TELL QUDADI

COLLOQUIA ANTIQUA

Supplements to the Journal ANCIENT WEST & EAST

Colloquia Antiqua is a refereed publication

COLLOQUIA ANTIQUA
15

TELL QUDADI: AN IRON AGE IIB FORTRESS ON THE CENTRAL MEDITERRANEAN COAST OF ISRAEL (WITH REFERENCES TO EARLIER AND LATER PERIODS)

By

ALEXANDER FANTALKIN and OREN TAL

Final Report on the Hebrew University of Jerusalem Excavations Directed by E.L. Sukenik and S. Yeivin, with the Participation of N. Avigad

Contributions by Ram Gophna, Mark Iserlis, Shahar Krispin, Izhak Paz, Renate Rosenthal-Heginbottom, Benjamin Sass, Ran Zadok

PEETERS
LEUVEN – PARIS – BRISTOL, CT
2015

The preparation of this publication was made possible through a grant from the Shelby White-Leon Levy Program for Archaeological Publications

A catalogue record for this book is available from the Library of Congress.

ISBN 978-90-429-3182-4
D/2015/0602/??

TABLE OF CONTENTS

Series Editor's Preface vii

Foreword ix

List of Illustrations xiii

List of Tables xix

Introduction 1

Appendix A The Name Qudadi
R. Zadok 11

Chapter 1 Site Formation and History 13
1.1 The Site in the Context of Its Natural Environment . . . 13
1.2 The Site in the Context of World War I 22
1.3 The History of Excavations: The Site in the Context of the Building of the Lighthouse and the Foundation of Reading Power Station 28

Chapter 2 Stratigraphy and Architecture 45

Chapter 3 The Finds 69
3.1 Introduction 69
3.2 Optical Mineralogy Analysis of Selected Pottery Finds of the Iron Age IIB
Mark Iserlis, Alexander Fantalkin and Oren Tal 70
3.3 The Common Ware 81
3.4 The Imported Ware 94
3.5 Incidence of Pottery Types 101
3.6 The Unstratified Iron Age and Later Period Pottery . . . 104

Appendix B Pottery of the Chalcolithic Period and the Early and Middle Bronze Age
Ram Gophna and Izhak Paz 107

Appendix C Flint Tools
Shahar Krispin 112

Appendix D: Late Iron Age/Persian Period Earring
Benjamin Sass 113
Appendix E: Roman Period Earring
Renate Rosenthal-Heginbottom 114
Lists of Loci (according to squares and areas of excavations). 125

CHAPTER 4 Summary and Conclusions 187
4.1 Chronological Attribution of Tell Qudadi's Iron Age Assemblages. 187
4.2 The Fortress in the Context of Neo-Assyrian Imperial Policies and Site Occupation in Achaemenid Times . . 195
4.3 Microregional Developments in the *Longue Durée* Perspective 205
4.4 Synopsis and Further Perspectives 211

Bibliography 215

General Index. 000

SERIES EDITOR'S PREFACE

Like me, every archaeologist knows only too well how difficult it is to study and publish the results of the excavations of their predecessors, especially those conducted as long ago as the late 1930s. This volume is a demonstration of what can be achieved despite the problems one can encounter in doing so. It publishes the results of the investigation of Tell Qudadi (Tell esh-Shuna), a fortress of the second half of the 8th–first half of the 7th century BC, a time when the site formed part of the Neo-Assyrian presence on the eastern Mediterranean, that also contains some Achaemenid and even earlier material.

I have known both principal authors for many years and have admired their determination and hard work – they took me to see this impressive site during my visit to Tel Aviv in March 2002. They have assembled a team and studied all available documentary and other evidence from the original excavations of 1937–38. As a result, we have an exemplary presentation of how old excavations can be re-examined and contextualised in line with modern developments in archaeology. I hope that colleagues will find this volume as rewarding as I have.

I should like to thank James Hargrave for his help in preparing the volume for publication, and Peeters for their technical expertise.

Gocha R. Tsetskhladze
Series Editor
Melbourne, July 2014

FOREWORD

The decision to publish the Tell Qudadi excavations of the late 1930s and early 1940s was made while we were PhD students in the early 2000s in the Department of Archaeology and Ancient Near Eastern Cultures at Tel Aviv University (TAU). As residents of the city of Tel Aviv we used to visit the site from time to time, given its superb location on the estuary of the Yarkon river, and became curious about its history. However, a half-page entry in the new encyclopaedia of archaeological excavations in the Holy Land was the most detailed available presentation of the remains at that time (Avigad 1993). Given this state of affairs, we came to the conclusion that a final report is most desired since the main excavations were not only carried out in 1937–38, but also formed one of the first excavations of a biblical period site by the Hebrew University of Jerusalem (HUJ), founded in 1925 as the first university in the Land of Israel/Mandatory Palestine. While attending courses at the Institute of Archaeology of HUJ as visiting students, we accidentally came across the original boxes of the finds from the excavations in the storehouses of the institute. Our later decision to publish the material raised the need to detect the original documentation on the site excavations, which was found after a very long inquiry in the possession of the late D. Barag (HUJ), with additional copy found later on in the possession of the late I. Beit-Arieh (TAU). Documentation on the earlier trial excavation by P.L.O. Guy and site surveying by antiquity inspectors of both the Mandatory Government of Palestine and the State of Israel was found in the archives of the Israel Antiquities Authority (IAA), located in the Rockefeller Museum, Jerusalem, and the Palestine Exploration Fund (PEF) in London. We were also assisted by the Imperial War and National Army Museums in London, as well as by the Research Centre of the Australian War Memorial, Canberra. All of them provided us with relevant information on the site in the context of World War I. Additional information on the excavation of HUJ, in the context of the foundation of Reading Power Station, was gained through work in the archives of the Israel Electric Corporation (IEC), located in Haifa and the archives of Tel Aviv-Yafo (Jaffa) Municipality. Funds to support this complex endeavour were raised from a number of bodies; first and foremost the Shelby White-Leon Levy Program for Archaeological Publications who supported the project for two years (2004/05–2005/06). Additional funds came from the Mediterranean Archaeological Trust, the

Ancient Israel Program – TAU, the IEC and Bank HaPoalim. The Institute of Archaeology of TAU financed the technical works which include pottery restoration, finds drawing and photographing and reproductions of site plans. Preliminary insights of our research were published in both English (Fantalkin and Tal 2009a; 2010) and Hebrew (Tal and Fantalkin 2009a) and we presented the material in a number of public talks in Israel (Tel Aviv University; University of Haifa) and abroad (The American Schools of Oriental Research Annual Meeting 2006, Washington, DC; the Archaeological Institute of America Annual Meeting 2013, Seattle).

We would like to thank in particular the late D. Barag, who provided us with N. Avigad's site documentation. G. Foerster, the then Head of the Institute of Archaeology of the HUJ, who provided us with permission to publish the excavations. A. Mazar supplied valuable information on the site and its finds, and G. Horowitz, the then Curator of the Institute of Archaeology of the HUJ, as well as A. Sabariago, Curator of the IAA (Rockefeller Museum, Jerusalem), took care of the safe transfer of the excavation finds, documentation and archival material from their respective institutes to the Institute of Archaeology of TAU.

We also wish to thank F. Cobbing (PEF) and S. Shactman (IEC, Historical Archive Section) for supplying additional archival material. Thanks are also due to the late I. Beit-Arieh, I. Bîrzescu, P. Dupont, I. Finkelstein, Y. Goren, Z. Herzog, B. Hürmüzlü, M. Kerschner, Y. Levy, H. Mommsen, N. Na'aman, B. Rosen, T. Shacham, U. Schlotzhauer, L. Singer-Avitz and R. Zadok, and, yet again, A. Mazar for fruitful discussions concerning a number of issues we raised in this study. Additional thanks and credits will appear in suitable places further into the text. We are also grateful to I. Ben-Ezra, A. Brauner, R. Pelta, Y. Gottlieb, A. Perry and P. Shrago of the Institute of Archaeology of TAU for their technical assistance, and to B. Arubas who helped us to redraw the fortress based on its current visible remains. We are grateful to the Series Editor and Editorial Board of *Colloquia Antiqua* both for accepting this volume for publication and for their constructive suggestions on the original draft.

Last, but certainly not least, our thanks go to the scholars who contributed from their knowledge to this volume, in the form of written chapters: R. Gophna, M. Iserlis, S. Krispin, I. Paz, R. Rosenthal-Heginbottom, B. Sass and, yet again, R. Zadok.

Our work on Tell Qudadi is supplemented by further research, resulted in a number of studies that dealt with publication of the results from the 'old' excavations carried out in the area of present-day Tel Aviv-Yafo and its regional archaeology and history in general (Fantalkin and Tal 2003; 2009b; Fantalkin 2005; Tal and Fantalkin 2009b; Tal and Taxel 2010; 2014; Tal, Taxel and

Jackson-Tal 2013). It is a reflection of our long-term commitment to the academic community and to the general public and in particular to the beautiful Mediterranean city where we live and which we love.

A. Fantalkin and O. Tal
Tel Aviv University, June 2014

LIST OF ILLUSTRATIONS

All photographs from excavation files were reproduced from the negatives by courtesy of the Israel Antiquities Authority.

Fig. 1. Location map: central sites along the Yarkon river (Nahr el ‘Auja).

Fig. 2. Aerial photograph of the Yarkon river (Nahr el ‘Auja) and Tell Qudadi on its right (north) estuary (November 1917) (photograph: Deutsche Luftwaffe).

Fig. 3. Aerial photograph of the Yarkon river (Nahr el ‘Auja) and Tell Qudadi on its right (north) estuary, with probable remains of maritime installations (piscine?) (November 1933), looking south (photograph: American Colony, Jerusalem [Photographic Department]; courtesy of Library of Congress, free on-line access: http://www.loc.gov/pictures/item/mpc2010001382/PP/).

Fig. 4. Aerial photograph of the Yarkon river (Nahr el ‘Auja) and Tell Qudadi on its right (north) estuary (November 1933), looking east (photograph: American Colony, Jerusalem [Photographic Department]; courtesy of Library of Congress, free on-line access: http://www.loc.gov/pictures/item/mpc2010007801/PP/).

Fig. 5. Photograph of Tell Qudadi taken from the south bank of the Yarkon river (early 1920s), looking north (photograph: courtesy of the Imperial War Museum, London, Q12304, Crown Copyright).

Fig. 6. Photograph of Tell Qudadi taken from the south bank of the Yarkon river (Nahr el ‘Auja) (1925), looking north (photograph: Shimon Korbman, by special permission of the Administrator General, the State of Israel, as executor of the S. Korbman estate and Eretz Israel Museum, Tel Aviv).

Fig. 7. Tell Qudadi (late 1920s/early 1930s), looking east (photograph: unknown; excavation files).

Fig. 8. Tell Qudadi (1935/1936), looking north (photograph: unknown; IEC, historical archive section).

Fig. 9. Persian period wall excavated by P.L.O. Guy, looking south-east (photograph: unknown; excavation files).

Fig. 10. Site map of the 1937–1938 and 1941 seasons of excavations with main remains (redrawn according to archival plan and authenticated according to visible remains on the ground).

Fig. 11. The site’s first fortress at the end of excavations, looking south (photograph: unknown; excavation files).

Fig. 12. Plan of the fortress (redrawn according to archival plan and authenticated according to visible remains on the ground).

Fig. 13. Plan showing the core-sections made by Tahal (Water Planning for Israel) for the IEC in the area of Tell Qudadi (located between core-sections 2 and 3).

Fig. 14. Core-section 2, where packed clay-silt deposits of probable coastal estuary origin are shown some 3 km off the sea-shore (Tahal: Water Planning for Israel).

Fig. 15. Map showing division of British forces in the passage of Nahr el ʻAuja (Yarkon river) on 20th–21st December 1917 (after Falls 1930).

Fig. 16. Memorandum of Tell Qudadi as it appears today, looking north (photograph: authors, March 2013).

Fig. 17. Inscription on the memorandum of Tell Qudadi as it appears today, looking west (photograph: authors, March 2013).

Fig. 18. Later inscriptions on the pedestal of the memorandum of Tell Qudadi as they appear today (photograph: authors, March 2013).

Fig. 19. Fragments of artillery shells (shrapnel) from Locus 458 (Squares F5/F6).

Fig. 20. Fragments of working tool/s and artillery shells (shrapnel) from Locus 479 (Square E7).

Fig. 21. Tell Qudadi and the lighthouse (and its keeper's house) on top of it, taken from the south bank of the Yarkon river (1936), looking north-east (photograph: Kurt Bremmer).

Fig. 22. The lighthouse and the sea wall protecting its foundations at the bottom of the mound cutting the mound western façade (1936/1937), looking south-east (photograph: IEC, historical archive section).

Fig. 23. The lighthouse on top of Tell Qudadi, prior to the works of Reading Power Station (February 1937), looking south (photograph: unknown; IEC, historical archive section).

Fig. 24. The lighthouse and the keeper's house on top of Tell Qudadi, prior to the works of Reading Power Station (early 1937), looking north (photograph: unknown; IEC, historical archive section).

Fig. 25. Tell Qudadi during preparation works for the Reading Power Station and prior to excavation (1937), looking north (photograph: unknown; IEC, historical archive section).

Fig. 26. Mechanical works cutting and damaging the mound of Tell Qudadi (1937), looking north (photograph: unknown; IEC, historical archive section).

Fig. 27. The lighthouse and the keeper's house after its dismantling on top of Tell Qudadi, during works of Reading Power Station and prior to site excavation (1937), looking south-west (photograph: unknown; IEC, historical archive section).

Fig. 28. The building of Wauchope Bridge over the Yarkon river (Nahr el ʻAuja) (1937), looking south-east (photograph: unknown; IEC, historical archive section).

Fig. 29. The mound during excavation and the newly built break water wall of the PEC (Palestine Electricity Corporation) lagoon to its north-west (1937/1938) (photograph: unknown; excavation files).

Fig. 30. Aerial photography of the Reading Power Station lagoon during preparation works and its break water wall in the foreground (1938/1939), looking east (photograph: unknown; IEC, historical archive section).

Fig. 31. Aerial photography of the Reading Power Station lagoon (1960s), looking north-west (photograph: unknown; IEC, historical archive section).

Fig. 32. The mound during excavation, while preparation works were still on the ground and lighthouse base reinforcement took place (the newly built Reading Power Station in the background) (late 1937) (photograph: unknown; IEC, historical archive section).

Fig. 33. The lighthouse base reinforcement (late 1937/early 1938), anchor stone in the foreground (photograph: unknown; excavation files).

Fig. 34. The lighthouse base after being reinforced (1941), outer rampart wall of the fortress's second stage in the foreground (photograph: unknown; IEC, historical archive section).

Fig. 35. The lighthouse requested colouring (IEC, historical archive section).

Fig. 36. Tell Qudadi after excavation and before conservation works (1939/1940) (photograph: unknown; IEC, historical archive section).

Fig. 37. Tell Qudadi after excavation; water channel cutting the mound northern limit (1940?), looking east (photograph: unknown; IEC, historical archive section).

Fig. 38. Aerial photograph showing the two water channels on the south side of the mound (1981), looking south-east (courtesy of Z. Herzog).

Fig. 39. Excavations in the process, looking north-west (photograph: unknown; excavation files).

Fig. 40. Hebrew University Expedition to Tell Qudadi; standing in the foreground E. L. Sukenik (third from right), N. Avigad (fourth from right), S. Yeivin (fifth from right), P. Rutenberg (top row, right) (1937/1938) (photograph: unknown; IEC, historical archive section).

Fig. 41. Tell Qudadi as it appears today after conservation works in 2007, looking north (photograph: authors, March 2013).

Fig. 42. Reading Power Station lagoon as it appears today, looking north-west (photograph: authors, March 2013).

Fig. 43. Mechanical works cutting and damaging the mound of Tell Qudadi (1937), looking west (photograph: unknown; IEC, historical archive section).

Fig. 44. Site map of the 1937–1938 and 1941 seasons of excavations, with section at bottom looking north (redrawn according to archival plan and authenticated according to visible remains on the ground).

Fig. 45. Plan of the fortress (redrawn according to archival plan and authenticated according to visible remains on the ground).

Fig. 46. The site's first fortress at the end of excavations, looking south (photograph: unknown; excavation files).

Fig. 47. Section through Room (casemate) 2, looking north (redrawn according to archival plan).

Fig. 48. Room (casemate) 1 during excavations, northern wall of the courtyard in the foreground, looking north-west (photograph: unknown; excavation files).

Fig. 49. Room (casemate) 1 during excavations, northern wall (in close-up) of the courtyard in the foreground, looking north (photograph: unknown; excavation files).

Fig. 50. The courtyard, looking north (photograph: unknown; excavation files).

Fig. 51. The courtyard, looking south (photograph: unknown; excavation files).

Fig. 52. The continuation of the outer rampart wall towards the south-west, looking north-east (photograph: unknown; excavation files).

Fig. 53. The continuation of the outer rampart wall towards the south-west, looking east (photograph: unknown; excavation files).

Fig. 54. The stepped eastern façade of the fortress's first stage, looking south (photograph: unknown; excavation files).

Fig. 55. The stepped eastern and northern façade of the fortress's first stage, looking west (photograph: unknown; excavation files).

Fig. 56. The site's first and second fortress at the end of excavations, looking south (photograph: unknown; excavation files).

Fig. 57. The inset-offset wall: a close-up, looking north-west (photograph: unknown; excavation files).

Fig. 58. The inset-offset wall (side view), looking north-west (photograph: unknown; excavation files).

Fig. 59. The fortress northern wall and the inset-offset eastern wall attach to the fortress eastern wall, looking south-west (photograph: unknown; excavation files).

Fig. 60. The fortress northern wall: a close-up, looking south (photograph: unknown; excavation files).

Fig. 61. Plan of the entrance of the fortress's second stage, with section at bottom looking south (redrawn according to archival plan and authenticated according to visible remains on the ground).

Fig. 62. The entrance of the fortress's second stage: a close-up on the paving and threshold, looking west (photograph: unknown; excavation files).

Fig. 63. Plan and section of the tripartite plastered installation paved with white mosaic stones (redrawn according to archival plan).

Fig. 64. The tripartite plastered installation, looking south-east (photograph: unknown; excavation files).

Fig. 65. Plan of the Persian period wall excavated by P.L.O. Guy, with top and side view, looking south (redrawn according to archival plan).

Fig. 66. Persian period wall excavated by P.L.O. Guy, looking north (photograph: unknown; excavation files).

Fig. 67. Plan of the architectural element to the north of the Persian period wall, with side view of the two freestanding pillars at bottom (redrawn according to archival plan).

Fig. 68. The architectural element to the north of the Persian period wall (in the background), with the two freestanding pillars in the foreground (photograph: unknown; excavation files).

Fig. 69. A stone weight, with an inverted T-shape hole (photograph: unknown; excavation files; IAA 1983-15; currently on display at the Eretz Israel Museum, Tel Aviv).

Fig. 70. Later remains in foreground, fortress eastern façade in background looking west (photograph: unknown; excavation files).

Fig. 71. Holed (triangular-shaped) stone/ship anchor (photograph: unknown; excavation files).

Fig. 72. Stratum V pottery.

Fig. 73. Stratum IV pottery: bowls.

Fig. 74. Stratum IV pottery: bowls (cont.).

Fig. 75. Stratum IV pottery: heavy bowls.

Fig. 76. Stratum IV pottery: jugs and juglets.

Fig. 77. Stratum IV pottery: cooking pots.

Fig. 78. Stratum IV pottery: storage jars.

Fig. 79. Stratum IV pottery: loom weights.

Fig. 80. Stratum IV pottery: selective assemblage.

Fig. 81. Stratum IIIB pottery: bowls.

Fig. 82. Stratum IIIB pottery: heavy bowls.

Fig. 83. Stratum IIIB pottery: heavy bowls (cont.).

Fig. 84. Stratum IIIB pottery: jugs and juglets.

Fig. 85. Stratum IIIB pottery: cooking pots.

Fig. 86. Stratum IIIB pottery: cooking pots (cont.).

Fig. 87. Stratum IIIB pottery: storage jars.

Fig. 88. Stratum IIIB pottery: storage jars, stand and lamps.

Fig. 89. Stratum IIIB pottery: fragments of a Lesbian amphora.

Fig. 90. Stratum IIIB pottery: loom weights.

Fig. 91. Stratum IIIB pottery: selective assemblage.

Fig. 92. Stratum IIIA pottery: fragments of an Egyptian bowl.

Fig. 93. Stratum IIIA pottery: bowls.

Fig. 94. Stratum IIIA pottery: heavy bowls.

Fig. 95. Stratum IIIA pottery: a fragment of East Aegean oinochoe.

Fig. 96. Stratum IIIA pottery: decanters and jug.

Fig. 97. Stratum IIIA pottery: flask, bottle, table amphora and juglets.

Fig. 98. Stratum IIIA pottery: cooking pots.

Fig. 99. Stratum IIIA pottery: cooking pots (cont.).

Fig. 100. Stratum IIIA pottery: storage jars and lamps.

Fig. 101. Stratum IIIA pottery: loom weights.

Fig. 102. Stratum IIIA pottery: a loom weight.

Fig. 103. Stratum IIIA pottery: selective assemblage.

Fig. 104. Unstratified Iron Age IIB pottery.

Fig. 105. Unstratified Iron Age IIB pottery (cont.).

Fig. 106. Unstratified Persian period pottery.

Fig. 107. Unstratified Persian period pottery (cont.).

Fig. 108. Unstratified Byzantine and mediaeval period pottery.

Fig. 109. Meẓad Ḥashavyahu: fragments of a Lesbian amphora.

Fig. 110. Thin-section of the Lesbian amphora from Tell Qudadi (width of field 2.5 mm).

Fig. 111. Thin-section of the Lesbian amphora from Meẓad Ḥashavyahu (width of field 2.5 mm).

Fig. 112. Unstratified fragment of Chalcolithic ossuary.

Fig. 113. Unstratified Early Bronze Age pottery.

Fig. 114. Unstratified Middle Bronze Age II pottery.

Fig. 115. Early Bronze Age III sites along the coast of Israel.

Fig. 116. Unstratified flint tools.

Fig. 117. Silver earring.

Fig. 118. Silver earring.

Fig. 119. Tel Ḥashash: unstratified Iron Age IIB pottery (J. Kaplan excavations).

LIST OF TABLES

Table 1. Description of the specific samples 116

Table 2. Description of potential raw material samples. 124

Table 3. Vessel/object types of the *ḥamra* group. 72

Table 4. Object types of the *kurkar* group 73

Table 5. Vessel types of the *loess* soil group 74

Table 6. Vessel types of the *terra rosa* group 75

Table 7. Vessel types of the *terra rosa* and crushed calcite group 76

Table 8. Vessel types of the Motza clay with dolomitic sand group. 76

Table 9. Vessel types of the neogene marl group 77

Table 10. Vessel types of the neogene marine marl group 78

Table 11. Vessel types of taqiye marl group 79

Table 12. Vessel types of taqiye marl and coastal sand group 79

Table 13. Vessel types of coastal sand and tuff group. 80

Table 14. Vessel types of rendzina and *terra rosa* group 81

Table 15. Capacity of cooking pots (type CP4) 90

Table 16. NAA results for amphorae from Meẓad Ḥashavyahu and Tell Qudadi 98

Table 17. Incidence of pottery types according to strata (Strata V, IV, IIIB, IIIA) 101

Table 18. Revised chronology of the Iron Age IIB fortress 191

INTRODUCTION

Tell Qudadi is situated on the northern bank of the Yarkon river estuary, within the municipal boundaries of the city of Tel Aviv. The site is located on the road that traversed the length of the coastal plain, linking Syria and Phoenicia with Egypt. Historical documents prove that during various periods the main international north–south highway crossed the Aphek Pass at the sources of the Yarkon to the north-east. However, Tell Qudadi apparently controlled the ford of the Yarkon estuary, allowing those who held the site to monitor convoys and travellers who chose the coastal road. There is no doubt, however, that because of its strategic location, Tell Qudadi's main purpose was to protect maritime trade along the coast of Palestine. The mound also afforded a view of the settlements on the banks of the Yarkon in antiquity, among them Kikar Hill (Giv'at Beth HaMitbaḥayim), Tell Qasile, Tel Gerisa, Tell Abu Zetiun and, perhaps, also Tel Aphek (Fig. 1). It is noteworthy that during various historical periods, the Yarkon river, being one of the most important sources of fresh water (Avisar *et al*. 2001) and the widest of the country's Mediterranean coastal waterways, was considered a political, social and even cultural border (Rainey 2001; Gilboa 2005, 66–67).[1]

Tell Qudadi was declared an antiquities site in 1944 after it was included in the booklet of addenda to Mandatory antiquities sites.[2] The site was discovered in 1934, following a survey by J. Ory, in which he reported an artificial mound from the biblical period which had recently been robbed.[3] The fact that Tell Qudadi was recognised as an antiquities site only in 1934 is of particular interest since the site had been a military stronghold during World War I, in 1917, in the struggle of the allied forces against the Turks (Figs. 2–8) (and below).

Salvage digs were carried out at Tell Qudadi from 1937 to 1938, during preparation for the construction of the Reading (Electric) Power Station, and again in 1941 as part of conservation work at the site. Further excavations took

[1] The exact location of the Yarkon mentioned in the Bible (*Joshua* 19:46) does not necessarily matches the path of the modern stream of the same name and might relate to the Ayalon river (Rainey 1990).

[2] S*upplement No. 2 to the Palestine Gazette Extraordinary No. 1375 of 24 November, 1944*: Schedule of Historical Monuments and Sites, p. 1317, *s.v*. esh Shûna (Qudâdî, Tell): 'Remains of Iron Age tower, ramp, foundations and surface pottery to south and east'.

[3] Report dated to 8 June 1934, File no. S2274, IAA archive, Rockefeller Museum, Jerusalem.

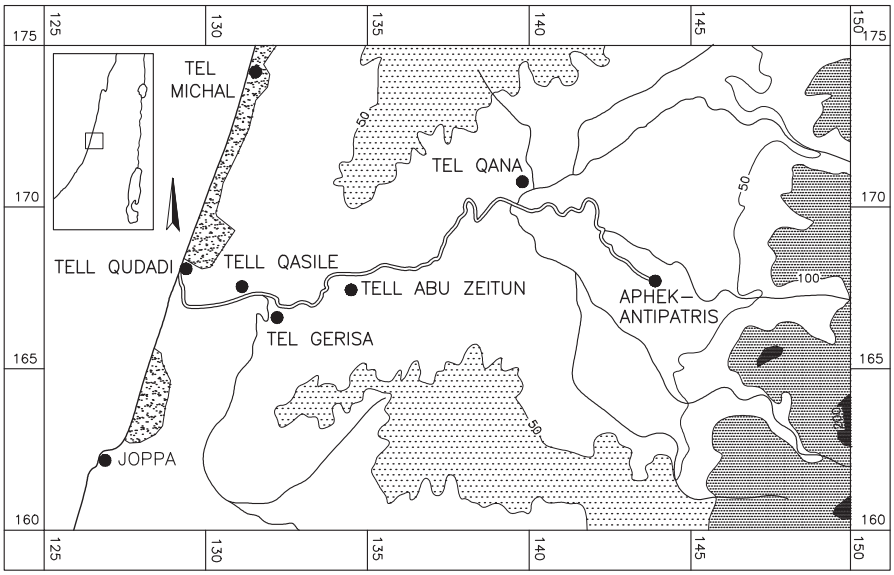

Fig. 1. Location map: central sites along the Yarkon river (Nahr el ‘Auja).

Fig. 2. Aerial photograph of the Yarkon river (Nahr el ‘Auja) and Tell Qudadi on its right (north) estuary (November 1917) (photograph: Deutsche Luftwaffe).

Fig. 3. Aerial photograph of the Yarkon river (Nahr el ‘Auja) and Tell Qudadi on its right (north) estuary, with probable remains of maritime installations (piscine?) (November 1933), looking south (photograph: American Colony, Jerusalem [Photographic Department]; courtesy of Library of Congress, free on-line access: http://www.loc.gov/pictures/item/mpc2010001382/PP/).

Fig. 4. Aerial photograph of the Yarkon river (Nahr el ‘Auja) and Tell Qudadi on its right (north) estuary (November 1933), looking east (photograph: American Colony, Jerusalem [Photographic Department]; courtesy of Library of Congress, free on-line access: http://www.loc.gov/pictures/item/mpc2010007801/PP/).

Fig. 5. Photograph of Tell Qudadi taken from the south bank of the Yarkon river (early 1920s), looking north (photograph: courtesy of the Imperial War Museum, London, Q12304, Crown Copyright).

Fig. 6. Photograph of Tell Qudadi taken from the south bank of the Yarkon river (Nahr el ʻAuja) (1925), looking north (photograph: Shimon Korbman, by special permission of the Administrator General, the State of Israel, as executor of the S. Korbman estate and Eretz Israel Museum, Tel Aviv).

Fig. 7. Tell Qudadi (late 1920s/early 1930s), looking east (photograph: unknown; excavation files).

Fig. 8. Tell Qudadi (1935/1936), looking north (photograph: unknown; IEC, historical archive section).

Fig. 9. Persian period wall excavated by P.L.O. Guy, looking south-east (photograph: unknown; excavation files).

place in March 1969 in preparation for the building of the new Reading D Power Station, some 30 m east of the previous excavations (Kaplan 1971). The latter were limited in extent, revealing later classical period remains, and are beyond the scope of this publication.

The preliminary trial excavation at the site took place in October 1937, conducted by P.L.O. Guy of the British School of Archaeology in Jerusalem. A fieldstone wall was uncovered, reinforced by Phoenician-style dressed piers (*ca*. 17 m long, *ca*. 0.75 m thick, with a maximum height of 1.2 m) (Fig. 9). A preliminary report on the excavation notes that the wall was dated to the Persian period (the 6th or 5th century BC) apparently based on the wall design which Guy compared to Tell Abu Hawam rather than on ceramics (Guy 1938, 15–16; Avigad 1993; and below Chapter 2, Stratum III–II).

An extensive salvage excavation was conducted at the site by the Hebrew University of Jerusalem (HUJ) from November 1937 to March 1938, headed by E.L. Sukenik and S. Yeivin and assisted by N. Avigad.[4] This excavation uncovered the remains of an impressive Iron Age fortress revealing two architectural phases (Figs. 10–11).

[4] The excavation was funded by the managing director and 'founding father' of the Palestine Electricity Corporation (to be named later the Israel Electric Corporation), P. Rutenberg, who followed its progress closely and assisted in every way possible, according to letters found in the IAA archive at the Rockefeller Museum and the PEF archive in London (see also Guy 1938, 16).

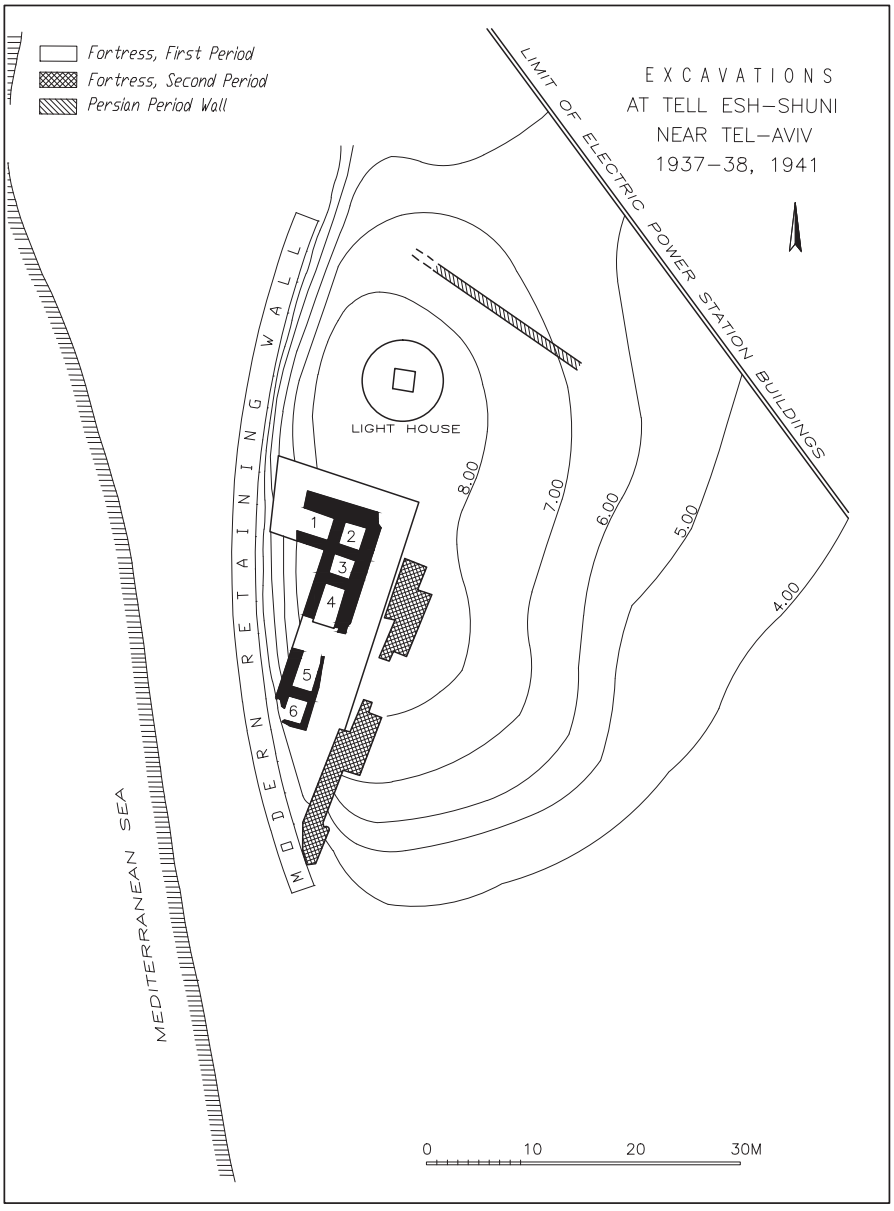

Fig. 10. Site map of the 1937–1938 and 1941 seasons of excavations with main remains (redrawn according to archival plan and authenticated according to visible remains on the ground).

A foundation was discovered from the first phase of the fortress consisting of roughly hewn *kurkar* (fossilised dune sandstone), whose maximum height was 3 m and maximum width of the walls *ca*. 7 m. The eastern wall was preserved along *ca*. 33 m and its northern wall along *ca*. 14 m. The rest of its walls were completely destroyed and apparently washed into the sea. Above the walls of the foundation a row of rooms was built around a courtyard, of which six survived – two in the north and four in the east. The walls of the rooms were also constructed of roughly hewn *kurkar* stones; their maximum height was 0.6 m. The rooms were found filled with sand and almost devoid of artefacts. The excavators concluded that the walls above the rooms, which did not survive, were built of mud-bricks. The entrance to the courtyard was on the east in the centre, between the two pairs of rooms. The surviving walls apparently enclosed an inner courtyard, which meant that the original fortress had a square plan with an entrance in the centre of the eastern side. However, if the entrance was to the side of the eastern wall rather than in its centre, the fortress may have been much larger than the excavators estimated. The excavators disagreed as to the dating of the first phase of the fortress. In Yeivin's opinion, it was established during the 10th century BC (Yeivin 1960, 204–05), while Avigad believed it was not built until the 9th century BC (Avigad 1993).

From the second phase of the fortress, an inset-offset wall of roughly hewn *kurkar* stones was found parallel to the eastern façade of the first phase. Its length is *ca*. 30 m, its thickness *ca*. 2.5 m and its maximum height more than 2 m. Near its centre was an entrance 4 m wide, protected by a buttress on each side and approached by a ramp paved with fieldstones.

According to the excavators, two floors and two burnt layers they discovered were connected to the second phase of the fortress, since they cover the rooms of the first fortress. The pottery found in the burnt layers was dated to the end of the 9th and the 8th centuries BC. The excavators therefore determined that the fortress belonged to the Israelite kingdom and they attributed the destruction of the second phase to the campaign of Tiglath-pileser III in 732 BC. Such a reconstruction of events was unreservedly accepted by other scholars (for example: Kaplan 1959, 66, 71; Wright 1985, 212; Mitchell 1991, 336; Becking 1992, 59; Ortiz 2000, 96; Bloch-Smith 2009, 37; Dever 2012, 97–98). Likewise, according to the excavators, the 7th-century BC potsherds discovered at the site demonstrated settlement's continuity after the destruction of Tiglath-pileser III.

Considering the absolute dates proposed for the Iron Age phases of the fortress, accepted scholarly opinion ascribed to it the function of guarding the entrance to the Yarkon against invaders and pirates. The site was therefore seen as an integral part of the settlement network that included other sites in

Fig. 11. The site's first fortress at the end of excavations, looking south (photograph: unknown; excavation files).

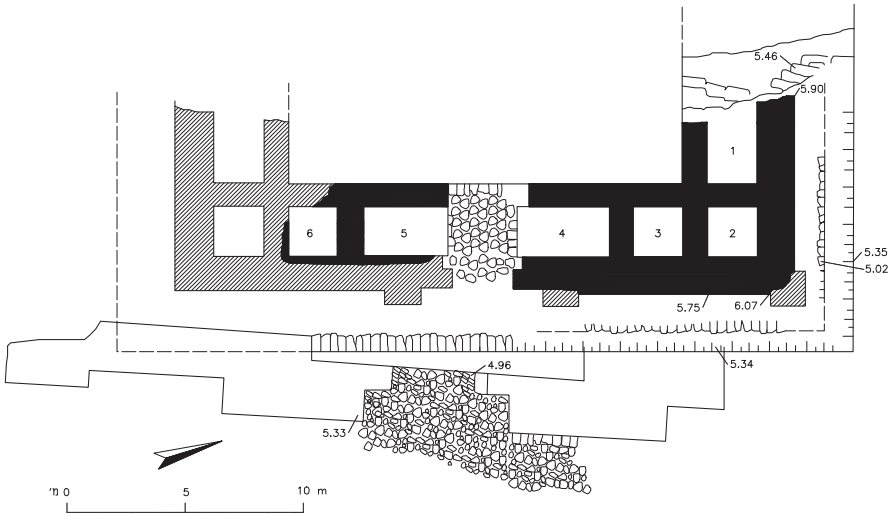

Fig. 12. Plan of the fortress (redrawn according to archival plan and authenticated according to visible remains on the ground).

the Yarkon basin, among them Tell Qasile and Tel Gerisa (Yeivin 1960, 204–05; Gophna and Ayalon 1989, 21; Avigad 1993).

The two phases can clearly be seen at the site today; our computerised measurements of the area and the remains verify the basic architectural data proposed by the excavators (Fig. 12). Nevertheless, neither the final results of the excavations carried out more than 70 years ago, nor the finds, were ever published, and Avigad's succinct half-page summary was the most detailed presentation of the Iron Age remains of the site (Avigad 1993).

Appendix A: The Name Qudadi

Ran Zadok

Quḍāḍi, Tell, see Yalqût hap-Pirsûmîm 1091 (from 18 May 1964), p. 1425, no. 70 and Yalqût hap-Pirsûmîm 1327 (from 1 January 1967), p. 631, no. 70 (Location: 1290–1 / 1677–9). Both are read ([תל קצאצי] אל־שונה) that is esh-Shuna (Tell Quḍâḍî) while transliterated, and also may be read as esh Shūna / esh Shūne / esh Shūneh / esh Shūni, Tell) that is iš- Šūni 'barn, granary' (Egyptian Arab. < Coptic). It seems that the site-name Tell Kudadi as appears in the excavation diary of Sh. Yeivin (Tall-Kudādi) or as cited in preliminary publications (i.e. Sukenik 1939; 1945) and later ones (i.e. Avigad 1993) and elsewhere is erroneous. The consonantal phonemes /*k*/ and /*q*/ were not necessarily differentiated in central Palestinian Arabic during the first half of the 20th century and probably earlier. If one takes the initial *q*- as granted, then *Quḍāḍi* is apparently a *qutāl* formation of Q-Ḍ-Ḍ with an ending, which might have originally been long, *viz*. *-ī* (adjectival, especially. gentilics, Arab. *nisba*). Q-Ḍ-Ḍ, Arab. *qaḍḍa* (*alif qaṣīrah*) denotes 'to bore, perforate; break (a thing), crush, destroy (a wall); be full of gravel'. Derived nouns are, for example, *qaḍaḍ* 'small pebbles broken in pieces and crushed' or 'dust', *qiḍaḍ* 'food in which are pebbles and dust', *qa*/*iḍḍat*, plural *qiḍāḍ*, 'pounded pebbles, shingles; remains', *qaḍḍ, qaḍīḍ* 'pebbles' (*qaḍḍ* means also 'full of pebbles and gravel', hence 'hard'). The adjective (*arḍ*) *qaḍḍat* can be substantivised *qaḍḍat* 'land in which are pebbles, low or depressed land the ground of which is sand and by the side of which is plain or hard and elevated land'. As for the formation, *qutāl* in Arabic is adjectival and diminutive or deteriorative (see Brockelmann 1908 I, 351-52) and can denote also pieces, shreds, scraps, particles and waste, refuse. It is probable that the site-name (Quḍāḍi) as preserved at present, being Arabic is hardly pre-Islamic. The meaning suits the location of the site next to the Yarkon estuary.

CHAPTER 1

SITE FORMATION AND HISTORY

1.1. The Site in the Context of Its Natural Environment

The coastal plain, in the broadest sense, extends from the Nile Delta in the south to the Mt Carmel range in the north. The Sharon is its northern segment and its southern part is divided into three geomorphologic units:

1. The coastal strip: this unit includes the coastline, the coastal ridge which is the first *kurkar* (fossilised dune sandstone) ridge, the second *kurkar* ridge, about 1.5 km to the east of the coastal ridge (with a long, narrow plain filled with fertile soil in between), and the third *kurkar* ridge, about 1 km east of the second.
2. The *ḥamra* (red loam) hills: these cover most of the central Sharon area and are drained by the Naḥal (stream/river) Poleg to the north.
3. The *marzeva* (swale): a long, narrow swale (valley), covered with fertile silty soil, and delimited by the tributaries of the Yarkon river to the south, situated between the *ḥamra* hills and the western foothills of Samaria (for a full discussion of the subject, see Dan and Yaalon 1968; 1990).

Geology of the Quaternary epoch has relevance to various fields of research, including oceanography, sedimentology, geomorphology, pedology, prehistory and protohistory, as well as climate history and natural history. Therefore, a study of geological processes of this period is essential before analysing any given site. However, unlike the pre-Quaternary lithostratigraphic terminology of the Sharon area (Gvirtzman 1990) which is fairly generally accepted, that of the Quaternary is still being debated.

The formation of a sequence of Quaternary sedimentary units along the coastline of Israel enables a detailed stratigraphic discussion of the Sharon coast. The *kurkar* ridge on the Sharon coast is a coastal ridge of fossilised dune sandstone comprised of quartz sand particles and calcareous cement, in various degrees of consolidation, mostly originating from terrestrial deposits. It is buff in colour, with cross bedding in some parts, indicating a dunal origin. The presence of shell fragments of terrestrial snails, as well as terrestrial plants remains within its layers, indicates terrestrial environment of deposition, and may reflect

interludes between stages of deposition, development and stabilisation of the surface. The sub-division of this coastal ridge into a sequence of sedimentary units has often been described (for example Picard and Avnimelech 1937; Avnimelech 1952), but earlier discussions were based on the chronostratigraphy of the European Pleistocene. Horowitz, adding his own suggestions, summarised previous discussions (1979, 95–97, 100, 109–15, table 5.1, figs. 5.20, 5.53–5.59, with bibliography). Gavish and Bakler (1990) have also reviewed current studies on geomorphological and sedimentological processes in the Sharon. Nir (1992, 8–16, table 1) revised all the important studies and the various definitions of the units and their stratigraphy, and incorporated all the suggestions in one table. He adopts the terminology suggested by Neev and Bakler (1978). It seems, therefore, that there are disagreements regarding the lithographic terminology of the coastal escarpment. These probably stem from different methodological approaches and different reconstruction of the processes that led to the development of the coastal scarp and the *kurkar* ridges (on this subject, see Gavish and Bakler 1990, 71–74, with bibliography). It should be noted that the *kurkar* units of the coastal scarp may be the more recent fragment of the Gaza Formation (see Horowitz 1979, 112–15, fig. 5.58)/Ḥefer Formation (see Gvirtzman 1990, 48–49), which constitutes, along with the Pleshet Formation and the Aḥuzam Conglomerate, the *Kurkar* Group (Gvirtzman 1990, 48–50, 52–53, map 10, with bibliography). In the following discussion, we will attempt to summarise most of the existing data regarding the coastal scarp, emphasising its basic features, according to the more recent publications. The coastal ridge comprises the following sedimentary units. In the following we will not attempt to follow the history of sedimentary units' terminology. Terminology follows Horowitz (1979), while units in parenthesis follow Bakler (1989).

Ramat Gan *Kurkar* Member (Giv'at Olga *Kurkar*)

This is the oldest and least exposed unit of the coastal ridge. It forms typical dunal morphology (*barḥan*) with a pronounced asymmetry to the north-east. Its base, which is about 20–30 m thick or possibly more, is buried beneath the surface (Bakler 1989, 198, fig. 16.1; Nir 1992, 11).

Naḥsholim *Ḥamra* Bed (Ga'ash *Ḥamra*)

This layer overlies the Ramat Gan *Kurkar* Member in the area discussed. Itis a greyish-brown silty clay-like sediment, a few metres thick, varying in thickness, according to previous topography. The lower contact of this unit is gradual, whereas its upper is smooth and well defined. It follows the profile of the lithified surface morphology, forming a wavy dunal relief pattern. In other places, the unit almost reaches the ridge's crest, with the Tel Aviv *Kurkar* Bed overlying it. Nir claims that the definition of this unit as *ḥamra* is genetically

mistaken, since its environment of formation is different from those of typical *ḥamra* whose colour is red (Nir 1992, 11–12). This explains the various names ascribed to this unit, such as 'café au lait' (for example Avnimelech 1952, 54) and 'sandy regosol' (for example Dan and Yaalon 1990, 88–89). The unit seems to have had two stages of formation, which have been detected in various cross-sections, both at the base of the ridge, between the Ramat Gan *Kurkar* Member and the Dor *Kurkar* Bed, and in the upper part of the Dor *Kurkar* Bed.

Dor *Kurkar* Bed (Wingate *Kurkar*)

This is the second *kurkar* unit, which forms the middle part of the coastal ridge and its scarp, 15–20 m thick. This unit is similar in many respects to the Ramat Gan *Kurkar* Member, in its buff hue, its cross-bedded sets, and in the types of fossils it contains (Bakler 1989, 200; Nir 1992, 12). However, the Dor *Kurkar* Bed is characteristically less consolidated than its predecessor, since the cementing by the carbonate fraction is less complete. This is apparent from the low percentage of magnesium in the aragonite of this unit (Bakler 1989, 200). Horowitz includes also an intermediate *ḥamra* layer in this unit – the Tel Barukh *Ḥamra* (1979, 112, fig. 5.58).

Netanya *Ḥamra* Bed

This is a reddish-brown, silty, clay-like sediment. This layer has a maximum thickness of 5 m and is, at some points, entirely absent from the section. It occurs at different topographic elevations, following an ancient relief pattern similar to the morphology of the Naḥsholim *Ḥamra* Bed. Bakler maintains that this is an aquatic swamp deposit since its upper part is in some instances characterised by laminations of sand and black clay, and in others only by black clay with some organic matter (Bakler 1989, 200).

Tel Aviv *Kurkar* Bed (Beth Yannai *Kurkar*)

This is the uppermost and youngest *kurkar* unit. It forms the top of the coastal ridge and consists of large, semi-cemented to fully cemented calcareous grains, as well as well-preserved terrestrial snails. It reaches a maximum thickness of 5 m (Nir 1992, 14). The local name given to this unit, 'plate', derives from its flat surface morphology. According to Neev and Bakler (1978, 16), the bioclastic bank of this ridge was deposited in a shallow marine environment. This opinion is based on the typical bioclastic composition of the unit, the widespread occurrence of uniform horizontal layers in the lower part of this bank, and on the abundance of marine mollusc burrows within the unit. According to Gavish (1978, 229), the Tel Aviv *Kurkar* Bed is a beach-dune aeolian deposit, as attested by the uniform grain size, typical cross bedding, and the presence of terrestrial snails. On most parts of the coastal ridge, the

Netanya *Ḥamra* Bed lies in varying thickness beneath the 'plate'. In the central Sharon area this unit is highly developed, while to its south it is much thinner and rarely occurs. Its relatively high resistance to erosion has caused the formation of undercut cliffs with steep slopes beneath them. In some areas this unit looks like a protruding shelf on the uppermost part of the ridge, a condition which leads to avalanches as a result of its instability (Nir 1992, 14). Wiseman and Hayati (1971, 5) claim that there are two sub-units: a lower hard layer and a higher softer one. In places where this unit is absent, the Netanya *Ḥamra* Bed forms the surface of the ridge.

Ta'arukha *Ḥamra* Bed (Nof Yam Deposit)

This unit can be found in various locales between Tel Aviv and Netanya. It consists of a dark grey soil, buried a few metres beneath the dunes. In some places it constitutes the present-day surface. Its date of deposition is set about 3000 years ago, based on analyses of its organic constituents (remnants of plants and snails; Bakler *et al*. 1977). This fact can theoretically serve as a chronostratigraphic anchor separating this unit from the overlying unit, since the date of deposition of the Ḥadera Dune Bed could have occurred simultaneously in other locations (Gavish and Bakler 1990, 70–71).

Ḥadera Dune Bed (Rishon LeẔion Deposit)

This is a migrating sand unit, which is stabilised in part by plants, as perhaps new sedimentary units are developing (Bakler 1989, 201; Gavish and Bakler 1990, 70–71; Nir 1992, 14–16; for a detailed discussion, see Bakler *et al*. 1977; Dan and Yaalon 1990). The dominating morphology is dunal with typical cross bedding. It contains terrestrial snails, plant remains, animal bones and pottery, deposited during the different historical periods. This unit apparently overlies most of the sites along the southern Sharon coast, and woods and undergrowth usually characterise it. Erosion sometimes removes this upper unit, exposing the *kurkar*.

Geomorphology of the Southern Sharon Coast

The Sharon is a product of a Pliocene-Pleistocene sedimentary process that was affected by two main factors:

1. Sediments from the Nile were swept northward by coastal currents.
2. Alluvium originating in the Mesozoic foothills of Samaria and the area to their east was swept in the direction of the coast (Avnimelech 1962; Gifford and Rapp 1989, 203).

The coastal ridge of the Sharon is of the Late Pleistocene Age, the eastern ridges being older than the western ones (Gavish and Friedman 1969; Gavish and Bakler 1990, 63). The formation processes are connected to substantial changes that occurred at sea level, which caused alternating regressions and transgressions of the coastline. During regressions, terrestrial processes predominated, and caused accumulations of aeolian deposits and aggregations of layers overlying beach and marine deposits. During transgressions, the process was reversed, and marine deposit accretion occurred over terrestrial deposits. Boreholes drilled into the scarp indicate a periodic recurrence of these processes. The general direction of deposit accumulation seems to have been from east to west, and in this way the Pleistocene coastal area of the Sharon was formed (Gavish and Bakler 1990, 71). It should be noted that according to Issar (1961; 1968), a continuum of *kurkar* covered by *ḥamra* indicates a sedimentary cycle of transgression and regression (see also Gvirtzman 1990, 47).

The swales are situated between *kurkar* ridges. As a rule, *ḥamra* soil areas seem to predominate to the east, while in the lower areas, and especially in the swales, the soil is often enriched by aeolian silt and clay, and as such, become non-porous grumosol (Gavish and Bakler 1990, 63; Dan and Yaalon 1990, 90–92).

Kurkar ridges represent coastal sand dunes deposited and lithified during periods of Quaternary standstill (high or low sea levels). Remnants of several ridges buried by recent marine sediment are noted on the Israeli Mediterranean shelf (Neev, Almagor *et al*. 1976; Horowitz 1979, 105–06, fig. 5.39).

The question of the tectonic activity of the Sharon coast remains open. Some scholars (Gifford and Rapp 1989, 203) view the existence of underwater Neolithic sites off the coast (for example ‘Atlit Yam and Newe Yam near ‘Atlit, and Tel Barukh) as evidence of a relatively lower sea level during the 6th and 5th millennia BC. Similarly, there are disagreements regarding ‘young/recent’ coastal tectonic activities dated to the latest stage of the Early Bronze Age (*ca*. 2000 BC) and their connection to the present position of the coastline of the country. There are those who support this theory (Neev, Bakler *et al*. 1973; Neev, Shachnai *et al*. 1978; Neev, Bakler and Emery 1987, 49–65, 93–114), and others who reject it (Flemming *et al*. 1978; Gifford and Rapp 1989, 206. For a summary of this discussion, see Gvirtzman 1990, 53–54, with bibliography). This discussion is very important if we are to achieve a better understanding of any coastal archaeological site in the Sharon area, first of all, the definition of layers including shell accumulations as natural deposits or as artificial fills (Ronen 1980) and, secondly, the understanding of the accretion environment of recent coastal sediments that are uncovered at these sites, as compared to their present position in relation to sea level. This subject raises

queries regarding the understanding of marine deposits in coastal sites, their elevation in relation to the coast, and how far these deposits served as a breakwater in the natural anchorage at the base of a site.

Some Notes on the Geology and Palaeo-environment of Tell Qudadi

A low-angled, narrow sand beach characterises the southern coast of the Sharon. It is less than 100 m wide, so that in several places high-energy waves reach the base of the ridge, forming a vertical cliff. The Fortress at Tell Qudadi was built during the Iron Age at an elevation of about 5 m (at its lowest foundations) above present-day sea level on the Tel Aviv *Kurkar* Bed, constituting the coastal ridge's upper stratum which gradually spreads south. The site located in the centre of the coastal strip of the southern Sharon area and faces the mountainous region of Shechem and south-western Samaria.

The building materials used at the Iron Age fortress of Tell Qudadi were brought from the area surrounding the site. The foundation trenches of the rectangular fortress were established on deposits of the Ḥadera Dune Bed, and so are the foundation trenches of the fortress façade which was erected anew in the second occupation stage. Deposits of the Ḥadera Dune Bed characterised the site's immediate environment. Most of the building stones of the fortress were made from *kurkar* (fossilised dune sandstone), most probably originated in the coastal ridge's upper stratum, Tel Aviv *Kurkar* Bed.

The southern coast of the Sharon is characterised by a shortage of natural anchorage. The site location on the north bank of the Yarkon estuary was selected most probably because of its natural anchorage. However, some researchers have expressed the opinion that at ancient times a harbour existed at the foot of Tell Qasile (some 1.5 km to the east of Tell Qudadi), which, at present, is the site of Tel Aviv's Eretz Israel Museum. As far as marine archaeology is concerned, one should bear in mind that hardly any artefact that could bear a testimony on the existence of a harbour was found in either Tell Qudadi (see Raban 1994, 112) or further inland at Tell Qasile. While almost any ancient marine vessels passing along the coast off Tell Qudadi could have anchored in the open water by the water mouth of the Yarkon river, in our sorting of the photographs from the site of Tell Qudadi, we came across only one anchor discovered there, whose current whereabouts is unknown. It belongs to a type that can be dated to the Middle or Late Bronze Age (see Fig. 71, below), but may have also been used in later periods (Chapter 2, Stratum I). Likewise, many of the site photographs show active anchoring of mostly relatively small fisherman boats in the estuary of the Yarkon river (see Figs. 3–4, above). While east Mediterranean Late Holocene relative sea-level

changes is a debated domain, there are some indications that during the Iron Age and the Persian period the sea level may have been lower (Nir 1997, table 1; Sivan *et al*. 2001, 115; Toker *et al*. 2012, fig. 2a), hence the sea coast along Tell Qudadi may have provide an even less optimal anchoring conditions than that at present (this may even explain the relative partial preservation of the fortress). Still, the question whether the estuary of the Yarkon could have been wide and deep enough to warrant the possible existence of a harbour has been examined. Bakler is of the opinion that the Yarkon estuary has penetrated at least 3 km to the east, and its width extended from Tel Barukh on north, as far south as HaBashan Street at present (Bakler 1986). According to Bakler, dating by C14 reveals that the estuary in its 'wide' shape existed about 5000 years BP. Since the site of Tell Qudadi yielded PPNA-PPNB flint tools and Chalcolithic, Early and Middle Bronze Ages pottery (Appendixes B and C), the 'wide' estuary (if truly existed), may have appeared intermittingly in proto-historical periods. It should be noted that geological structure of the area does not preclude the possibility of a broad and deep river-mouth. In order to verify whether there is the evidence of previous coverage of the area with sea/fresh water, we have studied some reports that were kindly provided us by Tahal (Water Planning for Israel), which performed some exploratory bores for the IEC in the 1960s. The general area where core-drillings were performed is shown in Fig. 13 (Tell Qudadi is located between sections 2 and 3), while the existence of sea shells and foraminifera in the depth of approximately 80 m in the area may be inferred from packed clay-silt deposits of probably coastal estuary origin (Fig. 14). Thus, cross and longitudinal core-sections performed across the Yarkon show results that demonstrate the possibility that the area was covered by sea water, suggesting that the Yarkon estuary may have been quite wide and deep, and that the present location of Tell Qudadi was in the very middle of an area that was covered by sea water in certain stages in the Holocene.[1]

In conclusion, the geological and environmental characteristics of the site, which is situated near the natural anchorage and fertile lands, certainly affected its selection for habitation. It is logical to assume that the site enjoyed a comfortable climate during Iron Age II (Liphschitz 1988; Horowitz 1992, 416–28, fig. 10.3.4), apparently quite similar to that of the present.

[1] We are grateful to D. Mirkin for providing us the information on the boreholes performed.

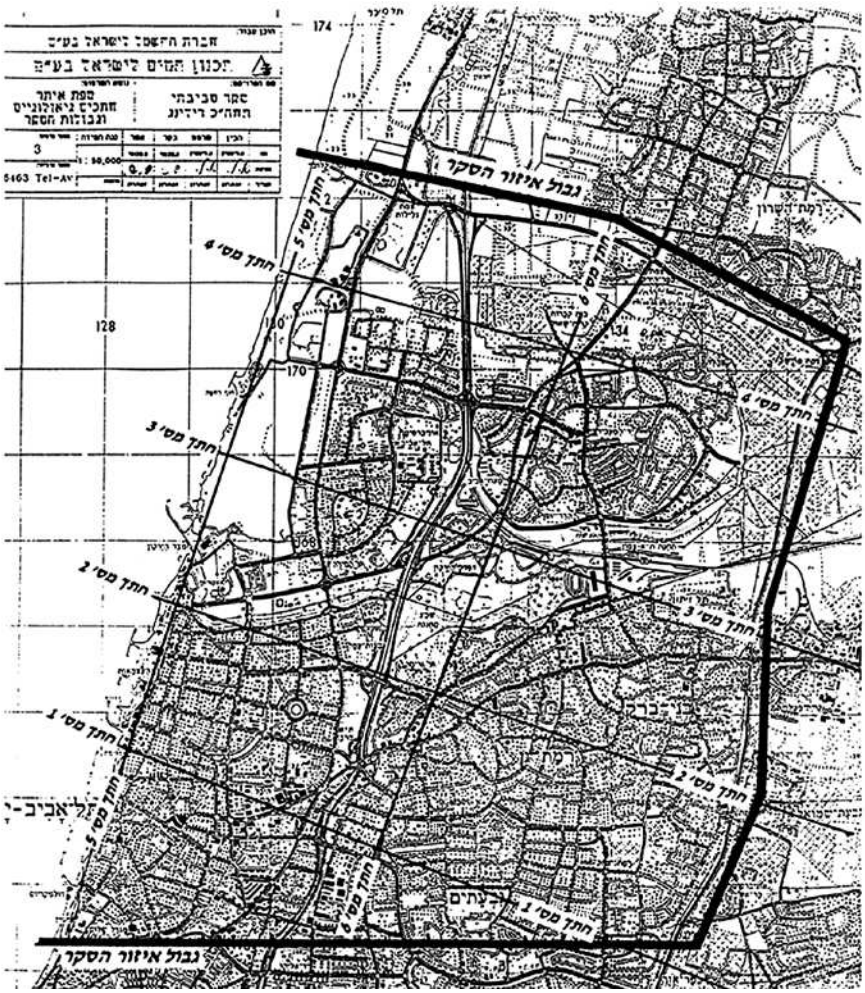

Fig. 13. Plan showing the core-sections made by Tahal (Water Planning for Israel) for the IEC in the area of Tell Qudadi (located between core-sections 2 and 3).

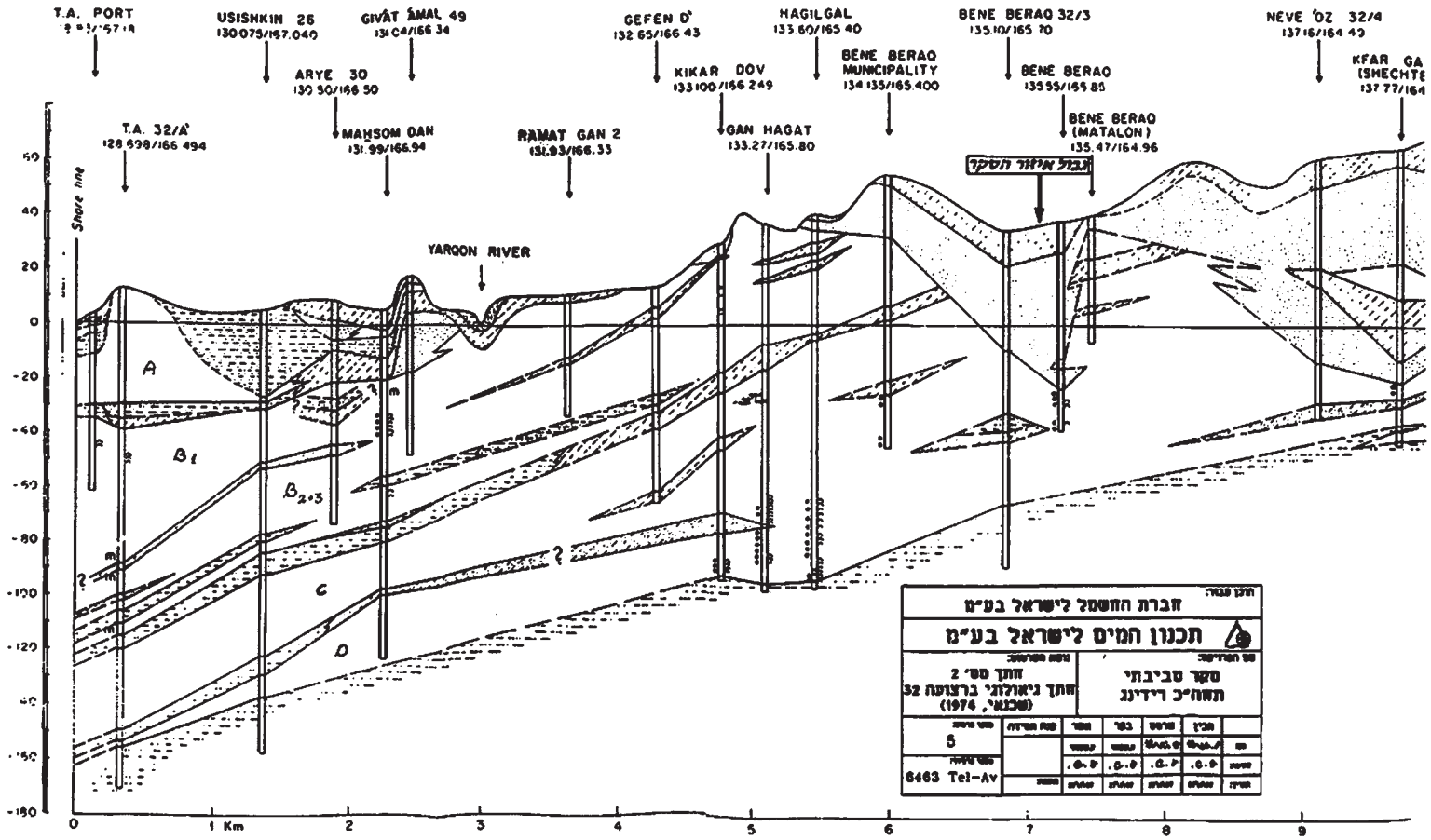

Fig. 14. Core-section 2, where packed clay-silt deposits of probable coastal estuary origin are shown some 3 km off the sea-shore (Tahal: Water Planning for Israel).

1.2. The Site in the Context of World War I

The site of Tell Qudadi was active in World War I for a short period of time, from about 16th November 1917 to 19th–20th September 1918, but it features prominently in the descriptions of the famous Battle of Auja.[2] On 16th–17th November 1917, the Australian and New Zealand Army Corps (ANZAC) riders first formed a line protecting Jaffa. In the line were: Yeomanry Division, Australian Mounted Division and Infantry 52nd and 75th Divisions. On the morning of 24th November, the Canterbury Regiment, 8th Squadron leading, crossed opposite Tell Qudadi and attacked Sheikh Muanis. More action was also reported in the vicinity. Later, the 161st Brigade (54th Division), took the line and the mounted troops patrolled in front. In the morning of 25th November, the Turks counter attacked resulted in a complex British withdrawal. On the 26th, the Turks were occupying the north bank of the Yarkon river west of Sheikh Muanis, including Tell Qudadi. British shelling on Tell Qudadi from this date on can be assumed with a high degree of certainty. Next, a major reorganisation of the whole British forces along this line is documented, from the sea to the River Jordan, as most ANZACs moved east. Preparations for a second massive crossing in the area north of Jaffa to secure the port and to defend the river line took place then.

On 19th–20th December it rained hard; on the 21st the 52nd Division, XXI Corps, crossed at night (Fig. 15). It was a complex plan, put in motion by Major General J. Hill, commander of the 52nd Division. The 157th Brigade attacked while crossing the ford opposite Tell Qudadi; the main crossing force, the 156th Brigade, advanced toward the river below Sheikh Muanis, and the 155th Brigade moved up and crossed the river near Jerisheh (Tel Gerisa).

During 22nd–23rd December a new British line was formed by the British troops at Arsuf, some 10 km north of Tell Qudadi. It would be logical to assume that given the relative importance of the hill and the crossing at Tell Qudadi, the British established a frontal base therein after the withdrawal of the Turks, as cannon and patrol action along the line are documented until 19th September 1918, when troops of the 180th Brigade, 60th Division, XXI Corps moved northward.

[2] Nahr el-Auja نهر العوجا is the Arabic name of what is presently considered the Yarkon river (נחל הירקון, Naḥal HaYarkon in Hebrew). Detailed descriptions of the battle from a number of perspectives could be found in numerous publications; just to name a few: Nicol 1921, 167–76 *passim*; Powles 1922, 161–63; 1928, 179–82; Falls 1930, 214–17, 265–75; Bowman-Manifold 1932, 53–58; Gullett 1941, 497–510 *passim*; Gihon 1974, map 194. We are grateful to B. Rosen for his valuable comments on these matters and to the staff of the Imperial War Museum and the National Army Museum, both in London, for their help.

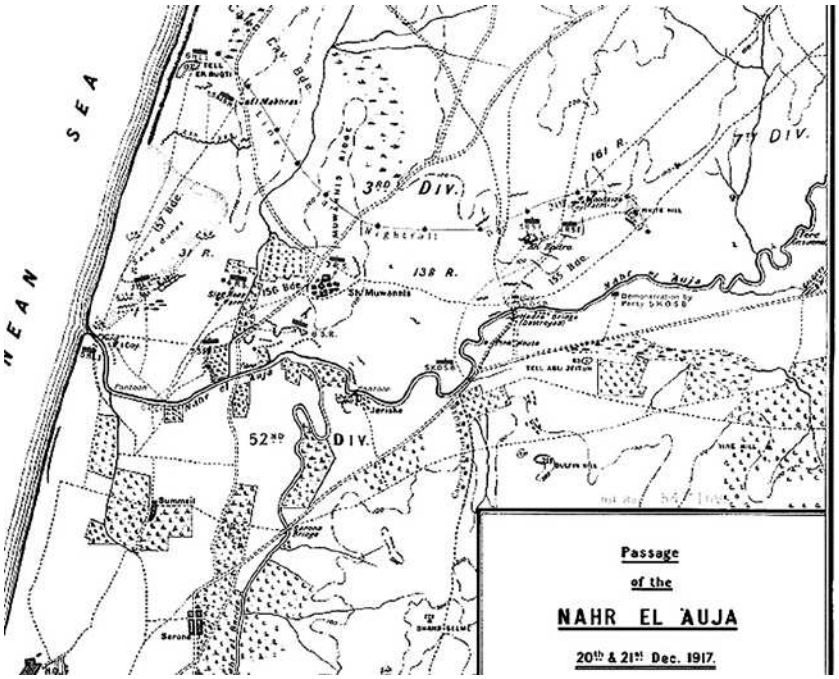

Fig. 15. Map showing division of British forces in the passage of Nahr el 'Auja (Yarkon river) on 20th–21st December 1917 (after Falls 1930).

