looking west.

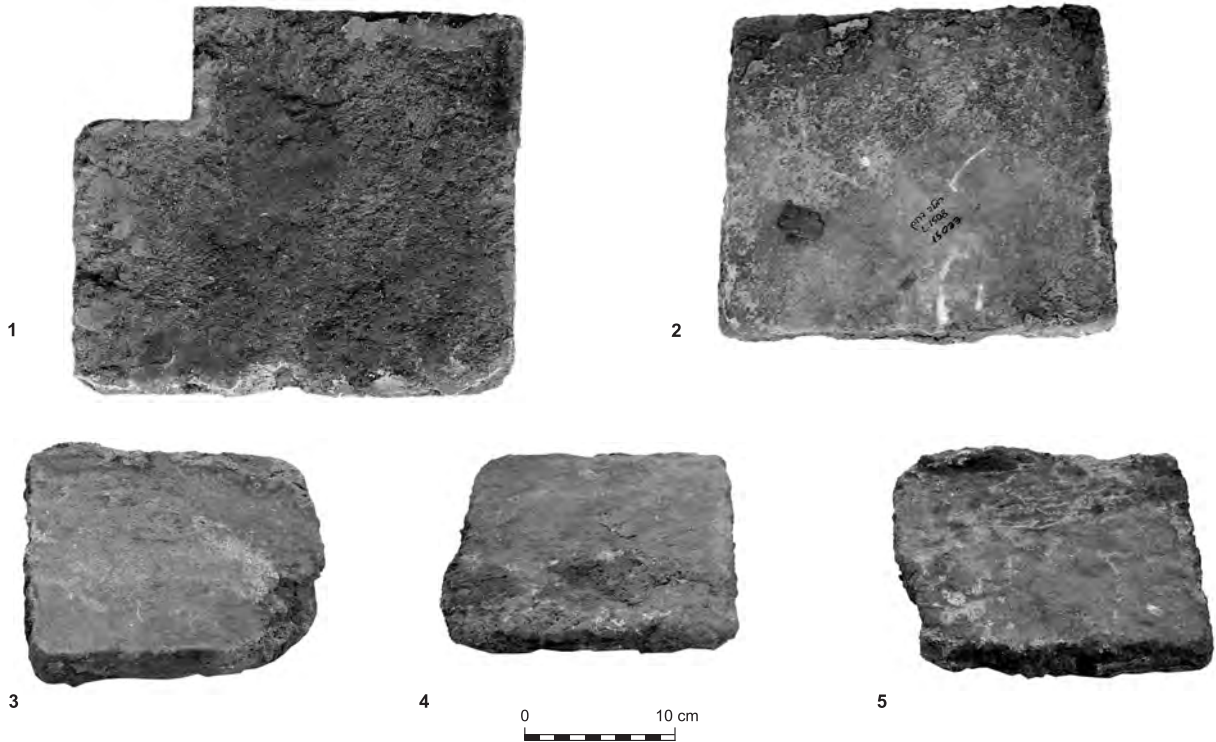


Fig. 6.35: Ceramic floor tiles. 1) Surface; 2) L1508; 3-5) L747 (taken from I145).



Fig. 6.36: Pool I39, looking north.



Fig. 6.37: Pool I123 and Floor 152, looking east.



Fig. 6.38: Pools I345 (in foreground) and I343, looking south.



Fig. 6.39: Pools I349 (in foreground) and I348, looking south.

- I349: Square M137; internal measurements: 0.55 × 1.00 m; known depth 0.44 m (Fig. 6.39)
- I581: Square O138; partially preserved; internal measurements: 0.60 m wide; known depth 0.10 m.
- I587: Square N138; partially preserved; internal measurements: 1.75 m wide; known depth 0.17 m.
- I601 (two connected pools): Square L134; internal measurements: northwestern pool [I601a] (partially excavated) 0.55 × 0.90 m; known depth 0.44 m; southeastern pool [I601b] (partially preserved) 0.55 × 0.65 m; known depth 0.44 m. Connection with other features: Wall W967 (Fig. 6.40).
- I616: Square R139; partially preserved; internal measurements: 0.35 × 0.60 m; known depth 1.55 m. Connection with other features: Pool I619.
- I619: Squares R138, R139; partially preserved; internal measurements: 0.75 m wide; known depth 0.36 m. Connection with other features: Pool I616.
- I624: Square T209; partially preserved; base of storage jar for settling *in situ*; known depth 0.18 m (Fig. 6.41). For the column base see Fig. 6.122:2.
- I631: Square U210; partially preserved; internal measurements: 0.45 × 0.75 m; known depth 0.93 m (Fig. 6.42).
- I642: Square W209; internal measurements: 0.90 × 0.95 m; known depth 1.24 m; in its upper western wall two drainage holes (5 cm in diameter) were set (Fig. 6.43).
- I655 (four connected pools): Squares M133, M134; internal measurements: northwest pool [I655a] (partially preserved) 1.05 m width; known depth 0.20 m; southwest pool [I655b] (partially preserved) 0.65 × 0.95 m; known depth 0.20 m; southeast pool [I655c] (partially preserved) 0.95 × 1.05 m; known depth 0.20 m; northeast pool [I655d] (partially preserved) 1.05 × 1.65 m; known depth 0.20 m. Connection with other features: Wall W600 (Fig. 6.32).
- I669: Square W210; partially preserved; known depth 0.26 m.
- I673: Square V211; partially preserved; internal measurements: 1.05 m wide; known depth 0.22 m. Connection with other features: Walls W671 and W672 (Fig. 6.44).
- I679: Square R137; partially excavated; internal measurements: 0.35 m wide; known depth 0.33 m (Fig. 6.45).
- I724 (with settling pit): Squares Q138, Q139; internal measurements: 0.85 × 1.15 m; known depth 0.62 m. quarter-circular settling pit 0.35 m in diameter and 0.30 m deep in its northwest corner. Connection with other features: Wall W790 (Fig. 6.46).
- I1522: Square Q10; internal measurements: 0.60 × 0.80 m; known depth 0.49 m. Connection with other features: W1517(?) (Fig. 6.47).
- I1562 (with step): Squares T10, U10; internal measurements: 0.90 × 1.10 m; known depth 0.98 m (Fig. 6.48).
- I1575 (four connected pools): Squares T11, T12; internal measurements: northern pool [I1575a] (partially preserved) 1 × 1.30 m; known depth 0.85 m; western pool [I1575b] 1.6 × 3.5 m; known depth 0.64 m; southern pool [I1575c] (partially preserved) 1 × 1 m; known depth 0.80 m; eastern pool [I1575d] (partially preserved) 1.30 × 1.40 m; known depth 0.80 m. Connection with other features: Floor F1578 (Figs. 6.33 and 6.75).
- I1674 (with step; partially excavated): Square Y11; internal dimensions: 0.7 × 0.8 m; known depth 0.40 m (Fig. 6.49).
- I1683 (with step and settling pit): Square X12; internal dimensions: 0.9 × 1.2 m; known depth 0.92 m; settling pit 0.20 m in diameter and 0.10 m deep in its southwestern corner (Fig. 6.50).
- I1725 (with step and settling pit): Square W10; internal dimensions: 0.9 × 1.1 m; known depth 0.31 m; settling pit 0.20 m in diameter and 0.10 m deep in its southeastern corner (Fig. 6.51).

TYPE 3: OPEN ROUND POOLS

Only two pools of this type were discovered. Both are small and shallow. I716 (Square Q137) is built of fairly thick walls (0.40 m) and is ca. 1.15 m internal diameter, 1.30 m deep, and has a settling pit (0.30 m in diameter at its base (Fig. 6.52). The other (I372; Square L138) is built of 0.20 m thick walls and is ca. 0.50 m internal diameter, 0.25 m deep, with rough white mosaic floor (Fig. 6.53).



Fig. 6.40: Pool I601b, looking north.



Fig. 6.41: Pool I624, looking south.



Fig. 6.42: Pool I631, looking east.



Fig. 6.43: Pool I642, looking west.



Fig. 6.44: Pool I673, looking south.



Fig. 6.45: Pool I679 (*top right*), looking north.



Fig. 6.46: Pool I724, looking south.

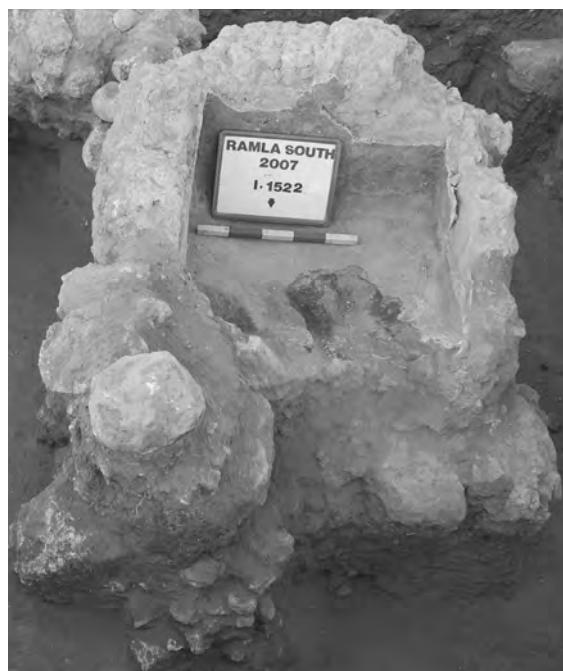


Fig. 6.47: Pool I1522, looking south.



Fig. 6.48: Pool I1562, looking west.



Fig. 6.49: Pool I1674, looking north.



Fig. 6.50: Pool I1683, looking west.



Fig. 6.51: Pool I1725, looking east.

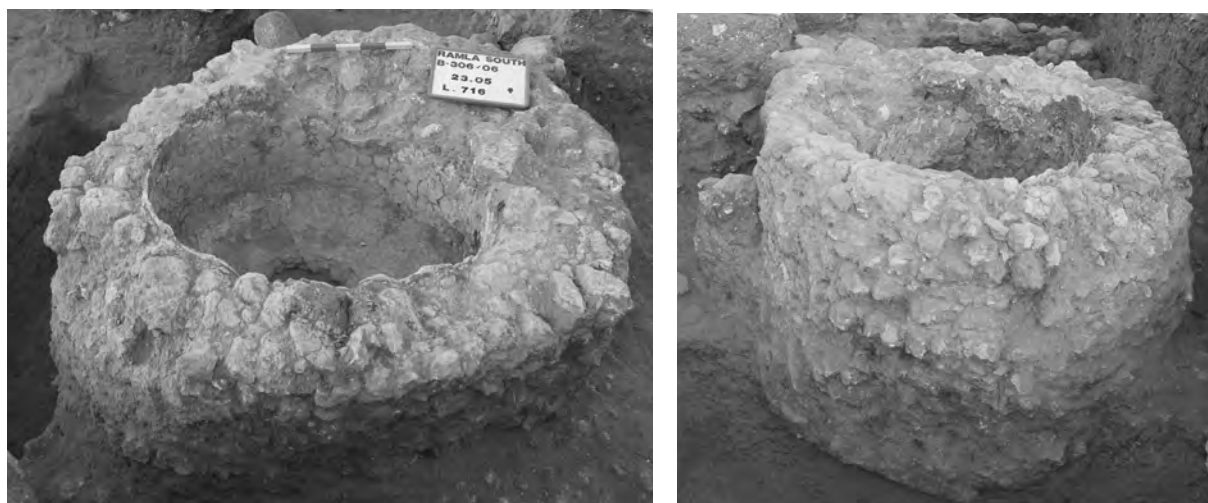


Fig. 6.52: Pool I716. *Left*) Looking south; *right*) Looking west.

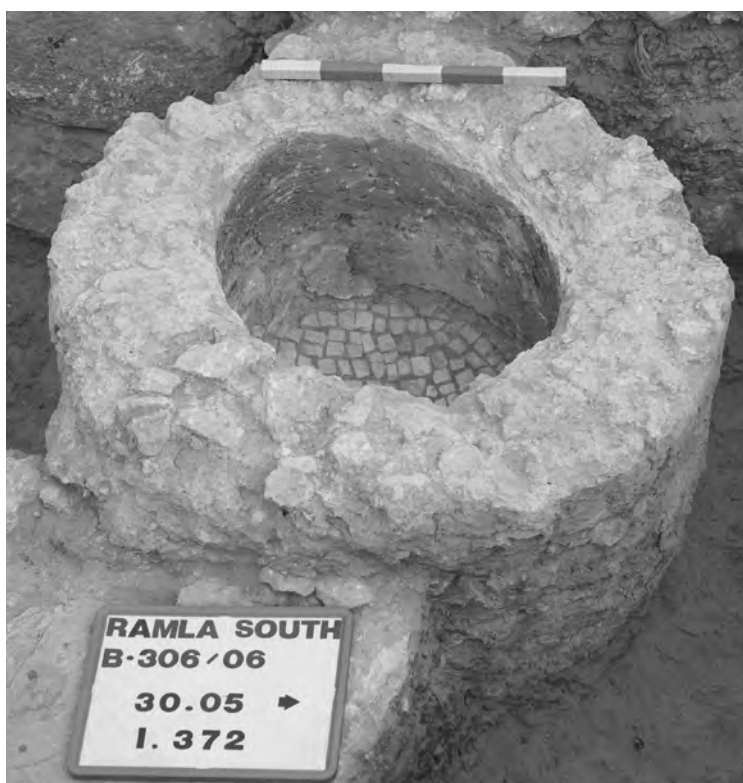


Fig. 6.53: Pool I372, looking west.

SUBTERRANEAN VAULTED CHAMBERS

Remains of 13 subterranean vaulted chambers were discovered during excavations at the site. The majority are small (not exceeding 3 m²) with vaults about 1 m wide. The two largest chambers are I538 in Squares R140, S140, ca. 1.50 × 3 m and about 2.50 m deep (Fig. 6.54), and I280 in Square X209, ca. 1.50 × 3 m, which was partially excavated (Fig. 6.55). A vaulted chamber with rounded contour lower foundations (I1718; Square V12) was discovered in the 2007 season. Its diameter is 1.40 m (Fig. 6.56). The building technique was similar in all chambers. The roof was built of fieldstones bound with grey mortar. No floors were discerned except for one example which had a stone floor with a settling pit in its centre (I247; Square L139) apparently to collect residues from the water that flowed into the pool to its east (I230) (Fig. 6.30). The near absence of floors or stairs led to the conclusion that most (if not all) subterranean vaulted chambers at the site are sewage oriented.

Complete vaults were preserved in six installations: I787 in Square Q138, I247 in Square L139, I1569 in Square Q10, I1716 in Square X11, I1717 in Squares X11, X12 and I1718 in Square V12.

The subterranean vaulted chambers are listed below:

- I142: Square T212; partially excavated; internal measurements: 1 × 1.60 m; known depth: 1 m (Fig. 6.57).
- I247: Square L139; internal dimensions: 1 × 1.50 m; known depth: 0.52 m. Connection with other features: Pool I230 (Fig. 6.30).
- I280: Square X209 (discovered filled with finds); partially excavated; internal measurements: 1.50 m long; known depth: 0.74 m (Fig. 6.55).
- I344: Squares L136, M136 (discovered filled with finds); partially excavated; internal measurements: 0.75 × 1.45 m; known depth: 0.70 m (Fig. 6.58).
- I538: Squares R140, S140 (discovered filled with finds); internal measurements: 1.55 × 3 m; known depth: 2 m (Fig. 6.54).
- I625: Square T209 (discovered filled with finds); partially preserved; known depth: 1.24 m.

Connection with other features: Pool I624(?) (Fig. 6.59).

- I664: Square U210; partially excavated; internal measurements: 1.75 m long; known depth: 0.29 m.
- I787: Square Q138 (discovered filled with finds); partially excavated; internal measurements: 1 m long; known depth: 1.69 m. Connection with other features: Channel I788(?) (Fig. 6.60).
- I1569: Square Q10; internal dimensions: 1.10 × 2 m; known depth: 0.75 m (Fig. 6.61).
- I1589: Square T11; internal dimensions: 0.70 × 1 m; partially excavated (Fig. 6.33).
- I1716: Square X11; internal dimensions: 1.50 × 1.85 m; known depth: 0.75 m (Fig. 6.63).
- I1717: Squares X11, X12; internal dimensions: 1.50 × 2.90 m; known depth: 0.75 m (Fig. 6.62).
- I1718: Square V12; diameter 1.40 m (rounded contour); known depth: 1.55 m. Connection with other features: Floor F1626 (Fig. 6.56).

Chambers I280, I344, I538, I625 and I787 were modified and used for refuse in their later stage of use. These produced a considerable amount of domestic refuse which mainly included broken pottery vessels and, in smaller quantities, glass vessels, metal objects, coins and a few animal bones (almost exclusively caprovine metapodia).

These vaulted chambers are thus well-stratified, secure loci of undisturbed nature that actually contain the richest assemblages discovered at the site. The assemblages are dated to the 9th-10th centuries CE yet lack glazed cooking vessels and lamps. Pottery and glass types represent the known domestic repertoire of the period under discussion, which can be divided into families of table vessels, cooking vessels, storage vessels and lamps. Since the pottery sank in the sewage sludge of the subterranean vaulted chambers, the ware of many fragments changed its original colour to yellowish-greyish and become stained by sludge residues.

The phenomenon of vaulted chambers used as refuse pits in the city of Ramla is known from other excavations (e.g. Abd Rabu 1999: Fig. 101).



Fig. 6.54: Vaulted Chamber I538, looking north.



Fig. 6.55: Vaulted Chamber I280, looking north.

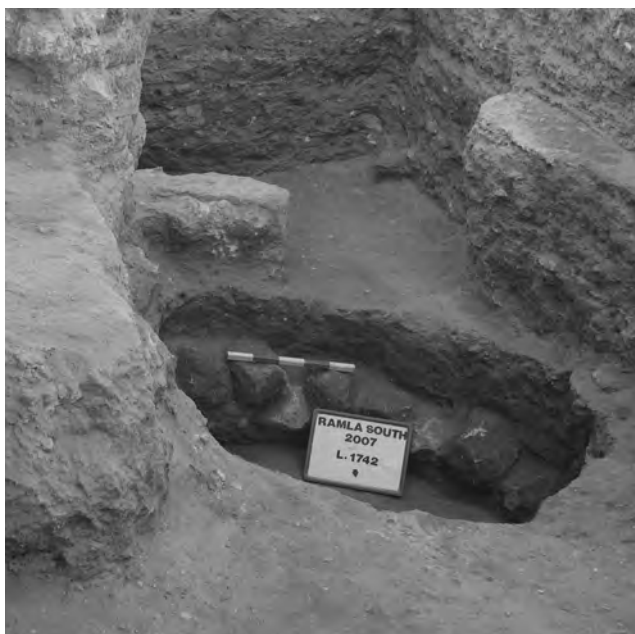


Fig. 6.56: Vaulted Chamber I1718, looking southwest.



Fig. 6.57: Vaulted Chamber I142, looking west.



Fig. 6.58: Vaulted Chamber I344, looking southwest.



Fig. 6.59: Vaulted Chamber I625 (in foreground), looking east.



Fig. 6.60a: Vaulted Chamber I787, looking south.

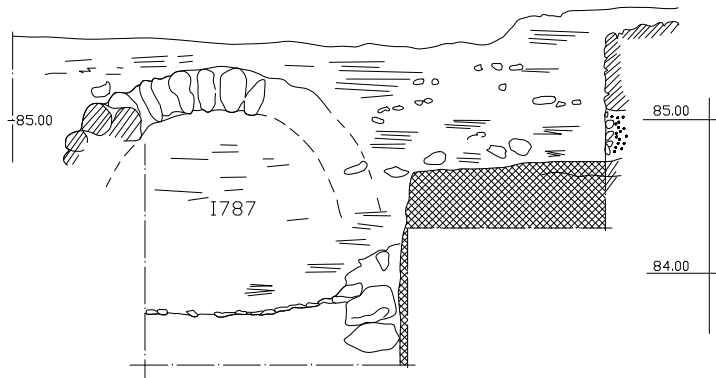


Fig. 6.60b: Section through Vaulted Chamber I787, looking south.



Fig. 6.61: Vaulted Chamber I1569, looking east.



Fig. 6.62: Vaulted Chamber I1717, looking south.



Fig. 6.63: Vaulted Chamber I1716, looking east.

PAVED WORKING SURFACES

Some of the squares excavated revealed remains of paved surfaces which were usually close or adjacent to other installations such as cisterns and plastered pools. Most of these were working surfaces or threshing floors connected to the industrial activity of a particular installation, although some belonged to other structures which seem to have been of a domestic nature.

The surfaces were paved with mortar, mosaic or stone. The mortar was usually bound with small fieldstones and sometimes with fragmented shells, as in Squares K137, L137 (F240) where it lay on a fill which covered the remains of an older mortar floor (F260 [not on plan]). The new floor was built together with a Channel I261 (see Fig. 6.19). Another patch of this floor protrudes from the eastern bank of Square K138, and continued westwards.

Better preserved stretches of mortar floors, some of which form a sequence one above the other, were discovered in the 2007 season in the western part of the excavated site, especially in Squares R11, X10, Y10 and Y12. These working surfaces were also associated with installations or abutted on pools and/or subterranean vaulted chambers. This connection was not always obvious but in some cases it was physically demonstrable, e.g. F1626 in Square V12, abutting on Vaulted Chamber I1718 (Fig. 6.56).

A mosaic-paved working surface (F117/F150) was found in Square S212. This floor was made of white medium-sized *tesserae* (1.5-2 cm²) (Fig. 6.64). In the south, it probably abutted on wall W116, beyond which were additional installations, namely a floor made of small fieldstones (F129), a subterranean vaulted chamber (I142) and two pipes (I130 and I131).

Another, considerably smaller, mosaic-paved working surface (F605) was found in Squares M135, N135 (Fig. 6.65). This mosaic was too made of white medium-sized *tesserae* (1.5-2 cm²). The floor was part of an installation (I593) to which belong the remains of walls and a round feature (0.70 m in diameter) built of small fieldstones which may have been used as a jar stand.

Most of the stone floors found at the site were built of small fieldstones, sometimes bound with mortar, although at least three exceptions are known. A small patch of floor (F550) was exposed in Square O140. It is made of large coarse slabs of hard rough Glycymeric (Palmahim type) beach-rock (Fig. 6.66). This type of rock, composed mainly of whole and broken *Glycymeris violacescens* shells, is the hardest among those known along the Mediterranean coast of Palestine and common mainly on the southern coast (Neri 1994:72). The slabs, therefore, must have been brought to the site from that area, perhaps from one of the closest harbours operating in the Early Islamic period such as Jaffa or Yavneh-Yam. Beach-rock was used in antiquity mainly for producing various types of millstone (usually saddle querns and rotary querns). These implements were most probably made in the quarry itself, as indicated by a beach-rock millstone quarry found near Akko (Galili and Sharvit 2001). The heavy beach-rock slabs, thus, were brought to the site for some other purpose (see in this respect Kletter 2005a:91, Fig. 26:2-3). According to Neri, the morphological characteristics of the beach-rock made it suitable for processing leather which was rubbed against the rough surface (1994:19). It is possible, therefore, that Floor F550 was used for processing some kind of organic material. This floor was part of a larger complex comprising also two large bell-shaped clay vats (I580; 0.90 and 0.80 m in diameter) which were partially sunk into the ground (Fig. 6.67). The vats were made of coarse dark brown clay which was fired at a relatively low temperature. They have a flat base, thick walls and a plain rim. Fragments of additional vats, some decorated with incisions, were found in other parts of the site too (see below). These vats, although resembling *tabuns* in their shape and material were not used for cooking purposes as evident from the absence of charring or ash inside them, and may thus be defined as storage bins for dry materials.

In Squares K138, L138 a beach-rock floor (F207) was found adjacent to the edge of a small plastered

pool (I222; see Fig. 6.24). Between the floor and the pool's eastern wall a rectangular stone slab with four round sockets was embedded in secondary use. Originally it probably served as a stand for storage jars (see Fig. 6.125:1). This floor might have been connected to the mortar floor (F240) mentioned above, but due to the poor condition of preservation of these two floors this cannot be proved.

Another stone floor (F845) was found by the Israel Antiquities Authority in Squares W138, W139. The western part of the preserved section of this floor was made of small fieldstones, but its eastern part was made of large fieldstones in the main together with ashlar in secondary use. This floor could not be securely connected to any feature (Fig. 6.68).

In addition to the mortar, mosaic and stone floors which can be identified as industrial working surfaces, other floors apparently belonged to domestic complexes. The largest complex of this kind was unearthed in Squares M138, M139 (Fig. 6.5). The main excavated part was a large space, most probably a courtyard (F355; 5 m width; 6.50 m minimum length). The northern wall of the courtyard was almost completely dismantled, most probably during a later stone looting, excluding one ashlar stone which remained *in situ*. The eastern wall was also completely robbed out, as was most of the western wall. Only part of the foundation course of the latter wall was preserved. The area of the southern wall was not excavated. The courtyard was paved with a white mosaic of medium-sized *tesserae* (1.5-2 cm²), arranged haphazardly (Fig. 6.69). The mosaic floor was divided by rows of small polished ashlar into three or even four rectangular carpets. In the centre of the courtyard was a large cistern (I356) with a square opening (see above). Adjacent to the courtyard on its west was another paved space, possibly a room, of which only a small part was preserved. This floor (F358) was made of mortar laid on a foundation of small fieldstones (Fig. 6.70). The remains of the floor were found covered with many small voussoirs (Locus 329) indicating the presence of an arch which was possibly part of a dividing wall between the room and the courtyard

(Fig. 6.71). Since the above remains lay close to the surface, only few finds were found in the earth layer (Loci 322 and 328) which covered them. The *terminus post quem* dating of the complex to the 'Abbasid period is based on the few pottery sherds (some glazed) which were found in a trench (Locus 394) made right below the mosaic floor. Another trench (Locus 330), which was cut west of the preserved section of the adjacent room, also yielded pottery (mainly sherds but also an intact lamp, Fig. 6.101:5), glass vessels (Fig. 6.109:3) and metal objects (Fig. 6.135:5) and an Umayyad period coin (Chapter 7: No. 24). The dimensions and characteristics of the discussed remains and their possible connection to the industrial installations to their south (Pool I587, and see above), allow us to suggest that they formed part of a combined domestic-industrial complex.

Other remains of a possibly domestic nature were found in Square Q139, above parts of the Late Byzantine-Umayyad oil press. The remains of the oil press were incorporated, at least from the 'Abbasid period onwards, in the construction of other, mainly industrial complexes. Two levels of beaten earth floors were identified in this area. The lower, earlier floor (Locus 767 [not on plan]) sealed the area occupied by the large screw weight found *in situ* and the walls to its west (W956) and north (W790). The upper parts of these walls now delimited a smaller space from whose beaten earth floor the top of the screw weight protruded. It is possible that this floor was related also to the channel built on its southern fringe (I789, and see above) and to a subterranean vaulted chamber (I787) and another channel (I788) built to its east. On the floor a relatively large amount of pottery was found, including some restorable vessels dated to the 'Abbasid period. This floor was sealed and the adjacent installations (I787, I788 and I789) were partially destroyed and became unusable when a plastered pool (I724) was built on top of them. Together with the pool a part of the older wall (W790) was rebuilt, which now joined the pool's northern wall. The area west of the pool was covered by a new beaten earth floor (Locus 733 [not on plan]), in which a storage jar was found *in situ* in its northwestern corner.

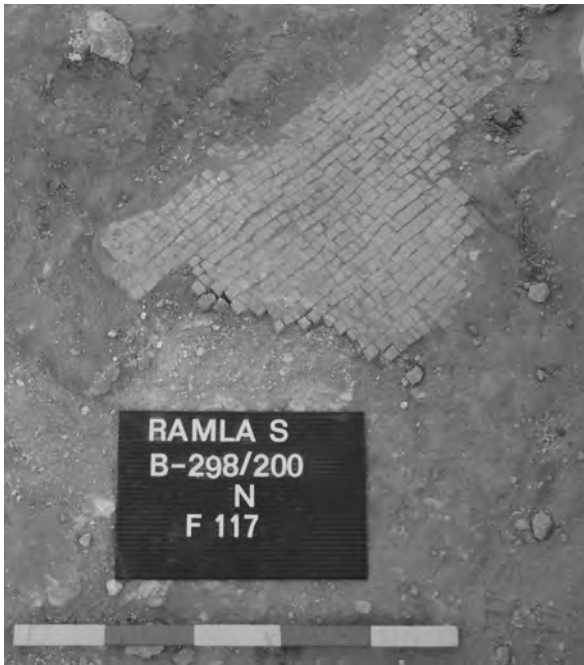


Fig. 6.64: Floor 117/150, looking north.



Fig. 6.65: Floor 605, looking north.



Fig. 6.66: Floor 550, looking northwest.



Fig. 6.67: Vat I580b, looking north.

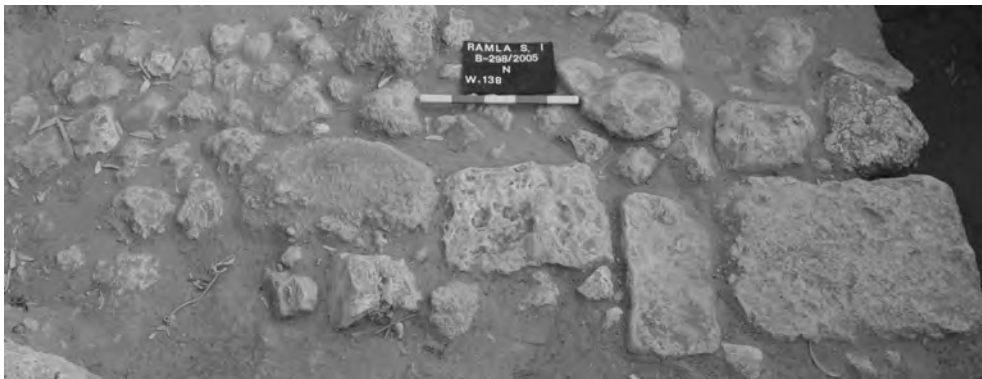


Fig. 6.68: Floor 845, looking north.



Fig. 6.69: Floor 355, looking west.



Fig. 6.70: Floor 358, looking south.



Fig. 6.71: Collapse of voussoirs on Floor 358, looking southwest.

Additional paved working surfaces were excavated:

- F152: Square U211; material: fieldstones bound with mortar. Connection with other feature: Pool I123 (Fig. 6.37).
- F155: Square U214; material: mortar bound with small fieldstones. Connection with other features: Walls W74 and W156.
- F351: Square M137; material: fieldstones bound with mortar. Connection with other features: I348, I349.
- F519: Square R140; material: fieldstones bound with mortar. Connection with other features: I538(?) (Fig. 6.72).
- F621: Square R139; material: fieldstones bound with mortar.
- F644: Square V211; material: limestone slabs.
- F713: Square X211; material: fieldstones bound with mortar.
- F723: Square W140; material: fieldstones bound with mortar. Connection with other features: Walls W916 and W917.
- F821: Square ZB138; material: fieldstones bound with mortar. Connection with other features: Floor F834 (earlier phase) and Wall W819.
- F834: Square ZB138; material: fieldstones bound with mortar. Connection with other features: Floor F821 (later phase) and Wall W819.
- F1514: Square Q11; material: mortar bound with small fieldstones (Fig. 6.73).
- F1516: Square R11; material: mortar bound with small fieldstones (Fig. 6.74).
- F1531: Square Q11; material: mortar bound with small fieldstones. Connection with other features: Wall W1537 (Fig. 6.73).
- F1542: Square R11; material: mortar bound with small fieldstones. Connection with other features: Wall W1536 (Fig. 6.74).
- F1571: Square R12; material: mortar bound with small fieldstones.
- F1578: Square T12; material: mortar bound with small fieldstones. Connection with other features: Pool I1575b (Fig. 6.75).
- F1626: Square V12; material: mortar bound with small fieldstones. Connection with other features: Vaulted Chamber I1718 (Fig. 6.56).
- F1627: Square Y10; material: mortar bound with small fieldstones (Fig. 6.76).
- F1628: Square W12; material: mortar bound with small fieldstones.
- F1629: Square Y11; material: mortar bound with small fieldstones.
- F1642: Square X10; material: mortar bound with small fieldstones.
- F1648: Square X10; material: mortar bound with small fieldstones.
- F1649: Square Y12; material: mortar bound with small fieldstones.
- F1680: Square V11; material: mortar bound with small fieldstones.
- F1681: Square X11; material: mortar bound with small fieldstones.
- F1690: Square X10; material: mortar bound with small fieldstones.
- F1691: Square X10; material: mosaic (white medium-sized *tesserae*); may be part of the western wine press (see Chapter 5, especially Fig. 5.18).
- F1697: Square Y10; material: mortar bound with small fieldstones (Fig. 6.76).
- F1698: Square V10; material: mortar bound with small fieldstones.
- F1711: Square X12; material: mortar bound with small fieldstones.
- F1719: Square Y12; material: mortar bound with small fieldstones.



Fig. 6.72: Floor 519, looking south.



Fig. 6.73: Floors 1514 (in foreground) and 1531, and Wall 1537, looking north.



Fig. 6.74: Floors 1516 (in foreground) and 1542 and Wall 1536, looking east.



Fig. 6.75: Floor 1578 and Pool I1575b, looking south.



Fig. 6.76: Floor 1627 (on right) and earlier mosaic floor 1696, and paved working surface 1697, looking east.

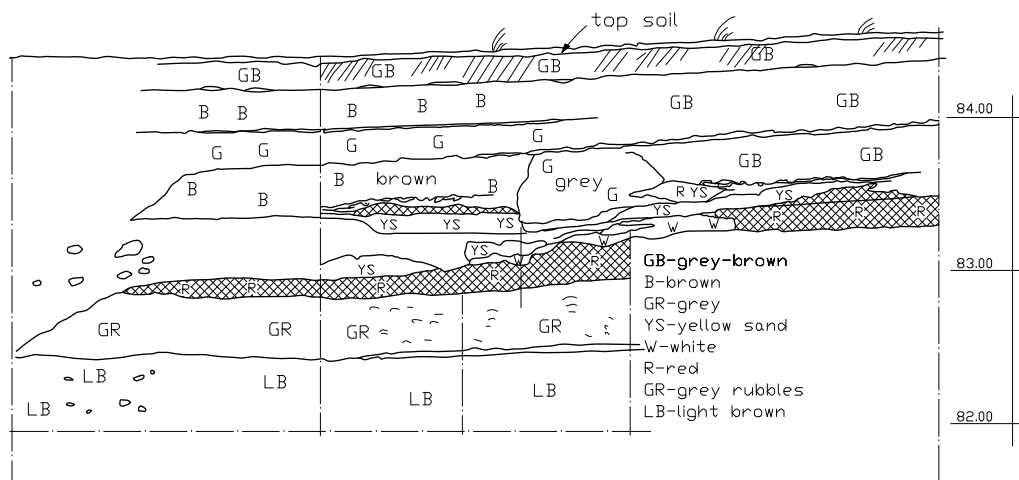
REFUSE PIT

Close to the southern fringes of the excavated area (Square Y138) part of a large deep refuse pit was discovered. On careful excavation it transpired that this was actually a series of refuse pits (Loci 752, 924, 946, 948 and 957) which were dug one inside the other, and that the older pits were partially levelled when a new pit was dug into them. The pits vary in depth between 0.37 m to 1.40 m and their combined total depth, from the topsoil layer to virgin soil, is 2.60 m (Fig. 6.77).

It is possible that these pits marked the southern fringe of the industrial site. Furthermore, their close proximity to some built features (including some that are located to the south of the refuse pits) may indicate that the latter were no longer in use when the pits were dug, and that the site's area was smaller at that time. The pits contained considerable amount of pottery sherds, in addition to fragments of glass vessels, stone objects and animal bones.²



Fig. 6.77: Refuse pit (combined L957 in Square Y138): *Above*) Looking southwest. *Below*) Section through pit, looking southwest.



2. The animal bones are exclusively metapodia of *ovis/capra*. However, the amount of bone material was relatively scanty in comparison to that of pottery and glass, and the MNI did not exceed a total of three adults from all the pits together. It should be emphasized that all other archaeozoological material recovered from the excavations of Ramla (South) was retrieved from disturbed fills and in any case was meagre in comparison to the area dug.

INDUSTRY

Among the different installations discovered during our excavations are cisterns of different sizes, pipes and channels of different kinds, pools of three types (vaulted, open-square and open-round), subterranean vaulted chambers (which initially served to collect residual material in the water) and working surfaces paved with mortar, mosaic or beach-rock. In our opinion, all these installations are related to the processing of flax (*Linum usitatissimum* L. [var. *vulgaris*]) into textile fibres.³

Flax was probably cultivated in the alluvium fields south and east of the site, where surveys and archaeological sections cut with mechanical tools did not reveal any contemporaneous archaeological finds. The dominance of alluvial soil, the existence of a subterranean latent water level at a depth of 3 m below the surface near the site, the fact that flax was cultivated in the area (until the 1960s when cotton growing replaced flax because of economic benefits) all strengthen this assumption.

In Palestine flax is a winter crop watered by rain and thus harvested in the summer months. When the stems turn from green to yellow they are harvested manually, which is a slow operation, and gathered into sheaves. The sheaves are left to dry on the ground for a day or two and then stooked in order to complete the drying which takes up to two weeks. The dried stalks are separated from the seeds by beating or rippling (combing). The seeds were used in other industries (food and cosmetics), whereas the stalks were retted (water-soaked). In one stem there are about 30 fibre bundles arranged inside the cortex and forming a ring around the stem, with small spaces between the bundles. One stem contains on average 1,000 individual fibre cells which are never all of the same length. In the plant they are joined together by a matrix (middle

lamella), intercellular substance. The matrix which joins the fibre cells differs from that which connects most of the other cells in that the latter can be broken down without at the same time breaking down that of the fibre cells. The procedure used for this isolation is retting. In this process the stems are submitted to the action of water, fungi and bacteria which decompose the material surrounding the woody part of the stems but leave the fibre bundles intact. This micro-biological process breaks down first the pectic substances in the matrix (middle lamella), then the cambium (or growth-tissue layer), then the phloem parenchyma and ground tissue and finally the parenchyma between the bundles and the outer parenchyma. Although the time taken for retting depends on a number of factors (water temperature, the nature of the water used and the crop itself), it requires a week to 10 days. The retted fibres are leached from the water and dried for a few days, and then processed in two stages: Firstly the flax fibres are separated from the straw, cleaned and opened up by beating the stems in order to break the internal pith (or boon) and free it from the fibres. Then they are scutched (or cleaned) by separating the woody fibres by gentle shaking and combing. During this operation the long fibres (linen fibres) break into shorter coarse fibres which are classified as scutched tow. The linen fibres, which form up to 15% of the crop, are used for fine thread weaving whereas the tow fibres are used in ropes, coarse fabrics, etc. (*Encyclopedia of Agriculture*, II, s.v. Pishta; Kirby 1963:15-37). Since no evidence connected to the weaving process was found, it seems likely that this was carried out elsewhere by artisans specializing in this craft.

Reconstruction of the industrial process carried out at the site makes use of all the industrially-oriented features discovered. Since the flax is

3. Although pollen was collected for archaeo-botanical analysis, we were unable to prove our assumption. Flax is characterized by insect pollination. Insects are attracted to the nectar secretion and the big pollen grains within the flower (Zohary 1978: 495) and, therefore, the pollen grains are very large, relatively few and quite heavy. On the other hand, wind pollinated plants are characterized by light, small-sized pollen grains produced in ample amounts (Faegri and Ivensen 1989). Usually it is impossible to distinguish between species of the same genus according to their pollen grains. Moreover, in many families the various genera have the very same pollen grains (cf. Oleaceae family – where there is no difference between pollen of *Olea europaea* and *Phillyrea media*; Liphshitz *et al.* 1991). The only difference within the Gramineae family is in the size of the pollen grain in the cultivated versus the wild genera. All members of the Chaenopodiaceae have the same size and shape of the pollen grains. We are indebted to N. Liphshitz of Tel Aviv University for this comment.

watered by winter rain, it is logical to assume that the site under discussion operated mainly in the spring and summer, especially considering its open-air features. Once the flax was harvested, collected in sheaves and dried in the fields during the spring, it was brought to the site for further processing. Since the site lacks natural water resources it is conceivable that water was collected in the cisterns first and foremost for industrial use. The numerous fragmented water-wheel (*antilya/sāqiya*) jars (Fig. 6.96) may attest to the existence of a well in addition to the cisterns. The number of water-collecting installations at the site indicates the primary role of water in the industrial process. Pipes and channels were used for controlling drainage. Water from cisterns was hand-drawn (except for I590 where a pipe 1968 apparently controlled the surplus). The fragmented nature of the archaeological remains precludes direct knowledge of the way that the pools were filled with water. However, at least in one case we have a pool (I222) that was supplied by means of a channel (I249). It is plausible that the vaulted pools (Type 1) served as distributional cisterns for the smaller square-shaped pools (Type 2) and round pools (Type 3), although there is no concrete evidence to support this assumption. It would seem that the numerous square pools unearthed could have been used as retting pools for the flax stalks. After the stalks were water-soaked for a period of some two weeks, they were leached and dried for a few days upon the many paved working surfaces which then served as a base for breaking up the flax by beating and scutching to isolate linen fibres. The many layers of paved surfaces one on top of the other can be explained by the wear and tear involved in these operations. Nevertheless, we do not rule out the possibility of other contemporaneous industries in some of the installations excavated at Ramla (South).

The industrial activities in the city of Ramla are known from several historical sources. Some are contemporaneous to the existence of Ramla as the capital of *jund Filasṭīn* and others are of a later Mediaeval date. Of special interest are the accounts of the geographer Ibn Zāfir (late 12th century CE) who mentioned the Ramalic-Tabaric (after Tabaristan in northern Iran) linen that was most probably produced

in Ramla (Ibn Zāfir, p. 35). Ibn Zāfir adds that the Fatimid caliph al-ʿAzīz (975-996 CE) established weaving workshops for linen in Egypt (*ibid.*; see also Gil 1992:246, Note 23). This was apparently the first step in the gradual monopoly of flax processing and linen production in Egypt and consequently the decline of this industry in Ramla and elsewhere in Palestine, for it is commonly accepted that in Mediaeval times there was no flax cultivation in this region (Amar 2000:160, 331, 336 and 340). However, there are two later historical sources that mention the linen industry in the context of Ramla. The first is the geographer al-Ḥimyarī (late 13th/early 14th centuries CE) who mentioned the Šuk al-Mašaṭīn (“the Market of the Scutchers [combers]”) in his description of the city of Ramla (al-Ḥimyarī, p. 268). The second source is the chronicler al-Ḥanbali (late 15th century CE) who while describing the city of Ramla mentioned the Šuk al-Mašaṭīn lele-Ktan (“the Market of the Linen Scutchers [combers]”) (al-Ḥanbali, p. 68). Both sources are based on an earlier source referring to Ramla’s glorious days, apparently during the ʿAbbasid period, while the linen industry still flourished. We believe that our excavations have unearthed an industrial quarter which served this market and may have been located in its relative proximity. The location of this market according to the sources in hand was however closer to the city centre, and within its walled area, as were the other markets of the city of Ramla (see Gat 2004:151, 164-166). Our industrial quarter was located outside of the city walls of Ramla but served as an integral part of its extra-mural remains, apparently close to the southern gate/s.

While the historical and archaeological data somehow contradict Amar’s observation on the gradual abandonment of flax cultivation in Palestine in the Early Islamic period (2000:160, 331, 336 and 340), the evidence of Tell Abu Shusha may provide local evidence of flax cultivation in the Late Roman and Byzantine periods and its replacement by the olive oil industry in the Late Byzantine period (see Safrai and Linn 1988).

The evidence brought forward from our excavations lends support to the historical data on the monopoly of Fatimid Egypt on flax cultivation and production in the 10th-11th centuries CE.

FINDS

Oren Tal and Itamar Taxel

POTTERY: TYPOLOGICAL DISCUSSION

The ceramic repertoire of the late Umayyad(?), ʿAbbasid and Fatimid periods is the largest and most varied found at the site. Many of the vessels originated in pools and subterranean vaulted chambers that were transformed into dumps in their last stage of use. Assemblages of a more domestic nature which originated in fills and refuse pits are also included. Representatives of other loci which yielded complete or nearly complete vessels are presented here as well.

The majority of the pottery types are defined according to rim morphology, which became the basis for most of the classifications of the vessels. Most of the rim prototypes were drawn and studied, but bases and decorated sherds were studied selectively only for their chronological contribution. Had the current study dealt with complete vessels only, the classification would have been somewhat different. Figures of vessels and fragments were edited according to prototypes and are organized typologically from open to closed vessels (Figs. 6.78-6.106). Types are also presented by loci in order to demonstrate those found together (Figs. 6.107-6.108). Vessels of the same prototype are presented selectively. The figures presented do not exhaust every sub-type of pottery retrieved from the site, but give a fair picture of all pottery types retrieved.

Most of the vessels discussed are wheel-made, and reference to ware types (sandy, gritty, semi-fine, fine) and colour is given for groups and prototypes in the text below. The recurrent use of the term buff ware refers to a wide range of colour notations of cream-yellowish hues that is familiar in the pottery repertoire of the Early Islamic period mainly in ʿAbbasid and Fatimid pottery types. A few of the buff ware jugs and juglets were found with cracked bases (e.g. Figs. 6.91: 1, 11; 6.92:11). This may indicate the presence of a potter's workshop at the site or in its immediate vicinity, for defective vessels do not travel far.

BOWLS

All bowls are medium to high-temperature fired ware.

FINE BYZANTINE WARE (FBW)

This term follows Gichon's study (1974) of a group of vessels (mainly bowls and cups) of homogeneous semi-fine ware distinguished by its fabric and surface treatment mostly found in southern Palestine in contexts of Late Byzantine and Early Islamic date. Magness provided a wider pattern of distribution (1993:166-171) and repertoire of vessels (1993:193-201) and the current classification follows her typology. Fig. 6.78:1 corresponds to Magness' Form 1E (1993:194, 196) with equivalents of the 8th and 9th centuries CE. Fig. 6.78:2 corresponds to Magness' Form 2A (1993:198-199) with equivalents of the 8th and 9th centuries CE. Fig. 6.78:3 corresponds to Magness' Form 2B (1993:198-199) with equivalents of the mid-7th to 9th/10th centuries CE. All of our examples can be attributed with a high degree of certainty to the late Umayyad and ʿAbbasid occupation at the site.

PLAIN

This term refers to bowls of coarse and semi-fine wares of different shapes. Fig. 6.79:1-3 are fragments of out-turned rim bowls. Equivalents from Early Islamic contexts are numerous (e.g. Peleg 1989: Fig. 43:2-3; Avissar 1996: Fig. XIII.64: 1-2; Kletter 2005a: Fig. 14:1, 3; Arnon 2007: Fig. 1:4). Fig. 6.79:4-5 are fragments of carinated (in-turned) rim bowls. Here, too, equivalents from Early Islamic contexts are numerous (e.g. Peleg 1989: Fig. 43:16, 22; Priel 1999: Fig. 157:2-3; Stacey 2004: Fig. 5.5:4-5; Kletter 2005a: Fig. 14: 5-6; Avissar 2006: Fig. 4:5; Arnon 2007: Fig. 1: 1). Fig. 6.79:6-7 are fragments of larger bowls with flattened rim and sharply carinated bodies. Equivalents are known from sites in northern Palestine (Avissar 1996: Fig. XIII.64:2; Stacey 2004: Fig. 5.14:5) and Transjordan (Khalil and Kareem 2002: Fig. 8:15, 17).

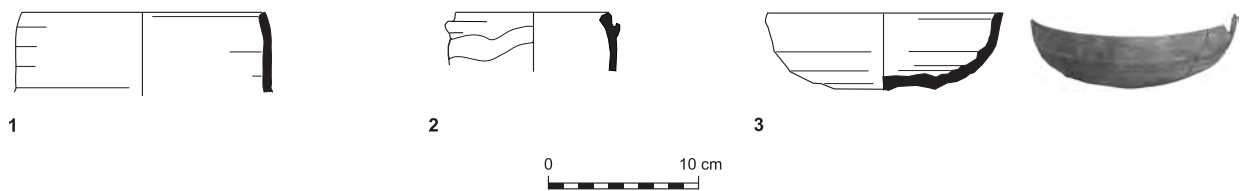


Fig. 6.78: Fine Byzantine Ware bowls: 1-2) L538; 3) L247.

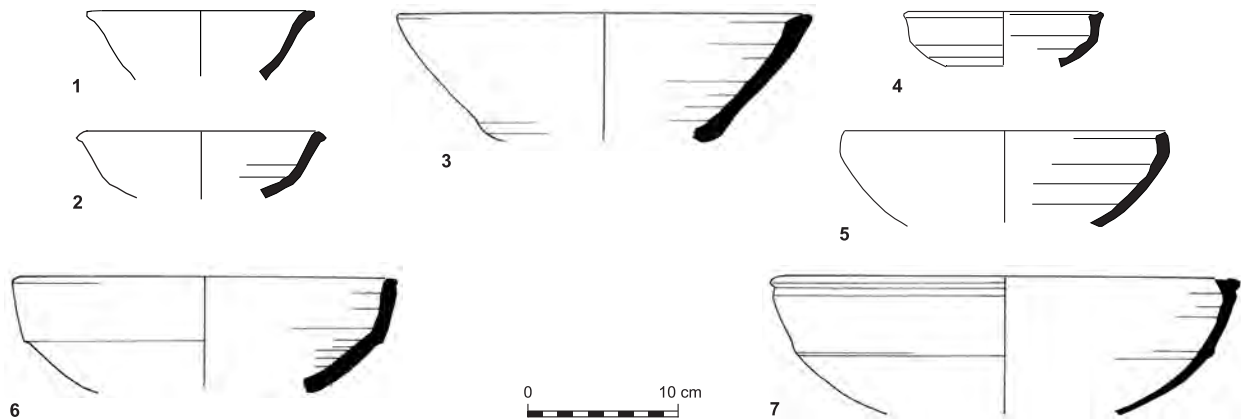


Fig. 6.79: Plain bowls: 1-2) L625; 3) L767; 4) L625; 5) L538; 6) L912; 7) L752.

DECORATED WITH WHITE BANDS

This term refers to bowls of orange-brown semi-fine and hard-fired (“metallic”) ware of different shapes with painted white bands of different shapes on the exterior and rim. They may be compared with a group of hard-fired, white band decorated vessels produced at Jerash in northern Transjordan between the 7th and the early 9th centuries CE. Yet, the bowls which belong to this group were reported only from assemblages of the mid-8th century CE

onwards (Walmsley 1995:661, 664, Ware 11). In Palestine these bowls are reported mainly from northern sites, and only seldom found in coastal sites. Fig. 6.80:1 is a ledge rim cylindrical body bowl (cf. Avissar 1996:120, Fig. XIII.70:2). Fig. 6.80:2 is a flattened rim shallow body bowl (cf. Avissar 1996:120, Fig. XIII.70:1). Fig. 6.80:3-4 are carinated body bowls with sharp to rounded rims (cf. Abu-Uqsa 2005: Fig. 20:1).

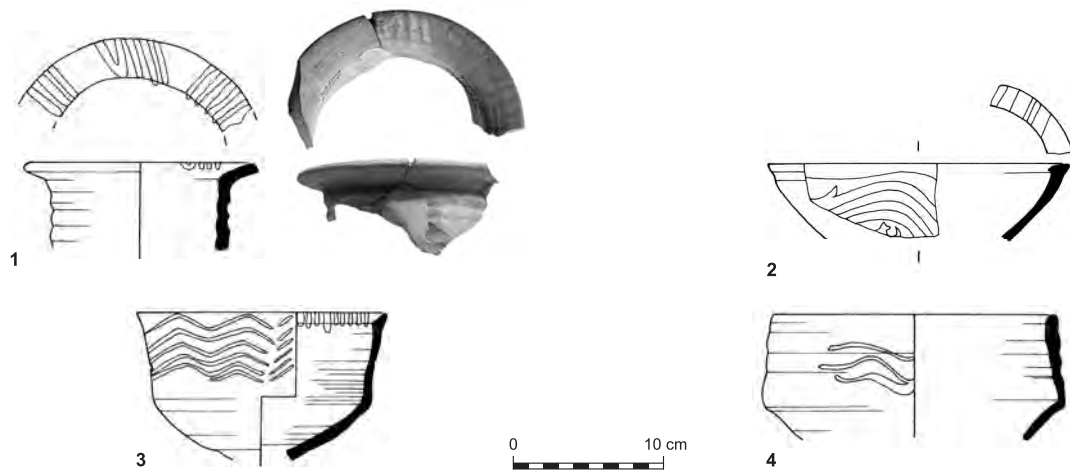


Fig. 6.80: White-band decorated bowls: 1) L762; 2) L912; 3-4) L752.

INCISED

This term refers to bowls of different wares, shapes and surface treatment. Fig. 6.81:1 is a sandy and gritty dark brown ware decorated with two wavy horizontal incisions on the outside. This bowl seems to be as a late (apparently ‘Abbasid) version of a FBW hemispherical bowl-type of the Late Byzantine and Umayyad periods (Magness 1993: 193, Form 1A), though it has no contemporaneous parallels. Fig. 6.81:2-10 are out-turned rim, flattened to drop lip, carinated body, sandy and

gritty buff to orange ware bowls. Decoration is varied and apparently unique to a certain specimen for it is hand-made. Horizontal wavy incisions in panels and sometimes on the upper part of the rim are dominant. Our examples can be compared with others of Early Islamic contexts (e.g. Peleg 1989: Fig. 43:12-13; Stacey 2004: Fig. 5.5:1-2, 6-8; Arnon 2008:93-94, 168, Nos. 124e-f, 131g). Fig. 6.81:11 is a flattened base of coarse light brown ware with at least two panels of incised vegetal motifs on the interior. No parallels were found.

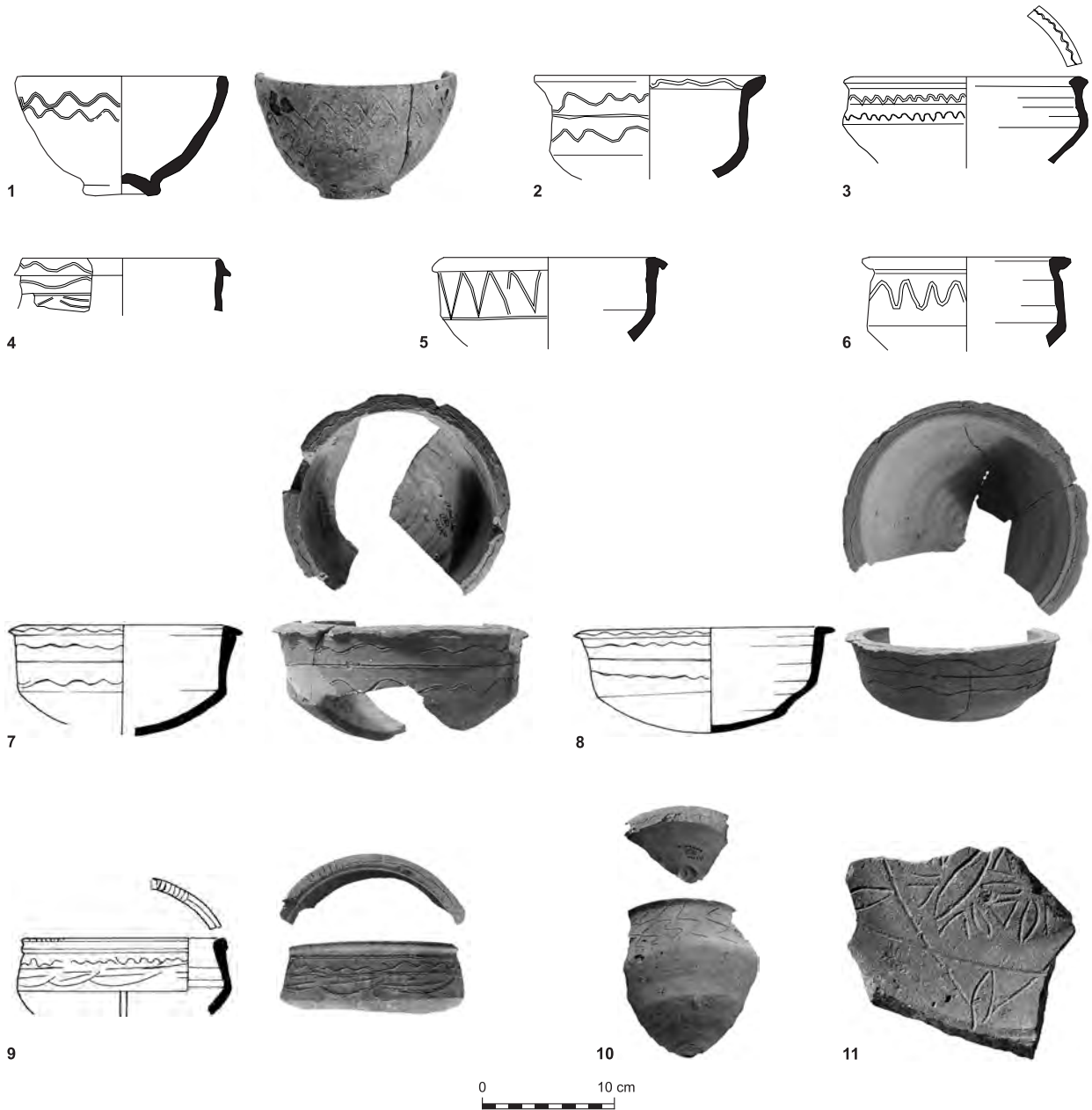


Fig. 6.81: Incised bowls: 1-6) L538; 7) L370; 8) L318; 9) L370; 10) L912; 11) L785.

CUT-DECORATED

This term refers to vessels of different shapes and wares with cut geometric decoration, confined mostly to triangles and oval-shaped designs, that is commonly known as Kerbschnitt (borrowed from the wood carving industry that these vessels imitate), sliced cutting (after Lane 1937:38) or chip-carved (after Rahmani 1983:222). Our bowls (Fig. 6.82) are made of sandy and gritty buff ware and characterized by thickened rims and carinated bodies. Decoration is however varied and apparently unique to a certain specimen for it is hand-made.

Horizontal wavy and geometric incised decoration in panels and on the upper part of the rim, as well as cut-triangles and vegetal-styled motifs are well-represented. One example has also a painted red decoration of a band with a vertical wavy line on the interior (Fig. 6.82:4). Counterparts from Early Islamic contexts are numerous and can be found in Palestine and beyond (e.g. Peleg 1989: Fig. 46; Avissar 1996: Fig. XIII.74; Stacey 2004: Fig. 5.5:1-2, 6-8; Kletter 2005a: Fig. 15:6-7, all with additional equivalents; for a red-painted parallel see Johnson 2006: Fig. 15.15:289).

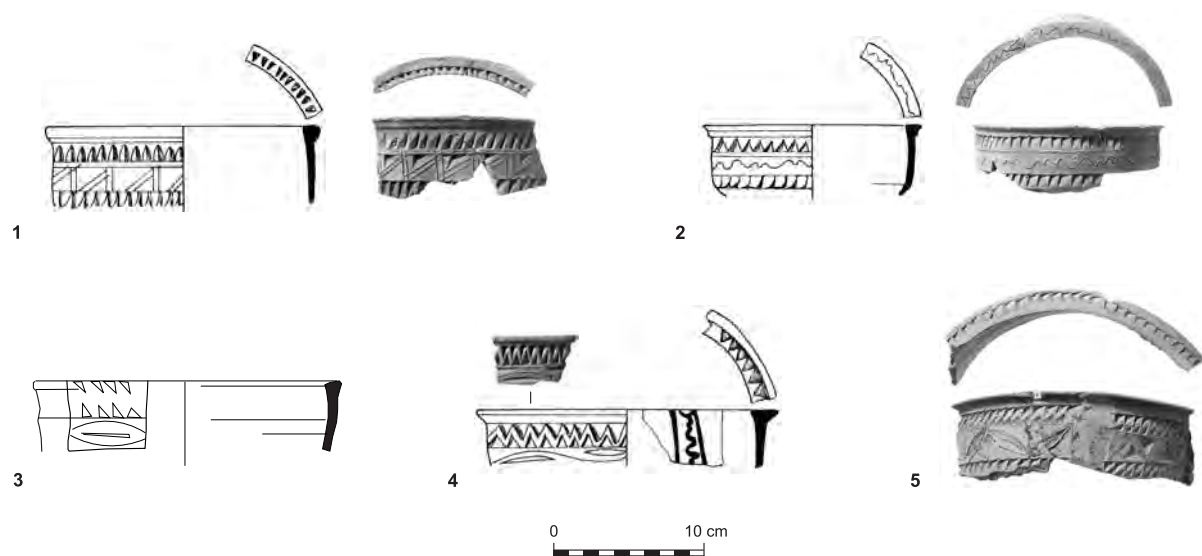


Fig. 6.82: Cut-decorated bowls: 1-3) L538; 4) Surface; 5) L912.

GLAZED

A relatively small amount of glazed bowls was found. They can be divided into seven types, based on glazing and decorative characteristics.

Coptic Glazed

The earliest type of glazed bowls found at the site is that known as Coptic glazed. These bowls were produced in Egypt between the late 8th and 9th/10th centuries CE and had probably Levantine imitations (for recent discussions see e.g. Whitcomb 1989; Walmsley 2000:330; Stacey 2004:104-110; Arnon 2007:48). The present bowls are characterized by a pinkish-yellowish ware which contains tiny reddish-brown (granite?) grits, a pinkish-orange slip, and

a transparent glaze over yellow and green splashes and black painted bands (Fig. 6.83:1-2; Colour plate 1:1). Equivalents can be found in Egypt (Whitcomb 1989: Fig. 3:i-j), as well as in Palestinian sites (e.g. Whitcomb 1989: Fig. 5:h-p; Stacey 2004: Fig. 5.17; Kletter 2005a: Fig. 11:16; Arnon 2007: Fig. 4:7; 2008:109-112, Nos. 221a-c).

Polychrome Splash-glazed

These bowls are made of buff or pinkish ware. They are covered on the interior and beyond the rim with undefined design of green, yellow and sometimes manganese brown splash over a white slip and under a transparent glaze. The transparent glaze and the polychrome splashes are sometimes

extended down to the bowl's bottom. These bowls are most probably of local origin, and were very common throughout Palestine between the 9th and 11th centuries CE (Avisar 1996:75-81; Northedge 2001:214; Stacey 2004:117). Two bowls of this type are presented here. The first has flaring rounded walls, out-turned rim and a flat base (Fig. 6.83:3; Colour plate 1:2). It has numerous parallels throughout the country, including major sites such as Caesarea (Arnon 2008: 115-116, 188-194, 234-238, Nos. 223a-e, 233b-m, 243a-c, e-i), Ramla (Kletter 2005a: Fig. 11:1-2, 5; Arnon 2007: Fig. 3: 1-7), Yoqne'am (Avisar 1996: Fig. XIII.6:4) and Tiberias (Stacey 2004: Figs. 5.25:1, 5.27:3). The second bowl has rounded walls and an incurved rim (Fig. 6.83:4), with many parallels (Kessin Berman 1989: Fig. 71:21; Cohen Finkelstein 1997a: Fig. 3:2; Avisar 2006: Fig. 4:2; Arnon 2008:235, No. 243d).

Polychrome Splash-glazed with Sgraffito

A few buff ware polychrome splash-glazed bowls, represented here by two low ring bases, are decorated with shallow *sgraffito* in simple patterns of radial or spiral lines (Fig. 6.83:5-6; Colour plate 1:3-4). Based on parallels from Iraq and Iran, the introduction of the *sgraffito* technique to the Levant was dated by scholars to the late 9th century CE (Avisar 1996:81-82) or early 10th century CE (Northedge 2001:212-213). Parallels for similar bowls were found throughout Palestine, including in some major sites such as Yoqne'am (Avisar 1996: Fig. XIII.7:2), Caesarea (Arnon 2008:194-196, Nos. 233n-p), Tiberias (Stacey 2004: Fig. 5.25:8-9, 11) and Ramla (Kletter 2005a: Fig. 11:15).

Monochrome Glazed

Some of the glazed bowls found at the site are decorated with a monochrome glaze. They are made of sandy and gritty buff, yellowish or pinkish-orange ware, and decorated with green, yellow or turquoise-blue glaze over a white slip. Most of these bowls have a flaring rim, rounded walls and a low ring base (Fig. 6.83:7-9). Bowls of similar morphology were documented in other excavations at Ramla (Kletter 2005a: Fig. 11:1; Avisar 2006: Fig. 5:3) and elsewhere in Palestine (Avisar 1996: Fig. XIII.12; Stacey 2004: Fig. 5.19: 9-13), are normally dated to the 9th-10th centuries

CE. Few bowls have an in-turned rim, rounded body and a flat base (cf. Fig. 6.83:10). This type too was documented (in morphological terms) in other excavations at Ramla (Kletter 2005a: Fig. 12: 14-15; Avisar 2006: Fig. 4:2-3) and elsewhere in Palestine (Avisar 1996: Fig. XIII.16; Stacey 2004: Fig. 5.19:14-18), and are normally dated to the 9th-10th centuries CE.

Hatched Sgraffito Ware

Two glazed bowl fragments found at the site belong to an unusual type with hatched *sgraffito* in vegetal motifs. These bowls have a flaring rim, rounded body and a low ring base, and a crazed yellow glaze which was applied directly onto the bowl (Fig. 6.83: 11-12; Colour plate 1:5-6). These bowls are probably Egyptian imports, as indicated by parallels with a vegetal decoration from Fustat (dated to the 9th/10th century CE; Kubiak and Scanlon 1986: Fig. 55) and another with a Kufic-inspired decoration from Tiberias (dated to the late 9th-early 11th centuries CE; Stacey 2004: Fig. 5.28:5).

Alkali-Glazed Ware

Two fragments of alkali-glazed bowls were found. These bowls are made of sandy buff or pinkish ware and bear a glaze (sometimes crazed) which was applied directly onto the bowl without any slip. The first bowl has a rounded body and a crazed turquoise-blue glaze (Fig. 6.83:13; Colour plate 1: 7). It has relatively few parallels, dated to the 9th-11th centuries CE (e.g. Avisar 1996: Fig. XIII.11: 1-3; Stacey 2004: Fig. 5.20:7; Arnon 2008:312, No. 261b). The second bowl has a low ring base with a protruding ridge above, and a turquoise-blue glaze (Fig. 6.83:14; Colour plate 1:8). No parallels were found to this fragment.