Fig. 16. Memorandum of Tell Qudadi as it appears today, looking north (photograph: authors, March 2013).

The evidence on the new line and the entrenchment of the troops therein is given in cases first hand; a testimony of a man who fought at Arsuf is recorded in E. Thompson (1929, 12–25):

> Vaults and masonry, that served us for makeshift trenches, are overgrown with datura and scrub; ... Will the archaeologist of later ages, examining pillars and tumbled castle, think of us who burrowed in rock-tombs and hid in caves at the cliff root, while the 5,9's [i.e. 150 mm canon] rapped on the flowery pastures overhead? (Thompson 1929, 24–25).

Another testimony on Arsuf that bears relevance to Tell Qudadi is documented in W.T. Massey (1919, 235–36):

> At a later date, when digging at Arsuf, these Scots came across some marble columns which had graced a hall when Apollonia was in its heyday. The glory of Apollonia has long vanished, but if in that age of warriors there had been a belief that those marble columns would some day be raised as monuments to commemorate a great operation of war the ancients would have had a special veneration for them. Three of the columns marked the spots where the Scots spanned the river, and it is a pity that they cannot tell the full story to succeeding generations.

Indeed these Proconnesian marble columns that probably originated in a Byzantine period church at Apollonia-Arsuf became three memoranda on which inscriptions were carved (R. Fuchs 2004, 652), commemorating the deeds of the 155th, 156th and 157th Brigades of the 52nd Division against the Turks, while crossing the Yarkon (Nahr el 'Auja) river in three different locations. They were erected in the respected locations of the crossing, i.e. at Tell Qudadi (on the north bank of the Yarkon estuary), Kikar Hill (Giv'at Beth HaMitbacḥayim) and Ramat Gan (in the intersection of Ben Gurion and Aba Hillel Streets), and visible to this very day.[3]

The memorandum of Tell Qudadi as seen today (Fig. 16), erected in 1918 and preserves the original English inscription on the east side of the column, as well as a later Hebrew translation on the south side of the column (see also Figs. 3–8, above, for earlier photographs of the memorandum). There are also later (and perhaps earlier) graffiti on the column. The original English inscription can be seen in Fig. 17, it reads:

[3] Based on a note appeared in the *Hawick Express* (a Scottish local newspaper) all three memoranda of the 52nd division on the banks of the Yarkon were provided with protective fences in the course of their repair in 1926, hence early site photographs on which the protective fence is apparent are postdate 1926.

ON THE NIGHT
20th - 21st DEC 1917
THE 157th BRIGADE
52nd (LOWLAND) DIV
CROSSED THIS
FORD & CAPTURED
THE TURKISH
POSITIONS COM-
MANDING IT

The stepped octagonal pedestal at its bottom was restored in 2007 and the following English and Hebrew Inscriptions were added on the eastern sides (Fig. 18).[4]

MEMORIAL FOR
THE COMMEMORATION OF
THE YARKON (AUJA) RIVER
CROSSING BY THE BRITISH 52nd
(LOWLAND) DIVISION IN THE
BATTLE AGAINST THE TURKISH ARMY
DURING THE FIRST WORLD WAR
ERECTED IN 1918
RESTORED BY THE MUNICIPILITY
OF THE CITY OF TEL AVIV-YAFO, 2007

אנדרטה
להנצחתה של צליחת הירקון
ע״י הדיויזיה ה-52 (לולנד) הבריטית
שלחמה נגד הצבא התורכי
בארץ ישראל
בתקופת מלחמת העולם הראשונה
הוקמה בשנת 1918
שופצה על ידי
עיריית תל אביב - יפו, 2007

On 19th September 1918, the British troops moved north and Tell Qudadi's frontal base (if truly existed) was probably soon abandoned. Few artillery shells (shrapnel) and/or fragments of working tools collected by the excavators of Tell Qudadi (especially in Squares F5/F6) along with the pottery finds may attest to the events that occurred at the site during that time (Figs. 19–20).

[4] Earlier restoration by the municipality of Tel Aviv-Yafo took place in 1990 and recorded a somewhat different version of the inscription, in both English and Hebrew, the English reads as follow: WAR MEMORIAL FOR THE / COMMEMORATION OF THE / 52ND DIVISION OF THE / AUSTRALIAN SOLDIERS IN / THEIR FIGHT AGAINST THE / TURKS IN PALESTINE DURING / THE FIRST WORLD WAR.

Fig. 17. Inscription on the memorandum of Tell Qudadi as it appears today, looking west (photograph: authors, March 2013).

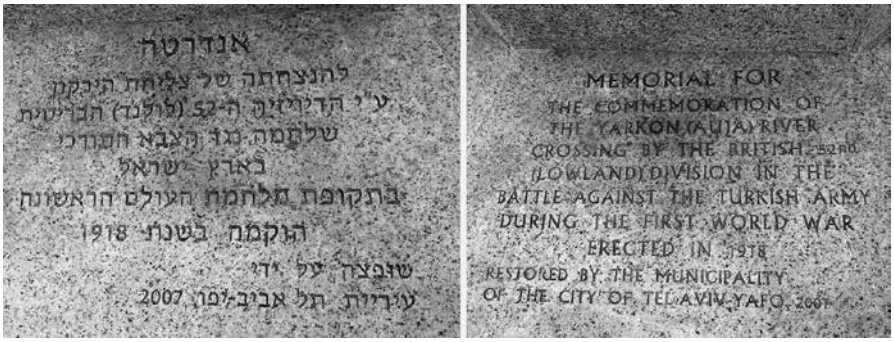

Fig. 18. Later inscriptions on the pedestal of the memorandum of Tell Qudadi as they appear today (photograph: authors, March 2013).

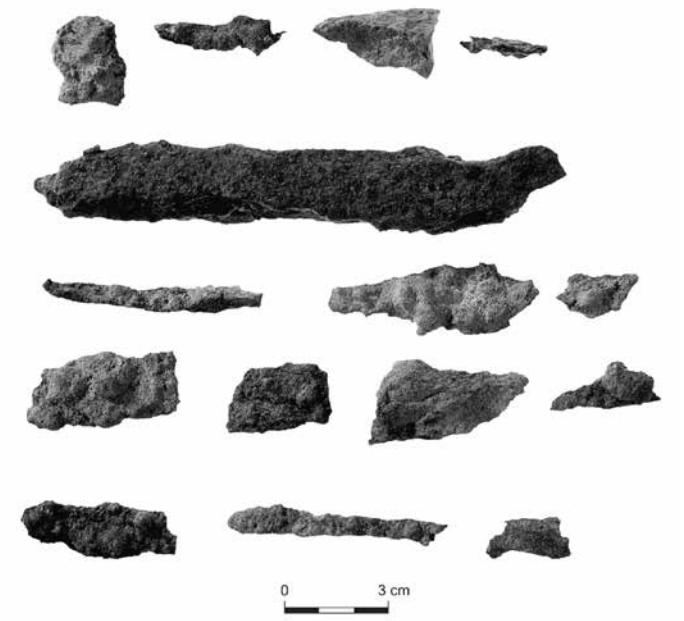

Fig. 19. Fragments of artillery shells (shrapnel) from Locus 458 (Squares F5/F6).

Fig. 20. Fragments of working tool/s and artillery shells (shrapnel) from Locus 479 (Square E7).

1.3. The History of Excavations: The Site in the Context of the Building of the Lighthouse and the Foundation of Reading Power Station

Tell Qudadi was discovered in 1934, following a survey by J. Ory of the Department of Antiquities of the Mandatory Government of Palestine, in which he reported an artificial mound from the biblical period which had recently been robbed. As stated above, the fact that Tell Qudadi was recognised as an antiquities site only in 1934 is of particular interest since the site had been a military stronghold during World War I, in 1917, in the struggle of the allied forces against the Turks. The mound which was apparently covered by a few meters of stratified shifting sand, compacted and partially stabilised, looked as a natural sandy hill of some 8–9 m above sea level and this is probably the reason why it was not identified as an archaeological site until the beginning of the 1930s (Figs. 3–8, above). Obviously its position made the site vulnerable to coastal erosion and it is probable that this erosion enable identify it as an antiquity site back then.

Be that as it may, the site was clearly identified in a period when a lighthouse was built in close proximity to the north of the future areas of excavations, probably severely damaging a great part of its ancient remains. The lighthouse (and the sea wall [retaining wall] at its bottom on the west that was built in order to protect its foundations), of which there are records of operation from 10th January 1935 (in the archive of the IEC), was probably built in the course of 1934. It was authorised by the Government of Palestine, Department of Customs, Excise and Trade, and operated by a French company by the name of Phares de Palestine, who named it in its official correspondence 'Phare de Auja au nord de Jaffa' (Figs. 21–23). The lighthouse was supplemented by a small house of its keeper built on the mound to its south. The lighthouse served as a reference point in the Palestinian coast and especially that of Tel Aviv-Jaffa, probably also warning approaching ships of sand reefs in the area of the ford of the Yarkon estuary and possibly other underwater hazards such as rocks. Later on, when the British singled-out Jaffa and its port specifically, in the context of the Palestinian general strike (and the Peel Commission),[5] and authorised the Zionist Movement to build the Tel Aviv Port (in May 1936) in proclaimed competition with the strike-bound Port of Jaffa (see on this S. Stern 1982), the lighthouse may have gained an additional function, as a possible mark of the newly built port that was situated some 700 m to its south.

[5] A British Royal Commission of Inquiry with recommendations of partitioning the land between the Jews and Arabs into two states, headed by the 1st Earl Peel, which was appointed in 1936 to investigate the causes of unrest in Mandatory Palestine.

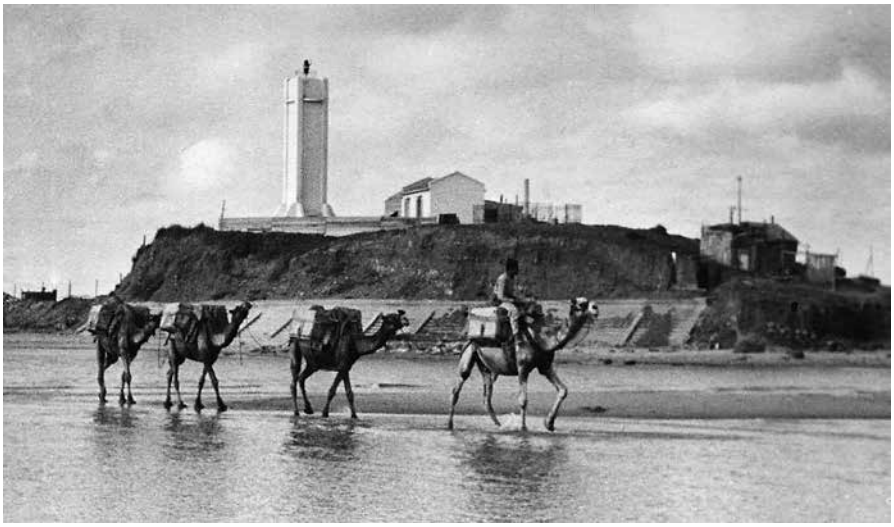

Fig. 21. Tell Qudadi and the lighthouse (and its keeper's house) on top of it, taken from the south bank of the Yarkon river (1936), looking north-east (photograph: Kurt Bremmer).

Fig. 22. The lighthouse and the sea wall protecting its foundations at the bottom of the mound cutting the mound western façade (1936/1937), looking south-east (photograph: IEC, historical archive section).

Fig. 23. The lighthouse on top of Tell Qudadi,
prior to the works of Reading Power Station (February 1937), looking south
(photograph: unknown; IEC, historical archive section).

Fig. 24. The lighthouse and the keeper's house on top of Tell Qudadi,
prior to the works of Reading Power Station (early 1937), looking north
(photograph: unknown; IEC, historical archive section).

The exact date of commencing the works of the Reading Power Station is not known.[6] Nor are the initial works which included site surveying, ground levelling, and other preliminary site works that affected the site formation enormously in addition to the works of the lighthouse carried thus far (Fig. 24), and those related to its activities in World War I on which we have no sound information (Figs. 15–16, 19–20). The available records show that as early as 1934 there was a growing awareness that the old Jaffa/Tel Aviv Power Station would soon be unable to meet the growing demand for electricity. The initial formal correspondence in regard to its building is dated to April 1936; the new hydro-electric station was designed by Richard Kauffmann as early as 1921 but it was put to the ground (with some transformations) probably only in April 1937 (Figs. 25–27). The area which was roughly triangular in shape, just north of the mouth of the Yarkon river, encompasses on its south tip Tell Qudadi. A service bridge connecting Tel Aviv and its newly built port with the Reading Power Station was established across the Yarkon estuary and named after the then High Commissioner, Wauchope Bridge (Fig. 28).[7] Fuel-oil for the newly built power station was to be discharged directly from off-shore tankers through a submarine pipeline to the Reading storage tanks, and a jetty (which was later formed into a lagoon) with a submerged pipeline were built just to the north of Tell Qudadi in order to facilitate this task (Figs. 29–31).[8] Pinhas Rutenberg, founder of the Palestine Electricity Corporation (PEC), had originally thought to remove the lighthouse built some three years earlier and have it integrated in the new building (Fig. 32), but letters in the archive of the IEC record correspondence with government officials (especially with the Director of Public Affairs and the Director of Customs, Excise and Trade) in February–May 1937 on restricting its removal and agreeing on leaving its geographical location and height unchanged but reinforcing its base (Figs. 32–34, see also Fig. 30), removing the old lighthouse keeper's dwelling (Figs. 21 *vs* 32) and later after these works were completed (in late 1937/early 1938), colouring the lighthouse in alternating panels of black and white (Figs. 35).

[6] Named after Rufus Isaacs, 1st Marquess of Reading, a British lawyer, jurist, diplomat, pro-consul and politician, chairman of the PEC, and the first practising Jew to be appointed to the British cabinet, died in December 1935.

[7] That is General Sir Arthur Grenfell Wauchope who was in position of High Commissioner and Commander-in-Chief in Palestine and Trans-Jordan from November 1931 to March 1938.

[8] For the architecture and building of the Reading Power Station ('Power House South') and the history behind it, see Herbert, Heinze-Greenberg and Sosnovsky 2003, 54–58 *passim*. On the earlier Jaffa/Tel Aviv Power Station, see Herbert, Heinze-Greenberg and Sosnovsky 2003, 21–23. See also the biography of P. Rutenberg (Shaltiel 1990). There are also several letters in the archive of the IEC who tell the story of the integration of the lighthouse in the overall plan of the power station (not mentioned in the references above).

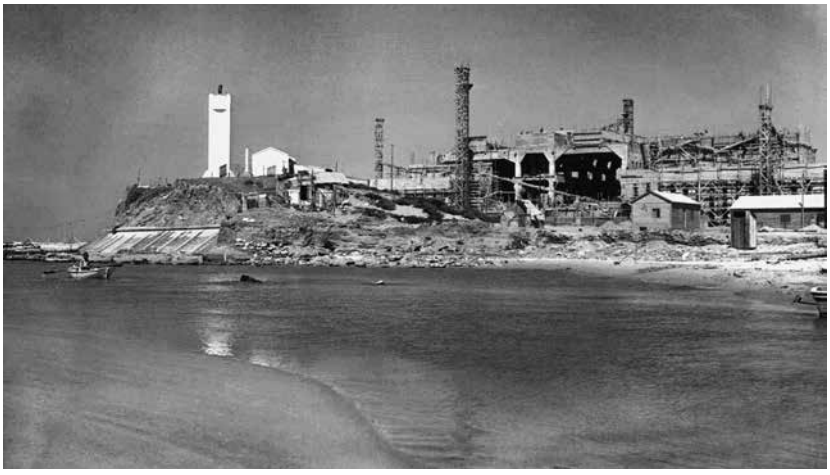

Fig. 25. Tell Qudadi during preparation works for the Reading Power Station and prior to excavation (1937), looking north (photograph: unknown; IEC, historical archive section).

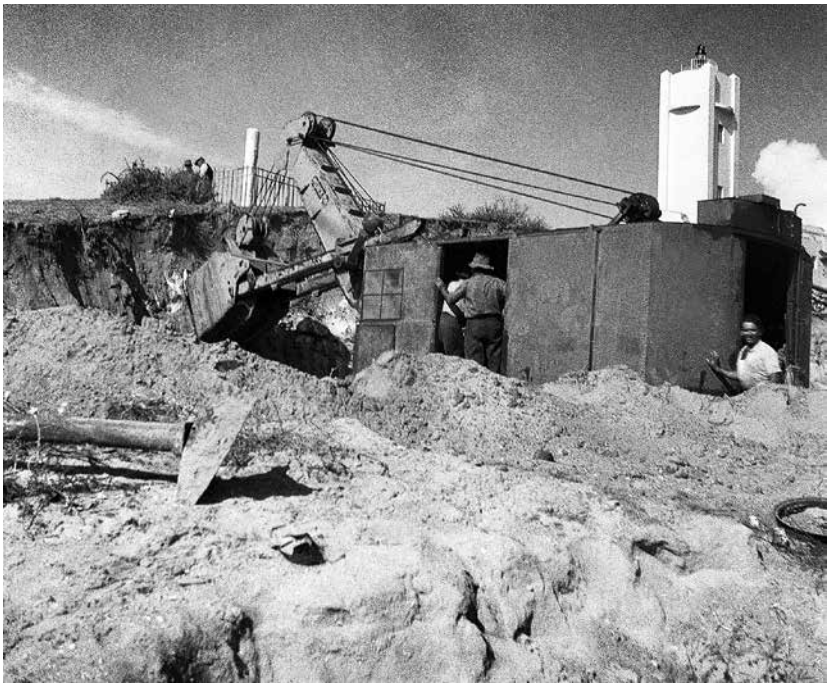

Fig. 26. Mechanical works cutting and damaging the mound of Tell Qudadi (1937), looking north (photograph: unknown; IEC, historical archive section).

Fig. 27. The lighthouse and the keeper's house after its dismantling on top of Tell Qudadi, during works of Reading Power Station and prior to site excavation (1937), looking south-west (photograph: unknown; IEC, historical archive section).

Fig. 28. The building of Wauchope Bridge over the Yarkon river (Nahr el 'Auja) (1937), looking south-east (photograph: unknown; IEC, historical archive section).

Fig. 29. The mound during excavation and the newly built break water wall of the PEC (Palestine Electricity Corporation) lagoon to its north-west (1937/1938) (photograph: unknown; excavation files).

Fig. 30. Aerial photography of the Reading Power Station lagoon during preparation works and its break water wall in the foreground (1938/1939), looking east (photograph: unknown; IEC, historical archive section).

Fig. 31. Aerial photography of the Reading Power Station lagoon (1960s), looking north-west (photograph: unknown; IEC, historical archive section).

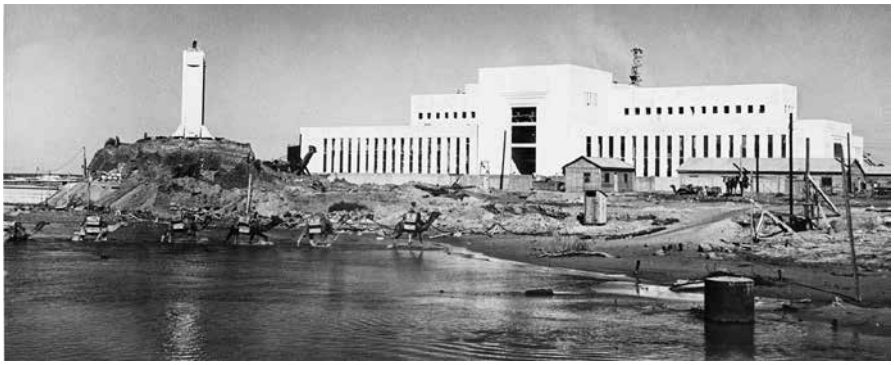

Fig. 32. The mound during excavation, while preparation works were still on the ground and lighthouse base reinforcement took place (the newly built Reading Power Station in the background) (late 1937) (photograph: unknown; IEC, historical archive section).

The reinforcement of the base of the lighthouse probably caused more damages to the site's ancient remains (see especially Figs. 34 and 36), as levelling works were carried from some 8–7 m to about 4–3 m above sea level according to the above records. Moreover, one can imagine that the wide channel that lead sea water out of the hydro-electric station in its early stage of operation, located to the north of the lighthouse, aggressively cut parts of the mound's northern limits (Fig. 37). Later on this channel was replaced by two other channels located to the south of the lighthouse, probably brutally cut parts of the mound's southern limits (Fig. 38). Furthermore, the sea wall that was previously erected in order to protect the lighthouse (Figs. 21–22), severely damaged the mound's western limits or what was left from them (Fig. 34), if coastal erosion had not already affected this part severely as may be seen in photographs of 1933 (Fig. 3).

The rediscovery, excavation and conservation of the site can be credited to P.L.O. Guy, the then Director of the British School of Archaeology in Jerusalem. In the context of his reviewing of the work of the original Survey of Western Palestine (SWP), Guy prepared and proposed the objectives of the new Archaeological Survey of Palestine, where he focused on the relatively safe and accessible parts of Sheet 7 of the SWP, particularly along the central coast (Guy 1938, 14–15). The site which was obviously known at the time of Guy's survey as a memorial site of World War I, was endangered because of the newly built Reading Power Station. The land upon which Tell Qudadi stood was recently purchased by Rutenberg on behalf of the PEC, from a Sheikh of Abu Kishk tribe, Seif al-Din Abu Kishk, though indirectly.[9] As it happened when Guy visited the site it was coincided with development works of the newly built power station, while parts of the ancient mound were removed. At the beginning he did not realise that the site was already known to the Department of Antiquities of the Mandatory Government of Palestine.

Letter of Guy to J.W. Crowfoot, 14th September 1937 (PEF/DA/BSAJ [J]):

> You will be amused to hear that the other day I found quite a nice little tell almost in Tel Aviv itself. It is marked neither on the old map nor on the new one, and was unknown to the Department. It lies just at the mouth of the Yarkon, or Auja, on the north bank, and evidently guarded the mouth from the beginning of the Iron Age down to Roman times. It is on the point of being partially demolished owing to the construction of a new electric power station, and tomorrow I am seeing what can be done about recording its context.

[9] Abu Kishk was an Egyptian Bedouin tribe that had settled in the area located some 6 km to the north-east of Tell Qudadi (modern Ramat HaSharon), as a part of a Bedouin settlement activity along the Nahr Auja (Yarkon) during the 19th century AD. Ironically, the Sheikh who sold the land for the building of the Reading Power Station was a prominent figure during the 1929 Arab anti-Jewish riots in Palestine.

Fig. 33. The lighthouse base reinforcement (late 1937/early 1938), anchor stone in the foreground (photograph: unknown; excavation files).

Fig. 34. The lighthouse base after being reinforced (1941), outer rampart wall of the fortress's second stage in the foreground (photograph: unknown; IEC, historical archive section).

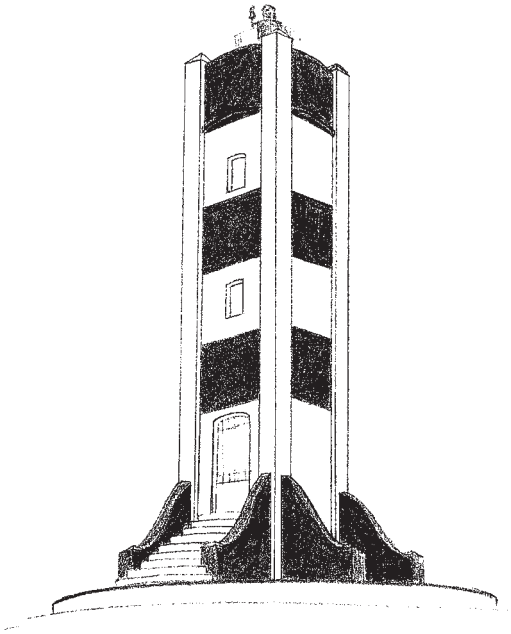

Fig. 35. The lighthouse requested colouring
(IEC, historical archive section).

Fig. 36. Tell Qudadi after excavation and before conservation works (1939/1940)
(photograph: unknown; IEC, historical archive section).

Fig. 37. Tell Qudadi after excavation; water channel cutting the mound northern limit (1940?), looking east (photograph: unknown; IEC, historical archive section).

Fig. 38. Aerial photograph showing the two water channels on the south side of the mound (1981), looking south-east (courtesy of Z. Herzog).

A few days later came a clarification with a letter from Guy to Crowfoot, 23rd September 1937 (PEF/DA/BSAJ [J]):

> As to the little Tell I told you about, at the mouth of the Yarkon, it now turns out that the Department does know about it (although Hamilton told me that it did not), and that Ory has visited it several times. He recommended it for registration as an ancient site in 1935, but it has not yet been registered and there is apparently some difficulty about taking official notion in regard to it. I am writing the Palestine Electric Co. to find out what their plans are, and shall see if I cannot arrange for some observer to be there when it is dug into.
>
> Meanwhile I find that the keeper of the lighthouse on it is Christian Arab who married a former maid of ours. Since we stood the wedding breakfast he is, of course, delighted to keep me informed of anything that may happen. This little mound may be quite interesting, for I have an idea that it stood in relation to Tell el Jerisheh as Minet el Baidha stood to Ras Shamra. Sukenik is coming back from leave soon, and I propose to tell him this. It ought to make him rush down at once and do the necessary supervision.

Alerted by possible demolition of an important archaeological site, Guy wrote to Rutenberg, describing the historical importance of the mound and inquiring on his further intentions. The alleged Solomonic (biblical) connotation with regard to Tell Qudadi, suggested by connection to the biblical passage in II *Chronicles* 2:15,[10] fitted the purpose well. Guy, through his personal views and marriage into the Ben-Yehuda family, was actively involved in Zionist politics of the period and realised how to gain the support and interest of influential PEC and its founder Rutenberg as well as of Jewish public (Green 2009).

Letter of Guy to Rutenberg, 24th September 1937 (PEF/DA/BSAJ [J]):

> As you know, there is, just south of your new Reading Power Station, a small mound on which stand a lighthouse and a war memorial.
>
> The mound is ancient, having been apparently a coastal trading-station, or a fort, or both, from about 1200 B.C. down to Roman times, and I fancy that it may have had connections with the large town of Tell Jerisheh situated further up the Yarkon, near Ramat Gan. *It would appear to be the precursor of the new Tel Aviv harbour, and it would be of considerable interest to the public if it were found to contain evidence of Jewish occupation, particularly if this should prove to have existed at the time when King Solomon was importing his cedar from the Lebanon for building purposes* [our emphasis].

[10] 'And we will have wood cut from Lebanon, as much as you have need of, and will send it to you on flat boats by sea to Joppa, and from there you may take it up to Jerusalem.' Needless to say, the historical information supplied by this apparently late Persian/early Hellenistic source is not reliable when implied on 10th-century BC realities (on the historicity of the biblical material describing the days of King Solomon, see Finkelstein and Silberman 2006).

> I had a look at the mound lately, and finding that some work had been done on it I called your chief engineer about it. He received me most kindly, but could not tell me exactly what your intentions were in regard to it.
>
> I therefore ask you to be good enough to let me know what you propose to do, and when you expect to begin work. It would be a pity if interesting archaeological evidence were lost, and I feel sure that you would be glad if I could arrange for a qualified observer to watch tor that evidence while the digging was being done.

In the meantime, Crowfoot informed Guy, in a letter dated 30th September 1937 (PEF/DA/BSAJ [J]), that: 'Sukenik has been staying with us lately: he tells me that he knows the tell to which you refer well, and I hope your negotiations with the Palestine Electric Co. will be fruitful.'

A positive answer from Rutenberg dated 3rd October 1937 swiftly arrived (PEF/DA/BSAJ [J]; PEC/letter from Rutenberg to Guy/Ref 37/11328):

> Lately I am moving a lot, and your letter reach me only today. What you are writing about the site of the lighthouse near Tel-Aviv is most interesting. You will certainly be informed when excavation will commence, enabling you to send a qualified observer to watch for any archaeological evidence which might be found on that site.

Thus, S.D. Sorsky wrote to Guy on 4th October 1937 (PEF/DA/BSAJ [J]; PEC/letter from Sorsky to Guy/ Ref 37/11401):

> Subject: – Excavation at Lighthouse Mound North of R. Yarkon Estuary.
> We beg to refer to Mr. Rutenberg's letter No. 37/11328 dated October 3rd, 1937 and addressed to you on the above subject, and to inform you that we have commenced excavation.

As shown from the correspondence, Guy apparently played the game right. Work began in October 1937 and Guy recorded a 17 m-long stone wall on the north-east side of the mound (with the help of his field supervisor a certain Mr Waechter), that was initially accidently unearthed by mechanical tool, which he dated to the 6th or 5th centuries BC and ascribed to the outside wall of a house which still remains unexcavated (Guy 1938, 15–16; Avigad 1993; and below Chapter 2, Stratum III–II).

Guy subsequently handed over responsibility to E.L. Sukenik and S. Yeivin of the HUJ because Waechter was unable to continue working at the site. He asked to halt the development works at the site until the HUJ mission will take charge.

Letter of Guy to Crowfoot, 2nd December 1937 (PEF/DA/BSAJ [J]):

> You will be glad to hear that I have arranged with Sukenik for him to supervise the digging at that little tell at the mouth of the Yarkon. Yievin is on the job, and

> I was fortunate enough to get Rutenberg to put up the necessary cash. I picked out some sherds of what you used to call Megiddo ware (fine red & buff) from the bottom, and Sukenik tells me he has a wall of that period standing five metres high.

Sukenik and Yeivin began working at the site in November 1937 and continued to March 1938.[11] The PEC/Rutenberg financed this campaign; and correspondence between Sukenik and Rutenberg on the terms of funding the dig is dated to 12th October 1937 (Figs. 38–39). It seems that the idea to maintain an Israelite identification to the site (as first prompted by Guy), together with the fact that the site served as a World War I memorial, led to its conservation work in 1941, which were too financed by Rutenberg.[12] Since then constant inspections on the site are reported by antiquity inspectors of both the Department of Antiquities of the Mandatory Government of Palestine and of the State of Israel.[13] In this context, it should be added that the fortress underwent conservation works also recently in October 2007, supervised by the Israel Antiquities Authority, and financed by Tel Aviv-Yafo Municipality. The walls were stabilised and in cases stones were added in places where they fell. The area around the fortress was paved with a wide wooden deck (as is the entire Tel Aviv Port area nowadays) and the lighthouse was coloured in accordance with its earlier manifestation (Fig. 40). The PEC/IEC lagoon now forms part of Tel Aviv's coastal promenade on both sides of the Yarkon along the coastal strip (Figs. 41–42).

[11] Oddly enough, according to Lipiński's treatment of the *Itineraria Phoenicia*, Tell Qudadi 'was not yet excavated' (Lipiński 2004, 198).

[12] A letter dated 15th August 1941 from Sukenik to Rutenberg, found in the archive of the IEC, states the sum of 'several hundreds of Eretz-Israeli liras [Palestine pounds]' as the cost of the entire campaign, in the context of asking for additional 100 Israeli liras for bilingual (Hebrew and English) final publication. Another letter, of 5th May 1941 (ATQ/86/6) from the Director of Antiquities to the PEC conveys thanks to Rutenberg for contributing £P20 (Palestine pounds) for the cost of the conservation works at the site (initially, in a letter of 12th April 1941, the sum of £P50 was sought).

[13] Regrettably, neither Rutenberg's interest in the excavations nor the PEC obligation for the safe-keeping of the site after its excavations are recorded in the story of the building of the Reading Power Station (Herbert, Heinze-Greenberg and Sosnovsky 2003) or in the biography of Rutenberg (Shaltiel 1990).

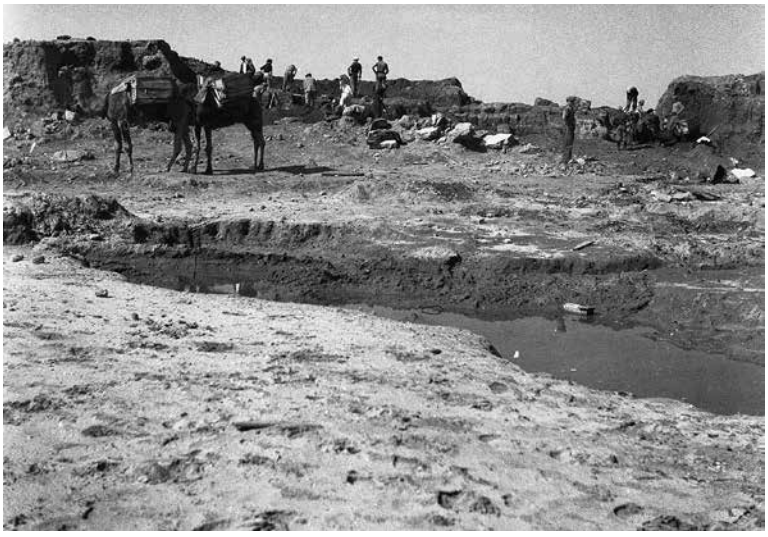

Fig. 39. Excavations in the process, looking north-west (photograph: unknown; excavation files).

Fig. 40. Hebrew University Expedition to Tell Qudadi; standing in the foreground E. L. Sukenik (third from right), N. Avigad (fourth from right), S. Yeivin (fifth from right), P. Rutenberg (top row, right) (1937/1938) (photograph: unknown; IEC, historical archive section).

Fig. 41. Tell Qudadi as it appears today after conservation works in 2007, looking north (photograph: authors, March 2013).

Fig. 42. Reading Power Station lagoon as it appears today, looking north-west (photograph: authors, March 2013).

CHAPTER 2

STRATIGRAPHY AND ARCHITECTURE

Further to the description of the site formation in the previous chapter, it should be stressed that by the time that controlled archaeological excavations began, at least half of the original mound was demolished, especially on the west side (Fig. 43). Excavations were concentrated, therefore, on the east side, where a relatively narrow strip of some 15 m wide was left comparatively unharmed (if one overlooks the lighthouse area, the sea wall and suspected natural erosion).

Fig. 43. Mechanical works cutting and damaging the mound of Tell Qudadi (1937), looking west (photograph: unknown; IEC, historical archive section).

The Iron Age II Fortress (Figs. 44–45)

As noted in the Introduction, the excavators ascribed the two floors and the two burnt layers in which pottery was found to the second architectural phase of the fortress. However, an examination of the excavation notes, the plans and the site's excavated sections, as well as the excavators' impression, prove that all the floors uncovered in the excavation are isolated from the fortress walls of the first and second phases. Accordingly, the link between the floor and the walls of the earlier phase and the floor and the walls of the later phase – as well as any other floor uncovered during the excavation – is not a physical one (Fig. 46). A probe of the north-eastern casemate (casemate 2) of the fortress strongly supports this argument (Fig. 47). This probe may reveal the stratigraphy of the entire fortress or at least point on its ambiguity. According to this figure the layers are all post-casemate structure. If they relate to any surviving structural elements it can only be to the second fortress (with the inset-offset wall). However, the fact is that the casemate structure (Stratum V) is a stone foundation which was used to strengthen the foundations of the building. Above the casemates of the foundation a superstructure would certainly have been built of mud-bricks that did not survive. Indeed in some of the site photographs scattered mud-bricks may be observed but none of these is seen *in situ*. The intentional filling of beach sand almost devoid of artefacts (Fig. 47.9) as well as scattered mud-bricks in the area, as reported in the excavation log book support this argument. On top of the casemate wall (Fig. 47.8) there is a fill of brown earth that covers the casemate walls. This fill seems to relate to the construction layer of the floor of the first fortress in casemate 2, which can be clearly seen on top of it as a relatively thick occupation layer which was destructed (Fig. 47.7). The destructed layer was re-occupied with a floor of shells (Fig. 47.6), which was sealed by an occupation layer of the second fortress (Fig. 47.5). The occupation layer was sealed by a stone pavement (Fig. 47.4) which is covered by another destruction that we relate to the second fortress (Fig. 47.3). The dark earth (Fig. 47.2) and the surface layer (Fig. 47.1) are separated from the Iron Age fortress. In spite of the fact that the section shows no physical connections between the floors and the walls of the fortress building, the excavation logbooks give the impression that the excavators were confident in their stratigraphic division and in the physical relation between the floors and the walls. This can also be deduced from the location of the pottery vessels as found on the floors and in the building. The relative absent of documented sections in the fortress building (apart from Fig. 47) does not necessarily suggest that the excavators did not witness it, yet failed to record it illustratively. In any case the building, that is a fortress of a probable

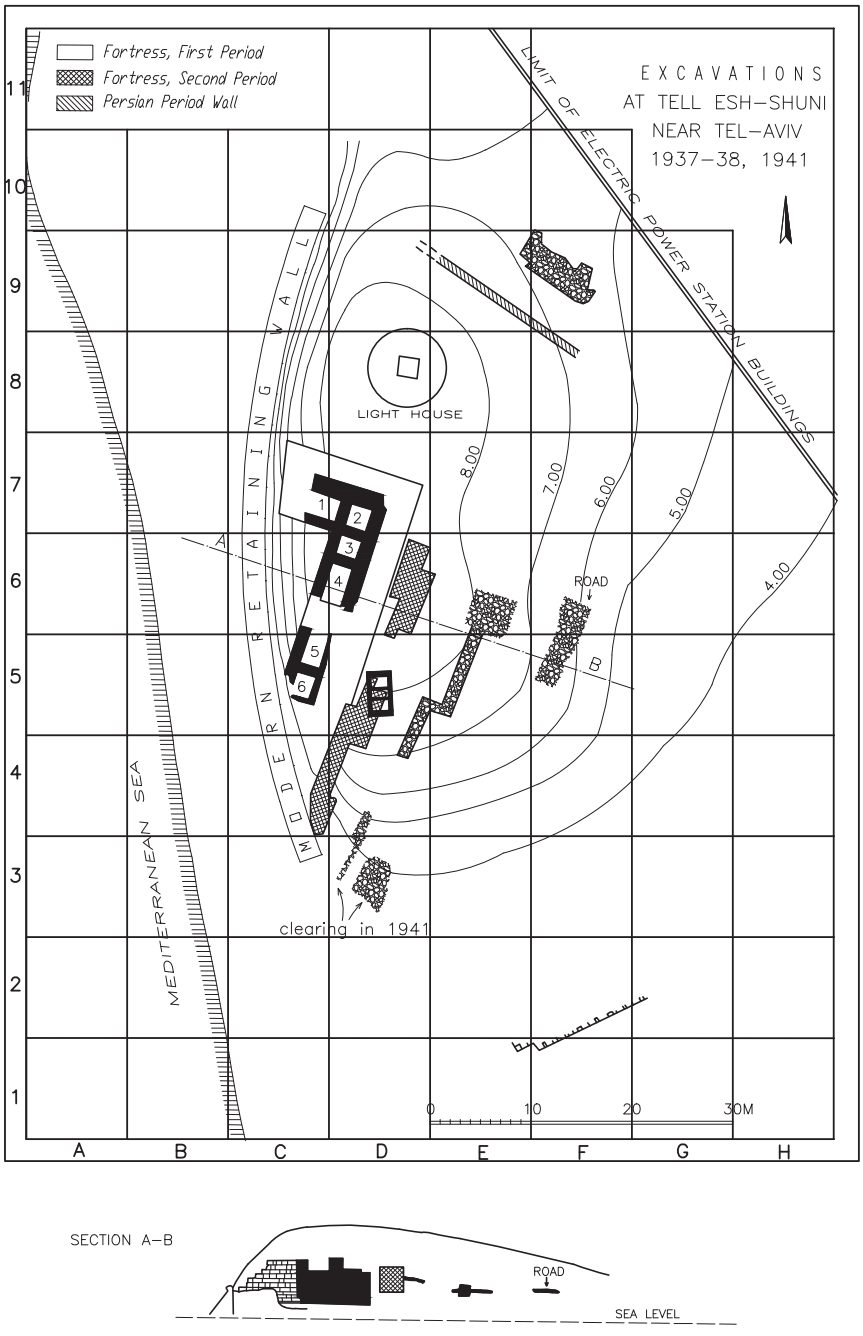

Fig. 44. Site map of the 1937–1938 and 1941 seasons of excavations, with section at bottom looking north (redrawn according to archival plan and authenticated according to visible remains on the ground).

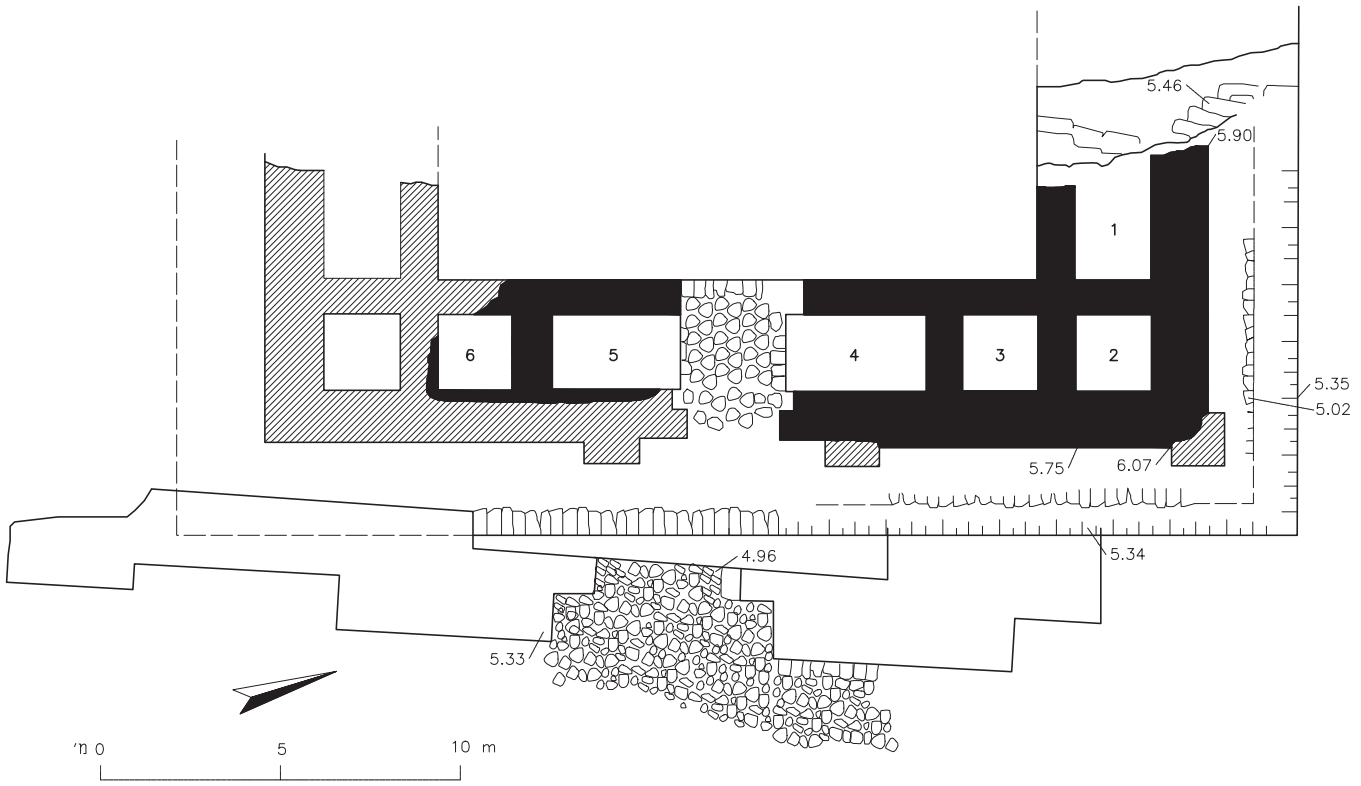

Fig. 45. Plan of the fortress (redrawn according to archival plan and authenticated according to visible remains on the ground).

Fig. 46. The site's first fortress at the end of excavations, looking south (photograph: unknown; excavation files).

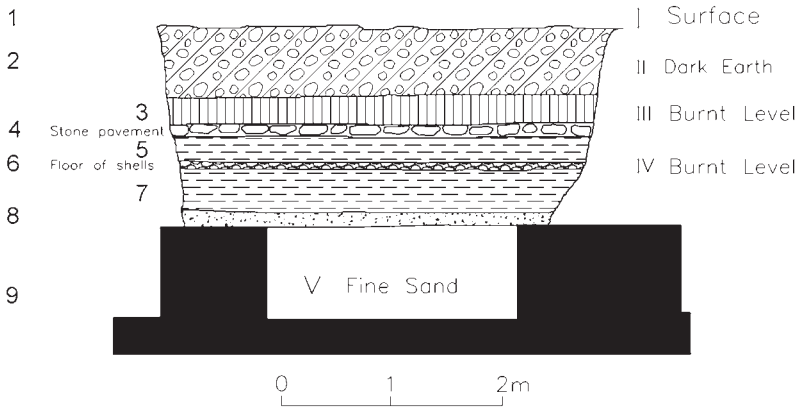

Fig. 47. Section through Room (casemate) 2, looking north (redrawn according to archival plan).

symmetrical design, with a square-shaped open courtyard, flanked by four rows of rooms (casemates), exhibits one of the earliest appearances of a military-oriented type of building whose origins can be found in Mesopotamia (see in this respect Amiran and Dunayevsky 1958).

Strata V–II in the Iron Age Fortress

Stratum V is associated with the stone foundation and the walls of the north-eastern casemate. This stone foundation was made of roughly hewn *kurkar* (fossilised dune sandstone) of varying dimensions, whose maximum height 3 m and maximum width of the walls *ca*. 7 m. The eastern wall was preserved along *ca*. 33 m and its northern wall along *ca*. 14 m. The building technique was based on the use of stones of various dimensions, roughly cut to a rectangular shape, which were laid in levelled courses straightened by the addition of smaller field stones. Based on the remains preserved in the north-east corner, stones in the corners seem to have been roughly cut relatively larger than those of either the outer or inner walls of the fortress. The rest of its walls were completely destroyed and apparently washed into the sea. Above the walls of the foundation a row of rooms was built around a courtyard, of which six survived – two in the north and four in the east. The walls of the rooms were also constructed of roughly hewn *kurkar* stones; their maximum height was 0.6 m. The rooms were found filled with sand and almost devoid of artefacts (Fig. 46). Room (casemate) 1 was partially preserved to about 3.5 × 2 m (Figs. 48–49); Rooms 2 and 3 which are identical in size were completely preserved to about 2 × 2 m; Rooms 4 and 5 which are located on both sides of the doorway were completely preserved to about 3.5 × 2 m; while Room 6 was partially preserved, yet can be reconstructed similarly to Room 3 (2 × 2 m) (Fig. 45). If one attempts to suggest a symmetrical ground-plan the south-eastern corner casemate and the casemate to its west (which did not survive) probably share the same dimensions of Rooms 1 and 2.

The entrance to the courtyard (some 3 m wide), with preserved paving, was on the east in the centre, between the two pairs of rooms (4 and 5) (Fig. 46). The surviving walls apparently enclosed an inner courtyard (some 16.5 m wide) (Figs. 50–51, see also Fig. 29), which meant that the original fortress could have had a square plan with an entrance in the centre of the eastern side. However, if the entrance was to the side of the eastern wall rather than in its centre (namely have has an asymmetrical ground-plan), the fortress may have been larger than the excavators estimated. An asymmetrical ground-plan at least for the second stage may be supported by the fact that some of the site photographs show the continuation of the outer rampart towards the south-west

Fig. 48. Room (casemate) 1 during excavations, northern wall of the courtyard in the foreground, looking north-west (photograph: unknown; excavation files).

Fig. 49. Room (casemate) 1 during excavations, northern wall (in close-up) of the courtyard in the foreground, looking north (photograph: unknown; excavation files).

Fig. 50. The courtyard, looking north (photograph: unknown; excavation files).

Fig. 51. The courtyard, looking south (photograph: unknown; excavation files).

(the sea) (Figs. 52–53, see also Fig. 34 above), while the entrance area is clearly set off the assumed centre of the outer rampart wall, and is oriented in an almost symmetrical alignment to the entrance of the fortress's first stage (whose square plan is questionable).

The external eastern wall of the casemates was supported by at least three engaged pillars (some 1.5 m thick) on the north-eastern corner and on the walls of the rooms (4 and 5) that flanked the doorway (Figs. 45–46). The casemate building whose external walls on the north and east reached some 1.5 m was an inner construction of a larger massive foundation which had a stepped façade (Fig. 46). This stepped façade, whose total thickness on the north and east reached some 2.5 m (Figs. 54–55), may have served as a stone glacis that protected the foundations of the structure. The general impression of the original building may have been of that of a stepped elevated structure that can be seen from afar. The inset-offset wall of the second fortress apparently cancelled out the glacis and the stepped façade of the first fortress. The method in which the inset-offset wall adjoined the original façade left what seems to be the upper two levels of steps of the stepped façade of the first fortress.

Stratum IV was destroyed in a conflagration, as was Stratum IIIA (termed Stratum III by the excavators). Between these two strata (i.e. above the first destruction level [Fig. 47.7] and below the second one [Fig. 47.3]) an occupation level was uncovered (Stratum IIIB [Fig. 47.5]), which should be regarded as a stratum of repairs between the two phases.

As noted, the floors, including the two burnt layers, were found without proper connection to the walls of either phase of the fortress. Therefore the excavators' conclusion that the two floors and the two burnt layers were associated with the second architectural phase of the fortress does not correspond to the findings. Logic indicates that each burnt layer represents a destruction, i.e. the first burnt layer represents the destruction of the first phase of the fortress (Stratum IV) and the second such layer represents the destruction of the second phase of the fortress (Stratum IIIA). In fact, all the pottery recovered from secured contexts came from 'floating floors' or 'floating occupation layers', whose physical connection to the walls, although logical, does not exist. Yet given the fact that many vessels ascribed to Strata IIIB and IIIA came from Squares D5 and D6, namely in areas which seem to physically correspond to the occupation of the second fortress, while vessels ascribed to Stratum IV mostly came from Squares C5 and D7 that physically relate to the occupation of the first fortress, the connection between the pottery and the fortress is relatively well-sounded. It should also be noted that the archaeological data indicate no essential changes in the internal plan of the fortress between its two phases, i.e. the inset-offset wall of the second phase is no

Fig. 52. The continuation of the outer rampart wall towards the south-west, looking north-east (photograph: unknown; excavation files).

Fig. 53. The continuation of the outer rampart wall towards the south-west, looking east (photograph: unknown; excavation files).

Fig. 54. The stepped eastern façade of the fortress's first stage, looking south (photograph: unknown; excavation files).

Fig. 55. The stepped eastern and northern façade of the fortress's first stage, looking west (photograph: unknown; excavation files).

more than a new façade and a new gate on top of a ramp to the fortress (Figs. 56–58), as the other walls were left untouched (Figs. 59–60). This is the reason why it shows no foundation phase in the section as is the case with the first phase of the fortress that of Stratum V. However, as stated above, our re-examination of the remains at the site also indicates that the massive foundation representing the first architectural phase of the fortress had a stepped façade (Figs. 54–55), which may have served as a stone glacis that protected the foundations of the structure. Thus the inset-offset wall of the second phase apparently cancelled out the glacis and the stepped façade of the first phase.

Stratum III with its inset-offset wall that is made of roughly hewn *kurkar* stones of varying dimensions relates to the last phase of the fortress. The length of the inset-offset wall is *ca*. 30 m, its thickness *ca*. 2.5 m and its maximum height is more than 2 m (Figs. 45, 56). The building technique is similar to that of the previous stage, namely the use of stones of various dimensions, roughly cut to a rectangular shape, which were laid in levelled courses straightened by the addition of smaller field stones. Interfacing inset-offset walls were joined by relatively larger stones. Near its centre was an entrance 4 m wide, protected by a buttress on each side and approached by a ramp with a somewhat moderate ascent paved with fieldstones (Fig. 61). The preserved doorway was about 6 m wide on its external side and 4 m wide on its inner side. It also had a later addition in the form of an engaged pillar (1 m thick) on the southern doorpost that can be related to Stratum IIIA (Fig. 62). This addition narrowed the opening to about 3 m wide in the fortress's last phase.

It seems that the main change between the two fortresses is in their façade and consequently their entrances. While the fortress of the first phase seems to have a stepped entrance protected by some sort of a single-chambered gate-house, which probably had double doors, the second fortress and its new façade have added an external doorway that was accessible via a ramp that may have facilitated the passage of animals and carriages into the inner court-yard of the fortress (Fig. 46). The general impression is that the new façade and entrance of the second phase did not supplant the single-chambered gate-house of the first phase but rather strengthened it by creating an enormous façade whose thickness reached 11 m.

As will be shown below, ceramics from Iron Age IIB were found in all strata of the fortress (V, IV, IIIB and IIIA).

Fig. 56. The site's first and second fortress at the end of excavations, looking south (photograph: unknown; excavation files).

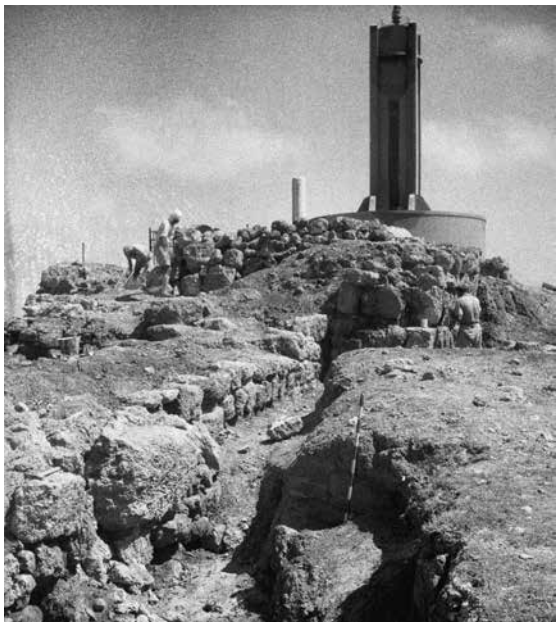

Fig. 57. The inset-offset wall: a close-up, looking north-west (photograph: unknown; excavation files).

Fig. 58. The inset-offset wall (side view), looking north-west (photograph: unknown; excavation files).

Fig. 59. The fortress northern wall and the inset-offset eastern wall attach to the fortress eastern wall, looking south-west (photograph: unknown; excavation files).

Fig. 60. The fortress northern wall: a close-up, looking south (photograph: unknown; excavation files).

Stratum III–II

The excavators' idea of Stratum III–II (preferably defined as Stratum IIB) apparently refers to a number of pottery vessels and sherds found on top of Stratum III whose date was assigned to either the 7th century BC or to the Persian period, but without any indication of architectural remains related to them. We have this pottery assembled selectively in Figs. 104–107 (below) as part of our unstratified finds. Following this reasoning of ascribing post-fortress finds recovered from the areas of excavations in the fortress, one can ascribe the plastered installation paved with white mosaic stones which was discovered built onto the inset-offset wall of the second Iron Age IIB fortress to this phase as well (Fig. 44). This tripartite installation (external dimensions are 4.5 × 2.5 m; internal dimensions are 3.5 × 1.75 m) was north-south oriented, and divided into three pools of different size (Fig. 63). Given its building technique it may be assigned to the Late Roman/Byzantine periods (Fig. 64). Its northernmost pool (internal dimensions are 1.3 × 1.75 m) apparently had a stair on its south-western corner; its southernmost (internal dimensions are 1.15 × 1.75 m) apparently had a stair on its north-eastern corner; while its central, smallest pool (internal dimensions are 0.75 × 1.75 m) had a settling pit on its bottom (upper diameter is 0.55; lower diameter is 0.35 m).

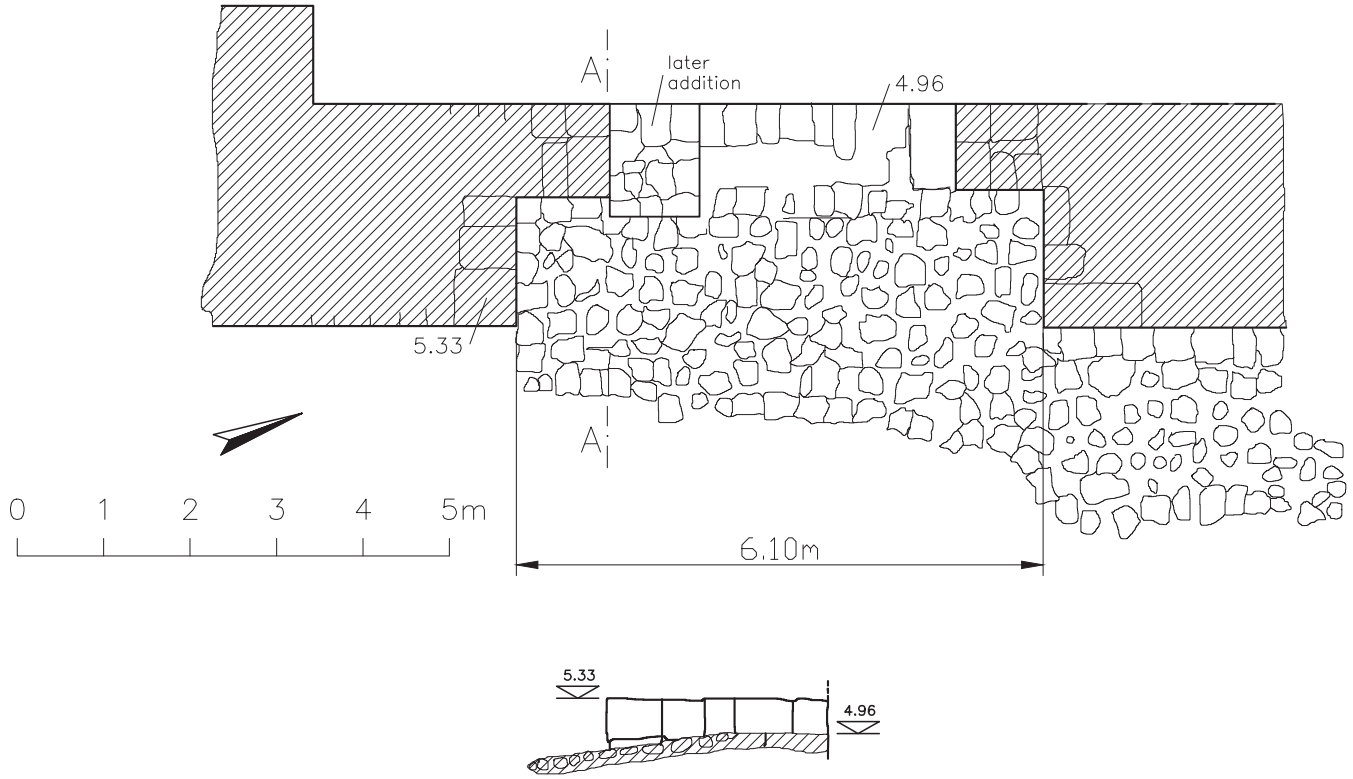

Fig. 61. Plan of the entrance of the fortress's second stage, with section at bottom looking south (redrawn according to archival plan and authenticated according to visible remains on the ground).

Fig. 62. The entrance of the fortress's second stage: a close-up on the paving and threshold, looking west (photograph: unknown; excavation files).

The installation is extremely unusual and we know of hardly any equivalents. Its external walls are relatively massive (0.75–1 m thick) and so are its dividing walls (0.75 m thick) (Figs. 63–64). We can thus infer high volume of liquids in the plastered pools which are relatively small in size. Still, given the plan and photographs available, we can only suggest that the installation holds liquids; it may have been used as fish tanks due to its proximity to the Yarkon estuary and the Mediterranean (and thus separating between sweet water and sea fish). Leather-working is yet another possibility given the proximity to water sources.[1]

It should be added that in the preliminary report of Sukenik (1939) there is a mentioning of houses and a bath-house of the Byzantine period probably relating to the segmented space and tripartite installation discussed above; our reservations on such interpretation are clear.

[1] A quite similar installation has been documented in Nazareth and identified as a winepress (Alexandre 2012, 8, fig. 1.6).

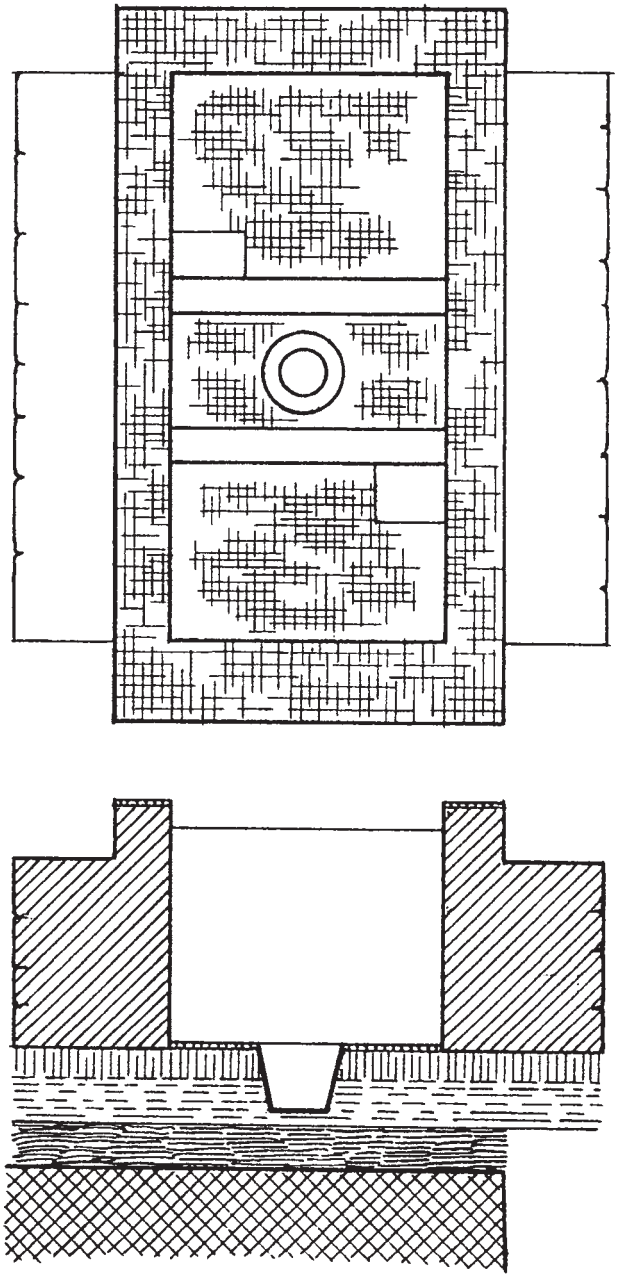

Fig. 63. Plan and section of the tripartite plastered installation paved with white mosaic stones (redrawn according to archival plan).

Fig. 64. The tripartite plastered installation, looking south-east (photograph: unknown; excavation files).

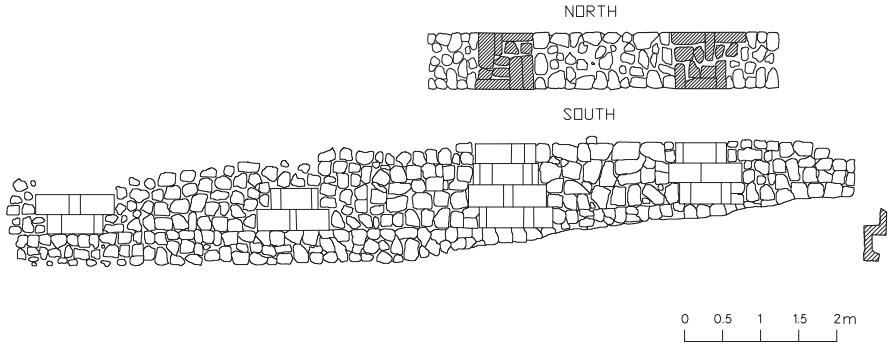

Fig. 65. Plan of the Persian period wall excavated by P.L.O. Guy, with top and side view, looking south (redrawn according to archival plan).

The excavators Stratum II (or Stratum IIA if the previous stratum is better be termed IIB) refers to a fill underneath the site's upper top soil layer that too produced a mixture of pottery sherds dating from Iron Age IIB to the Mamluk period, without any indication of architectural remains. However, Stratum II also produced few complete vessels of the Persian and Iron Age IIB. These vessels originated in fills and no floors were attributed to them. This layer produced no architectural remains. It mostly contains a mixture of pottery sherds dating from Iron Age IIB to the Mamluk period.

Stratum I

The excavators' Stratum I refers to the site's upper top soil layer unearthed. This layer produced no architectural remains. It mostly contains a mixture of pottery sherds dating from Iron Age IIB to the Mamluk period.

Architectural Elements and Isolated Finds Outside the Iron Age Fortress (Figs. 65–71)

Two architectural elements should be mentioned in this context. The first is the wall unearthed in the preliminary trial excavation conducted by Guy we mentioned above (Fig. 9) (Guy 1938, 15–16). This fieldstone wall which was reinforced by Phoenician-style dressed piers (*ca*. 17 m long, *ca*. 0.75 m thick, with a maximum height of 1.20 m; of the type discussed by Shiloh 1979, 50–59; Elayi 1996, Type G; Stern 2001, 464–66), seems to be an isolated architectural element dated with some certainty to the Persian period based on its style and on the pottery recovered from its foundations (Figs. 65–66). It is located some 20 m apart from the northern wall of the fortress hence it is separated from it altogether. Guy identified this element as the outside wall of a house which still remains unexcavated and dated it to either the 6th or 5th century BC, based on its wall design which he paralleled to Tell Abu Hawam rather than on ceramics (Guy 1938, 14–16). Our sorting of the pottery recovered from Guy's excavations that was stored in the Rockefeller Museum (Jerusalem) revealed considerably small fragments at most that are identical in forms and fabrics to the pottery fragments and vessels recovered by the later excavations at the site. We failed to find detailed documentation of these pottery fragments which were selectively recorded by the excavator or the curators of the Rockefeller Museum. In other words, we could not find a relationship between a certain fragment and its whereabouts in the excavation, and the general appearance was that the material found in the foundation trench of the so-called Persian period wall

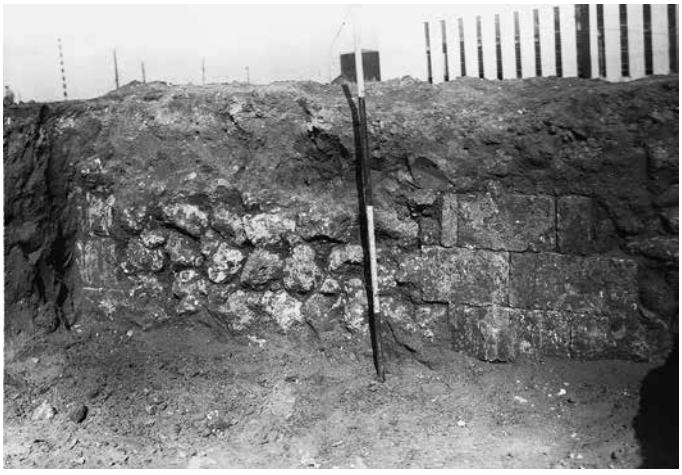

Fig. 66. Persian period wall excavated by P.L.O. Guy, looking north (photograph: unknown; excavation files).

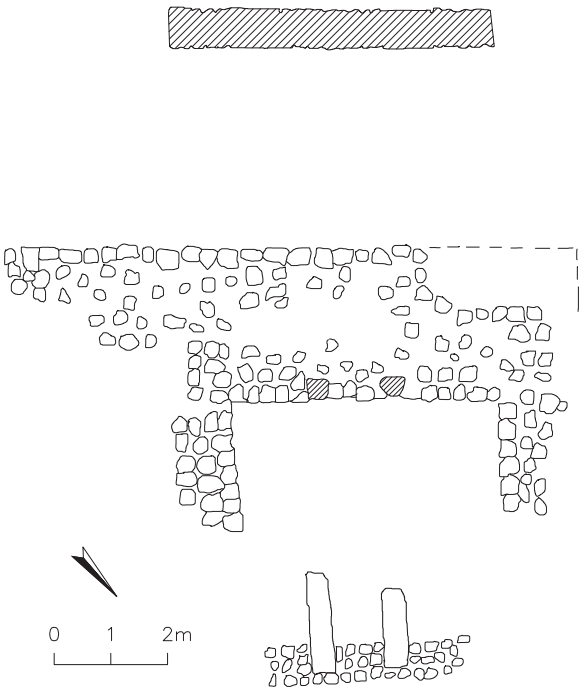

Fig. 67. Plan of the architectural element to the north of the Persian period wall, with side view of the two freestanding pillars at bottom (redrawn according to archival plan).

was a mixture of Persian and Iron Age IIB, some of the Persian period types can be assigned to the 4th century BC.

The second architectural element was discovered in Sukenik-Yeivin excavations north of the Persian-period wall, some 5 m to its north and detached of it (Fig. 44); it is a segmented space open to the north-east, whose closing wall which is somewhat aligned in an east–west axis, was about 2.75 m thick (Fig. 67). It seems to relate to the so-called Persian period wall discovered by Guy, and the recorded pottery in its vicinity was said to be of Byzantine date. It is built of fieldstones and has two freestanding pillars, about 1 m apart, in the centre of its inner space (Fig. 68). The distance between the freestanding pillars raises doubt about a possible functionality of these architectural remains as olive oil press as normally lever and drum press are set between pillars whose distance is 0.4–0.5 m. Still a stone weight, with an inverted T-shape holes, found at the site (in some proximity to this installation), indeed belongs to a winepress of post-Persian period date (Fig. 69).[2] Patches of plaster recorded in the excavation log book and on site photographs at the time of excavations apparently relate to additional industrial installations of later (Classical and Mediaeval) periods that did not preserve (Fig. 70).

Another holed stone (triangular in shape although asymmetrical) appear on of the photographs of the site documentation during excavations (Fig. 71). The photograph lacks a scale but estimation would suggest a limestone of some 20–40 kg that was used as ship anchor. Given the relative large size of the hole and the asymmetrical triangular shape of the stone, it seems to belong to an anchor of a type that can be dated to the Middle or Late Bronze Age (for example Kapitän 1984, fig. 2.3) but may have also been used in later periods.

[2] Surprisingly, the stone weight is mentioned in Roll and Ayalon's publication on the southern Sharon (1989, 155) as originating in J. Kaplan's excavations (1971), which given the above is quite wrong. Kaplan excavated two strata and notes that the upper stratum had sections of stone built foundations of square-shaped structures made of dressed stones and dated to the 4th and 5th centuries AD, which he identifies as part of a storage complex. A number of bronze coins mentioned in Kaplan's report are (mostly) dated, however, to the 6th and 7th centuries AD according to their registration in the Israel Antiquities Authority archive.

Fig. 68. The architectural element to the north of the Persian period wall (in the background), with the two freestanding pillars in the foreground (photograph: unknown; excavation files).

Fig. 70. A stone weight, with an inverted T-shape hole (photograph: unknown; excavation files; IAA 1983-15; currently on display at the Eretz Israel Museum, Tel Aviv).

Fig. 69. Later remains in foreground, fortress eastern façade in background looking west (photograph: unknown; excavation files).

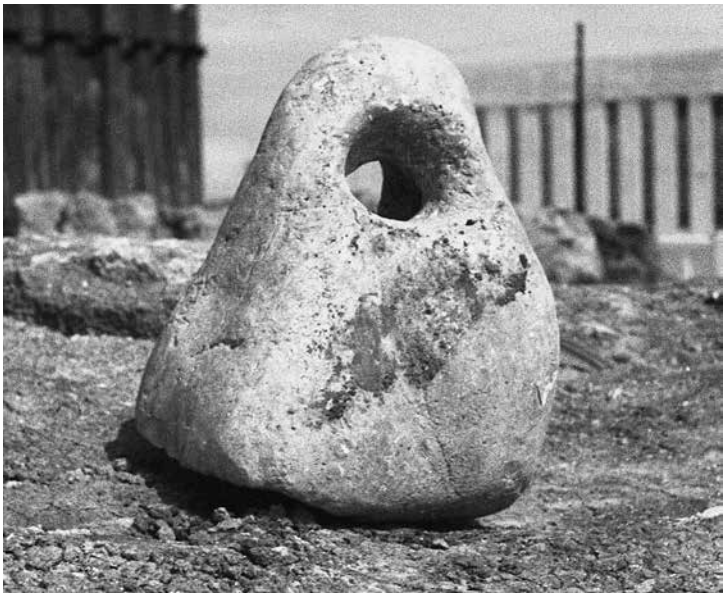

Fig. 71. Holed (triangular-shaped) stone/ship anchor (photograph: unknown; excavation files).

CHAPTER 3

THE FINDS

3.1. Introduction

The excavations of the Iron Age fortress of Tell Qudadi have yielded relatively rich pottery assemblages from well-secured loci (see Lists of Loci, pp. 125–32 below). The pottery assemblages discussed below include different types – common and semi-fine tablewares, cooking and storage vessels, loom weights and lamps – originating in different parts of the southern Levant, from Phoenicia in the north to the western Negev in the south. A few imported vessels, in particular from the East Greece, will be discussed separately. The majority of the pottery types were defined according to rim morphology, which became the basis for the classification. All the rims from clear stratigraphic contexts were drawn and studied. Bases and decorated sherds were studied, but drawn selectively, only for their chronological contribution. Additional venue for defining the pottery types and origin was explored via optical mineralogy analysis (see section 3.2 below).

Figures of pottery types and vessels were mostly edited according to typological seriations (from open to closed vessels) in order to trace the internal typological evolution and chronological sequence of the locally produced ware.[1] Vessels of the same type are presented selectively. The figures presented do not exhaust every sub-type of pottery retrieved from the site, but give a coherent picture of all pottery types retrieved.

In what follows we shall concentrate mainly on presenting the pottery from secured stratigraphic contexts. A few plates of some unstratified pottery vessels, clearly belonging to the site but not attested in well-secured loci, will complement the picture. Since the excavations have been conducted many years ago, we have no way of knowing if all sherds have been kept whether they are indicative or not. This makes the exact statistical analysis of little

[1] Numbers with asterisks in the pottery description tables refer to vessels and fragments that underwent optical mineralogy analysis. Where we are sub-dividing pottery types with an -a-, -b- and -c- suffix (as with HB2a, HB2b, HB2c), this indicates vessels of similar morphological appearance yet of different workshops (as is evident by their optical mineralogy analysis) or body treatment, for example the addition of handles and slip.

help. However, based on the state of preservation of ceramic specimens and on excavation documentation, it seems that most of the indicative sherds that have been ascribed by excavators to clear stratigraphic contexts were kept. We present therefore the stratified assemblages basically in full, assuming that the numbers of preserved specimens reflect statistical distribution in more or less reliable way, at least near the gate-area of the fortress.

Due to the fact that most pottery types retrieved from the fortress belong to the well-known chronological horizons (see below), we shall mainly concentrate on clarifying the more nuanced chronological aspects as well as on the socio-historical implications that may be obtained from studying the pottery assemblages from a given site. The groups are arranged therefore according to their respected strata: Stratum V, from the earliest foundation layer (Fig. 72, at p. 133 below); Stratum IV, from the first destruction layer (Figs. 73–80, at pp. 133–39 below); Stratum IIIB, from the occupation level above the first destruction layer (Figs. 81–91, at pp. 140–55 below); and Stratum IIIA, from the second destruction layer (Figs. 92–103, at pp. 155–71 below).[2]

3.2. Optical Mineralogy Analysis of Selected Pottery Finds of Iron Age IIB

Mark Iserlis, Alexander Fantalkin and Oren Tal[3]

Method

A sample of some 60 vessels covering a range of types was selected for optical mineralogy analysis (OM, often dubbed petrography; Table 1 [at pp. 116–23 below] for description according to specific samples). Using site catchment (Vita-Finzi 1978; Arnold 1985) and drainage system approaches to raw material sampling (Goren, Finkelstein and Na'aman 2004, 6–9), five potential raw material samples from the environs of Tell Qudadi were taken in order to identify possible local clay sources (Table 2, at p. 124 below). Three samples were wetted with water, each formed into two small briquettes. After drying in room temperature, one briquette of each sample was fired in an electric pottery kiln to

[2] In earlier publications (Fantalkin and Tal 2009, fig. 9.15–16; 2010, fig. 7.15–16; Tal and Fantalkin 2009, fig. 9.15–16) we have accidently included two intrusive Persian period storage jars on the pottery plate that represents Stratum IIIA.

[3] While optical mineralogy analysis was carried out by Iserlis, the sampling strategy and research questions were designed and coordinated by Fantalkin and Tal. We are indebted to Y. Goren, head of the Laboratory for Comparative Microarchaeology of the Institute of Archaeology at Tel Aviv University, for his permission to use the laboratory's equipment and petrographic reference database.

bisque at 100C, then at 650C. The briquettes were then sliced and used for the production of petrographic thin sections. Each thin section sample was examined in its natural appearance and after firing: test briquettes were prepared to check plasticity, shrinkage and firing behaviour of the materials (Rice 1987; Kingery and Francl 1964; Moore 1961). Plasticity was checked by the 'water of plasticity' method and by pressing wet clay to cause cracks (Rice 1987, 58–63).

The OM analysis used in this study follows standard procedures (Bishop, Rands and Holley 1982; Goren, Finkelstein and Na'aman 2004; Porat 1989a; Whitbread 1995). Slices taken from pots were impregnated with Buehler EpoThin epoxy resin in vacuum and allowed to cure for 9 hours. Samples were polished on Buehler Metaserv grinding machine and affixed to glass slides with Buehler EpoThin epoxy resin. Buehler PetroThin Thin Sectioning System was used to grind the samples to a standard thickness of 30 μm. The slides were covered with microscope cover glass.

The samples were examined and described under a Zeiss Axiolab-POL polarising microscope in the Laboratory for Comparative Microarchaeology of the Institute of Archaeology, Tel Aviv University. Colour and orientation patterns of the matrix were identified and described according to Bullock *et al*. (1985). The minerals in the silt and the temper were identified and their frequency, sorting, shape and roundness were described with the aid of visual charts (FitzPatrick 1980; Bullock *et al*. 1985). We define temper as non-plastic coarse (larger than 62 μm) particles, added by a potter as well as occurring naturally in the clay. The samples were divided into fabric groups on the basis of their petrographic affinities in both clay and temper.

After firing, the potential raw material briquettes were thin-sectioned, analysed and compared to the thin-sections of sherds; both were compared in turn with thin-sections from the collection in the Laboratory for Comparative Microarchaeology of the Institute of Archaeology, Tel Aviv University. The lithology of the thin-sections was compared to the geological maps (Sneh, Bartov and Rosensaft 1998).

1. Ḥamra *Soil Group*

Characterisation. The clay is brown or reddish-brown. The matrix is clayey, ferruginous, slightly silty or silty (<3–>5%) and rich in small opaque particles of iron minerals. Sometimes rare *foraminifera* were observed. The silt contains mainly quartz and accompanied by feldspar, zircone and epidote. The inclusions (>10–15%) are composed mainly of well-sorted, rounded to sub-angular quartz grains. The quartz sand is accompanied by occasional chert, *kurkar* (calcareous sandstone), shell, epidote, zircon, plagioclase, microcline and rutile.

Interpretation. Based on the extensive body of reference material, this petrographic group is identified as quaternary *ḥamra* soil mixed with coastal sand. *Ḥamra* (red sand and loam) occurs along the coastal plain of Israel between Ashdod and the Carmel coastal plain (Dan *et al*. 1976; Goren, Finkelstein and Na'aman 2004, 292–93; Singer 2007). The *ḥamra* soil from the Carmel coastal plain contains up to 50% calcareous component (Nir 1989, 12). The *ḥamra* soil between Ashdod and Caesarea contains mainly quartz. The inclusion assemblage of this group is consistent with potential raw material sample 4 (Appendix B: Rm4). Based on potential raw materials samples, geological map and published data, the matrix and inclusions indicate a depositional environment peculiar to Tell Qudadi and its immediate surroundings (Ravikovitch 1969, 1981; Sneh, Bartov and Rosensaft 1998). The silty and non-plastic components were purified, since raw material samples contain up to 45% silt and non-plastics.

Reference. This petrographic group is well known from pottery assemblages from sites of different periods in the central coastal plain. It has been recorded from the Middle Bronze Age workshops at Naḥal Soreq Site, in Tel Aviv and at Tel Michal (Singer-Avitz and Levy 1992; Kletter and Gorzalczany 2001; 2006b). In the Persian period this group was found to be common in the assemblages from Tel Michal, Naḥal Tut, Ḥorbat Malta, Tel Ya'oz and Apollonia-Arsuf (Gorzalczany 1999; 2006a; 2006b; 2006c; 2008).

Table 3: Vessel/object types of the *ḥamra* group.

Locus/Reg. No.	**Vessel/Object**	**Stratum**	**Figure**	**Type**
327/1	Cooking pot	V	72.2	CP1
327/2	Cooking jug	V	72.3	CJ1
355/1	Cooking pot	IV	77.1	CP1
384/1	Stand	IIIB	88.8	ST1
252/1	Bowl	IIIA	93.7	BL7c
335/1	Bowl	IIIA	93.1	BL5b
308/3	Cooking pot	IIIA	99.4	CP4
328/2	Cooking jug	IIIA	99.6	CJ1
310/3	Loom weight	IIIA	101.2	LW1

2. Kurkar *Group*

Characterisation. The clay is red or brown, brittle and poorly fired. The matrix is very silty (>10%). The silt includes mainly quartz (10%) and accompanied by opaque minerals, plagioclase, calcite and zircon particles. The non-plastic

assemblage (>5–<10%) of this group includes well-sorted, rounded to sub-angular quartz grains (5%), limestone, *kurkar*, shell and *ḥamra* fragments.

Interpretation. Based on potential raw material analyses (Appendix B) and geological map this petrographic group is identified as soil of the site created on the calacareous sandstone (*kurkar*) (Sneh, Bartov and Rosensaft 1998). The non-plastic component was probably levigated to isolate the non-plastic component, since raw material sample contain 35–55% silt and sand.

Table 4: Object types of the *kurkar* group.

Locus/Reg. No.	**Object**	**Stratum**	**Figure**	**Type**
258/1	Loom weight	IV	79.1	LW1
435/1	Loom weight	IIIB	90.3	LW1
310/1	Loom weight	IIIA	101.1	LW1
310/2	Loom weight	IIIA	102.1	LW1

3. Loess *Soil Group*

Characterisation. This group is characterised by a silty (10–20%), calcareous clay matrix. The silty component contains mainly quartz, accompanied by hornblende, feldspars, zircon, mica, augite, tourmaline and very rare epidote, garnet and rutile. The silt is relatively well sorted. The temper includes badly sorted foraminiferous chalk and rare chert, or well-sorted. spherical quartz grains, accompanied by feldspars, zircon, hornblende and augite. Sometimes chalk, chert and quartz grains appear together. In some cases straw, *kurkar* grains and shell fragments were observed. In some cases, limestone sand is the dominant component of the non-plastic assemblage.

Interpretation. The group is identified as the *loess* soil. It is well-recorded and published. The *loess* soil occurs in the northern Negev and the southern Shephelah (Gilead and Goren 1989, 7; Goren 1987; 1988; 1991b, 101–04; 1996, 54; Goren, Finkelstein and Na'aman 2004, 112–13; Goren and Halperin 2004, 2554; Porat 1989b, 50–52). The inclusions that accompany this matrix may indicate different depositional environments within the *loess* soil distribution provenance.

Reference. The use of *loess* with limestone as dominant non-plastic component is prevalent mainly at sites north-east of the Beersheba valley. At north-western Negev sites quartz is the major constituent (Gilead and Goren 1989, fig. 2).

Chalk sand is the dominant component of the non-plastic assemblage in the inner southern Shephelah (Goren and Halperin 2004, 2554–55). Although relatively distant, sands of coastal origin appear as far inland as the central Beersheba valley.

Table 5: Vessel types of the *loess* soil group.

Locus/Reg. No.	Vessel	Provenance	Stratum	Figure	Type
396/1	Bowl	Negev, northern Shephelah	IV	73.3	BL2
391/1	Heavy bowl	North-western Negev	IV	75.3	HB2a
354/1	Storage jar	Western Negev	IV	78.9	SJ5
223/1	Heavy bowl	Shephelah	IIIB	82.3	HB3a
323/1	Bowl	Western Negev	IIIA	93.5	BL7b
323/5	Bowl	Western Negev	IIIA	93.9	BL6b
334/1	Heavy bowl	North-western Negev	IIIA	94.3	HB3b

4. Terra Rosa *Group*

Characterisation. The group is characterised by its dark reddish-brown colour with a dark core. The matrix is silty, non-calcareous, mostly ferruginous, commonly with isotropic properties. The silt (>5–<20%) contains mainly quartz, accompanied by iron oxides and rare calcite and limestone particles. The most common component in the non-plastic assemblage is quartz (>5–15%). Quartz grains are commonly accompanied by rare limestone, *nari*, chalk and very rare fossil shells in different proportions. In one case (table amphora 280/1; Fig. 97.3), temper assemblage (<15%) contains quartz (10%), limestone, *nari*, chalk, fossil shell and voids indicating vegetal material (>3%). The shape and size range of the vegetal material ghosts suggest that chopped straw was added to the body of clay by the potters.

Interpretation. Based on a large body of published data, the group is identified as *terra rosa* soil mixed with wadi sand. *Terra rosa* soil is typical for the mountainous regions within the Mediterranean climatic zones of Palestine. Since *terra rosa* occurs in the Judean-Samarian hills, Mt Carmel and the Galilee, sometimes the provenance of pots belonging to this group cannot be determined. The use of geological maps, maps of soils, published data and the reference material may indicate a provenance of vessels. The combination of *terra rosa*, wadi quart sand, chalk, *nari*, limestone and chert suggests that the upper Shephelah (Goren, Finkelstein and Na'aman 2004, 284–85; Goren and Halperin 2004, 2555–56) should be preferred as the origin of the group.

Reference. *Terra rosa* soil mixed with wadi sand and/or crushed calcite, was used by the potters starting Early Bronze Age. The *terra rosa* group is dominant in the pottery assemblages of Lachish, Beth Shemesh and Tel Batash (Goren and Halperin 2004, 2555–56). In most cases, pottery belonging to this group can be identified on typological grounds to the region of Judah or the upper Shephelah. For example, the results of Neutron Activation Analysis of *lmlk*-type storage jar handles suggest that the jars were produced at a single site, perhaps in the Shephelah (Mommsen, Perlman and Yellin 1984, 109–12).

Table 6: Vessel types of the *terra rosa* group.

Locus/Reg. No.	Vessel	Provenance	Stratum	Figure	Type
262/1	Jug	Upper Shephelah(?)	IV	76.1	JG1
416/1	Bowl	Upper Shephelah	IIIB	81.3	BL5a
193/1	Bowl	Upper Shephelah(?)	IIIA	93.11	BL15
293/1	Jug/Decanter	Upper Shephelah	IIIA	96.1	JG7a
280/1	Table amphora	Upper Shephelah	IIIA	97.3	TA1
193/2	Storage jar	Upper Shephelah(?)	IIIA	100.8	SJ2b
484/1	Chalice	Shephelah	Unstratified	104.4	-
195/1	Chalice	Upper Shephelah	Unstratified	Not illustrated	-

4a. Terra Rosa *and Crushed Calcite Group*

Characterisation: The matrix of this group can be identified as *terra rosa*. The most common component in the non-plastic assemblage is crushed angular calcite (10–<15%), accompanied by quartz, soil balls and rare limestone.

Interpretation. The provenance of vessels belonging to this petrographic group cannot be determined on the basis of their clay matrix alone. The non-plastic assemblage of cooking pot and cooking jug (336/1 and 336/4; Figs. 98.6 and 99.6) contains crushed calcite, quartz, *nari*, and chert. Based on the reference material, the provenance of these two pots is the upper Shephelah (Goren, Finkelstein and Na'aman 2004, 284–85; Goren and Halperin 2004, 2555–56). This group is identified as a non-local *terra rosa* soil with added crushed calcite.

Reference. This petrographic group is well known from pottery assemblages from Iron Age sites, especially for the production of cooking pots.

Table 7: Vessel types of the *terra rosa* and crushed calcite group.

Locus/Reg. No.	Vessel	Provenance	Stratum	Figure	Type
341/1	Cooking pot	Upper Shephelah(?)	IV	77.4	CP4
187/2	Cooking pot	Upper Shephelah(?)	IIIB	86.4	CP4
417/1	Cooking pot	Upper Shephelah(?)	IIIB	86.6	CP4
437/1	Cooking pot	Upper Shephelah(?)	IIIB	86.3	CP4
336/4	Cooking pot	Upper Shephelah(?)	IIIA	98.6	CP4
336/1	Cooking jug	Upper Shephelah(?)	IIIA	99.5	CJ1

5. Motza Clay Group

Characterisation. The clay is yellowish-pink. The matrix of the group is calcareous, silty and very rich in iron oxides. The silt (5%) contains dolomite and iron oxides. The non-plastic assemblage includes homogenous, well-sorted fine sand of euhedral dolomite crystals.

Interpretation: A large body of comparative data enables to determine that the upper member of the Motza formation, mixed either with wadi sand or with dolomitic sand quarried from the ʻAminadav formation (Arkin, Braun and Starinsky 1965; Bentor 1945; Goren and Halperin 2004, 2556–57; Sneh, Bartov and Rosensaft 1998). The quantity of silt and temper sorting suggest that the clay and temper were sieved by potters. The provenance of this group is the Judean hill.

Reference. This group is known from pottery assemblages from sites of different periods. The group is known from the Iron Age assemblages of Tell en-Naṣbeh, Radana and Tel Shiloh, Jerusalem (City of David, Ramot 06), Motza and Beer-Sheba (Franken and Steiner 1990, 79–85; Goren 1996; Glass *et al*. 1993; Gunneweg, Perlman and Meshel 1985).

Table 8: Vessel types of the Motza clay with dolomitic sand group.

Locus/Reg. No.	Vessel	Stratum	Figure	Type
361/1	Lamp	IIIB	88.10	LP2

6. Neogene Marl Group

Characterisation. The clay is yellowish-pink to brown in Plain Polarised Light (PPL). The clay is optically active, calcareous and foramenferous (up to 3%)

The silt contains fine calcite, limestone, quartz and plagioclase (1–<3%). Typical spherical concentrations of limonite and haematite (these appear as yellowish or pinkish spherical and rounded particles) were registered (5%). The inclusions consist mainly of rounded to sub-rounded good sorted quartz grains (5–<15%) and accompanied by micritic limestone (1–>3%). Sometimes very rare shell, plagioclase and chert were observed. In some cases the presence of *Amphiroa Sp*. *Algae* was observed.

Interpretation. A large body of comparative data enables to determine that the neogene marl was used as a source for clay and inclusions (Gorzalczany 2003, 33–34). This group can be linked by its characteristic matrix and inclusions to a petrographic group connected to the Lebanese coast. Exposures of neogene marl can be seen in the area of Tripoli and along the coast between Tripoli and Tyre. The presence of *Amphiroa Sp*. Algae and good-sorted quartz sand suggests the use of the neogene marl from the coastal area.

Reference. This petrographic group has been discussed in detail by Goren, Finkelstein and Na'aman (2004, 134–36) and Gorzalczany (2003, 33–34; 2006, 41*).

The group is well known from pottery assemblages of Persian period sites. It has been recorded in Tel Ya'oz, Tel Mikhal, Apollonia-Arsuf and Jerusalem (City of David) (Gorzalczany 2003; 2006a; 2006b).

Table 9: Vessel types of the neogene marl group.

Reg. No	**Vessel**	**Stratum**	**Figure**	**Type**
263/1	Bowl	V	72.1	BL3
398/1	Juglet	IV	76.2	JL1
399/1	Juglet	IV	76.3	JL2
385/1	Jug	IIIB	84.1	JG2
360/1	Jug	IIIB	84.2	JG3
387/1	Juglet	IIIB	84.6	JL1
434/4	Storage jar	IIIB	87.3	SJ1b
418/4	Storage jar	IIIB	88.5	SJ4
403/1	Lamp	IIIB	88.9	LP1
324/4	Hole-mouth jar	IIIA	100.13	HM2

7. Neogene Marine Marl Group

Characterisation. The clay is yellowish-tan or yellowish-pink in PPL. The clay is calcareous, silty and contains badly preserved foraminifera (up to 3%) and opaque iron minerals (up to 2%). The matrix is optically active with weak optical orientation. The silt contains quartz, calcite and sometimes zircon. The inclusions consist mainly of micritic and sparitic limestone grains and calcite particles, accompanied by very rare quartz grains.

Interpretation. This group can be linked by its clay and temper to the neogene marine marl (Goren, Finkelstein and Na'aman 2004, 105). Exposures of neogene marl can be seen along the Lebanese coast.

Reference. This petrographic group has been discussed in detail by Goren, Finkelstein and Na'aman (2004, 105) and Gorzalczany (2003, 33–34; 2006, 41*). The group is well known from pottery assemblages of Persian period sites. It has been recorded in Tel Ya'oz, Tel Mikhal, Apollonia-Arsuf and Jerusalem (City of David) (Gorzalczany 2003; 2006a; 2006b).

Table 10: Vessel types of the neogene marine marl group.

Locus/Reg. No.	**Vessel**	**Stratum**	**Figure**	**Type**
438/1	Bowl	IIIB	81.1	BL3

8. Taqiye Marl Group

Characterisation. The matrix is light yellowish-grey (in PPL), calcareous, silty and exhibits weak optical orientation. The silt (>3%) contains quartz, opaque particle, occasional limestone, plagioclase and zircon. The non-plastic assemblage includes angular to sub-angular quartz grains (3%) and bioclastic limestone (<3%).

Interpretation. The sample belongs to a well-known petrographic group distributed in the northern Negev, the central Jordan valley, the Judean desert, the western section of the Judean Anticlinorium and the western Galilee. This marl is also appears in Turkey, Morocco and Egypt. The Taqiya formation of the Paleocene Age to the basal Eocene Age was used as a source for clay and inclusions (Bentor 1966, 72–73). The provenance of vessels belonging to this petrographic group cannot be determined on the basis of their clay matrix and non-plastic assemblage.

Reference. Taqiye marl group has been discussed by Goren, Finkelstein and Na'aman (2004, 256–58).

Table 11: Vessel types of taqiye marl group.

Locus/Reg. No.	Vessel	Stratum	Figure	Type
395/1	Bowl	IV	74.1	BL4
438/2	Bowl	IIIB	81.13	BL12

9. Taqiye Marl and Coastal Sand Group

Characterisation. The matrix is pink or light greyish-tan (in PPL), calcareous and exhibits weak optical orientation. The silt (up to <3%) contains quartz and occasional chalk, zircone, plagioclase and biotite. Sparsely distributed opaque minerals and haematite concentrations are typical for this group. The non-plastic assemblage includes angular to sub-angular quartz grains (<10%), foraminiferous chalk (1–3%) and occasional microcline.

Interpretation. A large body of comparative data enables to determine that the taqiya formation of the Paleocene Age was used as a source for clay and inclusions (Bentor 1966, 72–73). The group can be linked by its characteristic matrix and inclusions to the Shephelah area since the combination of taqiye marl and quartz coastal sand is uncommon in the southern Levant (Goren, Finkelstein and Na'aman 2004, 108–11, 271).

Reference. This petrographic group has been discussed in detail by Goren, Finkelstein and Na'aman (2004, 271) and Bullard (1970, 107–09) and Gorzalczany (2006, 59).

Table 12: Vessel types of taqiye marl and coastal sand group.

Locus/Reg. No.	Vessel	Stratum	Figure	Type
393/1	Bowl	IV	73.4	BL2
418/3	Storage jar	IIIB	88.1	SJ2a
279/1	Storage jar	III-II (unstratified)	107.13	-

10. Coastal Sand and Tuff Group

Characterisation. This group is characterised by a greyish-brown (PPL), silty (5%) and calcareous matrix. The silty component contains mainly quartz,

accompanied by hornblende, calcite, plagioclase, tuff and opaque minerals. The silt is relatively well sorted. The temper includes mainly badly sorted angular to sub-rounded quartz grains (<10%), limestone (5%), volcanoclastic tuffs (3%) and occasional angular to sub-rounded plagioclase crystals. The volcanoplastic tuffs are characterised by pyroclastics of basic composition: xenoliths, xenocrysts and basaltic flows.

Interpretation. Based on characterisation and published data, the tuffs are readily identified as Late Cretacous, which occurs in Israel mainly in the Mt Carmel, Umm el-Hahm ridge and in minor points in the western Galilee (Sass 1972; Sass 1980; Kafri 1972). The mixture of volcanoplastic tuffs and coastal sand are indicate the coastal plain of the Carmel area as source of this raw material.

Reference. This petrographic group is known from pottery assemblages of Persian period site Naḥal Tut (Gorzalczany 2003, 39).

Table 13: Vessel types of coastal sand and tuff group

Locus/Reg. No.	**Vessel**	**Stratum**	**Figure**	**Type**
363/1	Jug	IIIB	84.4	JG5

11. Rendzina and Terra Rosa *Group*

Characterisation. The matrix is brown-greyish, calcareous, silty (>3–<10%), and exhibits weak optical orientation. The silt contains chalk (predominant), quartz, calcite and limestone. Very few silty opaque minerals were observed. The non-plastic assemblage includes mainly chalk (>5–>10%) and well sorted quartz grains (up to >5%). Temper also includes rounded balls of *terra rosa* (3–5%) and rare chert grains.

Interpretation. The raw material is a combination of rendzina and *terra rosa* soils. Rendzina soil is a product of erosion of chalk rocks in Mediterranean climate zone and distributed in the upper Galilee, Mt Carmel and Judean-Samarian hills. *Terra rosa* soil occurs as a result of erosion of limestone rocks in the mountainous regions with the Mediterranean climate. The *terra rosa* occurs in the Judean-Samarian hills, Mt Carmel and the Galilee. The group can be linked by its characteristic matrix and inclusions to the upper Galilee since the combination of rendzina and *terra rosa* soil is typical for this area and uncommon in other areas.

Reference. This petrographic group has been discussed in detail by Goren (1995, 303) and Gorzalczany (2008, 82–83). The group is known from pottery assemblages of Persian period sites. It has been recorded in Ḥorbat Malta as local product.

Table 14: Vessel types of Rendzina and *terra rosa* group.

Locus/Reg. No.	Vessel	Stratum	Figure	Type
390/1	Bowl	IV	74.4	BL6a
392/1	Bowl	IV	74.5	BL7a
397/1	Heavy bowl	IV	75.1	HB1a
389/1	Bowl	IIIB	81.5	BL6a

3.3. The Common Ware

The Types

Bowls

Our bowls exhibit the most varied vessel-type recovered at the site.

Type BL1; Stratum IV: Fig. 73.1–2

Refers to tapering or rounded rim shallow bowls with flaring walls and discus base (see, for example, Amiran 1969, pl. 64.6–8 [North]; A. Mazar and Panitz-Cohen 2001, 49–50, type BL 15).

Type BL2; Stratum IV: Fig. 73.3–4

Refers to rounded or everted rim shallow bowls with flaring walls and ring base (see, for example, Amiran 1969, pl. 65.11 [South]). A somewhat delicate version of BL1. Based on the matrix an origin in the Negev or the northern Shephelah is suggested (Group 3: *loess* soil; see section 3.2 above).

Type BL3; Stratum V: Fig. 72.1; Stratum IIIB: Fig. 81.1

Refers to a fine thin-walled red-slipped 'Samaria' bowl type with a sharp rim and slightly convex walls. According to some scholars, these bowls may be divided into two sub-types. An earlier one with oblique, straight walls that sometimes has a black line on its rim, and another that postdates it with oblique, slightly convex walls which is similar to our types (see Bikai 1978a, 52–54; Gilboa 1995, 7). For parallels see, for example, Amiran 1969, pl. 66.16 ('Samaria' Bowls); Bikai 1978a, 26–27, Fine Ware Plates 1–2, pls. 1.1–2,

11A.5–8, 12–13; Tell Keisan, Stratum 5, Chambon 1980, 171, pl. 40.12, 12a; Hazor, Stratum VA, Yadin *et al*. 1989, 111–12, pl. 230.12; Dor, Area A, 'Phase 10' and Phase 9, Gilboa 1995, 7, types BL 47a–47b, figs. 1.1.11, 1.4.15–17; and Akhzib, Dayagi-Mendels 2002, 115–16, type B 8 I: fig. 5.3.1. The long suggested Phoenician origin of this bowl type is also attested from our analysed example (Group 7: neogene marine marl; see section 3.2 above), i.e. an origin on the Lebanese coast. Our preserved parts suggest that these items have a plain rim, probably an angle below the middle of the body and seem to be completely red-slipped on the interior and the exterior. As such, this type belongs to Bikai's type of 'Fine Ware Plate 6', attested in Tyre from Strata V to II (Bikai 1978a, 27–28, table 44), which would safely place it into the second half of the 8th century BC.

Type BL4; Stratum IV: Fig. 74.1

Rounded (somewhat plain) thick rim shallow bowls with a prominent lower carination and a thickened ring base (see, for example, A. Mazar and Panitz-Cohen 2001, 44–45, type BL 24, and additional comparanda therein). In our case it is red-slipped on the interior with splashes around the rim on the exterior. As our analysed complete example belongs to Group 8: taqiye marl (see section 3.2 above) an exact origin in the country is difficult to assess.

Type BL5a; Stratum IV: Fig. 74.2–3; Stratum IIIB: Fig. 81.2–4
Type BL5b; Stratum IIIA: Fig. 93.1–2

Type BL5 refers to rounded and thickened (somewhat everted) rim bowl with rounded walls, red slip and occasional wheel-burnish inside and/or outside see, for example, A. Mazar and Panitz-Cohen 2001, 38–39, type BL 28, and additional comparanda therein). While our analysed specimen of BL5a (Fig. 81.3) belongs to Group 4: *terra rosa* (see section 3.2 above), which suggest an origin in the upper Shephelah; our analysed specimen of BL5b (Fig. 93.1) belongs to Group 1: *ḥamra* soil (see section 3.2 above), which suggest an origin in the central coastal plain.

Type BL6a; Stratum IV: Fig. 74.4; Stratum IIIB: Fig. 81.5–6; Stratum IIIA: Fig. 93.3
Type BL6b; Stratum IIIA: Fig. 93.9

Refers to ledge or moulded rim bowls with softly carinated walls and a ring base (see, for example, Zimhoni 1997, 218, fig. 5.4.14–15; A. Mazar and Panitz-Cohen 2001, 40–41, type BL 11, and additional comparanda therein). While the two specimens analysed of BL6a (Figs. 74.4, 81.5) show an origin in the upper Galilee (Group 11: rendzina and *terra rosa*; see section 3.2 above), the analysis of the sample of BL6b shows an origin in the western Negev (Group 3: *loess* soil; see section 3.2 above).

Type BL7a; Stratum IV: Fig. 74.5; Stratum IIIB: Fig. 81.7; Stratum IIIA: Fig. 93.6
Type BL7b; Stratum IIIB: Fig. 81.8; Stratum IIIA: Fig. 93.4–5
Type BL7c; Stratum IIIA: Fig. 93.7
Type BL7d; Stratum IIIA: Fig. 93.8

Type BL7 is somewhat similar but a larger version of BL6 that is moulded/turned over rim bowls with rounded to softly carinated walls (see, for example, Amiran 1969, pl. 64: 21 [North]; Zimhoni 1997, 181, figs. 4.1.4, 4.3.8, 4.5.6–8, and additional comparanda therein). While our analysed specimen of BL7a (Fig. 74.5) belongs to Group 11: rendzina and *terra rosa* (see section 3.2 above), which shows an origin in the upper Galilee; our analysed specimen of BL7b (Fig. 93.5) belongs to Group 3: *loess* soil (see section 3.2 above), which suggests an origin in the western Negev; and our analysed specimen of BL7c (Fig. 93.7) belongs to Group 1: *ḥamra* soil (see section 3.2 above), which suggests an origin in the central coastal plain. Although the type was produced similarly from a morphological perspective it was a product of many workshops throughout the country.

Type BL8; Stratum IIIB: Fig. 81.9
Type BL9; Stratum IIIB: Fig. 81.10

Both types are morphologically attested in the 'Samaria' ware, while the former preserves an upper part (see, for example, Amiran 1969, pl. 67.14 ['Samaria' Bowls]), the latter preserves a lower cylindrical-shaped body part with delicate plain base (see, for example, Amiran 1969, pl. 66.8 ['Samaria' Bowls]).

Type BL10; Stratum IIIB: Fig. 81.11

Refers to thick-walled red-slipped 'Samaria' bowl type with a rounded rim and rounded or softly carinated walls, which are double the thickness from those of BL3 (see, for example, Hazor, Stratum V [Yadin *et al*. 1989, 45, pl. 189.1]; Dor, Area A, Phase 9 [Gilboa 1995, 4, types 22a–22b, fig. 1.3.24–25]; and Tel Yoqne'am, Stratum XII [Zarzecki-Peleg, Cohen-Anidjar and Ben-Tor 2005, 251–52, type B IXB, fig. II.9.13]).

Type BL11; Stratum IIIB: Fig. 81.12

Refers to thick-walled red-slipped 'Samaria' bowl type with a rounded and thickened (somewhat everted) rim bowl and rounded or softly carinated walls, which are too double the thickness from those of BL3 (see, for example, Amiran 1969, pl. 67.1–2 ['Samaria' Bowls]; Hazor, Stratum VI, [Yadin *et al*. 1958, 19–20, pl. 5.25], Tell Keisan, Stratum 5 [Chambon 1980, 170, pl. 40.7a] and Gezer, Stratum VIA [Gitin 1990, 60, 191–93, type 67]).

Type BL12; Stratum IIIB: Fig. 81.13; Stratum IIIA: Fig. 93.12

A rounded and thickened rim bowl with rounded walls (see, for example, Zimhoni 1997, 181, fig. 4.5.10). As our analysed complete example (Fig. 81.13) belongs to Group 8: taqiye marl (see section 3.2 above) an exact origin in the country is difficult to assess.

Type BL13; Stratum IIIB: Fig. 81.14

Refers to thick-walled red-slipped 'Samaria' bowl type with a rounded rim and oblique walls (see, for example, Amiran 1969, pl. 66.13 ['Samaria' Bowls]).

Type BL14; Stratum IIIB: Fig. 81.15

Refers to a well-known type of the thick-walled bevelled rim bowl with rounded walls and bar handle (see, for example, Amiran 1969, pls. 64.26, 67.18–19, 21).

Type BL15; Stratum IIIA: Fig. 93.10–11

Ledge-rim bowls with convex or rounded walls (see, for example, Tel Yoqne'am, Stratum XII [Zarzecki-Peleg, Cohen-Anidjar and Ben-Tor 2005, 240, type B II, fig. II.2.1–2]). Our analysed specimen (Fig. 93.11) belongs to Group 4: *terra rosa* (see section 3.2 above), which suggests an origin in the upper Shephelah.

Heavy Bowls

Type HB1a; Stratum IV: Fig. 75.1–2; Stratum IIIB: Fig. 83.2
Type HB1b; Stratum IIIB: Fig. 83.3

Type HBL1 refers to horizontally everted rim heavy bowl with slightly carinated walls and a shallow ring base (see, for example, Gezer, Stratum VIA, Gitin 1990, 60, 191, type 66, and additional comparanda therein). While our type HBL1a is plain, our type HB1b has slip on the interior. Our analysed (complete profile) specimen shows and origin in the upper Galilee (Group 11: rendzina and *terra rosa*; see section 3.2 above).

Type HB2a; Stratum IV: Fig. 75.3; Stratum IIIB: Fig. 82.2, 5–6, 9
Type HB2b; Stratum IIIB: Fig. 82.1; Stratum IIIA: Fig. 94.1–2
Type HB2c; Stratum IIIB: Fig. 82.7–8

Type HB2 refers to bulbous or mushroom-shaped rim heavy bowl with carinated walls and a shallow ring base. While our type HB2a is plain, our type HB2b has handles and type HB2c has slip on the interior. Comparative material

(see, for example, Gezer, Stratum VIA, Gitin 1990, 65, 204–05, type 89b-c, and additional comparanda therein) suggests a wide distribution in both the south and the north of the country, while our analysed (complete profile) specimen shows an origin in the north-western Negev based on its matrix (Group 3: *loess* soil; see section 3.2 above).

Type HB3a; Stratum IIIB: Fig. 82.3
Type HB3b; Stratum IIIA: Fig. 94.3–4

Type HB3 refers to a triangular in section rim heavy bowl, with rounded walls and a shallow ring base. While the rim of our type HB3a has tapered inner top and external plain flange, our type HB3 has a more rounded top (see, for example, Gezer, Stratum VIA, Gitin 1990, 65, 204–05, type 89b-c, and additional comparanda therein; Zimhoni 1997, 220, fig. 5.5.2). Both of our analysed (complete profile) specimens show an origin in the north-western Negev and the Shephelah based on their matrix (Group 3: *loess* soil; see section 3.2 above).

Type HB4; Stratum IIIB: Fig. 82.4

A rounded and thickened rim heavy bowl, slightly concave upper body and rounded walls. The type is represented by a single example (see, for example, A. Mazar and Panitz-Cohen 2001, 64, type KR 14d)

Jugs

Type JG1; Stratum IV: Fig. 76.1

Jug with an elongated neck (the rim is missing), sack-shaped body and a ring base. It is partially red-slipped and burnished in the mid-body (see, for example, Amiran 1969, pl. 87.5, and resembles the late variants of the so-called 'Ashdod ware'-type jug, Area D, Stratum 3b; Dothan 1971, 98, fig. 41.26–27; although it does not necessarily belong to the 'Ashdod ware' group). According to our petrographic examination, it belongs to *terra rosa* and probably originates in the upper Shephelah (Group 4; see section 3.2 above).

Type JG2; Stratum IIIB: Fig. 84.1

Trefoil-rim jug with a broad neck, globular body and a strap handle that extends from the rim to the shoulder. It combines a ring base with a central depression that is characteristic of Akhziv's late 8th–7th-century BC horizon (Dayagi-Mendels 2002, 124–25, type JG 3; E. Mazar 2003, 43–44). According to our petrographic examination, it originates on the Lebanese coast (Group 6: neogene marl; see section 3.2 above).

Type JG3; Stratum IIIB: Fig. 84.2; Stratum IIIA: Fig. 96.3

Red-slipped trefoil mouth jug with a double rope handle that extends from the rim to the base of the neck. This type has a long pedigree in Phoenician cultural world, spanning the 9th to 7th centuries BC. Although partially preserved, our example seems to be related to the variants that do not appear before the latter part of the 8th century BC, corresponding mainly to Lehmann's assemblages 1–2 (1996; see also Dayagi-Mendels 2002, 124, type JG 2 II, fig. 5.7.6). According to our petrographic examination, it originates on the Lebanese coast (Group 6: neogene marl; see section 3.2 above).

Type JG4; Stratum IIIB: Fig. 84.3

Refers to a relatively small jug with an elongated narrow neck with ridge in its centre and a rounded body (the rim is missing). Comparative material is found mostly in the Shephelah (see, for example, Dothan 1971, 98, figs. 41.24, 46.5; A. Mazar and Panitz-Cohen 2001, 117–18, type JG 26, and additional comparanda therein).

Type JG5; Stratum IIIB: Fig. 84.4

Displays only the neck and upper body part of a ridge neck type jar with ovoid body. The petrographic analysis points to the mixture of volcanoplastic tuffs and coastal sand, which are indicative of the coastal plain of the Carmel area (Group 10: coastal sand and tuff; see section 3.2 above).

Type JG6; Stratum IIIB: Fig. 84.5

A wide slightly concave neck, thick-walled jar with bulbous rim that is triangular in section. A loop handle extends from the rim to the shoulder. Similar jugs were discovered in a 7th-century context in Tel Batash, Stratum II A (Mazar and Panitz-Cohen 2001, 114–15, type JG 19).

Type JG7a; Stratum IIIA: Fig. 96.1
Type JG7b; Stratum IIIA: Fig. 96.2

Type JG7a exhibits an asymmetrical version of a decanter-type jar with an everted rim and a narrow triangular exterior, straight narrow neck with a ridge in its centre, sloping shoulders and a body that is widening towards the base, which creates a carination above the ring base. A loop handle extends from the ridge on the neck to the lower shoulder (see, for example, A. Mazar and Panitz-Cohen 2001, 119–20, type JG 14, and additional comparanda therein). According to our petrographic examination, it belongs to *terra rosa* and probably originates in the upper Shephelah (Group 4; see section 3.2 above). Type JG7b is the body of a decanter-type jar which may exhibit a

symmetrical version of the same type of vessel as JG7 yet of a different (more delicate, possibly northern) fabric (see, for example, Amiran 1969, pl. 88.3–4).

Table Amphora, Flask and Bottle

Type TA1; Stratum IIIA; Fig. 97.3

Our single example of a table amphora refers to a somewhat unusual type of close, ridged-neck vessel type (the rim is missing) with thick-walled ovoid body and two small loop handles that extend from the neck base to the upper shoulder. According to our petrographic examination, it belongs to the *terra rosa* group, hence it probably originates in the upper Shephelah (Group 4; see section 3.2 above). Voids on the ware indicate the addition of vegetal material to its temper by the potters (probably chopped straw), which is relatively uncommon in the *terra rosa* group of vessels.

Type FL1; Stratum IIIA: Fig. 97.1

Our single example of a flask is an upper body part of a candle-stick rim (lacking its lip), elongated neck vessel type with two loop handles that extend from the rim to the shoulders (see, for example, Amiran 1969, pl. 95.12).

Type BT1; Stratum IIIA: Fig. 97.2

Our single example of a bottle resembles the so-called Assyrian(-inspired) vessel types (see, for example, A. Mazar and Panitz-Cohen 2001, 129–30, type BT1 and also photograph 79 on p. 132), yet differ in its morphological proportions. Its unique matrix (see section 3.2 above, and Table 1, no. 44 below) prevents us from suggesting a place of origin.

Juglets

Type JL1: Stratum IV: Fig. 76.2; Stratum IIIB: Fig. 84.6; Stratum IIIA: Fig. 97.5

Dipper juglet with a plain or thickened rim, short convex or straight neck that rises from sack-shaped body and irregular rounded thick base, which protrudes in the centre. A high loop handle extends from the rim to the shoulder. Both the petrographic analyses (Group 6: neogene marl; see section 3.2 above) and the comparative material suggest the Lebanese coast as a place of origin. It is common in Tyre Stratum III and in contemporaneous Phoenician, northern Israeli and Syrian assemblages (see, for example, Bikai 1978b, 52, fig. 3.6; Dayagi-Mendels 2002, 130–31, types DJ 1–DJ 2). In Lehmann's chronological

scheme, it belongs to assemblages 1–2–3 (Lehmann 1996, 398, forms 210–211), spanning from *ca*. 750 to 650 BC (Lehmann 1998). Another example is attested in Ashdod, Area D, Stratum 2 (Dothan and Freedman 1967, 140, fig. 40.12).

Type JL2; Stratum IV: Fig. 76.3

Morphologically, type JL2 resembles type JL1, but has a more swollen sack-shaped body. Other than that it too has a plain rim, a high loop handle that extends from the rim to the shoulder and a rounded and thick base, which protrudes in the centre. Petrographic analyses suggests the Lebanese coast as a place of origin for JL2a (Group 6: neogene marl; see section 3.2 above).

Type JL3; Stratum IIIA: Fig. 97.4

Displays only the body of an asymmetrical sack-shaped juglet with a rounded and thick base and vertical burnishing on the body exterior (see, for example, Amiran 1969, pl. 87.11).

Cooking Pots

Type CP1: Stratum V: Fig. 72.2; Stratum IV: Fig. 77.1

An open cooking pot with elongated rim triangular in section, rounded or pinched at the upper edge. It is represented only by two specimens. Complete examples of this type from other sites (for example from Tel Gerisa, Stratum 4: Herzog and Singer-Avitz 2011, fig. 4.9), suggest a presence of two loop handles. This is a typical late Iron Age IIA type (Herzog and Singer-Avitz 2011; Fantalkin 2005, 8, with references), produced at the central coastal plain of Israel (Group 1: *ḥamra* soil; see section 3.2 above).

Type CP2; Stratum IV: Fig. 77.2
Type CP3; Stratum IV: Fig. 77.3

Both types, CP2 and CP3 are short, straight neck open cooking pots with thickened rim, which are more likely variants (may be even predecessors) of our type CP4 (see below). As both were found as single fragments of relatively small size we are refrained from elaborating on their typology.

Type CP4; Stratum IV: Fig. 77.4–7; Stratum IIIB: Figs. 85–86; Stratum IIIA: Figs. 98, 99.1–4

The most common type of cooking pots recovered from the site. It is a relatively shallow, open cooking pot with a rounded or slightly carinated body. It

has a short, stepped rim top, which is either rounded or truncated, and a short neck. Two loop handles extend from the rim top to the body just above its mid-body. Comparative material shows that the type is most common in Iron Age IIB sites throughout the country (see, for example, Gitin 1990, 217–19, type 105 with its many variants; Zarzecki-Peleg, Cohen-Anidjar and Ben-Tor 2005, 277–78, types CP VI and CP VII and additional comparanda therein), yet the evidence of Tell Qudadi, as well as from few other sites (for example Gezer, Strata VIA–VA and Tel Yoqne'am, Strata XII and XI) proves its continuation well into the 7th century BC (and see below). Most of our analysed samples contain *terra rosa* and crushed calcite material (Group 4a; see section 3.2 above), hence their origin is probably in the upper Shephelah, while fewer analysed specimens have *ḥamra* soil (Group 1; see section 3.2 above), and thus their origin is most probably in the central coastal plain. Many of the cooking pots illustrated in our figures bear a single cavity on the upper part of their handles that was made before firing. This so-called 'thumb impression', which is somewhat smaller (up to 1 cm in diameter) than an actual thumb impression, is familiar in other Iron Age sites. It is reasonable to assume that the cavities served some sort of marking by the potters for the cooking pots intended use. Below, in Chapter 4, section 2, we have suggested the existence of an Assyrian logistical network, where these cooking pots were produced in the vicinity of Gezer and shipped via the Ayalon and Yarkon rivers to the fortress of Tell Qudadi for storage and further distribution, at times of need, via the Yarkon river to Aphek. Their assumed standardisation lends support to such an argument.

Given the high frequency of the appearance of CP4 at the site and the complete profiles of many of our retrieved examples, we have decided to assess the capacities of the nearly complete examples from the three strata of the fortress building in order to trace standards and their implications. These are collated in Table 15. The capacities were measured from the drawings of these vessels, with Pot Utility Version 1.05, a computer programme developed by J.P. Thalmann.[4]

[4] We are grateful to Y. Agmon for calculating the capacities of the cooking pots.

Table 15: Capacity of cooking pots (type CP4).

Stratum	Vessel (figure)	Volume (Water)	Average Water (Stratum)	Volume (Oil)	Average Oil (Stratum)
IIIA	98.4	6.71	5.068	6.17	4.663
IIIA	98.5	3.26		3.00	
IIIA	98.6	2.83		2.60	
IIIA	98.7	4.42		4.07	
IIIA	98.8	3.84		3.54	
IIIA	99.1	6.13		5.64	
IIIA	99.2	6.82		6.28	
IIIA	99.3	6.54		6.01	
IIIB	86.1	3.31	5.820	3.05	5.355
IIIB	86.2	5.78		5.32	
IIIB	86.3	7.57		6.96	
IIIB	86.4	6.62		6.09	
IV	77.4	13.15	10.763	12.10	9.903
IV	77.6	10.50		9.66	
IV	77.7	8.64		7.95	

Type CJ1; Stratum V: Fig. 72.3; Stratum IIIA: Fig. 99.5–6

Plain rim, straight neck and rounded-ovoid body type. Relatively well known almost throughout the Iron Age (see, for example, Greenhut and De Groot 2009, fig. 3.24.13). Tell Qudadi's analysed specimens have been produced at the central coastal plain and possibly also at the upper Shephelah (Groups 1 and 4a: *ḥamra* soil and *terra rosa* and crushed calcite; see section 3.2 above).

Storage Jars

Type SJ1a; Stratum IV: Fig. 78.1–3; Stratum IIIB: Fig. 87.1–2, 5–8, 11; Stratum IIIA: Fig. 100.2, 5, 7
Type SJ1b; Stratum IIIB: Fig. 87.3–4, 9–10, 12–13; Stratum IIIA: Fig. 100.1, 3–4, 6

This type, which unfortunately is mostly confined to rim fragments and upper body parts, reflects the most predominant storage jar recovered from the site. As only fragments are preserved, we have tried to define on the basis of the fabric those storage jars whose rims are normally thickened and/or rounded,

and the length of their necks varies, whereas the shoulders are narrow, straight or slightly sloping and carinated. While Type SJ1b corresponds to a 'torpedo' Phoenician type jar (see, for example, Bikai 1978a, especially types 2, 5–6, pls. II–IV; A. Mazar and Panitz-Cohen 2001, 103–105, type SJ 15, with extensive literature), as can also be deduced from our petrographic examination (Group 6: neogene Marl; see section 3.2 above). Type SJ1a can apparently be defined by its bag-shaped lower body and it is more common along the southern coast and the adjacent lowlands during late Iron Age IIB and IIC (see, for example, Zimhoni 1997, 245–47, Group IID; A. Mazar and Panitz-Cohen 2001, 97–101, type SJ 7 [especially 7b]). For complete unstratified examples of both sub-types, see Fig. 105.1 *vs* 105.5).

Type SJ2a; Stratum IV: Fig. 78. 4, 7; Stratum IIIB: Fig. 88.1
Type SJ2b; Stratum IIIA: Fig. 100.8

This is a rather common southern coastal type (as accorded by our petrographic analysis – Group 9: taqiye marl and coastal sand; see section 3.2 above), with a rounded and thickened ('folded') rim, a short upturned neck and relatively rounded (sometimes angled) shoulders, as is evident from comparative material (see, for example, Ashdod, Area D, Stratum VIII; Dothan 1971, 95, fig. 38.2). Type SJ2b is differentiated from type SJ2a by its neck 'stuck' onto the body, which creates a lower protrusion (see, for example, Ashdod, Area D, Stratum VIII, Dothan 1971, 95, 99, figs. 38.4, 43.3–7).

Type SJ3; Stratum IV: Fig. 78.5; Stratum IIIB: Fig. 88.2–3; Stratum IIIA: Fig. 100.9

Only the rim and neck fragments of this type were unearthed, that is rounded rim with slightly inverted upturned neck and relatively rounded shoulders. Close comparanda seem to be found in Tel Batash, Strata IV and III (A. Mazar and Panitz-Cohen 2001, 89–93, type SJ 21 [especially 21b]).

Type SJ4; Stratum IV: Fig. 78.6; Stratum IIIB: Fig. 88.4–6; Stratum IIIA: Fig. 100.10–11

Here too only the rim and neck fragments of this type were unearthed, showing a rounded and thickened rim with a short upturned neck and with a ridge at its base (or slightly above it). Complete such vessels are found, for example, in Tel Michal, Stratum XIII (Singer-Avitz 1989a, 86, fig. 7.5.18) or Gezer, Stratum VIA (Gitin 1990, 47, 120–21, type 2c/2d), and comparative material is more restricted to the north of the country. This can be strengthened by our petrographic examination, which shows an origin on the Lebanese coast (Group 6: neogene marl; see section 3.2 above). It seems, therefore, that this

type, which is already attested during late Iron Age IIA, continued to be produced in Iron Age IIB as well.

Type SJ5; Stratum IV: Fig. 78.8–9

A plain rim, short upturned neck and relatively levelled shoulders type (see Zimhoni 1997, 235, fig. 5.18: 1 'coastal origin') whose origin, from our analysis, should be traced in the western Negev based on its matrix (Group 3: *loess* soil; see section 3.2 above).

Type SJ6; Stratum IIIA: Fig. 100.12

Only one rim and neck fragment of this type was found, namely a rounded rim with concave upturned neck and relatively rounded shoulders, close comparanda seem to be found in Ashdod, Stratum VIII, Area D (Dothan 1971, 99, fig. 43.2) and Stratum VII, in local Stratum 7b in Area M (Dothan and Porath 1982, 36, fig. 21.12).

Type HM1; Stratum IIIB: Fig. 88.7

While the term hole-mouth jar refers to relatively small, cylindrical, neckless and handleless vessels, our type HM1 is generally characterised by a bulbous rim, triangular in section and rounded in its lip (see, for example, Barkay, Fantalkin and Tal 2002, 60–65, type 1, with extensive literature).

Type HM2; Stratum IIIA: Fig. 100.13

Generally characterised by a bulbous rim with a ridged top, triangular in section and rounded in its lip (see, for example, A. Mazar and Panitz-Cohen 2001, 106–07, type SJ 10b, with extensive literature; Zimhoni 1997, 252, fig. 5.32.5). According to our petrographic examination, it originates on the Lebanese coast (Group 6: neogene marl; see section 3.2 above).

Lamps

Two distinctive types have been found:

Type LP1; Stratum IIIB: Fig. 88.9; Stratum IIIA: Fig. 100.15–16

A thin-ware shallow type with a sharply out-turned rim and a red slip and burnish on the interior and partially on the exterior. Its petrographic profile suggests the Lebanese coast as a place of origin (Group 6: neogene marl; see section 3.2 above). In Tyre these lamps belong to a distinctive category, which did not appear before Stratum IV. It became a dominant type during the period of Strata III–I (Bikai 1978a, 19–20, table 2), making it a chronologically reliable marker of the late 8th and possibly the early 7th century BC.

Type LP2; Stratum IIIB: Fig. 88.10

A wide, low disk base lamp with a shelf-like rim top is the Judahite version of LP1 (above) (see, for example, Amiran 1969, pl. 100.20 [South]; A. Mazar and Panitz-Cohen 2001, 134, type LP 3a, with extensive literature). The Tell Qudadi specimen has been produced at the Judean hill (Group 5: Motza clay; see section 3.2 above). Oddly enough, this is our one and only specimen from the analysed thin-section assemblage whose origin is in the Judean highlands.

Stand

Type ST1: Stratum IIIB: Fig. 88.8.

Although this type of vessel, used as a stand, consists of a basic biconical form, it is characterised by remarkable morphological variability in terms of design and proportions. Comparative examples have been found in a number of sites across the coastal region, for example: Keisan, Stratum 5 (Chambon 1980, 174, fig. 45.7–12), Ashdod, Stratum VII (in local Stratum 2 in Area D: Dothan and Freedman 1967, 141, 143, figs. 40.20, 41.24), Stratum VII (in local Stratum 7b in Area M: Dothan and Porath 1982, 37, fig. 24.3). Our petrographic analysis shows that the Tell Qudadi's specimen was produced on the central coastal plain of Israel (Group 1: *ḥamra* soil; see section 3.2 above).

Loom Weights

Type LW1; Stratum IV: Fig. 79; Stratum IIIB: Fig. 90; Stratum IIIA: Figs. 101–102

All in all nine loom weights of the same type came from secured contexts in the fortress. Most of them were found complete and only a few were found broken. The retrieved specimens are made of unfired brownish clay whose origin is either from the *ḥamra* soil (one analysed specimen) or *kurkar* groups (four analysed specimens) (Groups 1 and 2: *ḥamra* soil/*kurkar*; see section 3.2 above). Both groups originate from the coastal plain. The loom weights belong to the doughnut-shaped type, which is spherical in contour with a diameter that exceeds its height (see, for example, Shamir 1996; 2009). Our loom weights range from 6 to 9 cm in diameter and 4.5 to 8 cm in height. Their weight ranges from *ca*. 200 gr to *ca*. 540 gr (that is the nearly complete/complete specimens). All are vertically perforated and some were perforated off-centre. The diameters of the holes range from 0.4 to 1.5 cm. While most perforations are plain (having a relatively consistent thickness throughout their body), a few are conical, where one end is larger than the other. The type of perforation may relate to its mode of formation (the insertion of a

stick through one end or through both, for example). In some of our examples thread marks are still visible in the holes and it seems that the larger the holes, the thicker the strung thread. It is important to note that the loom weights recovered from Stratum IIIA were found in one concentration above the foundations of casemate 2 (Square D7). This may attest to weaving being undertaken in that room. In this regard, a comparative cache of some 50 loom weights of similar type, found not far from the gate at the Iron Age IIB site of Khirbat al-Mudayna in Moab, should be mentioned (Boertien 2014, 143–47).

3.4. The Imported Wares

Type AJ1; Stratum IV: Fig. 76.4

An upper part of a juglet retrieved from Stratum IV (Fig. 76.4) does not belong to any known Levantine type in terms of fabric and shape, both of which seem to suggest an Anatolian origin.

Type AM1; Stratum IIIB: Fig. 89

The discovery of a number of fragments in Stratum IIIB, consisting of the rim, neck, body and handle belonging to the same imported amphora of the Grey Ware family (Fig. 89.1–3),[5] most probably originating on the island of Lesbos in the north-eastern Aegean, should be discussed in detail due to the uniqueness of this find.

The term 'Lesbian Grey Series amphorae' relates to a well-known family of ceramic transport amphorae, originating most probably on Lesbos. The chronology, typology and distribution of these containers have been discussed at length in a number of detailed studies (Clinkenbeard 1982; Abramov 1993; Dupont 1998, 156–63; Monakhov 2003, 43–49; Bîrzescu 2006, 22–56). According to a commonly held view, the initial production of the Lesbian Grey series took place in the later part of the 7th century BC.[6] Indeed, although J.M. Cook, following his excavations of ancient Smyrna in Asia Minor, suggested that these amphorae were already in existence in the 8th century BC

[5] For a preliminary publication, see Fantalkin and Tal 2010. The preliminary publication exhibits a large fragment of a neck and body (here Fig. 89.3), whereas the additional rim and handle shown here (Fig. 89.1–2) were recovered during the later sorting of the material and provide a fuller profile of the piece. We are grateful to many colleagues who have offered their valuable comments during the study of this intriguing find, namely to I. Bîrzescu, P. Dupont, B. Hürmüzlü, M. Kerschner, R. Posamentir and U. Schlotzhauer.

[6] It should be noted that the Lesbian Grey series amphorae constitute an integral part of a larger contemporaneous ceramic family, which also includes the series of containers related in shape but made of oxidised clays (Whitbread 1995, 154–55; Dupont 1998, 158–59; Bîrzescu 2005).

if not earlier,[7] until recently this theory has never been supported by secure additional archaeological evidence,[8] and the early Grey series amphorae from Smyrna remain largely unpublished. For years the earliest securely dated examples of Lesbian Grey series amphorae were known from the excavation of the Athenian Agora, in a context of the third quarter of the 7th century BC (Brann 1961, 346, pls. 86, 89: F 80; Clinkenbeard 1982, 249; Dupont 1998, 159).[9]

[7] Thus, according to Cook's suggestion, based on his findings from Smyrna: 'study of the archaic amphorae shows that the import of wine from Chios and from a centre exporting in grey jars can be dated as far back as the 8th century – in fact to Homeric times' (Cook 1953, 124; and see also Cook 1958–59, 14).

[8] In Kommos, a number of supposedly late 7th century BC contexts, which included some Lesbian pieces, have yielded earlier material as well (Johnston 2005, 365, no. 206). Moreover, a few pieces of the Lesbian red-fired transport amphora handles were discovered in a 'stratigraphically intriguing' location, *viz*. in a level that 'is below that of the transition from pure MG to later material' (Johnston 2000, 218, no. 108). The most recent examples of allegedly late 8th–early 7th century BC Lesbian Grey and Red series transport amphorae were reported from the site of Methone at Pieria (Bessios, Tzifopoulos and Kotsonas 2012, 465–72, nos. 132–40). This publication (Kotsonas 2012, 208) already took into account our suggestion regarding the updating of the initial appearance of Grey series transport amphorae, based on the findings from Tell Qudadi (Fantalkin and Tal 2010). The stratigraphic interpretation of the Methone deposits within a pit, however, has been severely criticised. Although according to the excavator there were three phases of fill deposits (Bessios 2012), it seems more likely that the two earliest, 'Phase I' (*ca*. 730–690 BC) and 'Phase II' (first half of the 7th century BC), are actually the same phase (Chavela 2013; Gimatzidis 2013). This would undermine the secure chronological attribution of the Lesbian Grey and Red series transport amphorae from Methone to the late 8th–early 7th century BC, since they could have been deposited in a dump much later during the 7th century BC.

[9] For Archaic material from Lesbos, see also Clinkenbeard 1982, 266, pl. 69a-d; Spencer 1995, 301, fig. 12; Zachos 2012. Other possible early examples have also been ascribed to no earlier than the second part of the 7th century BC. This relates to a modest number of vessels uncovered in a number of late 7th-century BC assemblages, their find-spots encompassing the whole Mediterranean. Thus, a number of Grey series Lesbian amphorae pieces have been unearthed in what seems to be late 7th-century BC contexts in Kommos (Crete) (Johnston 1993, 362–63; 2005, 365–67; Csapo, Johnston and Geagan 2000, 124, no. 67, 125, no. 74); in a number of Greek colonial context in southern Italy (Castoldi 1986, pl. 39.4; Stea 2000, 473, abb. 322; Berlingo 1993, 9, abb. 16.10; Di Sandro 1986, 85–86, Sg. 201); in Tocra on the Libyan coast (Boardman and Hayes 1966, 139, no.1416, pl. 90); in Clazomenai (Ionia), particularly in its Akpinar necropolis, where such amphorae were used as containers for infant inhumations (Hürmüzlü 2003, 455–56, figs. 101/m, 106/m; 2004, 82); in Abdera on the Thracian coast (Dupont and Skarlatidou 2012; for the cemetery, see Skarlatidou 1986; 2004); in Histria on the Black Sea (Bîrzescu 2006); and in Meẓad Ḥashavyahu and Ashkelon in Israel (Fantalkin 2001a, 94, fig. 34.2*; Master 2001, 40, 146–47, 155, fig. 2.9.8 [category 18]; Barako 2008, 445, amphora 15). In the early 6th century BC, both the distribution and quantity of Lesbian transport amphorae exports rose significantly (Dupont 1998, 159–61; Bîrzescu 2005; 2007; 2012). For the Black Sea area, see Monakhov 1999, 33–60; 2003, 43–49. For Troy, see Aslan 2002. For Gordion, see Lawall 2002; 2010. For quite a number of Lesbian Grey Ware amphorae from Egypt, starting mainly from the 6th century BC and continuing through the Hellenistic period, see Oren 1984, 27; Smoláriková 2002, 25–26.

Our fragments were discovered within a clear context of Stratum IIIB, that is the middle occupation layer above the first destruction layer of the fortress. Based on the excellent recording in the excavation logbooks, we can even trace the date of this discovery, which was specifically mentioned on 16th February 1938. Thus, according to the excavators, parts of the large neck of a grey vase were found together with numerous pottery sherds in a clear context, above the first destruction layer and beneath the second destruction layer of the Iron Age fortress. The excavators offered no suggestions concerning the place of origin of this piece, other than acknowledging its unusual grey fabric. Taking into consideration the date of the discovery, this is not surprising. Even today it is not always easy to postulate with certainty if a given Grey Ware pottery fragment was produced in Lesbos or in mainland Aiolis, since the Anatolian pedigree of a grey monochrome fabric is a well-known phenomenon (Lamb 1932; Bayne 2000; Coldstream 2003, 262–64). Although through the ages Grey Ware was certainly not alien to the Aegean-Balkan milieu (Jung 2007; Pavúk 2007), it has been noted that during the Bronze and Iron Age the Grey Ware from Lesbos, for instance, has much more in common with Anatolia than with any region of mainland Greece (Spencer 1995, 303–05; Rose 2008). Although some advances have been made recently in identifying various pottery workshops for different types of Grey Ware in Aiolis (Kerschner 2006a; Mommsen and Pavúk 2007), our knowledge concerning the workshops of the Grey Ware amphorae is far from satisfactory.

Given the uniqueness of Tell Qudadi's allegedly Lesbian piece, it has been subjected to thin-section analysis (petrography/mineralogy) and neutron activation analysis (NAA).[10] For comparative purposes, the same analyses were undertaken on a large piece of a Lesbian amphora (Fig. 109, at p. 178 below), discovered in the late 7th-century BC context at the site of Meẓad Ḥashavyahu, located some 25 km to the south of Tell Qudadi.[11] The petrographic examination largely confirms the earlier observations made by Whitbread and Master concerning the Lesbian fabrics (Whitbread 1995, 154–64; Master 2001, 40, 146–47 [category 18]), and according to Y. Goren, shows the following picture:

- Qudadi Reg. No. 362 (Fig. 89.3 [neck and body]). Dark tan, ferruginous matrix with silt dominated by mica laths, quartz and some epidote. Inclu-

[10] We wish to express our gratitude once again to Y. Goren, who conducted the thin-section analysis, and to H. Mommsen, who conducted the NAA analysis. These analyses have contributed immensely to the present study.

[11] For the historical significance and chronology of the Meẓad Ḥashavyahu assemblage within the context of Egyptian imperial domination of the coast of Palestine in the last quarter of the 7th century BC, see Fantalkin 2001a.

sions contain serpentine, quartzite, plagioclase, biotite mica and crystalline basalt (Fig. 110, at p. 179 below).

- Meẓad Ḥashavyahu Reg. No. C 30/1 (Fig. 109.1 [rim]). Dark tan, ferruginous matrix with silt dominated by mica laths, quartz and some epidote. Inclusions contain serpentine, quartzite, plagioclase, biotite mica and rarely finely crystalline basalt (Fig. 111, at p. 179 below).
- Meẓad Ḥashavyahu Reg. No. C 30/2 (Fig. 109.2 [base]). As Meẓad Ḥashavyahu C 30/1, with additions of some grains of the basalt.

The fabric of these samples is characterised by a dark-grey micromass colour, a sandy, well-sorted texture and inclusions of quartz, mica, epidote minerals and metamorphic and volcanic fragments, though rarely presented. These components are typically found throughout north-western Anatolia and on Lesbos.