Coarse Sgraffito Ware

This term was given to a large group of bowls which are made of coarse, reddish-brown ware, and are covered from both sides with a yellowish or whitish slip. These bowls have a low ring base, flaring, rounded walls and flattened or rounded rim. The interior of the bowls and parts of their exterior were (usually) covered with yellow or green glaze, which are decorated with a thin *sgraffito* in spiral or pseudo-arabesques motifs (Fig. 6.83:15-16; Colour plate 1:9). This type of

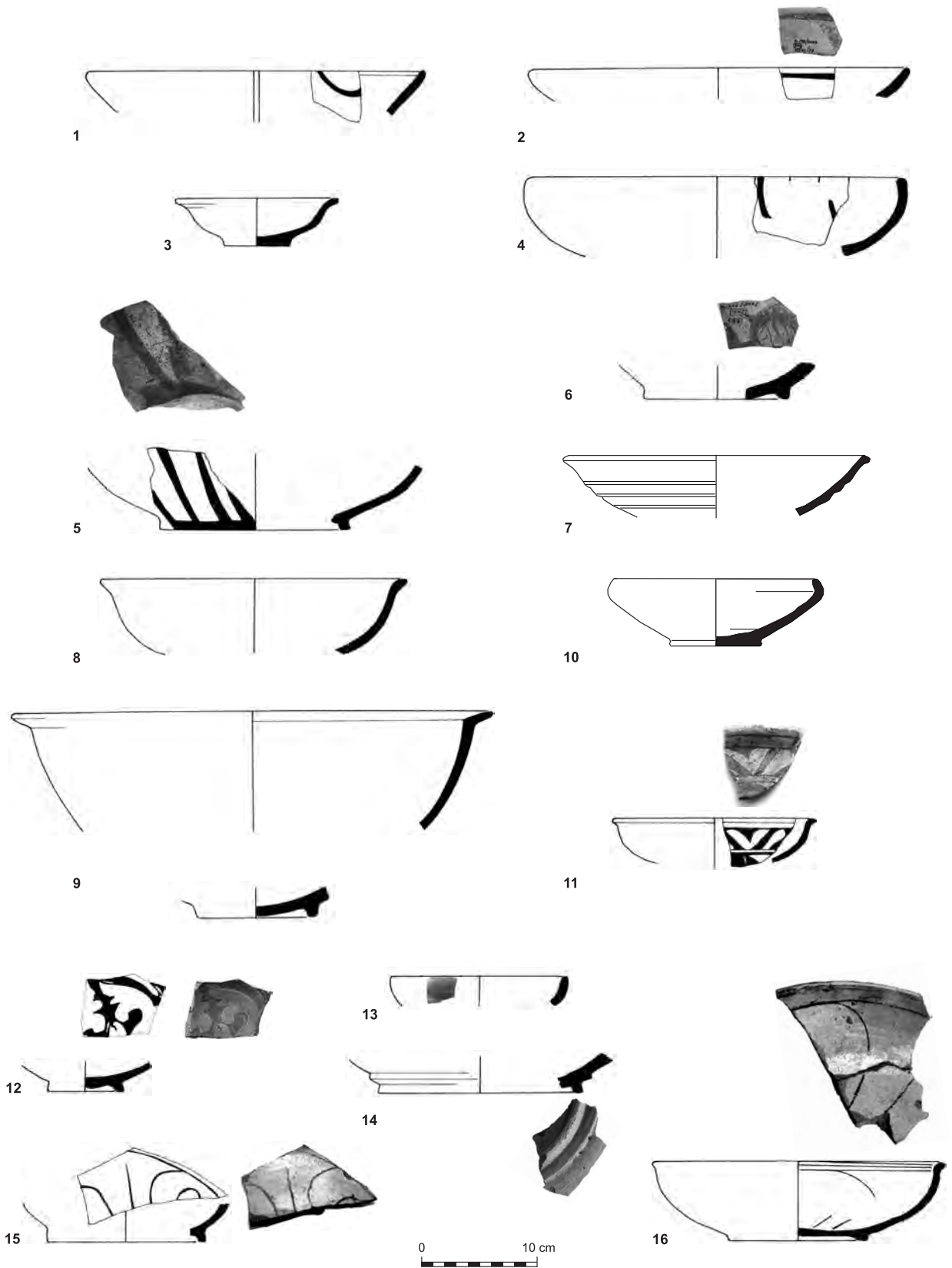
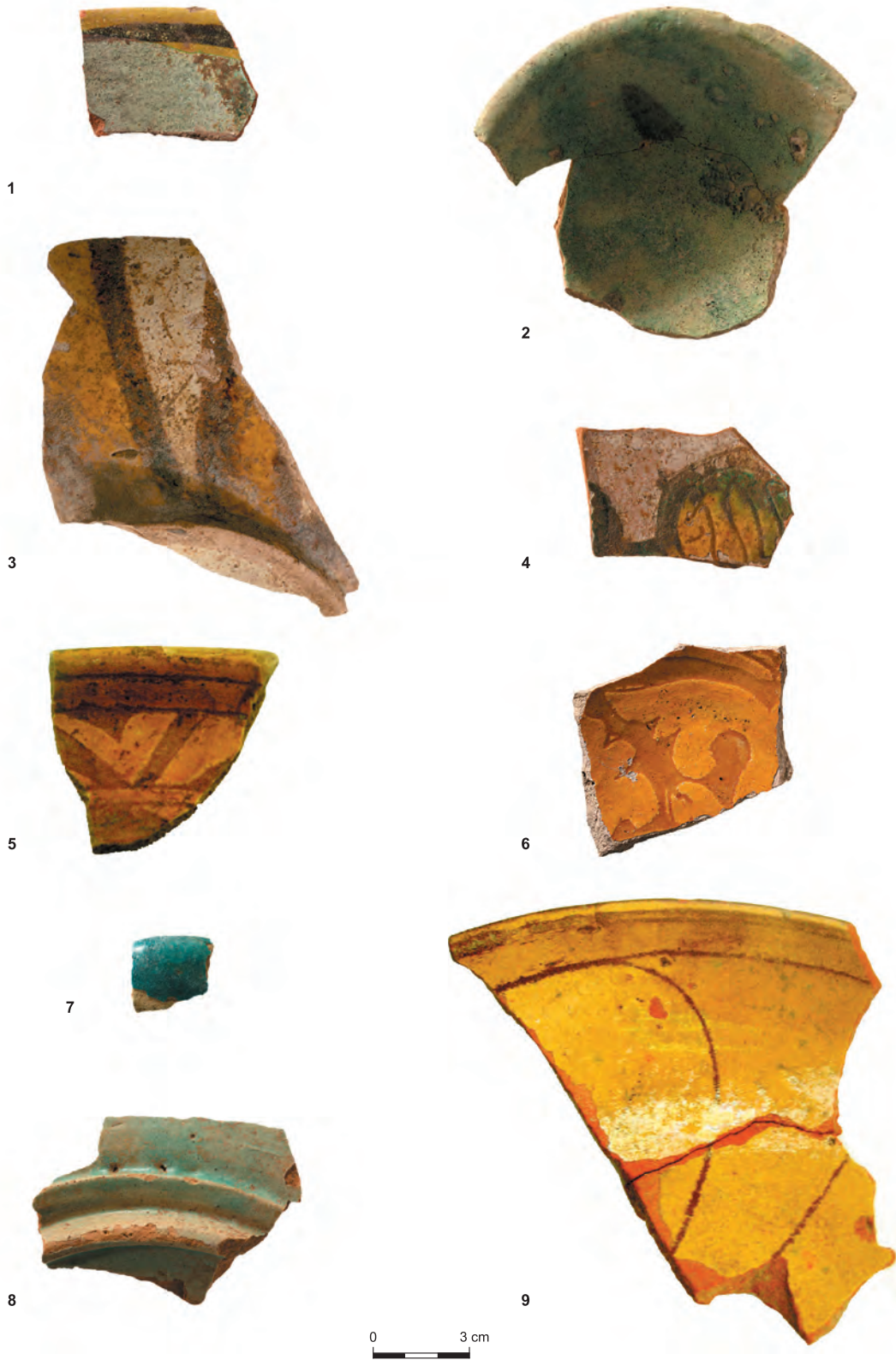


Fig. 6.83: Glazed bowls: 1) L390; 2) L502; 3) L767; 4) L544; 5) L538; 6) L772; 7) L538; 8) L699; 9) L508; 10) L625; 11) L323; 12) Surface; 13) L761; 14) L948; 15) L752; 16) L543.



Colour plate I: Glazed wares. 1) Coptic glazed: Fig. 6.83:2; 2) Polychrome splash-glazed: Fig. 6.83:3; 3-4) Polychrome splash-glazed with *sgraffito*: Fig. 6.83:5-6; 5-6) Hatched *sgraffito*: Fig. 6.83:11-12; 7-8) Alkali-glazed: Fig. 6.83:13-14; 9) Coarse *sgraffito*: Fig. 6.83:16.

bowl probably appeared in the 11th century CE, as indicated by their presence in the Serçe Limani shipwreck (southern Turkey) which was dated to ca. 1025 CE (Jenkins 1992). They continued into the Crusader period, when towards the end of the 12th century CE they were replaced by new bowls types with different rim shapes and sometimes coarser glazing. The high distribution of these bowls throughout Palestine points to a probable Levantine origin (Avissar 1996:89-90, Figs. XIII.16-XIII.21; Stern and Stacey 2000:174, Fig. 3:1-5; Hoffman 2003: Fig. 32:1-6; Kletter 2005a: Fig. 12:11, 12, 14-16; Arnon 2008:262-263, 314, Nos. 251i, 261h).

HANDLED BOWLS

This term refers to a unique group of bowls with two horizontal handles made of buff to orange sandy and gritty ware of medium- to high-temperature firing (Fig. 6.84). They are small to medium-sized with cut-away rims, flaring (sometimes ribbed) walls and rounded (or flattened) bases. Morphologically they are identical to contemporaneous and earlier (Roman and Byzantine) casseroles (cf. Magness 1993:212-213, Form 1) yet have no burning marks, nor are they made of cooking ware. The group is almost restricted to Ramla (but cf. Arnon 2008: 59, No. 112a) and petrographic analyses carried out on six examples (marked by an asterisk) has shown that their ware belongs to the group of Taqiya marl with coastal sand.⁴ Since one of our

examples was retrieved together with its original lid (Fig. 6.84:10), it seems likely that these vessels were produced together with lids, as is the case of casseroles. In one small example no handles were attached (Fig. 6.84:8).

BASINS

Most of our basins have thickened in-turned rims and flaring walls. They are made of light brown to red-brown sandy and gritty ware of medium- to high-temperature firing. Some are plain (Fig. 6.85:1-2) and other are combed-decorated with wavy and straight incisions (Fig. 6.85:3-4). We have also an example of a thumbbed-decorated basin that morphologically is similar to the above (Fig. 6.85:5). They form one of the dominant types of Early Islamic basins that originated from Late Byzantine predecessors, except for Fig. 6.85:2 which appears to be of Egyptian origin. Counterparts are thus numerous in Palestine and beyond (e.g. Peleg 1989: Fig. 47:2; Magness 1993: 210-211 [in-turned rim basins]; Avissar 1996: Figs. XIII.79-XIII.80 *passim*; 2006: Fig. 4:10; Zelinger 2000: Fig. 107:2; Stacey 2004: Fig. 5.15:7; Kletter 2005a: Fig. 13:4-6). Another type of basin that was retrieved in the excavations has a nicked, flattened rim and deep incisions on the exterior and upper rim (Fig. 6.85:6). Similar basins were found at Caesarea (Arnon 2008:202, No. 432e) and Tiberias (Stacey 2004: Figs. 5.14:4, 5.15:1).

4. Microscopically a light, highly calcareous marl containing sparse foraminifers and iron oxides, characterizes the matrix of this group. The micro faunal assemblage within the matrix, when identified, is usually of Eocene-Pliocene age. When fired in an oxidizing atmosphere, the clay takes on a light tan colour in thin-section. Fine, fibrous carbonate crystals that sometimes exhibit weak optical orientation (length fast) are abundant in the matrix. Well-sorted, sparsely distributed silty quartz appears in many cases. The inclusions include some chalk or limestone, but essentially coastal sand (see above). Based on its mineralogical and palaeontological affinities, this clay is identified as marl of the Taqiya Formation of Paleocene age which is exposed in the northern and central Negev and central Sinai. It also outcrops in the Judaea Desert and along the western slopes of the Judaea-Samaria anticline. In the southern Levant, the use of a combination of Taqiya marl with nummulitic chalk or chalk with coastal sand is very typical of sites located in the Shephelah region (e.g. Bullard 1970:107-108). The inclusions in pottery assemblages belonging to the Taqiya Group usually indicate an inner Shephelah origin, where Eocene chalks (including typical numolites), covered with nari layers are exposed. The use of Taqiya marl indicates an eastern origin within the Shephelah area, since Taqiya marl exposes mainly on the lowermost parts of the slopes of the Judaea Hills ridge. Taqiya marl group contains a more dominant coastal component. The combination of Taqiya marl, Eocene chalk and chert, and coastal sand indicate an origin in the northwestern Shephelah where these three formations meet. In geographic terms, only the area of Gezer corresponds with this description, and is thus makes their production in Ramla highly plausible. We are indebted to Y. Goren of Tel Aviv University and M. Iserlis for carrying out the analyses.

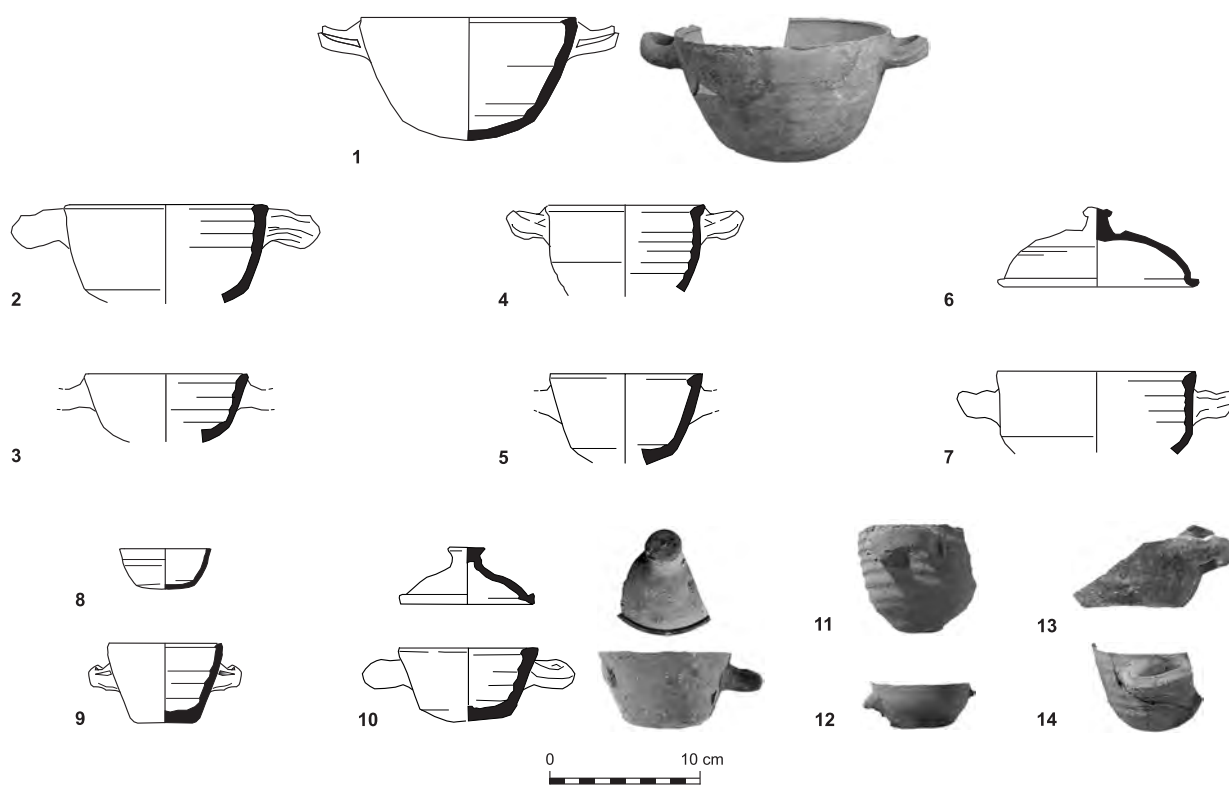


Fig. 6.84: Handled bowls: 1) L271; 2) L538; 3) L625; 4) L538; 5-6) L625; 7) L538; 8*) L652; 9*) L690; 10) L625; 11*) L370; 12*) L752; 13*) L370; 14*) L954.

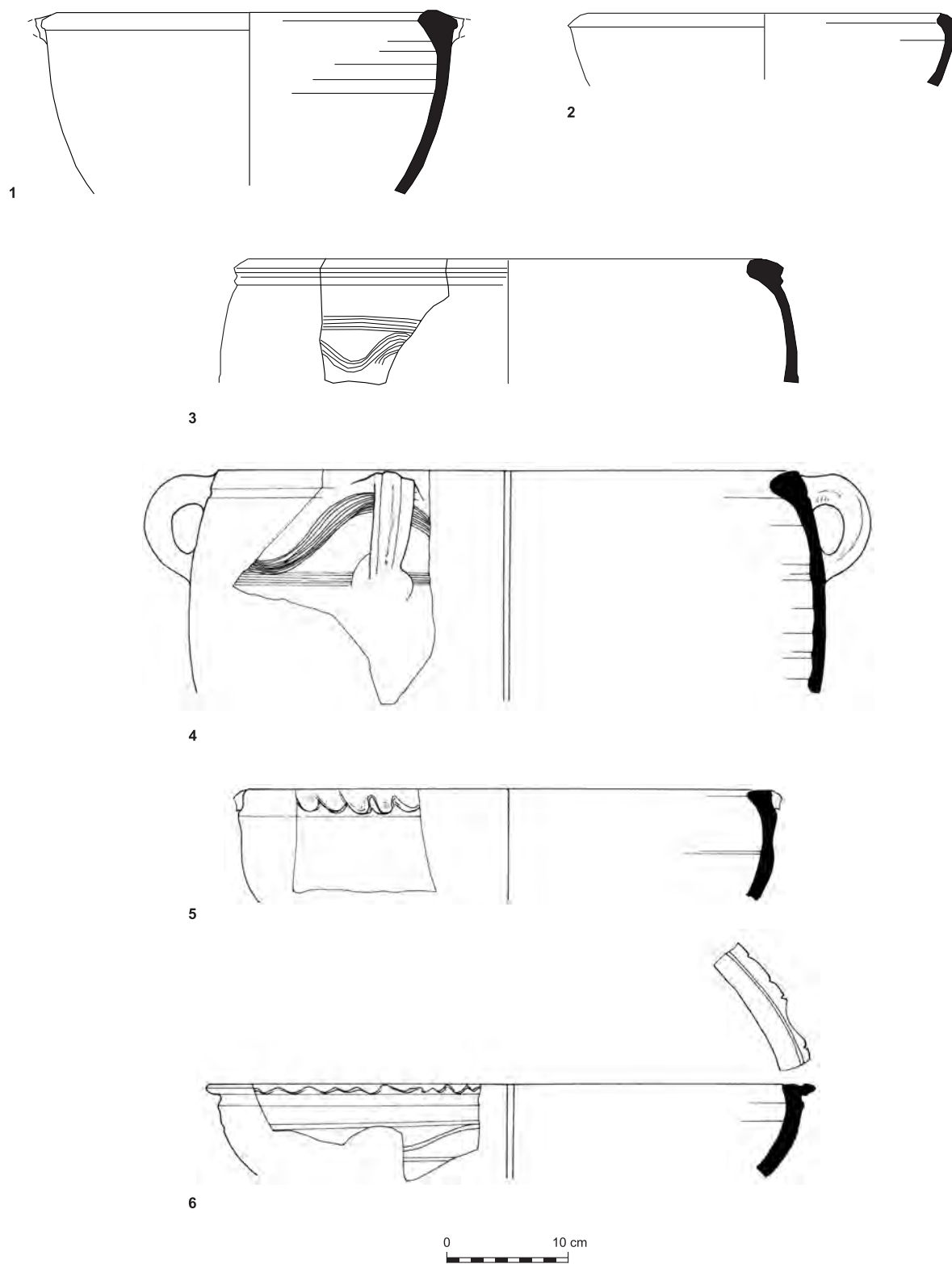


Fig. 6.85: Basins: 1-2) L625; 3) L538; 4) L1500; 5) L563; 6) L1601.

CUPS

All cups are made of of medium to high-temperature fired ware.

LOOP-HANDLED

This term refers to a group of loop-handled cups of buff to orange sandy and gritty ware (Fig. 6.86:1-3). They are small with rounded rims, flaring or carinated walls and flattened bases. Morphologically they resemble the handled bowls (above), and the single petrographic analyzed specimen of this group (Fig. 6.86:1) has proven to belong to the same petrographic group (Taqiya marl with coastal sand). This lends support to the idea that both handled bowls and loop handled cups were produced in Ramla. Moreover, here too comparative material is restricted to Ramla alone. For example Kletter published a similar vessel yet define it as a kiln waster for it was found with slag around it (2005a:77, Fig. 17:11). For another parallel from Ramla see Kogan-Zehavi 2004:

Fig. 2:11. Another buff ware cup was published by Arnon, though erroneously identified as a jug (2007: Fig. 7:4).

S-SHAPED CUPS /LIDS

These are semi-fine buff to orange ware small cups (or cup lids) with straight (somewhat out-turned) rims, piriform body (sometimes shallow ribbed) and flat base (Fig. 6.86:4-7). These cups are more common in southern Palestine and are known from other excavations in Ramla (e.g. Kletter 2005a: Fig. 17:4-6, with additional equivalents).

CYLINDRICAL

These are semi-fine buff to orange ware small cups with out-turned rims, cylindrical (sometimes slightly convex) body and flat base (Fig. 6.86:8-12). Based on the few parallels found to this type, all originated in Ramla (Sion 2004: Fig. 14:84; Arbel 2005: Fig. 2:7-8), it seems that these cups also represent a local product.

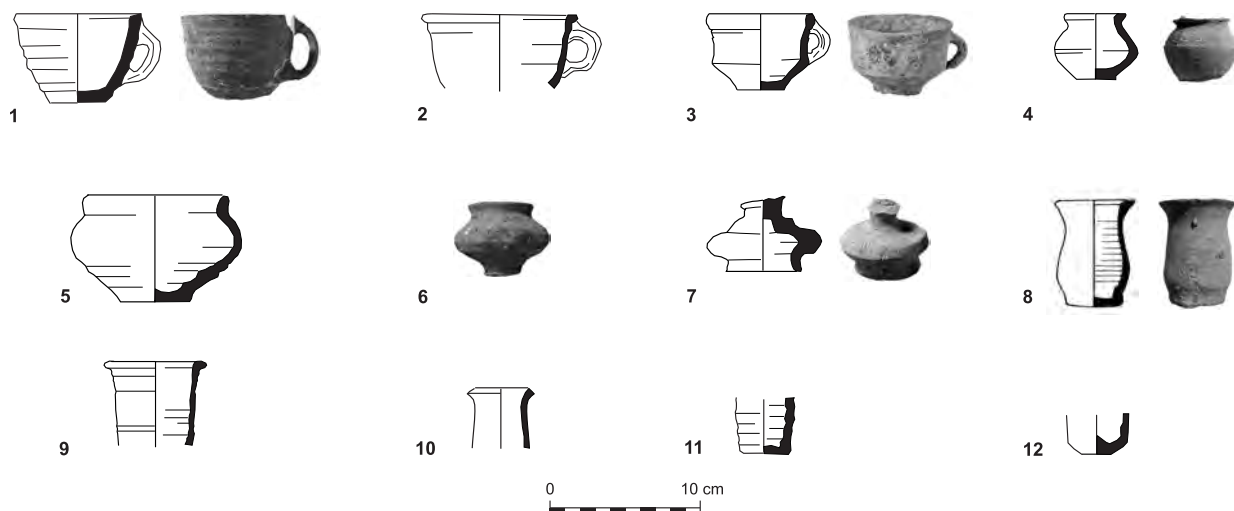


Fig. 6.86: Cups: 1*) L370; 2-3) L538; 4) L62; 5) L625; 6) L1559; 7) L110; 8) L1586; 9) L625; 10) L538; 11-12) L625.

COOKING VESSELS

All cooking ware vessels, divided into four types, are made of medium to high temperature-fired sandy red to brown colour ware.

CASSEROLES

Bevelled in-turned lip, semi-globular plain body casseroles with two horizontal handles are the

most common type of cooking vessel found at the site. The casseroles vary in size, from relatively shallow to deep (Fig. 6.87). This type seems to be a successor of a Byzantine version (Magnes 1993:211-213) with many Umayyad, 'Abbasid and Fatimid counterparts (*ibid.*:214; Stacey 2004: Fig. 5.32:6; Avissar 2006: Fig. 5:10).

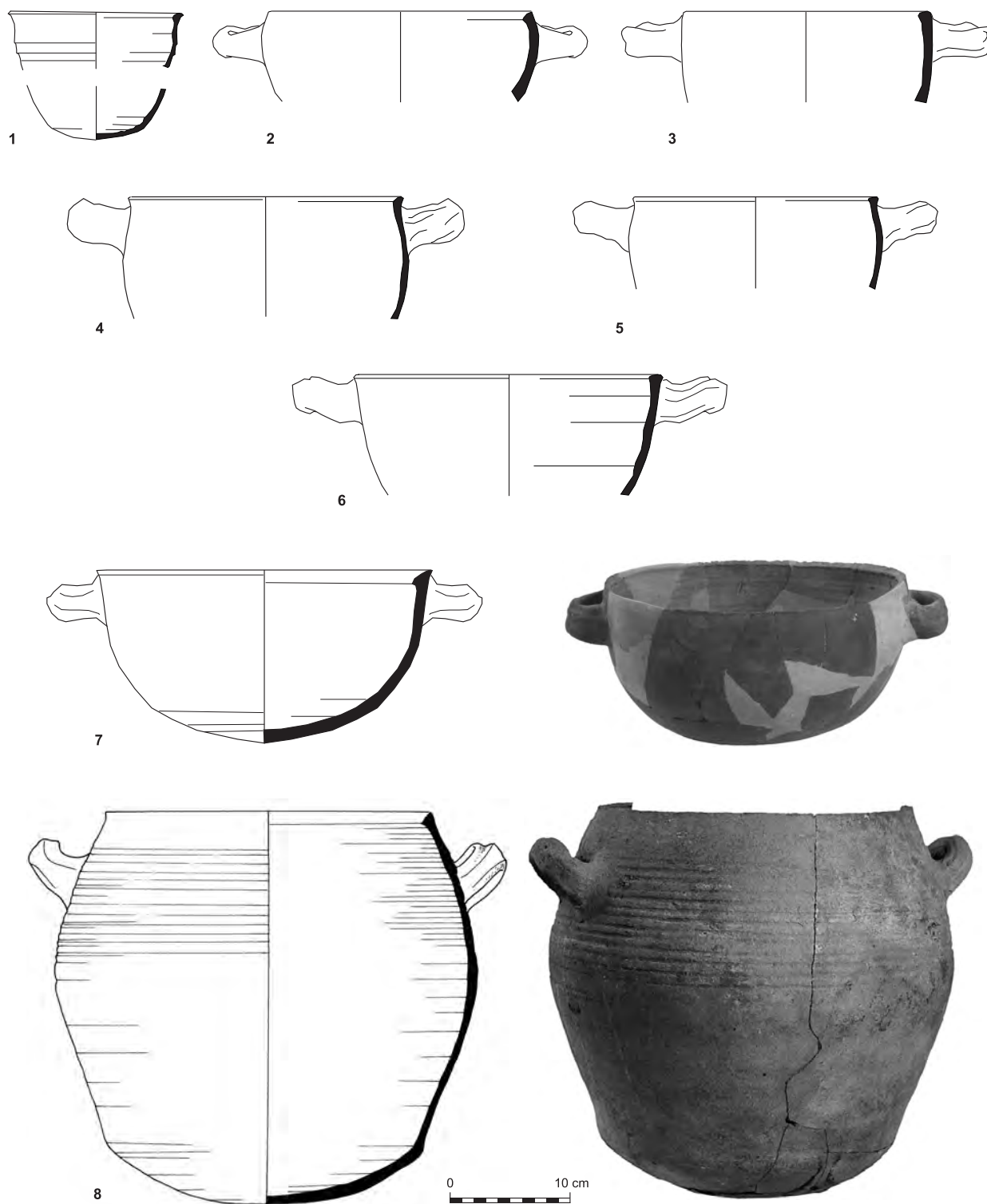


Fig. 6.87: Casseroles: 1-2) L625; 3-6) L538; 7) L7; 8) L1647.

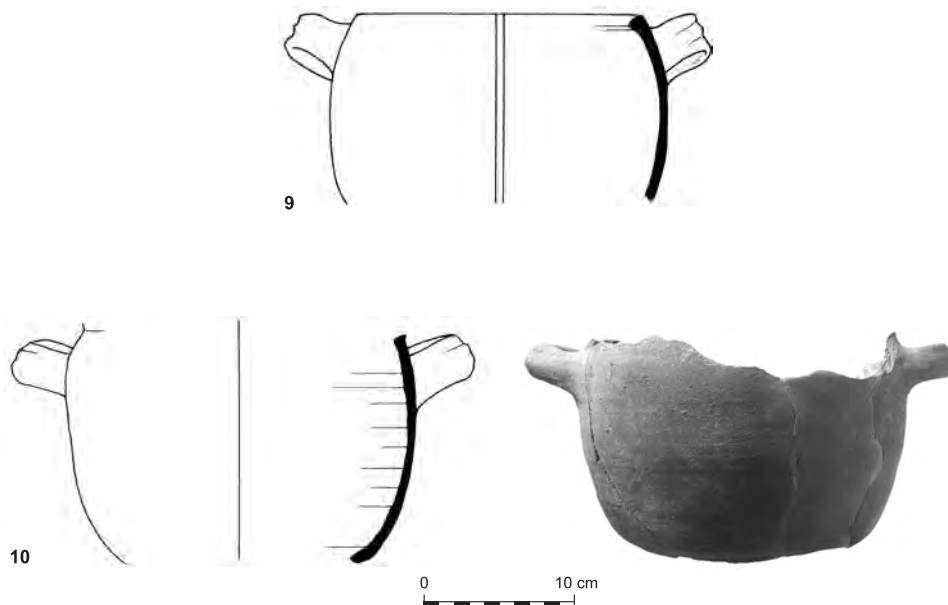


Fig. 6.87 (cont.): Casseroles: 9) L752; 10) L372.

GLOBULAR COOKING-POTS

Cooking-pots are an uncommon vessel-type at the site. Those found are globular, neckless with two broad strap handles. The lower third of their interior is covered by a purple-brown glaze, which sometimes appears as splashes or horizontal strip also on their shoulder (Fig. 6.88). This variant of globular glazed cooking-pots was in use between the late 9th and 12th centuries CE (Avisar 1996: Figs. XIII.91-XIII.92; Stacey 2004: Fig. 5.32:9; Arnon 2008:249-250, 301-302, 329, Nos. 741c-d, 752o, 761c). Similarly to the glazed frying pans (below), neckless, glazed cooking-pots also first appeared in Palestine towards the late 9th/early 10th century CE, as indicated from major sites such as Caesarea (Arnon 2008:41) and Tiberias (Stacey 2004:125).

FRYING PANS

Another uncommon type of cooking vessel found at the site is a shallow frying pan with a flat base, everted walls, rounded or triangular rim, two horizontal handles and two narrow, thumbled ledge handles. These pans bear a brown-purple glaze, which covers either only their bottom or the entire interior (Fig. 6.89). The first appearance of this type of cooking vessel seems to differ from site to site, or from region to region. Still, it probably did not appear before the late 9th century CE, as indicated by the finds from Yoqne'am (Avisar 1996:139, Fig. XIII.100) and Tiberias (Stacey 2004:

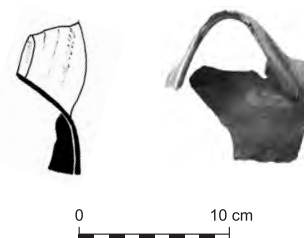


Fig. 6.88: Globular cooking-pot (L329).

125, Fig. 5.32:14, 15). At Caesarea, glazed frying pans first appeared only in the second half of the 10th century CE and continued into the Crusader period (Arnon 2008:250-251, 302-304, 330, Nos. 742a-d, 753a-e, 762a-d) and at Ashkelon – only in the 12th century CE (Hoffman 2003:224, Fig. 41). Furthermore, the variant with the rounded rim probably appeared even later – towards the end of the Early Islamic period or in the Crusader period (e.g. Avisar 1996: Fig. XIII.102; Arnon 2008:303, No. 753c), although at Ramla (South) such frying pans were surely in use in the Fatimid period.

LIDS

Casserole and frying pan lids are ubiquitous and are basically bell-shaped in form with a vertical knob handle. They can be divided between plain versions that are sometimes shallow ribbed (Fig. 6.90:1-7) and incised-decorated versions (Fig. 6.90:8-9). Pierced holes made before firing close to the rims (Fig. 6.90:5-6) are probably steam-release valves.

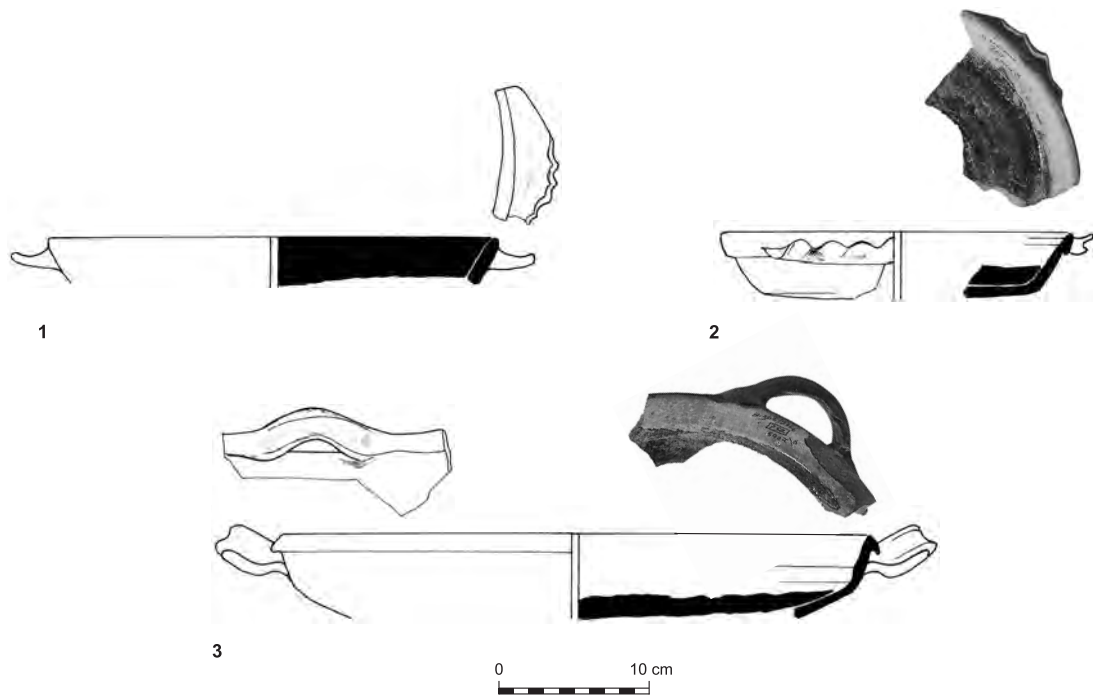


Fig. 6.89: Frying pans: 1) L1511; 2) L761; 3) L752.

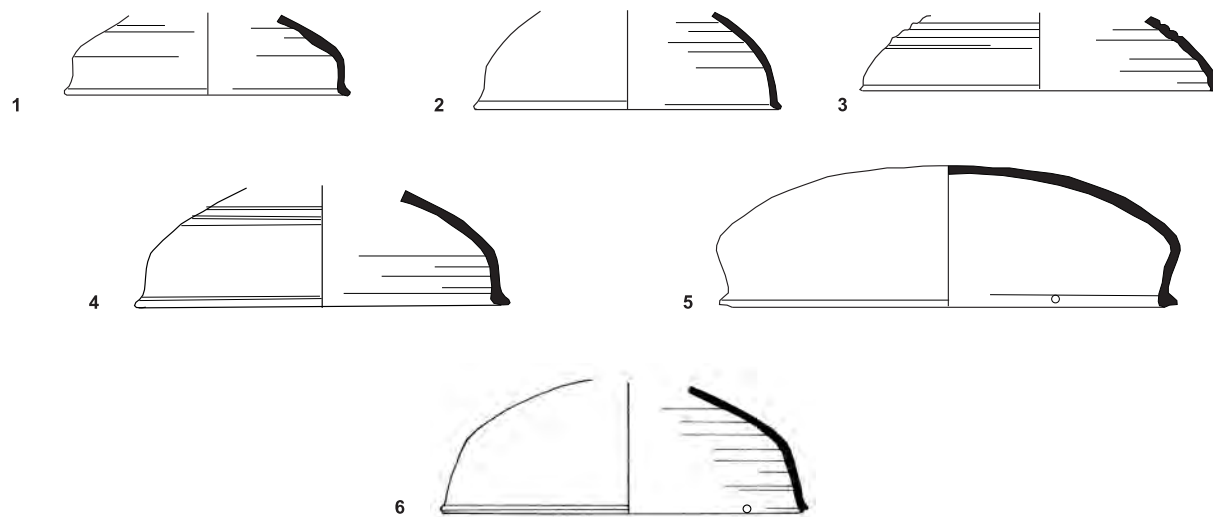
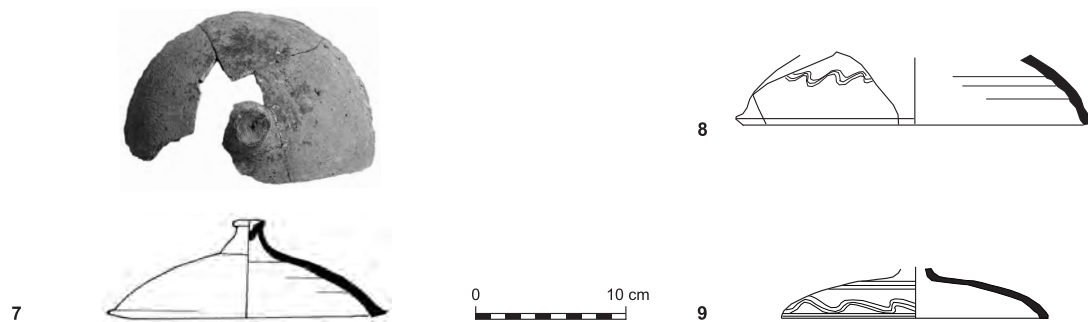


Fig. 6.90: Lids: 1-5) L538; 6) L912; 7) L370; 8-9) L538.



JUGS

All jugs are made of medium to high-temperature fired ware. Sixteen types of jugs were found.

Type 1: Made of semi-fine buff ware, this is a small to medium-sized jug with a plain rim, funnel-shaped neck, carinated body, flat or concave base and a high loop handle that extends from the rim to the shoulder. Applied decorations on the handle and vertical incisions below the rim are visible on some examples (Fig. 6.91:1-4). This is the most common buff ware type jug found at the site. It is commonly found in Palestinian contexts of the 9th through 11th centuries CE. Notable variants were documented in Khirbet al-Mafjar (Baramki 1944: Fig. 14: 7, 9), Abu Ghosh (de Vaux and Steve 1950: Pls. C:16, 19, 21-24, D:14), Caesarea (Arnon 2008:202-205, Nos. 531a-b, d, f) and Ramla (Sion 2004: Fig. 13:73-74; Kletter 2005a: Fig. 16:1-2; Arnon 2007: Fig. 7:1).

Type 2: Made of semi-fine buff ware, this medium to large jug has a plain rim, funnel-shaped neck (sometimes with a strainer at its upper part), globular body and flat or disc base. The neck of this jug-type is sometimes decorated with thin geometric or calligraphic/pseudo-calligraphic incisions which were sometimes applied between two horizontal grooves, or with short vertical impressions (Fig. 6.91:5-8). Parallels suggest a similar chronological frame to that of Type 1 (e.g. Avissar 1996: Fig. XIII.131:1; Kogan-Zehavi 2004: Fig. 81:8, 12; Kletter 2005a: Fig. 16:5; Arnon 2007: Fig. 7:2, 10; 2008:209, 241-242, Nos. 531i, 541a, c).

Type 3: Made of fine buff ware, this type is represented by large jugs (table amphorae). They have a plain rim, funnel-shaped neck with a strainer right below the rim, globular body and a disc base (Fig. 6.91:9-11). This type is not very common at the site nor from other excavations carried out at Ramla (Arnon 2007: Fig. 8:5) and elsewhere (e.g. Arnon 2008:140, 280, Nos. 521o, 551e). Another large jug which can be attributed to this type has a convex neck and thickened

rim (Fig. 6.91:12). A possible parallel was found in another excavation at Ramla (Avissar 2007: Fig. 2:18).

Type 4: Made of sandy and gritty buff ware, this has a bag-shaped body, rounded base and a handle base (Fig. 6.91:13). No parallels were found.

Type 5: Made of fine buff ware, it has a narrow, cylindrical neck and one handle base. The decorative incisions on the neck (Figs. 6.91:14 and 6.141) were made prior to firing and seem to correspond to a West Semitic (later cursive Samaritan or Aramaic?) script. The inscription reads: LṢṬ, meaning to swallow, to sip, to eat or even to lick in many Semitic languages and may represent an imperative form directed at the jug's user. Alternatively these incisions might not relate to a word but rather symbolise the contents, owner or manufacturer. Some jugs with similar, though plain neck, were documented at Abu Ghosh (de Vaux and Steve 1950: Pl. D:17, 19-21). Another vessel, identified as a flask with an incised neck was reported from Tiberias (Stacey 2004: Fig. 5.46:2).

Type 6: Made of fine buff ware, this is a jug with a wide funnel-shaped neck, rounded rim and incised, impressed and/or cut decorations on the neck and rim. One jug also has a vertical decorated ridge below the rim (Fig. 6.91:15-17). This uncommon type has few parallels from the mid-10th to 11th centuries CE assemblages in Caesarea (Arnon 2008: 242, No. 541b) and Tiberias (Stacey 2004: Fig. 5.43:4-8).

Type 7: This type is represented by fragmentary buff ware loop handles, apparently of large jugs, with various plastic applications such as a ridged cone (Fig. 6.91:18; e.g. Sion 2004: Fig. 12:67, 68, 70; Kletter 2005a: Fig. 20:1) and a hollow, cut-decorated cone (Fig. 6.91:19; cf. a similar flask-top from Tiberias, Stacey 2004: Fig. 5.46:4).

Type 8: Made of sandy and gritty, reddish-brown, yellowish-brown or pinkish-orange ware. This type of jug is quite similar to that of the finer buff ware jugs of Type 1, above,

i.e., a plain rim, funnel-shaped neck, carinated body, flat or concave base and a high loop handle that extends from the rim to the shoulder, but with a disc or concave base instead of a flat one (Fig. 6.91:20-27). Among them is a spouted jug (e.g. Fig. 6.91:21). There are also examples of jugs decorated with an incised vegetal motif (palm branches?) (Fig. 6.91:25) which seem to imitate the incised decoration of the buff ware jugs of Type 2, above. Another jug has a strainer and a wavy incised decoration on its neck and shoulder (Fig. 6.91:24). This type has relatively few parallels, found mainly in Caesarea (Fatimid period; Arnon 2008: 245, 289, 325, Nos. 543c, 553a, 562a; cf. also Avissar 1996: Fig. XIII.139:4). It seems, thus, that these jugs were produced locally (in Ramla), though it must be noted that no parallels have been reported from other excavations at Ramla.

Type 9: Made of grey or orange-brown semi-fine hard-fired ware, This jug has a plain or thickened pinched rim (sometimes with a sharp ridge below), vertical plain or ridged neck, bi-conical body, concave base and a loop handle that extends from the rim to the shoulder. The neck is usually decorated with wavy white bands which are sometimes barely visible (Fig. 6.91: 28-38). The high frequency of these jugs at the site may indicate local production of Ramla in the 'Abbasid period (cf. parallels from other excavations at Ramla: Kletter 2005a: Fig. 16:9; Arnon 2007: Fig. 10: 5). However, a northern Palestinian or Transjordanian origin for this type cannot be ruled out since vessels decorated with white bands were produced in these regions since the Late Byzantine period (e.g. the white band decorated bowls, above). These jugs have indeed parallels in some northern Palestinian sites (e.g. Avissar 1996: Fig. XIII.142:2; Boas 1997: Pl. I:20; Johnson 2006: Fig. 15.16:290), but also in more southern sites (e.g. Cohen-Finkelstein 1997a:

Fig. 4:7; Gophna and Taxel 2007: Fig. 3.7:6; Arnon 2008:69, 141-143, 214-215, Nos. 513d, 522a, d, g, 534a-d).

Type 10: Made of orange-brown semi-fine hard-fired ware, this is a jug with a plain rim, high funnel-shaped neck with a strainer at its upper part, a bi-conical body, a low ring base and a loop handle that extends from the rim to the shoulder (Fig. 6.91:39-41). No close parallels were found, which also seems to be inspired by the buff ware jugs of Type 1, above.

Type 11: Made of grey-brown sandy and gritty ware this type has a bi-conical body and flat base (Fig. 6.91:42). An identical parallel was found in an early 'Abbasid assemblage at Khirbet Abu Suwwana (Cohen Finkelstein 1997a: Fig. 4:10).

Type 12: Made of light orange-buff semi-fine ware this jug with a wide cylindrical neck, thickened rim and carinated shoulder, strap handle from rim to shoulder has painted decoration of horizontal, wavy and spiral red strips (6.91:43-44). These jugs belong to a ceramic group known as Red-painted Ware (RPW) which originated in Transjordan and was common in that region and in northern Palestine (Walmsley 1995: 661). This particular type of jug probably appeared in the first half of the 8th century CE, but was common mainly during its later part and in the 9th century CE (e.g. Harding 1951: Fig. 3:39, 61-62; Walmsley 1995: Fig. 6:2; Shalem 2002: Fig. 8:5-7).

Type 13: Made of fine yellowish-orange ware, it has a globular(?) thin-walled body and a long spout which is decorated with thin white and black-painted geometric and vegetal motifs (6.91:45-46). This type of jug can be related to a black-painted variant of FBW bowls which was common during the early 'Abbasid period and was apparently influenced by contemporary Egyptian pottery (e.g. Stacey 2004:90, with equivalents). Parallels for similar jugs are rare, but include a few complete examples (Baramki 1944: Fig. 9: 34, 39; Arnon 2008: Pl. 14:1).



Fig. 6.91: Jugs: 1) L538; 2) L625; 3) L633; 4) L625; 5) L1501; 6-7) L538; 8) L625; 9) L538; 10) L514; 11) L767; 12-15) L538; 16) Surface; 17) L924; 18) L546; 19) L912; 20) L538.

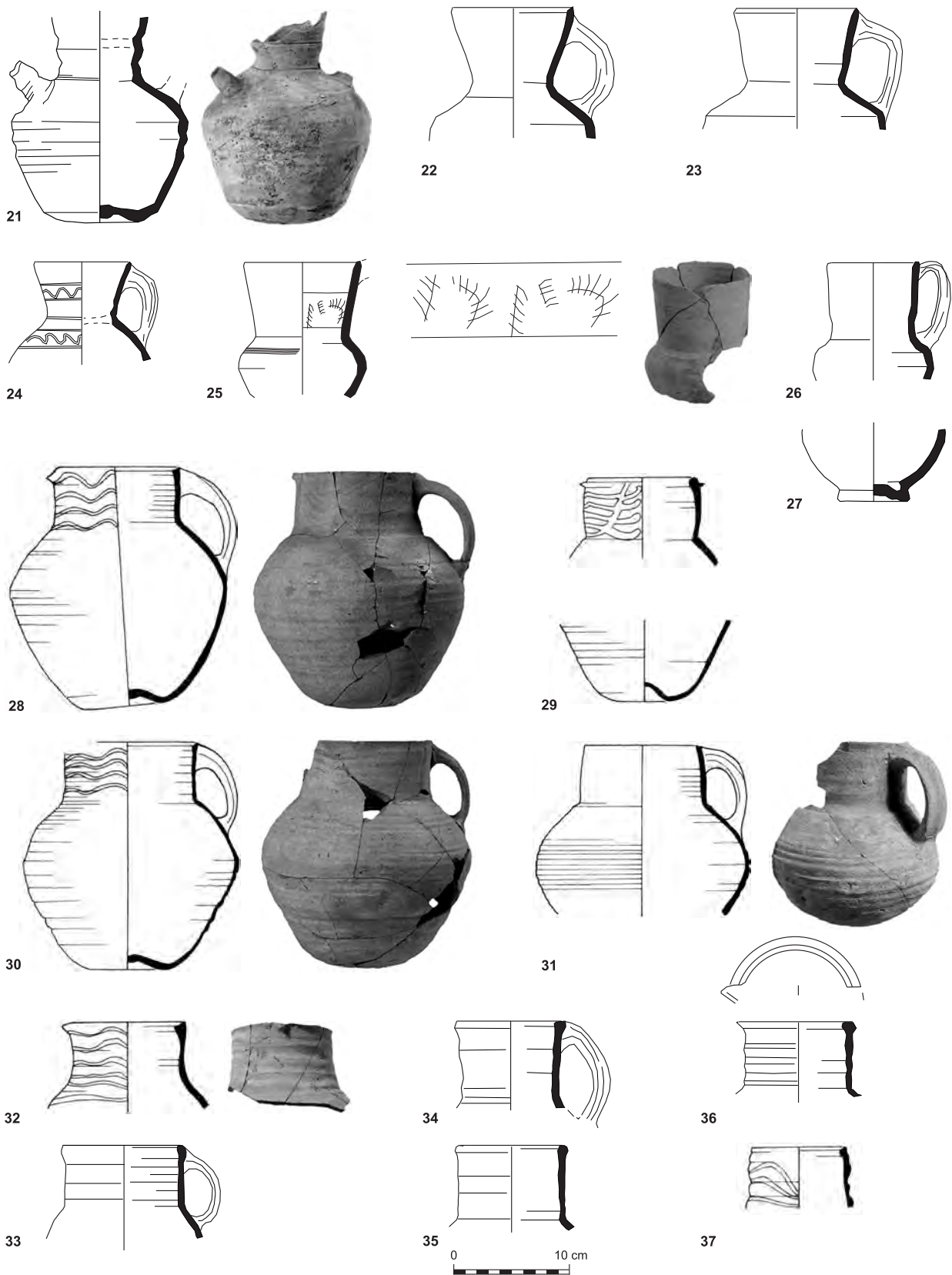


Fig. 6.91 (cont.): Jugs: 21) L535; 22-24) L538; 25) L625; 26-27) L538; 28) L1611; 29) L912; 30) L1611; 31) L690; 32) L772; 33-34) L538; 35) L338; 36) L538; 37) L772.

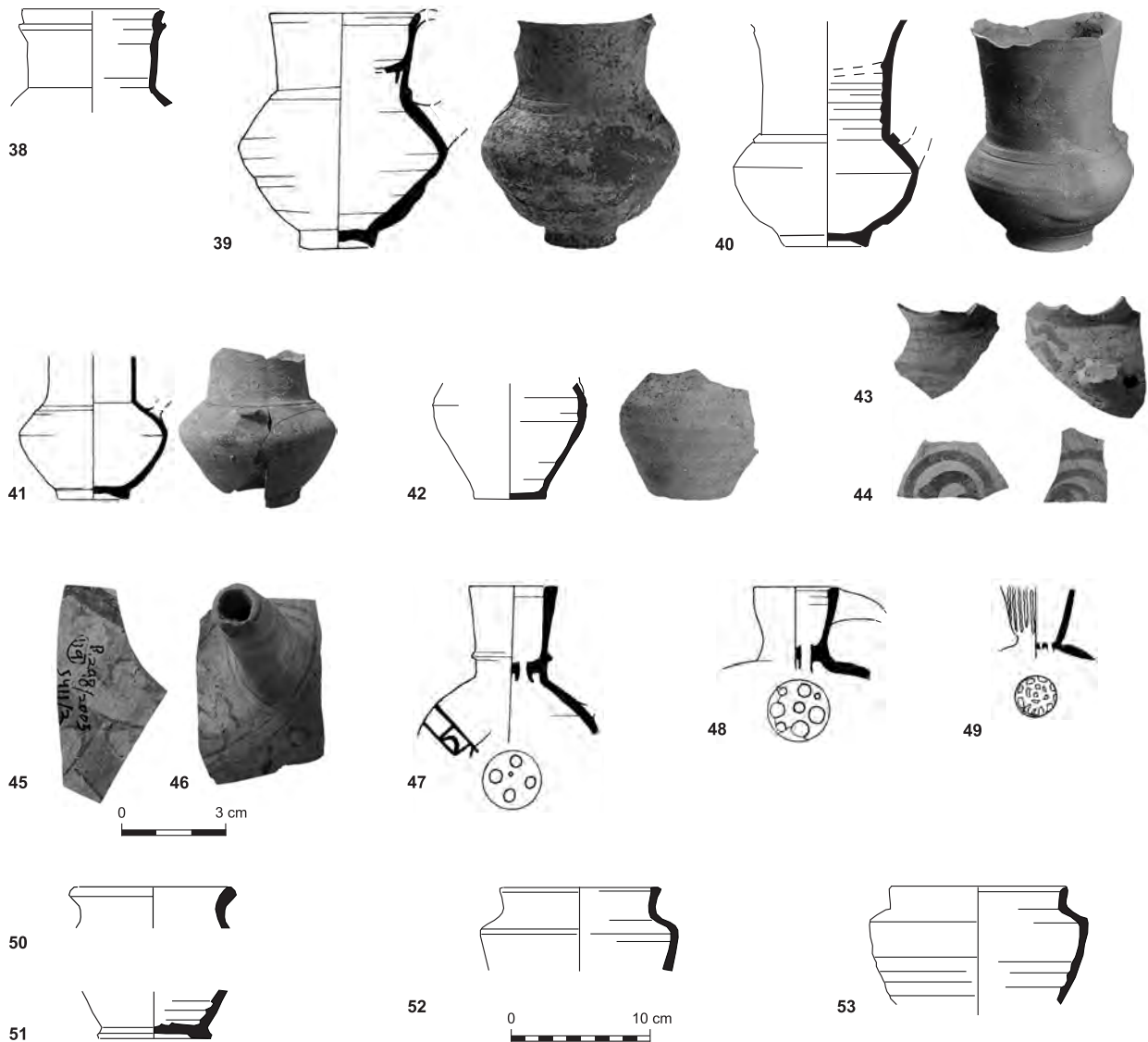


Fig. 6.91 (cont.): Jugs: 38) L538; 39) Surface; 40) L767; 41) L926; 42) L538; 43) L772; 44) L318; 45) L576; 46) L103; 47) L527; 48) L330; 49) L752; 50-51) L625; 52-53) L538.

Type 14: This type includes two main variants of strainer jugs. The first is made of sandy and gritty brown ware and has a thickened rim, a short funnel-shaped neck and a loop handle that extends from the rim to the shoulder. One jug also has a ridge at the base of the neck and a red-brown geometric painted decoration on the shoulder (Fig. 6.91:47-48). The second variant is made of a semi-fine orange-brown ware and has a funnel-shaped neck (the rim is missing), decorated with white-painted vertical bands (Fig. 6.91:49). No close parallels were found to either variant (but cf. Arnon 2008:133, No. 521j for the

former) though the painted decorated jug may be inspired by contemporary Egyptian water jugs, characterized by a red-brown painting over a white slip (e.g. Ballet 1991:491-492; Bailey 1998:87-90, Pl. 120:J185-J323).

Type 15: This type is represented by two fragments of glazed jugs found at the site. Both are made of coarse buff ware. One example is a short flaring neck fragment covered by a green glaze (Fig. 6.91:50). This type of glazed jug has relatively many parallels throughout Palestine (e.g. Avissar 1996: Fig. XIII.144:1-2; Stacey 2004: Fig. 5.31:3-4; Arnon 2007: Fig. 10:9; 2008:215,

Nos. 631a-b). The other is part of the lower body with a disc base and is covered on the exterior with green glaze (Fig. 6.91:51). A close parallel was found at Yoqne‘am (Avisar 1996: Fig. XIII.143:4).

Type 16: Made of buff sandy and gritty ware and is a jug (or jar) with a plain rim, short vertical neck, sharply carinated shoulder and conical, thin-walled body (Fig. 6.91:52-53). The morphology of these vessels resembles that of the contemporary ceramic pipe (see above), although their buff ware, thin walls and conical rather than cylindrical body indicate that these are closed vessel. This type has only few parallels (Baramki 1944: Fig. 4:23; Johnson 2000: Fig. 10:19; Stacey 2004: Fig. 5.47:1).

JUGLETS

All juglets are made of medium to high-temperature fired ware. Six types of juglet were found.

Type 1: Made of semi-fine buff or yellowish ware, this small juglet has a plain rim, wide cylindrical (sometimes ribbed) neck, globular ribbed body, rounded base and one loop handle that extends from the rim to the shoulder (Fig. 6.92:1-9). No close parallels were found (see however Baramki 1944: Fig. 14:8, 10; Stacey 2004: Fig. 5.51:2, for juglets of close forms).

Type 2: Made of semi-fine buff ware, this has a concave neck, piriform squat body, flat base, and handle base (Fig. 6.92:10). A somewhat similar parallel was recorded at Yoqne‘am (Avisar 1996: Fig. XIII.136).

Type 3: Made of semi-fine buff ware, it has a carinated cylindrical body, concave base, handle base and spout (Fig. 6.92:11). An identical parallel was found at Khirbet Deiran (Bouchenino 2007: Fig. 18:28).

Type 4: Made of coarse orange-brown ware this juglet has a high, narrow neck and pinched rim (Fig. 6.92:12). There are a few somewhat different parallels with shorter necks (Arnon 2007: Fig. 10:1; 2008:291, No. 553d).

Type 5: Made of semi-fine yellowish-brown ware, this juglet with a narrow vertical neck and a

funnel-shaped pinched rim (Fig. 6.92:13) has an identical parallel from another excavation at Ramla (Kletter 2005a: Fig. 16:10).

Type 6: Made of high temperature-fired dark red or dark brown sandy and gritty ware are the so-called spheroid vessels. These are thick-walled juglets with a plain and thickened rim, short vertical neck, globular body and round base (Fig. 6.92:14-16). Known also as grenades or Greek Fire containers, they were relatively common throughout the Early Islamic period, although the present type was common only in the Umayyad and (early?) ‘Abbasid periods. The exact use of these vessels is unknown though much research has been dedicated to the subject. De Saulcy (1874) was the first to identify their military use and Mercier’s (1952) monograph remains the most extensive one written on the subject. A workshop was discovered in Hama (Pentz 1988) and many parallels are known from Palestine (e.g. Bagatti 1953; Brosh 1980; Boas 1999:179-180). There are scholars who reject their use as grenades (e.g. Ettinghausen 1965; Partington 1999: 14-15). ‘Abbasid period parallels to this type were published from Caesarea (Arnon 2008: 72, 160, Nos. 516a, 824a), Ramla (Kletter 2005a: Fig. 17:2; Arnon 2007: Fig. 14:1-11) and Tiberias (Stacey 2004: Fig. 5.52). One of the vessels (Fig. 6.92:14) seems to originate in Egypt because of fabric characteristics (Nilothis ware).

FLASKS

A small number of flasks represent another group of closed containers. These flasks can be divided into four types.

Type 1: The semi-fine yellowish ware was well fired to grey. It has a short neck with a narrow lower part and a wider out-turned upper part (Fig. 6.93:1). It is decorated with two concentric white painted bands and resembles in fabric and decoration our Type 9 jugs (above). This type has only a few parallels from the Umayyad and ‘Abbasid periods (Baramki 1944: Fig. 15:7; Ben-Arieh

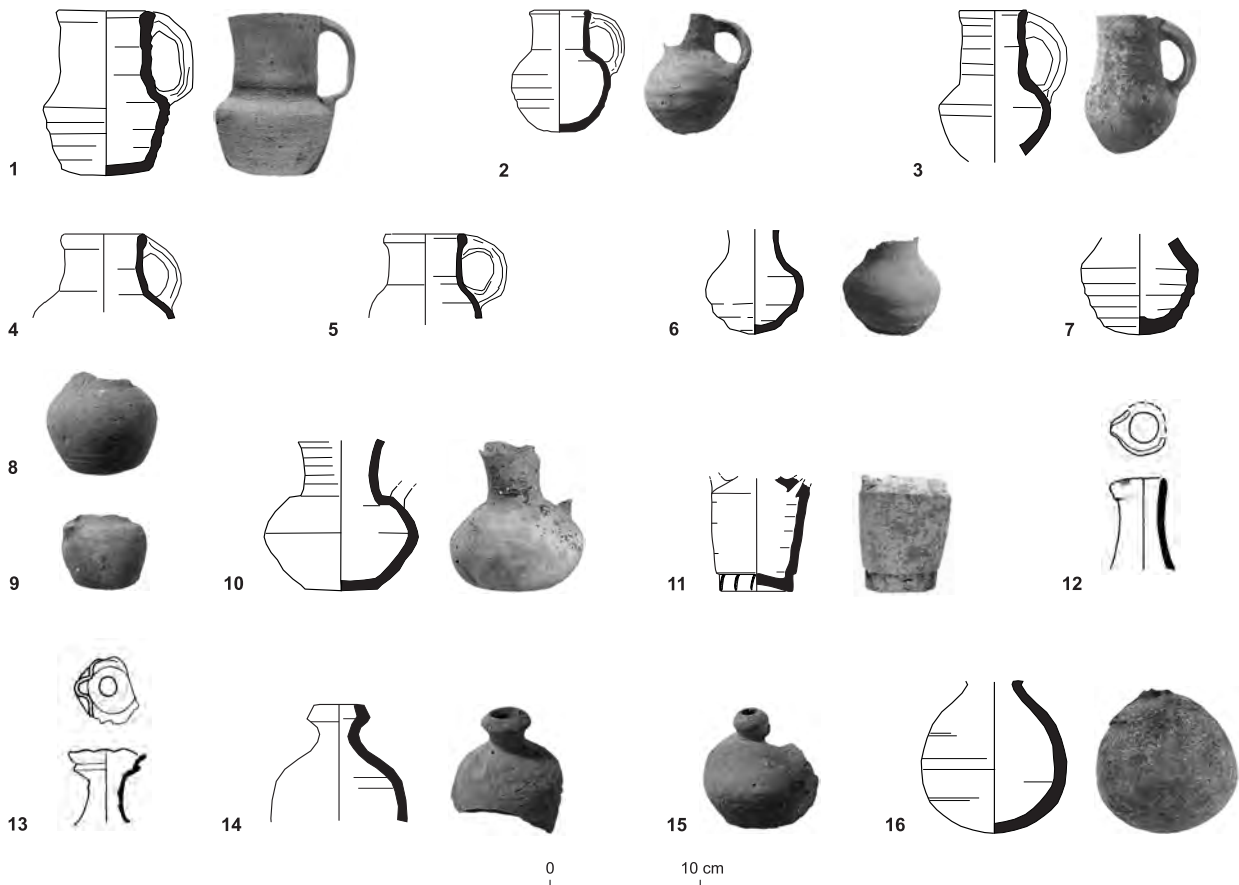


Fig. 6.92: Juglets: 1) L654; 2) L255; 3) L625; 4-5) L538; 6) L66; 7) L538; 8) L924; 9) L752; 10) L538; 11) L617; 12) L1616; 13) L615; 14) Surface; 15) L750; 16) L538.

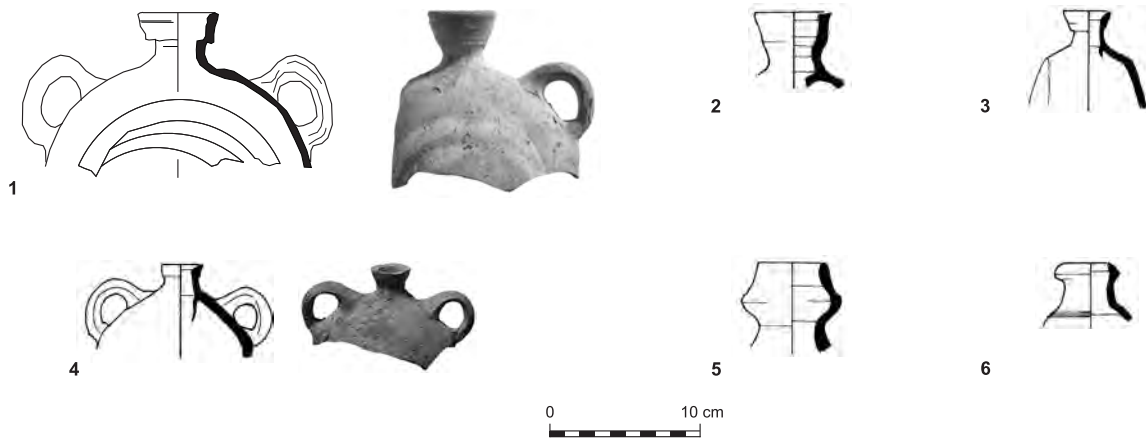


Fig. 6.93: Flasks: 1) L538; 2) L370; 3) L752; 4) L1739; 5) L752; 6) L549.

1997: Pl. 14:8; Ayalon 1998: Fig. 9:8; Arnon 2007: Fig. 20:7).

Type 2: Made of sandy and gritty reddish-brown ware, it has a short neck with a thickened, out-turned rim (Fig. 6.93:2-4). This type also has few parallels in Umayyad and 'Abbasid periods assemblages (Ben-Arieh 1997: Pl. 15:4).

Type 3: Made of semi-fine buff ware, it has a short convex neck and a plain rim (Fig. 6.93:5). Parallels were found in Umayyad and 'Abbasid period assemblages (Baramki 1944: Fig. 5:14; Peleg 1989: Fig. 56:3).

Type 4: Made of semi-fine buff ware, it has a short neck, a triangular rim and a combed band on the shoulder (Fig. 6.93:6). A somewhat different parallel, dated to the 'Abbasid period was found in another excavation at Ramla (Torge 2005: Fig. 2:24).

STORAGE JARS AND AMPHORAE

All storage jars are made of high-temperature fired ware. Seven types were found.

Type 1: Made of sandy and gritty, reddish-brown ware. It has a plain (somewhat thickened) rim, a short and slightly convex neck, and a bag-shaped body decorated with horizontal combed bands (Fig. 6.94:1-2). This type seems to be a late Umayyad-'Abbasid descendant of southern Palestinian Late Byzantine-early Umayyad bag-shaped jars with a densely combed shoulder (e.g. storage jars of both variants found in Ramla [Ayash 2000: Fig. 126:11, 14; Sion 2004: Fig. 11:43; Arnon 2007: Fig. 12:1] and Caesarea [Arnon 2008:74-76, 81, Nos. 811a-b, 815a]).

Type 2: The most common type of Early Islamic storage jar found at the site. It is made of sandy and gritty, yellowish-brown or brown ware. It is bag-shaped and has two variants: The first has a plain (somewhat thickened) rim, vertical, sometimes convex neck with a ridge at its base, a decorated body with horizontal, wavy and sometimes crisscross combing and ribbed lower body and base (Fig. 6.94:3-7). This variant can be regarded

as the latest version of bag-shaped jar of central/southern Palestine, commonly found in assemblages dated to the 8th, 9th and 10th centuries CE (Kletter 2005a: Fig. 19:9; Avissar 2006: Fig. 5:12; Arnon 2007: Fig. 13:4; 2008:159, 222, 252, Nos. 822b, 831g, 841). The second variant differs from the latter by the lack of a ridge at the base of its neck (Fig. 6.94:8-11). The several parallels found came from the central coastal plain (Ayash 2000: Fig. 126:13; Sion 2004: Fig. 11:41, 42; Arnon 2008:158-159, Nos. 822a, 823a). The jars in Fig. 6.94:12-18, 20 can be attributed to either variant Type 2a or 2b, for they are too fragmented.

Type 3: Made of semi-fine, yellowish ware. It is bag-shaped and has a plain, convex rim, short, carinated neck and few horizontal grooves on the upper body (Fig. 6.94:19). This type of jar characterizes, according to the parallels found, the central hill country and the central coastal plain. It seems to appear in the Umayyad period, or more accurately during the 8th century CE, as indicated by the finds from Khirbet Abu Suwwana (Cohen Finkelstein 1997a: Fig. 5:10), but the evidence shows that it continued to exist until the 10th or 11th century CE (Avissar 2006: Fig. 5:11; Cohen Finkelstein 1997a: Fig. 6:12; Kletter 2005a: Fig. 19:7; Messika 2006: Fig. 15:1).

Type 4: The second most common type of Early Islamic storage jar found at the site. It is made of sandy and gritty grey ware (though few examples are made of yellowish or orange-brown ware which was fired to grey), which was metallicly-fired. It is of a northern Palestinian bag-shaped type. It has a plain and thickened (sometimes grooved) rim, vertical (sometimes ridged) neck with a thickened, ridged shoulder and large, grooved loop handles. The body is decorated on the exterior with vertical and wavy white-painted strips (Fig. 6.94:21-26). This type probably appeared as early as the 9th century CE (Walmsley 1995:

664), yet continued to be in use up to 11th century CE. It is found mainly in northern Palestinian sites (e.g. Avissar 1996: Fig. XIII.114 [Yoqneʿam]; Stacey 2004: Figs. 5.34:3-4, 5.58:1 [Tiberias]) and in northern Transjordan (Walmsley 1995: Fig. 7:9), but also in major sites in central Palestine, such as Caesarea (Arnon 2008:154-157, 219-221, 305-307, Nos. 821a-h, 831a-e, 851a-d), Ramla (Kletter 2005a: Fig. 19:10; Arnon 2007: Fig. 12:2-4) and Kefar Saba (Roll and Ayalon 1989: Fig. 109:2).