The NAA analysis, on the other hand, has yielded an unknown provenance group for both specimens. According to H. Mommsen, however, the Tell Qudadi piece is made of the same paste (fabric) as that of the abovementioned amphora from Meẓad Ḥashavyahu. Both pieces are very close in composition, i.e. 18 of the 25 elements have spreads (root mean square deviations = standard deviations) of less than 6% and 8 elements have even less than 3% (Table 16).

Since the complete profile of the Meẓad Ḥashavyahu amphora is widely considered to be of truly Lesbian origin (Dupont 1998, 159; Bîrzescu 2006, 24–26; 2012, 43), we are inclined to believe that the Tell Qudadi piece must also be attributed to Lesbos. Paradoxically, because of the lack of contemporary NAA analyses from Lesbos,[12] the fact that a particular chemical fingerprint detected in the Grey series amphorae from Tell Qudadi and Meẓad Ḥashavyahu fits none of the many known chemical pottery profiles from Anatolia strengthens our view that these amphorae were produced in Lesbos. Nevertheless, additional NAA analyses are needed, especially from Lesbos.

The conventional chronology concerning the initial production of Lesbian amphorae is in line with the so-called conventional chronologies of additional East Greek series transport amphorae, which came from workshops in Samos, Chios, Clazomenai, Miletos and elsewhere, and according to the widespread view also began to appear in the second half of the 7th century BC (at the

[12] The NAA analysis presented by Clinkenbeard (1982, 261–64, and table on p. 268) was conducted mainly on fragments that lack clear provenance and dates. Out of 18 tested chemical elements, however, some are close in composition to ours, while others are different, attesting to different origins.

Table 16: NAA results for amphorae from Meẓad Ḥashavyahu (Reg. No. C30/1) and Tell Qudadi (Reg. No. 362). Concentrations of elements C in $\mu g/g$ (ppm), if not indicated otherwise, and experimental counting errors δ in % of C measured by NAA analysis, University of Bonn. The third column pair gives the average concentrations M and spreads σ in % of M (courtesy of H. Mommsen).

	Meẓad Ḥashavyahu 1 sample (MeHa 1) factor 1.00		Tell Qudadi 1 sample (QuDa 1) factor 1.00		Averages 2 samples factor 1.00	
	C	± δ(%)	C	± δ(%)	M	± σ(%)
As	17.5	(0.9)	20.6	(0.8)	19.0	(11.)
Ba	1621.	(1.7)	1786.	(1.6)	1702.	(6.7)
Ca %	2.22	(10.)	2.41	(9.1)	2.31	(9.5)
Ce	152.	(1.4)	147.	(1.4)	149.	(2.3)
Co	15.8	(0.7)	15.8	(0.7)	15.8	(0.7)
Cr	84.1	(0.9)	93.4	(0.8)	88.7	(7.2)
Cs	8.91	(1.1)	7.31	(1.2)	8.11	(14.)
Eu	2.00	(1.5)	2.16	(1.4)	2.08	(5.4)
Fe %	4.03	(0.4)	4.38	(0.4)	4.20	(5.6)
Ga	23.2	(18.)	28.6	(14.)	26.1	(16.)
Hf	9.66	(0.8)	9.44	(0.8)	9.55	(1.9)
K %	3.03	(1.8)	2.93	(1.7)	2.98	(2.6)
La	76.6	(0.7)	76.8	(0.7)	76.6	(0.7)
Lu	0.46	(3.8)	0.46	(3.8)	0.46	(3.8)
Na %	2.12	(0.6)	1.80	(0.6)	1.96	(12.)
Nd	51.2	(2.1)	53.1	(2.1)	52.1	(2.4)
Ni	--		91.0	(35.)	91.0	(35.)
Rb	127.	(2.0)	122.	(2.0)	124.	(3.3)
Sb	2.28	(3.9)	1.93	(4.2)	2.10	(12.)
Sc	16.0	(0.1)	14.9	(0.1)	15.4	(5.0)
Sm	8.38	(0.2)	8.96	(0.2)	8.67	(4.5)
Ta	1.20	(2.7)	1.22	(2.7)	1.21	(2.7)
Tb	0.83	(5.7)	0.89	(5.3)	0.86	(5.5)
Th	39.7	(0.3)	39.6	(0.3)	39.7	(0.4)
Ti %	0.48	(20.)	0.42	(23.)	0.45	(22.)
U	5.94	(2.2)	5.61	(2.3)	5.77	(4.3)
W	3.24	(7.2)	3.32	(6.6)	3.28	(6.9)
Yb	3.17	(2.0)	3.36	(1.9)	3.26	(3.9)
Zn	72.7	(2.7)	76.4	(2.6)	74.5	(3.3)
Zr	71.3	(74.)	80.4	(64.)	75.9	(68.)

earliest) (for example: Abramov 1993; Dupont 1998; Twede 2002; Monakhov 2003; Lawall 2004; Seifert 2004; Sezgin 2004). However, in too many cases much weight was given to the Black Sea region whereas the evidence from other areas was sometimes overlooked (see Docter 2000; Kerschner 2000). The current archaeological consensus, although still disputed by some historians, is that actual Greek colonisation of the Black Sea area began only in the second half or even in the late 7th century BC.[13] This is the reason why the conventional chronologies for the initial production stages of the Archaic East Greek amphorae, based mainly on evidence from the Black Sea region, have been so widely accepted. However, new evidence from Carthage in North Africa and Toscanos in Spain prove that these chronological assumptions are not precise, since several East Greek amphorae fragments from various workshops were found in much earlier contexts. Docter, in his comprehensive study of these early amphorae, concludes persuasively that the production and distribution of the Samian amphorae began as early as the third quarter of the 8th century BC, rather than the customary late 7th-century BC date; those of Chios were already produced from the beginning of the second quarter of the 7th century BC and not just from the third quarter of that century, while the beginning of the Clazomenian series may be dated to the end of the 8th century BC instead of the second half of the 7th century BC (Docter 2000). Although some hints at the earlier appearance of the Lesbian series of transport amphorae are known (above), the amphora found in Tell Qudadi enables to claim with certainty that, like the Samian, Chian and Clazomenian series, the beginning of the Lesbian series, at least the Grey ones, should also be dated significantly earlier than the second half of the 7th century BC.

Type EB1; Stratum IIIA: Fig. 92

A fragment of an Egyptian simple shallow bowl with flaring rim was retrieved from Stratum IIIA (Fig. 92), i.e. in the group from the second destruction layer. It has a common 7th-century BC shape and comparanda in Egypt (Aston 2009, 321–22, types 18–22, 24); however, quite similar bowls are common in the Egyptian pottery repertoire for many periods (see, for example, Aston 1999; Martin 2011, BL 3a-b, 35–38).

[13] For archaeological summaries concerning the beginnings of the Greek colonisation at the Black Sea area, see, for example, Boardman 1980, 238–55; 1991; Tsetskhladze 1994; 1998; 2002; 2012; Petropoulos 2003; 2005; Opperman 2005; Posamentir 2006; Kerschner 2006b; Dupont 2007; and Vachtina 2007. For tracing the beginning of the Greek colonisation of the Black Sea area as early as the 8th century BC, based on a limited number of late historical sources, see, for example, Graham 1958; 1971; 1982, 119, 123; 1990; Drews 1976; Malkin and Shmueli 1988, 23; Gorman 2001, 65–71.

Type ON1; Stratum IIIA: Fig. 95

A fragment belonging to an East Aegean oinochoe (Fig. 95) is of special importance, since it provides assistance for dating the destruction of Stratum IIIA, the latest stratum in the occupational history of the fortress during the Iron Age. The preserved part of the handle with connected rods is painted with simple horizontal lines. This type is known on Subgeometric pieces from South Ionia, but becomes frequent only after the middle of the 7th century BC. The wall at the beginning of the shoulder, however, is very steep, so it cannot belong to a typical SiA Ia oinochoe.[14] Taking this into consideration, together with the fact that the local Iron Age IIC horizon, which corresponds to the later part of SiA Ib, SiA Ic and SiA Id horizons in the East Greece, is missing from the Tell Qudadi assemblage (see below), the East Greek Subgeometric attribution for this piece appears to be correct. In East Greece the beginning of this phase comes after the beginning of the Middle Protocorinthian and before the end of Early Protoattic (Cook 1998, 25). The approximate dates for the Middle Protocorinthian vary as follows: MPC I *ca*. 700–675 BC and MPC II *ca*. 675–650 BC, according to Payne (1931); MPC I *ca*. 690–670 BC and MPC II *ca*. 670–650 BC, according to Amyx (1988); or a general range of *ca*. 680–650 BC for both sub-phases, as suggested by Morris (1996). It seems that the absolute date for this handle cannot be earlier than the first third of the 7th century BC. Excluding the SiA Ia or later attribution suggests a date around 680–670 BC for this piece. That is to say Stratum IIIA was destroyed probably after this date, but before the typical Iron IIC forms of the late 7th century BC became widespread.

In concluding the discussion regarding the imported pottery from Tell Qudadi, we would like to mention the absence of Cypriot imports of any kind (except for a single unstratified sherd of a general Cypro-Archaic date, which is discussed below). The absence of Cypriot mortaria with flat bases at Tell Qudadi is of particular importance. These vessels had already started to appear

[14] We follow a revised terminology and periodisation for Archaic East Greek pottery as proposed by Kerschner and Schlotzhauer (2005), where SiA Ia stands for South Ionian Archaic Ia horizon, which lasted between *ca*. 670 and 650 BC; SiA Ib stands for South Ionian Archaic Ib horizon, which lasted between *ca*. 650 and 630 BC; SiA Ic stands for South Ionian Archaic Ic horizon, which lasted between *ca*. 630 and 610 BC; and SiA Id stands for South Ionian Archaic Id horizon, which lasted between *ca*. 610 and 580 BC. Chronologically, some slight adjustments to the scheme might include more flexible dates for the beginning and end of certain styles. Thus, the beginning of the SiA Ic is better placed around 630/625 BC, while a date around 615/610 BC for the transition between SiA Ic and SiA Id ostensibly corresponds to the beginning of the Early Corinthian style (Fantalkin 2011). In any event, Kerschner and Schlotzhauer's scheme clearly supersedes Cook's (1998) previous classification. We are grateful to M. Kerschner for his valuable comments concerning the East Aegean oinochoe sherd from Tell Qudadi.

in Levantine coastal sites during Iron Age IIB and became common in late 7th-century BC coastal assemblages and later on in the entire eastern Mediterranean, yet it seems that they are relatively absent from the Levantine contexts of first half of the 7th-century BC (see Villing 2006; Villing and Spataro 2009; Zukerman and Ben-Shlomo 2011). This pattern of the general decline in Cypriot imports to Levantine sites during the period of Neo-Assyrian domination (Lehmann, pers. com.; Mavronanos forthcoming) mirrors the absence of Aegean imports of almost any kind on the Levantine coast (except for the site of Al Mina), a process labelled by one of us as one of the manifestations of a 'Great Divide' between the areas dominated by the Neo-Assyrian empire and the Aegean world (Fantalkin 2006, 201–02, 204–05). The presence of a couple of sherds, originating from the East Greek milieu at Tell Qudadi appears to be unique for this period and can contribute significantly to the chronological clarification of local assemblages during Iron Age IIB (and see below).

3.5. Incidence of Pottery Types

Hereunder (Table 17) we have summarised in a coherent manner the local and imported pottery types' appearances from secured archaeological contexts according to strata (Strata V, IV, IIIB, IIIA). The cells of grey shades represent the same pottery types that appear in the two or more strata. The fact that the clear Iron Age IIB types appear in many cases in all strata of the fortress building (IV, IIIB, IIIA) is of special significance, since it allows postulating Iron Age IIB as the only possibility for the entire occupational history of the fortress (see section 3.6 below).

Table 17: Incidence of pottery types according to strata (Strata V, IV, IIIB, IIIA).

Type	Stratum V	Stratum IV	Stratum IIIB	Stratum IIIA
BL1		+		
BL2		+		
BL3	+		+	
BL4		+		
BL5a		+	+	
BL5b				+
BL6a		+	+	+
BL6b				+
BL7a		+	+	+
BL7b			+	+

Type	Stratum V	Stratum IV	Stratum IIIB	Stratum IIIA
BL7c				+
BL7d				+
BL8			+	
BL9			+	
BL10			+	
BL11			+	
BL12			+	+
BL13			+	
BL14			+	
BL15				+
EB1				+
HB1a		+	+	
HB1b			+	
HB2a		+	+	
HB2b			+	+
HB2c			+	
HB3a			+	
HB3b				+
HB4			+	
CP1	+	+		
CP2		+		
CP3		+		
CP4		+	+	+
CJ1	+			+
JG1		+		
JG2			+	
JG3			+	+
JG4			+	
JG5			+	
JG6			+	
JG7a				+

Type	Stratum V	Stratum IV	Stratum IIIB	Stratum IIIA
JG7b				+
FL1				+
BT1				+
TA1				+
ON1				+
JL1		+	+	+
JL2		+		
JL3				+
AJ1		+		
SJ1a		+	+	+
SJ1b			+	+
SJ2a		+	+	+
SJ2b				+
SJ3		+	+	+
SJ4		+	+	+
SJ5		+		
SJ6				+
HM1			+	
HM2				+
AM1			+	
ST1			+	
LP1			+	+
LP2			+	
LW1		+	+	+

3.6. The Unstratified Iron Age and Later Period Pottery (Figs. 104–108 – see pp. 172–78 below)

A number of complete Iron Age IIB vessels as well as vessels of certain types that do not appear in stratified contexts came from unstratified ones; but they clearly relate to the time of operation of the fortress. These types are brought together here in order to complement the general picture. Thus, two complete bowls illustrated on Fig. 104.1–2 represent our Types BL5a and BL14 respectively. Two chalices on Fig. 104.3–4 most probably belong to the Iron IIB horizon. According to our petrographic analysis, the second example (with two ridges on the lower part of the bowl) was produced in the Shephelah, as it belongs to the *terra rosa* group (see below, Table 1, no. 58). During the Iron Age, the chalice became quite a well-known type in Palestine and on many occasions examples were found in cult-related contexts (for the most recent studies, see Maeir and Shai 2005; Panitz-Cohen 2010, 120–23; Namdar, Neumann and Weiner 2010; Gadot *et al*. 2014). The two jugs/decanters have a wide distribution during Iron Age IIB–IIC in all parts of the country. Our unstratified examples illustrated on Fig. 104.5–6 seem to belong to the southern milieu. The lower part of a typical Iron Age IIB juglet is represented on Fig. 104.7 (for an extended discussion of this type, with parallels, see A. Mazar and Panitz-Cohen 2001, 127, type JT 9).

A decorated sherd with dark brown/black stripes and concentric circles (Fig. 104.8), belongs to a Cypro-Archaic milieu. It is hard to relate it to particular type. If it belongs to Iron Age IIB, its presence would be of particular significance on account of the absence of Cypriot imports in Tell Qudadi's stratified Iron Age IIB assemblages. However, this piece may belong to a later period as well.

A complete storage jar (Fig. 105.1), belongs to a variant of Bikai's short torpedo storage jars from Type 5, represented widely in the late Iron Age IIB Stratum II of Tyre (Bikai 1978a, pls. II.2; IV.2, 6; for comparative example from Ashkelon, see the discussion in Stager, Master and Schloen 2011, 101–02, fig. 6.12). Three further examples on Fig. 105.2–4, belong to a more regular version of the torpedo jar, one of the most widespread Phoenician types along the Levantine coast during Iron Age IIB (Lehmann 1996, type 386, assemblages 1–2–3). All these storage jars correspond to our Type SJ1b (above), which unfortunately is mostly confined to rim fragments and upper body parts. A complete storage jar, depicted on Fig. 105.5, belongs to a well-known type of bag-shaped coastal jar (our Type SJ1a), which appears to be one of the most popular types along the southern coast and the adjacent lowlands during late Iron Age IIB and IIC (for extended discussions, see Zimhoni 1997, 245–47,

group IID; A. Mazar and Panitz-Cohen 2001, 97–98, type SJ 7a; and Stager, Master and Schloen 2011, 88–89). The base of the lamp, shown in Fig. 105.6, belongs to a well-known Judean type with a high and very thick disc base. Although it is usually assumed that this type belongs solely to Iron IIC assemblages, it might already have been produced during late Iron Age IIB. On the other hand, this kind of evidence can help in further attempts to differentiate between early and late horizons within Iron Age IIB.

Interestingly, the stratified assemblages of Tell Qudadi have not yielded either Cypriot imports or Judean finds (except for a single piece from Stratum IIIB, Type LP2, for the latter). On the other hand, the unstratified Iron Age IIB finds presented here feature, in addition to a Cypriot sherd (which may belong to the Iron Age IIB horizon), another lamp that clearly originates in Judah. The latter attribution might be correct concerning a couple of unstratified decanters, although their Judean provenance cannot be postulated with certainty.

In addition to the unstratified Iron Age IIB material, below we make some reference to the pottery of the Persian period. It should be emphasised that this came from unsecured (in some cases disturbed) loci and in the figures we have decided to present pottery types of considerable preservation in terms of size and with some chronological indicators. The so-called assemblage shows close resemblance to those of this era in nearby sites, such as Tell Abu Zeitun (Katz 2007), Tel Michal (Singer-Avitz 1989b; Marchese 1989) and Apollonia-Arsuf (Tal 1999), that were active in both the 5th and 4th centuries BC. Hence, Fig. 106 displays mostly imported (Attic, Cypriot and other) wares, plates, bowls and heavy bowls, while Fig. 107 shows mostly local (Phoenician and other) wares, juglets, cooking pot, lamps, storage jars and amphora toes. Attic ware types presented in Fig. 106, such as plates nos. 1, 6 (see, for example, Sparkes and Talcott 1970, 146–48, nos. 1035–1036, 1061–1076, fig. 10, pl. 37) and incurved rim bowls nos. 2–3 (see, for example, Sparkes and Talcott 1970, 131–32, nos. 826–842, fig. 8, pl. 33) are clearly 4th-century BC types. On the other hand, the Vicup shown at no. 4 and what may have been its short stem (no. 10) (see, for example, Sparkes and Talcott 1970, 93, nos. 434–438, fig. 5, pl. 20) belong to a type that can be dated to the second quarter of the 5th century BC. The lower body part of a plate or bowl with four palmettes in its centre, encircled by eight alternatively linked palmettes within a rouletting spiral (no. 5), is probably dated to the 4th century BC (see, for example, Sparkes and Talcott 1970, pls. 55–59 *passim*). The semi-fine ware red-slipped incurved rim bowl (no. 7) is a common type for the Persian period (see, for example, Tal 1999, 153–54, fig. 4.35.2–4, and p. 123 for comparanda). The coarse ware heavy bowl represented by its rim and upper body part (no. 8) and ring base (no. 9) is another common type for the period (see discussion in

Tal 1999, 97–99, 124, 154–55, figs. 4.11.7–16, 4.21.11–15, 4.35.13–18; see also Villing 2006, for a pan-eastern Mediterranean perspective). The band-painted fragment with a horizontal loop handle probably belongs to a Cypro-Classical jar (no. 11) given its thickness (for example Gjerstad 1960, 112–13, fig. 4.8–9).

As to Fig. 107, both the shallow-ribbed globular perfume juglet no. 1 (see, for example, Stern 1982, 122, type 2, yet normally appears with a flat or disk-shaped base) and the elongated dipper juglets nos. 2–3 (see, for example Stern 1982, 119, types 2a and 2b) are well-known types for the Persian period. The necked cooking pot with a plain (somewhat rounded) lip (no. 4) forms yet another common period type (Stern 1982, 100–02, type C), and so is the base and lower body part of the close wheel-made lamp (no. 5), which is characteristic of the latter part of the Persian period (see, for example, Stern 1982, 129, type B1; Tal 1999, 161). The rims of the basket handle jars (nos. 6–7) exhibit Persian period types, while the body part (no. 8) and bases/toes (nos. 9–12) are assigned to the Persian period based on their fabric (see, for example, Tal 1999, 100–01, 126–27, 158, figs. 4.13.1–6, 4.24, 4.39.1–11). The biconical body flat-shouldered Phoenician jars (nos. 13–15) apparently belong to 5th century BC types (see, for example, Tal 1999, 103–04, 128, 159, figs. 4.13.19–24, 4.26.1–9, 4.40.7–12), illustrating one of the most common types of transport amphora of the eastern Mediterranean (see in this respect Bettles 2003); while the toes of the imported amphora (nos. 16–17) most probably relate to Samian and Thasian types (see, for example, Whitbread 1995, 122–33; see also Dupont 1998, 164–69).

The Byzantine and mediaeval pottery exhibited in Fig. 108 is more selective and restricted to Gaza (no. 1) and Palestinian (no. 2) bag-shaped jars of apparently 4th–7th-century AD date, and a mediaeval (handmade) cooking pot (no. 3) of apparently mid-13th–15th-century AD date. While the appearance of mediaeval pottery is more random in the finds unearthed at the site, Byzantine pottery was more recurrent, especially fragments of large storage vessels (jars). The Byzantine and mediaeval pottery from the site originated in unsecured and disturbed loci. The architectural elements that may be related chronologically to the Byzantine pottery are discussed above (Chapter 2, Stratum III–II). Some of the Byzantine pottery recovered from the site may have originated in the so-called ‘Reading D’ site excavated by the late J. Kaplan (1971), located some 30 m to the east of the Iron Age fortress.

Appendix B: Pottery of the Chalcolithic Period and the Early and Middle Bronze Age

Ram Gophna and Yitzhak Paz

While processing the materials from the excavations in the scope of an on-going project of publication of the Iron Age fortress and its finds, some earlier pottery fragments were detected by Fantalkin and Tal. It was then that we could identify among the pottery Chalcolithic, Early and Middle Bronze Age sherds. These sherds hint at a rather continuous history of occupation at the site, from the Chalcolithic period through a considerable part of the Bronze Age.

The presence of early pottery in Tell Qudadi, a fairly large site located at the mouth of the Yarkon river, may enable us not only to insert the site into the regional settlement pattern of the Tel Aviv vicinity between the Chalcolithic period and the Middle Bronze Age, but also to assume that the existence of settlements at the tell during these periods has important implications on efforts to reconstruct maritime activity along the central Mediterranean coasts of Israel. It may be proposed that mariners roamed the sea and anchored at sites such as Jaffa and Tell Qudadi, and could also use the inland river connections to anchor in sites like Tel Gerisa, during both the Early and Middle Bronze Age.

The score of sherds that is presented here and discussed below is by no means a reflection of squatters or impermanent occupation levels that pre-dated the Iron Age fortress. On the contrary, they reflect the multi-period history of occupation at the site that was badly damaged by both Iron Age IIB building activities and the construction of the lighthouse and power station during the 1930s.

The pottery that is thus presented here reflects the following:

Chalcolithic (Fig. 112, at p. 180 below). A fragment of a rectangular ossuary, a large crude vessel that was decorated with a plastic 'knob' adjacent to its base. Equivalents are abundant at Chalcolithic burial sites such as Shoham North (van den Brink 2005, fig. 4.14).

Early Bronze Age (EBA) (Fig. 113.1–7, at p. 181 below). The few small fragments found to date are not sufficient for accurate dating within the ca. 1300 years of the EBA time span. That said, an effort is made to try and give the most reliable date.[15]

Bowls (Fig. 113.1–2). No. 1 is a plain shallow bowl made of orange clay that was found at both EBIB and EBII contexts at sites like Aphek (Beck 2000, fig. 8.6.10). No. 2 on the other hand, is a deep bowl, that was badly fired and its burnish on red slip may help in dating it to EBIII. Parallels may be sought at sites such as Yarmouth (de Miroschedji 1988, pl. 32.8).[16] Pithos body sherd (Fig. 113.3) – a fragment of a very

[15] The Early Bronze Age pottery finds and their social implications were already discussed in Gophna and Paz 2011.

[16] Among the finds collected by P.L.O. Guy and handed over to the Sukenik–Yeivin Expedition were a few EB III Khirbet Kerak sherds of red-black burnished kraters. They were analysed by Y. Goren head of the Laboratory for Comparative Microarchaeology of the Institute of

large pithos that had thick walls and was decorated with an applied plastic rope design. It cannot be accurately dated, although such vessels are more common in EBIII contexts where large well fired pithoi are abundant at various sites (see, for example, Bet-Yerah, Paz 2006, fig. 7.38.12). Amphoriskoi (Fig. 113.4–5) – very fragmentary though indicative sherds that belong to the neck and base of two amphoriskoi or small jugs. Equivalents can be found at settlement sites such as EBI 'En Esur (Yannai 2006, figs. 4.60, 14, 4.74, 16; 4.76, 13). Vat (Fig. 113.6) – the general shape of this vessel that was made of buff clay and was badly fired may help us to assign it to the EBIII. Parallels may be sought at Yarmouth (de Miroschedji 1988, pl. 35.1, 5) and Lachish (Tufnell 1958, pls. 62.290, 63.309). The lower body part of the storage jar (Fig. 113.7) was retrieved, and a redundant ledge handle is seen on its side. Since its rim is completely missing, we cannot date the vessel accurately, a general EBA date is therefore suggested.

Middle Bronze Age (MBA) (Fig. 114.1–5, at p. 182 below) – the five sherds described below may reflect a rather continuous history of occupation at Tell Qudadi during the first half of the 2nd millennium BC.

The bowl base (Fig. 114.1) seems to have belong to a red-slipped and burnished type in a tradition that was well known in MBIIA in sites such as Aphek (Beck 2000, fig. 8.12, 14). The krater (Fig. 114.2) may belong to the same horizon or a later one, MBIIB, as reported by Kletter (2006, 110, fig. 30.4, 5). Kletter has excavated a settlement site west of Tell Qasile, which was located less than 1 km south-east of Tell Qudadi. Kletter reports on two rather singular specimens and suggests parallels from Shechem and Shiloh (Kletter 2006, 110), thus dating them to MBIIB. This may apply to the cooking pot (Fig. 114.3) with an elongated everted rim. Wheel-made cooking pots of this type with a shorter rim were common in MBIIA sites (Kochavi and Yadin 2002, fig. 16.1–7), and late MBIIA and even MBIIB date may be attributed to vessels with elongated rims as well (see Beck 2000, fig. 10.1.23; Kletter 2006, fig. 30.3). The two storage jars from Tell Qudadi (Fig. 114.4–5) may reflect the same situation. A mere typological examination of both specimens may dictate an MBIIA dating to both, with Aphek and Gezer as sites where parallels are existed (Beck 2000, figs. 8.16.4, 10.8.1, 10.8.7, 10.23.4; Dever 1974, pl. 15.35). It is, however, important to note the difference between no. 4, high temperature fired coarse orange clay, and no. 5, low temperature fired gritty brown-buff clay. It is true that the latter may also be dated to MBIIB, as suggested by Kletter for some vessels that were found west of Tell Qasile (Kletter 2006, fig. 14.1).

Discussion

The pre-Iron Age pottery that was discussed above may, albeit scanty, cover a rather long period. It is thus clear that the earliest pottery found at Tell Qudadi, whether it belonged to a mortuary ground or an inhabited settlement, should be dated to the

Archaeology at Tel Aviv University and may have been manufactured somewhere in the Sharon coastal plain or in the Samarian hills. The mere possibility that Khirbet Kerak Ware was detected at Tell Qudadi is of importance, albeit that it was unregistered and unstratified, also in view of the fact that it was absent at Tel Gerisa.

Chalcolithic period. The ossuary located at the site marks Tell Qudadi as the western-most point in which Chalcolithic remains were found in the close vicinity of Tel Aviv and may hint at a connection with settlement sites such as the Kikar Hill (Giv'at Beth HaMitbacḥayim), Jabotinsky Street and the Exhibition Ground (for detailed discussion, see Gophna and Paz, in press). The scanty Bronze Age (EBA–MBA) sherds that remained from the razed Tell Qudadi enable us to use a working hypothesis that, albeit they reflect specific phases in each of these two periods, the sherds may testify to a contemporaneous existence of the Tell along with the periods and cultural sequences revealed at nearby Tel Gerisa. What may strengthen this assumption is the original estimated size of Tell Qudadi (*ca*. 0.25 ha) and the fact that it was not settled after the Iron Age IIB (the post-Iron Age remains were located at the fringes of the mound). Thus, the accumulation of the mound should contain substantive Bronze Age strata.

Tell Qudadi in the Scope of Early Bronze Age Maritime Activity

While examining the coastline of Israel in the EBA, one gains the impression that it was sparsely occupied by very few settlements (see Fig. 115, at p. 183 below). From north to south one may count the following: Tel Megadim on the Carmel coast (EBI–II, see Wolff 2000), Tell Qudadi (mainly EBIII), Jaffa (a few EBI–II sherds were collected during the 1999 excavation, examined by the authors), Palmaḥim (Giva'at Ha-'Esev) (EBIB occupation, see, for example, Gophna and Liphschitz 2009), and Ashkelon (substantial EBIII, pottery examined by the authors). While no anchorage devices were reported from any of the abovementioned sites, Raban (1998, 95) raised the possibility that a naturally protected harbour did exist at Ashkelon during EBII–III, taking into account lower sea levels during the 3rd millennium BC. This view stands in contrast with the one presented by Galili (2009, 17–19), who rejects any possibility of the presence of a harbour at Ashkelon and states that the ships were unloaded hundreds of metres west of the shore and their cargoes brought to the shore by boats.

The evidence derived from the EBA sherds found in Tell Qudadi presents rather surprising results. While EBI and EBII pottery was found in the vicinity of Tel Aviv at sites such as HaMasger Street, the Kikar Hill (Giv'at Beth HaMitbacḥayim), HaBashan Street, Rishpon-4 and Tel Gerisa (Gophna and Paz 2011), EBIII remains were found in rather large amount only at Tel Gerisa, located less than 5 km south-east of Tell Qudadi on the southern bank of the Yarkon. Furthermore, Tel Gerisa and Tell Qudadi stand in sharp contrast to the almost complete lack of EBIII coastal settlements north of Tel Poran (near Ashkelon). They may mark the northernmost border of the flourishing EBIII urban landscape that prevailed in the southern coastal plain and in the Judean Shephelah. EBIII Tel Gerisa and Tell Qudadi can be counted among the very few maritime stations along the coastline between Old Kingdom Egypt and North Levantine centres such as Sidon, Byblos, Tell Soukas and Qalaat er-Rus (in the latter two Khirbet Kerak Ware was abundant: see Lehmann 2002).

The picture becomes even clearer when one considers the abandonment of most urban settlements in the central coastal plain between the EBII and the EBIII (Getzov, Paz and Gophna 2001, 30–38). The scanty evidence for EBIII squatter phases at sites such as Tel Dalit, Tel Gimzo and Tel Bareqet (Gophna 1996, 161) may reflect this situation.

The EBA pottery that was collected from the excavations at Tel Gerisa (in both Sukenik's and Herzog's campaigns) indicates a continuous settlement between the late EBI and EBIII (Gophna and Paz 2011). There is a possibility that Tell Qudadi served as a marine outpost of Tel Gerisa for the purpose of maritime activity heading inland, at least during EBIII.

EBIII settlements such as Tell Sakan, Ashkelon and Tel Poran in the southern coastal plain belong to the abovementioned southern urban cluster. These sites must have engaged in maritime commercial activity that was conducted along the Canaanite Mediterranean coast and could have mediated between Egypt and Byblos and other Syrian coastal sites. The possibility that traits of Egyptian material culture (such as the Egyptian cubit that was the basic measuring unit in the EBIIIC palace at Tel Yarmouth: de Miroschedji 2006) were used as status symbols by the local Canaanite elite was discussed by Sowada (2009, 152–53). The need for an anchorage or a coastal outpost such as Tell Qudadi north to Tel Poran was therefore essential. Due to the lacuna in the data about EBIII occupation at Jaffa, the only firm evidence for a rather strong entity that prevailed during the EBIII in the Tel Aviv vicinity comes from Tel Gerisa and its possible coastal outpost at Tell Qudadi.

Tell Qudadi and the Central Coastal Settlements during the Middle Bronze Age

The role played by Tell Qudadi in the scope of maritime activity is even more valid for the beginning of the MBA (MBIIA), a period during which the coastal plain of Canaan became a flourishing urban landscape possessing many large and small settlements. The controversy about the location of possible points of anchorage, whether in river outlets (as stated by Raban 1998, 91–95) or only in naturally protected sea harbours (as suggested by Galili 2009, 19) cannot be settled. Raban noted that the relationship between anchorages/havens and river outlets is well established in Egyptian documents from the New Kingdom (Raban 1998, 91), and that trade relations between Egypt and the Lebanese/Syrian coast included the Canaanite settlements which traded agricultural products for prestige items, and employed river transport along the transversal streams of the coastal plain running towards the Mediterranean. Along these streams, various settlements were established during the MBA; some were large and fortified, being central political entities, others served as hinterland settlements or, when located on the coastline, as outpost anchorage stations, from the northernmost point, Tel Masrefot Yam, to the southernmost, Tell el-Ajjul (Raban 1998, 95–98). Raban went further and describes the artificial devices used for the preparation of anchorages that were found at sites such as Tel Nami, Tel Michmoret and Tel Dor (1998, 100–02).

It is sufficient to focus on the central coastal plain in order to examine closely the role of the Yarkon river settlements of Tel Aphek, Tel Gerisa and Tell Qudadi in the maritime and trading activities that prevailed along the Canaanite coast and eastwards during the MBA. About 6 km north of Tell Qudadi, MBIIB remains were discovered at Tel Michal, which was a considerably small unfortified settlement (some 0.25 ha in size), yet possibly an important maritime trading station (Herzog 1993a, 32).

The Yarkon was a considerable natural water route along which major settlements existed during the Bronze Age. It seems that the central city during the MBA was Tel Gerisa, fortified with a ramp and a glacis, commanding the Yarkon's outlet on the one hand and the way eastward to Tel Aphek on the other hand. It is also important to men-

tion Tel Qanah (some 0.25 ha in extent) west of Tel Aphek, located north of the Yarkon and encompassing MBIIB remains (Gophna and Ayalon 1998, site no. 97), which may have played some role in the westwards cultural dynamics that prevailed along the river. To this we may add that during the MBA, the fortifications of Jaffa were erected and the settlement became an urban maritime centre.

The exact relationship between all the sites situated along the central coastal plain with Tell Qudadi, and that of Tell Qudadi with the other Yarkon river settlements such as Tel Gerisa and Tel Aphek, is beyond the scope of the current study. Nevertheless, it is tempting to consider Tell Qudadi as a maritime outpost, commanding and controlling transport that headed towards Tel Gerisa and Tel Aphek.

Appendix C: Flint Tools

Shahar Krispin

The flint assemblage of Tell Qudadi is relatively small. It consists of eleven artefacts: ten arrowheads and a sickle blade. These are dated to various stages of the Neolithic period in the southern Levant. Their exact context in the site is unknown to us. Thus we will focus on their typology and chronology. Their drawings in Fig. 116 (at pp. 184–85 below) were produced by the computerised archaeology laboratory of the Institute of Archaeology of the HUJ (for the methodology, see Grosman, Smikt and Smilansky 2008). The assemblage is divided into two groups plus the additional isolated sickle blade, based on typology and chronology.

Group 1

The first group dates to the late Pre-Pottery Neolithic A (PPNA) and contains four arrowheads of the El-Khiam type (1–4) (Gopher 1994, 32–34). Although it is possible to find arrowheads of this type also in later assemblages, they appear in relatively small quantity or percentage in the assemblage (Nadel, Bar-Yosef and Gopher 1991). It seems therefore that it is not the case here. The presence of a PPNA archaeological material in this area is very rare (Gopher, Burian and Friedman 2005; Noy 1977) and these may hold an important contribution to the research of the Neolithic period.

Group 2

The second group dates to the early Pre-Pottery Neolithic B (PPNB) and contains six arrowheads, four of those are Helwan type (5–8) (Gopher 1994, 34–36) and two are Jericho type (9–10) (Gopher 1994, 36–37). This group is well known from several sites in the area excavated by the late J. Kaplan in the early 1950s (Kaplan 1958a; 1972).

The sickle blade (11) dates to the Pottery Neolithic (PN) period and it is likely to be attributed to the 'Yarmukian' Culture (Gopher and Gophna 1993; Kaplan 1958a; 1972).

The flint assemblage of Tell Qudadi, despite being modest, represents three stages of the Neolithic period in the Levant: late PPNA, early PPNB and PN (the late 8th, early 7th and 6th–5th millennia BC respectively). The last two stages are well known in the vicinity of the site (Kaplan 1958a; 1972). The first stage is less known in this area (Gopher, Burian and Friedman 2005; Noy 1977). If our assumption on dating the first group to the PPNA is correct, its implications can bear on the study of PPNA sites distribution. In respect to the small size of the assemblage, it is most likely being the result of a selective collecting by the original surveyors/excavators of the site, as may be inferred from the fact that the assemblage consists of arrowheads in the main, and lacks other tools or production waste that can be found in such Neolithic period site. Another fact that reinforces this assumption is that all items in the assemblage are undamaged or almost complete. It would thus be reasonable to assume that this assemblage does not represent a complete picture; it is hoped that further research will provide more information about the material culture of the Neolithic period in the area of the site.

Appendix D: Late Iron Age/Persian Period Earring

Benjamin Sass

Silver earring ('from debris'), field no. 480, IAA inv. 1946.63 (Fig. 117, at p. 186 below).

Description. An oblate spheroid, a six-tier inverted triangular pyramid (seven to two granules per face and tier), and a sphere are attached in this order to the bottom of an elongated hoop with its opening on the side. Examined on 24th April 2013 with the naked eye and under low magnification: no gaps were detected between the granules of the pyramid, so that it appears to be cast, with pseudo-granulation. Yet this is uncertain; it may be a false impression due to the oxidised state of the earring. Weight 3.0 g.

Dating. Probably 7th–5th centuries BC according to partial comparisons.

Discussion. No exact parallel with the pyramid as main element, but upside-down granule pyramids with a larger granule/sphere at the tip occur, in addition to other elements, on silver earrings from Cis- and Trans-Jordan and the southern Lebanon of the 7th–5th centuries: at Ketef Hinnom in Jerusalem (Barkay 1986, 27 English, 31 Hebrew); Tell el-Far'ah south, Tomb 754 (Petrie 1930, 15 and pl. 48); Amman, Meqabelein (Harding 1950a, 45 and pl. 15.4) and Umm Udheina (Hadad 1984, 56; Bienkowski 1991, 103); and Kamid el-Loz (Hachmann and Kuschke 1966, 64, fig. 20.6–7). Farther afield possibly on the reliefs of Assurnasirpal from Nimrud, where the material is probably intended to be gold (for example Maxwell-Hyslop 1971, fig. 126.12) and, in actual gold, at Kish (Quarantelli 1985, no. 228 on pp. 347 and 422) and Susa (Maxwell-Hyslop 1971, 228 and pl. 211) without the bottom sphere. Apparently not in Phoenician jewellery, which often displays, however, an upright pyramid of the most basic, four-granule form in silver 'basket' earrings, for example at Akhziv and Miqne (Dayagi-Mendels 2002, 58, fig. 4.10.17; Golani and Sass 1998, fig. 11.3), and in the West in gold, such as at Tharros with multiple-tier pyramids topped by a sphere (or rather larger granule) (for example Barnett and Mendelson 1987, pl. 84.6.15–16).

Appendix E: Roman Period Earring

Renate Rosenthal-Heginbottom

Silver earring ('from debris'), field no. 481, IAA inv. 1946.64 (Fig. 118, at p. 186 below).

Description. The silver earring has three parts: a disc-shaped rosette, a bar soldered to the lower section and six pendants suspended from the bar. The rosette was created in repoussé technique, the elements punched with a wooden or metal tool from the back. The flower is formed by eight tongue-shaped leaves decorated with a raised point; each leaf is surrounded by a ridge which produced a slightly concave inner surface. In the centre there is a round flat section with a raised point. The bar is cut to form a curved lower edge with six holes. In each of these there is a small ring holding the pendant: a narrow strip terminating in a pointed tip. Measurements: maximum diameter of disc 1.35 cm; size of bar 1.35 × 0.35 cm; length of pendants 1.2 cm; diameter of rings. The overall height of the earring is close to 3 cm. The size and the decorative elements help to define the piece as earring and not as brooch as suggested by the excavator (in the log book). A rare group of silver and bronze dress clasps from Syria has always an upper conical disc-shaped element; being used like a fibula the shape facilitated its fastening onto the cloth. A brooch of unknown provenance in the Damascus National Museum has a total height of 11.8 cm; the diameter of the disc is 5.5 cm (Cat. Berlin 1982, no. 199; Deppert-Lippitz 1987, 188, fig. 12). In addition there are half a dozen pieces acquired on the antiquities market (Hackens 1976, 73; Cat. Bonn 1981, 96–97 where Petra is wrongly stated as provenance, see Cat. Berlin 1982, no. 199). On the Palmyerene funerary stele this type of fibula occurs from the late 2nd century onwards (Deppert-Lippitz 1987, 190, figs. 1, 3).

Dating. Probably the 2nd and 3rd centuries AD.

Discussion. The earring from Tell Qudadi can be attributed to the Italo-Roman 'baretta' type, consisting of a disc, bar and pendants in countless variations (Pfeiler 1970, 19; Oliver 1996, 132). The type was conceived in the 1st century AD and popular and widespread during the 2nd and 3rd centuries; all extent examples are made of gold. Securely dated parallels for the earring-type include two 2nd-century contexts, the Eleutheropolis hoard and the Deb'aal hypogeum (Oliver 1996, 146, cat. 41–42), and 3rd-century burials in Jerusalem, Naḥal Raqafot and Nablus Road (Oliver 1996, 150, cat. 77–78; Rahmani 1976, 86–87; Hamilton and Husseini 1935, pls. 81.5, 82.2). The prominence of the earring type is underlined by a number of additional examples, mostly from burials: Jerusalem (Baramki 1932, pl. 14.4); Amman (Harding 1950b, pl. 27.230, 235); Heshbon (Geraty 1976, pl. 11.1); es-Salt (Hadidi 1979, pl. 55.1–2); and Tell Al-Aschari (Chehadeh 1972, no. 20). Mostly, there are three pendants. Four occur on two pairs of disc-and-bar earrings from a 3rd-century burial at Jerash (Naghawi 1989, 213, fig. 8.1) and on pelta-shaped earrings (Chehadeh 1972, 11–15, figs. 8–12 in the Damascus National Museum, from excavations in Djebel Sim'an). The only example with six pendants which has come to my notice is an elaborate crescent-shaped pair unearthed in Tafas, Hauran (Chehadeh 1972, 10, fig. 7); the pendants take the shape of small amphorae. All of these earrings are technically and

aesthetically more sophisticated; the disc is made in filigree open work and there is a central mount decorated with semi-precious stones or glass beads; the bar is ornate, sometimes in form of dolphins, and the pendants are decorated with pearls and glass beads (which are often missing). Baretta-type earrings are depicted on Palmyrene funerary reliefs (Deppert-Lippitz 1987, 180–81, fig. 1), while oval-shaped discs with pendants are shown on necklaces (Chehadeh 1987, 195–96, fig. 5). While the earring under discussion displays the features of the baretta-type it is a simple product made by a jeweller with restricted technological skills, either in a local workshop or by an itinerant craftsman. All ornamental elements are based on sheet metal and the techniques used are repoussé and cutting. Even so, the plain silver with its bright colour appeals to the eye; the neatly and delicately rendered details of the rosette are an additional attraction; the six closely set pendants will have tinkled when the bearer moved; and last, but not least, the possession of a precious metal object is an indication for the owner's social status.

Table 1: Description of the specific samples.

No.	Locus/ Reg. No.	Stratum	Vessel/ Object	Figure	Type	Petrographic description	Group	Provenance
1.	263/1	V	Bowl	72.1	BL3	Matrix: calcareous, foraminiferous and optically active. Silty fine quartz. Rich in limonite and haematite concentrations in a range of sizes. Temper: very rare quartz grains and foraminiferous chalk fragments.	Neogene marl	Lebanese coast
2.	327/1	V	Cooking pot	72.2	CP1	Matrix: silty, weak optical orientation. Temper: badly sorted quartz, chert, *kurkar*, shell, augite, zircone and feldspar.	*Ḥamra* and sand	Central coastal plain
3.	327/2	V	Cooking jug	72.3	CJ1	Matrix: silty, weak optical orientation. Temper: badly sorted quartz, chert, *kurkar*, shell, augite, zircone and feldspar.	*Ḥamra* and sand	Central coastal plain
4.	390/1	IV	Bowl	74.4	BL6a	Matrix: calcareous, silty, weak optical orientation. Silt: chalk, quartz, calcite and limestone. Very few silty opaque minerals. Temper: mainly chalk and well sorted quartz grains, accompanied by rounded balls of *terra rosa* and rare chert grains.	Rendzina and *terra rosa*	Northern Israel: Upper Galilee, Nazareth(?)
5.	392/1	IV	Bowl	74.5	BL7a	Matrix: calcareous, silty, weak optical orientation. Silt: chalk, quartz, calcite, limestone, opaque minerals. Temper: chalk and well sorted quartz grains, accompanied by *terra rosa* balls and rare chert grains.	Rendzina and *terra rosa*	Northern Israel: Upper Galilee, Nazareth(?)
6.	393/1	IV	Bowl	73.4	BL2	Matrix: calcareous, weak optical orientation. Silt: quartz and occasional chalk. Haematite and opaque minerals. Temper: quartz, foraminiferous chalk, microcline.	Taqiye marl and coastal sand	Northern Shephelah (Gezer area)

7.	395/1	IV	Bowl	74.1	BL4	Matrix: calcareous, silty and exhibits weak optical orientation. Silt: quartz, opaque particle, occasional limestone, plagioclase and zircon. Temper: angular to sub-angular quartz and bioclastic limestone.	Taqiye marl	Negev, Shephelah, Judean desert, Jordan valley, Western Gallilee, Lebanese Beqa, Lebanese coast
8.	396/1	IV	Bowl	73.3	BL2	Matrix: very silty and calcareous. Silt: quartz, hornblende, feldspars, zircon, mica, augite, tourmaline and very rare epidote, garnet and rutile. Temper: limestone, soil balls and quartz.	*Loess*	Negev, northern/ Shephelah
9.	397/1	IV	Heavy bowl	75.1	HB1a	Matrix: calcareous, silty, weak optical orientation. Silt: chalk, quartz, calcite and limestone. Very few silty opaque minerals. Temper: mainly chalk and well sorted quartz grains, accompanied by rounded balls of *terra rosa* and rare chert grains.	Rendzina and *terra rosa*	Northern Israel: Upper Galilee, Nazareth(?)
10.	391/1	IV	Heavy bowl	75.3	HB2a	Matrix: calcareous, very silty. Silt: quartz, hornblende, feldspars, zircon, mica and very rare epidote and rutile. Temper: mainly quartz, accompanied by soil balls and chert.	*Loess*	North-western Negev
11.	262/1	IV	Jug	76.1	JG1	Matrix: silty, non-calcareous, ferruginous. Silt: quartz. Temper: quartz, plagioclase.	*Terra rosa*	Upper Shephelah(?)
12.	398/1	IV	Juglet	76.2	JL1	Matrix: calcareous, foramenferous and optically active. Silt: fine quartz. Limonite and haematite concentrations. Temper: quartz and limestone.	Neogene marl	Lebanese coast
13.	399/1	IV	Juglet	76.3	JL2	Matrix: calcareous, foramenferous and optically active. Silt: fine quartz, zircon, plagioclase. Limonite and haematite concentrations. Temper: quartz grains and limestone fragments.	Neogene marl	Lebanese coast

No.	Locus/ Reg. No.	Stratum	Vessel/ Object	Figure	Type	Petrographic description	Group	Provenance
14.	341/1	IV	Cooking pot	77.4	CP4	Matrix: silty, non-calcareous, ferruginous. Silt: quartz, iron oxides, calcite and limestone particles. Temper: crushed calcite, quartz.	*Terra rosa* and crushed calcite	Upper Shephelah(?)
15.	355/1	IV	Cooking pot	77.1	CP1	Matrix: silty, weak optical orientation. Temper: badly sorted quartz, accompanied by chert, shell, zircone and feldspar.	*Ḥamra* and sand	Central coastal plain
16.	354/1	IV	Storage jar	78.9	SJ5	Matrix: very silty and calcareous. Silt: quartz, hornblende, feldspars, zircon, mica. Temper: quartz, limestone, chert.	*Loess*	Western Negev
17.	258/1	IV	Loom weight	79.1	LW1	Matrix: calcareous, very silty. Silty quartz, opaque minerals, plagioclase, calcite. Temper: quartz, *kurkar*, augite, zircon and feldspar.	*Kurkar*	Central coastal plain
18.	389/1	IIIB	Bowl	81.5	BL6a	Matrix: calcareous, silty, weak optical orientation. Silt: chalk, quartz, calcite and limestone. Temper: mainly chalk and well sorted coarse quartz grains, accompanied by rounded balls of *terra rosa*.	Rendzina and *terra rosa*	Rendzina and t*erra rosa*
19.	416/1	IIIB	Bowl	81.3	BL5a	Matrix: silty, non-calcareous, ferruginous. Silt: quartz, iron oxides and limestone particles. Temper: quartz, limestone, chert, *nari*.	*Terra rosa*	Upper Shephelah
20.	438/1	IIIB	Bowl	81.1	BL3	Matrix: calcareous, foramenferous and optically active. Silty quartz. Temper: quartz and micritic limestone.	Neogene marl	Lebanese coast
21.	438/2	IIIB	Bowl	81.13	BL12	Matrix: calcareous, silty, weak optical orientation. Silty quartz, opaque minerals, occasional limestone and plagioclase. Temper: angular to sub-angular quartz grains and bioclastic limestone.	Taqiye marl	Negev, Shephelah, Judean desert, Central Jordan valley, Western Gallilee, Lebanese Beqa, Lebanese coast

22.	223/1	IIIB	Heavy bowl	82.3	HB3a	Matrix: very silty and calcareous. Silt: quartz, hornblende, feldspars. Temper: chalk, quartz and *terra rosa* balls.	*Loess*	Shephelah
23.	360/1	IIIB	Jug	84.2	JG3	Matrix: calcareous, foramenferous and optically active. Silty quartz. Limonite and haematite concentrations. Temper: rare quartz grains and limestone.	Neogene marl	Lebanese coast
24.	363/1	IIIB	Jug	84.4	JG5	Calcareous matrix. Silt: mainly quartz, accompanied by hornblende, calcite, plagioclase, tuff and opaque minerals. Temper: quartz limestone, volcanoclastic tuffs and occasional plagioclase crystals.	Coastal sand and tuff	Coastal plain of the Carmel area
25.	385/1	IIIB	Jug	84.1	JG2	Matrix: overfired, milky. Silty quartz, opaque minerals. Temper: rare quartz grains and grains of milky calcareous rocks.	Neogene marl(?)	Lebanese coast(?)
26.	387/1	IIIB	Juglet	84.6	JL1	Matrix: overfired. Silt: fine quartz. Temper: very rare quartz and milky limestone.	Neogene marl(?)	Lebanese coast(?)
27.	187/2	IIIB	Cooking pot	86.4	CP4	Matrix: silty, non-calcareous, ferruginous. Silt: quartz, iron oxides, calcite. Temper: crushed calcite, quartz, soil ball.	*Terra rosa* and crushed calcite	Upper Shephelah(?)
28.	417/1	IIIB	Cooking pot	86.6	CP4	Matrix: silty, non-calcareous, ferruginous, isotropic properties. Silt: quartz, iron oxides, calcite. Temper: crushed calcite, quartz, soil ball.	*Terra rosa* and crushed calcite	Upper Shephelah(?)
29.	437/1	IIIB	Cooking pot	86.3	CP4	Matrix: silty, non-calcareous, ferruginous. Silt: quartz, calcite, iron oxides. Temper: crushed calcite, quartz.	*Terra rosa* and crushed calcite	Upper Shephelah(?)
30.	418/3	IIIB	Storage jar	88.1	SJ2a	Matrix: calcareous, weak optical orientation, opaque minerals. Silt: rare quartz, very rare plagioclase. Haematite and glauconite. Temper: quartz and foraminiferous chalk.	Taqiye marl and coastal sand	Northern Shephelah (Gezer?)

No.	Locus/ Reg. No.	Stratum	Vessel/ Object	Figure	Type	Petrographic description	Group	Provenance
31.	418/4	IIIB	Storage jar	88.5	SJ4	Matrix: optically active, calcareous and foramenferous. *Amphiroa Sp. Algae*. Silt: fine calcite, limestone, quartz and plagioclase. Spherical concentrations of limonite and haematite. Temper: quartz grains, micritic limestone, plagioclase and chert.	Neogene marl	Lebanese coast
32.	434/4	IIIB	Storage jar	87.3	SJ1b	Matrix: optically active, calcareous and foramenferous. Silt: calcite, limestone, quartz and plagioclase. Concentrations of limonite and haematite. Temper: quartz grains, micritic limestone, plagioclase and chert.	Neogene marl	Lebanese coast
33.	384/1	IIIB	Stand	88.8	ST1	Matrix: silty, weak optical orientation. Temper: badly sorted quartz, accompanied by chert, *kurkar*, shell, augite, zircone and feldspar.	*Ḥamra*	Central coastal plain
34.	361/1	IIIB	Lamp	88.10	LP2	Matrix: calcareous, fine, very rich in iron oxides. Temper: homogenous, well-sorted, rhomboid dolomite crystals.	Motza clay	Judean hills
35.	403/1	IIIB	Lamp	88.9	LP1	Matrix: calcareous, foramenferous and optically active. Silt: fine quartz. Limonite and haematite concentrations. Temper: quartz grains, micritic limestone.	Neogene marl	Lebanese coast
36.	435/1	IIIB	Loom weight	90.3	LW1	Matrix: calcareous, very silty, weak optical orientation. Silty quartz, opaque minerals, plagioclase, calcite. Temper: quartz, *kurkar* and feldspar.	*Kurkar*	Central coastal plain
37.	193/1	IIIA	Bowl	93.11	BL15	Matrix: very silty, non-calcareous, ferruginous. Silt: quartz, iron oxides, calcite. Temper: quartz, fossil shell.	*Terra rosa*	Upper Shephelah(?)

38.	252/1	IIIA	Bowl	93.7	BL7c	Matrix: silty, optical orientation. Temper: artificially sorted sand of quartz, chert, *kurkar*, shell, zircone and feldspar.	*Ḥamra*	Central coastal plain
39.	323/1	IIIA	Bowl	93.5	BL7b	Matrix: calcareous and very silty. Silt: quartz, hornblende, feldspars, zircon, mica, augite, garnet and rutile. Temper: quartz, limestone, fresh shell, chert, *kurkar*.	*Loess*	Western Negev
40.	323/5	IIIA	Bowl	93.9	BL6b	Matrix: very silty and calcareous. Silt: quartz, hornblende, feldspars, zircon, mica, tourmaline epidote. Temper: quartz, limestone, fresh shell, chert.	*Loess*	Western Negev
41.	335/1	IIIA	Bowl	93.1	BL5b	Matrix: silty, optical orientation. Temper: badly sorted quartz, chert, *kurkar*, shell, augite, zircone and feldspar. Thick slip layer.	*Ḥamra*	Central coastal plain
42.	334/1	IIIA	Heavy bowl	94.3	HB3b	Matrix: calcareous, very silty. Silt: quartz, hornblende, feldspars, zircon, mica. Temper: quartz, limestone, chert, fresh shell.	*Loess*	North-western Negev
43.	293/1	IIIA	Jug/ Decanter	96.1	JG7a	Matrix: very silty, non-calcareous, ferruginous, isotropic properties. Silt: quartz, iron oxides, calcite and limestone. Temper: quartz, limestone, *nari*, chalk, chert.	*Terra rosa*	Upper Shephelah
44.	359/1	IIIA	Bottle	97.2	BT1	Overfired. Matrix: milky (greenish-white), silty, undifferentiated marl. Silty quartz. Temper: quartz, vegetal material.	Marl-undifferentiated	Unknown
45.	280/1	IIIA	Table amphora	97.3	TA1	Matrix: silty, ferrugunous. Silty quartz, opaque minerals, calcite, limestone. Temper: mainly quartz, accompanied by straw, limestone, *nari*, chalk and fossil shell.	*Terra rosa* and chopped straw	Upper Shephelah
46.	308/3	IIIA	Cooking pot	99.4	CP4	Matrix: silty, optical orientation. Temper: badly sorted quartz, straw, chert, *kurkar*, shell, augite, zircone and feldspar.	*Ḥamra*, coastal sand and straw	Central coastal plain

No.	Locus/ Reg. No.	Stratum	Vessel/ Object	Figure	Type	Petrographic description	Group	Provenance
47.	336/4	IIIA	Cooking pot	98.6	CP4	Matrix: very silty, non-calcareous, ferruginous, isotropic properties. Silt: quartz, iron oxides, calcite, limestone. Temper: crushed calcite, quartz, *nari*, chert.	*Terra rosa* and crushed calcite	Upper Shephelah(?)
48.	328/2	IIIA	Cooking jug	99.6	CJ1	Matrix: silty, optical orientation. Temper: badly sorted quartz, chert, *kurkar*, shell, augite, zircone and feldspar.	*Ḥamra* and sand	Central Coastal Plain
49.	336/1	IIIA	Cooking jug	99.5	CJ1	Matrix: very silty, non-calcareous, ferruginous. Silt: quartz, iron oxides, calcite and limestone. Temper: crushed calcite, quartz, grog, *nari*, soil ball, fossil shell.	*Terra rosa*, crushed calcite, grog and soil balls	Upper Shephelah(?)
50.	193/2	IIIA	Storage jar	100.8	SJ2b	Matrix: very silty, non-calcareous, ferruginous. Silt: quartz, iron oxides, calcite. Temper: quartz, fossil shell.	*Terra rosa*	Upper Shephelah(?)
51.	324/4	IIIA	Hole-mouth jar	100.13	HM2	Matrix: calcareous, foramenferous (up to 3%), optically active. Silt: fine calcite, limestone, quartz and plagioclase (>1%). Typical spherical concentrations of limonite and haematite. Temper: mainly good sorted quartz (10%), micritic limestone (3%), very rare shell and plagioclase. *Amphiroa Sp. Algae*.	Neogene marl	Lebanese coast
52.	310/1	IIIA	Loom weight	101.1	LW1	Matrix: very silty, calcareous, weak optical orientation. Silty quartz, opaque minerals, plagioclase, calcite and zircon. Temper: quartz, *kurkar*, shell.	*Kurkar*	Central coast
53.	310/3	IIIA	Loom weight	101.2	LW1	Matrix: calcareous, very silty, weak optical orientation. Silty quartz, opaque minerals, plagioclase, calcite. Temper: quartz, *kurkar* and feldspar.	*Kurkar*	Central coast

54.	310/2	IIIA	Loom weight	102.1	LW1	Matrix: silty, weak optical orientation. Temper: badly sorted quartz, accompanied by chert, *kurkar*, shell, augite.	*Ḥamra*	Central coast
55.	388/1	III–II (unstratified)	Juglet	-	-	Matrix: optically active, calcareous and foramenferous. Silt: fine calcite, limestone, quartz and plagioclase. Spherical concentrations of limonite and haematite. Temper: quartz grains, micritic limestone, bone, very rare shell, plagioclase and chert. *Amphiroa Sp. Algae*.	Neogene marl	Lebanese coast
56.	279/1	III–II (unstratified)	Storage jar	107.13	-	Matrix: calcareous, weak optical orientation. Silt: quartz and occasional chalk. Haematite and opaque minerals. Temper: quartz, foraminiferous chalk, microcline.	Taqiye marl and coastal sand	Northern Shephelah (Gezer?)
57.	195/1	Unstratified	Chalice	-	-	Matrix: silty, ferrugunous, strong optical orientation. Silty quartz, opaque minerals, calcite, limestone. Temper: mainly quartz, accompanied by limestone, *nari*, chalk and fossil shell.	*Terra rosa*	Upper Shephelah
58.	484/1	Unstratified	Chalice	104.4	-	Matrix: silty, ferrugunous, strong optical orientation. Silty quartz, opaque minerals, calcite. Temper: mainly quartz, accompanied by straw, limestone, *nari*, chalk and fossil shell.	*Terra rosa* and straw	Shephelah
59.	350/1	Unstratified	Jug	-	-	Matrix: isotropic. Temper: quartz, vegetal material, feldspar.	Marl-undifferentiated	Unknown

Table 2: Description of potential raw material samples.

Number	Place	Type	Petrographic description	Plasticity, shrinkage and firing behavior	Petrographic Group
Rm 1	Fortress	Topsoil, yellowish soil	Calcareous, silty (<5%). Silt: quartz, calcite, opaques. Temper: rounded to sub-rounded quartz (<20%), *kurkar* (>10%), shell, chert, plagioclase, limestone opaques.	Bad plasticity. Drying cracks. Firing cracks.	*Kurkar*
Rm 2 soil	Fortress	Horizon B (0.20m), yellowish-brown soil	Mixture of calcareous and non-calcareous clays, very silty (10%). Silt: calcite, quartz, opaque minerals, plagioclase, limestone. Badly sorted temper: bimodal sub-angular to rounded quartz (<10%), *kurkar* (<10%), *ḥamra* ball (<3%), limestone, shell, chert, opaque. Soil balls: non-calcareous and calcareous, very silty (up to 10%); rare quartz temper (up to 75μm), mica, tourmaline.	Medium plasticity. Good firing behavior. No cracks.	*Ḥamra* and *kurkar*. (Material of loom weights 310/1 and 310/2).
Rm 3-sand	The Yarkon river, 150 m east to the site	Riverbed, fine sand	Very rare silt (1%). Fine sand 70–450 μm, mainly 200–400 μm. Quartz (90% of the groundmass): rounded (30%), sub-rounded (40%), sub-angular (30%). Accompanied by plagioclase, microcline, limestone, fossil shell, calcite, *kurkar*, epidote, chert.	Sand	Recent sea sand
Rm 4	50 m north-east of the site	*Ḥamra* (extremely silty)	Non-calcareous clay, very silty (>15%). Silt: quartz, opaque minerals, plagioclase. Temper: bimodal sub-angular to rounded quartz (<15%), shell, chert, opaque. Mica, tourmaline. Up to 30% silt and temper.	Absolutely non-plastic before sieving or levigation. Medium plasticity after sieving and levigation.	*Ḥamra*
Kurkar	Fortress	Base of the fortress, yellowish rock	Calcareous, fossiliferous. Silt (5%): quartz, opaque. (25%): good sorted sub-angular to sub-rounded quartz (two groups: 62–230 μm and large sub-angular to sub-rounded- up to 900 μm). Shell, zircon, plagioclase, and opaque particles.	Rock	*Kurkar*

Stratigraphy According to Squares Excavated in the Fortress of Tell Qudadi

Stratum	Description	Square C4	Square C5	Square C6	Square C7	Square D5	Square D6	Square D7
UNSTRATIFIED [Avigad's I]	Top Soil			6–8, 69–73, 157, 165, 243	51–61, 83–89, 102–106, 164, 199–201	65, 95–101, 289–290, 299	39–49, 63–64, 78, 92–94, 110–118, 205, 270, 284	167, 271–272
UNSTRATIFIED [Avigad's II]	Dark Grey Fill (Mixed Iron Age II–Persian Pottery)					121–124, 152–153, 162, 176, 297, 300–303, 312–322, 329, 344–348, 350–352, 445–448	79, 135–138, 146–151, 291, 294–296, 304–306	119–120, 171–173, 236–239, 253, 279, 282, 330, 333
UNSTRATIFIED [Avigad's III–II]	Brownish-Grey Fill (Mixed Iron Age II–Persian Pottery)		80, 383(?), 390–401	158	128–131, 141–145, 163–166, 183–186, 202–204	366–382, 404–405, 411–414, 430–433, 463–465	159, 170, 349, 454(?)	
IIIA [Avigad's III]	Second Destruction				246–248	359	190–192, 293, 298, 307–311	193, 206–213, 250–253, 259–261, 280–281, 285–286, 293, 308–311, 323–326, 328, 331–332, 334(?)–338

Stratum	Description	Square C4	Square C5	Square C6	Square C7	Square D5	Square D6	Square D7
IIIB [2nd Architectural Phase]	Brown Fill		402–403(?)	214(?)	133–134(?), 181–182(?), 482	218–219, 356–357, 360–364, 384–389, 416–425, 434–438	168–169, 187–189, 194(?), 230–235, 409–410	222–225(?)
IV [1st Architectural Phase]	First Destruction		390–400					257–258, 262, 288, 339–340(?), 341–342, 354–355, 470
V	Foundations						263–264, 358	327

Loci represent unified baskets according to documentation, stratigraphy re-analysing and finds screening.

Stratigraphy According to Squares Excavated adjacent to the Fortress of Tell Qudadi

Description	Square C8	Square D4	Square E6	Square E7
Top-Soil	50, 62, 90–91, 107–109, 179–180, 229			
Mixed Fill I	139–140, 244–245, 353	459–461, 467–469	265, 269, 278, 283,287, 406–408, 415, 426–429, 440–441, 442–444, 449–453, 462	278(?), 426(?)
Mixed Fill II	292(?), 480, 481(?)			479

Loci represent unified baskets according to documentation, stratigraphy re-analysing and finds screening.

Stratigraphy According to Areas Excavated in Tell Qudadi

Area A (Squares E9 [north] and F9) (North of P.L.O. Guy's Excavations)

Description	Square E9 (north)	Square E9/F9	Square F9
Top-Soil	1–2	9, 125	154, 483(?)
Mixed Fill I	27–28	132, 155–156, 174	160–161, 484(?)
Mixed Fill II		220–221(?)	175, 195–197, 485(?)
Mixed Fill III	276–277		254, 256, 266, 471–478, 486–487(?)

Loci represent unified baskets according to documentation, stratigraphy re-analysing and finds screening.

Stratigraphy According to Areas Excavated in Tell Qudadi

Area B (Squares E8 and E9 [south])
(South of P.L.O. Guy's Excavations)

Description	Square E8	Square E8/E9	Square E9 (south)
Top-Soil	68, 74	3–5, 10–12, 29–31, 66–67, 198, 228, 242	75, 77
Mixed Fill	81–82		76, 126–127, 177–178
Sand		273–275	

Loci represent unified baskets according to documentation, stratigraphy re-analysing and finds screening.

Stratigraphy According to Areas Excavated in Tell Qudadi

Area C (Squares C6, C7 and C8)
(Fortress [Squares C6 and C7] and Surrounding Area [Square C8])

Stratum	Description	Square C6	Square C7	Description	Square C8
UNSTRATIFIED [Avigad's I]	Top-Soil	6–8, 69–73, 157, 165, 243	51–61, 83–89, 102–106, 164, 199–201	Top-Soil	50, 62, 90–91, 107–109, 179–180, 229
UNSTRATIFIED [Avigad's II]	Dark Grey Fill (Mixed Iron Age II–Persian Pottery)			Mixed Fill I	139–140, 244–245, 353
UNSTRATIFIED [Avigad's III–II]	Brownish-Grey Fill (Mixed Iron Age II–Persian Pottery)	158	128–131, 141–145, 163–166, 183–186, 202–204	Mixed Fill II	292(?), 480, 481(?)
IIIA [Avigad's III]	Second Destruction		246–248		
IIIB [2nd Architectural Phase]	Brown Fill	214(?)	133–134(?), 181–182(?), 482		
IV [1st Architectural Phase]	First Destruction				
V	Foundations				

Loci represent unified baskets according to documentation, stratigraphy re-analysing and finds screening.

Stratigraphy According to Areas Excavated in Tell Qudadi

Area D (Square F2)
(Outside the Fortress)

Description	Square D3/D4	Square F2
Top-Soil		14–16, 20–26, 249(?)
Fill (Mixed Iron Age II–Early Islamic Pottery)	488–493	267–268(?)