Type 5: This is a variant of the northern Palestinian bag-shaped jars (above, Type 4). It is identical to the latter by ware and profile, but its decoration is exceptional – it includes not only white-painted strips, but also horizontal panels of impressed and cut-decorated triangles (Fig. 6.94:27; on the cut decoration see discussion under bowls, above). No parallels have been found to this unique jar.

Type 6: Made of a sandy and gritty greyish core ware which was fired to yellowish. This holemouth jar (or pithos) has thick walls, a barrel or bag-shaped body, wavy and horizontal combing on the body and two large loop handles. The handles of the largest illustrated jar are stamped on the lower part of the handles with round impressions. They bear an octagonal star with dots between its rays and an additional dot in the centre (Fig. 6.94:28-29, 31). This type of jar is a descendant of Late Byzantine-Umayyad Judaeian storage jar (Magness 1993:226-227, Storage Jars Form 6), and it remained in use during the ʿAbbasid period. However, only a few parallels for the holemouth variant of this jar were published, most of which originated in other excavations at Ramla, and some also preserve stamped handles (Kletter 2005a: Fig. 19:13; de Vincenz 2004: Figs. 1-2 [erroneously reconstructed with a missing neck]; Buchennino 2008: Fig. 5:18). There are many more parallels

of stamped impressions on single, usually fragmentary handles. Another parallel, also with a stamped handle (with a rossete/star motif), was found at Tell el-Fadda in northern Sinai, where it was identified as a Palestinian import and was dated to the 6th-7th centuries CE (Vogt 1997: Fig. 7). The impressions are divided between two major types – geometrical (like our example) and Arabic-inscribed (de Vincenz 2004:403-404). Dozens of inscribed jar handles were found in Umayyad period contexts (8th century CE) pottery kilns in Nebi Samwil (north of Jerusalem), where these jars have been produced (Magen and Dadon 2003:129-130; Sharon 2004:132, Pl.145, first on left). Geometrical impressions, similar (though not identical) to ours, were published from 9th-10th century CE assemblages in various sites of the central coastal plain and the central hill country (e.g. Brand 1993: Fig. 47:18; Cohen Finkelstein 1997b: Fig. 3/III.2: 21; Milevski and Rapuano 2001: Fig. 147:8; Dahari 2002: Fig. 26; Messika 2006: Fig. 18:4-7). A similar design is known from an impression on a base of an oil lamp dated to the first half of the 8th century CE through the 11th century CE (Amir 2004: 49-50, Fig. 3.15, 1). The function of these impressions may correspond to workshops or ownership.⁵

Type 7: This is another type of large storage jar (pithos) made of sandy and gritty reddish-brown ware. It has a short, vertical wide neck and a thumb-decorated rim (Fig. 6.94:30). This is a relatively common type (known also with other rim decorations), which appears mainly in sites in central Palestine (for parallels with a similar decoration, see e.g. Cohen Finkelstein 1997a: Fig. 6:4; Arnon 2007: Fig. 13:11-12).

Type 8: A single amphora of Early Islamic date found at the site is represented by few fragments. These amphorae are made of a coarse hard-fired reddish-brown ware

5. We are indebted to N. Amitai-Preiss for her valuable comments on the stamped handles of Type 6.

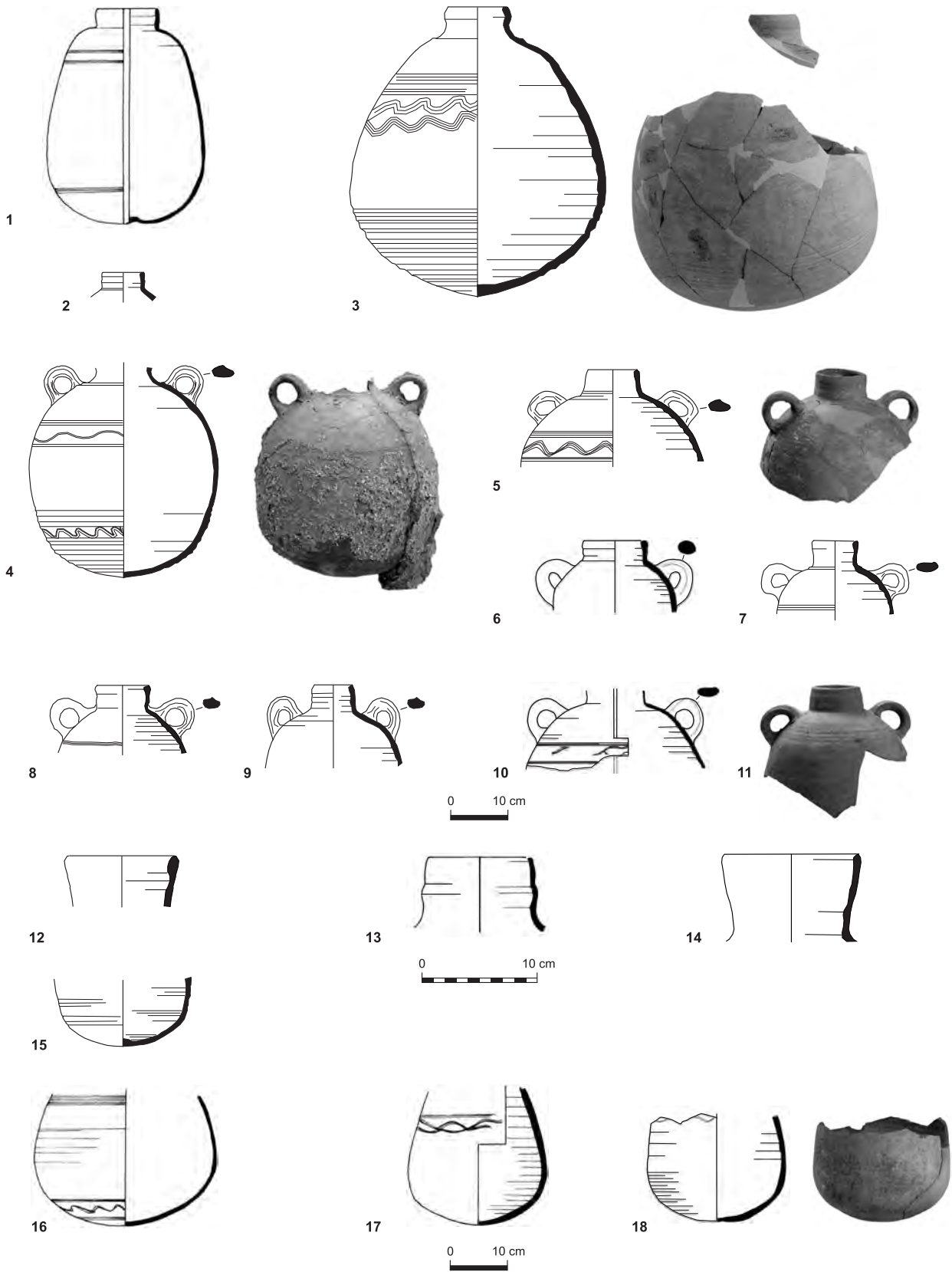


Fig. 6.94: Storage jars: 1) 1611; 2) L247; 3) L594; 4) L655; 5) L957; 6) L1661; 7-8) L538; 9) Surface; 10) L1646; 11) L1643; 12) L625; 13) L318; 14) L538; 15) L114; 16-18) L1508.

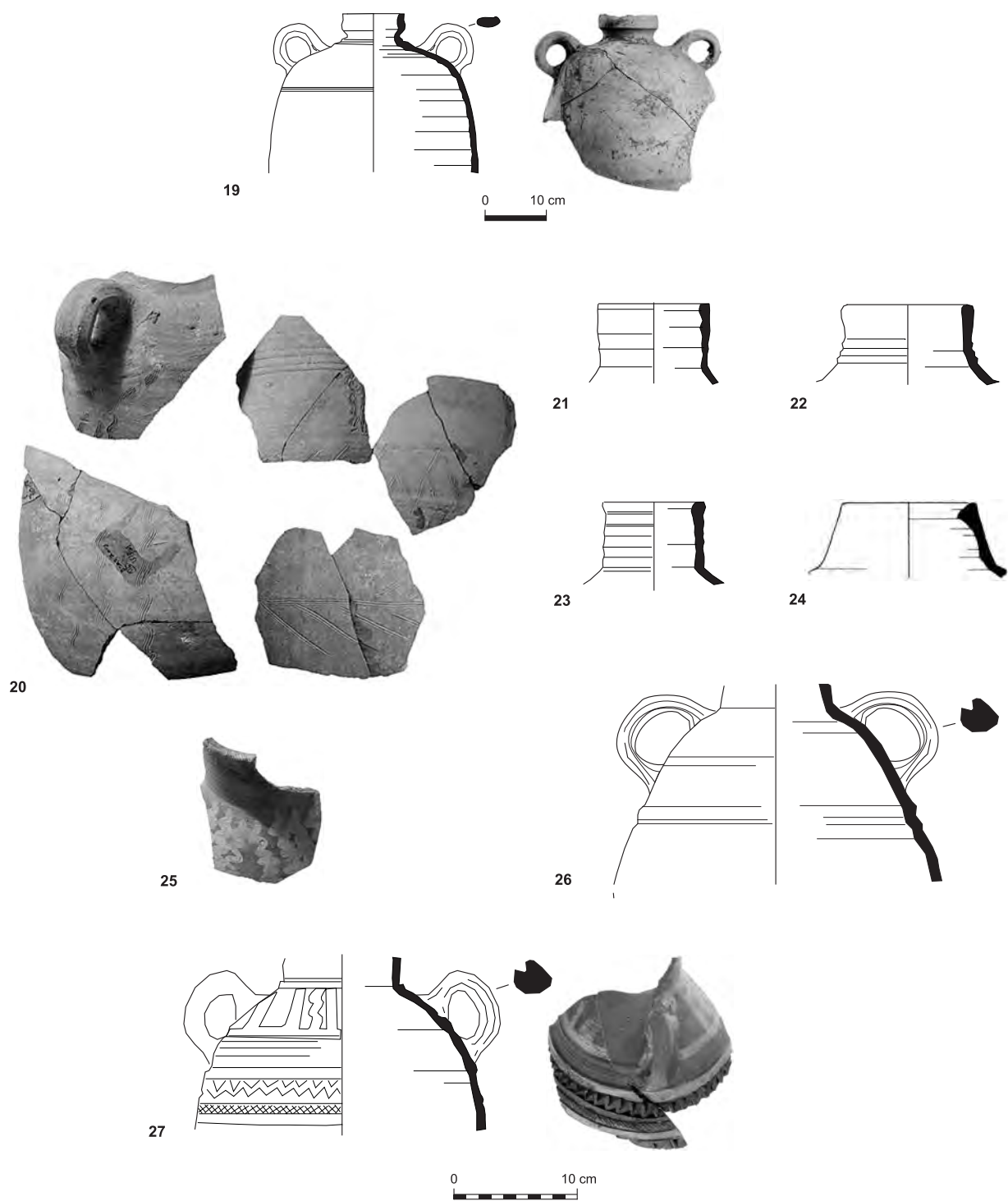


Fig. 6.94 (cont.): Storage jars: 19) L584; 20) L114; 21-23) L538; 24) L752; 25) L521; 26) L514; 27) L538.

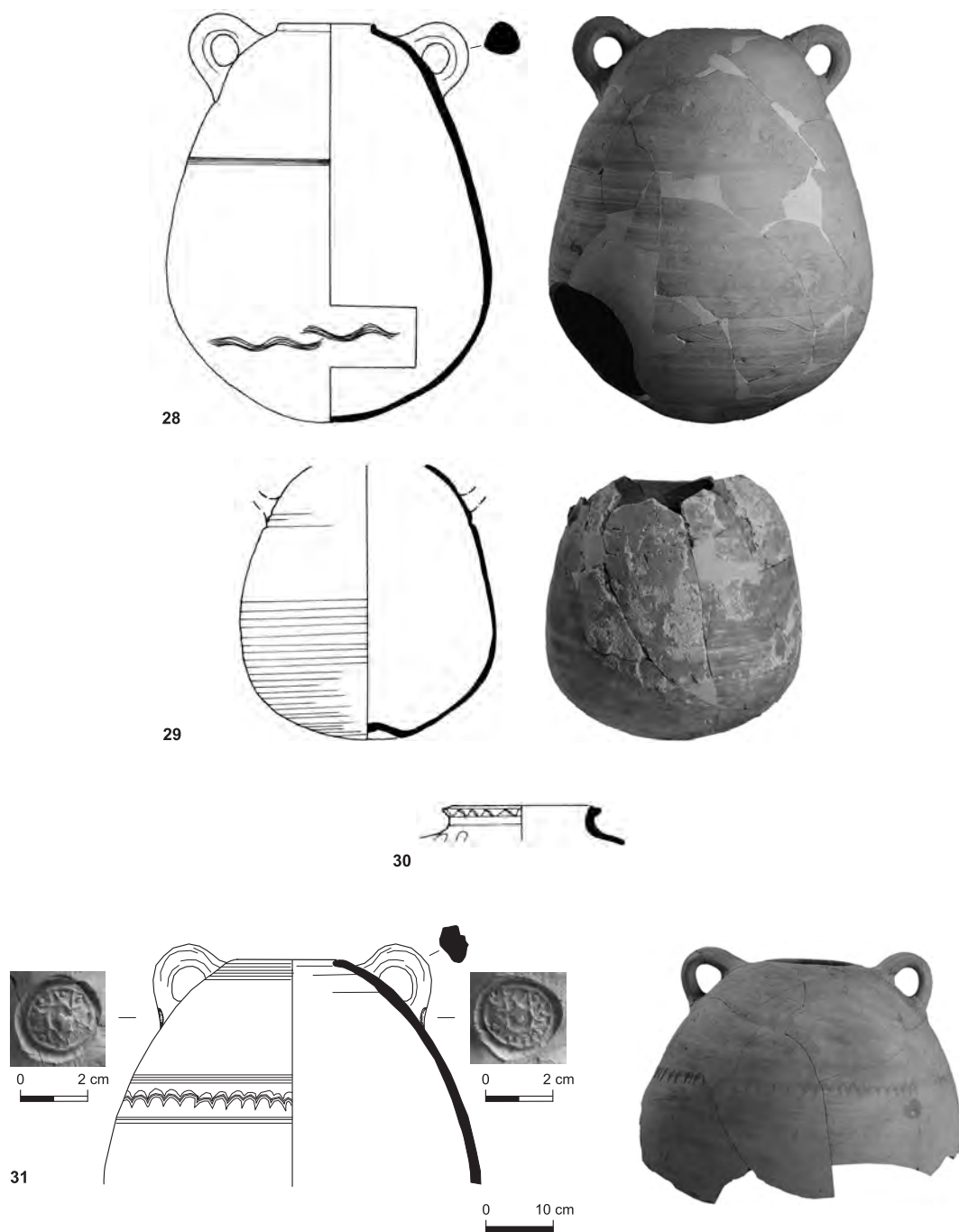


Fig. 6.94 (cont.): Storage jars: 28) L1661; 29) L1643; 30) L575; 31) L544.

which contains large amounts of basalt grits. They have a thickened everted rim, a very short neck, two loop handles from neck to shoulder, ridged shoulder and (originally) a short conical body with a pointed base (Fig. 6.95). These amphorae were produced in Byzantium (Black Sea region), where they were dated to the 9th/10th-11th centuries CE, and were used probably for transporting wine (Günsenin 1989:269-271, Fig. 4: left; Hayes 1992:73, 75, Fig. 24:14; Bass and van Doorninck 2004: Fig. 15-3). In Palestine, such amphorae were reported from Caesarea (Arnon 2008: 308-309, Nos. 853a-d) and Ramla (Yasur-Landau 1998: Fig. 141:1; Arnon 2007: Fig. 12:15-16), in assemblages dated to the 11th-12th centuries CE.

Another type of storage jar found at the site, though only represented by body sherds and handles and thus is not illustrated, is the small Egyptian bag-shaped jar known also as Red-Brown Ovoid Amphora. In Egypt these jars were produced from the 7th to the 9th or 10th century CE (Watson 1995:319; Gayraud 2003:559), but it is generally believed that in the southern Levant their presence ceased at the end of the Umayyad

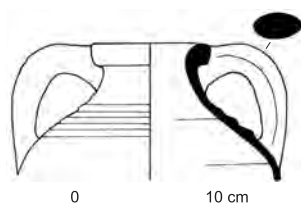


Fig. 6.95: Amphora (L752).

period (Walmsley 1995:66; Watson 1995:319) or at the end of the 8th century CE (Arnon 2007:63). However, the fact that at Ramla (South) these jars were found together with pottery types typical of the ʿAbbasid period indicates that their import into Palestine continued well into the 9th or even the 10th century CE.⁶

WATER-WHEEL JARS

Several fragmentary and nearly complete water-wheel (*antilya/sāqiya*) jars were found in the excavations. They are made of sandy and gritty buff ware, and have thick walls, elongated bag-shaped body and a plain or slightly ridged cylindrical neck with a plain rim (Fig. 6.96). According to Ayalon (2000:223-224, Fig. 3:5-6), this variant should be dated to the 7th through 11th centuries CE.

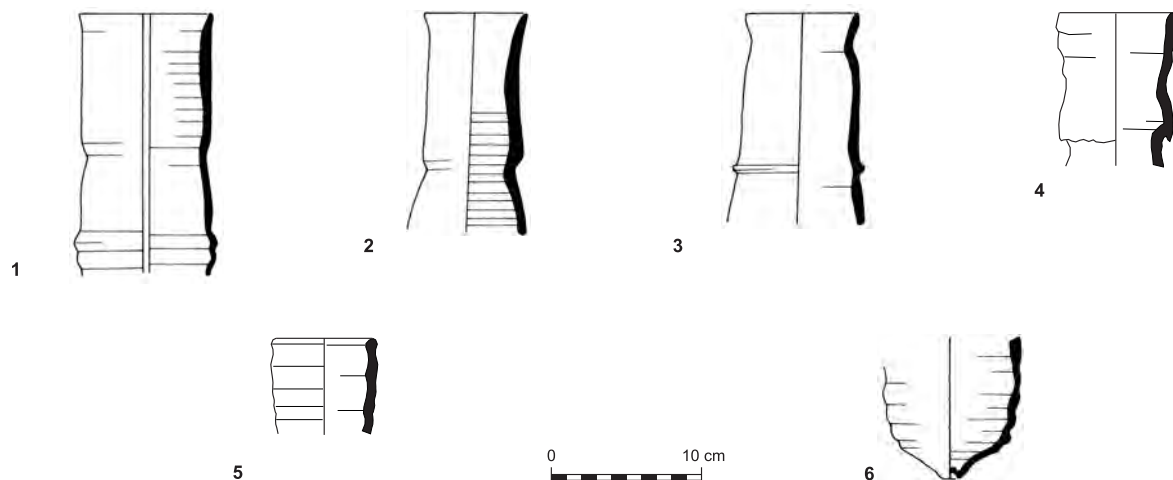


Fig. 6.96: Water-wheel jars: 1-3) L1643; 4-5) L625; 6) L924.

6. This dating is supported by at least one of the Egyptian jars found in another excavation at Ramla and published by Arnon (2007: Fig. 12:6), which was found in a stratum dated to the 9th century CE (Toueg 2007:17).

STORAGE JAR STOPPERS

Two types of storage jar lids were found. The first type is a bowl-shaped lid with a flat base, flaring walls and rounded rim which is made of buff ware (Fig. 6.97:1). This type of stopper is a descendant of a well-known Late Byzantine-Umayyad form (Magness 1993:247-248, Lids and Stoppers Form 1). It is remarkable that while in Ramla (South) this type is represented by only few specimens, at other sites, including in other excavations at Ramla, it is the main or even the only type of jar stopper (e.g. Avissar 2003: Pl. 19.1:19; Sion 2004: Fig. 14:79-81; Stacey 2004: Fig. 5.33:4; Kletter 2005a: Fig. 20:4-5).

The commonest type has thick walls, conical body and protruding ridge on the rim. It is made of high temperature fired sandy and gritty orange to brown ware (Fig. 6.97:2-11). A late Umayyad equivalent comes from Pella (McNicoll, Smith and Hennessy 1982: Pl. 146:2) and another, as yet unpublished, was found in an 'Abbasid context at Yavneh-Yam (M. Fischer and I. Taxel, unpublished).

FUNNELS

One of the most unusual form of vessel found in the excavations is the funnel, represented by two types. The first type is made of a sandy and gritty light brown medium-temperature fired ware. It has a bowl-shaped upper part and a cylindrical-shaped lower part with a loop handle that extends from the rim to the mid-body (Fig. 6.98:1). This is quite a rare form which has so far only a few somewhat different parallels from northern Palestine (Khirbet el-Waziya, Late Byzantine context: Aviam 2002: Fig. 75; Tiberias, second half of the 10th century CE context: Stacey 2004: Fig. 5.61:3) and northern Transjordan (Pella, late Umayyad context: McNicoll *et al.* 1992: Pl. 107:b).

The second type is made of a semi-fine orange-brown ware. It has a convex upper part with a deep groove at its middle and a loop handle (Fig. 6.98:2). No parallels were found.

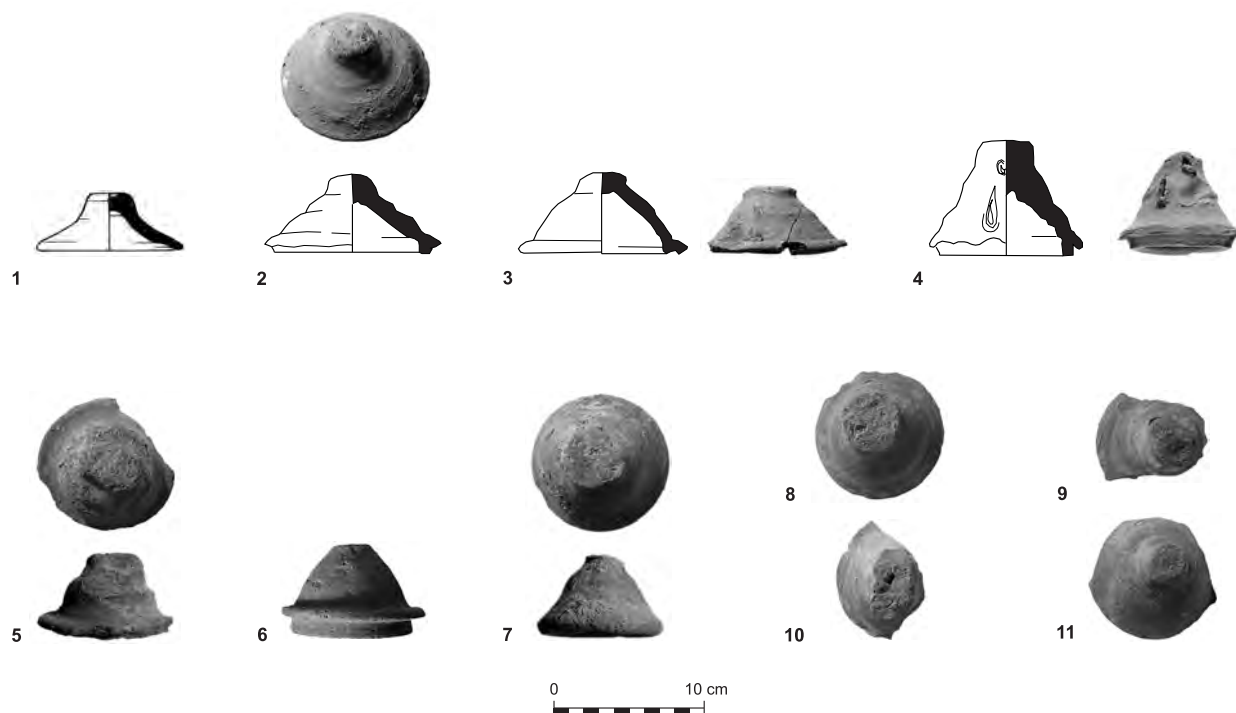


Fig. 6.97: Storage jar lids and stoppers: 1) L1604; 2) L514; 3) L816; 4) L585; 5) L1502; 6) L1739; 7) L1600; 8) L761; 9) L762; 10) L752; 11) L395.

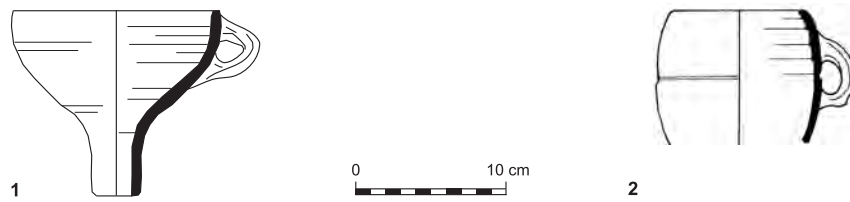


Fig. 6.98: Funnels: 1) L247; 2) L324.

STORAGE BINS

This term was given to large bell-shaped clay vats found either *in situ* (Square O140; I580) or as fragments in fills. They are handmade of a brownish coarse low temperature fired *ṭabun* ware and are decorated with deep wavy incisions below the thickened rim (Fig. 6.99). No parallels for such clay vats were found although it is probable that similar installations were found in other excavations and were wrongly identified as *ṭabuns*.

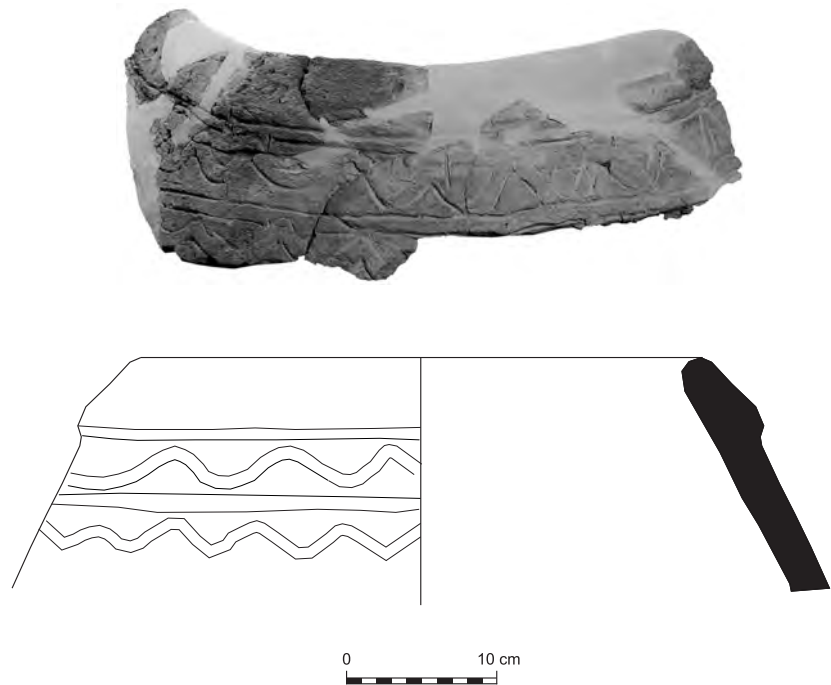


Fig. 6.99: Storage bin (L550).

KILN DIVIDER(?)

Among the numerous pottery finds retrieved was a clay nail-like object (Fig. 6.100). It is possible that it served to separate glazed pottery vessels in the kiln to prevent them from sticking to each other.



Fig. 6.100: Kiln divider(?) (L1511).

LAMPS

Three types of lamp were found. The first two are mould-made and the third is wheel-made.

Type 1: Figs. 6.101-6.103 is the commonest and is represented by the latest variant of the so-called Samaritan lamp. These lamps are made of a sandy to semi-fine yellowish-brown ware. They are characterized by an almond-shaped body, flat, slightly concave base, channel-nozzle, horseshoe-shaped filling hole, horizontal or slightly up-turned tongue handle and mould-made geometric decoration. The decorative motifs which cover the body include herring bone and net patterns, vertical lines and dots. The channel-nozzle is also decorated with various geometric motifs – triangles, rhombi, herring bone, zigzag lines, spirals and more. Two unusual motifs, depicted on two of the lamps, are a six-pointed star (Fig. 6.102:1) and a mirror-shaped object (Fig. 6.102:7). This type of lamp is dated by Sussman to the 6th-7th centuries CE, until the beginning of the Early Islamic period (Sussman 1983:74, Type 4, Fig. 7:3; 2002: 343). Hadad dated their appearance to the late 6th century CE and their *floruit* to the Umayyad period until its end (Hadad 2002: 74-78, Type 32, Nos. 327-336). However, the large number of these lamps retrieved from the present excavations clearly indicates that this type of lamp continued to be produced well into the ʿAbbasid period, at least until the 9th century CE. This date is confirmed by similar lamps found in other excavations at Ramla (Kletter 2005a: Fig. 21:2; Shmueli and Artzi 2006: Fig. 3:9), Khirbet Deiran (Bouchenino 2007: Fig. 9: 14), Khirbet Tinani (Yavor 1999: Fig. 33: 2) and even Umm al-Rasas in Transjordan (Alliata 1994: Nos. 86, 111).

Type 2: Figs. 6.104:1-3, 6.105-6.106 appears in smaller numbers at the site. It is the well-known lamp type of the ʿAbbasid and Fatimid periods. These lamps are made of a sandy to semi-fine buff or yellowish-brown ware. They have an almond-shaped body, flat, slightly concave base, channel-nozzle, round filling hole surrounded by a ridge and a tongue handle. Most of these lamps have vegetal decoration based on tendrils, sometimes in addition to bunches of grapes or stylized leaves (Figs. 6.104: 2, 6.105:1-4, 6.106:1, 3-5; cf. Hadad 2002: 99-100, Nos. 441-445, 448; Sion 2004: Fig. 14:85-88; Stacey 2004: Figs. 6.8, 6.9; Kletter 2005a: Fig. 21:5-9). One of the lamp bases is decorated with a six-pointed star (Fig. 6.105:3), which is uncommon on this type of lamps. Other lamps of this type have geometric decoration, which consist of wavy lines (Fig. 6.105:5; cf. Kogan-Zehavi 2004: Fig. 81:16; Kletter 2005a: Fig. 21: 10; Taxel and Feldstein 2006: Fig. 10:3), net-work pattern (Figs. 6.104:1, 6.106:2, 6) or stars (Fig. 6.104:3; no parallels were found). These lamps are dated to the late 8th-11th centuries CE (Magness 1993:258-259, Channel-Nozzle Oil Lamps [Form 5]; Hadad 2002:95-106, Type 37).

Type 3: Fig. 6.104:4 is represented by a single example of a so-called saucer lamp. It is a small wheel-made lamp made of a sandy and gritty hard-fired reddish ware. It has a round, squat body with a prominent peripheral ridge, a loop handle from the shoulder to the ridge and a flat base. At Caesarea this lamp type was dated to the mid-8th-11th centuries CE (Arnon 2008:15, Fig. 6), and at Tiberias it was dated to ca. 950-1100 CE (Stacey 2004:165-166, Fig. 6.21, for contemporary parallels from Ramla, see e.g. Arnon 2007: Fig. 17:7-8).

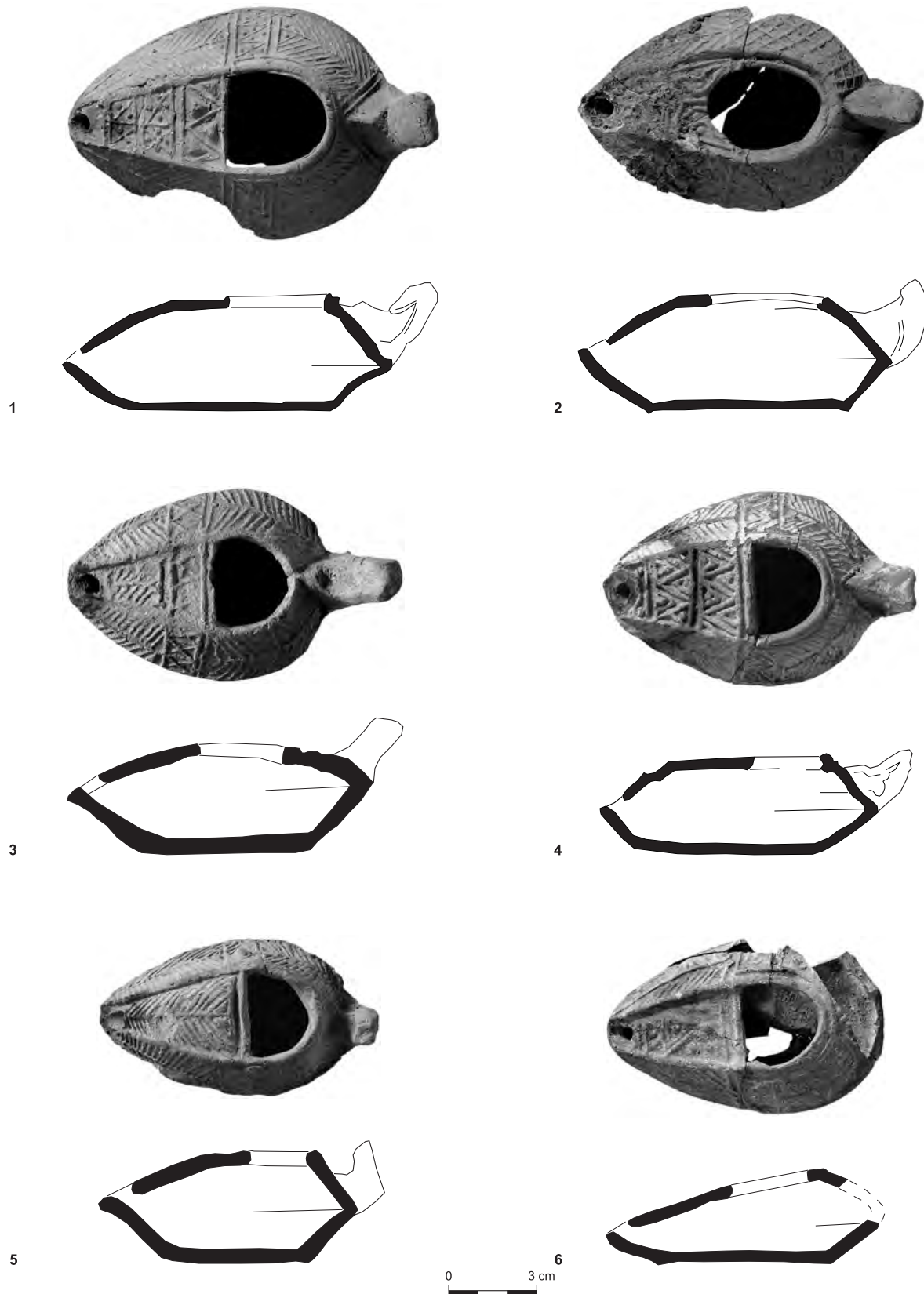


Fig. 6.101: Lamps: Type 1: 1) L521; 2) L143; 3) L912; 4) L538; 5) L330; 6) L245.

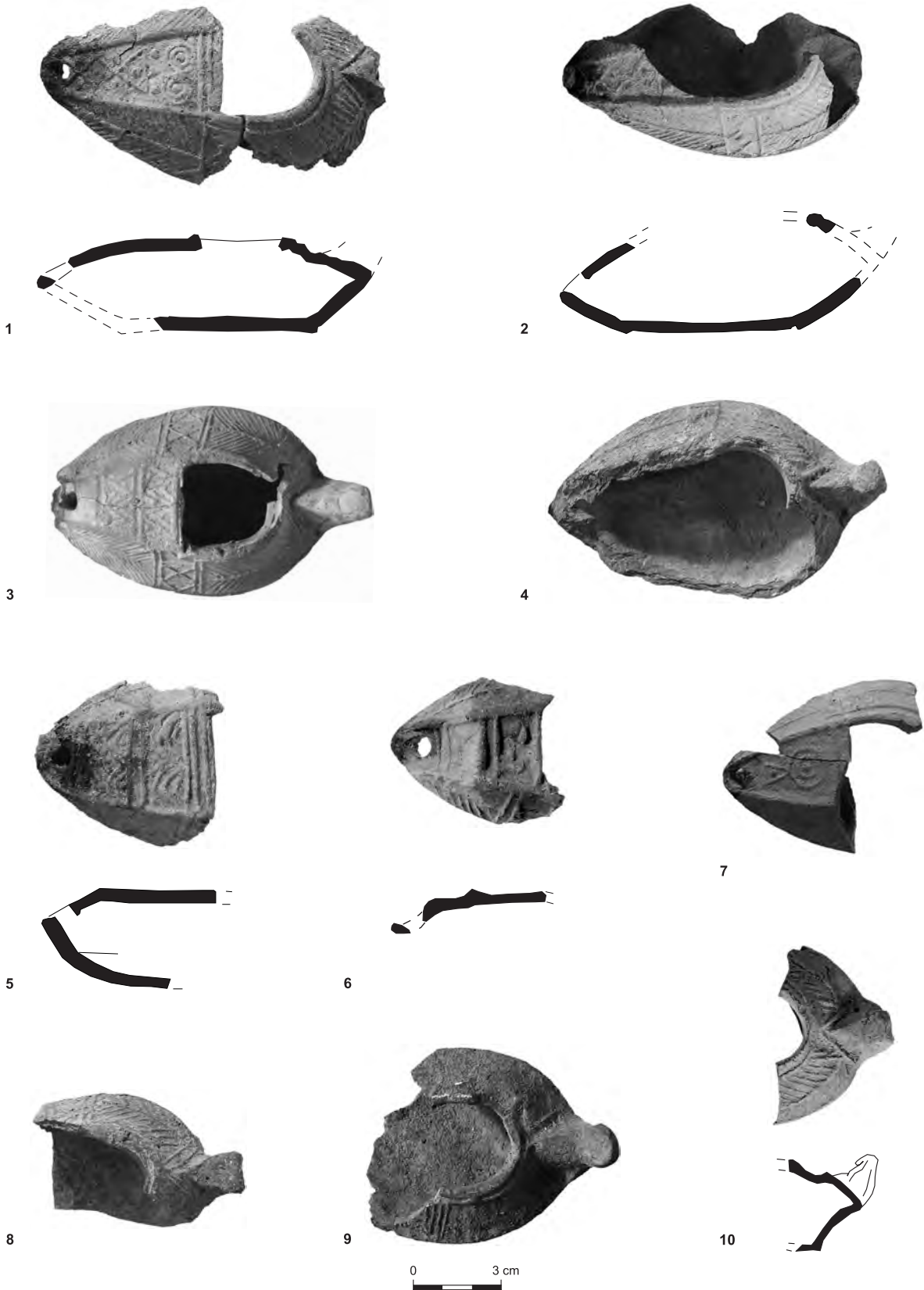


Fig. 6.102: Lamps: Type 1: 1-2) L538; 3) L1523; 4) L838; 5-6) L538; 7) L124/139; 8) L538; 9) Surface; 10) L538.

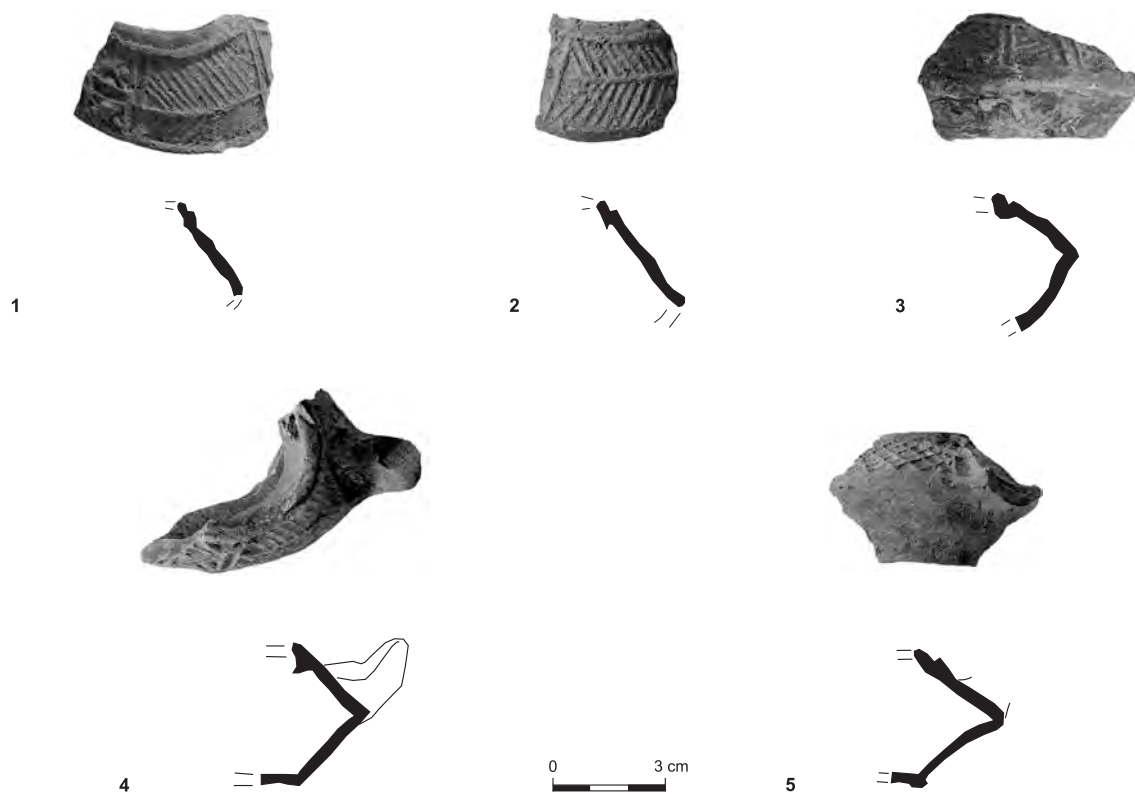


Fig. 6.103: Lamps: Type 1 (L538).

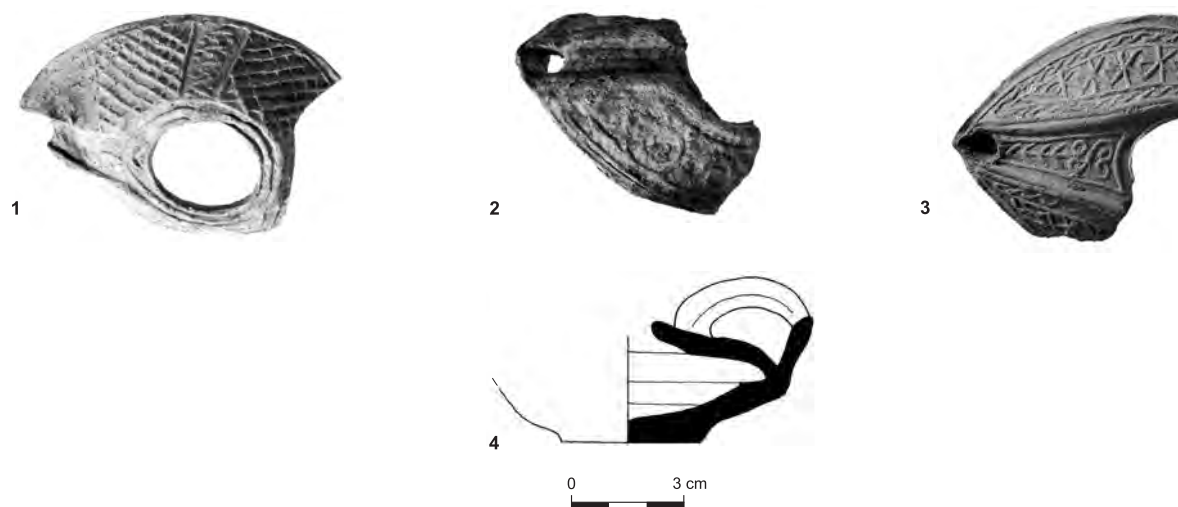


Fig. 6.104: Lamps: Type 2: 1-2) L951; 3) Surface; Type 3: 3) L1605.

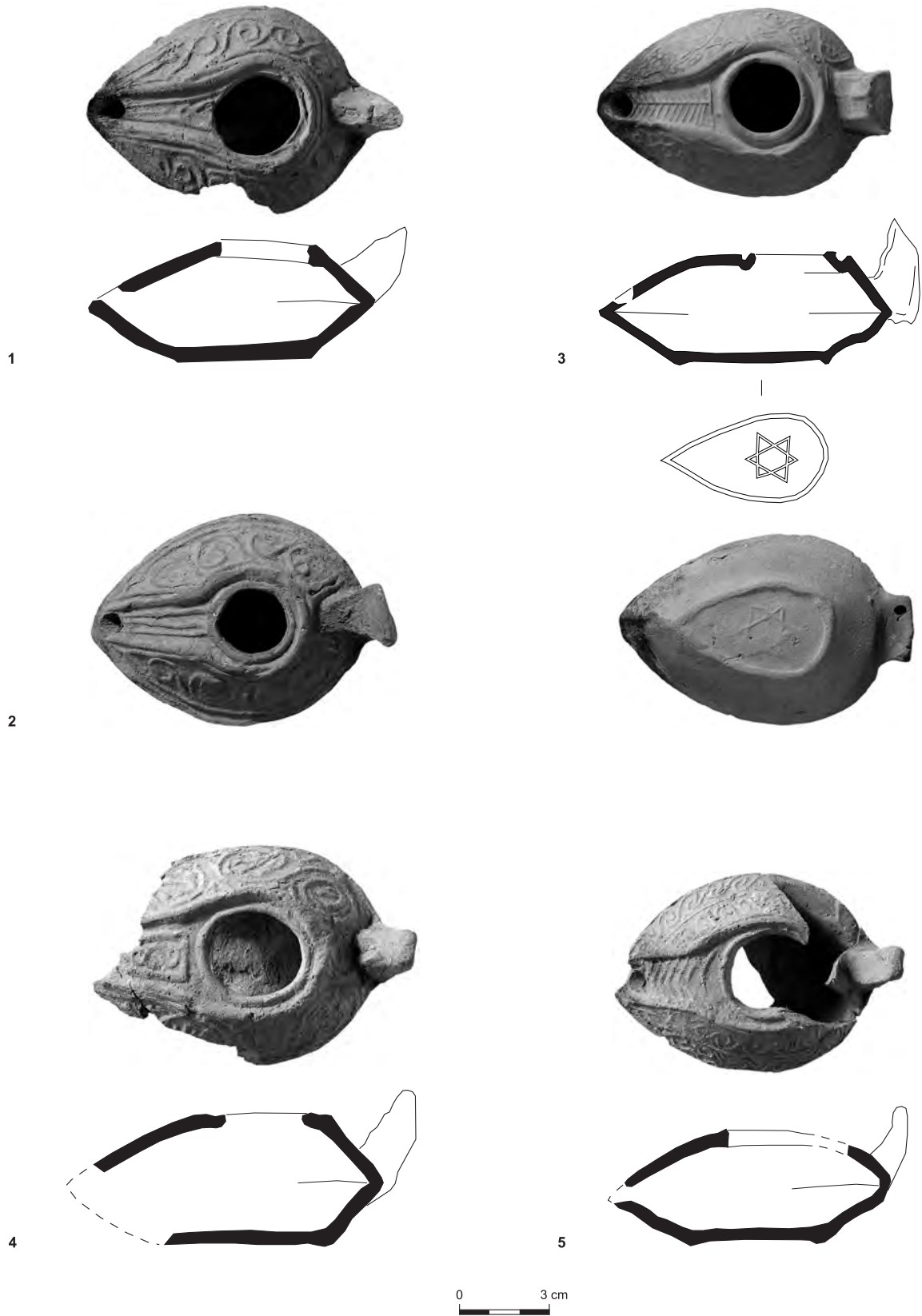


Fig. 6.105: Lamps: Type 2: 1) L768; 2) L1611; 3) L521; 4) L948; 5) L752.

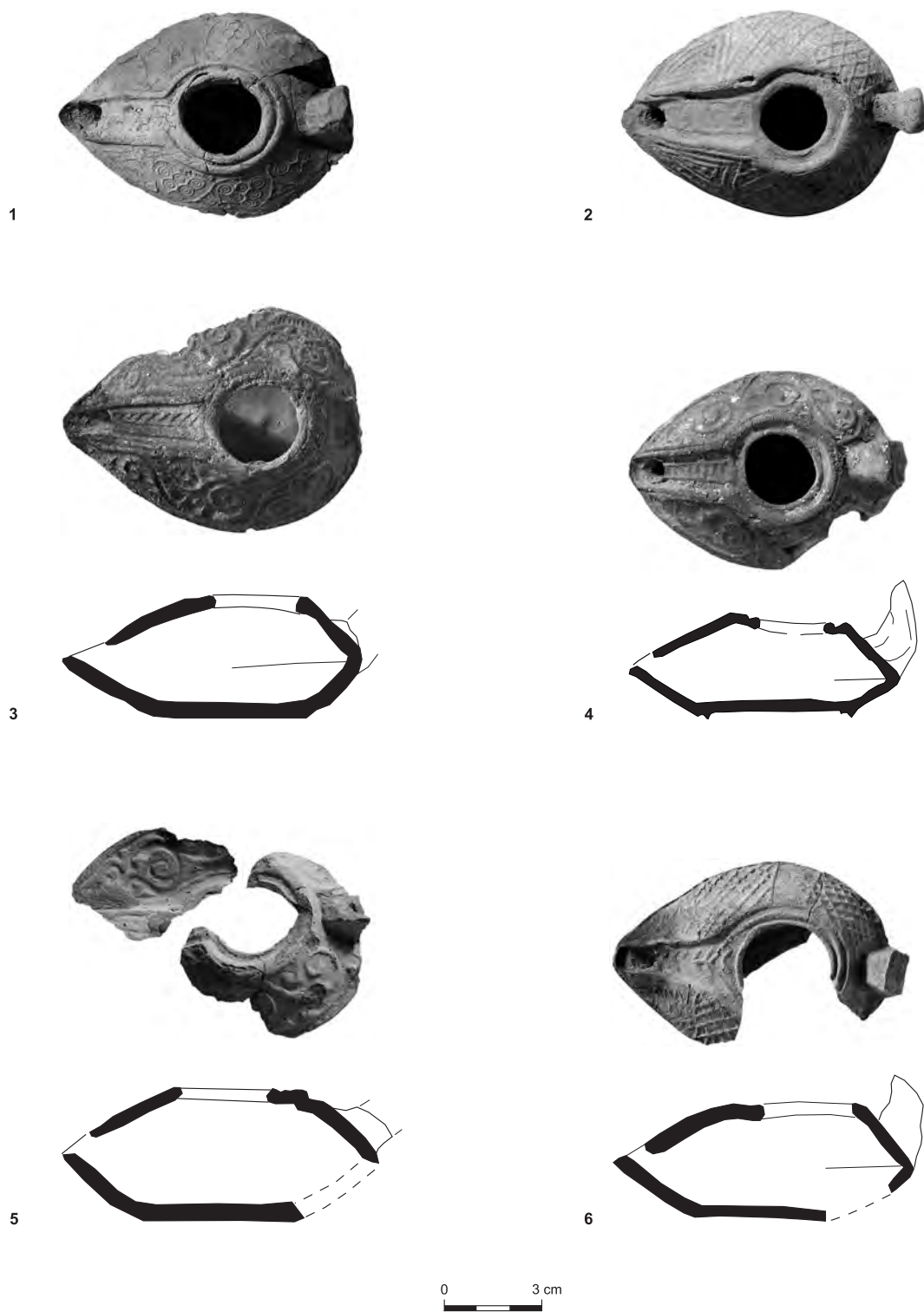


Fig. 6.106: Lamps: Type 2: 1) L1538; 2) L1611; 3) L921; 4) L516; 5) L247; 6) L921.

SELECTED LOCI

The richest Early Islamic pottery assemblages found at the site originated in some of the subterranean vaulted chambers which were reused as refuse pits after ceasing to function as sewage installations (pits). Of these, Vaulted Chambers I538 and I625 (and especially the former) yielded the largest and most varied pottery assemblages. These loci are presented here as representative of chronologically homogeneous repertoires.

The ceramic assemblage from I538 (Fig. 6.107) comprises various types of bowls (namely FBW, plain, incised-decorated, cut-decorated, monochrome glazed and handled), basins, loop-handled and cylindrical cups, casseroles and casserole lids, jugs and juglets, local and northern Palestinian bag-shaped storage jars, flasks and lamps of our Type 1. The smaller, though still diverse ceramic assemblage from I625 (Fig. 6.108) includes various types of bowls (plain monochrome glazed and handled), basins, s-shaped and cylindrical cups, casseroles, jugs (including a few glazed examples), juglets, local bag-shaped jars and water-wheel jars. Although FBW and cut-decorated bowls, casseroles and Type 1 lamps are known to have existed in the 8th century CE (late Umayyad/early 'Abbasid period), the presence of glazed bowls and jugs, and buff ware jugs and juglets which did not appear before the 9th century CE provides an early 9th century CE *terminus post quem* for the two assemblages. The absence of pottery types which characterize the late 10th and 11th centuries CE (such as glazed frying pans) indicates that the latest date which can be given to the assemblages is ca. 950 CE.

The re-use of architectural, usually domestic spaces as dump receptacles is a phenomenon which Schiffer calls secondary refuse and is known from various ancient and pre-modern traditional cultures (1995:205-206).⁷ Schiffer's terminology refers mainly to assemblages from house floors where distinguishing between primary, secondary and *de facto* refuse is sometimes difficult (*ibid.*:211). However, in the case of re-use of subterranean (either built or rock-cut) features as dump receptacles, the deposits can undoubtedly be identified as secondary refuse. In the case of our excavations in Ramla (South), it seems that the re-used subterranean vaulted chambers and the conversion of similar features such as cisterns, wells, etc. into refuse pits, provides a clear indication of a change in the nature of the site and/or the social/ethnic identity of its inhabitants.⁸

The numerous domestic artefacts discarded in the subterranean vaulted chambers clearly indicate a sharp change in the nature of the site during the 10th century CE. Since very few clear domestic complexes of the late Umayyad to Fatimid periods were identified in the excavations reported here, it is reasonable to assume that the above-mentioned dumped domestic artefacts originated in the nearby *khan* complex that was engaged with domestic and commercial activities. However, the possibility that parts of the site continued to be occupied for domestic and/or industrial purposes cannot be ruled out, although this might have been on a much smaller scale. Nonetheless, the subterranean vaulted chambers, which seem to have been an essential component of local industrial activity, could only have become dumps after the abandonment of the related cisterns, pools, pipes and channels and working surfaces.

7. This phenomenon is known, *inter alia*, from traditional Palestinian Arab villages (Ziadeh-Seely 2000:86), and has been archaeologically identified in excavations at Kafr 'Ana in the Lod valley (Taxel 2007:32, Note 5).

8. An example of such a change can be found in the Late Byzantine-early Umayyad monastery of Khirbet es-Suyyagh (in the Judaean Shephelah), where at least one of the cisterns was converted into a refuse pit during the late Umayyad or early 'Abbasid period (in the 8th century CE) when the abandoned monastery was reinhabited by a non-Christian rural population (Taxel, forthcoming).

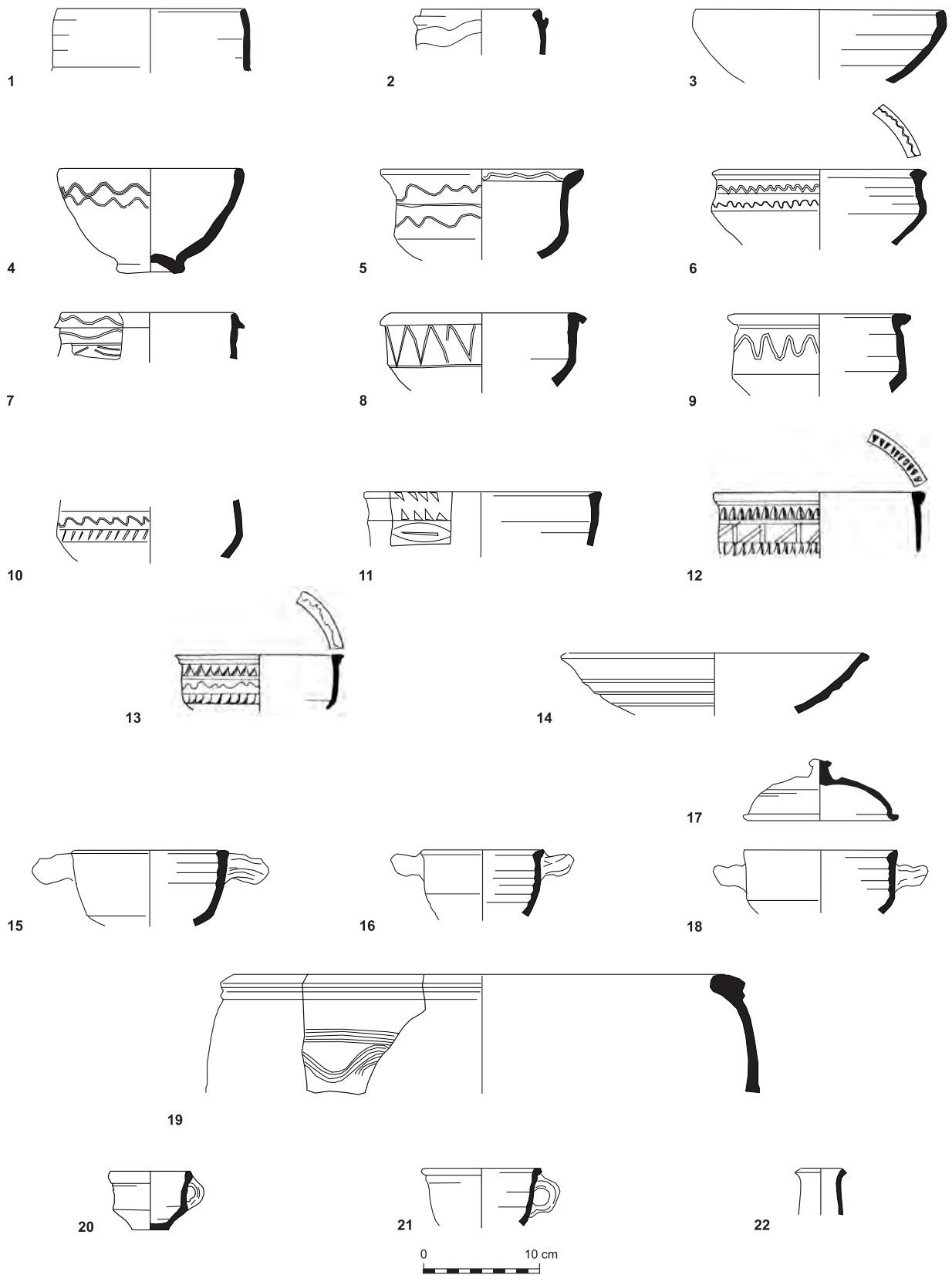


Fig. 6.107: Selected pottery from L538.

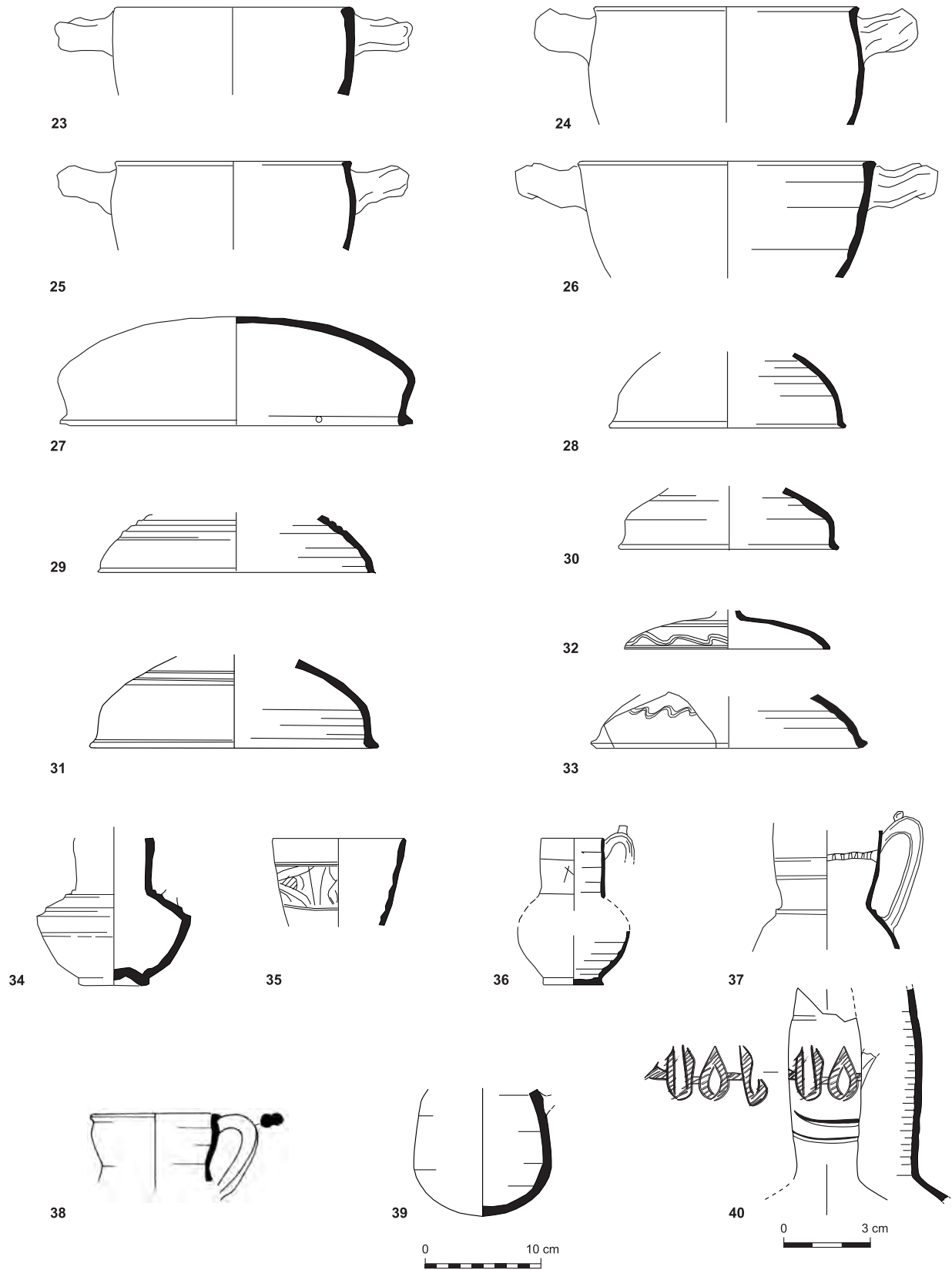


Fig. 6.107 (cont.): Selected pottery from L538.

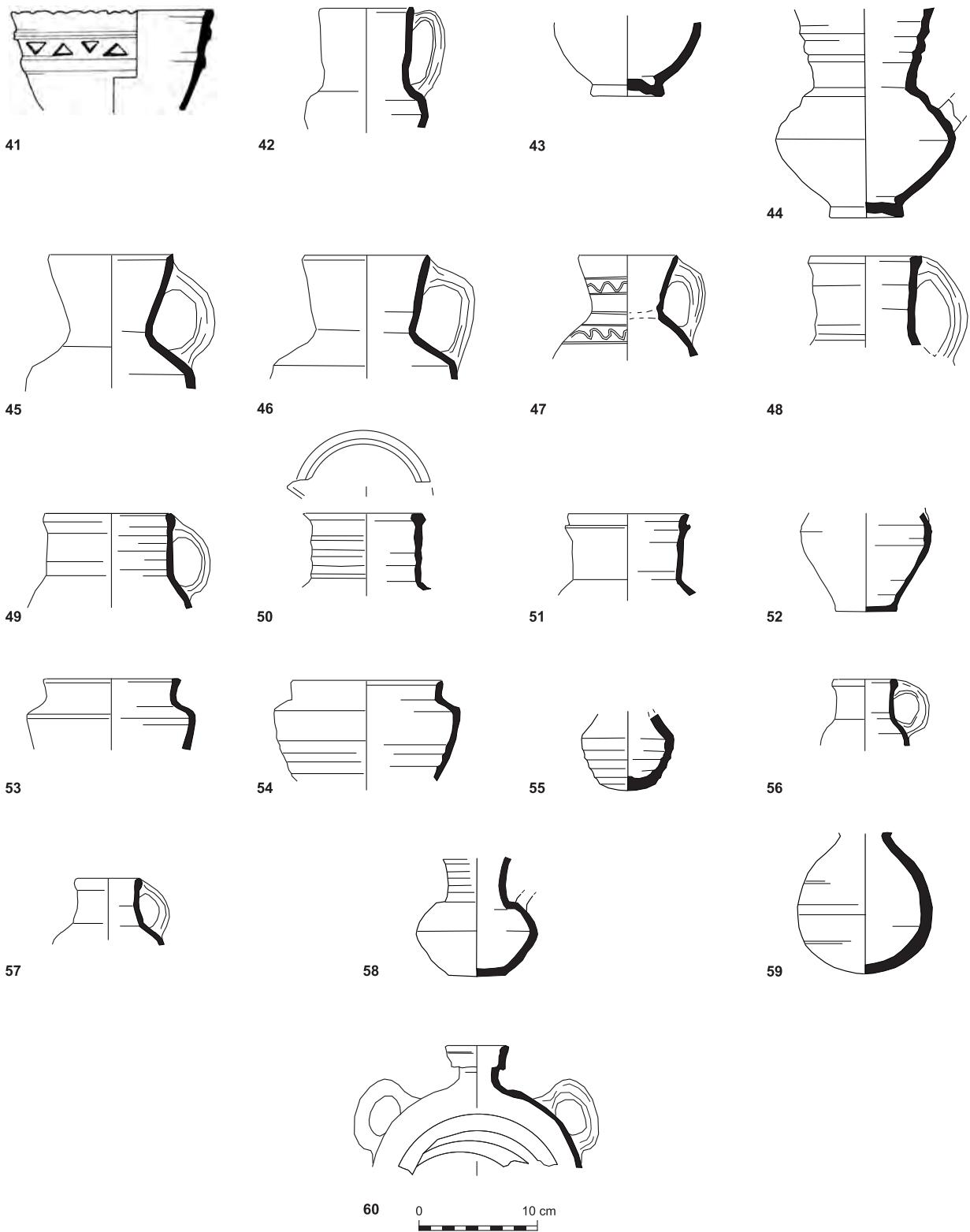


Fig. 6.107 (cont.): Selected pottery from L538.