Stratigraphy According to Areas Excavated in Tell Qudadi

Area E (Squares D6, D7, E6 and E7)
(Fortress [Squares D6 and D7] and Surrounding Area [Square E6])

Stratum	Description	Square D6	Square D7	Description	Square E6	Square E7
UNSTRATIFIED [Avigad's I]	Top-Soil	32–49, 63–64, 78, 92–94, 110–118, 205, 270, 284	167, 271–272			
UNSTRATIFIED [Avigad's II]	Dark Grey Fill (Mixed Iron Age II–Persian Pottery)	79, 135–138, 146–151, 291, 294–296, 304–306	119–120, 171–173, 236–239, 253, 279, 282, 330, 333	Mixed Fill	265, 269, 278, 283,287, 406–408, 415, 426–429, 440–441, 442–444, 449–453, 462	278(?), 426(?)
UNSTRATIFIED [Avigad's III–II]	Brownish-Grey Fill (Mixed Iron Age II–Persian Pottery)	159, 170, 349, 454(?)				479
IIIA [Avigad's III]	Second Destruction	190–192, 293, 298, 307–311	193, 206–213, 250–253, 259–261, 280–281, 285–286, 293, 308–311, 323–326, 328, 331–332, 334(?)–338			
IIIB [2nd Architectural Phase]	Brown Fill	168–169, 187–189, 194(?), 230–235, 409–410	222–225(?)			
IV [1st Architectural Phase]	First Destruction		257–258, 262, 288, 339–340(?), 341–342, 354–355, 470			
V	Foundations	263–264, 358	327			

Stratigraphy According to Areas Excavated in Tell Qudadi

Area F (Squares C5, D4 and D5)
(Fortress [Square C5 and D5] and Surrounding Area [Square D4])

Stratum	Description	Square C5	Square D5	Description	Square D4
UNSTRATIFIED [Avigad's I]	Top-Soil		65, 95–101, 289–290, 299		
UNSTRATIFIED [Avigad's II]	Dark Grey Fill (Mixed Iron Age II–Persian Pottery)		121–124, 152–153, 162, 176, 297, 300–303, 312–322, 329, 344–348, 350–352, 445–448	Mixed Fill	459–461, 467–469
UNSTRATIFIED [Avigad's III–II]	Brownish-Grey Fill (Mixed Iron Age II–Persian Pottery)	80, 383(?), 390–401	366–382, 404–405, 411–414, 430–433, 463–465		
IIIA [Avigad's III]	Second Destruction		359		
IIIB [2nd Architectural Phase]	Brown Fill	402–403(?)	218–219, 356–357, 360–364, 384–389, 416–425, 434–438		
IV [1st Architectural Phase]	First Destruction	390–400			
V	Foundations				

VARIA

Sherds Collected after Bulldozer's work:
Squares F7/G7: 17–18; Square F7: 343

Area to the north-east of Area A (within the Reading Power Station):
Square G9: 365; Square G10: 19

Section(?):
Squares F5/F6: 455–458

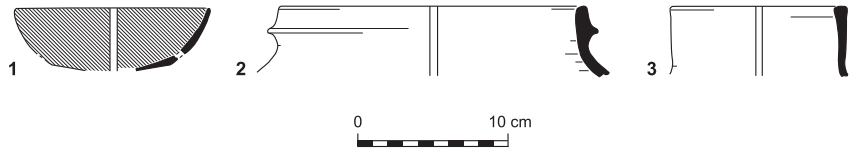

Fig. 72. Stratum V pottery.

No.	Vessel	Locus / Reg. No.	Type	Description
1*	Bowl	263/1	BL3	Fine 'Samaria' ware (buff, red slip).
2*	Cooking pot	327/1	CP1	
3*	Cooking jug	327/2	CJ1	

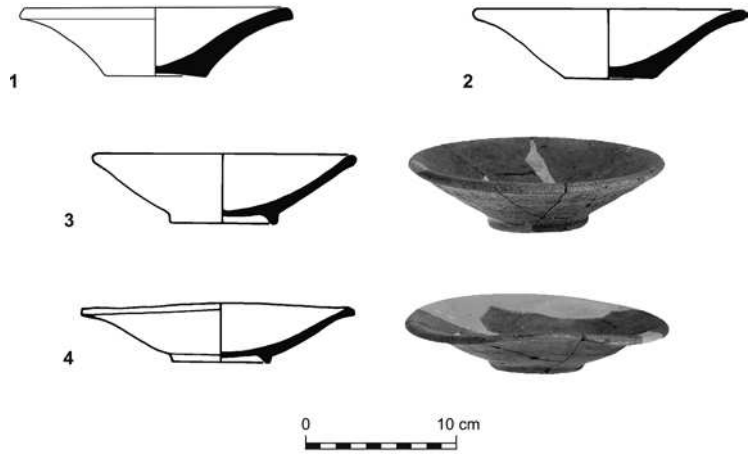

Fig. 73. Stratum IV pottery: bowls.

No.	Vessel	Locus / Reg. No.	Type
1	Bowl	394/1	BL1
2	Bowl	400/1 (IAA 46.59)	BL1
3*	Bowl	396/1 (IAA 46.56)	BL2
4*	Bowl	393/1	BL2

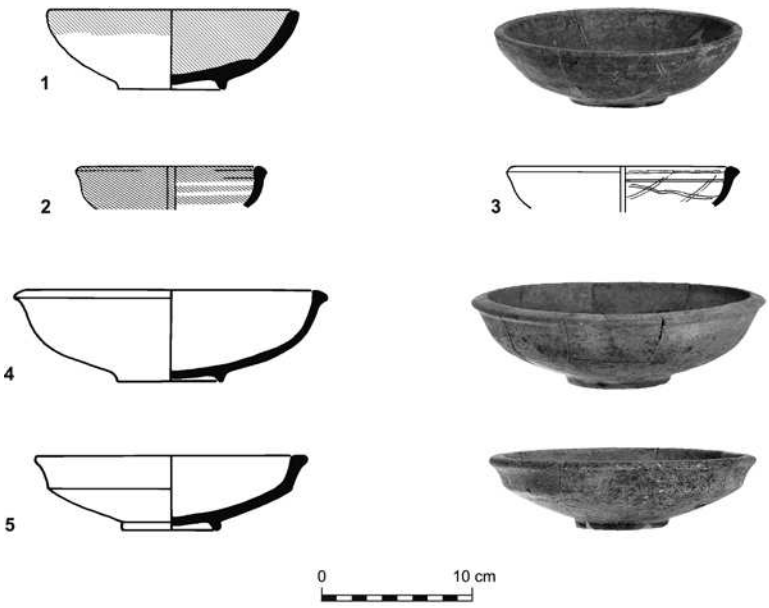

Fig. 74. Stratum IV pottery: bowls (cont.).

No.	Vessel	Locus / Reg. No.	Type	Description
1*	Bowl	395/1 (IAA 46.55)	BL4	
2	Bowl	342/6	BL5a	
3	Bowl	342/7	BL5a	Hand-burnished
4*	Bowl	390/1 (IAA 46.52)	BL6a	
5*	Bowl	392/1 (IAA 46.54)	BL7a	

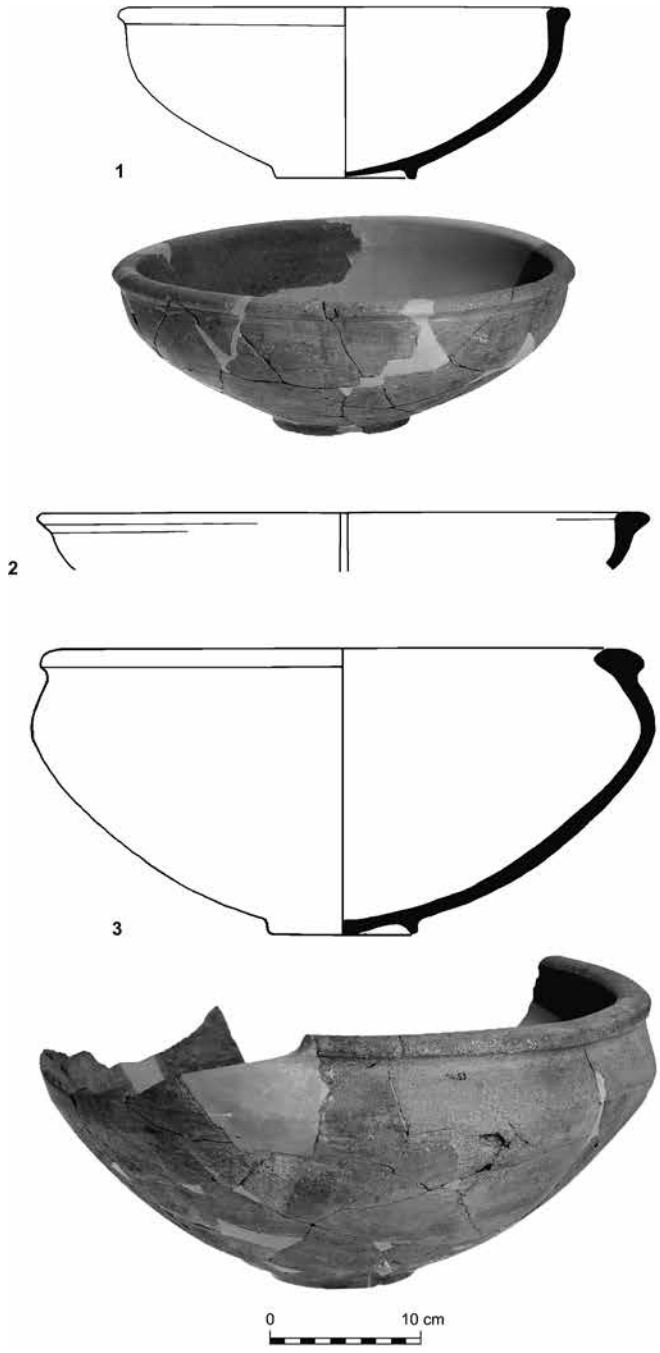

Fig. 75. Stratum IV pottery: heavy bowls.

No.	Vessel	Locus / Reg. No.	Type
1*	Heavy bowl	397/1 (IAA 46.57)	HB1a
2	Heavy bowl	470/2	HB1a
3*	Heavy bowl	391/1 (IAA 46.53)	HB2a

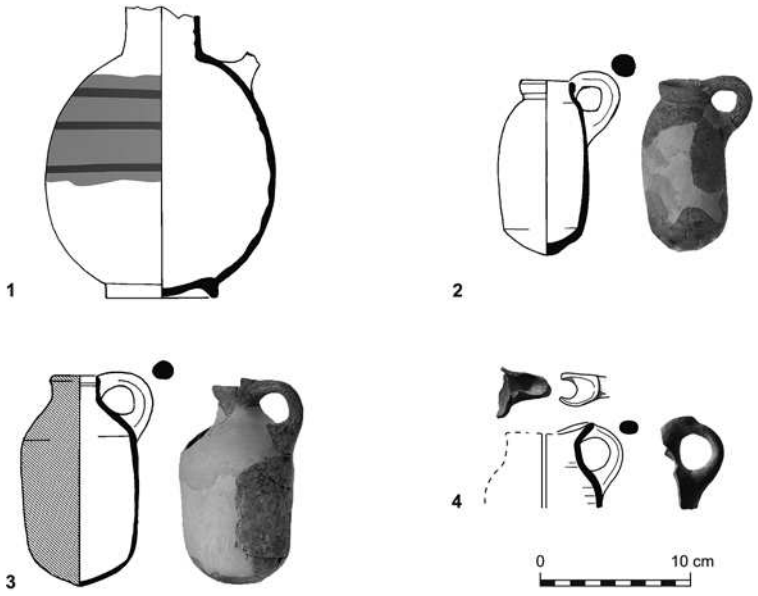

Fig. 76. Stratum IV pottery: jugs and juglets.

No.	Vessel	Locus / Reg. No.	Type	Description
1*	Jug	262/1	JG1	
2*	Juglet	398/1	JL1	
3*	Juglet	399/1 (IAA 46.58)	JL2	
4	Juglet	399/2	AJ1	Anatolian (?)

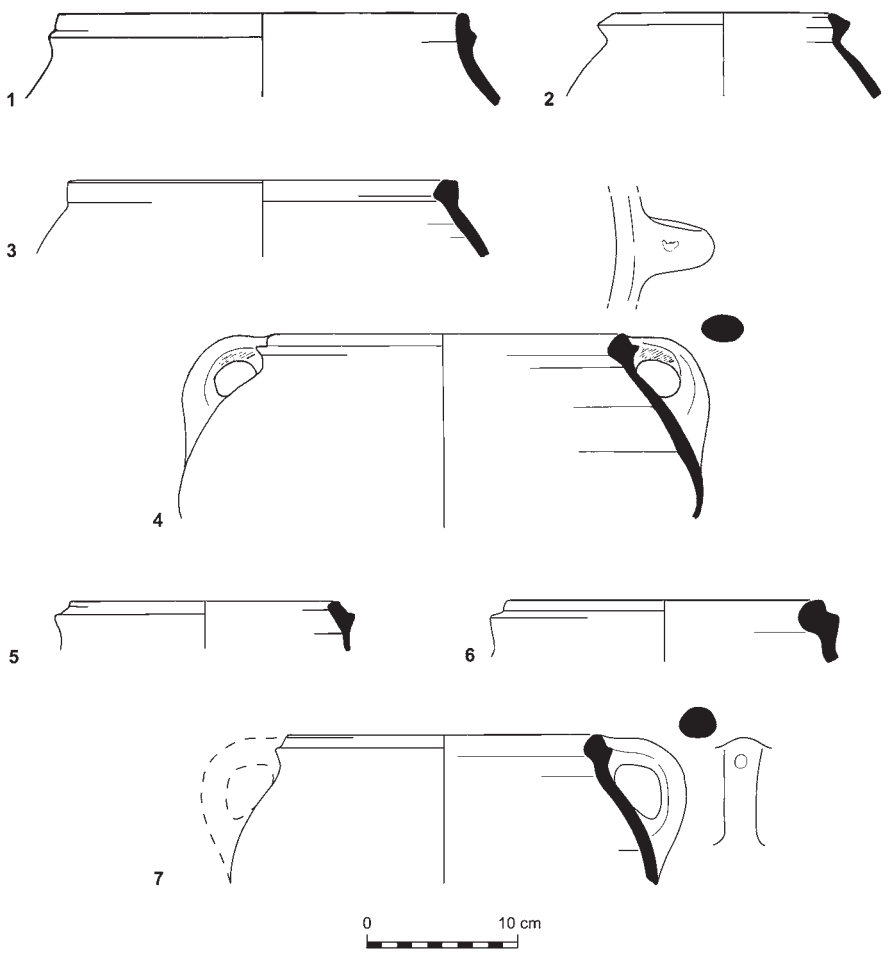

Fig. 77. Stratum IV pottery: cooking pots.

No.	Vessel	Locus / Reg. No.	Type	Description
1*	Cooking pot	355/1	CP1	
2	Cooking pot	288/1	CP2	
3	Cooking pot	470/3	CP3	
4*	Cooking pot	341/1	CP4	Cavity on handle
5	Cooking pot	288/2	CP4	
6	Cooking pot	355/2	CP4	
7	Cooking pot	340/2	CP4	Cavity on handle

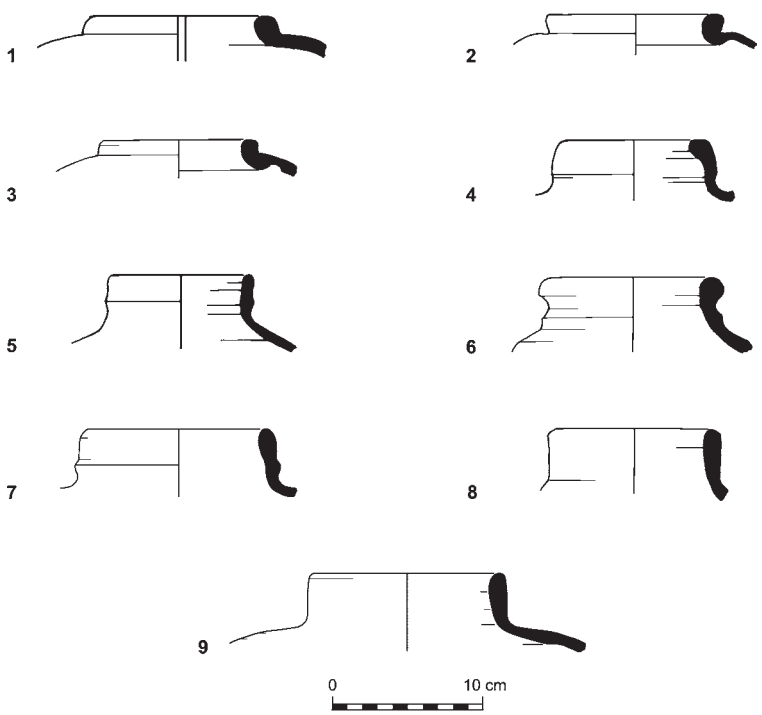

Fig. 78. Stratum IV pottery: storage jars.

No.	Vessel	Locus / Reg. No.	Type
1	Storage jar	354/4	SJ1a
2	Storage jar	342/4	SJ1a
3	Storage jar	342/3	SJ1a
4	Storage jar	354/3	SJ2a
5	Storage jar	354/2	SJ3
6	Storage jar	288/3	SJ4
7	Storage jar	342/2	SJ2a
8	Storage jar	342/1	SJ5
9*	Storage jar	354/1	SJ5

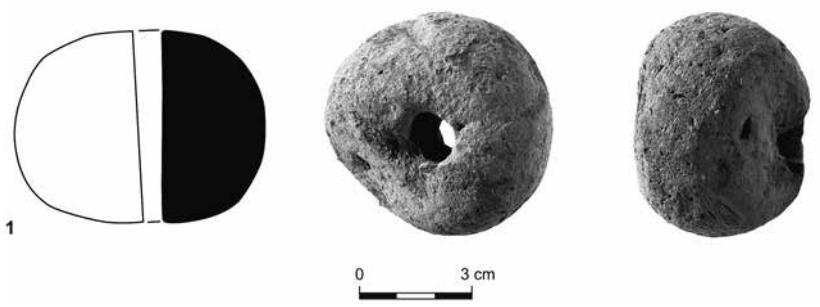

Fig. 79. Stratum IV pottery: loom weights.

No.	Vessel	Locus / Reg. No.	Type	Description
1*	Loom weight	258/1	LW1	Nearly complete. Weight: 200.24 g; height 5.1 cm; diam. 6.5 cm; hole diam. 0.4–0.6 cm

Fig. 80. Stratum IV pottery: selective assemblage.

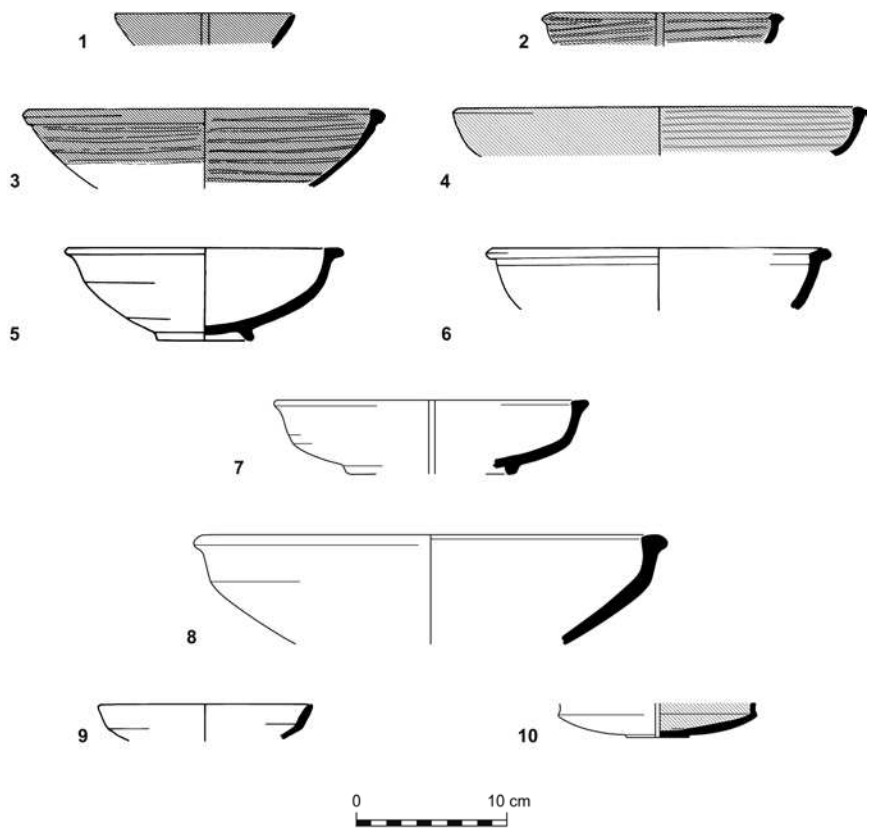

Fig. 81. Stratum IIIB pottery: bowls.

No.	Vessel	Locus / Reg. No.	Type	Description
1*	Bowl	438/1	BL3	Fine 'Samaria' ware
2	Bowl	419/2	BL5a	Wheel-burnished
3*	Bowl	416/1	BL5a	Wheel-burnished
4	Bowl	189/1	BL5a	Wheel-burnished
5*	Bowl	389/1	BL6a	
6	Bowl	438/4	BL6a	
7	Bowl	422/1	BL7a	
8	Bowl	364/1	BL7b	
9	Bowl	438/3	BL8	
10	Bowl	410/1	BL9	

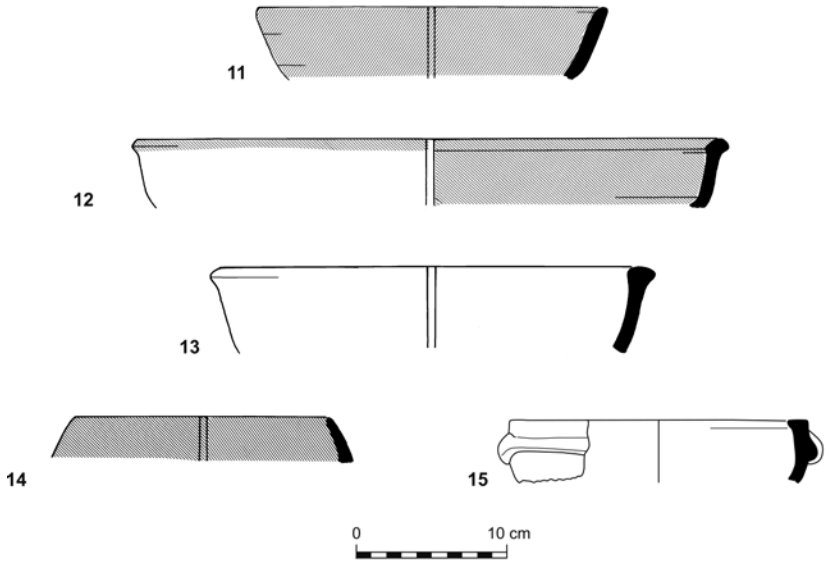

Fig. 81. Stratum IIIB pottery: bowls (cont.).

No.	Vessel	Locus / Reg. No.	Type	Description
11	Bowl	419/1	BL10	Coarse 'Samaria' ware
12	Bowl	1981/	BL11	Coarse 'Samaria' ware
13*	Bowl	438/2	BL12	
14	Bowl	438/5	BL13	Coarse 'Samaria' ware
15	Bowl	231/1	BL14	

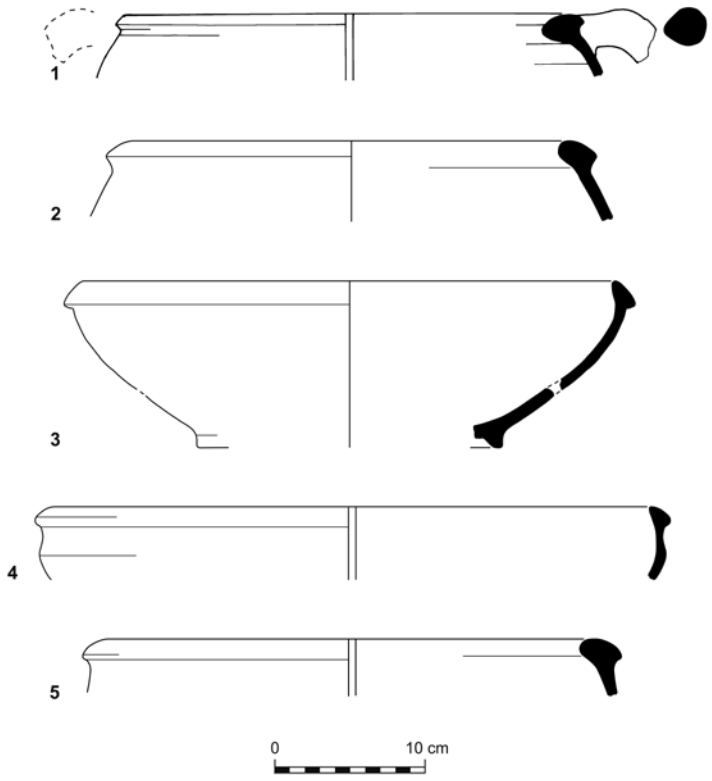

Fig. 82. Stratum IIIB pottery: heavy bowls.

No.	Vessel	Locus / Reg. No.	Type
1	Heavy bowl	437/2	HB2b
2	Heavy bowl	420/5	HB2a
3*	Heavy bowl	223/1	HB3a
4	Heavy bowl	134/1	HB4
5	Heavy bowl	437/3	HB2a

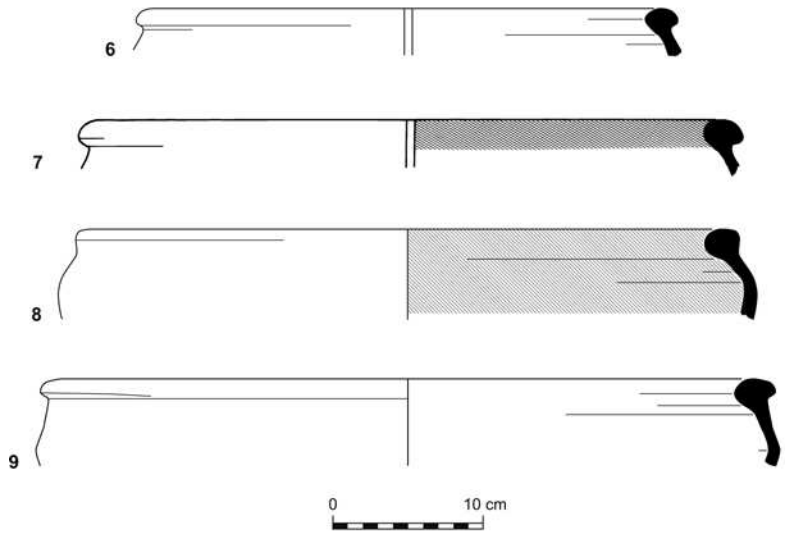

Fig. 82. Stratum IIIB pottery: heavy bowls (cont.).

No.	Vessel	Locus / Reg. No.	Type
6	Heavy bowl	364/7	HB2a
7	Heavy bowl	194/1	HB2c
8	Heavy bowl	418/5	HB2c
9	Heavy bowl	438/7	HB2a

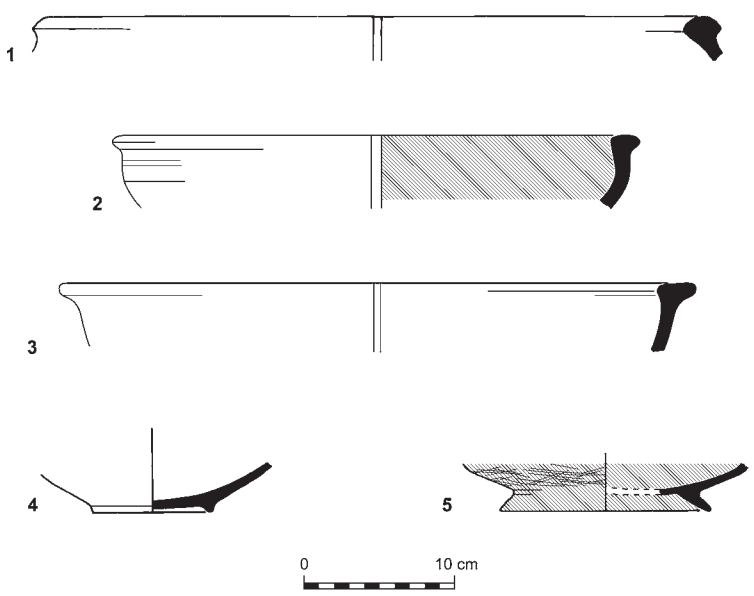

Fig. 83. Stratum IIIB pottery: heavy bowls (cont.).

No.	Vessel	Locus / Reg. No.	Type	Description
1	Heavy bowl	438/6	HB2a	
2	Heavy bowl	224/2	HB1a	
3	Heavy bowl	224/1	HB1b	
4	Heavy bowl (base)	436/1	--	Not found
5	Heavy bowl (base)	168/1	--	Burnished

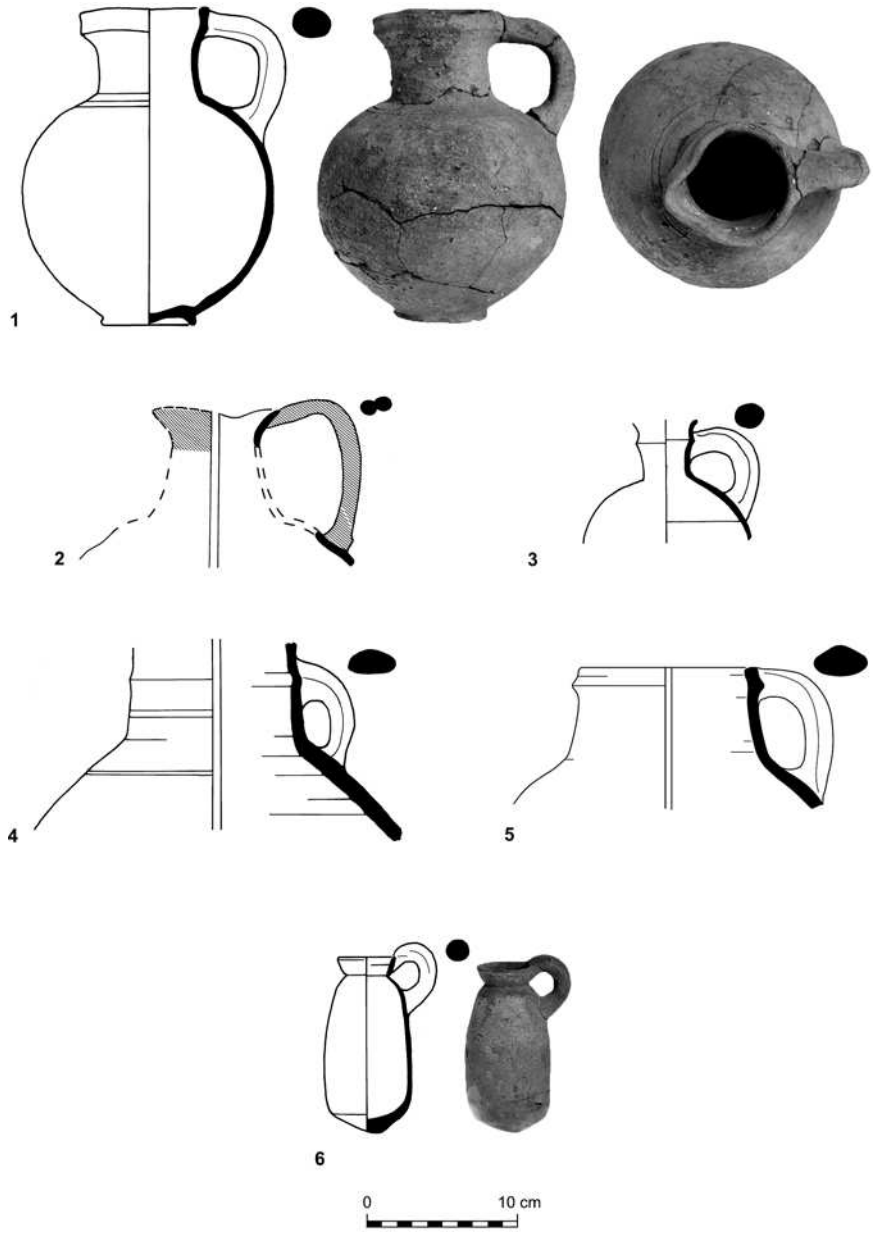

Fig. 84. Stratum IIIB pottery: jugs and juglets.

No.	Vessel	Locus / Reg. No.	Type
1*	Jug	385/1	JG2
2*	Jug	360/1	JG3
3	Jug	234/1	JG4
4*	Jug	363/1	JG5
5	Jug	189/1	JG6
6*	Juglet	387/1	JL1

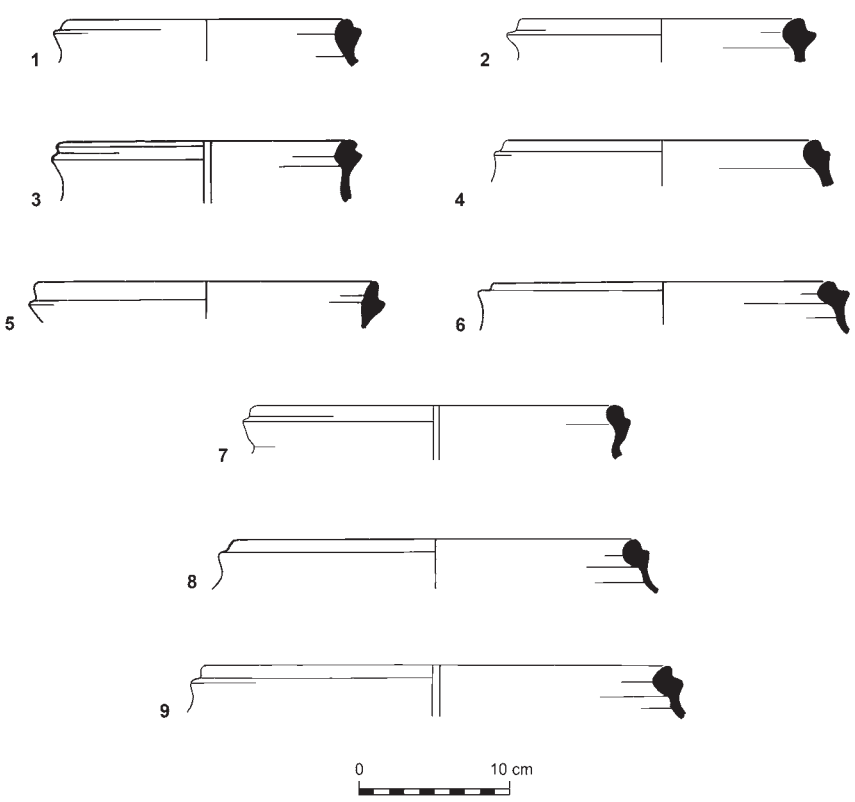

Fig. 85. Stratum IIIB pottery: cooking pots.

No.	Vessel	Locus / Reg. No.	Type
1	Cooking pot	417/3	CP4
2	Cooking pot	356/2	CP4
3	Cooking pot	181/1	CP4
4	Cooking pot	364/2	CP4
5	Cooking pot	232/2	CP4
6	Cooking pot	232/1	CP4
7	Cooking pot	423/1	CP4
8	Cooking pot	437/4	CP4
9	Cooking pot	420/1	CP4

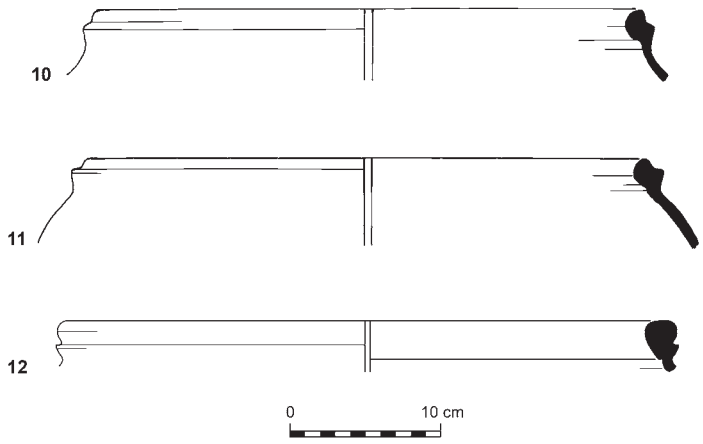

Fig. 85. Stratum IIIB pottery: cooking pots (cont.).

No.	Vessel	Locus / Reg. No.	Type
10	Cooking pot	420/2	CP4
11	Cooking pot	417/4	CP4
12	Cooking pot	158/1	CP4

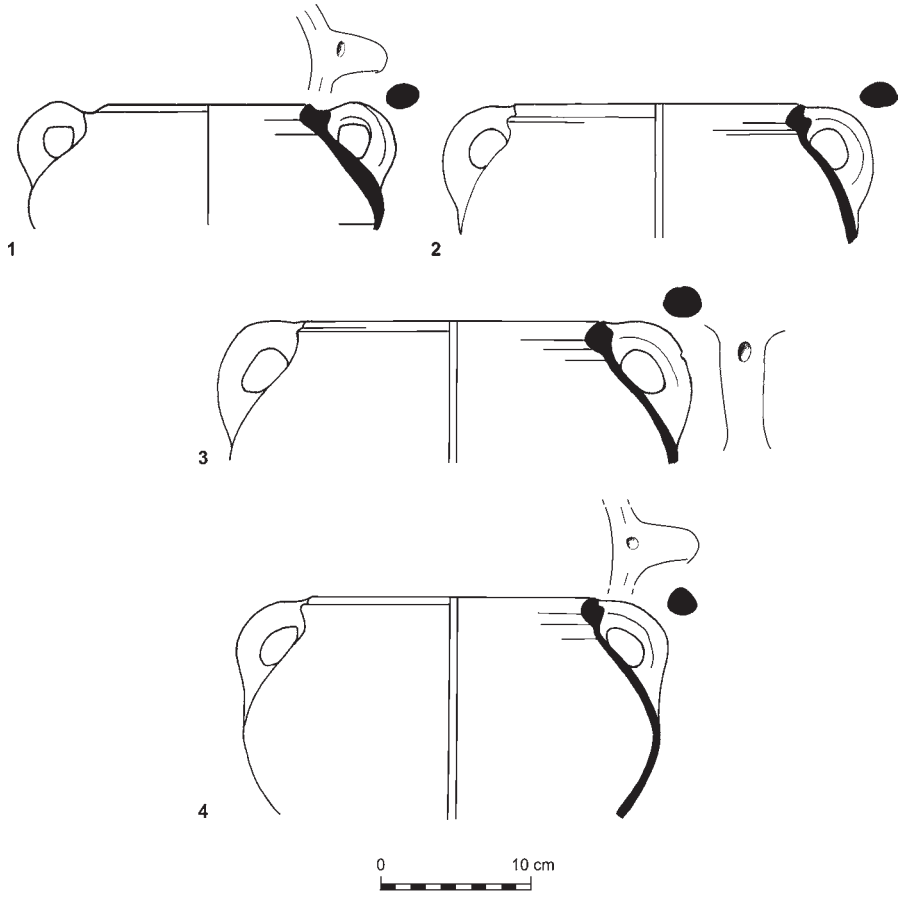

Fig. 86. Stratum IIIB pottery: cooking pots (cont.).

No.	Vessel	Locus / Reg. No.	Type	Description
1	Cooking pot	187/1	CP4	Cavity on handle
2	Cooking pot	356/1	CP4	
3*	Cooking pot	437/1	CP4	Cavity on handle
4*	Cooking pot	187/2	CP4	Cavity on handle

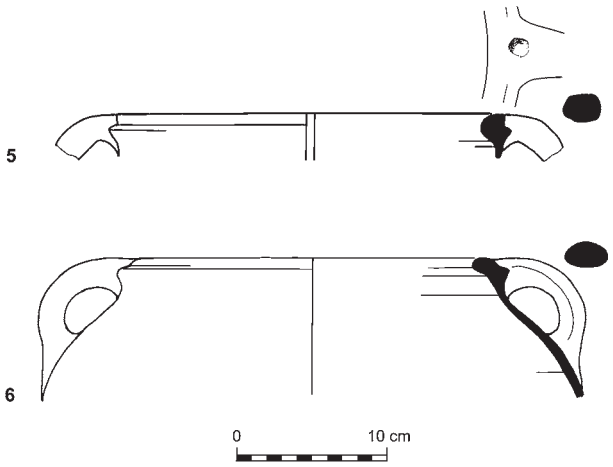

Fig. 86. Stratum IIIB pottery: cooking pots (cont.).

No.	Vessel	Locus / Reg. No.	Type	Description
5	Cooking pot	232/3	CP4	Cavity on handle
6*	Cooking pot	417/1	CP4	

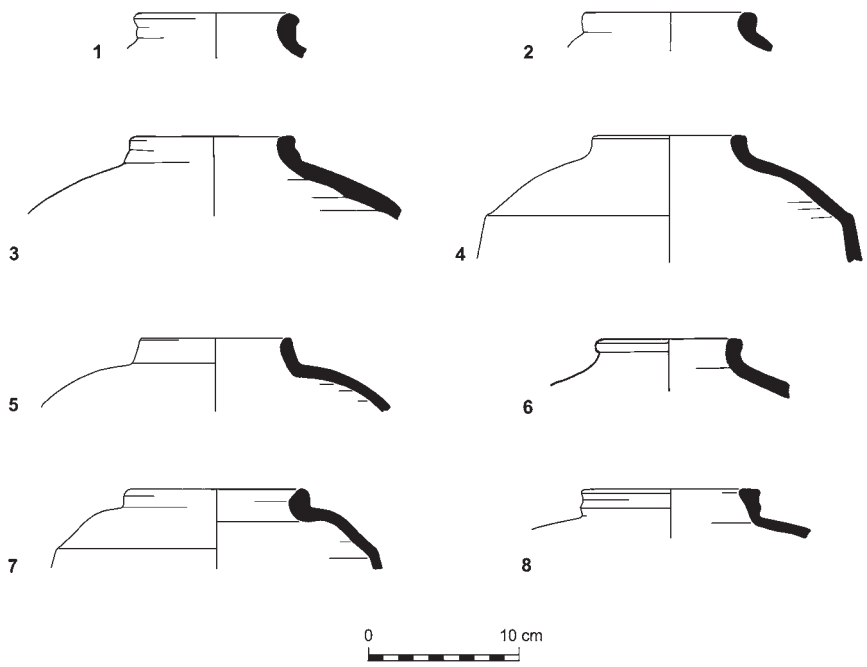

Fig. 87. Stratum IIIB pottery: storage jars.

No.	Vessel	Locus / Reg. No.	Type
1	Storage jar	420/1	SJ1a
2	Storage jar	420/2	SJ1a
3*	Storage jar	434/4	SJ1b
4	Storage jar	424/1	SJ1b
5	Storage jar	364/5/	SJ1a
6	Storage jar	235/1	SJ1a
7	Storage jar	424/2	SJ1a
8	Storage jar	364/6	SJ1a

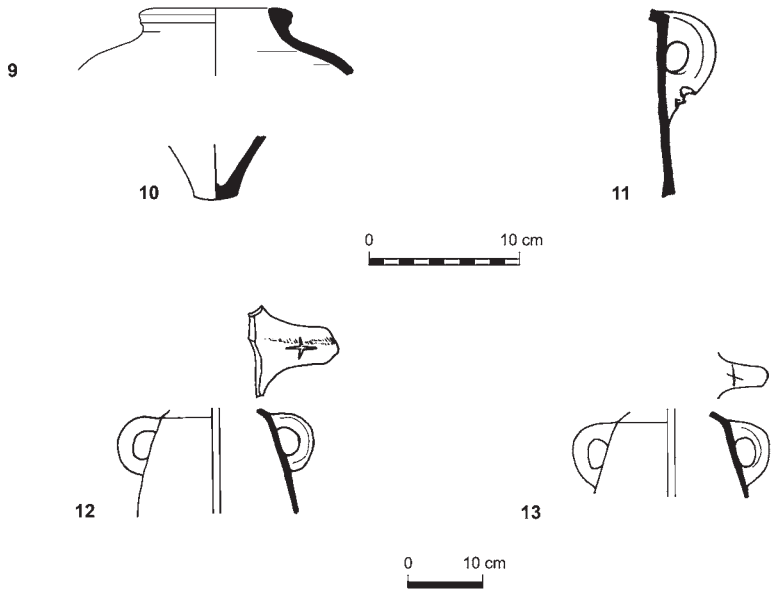

Fig. 87. Stratum IIIB pottery: storage jars (cont.).

No.	Vessel	Locus / Reg. No.	Type
9	Storage jar	235/2	SJ1b
10	Storage jar (base)	424/3	SJ1b
11	Storage jar (body)	214/1	SJ1a
12	Storage jar (body)	421/1	SJ1b
13	Storage jar (body)	434/3	SJ1b

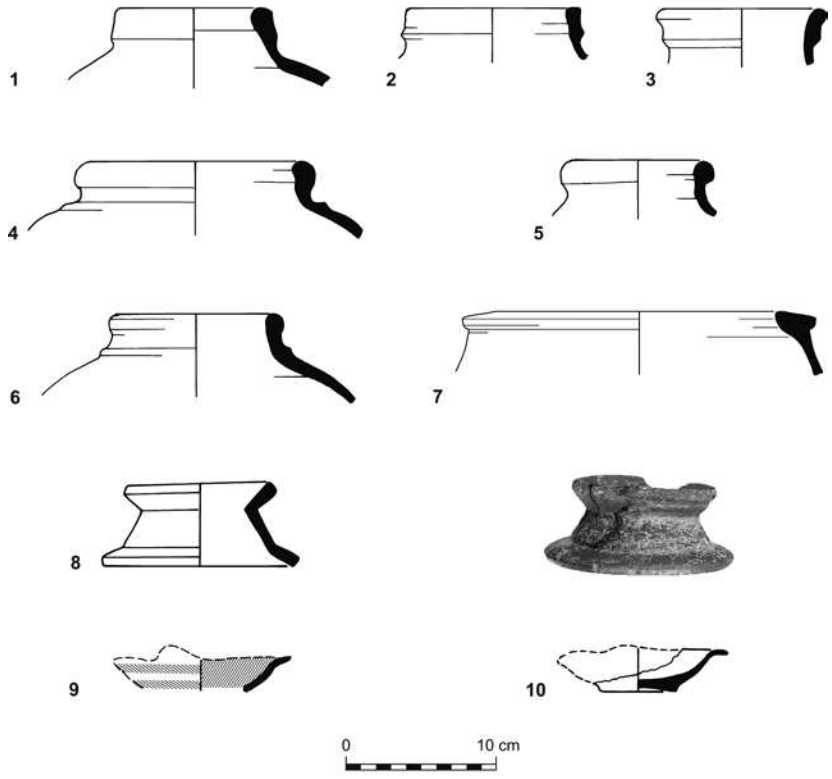

Fig. 88. Stratum IIIB pottery: storage jars, stand and lamps.

No.	Vessel	Locus / Reg. No.	Type
1*	Storage jar	418/3	SJ2a
2	Storage jar	434/1	SJ3
3	Storage jar	418/1	SJ3
4	Storage jar	418/2	SJ4
5*	Storage jar	418/4	SJ4
6	Storage jar	434/2	SJ4
7	Hole-mouth jar	364/3	HM1
8*	Stand	384/1	ST1
9*	Lamp	403/1	LP1
10*	Lamp	361/1	LP2

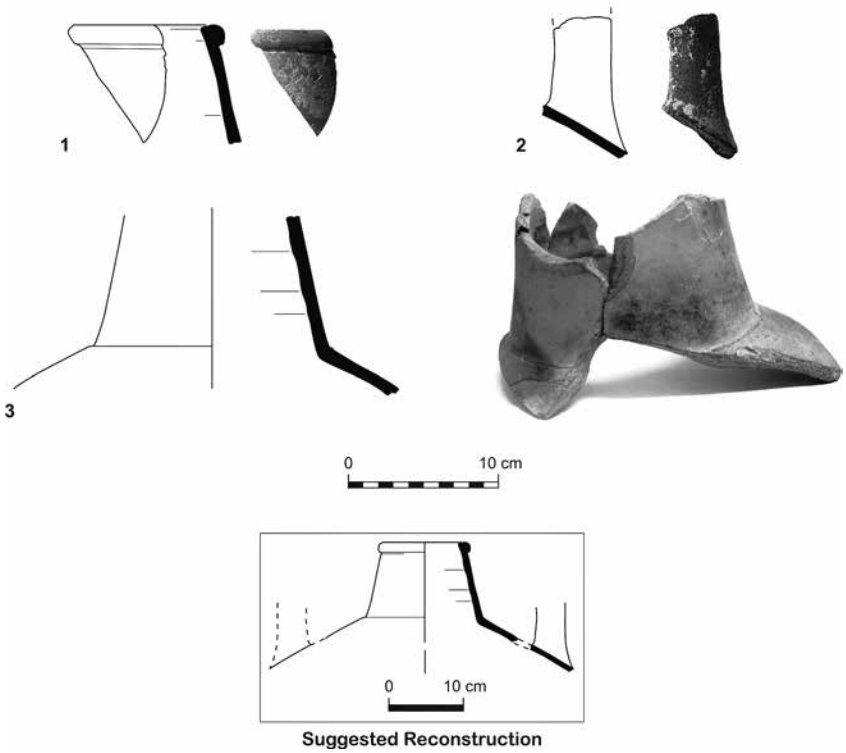

Fig. 89. Stratum IIIB pottery: fragments of a Lesbian amphora.

No.	Vessel	Locus / Reg. No.	Type	Description
1	Amphora (rim)	118/1	AM1	Lesbian
2	Amphora (handle)	118/2	AM1	Lesbian
3*	Amphora (neck)	362/1	AM1	Lesbian

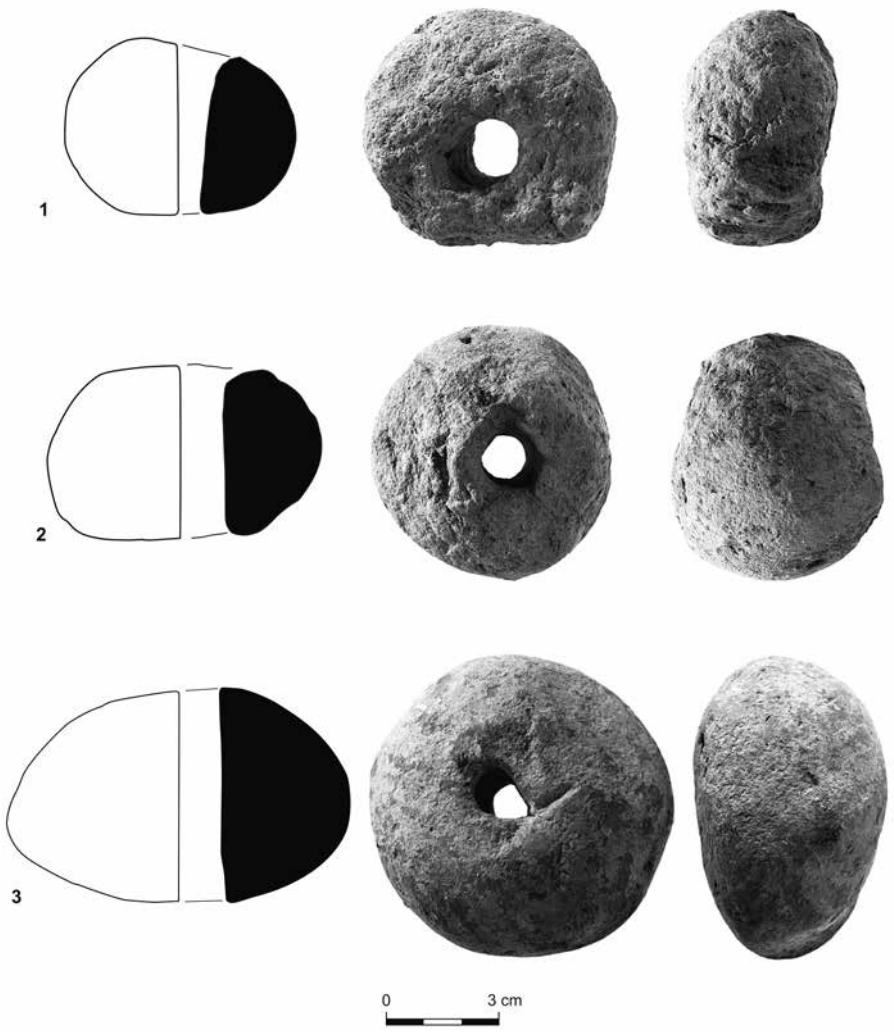

Fig. 90. Stratum IIIB pottery: loom weights.

No.	Vessel	Locus / Reg. No.	Type	Description
1	Loom weight	357/1	LW1	Nearly complete. Weight: 208.71 g; height 4.6 cm; diam. 6 cm; hole diam. 0.6–1 cm
2	Loom weight	402/1	LW1	Nearly complete. Weight: 303.70 g; height 4.5 cm; diam. 6.2 cm; hole diam. 1.2 cm
3*	Loom weight	435/1	LW1	Complete. Weight: 446.23 g; height 5.8 cm; diam. 9 cm; hole diam. 1–1.2 cm

Fig. 91. Stratum IIIB pottery: selective assemblage.

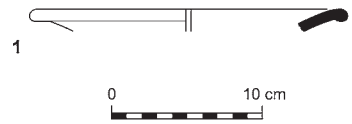

Fig. 92. Stratum IIIA pottery: fragments of an Egyptian bowl.

No.	Vessel	Locus / Reg. No.	Type	Description
1	Bowl	206/2	EB1	Egyptian (Nilothic) Ware

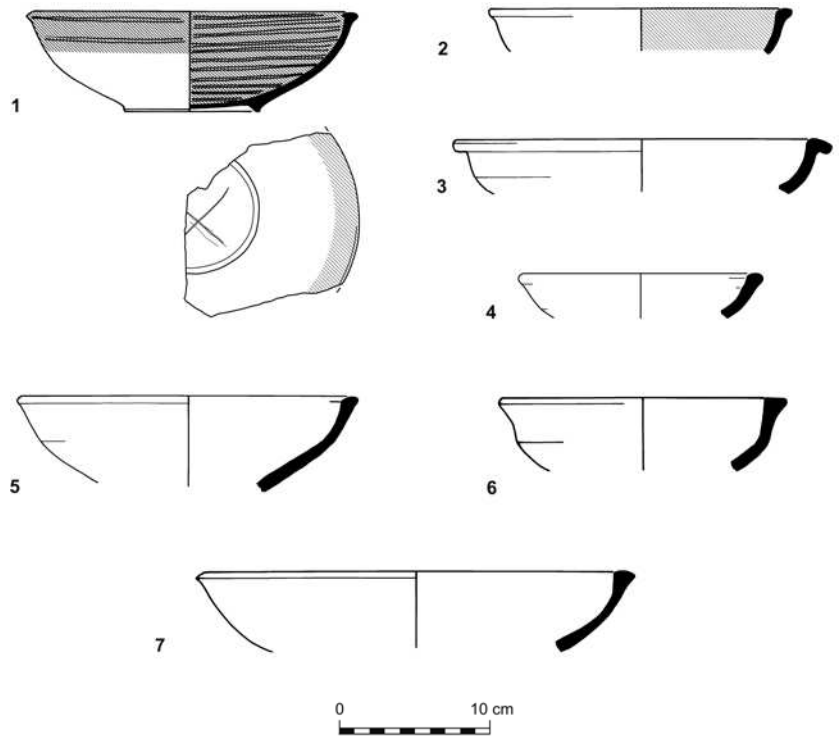

Fig. 93. Stratum IIIA pottery: bowls.

No.	Vessel	Locus / Reg. No.	Type	Description
1*	Bowl	335/1	BL5b	Wheel-burnished; cross-shaped (post-firing) incision on base
2	Bowl	251/2	BL5b	
3	Bowl	323/2	BL6a	
4	Bowl	206/5	BL7b	
5*	Bowl	323/1	BL7b	
6	Bowl	328/1	BL7a	
7*	Bowl	252/1	BL7c	

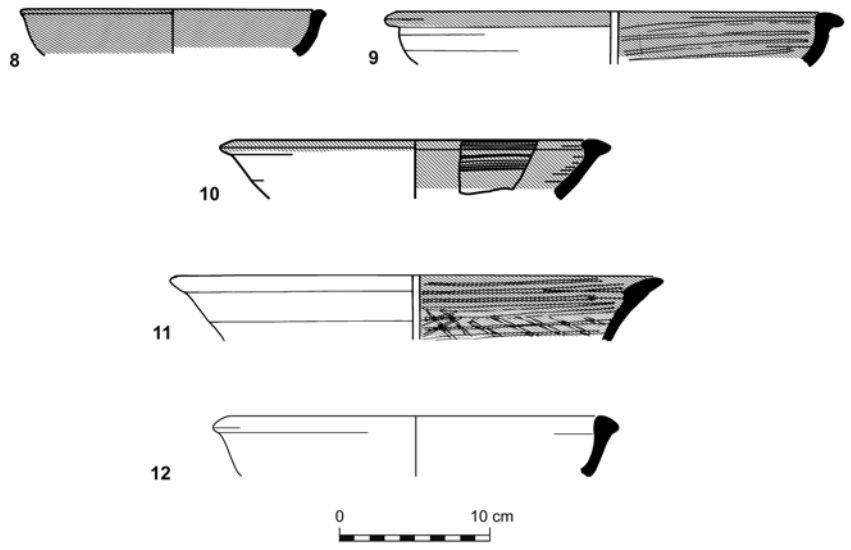

Fig. 93. Stratum IIIA pottery: bowls (cont.).

No.	Vessel	Locus / Reg. No.	Type	Description
8	Bowl	323/4	BL7d	
9*	Bowl	323/5	BL6b	Wheel-burnished
10	Bowl	206/1	BL15	
11*	Bowl	193/1	BL15	Wheel-burnished
12	Bowl	206/3	BL12	

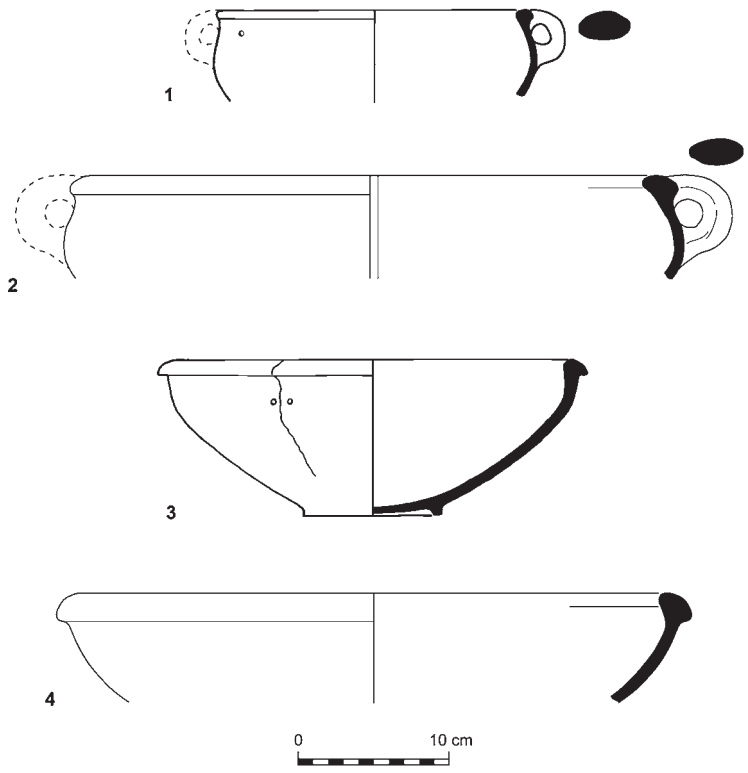

Fig. 94. Stratum IIIA pottery: heavy bowls.

No.	Vessel	Locus / Reg. No.	Type	Description
1	Heavy bowl	307/1	HB2b	Mending hole
2	Heavy bowl	206/6	HB2b	
3*	Heavy bowl	334/1	HB3b	Mending holes
4	Heavy bowl	206/7	HB3b	

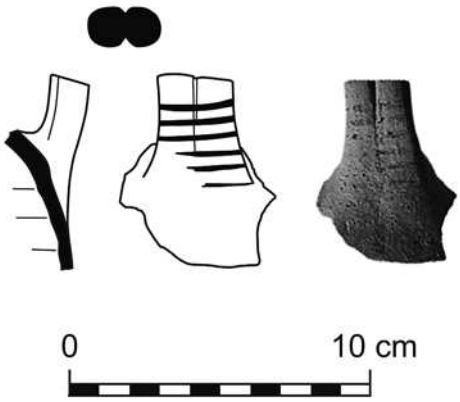

Fig. 95. Stratum IIIA pottery: a fragment of East Aegean oinochoe.

No.	Vessel	Locus / Reg. No.	Type	Description
6	Oinochoe	326/1	ON1	East Greek

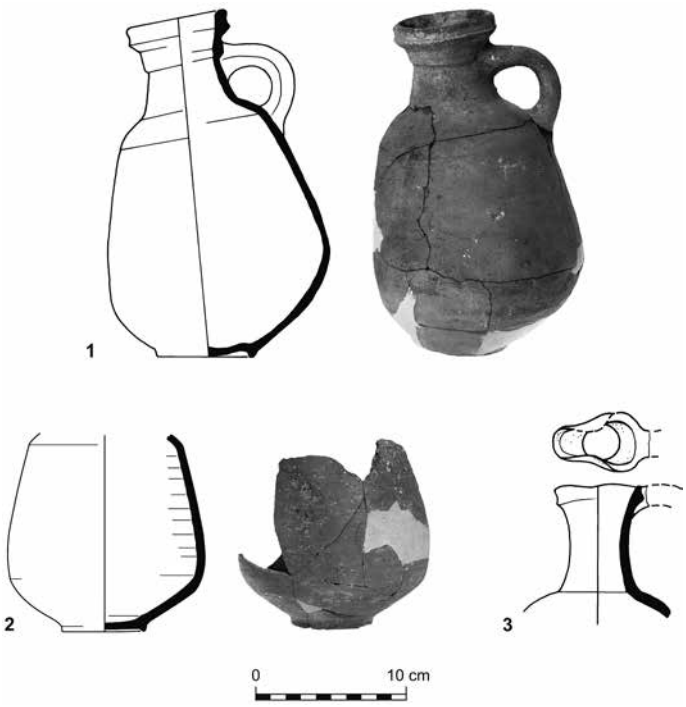

Fig. 96. Stratum IIIA pottery: decanters and jug.

No.	Vessel	Locus / Reg. No.	Type
1*	Jug/Decanter	293/1	JG7a
2	Jug/Decanter	251/3	JG7b
3	Jug	190/1 (IAA 46.45)	JG3

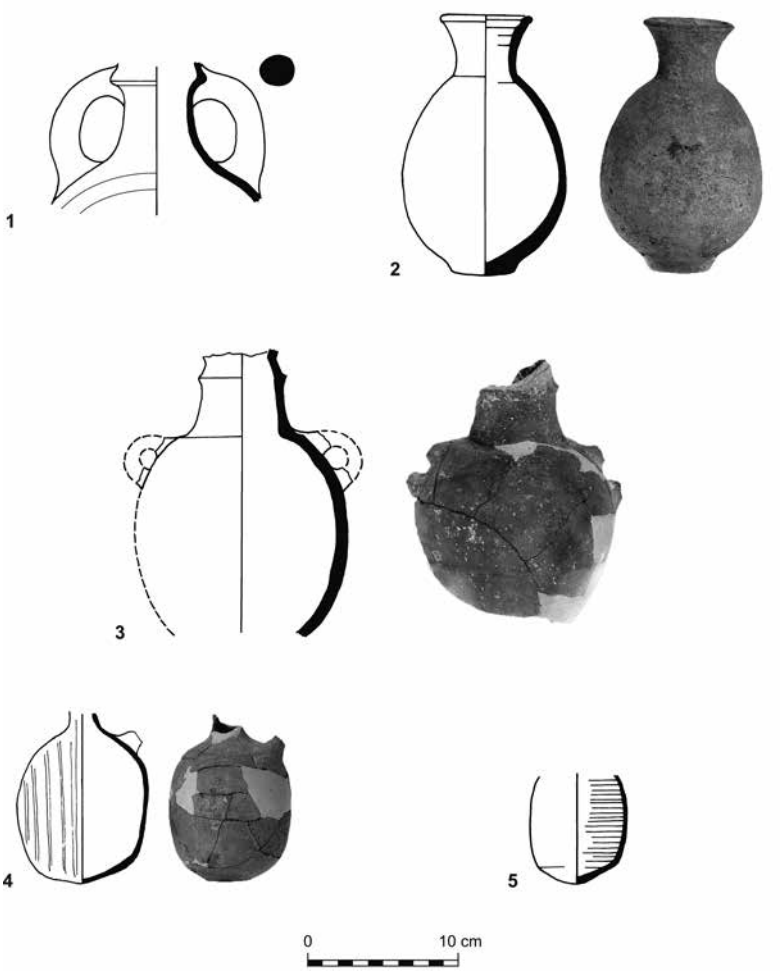

Fig. 97. Stratum IIIA pottery: flask, bottle, table amphora and juglets.

No.	Vessel	Locus / Reg. No.	Type	Description
1	Flask	331/1	FL1	
2*	Bottle	359/1	BT1	
3*	Table amphora	280/1 (IAA 46.47)	TA1	
4	Juglet	359/2	JL3	Burnished
5	Juglet	250/1	JL1	

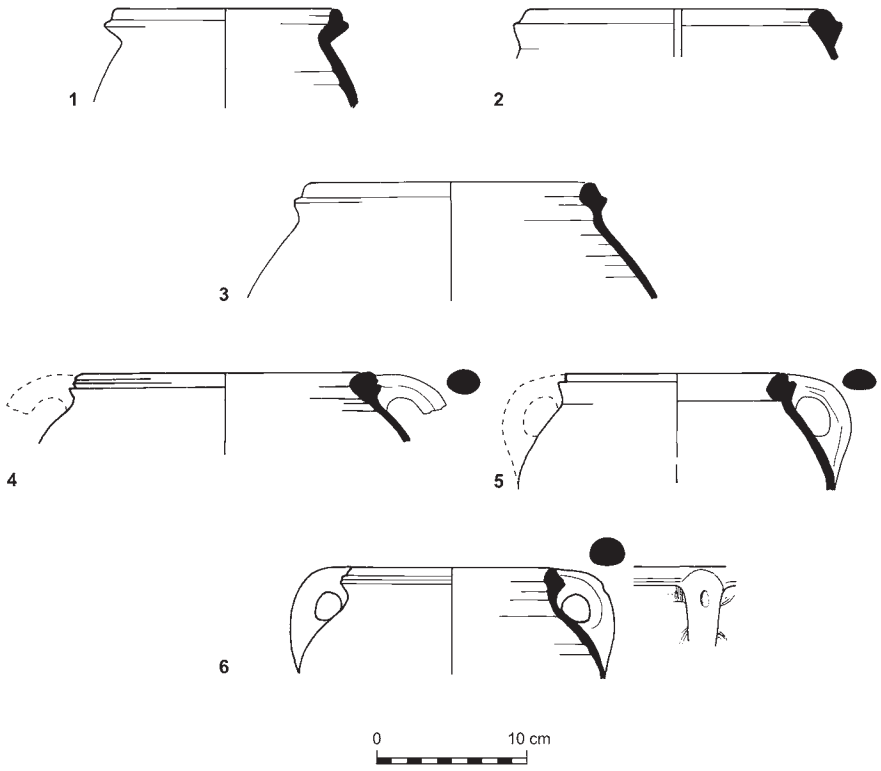

Fig. 98. Stratum IIIA pottery: cooking pots.

No.	Vessel	Locus / Reg. No.	Type	Description
1	Cooking pot	261/1	CP4	
2	Cooking pot	251/1	CP4	Not found
3	Cooking pot	336/7	CP4	
4	Cooking pot	308/1	CP4	
5	Cooking pot	193/3	CP4	
6*	Cooking pot	336/4	CP4	Cavity on handle

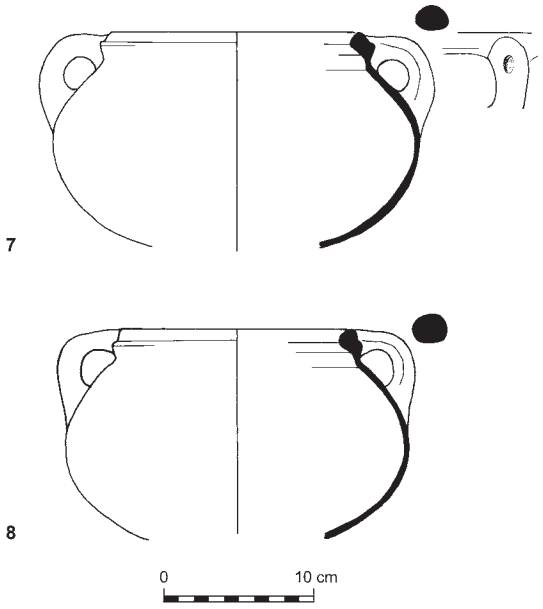

Fig. 98. Stratum IIIA pottery: cooking pots (cont.).

No.	Vessel	Locus / Reg. No.	Type	Description
7	Cooking pot	336/5	CP4	Cavity on handle
8	Cooking pot	336/6	CP4	

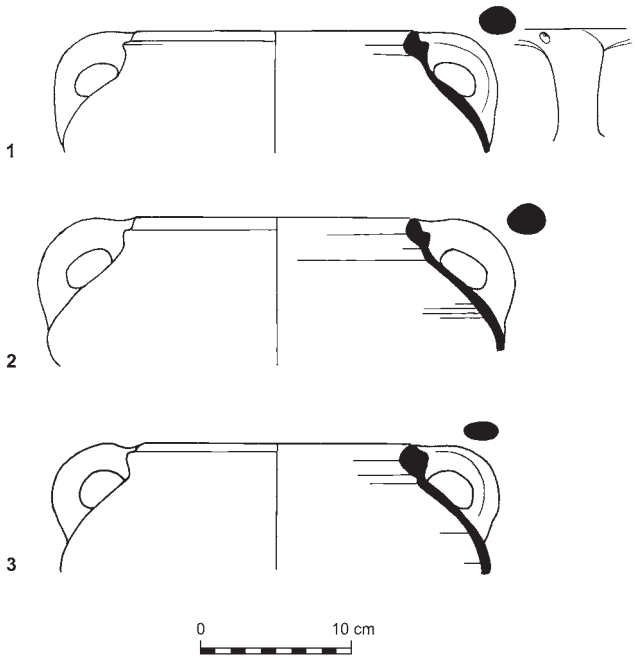

Fig. 99. Stratum IIIA pottery: cooking pots (cont.).