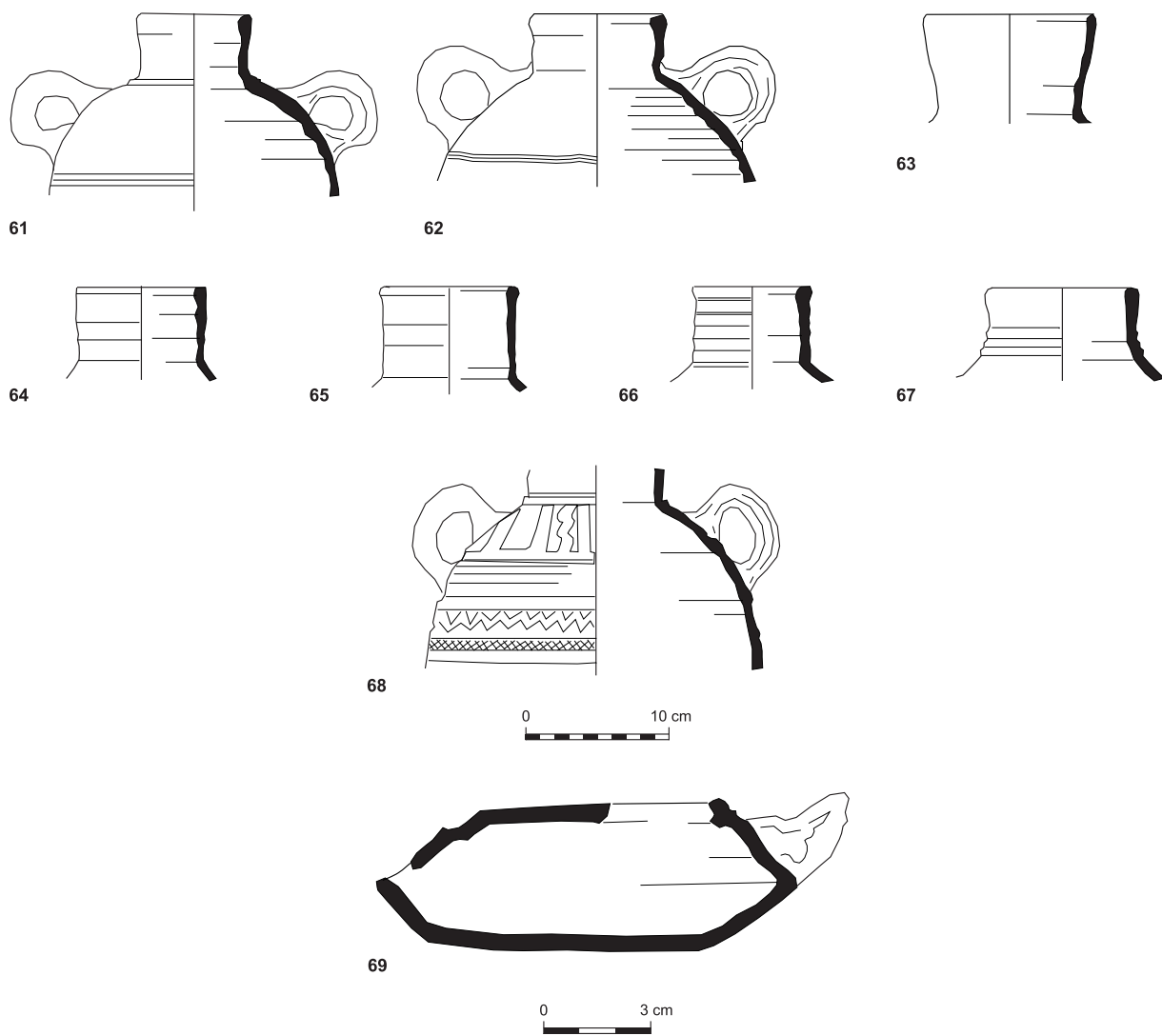


Fig. 6.107: (cont.) Selected pottery from L538.

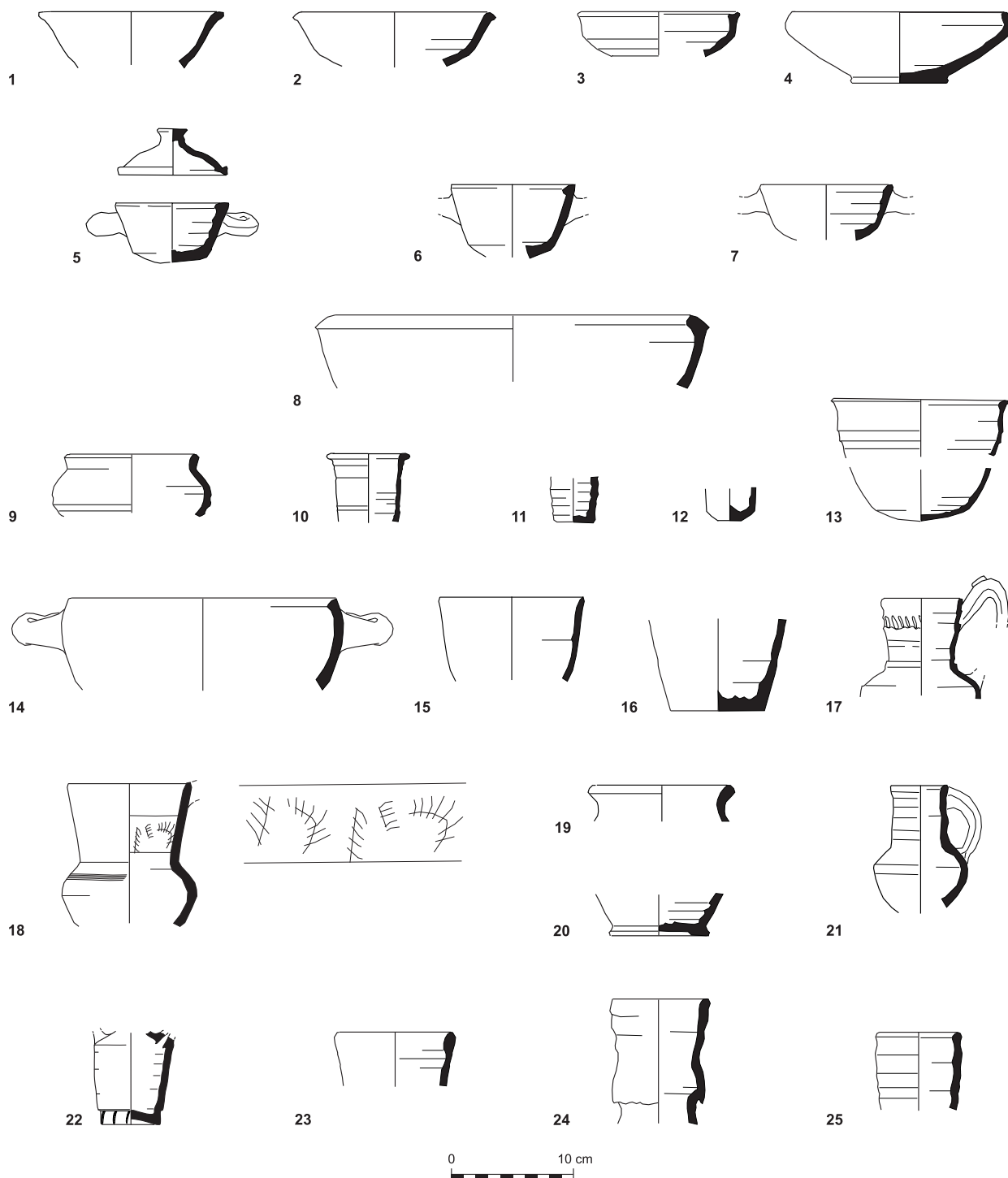


Fig. 6.108: Selected pottery from L625.

GLASS VESSELS

Ruth E. Jackson-Tal

Around 400 glass fragments were unearthed at Ramla. Ninety-six diagnostic fragments are presented here. The glass fragments from contexts dated to the Late Hellenistic, Late Roman and Byzantine periods have been dealt with in previous chapters. However, the large quantity and type variation of the glass vessels of the Early Islamic period warrant separate treatment.

Many of the vessels came from Loci 538, 625 and 912. The first two of these loci are subterranean vaulted chambers (sewage installations) that were modified for garbage disposal in their later stage. Locus 912 may be yet another sewage installation that was later used as a refuse dump. All the glass vessels presented here are dated according to their stratigraphic location at the site and typological studies to the late Umayyad, Abbasid and early Fatimid periods, i.e., the mid-8th-11th centuries CE. The bulk of the glass vessels are bowls and bottles with few examples of jars, lamps and alembics. They represent common household vessels used for serving and storing food or as light and medicinal apparatus.

They are decorated in various techniques: mould-blowing, incising, tonging and wheel-cutting. All these are typical of the Abbasid-Fatimid periods. The vessels are made mostly of colourless glass but also of light purple, bluish, greenish and yellowish shades. They are covered in thick black and silver weathering and iridescence. The vessels are presented typologically. Parallels are given mainly from other excavations carried out in the vicinity of the excavated area at Ramla and from other areas in Palestine where several parallel contexts of the Abbasid-Fatimid periods containing glass vessels were recently published (Pollak 2000; 2003; 2007; Lester 2004a; Hadad 2005; Gorin-Rosen and Katsnelson 2005).

BOWLS

Bowls consist of a large part of the glass vessel repertoire. They appear in various shapes and sizes. They were used as table ware; the plain

types for everyday use and the more decorated types probably on festive occasions. The most dominant shapes are the bowls with rounded, tapering or cylindrical walls (Figs. 6.109-6.110, 6.111:1-8). These are shallow or deep wide bowls used as plain everyday tableware. The majority is undecorated, but several were adorned with applied trails, mould-blowing, incising and tonging. The decorative design is always geometric.

BOWLS WITH ROUNDED WALLS

Fig. 6.109:1-3 have straight rims. The first is shallow and hemispherical, and the second is deep and ovoid. Similar shallow bowls were found in Abbasid-Fatimid contexts at Beth Shean (Hadad 2005:35, Pl. 27:534-536), and similar deep bowls were found in Tiberias (Lester 2004a:173, Fig. 7.1:27) and Caesarea (Pollak 2000:241, Fig. 6:9) in similar contexts. Fig. 6.109:3 is decorated with a horizontal trail, a common decorating method for glass vessels for a long period from the beginning of glass vessel production. No exact parallel was found. Fig. 6.109:4-8 have a flaring thickened rim. These bowls are well known during the Abbasid-Fatimid periods and may be either deep or shallow. Similar bowls were found in Abbasid-Fatimid contexts in several other excavations at Ramla (Gorin-Rosen 1999:12, Fig. 2:4; Gorin-Rosen and Katsnelson 2005:104-105, Fig. 2:14; Pollak 2007:107, Fig. 4:20), Tiberias (Lester 2004a:168, Fig. 7.1:8-10, 12), Yoqne'am (Lester 1996:203, Fig. XVII:1-6), and Beth Shean (Hadad 2005:35-36, Pl. 27:538-540, 542-543).

BOWLS WITH TAPERING/SLANTING WALLS AND SOLID DISC BASES

Figs. 6.109:9-14, 6.111:6-8 are very common types during the Abbasid-Fatimid periods and many fragments of rims and bases of this type were found at the site. Similar bowls were found in Abbasid-Fatimid contexts in several other excavations at Ramla (Gorin-Rosen 1999:12, Fig. 2:1; Gorin-Rosen and Katsnelson 2005:106, Fig. 2:16; Pollak 2007:109, Fig. 5:24), Caesarea (Pollak 2000:241, Fig. 6:10-11; 2003:167, Fig. 1:19) and Beth Shean (Hadad 2005:35-36, Pls. 25:479-480, 482, 485, 28:550-552).

BOWLS WITH OUT-FOLDED RIMS

Fig. 6.110 are very common in the region during the Roman and Byzantine periods and continue into the Early Islamic period. Therefore, when possible, their dating is based on their archaeological context or their shape and fabric. Similar bowls were found in another excavation at Ramla (Pollak 2007:101, Fig. 1:2), and in ʿAbbasid-Fatimid contexts at Tiberias (Lester 2004a:168, 173, Fig. 7.1:23-26) and Beth Shean (Hadad 2005:36, Pls. 28:556-563, 29:564-565).

BOWLS WITH CYLINDRICAL WALLS AND FLAT BASES

Fig. 6.111:1-5 are very common during the ʿAbbasid-Fatimid periods. They are known in shallow and deep versions. Many fragments of rims and bases of such bowls were found at the site. Similar cylindrical bowls were found in ʿAbbasid-Fatimid contexts in other excavations at Ramla (Gorin-Rosen 1999:12, Fig. 2:2-3, 5; Pollak 2007: 104-106, Fig. 3:13-16), Caesarea (Pollak 2003:167, Figs. 1:18; 3:39-40) and Beth Shean (Hadad 2005: 35, Pl. 25:484, 486-495).

BOWLS WITH TUBULAR BASE-RINGS

Tubular base-rings (Fig. 6.111:9-11) are a common base for various vessels during long periods of time. Therefore their dating is usually based on their archaeological context, when possible, or their shape and fabric. Similar bases were found in ʿAbbasid-Fatimid contexts at Tiberias (Lester 2004a:174, Fig. 7.3:40).

BOWLS WITH MOULD-BLOWN DECORATION

Mould-blowing was employed for glass production since the Early Roman period. During the ʿAbbasid-Fatimid period this technique became very common (Hadad 2005:36). The fragments found at the site are mainly thick solid bases and a single wall fragment from bowls (Fig. 6.112). The bases are decorated with vertical ribs and with double ellipses with a central dot (sometimes referred to as eye, Pollak 2000:241, No. 13). The two decorative designs are well known during this period. Similar decorated fragments with double ellipses were found at Caesarea (Pollak 2000:241-242, Fig. 7), Yoqneʿam (Gorin-Rosen 2005b:107, Fig. 7.2:16), and at Beth Shean in ʿAbbasid-Fatimid

context, alongside with bases of similar vertical ribs (Hadad 2005:36-37, Pls. 30:583, 31:604-606).

BOWLS/BEAKERS/BOTTLES WITH MOULD-BLOWN DECORATION

Two upright mould-blown wall fragments were found at the site and probably belong to bowls or beakers. Fig. 6.113:1 is decorated with vertical panels and near the base with an ellipse with an inner circle. Fig. 6.113:2 is decorated with vertical panels above lozenges with inner circles. A closely decorated wall fragment was found in other excavations at Ramla (Gorin-Rosen and Katsnelson 2005:107, Fig. 2:22).

BOWL WITH INCISED DECORATION

A single upright wall fragment (Fig. 6.113:3) decorated with incised geometric designs was found at the site. This mode of decoration was used during the Roman period, and is well known in the Umayyad and especially during the ʿAbbasid-Fatimid period (Hadad 2000:63). Incised vessels were found in such contexts at Beth Shean (Hadad 2000:63-66; 2005:37-38, Pls. 33:650-663, 34:664-668, with extensive parallels to sites in Palestine and beyond). Due to the wide distribution of these vessels it was assumed there were several workshops that produced them (Hadad 2000:66-71). The rarity of the find at Ramla indicates it was probably not locally produced.

VESSEL WITH TONGED DECORATION

The decoration on Fig. 6.113:4 was very common from the Umayyad to the ʿAbbasid periods. A pair of tongs was used to decorate open vessels, forming a pattern on both sides of the wall. A single upright wall fragment, probably from an open vessel beaker or bowl was found at the site. It is decorated with two vertical dotted lines. Vessels with a similar tonged design of vertical dotted lines and an alternating oval pattern were found in other excavations at Ramla (Priel 1999: 102, Fig. 157:8; Gorin-Rosen and Katsnelson 2005: 101, 103, Fig. 1:2) and in ʿAbbasid-Fatimid contexts at Hammath Gader (Lester 1997:434, 437-439, Pl. 1:11-12), Ḥorvat Ḥermeshit (Winter 1998:174-175, Fig. 2:10), Caesarea (Pollak 2003:167, Fig. 2:31-33) and Beth Shean (Hadad 2005: Pl. 40:840).

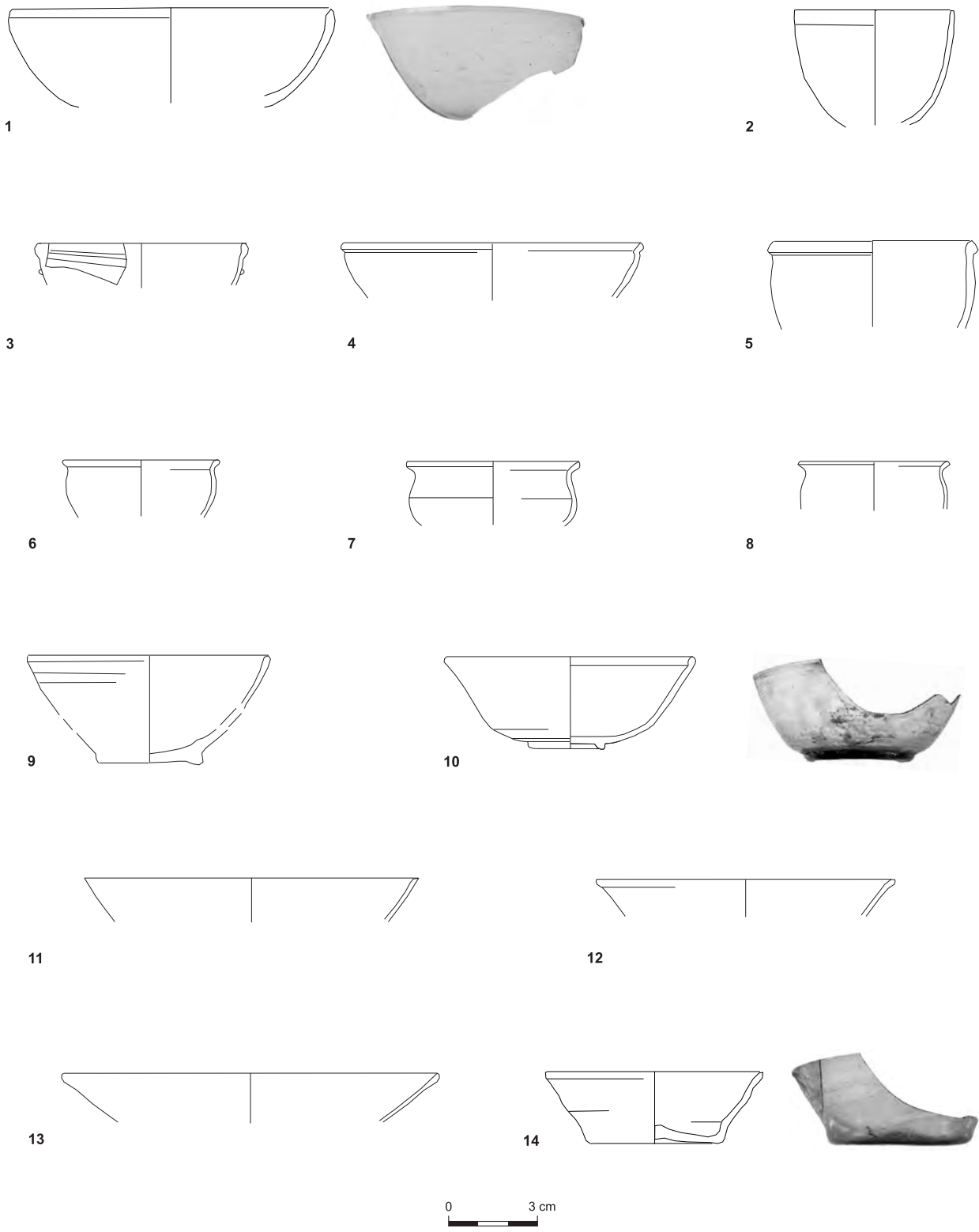


Fig. 6.109: Bowls.

Catalogue of Fig. 6.109:

1. Locus 538. Rim and wall fragment. Light blue with iridescence. Straight rounded rim, curving in rounded hemispherical wall. Thick wall with horizontal polishing marks. Rim D.: 10.8 cm.
2. Locus 538. Rim and wall fragment. Colourless with remains of black and golden weathering and iridescence. Straight cut rim, thin wall, slightly curving in. Rim D.: 5.4 cm.
3. Locus 330. Rim and wall fragment. Colourless with thick black and silver weathering. Straight rounded rim, thickened on the exterior side, straight wall with applied thin horizontal trail. Rim D.: 7.2 cm.
4. Locus 912. Rim and wall fragment. Colourless with thick black weathering and iridescence. Slightly flaring thickened rounded rim, curving in wall. Rim D.: 10 cm.
5. Locus 538. Rim and wall fragment. Colourless with black and silver weathering and iridescence. Straight thickened rounded rim, slightly curving in wall. Rim D.: 6.8 cm.
6. Locus 912. Rim and wall fragment. Colourless with bluish tinge and black weathering. Flaring rounded rim, slightly curving in thin wall. Rim D.: 5.4 cm.
7. Locus 912. Rim and wall fragment. Colourless with thick black and silver weathering and iridescence. Flaring rounded rim, curving in wall. Rim D.: 5.8 cm.
8. Locus 912. Rim and wall fragment. Light purple with remains of black weathering and iridescence. Flaring rounded rim, curving in wall. Rim D.: 5 cm.
9. Locus 912. Rim, wall and base fragment. Light bluish-green with remains of black and silver weathering and iridescence. Straight rounded rim, curving in tapering wall, flattened base with a solid triangular section. Pontil mark (1 cm). Rim D.: 8 cm. Base D.: 3.6 cm. Height: 3.8 cm.
10. Locus 912. Rim, wall and base fragment. Light bluish-green with remains of black and silver weathering and iridescence. Straight rounded thickened rim, curving in tapering wall, flattened base with a solid base-ring. Pontil mark (1.2 cm). Rim D.: 8.4 cm. Base D.: 2.6. Height: 3 cm.
11. Locus 625. Rim and wall fragment. Colourless with bluish tinge, silver weathering and iridescence. Curving out rounded rim, curving in tapering wall. Rim D.: 11 cm.
12. Locus 625. Rim and wall fragment. Colourless with bluish tinge, silver weathering and iridescence. Curving out rounded thickened rim, curving in tapering wall. Rim D.: 10 cm.
13. Locus 625. Rim and wall fragment. Colourless with black and silver weathering and iridescence. Curving out rounded rim, curving in tapering wall. Rim D.: 12.6 cm.
14. Locus 538. Rim, wall and base fragment. Purple, with remains of silver weathering and iridescence. Curving out rounded rim, curving in uneven tapering wall. Concave base, with pontil mark (1 cm). Rim D.: 7.2 cm. Base D. 4.4 cm. Height: 2.4 cm.

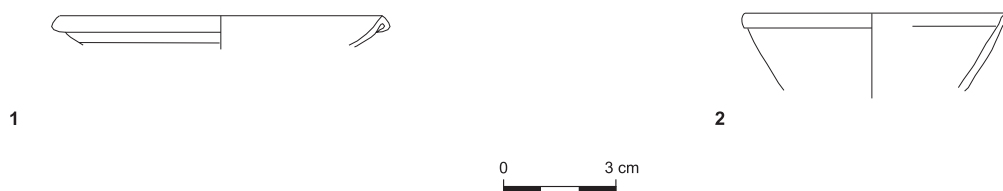


Fig. 6.110: Bowls.

1. Locus 320. Rim and wall fragment. Colourless with light purple tinge, silver weathering and iridescence. Flaring folded-out tubular rim, curving in thin tapering wall. Rim D.: 8.6 cm.
2. Locus 538. Rim and wall fragment. Colourless with thick black and silver weathering. Flaring folded-out rim, straight uneven wall. Rim D.: 7.2 cm.

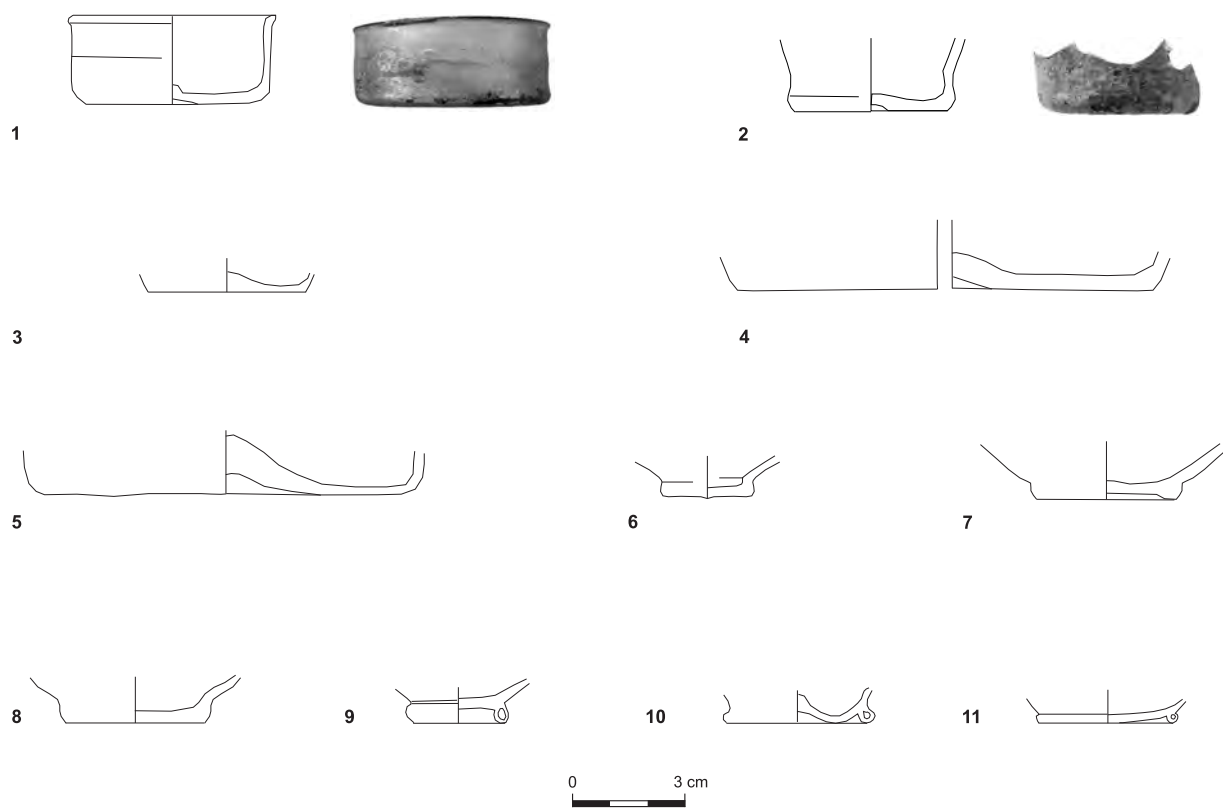


Fig. 6.111: Bowls.

1. Locus 912. Complete (missing small wall fragment). Colourless with greenish tinge, remains of black and silver weathering and iridescence. Slightly flaring rounded rim, straight wall, flattened concave base with pontil mark (0.8 cm). Rim D.: 5.4 cm. Base D.: 4.6 cm. Height: 2.4 cm.
2. Locus 538. Base and wall fragment. Yellowish-green, with black and silver weathering. Flat base with pontil mark (0.6 cm). Straight thick wall. Base D.: 4 cm.
3. Locus 912. Base and wall fragment. Colourless with black and silver weathering and iridescence. Flattened concave base with pontil mark (1 cm), beginning of straight wall. Base D.: 4 cm.
4. Locus 538. Base and wall fragment. Colourless, with black and silver weathering. Flat base with pontil mark (0.6 cm). Straight thick wall. Base D.: 11 cm.
5. Locus 625. Complete base and wall fragment. Bluish-green, with silver weathering. Flat base with uneven high concavity. Straight thick wall. Base D.: 10 cm.
6. Locus 912. Complete base and wall fragment. Yellowish-brown, with black and silver weathering. Flat solid base-ring with pontil mark (0.5 cm), curving out wall. Base D.: 4.4 cm.
7. Locus 912. Complete base and wall fragment. Unidentified colour, with thick black and silver weathering. Flat solid base-ring with pontil mark (0.5 cm), curving out wall. Base D.: 3.8 cm.
8. Locus 912. Complete base and wall fragment. Bluish-green, with remains of black and silver weathering. Flat solid base, curving out wall. Base D.: 3.8 cm.
9. Locus 912. Complete base and wall fragment. Colourless with yellowish tinge, remains of black and silver weathering. Tubular base ring with pontil mark (0.7 cm), curving wall. Base D.: 2.4 cm.
10. Locus 321. Base and wall fragment. Colourless with bluish tinge. Black and silver weathering. Delicate tubular base-ring and straight wall. Base D.: 4 cm.
11. Locus 912. Base and wall fragment. Light bluish, with black and silver weathering and iridescence. Tubular base-ring and straight wall. Base D.: 3.8 cm.

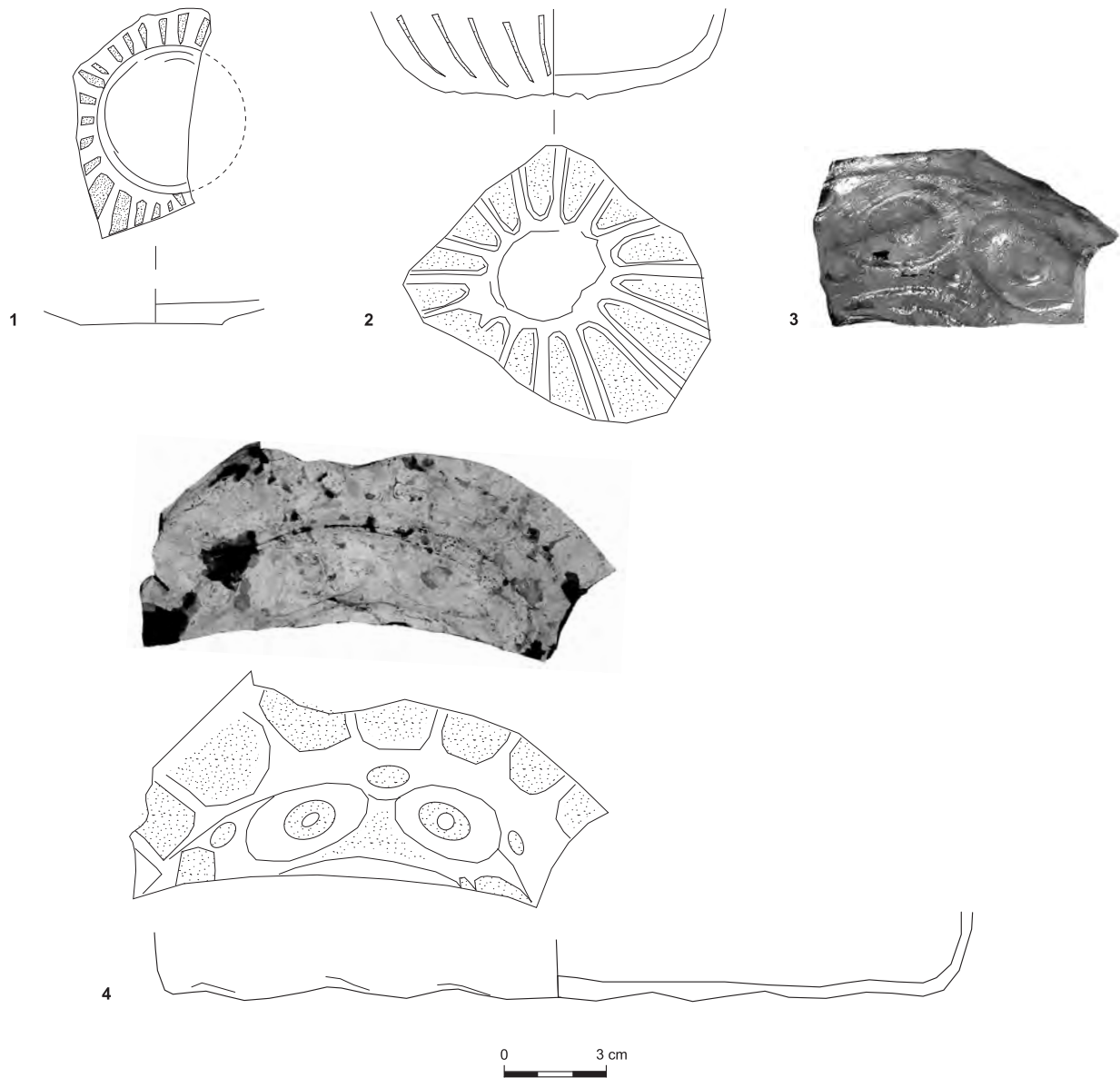


Fig. 6.112: Bowls.

1. Locus 692. Base fragment. Colourless with thick black weathering and iridescence. Thick solid base decorated with mould-blown concentric circle and vertical ribs. Base D.: 4 cm.
2. Locus 921. Base and wall fragment. Colourless with black and silver weathering and iridescence. Flat base with pontil mark (0.6 cm), and curving up wall, decorated with mould-blown vertical ribs extending from the base. Base D.: 6 cm.
3. Locus 1622. Base and wall fragment. Light greenish with iridescence. Flat thick base and curving up wall. The base is decorated with mould-blown concentric circles and double ellipses with a central dot on the base and vertical panels on the wall.
4. Locus 625. Base and wall fragment. Colourless with yellowish tinge, silver weathering and iridescence. Flat large base and curving up wall, decorated with mould-blown double ellipses with a central dot on the base and beginning of vertical panels on the wall. Base D.: 22.8 cm.

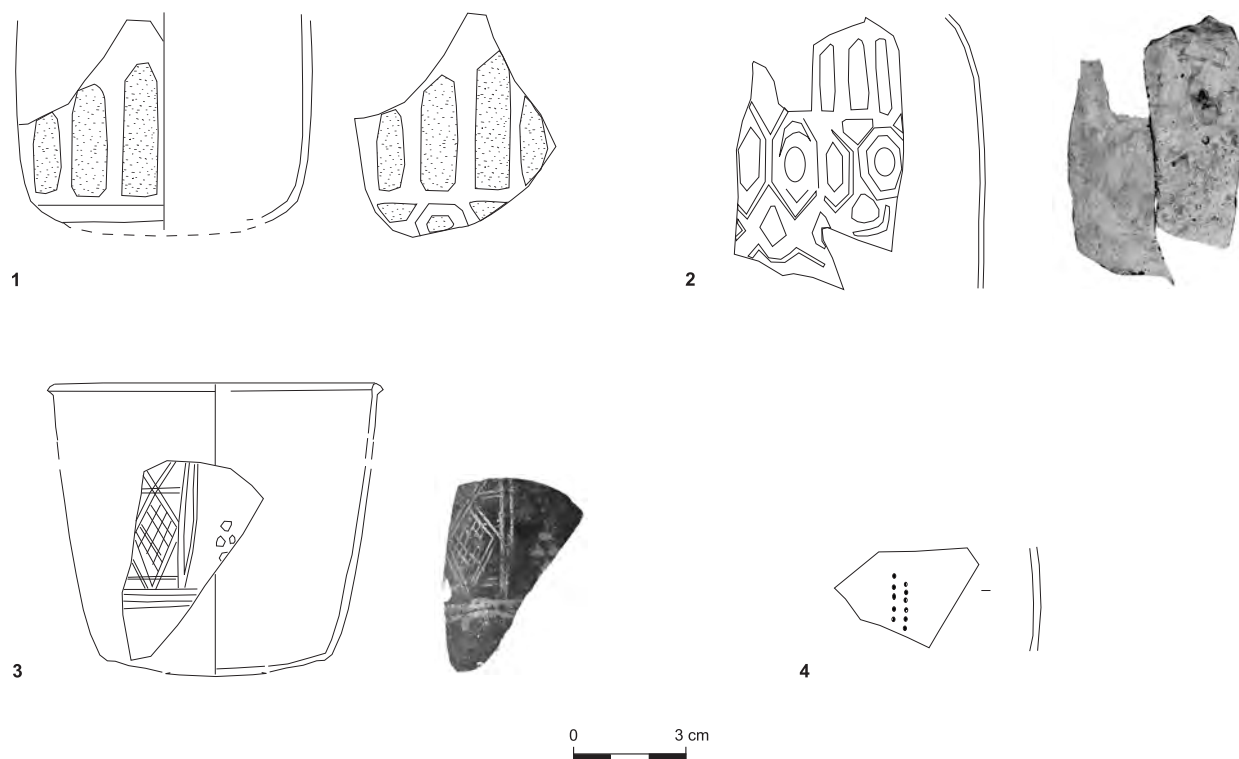


Fig. 6.113: Bowls and beakers.

1. Locus 574. Wall fragment. Colourless with iridescence. Straight wall beginning to curve in. The wall is decorated with mould-blown vertical panels and below it ellipses with inner circles.
2. Locus 625. Wall fragment. Colourless with bluish tinge and silver weathering. Straight and curving in wall. The wall is decorated with mould-blown geometric designs, vertical panels above lozenges with inner circles.
3. Surface find. Separate rim, wall and base fragments. Colourless with thick black weathering. Slightly flaring thickened rim, straight wall with geometric incisions dividing the vessel in panels, beginning of flat base. Rim D.: 9 cm. Base D.: 6 cm.
4. Locus 690. Wall fragment. Colourless with bluish tinge, silver weathering and iridescence. Straight wall with two tongued horizontal dotted lines.

JARS

The rim fragment of Fig. 6.114:1 has a flaring rim. Similar jar rims were found at Caesarea (Pollak 2000:239, Fig. 6:1), Tiberias (Lester 2004a:175, 177, Fig. 7.4:42, 45-47) and Beth Shean (Hadad 2005:45, Pl. 43:890-892) in 'Abbasid-Fatimid

contexts. The rim fragment of Fig. 6.114:2 is very large and has an upright rim. A similar jar rim was found in another excavation at Ramla in context dated to the 'Abbasid-Fatimid period (Pollak 2007: 116-117, Fig. 8:46).

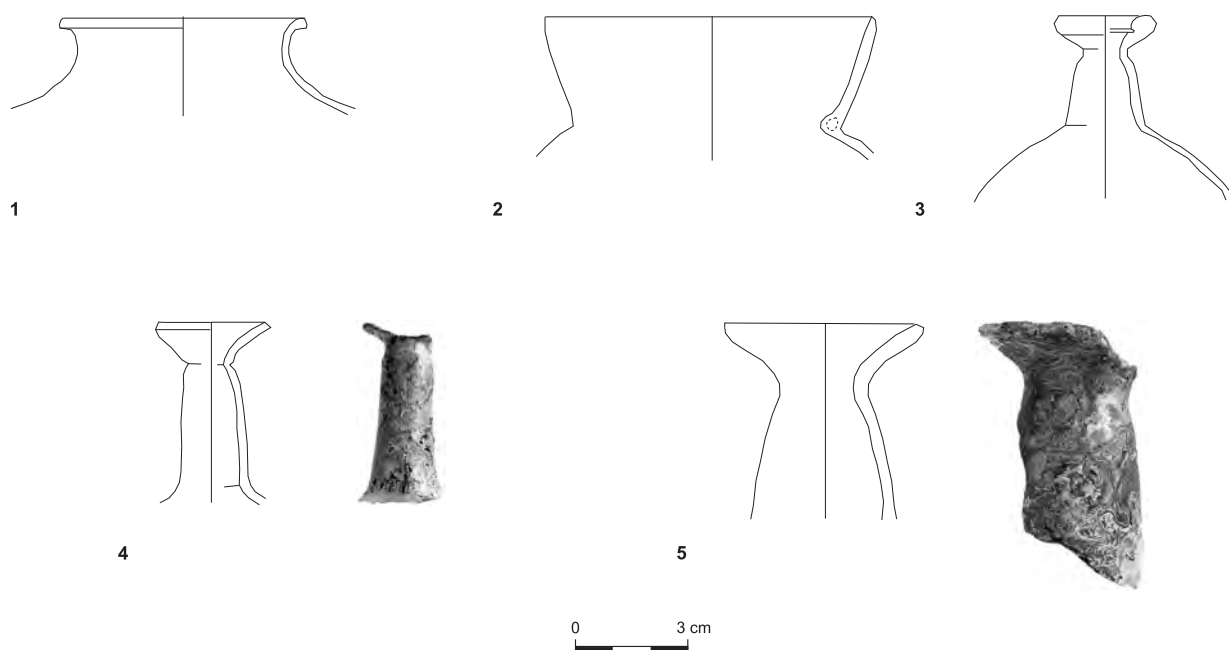


Fig. 6.114: Jars and bottles.

1. Locus 940. Rim and wall fragment. Colourless with yellow tinge, silver weathering and iridescence. Curving out rounded rim, beginning of curving out wall. Rim D.: 6.4 cm.
2. Locus 240. Complete rim and wall fragment. Colourless with bluish tinge, thick black weathering and iridescence. Straight rounded rim and neck, curving out wall with inner hollow fold in the connecting point. Rim D.: 8.6 cm.
3. Locus 354. Complete rim and neck and wall fragment. Colourless with thick black weathering and iridescence. Short funnel-mouth infolded rim, short tapering neck constricted below the rim and curving out sloping shoulder. Rim D.: 2.6 cm.
4. Locus 538. Rim, neck and wall fragment. Colourless with black and silver weathering. Curving out funnel-mouth rounded rim, tapering neck constricted below the rim and beginning of curving out wall. Rim D.: 2.8 cm.
5. Locus 538. Rim and neck fragment. Colourless with black and silver weathering. Curving out funnel-mouth rounded rim, tapering neck constricted below the rim. Rim D.: 5.2 cm.

BOTTLES

Bottles comprise a large part of the glass vessel repertoire found at Ramla, alongside the bowls. They appear in various shapes and sizes. They were used as table ware, the plain types for everyday use and the more decorated types probably on festive occasions. The majority is undecorated, but several were adorned with mould-blowing, wheel-cutting and applied trails.

BOTTLES WITH FUNNEL-MOUTHED RIM

Bottles with funnel-mouthed rims are well known in the ʿAbbasid-Fatimid periods (Figs. 6.114:3-5, 6.115). Fig. 6.114:3-5 have a flaring rim and Fig. 6.115:1-2 have

a splayed shelf-like rim. Similar bottles were found in other excavations at Ramla (Gorin-Rosen and Katsnelson 2005:113, Fig. 4:42; Pollak 2007:123, Fig. 10:65), and in ʿAbbasid-Fatimid context at Caesarea (Pollak 2003:167, Fig. 3:41, 43-44, 50-51), Tiberias (Lester 2004a:178, 180, Fig. 7.5:59-62) and Beth Shean (Hadad 2005:40, Pls. 37:727, 38:761). Figs. 6.115:4 has a flaring in-folded rim. A similar bottle was found in an ʿAbbasid-Fatimid context at Beth Shean (Hadad 2005:40, Pl. 37:755). The base of Figs. 6.115:5 is a large fragment of an unknown vessel with rounded walls and probably belongs to a large vessel, such as the bottle in Fig. 6.115:4. The context, shape and fabric indicate an Early Islamic dating.

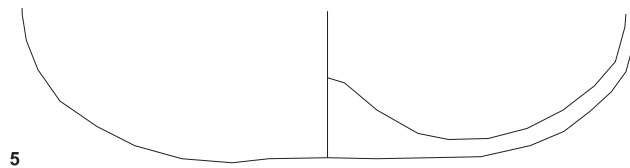
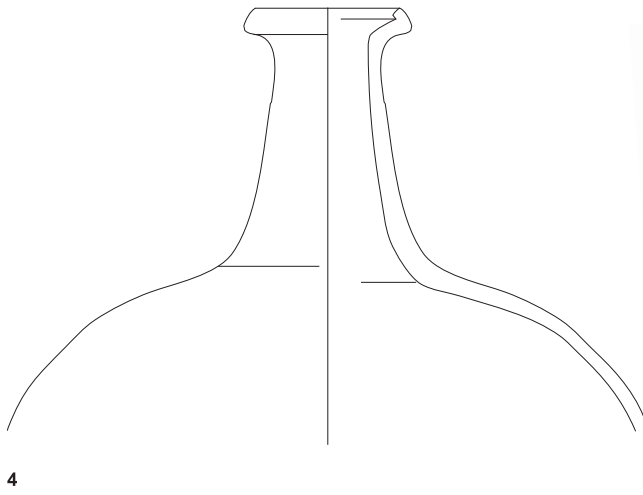
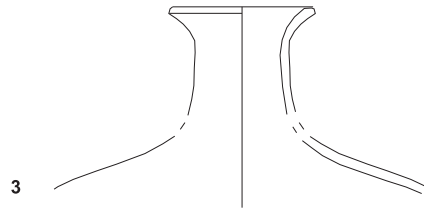
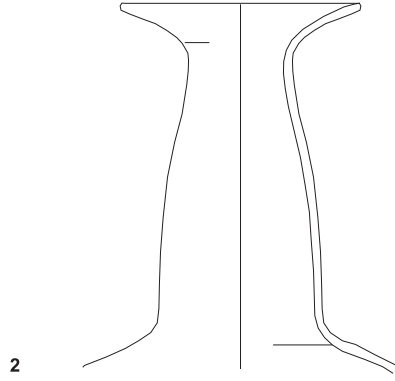
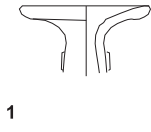


Fig. 6.115: Bottles.

Catalogue of Fig. 6.115:

1. Locus 538. Complete rim and neck fragment. Colourless with black and silver weathering. Curving out funnel-mouth rounded rim, beginning of cylindrical neck. Rim D.: 3.6 cm.
2. Locus 625. Complete rim, neck and wall fragment. Light blue with silver weathering and iridescence. Curving out funnel-mouth rounded rim, tapering neck and beginning of curving out wall. Rim D.: 6.4 cm.
3. Locus 625. Rim, neck and separate wall fragments. Light blue, with silver weathering and iridescence. Flaring, rounded rim, cylindrical neck and curving out large wall. Rim D.: 3.8 cm.
4. Locus 625. Complete rim and neck and wall fragment. Light blue, with silver weathering and iridescence. Flaring, infolded rounded rim, wide tapering neck and curving in rounded large wall. Rim D.: 8 cm.
5. Locus 754. Base and wall fragment. Colourless, with thick white and silver weathering. Large flat concave base, curving up thick wall. Base D.: 8 cm.

BOTTLE WITH WHEEL-CUT ENGRAVED DECORATION

Wheel-cutting was used to decorate various vessel types with deep or shallow geometric designs, during the 'Abbasid-Fatimid periods (Hadad 2005:38). The bottle found at Ramla (Fig. 6.116) is too fragmentary to attribute to a specific type, but its dimensions are large and the decorations are made in low relief in geometric and vegetal designs. No exact parallel was found in Palestine. Wheel-cut bottles were found in 'Abbasid-Fatimid context at Yoqne'am (Lester 1996: 210-211, Fig. 17.10:1, 4), Caesarea (Pollak 2003:167, Fig. 3:47-51) and Beth Shean (Hadad 2005: Pl. 42: 863-865, and p. 55, Note 400).

BOTTLES WITH HORIZONTAL RIDGE BELOW THE RIM

Fig. 6.117:1 has an upright rim and delicate ridge below, whereas Fig. 6.117:2 has a flaring rim and a rounded bulge below. Similar vessels were found in 'Abbasid-Fatimid contexts in other excavations at Ramla (Gorin-Rosen and Katsnelson 2005:110, Fig. 3:32-33) and at Beth Shean (Hadad 2005:41, Pl. 38:781-784).

BOTTLES WITH IN-FOLDED RIMS

Fig. 6.117:3-5 have delicate infolded rims and Fig. 6.117:6-7 have infolded thick flattened rims. Bottles of this rim type are known from the Early Roman period and were common ever since. The flattened rim is more typical of the Islamic period, very common in the Umayyad period and later. Similar bottles of both types were found in other excavations at Ramla (Gorin-Rosen 1999: 11, Fig. 1:4-8, Umayyad context; Gorin-Rosen and Katsnelson 2005:108, 110, Fig. 3:25-26, 31; Pollak 2007:128, Fig. 11:74-76). Others were found

in 'Abbasid-Fatimid contexts at Tiberias (Lester 2004a:185, Fig. 7.8:86, 88-89, 93-94) and Beth Shean (Hadad 2005:40, Pl. 37:738-740, 751-755).

BOTTLES WITH GROOVED RIDGED NECKS

These bottles (Fig. 6.117:8-10) are well known throughout the country during the Umayyad and 'Abbasid-Fatimid periods. Similar bottles were found in 'Abbasid-Fatimid contexts at other excavations at Ramla (Gorin-Rosen 1999:12, Fig. 2:10-11; Gorin-Rosen and Katsnelson 2005:110, Fig. 3:29), at Caesarea (Pollak 2003:167, Fig. 2: 25-29) and Beth Shean (Hadad 2005:40-41, Pl. 38: 762-779).

BOTTLES WITH SHORT CYLINDRICAL NECKS

These bottles (Fig. 6.117:11-15) are known in the Umayyad and 'Abbasid-Fatimid periods. Most of the retrieved fragments are undecorated, apart from a single fragment decorated with an applied horizontal wavy trail below a pinched fold (Fig. 6.117:15). Bottles or jars decorated in this manner are a characteristic of the Umayyad period, with a continuation during the 'Abbasid period. Similar plain bottle rims were found in 'Abbasid-Fatimid contexts in other excavations at Ramla (Gorin-Rosen and Katsnelson 2005:103, 110, Figs. 1:4, 3: 30), at Yoqne'am (Lester 1996:204, Fig. XVII.4:1), Caesarea (Pollak 2000:239-240, Fig. 6:3-4; Pollak 2003:167, Fig. 2:23-24) and Tiberias (Lester 2004a: 180, Fig. 7.5:63-66). Similar bottles with a wide decorated neck were found in other excavations at Ramla (Pollak 2007:120, Fig. 9:55) and in an 'Abbasid-Fatimid context at Beth Shean (Hadad 2005:41, Pl. 39:824).

BOTTLES WITH SQUARE WALLS

Square small bottles, well known in the Early Islamic period especially during ʿAbbasid-Fatimid times, were probably blown into an open mould. Fig. 6.118: 1-3 are plain while Fig. 6.118:4 is facet-cut. Fig. 6.118: 5 is decorated by deep incisions and has the typical four-legged base (the so-called molar flask type). Similar plain bottles were found in other excavations at Ramla (Gorin-Rosen and Katsnelson 2005:112-113, Fig. 4:41; Pollak 2007:126-127, Fig. 11:71). Others were found in ʿAbassid-Fatimid contexts at Yoqneʿam (Lester 1996:206-207, Fig. XVII.6:1-8; Gorin-Rosen 2005b:106, Fig. 7.2:8), Tiberias (Lester 2004a:188, 191, Fig. 7.9:100-106) and Beth Shean (Hadad 2005: 39-40, Pls. 35:695-697, 36:698-704, with additional parallels). Similar molar flask type bottles were found in Abbasid-Fatimid contexts at other excavations at Ramla (Gorin-Rosen 1999:12, Fig. 2:14-15) and Beth Shean (Hadad 2005:45, Pl. 42:868, with additional equivalents in Palestine and beyond)

BOTTLES WITH CYLINDRICAL RIMS AND NECKS

Bottles with cylindrical necks are known since the Byzantine period and continued into the Islamic period. Fig. 6.118:6-7 have cylindrical necks with applied trails. Fig. 6.118:6 has a cut-off rim. These bottles are well known in the ʿAbbasid-Fatimid period, sometimes with a rounded base like Fig.

6.119:1. Fig. 6.118:8 has a horizontal incision below the rim and Fig. 6.118:9 has a tapering ridged neck. Fig. 6.118:10 has a wheel-cut decorated neck. Plain and trailed bottles with cylindrical necks were found in ʿAbassid-Fatimid contexts in other excavations at Ramla (Pollak 2007:120, Fig. 9:52-53) and Beth Shean (Hadad 2005:40, Pl. 36:707-709), and in Umayyad contexts at Caesarea (Pollak 2003:165, Fig. 1:3, 8-10).

BOTTLE WITH MOULD-BLOWN DECORATION

This bottle (Fig. 6.118:11) has a globular body, a cylindrical neck and mould-blown ribs. A similarly decorated bottle was found in other excavations at Ramla (Pollak 2007:123, Fig. 10:67).

BOTTLE WITH A ROUNDED BASE

Fig. 6.119:1 probably belongs to a bottle with spherical base, elongated walls and cut-off rim. These bottles are well known in the Islamic period and while their function is not clear, they are believed to be associated with medicinal activities. They are usually made of blue glass, but this fragment is colourless. Similar bottles were found in ʿAbbasid-Fatimid contexts in other excavations at Ramla (Gorin-Rosen 1999:12, Fig. 2:12-13), Caesarea (Pollak 2003:167, Fig. 3:45) and Tiberias (Lester 2004a:187-188, Fig. 7.8:98-99).

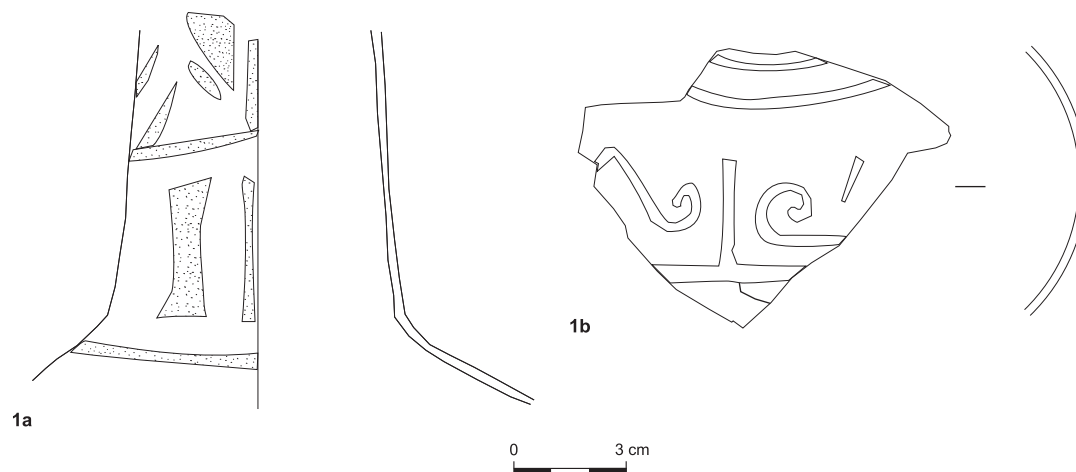


Fig. 6.116: Bottles.

1. Locus 625. Neck and wall fragments. Colourless with iridescence. Wide tapering neck and curving out wall, another separate rounded wall fragment. The bottle is decorated by shallow wheel-cut engraved geometric and vegetal designs.



0 3 cm

Fig. 6.117: Bottles.

Catalogue of Fig. 6.117:

1. Locus 538. Complete rim and neck, beginning of shoulder. Colourless with thick black and silver weathering and iridescence. Straight rounded rim, tapering neck with a horizontal ridge below and beginning of sloping shoulder. Rim D.: 2.8 cm.
2. Locus 830. Rim, neck and shoulder fragment. Yellow with thick black and silver weathering. Splaying-out rounded rim with a horizontal bulge below, tapering neck and beginning of sloping shoulder. Rim D.: 3 cm.
3. Locus 538. Rim and neck fragment. Colourless with thick black and silver weathering. Flaring and infolded rim, cylindrical neck. Rim D.: 2 cm.
4. Locus 538. Rim, neck and shoulder fragment. Colourless with thick black and silver weathering. Flaring and infolded uneven rim, short cylindrical neck, beginning of sloping shoulder. Rim D.: 2 cm.
5. Locus 538. Complete body and neck and rim fragment. Colourless with thick black and silver weathering and iridescence. Splaying out and infolded rim, cylindrical neck, uneven pear-shaped body, concave base with pontil mark (0.4 cm). Rim D.: 2 cm. Base D.: 2 cm. Height: 5.2 cm.
6. Locus 912. Complete rim and neck fragment. Light blue, thick white and silver weathering and iridescence. Flaring infolded uneven thick rim, cylindrical neck. Rim D.: 2.8 cm.
7. Locus 768. Complete rim, neck and shoulder fragment. Light blue with silver weathering and iridescence. Flaring infolded flattened uneven rim, short cylindrical neck and beginning of sloping shoulder. Rim D.: 2 cm.
8. Locus 370. Complete rim and neck fragment. Light blue with silver weathering. Straight rounded thick rim, grooved neck creating horizontal ridges. Rim D.: 2 cm.
9. Locus 83/84. Complete rim and neck, shoulder fragment. Colourless with thick black and silver weathering. Flaring unevenly rounded rim, grooved unevenly neck creating slanted ridges and beginning of sloping shoulder. Rim D.: 1.6 cm.
10. Locus 347. Neck and shoulder fragment. Colourless with silver weathering. Grooved neck creating horizontal ridges, beginning of shoulder.
11. Locus 538. Rim and neck fragment. Colourless with thick black and silver weathering and iridescence. Flaring rounded rim, wide cylindrical neck. Rim D.: 4.8 cm.
12. Locus 538. Rim, neck and shoulder fragment. Colourless with silver weathering and iridescence. Straight rounded rim, short cylindrical neck and beginning of shoulder. Rim D.: 3.4 cm.
13. Locus 538. Rim, neck and shoulder fragment. Colourless with thick black and silver weathering and iridescence. Straight thickened rounded rim, short cylindrical neck and beginning of shoulder. Rim D.: 2.8 cm.
14. Locus 912. Rim and neck fragment. Colourless with black and silver weathering. Straight rounded rim, short cylindrical wide neck. Rim D.: 3 cm.
15. Locus 714. Rim and neck fragment. Colourless with bluish tinge, thick white and silver weathering and iridescence. Straight rounded rim, short wide cylindrical neck with a pinched horizontal fold above an applied wavy trail. Rim D.: 4.6 cm.

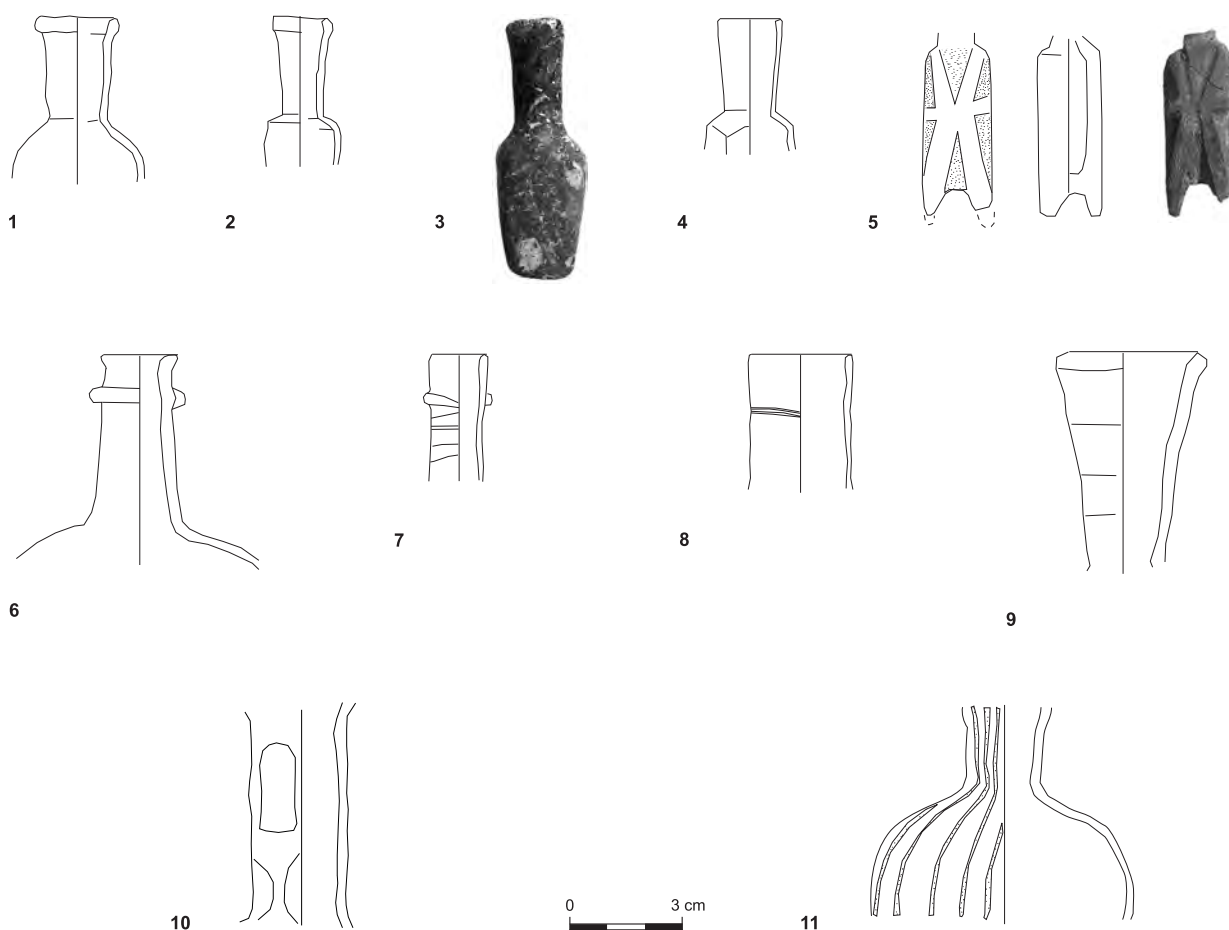


Fig. 6.118: Bottles.

1. Locus 324. Complete rim and neck and shoulder fragment. Colourless with thick black and silver weathering and iridescence. Straight thickened rounded rim, short cylindrical neck, sloping shoulder and square wall. Rim D.: 2 cm.
2. Locus 741. Complete rim and neck and shoulder fragment. Colourless with thick black and silver weathering and iridescence. Straight thickened rounded rim, short cylindrical neck, sloping shoulder and square wall. Rim D.: 1.6 cm.
3. Locus 1501. Intact bottle. Colourless with thick black and white weathering and iridescence. Straight rounded rim, cylindrical neck, square body and flat base with pontil mark (0.8 cm). Rim D.: 1.5 cm. Base D.: 1.5 cm. Height: 6.5 cm.
4. Locus 932. Rim, neck and wall fragment. Colourless with thick black and silver weathering and iridescence. Straight thickened rounded rim, short cylindrical neck, facet-cut square shoulder wall. Rim D.: 1.8 cm.
5. Locus 723. Body, neck and base fragments. Greenish with severe pitting. Square body with deep vertical and horizontal cutting, four rounded legs, beginning of neck. Base D.: 1.4 cm.
6. Locus 912. Complete rim and neck and shoulder fragment. Light purple with black and silver weathering and iridescence. Straight cut rim, tapering neck with applied horizontal wavy trail below the rim, rounded wide shoulder. Rim D.: 2 cm.
7. Locus 926. Rim and neck fragment. Colourless with silver weathering and iridescence. Straight cylindrical rim, cylindrical neck with applied yellow trail. Rim D.: 1.6 cm.
8. Locus 387. Rim and neck fragment. Colourless with white weathering and iridescence. Straight rounded rim, cylindrical neck with horizontal incision below the rim. Rim D.: 2.6 cm.
9. Locus 912. Rim and neck fragment. Colourless with black and silver weathering and iridescence. Flaring rounded rim, tapering neck lightly ridged. Rim D.: 4 cm.
10. Locus 538. Neck fragment. Colourless with iridescence. Cylindrical neck with wheel-cut square panels above rounded designs(?).
11. Locus 912. Neck and wall fragment. Light blue with black and silver weathering and iridescence. Tapering neck and rounded body with mould-blown vertical ribs. Fig. 11 Bottle bases

CYLINDRICAL BASES

These cylindrical bases could belong to beakers or bottles (Fig. 6.119:2-8). Fig. 6.119:9 has a mould-blown hexagonal wall divided into vertical panels. Vessels with cylindrical base and walls are well known in the Abbasid-Fatimid periods. They were often decorated with mould-blown or wheel-cut decorations.

Similar plain bases were found in Abbasid-Fatimid contexts at Tiberias (Lester 2004a:174-175, Fig. 7.3:41) and Beth Shean (Hadad 2005:40, Pl. 38:791-793). A mould-blown ribbed base was found in other excavations at Ramla (Gorin-Rosen and Katsnelson 2005:111, Fig. 3:36).

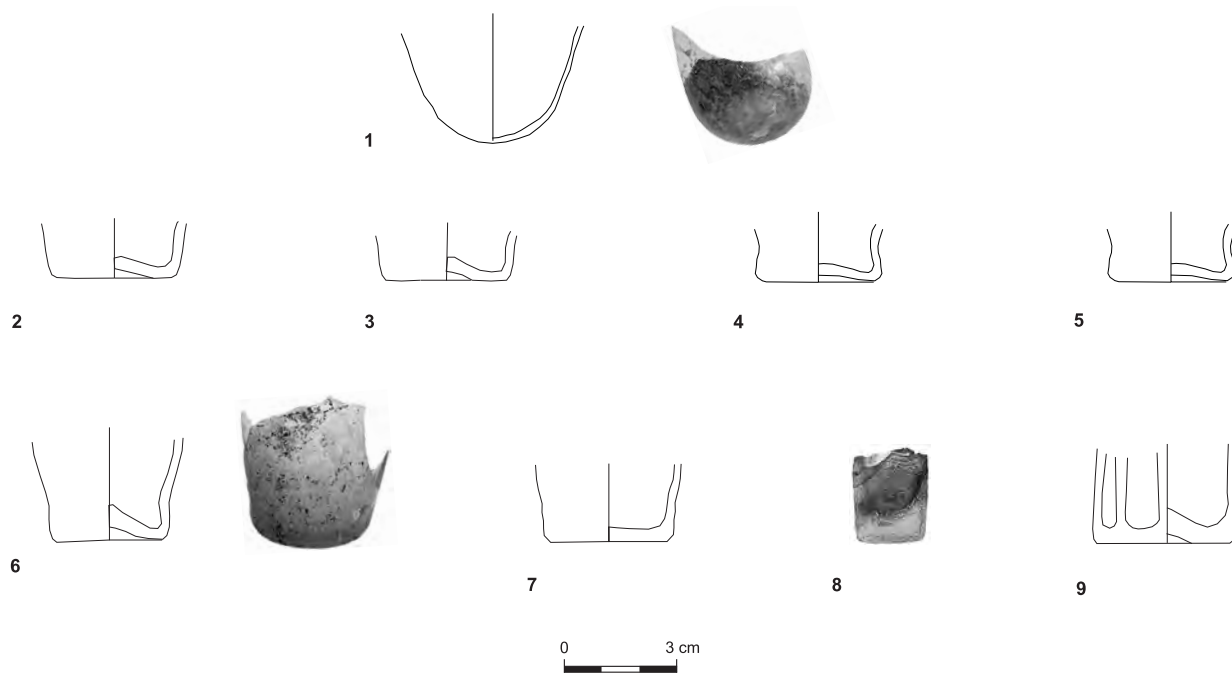


Fig. 6.119: Bases.

1. Locus 538. Complete base and wall fragment. Colourless with black and silver weathering and iridescence. Rounded base and curving thin wall. Base D.: 2 cm.
2. Locus 538. Complete base and wall fragment. Colourless with bluish tinge, silver weathering and iridescence. Flat base with pontil mark (1 cm). Straight thin wall. Base D.: 3 cm.
3. Locus 538. Complete base and wall fragment. Colourless with remains of black and silver weathering and iridescence. Flat base, concave in the centre, with pontil mark (1 cm). Straight thin wall. Base D.: 3 cm.
4. Locus 538. Complete base and wall fragment. Colourless with black and silver weathering and iridescence. Flat base with pontil mark (0.6 cm). Straight thin wall. Base D.: 3 cm.
5. Locus 538. Complete base and wall fragment. Colourless with bluish tinge, black and silver weathering and iridescence. Flat base with pontil mark (0.8 cm). Straight thin wall. Base D.: 3 cm.
6. Locus 538. Complete base and wall fragment. Colourless with remains of black and silver weathering and iridescence. Flat base, concave in the centre with pontil mark (0.8 cm). Straight thin wall. Base D.: 3 cm.
7. Locus 538. Complete base and wall fragment. Light blue with silver weathering and iridescence. Flat base with pontil mark (0.7 cm). Straight thin wall. Base D.: 3 cm.
8. Locus 1585. Complete base and wall fragment. Colourless with silver weathering and iridescence. Thick flat square base with pontil mark (1 cm), and square wall. Base D.: 0.8 cm.
9. Locus 752. Complete base and wall fragment. Colourless with thick black and silver weathering and iridescence. Flat base with central concavity and pontil mark (1 cm). Straight mould-blown hexagonal wall divided into vertical panels. Base D.: 3.9 cm.

*LAMP-BOWLS**SUSPENDED LAMP-BOWLS*

Fig. 6.120:1-5 belong to oil lamp bowls that were hung from the ceiling by their handles and have an inner cylindrical wick-tube. Suspended lamp bowls are well known from the Byzantine period, and also during the Islamic period. The handles found at the site are shaped with an applied glass gob and are a typical product of the ʿAbbasid-Fatimid period, sometimes named mosque lamps (Hadad 2005:47). An intact jar-shaped vessel with an inner wick-tube and similar handles was found in an ʿAbbasid-Fatimid context at Caesarea (Pollak 2000:240, Fig. 6:8). Similar handles were found at Tiberias (Lester 2004a:199-201, Fig. 7.12:153-157) and Beth Shean (Hadad 2005:47, Pl. 46:973-976). Wick tubes were found in ʿAbbasid -Fatimid context in other excavations at Ramla (Pollak 2007:114-115, Fig. 7:40-41), Tiberias (Lester 2004a:195, 199, Fig. 7.11:142-149) and Beth Shean (Hadad 2005:47, Pl. 46:977-978).