No.	Vessel	Locus / Reg. No.	Type	Description
1	Cooking pot	336/2	CP4	Cavity on handle
2	Cooking pot	336/3	CP4	
3	Cooking pot	308/2	CP4	

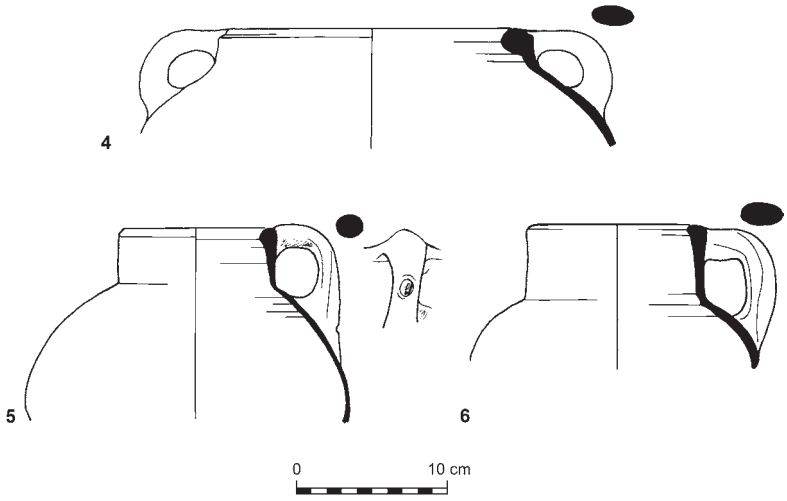

Fig. 99. Stratum IIIA pottery: cooking pots (cont.).

No.	Vessel	Locus / Reg. No.	Type	Description
4*	Cooking pot	308/3	CP4	
5*	Cooking jug	336/1	CJ1	Cavity on handle
6*	Cooking jug	328/2	CJ1	

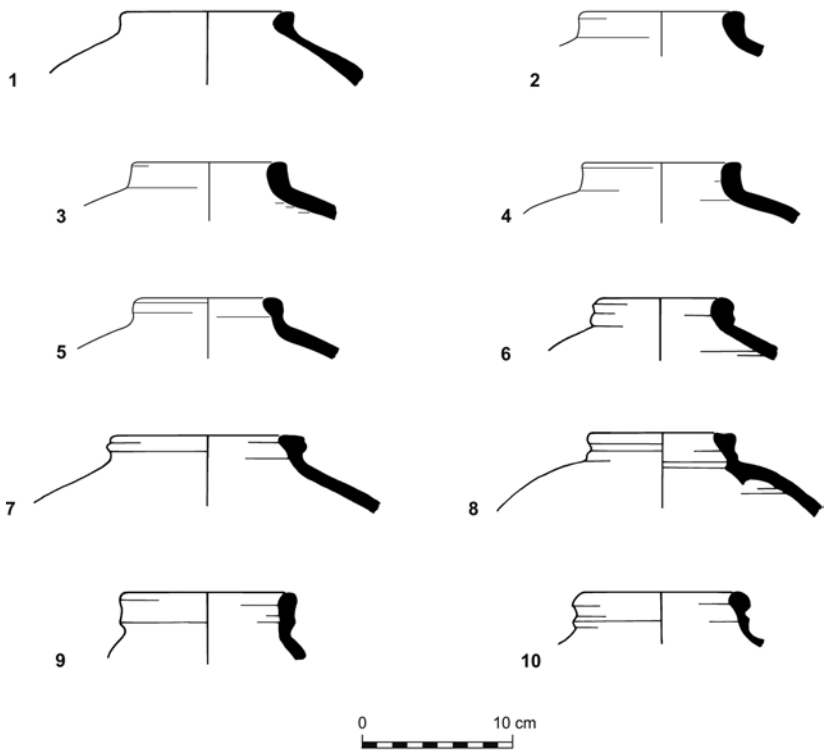

Fig. 100. Stratum IIIA pottery: storage jars and lamps.

No.	Vessel	Locus / Reg. No.	Type
1	Storage jar	208/1	SJ1b
2	Storage jar	193/6	SJ1a
3	Storage jar	193/5	SJ1b
4	Storage jar	324/8	SJ1b
5	Storage jar	208/5	SJ1a
6	Storage jar	324/7	SJ1b
7	Storage jar	208/2	SJ1a
8*	Storage jar	193/2	SJ2b
9	Storage jar	324/6	SJ3
10	Storage jar	251/4	SJ4

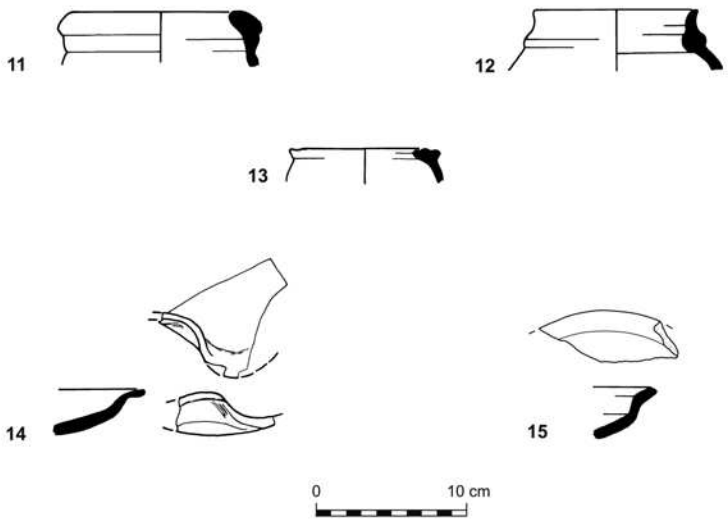

Fig. 100. Stratum IIIA pottery: storage jars and lamps (cont.).

No.	Vessel	Locus / Reg. No.	Type
11	Storage jar	208/3	SJ4
12	Storage jar	208/4	SJ6
13*	Hole-mouth jar	324/4	HM2
14	Lamp	212/1	LP1
15	Lamp	323/3	LP1

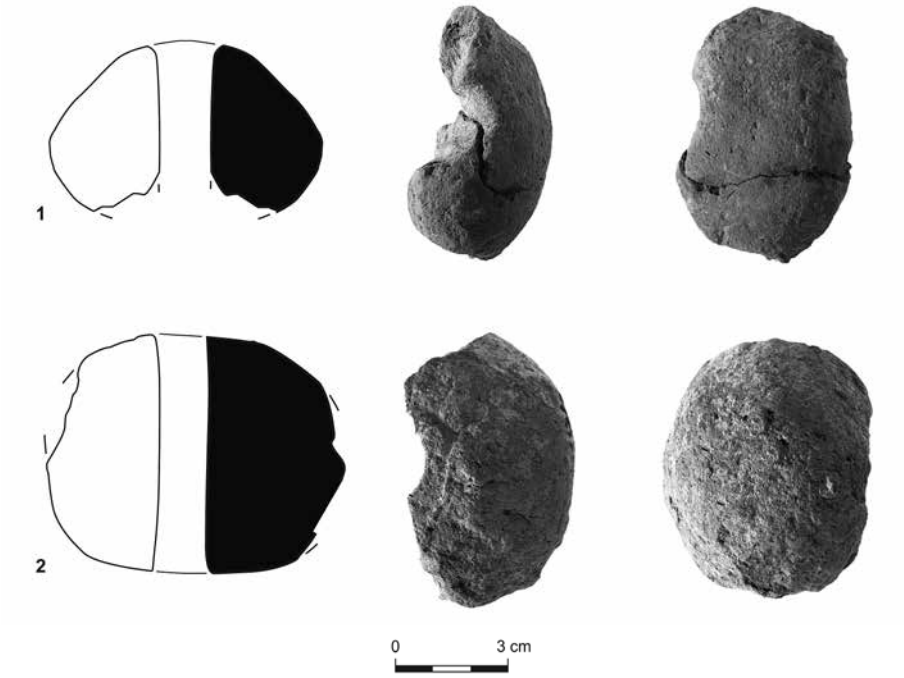

Fig. 101. Stratum IIIA pottery: loom weights.

No.	Vessel	Locus / Reg. No.	Type	Description
1*	Loom weight	310/1	LW1	Broken. Weight: 107.00 g
2*	Loom weight	310/3	LW1	Broken. Weight: 208.63 g

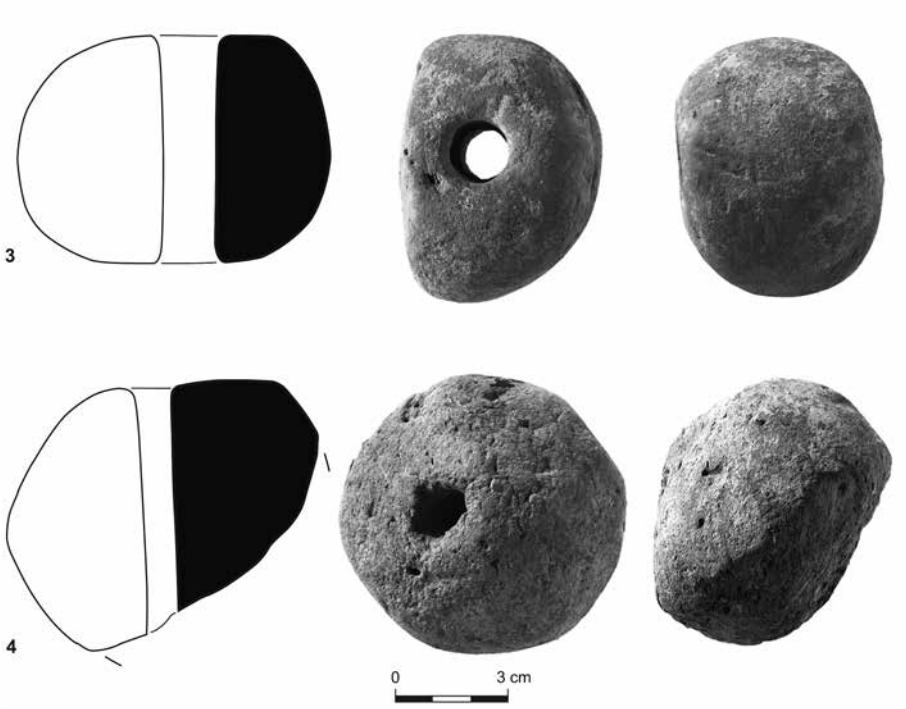

Fig. 101. Stratum IIIA pottery: loom weights (cont.).

No.	Vessel	Locus / Reg. No.	Type	Description
3	Loom weight	310/5	LW1	Roughly half. Weight: 315.96 g; height 6 cm; diam. 8.2 cm; hole diam. 1.2–1.4 cm
4	Loom weight	310/4	LW1	Nearly complete. Weight: 440.00 g; height 7 cm; diam. 8 cm; hole diam. 0.6–0.7 cm

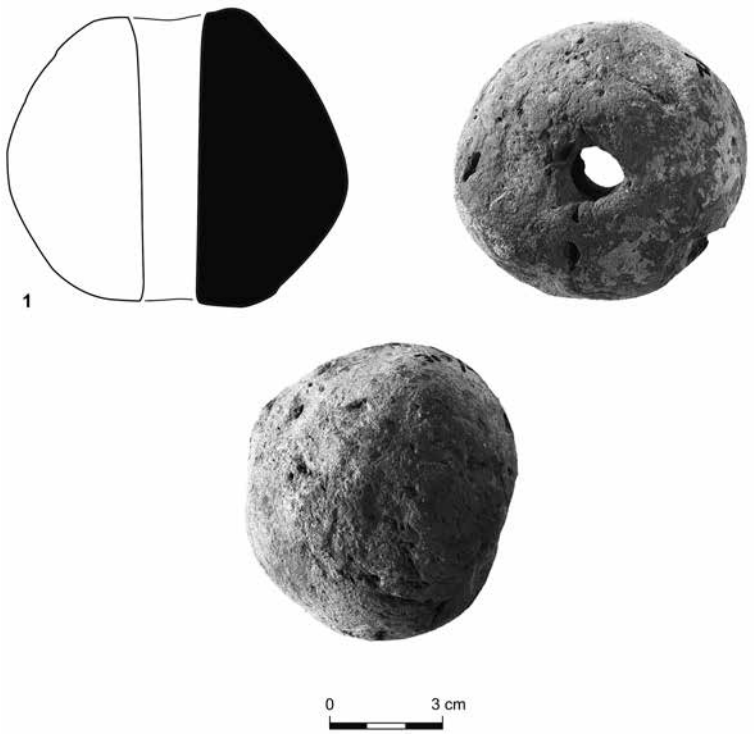

Fig. 102. Stratum IIIA pottery: a loom weight (cont.).

No.	Vessel	Locus / Reg. No.	Type	Description
1*	Loom weight	310/2	LW1	Complete. Weight: 541.12 g; height 8 cm; diam. 9 cm; hole diam. 1.4–1.5 cm

Fig. 103. Stratum IIIA pottery: selective assemblage.

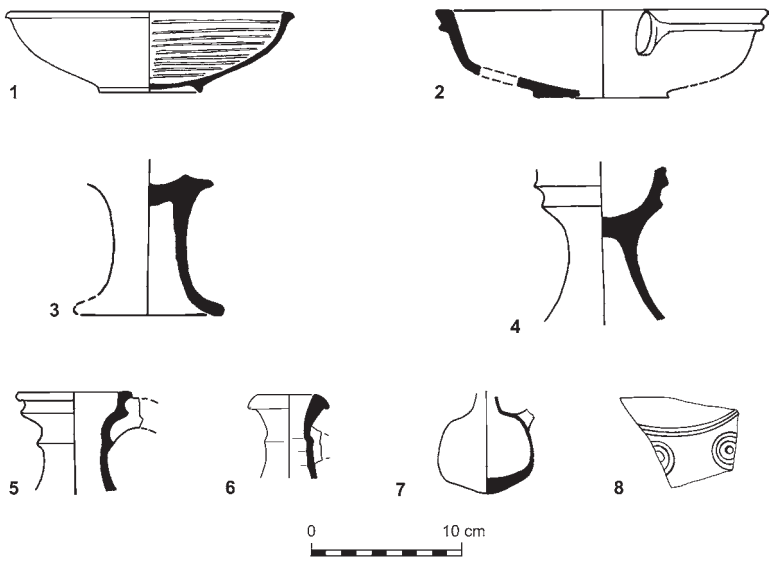

Fig. 104. Unstratified Iron Age IIB pottery.

No.	Vessel	Locus / Reg. No.	Provenance	Description
1	Bowl	055/1	I	Wheel-burnished
2	Bowl	141/1 (IAA 46.42)	III–II	Not found
3	Chalice	475/1	Mixed Fill III (Sq. F9)	Not found
4*	Chalice	484/1	Mixed Fill I (Sq. F9)	
5	Jug/Decanter	381/1	III–II	
6	Jug/Decanter	106/1	I	
7	Fragment	471/1	Mixed Fill III (Sq. F9)	
8	Juglet	347/1	II	

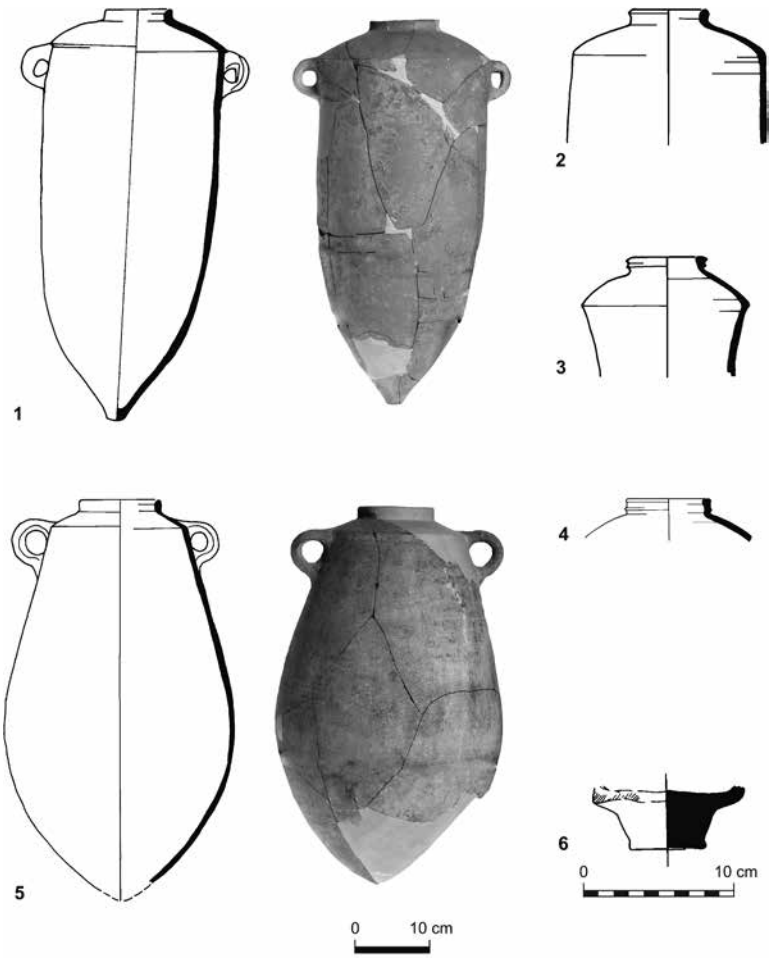

Fig. 105. Unstratified Iron Age IIB pottery (cont.).

No.	Vessel	Locus / Reg. No.	Provenance
1	Storage jar	345/1	II
2	Storage jar	445/1	II
3	Storage jar	346/1	II
4	Storage jar	237/1	II
5	Storage jar	426/1	Mixed Fill I (Sq. E6)
6	Lamp	254/1	Mixed Fill III (Sq. F9)

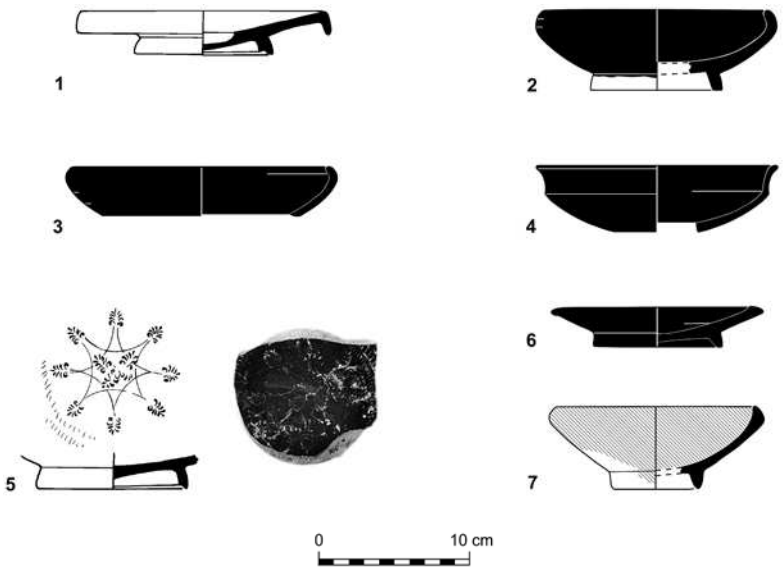

Fig. 106. Unstratified Persian period pottery.

No.	Vessel	Locus / Reg. No.	Provenance	Description
1	Plate	366/1	III–II	Not found
2	Bowl	017/1	Top soil (Sq. F7/G7)	
3	Bowl	313/1	II	
4	Vicup	294/1	II	
5	Base	306/1	II	
6	Plate	312/1	II	
7	Bowl	349/1	II	

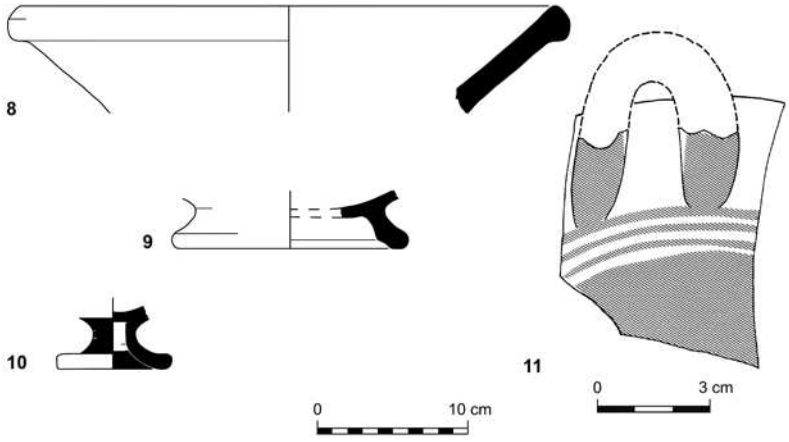

Fig. 106. Unstratified Persian period pottery (cont.).

No.	Vessel	Locus / Reg. No.	Provenance
8	Heavy bowl	042/1	I
9	Heavy bowl (base)	028/1	Mixed Fill I (Sq. E9, north)
10	Vicup (base)	126/1	Mixed Fill (Sq. E9, south)
11	Jar (body)	454/1 (IAA 46.62)	III–II

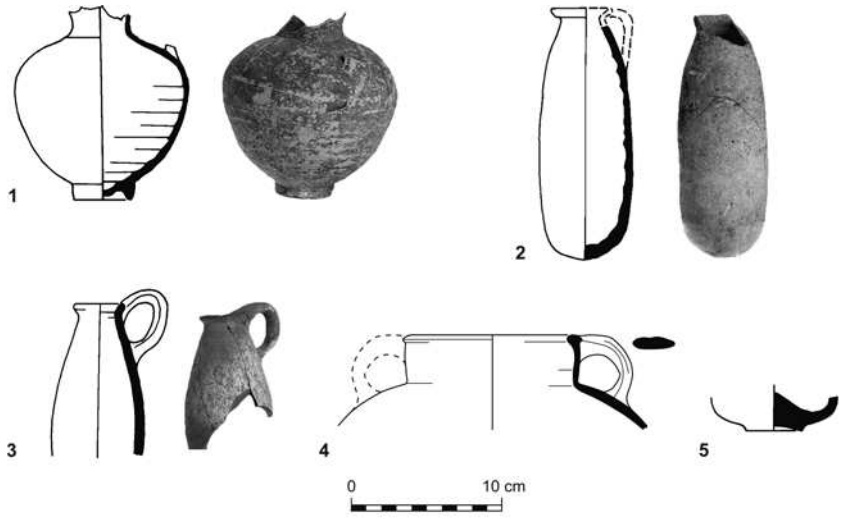

Fig. 107. Unstratified Persian period pottery (cont.).

No.	Vessel	Locus / Reg. No.	Provenance
1	Juglet	343/1	Top soil (Sq. F7)
2	Juglet	026/1	Top soil (Sq. F2)
3	Juglet	146/1	II
4	Cooking pot	299/1	I
5	Lamp	367/1	III–II

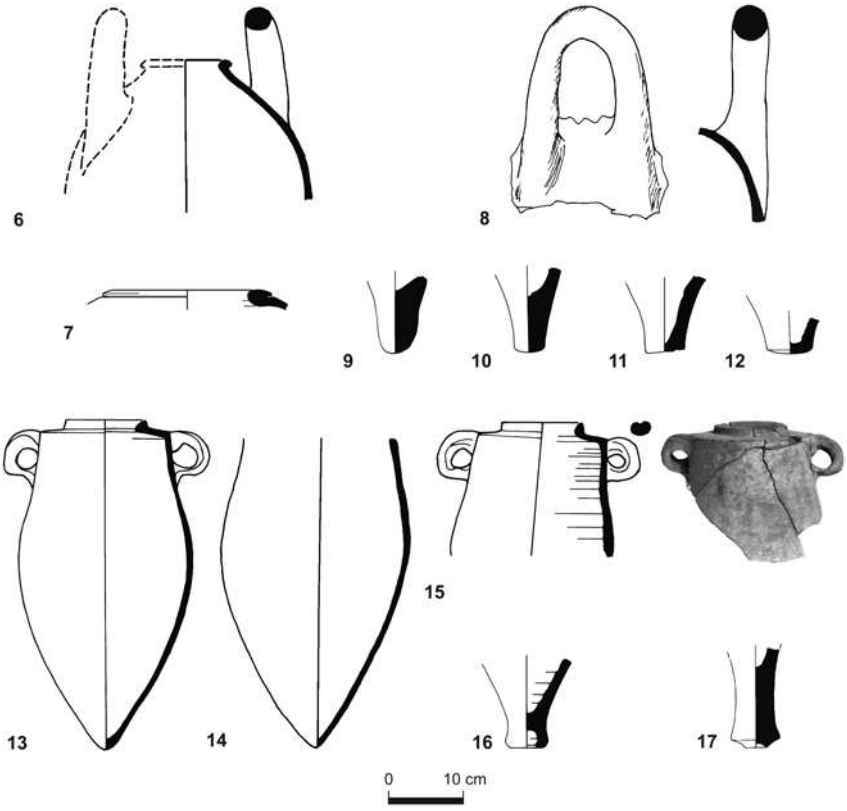

Fig. 107. Unstratified Persian period pottery (cont.).

No.	Vessel	Locus / Reg. No.	Provenance	Description
6	Storage jar	351/1	II (Sq. D5)	
7	Storage jar	030/1	Top soil (Sq. E8/E9)	
8	Storage jar (handle)	027/1	Mixed Fill I (Sq. E9, north)	
9	Storage jar (base)	303/1	II	
10	Storage jar (base)	411/1	III–II	
11	Storage jar (base)	464/1	III–II	
12	Storage jar (base)	085/1	I	
13*	Storage jar	279/1	II	
14	Storage jar (body)	346/2	II	Bands of red colour
15	Storage jar	279/2	II	
16	Amphora (base)	373/1	III–II	Not found
17	Amphora (base)	096/1	I	

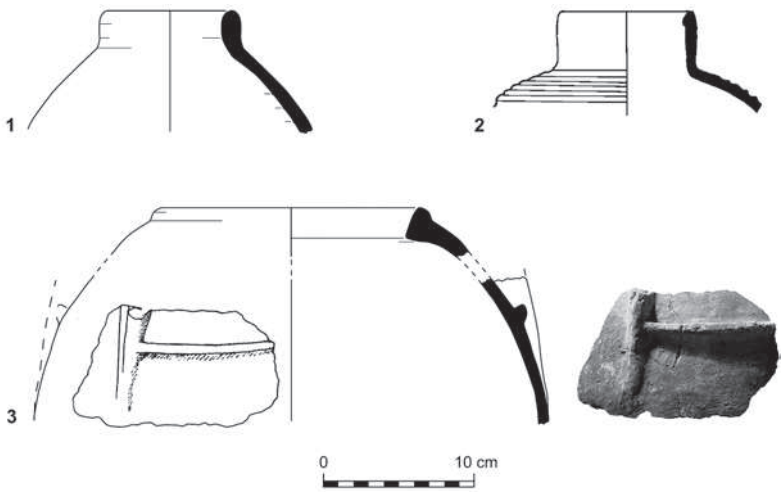

Fig. 108. Unstratified Byzantine and mediaeval period pottery.

No.	Vessel	Locus / Reg. No.	Provenance
1	Storage jar	023/1	Top soil (Sq. F2)
2	Storage jar	100/1	I
3	Cooking pot	164/1	I

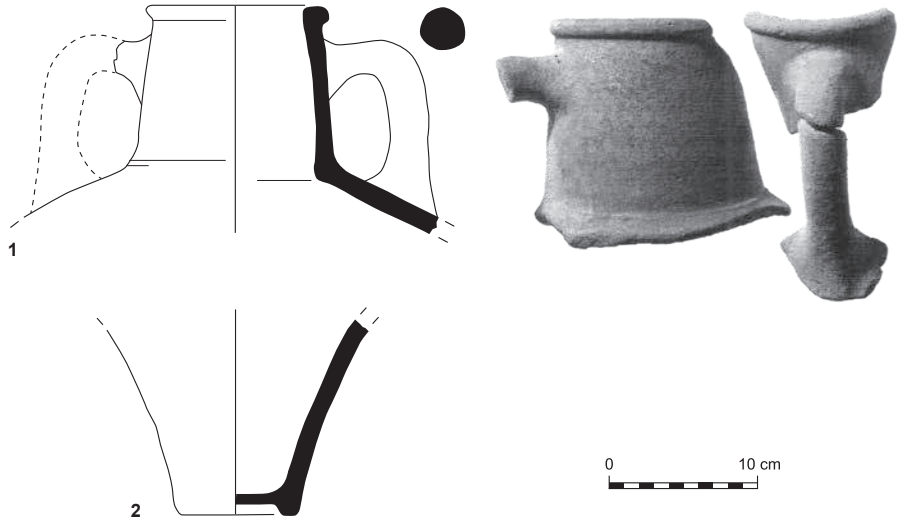

Fig. 109. Meẓad Ḥashavyahu: fragments of a Lesbian amphora.

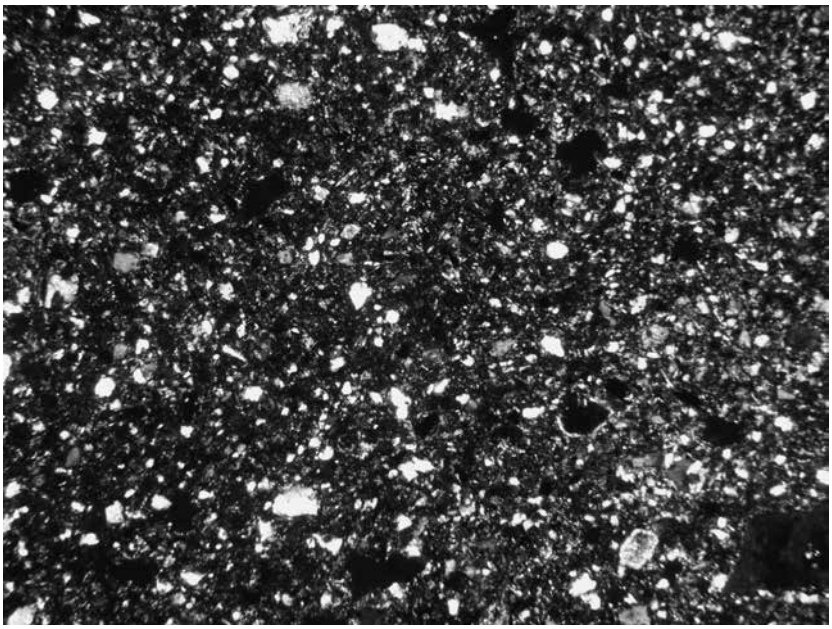

Fig. 110. Thin-section of the Lesbian amphora from Tell Qudadi (width of field 2.5 mm).

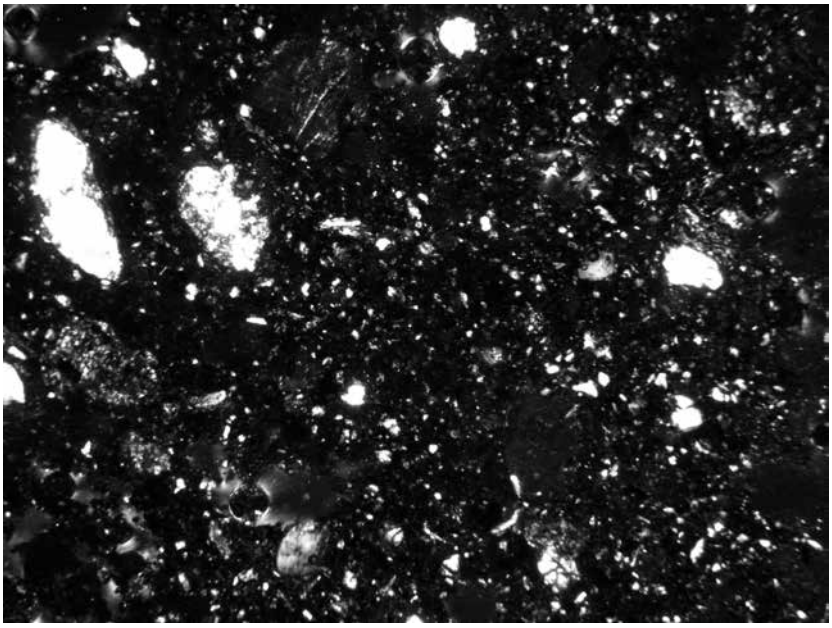

Fig. 111. Thin-section of the Lesbian amphora from Meẓad Ḥashavyahu (width of field 2.5 mm).

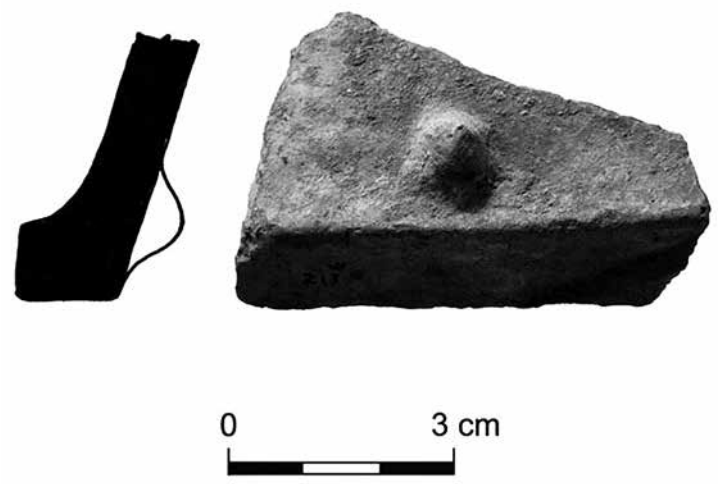

Fig. 112. Unstratified fragment of Chalcolithic ossuary.

No.	Vessel	Locus / Reg. No.	Provenance
1	Ossuary	213/1	IIIA

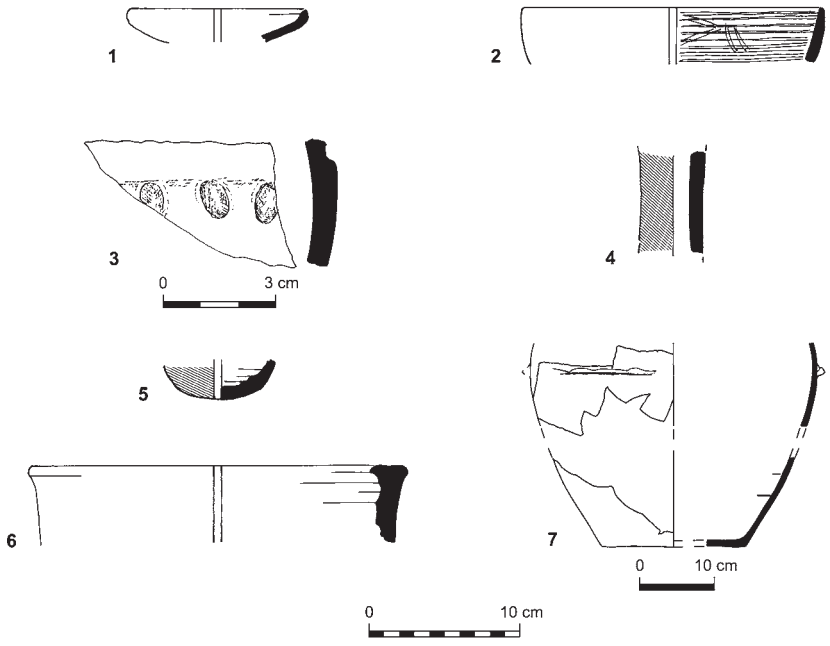

Fig. 113. Unstratified Early Bronze Age pottery.

No.	Vessel	Locus / Reg. No.	Provenance
1	Bowl	489/1	Fill (Sq. D3/D4)
2	Bowl	489/2	Fill (Sq. D3/D4)
3	Pithos	007/1	I
4	Amphoriskos (neck)	467/1	Mixed Fill I (Sq. D4)
5	Amphoriskos (base)	438/8	IIIB
6	Vat	IAA 46.40	
7	Storage jar	IAA 46.70	

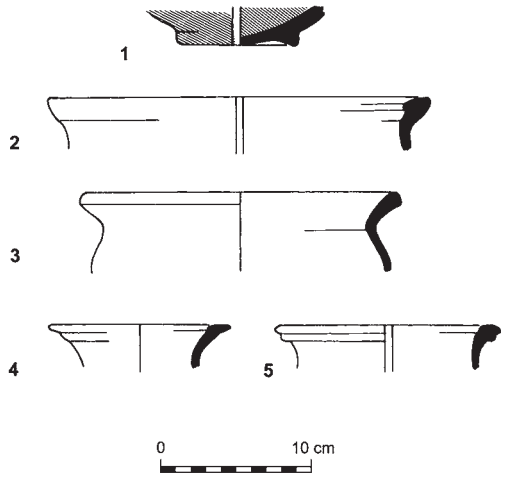

Fig. 114. Unstratified Middle Bronze Age II pottery.

No.	Vessel	Locus / Reg. No.	Provenance
1	Bowl (base)	438/9	IIIB
2	Krater	184/1	III–II
3	Cooking pot	256/1	Mixed Fill III (Sq. F9)
4	Storage jar	414/1	III–II
5	Storage jar	196/1	Mixed Fill II (Sq. F9)

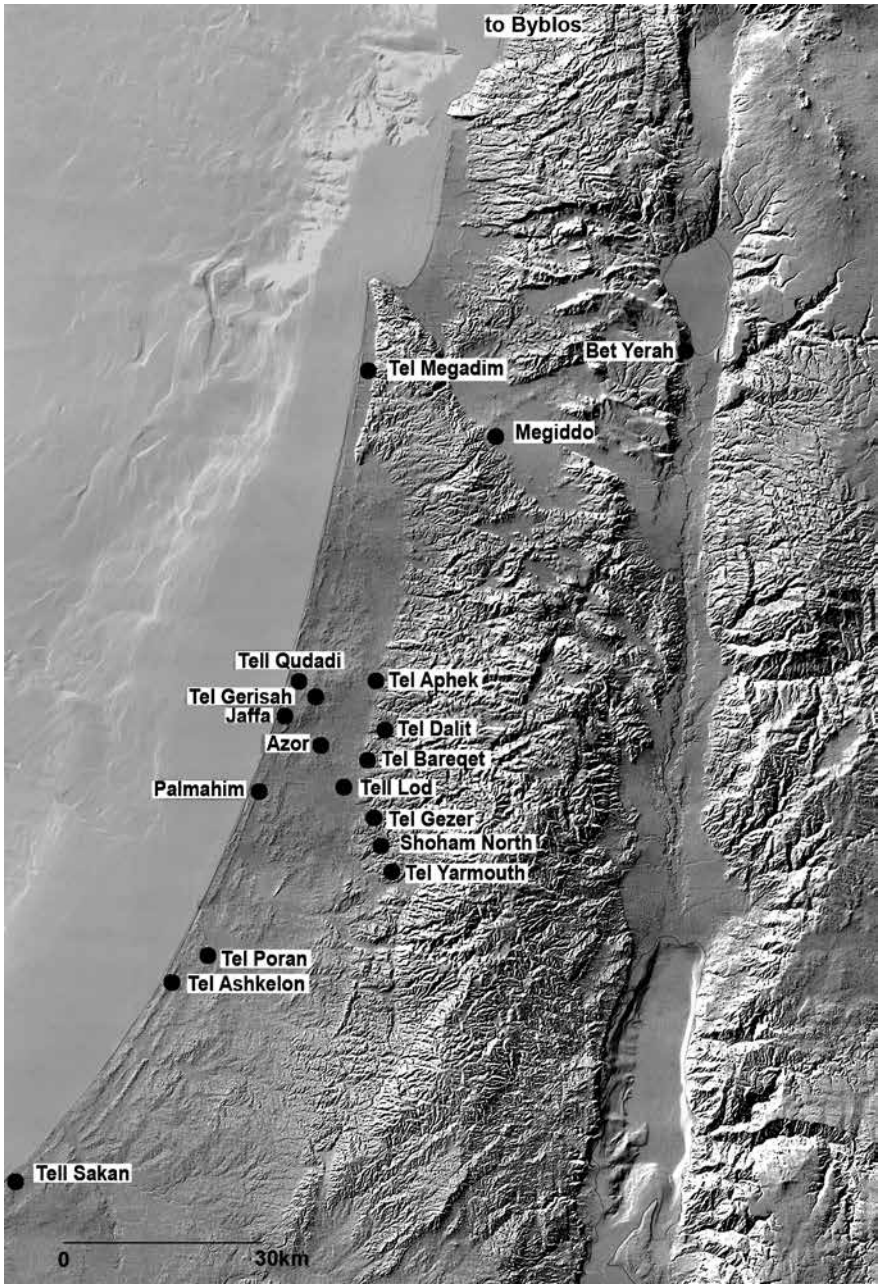

Fig. 115. Early Bronze Age III sites along the coast of Israel.

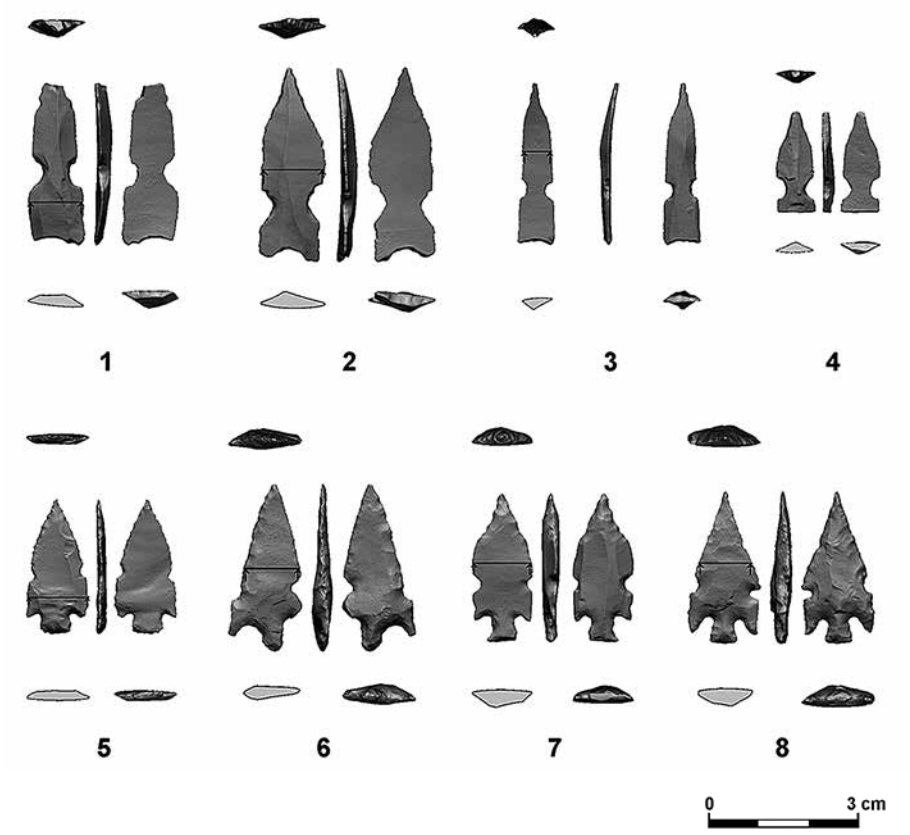

Fig. 116. Unstratified flint tools.

No.	Object	Locus / Reg. No.	Description
1	Arrowhead	IAA 47.4411/1	El-Khiam type
2	Arrowhead	IAA 47.4411/2	El-Khiam type
3	Arrowhead	IAA 47.4411/8	El-Khiam type
4	Arrowhead	IAA 47.4411/4	El-Khiam type
5	Arrowhead	IAA 47.4411/6 (?)	Helwan type
6	Arrowhead	IAA 47.4411/7	Helwan type
7	Arrowhead	IAA 47.4411/5	Helwan type
8	Arrowhead	IAA 47.4411/3	Helwan type

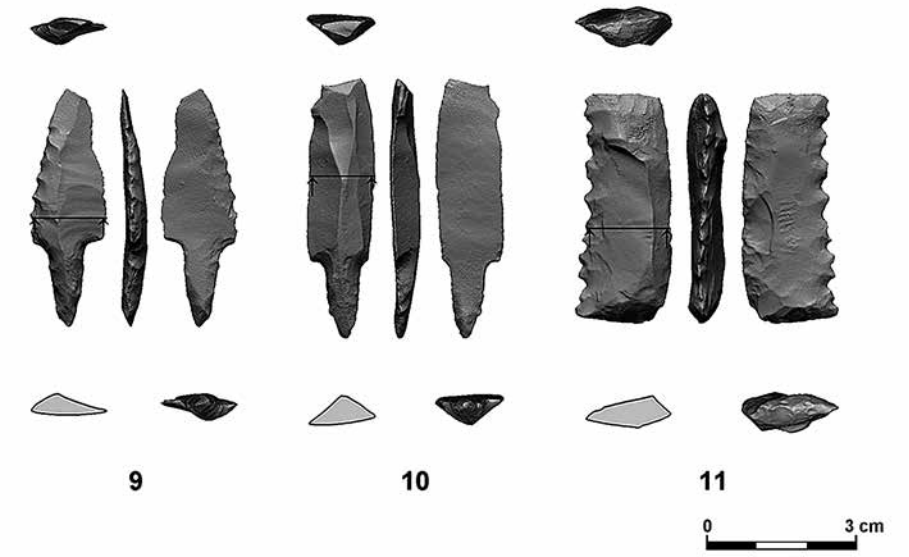

Fig. 116. Unstratified flint tools (cont.).

No.	Object	Locus / Reg. No.	Description
9	Arrowhead	IAA 47.4411/9 (?)	Jericho type
10	Arrowhead	IAA 47.4411/10	Jericho type
11	Sickle blade	IAA 47.4411/11	PN (Yarmukian)

Fig. 117. Silver earring.

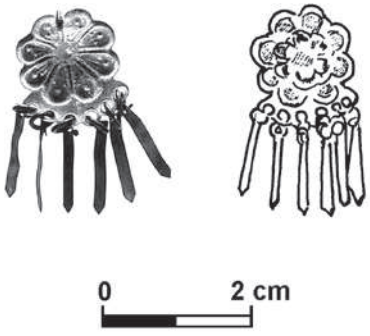

Fig. 118. Silver earring.

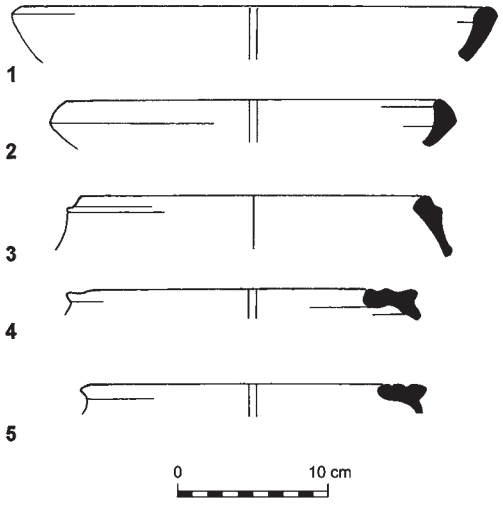

Fig. 119. Tel Ḥashash: unstratified Iron Age IIB pottery (J. Kaplan excavations).

CHAPTER 4

SUMMARY AND CONCLUSIONS

4.1. Chronological Attribution of Tell Qudadi's Iron Age Assemblages

Three main ceramic assemblages from the Iron Age fortress of Tell Qudadi (Strata IV, IIIB, IIIA),[1] although heterogenic in their nature, that is to say they feature northern, southern and coastal characteristics, reveal no essential differences in terms of typology, showing that the fortress was in use only during Iron Age IIB.[2] Indeed, the characteristics of the pottery clearly indicate a chronological horizon identified with the assemblages of, for example, Tyre III–I, Keisan 5–4b, Hazor VI–V or Beth-Shean P-7 in the north and its many parallels, or those of Ashdod VIII–VII, Gezer VIA–VB/VA, Lachish III, Tel Miqne/Ekron II and IC, and Tel Batash III to the south of Tell Qudadi and its many parallels.[3]

[1] For a number of different systems for labelling Iron Age horizons in the archaeology of the southern Levant, see, for example, Aharoni and Amiran 1958; Ben-Tor 1992; A. Mazar 2005; Finkelstein and Piasetzky 2011. In our discussion we follow the periodisation presented in the latter.

[2] Three documented sherds from what is termed Stratum V, despite the presence of a 'Late Iron IIA' cooking pot, do not affect the general Iron IIB date for all phases of Tell Qudadi's fortress, due to the presence of clearly Iron IIB type of BL 3 in the same deposit. It may be safely postulated that the first fortress (Stratum V) was established and destroyed (Stratum IV) during Iron IIB.

[3] For comparative assemblages in the northern coastal plain (Phoenicia and North Syria), see Lehmann 1996, 38–40 *passim*, Assemblages 1–3; 1998; 2002. For Tyre, in particular, see Bikai 1978a, 13, 67 *passim*. For Hazor, see Amiran 1969, 191–293, pls. 60–100 *passim*, which abundantly but selectively represents strata VII–VA at Hazor; otherwise one can refer to the five volumes (I–V) of Hazor final reports that were published by season and contexts resulting in the repetitive appearance of the same pottery types. For Beth-Shean, see A. Mazar 2006, 313–84 *passim*, especially pls. 26–42. For comparative assemblages in the Shephelah, see those of Lachish, (see Zimhoni 2004, *passim*), Tel Miqne/Ekron II and IC (Gitin 1989; 1997; 2003) and Tel Batash III (A. Mazar and Panitz-Cohen 2001, 10–185 *passim*). For comparative assemblages in the southern coastal plain, see those of Ashdod VIII and VII (Dothan and Porath 1982, 28–41, figs. 13–29 *passim*; Finkelstein and Singer-Avitz 2001, 244–46; 2004, 127–31; Ben-Shlomo 2003; 2005).

The date of transition between the later phase of Iron Age IIA, recently termed 'Late Iron IIA' (Herzog and Singer-Avitz 2004; 2006; 2011),[4] and the beginning of Iron Age IIB is widely discussed. Although for many years scholars used to believe that the Iron Age IIB horizon represents mainly the second half of the 8th century BC, nowadays, the majority opinion favours the idea that the transition from the assemblages of late Iron Age IIA to those of the beginning of Iron Age IIB had already occurred at the beginning of the 8th century BC (see, with slight alternations, A. Mazar and Panitz-Cohen 2001, 274–75; Herzog and Singer-Avitz 2004; 2006; Faust 2005; Fantalkin and Finkelstein 2006; Na'aman 2007). Still, more recently, it has been suggested that the Lachish Level III ceramic horizon of Iron Age IIB cannot predate the 760s BC (Finkelstein 2008, 502). This is based upon a number of C14 dates from Beth-Shemesh 3, recently published by Sharon *et al*. (2007, 40, 44) and re-evaluated by Finkelstein and Piasetzky (2007, 78).[5] Nevertheless, it seems that in terms of ceramic development, the transition between characteristic assemblages of late Iron Age IIA and Iron IIB was rather gradual and was completed sometime in the first half of the 8th century BC.

The ceramic horizon of Iron IIB in all parts of the country did not end, however, with the Neo-Assyrian destruction layers in the late 8th century BC, but probably continued at least throughout the first half of the 7th century BC (Finkelstein 1994). It is possible that this ceramic horizon may even be stretched slightly beyond the mid-7th century BC (and below).[6] Similar to the gradual transition from the assemblages of late Iron Age IIA to those of Iron Age IIB, it may be assumed that the transition between Iron Age IIB assemblages and those uncovered in the Neo-Babylonian destruction layers from the end of the 7th to the beginning of the 6th century BC (sometimes called Iron Age IIC) was also gradual and was completed only in the second half/last third of the 7th century BC. This next chronological horizon is securely defined in terms of ceramic assemblages, due to its preservation in the Neo-Babylonian destruction levels.[7]

[4] In the southern part of the country, the 'Late Iron IIA' horizon is represented by assemblages such as Lachish IV, Tell es-Safi/Gath A3 (Shai and Maeir 2012), Beersheba V and Arad IX (Herzog and Singer-Avitz 2004; for possible differences in the duration of these strata, see Fantalkin 2008, 33). For comparative assemblages in the north and at the coastal plain, see Herzog and Singer-Avitz 2006; 2011.

[5] For the actual pottery assemblage of Beth-Shemesh 3, a stratum which features transitional Iron IIA/Iron IIB pottery forms, see Bunimovitz and Lederman 2006, 419–20.

[6] On the problems involved in the identification of first half of the 7th century BC pottery assemblages, see in particular Finkelstein and Na'aman 2004, 72–73.

[7] For the southern coastal plain and the Shephelah, the destruction layer of Ashkelon which is dated to 604 BC, is of vital importance (Stager 1996, 61*–74*; Master 2001; Stager, Master

Taking these assumptions into consideration, we face a certain problem in our attempts to determine the period of existence of Tell Qudadi's Iron IIB fortress in absolute chronological terms. The chronological horizon of all three Iron IIB groups discerned at Tell Qudadi and presented above might extend over quite a long period of time, beginning already in the first half of the 8th century and ending around the middle of the 7th century BC or slightly later, that is to say a period of some 150 years. The fact that two clear construction phases were discerned in the fortress, sealed in burnt layers, and that the beginning of the second phase involved noticeable architectural changes, may point perhaps, although not necessarily, to maintaining the fortress during a sufficient period of time. Can this assumed lengthy time span be delimited in order to determine the period during which the fortress was occupied more precisely?

First of all, we should pay attention to the fact that all three Iron IIB ceramic groups from Tell Qudadi seem to represent the 'classic' Iron IIB horizon. That is to say, both the transitional features of Iron IIA/Iron IIB pottery forms and the forms that characterise the ceramic assemblages from the end of the 7th to the beginning of the 6th century BC (Iron IIC) are not prominent in Tell Qudadi's ceramic repertoire. Such an observation might help to limit the fortress's operation in broad terms as from the second half of the 8th to the first half of the 7th century BC.

Additional assistance comes from the discovery of the imported pieces of Greek pottery, whose typological-chronological attribution was discussed in detail above. As it is already noted, the presence of the amphora from Lesbos in what is clearly an Iron Age IIB context in our region comes as a surprise, since it is usually assumed that the production of these amphorae did not begin before the third quarter of the 7th century BC (Iron Age IIC in Levantine terms). It seems to us that considering the corrected date for the initial production and circulation of the majority of the Archaic East Greek transport amphorae, it would be inaccurate to assume that the series from Lesbos made its appearance in our region as early as the beginning of Iron Age IIB, i.e. already at the beginning of the 8th century BC. The single Lesbian amphora found in Stratum IIIB of Tell Qudadi cannot bear responsibility for raising the chronology of Lesbian Grey series transport amphorae so significantly.

and Schloen 2011; Waldbaum 2002; 2011; Fantalkin 2011). In addition to Ashkelon, other chronologically important assemblages include those of Meẓad Ḥashavyahu (Naveh 1962; Fantalkin 2001a); Lachish II (Zimhoni 1997, 240–56), Tel Miqne-Ekron IB (Gitin 1989); and Tel Batash II (A. Mazar and Panitz-Cohen 2001, 10–185 *passim*).

It is reasonable to assume that this amphora from Tell Qudadi, as the earliest secure example of the Lesbian amphorae found so far, dates no earlier than the late 8th/early 7th century BC, joining the rest of the Archaic East Greek amphorae series, which began to appear at more or less similar date (Docter 2000). Still, because of their rarity in such early contexts, the production and circulation of these transport amphorae were clearly on a modest scale between the end of the 8th and the end of the 7th centuries BC, and only during the 6th century BC did their production and circulation become widespread.[8] Likewise, we must take into account that the Lesbian amphora was found in a clear context of Stratum IIIB, sealed by the second destruction layer Stratum IIIA, which should be dated to the first half of 7th century BC, based on the presence of the handle belonging to the East Aegean oinochoe, dated to *ca*. 680–670 BC, and due to the absence of Iron IIC ceramic horizon at Tell Qudadi. Taking into consideration the period of existence of the second fortress, which came to a violent end at Stratum IIIA around mid-7th century or slightly later and the length of existence for the occupation level detected in the preceding Stratum IIIB (above the remains of the earlier fortress of Stratum IV), one may postulate that the Lesbian amphora from Tell Qudadi was deposited there not later than the very late 8th century BC or the very early 7th century BC.[9] The date of *ca*. 700 BC for the production of this piece can therefore not be greatly off the mark.

All in all, although in terms of absolute chronology the Iron IIB assemblage from Tell Qudadi can extend over a period of some 150 years, its particular characteristics as well as the presence of the Aegean imported fragments in Strata IIIB and IIIA do allow the period of the fortress's use to be further narrowed down to between the second half of the 8th century and the first half of the 7th century BC. This period of time corresponds, at least in general terms, to the period of Neo-Assyrian rule in Palestine. Accordingly, it may be assumed that the fortress at Tell Qudadi was an integral part of the system of administrative centres, trade stations and fortresses established on the coastal plain and inland in response to the needs of the Neo-Assyrian empire.

[8] Later Classical sources point to an excellent reputation for Lesbian wine in antiquity (see Clinkenbeard 1982, 254–56, for a summary). However, it is not entirely clear whether the Lesbian Grey series amphorae were indeed intended to carry wine. Johnston, for instance, has suggested that the Lesbian Grey series amphorae may have been used to carry oil, while the oxidised red Lesbian amphorae were used for wine (Johnston 1990, 41–42). Such a suggestion, compelling as it may be (see also Monakhov 2003, 45), should certainly await additional corroboration.

[9] In this regard one should also consider a certain time-span between the production of this vessel in Lesbos and its arrival and deposition at Tell Qudadi.

The revised chronology of the Iron Age IIB fortress can be summarised (Table 18).

Table 18: Revised Chronology.

Strata	**Description**	**Avigad/Sukenik/Yeivin**	**Fantalkin/Tal**
I	Surface		Surface
II	Fill		Mixed
II–III	Fill/Industrial Installations	7th century BC	Mixed
IIIA	Second architectural phase/ second destruction	8th century BC/ 732 BC destruction	*ca*. 680/670–640/ 635 BC
IIIB	Occupation phase	9th century/8th century BC	*ca*. 700/ early 7th century BC
IV	First architectural phase/ first destruction	9th century BC	Late 8th century BC
V	Foundation/first architectural phase	10th century/9th century BC	Late 8th century BC

The revised chronology of Tell Qudadi's Iron Age assemblages presents a unique opportunity to re-evaluate our understanding of the Late Iron Age chronology of the southern Levant, with archaeological and historical implications far beyond the immediate vicinity of Tell Qudadi.

As it is already mentioned, there is an understanding among many scholars that the ceramic horizon of Iron IIB did not end with the Neo-Assyrian destruction layers in the late 8th century BC, but continued at least throughout the first half of the 7th century BC (Finkelstein 1994). Until now, this was based on a number of reasonable assumptions, according to which there are basically two sets of destruction layers during the Late Iron Age, while the intermediate assemblages from the first half of the 7th century BC located in between, are not easily identified:

- The first set of destructions (Iron Age IIB) is associated with the Neo-Assyrian campaigns in the second half of the 8th century BC and includes a whole series of destructions related to Tiglath-pileser III policies in the north and along the coast; Sargon II in Samaria and along the coast and Sennacherib actions against Judah and its allies.
- The second set (Iron Age IIC) is associated with the Neo-Babylonian campaigns against Philistine cities and Judah, toward the end of the 7th/ early 6th century BC.
- The first half of the 7th century BC and slightly beyond, on the other hand, is presumably lacking destruction layers during the heyday of the

> *Pax Assyriaca* in the southern Levant. As a result of this, tracking the intermediate assemblages from this period is almost an impossible task and beyond a few clues, such as a modest intermediate phase at the gate area of Lachish, one may assume the continuity of Iron Age IIB assemblages into the 7th century BC, but not unequivocally prove it.

Two Aegean finds from Tell Qudadi, discussed in detail above, provide for the first time a reliable proof for such continuity. Simultaneously, however, it opens new directions towards our understanding of the geo-political realities of the Late Iron Age. Thus, in a stimulating recent study, A. Fuchs (2008) has demonstrated that the Neo-Assyrian siege techniques were less advanced than commonly held and that the well-fortified Levantine cities were almost invulnerable against Assyrian attacks. Many of these cities, he claims, fell at last more for political than military reason, as a result of inner tensions between their kings and elites, who became Assyrian loyalists, and their subjects, who had to bear all the burdens of the Assyrian yoke.

Let us make no mistake, if needed, the Assyrian war machine was capable enough to undertake by force any given Levantine city and there is no shortage of such cases: for instance, the conquest of Ashdod by *turtanu* of Sargon II in 712 BC or the destruction of Lachish by Sennacherib in 701 BC. These examples immediately come to mind since in both cases the Assyrian destructions are corroborated by three independent types of sources: Assyrian and biblical testimonies and the archaeological evidence. However, it is also clear that, if possible, the Assyrians tried to avoid direct military confrontation, preferring political solutions instead. Why does it matter?

In Syro-Palestinian archaeology there always has been a tendency to attribute this or another set of destructions to a particular campaign of this or another conqueror. Such correlations, if possible, present unique opportunities to create archaeological synchronisations between different regions, based on synchronisation of material remains unearthed in the destruction levels, which were attributed to particular historical event. On many occasions, however, these commonly accepted synchronisations turned out to be wishful thinking. Examples are numerous and it will be sufficed to mention just a few:

- The transition from the Middle to the Late Bronze Age. According to the traditional view, there was a wave of archaeologically attested destructions in Canaan, which should be attributed to the expulsion of the Hyksos from Egypt. These destructions were interpreted as a result of military conquest of Ahmose and his immediate successors, directed against principal centres of Hyksos power in Palestine (for example

Weinstein 1981; Dever 1990). The reassessment of the available data, however, has shown that the destructions in question present no discernable pattern that can be attributed to reconstructed historical event and instead, should be discussed against the background of a lengthy settlement crisis in Canaan that started toward the end of the 17th century BC and continued for slightly more than a century (Hoffmeier 1989; Bunimovitz 1995).

- The transition from Iron Age I to Iron Age IIA. According to the traditional view, the end of Iron Age I throughout the country should be attributed to Davidic conquests (for example A. Mazar 1992, 30, 372–74), somewhere around 1000 BC, down to 980 BC at the latest. The reassessment of the available data however, has shown that the end of Iron Age I should be seen as a lengthy process in which the late Iron Age I strata were not destroyed as a result of a single event (Fantalkin 2001b; Arie 2006; Finkelstein and Piasetzky 2011). These conclusions, which imply the existence of chronologically distinct ways of destructions, were fully corroborated by radiocarbon dates (for example Sharon *et al*. 2007; Finkelstein and Piasetzky 2009; 2010; Lee, Bronk Ramsey and Mazar 2013).
- The destructions of Shoshenq I (the biblical Shishak). According to the traditional view, Shoshenq I who campaigned in 926/925 BC, destroyed numerous sites in Palestine, which could be identified in accordance with his topographical list found next to the Bubastite Portal at the Temple of Karnak in Luxor (for example B. Mazar 1957; A. Mazar 1992, 398; Ahlström 1993). This event, presumably resulting in many destruction layers, was taken as the most secure anchor for the late 10th century BC. The reassessment of the available data, however, has shown that the destructions in question cannot be attributed to Shoshenq I's campaign, since he probably aimed at renewing the Egyptian foothold in Canaan instead of conducting no more than a *razzia* (Ussishkin 1990; Fantalkin and Finkelstein 2006; Finkelstein and Fantalkin 2012). Other agent(s) should be sought therefore for the destruction layers, which were previously identified with Shoshenq I's campaign.

Sennacherib's third campaign to the Levant, conducted in 701 BC, was always taken as a watershed event in the history of Judah.[10] Indeed, its 46 'strong, walled cities' and innumerable villages were presumably destroyed and 200,150 people were taken as captives, if one follows the information supplied

[10] The number of studies dedicated to this topic is enormous. For the most recent collection of studies, citing previous literature, see Kalimi and Richardson 2014.

by Sennacherib's annals literally (Luckenbill 1924, 32–33, lines 18–27). Although on many occasions the number of cities destroyed and especially the numbers of captives were considered by scholars as being exaggerated, as a result of a typical Assyrian propaganda, there has been always an understandable tendency to identify Sennacherib's destruction layers in many Judean sites. The discovery of Sennacherib's destruction at Lachish (Tufnell 1953; Ussishkin 2004), supplied a firm and reliable chronological anchor, which is usually borrowed for almost any detected destruction in the course of Iron Age IIB in many Judean sites (see, recently Katz and Faust 2012). However, the fact that Lachish Level III was destroyed by Sennacherib in 701 BC does not necessarily imply that other destructions, even if feature quite similar ceramic assemblages, should be dated to 701 BC as well. The evidence supplied by Tell Qudadi's finds permits one to reassess the current scholarly consensus, according to which there is only one destruction horizon of 701 BC in Iron Age IIB Judah.[11] Although Tell Qudadi's assemblages do not originate from Judah (above), the general characteristics and trends in ceramic forms and vessels' treatment of Iron Age IIB are not that different across the whole southern Palestine, creating a ceramic *koine*, connected to Phoenicia as well. As a result of this, since, as it is demonstrated in Tell Qudadi, the typical Iron Age IIB forms continue into the first half of the 7th century BC, the same applies to Judah as well. It is more than possible that quite a number of the so-called 701 BC destruction assemblages could be dated, in fact, a few decades later.[12] In this regard, a slight down-dating of Bikai's dates for Strata III–I in Tyre (Bikai 1978a), already implied by a discovery of an inscribed Egyptian urn of the late 25th or 26th Dynasty from Stratum III, is more than warranted (James 2008, 147).

What might be the agents for some possible destruction layers in southern Palestine, other than 701 BC and slightly later, but before the beginning of Saitic Egyptian expansion after the Assyrian withdrawal from the Levant in the second half of the 7th century BC? In the absence of straightforward historical sources we can only guess: a hypothetical Kushite intervention in the Levant, between 683 and 679 BC, as suggested by Kahn (2004)? Or, perhaps previously unrecognised policies of Esarhaddon at the southern end of the western frontier of the empire? Or, should one blame the tribal leaders, like Laban or Asuhili, if we use Knauf's (2003) suggestion concerning the latter?

[11] A suggestion of Blakely and Hardin (2002), according to which there are two destruction horizons in the Shephelah and Beersheba valley, the first by Tiglath-pileser III in 734 BC and the second by Sennacherb in 701 BC, was convincingly refuted by Finkelstein and Na'aman (2004).

[12] For such an attempt concerning the destruction of Beersheba II, see Knauf 2003.

One thing is clear enough, if possible, an updated typology for Iron Age IIB should be created (similar to Herzog and Singer-Avitz suggestion to distinguish between the early and late horizons for Iron Age IIA); the typology that would attempt to differentiate between early and late Iron Age IIB horizons, trying to distinguish the presence or absence of intermediate types with late Iron Age IIA for the former and with early Iron Age IIC for the latter, and using imported pottery as additional hints.[13]

4.2. The Fortress in the Context of Neo-Assyrian Imperial Policies and Site Occupation in Achaemenid Times

The Iron Age

Our analysis of the finds from Tell Qudadi presents the following picture:[14] in contrast to the previously accepted scholarly opinion with regard to the dating of the fortress,[15] its establishment can very reasonably be attributed to the second half of the 8th century BC at the earliest. The second phase of the fortress shows continuity in terms of the ceramics and therefore it should be dated to the first half of the 7th century BC. The presence of the handle belonging to the East Aegean oinochoe dated to *ca*. 680–670 BC, in the Stratum IIIA, strengthen this assumption. As for the end of the fortress, it seems to have ceased functioning slightly after the middle of the 7th century BC, due to the withdrawal of the Neo-Assyrian empire from the southern Levant around 640–635 BC.[16] This assumption is supported by the fact that the site revealed

[13] For a recent attempt to detect certain pottery types of the early 7th century BC from the southern coastal plain, using the evidence from Tell Jemmeh, see Ben-Shlomo 2014.

[14] The preliminary analysis, partially incorporated here, was published in Fantalkin and Tal 2009a–b.