STEMMED LAMP-BOWLS

Fig. 6.120:6-12 are the lower parts of stemmed lamps hung from the ceiling in a metal polycandela. These lamps are a typical find since the Byzantine period. They are also very well known in the Islamic period with several shape changes alongside typological continuation. The stems presented from the site belong to plain cylindrical stem (Fig. 6.120:6), stems with rounded knob at the base (Fig. 6.120:7-8), beaded stem (Fig. 6.120:9) and tapering stems with pinched bases (Fig. 6.120:10-12). Plain stems were found in the Fatimid hoard at Caesarea (Pollak 2000:240, Fig. 6:5-6). A beaded stem was found in Tiberias (Lester 2004a:195, Fig. 7.11:135). A knobbed stem fragment was found in 11th century CE context in other excavations at Ramla (Pollak 2007:115, Fig. 7:42) and at Tiberias (Lester 2004a:195, Fig. 7.11:141). A pinched stem was found in other excavations at Ramla (Gorin-Rosen and Katsnelson 2005:107, Fig. 2:19). All stem variations occur in ʿAbbasid-Fatimid context at Beth Shean (Hadad 2005:47, Pl. 45:958-971).

INNER TUBULAR FOLD

Vessels with inner horizontal tubular fold (Fig. 6.120:13) are known from Late Byzantine and Early Islamic periods in bowls and bottles (Lester 2004a:199). The fold is interpreted as a decorative motif which is also functional in that it supports a metal device for an inner wick (Barag 1970:186, Pl. 40:18). Similar tubular folds were found in Fatimid contexts at Caesarea (Pollak 2000:240-241, Fig. 6:7) and Tiberias (Lester 2004a:199, Fig. 7.11:150-152).

ALEMBICS

These small bowls with attached elongated horizontal spouts are known as alembics (Fig. 6.120:14-15). They are very common in sites dated to the Islamic period in the Levant, but are less known in Israel. Their exact function is unclear. It was suggested they were used as part of a set of three vessels in medicinal chemistry (bleeding cups placed upside down, see Pollak 2003:165), or in production of rose water or date wine in a domestic context (Kröger 1995:186). Similar vessels were found in contexts dated to the Umayyad period in other excavations at Ramla (Gorin-Rosen 1999:12, 14, Fig. 1:19-21), in ʿAbbasid-Fatimid context at Beth Shean (Hadad 2005:47-48, Pl. 46:979-981) and in Late Byzantine-Early Islamic context at Caesarea (Pollak 2003:165, Fig. 1:17).

STUCCO WINDOW FRAMES

Several fragments of stucco window frames were found at the site (Fig. 6.121). They are probably related to glass window panes. Stucco window frames were discovered at Shaqif Ed-Dir a Byzantine monastic settlement in southern Sinai (Gorin-Rosen 2000c:242-243, Fig. 4:9-10), at Khirbet al-Mafjar in an 8th century CE context (Brosh 1990) and at Nishapur in contexts dated to the 10th century CE (Kröger 1995:184, No. 237). Glass window panes are known since the 1st century CE, but the earliest large assemblages were discovered in Byzantine contexts. Glass window panes are divided into rounded windows (the so-called bulls'-eye type) and square windows. The former predominated with a variations in diameter

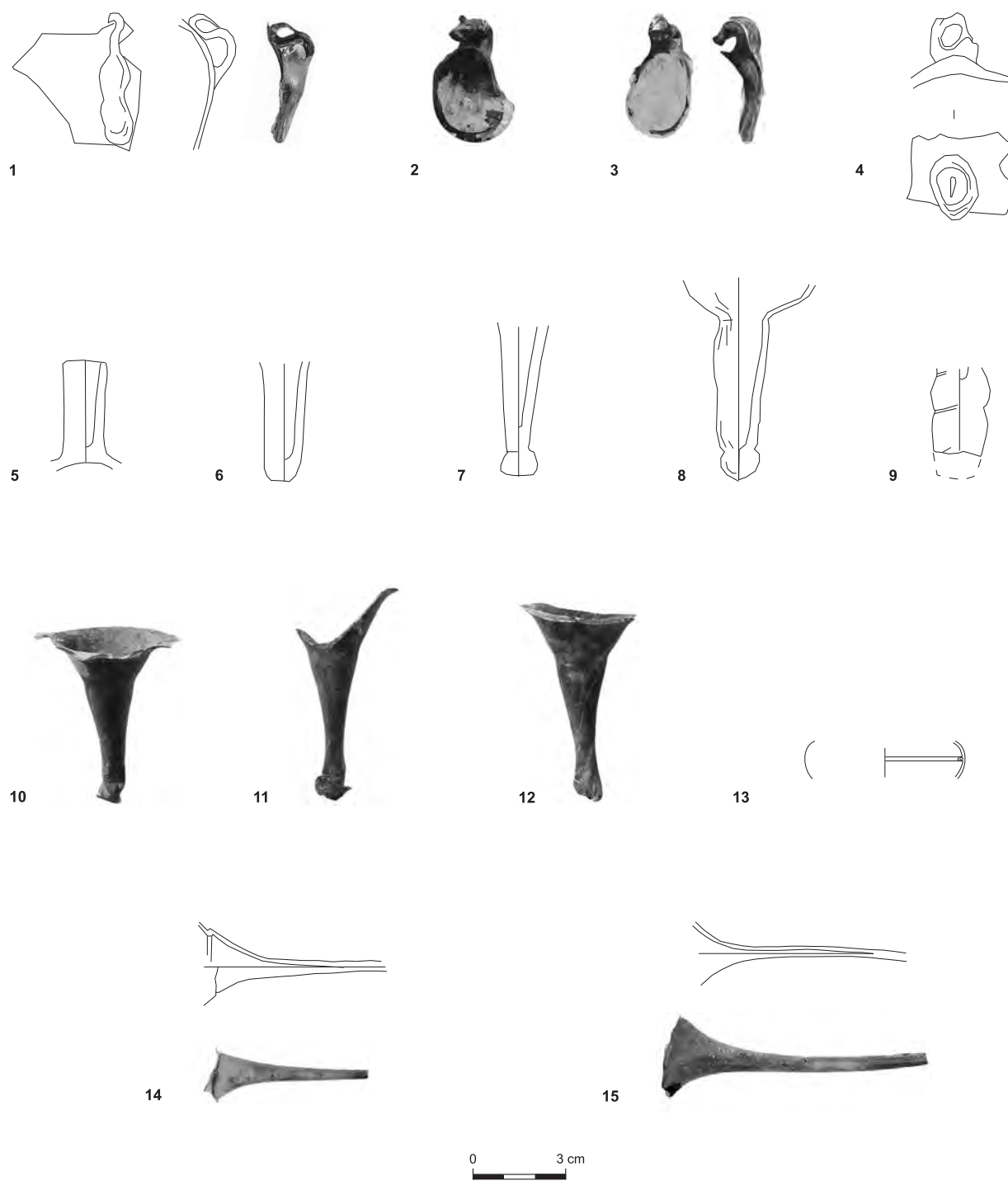


Fig. 6.120: Lamp bowls and alembics.

Catalogue of Fig. 6.120

1. Locus 912. Complete handle and wall fragment. Colourless with black and silver weathering and iridescence. Rounded wall with applied vertical small ear handle, drawn from an oval glass lump.
2. Locus 23. Complete handle and wall fragment. Green with silver weathering and iridescence. Rounded wall with applied vertical small ear handle drawn from a large oval glass lump.
3. Locus 319. Complete handle and wall fragment. Colourless with greenish tinge, silver weathering and iridescence. Rounded wall with applied vertical small ear handle drawn from a large oval glass lump.
4. Locus 345. Wick-tube and base fragment. Colourless with thick black and silver weathering. Concave base with applied inner cylindrical uneven wick-tube.
5. Locus 324. Complete wick-tube. Colourless with thick black and silver weathering. Cylindrical tube with cut rim and splaying out uneven base. Height: 3.7 cm.
6. Locus 693. Stem fragment. Light blue with iridescence. Cylindrical hollow stem with flat base. Base D.: 0.8 cm.
7. Locus 271. Stem fragment. Colourless with thick black weathering. Tapering hollow stem with a rounded flattened pinched base. Base D.: 1 cm.
8. Locus 912. Complete Stem and wall fragment. Light green with black and silver weathering and iridescence. Tapering uneven hollow stem with a pinched rounded unevenly flattened base. Rounded wall. Base D.: 0.9 cm.
9. Locus 387. Stem fragment. Bluish-green, with silver weathering. Thick cylindrical pinched partly hollow partly solid near the base stem. Uneven flat base. Base D.: 1.3 cm.
10. Locus 563. Complete stem and wall fragment. Colourless with thick black and silver weathering. Tapering uneven hollow stem with pinched rounded flattened base. Beginning of rounded wall. Base D.: 0.7 cm.
11. Locus 563. Complete stem and wall fragment. Colourless with thick black and silver weathering. Tapering uneven hollow stem with pinched rounded flattened base. Beginning of wall. Base D.: 0.7 cm.
12. Locus 563. Complete stem and wall fragment. Colourless with thick black and silver weathering. Tapering uneven hollow stem with pinched rounded flattened base. Beginning of rounded wall. Base D.: 0.9 cm.
13. Locus 736. Wall fragment. Colourless with greenish tinge, black and silver weathering and iridescence. Curving in thin wall with an inner tubular fold.
14. Locus 538. Wall and spout fragment. Light blue with silver weathering and iridescence. Rounded thin wall with horizontal thin hollow tapering spout.
15. Locus 538. Wall and spout fragment. Colourless with silver weathering and iridescence. Rounded thin wall with horizontal thin hollow tapering spout.

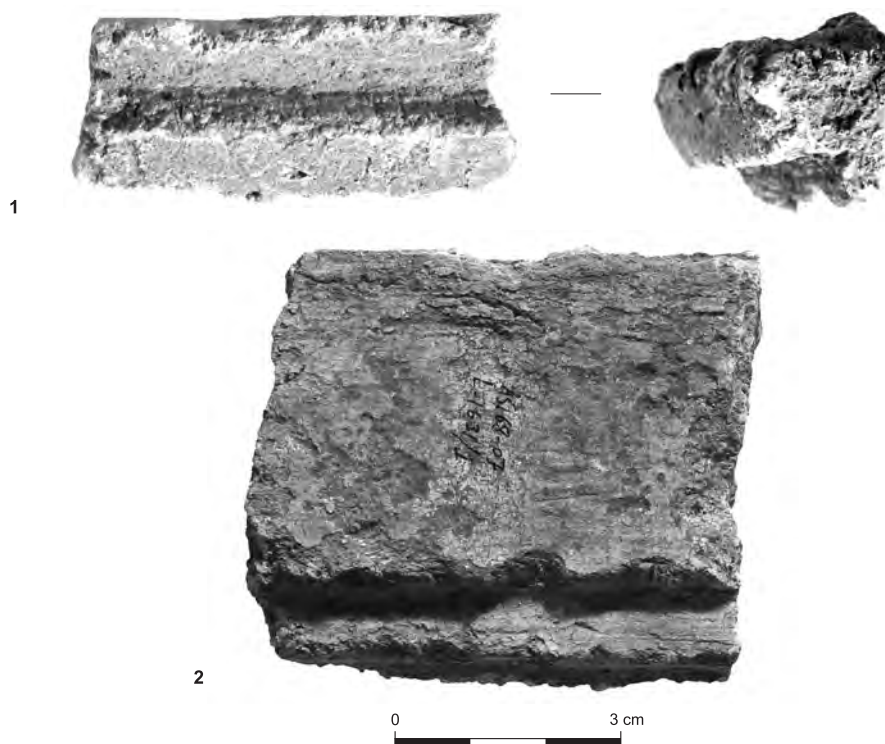


Fig. 6.121: Stucco window frames: 1) Surface find; 2) L1631.

and rim design: folded, curving up or thickened (for a detailed discussion of techniques and chronology see Meyer 1989). Fragments of glass windowpanes were found in Abbasid-Fatimid contexts at Tiberias (Lester 2004b:61, Fig. 5.1:4) and Beth Shean (Hadad 2005:49, Pl. 49:1016-1019, with additional equivalents outside Palestine).

CONCLUSIONS

The glass assemblage presented here is an important contribution to the accumulating information on the glass finds from Ramla. The variety and richness of glass vessel types and decoration found in different areas in the city is vital for Early Islamic glass research in Palestine. This previously rather neglected domain of research has advanced greatly in recent years

thanks to specialised study and concentrated excavation of Early Islamic sites. The glass vessels unearthed in these excavations reveal well-known types of table ware, both plain and decorated in various ways. The wealth of finds at the site, combined with the discovery of secondary Late Byzantine glass production (Chapter 5) reflects the vital role of glass production at Ramla. It is very plausible that glass vessels continued to be manufactured in the city and its surroundings, supplying the glass vessels that were a common household commodity during the Early Islamic period. It can only be hoped that additional research of the glass of the Islamic period in general and of Ramla in particular will increase our knowledge on these special and interesting artefacts still further.

STONE OBJECTS

A large variety of objects fashioned from stone was found in association with the Early Islamic (i.e., late Umayyad, 'Abbasid and Fatimid) period remains unearthed in the excavations. However, some of these finds (mainly the larger items) should be chronologically and/or typologically attributed to the earlier settlement which existed at the site (or in its vicinity) in the Late Byzantine and early Umayyad periods. These were found either as reused elements in architectural features of the Early Islamic period or in fills dated to this period. The great majority of these finds are made of limestone, basalt or marble. Exceptions are few, among them chlorite-schist, beach-rock, slate and tuff objects.

COLUMN BASES AND COLUMN

Among the architectural elements found are two column bases and a fragment of a narrow column. One simple column base and shaft made of limestone (Fig. 6.122:1) was lying on the surface. Its dimensions are 0.50 m (diameter of base), 0.35 m (diameter of shaft) and its total height is 0.33 m. A column base and shaft of the Ionic order (Fig. 6.122:2) was found embedded in secondary use in the plaster floor of Pool I624, dated to the 'Abbasid period (Fig. 6.41). It is made of marble (base 0.33 × 0.33 m; diameter of shaft 0.25 m; total height 0.12 m). A narrow column fragment (Fig. 6.122:3) (preserved length 0.15 m) is also made of marble. Its shape and diameter (0.16 m) indicate that it was probably used as a *ciborium* (the altar's canopy) column rather than as a cancel post (see, e.g. Acconci 1998: Nos. 16-19; Patrich 1988: Ill. 194-195).

STONE WINDOW GRILLES

The window grille fragments were found out of context in a disturbed locus (L13). The larger rectangular grille (0.23 × 0.32 m, 7.5 cm maximum thickness) is carved from brittle limestone (*nari*). It has a frame decorated with a vegetal pattern

(tendrils?), and most of its area is perforated with round holes, two of which are complete and at least six are partially preserved. They are 8 cm in diameter and surrounded by a ridge (1 cm wide) and round knobs (1.5 cm in diameter) (Fig. 6.123). Perforated stone window grilles, either plain or decorated with different carved motifs, are known from dwellings and public buildings from the Byzantine period, mainly in Syria (Butler 1969: Ill. 282) and northern Palestine (Ben-Dov 1973: Fig. 8, Pl. 15:1; 1975: Figs. 19-21; Hartal 2005: Figs. 187, 188; Porat 2006: Fig. 9:1), but also from the Negev (Negev 1988: Fig. 4:17). The present window grille is an uncommon find in this part of the country. It was most probably robbed from a Byzantine period structure (a church?) which existed at this site or one nearby.

WEIGHTS

The simple weight (Fig. 6.124:1) is actually a reused limestone ashlar (0.3 × 0.2 × 0.15 m) in which a hole (5 cm in diameter) was made close to one of its corners. The unusual limestone element in Fig. 6.124:2 is carved from a large rectangular ashlar (0.6 × 0.5 × 0.35 m). A round horizontal hole (0.1 m in diameter) was bored through its narrow face and two more vertical holes (0.1 m in diameter) were made in one of its wide faces and joined the vertical hole. Close to the holes a round depression (0.17 m in diameter; 0.1 m depth) was carved. It seems that this object reflects two stages of use. In the first stage, to which the widthwise horizontal hole can be attributed, it was probably used as a weight, possibly in an oil press (of the Byzantine-Umayyad period?) or as part of another industrial installation. In the second stage the weight was probably reused in a later structure, and the two vertical holes were then made, perhaps for tying animals. The round depression was added either in this stage or later, for an unknown purpose. Fig. 6.124:3 is a small round basalt weight (433.8 g) with flattened upper and lower surfaces (7.7 cm in diameter; 4 cm height). It has a remnant of an iron ring base on its upper surface that was joined to the stone weight by liquid lead.



Fig. 6.122: Column bases and column: 1) L1500; 2) Floor of I624 (stolen after excavation); 3) L1644.

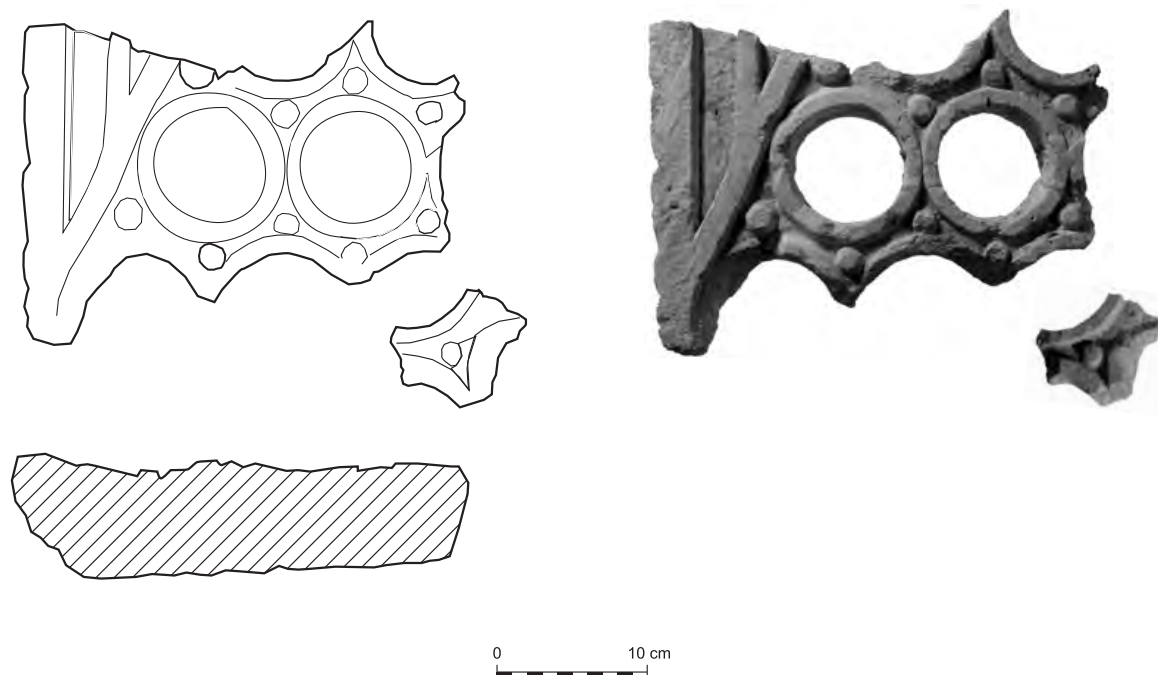


Fig. 6.123: Stone window grille (L13).

WORKED STONES

Two large limestone slabs bear four depressions carved on one of their wide faces. Fig. 6.125:1 was found embedded in secondary use in a wall of a pool (I222) dated to the 'Abbasid period which was built over part of the Late Byzantine domestic complex (see Fig. 6.24). This is a rectangular limestone ashlar/slab ($0.56 \times 0.43 \times 0.23$ m) on whose upper broad face four round depressions (0.11 m in diameter; 5 cm depth) were carved close to the edges. The area between the depressions is rounded and somewhat raised. Three short grooves carved between each pair of depressions run from the centre to the edges. The lower face of the slab is carved in a stepped form. This element is relatively well-dressed, as opposed to the other similar element in Fig. 6.125:2. The latter was found in Square U215, excavated by the Israel Antiquities Authority, therefore its exact context is uncertain. It is a rectangular limestone ashlar/slab (ca. $0.30 \times 0.40 \times 0.50$ m) on which four roughly-oval depressions (ca. 0.15×0.20 m in diameter; 5 cm depth) were carved. Since the two artefacts were found out of their original context, their use

in antiquity can only be conjectured. Most of the known Byzantine-Umayyad portable stones with carved depressions are cistern covering stones, which may be either round, square or rectangular. On their upper surface were two or three depressions which were designed to house storage jars for water (Tsuk 1994: Fig. 14; Piccirillo 1998: Figs. 24-26; Hirschfeld 2000: Figs. 133, 134). Our artefacts, however, were not cistern covering stones, since they are not perforated. Alternatively, they could have been placed next to a cistern or other water/liquid installation. The second, coarser example was indeed found beside a small cistern (I72) attributed to the late Umayyad-Fatimid phase. Therefore, it might belong to that phase or represent a re-used artefact. A rectangular stone with four round depressions(?) was found in a Byzantine oil press at Qedumim, where it was placed next to a large stone basin (Magen 1982: no page number [the oil press in Area M]). It is therefore possible that the original place of the artefacts of Ramla (South) (or at least of one of them) was also in the oil press complex unearthed at the site (Chapter 5).

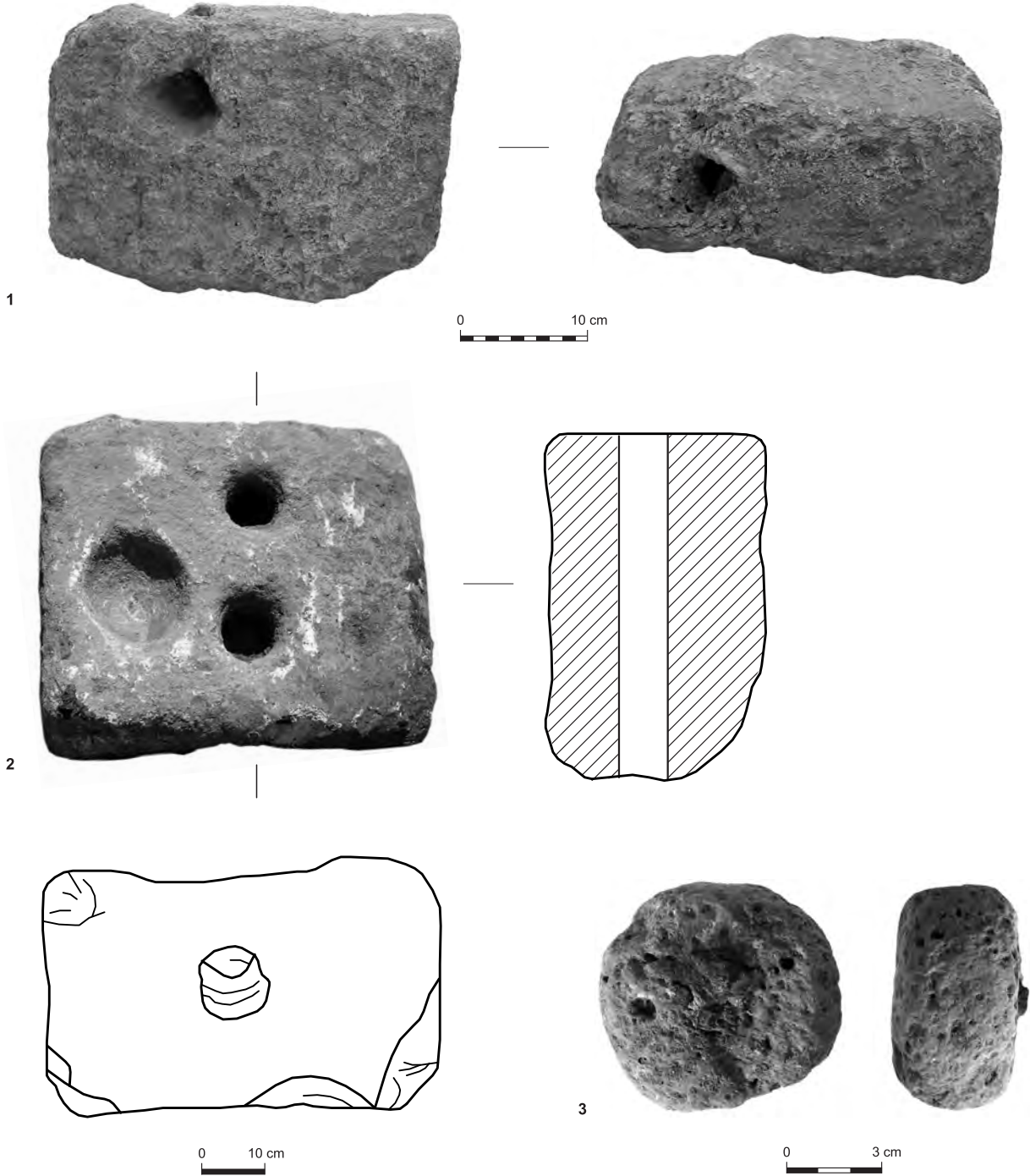
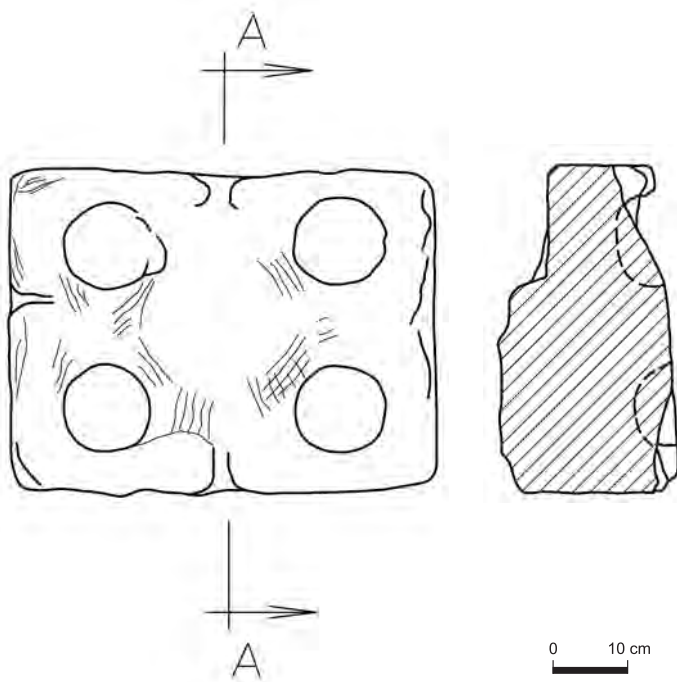


Fig. 6.124: Stone weights: 1) L767; 2) L1500; 3) L1644.



1



2

Fig. 6.125: Stone slabs with four carved depressions: 1) Upper east wall of I222; 2) L1500 (retrieved from IAA excavations).

BASIN

The large limestone basin (Fig. 6.126:1) was found out of context in Squares X10 and X11 while dismantling their western baulk. It is conical (0.5 m height; 0.6 m upper external diameter; 0.35 m lower external diameter; 7 cm wall thickness) with a flat base and concave bottom. Its exact use is unknown.

STEATITE VESSELS

Two identifiable fragments of soft greenish-black steatite vessels were found. These vessels, represented mainly by straight-walled bowls and open cooking casseroles but also by other types, were imported from the Arabian Peninsula during the 8th-9th centuries CE (Magnes 1994:204; Harrell and Brown 2008:41-42, 63), and are quite common in late Umayyad and early ʿAbbasid assemblages in Palestine. The present fragments seem to belong to less common types of these vessels. Fig. 6.126:2 is a trapezoid knob with a rectangular cross-section attached to a flat body part and decorated with diagonal incisions round its body. According to the few parallels of similar features on steatite vessels, this fragment could be either a lug handle from a bowl, a triangular lamp/burner (Saller 1941: Pl. 133.1:3, 5; Fischer and Tal 1999: Figs. 10.1:3, 10.2:1) or a vertical handle from a bowl's lid (Alliata 1990: 455, No. 41). Fig. 6.126:3 is a narrower, rectangular knob with an octagonal section and two horizontal incisions on one side. It looks more like a horizontal lug handle rather than a vertical lid handle.

BOWLS

A large variety of small to medium-sized round stone bowls was found in the excavations. Most of the bowls are made of either basalt or limestone, although few are made of marble. It seems that these bowls were used for grinding dry food stuff (such as grains, legumes and nuts) and/or other materials, such as spices, medicinal and make-up materials, dyes etc. The marble bowl in Fig. 6.127:1 has a semi-circular, grooved lug handle which was used as a spout. This is a well-known type of four-handled marble bowls, typical of the Byzantine period, which were used for grinding spices and

incense. Fig. 6.127:2 is also a marble bowl with a spiral lug handle. Both types are found throughout the Byzantine world in secular and religious contexts (Agady *et al.* 2002:505, with references). The various basalt (Fig. 6.127:3-4) and limestone bowls (Fig. 6.127:5-6) have somewhat deep concave walls and parallels at many archaeological sites, among them of the Early Islamic period (e.g. Israel, Nahlieli and Ben Michael 1995: Fig. 8; Shalem 2002: Fig. 17:2-3, 6; Kletter 2005a: Fig. 26:6-7). The two three-footed basalt mortars (Fig. 6.127:7-8) are also well-known type in many archaeological sites (Ayalon 2004:269), including those of the Early Islamic period (e.g. Shalem 2002: Fig. 17:1). The two limestone pestles (Fig. 6.127:9-10) can be generally related to grinding.

MILLSTONES

A number of complete and fragmentary millstones belonging to three different types was also found at the site. The first type is represented by three rotary hand querns – one upper stone made of beach-rock (0.33 m in diameter; Fig. 6.128:1a) and two lower stones made of beach-rock (0.5 m estimated diameter; Fig. 6.128:1b) and basalt (0.4 m estimated diameter; Fig. 6.128:2). According to Frankel, this implement was brought to Palestine by the Roman legions, probably around the 1st century CE but became the most widespread type of mill only in the Byzantine period (2003a:46; 2003b:18-19; for Early Islamic parallels, see e.g. Kletter 2005a: Fig. 26:1-3; Messika 2006: Fig. 21:6). The second type is the so-called Olynthus mill made from basalt. Here it is represented by a fragment of a lower grooved stone (Fig. 6.128:3). This type of mill which originated in Greece or Anatolia of the Classical period was the commonest type in Roman Palestine, continuing in use into the Byzantine period (Frankel 2003a:45-46; 2003b; Alexandre 2006:176-177, Fig. 59 for the earliest example recorded in Palestine). It seems, therefore, that the present example is of Byzantine date and was probably reused during the Early Islamic period (for Byzantine period parallels, see e.g. Ayalon 2004: Fig. 4:6-7; Delougaz and Haines 1960: Pl. 49:5, for such mill reused in Early



Fig. 6.126: Limestone basin and steatite vessels: 1) L1500; 2) L568; 3) L1585.

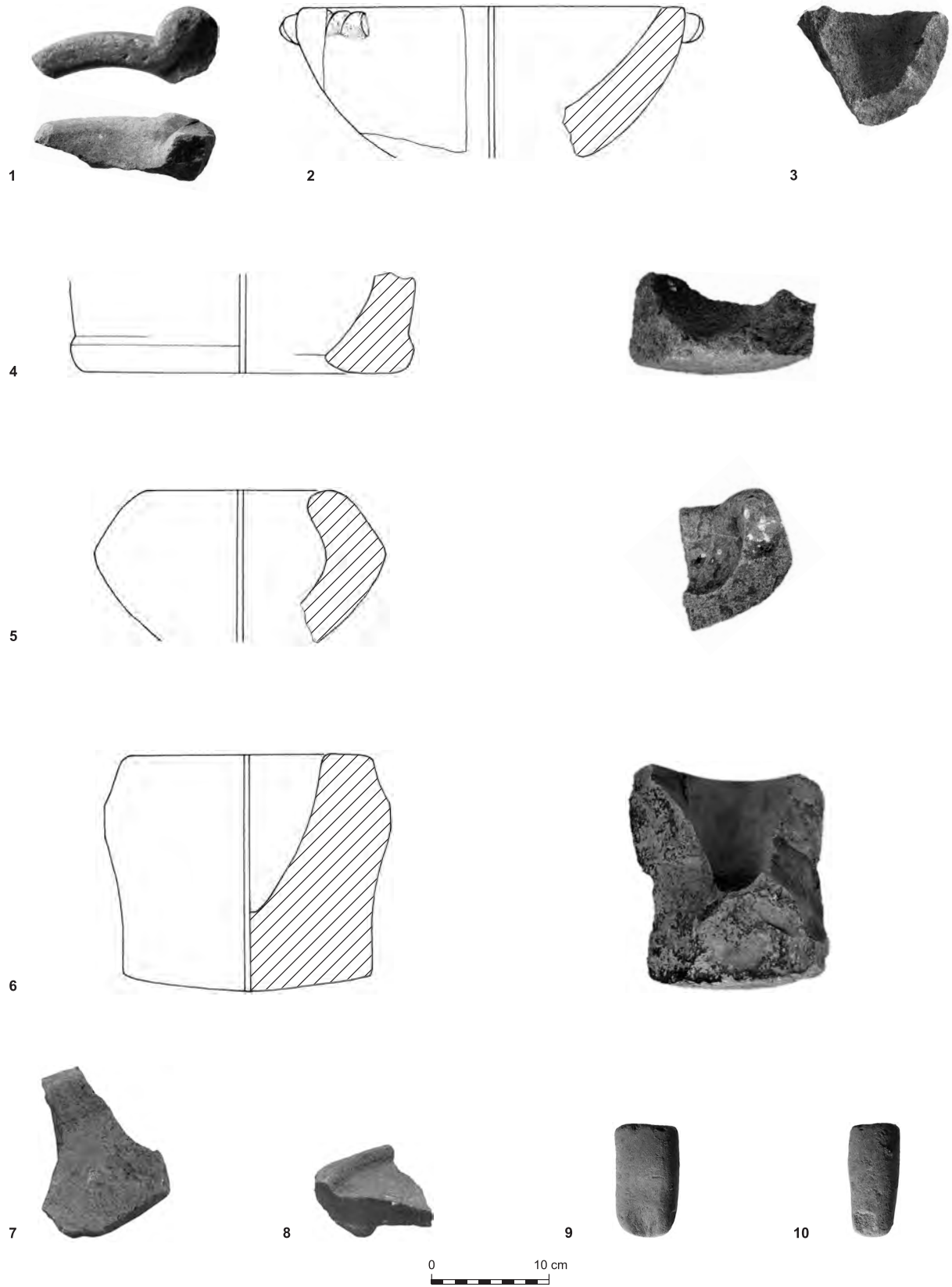


Fig. 6.127: Grinding bowls and pestles: 1) Surface find; 2) Surface find; 3) Surface find; 4) L1616; 5) L1637; 6) L1672; 7) L796; 8) L782; 9) Surface find; 10) Surface find.

Islamic structure, see Bouchenino 2007:123, Fig. 3). The third type is the Pompeian or hour-glass mill made from basalt. It is represented here by a fragment of an upper stone (originally shaped as two attached hollow cones; Fig. 6.129:1) and by an almost complete lower stone shaped as a solid cone with a wide base (Fig. 6.129:2). This type of mill originated in the western Mediterranean and probably appeared in Palestine already in the Hellenistic period (Frankel 2003a:47). Nevertheless, archaeological parallels show that it was most frequent during the Late Roman and Byzantine periods (see e.g. Delougaz and Haines 1960: Pl. 49:6; Netzer 1981: Ill. 64; Ayalon 2004: Fig. 3:17). Therefore, as in the case of the above-mentioned Olynthus mill, this type can be attributed to the Byzantine settlement, although the possibility that they continued to be used during the Early Islamic period should not be ruled out.

SCRAPER AND WHETSTONES

Several small stone objects found in the excavations can be identified as scrapers and whetstones. The probable scraper is made of reddish-brown scoria (a highly perforated basaltic rock) and is shaped as a flattened rectangle (Fig. 6.130:1). It was brought to the site from afar (most probably from the Golan Heights), either as the raw material or as a finished item. It could have been used for scraping soft objects, maybe even for body hygiene. It has no published parallels, but a similar object was found in Khirbet es-Suyyagh (in the Judaeen Shephelah), in a Late Byzantine-Umayyad context (Taxel, forthcoming). The three whetstones are made of greenish-grey slate. They are all shaped as flattened rectangles (Fig. 6.130:2-4), and some bear clear signs of wear (Fig. 6.130:2). Parallels for other slate whetstones, some perforated for hanging, were found in Late Roman/Byzantine to Crusader period contexts (e.g. Roll and Ayalon 1989: Fig. 60; Dar 1999: Fig. 18:31; Ayalon 2004: Fig. 3:4; Messika 2006: Fig. 21:4-5).

MULTI-COMPARTMENTED MARBLE OBJECT

One of the most unique small finds found in the excavations is a rectangular marble object (Fig. 6.131). Its dimensions are 11 × 12.5 cm and preserved to a height of 3 cm. The interior of this box is divided into six compartments – a central round one surrounded by four irregular compartments and one long rectangular compartment. The peripheral compartments are linked by a deep groove. One wide side – probably the front – is decorated with an incised spiral motif within a rectangular double frame. Two lead pins are attached to the ends of the front wall. The nature of this object is unknown, although its internal divisions indicate that more than one kind of material (most probably medicinal or make-up materials) was stored or prepared inside it. No parallels were found to this object.

MARBLE SLABS AND LIDS

A relatively large number of fragmentary marble slabs was found in the excavations. The great majority had no clear connection to any architectural feature, except for a few large rectangular slabs (Fig. 6.132:1) which were found embedded in remains of a foundation layer(?) made of small fieldstones and mortar. All these slabs, which were apparently floor (and wall?) revetments, were probably dismantled from deserted building/s (a church?) of the Late Byzantine-early Umayyad settlement. In addition to these ordinary plain slabs, a few slab-like marble fragments which seem to have another use were also found. Fig. 6.132:2 is a fragment with one convex side and Fig. 6.132:3 has a round central hole and raised margins. It is likely that they were lids of reliquary chests. Parallels for flat reliquary lids with a central hole were found in two churches in Palestine (Negev 1988: Ph. 50; Aviam 2002: Fig. 52); in both cases the reliquary chests were fixed in the floor of the *bema*. According to Bagatti, the reason for the existence of holes in reliquaries lids was “...to introduce oil for distribution to the faithful” (1971:253).

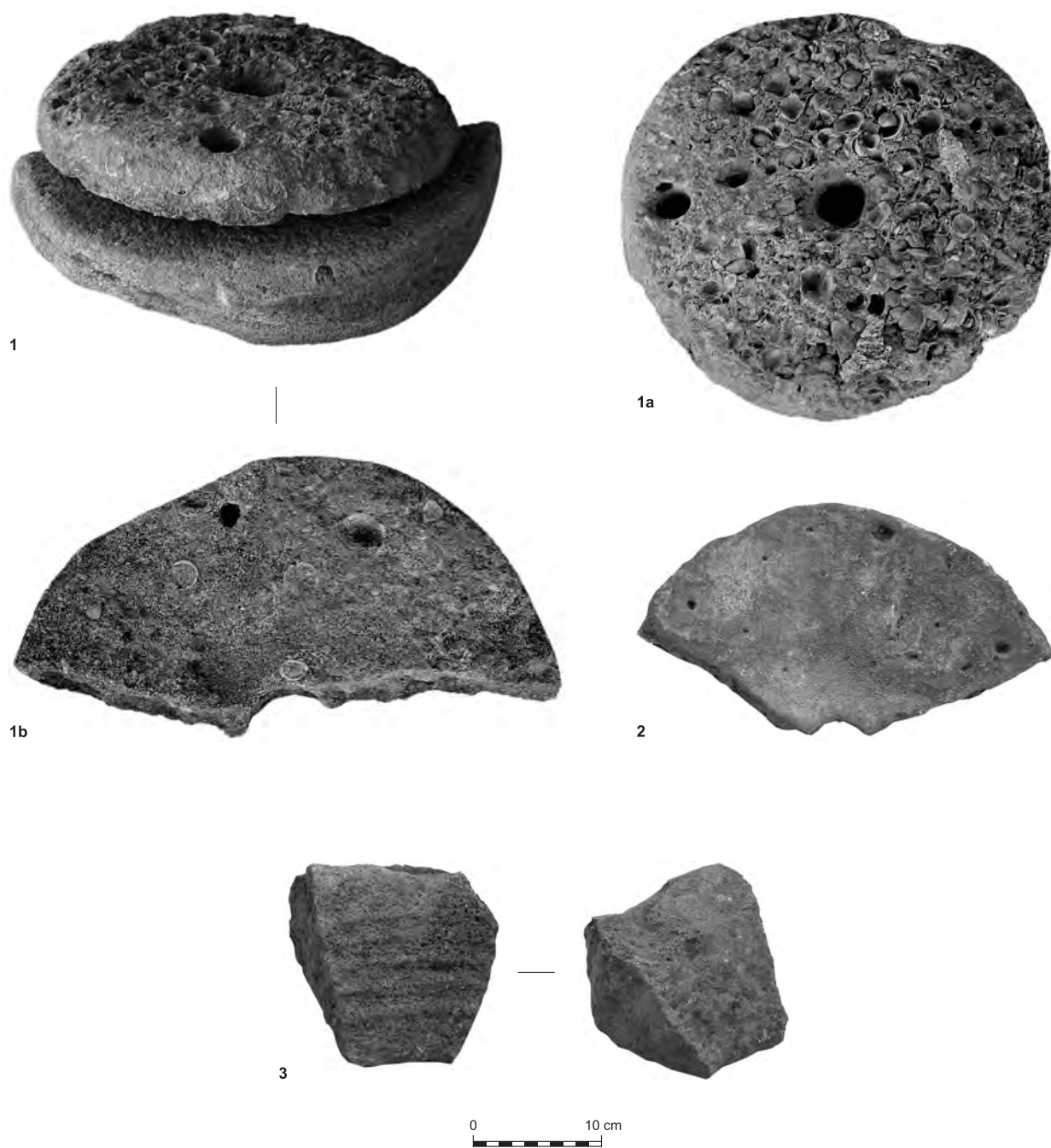


Fig. 6.128: Millstones: 1a) L1644; 1b) L1505; 2) L370; 3) L796.

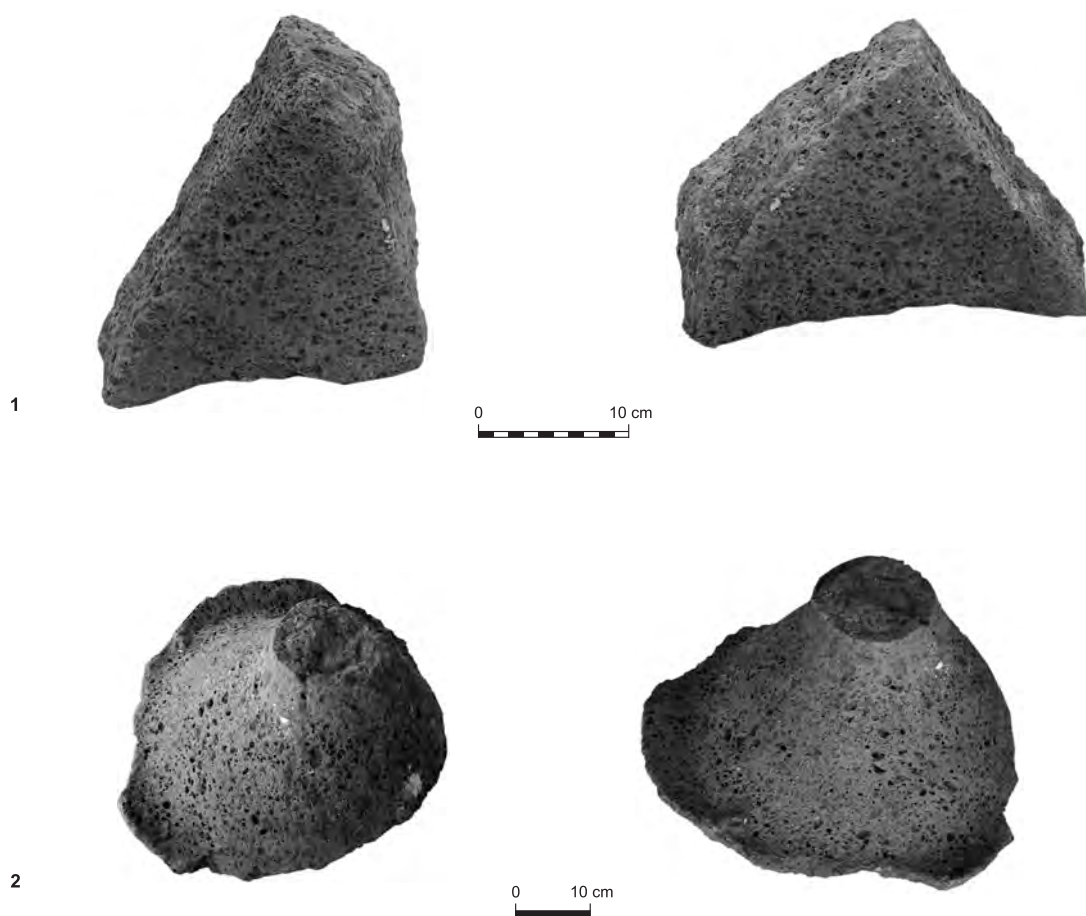


Fig. 6.129: Millstones: 1) L1734; 2) L1734.

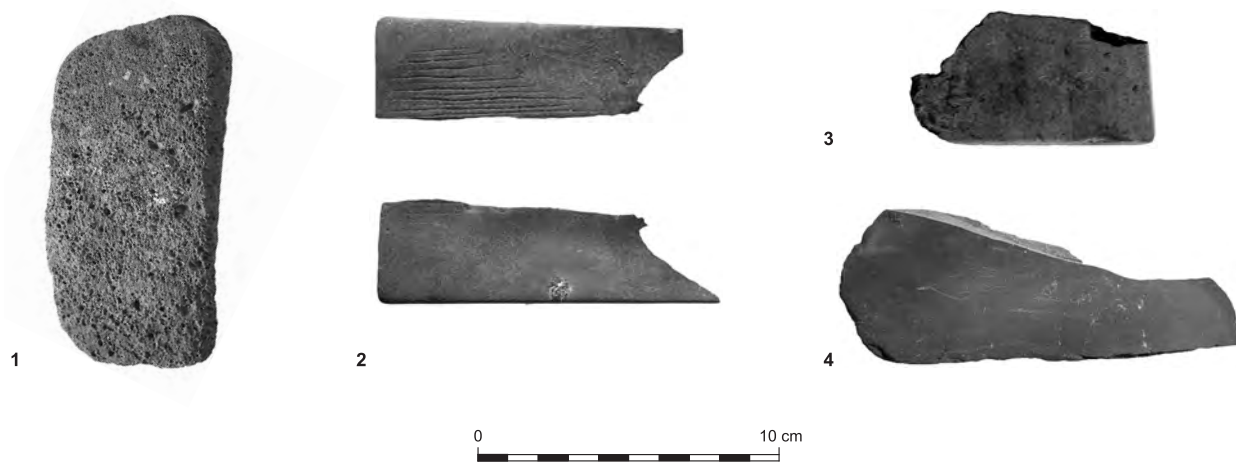


Fig. 6.130: Scoria scraper and slate whetstones: 1) L628; 2) L538; 3) L90; 4) L538.

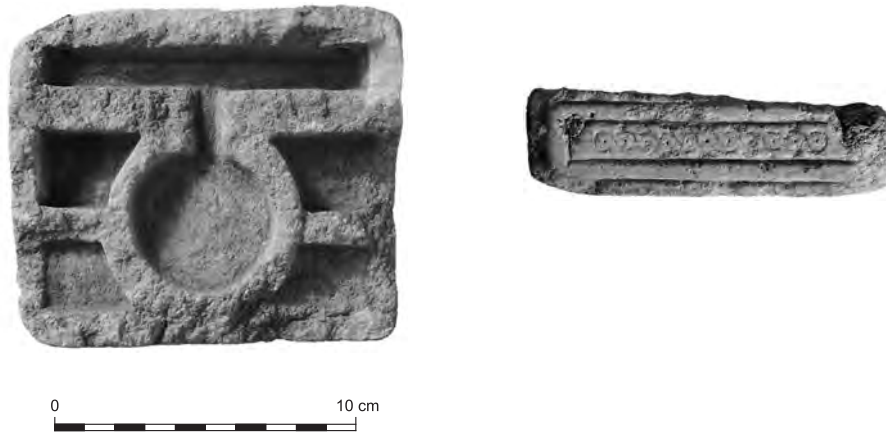


Fig. 6.131: *Left*) Multi-compartmented marble object (L767); *right*) Front side view.

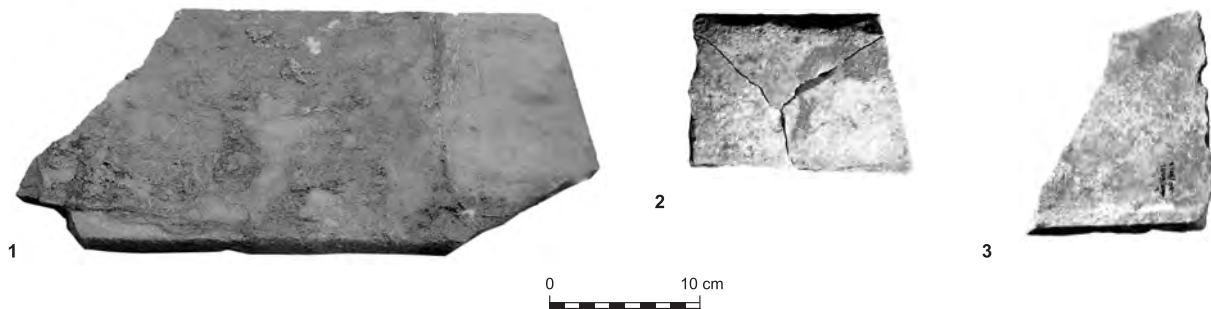


Fig. 6.132: A marble slab and lids: 1) L643; 2) L1518; 3) L1609.

CONCLUSIONS

Many of the stone items unearthed are identified as Late Byzantine or Late Byzantine-early Umayyad period items. They probably belonged to the settlement that existed at the site prior to the establishment of Ramla and the construction of the late Umayyad-Fatimid industrial quarter.⁹

The reuse of earlier architectural elements and even small objects in the Early Islamic (and later) settlements is a well-known phenomenon reflected in many contemporary sites in Palestine. According to some historical sources the builders of Ramla made use of stones from nearby Lod which was a prosperous centre in the Byzantine period (Kaplan 1958:102, Note 12; Sourdel 1981:388, 390; see in this respect Creswell 1969:482-483). Indeed, many Byzantine architectural elements, some of which

clearly originated in Christian buildings, have been found in excavations at Ramla (e.g. Kletter 2005a:90-91, Figs. 10, 25).

The case of Ramla (South), however, is somewhat different, since the late Umayyad-Fatimid industrial quarter was built directly onto and into the remains of a Late Byzantine-early Umayyad village. Thus, there is no reason to believe that the earlier stone objects found in relation to the late Umayyad-Fatimid remains were brought from a distance. The picture from Ramla (South) can be compared, for example, to that of Caesarea, where architectural elements from the Byzantine city structures were reused in the Early Islamic structures built directly onto and into them (see e.g. Netzer 1986: Ills. 5, 7, 11-15, 48, 52, 77, for marble thresholds in Early Islamic structures made of re-used Byzantine columns)

9. It should be noted that two other architectural elements made of limestone – a column base and a column shaft – were found embedded in secondary use in a wall (W10) unearthed in the western end of the excavation area (Square T217). Additional architectural elements of the Byzantine period, including a Corinthian column capital, were found in the Israel Antiquities Authority excavations at the site (see e.g. Gorzalczy 2006: Fig. 5).

METAL OBJECTS

Most of the metal finds retrieved during the excavations are structural fittings related to building activities, apparently connected to wooden roofing, as attested by the large numbers of nails that are commonly known in Classical

and Mediaeval times. Finds, such as the bronze kohl sticks, spatula, bracelet and the ornamental object, can be defined as personal accessories. Metal vessels are restricted to jugs that apparently served in the table ware assemblage of a particular household.

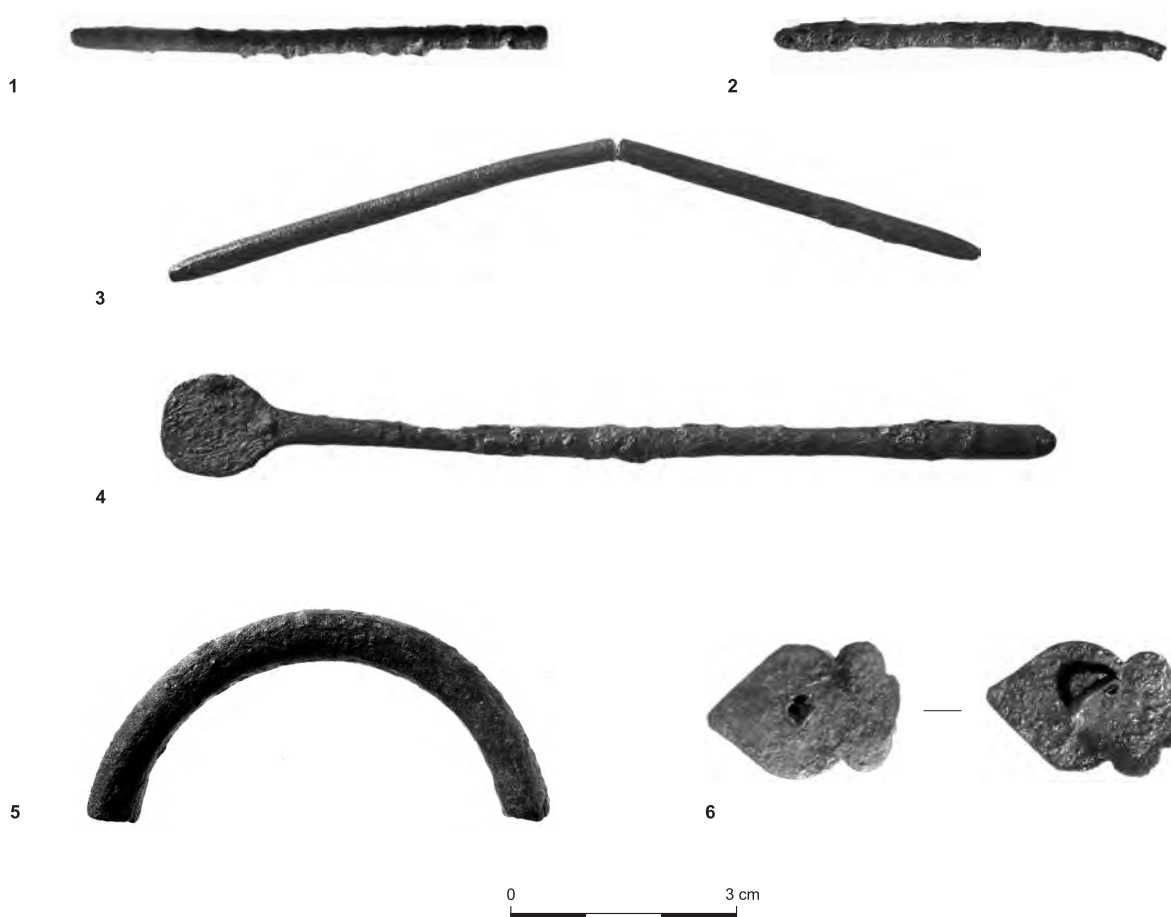


Fig. 6.133: Bronze kohl sticks (1-3), spatula (4), bracelet (5), ornament (6).

No.	Locus	Description	Equivalents
1	1525	Bronze, (kohl) stick (incised decoration)	Khmais 1996:225, Fig. XVIII.6:2-4, Phs. XVIII.16-XVIII.18
2	316	Bronze, (kohl) stick	
3	Surface find	Bronze, (kohl) stick	
4	239	Bronze, spatula	Khmais 1996:225, Fig. XVIII.6:1, Ph. XVIII.15
5	1594	Bronze, bracelet (ovoid in section)	Khmais 1996:228, Fig. XVIII.7:9
6	524	Bronze, ornament / button	

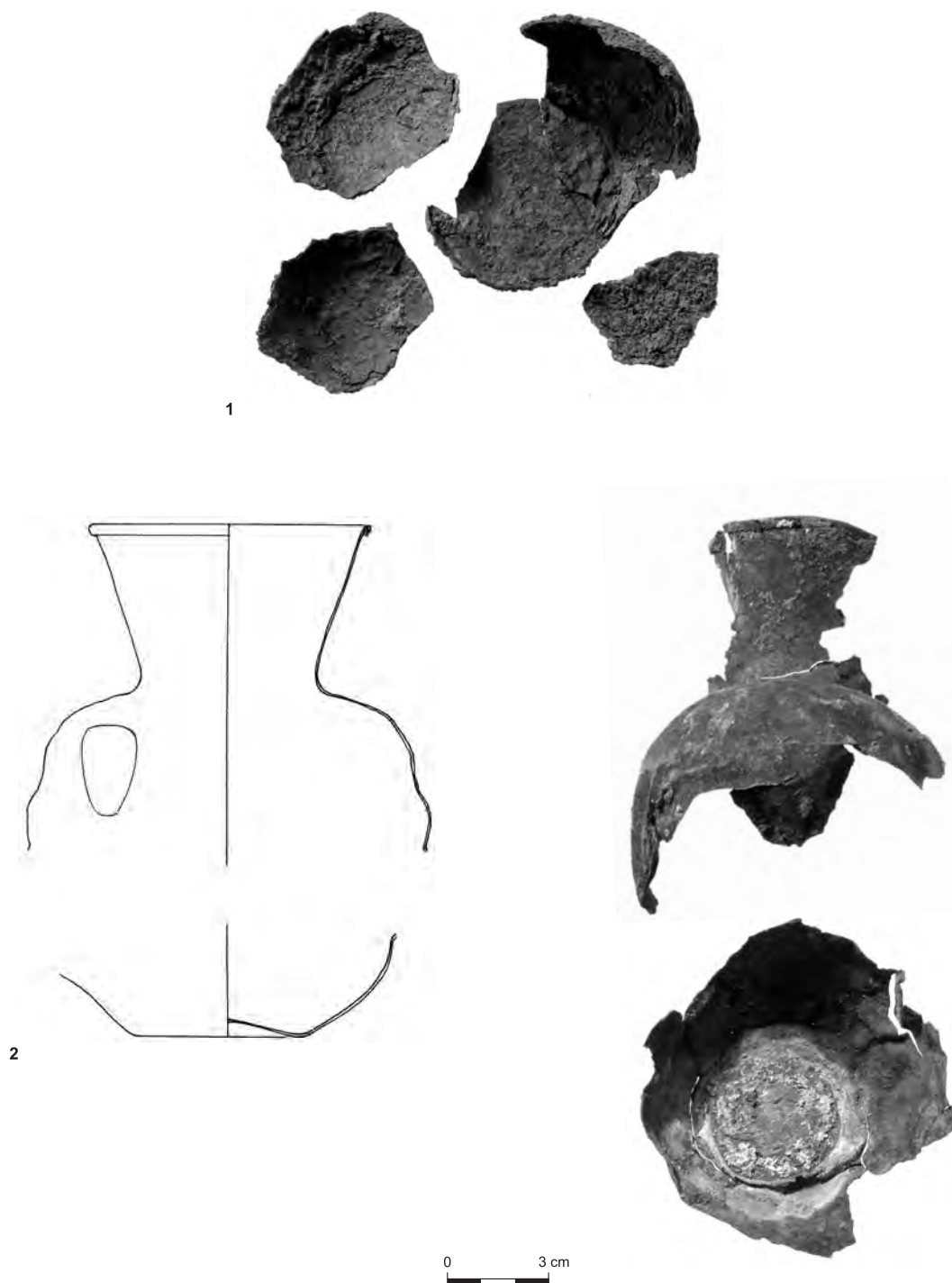


Fig. 6.134: Bronze jugs.

<i>No.</i>	<i>Locus</i>	<i>Description</i>
1	1538	Bronze, jug (lower body)
2	1559	Bronze, jug



Fig. 6.135: Iron nails.

FIG. 6.135: IRON NAILS

<i>No.</i>	<i>Locus</i>	<i>Description</i>
1	1616	Iron nail
2	752	Iron nail
3	316	Iron nail
4	734	Iron nail
5	330	Iron nail
6	3	Iron nail
7	355	Iron nail
8	1525	Iron nail
9	1525	Iron nail
10	1525	Iron nail
11	1525	Iron nail
12	1525	Iron nail, fragment
13	1525	Iron nail, fragment
14	11	Iron nail, fragment
15	5	Iron nail (bent)
16	549	Iron nail, fragment
17	615	Iron nail, fragment
18	7	Iron nail
19	3	Iron nail
20	7	Iron nail, fragment
21	502	Iron nail, fragment
22	27	Iron nail, fragment



Fig. 6:136: Iron nails and fitting implements.

<i>No.</i>	<i>Locus</i>	<i>Description</i>
1	1635	Iron nail, fragment
2	1747	Iron nail, fragment
3	912	Iron nail, fragment
4	750	Iron nail, fragment
5	782	Iron nail, fragment
6	273	Iron pegs (joined by corrosion) (square in section)
7	273	Iron peg (bent) (square in section)
8	273	Iron nail
9	912	Iron nail, fragment
10	912	Iron nail, fragment

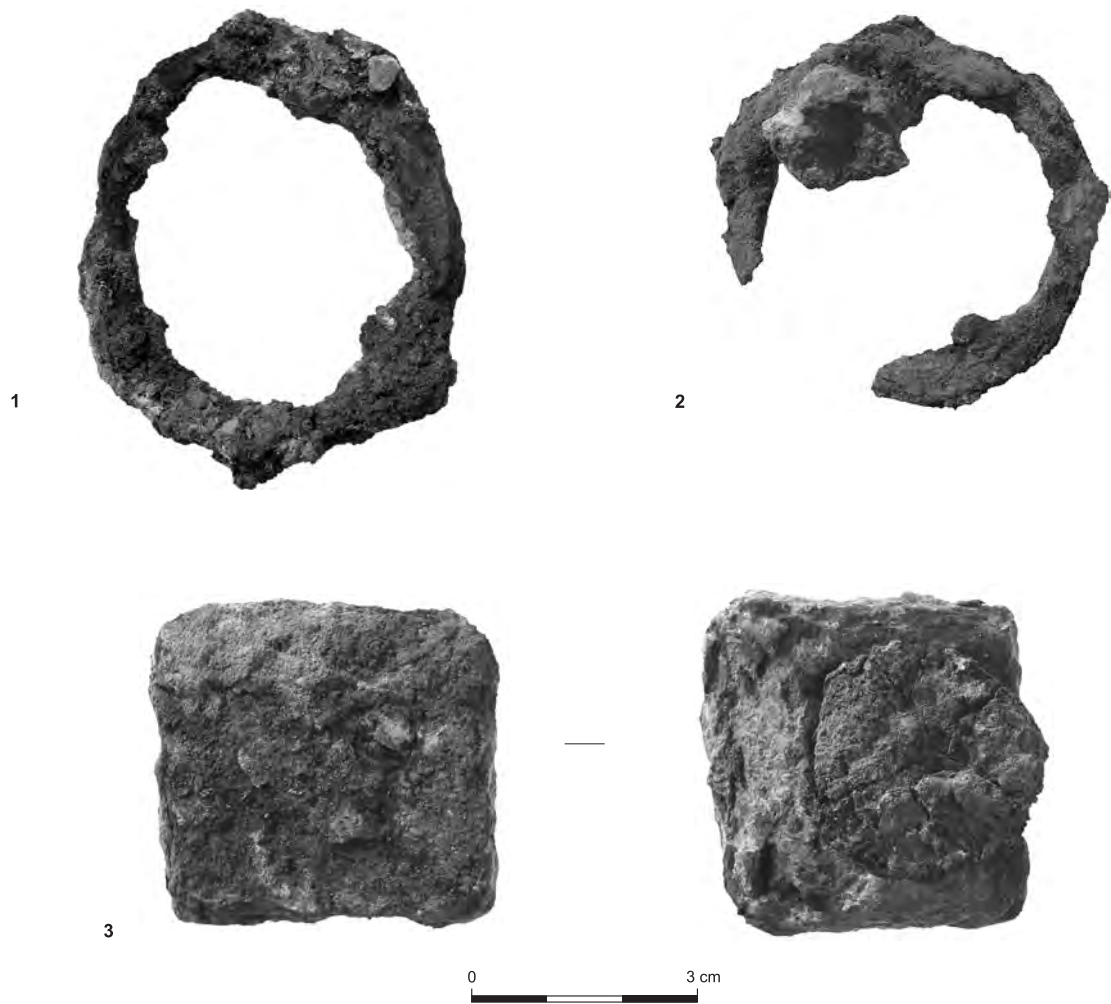


Fig. 6:137: Iron stabilization rings (1-2) and a hinge (3).

No.	Locus	Description
1	1702	Iron clasp / ring
2	1615	Iron clasp / ring
3	851	Iron hinge

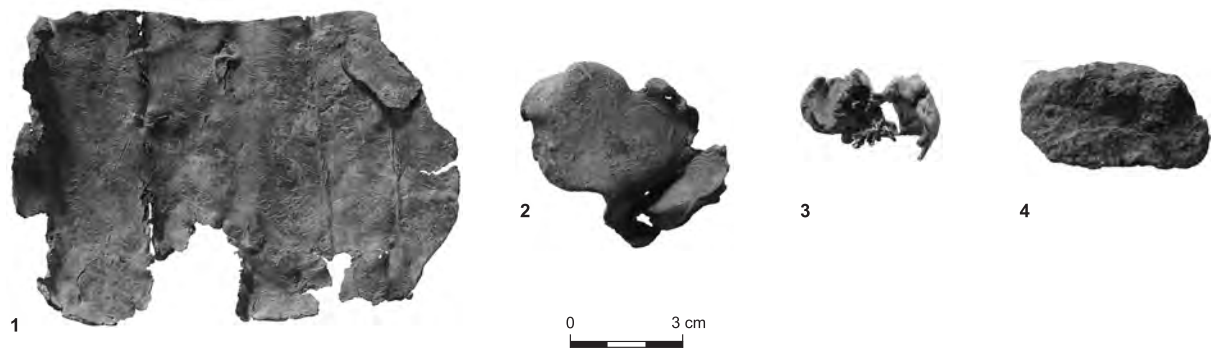


Fig. 6:138: Lead sheet and lead refuse.

No.	Locus	Description
1	812	Lead sheet
2	Surface find	Lead refuse
3	324	Lead refuse
4	318	Lead refuse

BONE ARTEFACTS AND SHELLS

The worked bone artefacts are few (Fig. 6.139). Typologically, they are not confined to the Early Islamic period but are also well represented in previous and later periods.

The appearance of various species of shells (Fig. 6.140) of Mediterranean Sea origin (with

the exception of Fig. 6.140:13), and the presence of fragmented shells in many of the mortar-paved working surfaces suggest that they were used as building material and not consumed as foodstuff. The fact that many of these shells were collected dead (e.g. Fig. 6.140:4, 7, 11) supports this argument. They may also have been used as personal ornaments or to decorate wooden articles.¹⁰



Fig. 6.139: Bone artefacts.