[15] Most scholars dealing with the site agreed on its earlier dating and Israelite hegemony, following the reconstruction suggested by excavators (above). Given the evidence gathered here we reject their arguments. Tell Qudadi's excavators were of the opinion that the fortress served to prevent sea raids on the Yarkon inner settlements, such as Tell Qasile and Tel Gerisa (Yeivin 1960, 204–05; Gophna and Ayalon 1989, 21). However, during the time the fortress operated these settlements had ceased to exist (Herzog and Singer-Avitz 2011). It is likely therefore that a renewal of the settlement at Stratum VII of nearby Tell Qasile (A. Mazar 1985, 113–14) is the outcome of Tell Qudadi's destruction, connected to the neo-Assyrian withdrawal from the Levant. Although suggested by A. Mazar (1985, 113–14), the poor remains discovered at Tell Qasile VII should not be identified with Judean expansion of any kind, but rather interpreted as an unsuccessful, short-lived attempt on the local level to renew the settlement on the mound; for it is clear that Josiah's modest territorial advances, if there had been any save perhaps for Bethel, did not encompass the coastal plain (Na'aman 1991; Fantalkin 2001a).

[16] Until recently, many scholars have followed Na'aman's (1991) influential interpretation concerning the neo-Assyrian withdrawal from Ebir nāri, according to which the Egyptian expansion to the Levant did not begin before 626 BC (see, however, Vanderhooft 1999, 64–68). In this

no ceramic types characteristic of Iron Age IIC (end of the 7th century and/or the beginning of the 6th century BC), familiar from numerous sites where layers associated with the Neo-Babylonian destructions or abandonment have been documented. Even if the archaeological interpretation seems wanting in and of itself that the period of the existence of the fortress at Tell Qudadi should be limited to a time corresponding to the Neo-Assyrian period, larger historical considerations provide even more support for this scenario. Indeed, considering the strategic location of the fortress, it is difficult to imagine its maintenance during Iron Age IIB under the control of anyone other than representatives on behalf of the Neo-Assyrian regime.

Although in current scholarly discourse there is a variety of perspectives concerning the extent of the so-called 'Assyrianisation' and its impact on the western territories, the processes that took place in the southern Levant near the end of the 8th and during the main part of the 7th century BC undoubtedly show unprecedented involvement of the Neo-Assyrian administration in local affairs (Gitin 1997; Na'aman 2001; 2003; Fales 2008; Bedford 2009; Faust 2011; Berlejung 2012; Bagg 2013; Ben-Shlomo 2014). This involvement may be seen in many fields, such as the annexation of certain Levantine kingdoms accompanied by the transformation of some of them into Neo-Assyrian provinces; population exchanges; rearrangement of the borders and intensive construction activity. The latter is particularly visible in the coastal area, which is dotted with Neo-Assyrian *emporia* and fortresses (see, for example, Na'aman 1995; 2001; Finkelstein and Singer-Avitz 2001; 2004). One may reasonably assume that the fortress at Tell Qudadi was an integral part of the fortresses and trade stations built during the period of Neo-Assyrian domination along the eastern coast of the Mediterranean. It seems to us that these building activities, both along the coast and along other main roads of Palestine, were intended to create a new architectural landscape that radiated political power of the Assyrian sovereign to the western margins of the empire, creating a new 'imperial landscape'.

The Assyrian interest in the coastal area is known to have stemmed from their desire to be involved in, and obtain their share from revenues of, the international trade among Phoenicia, Philistia and Egypt (see, for example, Elat 1978; 1990; Gilboa 1996). As a result, on the one hand the Phoenicians enjoyed the stability of the *pax Assyriaca* and exclusive access to trade routes

reconstruction Egypt is seen as a sort of a 'successor state', entering the void created by the Assyrians, only following the major rebellion in Babylon. New evidence, however, which came to light only a few years ago (Chauveau 2011), suggests that the Egyptians may have been already active in the Levant from at least 636/635 BC.

and mercantile centres, but on the other hand, Neo-Assyrian administrative officials closely monitored that trade and levied duties on it (Frankenstein 1979; Na'aman 2001; Fantalkin 2006, 201–02; Sommer 2007).[17] There is no doubt that the Assyrians invested a great deal of effort in the routing of commerce and its concomitant taxes, an effort that required constant supervision over main points of control, among them seaports. It is therefore reasonable to assume that the location of the fortress at Tell Qudadi made it an important intermediate station on the maritime and overland route between Egypt and Phoenicia.[18]

But must we assume that attributing the fortress to the Neo-Assyrian network means it was actually built and maintained by the Assyrians? While some of the architectural components discerned in the fortress may point in that direction,[19] in our opinion this was not the case. Rather, both the construction and maintenance of the fortress were likely to have been carried out by a local vassal on orders from the sovereign, as had been common practice in the frontier zones of the Neo-Assyrian empire (see, for example, Parker 1997; 2002; 2003; Dubovský 2006, 203–07).[20] Thus although, according to our reconstruction, the fortress at Tell Qudadi belonged to the Neo-Assyrian network, we need not seek standard Mesopotamian construction or even Neo-Assyrian pottery types there.[21] Concerning the southern Levant, Anastasio notes that in 'in general, analysis of known repertories clearly shows that a true Assyrian pottery production is never found in this region' (Anastasio

[17] As has amply been seen, for example, in the letter of Qurdi-Assur-Lamur to Tiglath-pileser III (ND 2715), dated to *ca*. 732 BC (Postgate 1974, 390–93; and, more recently, Yamada 2008, 301) or in a famous treaty from the 670s BC, between Asarhaddon and Ba'al of Tyre (Borger 1956, 108, lines 18–20; and more recently, Kuhrt 2002, 22–23; Edelman 2006, 219–23).

[18] In this respect, a neo-Assyrian trend of erecting fortresses by river mouths should definitely be emphasised (see Shavit 2003, 213).

[19] It is possible that the plan of the fortress, an open-court structure surrounded by a row of rooms, built upon a square monumental podium with a stepped glacis reflects direct Mesopotamian influences (see Amiran and Dunayevsky 1958). Resembling features were discovered in other 'neo-Assyrian' sites, for example Tell Abu Salima (Reich 1993), Ashdod-'Ad Halom (Kogan-Zahavi 2007) and Rishon LeZion (Levy, Peilstöcker and Ginzburg 2004), although concerning the latter, its neo-Assyrian influence is less pronounced.

[20] As Bagg fittingly notes: 'The logic of Assyrian world domination was based on the principle of maximum profit with minimum infrastructural investments' (2013, 131).

[21] Kletter and Zwickel (2006, 178) criticised our suggestion to ascribe the fortress of Tell Qudadi to a neo-Assyrian network, based on a wrong interpretation of a lecture we gave at Tel Aviv University in October 2005. Kletter and Zwickel accept the date proposed by us but reject a neo-Assyrian origin based on the fact that the fortress was built in accordance with local building traditions. It should be emphasised that we never argued for actual building and maintaining of the fortress by the Assyrians (although we do not reject such an idea altogether), but we concluded that it was politically controlled by representatives of the neo-Assyrian regime, given the fortress's chronology and the political history of the region.

2010, 25; see also Engstrom 2004; Ben-Shlomo 2014).[22] If our proposed date for the functioning of the fortress is accepted, its attribution to a certain ruling authority should be based on a wider historical perspective rather than construction style or ceramics. Considering the lack of a developed hinterland in the Yarkon basin in the 8th and 7th centuries BC (Shavit 2003; 2008; see also Dagot 2007), it seems only likely to attribute to a foreign power the initiative for the construction of a monumental fortress at the estuary of one of the most important rivers in the country.[23]

In fact, there is no shortage of possible scenarios concerning the building of the fortress or the causing of its destruction layers. Thus, as is well known, during Sennacherib's campaign in 701 BC, an Ashkelonian enclave was targeted in the area discussed, consisting of Beth Dagon, Joppa (Jaffa/Yafo), Bene-Baraq and Azur (Pritchard 1969, 287). How can the control of Ṣidqa, king of Ashkelon, be explained over this area? According to Gadot, it is plausible that already during Iron Age I Ashkelon had extended its power (colonised?) or at least significantly tightened its trade connection with the central part of Israel's coastal plain (Gadot 2008). In this reconstruction, the appearance of the Ashkelonian enclave in the area of Joppa in 701 BC may be an outcome of a colonisation process that had started 400 years earlier (Gadot 2006, 31). According to Na'aman, however, it was Tiglath-pileser III who may have transferred Joppa and the adjacent areas to the control of Rukibtu, king of Ashkelon, in 732 BC (Na'aman 1998).[24] Whatever the case, it is possible that Rukibtu was required to build and maintain the fortress at Tell Qudadi in the service of Assyrian interests in the region, which involved securing maritime trade and customs. However, after Ṣidqa joined Hezekiah's rebellion in 701 BC, the Ashkelonian enclave in the area of Joppa was targeted and

[22] For another recent attempt to create a corpus of Assyrian pottery, based on the deposits found in the Ishtar Temple at Assur, spanning the 3rd to 1st millennia BC, see Beuger 2005. For the most recent comprehensive corpus of Neo-Assyrian pottery, based on the deposits from Assur, see Hausleiter 2010.

[23] Throughout many periods of its history, the region experienced direct intervention of various rulers who shaped it as they saw fit. Thus, during the Late Bronze Age Joppa was an administrative centre with direct Egyptian rule over the surrounding lands (see Na'aman 1981, 177–80), while at the beginning of the Iron Age, the region and its resources were exploited by various Philistine rulers (Gadot 2006; 2008). For the history and archaeology of Joppa/Tel Aviv during the 1st millennium BC, see Fantalkin and Tal 2009b; Tal and Fantalkin 2009b (and below).

[24] Concerning the status of Ashkelon under the neo-Assyrian empire, see Faust and Weiss 2005; Na'aman 2009a. In both cases, Ashkelon was considered as one of the most important cities in Palestine and the hub of the local economic system during the *pax Assyriaca*. For alternative perspective that assumes that Ashkelon's enormous prosperity during the period of neo-Assyrian domination was probably exaggerated, see Fantalkin 2011.

most probably confiscated by the Assyrians. Could the first destruction layer discerned at Tell Qudadi, Stratum IV, be the work of Sennacherib, who was forced to conquer the fortress from the troops of the rebellious king who may have taken it over? According to this possibility, it might be assumed that the remains of the second phase of the fortress, in which the inset-offset wall and its gate and ramp were added, are none other than a repair of the imperial property and its restoration to the original owners. That is to say, one may hypothesise that Šarru-lū-dârri son of Rukibtu, who was appointed by the Assyrians to rule in Ashkelon instead of rebellious Ṣidqa, took care of the repair of the fortress and its daily maintaining as part of his vassal obligations to the Assyrian masters. Clearly we have no certain answer, and this scenario is one among many possibilities. [25]

Another, not less attractive possibility is that Assyrian orders were given to one of the local rulers to build the fortress at Tell Qudadi after the suppression of the revolt in 701 BC. According to Na'aman's original suggestion, after the rebellion of Ashkelon in 701 BC, the area of Joppa was transferred to Padi, king of Ekron, and served as a main port of trade for his kingdom. This is based on the notion that the territory of the kingdom of Ekron in the 7th century BC roughly overlapped the inheritance of Dan (in particular the western border of the town list of Dan) in the boundary system of the Israelite tribes (Na'aman 1998, 225; 2001, 262). It must be stressed, however, that the general decline of the Yarkon area during the 7th century BC, including the absence of late 7th-century BC remains at Joppa[26] and the absence of 8th–7th-century BC remains from Tel Gerisa, as well as the attested modest remains from Stratum VII at

[25] Is it possible that the destruction layers documented at the fortress of Tell Qudadi were the result of none other than occasional incursions of pirates, like those made by Ionian Greeks and documented in the areas further to the north of the eastern Mediterranean basin (see, for example, Parker 2000; Yamada 2008, 303–05)? On the other hand, could the first destruction of the fortress be an outcome of hypothetical Kushite intervention in the Levant, between 683 and 679 BC, suggested by Kahn (2004)? Note, however, Spalinger's thorough analysis on the military in Egypt during the 25th Dynasty, according to which 'it was more suitable for local wars than for massive international conflicts' (1981, 58). On the other hand, we have plenty of evidence for Kushite interventions in the Levantine affairs (Zamazalová 2011), not to mention the famous battle of Eltekeh (Radner 2012). The second destruction should be connected to the final years of Assyrian rule in the Levant and Egyptian takeover around 640/635 BC.

[26] Unlike more substantive traces of activity at Joppa during Iron Age IIA, still relatively modest (Fantalkin 2005, with previous literature), the reported Iron Age IIB remains from the tell are even less impressive and according to the excavators, they included a rough stone wall and an adjoining stone floor as well as two cattle burials with stone markers (Kaplan and Ritter-Kaplan 1993, 656, 658; some additional poor Iron Age IIB finds on the mound were reported by Herzog 2008). A few similar dated remains were exposed during the IAA excavations in the vicinity of the tell (Fantalkin and Tal 2009b, 242, n. 70, with references). For the history of archaeological research in Jaffa during 1948–2009, see Peilstöcker 2011.

Tell Qasile (only from the end of the 7th century BC), makes it difficult to accept that Joppa had served as a main port of trade for Ekron (Fantalkin and Tal 2009b).[27] The ports of Ashkelon, Ashdod-Yam and especially Yavneh-Yam might be considered better candidates for serving Ekron's oil trade (Fantalkin 2004; 2011).

Na'aman's more recent proposal appears to be more attractive. According to him, it is reasonable to assume that following Sennacherib's campaign, most of Joppa's inland enclave was annexed to the province of Samaria, while the coast of Joppa was transferred to the province of Dor (Na'aman 2009b).[28] In this scenario, one can assume that the repairing and maintaining of the fortress after its first destruction (and may be even the initial building of the fortress?) was entrusted to the governor of Dor who may be considered as the representative of the imperial power.[29]

On the other hand, the possibility that the first fortress at Tell Qudadi may have been built on the instructions of Sargon II, is not to be discounted. It was during the reign of this king, who 'opened the sealed harbour of Egypt', that immensely significant changes took place in all parts of the country, including the coast (see, for example, Tadmor 1958; Spalinger 1973; Na'aman and Zadok 1988; 2000; Liverani 2012).

Another attractive possibility, and perhaps the most plausible one, consists of a scenario where the construction of the first fortress at Tell Qudadi corresponds to the transformation of Gezer into important Assyrian centre, following Tiglath-pileser's III campaign in 734/733 BC.[30] Nowadays, the Yarkon

[27] The pottery evidence from two other sites along the Yarkon strengthens this assumption. At Tel Ḥashash, down the stream not far from the south bank of the Yarkon, only a few pottery fragments (Fig. 119 at p. 187) provide evidence for some meagre activity during the Iron Age IIB horizon. At Tell Abu Zeitun which is located further down the stream, not far from the south bank, a similarly dated modest assemblage was published (Katz 2007). In addition, some Iron Age IIB pottery was attested in several places in Tel Aviv, such as Kikar Hill (Giv'at Beth HaMitbaḥayim), and in areas bordering Yehoshua Ben Nun and Yoḥanan Hyrcanus Streets. According to Kaplan and Ritter-Kaplan, they may represent the military camps that were established on the eve of Sennacherib's campaign (1993, 1454). It seems, however, that all these findings should better be interpreted as belonging to Joppa's agricultural hinterland rather than to military encampments (Fantalkin and Tal 2009b).

[28] Indeed, in this case there is a reasonable explanation to the fact that later on, the Achaemenid king, apparently Cambyses II, transferred the territories of Dor and Joppa to 'Eshmun'azor II, king of Sidon (below).

[29] The cylinder seal found south of Netanya (in the vicinity of the Wingate Institute) and inscribed with the legend of Bel-ašarad, the palace overseer (Tadmor and Tadmor 1995) is of no help, since it is a heirloom, unrelated to the period of neo-Assyrian domination (Ornan, Ortiz and Wolf 2013). For Assyrianised pottery at Dor, see Gilboa 1996.

[30] For Gezer's importance in the system of Assyrian administration in the southern Levant, see Reich and Brandl 1985; Dubovský 2006, 203–18; Ornan 2013; Ornan, Ortiz and Wolf 2013.

and Ayalon rivers (the latter flows some 2 km to the north from Tell Gezer) are merged into one at around 3 km east of the Yarkon estuary. It is assumed that the ancient course of the Ayalon was diverted in recent geological times and that there was an ancient outlet for the Ayalon just offshore north of the Jaffa promontory (Raban 1985, 27). It is not clear whether the alternation was a natural one or a man-made and when exactly it took place (Raban 1985, 27). However, it is more than plausible that both rivers have merged into one during the Late Iron Age as they do today.

The fact that almost all the cooking pots from Tell Qudadi, belonging to the *terra rosa* and crushed calcite group, were probably produced in the upper Shephelah is of particular importance. One may assume the existence of a logistical network, where the Assyrian representatives at Gezer took care of supervising the production of sets of cooking pots of different but fixed standards[31] in the vicinity of Tell Gezer and of their shipment, via the Ayalon and the Yarkon,[32] to the fortress of Tell Qudadi, for storage and further distribution in times of need, via the Yarkon to the site Aphek, located near the sources of the Yarkon.[33] The need for the possibility of swift distribution of cooking utensils and other goods (possibly stored at Tell Qudadi) to the area of Aphek stems from the fact that the Assyrian armies were probably camping at Aphek (Apqu in Neo-Assyrian sources), the major gateway on the main road from north to south, on their way to Egypt. The account of the tenth campaign of Esarhaddon, undertaken in 671 BC against Egypt, elaborates the point:

> …(For a distance of) thirty 'miles' of land, from Apqu which is situated in the border region of Samerīna to Rapiḫu on the bank of the Brook of Egypt where there is no river, I let the troops drink buckets of water drawn from wells with ropes and chains… (K 3082+K 3086; translation after Radner 2008, 306).

[31] For capacity measures, applied to different types of vessels in neo-Assyrian documents, see Fales 1990; Gaspa 2007. The capacity measures of local cooking pots (Type CP4), brought to Tell Qudadi from the upper Shephelah, are outlined in Table 15. Although it is tempting to assume that the capacities of these cooking pots were based on some sort of Assyrian standards, it seems more plausible that they were created based on the local system of standardisation.

[32] The suitability of the Yarkon waters for extensive river navigation in ancient times is obvious. The same holds true for the Ayalon, as shown by the impressive preserved bridge of the Mamluk period built by Baybars in 1273 and located on the river near Lydda (Rosen-Ayalon 1995, 517). In this regard, one should mention the importance and the abilities of river transport in Mesopotamia, especially during the period of the neo-Assyrian empire (Fales 1993).

[33] As a matter of comparison, one thinks of the famous letter to Aššur, composed in the context of Sargon II campaign against Urartu (714 BC), where the provincial governors are expected to prepare stores of flour and wine for the Assyrian army (TCL 3, 1.53; after Thureau-Dangin 1912). For this and additional examples for civilian responsibilities and military duties of provincial governors as well as the hierarchy of Assyrian military and civilian administration, see Postgate 2007. For the attempt to estimate the average daily rations of grain/bread for the Assyrian army and to calculate the medium size of an Assyrian armed contingent on campaign, see Fales 1990.

It is obvious that the fields around the Aphek springs served as the focal point for replenishing the Assyrian army before a difficult journey to the south and, not less important, on its way back.[34] Under such circumstances, the role of the Tell Qudadi fortress within the Neo-Assyrian system of imperial control appears to be twofold: it could have served as an important intermediate station on the maritime and overland route between Egypt and Phoenicia, where the Neo-Assyrian administrative officials or their representatives could closely monitor the trade and levy duties on it; simultaneously, it could have served as an important and thus protected storage depot for the Assyrian army, being one of the focal nodes of logistical support within the system of an intentionally created imperial network.[35]

The Persian Period

Given the extent of excavations and preservation of Persian era remains the site character at that time is somewhat enigmatic. The pottery recovered suggests a gap between the late 7th century and the late 6th/early 5th century BC. The site proximity to Joppa, not only may suggest that administratively it was probably confined to its hinterland but also that politically it was under Sidonian (Phoenician) rule from the late 6th century BC. From the tomb inscription of 'Eshmun'azor II – *'yt dar wypy 'ršt dgn h'drt 'š bšd šrn* – 'Dor and Joppa the mighty lands of grains in the Plain of Sharon', one can deduce that Joppa was under the direct hegemony of the vassal kings of Sidon.[36]

[34] Although Aphek was not inhabited during the era of neo-Assyrian domination, its former rural hinterland flourished during this period (Torge 2007). Aphek is mentioned as a point of reference in a famous Adon Papyrus, a letter with a request for help, written by a local ruler to the pharaoh on the eve of the approach of the army of the king of Babylon. Although it has been suggested that the letter should be dated to either one of Sennacherib's campaigns (Krahmalkov 1981; Shea 1985) or to Esarhaddon (Green 2004), placing the letter within the framework of the neo-Babylonian assaults on the southern Levant in the late 7th century BC (most probably in 604 BC) remains the most plausible option (Porten 1981; Yurco 1991). Green, who opts for a date around 678/677 BC, suggests that the Aphek mentioned in the text should be located in central or northern Syria (2004). Such an attribution is unnecessary once one accepts the neo-Babylonian date and the identification of Adon as the king of Ekron (Porten 1981). For additional options concerning the identification of Adon's kingdom, mostly in Philistia, see Katzenstein 1983.

[35] For the notion of Assyria as a 'network empire' and its imperial ideology, see Liverani 1988 and 1979 respectively. Although in a response, a number of premises of the network model were rightly criticised by Postgate (1992), both views are not mutually exclusive but complementary, especially with regard to the southern Levant during the period of neo-Assyrian domination. If in this part of the world, conquered by the Assyrians, the empire is indeed 'not a spread of land but a network of communications over which material goods are carried' (Liverani 1988, 86), the Iron Age IIB fortress at Tell Qudadi should be seen as an integral part of such a network.

[36] Donner and Röllig 1966–69, § 14.1.19; Pritchard 1969, 662; Elayi 1990, 242–43; Briant 1996, 505–06, 977. The date for the reign of 'Eshmun'azor II and the chronology of the kings of

This state of affairs continued to about the end of the Persian period as a later historical testimony, the *Periplus* of Ps.-Scylax, conveniently dated to the mid-4th century BC, may point at the same political affiliation.[37] A further indication of Joppa's Sidonian hegemony comes from the coins retrieved from the site, as 20 out of 24 documented coins attributed to the Persian period (from the excavations carried out by J. Kaplan) are Sidonian (see Meir 2000; information on coins from recent excavations is not yet published).

During this period, the number of settlements in the region around the site, the southern Sharon plain, exceeded that of Iron Age IIB, based on data from excavations and surveys alike. The process of Sidonian migration (some would say colonisation) intensified the number of civil settlements, and additionally there was a military presence as attested from the excavated fortresses in Tel Michal. In many cases Iron Age sites continued to be occupied in Persian times, but elsewhere sites were founded anew (Fantalkin and Tal 2009b). One of us has argued (in Roll and Tal 2008) that given this new settlement landscape in which coastal settlements became provincial capitals or major administrative centres, the route network gave special emphasis to the coastal road, which became a major trunk route connecting Egypt to Phoenicia/Syria by land.

The historical and archaeological evidence on Joppa in the Persian period points to its having been the major administrative site in the region (Fantalkin and Tal 2009b, 247–50). In closer proximity to Tell Qudadi lies Tell Qasile,

this dynasty is disputed (see Kelly 1987 and more recently Elayi 2004, 26–27, fig. 2; 2006, table 1, where the years 539–525 BC are suggested). New dates are consequently given to the regnal years of the Sidonian dynasty. If we accept the High Chronology, the Sharon plain and its coastal harbours were given to Sidon towards the end of the 6th century BC, most probably as tribute for the participation of the Sidonian fleet in the campaigns of Cambyses and/ or Darius campaigns to Egypt. For the campaigns, see Herodotus 3 *passim*, 4. 166–67, 200–03; and Kelly 1987, 46–49; Briant 1996, 61–72, 488–500, 914–16, 972–75.

[37] Δῶρος πολίς Σιδωνίων· Ἰόππη πολίς ἐκτε-θῆναί φασιν ἐνθῦατα τὴν Ἀνδρομέδαν τῷ κήτει· Ἀσκάλων ... 'Doros a city of Sidonians, [city of Joppa] where it is said Andromeda was exposed [to the monster Asca]lon ...' This is the accepted completion by most scholars. Galling is of the opinion that Joppa's affiliation to Sidon is clear and that the mythological reference serves as an ethnographical coordinate (see Galling 1964, 200). One may add that given the fact that Dor remained under the same political affiliation, a change in Joppa's affiliation is somewhat improbable. The *Periplus* was apparently composed at or near Athens in the third quarter of the 4th century BC (see in this respect Shipley 2012, 122, nn. 4–5). A date in the early 330s BC was suggested for this source given an interpretation of its internal evidence (Shipley 2011, 6–8). Recently, Shipley suggested a more precise dating in 338 or 337 BC based on the mention of Boeotian Thebes as the city destroyed by Alexander the Great in the autumn of 335 BC (as a *terminus ante quem*) and the fact that the coastal towns of southern Messenia, which the source puts in 'Lakedaimon' (§46.1), ceased to belong to Sparta not long after the battle of Chaironeia (Shipley 2012, 122–23). This, according to Shipley, points to 338, or perhaps 337 BC, if one allows for a delay in the taking, or the implementation, of Philip II's decision to remove them from Spartan control (2012, 122–23).

where there is a large early 5th–4th-century BC courtyard house, of less than one *dunam* in size, which the excavators believe stood alone during the Persian period (Stratum VI). It was built on the southern terraces of the tell (Area A), and has three main parts: a built silo, an inner court with rooms along three sides, and another enclosed court, which was reached by stairs from the inner courtyard (B. Mazar 1950–51, 67–71, 211–14; Stern 1982, 17–18). Renewed excavations at the site revealed several silos in other areas of excavations and a square-shaped well in the north-eastern slope of the mound (A. Mazar 1990, 244; A. Mazar and Harpazi-Ofer 1994, 26–29).

Indeed, as stressed above, we have no clear evidence for the characterisation of the site of Tell Qudadi at the time. The architectural remains are restricted to a wall some 17 m long and 0.75 m thick built in the Phoenician ashlar-pier wall technique, while the pottery evidence came from mixed loci of undefined nature. Guy identified the architectural remains as belonging to the outside wall of a house (which still remains unexcavated) on the basis of comparison with comparable remains in Tell Abu Hawam (Guy 1938, 15–16). Although quite similar walls are attested closer by in Persian era dwellings at Tel Ya'oz (for example Fischer, Roll and Tal 2008, 129–34, especially fig. 8), some 18 km to the south, we cannot exclude the possibility that the site in the Persian period maintained in some sense through its location the strategic importance it had been thought to possess by the rulers of the Neo-Assyrian fortress. In this case it may have had a military character rather than a domestic one, manifested by a tower or a fortress, while the wall discovered may form part of its remains or of an appended structure. It is clear, however, that during this period the Iron Age IIB fortress was apparently in ruins or covered by sand.

The remains from the Persian period identified on sites in proximity to the banks of the Yarkon do not contribute to a more informed interpretation. The archaeological evidence from Kikar Hill (Giv'at Beth HaMitbaḥayim), located in proximity to the Yarkon estuary, but on its south bank, consisting of wall sections and large amounts of pottery, and is too meagre to indicate a substantial settlement at the site (Kaplan and Ritter-Kaplan 1993, 1454). Further down the stream at Tell Abu Zeitun, the excavators concluded from the two areas excavated that the Persian period settlement was composed of two non-consecutive strata. The first, Phase Ib, is characterised by several domestic structures, which date to the beginning of the Persian period, whereas the second, Phase Ia, reveals sections of domestic architecture and a brick wall on the eastern slope of the mound, which dates to the second half of the 5th century BC (Kaplan 1958b; 1959, 76–77).[38] Later limited excavations at the site suggest

[38] According to Stern, it seems doubtful that no settlement existed at Tell Abu Zeitun during the 4th century BC (1982, 17). The recovery of Late Persian and Hellenistic pottery in recent

an occupation between the mid-5th and the mid-4th century BC (Katz 2007). Other rural-oriented(?) sites within the city limits of Ramat Gan should also be mentioned (Or *et al*. n.d., sites nos. 43 and 44).

4.3. Microregional Developments in the *Longue Durée* Perspective

The emphasis on microregional developments in studying Mediterranean fragmented landscapes was put forward by Horden and Purcell (2000). Using the *longue durée* perspective, however, they show convincingly that the Mediterranean landscapes were exceptional in the degree to which they were fragmented and, simultaneously, in the degree of their connectivity. As one of us has argued in the past, what is missing in the portrait of a permanently connected Mediterranean is the notion of historical/chronological context. Indeed, the emphasis on microregions, 'leaves little room for pivotal turning points in Mediterranean history, since the assumed connectivity stretches across extremes of time, by-passing geo-political boundaries and empires, together with symbolically expressed ideologies of economic exchange and political domination' (Fantalkin 2006, 199; see also Algazi 2005). On the other hand, with no intention of being accused of environmental determinism, we cannot dismiss the geographical realities on the ground and their impact on the social behaviour. Given the diversity of microregional niches in the Levant and a variety of ethnic groups that have inhabited this region, coupled with the fact that the region always acted as a buffer zone between great powers to the south, to the north and to the east, it is clear that the region's history will be affected by these considerations. Using diverse historical/chronological contexts we can see if there is a pattern that underlies the operation of Tell Qudadi within the framework of its microregion.

surveys at the site strengthens his assumption (see Or *et al*. n.d., site no. 30, with bibliography). This seems to be the case when one reconstructs the settlement pattern of the region. Due to its strategic importance, Tell Qudadi probably served basically as a military outpost, while Tell Qasile was probably used as an administrative centre, in light of its reconstruction as a single building on the tell and the discovery of an inscribed official seal there (see Kaplan 1959, 75–76; Stern 1982, 17–18; A. Mazar 1990, 244). However, it seems that the fortified Persian-period site of some 10 *dunams* at Tell Abu Zeitun was the main town located on the Yarkon river. Farther to the east, two additional sites should be added: Tel Qana, where surveys revealed Persian period pottery (Gophna and Ayalon 1998, site no. 97), and the vicinity of Tel Aphek, where excavations some 300 m north of it uncovered part of a large building (farmstead?) of Persian date (Kochavi 1975, 37; Kochavi and Beit-Arieh 1994, site no. 32). Furthermore, excavations within the eastern city limits of Petaḥ Tiqwa, some 3 km south-west of Tel Aphek, reveal building remains of Persian times (Kochavi and Beit-Arieh 1994, sites no. 84 and 85) that may also be connected to the settlement pattern around the river and its sources.

Elsewhere, we have discussed in detail the shifting of land control and the modification of settlement patterns among sites in the region of Tell Qudadi (modern Tel Aviv) and a nearby Joppa (modern Jaffa)[39] from the Late Bronze Age to the Roman period (Fantalkin and Tal 2009b; Tal and Fantalkin 2009b). Hereunder we summarise these lengthy discussions and add some new observations.

At first glance, the estuary of one of the most important rivers in the southern Levant, such as the Yarkon, appears to be a perfect spot for establishing a major settlement on the Palestinian coast. The earliest remains from Tell Qudadi, as reported here, suggest that the site's superb location was already acknowledged and utilised, although probably on a modest scale, during the Neolithic and Chalcolithic periods, as well as during the Early and Middle Bronze Ages. Tell Qudadi's role in these periods was outlined in Appendices B and C (above). Indeed, following Gophna and Paz, it is tempting to consider Tell Qudadi as a maritime outpost, commanding and controlling transport that headed towards Tel Gerisa and Tel Aphek. The centrality of Tel Gerisa (Tell Jerishe) during the Middle Bronze Age is implied by the existence of two fortification systems from the MB IIA and MB IIB periods (Herzog 1993b), unlike the fortifications of Jaffa (located about 6 km south-west of Tel Gerisa), which were probably erected not before the later part of the Middle Bronze Age period.

During the following Late Bronze Age–Iron Age I, according to Gadot (2008), new socio-political organisations emerged along the Yarkon-Ayalon basin three times in succession. The first system was created by the Egyptians, who turned Joppa into one of their strongholds in Canaan, and the plains along the Yarkon river into royal or temple estates. When the Egyptian system came to a violent end in the second half of the 12th century BC, the second system – of disorder and general decline – may be attested. During this period, the region was marginalised and no single centralised social group had control over the land. The third system emerged only when the Philistines migrated into the region from the south and a new socio-political order was established again. Gadot suggests that in the region under discussion, the initiation of a new social order was always brought about by an external political power taking advantage of fragmented local social groups to exploit the region economically. Indeed, given the region's geographical conditions, its utilisation was determined primarily by the settlers' ability to control the flow of water. When no effort was made to manage water resources via extensive public projects, swamps and seasonal pools quickly formed, diseases spread and

[39] Nowadays, both sites are within the same municipal jurisdiction of Tel Aviv-Yafo.

the land became a virtual wasteland (Gadot 2008; and see also Avnimelech 1950–51; Faust 2007; Faust and Ashkenazy 2007).

Despite its undeniable potential, stemming from its geographical location, Joppa never became a major port-power on the Palestinian coast during the 2nd and 1st millennia BC.[40] In fact, as early as the aftermath of the military campaign of Thutmose III (*ca*. 1475 BC),[41] Joppa was transformed into an Egyptian administrative centre with a permanent garrison, also possessing Pharaonic royal granaries (*šunuti*) (Na'aman 1981; Goren, Finkelstein and Na'aman 2004, 320–25). It seems that during the years of direct Egyptian rule, Joppa's hinterland was considered a Pharaonic estate, bearing a special status.[42]

The nature of late Iron Age I/Iron Age IIA remains exposed in Joppa and at sites in its vicinity permits consideration of the possibility that, as in the late 12th and the 11th century BC, during late Iron Age I (late 11th/early 10th century BC), the settlement at Tell Qasile may have dominated the region under discussion, while Joppa, Tel Gerisa and Tell Abu Zeitun were of lower status. Due to the fact that the mound of Azor has not yet been excavated, and given the limited scope of excavations at Tel Messubim, their status remains unclear. A. Mazar (2009) suggested that the economy of Tell Qasile was based on maritime trade conducted by ships that used the nearby Yarkon estuary as an anchorage. Gadot (2006; 2008) hypothesised that Tell Qasile may have served as a mediator between the small farmsteads located next to the Yarkon river, where agricultural surplus was produced, and the large city-states to its south, in the heartland of Philistine territory.[43] To this observation we may add an additional dimension, which has to do with the cultic significance of the Tell Qasile temples. Considering the notion that during various historical periods the Yarkon, being the widest of the country's Mediterranean coastal waterways, was considered a political, social and even cultural border (above), the establishment of the Philistine cultic centre at Tell Qasile is of particular significance. Located in the northern frontier

[40] For the concept of a port-power with regard to the Palestinian coast, see Stager 2001 (see also Revere 1957; note, however, Kletter's [2010] scepticism concerning the applicability of using the concept of 'port-power', as developed by Bronson [1977], in the Syro-Palestinian landscape). It is possible that Joppa enjoyed independent or semi-independent status prior to the Egyptian conquest during the reign of Thutmose III; such a possibility remains, however, uncertain, pending additional archaeological confirmation and in light of the assumed centrality of Tel Gerisa during the Middle Bronze Age.

[41] Following Wente and Van Siclen's chronology (1977). For the campaigns of Thutmose III, see more recently Redford 2003.

[42] Aphek was probably turned into an Egyptian royal or temple estates as well, assuming both economic and political duties (Gadot 2008, 62).

[43] See also Higginbotham's observation that goods from Aphek could have been transferred to Joppa's port for further shipment (2000, 127).

zone, far from the Philistine core-area, this hub of cultic activity with its series of successive temples may have had a special symbolic dimension in the Philistines' mental maps, serving as a focal point in defining the space between the 'civilised' Philistine-inhabited world to the south and the 'other' world to the north. Likewise, Qasile's temples, similar to Aegean frontier sanctuaries, may have had facilitated relations between the indigenous populations around the Yarkon river and the Philistine settlers.[44]

Although it seems plausible to assume that during Iron Age I–IIA Tel Gerisa was subordinated to Tell Qasile (Herzog 1993b), the status of Joppa and Tell Abu Zeitun, as well as Azor and Tel Messubim, is definitely uncertain. The fact that Joppa, Azor, Tel Messubim (ancient Bené Braq) and Beth Dagon are mentioned in the 701 BC prism stela of Sennacherib as belonging to Ṣidqa, king of Ashkelon,[45] may suggest that a similar situation had existed earlier. The question, already briefly discussed above, is how far back can we assume a similar political condition (Singer 1994, 308)? As mentioned above, according to Gadot (2006, 31), the appearance of the Ashkelonian enclave in the region of Joppa in 701 BC may have been an outcome of a colonisation process that had started some 400 years earlier.[46] Gadot bases his claim on the well-known fact that after the beginning of the Philistine phase in the history of Ashkelon, its hinterland shrank and almost emptied of rural settlements.[47] Ashkelon was therefore forced to initiate trade with more distant localities, and it is highly plausible that during Iron Age I, Ashkelon extended its power (colonised?) or at least significantly tightened its trade connection with the central part of the Israelite coastal plain. Indeed, an examination of the provenance of some cultic and administrative finds from Aphek and Tell Qasile shows that they were probably made at Ashkelon, thus indicating strong ties between Ashkelon,

[44] For a useful discussion concerning the notion of 'frontier sanctuaries' in the Aegean world, see De Polignac 1995, 34–35. Such a comparison is especially warranted given a possible Aegean pedigree of Philistine migration in the first place. Although some scholars would not necessarily subscribe to the idea of Philistine migration (such as Sherratt 1992; 1998; 2013; Drews 1998; Bauer 1998), it seems that certain types of archaeological evidence are on the side of its supporters (Barako 2000; Killebrew 2005; Finkelberg 2006; Yasur-Landau 2010; Maeir, Hitchcock and Kolska Horwitz 2013).

[45] Luckenbill 1924, 31, lines 68–72; Pritchard 1969, 287. According to Aharoni (1979, 49), Azor, Bené Braq and Beth Dagon should be considered Joppa's hinterland. Such a reconstruction, however, is not supported by the Assyrian account, which mentions the four cities as belonging to the Ashkelonian enclave in the same breath, that is, without distinguishing Joppa's leading role as in Aharoni's reconstruction. Furthermore, Beth Dagon is even mentioned before Joppa.

[46] It should be noted that Na'aman hinted at such a possibility a long time ago (1981, 180).

[47] See in this respect Finkelstein 2000; Fantalkin 2011. According to Shavit (2008), the absence of developed hinterlands around the Philistine city-states may be explained by Aegean concepts of urban settlement, imported by the Philistine migrants in the 12th century BC.

Aphek and Qasile (Gadot 2008, 64). According to Na'aman (1998, 219–23; 2009a, 352), however, the appearance of the Ashkelonian enclave east of Joppa at the time of Sennacherib's campaign to Palestine was the outcome of the policy of Tiglath-pileser III, who may have transferred Joppa and surrounding towns to Rukibtu, king of Ashkelon, in 732 BC (above). It should be noted that such a scenario, although entirely plausible, is based on a hypothetical restoration of lines 12–13 in the Ann. 18 (Tadmor 1994, 220–21; and see Wazana 2003). It seems to us that the possibility that Ashdod dominated the region under discussion during the 9th and the main part of the 8th century BC should be taken into consideration. Ashdod, already a major centre in Iron Age I, expanded in the 9th century BC and reached its maximal area in the 8th century BC. It thus may be hypothesised that during the 9th and the main part of the 8th century BC, Ashdod's power extended up to the Yarkon region, including Joppa and the surrounding sites. In this reconstruction, one may posit that after Sargon II's conquest of Ashdod in 712/711 BC, its subordinated settlements, in particular Joppa, Azor, Bené Braq and Beth Dagon, were given to Ashkelon and were taken away by Sennacherib following Ṣidqa's rebellion in 701 BC.

Concerning the fortress at Tell Qudadi and its continuance during Iron Age IIB, on behalf of Assyrian representatives, a number of possible scenarios have been presented above and there is no need to repeat them here. What is important to mention is that the chronological gap, attested at Tell Qasile and Tel Gerisa during the 8th and the main part of the 7th century BC, shows that by erecting the fortress at Tell Qudadi the Neo-Assyrian rulers deliberately cut off these inland settlements along the Yarkon river from the profitable maritime trade, which was farmed out to the Phoenicians. It is more than plausible that such a policy was one of the main reasons behind the anti-Assyrian revolts in various cities of southern Palestine (Na'aman 2001).[48]

The potential of Joppa's hinterland as a 'grain reservoir' was fully exploited by the Egyptians during the Late Bronze Age and by the Philistines during late Iron Age I–IIB. However, the notion of external political power taking advantage of Joppa's port and hinterland resources is probably correct for the later periods as well. If the establishment of the first fortress at Tell

[48] As a telling example, one may consider the establishment of an Assyrian stronghold in Ashdod-Yam as a possible cause for Ashdod's rebellion (Na'aman 2001). A completely opposite scenario was suggested by Tell Qudadi's excavators, who assumed that its fortress was established at the estuary of the Yarkon river in order to prevent sea-borne raids against inland settlements. In fact, the renewal of the settlement activity at Tell Qasile Stratum VII, which should be placed in the last quarter of the 7th century BC, followed the cessation of activity at the fortress of Tell Qudadi, which should be connected to the Assyrian withdrawal from Palestine.

Qudadi is connected to Gezer's transformation into important Assyrian centre, following Tiglath-pileser's III campaign in 734/733 BC, one may assume that after the annexation of the Ashkelonian enclave in the course of Sennacherib's campaign of 701 BC, the Assyrians followed suit, entrusting Joppa and its immediate hinterland into the hands of the governor of the province of Dor, who was the representative of the imperial power, with a seat for his representative at the fortress of Tell Qudadi. The Assyrian representative at Gezer might continue supervising supplies for the Assyrian army to the fortress of Tell Qudadi, sharing the duties of maintaining with the governor of Dor.

It took many years, through the so-called 'Neo-Babylonian gap', with an absence of archaeological finds from Joppa and Tell Qudadi attested so far, until Joppa renewed its role as an important centre under Achaemenid rule. 'Dor and Joppa the mighty lands of grains in the Plain of Sharon', entrusted to the Achaeminid Sidonian vassal Eshmun'azor II during the period of Persian rule, follows the pattern, most probably reflecting previously existing territorial arrangements. Although the region continued to be exploited economically by the external political powers, it seems that the local population only profited from imperial ambitions, accompanied by the region's development and imperial investments. When the rule of the external political power, this time Philistine hegemony during Iron Age I/IIA and early Iron Age IIB, followed by direct Neo-Assyrian involvement during the late 8th and the first half of the 7th centuries BC, came to an end, the region was thrown into disarray once again, similar to what had happened after the end of the Egyptian system several centuries earlier. Only after direct Sidonian involvement on behalf of Achaemenid rule, did the region (including Joppa and Tell Qudadi) show signs of renewal and prosperity. If the minting of coins at Joppa under the Ptolemies points to a relatively high degree of independence, it was only during this period, and only under the minting kings (Ptolemy II, III and V), that Joppa probably became a semi-autonomous power for the first time during the 1st millennium BC.[49] Following the Hasmonean conquests, Joppa gained attention due to its role as the gateway to the Mediterranean. From the point of view of the Judean rulers, the advantages of having direct access to a wider Mediterranean via Joppa's port had been realised long before, but were put into practice only during the Hasmonean regime.

[49] Needless to say, we do not mean that Joppa enjoyed the status of an independent city-state; the notion of 'semi-independent power' should be taken in the context of the Ptolemaic kingdom.

This brief accounts indicates that Joppa's status as one of the most prominent cities of Palestine in ancient times is rather an artificial construction, at least when analysed against 1st-millennium BC *realia*. It seems that Joppa's prominent role in the Palestinian landscape reflects its role as the main port-town of Jerusalem during later periods (from the Hasmonean period onward). The existence and maintenance of roads between Joppa and Jerusalem (Fischer, Isaac and Roll 1996), which received special attention with the rise of pilgrimages to Jerusalem's holy sites, is of special importance. Overall, Joppa's fate in the 1st millennium BC, and, by extension, that of Tell Qudadi, almost always depended upon the external powers and their ability to manage the environmental resources for their benefit. In the 1st and 2nd millennia AD, Joppa's prominent position reflects the rise of Jerusalem as one of the religion centres of the world – but this should be dealt with in detail in a separate study.

4.4. Synopsis and Further Perspectives

- The site of Tell Qudadi, located on the northern bank of the mouth of the Yarkon river, was excavated almost 80 years ago and until recently remained basically unpublished. The main excavations were carried out from November 1937 to March 1938 on behalf of the HUJ, and were directed by E.L. Sukenik and S. Yeivin, with the participation of N. Avigad. As a result of these excavations, the remains of an impressive Iron Age fortress with two architectural phases were uncovered. The excavators dated the first phase of the fortress to the 10th or 9th century BC, whereas the second phase, attributed by them to the northern Israelite kingdom, existed in their opinion from the latter part of the 9th century BC until 732 BC, when it was destroyed as a result of the military campaign led by Tiglath-pileser III. Such a reconstruction of events was unreservedly accepted by other scholars.
- Based on re-evaluation of the finds from Tell Qudadi excavations, presented here for a first time basically in full, we have offered a different interpretation. From a strictly archaeological point of view, the site was not established before the second half of the 8th century BC at the earliest. The second phase of the fortress shows continuity and should be dated to the first half of the 7th century BC. The existence of the Iron Age IIB fortress at Tell Qudadi therefore corresponds to the period of the Neo-Assyrian domination in the Land of Israel. Considering the strategic location of the fortress, it is difficult to imagine its maintenance during

Iron Age IIB under the control of anyone other than representatives on behalf of the Neo-Assyrian regime.

- A number of possible scenarios concerning the building, maintaining and destruction of the fortress were presented. Although we cannot postulate with certainty under which Assyrian king the construction of the fortress was initiated (Tiglath-pileser III appears to be the most plausible candidate, but Sargon II or Sennacherib remain a possibility), we can presume that the fortress ceased functioning slightly after the middle of the 7th century BC, on account of the withdrawal of the Neo-Assyrian empire from the southern Levant in around 640–635 BC.
- The role of Tell Qudadi fortress within the Neo-Assyrian system of imperial control supports the notion that it was an integral part of an intentionally created imperial network. A number of Assyrian goals may be deduced from this pattern: first, the protection of land and sea trade routes by means of strongholds established along the eastern Mediterranean coast with a focus on supervising and controlling Phoenician trading activities; second, the creation of a 'new architectural landscape', which would project imperial power over the western strategic frontier; third, guarding the imperial road network, which enabled communication by the imperial civil bureaucracy and the transport of troops and expeditions to troubled areas and frontiers. Concerning the latter, we have also suggested that Tell Qudadi fortress, via the Yarkon river's connection to Aphek, served as the focal node of logistical support for the Assyrian armies on their way to Egypt and back.
- The revised chronology of Tell Qudadi's Iron Age ceramic assemblages has presented us with a unique opportunity to re-evaluate our understanding of the Late Iron Age chronology of the southern Levant, with archaeological and historical implications far beyond the immediate vicinity of Tell Qudadi. Based on the presence of particular Aegean imports, the assumed continuity of Iron Age IIB local assemblages into the 7th century BC has been proven for the first time. Such an understanding opens the possibility that quite a number of the so-called 701 BC destruction assemblages, associated with Sennacherib's third campaign, could be dated a few decades later.
- We think that further research on the Late Iron Age in the Levant should concentrate, if possible, on producing an updated typology for Iron Age IIB, one that would attempt to differentiate between early and late Iron Age IIB horizons, distinguishing the presence or absence of intermediate types with late Iron Age IIA for the former and with the early Iron Age IIC for the latter, and using imported pottery as additional evidence.

- The publication of Tel Qudadi's excavations demonstrates once again that old and hitherto unpublished excavations can hold crucial answers to some of the thorny historical and archaeological questions with which scholars are dealing today. It is our hope that more scholars around the globe will embark on studying unpublished archaeological excavations, fulfilling our moral obligations towards the general public and serving scholarship at large.

BIBLIOGRAPHY

List of Abbreviations

ABSA	*Annual of the British School at Athens*.
ADAJ	*Annual of the Department of Antiquities of Jordan*.
AJA	*American Journal of Archaeology*.
BASOR	*Bulletin of the American Schools of Oriental Research*.
ESI	*Excavations and Surveys in Israel*.
IEJ	*Israel Exploration Journal*.
IJES	*Israel Journal of Earth-Sciences*.
JAOS	*Journal of the American Oriental Society*.
JBL	*Journal of Biblical Literature*.
JCS	*Journal of Cuneiform Studies*.
JHS	*Journal of Hellenic Studies*.
JSOT	*Journal for the Study of the Old Testament*.
JSSEA	*Journal of the Society for the Study of Egyptian Antiquities*.
MHR	*Mediterranean Historical Review*.
NEAEHL	E. Stern (ed.), *New Encyclopedia of Archaeological Excavations in the Holy Land*, 5 vols. (Jerusalem/New York 1993–2008).
OJA	*Oxford Journal of Archaeology*.
PEQ	*Palestine Exploration Quarterly*.
QDAP	*Quarterly of the Department of Antiquities in Palestine*.
SAAB	*State Archives of Assyria Bulletin*.
ZDPV	*Zeitschrift des Deutschen Palästina-Vereins*.

Abramov, A.P. 1993: 'Antichnye Amfory. Periodizatsiya i Khronologiya'. *Bosporskii Sbornik* 3, 4–135.

Aharoni, Y. 1979: *The Land of the Bible: A Historical Geography*, 2nd ed. (London).

Aharoni, Y. and Amiran, R. 1958: 'A New Scheme for the Subdivision of the Iron Age in Palestine'. *IEJ* 8, 171–84.

Ahlström, G.W. 1993: 'Pharaoh Shoshenq's Campaign to Palestine'. In Lemaire, A. and Otzen, B. (eds.), *History and Traditions of Early Israel: Studies Presented to Eduard Nielsen* (Leiden), 1–16.

Alexandre, Y. 2012: *Mary's Well, Nazareth – the Late Hellenistic to the Ottoman Periods* (Jerusalem).

Algazi, G. 2005: 'Diversity Rules: Peregrine Horden and Nicholas Purcell's The Corrupting Sea'. *MHR* 20, 227–45.

Amiran, R. 1969: *Ancient Pottery of the Holy Land: From Its Beginnings in the Neolithic Period to the End of the Iron Age* (Jerusalem).

Amiran, R.B.K. and Dunayevsky, I. 1958: 'The Assyrian Open-Court Building and Its Palestinian Derivatives'. *BASOR* 149, 25–32.

Anastasio, S. 2010: *Atlas of the Assyrian Pottery of the Iron Age* (Turnhout).

Arie, E. 2006: 'The Iron I Pottery: Levels K-5 and K-4 and an Intrasite Spatial Analysis of the Pottery from Stratum VIA'. In Finkelstein, I., Ussishkin, D. and Halpern, B. (eds.), *Megiddo IV: The 1998–2002 Seasons* (Tel Aviv), 191–298.

Arkin, Y., Braun, M. and Starinsky, A. 1965: *Type Sections of Cretaceous Formations in the Jerusalem–Bet Shemesh Area* (Israel Geological Survey Stratigraphic Sections 1, Jerusalem), 1–59.

Arnold, D.E. 1985: *Ceramic Theory and Cultural Process* (Cambridge).

Aslan, C.C. 2002: 'Ilion before Alexander: Protogeometric, Geometric and Archaic Pottery from D9'. *Studia Troica* 12, 81–130.

Aston, D.A. 1999: *Elephantine XIX: Pottery of the Late New Kingdom to the Early Ptolemaic Period* (Mainz).

—. 2009: *Burial Assemblages of Dynasty 21–25: Chronology – Typology – Developments* (Vienna).

Avigad, N. 1993: 'Kudadi, Tell'. *NEAEHL* 2, 882.

Avisar, D., Kronfeld, J., Kolton, J., Rosenthal, E. and Weinberger, G. 2001: 'The Source of the Yarkon Springs, Israel'. *Radiocarbon* 43.2B, 793–99.

Avnimelech, M. 1950–51: 'Geological History of the Yarkon Valley and Its Influence on Ancient Settlement'. *IEJ* 1, 77–83.

—. 1952: 'Late Quaternary Sediments of the Coastal Plain of Israel'. *Research Council of Israel Bulletin* 2, 51–57.

—. 1962: 'The Main Trends in the Pleistocene-Holocene History of the Israelian Coastal Plain'. *Quaternaria* 6, 479–95.

Bagg, A. 2013: 'Palestine under Assyrian Rule: A New Look at the Assyrian Imperial Policy in the West'. *JAOS* 133, 119–44.

Bakler, N. 1986: 'The Latest Holocene Estuary Stage along the Mediterranean Coast of Israel'. *Cities on the Sea: Past and Present* (Haifa), 22.

—. 1989: 'Regional Geology'. In Herzog, Rapp and Negbi 1989, 198–202.

Bakler, N., Neev, D. and Kaufman, A. 1977: 'Soil and Concentration of Plant Fossils in the Vicinity of the Israeli Coastline as Evidence for a Period of Dunal Stability in Upper Holocene'. Abstract. *Conference of the Upper Pleistocene Exploration Society* (Hebrew).

Barako, T.J. 2000: 'The Philistine Settlement as Mercantile Phenomenon?'. *AJA* 104, 513–30.

—. 2008: 'Amphoras through the Ages'. In Stager, Schloen and Master 2008, 429–61.

Baramki, D.C.B. 1932: 'Note on a Cemetery at Karm al-Shaikh, Jerusalem'. *QDAP* 1, 3–5.

Barkay, G. 1986: *Ketef Hinnom: A Treasure Facing Jerusalem's Walls* (Israel Museum Catalogue, Jerusalem).

Barkay, G., Fantalkin, A. and Tal, O. 2002: 'A Late Iron Age Fortress North of Jerusalem'. *BASOR* 328: 49–71.

Barnett, R.D. and Mendelson, C. 1987: *Tharros: A Catalogue of Material in the British Museum from Phoenician and Other Tombs at Tharros, Sardinia* (London).

Bauer, A.A. 1998: 'Cities of the Sea: Maritime Trade and the Origin of Philistine Settlement in the Early Iron Age Southern Levant'. *OJA* 17, 149–68.

Bayne, N. 2000: *The Grey Wares of North-West Anatolia in the Middle and Late Bronze Age and the Early Iron Age and Their Relation to the Early Greek Settlements* (Bonn).

Beck, P. 2000: '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* (Tel Aviv), 93–111.

Becking, B. 1992: *The Fall of Samaria: An Historical and Archaeological Study* (Leiden).

Bedford, P. 2009: 'The Neo-Assyrian Empire'. In Morris, I. and Scheidel, W. (eds.), *The Dynamics of Ancient Empires: State Power from Assyria to Byzantium* (Oxford/New York), 30–65.

Ben-Shlomo, D. 2003: 'The Iron Age Sequence of Tel Ashdod'. *Tel Aviv* 30, 83–107.

—. 2005: 'Material Culture'. In Dothan, M. and Ben-Shlomo, D. (eds.), *Ashdod VI: The Excavations of Areas H and K (1968–1969)* (Jerusalem), 63–246.

—. 2014: 'Tell Jemmeh, Philistia and the Neo-Assyrian Empire during the Late Iron Age'. *Levant* 46, 58–88.

Ben-Tor, A. (ed.) 1992: *The Archaeology of Ancient Israel* (New Haven).

Bentor, Y.K. 1945: *Petrographic Investigations of the Upper Albian–Lower Cenomanian Near Jerusalem (Contribution to the Problem of Dolomitization and Quartzification)* (Dissertation, Hebrew University of Jerusalem).

—. 1966: *The Clays of Israel* (Jerusalem).

Berlejung, A. 2012: 'The Assyrians in the West: Assyrianization, Colonialism, Indifference, or Development Policy?'. In Nissinen, M. (ed.), *Conference of the International Organization for the Study of the Old Testament, Congress Volume, Helsinki, Finland 1–6 August 2010* (Leiden/Boston), 21–60.

Berlingo, I. 1993: 'Le necropoli di Siris'. *Bollettino di archeologia* 22, 1–21.

Bessios, M. 2012: 'H anaskafh tou "Upogeiou"'. In Tzifopoulos 2012, 41–112.

Bessios, M., Tzifopoulos, Y.Z. and Kotsonas, A. 2012: 'Katalogos'. In Tzifopoulos 2012, 329–508.

Bettles, E.A. 2003: *Phoenician Amphora Production and Distribution in the Southern Levant: A Multi-Disciplinary Investigation into Carinated-Shoulder Amphorae of the Persian Period (539–332 BC)* (Oxford).

Beuger, C. 2005: *Keramik der spätfrühdynastischen bis spätassyrischen Zeit aus Assur Eine Bearbeitung unter chronologischen Gesichtspunkten* (Dissertation, Freie Universität Berlin).

Bienkowski, P. (ed.) 1991: *Treasures from an Ancient Land: The Art of Jordan* (Liverpool).

Bikai, P.M. 1978a: *The Pottery of Tyre* (Warminster).

—. 1978b: 'The Late Phoenician Pottery Complex and Chronology'. *BASOR* 229, 47–56.

Bîrzescu, I. 2005: 'Die Handelsamphoren der "Lesbos rot"-Serie in Istros'. *Athenische Mitteilungen* 120, 45–70.

—. 2006: *Die archaischen Handelsamphoren von Istros* (Dissertation, Ruhr-Universität Bochum).

—. 2012: *Histria XV: Die archaischen und fruhklassischen Transportamphoren* (Bucharest).

Bishop, R.L., Rands, R.L. and Holley, G.P. 1982: 'Ceramic Composition Analysis in Archaeological Perspective'. *Advances in Archaeological Method and Theory* 5, 275–325.

Blakely, J.A. and Hardin, J.W. 2002: 'Southwestern Judah in the Late Eighth Century B.C.E.'. *BASOR* 326, 11–64.

Bloch-Smith, E. 2009: 'Assyrians Abet Israelite Cultic Reforms: Sennacherib and the Centralization of the Israelite Cult'. In Schloen 2009, 35–44.

Boardman, J. 1980: *The Greeks Overseas: Their Early Colonies and Trade*, 3rd ed. (London).

—. 1991: 'Early Greek Pottery on Black Sea Sites?'. *OJA* 10, 387–89.

Boardman, J. and Hayes, J. 1966: *Excavations at Tocra, 1963–1965. 1: The Archaic Deposits I* (London).

Boertien, J.H. 2014: 'Public or Domestic? Temple, Text and Textile Production at Khirbet Al- Mudayna in Moab'. In Mulder, N., Boertien, J. and van der Steen, E. (eds.), *Exploring the Narrative: Jerusalem and Jordan in the Bronze and Iron Ages* (London/New York), 133–58.

Borger, R. 1956: *Die Inschriften Asarhaddons, Königs von Assyrien* (Graz).

Bowman-Manifold, M.G.E. 1932: *An Outline of the Egyptian and Palestine Campaigns, 1914 to 1918* (Chatham).

Brann, E. 1961: 'Protoattic Well Groups from the Athenian Agora'. *Hesperia* 30, 305–79.

Briant, P. 1996: *Histoire de l'Empire perse de Cyrus à Alexandre* (Paris).

Brockelmann, C. 1908: *Grundriss der vergleichenden Grammatik der semitischen Sprachen*, vol. 1 (Berlin).

Bronson, B. 1977: 'Exchange at the Upstream and Downstream Ends: Notes towards a Functional Model of the Coastal State in Southwestern Asia'. In Hutterer, K.L. (ed.), *Economic Exchange and Social Interaction in Southwest Asia* (Ann Arbor), 39–52.

Bullard, R. 1970: 'Geological Studies in Field Archaeology'. *Biblical Archaeologist* 33, 98–132.

Bullock, P., Fedoroff, N., Jongerius, A., Stoops, G., Tursina, T. 1985: *Handbook for Soil Thin Section Description* (Albrighton).

Bunimovitz, S. 1995: 'On the Edge of Empires - Late Bronze Age (1550–1200 BCE)'. In Levy, T.E. (ed.), *The Archaeology of Society in the Holy Land* (London), 320–31.

Bunimovitz, S. and Lederman, Z. 2003: 'The Final Destruction of Beth Shemesh and the *Pax Assyriaca* in the Judean Shephelah'. *Tel Aviv* 30, 3–26.

—. 2006: 'The Early Israelite Monarchy in the Sorek Valley: Tel Beth-Shemesh and Tel Batash (Timnah) in the 10th and 9th Centuries BCE'. In Maeir, A.M. and de Miroschedji, P. (eds.), *"I Will Speak the Riddles of Ancient Times" : Archaeological and Historical Studies in Honor of Amihai Mazar on the Occasion of His Sixtieth Birthday* (Winona Lake), 407–27.

Castoldi, M. (ed.) 1986: *I Greci sul Basento: Mostra degli scavi archeologici all'Incoronata di Metaponto 1971–1984* (Como).

Cat. Bonn 1981: *Die Nabatäer: Erträge einer Ausstellung im Rheinischen Landesmuseum Bonn, 24. Mai – 9. Juni 1978* (Bonn).

Cat. Berlin 1982: *Land des Baal. Syrien – Forum der Völker und Kulturen, Museum für Vor- und Frühgeschichte Berlin* (Mainz).

Chambon, A. 1980: 'Le niveau 5 (Fer II C)'. In Briend, J. et Humbert, J.-B., *Tell Keisan (1971–1976). Une cité phénicienne en Galilée* (Paris), 157–79.

Chauveau, M. 2011: 'Le saut dans le temps d'un document historique: des Ptolémées aux Saïtes'. In Devauchelle, D. (ed.), *La XXVIe dynastie continuités et ruptures* (Lille), 39–45.

Chavela, K. 2013: Review of Tzifopoulos 2012 [*sub* Mathaios, Tziphopoulos and Kotsonas]. *AJA* 117.3 (DOI: 10.3764/ajaonline1173.Chavela).
Chehadeh, J. 1972: *Untersuchungen zum antiken Schmuck in Syrien* (Dissertation, Freie Universität Berlin).
—. 1987: 'Zu Schmuckdarstellungen auf palmyrenischen Grabreliefs'. In *Palmyra: Geschichte, Kunst und Kultur der syrischen Oasenstadt* (Linz), 193–99.
Clinkenbeard, B. 1982: 'Lesbian Wine and Storage Amphoras'. *Hesperia* 51, 248–67.
Coldstream, J.N. 2003: *Geometric Greece, 900–700 BC* (London).
Cook, J.M. 1953: 'Archaeology in Greece, 1952'. *JHS* 73, 108–30.
—. 1958–59: 'Old Smyrna, 1948–1951'. *ABSA* 53–54, 1–34.
Cook, R.M. 1998: 'East Greek Pottery'. In Cook and Dupont 1998, 1–141.
Cook, R.M. and Dupont, P. 1998: *East Greek Pottery* (London/New York).
Csapo, E., Johnston, A.W. and Geagan, D. 2000: 'The Iron Age Inscriptions'. In Shaw, J.W. and Shaw, M.C. (eds.), *Kommos IV: The Greek Sanctuary* (Princeton), 101–34.
Dagot, A. 2007: 'Tel Aviv, Ramat Aviv'. *Ḥadashot Arkheologiyot – ESI* 119 (http://www. hadashot-esi.org.il).
Dan, J. and Yaalon, D.H. 1968: 'Soil and Landscape Formation in the Sharon'. *Ktavim* 18, 69–94 (Hebrew).
—. 1990: 'The Formation of Soils in the Sharon in Relation to Landscape Characteristics'. In Degani, Grossman and Shmueli 1990, 83–97 (Hebrew).
Dan, J., Yaalon, D.H., Koyumdjisky, H. and Paz, Z. 1976: *The Soils of Israel* (Bet Dagan).
Dayagi-Mendels, M. 2002: *The Akhziv Cemeteries: The Ben-Dor Excavations 1941–1944* (Jerusalem).
de Miroschedji, P. 1988: *Yarmouth I*: *Rapport sur les trois premieres campagnes de fouilles à Tel Yarmouth, Israel (1980–1982)* (Paris).
—. 2006: 'At the Dawn of History: Sophisticated Developments in Southwestern Canaan in the Early Bronze Age III'. In Maeir, A.M. and de Miroschedji, P. (eds.), *"I Will Speak the Riddles of Ancient Times" : Archaeological and Historical Studies in Honor of Amihai Mazar on the Occasion of His Sixtieth Birthday* (Winona Lake), 55–78.
De Polignac, F. 1995: *Cults, Territory, and the Origins of the Greek City-State* (Chicago).
Degani, A., Grossman, D. and Shmueli, A. (eds.) 1990: *HaSharon Between Yarkon and Karmel* (Tel Aviv).
Deppert-Lippitz, B. 1987: 'Die Bedeutung der palmyrenischen Grabreliefs für die Kenntnis des römischen Schmucks'. In *Palmyra: Geschichte, Kunst und Kultur der syrischen Oasenstadt* (Linz), 179–92.
Dever, W.G. 1974: *Gezer II: Report of the 1967–1970 Seasons in Fields I and II* (Jerusalem).
—. 1990: '"*Hyksos" , Egyptian Destructions, and the End of the Palestinian Middle-Bronze Age*'. *Levant* 22, 75–81.
—. 2012: *The Lives of Ordinary People in Ancient Israel: Where Archaeology and the Bible Intersect* (Grand Rapids).
Di Sandro, N. 1986: *Le anfore arcaiche dello scarico Gosetti, Pithecusa* (Naples).
Docter, R.F. 2000: 'East Greek Fine Wares and Transport Amphorae of the 8th–5th Century BC from Carthage and Toscanos'. In Cabrera Bonet, P. and Santos Retolaza, M. (eds.), *Ceràmiques iònies d'època arcaica: Centres de producció i comercialització al Mediterrani occidental* (Barcelona), 63–88.

Donner, H. and Röllig, W. (eds.) 1966–69: *Kanaanäische und aramäische Inschriften*, 3 vols. (Wiesbaden).
Dothan, M. and Porath, Y. 1982: *Ashdod IV: Excavation of Area M* (Jerusalem).
Drews, R. 1976: 'The Earliest Greek Settlements on the Black Sea'. *JHS* 96, 18–31.
—. 1998: 'Canaanites and Philistines'. *JSOT* 81, 39–61.
Dubovský, P. 2006: *Hezekiah and the Assyrian Spies: Reconstruction of the Neo-Assyrian Intelligence Services and Its Significance for 2 Kings 18–19* (Rome).
Dupont, P. 1998: 'Archaic East Greek Trade Amphoras'. In Cook and Dupont 1998, 142–90.
—. 2007: 'Le Pont Euxin archaïque: Lac milésien ou lac nord-ionien? Un point de vue de céramologue'. In Bresson, A., Ivantchik, A. and Ferrary, J.-L. (eds.), *Une koinè pontique: Cités grecques, sociétés indigènes et empires mondiaux sur le littoral nord de la Mer Noire (VIIe s. a.C.–IIIe s. p.C.)* (Bordeaux), 29–36.
Dupont, P. and Skarlatidou, E. 2012: Archaic Transport Amphoras from the First Necropolis of Clazomenian Abdera. In Tiverios, M., Misailidou-Despotidou, V., Manakidou, E. and Arvanitaki, A. (eds.), *Archaic Pottery of the Northern Aegean and Its Periphery (700–480 BC)* (Thessaloniki), 253–64.
Edelman, D. 2006: 'Tyrian Trade in Yehud under Artaxerxes I: Real or Fictional? Independent or Crown Endorsed?'. In Lipschits, O. and Oeming, M. (eds.), *Judah and the Judeans in the Persian Period* (Winona Lake), 207–46.
—. 2008: 'Hezekiah's Alleged Cultic Centralization'. *JSOT* 32, 395–434.
Elat, M. 1978: 'The Economic Relations of the Neo-Assyrian Empire with Egypt'. *JAOS* 98, 20–34.
—. 1990: 'The International Trade in the Land of Israel under Assyria'. In Kedar, B.Z., Dothan, T. and Safrai, S. (eds.), *Commerce in Palestine Throughout the Ages* (Jerusalem), 67–88 (Hebrew).
Elayi, J. 1996: 'Nouveaux éléments sur le mur à piliers phénicien'. *Transeuphratène* 11, 77–94.
—. 2004: 'La chronologie de la dynastie sidonienne d''Ešmun'azor'. *Transeuphratène* 27, 9–28.
—. 2006: 'An Updated Chronology of the Reigns of Phoenician Kings during the Persian Period (539–333 BCE)'. *Transeuphratène* 32, 11–43.
Engstrom, C.M.A. 2004: 'The Neo-Assyrians at Tell el-Hesi: A Petrographic Study of Imitation Assyrian Palace Ware'. *BASOR* 333, 69–81.
Fales, F.M. 1990: 'Grain Reserves, Daily Rations, and the Size of the Assyrian Army: A Quantitative Study'. *SAAB* 4, 23–34.
—. 1993: 'River Transport in Neo-Assyrian Letters'. In Zablocka, J. and Zawadzki, S. (eds.), *Šulmu IV: Everyday Life in Ancient Near East* (Poznań), 79–92.
—. 2008: 'On Pax Assyriaca in the Eighth-Seventh Centuries BCE and Its Implications'. In Cohen, R. and Westbrook, R. (eds.), *Isaiah's Vision of Peace in Biblical and Modern International Relations: Swords into Plowshares* (New York), 17–35.
Falls, C. 1930: *Military Operations: Egypt and Palestine. 2: from June 1917 to the End of the War*, part I (London).
Fantalkin, A. 2001a: 'Meẓad Ḥashavyahu: Its Material Culture and Historical Background'. *Tel Aviv* 28, 3–165.
—. 2001b: 'Low Chronology and Greek Protogeometric and Geometric Pottery in the Southern Levant'. *Levant* 33, 117–125.

—. 2004: 'The Final Destruction of Beth-Shemesh and the Pax Assyriaca in the Judahite Shephelah: An Alternative View'. *Tel Aviv* 31, 245–61.
—. 2005: 'A Group of Iron Age Wineries from Ancient Jaffa (Joppa)'. *Salvage Excavation Reports* 2, 3–26.
—. 2006: 'Identity in the Making: Greeks in the Eastern Mediterranean during the Iron Age'. In Villing and Schlotzhauer 2006, 199–208.
—. 2008: 'The Appearance of Rock-Cut Bench Tombs in Iron Age Judah as a Reflection of State Formation'. In Fantalkin and Yassur-Landau 2008, 17–44.
—. 2011: 'Why Did Nebuchadnezzar II Destroy Ashkelon in Kislev 604 B.C.E.?'. In Finkelstein, I. and Na'aman, N. (eds.), *The Fire Signals of Lachish: Studies in the Archaeology and History of Israel in the Late Bronze Age, Iron Age, and Persian Period in Honor of David Ussishkin (*Winona Lake), 87–111.
Fantalkin, A. and Finkelstein, I. 2006: 'The Sheshonq I Campaign and the 8th-Century-BCE Earthquake – More on Archaeology and History of the South in the Iron I-IIA'. *Tel Aviv* 33, 18–42.
Fantalkin, A. and Tal, O. 2003: 'The 'Yannai Line' (BJ I, 99–100; AJ XIII, 390–91): Reality or Fiction?'. *PEQ* 135, 108–23.
—. 2009a: 'Re-Discovering the Iron Age Fortress at Tell Qudadi in the Context of the Neo-Assyrian Imperialistic Policies'. *PEQ* 141, 188–206.
—. 2009b: 'Navigating between the Powers: Joppa and Its Vicinity in the 1st Millennium B.C.E.'. *Ugarit-Forschungen* 40, 225–76.
—. 2010: 'Reassessing the Date of the Beginning of the Grey Series Transport Amphorae from Lesbos'. *BABESCH* 85, 1–12.
Fantalkin, A. and Yasur-Landau, A. (eds.) 2008: *Bene Israel: Studies in the Archaeology of Israel and the Levant during the Bronze and Iron Ages in Honour of Israel Finkelstein* (Leiden/Boston).
Faust, A. 2005: 'The Settlement of Jerusalem's Western Hill and the City's Status in Iron Age II Revisited'. *ZDPV* 121, 97–118.
—. 2007: 'The Sharon and the Yarkon Basin in the Tenth Century BCE: Ecology, Settlement Patterns and Political Involvement'. *IEJ* 57, 65–82.
—. 2011: 'The Interests of the Assyrian Empire in the West: Olive Oil Production as a Test-Case'. *Journal of the Economic and Social History of the Orient* 54, 62–86.
Faust, A. and Ashkenazy, Y. 2007: 'Excess in Precipitation as a Cause for Settlement Decline along the Israeli Coastal Plain during the Third Millennium BC'. *Quaternary Research* 68, 37–44.
Faust, A. and Weiss, E. 2005: 'Judah, Philistia, and the Mediterranean World: Reconstructing the Economic System of the Seventh Century B.C.E.'. *BASOR* 338, 71–92.
Finkelberg, M. 2006: 'Ino-Leukothea between East and West'. *Journal of Ancient Near Eastern Religions* 6, 105–21.
Finkelstein, I. 1994: 'The Archaeology of the Days of Manasseh'. In Coogan, M.D., Exum, J.C. and Stager, L.E. (eds.), *Scripture and Other Artifacts: Essays on the Bible and Archaeology in Honor of Philip J. King* (Louisville), 169–87.
—. 2000: 'The Philistine Settlement: When, Where and How Many'. In Oren, E. (ed.), *The Sea People and Their World: A Reassessment* (Philadelphia), 159–80.
—. 2008: 'The Settlement History of Jerusalem in the Eighth and Seventh Centuries BC'. *Revue Biblique* 115, 499–515.

Finkelstein, I. and Fantalkin, A. 2012: 'Khirbet Qeiyafa: An Unsensational Archaeological and Historical Interpretation'. *Tel Aviv* 39, 38–63.
Finkelstein, I. and Na'aman, N. 2004: 'The Shephelah of Judah in the Late 8th and Early 7th Century BCE: An Alternative View'. *Tel Aviv* 31, 60–79.
Finkelstein, I. and Piasetzky, E. 2007: 'Radiocarbon Dating and Philistine Chronology with an Addendum on el-Ahwat'. *Ägypten und Levante* 17, 73–82.
—. 2009: 'Radiocarbon-Dated Destruction Layers: A Skeleton for Iron Age Chronology in the Levant'. *OJA* 28, 255–74.
—. 2010: 'Radiocarbon Dating the Iron Age in the Levant: A Bayesian Model for Six Ceramic Phases and Six Transitions'. *Antiquity* 84, 374–85.
—. 2011: 'The Iron Age Chronology Debate: Is the Gap Narrowing?'. *Near Eastern Archaeology* 74, 50–54.
Finkelstein, I. and Silberman, N.A. 2006: *David and Solomon: In Search of the Bible's Sacred Kings and the Roots of the Western Tradition* (New York).
Finkelstein, I. and Singer-Avitz, L. 2001: 'Ashdod Revisited'. *Tel Aviv* 28, 231–59.
—. 2004: 'Ashdod Revisited – Maintained'. *Tel Aviv* 31, 122–35.
Fischer, M., Isaac, B. and Roll, I. 1996: *Roman Roads in Judaea II: The Jaffa–Jerusalem Roads* (Oxford).
Fischer, M., Roll, I. and Tal, O. 2008: 'Persian and Hellenistic Remains at Tel Ya'oz'. *Tel Aviv* 35, 123–63.
FitzPatrick, E.A. 1980: *The Micromorphology of Soils: A Manual for the Preparation and Description of Thin Sections of Soils* (Aberdeen).
Flemming, N.C., Raban, A. and Goetschel, C. 1978: 'Tectonic and Eustatic Changes on the Mediterranean Coast of Israel in the Last 9000 Years'. In Gamble, J.C. and Yorke, R.A. (eds.), *Progress in Underwater Science: Report of the Underwater Association* (London), 33–93.
Franken, H.J. and Steiner, M.L. 1990: *Excavations in Jerusalem 1961–1967 II: The Iron Age Extramural Quarter on the South-East Hill* (Toronto).
Frankenstein, S. 1979: 'The Phoenicians in the Far West: A Function of Neo-Assyrian Imperialism'. In Larsen, M.T. (ed.), *Power and Propaganda: A Symposium on Ancient Empires* (Copenhagen), 263–94.
Fuchs, A. 2008: 'Über den Wert von Befestigungsanlagen'. *Zeitschrift für Assyriologie und vorderasiatische Archäologie* 98.1, 45–99.
Fuchs, R. 2004: 'Sites of Memory in the Holy Land: The Design of the British War Cemeteries in Mandate Palestine'. *Journal of Historical Geography* 30, 643–64.
Gadot, Y. 2006: 'Aphek in the Sharon and the Philistine Northern Frontier'. *BASOR* 341, 21–36.
—. 2008: 'Continuity and Change in the Late Bronze to Iron Age Transition in Israel's Coastal Plain: A Long Term Perspective'. In Fantalkin and Yasur-Landau 2008, 55–74.
Gadot, Y., Finkelstein, I., Iserlis, M., Maeir, A.M., Nahshoni, P. and Namdar, D. 2014: 'Tracking Down Cult: Production, Function and Content of Chalices in Iron Age Philistia'. *Tel Aviv* 41, 54–75.
Galili, E. 2009: 'Ancient Ports and Anchorages along Israel's Coastline in Light of Five Decades of Maritime and Coastal Archaeological Activity and Excavations'. *Qadmoniot* 137, 2–21 (Hebrew).
Galling, K. 1964: *Studien zur Geschichte Israels im persischen Zeitalter* (Tübingen).

Gaspa, S. 2007: 'Vessels in Neo-Assyrian Documents: Capacity Measures and Listing Conventions'. *SAAB* 16, 145–84

Gavish, E. 1978: 'Post-Congress Excursion Y5. "Geoderma" – Continental Sedimentation Calcrete Desert Loess and Paleosols Sand Dunes and Eolionites'. In Yaalon, D.H. (ed.), *Sedimentology in Israel, Cyprus and Turkey. Guidebook*, part II (Jerusalem), 226–31.

Gavish, E. and Bakler, N. 1990: 'The Sharon Coastal Strip – Geomorphological and Sedimentological Factors and Processes'. In Degani, Grossman and Shmueli 1990, 61–81 (Hebrew).

Gavish, E. and Friedman, G.M. 1969: 'Progressive Diagenesis of Quaternary to Late Tertiary Carbonate Sediments: Sequence and Time Scale'. *Journal of Sedimentary Petrology* 39, 980–1006.

Geraty, L.T. 1976: 'The 1964 Season of Excavations at Tel Hesbân'. *ADAJ* 21, 41–53.

Getzov, N., Paz, Y. and Gophna, R. 2001: *Shifting Urban Landscapes during the Early Bronze Age in Canaan* (Tel Aviv).

Gifford, J.A. and Rapp, G. 1989: 'Paleogeography of the Central Sharon Coast'. In Herzog, Rapp and Negbi 1989, 203–08.

Gifford, J.A., Rapp, G. and Hill, C.L. 1989: 'Site Geology'. In Herzog, Rapp and Negbi 1989, 209–18.

Gihon, M. 1974: *Carta's Atlas of Palestine from Bethther to Tel Hai (Military History)* (Jerusalem) (Hebrew).

Gilboa, A. 1995: 'The Typology and Chronology of the Iron Age Pottery and the Chronology of Iron Age Assemblages'. In Stern, E., *Excavations at Dor, Final Report. I B: Areas A and C, The Finds* (Jerusalem), 1–49.

—. 1996: 'Assyrian-Type Pottery at Dor and the Status of the Town during the Assyrian Occupation Period'. *Eretz-Israel* 25, 122–35 (Hebrew, English summary p. 92*).

—. 1999: 'The View from the East – Tel Dor and the Earliest Cypro-Geometric Exports to the Levant'. In Iacovou, M. and Michaelides, D. (eds.), *Cyprus: The Historicity of the Geometric Horizon* (Nicosia), 119–39.

—. 2005: 'Sea Peoples and Phoenicians along the Southern Phoenician Coast – A Reconciliation: An Interpretation of Šikila (*SKL*) Material Culture'. *BASOR* 337, 47–77.

Gilead, I. and Goren, Y. 1989: 'Petrographic Analyses of Fourth Millennium B.C. Pottery and Stone Vessels from the Northern Negev, Israel'. *BASOR* 275, 5–14.

Gimatzidis, S. 2013: Review of Tzifopoulos 2012. *Bryn Mawr Classical Review* 2013.01.53 (http://bmcr.brynmawr.edu/2013/2013-01-53.html).

Gitin, S. 1989: 'Tel Miqne-Ekron: A Type-Site for the Inner Coastal Plain in the Iron Age II Period'. *Annual of the American Schools of Oriental Research* 49, 23–58.

—. 1990: *Gezer III: A Ceramic Typology of the Late Iron II, Persian and Hellenistic Periods at Tell Gezer* (Jerusalem).

—. 1997: 'The Neo-Assyrian Empire and Its Western Periphery: The Levant, With a Focus on Philistine Ekron'. In Parpola, S. and Whiting, R.M. (eds.), *Proceedings of the 10th Anniversary symposium of the Neo-Assyrian Text Corpus Project, Helsink, September 7–11, 1995* (Helsinki), 77–103.

—. 2003: 'Neo-Assyrian and Egyptian Hegemony over Ekron in the Seventh Century B.C.E.: A Response to Lawrence E. Stager'. *Eretz Israel* 27, 55*–61*.

Gjerstad, E. 1960: 'Pottery Types, Cypro-Geometric to Cypro-Clasical'. *Opuscula Athenensia* 3, 105–22.

Glass, J., Goren, Y., Bunimovitz, S. and Finkelstein, I. 1993: 'Petrographic Analyses of Middle Bronze III, Late Bronze and Iron Age I Ceramic Assemblages'. In Finkelstein, I., Bunimovitz, S. and Lederman, Z. (eds.), *Shiloh: The Archaeology of a Biblical Site* (Tel Aviv), 271–86.

Golani, A. and Sass, B. 1998: 'Three Seventh-Century B.C.E. Hoards of Silver Jewelry from Tel Miqne – Ekron'. *BASOR* 311, 57–81.

Gopher, A. 1994: *Arrowheads of the Neolithic Levant – A Seriation Analysis* (Winona Lake).

Gopher, A., Burian, F. and Friedman, E. 2005: 'Neolithic Coastal Sites near Palmahim with Some Comments on the Neolithic Period in the Israel Coastal Plain'. In Fischer, M. (ed.), *Yavneh, Yavneh-Yam and Their Neighborhood* (Tel Aviv), 17–46 (Hebrew).

Gopher, A. and Gophna, R. 1993: 'Cultures of the Eight and Seventh Millennia BP in Southern Levant: A Review for the 1990s'. *Journal of World Prehistory* 7.3, 297–353.

Gophna, R. 1996: *Excavations at Tel Dalit* (Tel Aviv).

Gophna, R. and Ayalon, E. 1989: 'History of Settlement in the Tel Michal Region'. In Herzog, Rapp and Negbi 1989, 16–28.

—. 1998: *Archaeological Survey of Israel: Map of Herzliyya (69)* (Jerusalem).

Gophna, R. and Liphschitz, S. 2009: 'Palmahim – Giv'at Ha-'Esev: A Navigational Landmark for Ancient Mariners?'. In Schloen 2009, 137–40.

Gophna, R. and Paz, Y. 2011: 'Tell Qudadi and Tel Gerisah: Two Early Bronze III Sites on the Yarkon River'. *Tel Aviv* 38, 42–51.

—. in press: 'Chalcolithic Sites in Tel Aviv Vicinity and the Settlement System at the Western Ayalon Basin'. In Gopher, A., Gophna, R. and Paz, Y., *The Excavations of J. and H. Kaplan*.

Goren, Y. 1987: *Petrography of Chalcolithic Period Pottery Assemblages from Southern Israel* (Thesis, Hebrew University of Jerusalem) (Hebrew).

—. 1988: 'A Petrographic Analysis of Pottery from Sites P14 and DII'. *Journal of the Israel Prehistoric Society* 21, 131–37.

—. 1991a: The Beginning of Pottery Production in Israel, Technology and Typology of Proto-Historic Ceramic Assemblages in Eretz Israel (6th–4th Millennia B.C.E) (Dissertation, Hebrew University of Jerusalem) (Hebrew).

—. 1991b: 'Pottery from Chalcolithic and Early Bronze Age Cemeteries in Israel: Some New Aspects of the Development of Ceramic Technology'. *Eretz-Israel* 21, 119–26 (Hebrew).

—. 1992: 'Petrographic Study of the Pottery Assemblage from Munhata'. In Garfinkel, Y., *The Pottery Assemblage of the Shaar Hagolan and Rabah Stages of Munhata (Israel)* (Paris), 329–60.

—. 1995: 'Shrines and Ceramics in Chalcolithic Israel: The View Through the Petrographic Microscope'. *Archaeometry* 37, 287–305.

—. 1996: 'The Southern Levant in the Early Bronze Age IV: The Petrographic Perspective'. *BASOR* 303, 33–72.

Goren, Y., Finkelstein, I. and Na'aman, N. 2004: *Inscribed in Clay, Provenance Study of the Amarna Tablets and Other Near Eastern Texts* (Tel Aviv).

Goren, Y. and Halperin, N. 2004: 'Section B: Selected Petrographic Analyses'. In Ussishkin 2004 V, 2553–68.

Gorman, V.B. 2001: *Miletos: The Ornament of Ionia. A History of the City to 400 B.C.E.* (Ann Arbor).

Gorzalczany, A. 1999: 'Petrographic Analysis of the Persian-Period Pottery—A Preliminary Report'. In Roll, I. and Tal, O., *Apollonia-Arsuf: Final Report of the Excavations I: The Persian and Hellenistic Periods (with Appendices on the Chalcolithic and Iron Age II Remains)* (Tel Aviv), 185–89.

—. 2003: *Ceramic Industry and Foreign Relations of Selected Persian Period Sites in Israel-Petrographic Research* (Thesis, Tel Aviv University) (Hebrew).

—. 2006a: 'Petrographic Analysis of the Persian-Period Pottery from Tel Ya'oz'. *'Atiqot* 52, 39*–45* (Hebrew).

—. 2006b: 'Petrographic Analysis of the Tel Mikhal (Tel Michal) Pottery'. *'Atiqot* 52, 57–65.

—. 2006c: 'Petrographic Analysis of the Pottery from Naḥal Tut'. *'Atiqot* 52, 191–95.

—. 2008: 'Petrographic Analysis of the Persian-Period Pottery from Ḥorbat Malta'. *'Atiqot* 59, 82–86.

Graham, A.J. 1958: 'The Date of the Greek Penetration of the Black Sea'. *Bulletin of the Institute of Classical Studies* 5, 25–42.

—. 1971: 'Patterns in Early Greek Colonization'. *JHS* 91, 35–47.

—. 1982: 'The Colonial Expansion of Greece'. In *Cambridge Ancient History* III.1, 83–162.

—. 1990: 'Pre-Colonial Contacts: Questions and Problems'. In Descœudres, J.-P. (ed.), *Greek Colonists and Native Populations* (Canberra/Oxford), 45–60.

Green, A.R.W. 2004: 'Esarhaddon, Sanduarri, and the Adon Papyrus'. In Kaltner, J. and Stulman, L. (eds.), *Inspired Speech: Prophecy in the Ancient Near East. Essays in Honor of Herbert B. Huffmon* (Sheffield), 88–97.

Green, J.D.M. 2009: 'Archaeology and Politics in the Holy Land: The Life and Career of P.L.O. Guy'. *PEQ* 141, 167–87.

Greenberg, R. and Porat, N. 1996: 'A Third Millennium Levantine Pottery Production Center: Typology, Petrography, and Provenance of the Metallic Ware of Northern Israel and Adjacent Regions'. *BASOR* 301, 5–24.

Greenhut, Z. and De Groot, A. 2009: *Salvage Excavations at Tel Moẓa: The Bronze and Iron Age Settlements and Later Occupations* (Jerusalem).

Grosman, L., Smikt, O. and Smilansky, U. 2008: 'On the Application of 3-D Scanning Technology for the Documentation and Typology of Lithic Artifacts'. *Journal of Archaeological Science* 35, 3101–10.

Gullett, H.S. 1941: *Official History of Australia in the War of 1914–18 VII: The Australian Imperial Force in Sinai and Palestine, 1914–1918* (Sydney).

Güngör, Ü. 2006: 'Archaic Ring-Askoi Found in Klazomenai'. *Arkeoloji Dergisi* 8.2, 47–62.

Gunneweg, J. and Mommsen, H. 1995: 'Instrumental Neutron Activation Analysis of Vessels and Cult Objects'. In Beit Arieh, I., *Ḥorvat Qitmit: An Edomite Shrine in the Biblical Negev* (Tel Aviv), 280–86.

Gunneweg, J., Perlman, I. and Meshel, Z. 1985: 'The Origin of the Pottery of Kuntillet 'Ajrud'. *IEJ* 35, 270–81.

Guy, P.L.O. 1938: 'British School of Archaeology in Jerusalem, Report for the Season 1936–7, Director's Report, 1936–7'. *PEQ* 70, 11–17.
Gvirtzman, G. 1990: 'The Geology and the Geomorphology of the Sharon and Its Mediterranean Shelf'. In Degani, Grossman and Shmueli 1990, 19–59 (Hebrew).
Hachmann, R. and Kuschke, A. 1966: *Kamid el-Loz 1963/64* (Bonn).
Hackens, T. 1976: *Catalogue of the Classical Collection, Classical Jewelry* (Providence).
Hadad, H.F. 1984: 'The Umm Udheina Tomb'. *ADAJ* 28, 7–14 (Arabic).
Hadidi, A. 1979: 'A Roman Family Tomb at es-Salt'. *ADAJ* 23, 129–37.
Hamilton, R.W. and Husseini, S.A.S. 1935: 'Shaft Tombs on the Nablus-Road-Jerusalem'. *QDAP* 4, 170–74.
Harding, G.L. 1950a: 'An Iron Age Tomb at Meqabelein'. *QDAP* 14, 44–48.
—. 1950b: 'A Roman Family Vault on Jebel Jofeh, 'Amman'. *QDAP* 14, 81–94.
Hausleiter, A. 2010: *Neuassyrische Keramik im Kerngebiet Assyriens: Chronologie und Formen* (Wiesbaden).
Herbert, G., Heinze-Greenberg, I. and Sosnovsky, S. 2003: *In Search of Excellence: The Architecture and Building Projects of the Electric Industry in the Land of Israel 1921–1942* (Jerusalem).
Herzog, Z. 1993a: 'Michal, Tel'. *NEAEHL* 2, 1036–41.
—. 1993b: 'Gerisa, Tel'. *NEAEHL* 2, 480–84.
—. 2008: 'Jaffa'. *NEAEHL* 5, 1791–92.
Herzog, Z., Rapp, G. and Negbi, O. (eds.) 1989: *Excavations at Tel Michal, Israel* (Minneapolis/Tel Aviv).
Herzog, Z. and Singer-Avitz, L. 2004: 'Redefining the Centre: The Emergence of State in Judah'. *Tel Aviv* 31, 209–44.
—. 2006: 'Sub-Dividing the Iron Age IIA in Northern Israel: A Suggested Solution to the Chronological Debate'. *Tel Aviv* 33, 163–95.
—. 2011: 'Iron Age IIA Occupational Phases in the Coastal Plain of Israel'. In Finkelstein, I. and Na'aman, N. (eds.), *The Fire Signals of Lachish: Studies in the Archaeology and History of Israel in the Late Bronze Age, Iron Age, and Persian Period in Honor of David Ussishkin (*Winona Lake), 159–74.
Higginbotham, C.R. 2000: *Egyptianization and Elite Emulation in Ramesside Palestine: Governance and Accommodation on the Imperial Periphery* (Leiden/Boston/Cologne).
Hoffmeier, J.K. 1989: 'Reconsidering Egypt's Part in the Termination of the Middle Bronze Age in Palestine'. *Levant* 21, 181–93.
Horden, P. and Purcell, N. 2000: *The Corrupting Sea: A Study in Mediterranean History* (Oxford).
Horowitz, A. 1979: *The Quaternary of Israel* (New York).
—. 1992: *Palynology of Arid Lands* (Amsterdam).
Hürmüzlü, B. 2003: *Klazomenai Ákpinar Nekropolisi* (Dissertation, Ege Üniversitesi).
—. 2004: 'Burial Grounds at Klazomenai: Geometric through Hellenistic Periods'. In Moustaka *et al*. 2004, 77–95.
Issar, A. 1961: *The Geology of the Groundwater Resources in the Shephela and Sharon Regions* (Dissertation, Geological Survey of Israel, Jerusalem) (Hebrew, English summary pp. I–VI).
—. 1968: 'Geology of the Central Coastal Plain of Israel'. *IJES* 17, 16–29.

James, P. 2008: 'The Alleged 'Anchor Point' of 732 BC for the Destruction of Hazor V'. *Antiguo Oriente* 6, 137–83.
Johnston, A. 1990: 'Aegina. Aphaia-Tempel XIII. The Storage Amphorae'. *Archäologischer Anzeiger*, 37–64.
—. 1993: 'Pottery from Archaic Building Q at Kommos'. *Hesperia* 62, 339–82.
—. 2000: 'Building Z at Kommos: An Eighth Century B.C. Pottery Sequence'. *Hesperia* 69, 189–226.
—. 2005: 'Kommos: Further Iron Age Pottery'. *Hesperia* 74, 309–93.
Jung, R. 2007: 'On the Origin of the Wheel-Made Grey Ware Found in Central Macedonia'. In Horejs, B. and Pavúk, P. (eds.), *Aegeo-Balkan Prehistory* (http://www.aegeobalkanprehistory.net/article.php?id_art=4).
Kahn, D. 2004: 'Taharqa, King of Kush and the Assyrians'. *JSSEA* 31, 109–28.
Kalimi, I. and Richardson, S. (eds.) 2014: *Sennacherib at the Gate of Jerusalem: Story, History and Historiography* (Leiden/Boston).
Kafri, U. 1972: *Lithostratigraphy and Environment of Deposition, Judea Group, Western and Central Galilee, Israel* (Jerusalem).
Kapitän, G. 1984: 'Ancient Anchors-Technology and Classification'. *International Journal of Nautical Archaeology and Underwater Exploration* 13.1, 33–44.
Kaplan, J. 1958a: *Neolithic and Chalcolithic Settlement in Tel Aviv and Neighbourhood* (Dissertation, Hebrew University of Jerusalem) (Hebrew).
—. 1958b: 'Notes and News. Tell Abu Zeitun'. *IEJ* 8, 133–34.
—. 1959: *The Archaeology and History of Tel-Aviv-Jaffa* (Ramat Gan) (Hebrew).
—. 1971: 'Notes and News: Tel Aviv-Yafo. Tell Qudadi (esh-Shuna)'. *IEJ* 21, 174.
—. 1972: 'The Archaeology and History of Tel Aviv-Jaffa'. *Biblical Archaeologist* 35, 65–95.
Kaplan, Y. and Ritter-Kaplan, H. 1993: 'Tel Aviv'. *NEAEHL* 4, 1451–57.
Katz, H. 2007: 'Tel Zeitun'. *Qamma: Reports on Salvage Excavations* 1, 35–40 (Hebrew).
Katz, H. and Faust, A. 2012: 'The Assyrian Destruction Layer at Tel 'Eton'. *IEJ* 62, 22–53.
Katzenstein, H.J. 1983: '"Before Pharaoh Conquered Gaza" (Jeremiah XLVII 1)'. *Vetus Testamentum* 33, 249–51.
Kelly, T. 1987: 'Herodotus and the Chronology of the Kings of Sidon'. *BASOR* 268, 39–56.
Kerschner, M. 2000: Review of Cook and Dupont 1998. *Klio* 82, 553–55.
—. 2006a: 'On the Provenance of Aiolian Pottery'. In Villing and Schlotzhauer 2006, 109–26.
—. 2006b: 'Zum Beginn und zu den Phasen der griechischen Kolonisation am Schwarzen Meer'. *Eurasia Antiqua* 12, 227–50.
Kerschner, M. and Schlotzhauer, U. 2005: 'A New Classification System for East Greek Pottery'. *Ancient West & East* 4.1, 1–56.
Killebrew, A.E. 2005: *Biblical Peoples and Ethnicity: An Archaeological Study of Egyptians, Canaanites, Philistines, and Early Israel 1300–1100 B.C.E.* (Atlanta).
Kingery, W.D. and Francl, J. 1954: 'Fundamental Study of Clay: XIII, Drying Behavior and Plastic Properties'. *Journal of the American Ceramic Society* 37.12, 596–602.

Kletter, R. 2006: 'A Middle Bronze Age II Site West of Tell Qasile'. '*Atiqot* 53, 65–131.
—. 2010: Review of Schloen 2009. *Review of Biblical Literature* (http://www.bookreviews.org/pdf/7114_7729.pdf).
Kletter, R. and Gorzalczany, A. 2001: 'A Middle Bronze Age II Type of Pottery Kiln from the Coastal Plain of Israel'. *Levant* 33, 95–104.
Kletter, R. and Zwickel, W. 2006: 'The Assyrian Building of 'Ayyelet ha-Šaḥar'. *ZDPV* 122, 151–86.
Knauf, E.A. 2003: 'Who Destroyed Beersheba II?'. In Hübner, U. and Knauf, E.A. (eds.), *Kein Land für sich allein: Studien zum Kulturkontakt in Kanaan, Israel/Palästina und Ebirnari für Manfred Weippert zum 65. Geburtstag* (Freiburg), 180–95.
Kochavi, M. 1975: 'The First Two Seasons of Excavations at Aphek-Antipatris. Preliminary Report'. *Tel Aviv* 2, 17–42.
Kochavi, M. and Beit-Arieh, I. 1994: *Archaeological Survey of Israel. Map of Rosh Ha-'Ayin (78)* (Jerusalem).
Kochavi, M. and Yadin, E. 2002: 'Typological Analysis of the MB IIA Pottery from Aphek According to Its Stratigraphic Provenance'. In Bietak, M. (ed.), *The Middle Bronze Age in the Levant* (Wien), 189–225.
Kogan-Zahavi, E. 2007: *Assyrian Palace North of Tel Ashdod* (Thesis, Tel Aviv University) (Hebrew).
Kopylov, V.P. and Larenok, P.A. 1994: *Taganrogskoe Poselenie. Katalog Sluchainykh Nakhodok u Kamennoi Lestnitsy* (Taganrog).
Kotsonas, A. 2012: 'H enepigrafh keramikh tou "Upogeiou": proeleush topologia, chronologhsh kai ermhneia'. In Tzifopoulos 2012, 113–304.
Krahmalkov, C.R. 1981: 'The Historical Setting of the Adon Letter'. *Biblical Archaeologist* 44, 197–98.
Kuhrt, A. 2002: 'Greek Contacts with the Levant and Mesopotamia in the First Half of the First Millennium BC: A View from the East'. In Tsetskhladze, G.R and Snodgrass, A.M. (eds.), *Greek Settlements in the Eastern Mediterranean and the Black Sea* (Oxford), 17–40.
Lamb, W. 1932: 'Grey Wares from Lesbos'. *JHS* 52, 1–12.
Lawall, M.L. 2002: 'Ilion before Alexander: Amphoras and Economic Archaeology'. *Studia Troica* 12, 197–244.
—. 2004: 'Archaeological Context and Aegean Amphora Chronologies: A Case Study of Hellenistic Ephesos'. In Eiring, J. and Lund, J. (eds.), *Transport Amphorae and Trade in the Eastern Mediterranean* (Aarhus), 171–88.
—. 2010: 'Pontic, Aegean and Levantine Amphoras at Gordion'. In Kassab Tezgör, D. and Inaishvili, N. (eds.), *PATABS 1: Production and Trade of Amphorae in the Black Sea* (Istanbul), 159–65.
Lee, S., Bronk Ramsey, C. and Mazar, A. 2013: 'Iron Age Chronology in Israel: Results from Modeling with a Trapezoidal Bayesian Framework'. *Radiocarbon* 55.2–3, 731–40.
Lehmann G. 1996: *Untersuchungen zur späten Eisenzeit in Syrien und Libanon. Stratigraphie und Keramikformen zwischen ca. 720 bis 300 v.Chr.* (Münster).
—. 1998: 'Trends in the Local Pottery Development of the Late Iron Age and Persian Period in Syria and Lebanon, ca. 700 to 300 B.C.'. *BASOR* 311, 7–37.
—. 2002: *Bibliographie der archäologischen Fundstellen und Surveys in Syrien und Libanon* (Rahden).

Levy, Y., Peilstöcker, M. and Ginzburg, A. 2004: 'An Iron Age Fortress in the Sand Dunes of Rishon Letzion'. *Qadmoniot* 128, 92–94 (Hebrew).

Liphschitz, N. 1988: 'Dendrochronological and Dendroarchaeological Investigations in Israel as a Means for the Reconstruction of Past Vegetation and Climate'. *Pact* 22, 133–46.

Lipiński, E. 2004: *Itineraria Phoenicia* (Leuven).

Liverani, M. 1979: 'The Ideology of the Assyrian Empire'. In Larsen, M.T. (ed.), *Power and Propaganda: A Symposium on Ancient Empires* (Copenhagen), 297–317.

—. 1988: 'The Growth of the Assyrian Empire in the Habur/Middle Euphrates Area: A New Paradigm'. *SAAB* 2, 81–98.

—. 2012: '"I Constructed Palaces throughout My Country" Establishing the Assyrian Provincial Order: The Motif and Its Variants'. *Revue d'assyriologie et d'archéologie orientale* 106, 181–91.

Luckenbill, D.D. 1924: *The Annals of Senacherib* (Chicago).

Maeir, A.M., Hitchcock, L.A. and Kolska Horwitz, L. 2013: 'On the Constitution and Transformation of Philistine Identity'. *OJA* 32, 1–38.

Maeir, A.M. and Shai, I. 2005: 'Iron Age IIA Chalices from Tell es-Safi/Gath'. In Czerny, E., Hein, I., Hunger, H., Melman, D. and Schwab, A. (eds.), *Timelines. Studies in Honour of Manfred Bietak*, vol. 2 (Leuven), 357–66.

Maeir, A.M., Yellin, J. and Goren, Y. 1992: 'A Reevaluation of the Red and Black Bowl from Parker's Excavations in Jerusalem'. *OJA* 11, 39–53.

Malkin, I. and Shmueli, N. 1988: 'The "City of the Blind" and the Founding of Byzantium'. *MHR* 3, 21–36.

Marchese, R.T. 1989: 'Aegean and Cypriote Imports in the Persian Period (Strata XI–VI)'. In Herzog, Rapp and Negbi 1989, 145–52.

Martin, M.A.S. 2011: *Egyptian-Type Pottery in the Late Bronze Age Southern Levant* (Vienna).

Massey, W.T. 1919: *How Jerusalem Was Won: Being the Record of Allenby's Campaign in Palestine* (London).

Master, D.M. 2001: *The Seaport of Ashkelon in the Seventh Century BCE: A Petrographic Study* (Dissertation, Harvard University).

Mavronanos, G. forthcoming: *Iatnana and the Assyrians: Illuminating the Role of Cyprus within the Trade Network of the Assyrian Empire* (Thesis, Tel Aviv University).

Maxwell-Hyslop, K.R. 1971: *Western Asiatic Jewellery c. 3000–612 B.C.* (London).

Mazar, A. 1985: *Excavations at Tell Qasile (Part Two): The Philistine Sanctuary. Various Finds: the Pottery, Conclusions, Appendixes* (Jerusalem).

—. 1990: 'Tell-Qasile'. In Degani, Grossman and Shmueli 1990, 233–47 (Hebrew).

—. 1992: *Archaeology of the Land of the Bible 10,000–586 B.C.E.* (New York).

—. 2005: 'The Debate Over the Chronology of the Iron Age in the Southern Levant: Its History, the Current Situation, and a Suggested Resolution'. In Levy, T.E. and Higham, T. (eds.), *The Bible and Radiocarbon Dating: Archaeology, Text and Science* (London), 15–30.

—. 2006: *Excavations at Tel Beth-Shean 1989–1996 I: From the Late Bronze Age IIB to the Medieval Period* (Jerusalem).

—. 2009: 'The Iron Age Dwellings at Tell Qasile'. In Schloen 2009, 319–36.

Mazar, A. and Harpazi-Ofer, S. 1994: 'The Excavations at Tell Qasile from 1988 to 1991'. In Zeevy, R. (ed.), *Israel − People and Land* (= Eretz Israel Museum Yearbook 7–8) (Tel Aviv), 9–34 (Hebrew, English summary p. 9*).

Mazar, A. and Panitz-Cohen, N. 2001: *Timnah (Tel Batash) II: The Finds from the First Millennium BCE* (Jerusalem).

Mazar, B. 1950–51: 'The Excavations at Tell Qasîle: Preliminary Report'. *IEJ* 1, 61–76, 125–40, 194–218.

—. 1957: 'The Campaign of Pharaoh Shishak to Palestine'. In Anderson, G.W. (ed.), *Conference of the International Organization for the Study of the Old Testament: Congress Volume, Louvain, Belgium, 1956* (Leiden), 57–66.

Mazar, E. 2003: *The Phoenicians in Achziv, The Southern Cemetery. Jerome L. Joss Expedition. Final Report of Excavations 1988–1990* (Barcelona).

Meir, C. 2000: 'Coins: The Historical Evidence of the Ancient City of Jaffa'. In Kluge, B. and Weisser, B. (eds.), *XII. Internationaler Numismatischer Kongress, Berlin 1997: Akten*, vol. 1 (Berlin), 123–30.

Mitchell, T.C. 1991: 'Israel and Judah from the Coming of Assyrian Domination until the Fall of Samaria, and the Struggle for Independence in Judah (c. 750–700 B.C.)'. In *Cambridge Ancient History* III.2, 322–70.

Mommsen, H. and Pavúk, P. 2007: 'Provenance of the Grey and Tan Wares from Troia, Cyprus and the Levant: The contribution of Neutron Activation Analysis'. *Studia Troica* 17, 25–41.

Mommsen, H., Perlman, I. and Yellin, J. 1984: 'The Provenience of the *lmlk* Jars'. *IEJ* 34, 89–113.

Monakhov, S.Y. 1999: *Grecheskie Amfory v Prichernomor'e: Kompleksy Keramicheskoi Tary VII–II vekov do n.e.* (Saratov).

—. 2003: *Grecheskie Amfory v Prichernomor'e: Tipologiya Amfor Vedushchikh Tsentrov-Eksporterov Tovarov v Keramicheskoi Tare* (Moscow).

Moore, F. 1961: 'The Mechanism of Moisture Movements in Clays with Particular Reference to Drying: A Concise View'. *Transactions of the British Ceramic Society* 60, 517–39.

Moran, W.L. 1992: *The Amarna Letters* (Baltimore).

Moustaka, A., Skarlatidou, E., Tzannes, M.-C. and Ersoy, Y. (eds.) 2004: *Klazomenai, Teos and Abdera: Metropoleis and Colony* (Thessaloniki).

Na'aman, N. 1981: 'Economic Aspects of the Egyptian Occupation of Canaan'. *IEJ* 31, 172–85.

—. 1991: 'The Kingdom of Judah under Josiah'. *Tel Aviv* 18, 1–69.

—. 1995: 'Province System and Settlement Pattern in Southern Syria and Palestine in the Neo-Assyrian Period'. In Liverani, M. (ed.), *Neo-Assyrian Geography* (Rome), 103–15.

—. 1998: 'Two Notes on the History of Ashkelon and Ekron in the Late Eighth–Seventh Centuries B.C.E.'. *Tel Aviv* 25, 219–27.

—. 2001: 'An Assyrian Residence at Ramat Rahel?'. *Tel Aviv* 28, 260–80.

—. 2003: 'Ekron under the Assyrian and Egyptian Empires'. *BASOR* 332, 81–91.

—. 2007: 'When and How Did Jerusalem Become a Great City? The Rise of Jerusalem as Judah's Premier City in the Eighth–Seventh Centuries B.C.E.'. *BASOR* 347, 21–56.

—. 2009a: 'Ashkelon under the Assyrian Empire'. In Schloen 2009, 351–59.

—. 2009b. 'Was Dor the Capital of an Assyrian Province?'. *Tel Aviv* 36, 95–109.

Na'aman, N. and Zadok, R. 1988: 'Sargon II's Deportations to Israel and Philistia (716–708 B.C.)'. *JCS* 40, 36–46.
—. 2000: 'Assyrian Deportations to the Province of Samerina in the Light of Two Cuneiform Tablets from Tel Hadid'. *Tel Aviv* 27, 159–88.
Nadel, D., Bar-Yosef, O. and Gopher, A. 1991: 'Early Neolithic Arrowhead Types in the Southern Levant a Typological Suggestion'. *Paléorient* 17, 109–19.
Namdar, D., Neumann, R. and Weiner, S. 2010: 'Residue Analysis of Chalices from the Repository Pit'. In Kletter, R., Ziffer, I. and Zwickel, W., *Yavneh I: The Excavation of the 'Temple Hill' Repository Pit and the Cult Stands* (Fribourg/Göttingen), 167–73.
Naghawi, A. 1989: 'A New Rock-Cut Tomb in Jerash'. *Syria* 61, 201–17.
Naveh, J. 1962: 'The Excavations at Meṣad Ḥashavyahu: Preliminary Report'. *IEJ* 12, 89–113.
Neev, D., Almagor, G., Arad, A., Ginzburg, A. and Hall, J.K. 1976: 'The Geology of the Southeastern Mediterranean'. *Israel Geological Survey Bulletin* 68, 1–51.
Neev, D. and Bakler, N. 1978: 'Recent Tectonic Activities along the Mediterranean Coast of Israel'. *Sea and Coast* (Tel Aviv), 9–30 (Hebrew).
Neev, D., Bakler, N. and Emery, K.O. 1987: *Mediterranean Coasts of Israel and Sinai: Holocen Tectonism from Geology, Geophysics, and Archaeology* (New York).
Neev, D., Bakler, N., Moshkovitz, S., Kaufman, A., Magaritz, M. and Gofna, R. 1973: 'Recent Faulting along the Mediterranean Coast of Israel'. *Nature* 245, 254–56.
Neev, D., Shachnai, E., Hall, J.K., Bakler, N. and Ben-Avraham, Z. 1978: 'The Young (Post Lower Pleistocene) Geological History of the Caesarea Structure'. *IJES* 27, 43–64.
Nicol, C.G. 1921: *The Story of Two Campaigns: Official War History of the Auckland Mounted Rifles Regiment, 1914–1919* (Auckland).
Nir, Y. 1989: *Sedimentological Aspects of the Israel and Sinai Mediterranean Coasts* (Jerusalem) (Hebrew).
—. 1992: *The Kurkar Cliff in the Mediterranean Coast of Israel* (Geological Survey of Israel, Jerusalem) (Hebrew).
—. 1997: 'Middle and Late Holocene Sea-Levels along the Israel Mediterranean Coast – Evidence from Ancient Water Wells'. *Journal of Quaternary Science* 12, 143–51.
Noy, T. 1977: 'Neolithic Sites in the Western Coastal Plain'. *Eretz-Israel* 13, 18–33 (Hebrew).
Oliver, A. 1996: 'Roman Jewelry: A Stylistic Survey of Pieces from Excavated Contexts'. In Calinescu, A. (ed.), *Ancient Jewelry and Archaeology* (Bloomington/Indianapolis), 130–51.
Opperman, M. 2005: 'Wesenszüge der griechischen Kolonisation am Westpontos'. *Eurasia Antiqua* 11, 3–14.
Or [Ordentlich], E., Ayalon, E., Shacham, Z., Feder, S. and Shalev, S. No Date: *Archaeological Sites in Tel Aviv – Jaffa and Its Vicinity* (Eretz Israel Museum) (Tel Aviv) (Hebrew, English summary pp. 1*–14*).
Oren, E. 1984: 'Migdol: A New Fortress on the Edge of the Eastern Nile Delta'. *BASOR* 256, 7–44.
Ornan, T. 2013: 'A Rediscovered Lost Seal from Gezer'. *PEQ* 145, 53–60.
Ornan, T., Ortiz, S. and Wolf, S. 2013: 'A Newly Discovered Neo-Assyrian Cylinder Seal from Gezer in Context'. *IEJ* 63, 6–25.

Ortiz, S. 2000: *The 11/10th Century BCE Transition in the Aijalon Valley Region* (Dissertation, University of Arizona).

Panitz-Cohen, N. 2010: 'The Pottery Assemblage'. In Kletter, R., Ziffer, I. and Zwickel, W., *Yavneh I: The Excavation of the 'Temple Hill' Repository Pit and the Cult Stands* (Fribourg/Göttingen), 110–45.

Parker, B.J. 1997: 'Garrisoning the Empire: Aspects of the Construction and Maintenance of Forts on the Assyrian Frontier'. *Iraq* 59, 77–87.

—. 2000: 'The Earliest Known Reference to the Ionians'. *Ancient History Bulletin* 14, 69–77.

—. 2002: 'At the Edge of Empire: Conceptualizing Assyria's Anatolian Frontier ca. 700 B.C.'. *Journal of Anthropological Archaeology* 21, 371–95.

—. 2003: 'Archaeological Manifestations of Empire: Assyria's Imprint on Southeastern Anatolia'. *AJA* 107, 525–57.

Pavúk, P. 2007: 'Grey Wares as a Phenomenon'. In Horejs, B. and Pavúk, P. (eds.), *Aegeo-Balkan Prehistory* (http://www.aegeobalkanprehistory.net/article.php?id_art=5).

Paz, Y. 2006: 'Area UN: The Ussishkin–Netzer Excavation, 1967'. In Greenberg, R., Eisenberg, E., Paz, S. and Paz, Y., *Bet Yeraḥ: The Early Bronze Age Mound. 1: Excavation Reports, 1936–1986* (Jerusalem), 277–338.

Peilstöcker, M. 2011: 'History of Archaeological Research in Jaffa, 1948–2009'. In Peilstöcker, M. and Burke, A.A. (eds.), *The History and Archaeology of Jaffa* (Los Angeles), 17–32.

Petrie, F. 1930: *Beth-Pelet I (Tell Fara)* (London).

Petropoulos, E.K. 2003: 'Problems in the History and Archaeology of the Greek Colonization of the Black Sea'. In Grammenos, D.V. and Petropoulos, E.K. (eds.), *Ancient Greek Colonies in the Black Sea* (Thessaloniki), 17–94.

—. 2005: *Hellenic Colonization in Euxeinos Pontos: Penetration, Early Establishment and the Problem of the 'Emporion' Revisited* (Oxford).

Pfeiler, B. 1970: *Römischer Goldschmuck des ersten und zweiten Jahrhunderts n. Chr. nach datierten Funden* (Mainz).

Picard, L. and Avnimelech, M. 1937: 'On the Geology of the Central Coastal Plain'. *Bulletin of the Geological Department, Hebrew University, Jerusalem* (Series I) 4, 255–99.

Porat, N. 1989a: 'Petrography of Pottery from Southern Israel and Sinai'. In de Miroschedji, P. (ed.), *L'urbanisation de la Palestine à l'Âge du Bronze ancient: Bilan et perspectives des recherches actuelles* (Oxford), 169–88.

—. 1989b: *Composition of Pottery – Application to the Study of the Interrelations between Canaan and Egypt during the Third Millennium B.C.* (Dissertation, Hebrew University of Jerusalem).

Porten, B. 1981: 'The Identity of King Adon'. *Biblical Archaeologist* 44, 36–52.

Posamentir, R. 2006: 'The Greeks in Berezan and Naukratis: A Similar Story?'. In Villing and Schlotzhauer 2006, 159–67.

Postgate, J.N. 1974: *Taxation and Conscription in the Assyrian Empire* (Rome).

—. 1992: 'The Land of Assur and the Yoke of Assur'. *World Archaeology* 23.3, 247–63.

—. 2007: 'The Invisible Hierarchy: Assyrian Military and Civilian Administration in the 8th and 7th centuries B.C.'. In Postgate, J.N. (ed.), *The Land of Assur and the Yoke of Assur: Studies on Assyria 1971–2005* (Oxford), 331–60.

Powles, C.G. (ed.) 1928: *The History of the Canterbury Mounted Rifles 1914–1919* (Auckland).
—. 1922: *The New Zealanders in Sinai and Palestine* (Auckland).
Pritchard, J.B. (ed.) 1969: *Ancient Near Eastern Texts Relating to the Old Testament* (Princeton).
Quarantelli, E. (ed.) 1985: *The Land between Two Rivers. Twenty Years of Italian Archaeology in the Middle East. The Treasures of Mesopotamia* (Turin).
Raban, A. 1985: The Ancient Harbours of Israel in Biblical Times. In Raban, A. (ed.), *Harbour Archaeology* (Oxford), 11–44.
—. 1994: 'The Ancient Harbors of Jaffa'. In Zeevy, R. (ed.), *Israel − People and Land* (= Eretz Israel Museum Yearbook 7–8) (Tel Aviv), 95–114 (Hebrew, English summary pp. 13*–14*).
—. 1998: 'Anchorages and Harbors on the Coast of Israel during the Bronze Age'. *Qadmoniot* 116, 90–108 (Hebrew).
Radner, K. 2008: 'Esarhaddon's Expedition from Palestine to Egypt in 671 BCE: A Trek through Negev and Sinai'. In Bonatz, D., Czichon, R. and Kreppner, F.J. (eds.), *Fundstellen: Gesammelte Schriften zur Archäologie und Geschichte Altvorderasiens ad honorem Hartmut Kühne* (Wiesbaden), 305–14.
—. 2012: 'After Eltekeh: Royal Hostages from Egypt at the Assyrian Court'. In Baker, H.D., Kaniuth, K. and Otto, A. (eds.), *Stories of Long Ago. Festschrift für Michael D. Roaf* (Münster), 471–79.
Rahmani, L.Y. 1976: 'Roman Tombs in Naḥal Raqafot, Jerusalem'. '*Atiqot* 11, 77–88.
Rainey, A.F. 1990: 'Tel Gerisa and the Danite Inheritance'. In Zeevy, R. (ed.), *Israel – People and Land* (= Eretz Israel Museum Yearbook 5–6) (Tel-Aviv), 59–72 (Hebrew; English Abstract on p. 14*).
—. 2001: 'Herodotus' Description of the East Mediterranean Coast'. *BASOR* 321, 57–63.
Ravikovitch, S. 1969: *Manual and Map of Soils of Israel* (Jerusalem) (Hebrew).
—. 1981: *The Soils of Israel: Formation, Nature and Properties* (Tel Aviv) (Hebrew).
Redford, D. 2003: *The Wars in Syria and Palestine of Thutmose III* (Leiden/Boston).
Reich, R. 1984: 'The Identification of the "Sealed *Karu* of Egypt"'. *IEJ* 34, 32–38.
—. 1993: 'Abu Salima, Tell (Sheikh Zuweid)'. *NEAEHL* 4, 1396–98.
Reich, R. and Brandl, B. 1985: 'Gezer under Assyrian Rule'. *PEQ* 117, 41–54.
Revere, R.B. 1957: '"No Man's Coast": Ports of Trade in the Eastern Mediterranean'. In Polanyi, K., Arensberg, C.R. and Pearson, H.W. (eds.), *Trade and Market in the Early Empires: Economies in History and Theory* (*Glencoe, IL*), 38–63.
Rice, P.M. 1987: *Pottery Analysis: A Sourcebook* (Chicago).
Roll, I. and Ayalon, E. 1989: *Apollonia and Southern Sharon: Model of a Coastal City and Its Hinterland* (Tel Aviv) (Hebrew with English summary pp. IV–IX).
Roll, I. and Tal, O. 2008: 'The Route Network of Persian Period Palestine'. In Kühne, H., Czichon, R.M and Janoscha Kreppner, F. (eds.), *Proceedings of the 4th International Congress on the Archaeology of the Ancient Near East, 29 March–3 April 2004* (Wiesbaden), 219–28.
Ronen, A. 1980: 'The Origin of the Raised Pelecypod Beds along the Mediterranean Coast of Israel'. *Paléorient* 6, 165–72.
Rose, C.B. 2008: 'Separating Fact from Fiction in the Aiolian Migration'. *Hesperia* 77, 399–430.

Rosen-Ayalon, M. 1995: 'Between Cairo and Damascus: Rural Life and Urban Economics in the Holy Land during the Ayyubid, Mamluk and Ottoman Periods'. In Levy T.E. (ed.), *The Archaeology of Society in the Holy Land* (Leicester), 512–23.
Sass, E. 1972: 'Geology of the Umm el Fahm Area, Northern Israel'. *IJES* 17, 115–30.
—. 1980: 'Late Cretaceous Volcanism in Mount Carmel, Israel'. *IJES* 29, 8–24.
Schipper, B.U. 2010: 'Egypt and the Kingdom of Judah under Josiah and Jehoiakim'. *Tel Aviv* 37, 200–26.
Schloen, J.D. (ed.) 2009: *Exploring the Longue Durée: Essays in Honor of Lawrence E. Stager* (Winona Lake).
Seifert, M. 2004: *Herkunftsbestimmung archaischer Keramik am Beispiel von Amphoren aus Milet* (Oxford).
Şenol, A.K. 2007: 'Hellenistik Dönem'de Khios ve Lesbos Şarabinin Misir'a Ihracati'. *Arkeoloji Dergisi* 9.1, 91–116.
Sezgin, Y. 2004: 'Clazomenian Transport Amphorae of the Seventh and Sixth Centuries'. In Moustaka *et al*. 2004, 169–83.
Shai, I. and Maeir, A.M. 2012: 'The Late Iron Age IIA Pottery Assemblage from Stratum A3'. In Maeir, A.M. (ed.), *Tell es-Safi/Gath I: The 1996–2005 Seasons. Part 1: Text* (Wiesbaden), 313–63.
Shaltiel, E. 1990: *Pinhas Rutenberg, 1879–1942: Life and Times* (Tel Aviv) (Hebrew).
Shamir, O. 1996: 'Loomweights and Whorls'. In Ariel, D.T. and De Groot, A. (eds.), *Excavations at the City of David 1978–1985 IV: Various Reports* (Jerusalem), 135–70.
—. 2009: 'The Loom Weights'. In Greenhut, Z. and De Groot, A., *Salvage Excavations at Tel Moẓa: The Bronze and Iron Age Settlements and Later Occupations* (Jerusalem), 157–61.
Sharon, I., Glboa, A., Jull, T.A.J. and Boaretto, E. 2007: 'Report on the First Stage of the Iron Age Dating Project in Israel: Supporting a Low Chronology'. *Radiocarbon* 49.1, 1–46.
Shavit, A. 2003: *Settlement Patterns in Israel's Southern Coastal Plain during the Iron Age II* (Dissertation, Tel Aviv University) (Hebrew).
—. 2008: 'Settlement Patterns of Philistine City-States'. In Fantalkin and Yasur-Landau 2008, 135–64.
Shea, W.H. 1985: 'Sennacherib's Second Palestinian Campaign'. *JBL* 104, 401–18.
Sherratt, E.S. 1992: 'Immigration and Archaeology: Some Indirect Reflections'. In Aström, P. (ed.), *Acta Cypria*, vol. 2 (Jonsered), 316–47.
—. 1998: '"Sea Peoples" and the Economic Structure of the Late Second Millennium in the Eastern Mediterranean'. In Gitin, S., Mazar, A. and Stern, E. (eds.), *Mediterranean Peoples in Transition: Thirteenth to Early Tenth Centuries BCE* (Jerusalem), 292–313.
—. 2013: 'The Ceramic Phenomenon of the "Sea Peoples": An Overview'. In Killebrew, A.E. and Lehmann, G. (eds.), *The Philistines and Other 'Sea Peoples' in Text and Archaeology* (Atlanta), 619–44.
Shiloh, Y. 1979: *The Proto-Aeolic Capital and Israelite Ashlar Masonry* (Jerusalem).
Shipley, D.G.J. 2011: *Pseudo-Skylax's Periplous: The Circumnavigation of the Inhabited World* (Exeter).
—. 2012: 'Pseudo-Skylax and the Natural Philosophers'. *JHS* 132, 121–38.
Singer, A. 2007: *The Soils of Israel* (Berlin).

Singer-Avitz, L. 1989a: Iron Age Pottery (Strata XIV–XII)'. In Herzog, Rapp and Negbi 1989, 76–87.
—. 1989b: 'Local Pottery of the Persian Period (Strata XI–VI)'. In Herzog, Rapp and Negbi 1989, 115–44.
Singer-Avitz, L. and Levy, Y. 1992: 'An MBIIa Kiln at the Naḥal Soreq Site'. *'Atiqot* 21, 9*–14* (Hebrew).
Sivan, D., Wdowinski, S., Lambeck, K., Galili, E. and Raban, A. 2001: 'Holocene Sea-Level Changes along the Mediterranean Coast of Israel, Based on Archaeological Observations and Numerical Model'. *Palaeogeography, Palaeoclimatology, Palaeoecology* 167, 101–17.
Skarlatidou, E. 1986: 'The Archaic Cemetery of Abdera'. *Thracia Pontica* 3, 99–108.
—. 2004: 'The Archaic Cemetery of the Clazomenian Colony at Abdera'. In Moustaka *et al*. 2004, 249–59.
Smoláriková, K. 2002: *Abusir VII: Greek Imports in Egypt. Graeco-Egyptian Relations during the First Millennium B.C*. (Prague).
Sneh, A., Bartov, Y. and Rosensaft, M. 1998: *Geological Map of Israel, 1:200.000* (Jerusalem).
Sommer, M. 2007: 'Networks of Commerce and Knowledge in the Iron Age: The Case of the Phoenicians'. *MHR* 22, 97–111.
Sowada, K.N. 2009: *Egypt in the Eastern Mediterranean during the Old Kingdom* (Fribourg/Göttingen).
Spalinger, A. 1973: 'The Year 712 B.C. and its Implications for Egyptian History'. *Journal of the American Research Center in Egypt* 10, 95–101.
—. 1981: 'Notes on the Military in Egypt during the XXVth Dynasty'. *JSSEA* 11, 37–58.
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).
Spencer, N. 1995: 'Early Lesbos between East and West: A "Grey Area" of Aegean Archaeology'. *ABSA* 90, 269–306.
Stager, L.E. 1996: 'Ashkelon and the Archaeology of Destruction: Kislev 604 BCE'. *Eretz-Israel* 25, 61*–74*.
—. 2001: 'Port Power in the Early and the Middle Bronze Age: The Organization of Maritime Trade and Hinterland Production'. In Wolff, S.R. (ed.), *Studies in the Archaeology of Israel and Neighboring Lands in Memory of Douglas L. Esse* (Chicago), 625–38.
Stager, L.E., Master, D.M. and Schloen, J.D. (eds.) 2011: *Ashkelon 3: The Seventh Century B.C*. (Winona Lake).
Stager, L.E., Schloen, J.D. and Master, D.M. (eds.) 2008: *Ashkelon 1: Introduction and Overview (1985–2006)* (Winona Lake).
Stea, G. 2000: 'Evidenze del commercio e dell'artigianato nel golfo di Taranto'. In Krinziger, F. (ed.), *Die Ägäis und das westliche Mittelmeer. Beziehungen und Wechselwirkungen 8. bis 5. Jh. v. Chr* (Vienna), 471–77.
Stern, E. 1982: *Material Culture of the Land of the Bible in the Persian Period 538–332 B.C*. (Warminster/Jerusalem).
—. 2001: *Archaeology of the Land of the Bible II: The Assyrian, Babylonian and Persian Periods, 722–332 BCE* (New York).

Stern, S. 1982: 'Tel Aviv Port: An Episode in the History of Eretz-Israel'. *Cathedra* 25, 113–34 (Hebrew).

Sukenik, E.L. 1939: 'Tell esh Shūni (Tell el Kudādi)'. *QDAP* 8, 167–68.

—. 1945: 'Tell esh Shūni, near Tel Aviv'. *QDAP* 11, 118.

Tadmor, H. 1958: 'The Campaigns of Sargon II of Assur: A Chronological-Historical Study (Conclusion)'. *JCS* 12, 77–100.

—. 1994: *The Inscriptions of Tiglath Pileser III, King of Assyria* (Jerusalem).

Tadmor, H. and Tadmor, M. 1995: 'The Seal of Bel-asharedu – A Case of "Migration"'. In Van Lerberghe, K. and Schoors, A. (eds.), *Immigration and Emigration within the Ancient Near East: Festschrift E. Lipiński* (Leuven), 345–55.

Tal, O. 1999: 'The Persian Period'. In Roll, O. and Tal, O., *Apollonia-Arsuf: Final Report of the Excavations I: The Persian and Hellenistic Periods (with Appendices on the Chalcolithic and Iron Age II Remains)* (Tel Aviv), 83–222.

Tal, O. and Fantalkin, A. 2009a: 'An Iron Age IIB Fortress at Tell Qudadi: A Preliminary Study'. *Eretz-Israel* 29, 192–205 (Hebrew, English summary p. 289*).

—. 2009b: 'The Region of Tel Aviv during the First Millennium BCE – Between Kingdoms and Empires'. In Gophna, R., Ayalon, E. and Bashkin-Yosef, N. (eds.), *The Secret History of Tel Aviv* (Tel Aviv/Jerusalem), 81–111 (Hebrew).

Tal, O. and Taxel, I. 2010: 'A Re-Appraisal of the Archaeological Findings at Tel Ḥashash: On the archaeology of the Yarqon Estuary from Classical Times to Late Antiquity'. *PEQ* 142, 95–126.

—. 2014: 'Samaritan Burial Customs outside Samaria: Evidence from Late Roman and Byzantine Cemeteries in the Southern Sharon Plain'. *ZDPV* 130, 155–80.

Tal, O., Taxel, I. and Jackson-Tal, R. 2013: 'Khirbet al-Ḥadra: More on Refuse Disposal Practices in Early Islamic Palestine and Their Socio-Economic Implications'. *Strata: The Bulletin of the Anglo-Israel Archaeological Society* 31, 117–48.

Thompson, E. 1929: *Crusader's Coast* (London).

Thureau-Dangin, F. 1912: *Une relation de la huitième campagne de Sargon, textes cunéiformes du Louvre*, vol. 3 (Paris).

Toker, E., Sivan, D., Stern, E., Shirman, B., Tsimplis, M. and Spada, G. 2012: 'Evidence for Centennial Scale Sea Level Variability during the Medieval Climate Optimum (Crusader period) in Israel, Eastern Mediterranean'. *Earth and Planetary Science Letters* 315–316, 51–61.

Torge, H. 2007: *The Foothills of the Yarkon Basin during the Iron Age* (Thesis, Tel Aviv University).

Tsetskhladze, G.R. 1994: 'Greek Penetration of the Black Sea'. In Tsetskhladze, G.R. and De Angelis, F. (eds.), *The Archaeology of Greek Colonisation: Essays Dedicated to Sir John Boardman* (Oxford), 111–35.

—. 1998: 'Greek Colonisation of the Black Sea Area: Stages, Models, and Native Population'. In Tsetskhladze, G.R. (ed.), *The Greek Colonisation of the Black Sea Area: Historical Interpration of Archaeology* (Stuttgart), 9–68.

—. 2002: 'Ionians Abroad'. In Tsetskhladze, G.R. and Snodgrass, A.M. (eds.), *Greek Settlements in the Eastern Mediterranean and the Black Sea* (Oxford), 81–96.

—. 2012: 'Pots versus People: Further Consideration of the Earliest Examples of East Greek Pottery in Native Settlements of the Northern Pontus'. In Hermary, A. and Tsetskhladze, G.R. (eds.), *From the Pillars of Hercules to the Footsteps of the Argonauts* (Leuven/Paris/Walpole, MA), 315–74.

Tufnell, O. 1953: *Lachish III (Tell ed-Duweir): The Iron Age* (Oxford).
—. 1958: *Lachish IV (Tell el Duweir): The Bronze Age* (Oxford).
Twede, D. 2002: 'Commercial Amphoras: The Earliest Consumer Packages?'. *Journal of Macromarketing* 22.1, 98–108.
Tzifopoulos, G.Z. (ed.) 2012: *Methōnē Pierias I: Epigraphes, charagmata kai emporika symbola stē geōmetrikē kai archaïkē keramikē apo to 'Hypogeio' tēs Methōnēs Pierias stē Makedonia* (Thessaloniki).
Ussishkin, D. 1990: 'Notes on Megiddo, Gezer, Ashdod, and Tel Batash in the Tenth to Ninth Centuries B.C.'. *BASOR* 277–278, 71–91.
—. 2004: *The Renewed Archaeological Excavations at Lachish 1973–1994*, 5 vols. (Tel Aviv).
Vachtina, M.J. 2007: 'Greek Orientalising Pottery from Barbarian Sites of the Forest-Steppe Zone of the northern Black Sea Coastal Region'. In Gabrielsen, V. and Lund, J. (eds.), *The Black Sea in Antiquity: Regional and Interregional Economic Exchanges* (Aarhus), 23–38.
van den Brink, E.C.M. 2005: 'The Ceramic Ossuaries'. In van den Brink, E.C.M. and Gophna, R., *Shoham (North): Late Chalcolithic Burial Caves in the Lod Valley, Israel* (Jerusalem), 27–46.
Vanderhooft, D. 1999: *The Neo-Babylonian Empire and Babylon in the Latter Prophets* (Atlanta).
Villing, A. 2006: '"Drab Bowls" for Apollo: the Mortaria of Naukratis and Exchange in the Archaic East Mediterranean'. In Villing and Schlotzhauer 2006, 31–46.
Villing, A. and Schlotzhauer, U. (eds.) 2006: *Naukratis: Greek Diversity in Egypt. Studies on East Greek Pottery and Exchange in the Eastern Mediterranean* (London).
Villing, A. and Spataro, M. 2009: 'Scientific Investigation of Pottery Grinding Bowls in the Archaic and Classical Eastern Mediterranean'. *British Museum Technical Research Bulletin* 3, 89–100.
Vita-Finzi, C. 1978: *Archaeological Sites in Their Setting* (London).
Waldbaum, J.C. 2002: 'Seventh Century B.C. Greek Pottery from Ashkelon, Israel: an entrepŏt in the Southern Levant'. In Faudot, A., Fraysse, A. and Geny, É. (eds.), *Pont-Euxin et commerce la genèse de la 'Route de la Soie'* (Paris), 57–75.
—. 2011: 'Greek Pottery'. In Stager, Master and Schloen 2011, 127–338.
Wazana, N. 2003: '"I Removed the Boundaries of Nations" (Isa. 10:13): Border Shifts as a Neo-Assyrian Tool of Political Control in Ḫattu'. *Eretz Israel* 27, 110–21 (Hebrew).
Weinstein, J. 1981: 'The Egyptian Empire in Palestine: A Reassessment'. *BASOR* 241, 1–28.
Wente, E.F. and Van Siclen, C.C. 1977: 'A Chronology of the New Kingdom'. In Johnson, J.H. and Wente, E.F. (eds.), *Studies in Honor of George R. Hughes* (Chicago), 217–61.
Whitbread, I.K. 1995: *Greek Transport Amphorae: A Petrological and Archaeological Study* (Exeter).
Wiseman, G. and Hayati, G. 1971: *Stability Study of the Coastal Cliff; Progress Report 1970–71* (Haifa) (Hebrew).
Wolff, S. 2000: 'Tel Megadim (Tel Sahar)'. *ESI* 20, 23*–24*.
Wright, G.R.H. 1985: *Ancient Building in South Syria and Palestine* (Leiden).

Yadin, Y., Aharoni, Y., Amiran, R., Ben-Tor, A., Dothan, M., Dothan, T., Dunayevsky, I., Geva, S. and Stern, E. 1989: *Hazor III–IV: An Account of the Third and Fourth Seasons of Excavation, 1957–1958*, edited by A. Ben-Tor (Jerusalem).

Yadin, Y., Aharoni, Y., Amiran, R., Dothan, T., Dunayevsky, I. and Perrot, J. 1958: *Hazor I: An Account of the First Season of Excavations, 1955* (Jerusalem).

Yamada, S. 2008: 'Qurdi-Assur-Lamur: His Letters and Career'. In Cogan, M. and Kahn, D. (eds.), *Treasures on Camels' Humps: Historical and Literary Studies from the Ancient Near East Presented to Israel Eph'al* (Jerusalem), 296–311.

Yannai, E. 2006: *'En Esur ('Ein Asawir) I: Excavations at a Proto-historic Site in the Coastal Plain of Israel* (Jerusalem).

Yasur-Landau, A. 2010: *The Philistines and Aegean Migration at the End of the Late Bronze Age* (Cambridge).

Yeivin, S. 1960: 'Did the Kingdom of Israel Have a Maritime Policy?'. *Jerusalem Quarterly Review* 50, 193–228.

Yurco, F.J. 1991: 'The Shabaka-Shebitku Coregency and the Supposed Second Campaign of Sennacherib against Judah: A Critical Assessment'. *JBL* 110, 35–45.

Zachos, G. 2012: 'Archaic Pottery from Eresos, Lesbos'. In Tiverios, M., Misailidou-Despotidou, V., Manakidou, E. and Arvanitaki, A. (eds.), *Archaic Pottery of the Northern Aegean and Its Periphery (700–480 BC)* (Thessaloniki), 305–20.

Zamazalová, S. 2011: 'Before the Assyrian Conquest in 671 B.C.E: Relations between Egypt, Kush and Assyria'. In Mynářová, J. (ed.), *Egypt and the Near East – The Crossroads* (Prague), 297–328.

Zarzecki-Peleg, A., Cohen-Anidjar, S. and Ben-Tor, A. 2005: 'Part II: Pottery Analysis'. In Ben-Tor, A., Zarzecki-Peleg, A. and Cohen-Anidjar, S., *Yoqnea'am II: The Iron Age and the Persian Period. Final Report of the Archaeological Excavations (1977–1988)* (Jerusalem), 235–344.

Zimhoni, O. 1997: *Studies in the Iron Age Pottery of Israel: Typological, Archaeological and Chronological Aspects* (Tel Aviv).

—. 2004: 'The Pottery of Levels III and II'. In Ussishkin 2004 IV, 1789–1899.

Zukerman, A. and Ben-Shlomo, D. 2011: 'Mortaria as a Foreign Element in the Material Culture of the Southern Levant during the 8th-7th Centuries BCE'. *PEQ* 143, 87–105.