<i>No.</i>	<i>Locus</i>	<i>Description</i>	<i>Equivalents</i>
1	792	Bone, decorated inlay	Corbo 1955: Pl. 29
2	912	Bone, spindle whorl	Kletter 2005a:89-90, Fig. 24:3

10. We are indebted to H. Mienis of Tel Aviv University for identifying the species.

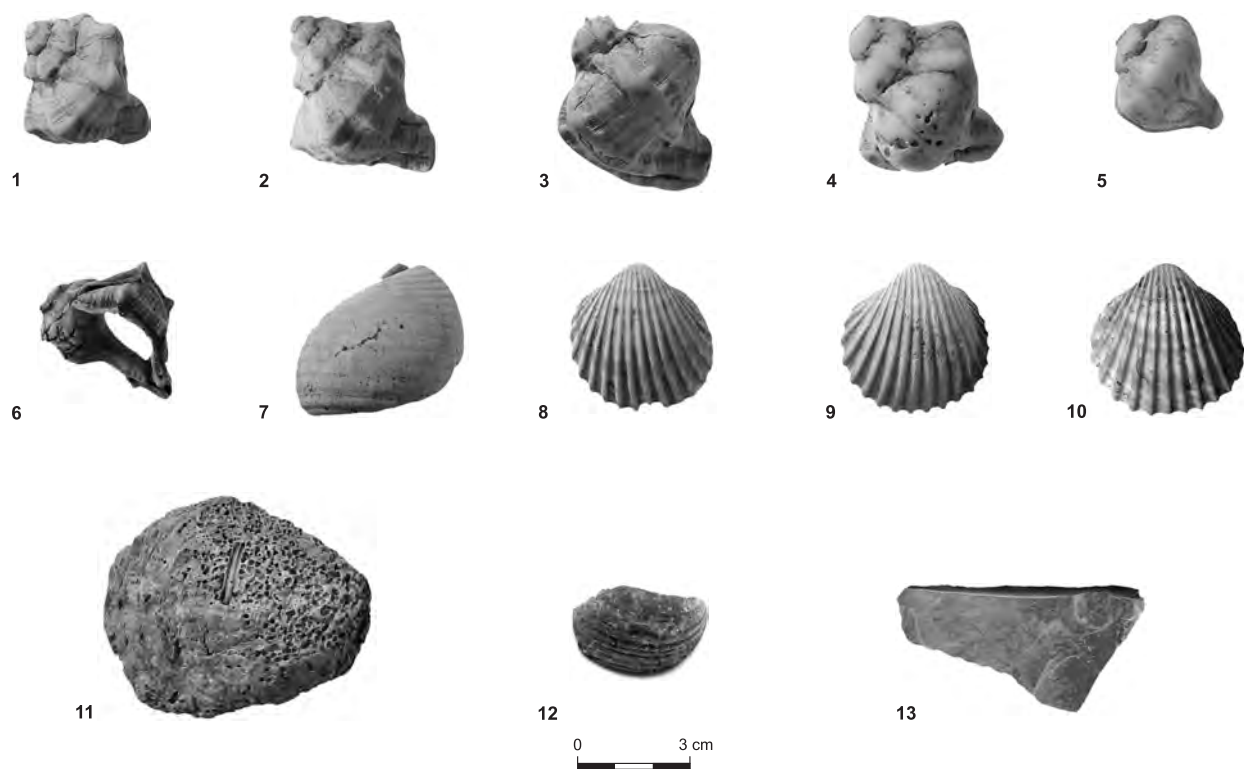


Fig. 6.140: Shells.

No.	Locus	Species	Origin
1	7	<i>Hexaplex trunculus</i>	Mediterranean Sea
2	514	<i>Hexaplex trunculus</i>	Mediterranean Sea
3	568	<i>Hexaplex trunculus</i>	Mediterranean Sea
4	576	<i>Hexaplex trunculus</i>	Mediterranean Sea
5	507	<i>Bolinus brandaris</i>	Mediterranean Sea
6	814	<i>Bolinus brandaris</i>	Mediterranean Sea
7	576	<i>Semicassis granulata undulata</i>	Mediterranean Sea
8	514	<i>Acanthocardia tuberculata</i>	Mediterranean Sea
9	643	<i>Acanthocardia tuberculata</i>	Mediterranean Sea
10	Surface find	<i>Acanthocardia tuberculata</i>	Mediterranean Sea
11	34	<i>Spondylus gaederopus</i>	Mediterranean Sea
12	637	<i>Glycymeris insubrica</i>	Mediterranean Sea
13	303	<i>Pinctada margaritifera</i>	Red Sea

EARLY ISLAMIC WEIGHTS

Oren Tal

Thirteen weights were retrieved from the excavations at Ramla (South). Eleven (Nos. 1-11) are made of bronze and two, which questionably functioned as weights (Nos. 12-13), are made of lead. Most are anepigraphic, with the exception of No. 3 which might preserve a barely legible legend and No. 5 with illegible punch marks (official stamps?) on both upper and lower sides.

Most of the weights were found with the aid of a metal detector which was operated during most stages of the excavations. They were cleaned in the laboratory of the Sonia and Marco Nadler Institute of Archaeology of Tel Aviv University by N. Halperin and photographed after cleaning by P. Shrago. They were weighed by Mettler PE 200 after cleaning and measured with an OMC caliper. All appear on a scale of 2:1 except for Nos. 12-13 which are actual size.

CATALOGUE

1. Locus 569, Basket/Reg. No. 5347/1, Elevation 85 m

Octagonal-cut spheroidal weight

State of Preservation: Good

Material and Weight: Æ, 20.44 g

Value: 5 dinars

Size (in cm): Height 1.05; maximal diameter 1.85

Description: An octagonal-cut spheroidal weight with convex sides, and flat upper and lower surfaces which are decorated with concentric circles and dots (bird's eyes). The sides have central rhomboids and pentagonal multi-facets on the edges, each decorated with concentric circles and a central depression.

*Comparisons:*¹¹ Holland 1986:193, Nos. 43-44, Pl. 33

2. Locus 742, Basket/Reg. No. 5763/1, Elevation 84.5 m

Octagonal-cut spheroidal weight

State of Preservation: Fair

Material and Weight: Æ, 8.17 g

Value: 2 dinars

Size (in cm): Height 0.9; maximal diameter 1.4

Description: An octagonal-cut spheroidal weight with convex sides and central spine, and flat upper and lower surfaces with traces of concentric circles.

Comparisons: Holland 1986:195, No. 115, Pl. 34; Kletter 2005b: 117, No. 1



11. Refer to the shape of the object and its actual weight.

3. Locus 521, Basket/Reg. No. 5101/1, Elevation 84.8 m

Octagonal-cut spheroidal weight

State of Preservation: Good to fair

Material and Weight: Æ, 4.20 g

Value: 1 dinar

Size (in cm): Height 0.6; maximal diameter 1.15

Description: An octagonal-cut spheroidal weight with convex sides and central spine. Flat upper and lower surfaces with concentric circles and either ﺕ or ﻍ may be legible on one side.

Comparisons: Holland 1986:195, No. 156, Pl. 34 (except for script)



4. Locus 538, Basket/Reg. No. 5345/1, Elevation 83.5 m

Octagonal-cut spheroidal weight

State of Preservation: Good

Material and Weight: Æ, 3.39 g

Value: 1 dinar or 4/5 dinar

Size (in cm): Height 0.45; maximal diameter 1.15

Description: An octagonal-cut spheroidal weight with convex sides and central spine, and flat upper and lower surfaces with concentric circles.



5. Locus 548, Basket/Reg. No. 5250/1, Elevation 85.3 m

Octagonal-cut spheroidal weight

State of Preservation: Good to fair

Material and Weight: Æ, 2.00 g

Value: 1/2 dinar

Size (in cm): Height 0.4; maximal diameter 0.95

Description: An octagonal-cut spheroidal weight with convex sides and central spine, and flat upper and lower surfaces. Illegible punch marks (official stamps?) on both sides.

Comparisons: Holland 1986:196, No. 191, Pl. 34 (except for script)



6. Locus 1630, Basket/Reg. No. 15729/1, Elevation 80 m

Brick-shaped weight

State of Preservation: Good to fair

Material and Weight: Æ, 5.89 g

Value: 2 dirhams

Size (in cm): Height 0.7; length 1.2; width 1.15

Description: Brick-shaped weight with plain sides.



7. Locus F355, Basket/Reg. No. 3036/1, Elevation 83.3 m

Brick-shaped weight

State of Preservation: Good to fair

Material and Weight: Æ, 5.84 g

Value: 2 dirhams

Size (in cm): Height 0.65; length 1.1; width 1.05

Description: Brick-shaped weight with plain sides.



8. Locus 1617, Basket/Reg. No. 15148/1, Elevation 80.43 m

Brick-shaped weight

State of Preservation: Good to fair

Material and Weight: Æ, 5.84 g

Value: 2 dirhams

Size (in cm): Height 0.75; length 1.15; width 0.95

Description: Brick-shaped weight with plain sides.



9. Locus 810, Basket/Reg. No. 8027/1, Elevation 83.2 m

Brick-shaped weight

State of Preservation: Fair, signs of wear on some sides

Material and Weight: Æ, 5.25 g

Value: 2 dirhams

Size (in cm): Height 0.6; length 1.15; width 1.1

Description: Brick-shaped weight with plain sides.



10. Locus 732, Basket/Reg. No. 5765/1, Elevation 84.95 m

Brick-shaped weight

State of Preservation: Good to fair

Material and Weight: Æ, 2.93 g

Value: 1 dirham

Size (in cm): Height 0.5; length 1.0; width 0.9

Description: Brick-shaped weight with plain sides.

Comparisons: Zelinger 2000:57*, Fig. 108:2



11. Locus 23, Basket/Reg. No. 1187/1, Elevation 85.7 m

Brick-shaped weight

State of Preservation: Good to fair

Material and Weight: Æ, 1.46 g

Value: 1/2 dirham

Size (in cm): Height 0.35; length 0.8; width 0.8

Description: Brick-shaped weight with plain sides.

Comparisons: Kletter 2005b:117-118, No. 4



12. Locus 615, Basket/Reg. No. 5513/1, Elevation 84.7 m

Pear-shaped weight(?)

State of Preservation: Good

Material and Weight: Lead, 90.51 g

Size (in cm): Height 4.9; maximal thickness 1.0

Description: Pear-shaped weight with a banded loop and flattened side.



13. Locus 504, Basket/Reg. No. 5034/1, Elevation 84 m

Heart-shaped weight(?)

State of Preservation: Good

Material and Weight: Lead, 48.08 g

Size (in cm): Height 0.6; length 2.2; maximal width 1.25

Description: Heart-shaped weight with plain sides.



DISCUSSION

Most of the weights from Ramla (South) came from different loci that represent Early Islamic fills in the main, with the exception of No. 6 which was found on a mosaic floor (F355; Square M138) which apparently formed part of a domestic complex. Thus there is no indication whether they formed one (or more) sets, nor that they were used contemporaneously. The dating of the bronze weights in the late 8th, 9th or 10th centuries CE is quite certain, as can be deduced from their typology and metrology. The weights were cast in moulds, whereas some details in the decoration of the octagonal-cut spheroidal weights, such as the inner dot in the faceted rhombi and pentagons, were added after they were finished and adjusted by punching. At the same time official stamps could have been added to the lower and upper surfaces.

Small bronze weights of the types retrieved from Ramla (South) are common in occupation layers of the Early Islamic period at sites in Palestine. However few studies discuss these weights in their Palestinian contexts thoroughly, and that of Holland's (1986) on weights of Caesarea Maritima and Kletter's (2005b) on weights of Ramla (‘Opher Park) are scholarly attempts on the subject.¹²

It is a well-known fact that the basic weights units of the Early Islamic period are the *dinar* and the *dirham* (*Encyclopedia of Islam*, II: s.v. Dīnār; Dirham). These weights units underwent standards variations under different dynasts, rulers and regions, as is attested from coins, inscribed weights and historical documentation. Based on these sources of evidence, it is clear that the bronze weights of Ramla (South) were produced according

12. More than 600 bronze weights of questionable provenance are recorded by Holland (1986) as coming from Caesarea Maritima. Kletter (2005b) published four from the ‘Opher Park at Ramla, and Zelinger (2000) published one from Yehezqel Street at Ramla. The current study records additional eleven, but contemporaneous excavation carried out at Ramla (South) by the Israel Antiquities Authority unearthed several more. All the published bronze weights of Ramla originated in controlled archaeological excavations. I am also familiar with a dozen from Apollonia-Arsuf.

to late Umayyad and ʿAbbasid standards. Their actual weight shows that the five spheroidal weights (or polyhedra, as classified by Holland 1986) correspond to the system of the *dinar*, whereas the six brick-shaped weights to that of the *dirham*. The Early Islamic *dinar* (from Greek, δηνάριον), which followed the weight standard of the Byzantine *solidus* (ca. 4.55 g), had a value of ca. 4.25 g after ʿAbd al-Malik Ibn Marwān’s reforms (ended in 696-697 CE [77 AH]), and was used for centuries to come (Miles 1964:78*-82*). Our weights thus correspond to 5 units (No. 1), 2 units (No. 2), 1 unit (No. 3) and one-half of a unit (No. 5). All these are slightly below the average theoretical value of ca. 4.25 g for a *dinar* (in roughly 1.2% [No. 3]-5.9% [No. 5]), but this may be explained by their wear and tear and the cleaning process they underwent. Weight No. 4 of 3.39 g is puzzling and the 1 (wear) unit of *dinar* or alternatively 4/5 unit is only suggestive. By contrast, the Early Islamic *dirham* (from Greek, δραχμή), was mainly used in Egypt until the Fatimid came to power (Balog 1970:239). Metrological studies suggest that the *dirham kail* unit corresponds to ca. 2.95 g. In that manner our weights correspond to 2 units (Nos. 6-9), 1 unit (No. 10) and one-half of a unit (No. 11). These weights are too slightly below the average theoretical value of ca. 2.95 g for a *dirham* (in roughly 0.7% [No. 10]-11% [No. 9]), but again we may explain these differences by their wear and tear and the cleaning process involved.

The function of these bronze weights is open to speculation. Balog referred to the weights he published as “coin weights” (1970), but this sole function was rightfully refuted by Holland due to the fact that a “true coin weight

is intended specifically for weighing coins of a particular denomination, ... and usually bears an inscription to that effect, identifying the denomination, the weight standard, and the issuing authority (1986:185-186).” Because of documentary and archaeological (cut gold and silver coins) evidence for the use of fractions of *dinars* in transactions, Holland suggested that these weights would be needed for almost all cash transactions (“money weights” in a sense), and that their abundance in Palestinian sites rules out exclusive use by officials, metal-smiths or other specialists (1986:186-192). Albeit one cannot exclude the possibility that these bronze weights were used as coins and transacted for their face value. It is however in the contexts of “money weights” that the bronze weights of Ramla (South) should preferably be explained. As expressed above, we are of the opinion that the site excavated at Ramla (South) was engaged in the processing of flax from vegetal material to threads and ropes. These products were most probably bought by artisans and merchants for further processing or consuming. Thus cash transactions were most probably made on site, and the bronze weights discovered form an evidence of cash transactions. It is not surprising that one of our weights (No. 4) was found together with pottery and glass vessels which formed a refuse of a domestic assemblage.

The lead weights illustrated as Nos. 12 and 13 form a different group of weights if indeed functioned as such, or merely placed as stabilization or setting objects of a kind. No. 13 and a coin of the Umayyad period (Chapter 7: No. 22) were found in the same locus. The actual weights of both lead weights do not agree with the system of the *dinar* nor to that of the *dirham*.

SUMMARY AND CONCLUSIONS

Oren Tal and Itamar Taxel

It is a well-known fact that the pottery repertoire of the late Umayyad period in Palestine (ca. 700-750 CE) remains largely the same in the early ʿAbbasid period (ca. 750-800) although new types had just began to appear (e.g. white/buff ware; cf. Whitcomb 1988; Walmsley 2001; and glazed ware; cf. Lane 1958:10-16; Northedge 2001:214).

As pointed out in Chapter 5, it is difficult to establish whether the site was continuant in nature during the Umayyad occupation or whether there was a break between the early and late phases of this period. Many of the pottery-types may well have carried over into the ʿAbbasid period (e.g. FBW, cut decorated, incised and plain ware bowls, basins, casseroles, storage jars and lamps of Type 1), yet several types are more restricted to this phase (e.g. glazed ware, most of the jugs and juglets and lamps of Type 2). Since many of the vessels were retrieved from the same loci, it is only logical to assume that the assemblage is dated to the ʿAbbasid period. The ʿAbbasid period in Palestine is fixed to the years 750-969 CE (including the periods of Tulunid and Ikhshidid dynasts domination), namely it covers the mid-8th, 9th and major part of the 10th century CE. Our main question is how late can we advance the site chronology in its most significant architectural phase in the Early Islamic period? In ceramic terms the position is somewhat flexible, although a *terminus ante quem* of ca. 950 CE can be suggested because of the lack of certain pottery types (e.g. coarse *sgraffito* ware bowls, glazed cooking ware, beehive lamps) in the many subterranean vaulted chambers reused as refuse dumps and in the few *in situ* floor assemblages.

Pottery types which most characterize the (late) 10th and 11th centuries CE (i.e., the late ʿAbbasid and Fatimid periods) were found only in the uppermost fills which covered parts of the site and in the uppermost levels of the deep refuse pit in Square Y138. Thus, based on the ceramic evidence alone, it is logical to assume that the site of Ramla (South) ceased to exist as an industrial quarter sometime in

the 10th century CE. The glass finds may support such a scenario for most are well-attributed to 9th-10th century CE types. In case our identification and interpretation of the site as flax industry oriented – an economic branch which started to decline at Ramla towards the late 10th century CE – is correct, the site's latest phase of industrial activity can be dated to the second half of the 10th century CE. The huge amount of 9th and 10th century CE secondary refuse of domestic pottery and glass dumped into the subterranean vaulted chambers most probably originated in the nearby *khan* complex that was engaged with domestic and commercial activities. The latest, Fatimid period accumulations, which were the closest to the site's surface, point to a continuous domestic and commercial activity in the nearby complex (and may be even in parts of the former industrial complex), well into the 11th century CE. It is also possible that another kind of industry – though apparently not an extensive one – had also been practised at the site during that time. The pottery, glass, stone and metal finds discussed above can be supplemented by ten coins of the Early Islamic period (Chapter 7: Nos. 21-30). All came from disturbed fills. However, none of the Early Islamic coins can be dated to the 11th century CE.

As mentioned above, the industrial site established at Ramla (South) in the late Umayyad or early ʿAbbasid period was an integral part (a suburb) of the city of Ramla in its glory days. Thus, at least in regard to the late Umayyad to Fatimid periods (8th-11th centuries CE) it should be considered as an extra-mural urban site (following Petersen's typology, 2005:28-29, 110). The effect of the foundation of the city of Ramla in the early 8th century CE on the rural settlements in its vicinity is an issue still neglected by scholars, and so is the issue on the social and economic relations between Ramla and its hinterland throughout the Early Islamic period. A thorough discussion in these issues should be the subject of another study, but the following observations are relevant.

As mentioned above (Chapter 5), some of the rural settlements in the vicinity of Ramla most probably continued to exist without any substantial change after the foundation of Ramla, while others were negatively affected by the foundation of Ramla and finally abandoned. Nearby excavated sites which reflect a continuation of occupation into the Early Islamic period (at least until the ʿAbbasid period) are Khirbat el-Niʿana (Tsioni 2008), Neshar Quarries (Kol-Yaʿakov 2000:67*; Y. Zelinger, personal communication),¹³ Şarafand el-Kharab (Glick 1998; Gorzalczany 2004), Şarafand el-ʿAmar (A. Kohn-Tavor, personal communication), Khirbet ʿAsfura (Ben-Zvi 1954; Gudovitch 1999) and Khirbet Deiran (Roll and Ayalon 1981; Bouchenino 2007; Kogan-Zehavi 2007). The rural nature of these settlements seems to have been preserved during the ʿAbbasid period too (and sometimes also in the Fatimid period), and the intensifying of most of them also seem similar to that of the Byzantine and early Umayyad periods. Apparently, this similarity indicates that no break occurred in the continuity of occupation of these settlements (see Magness 2003). However, short periods of abandonment or sharp decline of a given settlement are very hard to identify in the archaeological record. In regard to most of the above-mentioned settlements it cannot be said with certainty whether their occupation continued uninterruptedly from the Byzantine period or not. A possible exception is the site of Neshar Quarries, where the evidence of the destruction of the local church (Zelinger and Di Segni 2006) and the reduction in the size of the settlement may point to a certain break in the occupation of the site, maybe during the 8th century CE.

Sites dated to the Early Islamic period were found in the broader vicinity of Ramla (South). In the survey map of Lod (Gophna and Beit-Arieh 1997:12*), 28 sites were identified as Early Islamic; all were already inhabited in the Byzantine period. Only 12 sites which yielded a distinctive ʿAbbasid

/Fatimid pottery were found in the survey map of Yavneh (M. Fischer and I. Taxel, in preparation), and in a supplementary survey (I. Taxel, in preparation) to the east of the map of Yavneh. In this region too, all of the Early Islamic sites were inhabited in the Byzantine period too (Fischer and Taxel 2006).

In regard to the identification of the ancient name of the Ramla (South) site, one should pay attention to the toponym Bilaʿa/Baliʿa, mentioned in contemporaneous literary Arab sources. According to the geographer al-Muqaddasī (p. 164), Bilaʿa was the place where Christians intend to build a church, and its columns were confiscated by the Umayyad caliph Hishām Ibn ʿAbd al-Malik (724-743 CE) for the building of a mosque at Ramla. Al-Muqaddasī also mentioned Bilaʿa as a place, apparently to the south or east of Ramla, accessed from one of Ramla’s city gates (*ibid.*). The second source is an account about a Christian martir (ʿAbd al-Masīh) of the 8th(?) century CE who was executed at Ramla and his body was thrown into a dry well/cistern at Baliʿa (Griffith 1985; Gat 2004:82-83, 214-216). Gat (2004:84) was the first to suggest that Bilaʿa/Baliʿa should be identified with sites in the immediate vicinity of Ramla, and proposes two alternatives for its location – the site of Neshar Quarries (see above and below) and the site of Ramla (South). The above-mentioned sources may indicate that Bilaʿa/Baliʿa was apparently a village inhabited, at least in the early 8th century CE, by Christians, and therefore may have existed already in the Late Byzantine period. Both sites, Neshar Quarries and Ramla (South), have been inhabited in the Late Byzantine and Early Islamic periods, though clear proof for this or other identifications is yet to be found.

The religious identity of the rural settlements around Ramla is another vague issue. There is no information available as to how many non-Muslims (mainly Christians and Samaritans) lived in the region’s countryside during the late Umayyad, ʿAbbasid and Fatimid periods. The destruction

13. According to Zelinger and Di Segni (2006:468), the settlement at the site of Neshar Quarries was abandoned after the foundation of the city of Ramla in the early 8th century CE. According to Zelinger the settlement continued to exist, though in a smaller scale, until the ʿAbbasid period (Y. Zelinger, personal communication). This information corresponds to the mention of ʿAbbasid period finds in a previous excavation carried out at the site (Kol-Yaʿakov 2000:67*).

of the church at the site of Nesher Quarries may also point to a change in the settlement's religious identity. Another possible clue to a change in religious identity can be found at Khirbet 'Asfura, where a Samaritan inscription which bears a biblical text was found embedded in a mosaic floor of an industrial installation, probably of the Early Islamic period (Ben-Zvi 1954). This find can indicate a change in the settlement's religious identity sometimes in the Early Islamic period (on the problems of determination of the nature and religious identity of rural settlements in the Early Islamic period see Taxel 2005:169-173).

Whatever the religious arrangement of the rural settlements around Ramla in the Early Islamic period, it is obvious that all these settlements were part of the agricultural hinterland of the city. In the fields and orchards of these settlements numerous crops were grown – wheat and other cereals, various fruits, vegetables and legumes, linen, cotton and more – which are mentioned in historical sources of the Early Islamic period in relation to Ramla. These crops, such as the flax discussed above, were brought to the city mostly (or even only) in raw condition, and either sold as is or processed in the city's industrial areas (Gat 2004:129-135; 2007:42-44, 64-66).

The question of the ethnic and religious identity of Ramla (South)'s inhabitants/manufacturers is intriguing. A possible answer to this question can be given by the finding of the so-called Samaritan lamps (our lamp Type 1, above), a type which probably appeared in the 6th century CE and continued to exist – as shown by the finds from Ramla (South) and other contemporaneous sites – until the 9th or 10th century CE. As mentioned above, Sussman (1983:74, Type 4) was the first to suggest that this lamp type (and other preceding types) is a characteristic of the Samaritan material culture in Palestine, though recently she admitted that these lamps may have been used also by other ethnic/religious groups (Sussman 2002: 339). Magen (2002:243) is also in the opinion that these lamps have not been used exclusively by the Samaritans, but by all of the religious/ethnic groups which lived in the regions where these lamps have

been found (mainly Samaria Hills and the coastal plain). He thus concluded that they cannot be used as a cultural indicator of the Samaritans.

This assumption, however, seems to be only partially true, as can be seen in the following examples. A presence of Samaritans at the city of Beth Shean is known from the literary sources of the Byzantine period and the archaeological evidence. The published lamps retrieved from the excavations of the Hebrew University show that relatively many late Samaritan lamps were found, which represent the most common lamp type of the Byzantine period and the third most common type of the Umayyad period. According to Hadad, this fact may indicate “that a non-Samaritan population used these lamps” (2002: 148, Table 1). A similar picture is reflected from the harbour town of Yavneh-Yam, known from the literary sources of the Byzantine period and the archaeological evidence as being inhabited by Christians, Samaritans and Jews. Here, the dominant lamp type in the Late Byzantine and early Umayyad assemblages is the Samaritan lamp, a fact which may indicate to the use of this lamp type by several ethnic/religious groups (M. Fischer and I. Taxel, unpublished). An opposite example is Ḥorvat Zikhrin, a village at the southwestern fringes of the Samaria Hills, which, during the Byzantine and Umayyad periods, was inhabited by Christians. The contemporaneous assemblages in the site yielded only two Samaritan lamps (Taxel 2005:83), compared to tens of candlestick lamps (the dominant lamp type at central and southern Palestine in the Byzantine and Umayyad periods; e.g. Magness 1993:251-255, Lamps Form 3). These differences can be explained either by cultural regionalism or – more probable – by different degrees of conservatism and openness to different cultural aspects in urban and rural settlements.

It is possible, though, that during the late Umayyad and 'Abbasid periods, the ethnic/religious factor was more dominant in regard to the use of lamp types, even in cities like Ramla, as can be assumed by the following facts: The large number of Samaritan (Type 1) lamps found at Ramla (South) is close to that of our Type 2 lamps (see above), which

is the dominant lamp type in contemporaneous assemblages elsewhere in Palestine, including Ramla. Type 2 lamps, stamped jar handles, etc. or stamped glass vessels with Arabic inscriptions – either Islamic-oriented or other – were not found at Ramla (South). Such finds were found, for instance, in other excavations at Ramla (e.g. Amitai-Preiss 2005; 2007; Arnon 2007: Fig. 17:3).

Samaritan presence at the site may also be inferred from yet another pottery find, a jug neck decorated by incisions made prior to firing which seem to correspond to a West Semitic (later cursive Samaritan or Aramaic?) script (Fig. 6.141). The inscription reads: LṢṬ, meaning to swallow, to sip, to eat or even to lick in many Semitic languages and may represent an imperative form that relates to the jug's user, owner or manufacturer.

Jugs (and juglets) of a similar (buff) ware unearthed at the site and found cracked in their bases (e.g. Figs. 6.91:1, 11 and 6.92:11) may even indicate on the presence of a potter's workshop at the site or in its immediate vicinity. Thus a local pottery industry may well supply the daily ware for the site's inhabitants.

The presence of a Samaritan community in Early Islamic Ramla is known from several Arab literary sources of the 9th and 10th centuries CE, and also from a 12th century CE Samaritan chronicle (the *Tolidah*). The size of

this community is estimated by 2,500-3,000 people or 500 families (Ben-Zvi 1976:93-94; Gat 2004:227-229; Gil 1992:821, with references). Samaritans probably lived also in some villages in the vicinity of Ramla (the Lod valley) during the Early Islamic and Mediaeval periods (Ben-Zvi 1976:94-95, with references). Gil (1997:947-948) published a letter from the Cairo *Geniza*, dated to 1046 CE, in which import of linen cloths from Ashkelon and Arsuf in Palestine to Tinnīs (in Egypt) is mentioned. Since we know that Samaritan communities existed in Arsuf at least until its Crusader occupation in 1101 CE and in Ashkelon at least until the 13th century CE (Ben-Zvi 1976:103-104, 110-113, with references), it can be suggested that Samaritans engaged somehow in the processing of raw flax and/or in the production of linen cloth during the Early Islamic period.¹⁴ This assumption may support our suggestion that the industrial activity – apparently flax processing – at Ramla (South) was dominated by Samaritans, whose presence is reflected by the exceptional number of Samaritan lamps found at the site. It should be emphasized that our identification of the industry at the site we excavated as flax-processing oriented, does not rule out the possibility of other contemporaneous industries in some of the installations discovered at the site of Ramla (South).



Fig. 6.141: West Semitic script incised jug (cf. Figs. 6.91:14 and 6.107:40).

14. One may even consider the possibility that flax products were shipped from Arsuf (and not from Jaffa) in the early Mediaeval, in order to corner the market for Samaritans alone.

NUMISMATIC FINDS

Forty coins were retrieved during the excavation of Ramla (South). Seventeen are pre-Early Islamic and these were analyzed by O. Tal, and additional 17 are Islamic and were studied by N. Amitai-Preiss. The remainder six coins are unidentified. Most of the coins were found with the aid of a metal detector which was operated during most

stages of the excavations. The coins were cleaned in the laboratory of the Sonia and Marco Nadler Institute of Archaeology of Tel Aviv University by N. Halperin and photographed after cleaning by P. Shrago. All appear on 1:1 scale with the obverse view on the left.

PRE-ISLAMIC COINS

Oren Tal

CATALOGUE

1. Locus 12, Basket/Reg. No. 1057/1, Elevation 85.8 m
Date: Hellenistic, Seleucid
Type: Royal, Accho-Ptolemais, Demetrius I (145-138 BCE)
 or Demetrius II (130-125 BCE)
Obverse: Head of a male r.
Reverse: Goddess standing to r. holding sceptre (or torch) in l. hand.
 Traces of legend in field ΒΑΣΙΛΕΩΣ ΔΗΜΗΤΡΙΟΥ.
Æ 1.83 g. Axis 3
Comparisons: *SNG Israel I:* Nos. 1734-1737; Bijovsky 1999
2. Locus 510, Basket/Reg. No. 5100/1, Elevation 85 m
Date: Hasmonean
Type: Jewish, Jerusalem, Alexander Jannaeus (104-76 BCE)
Obverse: Traces of anchor (or an unclear sign).
Reverse: Traces of pointed star and surrounding border.
Prutah, *Æ* 1.04 g
Comparisons: Cf. *TJC:* Nos. L9-L11
3. Wall 24, Basket/Reg. No. 1127/1, Elevation 85.5 m
Date: Hasmonean
Type: Jewish, Jerusalem, Alexander Jannaeus (104-76 BCE)
Obverse: Anchor surrounded by a circle.
Reverse: Traces of pointed star and surrounding border.
Prutah, *Æ* 0.92 g
Comparisons: *TJC:* Nos. L9-L11



4. Locus 511, Basket/Reg. No. 5036/1, Elevation 85.2 m
Date: Hasmonean
Type: Jewish, Jerusalem, Alexander Jannaeus (104-76 BCE)
Obverse: Traces of palm branch and a legend *hmlk [yhwntn]*, surrounded by dotted border.
Reverse: Lily surrounded by dotted border.
Prutah, Æ 1.17 g. Axis 12
Comparisons: *TJC*: Nos. O1-O4
5. Locus 374, Basket/Reg. No. 3178/1, Elevation 82 m
Date: Herodian
Type: Jewish, Jerusalem or Caesarea Maritima, Herod Agrippa I's year 6 (= 41/42 CE) or Herod Agrippa II (in 66/67 CE)
Obverse: Canopy (or umbrella), traces of legend in field BACIAEΩC AΓPIIIA.
Reverse: Three ears of grain stemming from two leaves, in field ΛϚ ("Year 6") is visible.
Prutah, Æ 2.60 g. Axis 12
Comparisons: *TJC*: Nos. 120-120a; Lönnqvist 1997
6. Locus 539, Basket/Reg. No. 5172/1, Elevation 84.5 m
Date: Roman
Type: Provincial, City coin. First half of the 3rd century CE.
Obverse: Head to r.
Reverse: Worn.
 Æ 7.10 g
7. Locus 1526, Basket/Reg. No. 15252/1, Elevation 78.8 m
Date: Late Roman
Type: Imperial, Constantine II (346-361 CE)
Obverse: Head of Constantine II r. Traces of hardly visible legend.
Reverse: Wreath(?), worn.
 Æ 0.80 g
Comparisons: Cf. *RIC VIII*:521, No. 118
8. Locus 796, Basket/Reg. No. 6060/1, Elevation 84.2 m
Date: Late Roman
Type: Imperial, Constantine II (346-361 CE)
Obverse: Head of Constantine II r. Traces of hardly visible legend around.
Reverse: Helmeted soldier to l., shield on l. arm, spearing falling horseman; shield on ground. Traces of legend around [FEL TEMP R-EPARATIO {Type}].
 Æ 1.69 g. Axis 6
Comparisons: *RIC VIII*:167, No. 359



9. Locus 48, Basket/Reg. No. 1186/1, Elevation 85.2 m

Date: Late Roman

Type: Imperial, Arcadius, Theodosius II, or Honorius (402-408 CE)

Obverse: Bust of Emperor r. Traces of hardly visible legend in field.

Reverse: Three emperors standing facing.

Traces of legend around [GLORI-A ROMA-NORVM {Type}].

In exergue illegible mint.

Æ 1.58 g. Axis 12

Comparisons: Cf. Grierson and Mays 1992:126-127, Nos. 254-256, 258-260, 263 (for Arcadius); 139-140, Nos. 308-312 (for Theodosius II), and 213, Nos. 772-775 (for Honorius).



10. Locus 1615, Basket/Reg. No. 15154/1, Elevation 79.7 m

Date: Byzantine

Type: Imperial, Justin I (518-527 CE)

Obverse: Bust of Justin I r., diademed, cuirassed and draped.

Legend around]STINI-ANVSPPA[VC].

Reverse: M, above cross, below A.

On l. star, on r. cross.

Follis, Æ 15.80 g. Axis 12

Comparisons: Cf. *DOC I*:40, 48, Nos. 9a, 29a



11. Locus 569, Basket/Reg. No. 5346/1, Elevation 84.1 m

Date: Byzantine

Type: Imperial, Constantinople(?), Justin II (565-578 CE)

Obverse: Justin II on l. and Sophia on r. seated, facing, on double throne, J. holds cross in r. hand.

Traces of legend around DNI-[VSTI NVSPPAV]

Reverse: M, above cross, below E(?). On l. ANNO, on r. Ч.

Follis, Æ 10.70 g. Axis 2

Comparisons: Cf. *DOC I*:207, No. 27 (dated to 5th year = 569/570 CE)



12. Locus 5, Basket/Reg. No. 1006/1, Elevation 85.85 m

Date: Byzantine

Type: Imperial, Nicomedia, Maurice (582-602 CE)

Obverse: Bust of Maurice facing, wearing cuirass and crown. In r. hand cross. No visible legend.

Reverse: M, above cross, below Δ. On l. ANNO, on r. I. In exergue below NIKO.

Follis, Æ 10.71 g. Axis 6

Comparisons: Cf. *DOC I*:323, No. 91a (dated to 1st year = 582/583 CE)



13. Locus 15, Basket/Reg. No. 1063/1, Elevation 85.3 m
Date: Byzantine
Type: Imperial, Nikomedia, Maurice (582-602 CE)
Obverse: Bust of Maurice facing, wearing cuirass and crown. In r. hand cross. Traces of hardly visible legend.
Reverse: M, above cross, below A. On l. ANNO, on r. III. In exergue below NIKO.
Follis, Æ 11.22 g. Axis 7
Comparisons: Cf. *DOC* I:324, No. 93.1 (dated to 3rd year = 584/585 CE)



14. Locus 27, Basket/Reg. No. 1125/1, Elevation 84.9 m
Date: Byzantine
Type: Imperial, Antioch, Maurice (582-602 CE)
Obverse: Bust of Maurice facing, crowned with triple ornament. No visible legend.
Reverse: M, above cross, below E. On l. ANNO, on r. XϞIII. In exergue below THEUP'.
Follis, Æ 10.41 g. Axis 6
Comparisons: *DOC* I:344, No. 169c (dated to 18th year = 598/599 CE)



15. Locus 27, Basket/Reg. No. 1125/2, Elevation 84.9 m
Date: Late Roman
Obverse: Worn
Reverse: Worn
 Æ 1.47 g
16. Locus 695, Basket/Reg. No. 5661/1, Elevation 85.7 m
Date: Late Roman
Obverse: Worn
Reverse: Worn
 Æ 0.65 g
17. Locus 796, Basket/Reg. No. 6060/2, Elevation 84.2 m
Date: Late Roman
Obverse: Worn
Reverse: Worn
 Æ 1.05 g

DISCUSSION

Most of the pre-Islamic coins came from disturbed fills, with the exception of No. 2 which came from a locus of Hasmonean date which comprises cooking-pots and fragmented bowls and Nos. 8 and 17 which came from a locus of a Late Roman and Early Byzantine date together with pottery and glass finds.

The earliest coin discovered (No. 1) is a Seleucid coin of either Demetrius I or II, minted in Accho-Ptolemais. Bijovsky (1999) suggested that the bronze coins bearing a portrait on the obverse and a standing goddess holding a sceptre or torch on the reverse with the legend ΒΑΣΙΛΕΩΣ ΔΗΜΗΤΡΙΟΥ are from the reign of Demetrius I and not from that of Demetrius II, and thus ruled out any issue from the city during the first period of the reign of Demetrius II (as opposed to *SNG Israel* I: Nos. 1734-1737).

There are four Jewish coins. Three belong to two types of the coinage of Alexander Jannaeus and a fourth to either Herod Agrippa I or II. Nos. 2-3 (*TJC*: Type L) are extremely common in archaeological sites in Palestine and quite often smaller than the average Hasmonean coin size (see Shachar 2004), whereas No. 4 (*TJC*: Type O) is the rarest of the Alexander Jannaeus' coin-types and its discovery in Ramla is surprising.

Following a suggestion of S. Qedar, K. Lönnqvist (1997) proposed that the customary attribution of the bronze coins depicting a canopy and three ears of grain (No. 5) were not minted by Agrippa I in his 6th regal year, but by his son Agrippa II in the year 66/67 CE. This attribution is based on denominational, paleographic, iconographic, statistical and chronological evidence. Lönnqvist however failed to explain which calendar Agrippa II used for dating this coin by "Year 6" and, according to the now accepted theory, Agrippa II began to mint coins only in 67/68 CE (*TJC*:102-103). According to Lönnqvist this coin-type series began in about September-

October 66 CE and formed a royal contribution to the cost of the First Jewish War. This re-attribution means that the minting authority which issued the coin type was Caesarea Maritima. Qedar and Lönnqvist's re-attribution of this coin-type to Agrippa II and its minting in the contexts of the First Jewish War are very tempting to accept from an archaeological point of view. Such an attribution could explain why many Judahite sites that were abandoned because of the First Jewish War lack coins of the year 66/67 CE, yet yielded the coin-type under discussion and sometimes in considerable numbers (e.g. 'En Boqeq's *officina* [Kindler 2000: Nos. 41-44]; En-Gedi [hoard and coins: Meshorer 2007: Nos. 1-47; Ariel 2007: Nos. 14-17; Bijovsky 2007: Nos. 47-56, 486]).

No. 6 is a Roman Provincial coin, apparently of either Elagabalus (218-222 CE) or Severus Alexander (222-235 CE). The Late Roman coins are represented by Nos. 7-9 which belong to Constantine II (Nos. 7-8) and later emperors of the Late Roman Empire (Early Byzantine dated in the archaeological milieu) of the early fifth century CE (No. 9). Nos. 15-17 are worn but apparently too belong to emperors of the Late Roman Empire (383-402 CE?) based on the flan size and fabric. Nos. 10-14 are Byzantine bronze coins of larger denomination (*folles*). All are dated to the 6th century CE; one belongs to Justin I (518-527 CE) (No. 10), another one belongs to Justin II (565-578 CE) (No. 11) and three to Maurice (582-602 CE) (Nos. 12-14).

Since the Late Roman and Byzantine coins came from disturbed fills, it is difficult to establish whether they formed part of the economic life of the Late Roman and Byzantine settlements of Ramla (South) or simply stayed in circulation during the Early Islamic period and as such can be attributed to the site's respective occupation. All in all given the extent of the pre-Islamic occupation remains the number of coins recovered is modest.

ISLAMIC COINS

Nitzan Amitai-Preiss

CATALOGUE

18. Surface

Date: Arab-Byzantine / Umayyad

Type: Unkwnon mint – الوفا لله

Obverse: An imperial standing figure.

Reverse: م. Traces of exergual line legend
الوفا لله meaning (honesty belongs to God).

Æ 2.36 g. Axis 3

Comparisons: Cf. Walker 1956: 51, No. ANS9



19. Locus 23, Basket/Reg. No. 1187/2, Elevation 85.7 m

Date: Arab-Byzantine / Umayyad

Type: Byzantine, with an Arabic counter mark

Obverse: An imperial crowned standing figure, facing,
holding a sceptre in r. hand with a cross on top.

Reverse: م. On top r. a countermark with an undeciphered
Arabic legend. Possibly Lud (= re-stamped at Ludd).

Æ 1.85 g. Axis 12

Comparisons: Ilisch 1993:24, No. 203; Goodwin 2000:
15, No. B1a



20. Locus 744, Basket/Reg. No. 5861/1, Elevation 84.3 m

Date: Umayyad

Type: Arab-Byzantine, standing caliph, one of the mints
of *jund Filastīn*

Obverse: A standing caliph figure facing, geared with a
sword. On the figure's r. and l. sides traces of an Arabic
legend [محمد رسول الله].

Reverse: م, a horizontal line underneath. A hardly
decipherable legend on l. [فل] س [طين] and undecipherable
mint name on r. (possibly Iliya).

Æ, 2.78 g. Axis 12

Comparisons: Cf. Walker 1956:22-24, Nos. 73-82



21. Locus 527, Basket/Reg. No. 5103/1, Elevation 84.8 m

Date: Umayyad

Type: Al-Ramla

Obverse: A branch within a dotted circle. Marginal legend لا اله الا الله وحده .

Reverse: A crescent with a dot within a dotted circle. Traces of a marginal legend
[ضرب هذا الفلّس بالرملة].

Æ 1.14 g. Axis 12

Comparisons: Cf. Walker 1956:257-259, Nos. 855-879; Ilisch 1993:14, No. 64

22. Locus 504, Basket/Reg. No. 5167/1, Elevation 83.8 m

Date: Umayyad

Type: Al-Ramla

Same as No. 21.

Æ 2.26 gr. Axis 12

23. Locus 213, Basket/Reg. No. 3266/1, Elevation 81.4 m

Date: Umayyad

Type: Dimashq

Obverse: An Arabic legend in three lines within a double circle

. لا اله / الا الله / وحده

Reverse: A branch on top and a legend underneath within a double circle . دمشق / جائز

Æ 1.13 g. Axis 7

Comparisons: Walker 1956:249, No. 816



24. Locus 330, Basket/Reg. No. 3143/1, Elevation 83 m

Date: Umayyad

Type: Dimashq

Obverse: An Arabic legend in three lines within a circle

. لا اله / الا الله / وحده

Reverse: An Arabic legend in three lines within a circle

. ضرب هذا الفلّس بدمشق . محمد رسول الله

Æ 2.90 g

Comparisons: Walker 1956:252, No. 835



25. Locus 1575, Basket/Reg. No. 15365/1, Elevation 79.4 m

Date: Umayyad

Type: Dimashq

Obverse: Traces of an Arabic legend in three lines within a double circle . لا اله / الا الله / وحده

Reverse: Outer circle, traces of Arabic legend [ضرب / هذا الفلّس / بدمشق] .

Æ 0.75 g

Comparisons: Cf. Walker 1956:213, No. 665.



26. Surface

Date: Umayyad

Type: No mint name, dated (100-116 AH[?] / 718-735 CE)

Obverse: An Arabic legend in three lines [وحده] . لا اله / الا الله / وحده

Marginal legend (missing) [Quraan ix:33]

Reverse: An Arabic legend in three lines

. الله / احد الله / الصمد لم يلد . Marginal legend and date are missing.

Æ 2.63 g. Axis 12

Comparisons: Cf. Walker 1956:292, No. B61



27. Locus 805, Basket/Reg. No. 8026/1, Elevation 84.3 m

Date: Umayyad

Type: No mint nor date (worn)

Obverse: Traces of an Arabic legend in three lines within circles(?)

[لا اله الا الله / وحده]

Reverse: Traces of an Arabic legend in three lines within a circle(?)

[محمد / رسول / الله]

Æ 2.81 g

Comparisons: Cf. Walker 1956:212-213, Nos. 662-665

28. Locus 712, Basket/Reg. No. 5762/1, Elevation 85.3 m

Date: Abbasid

Type: Undated, but attributed to the late 130s AH

(L. Ilisch, personal communication), *Hims*, with a governor's name

Marwān b. Bashīr

Obverse: Badly effaced, within a plain circle: a jerboa. Marginal legend

around [بسم الله ضرب هذا الفليس بحمص].

Reverse: An arch with a legend in two lines بامر / مروان بن / بشير .

Marginal legend around [محمد رسول الله] ارسله [بالهدى] Quraan ix:33.

Æ 1.55 g.

Comparisons: Lavoix 1887:367, No.1418; Walker 1956:246, No.805;

Bates 1989:220-221



29. Locus 513, Basket/Reg. No. 5099/1, Elevation 83.5 m

Date: Abbasid

Type: No mint nor date (worn)

Obverse: Within a circle [] لا اله الا الله .

Reverse: A legend محمد رسول الله .

Æ 0.42 g. Axis 6

Comparisons: Cf. Ilisch 1993:34, No. 337

30. Locus 12, Basket/Reg. No. 1057/2, Elevation 85.8 m

Date: Abbasid-Fatimid(?)

Type: No mint nor date (worn and broken)

Obverse: Traces of elongated letters.

Reverse: Traces of an Arabic legend within two concentric circles.

Æ 0.26 g

Comparisons: Cf. Ilisch 1993:14, No. 104

31. Locus 16, Basket/Reg. No. 1055/1, Elevation 85.1 m

Date: Mamluk

Type: Baybars I(?), Dimashq, 658-676 AH / 1260-1277 CE

Obverse: Worn.

Reverse: Worn.

Æ 1.60 g



32. Locus 4, Basket/Reg. No. 1007/1, Elevation 81.5 m

Date: Mamluk

Type: Al-Sālih Imād al-Dīn Ismāʿīl, Dimashq, 743 AH / 1342-1343 CE

Obverse: Three segments divided by two dotted lines within a dotted circle. Double circle with a legend الملك الصالح [معيل] اس .

Reverse: Traces of an Arabic legend within a dotted circle

ضرب بدمشق في سنة / ثلاث واربعين / وسبعمائة .

Æ 2.74 g. Axis 12

Comparisons: Balog 1964:173, No. 287

33. Locus 502, Basket/Reg. No. 5035/1, Elevation 85 m

Date: Ottoman

Type: Murād III, 1574-1595 CE, Misr

Obverse: [المحروسة مصر], traces of tugrā.

Reverse: Stylized flower attached to a circle's edge with two leaves.

Æ 8.28 g

Comparisons: Kabakları 1998:420, Nos. 12-Msr-10 and 11



34. Surface

Date: Islamic

Type: No mint nor date (worn)

Obverse: Traces of Arabic letters.

Reverse: Traces of Arabic letters.

Æ 2.17 g

DISCUSSION

The Islamic coins unearthed at the excavation of Ramla (South) came from disturbed layers representing in the main late Umayyad, ʿAbbasid and early Fatimid occupation periods. The few coins of Mamluk and Ottoman dates were retrieved in close proximity to or upon the surface. Only a few coins are worth mentioning. No. 20 shows a figure of a standing caliph. The coin was minted in the contexts the monetary

and administrative reforms of ʿAbd al-Malik Ibn Marwān (685-705 CE) which ended in 696-697 CE. The name of the mint written on it cannot be deciphered with certainty. It could have been Iliya (Jerusalem), and thus be dated to 690-697 CE.¹

No. 26 has the name Marwān b. Bashīr, an unknown governor of the district of *Hims* in northern Syria, and it is surprising to find such a coin in the southernmost district *Filasṭīn*.

1. For other standing caliph type coins from mints other than Iliya, see Album and Goodwin 2002:91. Other coins of the same type minted at Iliya are dated as early as the late 680s CE, see Goodwin 2005:23.

HISTORICAL SOURCES

- Al-Ḥanbali (Mujir al-Dīn al-ʿUlaymī al-Ḥanbali). *Uns al-Jalīl Fī Tarīkh al-Quds wa-al-Khalīl*, II. Amman 1973.
- Al-Ḥimyarī (Ibn ʿAbd al-Munʿim al-Ḥimyarī). *Kitāb al-Rawḍ al-Miʿṭār Fī Khabar al-Aqtār*, ed. I. ʿAbbās (Nasser Foundation for Culture). Cairo 1980.
- Al-Muqaddasī, Muḥammad b. Aḥmad. *Aḥsan al-Taqāsīm fī Maʿrifat al-Aqālīm*, ed. M. J. de Goeje. Leiden 1906.
- Ibn Zāfir (Ġamāl al-Dīn ʿAlī Ibn Zāfir). *Aḥbār al-Duwal al-Munqaṭiʿa*, ed. A. Ferré (Publications de l'Institut Française d'Archéologie Orientale du Caire. Textes arabes et études islamiques, Tome XII). Cairo 1972.
- Josephus, VII, *Jewish Antiquities*, ed. R. Marcus. Cambridge MA 1943.
- I Maccabees. *Maccabaeorum liber I*, ed. W. Kappler. Göttingen 1936.

REFERENCES

- Abd Rabu, O. 1999. Ramla, Yeḥezqel Street. *Ḥadashot Arkheologiyot – Excavations and Surveys in Israel* 110:54*.
- Abu-ʿUqsa, H. 2005. *Bet-Sheʿan in the Early Islamic Period I-II (661-969 CE) as Reflected in the Ceramic Assemblages from the 'Tourist Centre' Excavations*. (Unpublished M.A. Thesis, University of Haifa) Haifa. (Hebrew)
- Acconci, A. 1998. Elements of the liturgical furniture. In: Piccirillo, M. and Alliata, E., eds. *Mount Nebo: New Archaeological Excavations, 1967-1997*. Jerusalem. pp. 468-542.
- Agady, S., Arazi, M., Arubas, B., Hadad, S., Khamis, E. and Tsafir, Y. 2002. Byzantine shops in the street of the monuments at Bet Shean (Scythopolis). In: Rutgers, L. V., ed. *What Athens Has to Do with Jerusalem. Essays on Classical, Jewish, and Early Christian Art and Archaeology in Honor of Gideon Foerster*. Leuven. pp. 423-506.
- Aharoni, Y. 1979. *The Land of the Bible: A Historical Geography*. (Translated ed. by A. F. Rainey from the Hebrew). Philadelphia.
- Album, S. and Goodwin, T. 2002. *Sylloge of Islamic Coins in the Ashmolean, Volume 1: The Pre-Reform Coinage of the Early Islamic Period*. Oxford.
- Alexandre, Y. 2006. Naḥal Tut (Site VIII): A fortified storage depot from the late fourth century BCE. *ʿAtiqot* 52: 131-189.
- Alliata, E. 1990. Nuove settore del monastero al Monte Nebo-Siyagha. In: Bottini, G. C., Di Segni, L. and Alliata, E., eds. *Christian Archaeology in the Holy Land, New Discoveries. Essays in Honor of Virgilio C. Corbo, OFM*. Jerusalem. pp. 427-466.
- Alliata, E. 1994. Ceramica romana, bizantina, araba. In: Piccirillo, M. and Alliata, E., eds. *Umm al-Rasas – Mayfāʿah, I. Gli scavi del complesso di Santo Stefano*. Jerusalem. pp. 278-289.
- Amar, Z. 2000. *Agricultural Produce in the Land of Israel in the Middle Ages*. Jerusalem. (Hebrew)
- Amir, R. 2004. Pottery and small finds. In: Hirschfeld, Y. *Excavations at Tiberias, 1989-1994*. (IAA Reports 22) Jerusalem. pp. 31-56.
- Amitai-Preiss, N. 2005. Arabic-inscribed pottery from Ramla. *ʿAtiqot* 49:121-122.
- Amitai-Preiss, N. 2007. Excavations in Marcus Street, Ramla: An inscribed vessel stamp. *Contract Archaeology Reports* 2:134-135.
- Amrein, H. 2001. *L'Atelier de verriers d'Avenches: L'Artisanat du verre au milieu du 1^{er} siècle après J.-C.* (Cahiers d'archéologie romande 87; Aventicum 11) Lausanne.
- Arbel, Y. 2005. Ramla. *Ḥadashot Arkheologiyot – Excavations and Surveys in Israel* 117. [<http://www.hadashot-esi.org.il>]

- Ariel, D. T. 2007. Coins of En-Gedi. In: Stern, E. *En-Gedi Excavations I: Final Report (1961-1965)*. Jerusalem. pp. 423-427.
- Arnon, Y. D. 2007. Excavations in Marcus Street, Ramla: Pottery, oil lamps and carved stone vessels. *Contract Archaeology Reports* 2:38-99.
- Arnon, Y. D. 2008. *Caesarea Maritima, the Late Periods (700-1291 CE)*. (BAR International Series 1771) Oxford.
- Aston, D. A. 2004. *Tell el-Dab'a XIII: A Corpus of Late Middle Kingdom and Second Intermediate Period Pottery*. Vienna.
- Avi-Yonah, M. 1979. *The Holy Land from the Persian to the Arab Conquest (536 B.C. -to A.D. 640): A Geographical History*. (Revised ed. by A. F. Rainey). Grand Rapids.
- Aviam, M. 2002. Five ecclesiastical sites in western Upper Galilee. In: Gal, Z., ed. *Eretz Zafon: Studies in Galilean Archaeology*. Jerusalem. pp. 165-217. (Hebrew; English summary pp. 184*-185*)
- Aviam, M. and Gorin-Rosen, Y. 1997. Three burial caves from the Roman period at Ḥurfeish. *ʿAtiqot* 33:25-37. (Hebrew; English summary p. 9*)
- Avissar, M. 1996. The Medieval pottery. In: Ben-Tor, A., Avissar, M. and Portugali, Y., eds. *Yoqne'am I: The Late Periods*. (Qedem Reports 3) Jerusalem. pp. 75-172.
- Avissar, M. 1998. Lod – A mosaic floor. *Excavations and Surveys in Israel* 17:169-172.
- Avissar, M. 2000. Ramla (A). *Ḥadashot Arkheologiyot – Excavations and Surveys in Israel* 112:68*-69*.
- Avissar, M. 2006. The pottery. In: Barbé, H. Building fragments of the Early Islamic period on Ha-Gedud Ha-ʿIvri Street in Ramla. *ʿAtiqot* 51:41*-46*. (Hebrew; English summary pp. 237-238)
- Avissar, M. 2007. Ramla, David Raziʿel Street. *Ḥadashot Arkheologiyot – Excavations and Surveys in Israel* 119. [<http://www.hadashot-esi.org.il>]
- Avissar, M. and Shabu, E. 2000. Qula. *Excavations and Surveys in Israel* 20:51*.
- Avissar, M. and Stern, E. J. 2005. *Pottery of the Crusader, Ayyubid, and Mamluk Periods in Israel*. (IAA Reports 26) Jerusalem.
- Avni, G. 2008. “The Most Beautiful of Cities”. Ramla during the Early Islamic period: An archaeological survey. *Qadmoniot* 135:2-11. (Hebrew)
- Avni, G. in press. Continuity and change in urban centres of Palestine during the Early Islamic period – Jerusalem and Ramla as case studies. In: Holum, K. and Lapin, H., eds. *Shaping the Middle East*. Maryland.
- Ayalon, E. 1997a. The end of the ancient wine industry in the central coastal plain. In: Friedman, Y., Safrai, Z. and Schwartz, J., eds. *Hikrei Eretz: Studies in the History of the Land of Israel, Dedicated to Prof. Yehuda Feliks*. Ramat Gan. pp. 149-166. (Hebrew)
- Ayalon, E. 1997b. Ecological aspects of villages in the southern Sharon region during the Roman-Byzantine period. In: Dar, S. and Safrai, Z., eds. *The Village in Ancient Israel*. Tel Aviv. pp. 209-227. (Hebrew)
- Ayalon, E. 1998. Ancient Kefar Sava in the light of recent excavations. *ʿAtiqot* 34:107-120. (Hebrew; English summary pp. 8*-9*)
- Ayalon, E. 2000. Typology and chronology of water-wheel (*sāqiya*) pottery pots from Israel. *Israel Exploration Journal* 50:216-226.
- Ayalon, E. 2004. The stone and metal implements from Ḥorvat Raqit. In: Dar, S. *Raqit: Marinus' Estate on the Carmel, Israel*. (British Archaeological Reports International Series 1300) Oxford. pp. 268-296.
- Ayalon, E. and Harpazi-Ofer, S. 2007. A Late Roman burial cave and dump at Tell Qasile. *ʿAtiqot* 55:29-36. (Hebrew; English summary pp. 54-55)
- Ayash, E. 2000. Ramla (B). *Ḥadashot Arkheologiyot – Excavations and Surveys in Israel* 112:69*-70*.
- Bagatti, B. 1953. Bombe a “Fuoco Greco” in Palestina. *Faenza* 39:35-38.
- Bagatti, B. 1971. *The Church from the Gentiles in Palestine: History and Archaeology*. Jerusalem.
- Bagatti, B. and Milik, J. T. 1958. *Gli scavi del “Dominus Flevit” (Monte Oliveto-Gerusalemme)*, I: *La necropoli del periodo romano*. Jerusalem.

- Bailey, D. M. 1998. *Excavations at el-Ashmunein V: Pottery, Lamps and Glass of the Late Roman and Early Arab Periods*. London.
- Ballet, P. 1991. Ceramics, Coptic. In: Atiya, A. S., ed. *The Coptic Encyclopedia*, 2. New York. pp. 480-504.
- Balog, P. 1964. *The Coinage of the Mamlūk Sultans of Egypt and Syria*. New York.
- Balog, P. 1970. Islamic bronze weights from Egypt. *Journal of the Economic and Social History of the Orient* 13: 233-256.
- Bar-Nathan, R. 2002. *Hasmonean and Herodian Palaces at Jericho. Final Report of the 1973-1987 Excavations, III: The Pottery*. Jerusalem.
- Barag, D. 1970. *Glass Vessels of the Roman and Byzantine Periods in Palestine*. (Unpublished Ph.D. Dissertation, The Hebrew University) Jerusalem. (Hebrew)
- Barag, D. 1976. The glass vessels. In: Avigad, N. *Beth She'arim: Report on the Excavation during 1953-1958*, III: *Catacombs 12-23*. Jerusalem. pp. 198-209.
- Barag, D. 1978. *Ḥanita, Tomb XV: A Tomb of the Third and Early Fourth Century CE*. (ʿAtiqot 13) Jerusalem.
- Barag, D. and Hershkovitz, M. 1994. Lamps from Masada. In: Aviram, J., Foerster, G. and Netzer, E., eds. *Masada IV. The Yigael Yadin Excavations 1963-1965 Final Reports: Lamps · Textiles · Basketry, Cordage and Related Artefacts · Wood Remains · Ballista Balls*. Jerusalem. pp. 7-147 passim.
- Baramki, D. C. 1944. The pottery from Kh. el-Meḥḥer. *Quarterly of the Department of Antiquities in Palestine* 10:65-103.
- Barbé, H. 2006. Building fragments of the Early Islamic period on Ha-Gedud Ha-ʿIvri Street in Ramla. *ʿAtiqot* 51: 41*-46*. (Hebrew; English summary pp. 237-238)
- Barkai, R. and Gopher, A. 1999. The last Neolithic flint industry: A study of the technology, typology and social implication of the lithic assemblage from Naḥal Zehora I, a Wadi Raba (Pottery Neolithic) site in the Menashe Hills, Israel. *Journal of the Israel Prehistoric Society* 29:41-122.
- Bass, G. F. and van Doorninck, F. H. 2004. The ship, its lading, and its living spaces. In: Bass, G. F., Matthews, S. D., Steffy, J. R. and van Doorninck, F. H., eds. *Serçe Limani: An Eleventh-Century Shipwreck*, 1: *The Ship and Its Anchorage, Crew, and Passengers*. College Station. pp. 265-272.
- Bates, M. L. 1989. The coinage of Syria under the Umayyads, 692-750 A.D. In: Bakhit, M. A. and Schick, R., eds. *Proceedings of The Fourth International Conference on the History of Bilad al- Sham During the Umayyad Period*, II. Amman. pp. 195-228.
- Beck, P. 2000a. Area B: pottery. In: Kochavi, M. Beck, P. and Yadin, E., eds. *Aphek Antipatris I: Excavations of Areas A and B: The 1972-1976 Seasons*. (Monograph Series of the Institute of Archaeology of Tel Aviv University 19) Tel Aviv. pp. 93-133.
- Beck, P. 2000b. Area A: Middle Bronze Age IIA pottery. In: Kochavi, M. Beck, P. and Yadin, E., eds. *Aphek Antipatris I: Excavations of Areas A and B. The 1972-1976 Seasons*. (Monograph Series of the Institute of Archaeology of Tel Aviv University 19) Tel Aviv. pp. 173-238.
- Ben-Arieh, R. 1997. The Roman, Byzantine and Umayyad pottery. In: Hirschfeld, Y. *The Roman Baths at Hammath Gader*. Jerusalem. pp. 347-381.
- Ben-Dov, M. 1973. Remains of a synagogue at Kokhav Ha-Yarden and the site of Grofina in Gilead. In: Aviram, J., ed. *Eretz Shomron: The Thirteenth Archaeological Convention, September 1972*. Jerusalem. pp. 86-98. (Hebrew)
- Ben-Dov, M. 1975. Roman-Byzantine dwellings at Kafr Nassej. *Eretz-Israel* 12:171-185. (Hebrew; English summary p. 124*)
- Ben-Dov, M. 1982. *The Dig at the Temple Mount*. Jerusalem. (Hebrew)
- Ben-Shlomo, D. 2005. Material culture. In: Dothan, M. and Ben-Shlomo, D. *Ashdod VI: Excavations of Areas H-K*. (IAA Reports 24) Jerusalem. pp. 63-246.

- Ben-Tor, D. 1997. The relations between Egypt and Palestine in the Middle Kingdom as reflected by contemporary Canaanite scarabs. *Israel Exploration Journal* 47:162-189.
- Ben-Tor, D. 2003 Egyptian-Levantine relations and chronology in the Middle Bronze Age: Scarab research. In: M. Bietak, ed. *The Synchronisation of Civilisations in the Eastern Mediterranean in the Second Millennium B.C.*, II. Vienna. pp. 239-248.
- Ben-Tor, D. 2007. *Scarabs, Chronology, and Interconnections: Egypt and Palestine in the Second Intermediate Period*. (Orbis Biblicus et Orientalis, Series Archaeologica 27) Fribourg.
- Ben-Zvi, I. 1954. A Samaritan inscription from Kfar Bilu. *Bulletin of the Israel Exploration Society* 18:223-229. (Hebrew)
- Ben-Zvi, I. 1976. *The Book of the Samaritans*. (3rd ed.) Jerusalem. (Hebrew)
- Bijovsky, G. 1999. A coin of Demetrius I from Akko-Ptolemais. *Israel Numismatic Journal* 13:39-45.
- Bijovsky, G. 2007. The coins. In: Hirschfeld, Y. *En-Gedi Excavations II: Final Report (1996-2002)*. Jerusalem. pp. 157-233.
- Boas, A. J. 1997. Late ceramic typology. In: Hirschfeld, Y. *The Roman Baths at Hammath Gader*. Jerusalem. pp. 382-395.
- Boas, A. J. 1999. *Crusader Archaeology: The Material Culture of the Latin East*. London.
- Brosh, N. 1980. A reexamination of Islamic ceramic "Grenades". *Atiqot* 14:114-115.
- Brosh, N. 1990. Glass window fragments from Khirbet Al-Mafgar. *Annales du 11^e Congrès de l'Association Internationale pour l'Histoire du Verre*. Amsterdam. pp. 247-256.
- Brand, E. 1993. Ramat Gan. *Excavations and Surveys in Israel* 13:48-50.
- Bouchenino, A. 2007. Building remains and industrial installations from the Early Islamic period at Khirbet Deiran, Rehovot. *Atiqot* 56:119-144. (Hebrew; English summary pp. 84*-85*)
- Buchennino, A. 2008. Ramla, Beit Abu al-Hada. *Hadashot Arkheologiyot – Excavations and Surveys in Israel* 120. [<http://www.hadashot-esi.org.il>]
- Bullard, R. G. 1970. Geological studies in field archaeology. *Biblical Archaeologist* 33:98-132.
- Burke, A. A. 2004. *The Architecture of Defense: Fortified Settlement of the Levant during the Middle Bronze Age*. (Unpublished Ph.D. Dissertation, University of Chicago). Chicago.
- Butler, H. C. 1969. *Early Churches in Syria: Fourth to Seventh Centuries*. (Reprinted ed.) Amsterdam.
- Cameron, C. M. 1993. Abandonment and archaeological interpretation. In: Cameron, C. M. and Tomka, S. A., eds. *Abandonment of Settlements and Regions: Ethnoarchaeological and Archaeological Approaches*. Cambridge. pp. 3-7
- Cohen, S. L. 2002. *Canaanites, Chronologies, and Connections: The Relationship of Middle Bronze IIA Canaan to Middle Kingdom Egypt*. Winona Lake.
- Cohen Finkelstein, J. 1997a. The Islamic pottery from Khirbet Abu Suwwana. *Atiqot* 32:19*-34*.
- Cohen Finkelstein, J. 1997b. Method of pottery recording and analysis: The Islamic periods. In: Finkelstein, I. and Lederman, Z., eds. *Highlands of Many Cultures: The Southern Samaria Survey*. (Monograph Series of the Institute of Archaeology of Tel Aviv University 14) Tel Aviv. pp. 40-71.
- Corbo, V. 1955. *Gli scavi di Kh. Siyar el-Ghanam (Campo dei Pastori) e i monasteri dei dintorni*. (Studium Biblicum Franciscanum 11) Jerusalem.
- Creswell, K. A. C. 1969. *Early Muslim Architecture: Umayyads, AD 622-750*, I-II. (2nd ed.). Oxford.
- Crowfoot, G. M. 1957. The glass. In: Crowfoot J. W., Crowfoot G. M. and Kenyon K. M. *The Objects from Samaria*. London. pp. 403-422.
- Crowfoot Payne, J. 1983. The flint industries of Jericho. In: Kenyon, K. M. and Holland, T. A., eds. *Excavations at Jericho*, 5. London. pp. 622-757.
- Dahari, U. 2002. Region XIV: Survey and excavations of caves along the fault escarpment from Naḥal Kidron to Naḥal Deragot. *Atiqot* 41/2:209-247.

- Dar, S. 1999. *Sumaqa: A Roman and Byzantine Jewish Village on Mount Carmel, Israel*. (British Archaeological Reports International Series 815) Oxford.
- de Saulcy, F. 1874. Notes sur les projectiles à main creux et en terre cuite de fabrication arabe. *Mémoires de la Société Nationale des Antiquaires de France* 35:25-34.
- de Vaux, R. and Steve, A. M. 1950. *Fouilles à Qaryet el-‘Enab, Abū Gōsh, Palestine*. Paris.
- de Vincenz, A. 2004. Stamped handles from Ramla – Israel. In: Eiring, J. and Lund, J., eds. *Transport Amphorae and Trade in the Eastern Mediterranean. Acts of the International Colloquium at the Danish Institute at Athens, September 26-29, 2002*. Athens. pp. 403-406.
- Delougaz, P. and Haines, R. C., eds. 1960. *A Byzantine Church at Khirbat al-Karak*. (The University of Chicago Oriental Institute Publications 65) Chicago.
- Dever, W. G. 1973a. Tower 5017 at Gezer: A rejoinder. *Israel Exploration Journal* 23:23-26.
- Dever, W. G. 1973b. The Gezer fortifications and the ‘High Place’: An illustration of stratigraphic methods and problems. *Palestine Exploration Quarterly* 105:61-70.
- Dever, W. G. 1986. *Gezer IV: The 1969-71 Seasons in Field VI, the “Acropolis”*. Jerusalem.
- Dever, W. G. 1993. Gezer. In: Stern, E., ed. *New Encyclopedia of Archaeological Excavations in the Holy Land*, 2. Jerusalem. pp. 496-506.
- DOC I. Bellinger, A. R. 1966. *Catalogue of the Byzantine Coinage in the Dumbarton Oaks Collection and in the Whitmore Collection. Volume One: Anastasius I to Maurice 491-602*. Washington.
- Dornemann, H. 1979. Tell Hadidi: A millennium of Bronze Age city occupation. *Annual of the American Schools of Oriental Research* 44:113-151.
- Dorsey, D. A. 1991. *The Roads and Highways of Ancient Israel*. Baltimore and London.
- Dothan, M. 1993. Ashdod. In: Stern, E., ed. *The New Encyclopedia of Archaeological Excavations in the Holy Land*, 1. Jerusalem. pp. 93-102.
- Dothan, M. and Porath, Y. 1993. *Ashdod V: Excavations of Area G. The Fourth-Sixth Season of Excavations 1968-1970*. (‘Atiqot 23) Jerusalem.
- Dussart, O. 1997. Les verres. In: Clamer, C. *Fouilles archéologiques de ‘Ain ez-Zâra/Callirrhoé villégiature hérodienne*. (Institut Français d’Archéologie du Proche-Orient: Beyrouth–Damas–Amman. Bibliothèque Archéologique et Historique 147) Beirut. pp. 96-171.
- Elgavish, J. 1977. *Archaeological Excavations at Shikmona: The Pottery of the Roman Period*. Haifa. (Hebrew)
- Elisha, Y. 2007. Ḥorbat Harmas. *Ḥadashot Arkheologiyot – Excavations and Surveys in Israel* 119. [<http://www.hadashot-esi.org.il>]
- Encyclopedia of Agriculture*. Halperin, H., ed. 1972. *The Encyclopedia of Agriculture*, II. Tel Aviv. (Hebrew)
- Encyclopedia of Islam*. Lewis, B., Pellat, C. and Schacht, J., eds. 1965. *The Encyclopedia of Islam*, II. Leiden.
- Epstein, K. 1974. Middle Bronze Age tombs at Kfar Szold and Ginosar. ‘*Atiqot* 7:13-39. (Hebrew Series; English summary pp. 2*-6*)
- Erdmann, E. 1977. Die Glasfunde von Mezad Tamar (Kasr Gehainije) in Israel. *Saalburg-Jahrbuch* 34:98-146.
- Ettinghausen, R. 1965. The uses of spherico-conical vessels in the Muslim East. *Journal of Near Eastern Studies* 24:218-229.
- Faegri, K. and Ivensen, J. 1989. *Textbook of Pollen Analysis*. (4th ed. revised). Oxford.
- Fischer, A. and Patrick McCray, W. 1999. Glass production activities as practised at Sepphoris, Israel (37 BC-AD 1516). *Journal of Archaeological Science* 26:893-905.
- Fischer, M., Gichon, M. and Tal, O. 2000. ‘*En Boqeq. Excavations in an Oasis on the Dead Sea, II: The Officina – An Early Roman Building on the Dead Sea Shore*. Mainz.
- Fischer, M., Isaac, B. and Roll, I. 1996. *Roman Roads in Judaea, II: The Jaffa-Jerusalem Roads*. (British Archaeological Reports International Series 628) Oxford.

- Fischer, M., Roll, I. and Tal, O. 2008. Persian and Hellenistic remains at Tel Ya'oz. *Tel Aviv* 35:123-163.
- Fischer, M. and Tal, O. 1999. Stone artefacts from the Byzantine period. In: Beit Arie, I., ed. *Tel'era: A Stronghold in the Biblical Negev*. (Monograph Series of the Institute of Archaeology of Tel Aviv University 15) Tel Aviv. pp. 421-427.
- Fischer, M. and Tal, O. 2000. Pottery. In: Fischer, M., Gichon, M. and Tal, O. *En Boqeq. Excavations in an Oasis on the Dead Sea, II: The Officina – An Early Roman Building on the Dead Sea Shore*. Mainz. pp. 29-67.
- Fischer, M. and Taxel, I. 2006. Yavne, Survey Map. *Hadashot Arkheologiyot – Excavations and Surveys in Israel* 118. [<http://www.hadashot-esi.org.il>]
- Fischer, M. and Taxel, I. Forthcoming. Rural settlement in the vicinity of Yavneh in the Byzantine period: A religio-archaeological perspective. *Bulletin of the American Schools of Oriental Research* 350.
- Foy, D. and Nenna, M.-D. 2001. *Tout feu tout sable: Mille ans de verre antique dans le Midi de la France*. Marseilles.
- Frankel, R. 1994. Ancient oil mills and presses in the Land of Israel. In: Frankel, R., Avitsur, S. and Ayalon, E. *History and Technology of Olive Oil in the Holy Land*. Arlington and Tel Aviv. pp. 19-89.
- Frankel, R. 1999. *Wine and Oil Production in Antiquity in Israel and Other Mediterranean Countries*. (JSOT/ASOR Monograph Series 10) Sheffield.
- Frankel, R. 2003a. Mills and querns in Talmudic literature – A reappraisal in light of archaeological evidence. *Cathedra* 110:43-60. (Hebrew; English summary p. 188)
- Frankel, R. 2003b. The Olynthus mill, its origin, and diffusion: Typology and distribution. *American Journal of Archaeology* 107:1-21.
- Freestone, I. C., Gorin-Rosen, Y. and Hughes, M. J. 2000. Primary glass from Israel and the production of glass in Late Antiquity and the Early Islamic period. In: Nenna, M.-D., ed. *La route du verre: Ateliers primaires et secondaires du second millénaire av. J.-C. au Moyen Age*. (Travaux de la Maison de l'Orient Méditerranéen 33) Lyons. pp. 65-84.
- Freestone, I. C., Jackson-Tal, R. E. and Tal, O. 2008. Raw glass and the production of glass vessels at Late Byzantine Apollonia-Arsuf, Israel. *Journal of Glass Studies* 50.
- Gadot, Y. and Tepper, Y. 2003. A Late Byzantine pottery workshop at Khirbet Baraqa. *Tel Aviv* 30:130-162.
- Galili, E. and Sharvit, J. 2001. A millstone quarry on the 'Akko coastline. *'Atiqot* 42:73*-78*. (Hebrew; English summary p. 326)
- Gat, S. 2004. *The City of Ramla in the Middle Ages*. (Unpublished Ph.D. Dissertation, Bar Ilan University) Ramat Gan. (Hebrew)
- Gat, S. 2007. A flourishing Arab city: The economy of Medieval Ramla. *Cathedra* 123:39-66. (Hebrew; English summary pp. 191-192)
- Gat, S. 2008. The forgotten destruction of early Ramla. *Qadmoniot* 135:64-69. (Hebrew)
- Gayraud, R. P. 2003. La transition céramique en Egypte, VII^e-IX^e siècles. In: *VII^e congrès international sur la céramique médiévale en Méditerranée, Thessaloniki, 11-16 Octobre 1999*. Athens. pp. 558-562.
- Gichon, M. 1974. Fine Byzantine wares from the south of Israel. *Palestine Exploration Quarterly* 106:119-139.
- Gil, M. 1992. *A History of Palestine, 634-1099*. Cambridge.
- Gil, M. 1997. *In the Kingdom of Ishmael, 3: Texts from the Cairo Geniza: Letters of Jewish Merchants*. Jerusalem. (Hebrew)
- Gilead, D. 1973. Flint industry of the Bronze Age from Har Yeruham and Tel Nagila. In: Aharoni, Y., ed. *Excavations and Studies*. Tel Aviv. pp. 133-141. (Hebrew)
- Gitin, S. 1990. *Gezer III: A Ceramic Typology of the Late Iron II, Persian and Hellenistic Periods at Tell Gezer*. Jerusalem.
- Gitler, H. and Tal, O. 2006. *The Coinage of Philistia of the Fifth and Fourth Centuries BC: A Study of the Earliest Coins of Palestine*. (Collezioni Numismatiche 6) Milan.

- Glick, D. 1998. Nes Ziyiyona, Yad Eli'ezer. *Excavations and Surveys in Israel* 18:73.
- Glick, D. and Gamil, D. 1999. Ramla. *Excavations and Surveys in Israel* 19:52*-53*.
- Goodwin, T. 2000. Seventh century countermarks from Syria. *Oriental Numismatic Society Newsletter* 162:13-16.
- Goodwin, T. 2005. *Arab-Byzantine Coinage*. London.
- Gopher, A. 1989. *The Flint Assemblage of Munhata – Final Report*. (Les Cahiers du Centre de Recherches Français de Jerusalem – 4. Association Paléorient) Paris.
- Gopher, A. and Blockman, N. 2004. Excavations at Lod (Neve Yaraq) and the Lodian culture of the Pottery Neolithic Period. *Atiqot* 47:1-50.
- Gophna, R. and Beck, P. 1981. The rural aspect of the settlement pattern of the coastal plain in the Middle Bronze Age II. *Tel Aviv* 8:45-80.
- Gophna, R. and Beit-Arieh, Y. 1997. *Archaeological Survey of Israel: Map of Lod (80)*. Jerusalem.
- Gophna, R. and Taxel, I. 2007. Pottery. In: Gophna, R., Taxel, I. and Feldstein, A. Kafr 'Ana: A rural settlement in the Lod Valley. *Salvage Excavation Reports* 4:33-65.
- Gorin-Rosen, Y. 1997. The glass vessels. In: Aviam, M. and Stern, E. J. Burial caves near Ḥ. Sugar. *Atiqot* 33:96-98. (Hebrew; English summary p. 16*)
- Gorin-Rosen, Y. 1999. Glass vessels from recent excavations in Ramla: A preliminary presentation. In: Gibson, S. and Vitto, F., eds. *Ramla: The Development of a Town from the Early Islamic to Ottoman Periods*. One Day Conference. Jerusalem. pp. 10-15.
- Gorin-Rosen, Y. 2000a. Glass vessels from a burial cave at Beth She'an. *Atiqot* 39:200.
- Gorin-Rosen, Y. 2000b. The ancient glass industry in Israel: Summary of the finds and new discoveries. In: Nenna, M.-D., ed. *La route du verre: Ateliers primaires et secondaires du second millénaire av. J.-C. au Moyen Age*. (Travaux de la Maison de l'Orient Méditerranéen 33) Lyons. pp. 49-63.
- Gorin-Rosen, Y. 2000c. Glass from monasteries and chapels in South Sinai. In: Dahari, U. *Monastic Settlements in South Sinai in the Byzantine Period: The Archaeological Remains*. (IAA Reports 9) Jerusalem. pp. 233-245.
- Gorin-Rosen, Y. 2002. The glass vessels from Burial Cave D at Ḥurfeish. In: Gal, Z., ed. *Eretz Zafon: Studies in Galilean Archaeology*. Jerusalem. pp. 140*-166*.
- Gorin-Rosen, Y. 2004a. The glass finds. In: Jabour, I. Khirbat Jarrar. *Ḥadashot Arkheologiyot – Excavations and Surveys in Israel* 116:17*-18*.
- Gorin-Rosen, Y. 2004b. The glass finds. In: Sa'id, K. Jatt (B). *Ḥadashot Arkheologiyot – Excavations and Surveys in Israel* 116:26*.
- Gorin-Rosen, Y. 2005a. The glass vessels. In: Sion, O. Khirbat Hermas. *Ḥadashot Arkheologiyot – Excavations and Surveys in Israel* 117. [<http://www.hadashot-esi.org.il>]
- Gorin-Rosen, Y. 2005b. The glass vessels. In: Avissar M. *Tel Yoqne'am, Excavations on the Acropolis*. (IAA Reports 25) Jerusalem. pp. 103-109.
- Gorin-Rosen, Y. 2006. The glass finds from Ḥorbat Hermas. *Atiqot* 51:33*-35*. (Hebrew; English summary p. 236)
- Gorin-Rosen, Y. and Katsnelson, N. 2005. Glass finds from the salvage excavations at Ramla. *Atiqot* 49: 101-114.
- Gorin-Rosen, Y. and Katsnelson, N. 2007. Local glass production in the Late Roman–Early Byzantine periods in light of the glass finds from Khirbat el-Ni'ana. *Atiqot* 57:73-154.
- Gorzalczany, A. 2004. A site from the end of the Byzantine and the Early Islamic periods at Ṣarafand el-Kharab, Nes Ziyiyona. *Atiqot* 46:37-47. (Hebrew; English summary pp. 130*-131*)
- Gorzalczany, A. 2006. Ramla South. *Ḥadashot Arkheologiyot – Excavations and Surveys in Israel* 118. [<http://www.hadashot-esi.org.il>]
- Gorzalczany, A. 2008a. The Umayyad aqueduct to Ramla. *Qadmoniot* 135:11-16. (Hebrew)

- Gorzalczany, A. 2008b. Excavations in residential and industrial zone of the Early Islamic period at Mazliah. *Qadmoniot* 135:30-35. (Hebrew)
- Graham, M. 1993. Settlement organization and residential variability among the Rarámuri. In: Cameron, C. M. and Tomka, S. A., eds. *Abandonment of Settlements and Regions. Ethnoarchaeological and Archaeological Approaches*. Cambridge. pp. 25-42.
- Grierson, P. and Mays, M. 1992. *Catalogue of Late Roman Coins in the Dumbarton Oaks Collection and the Whitmore Collection: From Arcadius and Honorius to the Accession of Anastasius*. Washington.
- Griffith, S. H. 1985. The Arabic account of ‘Abd al-Masih an-Nagğrānī al-Ghassānī. *Le Muséon* 63:361-374.
- Grose, D. F. 1979. The Syro-Palestinian glass industry in the later Hellenistic period. *Muse* 13:54-65.
- Grose, D. F. 1989. *The Toledo Museum of Art. Early Ancient Glass: Core-Formed, Rod-Formed, and Cast Vessels and Objects from the Late Bronze Age to the Early Roman Empire, 1600 B. C. to A. D. 50*. New York.
- Grossberg, A. 2002. Cooking pots with holes found in Jerusalem and the customs of Haverim and Amei Ha-Aretz. In: Baruch, E. and Faust, A., eds. *New Studies on Jerusalem* 8:59-71. (Hebrew)
- Gudovitch, S. 1999. Khirbet ‘Aşfura. *Ḥadashot Arkheologiyot – Excavations and Surveys in Israel* 109:79*-81*.
- Gudovitch, S. 2004. Ramla (A). *Ḥadashot Arkheologiyot – Excavations and Surveys in Israel* 116:41*.
- Guidoboni, E. 1994. *Catalogue of Ancient Earthquakes in the Mediterranean Area up to the 10th Century*. Rome.
- Günsenin, N. 1989. Recherches sur les amphores byzantine dans les musées Turcs. In: Déroche, V. and Spieser, J. M., eds. *Recherches sur la céramique byzantine*. Paris. pp. 267-276.
- Gutfeld, O. 1999. Ramla (A). *Ḥadashot Arkheologiyot – Excavations and Surveys in Israel* 109:65*-66*.
- Guz-Zilberstein, B. 1995. The typology of the Hellenistic coarse ware and selected loci of the Hellenistic and Roman periods. In: Stern, E., dir. *Excavations at Dor, Final Report Volume I B. Areas A and C: The Finds*. (Qedem Reports 2) Jerusalem. pp. 289-433.
- Hadad, S. 2000. Incised glass vessels from the Umayyad and ‘Abbasid-Fatimid periods at Bet Shean, Israel. *Bulletin of the American Schools of Oriental Research* 317:63-73.
- Hadad, S. 2002. *The Oil Lamps from the Hebrew University Excavations at Bet Shean*. (Qedem Reports 4) Jerusalem.
- Hadad, S. 2005. *Islamic Glass Vessels from the Hebrew University Excavations at Bet Shean*. (Qedem Reports 8) Jerusalem.
- Harding, G. L. 1951. Excavations on the Citadel, Amman. *Annual of the Department of Antiquities of Jordan* 1: 7-16.
- Harrell, J. A. and Brown, J. M. 2008. Discovery of a Medieval Islamic industry for steatite cooking vessels in Egypt’s Eastern Desert. In: Rowan, Y. M. and Ebeling, J. R., eds. *New Approaches to Old Stones: Recent Studies on Ground Stone Artifacts*. London and Oakville. pp. 41-65.
- Hartal, M. 2005. *Land of the Ituraeans: Archaeology and History of Northern Golan in the Hellenistic, Roman and Byzantine Periods*. Qazrin. (Hebrew)
- Hayes, J. W. 1992. *Excavations at Sarachane in Istanbul, II: The Pottery*. Princeton.
- Heinz, M. 1992. *Tell Atchana/Alalakh: Die Schichten VII-XVII*. Neukirchen-Vluyn.
- Hermon, S. 2003. *Socio-Economic Aspects of Chalcolithic (4500-3500 BC) Societies in the Levant – A Lithic Perspective*. (Unpublished Ph.D. Dissertation, Ben-Gurion University) Beer Sheva.
- Hirschfeld, Y. 1999. *The Early Byzantine Monastery at Khirbet ed-Deir in the Judean Desert: The Excavations in 1981-1987*. (Qedem 38) Jerusalem.
- Hirschfeld, Y. 2000. Ḥorvat ‘Aqav: Architecture and stratigraphy. In: Hirschfeld, Y., *Ramat Hanadiv Excavations. Final Report of the 1984-1988 Seasons*. Jerusalem. pp. 13-87.

- Hirschfeld, Y. 2002. Deir Qal'ā and the monasteries of western Samaria. In: Humphrey, J. H., ed. *The Roman and Byzantine Near East, 3: Late-Antique Petra, Nile Festival Building at Sepphoris, Deir Qal'ā Monastery, Khirbet Qana Village and Pilgrim Site, 'Ain 'Arrub Hiding Complex, and Other Studies*. (JRA Supplement 49) Ann Arbor. pp. 155-189.
- Hirschfeld, Y. and Shapira, Y. 1999. Ramla, Nesher Quarries (East). *Ḥadashot Arkheologiyot – Excavations and Surveys in Israel* 110:52*.
- Hoffman, T. 2003. *Ascalon 'Arus al-Sham: Domestic Architecture and the Development of a Byzantine-Islamic City*. (Unpublished Ph.D. Dissertation, University of Chicago) Chicago.
- Holland, L. 1986. Islamic bronze weights from Caesarea Maritima. *American Numismatic Society, Museum Notes* 31:171-201.
- Ilan, D. 1996. The Middle Bronze Age tombs. In: Biran, A., Ilan, D. and Greenberg, R. *Dan I: A Chronicle of the Excavations, the Pottery Neolithic, the Early Bronze Age and the Middle Bronze Age Tombs*. Jerusalem. pp. 163-267.
- Ilisch, L. 1993. *Sylloge Numorum Arabicorum Tübingen, I. Palästina, IVa: Bilād aš-Šām*. Tübingen.
- Israel, Y. 1993. Survey of pottery workshops, Naḥal Lakhish-Naḥal Besor. *Excavations and Surveys in Israel* 13: 106-107.
- Israel, Y. 1995. The economy of the Gaza-Ashkelon region in the Byzantine period in the light of the archaeological survey and excavations of the '3rd Mile Estate' near Ashkelon. *Michmanim* 8:119-132. (Hebrew; English summary pp. 16*-17*)
- Israel, Y., Nahlieli, D. and Ben Michael, Y. 1995. The Naḥal Shaḥaḥ site: An Early Islamic settlement in the northern 'Arava. *'Atiqot* 26:1*-14*. (Hebrew; English summary p. 113)
- Jackson-Tal, R. E. 2004. The Late Hellenistic glass industry in Syro-Palestine: A reappraisal. *Journal of Glass Study* 46:11-32.
- Jackson-Tal, R. E. 2005. The glass vessels from 'En Gedi. *'Atiqot* 49:73*-82*. (Hebrew; English summary p. 138)
- Jackson-Tal, R. E. 2007. Glass vessels from En-Gedi. In: Hirschfeld Y. *En-Gedi Excavations II, Final Report (1996-2002)*. Jerusalem. pp. 474-506.
- Jacobson, G. L. 2004. The glass vessels from Ḥorvat Raqit. In: Dar, S. *Raqit: Marinus' Estate on the Carmel, Israel*. (British Archaeological Reports International Series 1300) Oxford. pp. 242-254.
- Jenkins, M. 1992. Early Medieval Islamic pottery: The eleventh century reconsidered. *Muqarnas* 9:56-66.
- Johnson, B. L. 1988. The pottery. In: Weinberg, G. D., ed. *Excavations at Jalame, Site of a Glass Factory in Late Roman Palestine*. Columbia. pp. 137-226.
- Johnson, B. L. 2000. Pottery. In: Dothan, M. and Johnson, B. L., eds. *Hammath Tiberias, 2: Late Synagogues*. Jerusalem. pp. 54-74.
- Johnson, B. L. 2006. The Hellenistic to Early Islamic period pottery. In: Mazar, A., ed. *Excavations at Tel Beth-Shean 1989-1996, 1: From the Late Bronze Age IIB to the Medieval Period*. Jerusalem. pp. 523-589.
- Kabaklarlı, N. 1998. "MANGIR" Osmanlı İmparatorluğu Bakır Paraları 1299-1808. Istanbul.
- Kaplan, J. 1958. Excavations at the White Mosque in Ramla. *'Atiqot* 2:96-103. (Hebrew Series)
- Kasher, A. 1990. *Jews and Hellenistic Cities in Eretz-Israel: Relations of the Jews in Eretz-Israel with the Hellenistic Cities during the Second Temple Period (332 BCE-70 CE)*. (Texte und Studien zum Antiken Judentum 21) Tübingen.
- Katsnelson, N. 1999. Glass vessels from the Painted Tomb at Migdal Ashqelon. *'Atiqot* 37:67*-82*.
- Keel, O. 1995. *Corpus der Stempelsiegel-Amulette aus Palästina/Israel von den Anfängen bis zur Perserzeit*. (Orbis Biblicus et Orientalis, Series Archaeologica 10) Freiburg.
- Keel, O. 1997. *Corpus der Stempelsiegel-Amulette aus Palästina/Israel von den Anfängen bis zur Perserzeit. Katalog Band 1: von Tell Abu Farag bis 'Atlit*. (Orbis Biblicus et Orientalis, Series Archaeologica 13) Freiburg.

- Kempinski, A. 1984. The pottery of the Middle Bronze Age strata. 1. The local pottery. In: Stern, E. 1984. *Excavations at Tel Mevorakh (1973-1976). Part Two: The Bronze Age.* (Qedem 18) Jerusalem. pp. 55-58.
- Kessin Berman, E. 1989. Glazed pottery. In: Tzaferis, V., ed. *Excavations at Capernaum, 1: 1978-1982.* Winona Lake. pp. 115-130.
- Khalil, L. and Kareem, J. 2002. 'Abbasid pottery from Area E at Khirbat Yajuz, Jordan. *Levant* 34:111-150.
- Khalilieh, H. S. and Artzy, M. 2007. Ramla's urban plan as reflected in primary Arabic sources. *Contract Archaeology Reports* 2:5-11.
- Khamis, E. 1996. The metal objects. In: Ben-Tor, A., Avissar, M. and Portugali, Y., eds. *Yoqne'am I: The Late Periods.* (Qedem Reports 3) Jerusalem. pp. 218-235.
- Kindler, A. 2000. Coins. In: Fischer, M., Gichon, M. and Tal, O. 2000. *'En Bozeq. Excavations in an Oasis on the Dead Sea, II: The Officina – An Early Roman Building on the Dead Sea Shore.* Mainz. pp. 85-92.
- Kingsley, S. A. 1994-95. Bag-shaped amphorae and Byzantine trade: Expanding horizons. *Bulletin of the Anglo-Israel Archaeological Society* 14:39-56.
- Kingsley, S. A. 2002. *A Sixth-Century AD Shipwreck off the Carmel Coast, Israel: Dor D and the Holy Land Wine Trade.* (British Archaeological Reports International Series 1065) Oxford.
- Kirby, R. H. 1963. *Vegetable Fibres: Botany, Cultivation, and Utilization.* London and New York.
- Kletter, R. 2005a. Early Islamic remains at 'Opher Park, Ramla. *'Atiqot* 49:57-99.
- Kletter, R. 2005b. Early Islamic bronze weights from Ramla. *'Atiqot* 49:117-119.
- Kochavi, M. 2000. Introduction. In: Kochavi, M. Beck, P. and Yadin, E., eds. *Aphek Antipatris I: Excavations of Areas A and B. The 1972-1976 Seasons.* (Monograph Series of the Institute of Archaeology of Tel Aviv University 19) Tel Aviv. pp. 1-8.
- Kochavi, M. and Yadin, E. 2002. Typological analysis of the MBIIA pottery from Aphek according to its stratigraphic provenance. In: Bietak, M., ed. *The Middle Bronze Age in the Levant. Proceedings of an International Conference on MBIIA Ceramic Material. Vienna 24th-26th of January 2001.* Vienna. pp. 189-225.
- Kodesh, M. 2002. El-Khirba. *Hadashot Arkheologiyot – Excavations and Surveys in Israel* 114:70*.
- Kogan-Zehavi, E. 2004. Ramla (A). *Hadashot Arkheologiyot – Excavations and Surveys in Israel* 116:41*-44*.
- Kogan-Zehavi, E. 2007. Remains of an Early Islamic settlement and a Hellenistic (Roman?) tomb at Khirbet Deiran, Rehovot. *'Atiqot* 57:77*-90*. (Hebrew; English summary pp. 170-173)
- Kohn-Tavor, A. 2008. Horbat Zerifin. *Hadashot Arkheologiyot – Excavations and Surveys in Israel* 120. [<http://www.hadashot-esi.org.il>]
- Kol-Ya'akov, S. 2000. Ramla, Neshet Quarries (East). *Hadashot Arkheologiyot – Excavations and Surveys in Israel* 112:67*-68*.
- Kröger, J. 1995. *Nishapur: Glass of the Early Islamic Period.* New York.
- Kubiak, W. and Scanlon, G. T. 1986. *Fustat Expedition, Final Report, 2: Fustat – C.* Winona Lake.
- Lane, A. 1937. Medieval finds at Al Mina in north Syria. *Archaeologia* 87:19-78.
- Lane, A. 1958. *Early Islamic Pottery: Mesopotamia, Egypt and Persia* (4th ed. revised). London.
- Lavoix, H. 1887. *Catalogue des monnaies musulmanes de la Bibliothèque Nationale*, I. Paris.
- Lester, A. 1996. The glass from Yoqne'am: The Early Islamic, Crusader and Mamluk periods. In: Ben-Tor, A., Avissar, M. and Portugali, Y. eds. *Yoqne'am I: The Late Periods.* (Qedem Reports 3) Jerusalem. pp. 202-217.
- Lester, A. 1997. Islamic glass finds. In: Hirschfeld, Y. *The Roman Baths at Hammath Gader.* Jerusalem. pp. 432-441.
- Lester, A. 2004a. The glass. In: Stacey, D. *Excavations at Tiberias, 1973-1974: The Early Islamic Periods.* (IAA Reports 21) Jerusalem. pp. 167-220.
- Lester, A. 2004b. Glass and metal objects. In: Hirschfeld, Y. *Excavations at Tiberias, 1989-1994.* (IAA Reports 22) Jerusalem. pp. 59-68.

- Liphshitz, N., Hartman, M., Gophna, R. and Bigger, G. 1991. Beginning of olive (*Olea europaea*) cultivation in the Old World. *Journal of Archaeological Science* 18:441-453.
- Livneh, A. 2005. The pottery of the Middle Bronze Age. In: Ben-Tor, A., Ben-Ami, D. and Livneh, A. *Yoqne'am III: The Middle and Late Bronze Ages. Final Report of the Archaeological Excavations (1977-1988)*. (Qedem Reports 8) Jerusalem. pp. 41-138.
- Lombardi, G. 1956-57. Bolli byzantino-arabi al "Dominus Flevit". *Liber Annuus* 7:165-190.
- Lönnqvist, K. 1997. A re-attribution of the King Herod Agrippa 1 "Year 6" - issue. The canopy and three ears of corn. *Liber Annuus* 47:429-440.
- Luz, N. 1996. Umayyad Ramleh: Urban renewal in Palestine – Geo-historical aspects. *Cathedra* 79:22-52. (Hebrew; English summary p. 203)
- Maier, A. M. 1997. Tomb 1181: A multiple-internment burial cave of the transitional Middle Bronze Age IIA-B. In: Ben-Tor, A. et al. *Hazor V: An Account of the Fifth Season of Excavation, 1968*. Jerusalem. pp. 295-340.
- Magen, I. 1982. *The Archaeological Discoveries at Qedumim – Samaria*. Qedumim.
- Magen, Y. 2002. The Samaritans in the Roman-Byzantine period. In: Stern, E. and Eshel, H., eds. *The Samaritans*. Jerusalem. pp. 213-244. (Hebrew)
- Magen, Y. and Dadon, M. 2003. Nebi Samwil (Montjoie). In: Bottini, G.C., Di Segni, L. and Chrupcala, D., eds. *One Land, Many Cultures: Archaeological Studies in Honor of Stanislaw Loffreda OFM*. Jerusalem. pp. 123-138.
- Magness, J. 1993. *Jerusalem Ceramic Chronology, circa 200-800 CE*. (JSOT/ASOR Monograph Series 9) Sheffield.
- Magness, J. 1994. The dating of the black ceramic bowl with a depiction of the Torah Shrine from Nabratim. *Levant* 26:199-206.
- Magness, J. 2003. *The Archaeology of the Early Islamic Settlement in Palestine*. Winona Lake.
- Majcherek, G. 1995. Gazan amphorae: Typology reconsidered. In: Meyza, H. and Mlynarczyk, J., eds. *Hellenistic and Roman Pottery in the Eastern Mediterranean: Advances in Scientific Studies, Acts of the Second Workshop at Nieborow*. Warsaw. pp. 163-178.
- Mazor G. and Bar-Nathan, R. 1998. The Beth She'an excavation project, 1992-1994. *Excavations and Surveys in Israel* 17:7-36.
- McNicoll, A. W., Smith, R. H. and Hennessy, J. B. 1982. *Pella in Jordan, 1: First Interim Report of the Joint University of Sydney and the College of Wooster Excavations at Pella, 1979-1981*. Canberra.
- McNicoll, A. W. et al. 1992. *Pella in Jordan, 2: The Second Interim Report of the Joint University of Sydney and Collage of Wooster Excavations at Pella 1982-1985*. Sydney.
- Mercier, M. 1952. *Le feu grégeois, les feux de guerre depuis l'Antiquité, la poudre à canon*. Paris.
- Meshorer, Y. 2007. The En-Gedi hoard. In: Stern, E. *En-Gedi Excavations I: Final Report (1961-1965)*. Jerusalem. pp. 411-421.
- Messika, N. 2006. An Early Islamic period site at Kafr Jinnis near Lod. *Salvage Excavation Reports* 3:84-112.
- Meyer, C. 1988. Glass from the North Theater Byzantine church, and soundings at Jerash, Jordan, 1982-1983. *Bulletin of the American Schools of Oriental Research, Supplement* 25:175-222.
- Meyer, C. 1989. Crown window panes: Constantinian or Justinian? In: Leonard, A. and Williams, B. B., eds. *Essays in Ancient Civilizations Presented to Helen J. Kantor*. Chicago. pp. 213-219.
- Miles, G. C. 1964. On the varieties and accuracy of eighth century Arab coin weights. *Eretz-Israel* 7:78*-87*.
- Milevski, I. and Rapuano, Y. 2001. Khirbet Kafr Jinnis. *Hadashot Arkheologiyot – Excavations and Surveys in Israel* 113:65*-66*.
- Misra, M. K., Ragland, K. W. and Baker, A. J. 1993. Wood ash composition as a function of furnace temperature. *Biomass and Bioenergy* 4/2:103-116.
- Mozel, I. 2000. Flint implements. In: Kochavi, M., Beck, P. and Yadin, E., eds. *Aphek-Antipatris I: Excavation of Areas A and B – The 1972-1976 Seasons*. (Monograph Series of the Institute of Archaeology of Tel Aviv University 19) Tel Aviv. pp. 255-264.

- Negev, A. 1988. *The Architecture of Mamfisis, Final Report, 2: The Late Roman and Byzantine Periods*. (Qedem 27) Jerusalem.
- Neri, Y. 1994. *Archaeological and Geological Aspects of the Beachrock Saddle-Querns Utilization in Antiquity*. (Unpublished M.A. Thesis, University of Haifa) Haifa. (Hebrew)
- Netzer, E. 1981. *Greater Herodium*. (Qedem 13) Jerusalem.
- Netzer, E. 1986. The main excavation area: Description and stratigraphy. In: Levine, L. I. and Netzer, E. *Excavations at Caesarea Maritima 1975, 1976, 1979: Final Report*. (Qedem 21) Jerusalem. pp. 16-65.
- Northedge, A. 2001. Thoughts on the introduction of polychrome glazed pottery in the Middle East. In: Villeneuve, E. and Watson, P. M., eds. *La céramique byzantine et proto-islamique en Syrie-Jordanie (IV^e-VIII^e siècles apr. J.-C.)*. Beirut. pp. 207-214.
- Panitz-Cohen, N. 2006. The pottery of Strata XII-V. In: Panitz-Cohen, N. and Mazar, A. 2006. *Timnah (Tel Batash) III: The Finds from the Second Millennium BCE*. (Qedem 45) Jerusalem. pp. 9-150.
- Partington, J. R. 1999. *A History of Greek Fire and Gunpowder*. (2nd ed.) London.
- Patrich, J. 1988. Architectural sculpture and stone objects. In: Tsafir, Y., Patrich, J. Rosenthal-Heginbottom, R., Hershkovitz, I. and Nevo, Y. D. *Excavations at Rehovot-in-the-Negev, Volume I: The Northern Church*. (Qedem 25) Jerusalem. pp. 97-133.
- Pele, O. 2003. Roof tiles of the Byzantine period from Area XV. In: Mazar, E., ed. *The Temple Mount Excavations in Jerusalem 1968-1978, Directed by Benjamin Mazar. Final Report, II: The Byzantine and Early Islamic Periods*. (Qedem 43) Jerusalem. pp. 133-134.
- Peleg, M. 1989. Domestic pottery. In: Tzaferis, V. *Excavations at Capernaum, I: 1978-1982*. Winona Lake. pp. 31-113.
- Peleg, M. 1991. Persian, Hellenistic and Roman burials at Loḥamei HaGeta'ot. *Atiqot* 20:131-152.
- Pentz, P. 1988. A Medieval workshop for producing "Greek Fire" grenades. *Antiquity* 62:89-93.
- Petersen, A. 2005. *The Towns of Palestine under Muslim Rule, AD 600-1600*. (British Archaeological Reports International Series 1381) Oxford.
- Piccirillo, M. 1998. The churches on Mount Nebo: New discoveries. In: Piccirillo, M. and Alliata, E., eds. *Mount Nebo, New Archaeological Excavations, 1967-1997*. Jerusalem. pp. 221-264.
- Pollak, R. 2000. Glass vessels of a Fatimid hoard from Caesarea Maritima. *Annales 14^e Congres de l'Association Internationale pour l'Histoire du verre*. Lochem. pp. 238-242.
- Pollak, R. 2003. Early Islamic glass from Caesarea: A chronological and typological study. *Annales 15^e Congres de l'Association Internationale pour l'Histoire du verre*. Corning. pp. 165-170.
- Pollak, R. 2007. Excavations in Marcus Street, Ramla: The glass vessels. *Contract Archaeology Reports* 2:100-133.
- Porat, P. 2006. A Late Byzantine-Early Islamic period farmhouse at Mesilot in the Bet She'an valley. *Atiqot* 53: 181-192.
- Price, J. 1988. Exhibits at Ballots: An Egyptian terracotta group showing Eros beside a glass furnace. *The Antiquaries Journal* 68/2:317-319.
- Price, J. 1998. The social context of glass production in Roman Britain. In: McCray, P. and Kingery, W. D., eds. *The Prehistory and History of Glassmaking Technology*. (Ceramics and Civilization 8) Westerville. pp. 331-348.
- Priel, M. 1999. Ramla (B). *Ḥadashot Arkheologiyot – Excavations and Surveys in Israel* 109:66*.
- Rahmani, L. Y. 1983. Finds from a sixth to seventh centuries site near Gaza, II: Pottery and stone objects. *Israel Exploration Journal* 33:219-230.
- RIC VIII*. Kent, J. P. C. 1981. *The Roman Imperial Coinage VIII: The Family of Constantine I A.D. 337-364*. London.
- Riley, J. A. 1975. The pottery from the first season of excavation in the Caesarea hippodrome. *Bulletin of the American Schools of Oriental Research* 218:25-63.

- Roll, I. 2000. Roman milestones in the vicinity of Aphek-Antipatris. In: Kochavi, M. Beck, P. and Yadin, E., eds. *Aphek Antipatris I: Excavations of Areas A and B. The 1972-1976 Seasons*. (Monograph Series of the Institute of Archaeology of Tel Aviv University 19) Tel Aviv. pp. 39-46.
- Roll, I. and Ayalon, E. 1981. Two large wine presses in the red soil regions of Israel. *Palestine Exploration Quarterly* 113:111-125.
- Roll, I. and Ayalon, E. 1989. *Apollonia and Southern Sharon, Model of a Coastal City and Its Hinterland*. Tel Aviv. (Hebrew; English summary pp. IV-IX)
- Rosen, S. A. 1997. *Lithics after the Stone Age*. Walnut Creek.
- Rosen, S. A. 2004. The chipped stone assemblages. In: Ussishkin, D. *Renewed Archaeological Excavations at Lachish (1973-1994)*. (Monograph Series of the Institute of Archaeology of Tel Aviv University 22). Tel Aviv. pp. 2197-2225.
- Rowe, A. 1936. *A Catalogue of Egyptian Scarabs, Scaraboids, Seals and Amulets in the Palestine Archaeological Museum*. Cairo.
- Russell, K. W. 1985. The earthquake chronology of Palestine and northwest Arabia from the 2nd through the mid-8th century A.D. *Bulletin of the American School of Oriental Research* 260:37-59.
- Safrai, Z. and Linn, M. 1988. The economic basis of Geva. In: Mazar, B., ed. *Geva: Archaeological Discoveries at Tell Abu-Shusha, Mishmar Ha-ʿEmeq*. Tel Aviv. pp. 120-166. (Hebrew)
- Saller, S. J. 1941. *The Memorial of Moses on Mount Nebo, Part 1: The Text*. Jerusalem.
- Saʿid, K. 2006. Ramla, esh-Sheikh Reiḥan. *Ḥadashot Arkheologiyot – Excavations and Surveys in Israel* 118. [<http://www.hadashot-esi.org.il>]
- Schibille, N., Marii, F. and Rehren, T. in press. Characterization and provenance of Late Antique window glass from the Petra Church in Jordan. *Archaeometry* 50.
- Schick, R. 1995. *The Christian Communities of Palestine from Byzantine to Islamic Rule: A Historical and Archaeological Study*. New Jersey.
- Schiffer, M. B. 1995. *Behavioral Archaeology: First Principles*. Salt Lake City.
- Schwartz, J. J. 1991. *Lod (Lydda), Israel, from Its Origins through the Byzantine Period, 5600 B.C.E.-640 C.E.* (British Archaeological Reports International Series 571) Oxford.
- Shachar, I. 2004. The historical and numismatic significance of Alexander Jannaeus' later coinage as found in archaeological excavations. *Palestine Exploration Quarterly* 136:5-34.
- Shalem, D. 2002. Nevé Ur – An Early Islamic period village in the Bet Sheʿan Valley. *ʿAtiqot* 43:149-176.
- Sharon, M. 2004. *Corpus Inscriptionum Arabicarum Palaestinae*. Leiden.
- Shavit, A. 1992. *The Ayalon Valley and Its Vicinity during the Bronze and Iron Ages*. (Unpublished M.A. Thesis, Tel Aviv University) Tel Aviv. (Hebrew)
- Shavit, A. 2000. Settlement patterns in the Ayalon valley in the Bronze and Iron Ages. *Tel Aviv* 27:189-230.
- Shimelmitz, R. Forthcoming. The flint finds from Qyriat Shemona. *Salvage Excavation Reports*.
- Shmueli, O. and Artzi, B.-A. 2006. Ramla. *Ḥadashot Arkheologiyot – Excavations and Surveys in Israel* 118. [<http://www.hadashot-esi.org.il>]
- Shmueli, O. and Kanias, T. 2007. Ramla, survey in the region. *Ḥadashot Arkheologiyot – Excavations and Surveys in Israel* 119. [<http://www.hadashot-esi.org.il>]
- Shor, Y. 1999. Ramla, Ha-Palmaḥ Compound. *Ḥadashot Arkheologiyot – Excavations and Surveys in Israel* 110: 53*-54*.
- Singer-Avitz, L. 1989. Local pottery of the Persian period (Strata XI-VI). In: Herzog, Z., Rapp, G. Jr. and Negbi, O., eds. *Excavations at Tel Michal, Israel*. (Publications of the Institute of Archaeology of Tel Aviv University 8) Minneapolis and Tel Aviv. pp. 115-144.
- Sion, O. 2004. An Early Islamic period settlement in Ramla. *ʿAtiqot* 46:67-92. (Hebrew; English summary p. 133*)

- Sion, O. 2007. The excavations at Khirbat el-Ni'ana. *Atiqot* 57:29*-49*. (Hebrew; English summary pp. 166-167)
- SNG Israel I. Houghton, A. and Spaer, A. 1998. *Sylloge Nummorum Graecorum, Israel I: The Arnold Spaer Collection of Seleucid Coins*. London.
- Sourdél, D. 1981. La fondation Umayyade d'Al-Ramla en Palestine. In: Roemer, H. R. and Noth, A., eds. *Studien zur Geschichte und Kultur des Vordern Orients: Festschrift für Bertold Spuler zum siebzigsten Geburtstag*. Leiden. pp. 387-395.
- Sparkes, B. A. and Talcott, L. 1970. *The Athenian Agora XII: Black and Plain Pottery of the 6th, 5th and 4th Centuries B.C.* Princeton.
- Stacey, D. 2004. *Excavations at Tiberias, 1973-1974: The Early Islamic Periods*. (IAA Reports 21) Jerusalem.
- Stager, L. E. 2002. The MBIIA ceramic sequence at Tel Ashkelon and its implications for the "Port Power" model of trade. In: Bietak, M., ed. *The Middle Bronze Age in the Levant. Proceedings of an International Conference on MBIIA Ceramic Material. Vienna 24th-26th of January 2001*. Vienna. pp. 353-362.
- Stern, E. 1982. *Material Culture of the Land of the Bible in the Persian Period 538-332 B.C.* Warminster-Jerusalem.
- Stern, E. 2001. *Archaeology of the Land of the Bible, Volume II: The Assyrian, Babylonian and Persian Periods, 722-332 BCE*. New York.
- Stern, E. J. 1997. Burial caves at Kisra. *Atiqot* 33:103-135. (Hebrew; English summary p. 17*)
- Stern, E. J. and Stacey, D. A. 2000. An eleventh-century pottery assemblage from Khirbat al-Khurrumiya. *Levant* 32:171-177.
- Stern, E. M. 1995. *The Toledo Museum of Art. Roman Mold-Blown Glass: The First through Sixth Centuries*. Rome.
- Sussman, V. 1969. Ancient burial cave at Rehovot. *Atiqot* 5:69-71. (Hebrew Series; English summary p. 8*)
- Sussman, V. 1983. The Samaritan oil lamps from Apollonia-Arsuf. *Tel Aviv* 10:71-96.
- Sussman, V. 2002. Samaritan oil lamps. In: Stern, E. and Eshel, H., eds. *The Samaritans*. Jerusalem. pp. 339-371. (Hebrew)
- Sussman, V. 2007. The clay oil lamps from Khirbat el-Ni'ana. *Atiqot* 57:53-72.
- Syon, D. 1998. A winepress at Akhziv. *Atiqot* 34:85-99. (Hebrew; English summary p. 7*)
- Tal, O. 1999. The Persian period. In: Roll, O. and Tal, O. *Apollonia-Arsuf: Final Report of the Excavations. Volume I: The Persian and Hellenistic Periods (with Appendices on the Chalcolithic and Iron Age II Remains)*. (Monograph Series of the Institute of Archaeology of Tel Aviv University 16) Tel Aviv. pp. 83-222 passim.
- Tal, O. and Blockman, N. 1998. A salvage excavation at Tel Hamid (The Lower Terrace). *Tel Aviv* 25:142-173.
- Tal, O., Jackson-Tal, R. E. and Freestone, I. C. 2004. New evidence of the production of raw glass at Late Byzantine Apollonia-Arsuf, Israel. *Journal of Glass Studies* 46:51-66.
- Tal, O. and Taxel, I. 2008. An Early Islamic period flax processing installation. *Qadmoniot* 135:39-44. (Hebrew)
- Taxel, I. 2005. *The Transition between the Byzantine and the Early Islamic Periods (the 7th Century CE) as Seen through Rural Settlement – Horvat Zikhrin as a Case Study*. (Unpublished M.A. Thesis, Tel Aviv University) Tel Aviv. (Hebrew)
- Taxel, I. 2007. Stratigraphy and architecture. In: Gophna, R., Taxel, I. and Feldstein, A. *Kafr 'Ana: A rural settlement in the Lod Valley. Salvage Excavation Reports* 4:9-32.
- Taxel, I. Forthcoming. Khirbet es-Suyyagh: A Byzantine monastery in the Judean Shephelah. *Salvage Excavation Reports*.
- Taxel, I. and Feldstein, A. 2006. Khirbet Ibreica: A rural settlement in the southeastern Sharon Plain. *Salvage Excavation Reports* 3:40-68.

- TJC. Meshorer, Y. 2001. *A Treasury of Jewish Coins*. Jerusalem and New York.
- Torge, H. 2005. Ramla (B). *Ḥadashot Arkheologiyot – Excavations and Surveys in Israel* 117. [http://www.hadashot-esi.org.il]
- Toueg, R. 2007. Excavations in Marcus Street, Ramla: Stratigraphy. *Contract Archaeology Reports* 2:12-37.
- Tsafir, Y. and Hirschfeld, Y. 1979. The church and mosaics at Horvat Berachot, Israel. *Dumbarton Oaks Papers* 33:293-326.
- Tsioni, G. 2008. A salvage excavation at Khirbet Ni'ana. *Contract Archaeology Reports* 3:33-66. (Hebrew; English summary p. 63*)
- Tsuk, Z. 1994. The water supply of Horbat Zikrin. *Israel – People and Land* 7-8:133-148. (Hebrew; English summary pp. 15*-16*)
- Tufnell, O. 1973. The Middle Bronze Age scarab-seals from burials on the mound at Megiddo. *Levant* 5:69-82.
- Tufnell, O. 1975. Seal impressions from Kahûn and Uronarti. *Journal of Egyptian Archaeology* 61:67-101.
- Tufnell, O. 1984. *Studies on Scarab Seals, II, Scarab Seals and Their Contribution to History in the Early Second Millennium B.C.* (2 vols.). Warminster.
- van den Brink, E. and Shmueli, O. 1997. Yehud. *Excavations and Surveys in Israel* 16:83-84.
- Vitto, F. 2000. Ramla, Ha-Shoftim (North) Quarter. *Ḥadashot Arkheologiyot – Excavations and Surveys in Israel* 111:55*.
- Vogt, C. 1997. La ceramique de Tell el-Fadda, Sinaï du Nord. *Cahiers de la Céramique Égyptienne* 5:1-22.
- Voss, R. V. 2002. A sequence of four Middle Bronze gates in Ashkelon. In: Bietak, M., ed. *The Middle Bronze Age in the Levant. Proceedings of an International Conference on MBIIA Ceramic Material. Vienna 24th-26th of January 2001*. Vienna. pp. 379-384.
- Walker, J. A. 1956. *Catalogue of the Muhammadan Coins in the British Museum, Volume II: Arab-Byzantine Coins and Post Reform Umayyad*, II. London.
- Walmsley, A. 1995. Tradition, innovation, and imitation in the material culture of Islamic Jordan: The first four centuries. *Studies in the History and Archaeology of Jordan* 5:657-668.
- Walmsley, A. 2000. Production, exchange and regional trade in the Islamic East Mediterranean: Old structures, new systems? In: Hensen, I. K. and Wickham, C., eds. *The Long 8th Century*. Leiden. pp. 265-343.
- Walmsley, A. 2001. Turning east. The appearance of Islamic Cream Ware in Jordan: The “end of antiquity”? In: Villeneuve, E. and Watson, P. M., eds. *La céramique byzantine et proto-islamique en Syrie-Jordanie (IV^e-VIII^e siècles apr. J.-C.)*. Beirut. pp. 305-313.
- Watson, P. M. 1995. Ceramic evidence for Egyptian links with northern Jordan in the 6th-8th centuries AD. In: Bourke, S. and Descoedres, J.-P., eds. *Trade, Contact, and the Movements of Peoples in the Eastern Mediterranean: Studies in Honor of J. Basil Hennessy*. Sydney. pp. 303-324.
- Weksler-Bdolah, S. and Golani, A. 2000. Tel Malot. *Ḥadashot Arkheologiyot – Excavations and Surveys in Israel* 112:70*-71*.
- Weinberg, G. D. 1987. A glass factory of Crusader times in northern Israel (preliminary report). *Annales de l'Association Internationale pour l'Histoire du Verre* 10:305-316.
- Weinberg, G. D. 1988. The glass factory and manufacturing processes. In: Weinberg, G. D., ed. *Excavations at Jalame, Site of a Glass Factory in Late Roman Palestine*. Columbia. pp. 24-37.
- Weinberg, G. D. and Goldstein, S. M. 1988. The glass vessels. In: Weinberg, G. D., ed. *Excavations at Jalame, Site of a Glass Factory in Late Roman Palestine*. Columbia. pp. 38-102.
- Whitcomb, D. 1988. Khirbet al-Mafjar reconsidered: The ceramic evidence. *Bulletin of the American Schools of Oriental Research* 271:51-67.
- Whitcomb, D. 1989. Coptic glazed ceramics from the excavations at Aqaba, Jordan. *Journal of the American Research Centre in Egypt* 26:167-182.

- Winter, T. 1998. The glass vessels from Ḥorvat Ḥermeshit (1998-1990). *ʿAtiqot* 34:173-177. (Hebrew; English summary p. 10*)
- Wolff, S. and Shavit, A. 1999. Tel Ḥamid. *Ḥadashot Arkheologiyot – Excavations and Surveys in Israel* 109:68*-70*.
- Yasur-Landau, A. 1998. Ramla, the Courthouse. *Excavations and Surveys in Israel* 18:76.
- Yavor, Z. 1999. Haifa, Kh. Tinani. *Ḥadashot Arkheologiyot – Excavations and Surveys in Israel* 109:21*-22*.
- Zelinger, Y. 2000. Ramla, Yeḥezqel Street. *Ḥadashot Arkheologiyot – Excavations and Surveys in Israel* 111:57*.
- Zelinger, Y. and Di Segni, L. 2006. A fourth-century church near Lod (Diospolis). *Liber Annuus* 56:459-468.
- Zelinger, Y. and Shmueli, O. 2002. The aqueduct of the Heretic's daughter: Remains of the Early Arab aqueduct to Ramla. In: van den Brink, E. C. M. and Yannai, E., eds. *In Quest of Ancient Settlements and Landscapes: Archaeological Studies in Honour of Ram Gophna*. Tel Aviv. pp. 279-288.
- Ziadeh-Seely, G. 2000. The archaeology of Ottoman Tiʿinnik: An interdisciplinary approach. In: Baram, U. and Carroll, L., eds. *A Historical Archaeology of the Ottoman Empire: Breaking New Ground*. New York. pp. 79-91.
- Zohary, M. 1978. *The Plant World: Morphology, Taxonomy, Evolution, Biology*. Tel Aviv. (Hebrew)

LIST OF LOCI

2005-2006 SEASONS OF EXCAVATIONS*

<i>Locus</i>	<i>Square</i>	<i>Opening height</i>	<i>Closing height</i>	<i>Associated loci/features</i>	<i>Description</i>
2	T215	85.96	85.48	16	Fill
3	T216	85.77	85.55	8	Fill
4	T217	85.75	85.35	9, 10, 14	Fill
5	S218	85.91	85.83	6	Fill
6	T218	86.01	85.88	5, 12	Fill
7	T214	85.98	85.5	34, 41	Fill
8	T216	85.55	84.7	3, 10, 13, 14	Fill
9	T217	85.63	85.31	4, 10, 14	Fill
11	S218	85.83	85.24	27	Fill
12	T218	85.98	85.73	6, 25, 43	Fill
13	T216	85.06	84.9	8, 17	Fill
14	T217	85.31	84.8	8, 10	Fill
15	S217	85.57	85.1	37	Fill
16	T215	85.48	84.8	2	Fill
17	T216	85.37	85.09	18, 19	Fill
18	T216	85.37	85	17, 19	Fill
19	T216	85.08	84.81	17, 18	Fill
20	T216	84.81	84.47	31	Fill
21	T215	85.37	85.12	28, 29	Fill
23	U216	86	85.5	55	Fill
25	T218	85.39	85.07	12	Fill
26	T216	85.47	84.34	47	Fill
27	S218	85.33	84.8	11	Fill
28	T214/T215	85.64	85.08	21, 107	Fill
29	R216 - V216	84.94	84.51	35, 36, 93	Installation (channel)
30	T215	85.33	85	20, 31	Fill
31	T215	85.33	85.03	20, 28, 30, 40	Fill
32	T218	85.73	84.9	43	Fill
33	T217	84.9	84.8	14	Fill
34	T214	85.5	85.1	7	Fill
35	T216	85.09	84.81	29	Fill
36	T216	84.97	84.65	29	Floor
37	S217	85.19	85	15, 45	Fill
38	T214/T215	85.5	85.09	41, 90	Installation (channel)
39	U216/V216	85.4	84.39	68	Installation (pool [type 2])
40	T215	85.11	85.03	38, 43	Fill
41	U214/T214	85.74	85.25	38, 89, 90, 99	Installation (channel)
42	U217	85.67	85.67	46	Plaster floor
45	S217	85.2	84.8	37	Fill
46	U217	85.43	85.23	42	Fill
47	S216	84.4	84.16	26	Fill
48	S215	85.43	84.93	74	Fill
49	S214	85.9	85.35	76	Fill
50	T215	85.6	85.4	51	Fill
51	T215	85.55	85.39	50	Fill
52	U214	86.1	85.32	-	Fill [partially excavated by the IAA]
53	S216	85.12	84.9	54	Fill/plaster floor
54	S216	84.4	84.1	53	Fill
55	V216	86.18	85.07	23, 65	Fill
56	S216	85	84.8	57	Floor
57	S216	84.63	84.4	54, 58	Fill
58	S216	84.45	84.12	56, 57	Fill

* All architectural features are of the Early Islamic period (late Umayyad, ʿAbbasid and Fatimid) unless indicated otherwise. The following squares were excavated by the Israel Antiquities Authority: K131, M210, N210, O210, P137, P138, P210, P211, Q140, Q209, S137, S219, T139, U214, U215, W137, W138, W212, Z133.

<i>Locus</i>	<i>Square</i>	<i>Opening height</i>	<i>Closing height</i>	<i>Associated loci/features</i>	<i>Description</i>
60	U215	85.43	85.3	63	Fill/plaster floor [partially excavated by the IAA]
61	T213	85.9	85.8	62	Fill
62	T213	85.9	85.8	61, 71	Fill
63	S215	85.43	85.2	60, 64	Fill
64	S215	85.33	85.33	63	Stone floor
65	V216	85.02	84.9	55	Fill
66	U213	86.1	85.95	82	Fill
67	T213	85.8	83.28	62, 75	Installation (pool [type 1])
68	V216	86.05	86.05	39	Fill
70	T213/T214	86.03	86.03	67, 69, 71, 86	Plaster floor
71	T213	86.03	85.39	69	Fill
72	U215	85.63	85.25	-	Installation (cistern) [excavated by the IAA]
75	T214	85.89	84.95	67, 90, 91, 92, 102	Installation (channel)
76	S214	85.37	85.2	49	Installation (channel)
81	S215	84.73	83.9	98	Fill
82	U213	85.53	85.35	66, 67	Fill
84	T213	85.3	85.15	69, 70, 71, 75	Fill
85	T214	85.27	85.15	69, 70, 71, 84	Fill
86	T214	85.4	85.25	70	Installation (channel)
87	R216	85.59	85.09	93	Fill
88	S213	85.16	84.9	94, 95, 96	Fill
89	U214	85.49	85.4	41, 69	Fill [partially excavated by the IAA]
90	T214	85.49	85.03	41, 75	Plaster floor
91	T214	85.4	85.09	41, 75, 109	Fill
92	T214	85.3	85.1	41, 75	Fill
93	R216	84.97	84.89	29, 87	Plaster floor
94	S214	85.7	85.53	88, 95, 96	Fill
96	S213	85.39	85.09	88, 94, 95	Fill
97	R216	85.09	84.89	93	Fill
98	S215	85.53	85.23	81, 94	Fill
99	T214	84.95	84.5	41	Installation
100	T214	85.1	85.05	41, 99, 112	Fill
101	T214	85.45	84.95	75, 89, 90, 91, 92, 102	Fill
102	T214	85.1	83.93	75, 101, 419	Fill
103	T213	84.8	84.22	67, 114	Fill
104	S213	85.22	85.02	116	Fill
105	T214	84.95	84.85	75	Fill
106	T213	85	84.7	104, 116	Fill
107	T214/T215	85.68	85.08	28, 34	Fill
108	S214	84.7	84.52	112	Fill
109	T214	85.52	84.21	91	Fill
110	T212	85.99	84.92	129, 130, 131	Fill
111	U214	84.7	84.6	103, 105	Fill [partially excavated by the IAA]
112	U214	84.8	84.2	100, 103, 104, 108, 419	Fill [partially excavated by the IAA]
114	U212	84.8	84.5	103	Fill
117	S212	85.87	85.7	127, 150	Mosaic working surface
118	S211	85.9	85.65	-	Fill
119	T211	86	85.7	-	Fill
120	U211	85.75	85.46	123	Fill
123	U211	85.75	85.25	120, 126, 152	Installation (pool [type 2])
124	S210	86.28	85.26	701	Fill
125	T212	85.42	85.3	129, 130, 131	Fill
126	U211	85.65	85.49	123	Fill
127	S212	85.59	85.2	117	Fill
128	S211	85.52	85.45	118	Installation (pool [type 2])
129	T212	86.23	86.23	116, 130	Stone floor
130	T212	85.84	85.6	129, 133	Installation (pipe)
131	T212 - W212	85.81	85.6	137	Installation (pipe)
133	U212	85.8	85.65	130, 134	Installation (pipe)
134	U212	85.92	85.6	133	Installation (pipe)
136	V212	85.76	85.6	145	Fill

<i>Locus</i>	<i>Square</i>	<i>Opening height</i>	<i>Closing height</i>	<i>Associated loci/features</i>	<i>Description</i>
137	T212	85.8	85.37	130, 131, 142	Fill
140	S209	85.98	85.19	700, 711, 712	Fill
141	W212	85.6	85.29	-	Fill
142	T212	84.95	83.95	137	Installation (subterranean vaulted chamber)
143	U212	85.48	85.3	133, 134	Fill
144	S212	84.8	84.45	-	Fill
145	V212	86.41	85.76	136, 747	Installation (pool [type 2])
150	S212	85.7	85.7	116(?), 117, 127	Mosaic working surface
152	U211	85.7	85.7	123	Stone working surface
155	U214	85.49	85.49	74, 156	Mortar working surface [partially excavated by the IAA]
201	K138	81.49	81.34	207, 376	Fill
202	L138	82.1	82.1	203, 392, 393	Plaster floor
203	L138	82.12	81.63	202, 234	Fill
204	L138/L139	82.52	82.2	212	Fill
205	K139	81.95	81.55	213, 366, 367	Fill
206	L139	81.76	81.61	375	Fill
207	K138/L138	82.8	82.61	201, 222, 235, 392	Beach-rock working surface
209	M137	82.76	82.14	352	Fill
212	L138	83	82.2	204, 217	Fill
213	K139	81.51	81.31	205, 367	Fill
214	M139	81.82	81.72	359	Mortar working surface
215	K138/L138	82.72	82.72	207, 222, 249	Plaster floor
221	L138	82.68	82.62	389, 395	Fill
222	K138/L138	82.78	82.27	207, 215, 249	Installation (pool [type 2])
223	K138	81.8	81.72	-	Dismantling of 362
225	L138	82.29	82.08	221, 389	Fill/occupation layer (Byz./Uma.)
229	K138	81.67	81.67	216, 378	Foundation of plaster floor
230	K-L138/K-L139	82.29	81.3	241, 247	Installation (pool [type 1])
231	L138	82.07	81.88	-	Fill
232	M138	83.29	82.53	-	Dismantling of 355
233	K139/L139	82.8	82.3	230	Fill
234	L138	82.12	81.63	202	Fill
235	L138	82.12	81.82	207, 222	Beach-rock working surface
236	K137/L137	82.46	82.34	243, 256, 259	Fill
237	L136	82.68	82.33	242, 245	Fill
238	K137	82.65	82.46	240, 250	Fill
239	K136	81.13	80.83	248, 268	Fill
240	K137/L137	82.46	82.46	238, 246, 261	Mortar working surface
241	K138/K139	82.05	81.49	230	Fill
242	L136	82.33	82.13	237	Fill
243	K139	81.95	81.64	236, 247	Fill
244	K139	81.97	81.58	247, 249	Fill
245	L136	82.68	82.12	237	Fill
246	K137	82.36	82.11	240, 250, 257	Fill
247	L139	81.93	81.41	230, 243, 244	Installation (subterranean vaulted chamber)
248	K136	82.17	81.72	239	Fill
249	K138	82.05	81.73	207, 215, 222, 244	Installation (channel)
250	K137/L137	82.68	82.26	238, 246, 253	Fill
252	L136	82.12	81.7	-	Fill
253	K137	82.19	81.7	246, 250	Installation (pool [type 2])
254	L136	82.11	81.4	255, 262	Fill
255	L136	83.02	82.03	254	Installation
256	L137	82.34	82.34	236	Plaster floor
257	K137	82.11	82.01	246, 258	Floor
258	K137	81.97	81.66	257, 263	Fill
259	L137	82.34	81.88	236, 260	Fill
260	K137/L137	82.36	82.36	259, 267, 270, 276	Mortar working surface
261	K137/L137	82.5	82.4	240	Installation (channel)
262	L136	81.4	81.1	254	Fill
263	K137	81.86	81.66	258, 264	Fill

<i>Locus</i>	<i>Square</i>	<i>Opening height</i>	<i>Closing height</i>	<i>Associated loci/features</i>	<i>Description</i>
264	K137	81.76	81.44	263	Fill
265	L137	81.78	81.63	266	Installation (<i>tabun</i>) (Byz./Uma.)
266	L137	81.6	81.6	265	Plaster floor (Byz./Uma.)
267	K137/L137	82.66	82.47	260, 271, 273	Plaster floor
268	K136/L136	81.88	81.68	239	Installation (pipe)
269	L137	81.88	81.61	271	Fill
270	K137/L137	81.16	81.16	260, 276	Plaster floor
271	K137	81.89	81.53	267, 269	Fill
272	K137/L137	82.46	81.53	-	Fill
273	K137	80.18	80.02	267, 269	Fill
274	K137/L137	81.53	81.53	275, 277, 278	Mosaic floor (Byz./Uma.)
275	K137	81.53	79.83	274	Installation (pool) (Byz./Uma.)
276	L137	81.16	81.06	260, 270	Installation (<i>tabun</i>)
280	X209	83.74	83	-	Installation (subterranean vaulted chamber)
301	H138	80.9	80.54	302, 305, 307	Fill
302	H138	80.9	80.51	301, 305, 307	Fill
303	H137	81.06	79.99	-	Fill
305	H138	80.73	80.73	301, 302, 307	Plaster floor
308	I138	80.9	80.73	309	Fill
309	I138	80.73	80.73	308	Plaster floor
310	F209	81.19	80.99	311, 312	Fill
311	F209	81.62	81.29	310, 312	Fill
312	F209	81.29	81.29	310, 311	Plaster floor
313	G140	80.9	80.64	314, 315	Fill
314	G140	81.01	81.01	313, 315	Mosaic floor
315	G140	80.88	80.88	313, 314	Plaster floor
316	L131	83.44	82.17	335	Fill
317	M133	83.02	81.74	331, 332, 334	Fill
318	L133	82.59	81.26	339, 340, 341	Fill
319	M138	83.7	83.23	328	Fill
320	L138	83.36	82.18	360, 371	Fill
321	K138	82.9	82.3	361, 362, 363	Fill
322	M139	83.66	83.23	325, 329, 330	Fill
323	L139	83.67	83.1	375, 395	Fill
324	K139	82.97	82.5	364, 365	Fill
325	M139	83.36	83.36	323, 329, 355	Mortar floor
326	M137	83.53	83	348, 349	Fill
327	M136	83.59	82.8	343, 344, 345, 346, 347	Fill
328	M138	83.8	83.23	319	Fill
329	M139	83.8	83.45	322, 325	Fill
330	M139	83.42	82.75	322	Fill
331	M133	83.37	83.17	317, 332	Installation (channel)
332	M133	83.08	82.57	317, 331, 333	Installation (cistern)
333	M133	83.08	82.57	332	Fill
334	M133	83.02	82.82	317	Fill
335	L131/M131	82.3	82.17	316, 337, 338, 969	Installation (pool [type 2])
337	L131	83.2	82.66	316, 335, 338	Installation
338	L131/L132/M133	82.78	82.35	316, 335, 337	Installation (channel)
339	L133	82.85	82.59	318, 340, 341, 342	Mortar working surface
340	L133	82.59	82.39	318, 339, 341	Fill
341	L133	83.54	82.59	318, 339, 340	Fill
342	L133	82.59	82.06	339	Fill
343	M136	83.26	82.7	327, 344, 345, 346, 347	Installation (pool [type 2])
344	L136/M136	83.79	83.09	208, 327, 343, 345, 346, 347	Installation (subterranean vaulted chamber)
345	M136	83.44	82.81	327, 343, 344, 346, 347	Installation (pool [type 2])
346	M136	83.45	82.95	327, 343, 344, 345, 347	Fill
347	M136	82.85	82.65	327, 343, 344, 345, 346	Fill
348	M137	83.35	83.2	211, 326, 349, 351	Installation (pool [type 2])
349	M137	83.24	82.8	211, 326, 348, 351	Installation (pool [type 2])
351	M137	83.14	83.14	209, 352	Stone working surface
352	M137	82.55	82.42	209, 351, 353	Fill

<i>Locus</i>	<i>Square</i>	<i>Opening height</i>	<i>Closing height</i>	<i>Associated loci/features</i>	<i>Description</i>
353	M137	82.29	82.09	352, 354	Fill
354	M137	82.28	82.18	353	Fill
355	M138	83.29	83.29	325, 356, 384	Mosaic floor
356	M138/M139	83.3	82.47	355, 357, 384	Installation (cistern)
357	M138	83.3	82.3	356	Fill (cistern)
358	M138/M139	83.44	83.44	325, 355, 394	Mortar floor
359	M139	82.35	81.82	214	Fill
360	L138	82.38	82.18	320, 369	Stone collapse
361	K138	82.97	82.55	321, 362, 363	Stone floor
362	K138	82.04	81.76	321, 361, 363	Fill
363	K138	82.55	82.05	321, 361, 362	Fill
364	K139	82.3	82	324	Stone collapse
365	K139	82.3	82.1	324	Built feature
366	K139	81.95	81.95	205	Floor (Byz./Uma.)
367	K139	81.95	81.55	205	Fill
368	M136	82.89	82.5	385	Fill
369	L138	82.62	82.2	360, 389	Fill
370	M136	81.77	81.5	385	Fill
371	L138	82.38	82.18	320	Fill
372	L138	82.18	81.83	373, 374	Installation (pool [type 3])
373	L138	82.75	82.67	372, 374	Installation (corner)
374	L138	82.18	81.83	372, 373	Fill
375	L139	82.23	81.71	206, 323	Fill
376	K138	81.68	81.55	201, 377	Fill
377	K138	81.78	81.48	376, 378	Installation (channel)
378	K138	81.77	81.77	229, 377	Foundation of plaster floor
379	K138	81.82	81.58	390	Fill
380	L138	82.29	82.1	381, 382	Installation (channel)
381	L138	82.29	81.36	380, 382	Fill
382	L138	82.29	81.99	380, 381, 383	Fill
383	L138	82.38	82.38	382	Fill
384	M138	83.35	82.5	355, 356	Fill
385	M136	82.89	82.59	368, 370	Installation (pipe)
386	M136	82.88	82.59	387	Installation (pipe)
387	M136	83.26	82.62	386	Fill
390	K138/L138	83.16	81.82	379, 391	Fill/occupation layer (Byz./Uma.)
391	K138/L138	83.16	82.05	390	Fill
392	L138	82.12	81.94	202, 207, 393	Fill/occupation layer (Byz./Uma.)
393	L138	82.24	81.9	392	Fill
394	M138	83.39	82.78	358	Fill
395	L139	81.8	81.64	221, 323	Stone collapse
396	L139	82.1	82.1	227, 228, 397	Plaster floor
397	L139	82.24	82.24	396	Mortar working surface
398	M136	82.39	81.9	399	Fill
399	M136	82.37	81.75	398	Fill
401	T213/T214	85.1	84.89	413, 414	Occupation layer (MBA)
402	S213	85.06	84.98	418	Top of I418
404	S213/S214	85.05	84.96	402, 418, 427	Fill
406	S213	84.98	84.83	408	Fill
407	S213	84.83	84.42	-	Fill
409	T213/T214	84.93	84.8	-	Occupation layer (MBA)
411	T213/T214	84.8	84.73	416, 432	Occupation layer (MBA)
413	S213/T213/S214	84.95	84.91	401	Occupation layer (MBA)
414	S213/T213/S214	84.91	84.87	401	Occupation layer (MBA)
415	S213/T213	84.77	84.7	-	Occupation layer (MBA)
416	S214/T214	84.87	84.85	411	Surface
417	S213/T213	84.95	84.6	-	Occupation layer
418	S213/S214	84.97	84.79	-	Installation
419	T213/T214	84.95	83.2	102, 112	Fill
420	S213/T213	84.84	84.84	-	Top soil (fill)
422	S213	85.07	84.86	418	Fill
424	T213	84.6	84.57	-	Robber trench

<i>Locus</i>	<i>Square</i>	<i>Opening height</i>	<i>Closing height</i>	<i>Associated loci/features</i>	<i>Description</i>
427	S213/S214	84.79	84.62	418	Fill
428	S213/T213	84.84	84.6	-	Occupation layer (MBA)
431	S213/T213	84.42	83.99	-	Fill
432	T214	84.75	84.69	411	Occupation layer (MBA)
433	S213/S214	84.62	84.5	437	Pit
435	S213	83.99	83.68	-	Pit
436	T214	84.73	84.65	-	Occupation layer (MBA)
437	T214	84.65	84.52	-	Occupation layer
438	T214	84.52	84.45	-	Fill
439	T214	84.45	84.43	-	Occupation layer (MBA)
440	T214	84.43	84.3	-	Occupation layer (MBA)
441	T214	84.43	84.3	-	Occupation layer (MBA)
443	S213	83.99	83.68	-	Pit
444	T214	84.12	83.95	-	Occupation layer (MBA)
445	T214	83.95	83.87	-	Occupation layer (MBA)
447	T214	83.82	83.6	-	Fill
449	T214	83.59	83.42	-	Fill
450	T214	83.42	83.28	-	Fill
452	T214	82.94	82.9	-	Fill
501	R209/R210	85.62	85.5	-	Fill
502	P140	85.36	84.87	-	Fill
503	O138	85.3	85.26	506	Fill
504	O136	85.3	83.76	-	Fill
505	O137	84.8	84.22	-	Fill
506	O138	85.3	84.25	503, 536, 537	Fill
507	O139	85.13	84.43	549	Fill
508	R140	85.9	84.82	519	Fill
509	R210	85.42	85.3	518	Fill
510	Q210	85.37	84.91	-	Occupation layer (Hasmonean)
511	R209	85.42	85.17	-	Fill
512	Q211	85.99	85	554	Fill
513	N209	84.33	83.01	-	Fill
514	M209	84.33	83.11	-	Fill
515	R209/R210	85.17	84.04	-	Fill
516	O140	84.65	84.03	-	Fill
517	R209	85.17	84.04	-	Fill
518	R210	85.44	85.24	515, 602, 632	Installation (pool [type 1])
519	R140	85.32	85.32	508	Stone working surface
520	R140	84.9	84.82	519	Fill
521	P140	84.87	83.7	534	Fill
522	Q211	85.75	85.42	572	Installation (channel)
524	Q211	85.75	85.2	-	Fill
525	Q211	85.75	85.1	-	Fill
526	O137	84.22	83.04	-	Fill
527	R140	84.9	84.71	528, 529	Fill
528	R140	84.5	84.8	527, 529	Fill
529	R140	85.1	84.56	527, 528	Fill (installation)
530	Q210	85.34	84.57	-	Fill
531	O136	83.76	83.61	-	Fill
532	O136	83.6	83.04	-	Fill (virgin soil)
533	O136	83.03	82.9	-	Fill
534	P140/P209	84.98	82.9	521, 535, 548	Installation (pool [type 1])
535	P140	84.63	82.9	534	Fill
536	O138	83.96	83.96	506, 537, 543, 555	Mosaic floor (wine press) (Byz./Uma.)
538	R140/S140	84.56	82.56	545, 558, 559, 562	Installation (subterranean vaulted chamber)
539	R140	84.71	84.31	-	Fill
540	R140	84.75	84.3	-	Fill
541	P140	84.74	84.65	-	Fill
542	P140	84.8	84.6	551	Fill
543	O138	83.89	83.67	536, 544, 555	Fill
544	O138	83.89	83.09	543	Fill
546	N209	83.01	82.56	547	Fill

<i>Locus</i>	<i>Square</i>	<i>Opening height</i>	<i>Closing height</i>	<i>Associated loci/features</i>	<i>Description</i>
547	M209	83.11	81.99	546, 556	Fill
548	P209	85.58	84.98	534	Fill
549	O139	84.27	82.94	507	Fill
550	O140	84.5	84.17	565, 580(?)	Beach-rock working surface
551	P140	84.59	84.59	542	Pebbles floor
552	R140	84.15	83.92	553	Fill
553	R140	83.97	82.58	552, 559	Fill
554	Q211	86.02	85.29	512, 572	Fill
555	O138	84.18	83.96	536, 543, 574, 582	Installation (wine press) (Byz./Uma.)
563	L209	84.35	82.21	-	Fill
556	M209	82.49	82.2	547	Installation (channel)
564	S140	85.57	84.93	566, 578	Fill
565	O140	83.7	83.47	550	Fill
566	S140	84.93	84.04	564	Fill
567	N137	84.34	82.96	-	Fill
568	N136	84.19	83.7	-	Fill
569	N138	84.47	83.54	586	Fill
570	N140	84.59	83.81	580	Fill
571	O135	84.42	83.71	-	Fill
572	Q211	85.19	84.19	522, 554, 573	Installation (cistern)
573	Q211	85.29	84.07	572	Fill
574	O138	83.91	83.2	555	Installation (wine press, settling pit) (Byz./Uma.)
575	M140	84.93	82.4	557	Fill (podium)
576	R139	85.96	85.05	-	Fill
577	S209	85.73	85.4	-	Fill
578	S140	84.93	84.5	564, 566	Fill
580	N140	84.93	84.65	550(?), 570	Fill
581	O138	82.73	82.63	-	Installation (pool [type 2])
582	O138	83.93	83.93	536, 555	Plaster floor (wine press, mosaic foundation)
584	M135	84.19	83.83	593	Fill
585	L134	84.57	83.86	594, 601	Fill
586	N138	83.54	83.5	569, 587	Fill
587	N138	83.57	83.4	555, 586, 588	Installation (pool [type 2])
588	N138	83.5	83.2	587	Fill
589	J132	83.62	82.08	-	Fill
590	S-T139/S-T140	85.3	73.3	782, 901, 968	Installation (cistern)
591	Q140/R140	-	-	-	Fill [partially excavated by the IAA]
592	S139	85.3	84.7	-	Fill
593	M135/N135	83.83	83.53	584, 595, 598, 599, 605	Installation (pool?)
594	L134	83.86	82.98	585	Fill
595	N135	84.19	83.53	593	Fill
596	S139	85.3	84.7	-	Fill
597	T139	85.3	84.7	-	Fill [partially excavated by the IAA]
598	M135	83.83	83.43	593, 599	Fill
599	M135/N135	83.83	83.53	593	Fill
601	L134	82.87	82.43	585, 658, 967	Installation (pool [type 2])
602	R210	86.24	85.39	518	Fill
603	M135	84.26	84.15	-	Fill
604	K131	84.38	83.76	-	Fill [partially excavated by the IAA]
605	M135/N135	84.95	83.88	593	Mosaic working surface
606	T209	86.05	85.62	-	Fill
607	T210	86.23	85.74	-	Fill
608	U209	86.05	85.75	627	Fill
609	U210	86.21	85.55	-	Fill
610	V209	85.79	84.98	-	Fill
611	W209	85.68	84.87	-	Fill
612	W210	85.82	84.93	-	Fill
613	W211	85.87	85.22	-	Fill
614	V210	86.11	84.79	-	Fill
615	V211	86.03	84.55	-	Fill
616	R138/R139	85.41	83.86	619, 667	Installation (pool [type 2])
617	R138/R139	85.41	83.86	616	Fill

<i>Locus</i>	<i>Square</i>	<i>Opening height</i>	<i>Closing height</i>	<i>Associated loci/features</i>	<i>Description</i>
618	R138/R139	85.05	84.13	616, 617, 619	Fill
619	R138/R139	85.16	84.8	616, 684, 685	Installation (pool [type 2])
621	R139	85.16	85.09	682, 683	Stone working surface
624	T209	85.68	85.5	622, 625(?) 674	Installation (pool [type 2])
625	T209	85.62	84.38	674(?), 754, 755	Installation (subterranean vaulted chamber)
626	T209	85.55	85.5	-	Fill
628	U209	85.75	85.64	-	Fill
629	U209	85.75	85.19	627, 641	Fill
630	U210	85.8	85.42	631	Fill
631	U210	85.8	84.87	630, 664, 668	Installation (pool [type 2])
632	R210	85.39	85.24	518	Fill
633	R138	84.77	84.5	684	Fill
634	U209	85.64	85.19	-	Fill
635	U209	85.64	85.19	-	Fill
637	T210	85.74	85.65	-	Fill
638	W209	85.37	84.9	639	Fill
639	W209	84.85	83.68	638	Fill
640	R139	84.13	83.88	620	Fill
642	W209	85.28	84.04	646	Installation (pool [type 2])
643	U209	85.74	85.18	-	Fill
644	V211	86.02	86.02	671, 672	Stone working surface
645	R139	83.88	82.58	659, 954	Installation (oil press, basin) (Byz./Uma.)
646	W209	85.26	84.04	642	Installation
647	V209	84.98	84.98	-	Fill
648	W210	84.93	83.6	670	Fill
649	W211	86.71	86.1	651, 675	Fill
650	W211	86.41	86.2	-	Fill
652	K134	83.86	82.43	-	Fill
653	M134	83.88	83.54	653	Fill
654	M134	83.54	83.34	654	Fill
655	M133/M134	83.76	83.56	600	Installation (four pools [type 2])
656	K131	81.93	82.4	657	Fill [partially excavated by the IAA]
657	K131	81.93	82.35	656	Fill [partially excavated by the IAA]
658	K134/L134	82.87	82.43	601	Fill
659	R139	83.88	82.58	645	Fill
660	R138	84.77	84.5	-	Fill
661	T209	85.68	85.5	624, 674	Fill
663	W210	84.47	85.93	-	Fill
664	U210	85.8	85.51	631, 668	Installation (subterranean vaulted chamber)
665	M134	83.5	83.3	655	Fill
666	R138	84.9	85.3	679	Fill
667	R139	84.13	83.93	616	Fill
668	U210	85.8	85.21	631, 664	Fill
669	W210	84.47	84.21	-	Installation (pool [type 2])
670	W210	85.93	83.6	648	Fill
673	V211	85.28	85.06	671, 672	Installation (pool [type 2])
678	T210	86.23	84.73	-	Fill
679	R137	82.53	82.2	666	Installation (pool [type 2])
680	V209	85.4	85	-	Fill (stones)
681	U210/U211	85.67	85.67	-	Floor
685	K-N136/N-P137/ R138	84.77	81.88	619, 633, 684	Installation (pipe) [partially excavated by the IAA]
687	W211	86.86	86.1	675, 676	Fill
688	M140	83.96	83.48	-	Installation (channel)
690	Q139	85.64	85.25	-	Fill
691	Q138	85.65	85.19	-	Fill
692	Q137	85.58	85.22	-	Fill
693	R137	85.59	85.3	-	Fill
694	U138	85.8	83.68	-	Fill
695	U139	85.88	85.5	-	Fill
696	U140	85.85	85.53	-	Fill

<i>Locus</i>	<i>Square</i>	<i>Opening height</i>	<i>Closing height</i>	<i>Associated loci/features</i>	<i>Description</i>
697	V140	85.69	85.06	931	Fill
698	V139	85.69	85.41	-	Fill
699	W140	85.59	85.19	-	Fill
700	S209	86.1	85.8	140, 711, 712	Fill
701	S210	85.73	85.4	-	Occupation layer (Hasmonean)
702	V212	85.78	85.4	145, 719	Fill
703	X209	85.18	85.08	772	Fill
704	X211	85.5	84.99	-	Fill
705	X139	86	85	-	Fill
706	Y134/Y135	82.56	81.3	707, 829	Fill
707	Y134/Y135	82.39	81.3	706, 829	Fill
710	U140	85.49	85.2	718, 764, 947	Installation (channel)
711	S209	85.8	85.43	140, 700, 712	Fill
712	S209	85.65	85.1	140, 700, 711	Fill
713	X211	85.34	85.1	765	Stone working surface
714	R137	84.8	84.5	708, 726	Fill
715	R137	84.84	84.63	708, 714, 726	Fill
716	Q137	85.5	84.2	761	Installation (pool [type 3])
718	U140	85.49	85.2	710, 739	Fill
719	V212	85.43	85.43	145, 702, 720	Mortar working surface
720	V212	85.14	84.8	719, 746	Fill
723	W140	85.22	84.95	757, 794, 916, 917	Stone working surface
724	Q138/Q139	85.22	84.6	790, 928	Installation (pool [type 2])
725	T212	85.75	85.75	114, 130, 742	Floor
726	R137	85.5	85.4	708, 714, 715	Installation
727	U138	85.8	83.68	-	Fill
728	U138	83.7	83.4	-	Fill
729	U138	85.8	83.68	728	Fill
730	U138	84	83.49	-	Fill
731	V212	85	84.8	719, 720	Fill
732	Q138	84.98	84.89	-	Fill
733	Q139	84.93	84.84	789	Floor
734	Q137	85.1	84.86	692	Fill
735	Y134/Y135	82.96	82.7	-	Fill
736	S209/T209	86.09	85.99	-	Fill
737	S210	85.92	85.62	749	Stone collapse
738	U139	84.99	84.83	-	Fill
739	U140	84.93	84.56	718, 939, 947	Fill
740	V139	85.23	84.47	773, 758, 782	Fill
741	V140	85.14	85.06	697, 762, 931	Fill
742	W140	84.95	84.35	725, 781	Fill
743	X211	84.51	84.73	713, 765, 771	Fill
744	X209	84.6	84.13	745	Fill
745	X209	83.82	83.25	721, 744, 796	Installation (pool) (Rom./Byz.)
746	V212	84.65	84.3	720	Fill
747	V212	86.37	85.54	145	Fill
748	S210	85.4	85.12	737, 749	Fill
749	S210	85.35	84.89	737, 748	Fill
750	Q138/Q139	85.5	85.1	751	Fill
751	Q139/Q140	85.43	85.16	750	Fill [partially excavated by the IAA]
752	Y138	84.69	83.29	946, 948, 957	Refuse pit
754	S209/T209	85.8	83.68	625	Fill
755	S209/T209	85.87	85.63	625	Fill
756	S209/T209	85.07	84.85	760, 785	Fill
757	W140	85.12	84.39	723, 781	Fill
758	V139	84.97	84.67	740, 773, 782	Fill
760	S209	85.83	85.58	756	Fill
761	Q137	84.86	83.89	-	Fill
762	V140	85.06	84.66	741, 800	Fill
763	X211	84.99	84.55	743	Fill
764	U140	85.56	85.25	710	Fill
765	Q138	84.89	84.61	-	Fill
766	T209	85.85	85.73	622	Fill

<i>Locus</i>	<i>Square</i>	<i>Opening height</i>	<i>Closing height</i>	<i>Associated loci/features</i>	<i>Description</i>
767	Q139	84.84	84.39	778	Floor
768	Y134/Y135	83.3	82.94	792, 829	Fill
769	Q137	85.19	84.78	716	Fill
770	U138	85.23	83.49	730	Fill
771	X211	84.73	84.21	743	Occupation layer (Hasmonean)
772	X209	84.13	83.66	703	Fill
773	V139	84.97	84.64	740, 758, 782	Fill
774	Q138	84.61	84.21	-	Fill
775	Q137	85.5	84.66	725	Fill
776	U138	84.74	84.21	914	Fill
777	Q138	84.88	84.34	-	Fill
778	Q139	84.93	84.39	-	Fill
781	W140	84.58	84.29	742, 757, 960(?)	Installation (channel)
782	V139	85.11	84.52	740, 758, 773, 783, 784	Installation (channel)
783	V139	85.29	85.07	782, 784	Plaster floor
784	V139	85.32	85.05	783, 911	Installation (pipe)
785	V139	85.07	84.85	782, 783, 784	Installation (pipe)
787	Q138	85.18	83.49	788(?), 950, 951	Installation (subterranean vaulted chamber)
788	Q138	84.74	84.3	787(?)	Installation (channel)
789	Q139	85.01	84.9	733	Installation (channel)
791	U139	85.07	84.88	-	Fill
792	Y134/Y135	83.3	82.94	768, 793, 795, 903, 906, 907	Fill
793	Y135	83.3	82.76	792	Fill
794	W140	84.95	84.77	723, 917	Fill
795	Y134	82.94	82.74	792, 903	Fill
796	X209	84.59	84.15	745	Refuse (Rom./Byz.)
797	X211	85.4	85.1	713	Fill
798	X209	83.66	83.5	-	Fill
800	V140	84.66	84.11	762, 931	Fill
801	X138	84.57	84.11	806	Fill
802	X137	84.57	84.48	804, 805	Fill
803	Y137	84.17	84.09	808, 811	Fill
804	X137	84.76	84.41	802, 805	Ashlar stones feature
805	X137	84.38	84.21	802, 804	Fill
806	X138	84.11	83.88	801, 807	Fill
807	X138	84.63	83.15	806, 826	Stone collapse
808	Y137	84.09	83.05	803, 811	Fill
809	X137	84.21	83.67	811, 814, 824	Fill
810	X138	83.88	83.06	818, 826	Fill
811	Y137	83.12	83	803, 809, 808, 813	Fill
812	ZB139	83.32	83.25	815	Fill
813	X137	83.67	83.26	811	Fill
814	X137	83.26	83	804, 809, 824	Fill
815	ZB138	83.36	82.68	812, 817	Fill
816	Z137	83.06	82.46	830	Fill
817	ZB138	83.34	83.34	815	Stone floor
818	X138	83.34	83.28	826	Fill
820	ZB138	83.23	83.16	821	Fill
821	ZB138	82.68	82.68	819, 820	Stone working surface
822	ZB138	82.68	82.34	829	Fill
823	Z135	82.45	82.37	829	Fill
824	X137	83.67	83.07	809, 814	Stone collapse
825	ZB138	83.34	82.66	817	Fill
826	X138	83.28	83.15	807, 810, 818	Stone collapse
827	Z135	82.68	82.6	823	Fill
830	Z137	84.17	83.06	816, 832	Fill
834	ZB138	82.34	82.34	912	Stone working surface
835	Z135	82.39	82.28	-	Fill
836	Z135	82.37	82.14	-	Fill
837	W139	85.07	84.65	845, 846	Fill
838	Z134	83.83	82.47	842, 844	Fill

<i>Locus</i>	<i>Square</i>	<i>Opening height</i>	<i>Closing height</i>	<i>Associated loci/features</i>	<i>Description</i>
839	V138	85.06	84.87	840	Fill
840	V138	84.87	83.59	839	Fill
843	ZB138	82.85	82.57	-	Floor
844	Z134	82.87	82.66	838	Fill
845	W138/W139	84.16	83.8	837, 846	Stone working surface [partially excavated by the IAA]
846	W139	83.9	83.82	837, 845	Fill
848	Y134	83.66	83.27	-	Fill
850	ZA138	83.18	83.13	-	Fill
901	S209	84.3	83.8	902	Installation (plastered)
902	S209	85.45	83.8	901	Fill
903	Y134	82.94	82.49	792, 795	Fill
904	Y134	82.93	82.57	-	Fill
908	W140	84.77	84.51	916, 917	Fill
909	Q138	84.21	83.83	914	Fill
910	V139	84.64	84.31	911, 920	Fill
911	V139	84.82	84.62	784, 910	Installation (pipe)
912	X209	83.79	82.48-82.42	834	Fill
913	Q139	84.34	84.11	922	Fill
914	Q138	84.4	83.85	909, 915	Installation
915	Q138	84.4	83.85	914	Fill
918	Q139	84.74	84.53	790	Fill
919	Y134/Y135	82.7	82.48	829	Fill
920	V139	84.31	83.97	910, 911, 938	Fill
921	Q138	84.68	83.49	-	Fill
922	Q139	84.4	84.06	913	Fill
923	W140	84.51	84.06	-	Fill
924	Y138	83.29	82.63	948, 957	Refuse pit
925	Q139	84.56	84.25	-	Fill
926	Q139	84.56	84.08	-	Fill
928	Q138/Q139	85.6	85.2	724	Fill
929	S209	86.22	84.75	-	Fill
931	V140	84.91	83.9	741, 800, 932	Installation (cistern)
932	V140	84.92	83.68	931	Fill
935	Q139	84.08	83.53	962	Fill
936	W140	84.67	84.28	943	Fill
937	W140	84.77	84.01	937	Fill
938	U139/V139	85.49	84.91	784(?), 785(?), 920	Fill
939	U139/U140	85.65	85.25	739, 945	Fill
940	Q137/Q138	85.51	84.82	716(?)	Fill
942	U139/V139	84.91	84.75	-	Fill
943	W140	84.28	84.22	936	Fill
944	W140	84.01	83.98	-	Fill (virgin soil)
945	U139/U140	85.25	85	739, 947	Fill
946	Y138	82.63	82.09	752, 948, 957	Refuse pit
947	U139/U140	85.52	85.22	710, 739, 945	Fill
948	Y138	84.18	83.81	924, 946	Refuse pit
949	Q137/Q138	85.47	84.82	-	Fill
950	W140	84.55	84.11	787	Fill
951	Q138	85.46	83.55	787	Fill
952	Q139/Q140	84.9	84.14	-	Fill [partially excavated by the IAA]
955	Q139	85.44	84.98	-	Fill
957	Y138	83.55	83.16	924, 946, 948	Refuse pit
958	Q139	85.18	84.79	-	Fill
959	Q139	84.98	84.51	-	Fill
960	W140	84.55	84.39	781(?)	Plaster floor
961	Q139	84.79	84.37	-	Fill
962	Q139	85.3	83.57	935	Olive press weight (Byz./Uma.)
963	Q139	84.37	84.08	-	Fill
964	P210/P211/Q211	-	-	-	Installation (cistern) [excavated by the IAA]
966	Y134	81.35	81.15	-	Fill (secondary glass workshop debris)
968	S139/S140	84.58	84.29	590, 901	Installation (pipe)
969	K131/L131	82.15	82.01	335	Installation (channel) [partially excavated by the IAA]

LIST OF LOCI

2007 SEASON OF EXCAVATIONS

<i>Locus</i>	<i>Square</i>	<i>Opening height</i>	<i>Closing height</i>	<i>Associated loci/features</i>	<i>Description</i>
1500	P12	79.13	78.67	1533	Fill
1501	P11	79.07	78	1528, 1539, 1583	Fill
1502	P10	79.19	78.69	1521, 1538	Fill
1503	Q12	79.48	78.34	1546, 1549	Fill
1504	Q11	79.33	78.75	1514	Fill
1505	Q10	79.55	79.22	1517, 1518, 1521	Fill
1506	R12	79.54	79.46	1519, 1527	Fill
1507	R11	79.57	79.49	1512	Fill
1508	R10	79.6	78.7	1544, 1545, 1547	Fill
1509	S12	79.8	79.39	1555, 1572, 1581	Fill
1510	S11	79.69	79.29	1534	Fill
1511	S10	80.03	79.08	1524, 1548	Fill
1512	Q12	79.4	79.34	1507	Fill
1513	R11	79.55	79.37	1515	Fill
1514	Q11	79.24	79.24	1504, 1525, 1551	Mortar working surface
1515	R11	79.49	79.39	1513, 1516	Fill
1516	R11	79.39	79.39	1515, 1535, 1552	Mortar working surface
1518	Q10	79.47	78.11	1505, 1517, 1521	Fill
1519	R12	79.46	78.95	1505, 1506, 1527	Fill
1521	P10	78.69	77.65	1502, 1517, 1518, 1520, 1522	Fill
1522	Q10	80	79.51	1505, 1517(?), 1521, 1523, 1526	Installation (pool [type 2])
1523	Q10	79.48	78.36	1522	Fill
1525	Q11	78.75	77.81	1514, 1531, 1541	Fill
1526	Q10	79.22	78.4	1522	Fill
1527	R12	78.95	76.68	1506, 1519	Fill
1528	P11	78.85	78.62	1501	Installation (<i>ṭabun</i>)
1531	Q11	78.59	78.59	1525, 1537	Mortar working surface
1532	R12	78.68	77.64	1529, 1571	Fill
1533	P12	78.67	77.91	1500, 1582	Fill
1534	S11	79.29	78.5	1510, 1538	Fill
1535	R11	79.39	78.23	1516, 1560	Fill
1538	P10	78.69	78.16	1502, 1534, 1565	Fill
1539	P11	78.93	78.07	1501, 1510, 1565	Fill
1541	Q11	78	77.56	1525	Fill
1542	R11	78.91	78.91	1516, 1552	Mortar working surface
1543	R11	78.97	78.28	-	Fill
1544	R10	79.26	79	1508, 1545, 1547	Fill
1546	Q12	78.33	77.38	1503, 1549, 1580	Fill
1547	R10	78.7	78.3	1508, 1544, 1545	Fill
1548	S10	79.08	78.7	1511, 1553, 1591, 1592	Fill
1549	Q12	79.44	79.21	1503, 1546, 1550	Fill
1550	Q12	78.3	78.2	1546	Installation
1551	Q11	79.24	77.95	1514, 1581	Fill
1552	R11	79.39	78.93	1516, 1542	Fill
1553	S10	79.26	79.13	1548, 1591, 1592	Installation (kiln) (Byz./Uma.)
1554	S10	79.23	78.57	1553, 1591, 1592	Fill
1555	S11	78.58	78.55	1509, 1535, 1560	Fill
1557	T12	80.08	79.17	1578, 1579	Fill
1558	T11	79.97	79.43	1566, 1575, 1576	Fill
1559	T10	79.9	79.5	1562, 1586	Fill
1560	S11	78.5	78	1535, 1555, 1560	Fill
1561	S11	78.5	78.02	1560	Fill
1562	T10/U10	80.14	79.38	1559, 1563	Installation (pool [type 2])
1563	T10/U10	80.14	79.38	1562	Fill
1564	P11	78.34	77.73	-	Installation (channel)
1565	P10	77.8	77.02	1538, 1539, 1582, 1583	Installation (channel)

<i>Locus</i>	<i>Square</i>	<i>Opening height</i>	<i>Closing height</i>	<i>Associated loci/features</i>	<i>Description</i>
1566	T11	79.91	79.41	1558	Installation
1567	T10	79.7	79.17	1584	Fill
1568	Q10	78.96	78.58	1569, 1570	Fill
1569	Q10	78.96	78.21	1568, 1570	Installation (subterranean vaulted chamber)
1570	Q10	78.49	78.35	1568, 1569	Installation
1571	R12	78.24	78.22	1532	Mortar working surface
1572	S12	79.39	78.99	1509, 1580	Fill
1575	T11/T12	79.71	78.81	1558, 1576, 1588	Installation (four pools [type 2])
1576	T11	79.35	78.47	1558, 1575	Fill
1578	T12	79.39	79.39	1557, 1579	Mortar working surface
1579	T12	79.12	79.06	1557, 1578, 1593	Fill
1580	S12	78.99	78.49	1546, 1572	Fill
1582	P12	78.67	78.58	1533, 1565	Fill
1583	P11	78.07	77.94	1501, 1565, 1590	Fill
1584	T10	79.16	78.84	1567, 1585, 1587	Installation (kiln) (Byz./Uma.)
1585	T10	79.5	79.05	1584	Fill
1586	T10	79.5	79.09	1559, 1587	Fill
1587	T11	79.16	79.04	1586	Fill
1588	T11	79.67	78.87	1575, 1589	Installation
1589	T11	79.74	79.49	1588	Installation (subterranean vaulted chamber)
1590	P11	77.94	77.84	1583	Fill
1591	S10	78.7	78.6	1548, 1553, 1554, 1592	Fill
1592	S10	78.7	78.57	1548, 1553, 1554, 1591	Fill
1593	T12	79.06	78.33	1579	Fill
1600	Y12	80.7	80.49	1622	Fill
1601	X12	80.66	80.13	1668	Fill
1602	W12	80.37	80.3	1620	Fill
1603	V12	80.25	80.09	1619, 1626	Fill
1604	Y11	80.65	80.44	1629	Fill
1605	X11	80.48	80.43	1617	Fill
1606	W11	80.25	80.23	1612, 1631	Fill
1607	V11	80.12	79.79	1615	Fill
1608	Y10	80.83	80.81	1613, 1614	Fill
1609	X10	80.55	80.4	1621, 1632	Fill
1610	W10	80.45	80.29	1616	Fill
1611	V10	80.29	79.97	1624, 1698	Fill
1612	W11	80.23	79.87	1606, 1631	Fill
1613	Y10	80.81	80.63	1608, 1627, 1614	Fill
1614	Y10	80.81	80.63	1608, 1613	Fill
1615	V11	79.79	79.62	1607, 1618	Fill
1616	W10	80.29	80	1610, 1643	Fill
1617	X11	80.43	80.43	1605, 1623	Stone and plaster floor
1618	V11	79.62	79.42	1615, 1729(?)	Installation (channel)
1619	V12	80.09	79.68	1603, 1626	Fill
1620	W12	80.3	80.07	1602, 1628	Fill
1621	X10	80.4	80.32	1609	Fill
1622	Y12	80.49	80	1600, 1647	Fill
1623	X11	80.25	79.77	1617, 1637, 1640, 1641	Fill
1624	V10	79.97	79.04	1611, 1698	Fill
1626	V12	79.68	79.68	1603, 1619, 1635, 1638, 1645	Mortar working surface
1627	Y10	80.63	80.63	1613, 1633	Mortar working surface
1628	W12	80.14	80.14	1620, 1636	Mortar working surface
1629	Y11	80.49	80.49	1604, 1630, 1650	Mortar working surface
1630	Y11	80.44	79.91	1629	Fill
1631	W11	79.87	79.4	1606, 1612, 1639	Fill
1632	X10	80.32	80.06	1609, 1642	Fill
1633	Y10	80.63	80.02	1627, 1694, 1720	Fill
1634	V11	79.62	78.83	1650, 1678, 1680	Fill
1635	V12	79.68	79.01	1626, 1678	Fill
1636	W12	80.07	79.27	1628, 1653	Fill
1637	X11	79.77	78.95	1623, 1640, 1641, 1644	Fill
1638	V12	79.91	79.31	1626	Fill

<i>Locus</i>	<i>Square</i>	<i>Opening height</i>	<i>Closing height</i>	<i>Associated loci/features</i>	<i>Description</i>
1639	W11	79.83	79.42	1631	Installation
1642	X10	80.52	80.52	1632, 1646	Mortar working surface
1643	W10	80.05	79.63	1616, 1655, 1661	Fill
1644	X11	80.2	79.79	1637, 1640, 1641	Fill
1645	U12	80.09	79.26	1626	Fill
1646	X10	80.09	79.91	1642, 1648	Fill
1647	Y12	80	79.82	1622, 1649	Fill
1648	X10	80.34	80.34	1646	Mortar working surface
1649	Y12	80.01	80.01	1647, 1654	Mortar working surface
1651	W11	79.41	79.3	1650, 1670	Fill
1652	V12	79.88	79.28	1638	Robber trench
1653	W11/W12	80	79.21	1636, 1657	Robber trench
1654	Y12	80	79.44	1649, 1677	Fill
1655	W10	79.92	79.19	1643	Fill
1657	W11	79.4	79.38	1653	Fill
1658	W11	79.3	79.1	79.13	Installation
1660	W11	79.4	79.13	1658	Fill
1661	W10	79.8	79.46	1643	Fill
1662	X10	79.91	79.16	1663, 1679	Fill
1663	X10	79.9	79.19	1662, 1664, 1671	Fill
1664	X10	79.92	79.7	1662, 1668	Fill
1665	X12	80.13	80.03	1672	Fill
1667	X11	79.89	79.61	-	Fill
1668	X10	80.01	79.61	1601, 1664, 1744	Mosaic floor
1670	W11	79.25	78.95	1651	Installation (basin) (wine press?) (Byz./Uma.)
1672	X12	80.03	79.44	1665, 1673	Fill
1673	X12	80.03	79.66	1672	Fill
1674	Y11	79.76	79.6	1675	Installation (pool [type 2])
1675	Y11	79.91	79.71	1672, 1674	Fill
1676	U12	79.26	78.46	-	Fill
1677	Y12	79.94	79.4	1654	Installation (channel)
1678	V11	79.25	78.95	1634, 1635, 1680, 1707, 1708, 1729(?)	Installation
1679	X11	79.79	79.03	1662	Fill
1680	V11	79.51	79.51	1634, 1678	Mortar working surface
1681	X11	79.61	79.61	1669	Mortar working surface
1683	X12	80.03	78.95/78.85	-	Installation (pool [type 2])
1684	X12	80.13	79.66	-	Fill
1685	W11	79.13	78.87	1686	Fill
1686	W11	79.13	78.79	1685	Fill
1687	X10	80.01	79.02	-	Fill
1690	X10	79.59	79.59	1691	Mortar working surface
1691	X10	79.54	79.54	1690, 1743	Mosaic floor
1692	W10	79.63	79.28	1693	Fill
1693	W10	78.63	79.33	1692	Fill
1694	Y10	80.02	79.95	1633	Fill
1695	Y12	79.48	79.48	1712	Mosaic floor (Byz./Uma.)
1696	Y10	79.81	79.81	1697(?), 1721(?)	Mosaic floor (wine press?) (Byz./Uma.)
1697	Y10	79.95	79.95	1696	Mortar working surface
1698	V10	79.07	79.07	1611, 1624	Fill
1699	W10	79.35	78.8	1700, 1704	Installation (wine press) (Byz./Uma.)
1700	W10	79.33	79.33	1699, 1728	Mosaic floor (wine press) (Byz./Uma.)
1701	U12	80.12	78.75	1709	Fill
1702	U11	80.13	78.88	1740, 1745	Fill
1703	U10	80.15	79.14	1734, 1739	Fill
1704	W10	79.28	78.95	1699	Fill
1705	X11	78.95	78.95	1706	Fill
1706	X11	78.95	78.95	1705, 1714, 1715	Mosaic floor (wine press?) (Byz./Uma.)

<i>Locus</i>	<i>Square</i>	<i>Opening height</i>	<i>Closing height</i>	<i>Associated loci/features</i>	<i>Description</i>
1707	Y11	79.71	79.39	1678	Fill
1708	V12	79.01	78.83	1678, 1709	Fill
1709	U12/V12	80.1	78.56	1701, 1708, 1742	Fill
1710	X12	79.74	79.7	1711, 1712	Fill
1711	X12	79.44	79.44	1710, 1713	Mortar working surface
1712	X12	79.46	79.46	1695, 1710, 1711, 1716	Mosaic floor
1713	V12	79.3	78.9	1718	Fill
1714	X11	79.26	78.77	1706	Installation (press-bed of a wooden screw) (Byz./Uma.)
1715	X11	78.83	78.83	1706	Installation
1716	X11	80.01	79.26	1712, 1717	Installation (subterranean vaulted chamber)
1717	X11/X12	80.01	79.26	1716	Installation (subterranean vaulted chamber)
1718	V12	79.68	78.13	1713	Installation (subterranean vaulted chamber)
1719	Y12	79.7	79.7	-	Mortar working surface
1720	Y10	80.08	80.02	1633	Fill
1721	Y10	79.81	79.64	1696(?)	Fill
1722	X10	79.34	79.34	1723	Mosaic floor (wine press?) (Byz./Uma.)
1723	V10	79.89	79.89	1722	Mosaic floor
1725	W10	80	79.49/79.35	-	Installation (pool [type 2])
1728	W10	79.33	78.8	1699, 1700	Settling pit (wine press) (Byz./Uma.)
1729	V12	78.8	78.65	1618(?), 1678(?), 1736, 1747	Installation
1734	U10	79.14	78/04	1703	Fill
1735	U12	78.75	78.57	1742	Fill
1736	V12	78.85	78.62	1729, 1737	Fill
1737	V12	78.83	78.83	1736	Fill
1738	U12	78.57	78.36	-	Fill
1739	U10	78.53	78.39	1703, 1741	Fill
1740	U11	78.88	77.91	1702, 1745	Fill
1741	U10	79.14	79.04	1739, 1746	Fill
1742	U12/V12	79.08	78.36	1709, 1735	Fill
1743	X10	79.54	78.96	1691	Fill
1744	X10	80.01	79.41	1668	Fill
1745	U11	78.88	78.68	1702, 1740, 1748	Fill
1746	U10	79.1	79.04	1741	Installation
1747	V12	78.8	78.63	1729	Robber trench
1748	U11	78.8	78.69	1745	Installation
1749	U11	78.88	78.65	1745, 1748	Fill

LIST OF WALLS

2005-2006 SEASONS OF EXCAVATIONS*

<i>Wall</i>	<i>Square</i>	<i>Axis</i>	<i>Opening height</i>	<i>Closing height</i>	<i>Thickness</i>	<i>Length</i>	<i>Feature above</i>	<i>Abutting/ combined/ equals</i>	<i>Description</i>
10	T217	E-W	85.83	85.4	0.66	4.2	3	8, 9, 14	One course/a round base and column in secondary use
24	T217/ T218	N-S	85.93	85.23	0.8	1.5	Top soil	46	Two courses
43	S218	N-S	85.91	85.61	0.75	1.45	12, 25	32, 40	One course
69	T215	N-S	85.89	85.49	0.6	2.5	Top soil, 34	70, 71, 84, 85	One course
74	U214	E-W	85.8	85.05	0.5	2.5	Top soil	48, 156	Four courses [partially excavated by the IAA]
76	S213	N-S	86.35	86.03	0.5	1	Top soil	-	One course
116	S213/ T212/ T213	E-W	86.5	86	0.6	3	Top soil	104, 129, 150(?)	Two courses
135	S211	N-S	85.88	85.5	0.6	2.5	Top soil, 118	-	One course
151	S212	N-S	86.3	86.04	0.4	1	Top soil	-	One course
156	U214	N-S	85.96	85.75	0.5	2.5	52	74	One course [partially excavated by the IAA]
157	W212	N-S	-	-	0.9	0.9	-	-	One course [excavated by the IAA]
208	M136	N-S	82.75	82.25	0.5	1.5	Top soil	344	One course
210	K138/ L138	E-W	82.87	81.9	0.65	2.3	Top soil	-	Three courses/domestic complex (Byz./Uma.)
211	M137	E-W	82.74	82.35	0.7	1.5	Top soil	348, 349	One course
216	K138	E-W	81.79	81.5	0.5	2.0	Top soil	229	One course (Byz./Uma.)
217	L138	E-W	83	82.2	0.6	4.5	Top soil	212	Three courses/domestic complex (Byz./Uma.)
226	L138	N-S	82.1	81.75	0.5	3.3	380	210, 217	One course/domestic complex (Byz./Uma.)
227	K139 - L139	N-S	82.38	82.1	0.6	1	Top soil	396	One course (Byz./Uma.)
228	L139	E-W	82.4	82.1	0.6	1	Top soil	396	One course (Byz./Uma.)
251	K136/ L136	N-S	82.9	82.05	0.5	3	Top soil	-	Three courses
277	K137/ L137	N-S	81.85	81.5	Unknown	3	Top soil	274	One course/domestic complex (Byz./Uma.)
278	L137	N-S	81.85	81.5	Unknown	1.5	Top soil	274	One course/domestic complex
307	H138	E-W	81.35	81.05	1.2	2.5	Top soil	305	One course
389	L138	N-S	82.62	82.2	0.5	5	Top soil	210, 217, 221, 225, 369	One course/domestic complex (Byz./Uma.)
523	Q211	N-S	85.63	85.5	0.7	4.2	Top soil	964	One course
537	O138	N-S	84.18	83.97	0.5	0.7	Top soil	506, 536	One course (Byz./Uma.)
545	R140	N-S	84.56	82.56	0.6	4.5	Top soil	538	West wall of 538
557	M209/ M140	SE-NW	83.84	82.44	1.5	2.2	Top soil	575	Five courses/podium (Rom./Byz.)
558	R140	N-S	84.56	82.56	0.6	4.5	Top soil	538	East wall of 538
559	R140	E-W	83.97	82.56	0.4	2.5	Top soil	543, 545, 558	South wall of 538
560	R140	E-W	84.95	84.55	0.8	1.6	Top soil	561	One course
561	R140	N-S	84.95	84.59	0.8	0.95	Top soil	560	One course

* All architectural features are of the Early Islamic period (late Umayyad, Abbasid and Fatimid) unless indicated otherwise. The following squares were excavated by the Israel Antiquities Authority: K131, M210, N210, O210, P137, P138, P210, P211, Q140, Q209, S137, S219, T139, U214, U215, W137, W138, W212, Z133.

List of Walls

Wall	Square	Axis	Opening height	Closing height	Thickness	Length	Feature above	Abutting/ combined/ equals	Description
562	R140	E-W	84.56	82.56	0.4	2.5	Top soil	538	North wall of 538
600	L134	E-W	83.86	82.98	1	2.6	Top soil	655	One course
620	R139	N-S	85.29	84.9	0.5	1	Top soil	621, 640, 682, 683	One course
622	T209	N-S	85.98	85.81	0.5	2.6	606	623, 625, 624, 661	One course
623	T209	E-W	85.89	85.5	0.6	2.5	606	622, 624, 625, 626	Two courses
627	U209	N-S	85.74	85.18	0.25	2	Top soil	629, 641	One course
641	U209	N-S	85.69	85.18	0.5	1	608	627, 629	One course
651	W211	N-S	86.41	86.2	0.5	3.5	613	649, 675, 687	One course
671	V211	N-S	86.45	86.22	0.6	1.5	615	644, 672, 673	One course
672	V211	E-W	86.45	86.22	0.6	1.5	615	644, 671, 673	One course
674	T209	E-W	85.68	85.5	0.15	1.5	Top soil	622, 624, 661	One course
675	W211	E-W	86.1	85.9	0.4	2.5	Top soil	649, 676, 687	One course
676	W211	E-W	86.34	86.1	0.5	2	Top soil	675, 687	One course
677	V210	N-S	85.7	85.5	0.6	0.6	614	-	One course
684	R138	E-W	85.16	84.77	0.5	2.5	633	619, 685	One course
708	R137	E-W	85.5	85.2	0.6	2.4	Top soil	-	One course
721	X209	E-W	84.37	83.87	0.5	2.5	Top soil	745	Two courses
779	X211	E-W	85.1	84.47	0.6	1.6	Top soil	780	Two courses
780	X211	N-S	85.04	84.57	1	1.3	Top soil	779	Two courses
790	Q139	E-W	85.12	84.53	0.6	3.5	Top soil	724, 918	Two courses
804	X137	N-S	83.17	82.96	1	1	Top soil	814	One course
819	ZB138/ B139	E-W	83.55	83.14	0.2	4	Top soil	821	One course
826	X138	E-W	83.26	83.15	0.5	1	Top soil	-	One course
829	Y134/ Z135	N-S	82.39	81.3	0.5	8	Top soil	706, 707, 768, 822, 823, 919	Three courses/foundation of a channel(?)
832	Z137	N-S	82.5	82.3	0.5	2.5	Top soil	830	One course
842	Z134	N-S	82.45	82.15	0.4	1.5	Top soil	838	One course
852	Z133	N-S	82.51	82.25	0.6	1.8	Top soil	-	One course [partially excavated by the IAA]
853	Z135	N-S	81.64	81.35	0.5	2	Top soil	-	One course
905	Y134	N-S	82.18	81.8	0.5	3.5	768	906	One course/ashlar wall (Byz./Uma.)
906	Y134	N-S	82.15	81.82	0.5	2.5	768	905	One course (Byz./Uma.)
907	Y134	N-S/E-W	82.2	81.8	0.7	0.5	768	829, 906	One course (Byz./Uma.)
916	W140	E-W	85.06	84.72	0.7	2.5	Top soil	723, 908, 917	One course
917	W140	N-S	84.98	84.84	0.75	1.5	Top soil	723, 908, 916, 937	One course
953	Q139	E-W	84.53	84.13	0.55	2.2	790	954, 956	One course/oil press (Byz./Uma.)
954	Q139	E-W	83.83	83.16	0.6	1.5	Top soil	645, 953, 956	Two courses/oil press (Byz./Uma.)
956	Q139	N-S	85.46	84.34	0.65	2.2	790	953, 954	Five courses/oil press (Byz./Uma.)
967	K134	E-W	82.6	82.4	0.5	1.5	Top soil	601	One course

LIST OF WALLS

2007 SEASON OF EXCAVATIONS

<i>Wall</i>	<i>Square</i>	<i>Axis</i>	<i>Opening height</i>	<i>Closing height</i>	<i>Thickness</i>	<i>Length</i>	<i>Feature above</i>	<i>Abutting/combined/equals</i>	<i>Description</i>
1517	Q10	E-W	79.51	79.22	0.5	2.2	Top soil	1518, 1521, 1522(?)	One course
1520	P10/P11/ P12	E-W	78.8	77.3	0.75	15	Top soil	1521, 1528	One course
1524	S10	E-W	80.03	78.82	0.4	1.8	Top soil	1511	One course
1529	R12	N-S	78.86	77.58	0.65	2	Top soil	1532, 1571	Two courses
1536	R11	E-W	79.34	79.05	0.5	1.6	Top soil	1516, 1542	One course
1537	Q11	N-S	78.74	78.5	0.7	1.5	Top soil	1514, 1531	One course
1545	R10	N-S	79.28	79.1	0.6	3.2	Top soil	1508, 1544, 1547	One course
1581	Q11	N-S	78.8	78.5	0.6	1.5	Top soil	1509, 1551	One course
1640	X11	N-S	78.95	78.65	0.5	1	Top soil	1623, 1637, 1644	One course
1641	X11	E-W	78.95	78.65	0.5	1.1	Top soil	1623, 1637, 1644	One course
1650	V11/ W11	N-S	79.69	79.27	0.5	3.1	Top soil	1629, 1634, 1651, 1678, 1727	One course
1671	W10/ X10	S-N	79.99	79.61	0.4	5	1668, 1690	1663, 1699, 1724, 1726, 1727	Plastered wall/wine press (Byz./Uma.)
1669	X11	N-S	79.81	79.61	0.4	1.1	Top soil	1681	One course
1724	W10/ W11	E-W	79.44	79.33	0.4	4.75	1693, 1685, 1686	1671, 1699, 1726, 1727	Plastered wall/wine press (Byz./Uma.)
1726	X11	E-W	79.66	78.95	0.4	6.2	1657	1671, 1699, 1724, 1727	Plastered wall/wine press (Byz./Uma.)
1727	W11	E-W	79.59	79.27	0.4	0.6	1685, 1686	1671, 1699, 1724, 1726	Plastered wall/wine press (Byz./Uma.)

LIST OF POTTERY AND GLASS FINDS

<i>Figure</i>	<i>No.</i>	<i>Locus</i>	<i>Basket/Reg. No.</i>	<i>Elevation</i>
3.1	1	4	1002/1	81.5
3.1	2	8	1016/3	84.6
3.1	3	8	1016/5	85.05
3.2	1	4	1066/1	81.35
3.2	2-7	510	5122/2-7	85.37-84.91
3.3	1	701	5675/7	85.45
3.3	2	14	1033/1	84.95
3.3	3	701	5675/5	85.45
3.3	4	701	5661/2	85.65
3.3	5	701	5661/8	85.65
3.3	6	4	1002/5	81.5
3.3	7	701	5661/5	85.65
3.3	8	701	5675/1	85.45
3.4	1	3	1015/1	85.6
3.4	2	8	1019/2	84.85
3.4	3	14	1019/6	84.85
3.4	4	14	1019/1	84.85
3.4	5	14	1044/1	84.8
3.4	6	14	1076/1	84.8
3.4	7	8	1016/8	85.05
3.4	8	8	1016/1	85.05
3.4	9	14	1038/3	84.82
3.4	10	8	1017/1	84.95
4.2	-	547	5183/7	82.05
4.4	1-5	796	5930/1-2-5931/1-3	84.35-84.2
4.5	1-3	796	5926/1-3	84.35-84.2
4.6	1	110	1322/1	85.1
4.6	2	36	1170/1	84.7
4.6	3	124	1336/1	85.5
5.7	1	225	3306/7	82.15
5.7	2	392	3240/18	82
5.7	3	225	3306/3	82.15
5.7	4	392	3240/6	82
5.8	1-5	392	3240/1, 26, 28-29, 34	82
5.16	-	778	5975/1	84.35
5.27	1	1586	15364/2	79.15
5.27	2	1586	15364/11	79.15
5.27	3	1588	15361/1	79.05
5.27	4	1586	15364/1	79.15
5.27	5	1588	15361/2	79.05
5.27	6	1586	15364/3	79.15
5.28-5.36	-	966	-	81.35-81.15
5.42	1	57	1194/24	84.5
5.42	2	57	1204/4	84.4
5.42	3	57	1204/2	84.4
5.42	4	57	1194/42	84.45
5.42	5	57	1194/11	84.45
5.42	6	57	1204/1	84.4
5.42	7	57	1194/4	84.45
5.42	8	1670	15711/1	79
5.42	9	16	1051/1	85.1
5.42	10	768	5823/1	83.1
5.42	11	55	1263/1	85.4
6.78	1	538	5300/2	84-83.5
6.78	2	538	5300/24	84-83.5
6.78	3	247	3360/1	81.5

<i>Figure</i>	<i>No.</i>	<i>Locus</i>	<i>Basket/Reg. No.</i>	<i>Elevation</i>
6.79	1	625	5486/28	85.4
6.79	2	625	5596/8	84.8-84.6
6.79	3	767	5812/1	84.5
6.79	4	625	5495/4	85.2-84.8
6.79	5	538	5300/94	84-83.5
6.79	6	912	6013/8	83
6.79	7	752	5964/7	83.3
6.80	1	762	5766/6	84.8
6.80	2	912	6014/5	82.9
6.80	3	752	5964/2	83.3
6.80	4	752	5902/1	83.7
6.81	1	538	5300/4	84-83.5
6.81	2	538	5300/83	84-83.5
6.81	3	538	5300/49	84-83.5
6.81	4	538	5300/95	84-83.5
6.81	5	538	5300/84	84-83.5
6.81	6	538	5300/17	84-83.5
6.81	7	370	3251/16	81.7
6.81	8	318	3067/3	82
6.81	9	370	3251/6	81.7
6.81	10	912	5967/11	83.1
6.81	11	785	5872/1	84.9
6.82	1	538	5300/93	84-83.5
6.82	2	538	5300/28	84-83.5
6.82	3	538	5300/124	84-83.5
6.82	4	Surface	-	-
6.82	5	912	6057/1	82.5
6.83	1	390	3200/2	82.5
6.83	2	502	5025/23	85
6.83	3	767	5812/4	84.5
6.83	4	544	5161/3	83.5
6.83	5	538	5152/68	84.5-84
6.83	6	772	5881/10	83.8
6.83	7	538	5300/204	84-83.5
6.83	8	699	5682/1	85.4
6.83	9	508	5026/5	85.3
6.83	10	625	5495/15	85.2-84.8
6.83	11	323	3152/1	83.2
6.83	12	Surface	-	-
6.83	13	761	5994/15	84
6.83	14	948	7000/2	84
6.83	15	752	5775/1	84.2
6.83	16	543	5161/1	83.75
6.84	1	271	3387/1	81.7
6.84	2	538	5306/11	84-83.5
6.84	3	625	5488/3	85.3
6.84	4	538	5300/250	84-83.5
6.84	5	625	5495/9	85.2-84.8
6.84	6	625	5495/10	85.2-84.8
6.84	7	538	5300/87	84-83.5
6.84	8	652	5546/1	83
6.84	9	690	5692/1	85.6
6.84	10	625	5488/1-2	85.3
6.84	11	370	3276/2	81.5
6.84	12	752	5796/14	84
6.84	13	370	3252/2	81.6
6.84	14	954	7040/11	83.5
6.85	1	625	5596/11	84.8-84.6
6.85	2	625	5495/17	85.2-84.8

List of Pottery and Glass Finds

<i>Figure</i>	<i>No.</i>	<i>Locus</i>	<i>Basket/Reg. No.</i>	<i>Elevation</i>
6.85	3	538	5300/72	84-83.5
6.85	4	1500	15000/1	79
6.85	5	563	5258/1	83.7
6.85	6	1601	15101/2	80.3
6.86	1	370	3300/1	81.5
6.86	2	538	5306/11	84-83.5
6.86	3	538	5285/1	84.5-84
6.86	4	62	1231/1	85.8
6.86	5	625	5596/10	84.8-84.6
6.86	6	1559	15325/1	79.6
6.86	7	110	1321/1	85.3
6.86	8	1586	15369/1	79.4
6.86	9	625	5596/9	84.8-84.6
6.86	10	538	5300/106	84-83.5
6.86	11	625	5495/2	85.2-84.8
6.86	12	625	5495/1	85.2-84.8
6.87	1	625	5495/22	85.2-84.8
6.87	2	625	5596/74	84.8-84.6
6.87	3	538	5300/280	84-83.5
6.87	4	538	5300/207	84-83.5
6.87	5	538	5300/247	84-83.5
6.87	6	538	5300/202	84-83.5
6.87	7	7	104/1	85.6
6.87	8	1647	15220/1	79.85
6.87	9	752	5964/8	83.3
6.87	10	372	3241/1	82
6.88	-	329	3081/3	83.6
6.89	1	1511	15051/1	79.5
6.89	2	761	5951/10	84.2
6.89	3	752	5902/6	83.7
6.90	1	538	5300/227	84-83.5
6.90	2	538	5300/226	84-83.5
6.90	3	538	5300/229	84-83.5
6.90	4	538	5300/86	84-83.5
6.90	5	538	5300/116	84-83.5
6.90	6	912	6052/5	82.45
6.90	7	370	3251/8	81.7
6.90	8	538	5300/251	84-83.5
6.90	9	538	5300/254	84-83.5
6.91	1	538	5304/1	84-83.5
6.91	2	625	5596/6	84.8-84.6
6.91	3	633	6565/2	84.6
6.91	4	625	5495/5	85.2-84.8
6.91	5	1501	15075/1	78.2
6.91	6	538	5300/107	84-83.5
6.91	7	538	5300/134	84-83.5
6.91	8	625	5495/46	85.2-84.8
6.91	9	538	5300/157	84-83.5
6.91	10	514	5129/1	83.5
6.91	11	767	5812/3	84.5
6.91	12	538	5300/116	84-83.5
6.91	13	538	5300/13	84-83.5
6.91	14	538	5300/12	84-83.5
6.91	15	538	5300/100	84-83.5
6.91	16	Surface	-	-
6.91	17	924	6070/5	82.8
6.91	18	546	5182/1	82.7
6.91	19	912	6014/3	82.9
6.91	20	538	5300/201	84-83.5

<i>Figure</i>	<i>No.</i>	<i>Locus</i>	<i>Basket/Reg. No.</i>	<i>Elevation</i>
6.91	21	535	5263/1	83.2
6.91	22	538	5300/29	84-83.5
6.91	23	538	5300/26	84-83.5
6.91	24	538	5300/3	84-83.5
6.91	25	625	5495/60	85.2-84.8
6.91	26	538	5300/156	84-83.5
6.91	27	538	5300/1	84-83.5
6.91	28	1611	15111/1	80
6.91	29	912	6052/1	82.45
6.91	30	1611	15111/2	80
6.91	31	690	5695/1	85.5
6.91	32	772	5881/9	83.8
6.91	33	538	5300/119	84-83.5
6.91	34	538	5300/35	84-83.5
6.91	35	338	5300/16	84-83.5
6.91	36	538	5300/10	84-83.5
6.91	37	772	5881/8	83.8
6.91	38	538	5300/32	84-83.5
6.91	39	Surface	-	-
6.91	40	767	5832/2	84.4
6.91	41	926	6049/4	84.2
6.91	42	538	5300/20	84-83.5
6.91	43	772	5881/1, 4	83.8
6.91	44	318	3067/1-2	82
6.91	45	576	5411/2	85.5
6.91	46	103	1288/1	84.6
6.91	47	527	5115/4	84.8
6.91	48	330	3140/1	83.1
6.91	49	752	5821/1	83.9
6.91	50	625	5495/38	85.2-84.8
6.91	51	625	5495/32	85.2-84.8
6.91	52	538	5300/179	84-83.5
6.91	53	538	5300/81	84-83.5
6.92	1	654	5624/1	83.4
6.92	2	255	3374/1	82.1
6.92	3	625	5596/3	84.8-84.6
6.92	4	538	5300/187	84-83.5
6.92	5	538	5300/163	84-83.5
6.92	6	66	1230/1	86
6.92	7	538	5300/7	84-83.5
6.92	8	924	6061/1	83
6.92	9	752	5924/6	83.5
6.92	10	538	5300/8	84-83.5
6.92	11	617	5466/1	84.5
6.92	12	1616	15136/2	80.1
6.92	13	615	5495/1	85
6.92	14	Surface	-	-
6.92	15	750	5755/3	85.2
6.92	16	538	5300/54	84-83.5
6.93	1	538	5300/75	84-83.5
6.93	2	370	3251/22	81.7
6.93	3	752	5811/3	83.95
6.93	4	1739	15842/1	78.45
6.93	5	752	5796/1	84
6.93	6	549	5231/5	83.6
6.94	1	1611	15111/3	80
6.94	2	247	3351/1	81.7
6.94	3	594	5396/16	83.2
6.94	4	655	5612/1	83.6

List of Pottery and Glass Finds

<i>Figure</i>	<i>No.</i>	<i>Locus</i>	<i>Basket/Reg. No.</i>	<i>Elevation</i>
6.94	5	957	7089/1	83.2
6.94	6	1661	15246/2	79.6
6.94	7	538	5300/59	84-83.5
6.94	8	538	5300/80	84-83.5
6.94	9	Surface	-	-
6.94	10	1646	15215/1	80
6.94	11	1643	15209/1	79.8
6.94	12	625	5495/42	85.2-84.8
6.94	13	318	3079/6	81.4
6.94	14	538	5300/39	84-83.5
6.94	15	114	1313/6	84.6
6.94	16	1508	15008/1	78.8
6.94	17	1508	15008/2	78.8
6.94	18	1508	15008/3	78.8
6.94	19	584	5360/1	84
6.94	20	114	1313/8	84.6
6.94	21	538	5300/36	84-83.5
6.94	22	538	5300/34	84-83.5
6.94	23	538	5300/21	84-83.5
6.94	24	752	5964/3	83.3
6.94	25	521	5201/4	84.1
6.94	26	514	5148/1	83.2
6.94	27	538	5300/30	84-83.5
6.94	28	1661	15805/1	79.5
6.94	29	1643	15209/2	79.8
6.94	30	575	5398/6	84.6
6.94	31	544	5322/1	83.2
6.95	-	752	5902/5	83.7
6.96	1	1643	15209/3	79.8
6.96	2	1643	15209/4	79.8
6.96	3	1643	15209/5	79.8
6.96	4	625	5495/19	85.2-84.8
6.96	5	625	5495/25	85.2-84.8
6.96	6	924	6061/6	83
6.97	1	1604	15103/1	80.5
6.97	2	514	5108/1	83.8
6.97	3	816	8069/1	82.7
6.97	4	585	5379/1	84.1
6.97	5	1502	15002/1	79
6.97	6	1739	15842/1	78.45
6.97	7	1600	15132/1	80.6
6.97	8	761	5994/16	84
6.97	9	762	5766/14	84.8
6.97	10	752	5880/4	83.8
6.97	11	395	3288/3	81.7
6.98	1	247	3351/2	81.7
6.98	2	324	3059/7	82.6
6.99	-	550	-	84.2
6.100	-	1511	15084/1	79.3
6.101	1	521	5184/1	84.3
6.101	2	143	1375/1	85.4
6.101	3	912	6020/1	82.8
6.101	4	538	5299/1	84-83.5
6.101	5	330	3126/1	83.2
6.101	6	245	3357/1	82.3
6.102	1	538	5299/2	84-83.5
6.102	2	538	5299/3	84-83.5
6.102	3	1523	15060/1	79
6.102	4	838	8121	83.1

<i>Figure</i>	<i>No.</i>	<i>Locus</i>	<i>Basket/Reg. No.</i>	<i>Elevation</i>
6.102	5	538	5192/1	84.5-84
6.102	6	538	5299/4	84-83.5
6.102	7	124/139	1380/1	
6.102	8	538	5299/5	84-83.5
6.102	9	Surface	-	-
6.102	10	538	5299/5	84-83.5
6.103	1-5	538	5299/6-10	84-83.5
6.104	1	951	7075/1	83.7
6.104	2	951	7075/2	83.7
6.104	3	Surface	-	-
6.104	4	1605	15104/1	80.5
6.105	1	768	5824/1	83.1
6.105	2	1611	15115/1	80
6.105	3	521	5132/1	84.5
6.105	4	948	7023/1	83.9
6.105	5	752	5933/1	83.4
6.106	1	1538	15254/1	78.5
6.106	2	1611	15116/1	80
6.106	3	921	6035/1	84.4
6.106	4	516	5039/1	84.4
6.106	5	247	3388/1	81.45
6.106	6	921	6025/1	84.5
6.109	1	538	5320/1	84-83.5
6.109	2	538	5320/2	84-83.5
6.109	3	330	3160/	82.9
6.109	4	912	7005/1	82.45
6.109	5	538	5320/3	84-83.5
6.109	6	912	6004/1	83
6.109	7	912	6034/1	82.7
6.109	8	912	6034/2	82.7
6.109	9	912	6034/3	82.7
6.109	10	912	6034/4	82.7
6.109	11	625	5642/1	84.8-84.6
6.109	12	625	5642/2	84.8-84.6
6.109	13	625	5642/3	84.8-84.6
6.109	14	538	5320/4	84-83.5
6.110	1	320	3098/1	83
6.110	2	538	5320/5	84-83.5
6.111	1	912	6034/5	82.7
6.111	2	538	5320/6	84-83.5
6.111	3	912	6004/2	83
6.111	4	538	5320/7	84-83.5
6.111	5	625	5642/4	84.8-84.6
6.111	6	912	6034/6	82.7
6.111	7	912	6034/7	82.7
6.111	8	912	6004/3	83
6.111	9	912	6043/1	82.5
6.111	10	321	3159/1	82.5
6.111	11	912	6004/4	83
6.112	1	692	5831/1	85.3
6.112	2	921	7038/1	83.7
6.112	3	1622	18726/1	80.2
6.112	4	625	5642/5	84.8-84.6
6.113	1	574	5325/1	83.5
6.113	2	625	5642/6	84.8-84.6
6.113	3	Surface	-	-
6.113	4	690	5717/	85.4
6.114	1	940	7082/1	85
6.114	2	240	3329/1	82.46

List of Pottery and Glass Finds

<i>Figure</i>	<i>No.</i>	<i>Locus</i>	<i>Basket/Reg. No.</i>	<i>Elevation</i>
6.114	3	354	3168/1	82.2
6.114	4	538	5320/8	84-83.5
6.114	5	538	5320/9	84-83.5
6.115	1	538	5320/10	84-83.5
6.115	2	625	5642/7	84.8-84.6
6.115	3	625	5642/8	84.8-84.6
6.115	4	625	5642/9	84.8-84.6
6.115	5	754	5782/1	84
6.116	1	625	5642/10	84.8-84.6
6.117	1	538	5320/11	84-83.5
6.117	2	830	8094/1	83.5
6.117	3	538	5320/12	84-83.5
6.117	4	538	5320/13	84-83.5
6.117	5	538	5247/1	84.5-84
6.117	6	912	7005/2	82.45
6.117	7	768	5895/1	83.1
6.117	8	370	3277/1	81.5
6.117	9	83/84	1266/1	85.2
6.117	10	347	3232/1	82.7
6.117	11	538	5320/14	84-83.5
6.117	12	538	5320/15	84-83.5
6.117	13	538	5320/16	84-83.5
6.117	14	912	6034/8	82.7
6.117	15	714	5781/1	84.6
6.118	1	324	3099/1	82.6
6.118	2	741	5863/1	85.1
6.118	3	1501	15036/1	78.5
6.118	4	932	7056/1	84
6.118	5	723	5892/1	85.1
6.118	6	912	6034/9	82.7
6.118	7	926	7007/1	84.2
6.118	8	387	3279/1	82.9
6.118	9	912	6034/10	82.7
6.118	10	538	5320/17	84-83.5
6.118	11	912	6034/11	82.7
6.119	1	538	5320/18	84-83.5
6.119	2	538	5320/19	84-83.5
6.119	3	538	5320/20	84-83.5
6.119	4	538	5320/21	84-83.5
6.119	5	538	5320/22	84-83.5
6.119	6	538	5320/23	84-83.5
6.119	7	538	5320/24	84-83.5
6.119	8	1585	15373/1	79.2
6.119	9	752	5921/1	83.7
6.120	1	912	6043/2	82.5
6.120	2	23	1200/1	85.7
6.120	3	319	3100/1	83.5
6.120	4	345	3270/1	83
6.120	5	324	3097/1	82.6
6.120	6	693	5669/1	85.4
6.120	7	271	3398/1	81.6
6.120	8	912	6043/3	82.5
6.120	9	387	3233/1	83.1
6.120	10	563	5260/1	83.4
6.120	11	563	5260/2	83.4
6.120	12	563	5260/3	83.4
6.120	13	736	5849/1	86
6.120	14	538	5320/25	84-83.5
6.120	15	538	5320/26	84-83.5

